SMD/BLOCK Type
EMI Suppression Filters

EMIFIL®

Murata
Manufacturing Co., Ltd.

C31E.pdf
09.4.20

Introduction

Murata Manufacturing Co., Ltd. has been developed the EMI suppression device market since the invention of 3 terminal capacitor DS310 series in 1979. Also, we have been struggling to develop and popularize new noise countermeasure technologies as well as new products in the concept of "Develop unique products", as the best solution partner of customers.
We hope you can find your key device to your noise problem.

Explanation of symbols in this catalog

	Features of each series	Features of each item
All Products	Flow soldering available	New product
	Reflow soldering available	Exist in design kit
	Meet large current lines	Rated current 1A or more
		Rated current 3A or more
Cip Ferrite Bead	Meet high frequency noise up to 1-2GHz	
	Meet ultra high frequency noise up to 10GHz	
LC Combined Type Filter		Low cut off frequency type for UHF band noise which affects to digital TV tuner
Chip Common Mode Choke Coil		for high speed differential signal lines (USB/LVDS/IEEE1394 etc.)
		for ultra high speed differential signal lines (HDMI/DVI/Display Port etc.)
		Line impedance has been matched to transmission lines

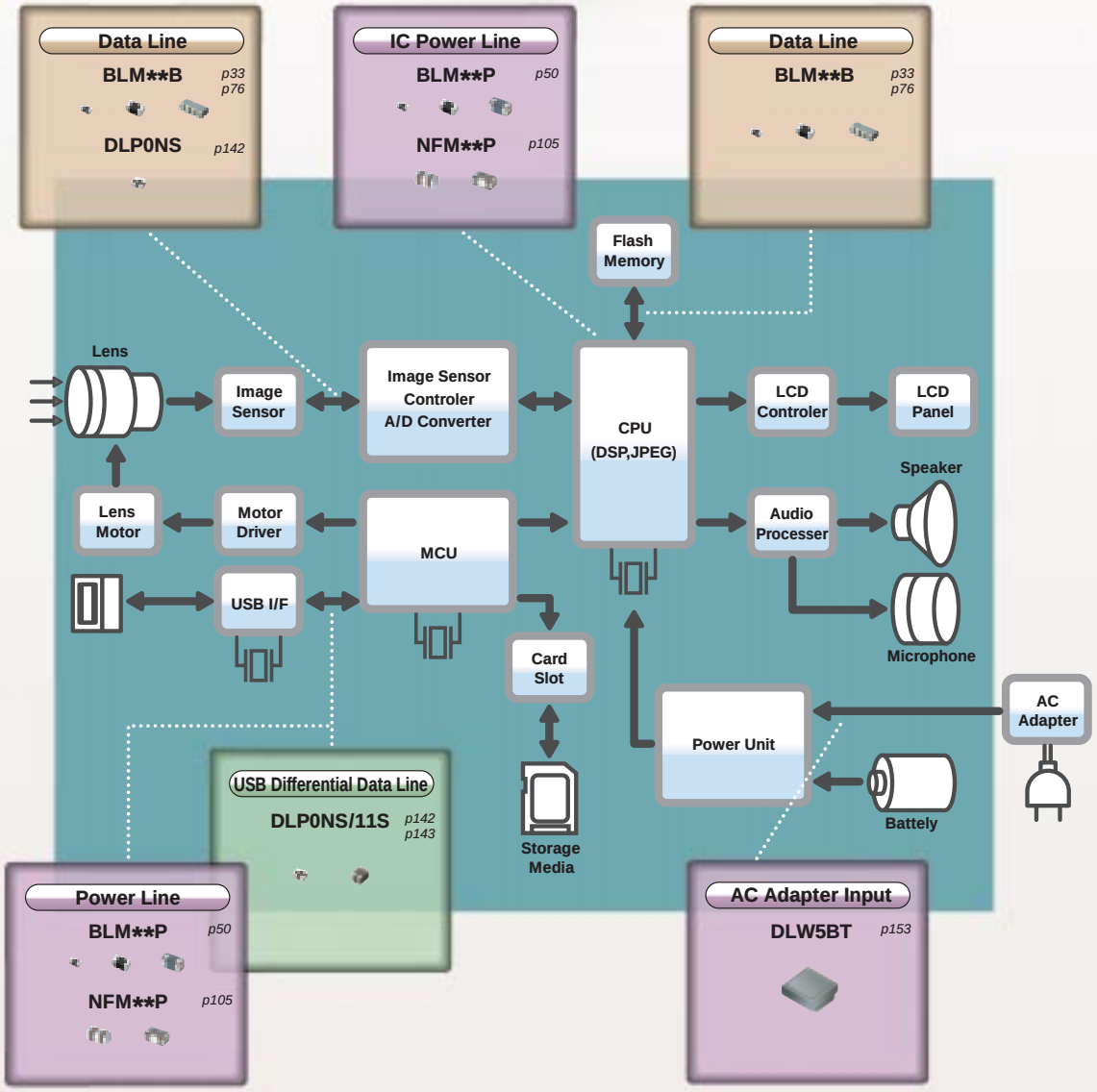
for EU RoHS Compliant

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment".
- For more details, please refer to our website 'Murata's Approach for EU RoHS' (http://www.murata.com/info/rohs.html).

CONTENTS

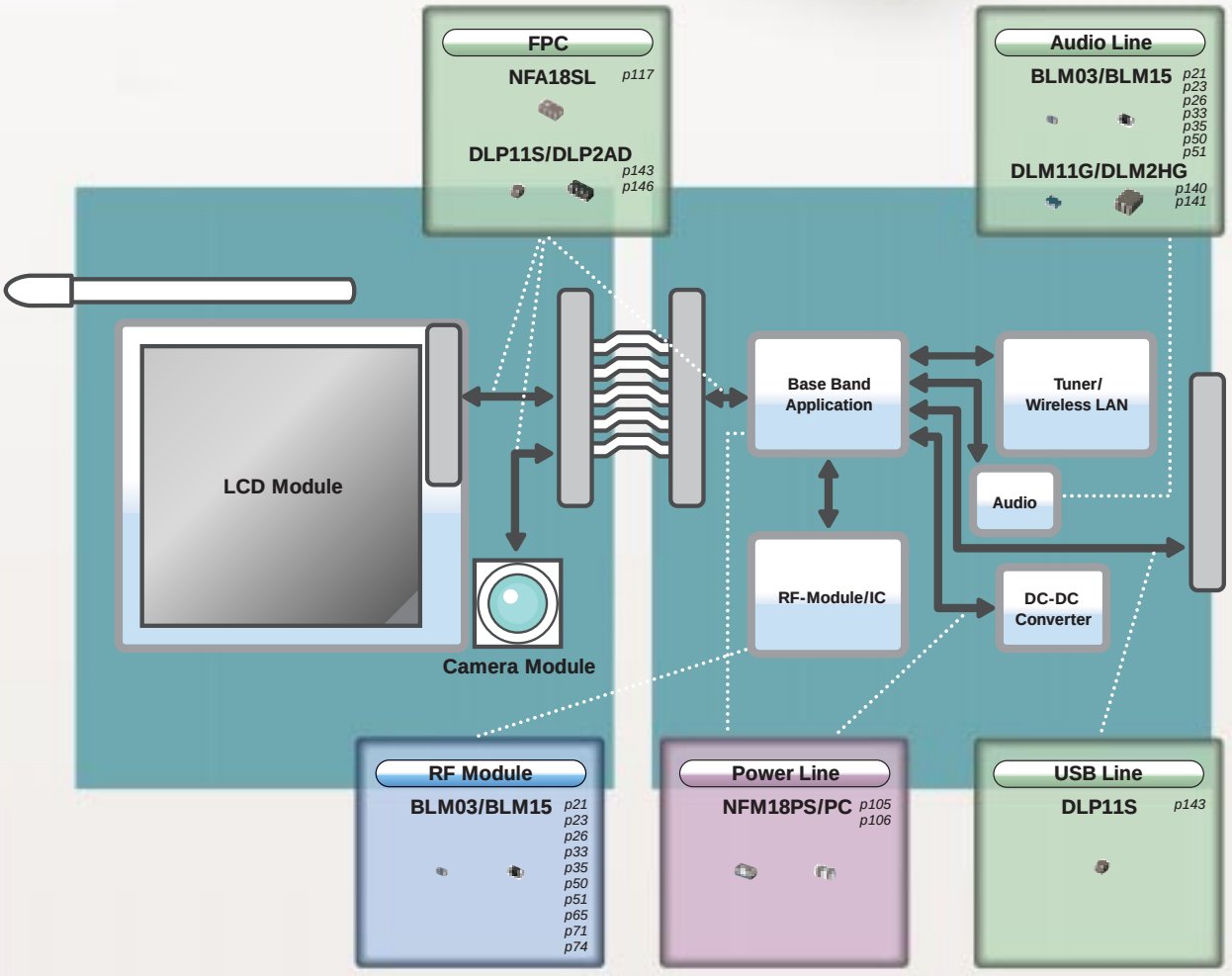
Digital Still Camera

Application Sample



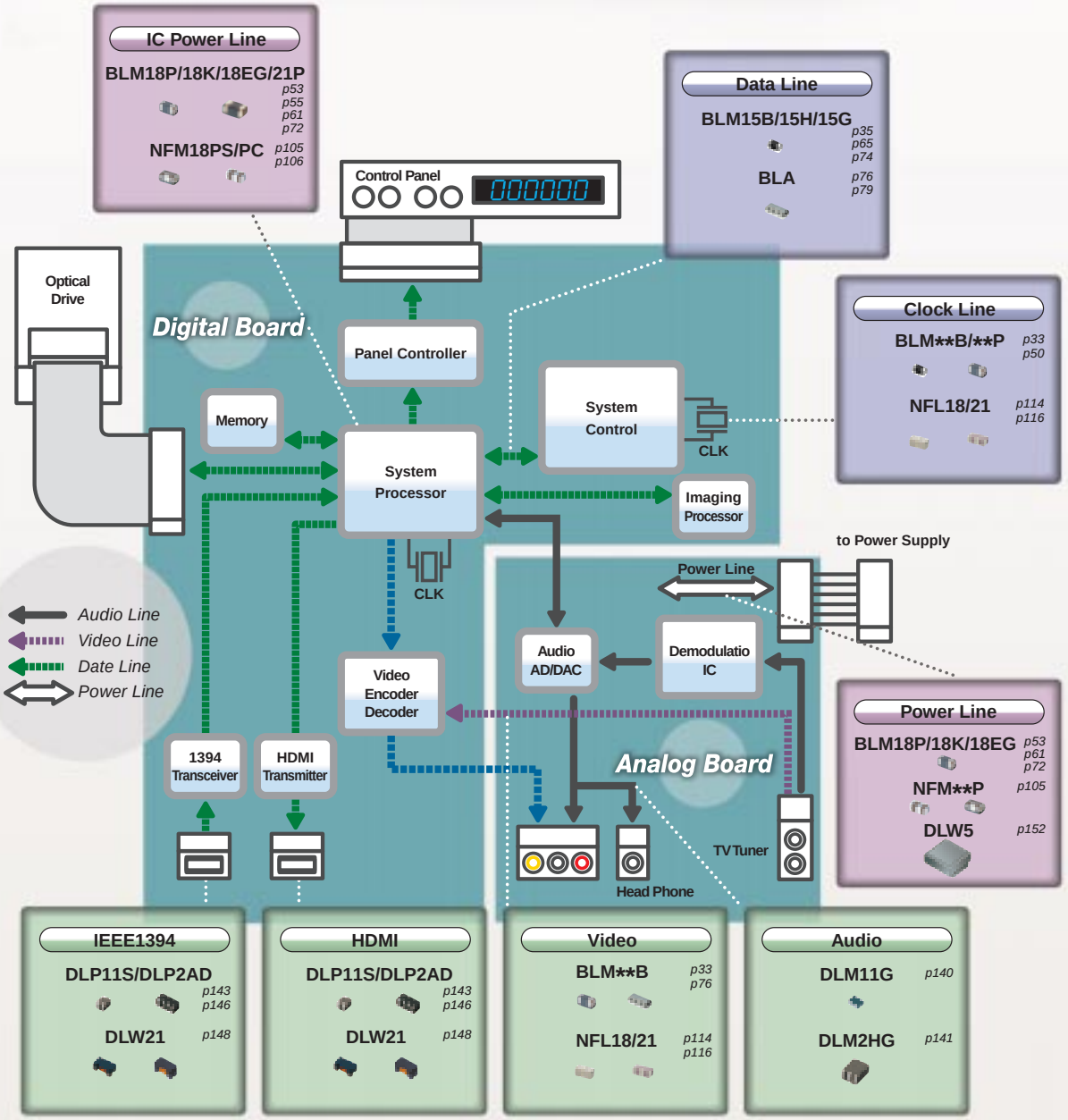
Mobile Phone

Application Sample



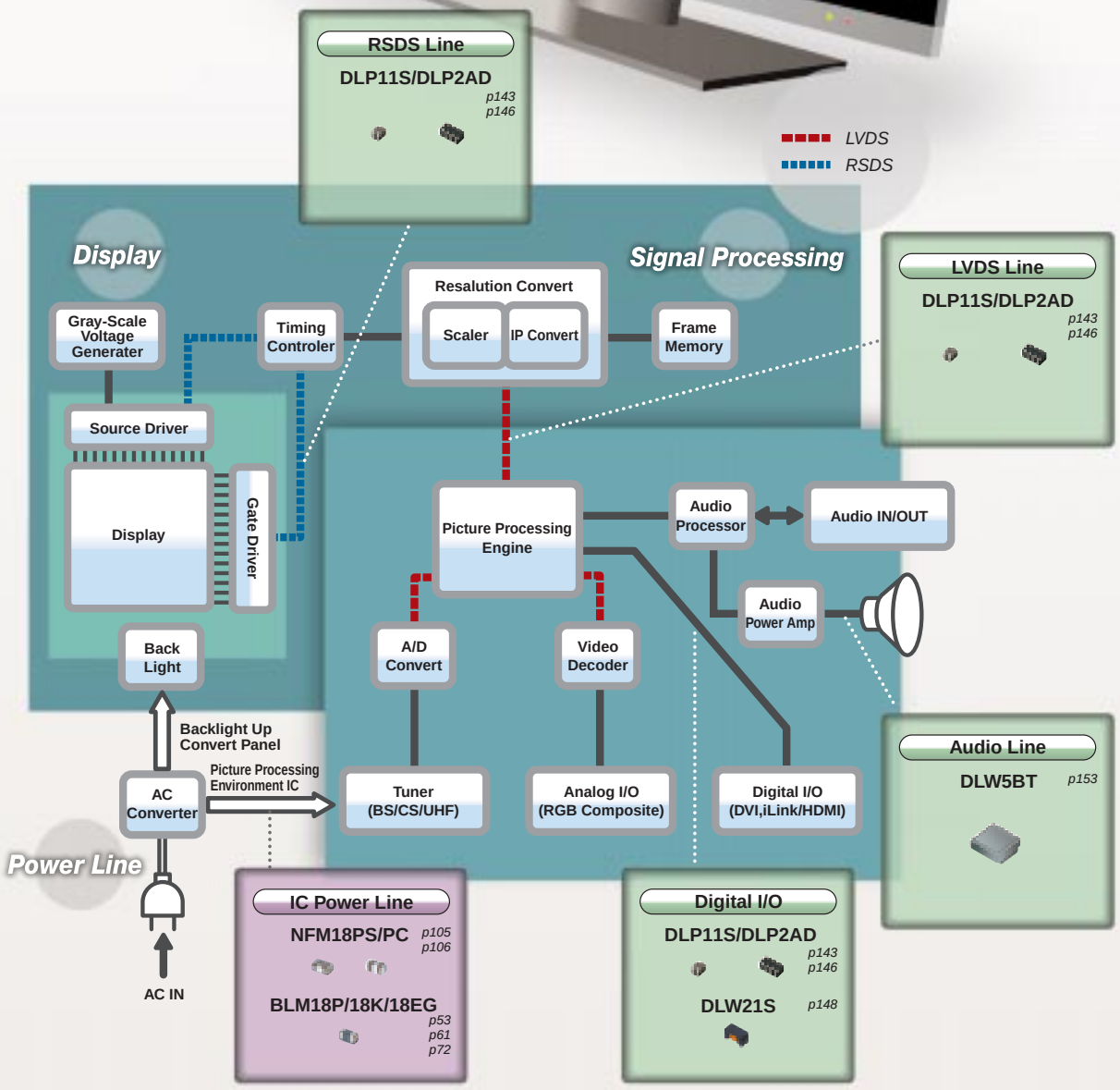
Blu-ray/DVD

Application Sample



LCD-TV

Application Sample



EMI Filter Selection by Circuits and Noise Frequency

●Chip Ferrite Bead / Chip EMIFIL®

Circuit Type?

Noise Frequency?

Noise Frequency: Under 1GHz

Inductor Type (Suppression Effect: Normal)

Power Line	General Signal Line (Under 10MHz)	High Speed Signal Line (Over 10MHz)
BLM03P p50 0201/0.75-0.9A/Imp.22-33Ω	**BLM02A** p20 01005/Imp.10-120Ω	**BLM03B** p33 0201/Imp.10-600Ω
BLM15P p51 0402/1-2.2A/Imp.10-120Ω	**BLM03A** p21 0201/Imp.10-1000Ω	**BLM15B** p35 0402/Imp.5-1800Ω
BLM18P p53 0603/0.5-3A/Imp.30-470Ω	**BLM15A** p23 0402/Imp.10-1000Ω	**BLM18B** p38 0603/Imp.5-2500Ω
BLM21P p55 0805/1.5-6A/Imp.22-330Ω	**BLM18A** p28 0603/Imp.120-1000Ω	**BLM21B** p42 0805/Imp.5-2700Ω
BLM31P p57 1206/1.5-6A/Imp.33-600Ω	**BLM18T** p32 0603/Imp.120-1000Ω	Array Type
BLM41P p59 1806/1.5-6A/Imp.60-1000Ω	**BLM18R** p45 0603/Imp.120-1000Ω	**BLA2AB** p76 0804/Imp.10-1000Ω
Low DC Resistance Type	**BLM21A** p30 0805/Imp.120-1000Ω	**BLA31B** p79 1206/Imp.120-1000Ω
BLM18K p61 0603/1.3-6A/Imp.26-600Ω	**BLM21R** p47 0805/Imp.120-1000Ω	
BLM18S p63 0603/1.5-6A/Imp.26-330Ω	Array Type	
	BLA2AA p76 0804/Imp.120-1000Ω	
	BLA31A p79 1206/Imp.30-1000Ω	

Capacitor Type (Suppression Effect: High)

Power Line	General Signal Line (Under 10MHz)	High Speed Signal Line (Over 10MHz)
NFM18PC p106 0603/2-4A/Cap.0.1-2.2μF	**NFM18C** p100 0603/Cap.22-22000pF	LC Combined
NFM21P p107 0805/2-6A/Cap.0.1-4.7μF	**NFM21C** p101 0805/Cap.22-22000pF	**NFL18ST** p114 0603/Cut off 200-500MHz
NFM3DP p108 1205/2A/Cap.0.022μF	**NFM3DC** p102 1205/Cap.22-22000pF	**NFL18SP** p115 0603/Cut off 150-500MHz
NFM31P p109 1206/6A/Cap.27μF	**NFM41C** p103 1806/Cap.22-22000pF	**NFL21S** p116 0805/Cut off 10-500MHz
NFM41P p110 1806/2-6A/Cap.0.2-1.5μF	Array Type	**NFW31S** p121 1206/Cut off 10-500MHz
NFM55P p111 2220/6A/Cap.1.5μF	**NFA31C** p104 1206/Cap.22-22000pF	RC Combined
T Circuit Filter Feed Through Type	T Circuit Filter Feed Through Type	**NFR21G** p123 0805/22-100Ω/Cap.10-100pF
NFE31P p112 1206/6A/Cap.22-2200pF	**NFE31P** p112 1206/Cap.22-22000pF	Array Type (RC/LC Combined)
NFE61P p113 2706/2A/Cap.33-4700pF	**NFE61P** p113 2706/Cap.33-4700pF	**NFA31G** p124 1206/6.8-100Ω/Cap.10-100pF
Block Type		**NFA18S** p117 0603/Cut off 50-480MHz
BNX022/023 p165 10-15A/Range1MHz-2GHz		**NFA21S** p119 0805/Cut off 50-330MHz

Noise Frequency: GHz Band

Inductor Type (Suppression Effect: Normal)

Power Line	General Signal Line (Under 10MHz)	High Speed Signal Line (Over 10MHz)
BLM15EG p71 0402/0.7-1.5A/Imp.120-220Ω	**BLM15HG** p65 0402/Imp.600-1000Ω	**BLM15HD** p65 0402/Imp.600-1000Ω
BLM18HE p67 0603/0.5-0.8A/Imp.600-1500Ω	**BLM15EG** p71 0402/Imp.120-220Ω	**BLM15HB** p65 0402/Imp.120-220Ω
BLM18EG p72 0603/0.5-2A/Imp.100-600Ω	**BLM18HG** p67 0603/Imp.470-1000Ω	**BLM18HD** p67 0603/Imp.470-1000Ω
	BLM18HK p67 0603/Imp.330-1000Ω	**BLM18HB** p67 0603/Imp.120-330Ω
	BLM18EG p72 0603/Imp.100-600Ω	**BLM18HE** p67 0603/Imp.600-1500Ω

Capacitor Type (Suppression Effect: High)

Power Line	General Signal Line (Under 10MHz)	High Speed Signal Line (Over 10MHz)
NFM18PS p105 0603/2A/Cap.0.47-1.0μF		LC Combined
		NFL18ST p114 0603/Cut off 200-500MHz
		Array Type (LC Combined)
		NFA18S p117 0603/Cut off 50-480MHz
		NFA21S p119 0805/Cut off 50-330MHz

Noise Frequency: High-GHz Band

Inductor Type

General Signal Line (Under 10MHz)	High Speed Signal Line (Over 10MHz)
BLM15GG p74 0402/Imp.220-470Ω	**BLM15GA** p74 0402/Imp.75Ω
BLM18GG p75 0603/Imp.470Ω	

●Chip Common Mode Choke Coil

Circuit Type?

DC Power Line


DLW5AH *p152*
2014/0.2A/Imp.4000Ω


DLW5BS *p152*
2020/0.5-5A/Imp.190-3000Ω


DLW5BT *p153*
2020/1.5-6A/Imp.100-1400Ω

High Speed Differential Signal Line

High Speed Signal Line
(USB/LVDS/IEEE1394 etc.)

DLP0NS *p142*
03025/Imp.67-120Ω

DLP11SN *p143*
0504/Imp.35-330Ω


DLW21H *p150*
0805/Imp.67-180Ω


DLW21S_SQ *p148*
0805/Imp.67-370Ω


DLP31S *p145*
1206/Imp.120-550Ω


DLW31S *p151*
1206/Imp.90-2200Ω

Array Type


DLP2AD *p146*
0804/Imp.67-280Ω


DLP31D *p147*
1206/Imp.90-440Ω

Ultra High Speed Signal Line
(HDMI/DVI/Display Port etc.)

DLP11SA *p143*
0504/Imp.35-90Ω


DLW21S_HQ *p148*
0805/Imp.67-120Ω

Audio Line

DLM11G *p140*
0504/Imp.600Ω


DLM2HG *p141*
1008/Imp.600Ω

Guidance of Digits in This Chart

●for **BLM03P**

0201/0.75-0.9A/Imp.22-33Ω
- 0201: Size (inch)
- 0.75-0.9A: Rated Current
- Imp.22-33Ω: Impedance

●for **BNX022/023**

10-15A/Range1MHz-2GHz
- 10-15A: Rated Current
- Range1MHz-2GHz: Effective Frequency Range

●for **NFR21G**

0805/22-100Ω/Cap.10-100pF
- 0805: Size (inch)
- 22-100Ω: Resistance
- Cap.10-100pF: Capacitance

●for **NFA18S**

0603/Cut off 50-480MHz
- 0603: Size (inch)
- Cut off 50-480MHz: Cut-off Frequency

●for **DLW5BS**

2020/0.5-5A/Imp.190-3000Ω
- 2020: Size (inch)
- 0.5-5A: Rated Current
- Imp.190-3000Ω: Impedance

BL□

Inductor Type

	Series	Size Code Inch (mm)	Impedance (Ω) at 100MHz (10 / 100 / 1000)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
For General Signal	**BLM02A** p20	01005 (0402)	10 70 120	
	BLM03A p21	0201 (0603)	10 80 70 120 240 600 1000	
	BLM15A p23 p26	0402 (1005)	10 70 120 220 600 1000	
	BLM18A p28	0603 (1608)	120 150 220 330 470 600 1000	
	BLM21A p30	0805 (2012)	120 150 220 330 470 600 1000	
	BLM18T p32	0603 (1608)	120 220 600 1000	
	BLA2AA p76 (4 circuits array)	0804 (2010)	120 220 600 1000	
	BLA31A p79 (4 circuits array)	1206 (3216)	30 60 120 220 600 1000	
For High Speed Signal	**BLM03B** p33	0201 (0603)	10 22 47 75 120 240 600 470	
	BLM15B p35	0402 (1005)	5 10 22 33 47 75 120 220 470 600 1000 1800	
	BLM18B p38	0603 (1608)	5 10 22 47 60 75 120 140 150 220 330 420 470 600 1000 1500 1800 2200 2500	
	BLM21B p42	0805 (2012)	5 60 75 120 150 200 220 330 420 470 600 750 1000 1500 1800 2200 2250 2700	
	BLA2AB p76 (4 circuits array)	0804 (2010)	10 22 47 75 120 220 470 600 1000	
	BLA31B p79 (4 circuits array)	1206 (3216)	120 220 470 600 1000	
For Digital Interface	**BLM18R** p45	0603 (1608)	120 220 470 600 1000	
	BLM21R p47	0805 (2012)	120 220 470 600 1000	
For Large Current	**BLM03P** p50	0201 (0603)	22 (0.9A) 33 (0.75A)	
	BLM15P* p51	0402 (1005)	10 (1A) 30 (2.2A) 60 (1.7A) 80 (1.5A) 120 (1.3A)	
	BLM18P* p53	0603 (1608)	30 (1A) 33 (3A) 60 (0.5A) 120 (2A) 180 (1.5A) 220 (1.4A) 330 (1.2A) 470 (1A)	
	BLM21P* p55	0805 (2012)	22 (6A) 30 (3A) 60 (3A) 220 (2A) 330 (1.5A)	
	BLM31P* p57	1206 (3216)	33 (6A) 50 (3A) 120 (3A) 390 (2A) 600 (1.5A)	
	BLM41P* p59	1806 (4516)	60 (6A) 75 (3A) 180 (3A) 470 (2A) 1000 (1.5A)	
	BLM18K* p61 (Low DC Resistance Type)	0603 (1608)	26 (6A) 70 (3.5A) 120 (3A) 220 (2.2A) 330 (1.7A) 470 (1.5A) 600 (1.3A)	
	BLM18S* p63 (Low DC Resistance Type)	0603 (1608)	26 (6A) 70 (4A) 120 (3A) 220 (2.5A) 330 (1.5A)	
For GHz Band Noise Suppression	**BLM15HG** p65	0402 (1005)	600 1000	
	BLM15HD p65	0402 (1005)	600 1000 1800	
	BLM15HB p65	0402 (1005)	120 220	
	BLM15EG* p71	0402 (1005)	120 (1.5A) 220 (0.7A)	
	BLM18HG p67	0603 (1608)	470 600 1000	
	BLM18HE* p67	0603 (1608)	600 (0.8A) 1000 (0.6A) 1500 (0.5A)	
	BLM18HD p67	0603 (1608)	470 600 1000	
	BLM18HB p67	0603 (1608)	120 220 330	
	BLM18HK p67	0603 (1608)	330 470 600 1000	
	BLM18EG* p72	0603 (1608)	100 (2A) 120 (2A) 220 (2A/1A) 330 (0.5A) 390 (0.5A) 470 (0.5A) 600 (0.5A)	

* The derating of rated current is required for some items according to the operating temperature on the each product page.

Inductor Type

for High-GHz Band Noise Suppression

Series	Size Code Inch (mm)	Impedance (Ω) at 100MHz (10 / 100 / 1000)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
BLM15GG p74	0402 (1005)	220 470	
BLM15GA p74	0402 (1005)	75	
BLM18GG p75	0603 (1608)	470	

NF□

Capacitor Type

For General Signal

Series	Size Code Inch (mm)	Capacitance (F) (10p 100p 1000p 10000p 0.1µ 1µ 10µ)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
NFM18C p100	0603 (1608)	22 47 100 220 470 1000 2200 22000	
NFM21C p101	0805 (2012)	22 47 100 220 470 1000 2200 22000	
NFM3DC p102	1205 (3212)	22 47 100 220 470 1000 2200 22000	
NFM41C p103	1806 (4516)	22 47 100 220 470 1000 2200 22000	
NFA31C p104 (4 circuits array)	1206 (3216)	22 47 100 220 470 1000 2200 22000	

For Large Current

Series	Size Code Inch (mm)	Capacitance (F) (10p 100p 1000p 10000p 0.1µ 1µ 10µ)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
NFM18P p105 p106	0603 (1608)	0.1 0.22 0.47 1.0 2.2	
NFM21P p107	0805 (2012)	0.1 0.22 0.47 1.0 2.2 4.7	
NFM3DP* p108	1205 (3212)	22000	
NFM31P p109	1206 (3216)	27	
NFM41P p110	1806 (4516)	0.2 1.5	
NFM55P p111	2220 (5750)	1.5	

T Circuit Filter Feed Through Type

Series	Size Code Inch (mm)	Capacitance (F) (10p 100p 1000p 10000p 0.1µ 1µ 10µ)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
NFE31P p112	1206 (3216)	22 47 100 220 470 1500 2200	
NFE61P p113	2706 (6816)	33 68 100 180 360 680 1000 4700	

LC(RC) Combined Type

For Signal Line

Series	Size Code Inch (mm)	Cut-off Frequency (MHz) (10 / 100 / 500)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
NFL18ST p114	0603 (1608)	200 300 500	
NFL18SP p115	0603 (1608)	150 200 300 500	
NFL21S p116	0805 (2012)	10 20 50 70 100 150 200 300 400 500	
NFA18S p117 (4 circuits array)	0603 (1608)	50 130 180 200 300 400 480	
NFA21S p119 (4 circuits array)	0805 (2012)	50 80 200 280 300 310 330	
NFW31S p121	1206 (3216)	10 20 50 100 150 200 300 400 500	
NFR21G p123	0805 (2012)	10 47 100	
NFA31G p124 (4 circuits array)	1206 (3216)	10 47 100	

* The derating of rated current is required for some items according to the operating temperature on the each product page.

Product Guide

DL□

Common Mode Choke Coils

	Series	Size Code Inch (mm)	Common Mode Impedance (Ω) at 100MHz	Effective Frequency Range
For Audio Line	DLM11G p140	0504 (1210)	600	
	DLM2HG p141	1008 (2520)	600	
For Differential Signal Line	DLP0NS p142	03025 (0806)	67, 90, 120	
	DLP11S p143	0504 (1210)	35, 67, 90, 120, 160, 200, 240, 280, 330	
	DLP31S p145	1206 (3216)	120, 220, 550	
	DLP2AD p146 (2 circuits array)	0804 (2010)	67, 90, 120, 160, 200, 240, 280	
	DLP31D p147 (2 circuits array)	1206 (3216)	90, 130, 200, 320, 440	
	DLW21S p148	0805 (2012)	67, 90, 120, 180, 260, 370	
	DLW21H p150	0805 (2012)	67, 90, 120, 180	
	DLW31S p151	1206 (3216)	90, 160, 260, 600, 1000, 2200	
For Large Current	DLW5BS*/DLW5AH p152	2020 (5050)/2014 (5036)	190, 350, 1000, 1500, 3000, 4000	
	DLW5BT* p153	2020 (5050)	100, 250, 500, 1000, 1400	

Effective Frequency Range: 10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz

BNX

Block EMIFIL®

	Series	Height (mm)	Rated Voltage (Vdc)	Rated Current (A)	Effective Frequency Range
SMD Type	BNX022* p165	3.1	50	10	
	BNX023* p165	3.1	100	15	
Lead Type	BNX002 p166	18 max.	50	10	
	BNX003 p166	18 max.	150	10	
	BNX005 p166	18.5 max.	50	15	
	BNX012* p167	12.0	50	15	
	BNX016* p167	12.0	25	15	

Effective Frequency Range: 10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz

* The derating of rated current is required for some items according to the operating temperature on the each product page.

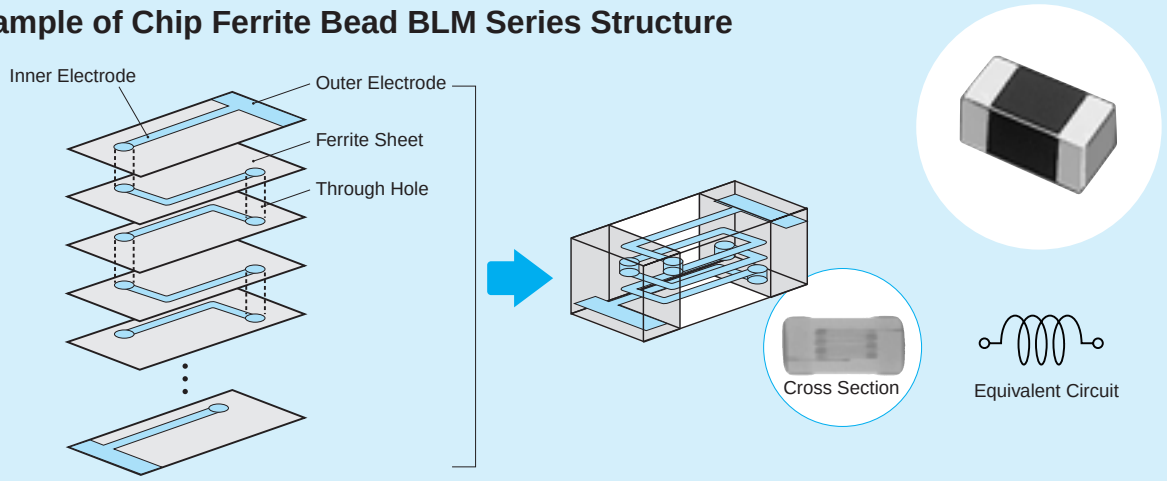
BL□

Chip Ferrite Bead

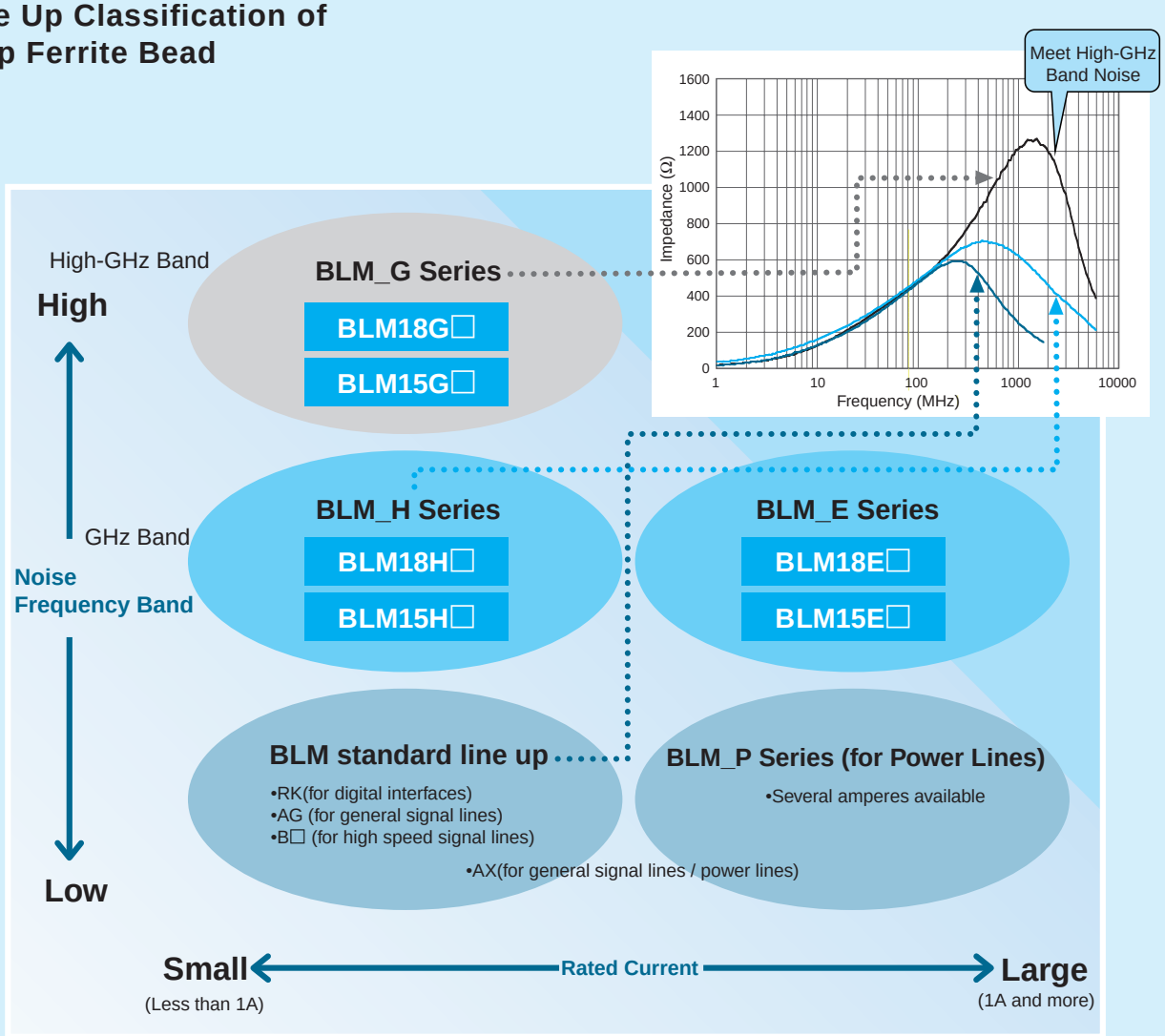
muRata

BL□ Series Introduction

Example of Chip Ferrite Bead BLM Series Structure



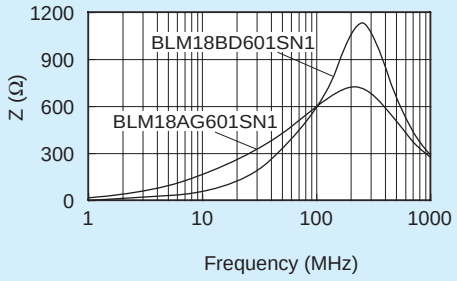
Line Up Classification of Chip Ferrite Bead



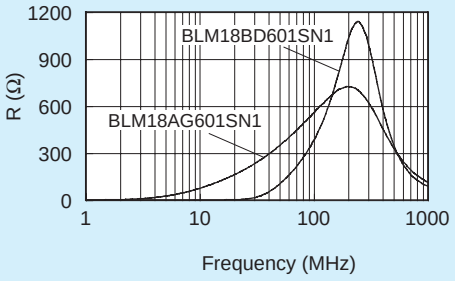
Difference between BLM A type and B type (HG type vs HD/HB type)

A type: Impedance curve rises from low frequency range. Suppress noise in wide frequency range.
B type: Impedance curve rises sharply. Less damage to signal waveforms.

■Comparison of Impedance Curve

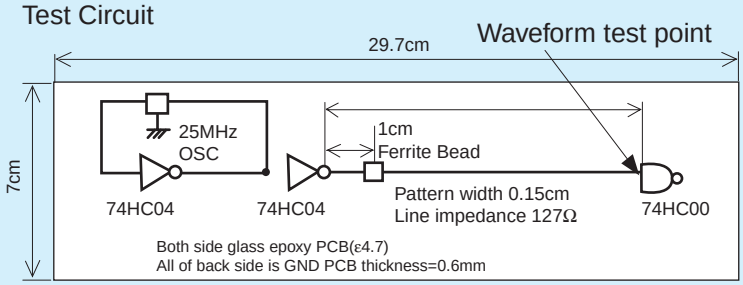


■Comparison of Resistance Element

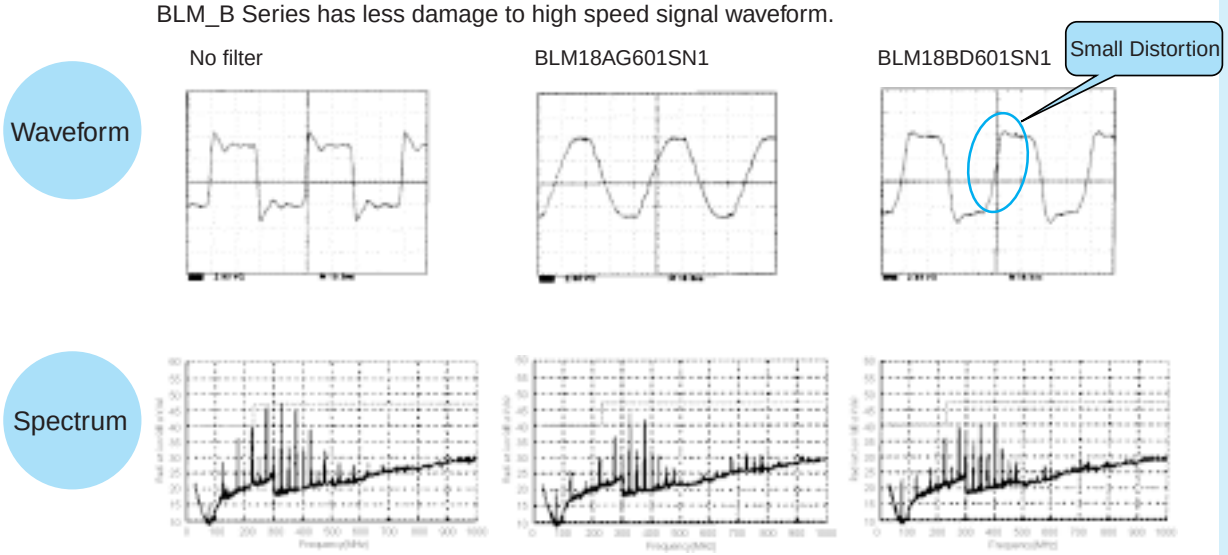


■Comparison of Test Effect (25MHz)

Test Circuit



BLM_B Series has less damage to high speed signal waveform.



Part Numbering

(Part Number)

BL	M	18	AG	102	S	N	1	D
❶	❷	❸	❹	❺	❻	❼	❽	❾

❶Product ID

Product ID	
BL	Chip Ferrite Beads

❷Type

Code	Type
A	Array Type
M	Ferrite Bead Single Type

❸Dimensions (L×W)

Code	Dimensions (L×W)	EIA
02	0.4×0.2mm	01005
03	0.6×0.3mm	0201
15	1.0×0.5mm	0402
18	1.6×0.8mm	0603
2A	2.0×1.0mm	0804
21	2.0×1.25mm	0805
31	3.2×1.6mm	1206
41	4.5×1.6mm	1806

❹Characteristics/Applications

Code *1	Characteristics/Applications	Series
AG	for General Use	**BLM02/03/15/18/21, BLA2A/31**
AX		**BLM15**
TG		**BLM18**
BA	for High-speed Signal Lines	**BLM15/18**
BB		**BLM03/15/18/21, BLA2A**
BD		**BLM03/15/18/21, BLA2A/31**
PD	for Power Supplies	**BLM15**
PG		**BLM03/15/18/21/31/41**
KG		**BLM18**
SG	for Power Supplies (Low DC Resistance Type)	**BLM18**
RK	for Digital Interface	**BLM18/21**
HG	for GHz Band General Use	**BLM15/18**
EG	for GHz Band General Use (Low DC Resistance Type)	
HB	for GHz Band High-speed Signal Lines	**BLM15/18**
HD		
HE		
HK	for GHz Band Digital Interface	**BLM18**
GA	for High-GHz Band High-speed Signal Lines	**BLM15**
GG	for High-GHz Band General Use	**BLM15/18**

*1 Frequency characteristics vary with each code.

❺Impedance

Expressed by three figures. The unit is in ohm (Ω) at 100MHz. The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❻Electrode

Expressed by a letter.

Ex.)

Code	Electrode
S/T	Sn Plating
A	Au Plating

❼Category

Code	Category
N	Standard Type

❽Number of Circuits

Code	Number of Circuits
1	1 Circuit
4	4 Circuits

❾Packaging

Code	Packaging	Series
K	Embossed Taping (ø330mm Reel)	**BLM21*1/31/41**
L	Embossed Taping (ø180mm Reel)	
B	Bulk	All Series
J	Paper Taping (ø330mm Reel)	**BLM03/15/18*3/21*2, BLA2A/31**
D	Paper Taping (ø180mm Reel)	**BLM02/03/15/18/21*2, BLA2A/31**

*1 BLM21BD222SN1/BLM21BD272SN1 only.
*2 Except BLM21BD222SN1/BLM21BD272SN1
*3 Except BLM18T

Size (Inch)	Type	Part Number	Impedance at 100MHz/20°C	Impedance at 1GHz/20°C	Rated Current	New / Kit / ≧1A / ≧3A / GHz / HiGHz / Flow / ReFlow
01005	For General Signal p20	BLM02AG100SN1	10ohm(Typ.)	-	500mA	Kit ReFlow
		BLM02AG700SN1	70ohm±25%	-	250mA	Kit ReFlow
		BLM02AG121SN1	120ohm±25%	-	200mA	Kit ReFlow
0201	For General Signal p21	BLM03AG100SN1	10ohm(Typ.)	-	500mA	Kit ReFlow
		BLM03AG700SN1	70ohm(Typ.)	-	200mA	Kit ReFlow
		BLM03AG800SN1	80ohm±25%	-	200mA	Kit ReFlow
		BLM03AG121SN1	120ohm±25%	-	200mA	Kit ReFlow
		BLM03AG241SN1	240ohm±25%	-	200mA	Kit ReFlow
		BLM03AG601SN1	600ohm±25%	-	100mA	Kit ReFlow
		BLM03AG102SN1	1000ohm±25%	-	100mA	Kit ReFlow
	For High Speed Signal (Sharp Impedance Curve) p33	BLM03BD750SN1	75ohm±25%	-	300mA	Kit ReFlow
		BLM03BD121SN1	120ohm±25%	-	250mA	Kit ReFlow
		BLM03BD241SN1	240ohm±25%	-	200mA	Kit ReFlow
		BLM03BD471SN1	470ohm±25%	-	215mA	New Kit ReFlow
		BLM03BD601SN1	600ohm±25%	-	200mA	New Kit ReFlow
		BLM03BB100SN1	10ohm±25%	-	300mA	Kit ReFlow
		BLM03BB220SN1	22ohm±25%	-	200mA	Kit ReFlow
		BLM03BB470SN1	47ohm±25%	-	200mA	Kit ReFlow
		BLM03BB750SN1	75ohm±25%	-	200mA	Kit ReFlow
		BLM03BB121SN1	120ohm±25%	-	100mA	Kit ReFlow
	For Large Current p50	BLM03PG220SN1	22ohm±25%	-	900mA	Kit ReFlow
		BLM03PG330SN1	33ohm±25%	-	750mA	Kit ReFlow
0402	For General Signal p23	BLM15AG100SN1	10ohm(Typ.)	-	1000mA	Kit ≧1A ReFlow
		BLM15AG700SN1	70ohm(Typ.)	-	500mA	Kit ReFlow
		BLM15AG121SN1	120ohm±25%	-	500mA	Kit ReFlow
		BLM15AG221SN1	220ohm±25%	-	300mA	Kit ReFlow
		BLM15AG601SN1	600ohm±25%	-	300mA	Kit ReFlow
		BLM15AG102SN1	1000ohm±25%	-	200mA	Kit ReFlow
	For General Signal p26	BLM15AX100SN1	10ohm(Typ.)	-	1740mA	New Kit ≧1A ReFlow
		BLM15AX700SN1	70ohm±25%	-	780mA	New Kit ReFlow
		BLM15AX121SN1	120ohm±25%	-	680mA	New Kit ReFlow
		BLM15AX221SN1	220ohm±25%	-	580mA	New Kit ReFlow
		BLM15AX601SN1	600ohm±25%	-	420mA	New Kit ReFlow
		BLM15AX102SN1	1000ohm±25%	-	350mA	New Kit ReFlow
	For High Speed Signal (Sharp Impedance Curve) p35	BLM15BD750SN1	75ohm±25%	-	300mA	Kit ReFlow
		BLM15BD121SN1	120ohm±25%	-	300mA	Kit ReFlow
		BLM15BD221SN1	220ohm±25%	-	300mA	Kit ReFlow
		BLM15BD471SN1	470ohm±25%	-	200mA	Kit ReFlow
		BLM15BD601SN1	600ohm±25%	-	200mA	Kit ReFlow
		BLM15BD102SN1	1000ohm±25%	-	200mA	Kit ReFlow
		BLM15BD182SN1	1800ohm±25%	-	100mA	Kit ReFlow
		BLM15BB050SN1	5ohm±25%	-	500mA	Kit ReFlow
		BLM15BB100SN1	10ohm±25%	-	300mA	Kit ReFlow
		BLM15BB220SN1	22ohm±25%	-	300mA	Kit ReFlow
		BLM15BB470SN1	47ohm±25%	-	300mA	Kit ReFlow
		BLM15BB750SN1	75ohm±25%	-	300mA	Kit ReFlow
		BLM15BB121SN1	120ohm±25%	-	300mA	Kit ReFlow
		BLM15BB221SN1	220ohm±25%	-	200mA	Kit ReFlow
		BLM15BA050SN1	5ohm±25%	-	300mA	Kit ReFlow
		BLM15BA100SN1	10ohm±25%	-	300mA	Kit ReFlow
		BLM15BA220SN1	22ohm±25%	-	300mA	Kit ReFlow
		BLM15BA330SN1	33ohm±25%	-	300mA	Kit ReFlow
		BLM15BA470SN1	47ohm±25%	-	200mA	Kit ReFlow
		BLM15BA750SN1	75ohm±25%	-	200mA	Kit ReFlow
	For Large Current p51	BLM15PG100SN1	10ohm(Typ.)	-	1000mA	Kit ≧1A ReFlow
		BLM15PD300SN1	30ohm±25%	-	2200mA	Kit ≧1A ReFlow
		BLM15PD600SN1	60ohm±25%	-	1700mA	Kit ≧1A ReFlow
		BLM15PD800SN1	80ohm±25%	-	1500mA	Kit ≧1A ReFlow
		BLM15PD121SN1	120ohm±25%	-	1300mA	Kit ≧1A ReFlow

Continued on the following page.

Size (Inch)	Type		Part Number	Impedance at 100MHz/20°C	Impedance at 1GHz/20°C	Rated Current	New / Kit / ≧1A / ≧3A / GHz / Hi-GHz / Flow / ReFlow
0402	For GHz Band Noise	p65 For General Signal	BLM15HG601SN1	600ohm±25%	1000ohm±40%	300mA	Kit GHz ReFlow
			BLM15HG102SN1	1000ohm±25%	1400ohm±40%	250mA	Kit GHz ReFlow
		p65 For High Speed Signal (Sharp Impedance Curve)	BLM15HD601SN1	600ohm±25%	1400ohm±40%	300mA	Kit GHz ReFlow
			BLM15HD102SN1	1000ohm±25%	2000ohm±40%	250mA	Kit GHz ReFlow
			BLM15HD182SN1	1800ohm±25%	2700ohm±40%	200mA	Kit GHz ReFlow
			BLM15HB121SN1	120ohm±25%	500ohm±40%	300mA	Kit GHz ReFlow
			BLM15HB221SN1	220ohm±25%	900ohm±40%	250mA	Kit GHz ReFlow
		For General Signal For Large Current p71	BLM15EG121SN1	120ohm±25%	145ohm(Typ.)	1500mA	Kit ≧1A GHz ReFlow
			BLM15EG221SN1	220ohm±25%	270ohm(Typ.)	700mA	Kit GHz ReFlow
	For High-GHz Band Noise	p74 For General Signal	BLM15GG221SN1	220ohm±25%	600ohm±40%	300mA	Kit Hi-GHz ReFlow
			BLM15GG471SN1	470ohm±25%	1200ohm±40%	200mA	Kit Hi-GHz ReFlow
		For High Speed Signal p74	BLM15GA750SN1	75ohm±25%	1000ohm±40%	200mA	Kit Hi-GHz ReFlow
0603	For General Signal	p28	BLM18AG121SN1	120ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18AG151SN1	150ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18AG221SN1	220ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18AG331SN1	330ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18AG471SN1	470ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18AG601SN1	600ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18AG102SN1	1000ohm±25%	-	400mA	Kit Flow ReFlow
		p32	BLM18TG121TN1	120ohm±25%	-	200mA	Flow ReFlow
			BLM18TG221TN1	220ohm±25%	-	200mA	Flow ReFlow
			BLM18TG601TN1	600ohm±25%	-	200mA	Flow ReFlow
			BLM18TG102TN1	1000ohm±25%	-	100mA	Flow ReFlow
	For High Speed Signal (Sharp Impedance Curve)	p38	BLM18BD470SN1	47ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18BD121SN1	120ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD151SN1	150ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD221SN1	220ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD331SN1	330ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD421SN1	420ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD471SN1	470ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD601SN1	600ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18BD102SN1	1000ohm±25%	-	100mA	Kit Flow ReFlow
			BLM18BD152SN1	1500ohm±25%	-	50mA	Kit Flow ReFlow
			BLM18BD182SN1	1800ohm±25%	-	50mA	Kit Flow ReFlow
			BLM18BD222SN1	2200ohm±25%	-	50mA	Kit Flow ReFlow
			BLM18BD252SN1	2500ohm±25%	-	50mA	Kit Flow ReFlow
			BLM18BB050SN1	5ohm±25%	-	700mA	Kit Flow ReFlow
			BLM18BB100SN1	10ohm±25%	-	700mA	Kit Flow ReFlow
			BLM18BB220SN1	22ohm±25%	-	600mA	Kit Flow ReFlow
			BLM18BB470SN1	47ohm±25%	-	550mA	Kit Flow ReFlow
			BLM18BB600SN1	60ohm±25%	-	550mA	Kit Flow ReFlow
			BLM18BB750SN1	75ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18BB121SN1	120ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18BB141SN1	140ohm±25%	-	450mA	Flow ReFlow
			BLM18BB151SN1	150ohm±25%	-	450mA	Kit Flow ReFlow
			BLM18BB221SN1	220ohm±25%	-	450mA	Kit Flow ReFlow
			BLM18BB331SN1	330ohm±25%	-	400mA	Kit Flow ReFlow
			BLM18BB471SN1	470ohm±25%	-	300mA	Kit Flow ReFlow
			BLM18BA050SN1	5ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18BA100SN1	10ohm±25%	-	500mA	Kit Flow ReFlow
			BLM18BA220SN1	22ohm±25%	-	500mA	Flow ReFlow
			BLM18BA470SN1	47ohm±25%	-	300mA	Kit Flow ReFlow
			BLM18BA750SN1	75ohm±25%	-	300mA	Kit Flow ReFlow
			BLM18BA121SN1	120ohm±25%	-	200mA	Kit Flow ReFlow
	For Digital Interface	p45	BLM18RK121SN1	120ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18RK221SN1	220ohm±25%	-	200mA	Flow ReFlow
			BLM18RK471SN1	470ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18RK601SN1	600ohm±25%	-	200mA	Kit Flow ReFlow
			BLM18RK102SN1	1000ohm±25%	-	200mA	Kit Flow ReFlow

Continued on the following page.

Size (Inch)	Type		Part Number	Impedance at 100MHz/20°C	Impedance at 1GHz/20°C	Rated Current	New / Kit / ≧1A / ≧3A / GHz / HiGHz / Flow / ReFlow
0603	For Large Current	p53 Standard Type	BLM18PG300SN1	30ohm(Typ.)	-	1000mA	Kit ≧1A Flow ReFlow
			BLM18PG330SN1	33ohm±25%	-	3000mA	Kit ≧3A Flow ReFlow
			BLM18PG600SN1	60ohm(Typ.)	-	500mA	Kit Flow ReFlow
			BLM18PG121SN1	120ohm±25%	-	2000mA	Kit ≧1A Flow ReFlow
			BLM18PG181SN1	180ohm±25%	-	1500mA	Kit ≧1A Flow ReFlow
			BLM18PG221SN1	220ohm±25%	-	1400mA	Kit ≧1A Flow ReFlow
			BLM18PG331SN1	330ohm±25%	-	1200mA	Kit ≧1A Flow ReFlow
			BLM18PG471SN1	470ohm±25%	-	1000mA	Kit ≧1A Flow ReFlow
		p61 Low DC Resistance Type	BLM18KG260TN1	26ohm±25%	-	6000mA	Kit ≧3A Flow ReFlow
			BLM18KG700TN1	70ohm±25%	-	3500mA	Kit ≧3A Flow ReFlow
			BLM18KG121TN1	120ohm±25%	-	3000mA	Kit ≧3A Flow ReFlow
			BLM18KG221SN1	220ohm±25%	-	2200mA	Kit ≧1A Flow ReFlow
			BLM18KG331SN1	330ohm±25%	-	1700mA	Kit ≧1A Flow ReFlow
			BLM18KG471SN1	470ohm±25%	-	1500mA	Kit ≧1A Flow ReFlow
			BLM18KG601SN1	600ohm±25%	-	1300mA	Kit ≧1A Flow ReFlow
		p63	BLM18SG260TN1	26ohm±25%	-	6000mA	Kit ≧3A Flow ReFlow
			BLM18SG700TN1	70ohm±25%	-	4000mA	Kit ≧3A Flow ReFlow
			BLM18SG121TN1	120ohm±25%	-	3000mA	Kit ≧3A Flow ReFlow
			BLM18SG221TN1	220ohm±25%	-	2500mA	Kit ≧1A Flow ReFlow
			BLM18SG331TN1	330ohm±25%	-	1500mA	Kit ≧1A Flow ReFlow
	For GHz Band Noise	p67 For General Signal	BLM18HG471SN1	470ohm±25%	600ohm(Typ.)	200mA	Kit GHz Flow ReFlow
			BLM18HG601SN1	600ohm±25%	700ohm(Typ.)	200mA	Kit GHz Flow ReFlow
			BLM18HG102SN1	1000ohm±25%	1000ohm(Typ.)	100mA	Kit GHz Flow ReFlow
		p67 For High Speed Signal (Sharp Impedance Curve)	BLM18HE601SN1	600ohm±25%	600ohm(Typ.)	800mA	Kit GHz Flow ReFlow
			BLM18HE102SN1	1000ohm±25%	1000ohm(Typ.)	600mA	Kit GHz Flow ReFlow
			BLM18HE152SN1	1500ohm±25%	1500ohm(Typ.)	500mA	Kit GHz Flow ReFlow
			BLM18HD471SN1	470ohm±25%	1000ohm(Typ.)	100mA	Kit GHz Flow ReFlow
			BLM18HD601SN1	600ohm±25%	1200ohm(Typ.)	100mA	Kit GHz Flow ReFlow
			BLM18HD102SN1	1000ohm±25%	1700ohm(Typ.)	50mA	Kit GHz Flow ReFlow
			BLM18HB121SN1	120ohm±25%	500ohm±40%	200mA	Kit GHz Flow ReFlow
			BLM18HB221SN1	220ohm±25%	1100ohm±40%	100mA	Kit GHz Flow ReFlow
			BLM18HB331SN1	330ohm±25%	1600ohm±40%	50mA	Kit GHz Flow ReFlow
		p67 For Digital Interface	BLM18HK331SN1	330ohm±25%	400ohm±40%	200mA	Kit GHz Flow ReFlow
			BLM18HK471SN1	470ohm±25%	600ohm±40%	200mA	Kit GHz Flow ReFlow
			BLM18HK601SN1	600ohm±25%	700ohm±40%	100mA	Kit GHz Flow ReFlow
			BLM18HK102SN1	1000ohm±25%	1200ohm±40%	50mA	Kit GHz Flow ReFlow
		p72 For General Signal For Large Current	BLM18EG101TN1	100ohm±25%	140ohm(Typ.)	2000mA	Kit ≧1A GHz Flow ReFlow
			BLM18EG121SN1	120ohm±25%	145ohm(Typ.)	2000mA	Kit ≧1A GHz Flow ReFlow
			BLM18EG221SN1	220ohm±25%	260ohm(Typ.)	2000mA	Kit ≧1A GHz Flow ReFlow
			BLM18EG221TN1	220ohm±25%	300ohm(Typ.)	1000mA	Kit ≧1A GHz Flow ReFlow
			BLM18EG331TN1	330ohm±25%	450ohm(Typ.)	500mA	Kit GHz Flow ReFlow
			BLM18EG391TN1	390ohm±25%	520ohm(Typ.)	500mA	Kit GHz Flow ReFlow
			BLM18EG471SN1	470ohm±25%	550ohm(Typ.)	500mA	Kit GHz Flow ReFlow
			BLM18EG601SN1	600ohm±25%	700ohm(Typ.)	500mA	Kit GHz Flow ReFlow
	For High-GHz Band Noise p75		BLM18GG471SN1	470ohm±25%	1800ohm±30%	200mA	Kit HiGHz ReFlow
0805	For General Signal	p30	BLM21AG121SN1	120ohm±25%	-	200mA	Kit Flow ReFlow
			BLM21AG151SN1	150ohm±25%	-	200mA	Kit Flow ReFlow
			BLM21AG221SN1	220ohm±25%	-	200mA	Kit Flow ReFlow
			BLM21AG331SN1	330ohm±25%	-	200mA	Kit Flow ReFlow
			BLM21AG471SN1	470ohm±25%	-	200mA	Kit Flow ReFlow
			BLM21AG601SN1	600ohm±25%	-	200mA	Kit Flow ReFlow
			BLM21AG102SN1	1000ohm±25%	-	200mA	Kit Flow ReFlow

Continued on the following page.

Size (Inch)	Type	Part Number	Impedance at 100MHz/20°C	Impedance at 1GHz/20°C	Rated Current	New / Kit / ≧1A / ≧3A / GHz / HiGHz	Flow / ReFlow
0805	p42 For High Speed Signal (Sharp Impedance Curve)	BLM21BD121SN1	120ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD151SN1	150ohm±25%	-	200mA		Flow ReFlow
		BLM21BD221SN1	220ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD331SN1	330ohm±25%	-	200mA		Flow ReFlow
		BLM21BD421SN1	420ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD471SN1	470ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD601SN1	600ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD751SN1	750ohm±25%	-	200mA		Flow ReFlow
		BLM21BD102SN1	1000ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD152SN1	1500ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD182SN1	1800ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD222TN1	2200ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BD222SN1	2250ohm(Typ.)	-	200mA	Kit	Flow ReFlow
		BLM21BD272SN1	2700ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BB050SN1	5ohm±25%	-	500mA	Kit	Flow ReFlow
		BLM21BB600SN1	60ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BB750SN1	75ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BB121SN1	120ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BB151SN1	150ohm±25%	-	200mA		Flow ReFlow
		BLM21BB201SN1	200ohm±25%	-	200mA		Flow ReFlow
		BLM21BB221SN1	220ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BB331SN1	330ohm±25%	-	200mA	Kit	Flow ReFlow
		BLM21BB471SN1	470ohm±25%	-	200mA	Kit	Flow ReFlow
	p47 For Digital Interface	BLM21RK121SN1	120ohm±25%	-	200mA		Flow ReFlow
		BLM21RK221SN1	220ohm±25%	-	200mA		Flow ReFlow
		BLM21RK471SN1	470ohm±25%	-	200mA		Flow ReFlow
		BLM21RK601SN1	600ohm±25%	-	200mA		Flow ReFlow
		BLM21RK102SN1	1000ohm±25%	-	200mA		Flow ReFlow
	p55 For Large Current	BLM21PG220SN1	22ohm±25%	-	6000mA	Kit ≧3A	Flow ReFlow
		BLM21PG300SN1	30ohm(Typ.)	-	3000mA	Kit ≧3A	Flow ReFlow
		BLM21PG600SN1	60ohm±25%	-	3000mA	Kit ≧3A	Flow ReFlow
		BLM21PG221SN1	220ohm±25%	-	2000mA	Kit ≧1A	Flow ReFlow
		BLM21PG331SN1	330ohm±25%	-	1500mA	Kit ≧1A	Flow ReFlow
1206	p57 For Large Current	BLM31PG330SN1	33ohm±25%	-	6000mA	Kit ≧3A	Flow ReFlow
		BLM31PG500SN1	50ohm(Typ.)	-	3000mA	Kit ≧3A	Flow ReFlow
		BLM31PG121SN1	120ohm±25%	-	3000mA	Kit ≧3A	Flow ReFlow
		BLM31PG391SN1	390ohm±25%	-	2000mA	Kit ≧1A	Flow ReFlow
		BLM31PG601SN1	600ohm±25%	-	1500mA	Kit ≧1A	Flow ReFlow
1806	p59 For Large Current	BLM41PG600SN1	60ohm(Typ.)	-	6000mA	Kit ≧3A	Flow ReFlow
		BLM41PG750SN1	75ohm(Typ.)	-	3000mA	Kit ≧3A	Flow ReFlow
		BLM41PG181SN1	180ohm±25%	-	3000mA	Kit ≧3A	Flow ReFlow
		BLM41PG471SN1	470ohm±25%	-	2000mA	Kit ≧1A	Flow ReFlow
		BLM41PG102SN1	1000ohm±25%	-	1500mA	Kit ≧1A	Flow ReFlow
0804	p76 For General Signal	BLA2AAG121SN4	120ohm±25%	-	100mA		ReFlow
		BLA2AAG221SN4	220ohm±25%	-	50mA		ReFlow
		BLA2AAG601SN4	600ohm±25%	-	50mA		ReFlow
		BLA2AAG102SN4	1000ohm±25%	-	50mA		ReFlow
	p76 For High Speed Signal	BLA2ABB100SN4	10ohm±25%	-	200mA		ReFlow
		BLA2ABB220SN4	22ohm±25%	-	200mA		ReFlow
		BLA2ABB470SN4	47ohm±25%	-	200mA		ReFlow
		BLA2ABB121SN4	120ohm±25%	-	50mA		ReFlow
		BLA2ABB221SN4	220ohm±25%	-	50mA		ReFlow
		BLA2ABD750SN4	75ohm±25%	-	200mA		ReFlow
		BLA2ABD121SN4	120ohm±25%	-	200mA		ReFlow
		BLA2ABD221SN4	220ohm±25%	-	100mA		ReFlow
		BLA2ABD471SN4	470ohm±25%	-	100mA		ReFlow
		BLA2ABD601SN4	600ohm±25%	-	100mA		ReFlow
		BLA2ABD102SN4	1000ohm±25%	-	50mA		ReFlow

Continued on the following page.

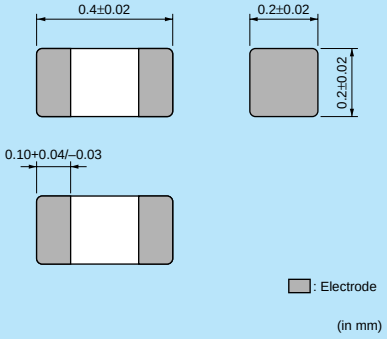
Size (Inch)	Type	Part Number	Impedance		Rated Current	New Kit ≧1A ≧3A GHz Hi-GHz Flow ReFlow
			at 100MHz/20°C	at 1GHz/20°C		
1206	For General Signal p79	**BLA31AG300SN4**	30ohm±25%	-	200mA	Flow ReFlow
		BLA31AG600SN4	60ohm±25%	-	200mA	Flow ReFlow
		BLA31AG121SN4	120ohm±25%	-	150mA	Flow ReFlow
		BLA31AG221SN4	220ohm±25%	-	150mA	Flow ReFlow
		BLA31AG601SN4	600ohm±25%	-	100mA	Flow ReFlow
		BLA31AG102SN4	1000ohm±25%	-	50mA	Flow ReFlow
	For High Speed Signal p79	**BLA31BD121SN4**	120ohm±25%	-	150mA	Flow ReFlow
		BLA31BD221SN4	220ohm±25%	-	150mA	Flow ReFlow
		BLA31BD471SN4	470ohm±25%	-	100mA	Flow ReFlow
		BLA31BD601SN4	600ohm±25%	-	100mA	Flow ReFlow
		BLA31BD102SN4	1000ohm±25%	-	50mA	Flow ReFlow

BLM02A Series (01005 Size)

Reflow OK

Ultra small 01005 size for general signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	20000
B	Bulk(Bag)	1000

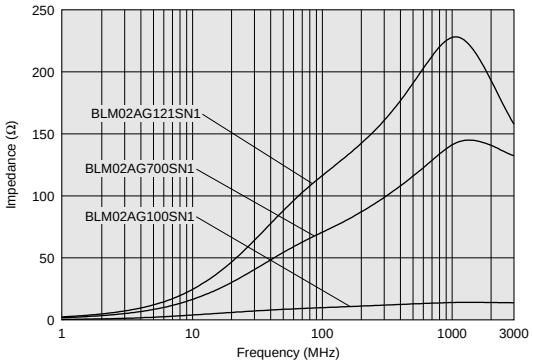
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM02AG100SN1☐	10ohm(Typ.)	500mA	0.1ohm	-55°C to +125°C	Kit
BLM02AG700SN1☐	70ohm±25%	250mA	0.5ohm	-55°C to +125°C	Kit
BLM02AG121SN1☐	120ohm±25%	200mA	0.8ohm	-55°C to +125°C	Kit

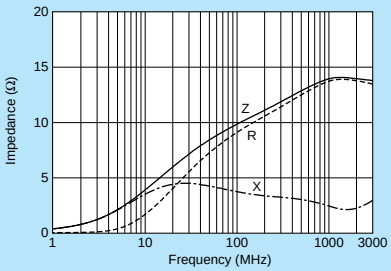
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

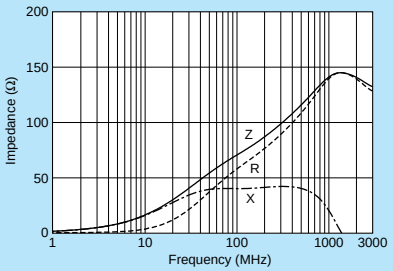


■ Impedance-Frequency Characteristics

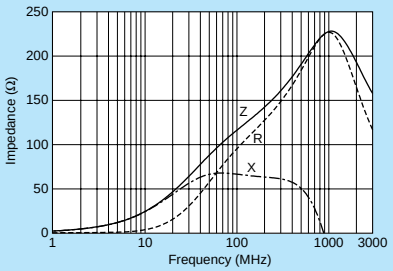
BLM02AG100SN1



BLM02AG700SN1



BLM02AG121SN1

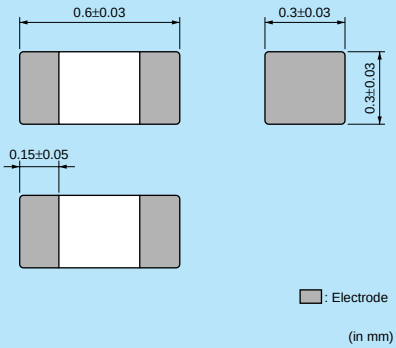


BLM03A Series (0201 Size)

Reflow OK

0201 size for general signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	15000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

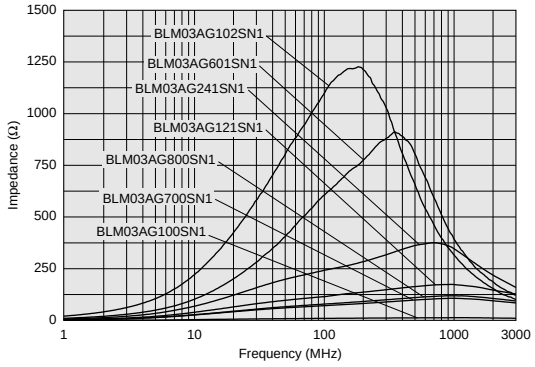
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM03AG100SN1☐	10ohm(Typ.)	500mA	0.1ohm	-55°C to +125°C	Kit
BLM03AG700SN1☐	70ohm(Typ.)	200mA	0.4ohm	-55°C to +125°C	Kit
BLM03AG800SN1☐	80ohm±25%	200mA	0.4ohm	-55°C to +125°C	Kit
BLM03AG121SN1☐	120ohm±25%	200mA	0.5ohm	-55°C to +125°C	Kit
BLM03AG241SN1☐	240ohm±25%	200mA	0.8ohm	-55°C to +125°C	Kit
BLM03AG601SN1☐	600ohm±25%	100mA	1.5ohm	-55°C to +125°C	Kit
BLM03AG102SN1☐	1000ohm±25%	100mA	2.5ohm	-55°C to +125°C	Kit

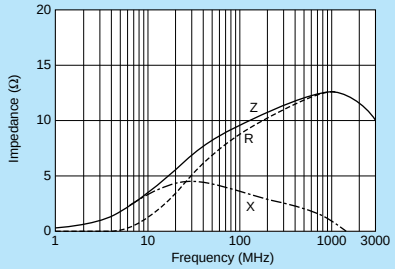
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

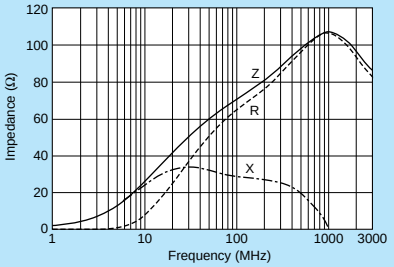


■ Impedance-Frequency Characteristics

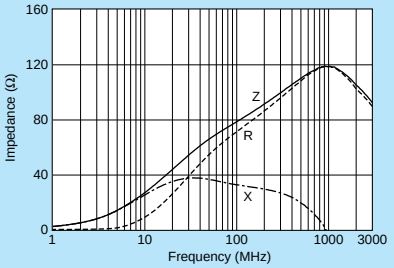
BLM03AG100SN1



BLM03AG700SN1



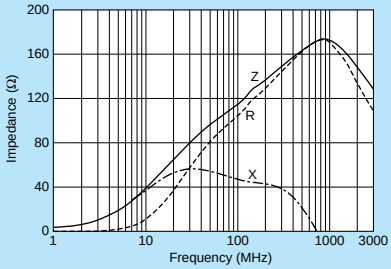
BLM03AG800SN1



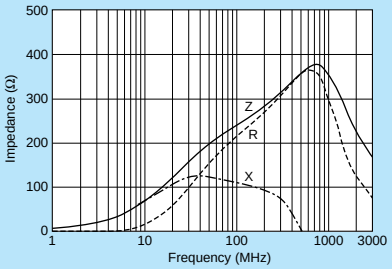
Continued on the following page.

■ Impedance-Frequency Characteristics

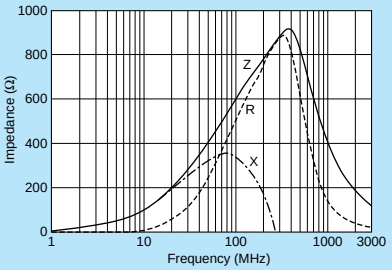
BLM03AG121SN1



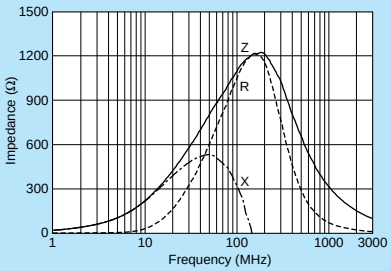
BLM03AG241SN1



BLM03AG601SN1



BLM03AG102SN1

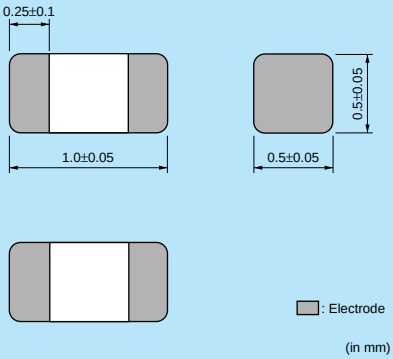


BLM15AG Series (0402 Size)

Reflow OK

0402 size for general signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

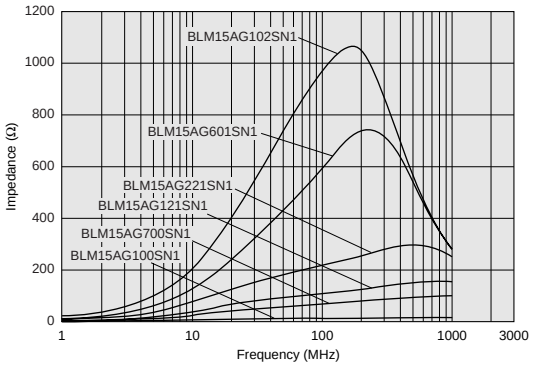
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15AG100SN1☐	10ohm(Typ.)	1000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM15AG700SN1☐	70ohm(Typ.)	500mA	0.15ohm	-55°C to +125°C	Kit
BLM15AG121SN1☐	120ohm±25%	500mA	0.25ohm	-55°C to +125°C	Kit
BLM15AG221SN1☐	220ohm±25%	300mA	0.35ohm	-55°C to +125°C	Kit
BLM15AG601SN1☐	600ohm±25%	300mA	0.6ohm	-55°C to +125°C	Kit
BLM15AG102SN1☐	1000ohm±25%	200mA	1.0ohm	-55°C to +125°C	Kit

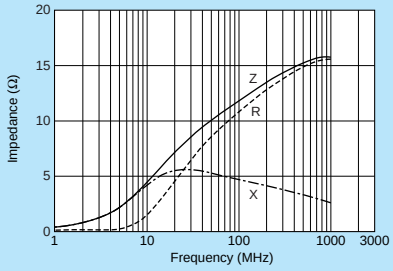
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

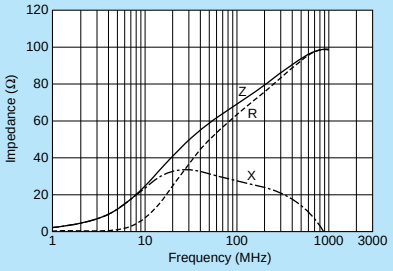


■ Impedance-Frequency Characteristics

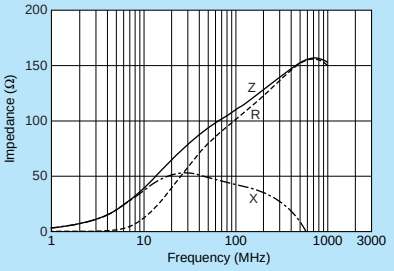
BLM15AG100SN1



BLM15AG700SN1



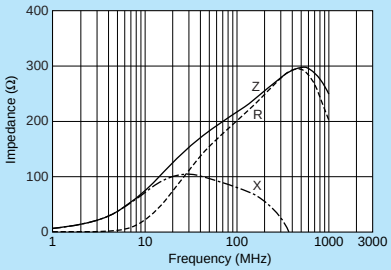
BLM15AG121SN1



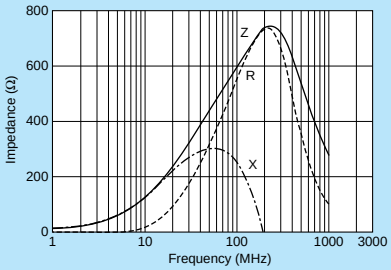
Continued on the following page.

■ Impedance-Frequency Characteristics

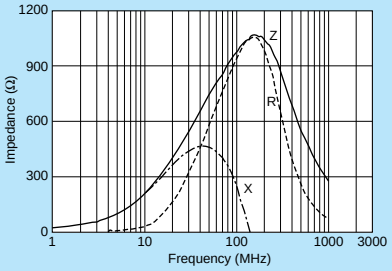
BLM15AG221SN1



BLM15AG601SN1



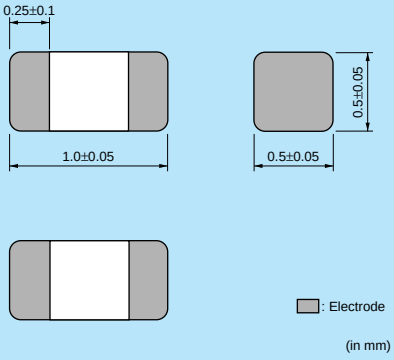
BLM15AG102SN1



BLM15AG_AN Series Gold Plating (0402 Size)

Au plating electrode for wire bonding mount.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

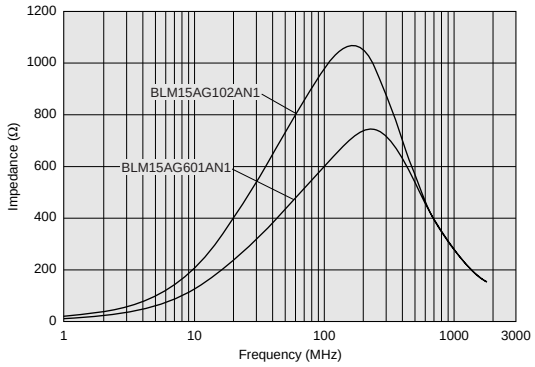
■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range
BLM15AG601AN1☐	600ohm±25%	300mA	0.6ohm	-55°C to +125°C
BLM15AG102AN1☐	1000ohm±25%	200mA	1.0ohm	-55°C to +125°C

Number of Circuits: 1

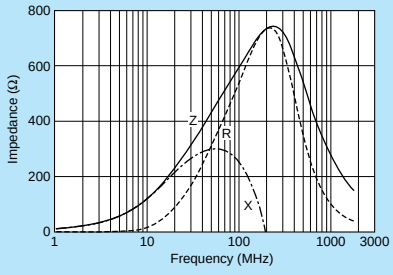
This product is Au plating version designed for wire bonding mount. Be sure that this product is not designed for solder mounting.

■ Impedance-Frequency Characteristics (Main Items)

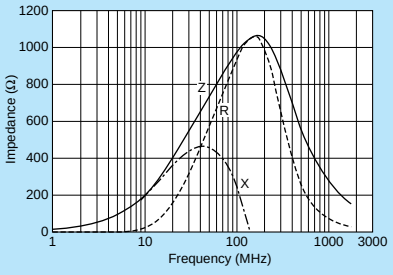


■ Impedance-Frequency Characteristics

BLM15AG601AN1



BLM15AG102AN1

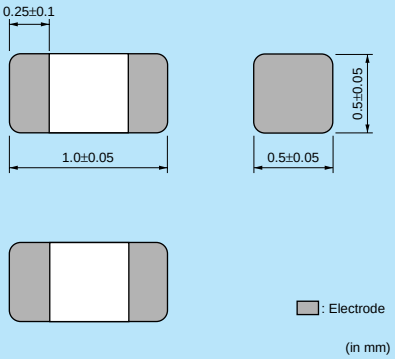


BLM15AX Series (0402 Size)

Hi Power Reflow OK

Low DC resistance, large current. Small characteristics change.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

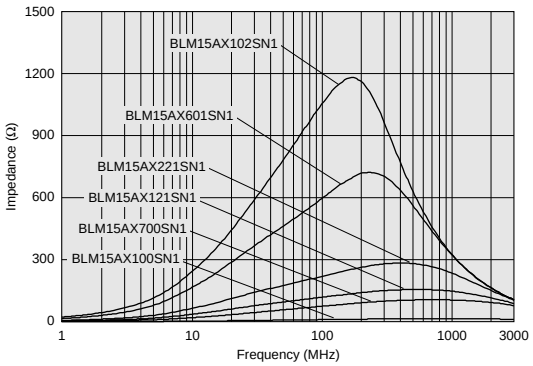
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15AX100SN1☐	10ohm(Typ.)	1740mA	0.02ohm	-55°C to +125°C	New Kit ≧1A
BLM15AX700SN1☐	70ohm±25%	780mA	0.1ohm	-55°C to +125°C	New Kit
BLM15AX121SN1☐	120ohm±25%	680mA	0.13ohm	-55°C to +125°C	New Kit
BLM15AX221SN1☐	220ohm±25%	580mA	0.18ohm	-55°C to +125°C	New Kit
BLM15AX601SN1☐	600ohm±25%	420mA	0.34ohm	-55°C to +125°C	New Kit
BLM15AX102SN1☐	1000ohm±25%	350mA	0.49ohm	-55°C to +125°C	New Kit

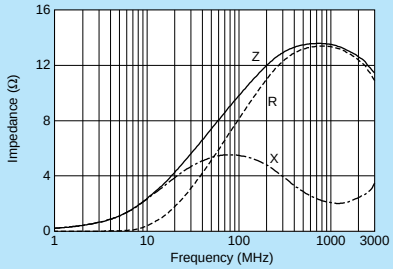
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

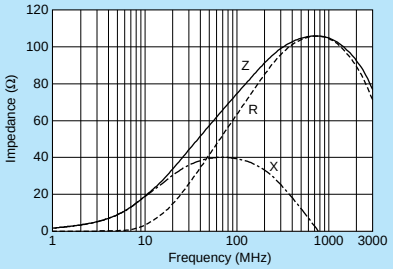


■ Impedance-Frequency Characteristics

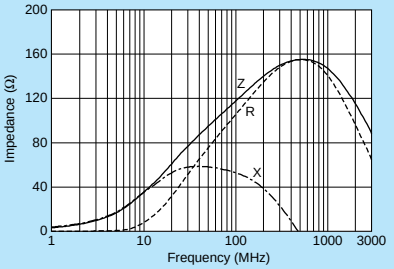
BLM15AX100SN1



BLM15AX700SN1



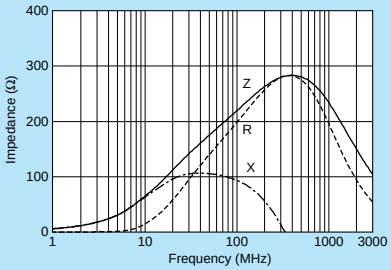
BLM15AX121SN1



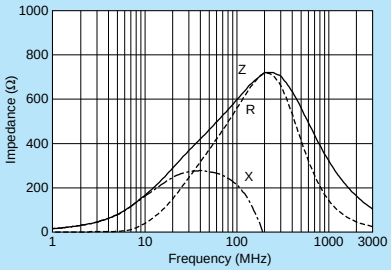
Continued on the following page.

■ Impedance-Frequency Characteristics

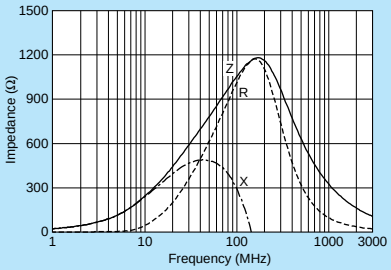
BLM15AX221SN1



BLM15AX601SN1



BLM15AX102SN1

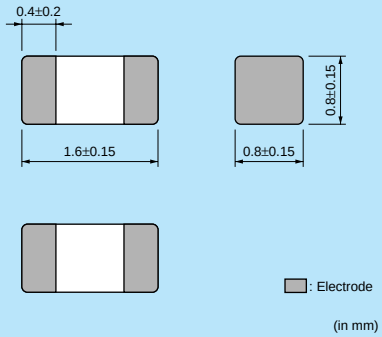


BLM18A Series (0603 Size)

Flow OK Reflow OK

0603 size for general signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

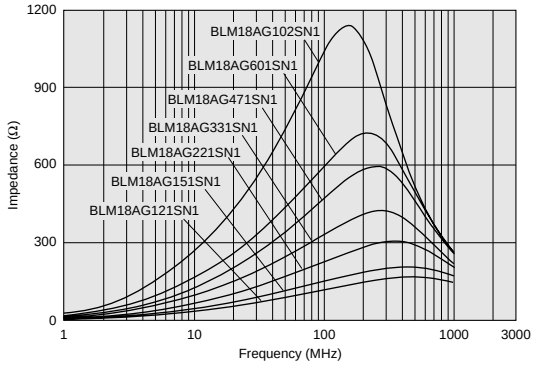
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18AG121SN1☐	120ohm±25%	500mA	0.18ohm	-55°C to +125°C	Kit
BLM18AG151SN1☐	150ohm±25%	500mA	0.25ohm	-55°C to +125°C	Kit
BLM18AG221SN1☐	220ohm±25%	500mA	0.25ohm	-55°C to +125°C	Kit
BLM18AG331SN1☐	330ohm±25%	500mA	0.30ohm	-55°C to +125°C	Kit
BLM18AG471SN1☐	470ohm±25%	500mA	0.35ohm	-55°C to +125°C	Kit
BLM18AG601SN1☐	600ohm±25%	500mA	0.38ohm	-55°C to +125°C	Kit
BLM18AG102SN1☐	1000ohm±25%	400mA	0.50ohm	-55°C to +125°C	Kit

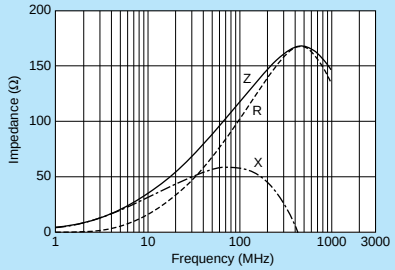
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

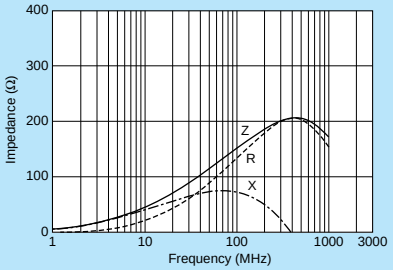


■ Impedance-Frequency Characteristics

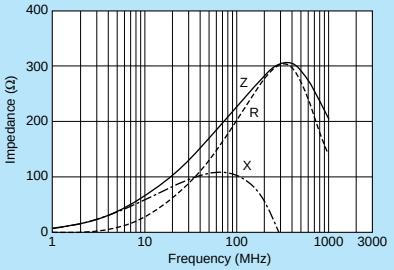
BLM18AG121SN1



BLM18AG151SN1



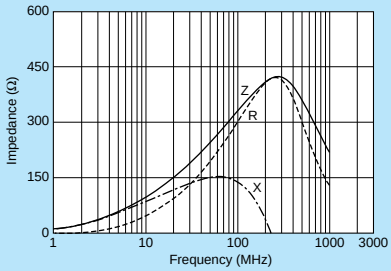
BLM18AG221SN1



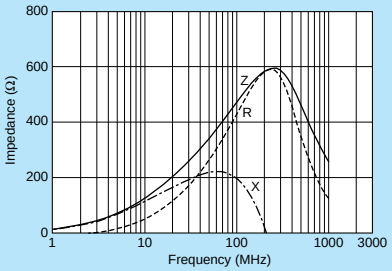
Continued on the following page.

■ Impedance-Frequency Characteristics

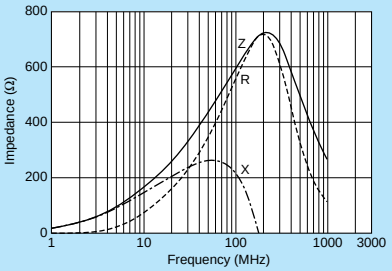
BLM18AG331SN1



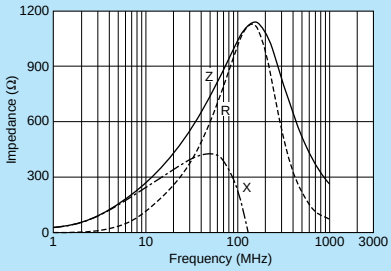
BLM18AG471SN1



BLM18AG601SN1



BLM18AG102SN1

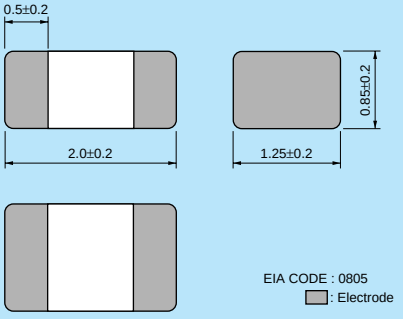


BLM21A Series (0805 Size)

Flow OK Reflow OK

0805 size for general signal lines.

■ Dimensions



EIA CODE : 0805
: Electrode

(in mm)

■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

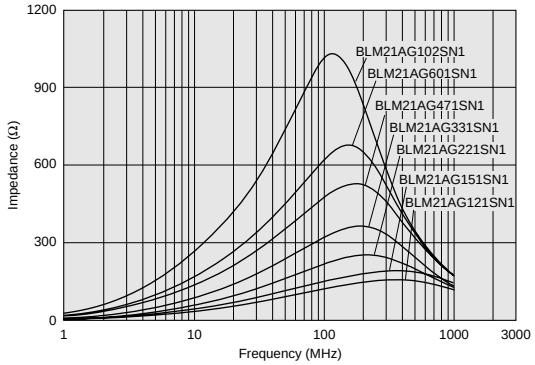
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM21AG121SN1☐	120ohm±25%	200mA	0.15ohm	-55°C to +125°C	Kit
BLM21AG151SN1☐	150ohm±25%	200mA	0.15ohm	-55°C to +125°C	Kit
BLM21AG221SN1☐	220ohm±25%	200mA	0.20ohm	-55°C to +125°C	Kit
BLM21AG331SN1☐	330ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM21AG471SN1☐	470ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM21AG601SN1☐	600ohm±25%	200mA	0.30ohm	-55°C to +125°C	Kit
BLM21AG102SN1☐	1000ohm±25%	200mA	0.45ohm	-55°C to +125°C	Kit

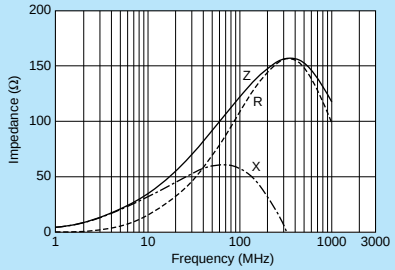
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

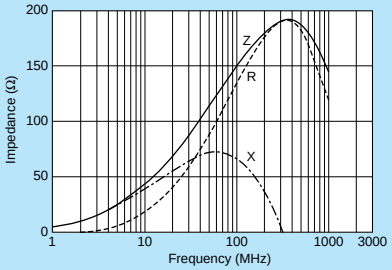


■ Impedance-Frequency Characteristics

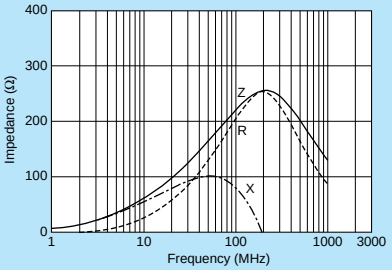
BLM21AG121SN1



BLM21AG151SN1



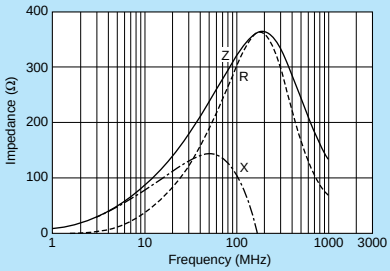
BLM21AG221SN1



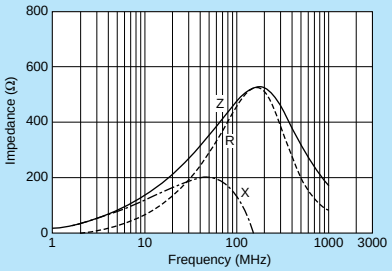
Continued on the following page.

■ Impedance-Frequency Characteristics

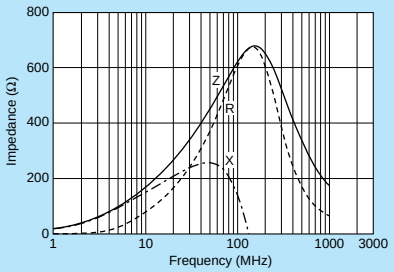
BLM21AG331SN1



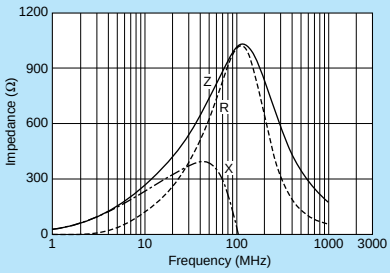
BLM21AG471SN1



BLM21AG601SN1



BLM21AG102SN1

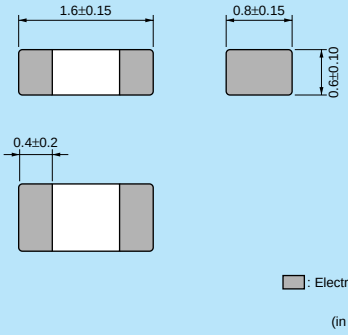


BLM18T Series (0603 Size)

Flow OK Reflow OK

Thin 0603 size for general signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

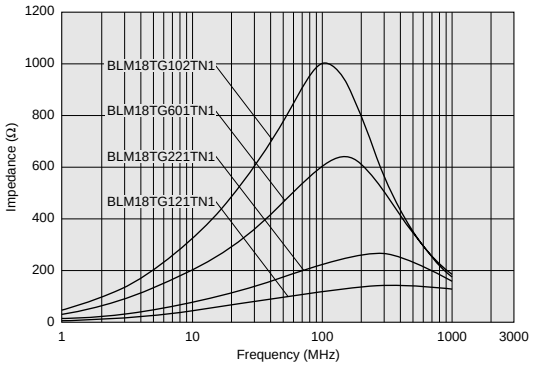
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range
BLM18TG121TN1☐	120ohm±25%	200mA	0.25ohm	-55°C to +125°C
BLM18TG221TN1☐	220ohm±25%	200mA	0.30ohm	-55°C to +125°C
BLM18TG601TN1☐	600ohm±25%	200mA	0.45ohm	-55°C to +125°C
BLM18TG102TN1☐	1000ohm±25%	100mA	0.60ohm	-55°C to +125°C

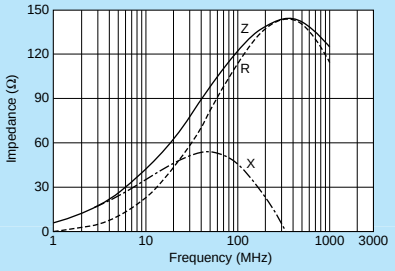
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

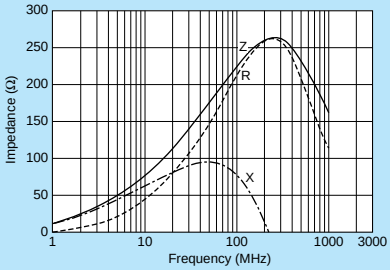


■ Impedance-Frequency Characteristics

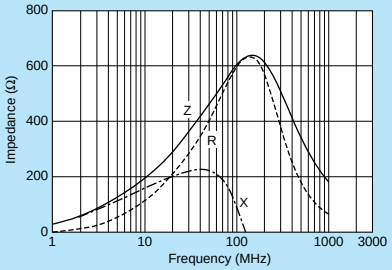
BLM18TG121TN1



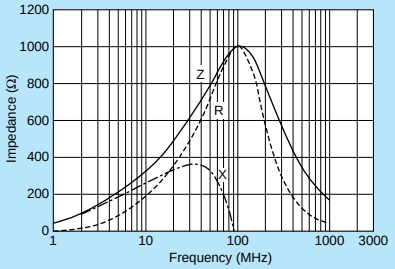
BLM18TG221TN1



BLM18TG601TN1



BLM18TG102TN1

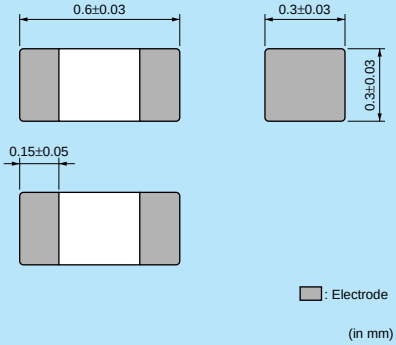


BLM03B Series (0201 Size)

Reflow OK

0201 size for high speed signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	15000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

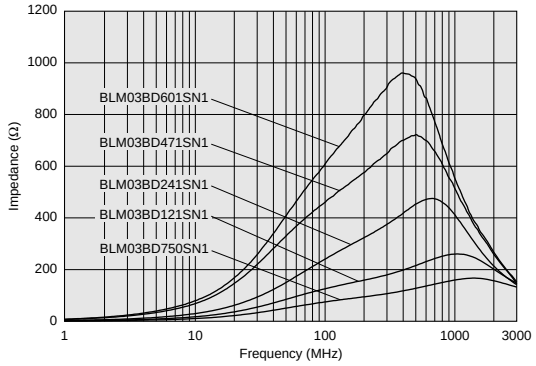
■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM03BD750SN1☐	75ohm±25%	300mA	0.4ohm	-55°C to +125°C	Kit
BLM03BD121SN1☐	120ohm±25%	250mA	0.5ohm	-55°C to +125°C	Kit
BLM03BD241SN1☐	240ohm±25%	200mA	0.8ohm	-55°C to +125°C	Kit
BLM03BD471SN1☐	470ohm±25%	215mA	1.5ohm	-55°C to +125°C	New Kit
BLM03BD601SN1☐	600ohm±25%	200mA	1.7ohm	-55°C to +125°C	New Kit
BLM03BB100SN1☐	10ohm±25%	300mA	0.4ohm	-55°C to +125°C	Kit
BLM03BB220SN1☐	22ohm±25%	200mA	0.5ohm	-55°C to +125°C	Kit
BLM03BB470SN1☐	47ohm±25%	200mA	0.7ohm	-55°C to +125°C	Kit
BLM03BB750SN1☐	75ohm±25%	200mA	1.0ohm	-55°C to +125°C	Kit
BLM03BB121SN1☐	120ohm±25%	100mA	1.5ohm	-55°C to +125°C	Kit

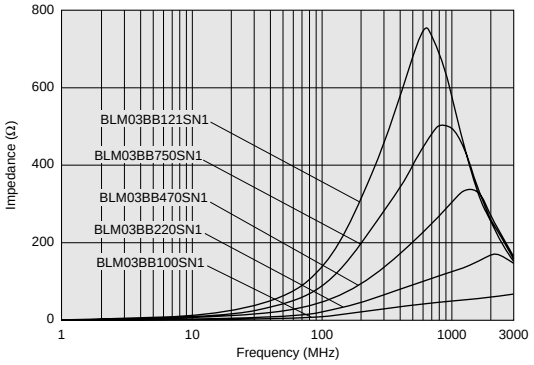
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

BLM03BD Series



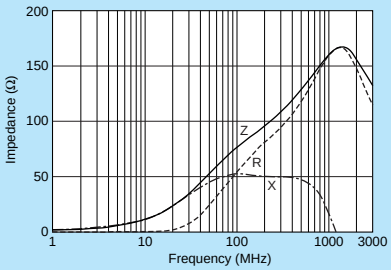
BLM03BB Series



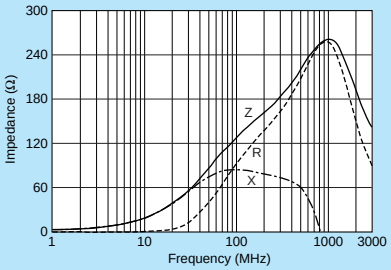
Continued on the following page.

■ Impedance-Frequency Characteristics

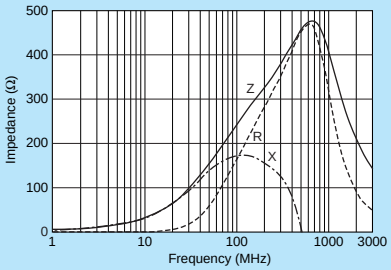
BLM03BD750SN1



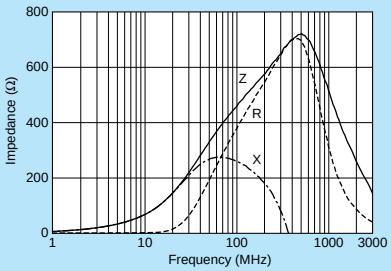
BLM03BD121SN1



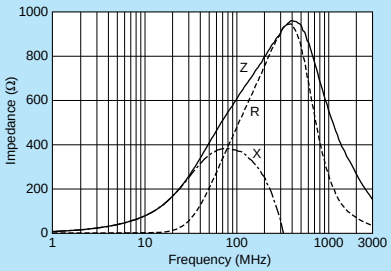
BLM03BD241SN1



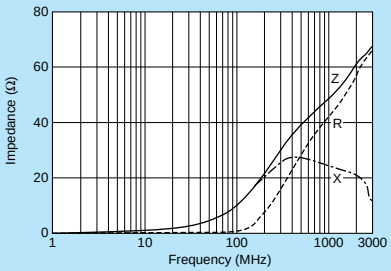
BLM03BD471SN1



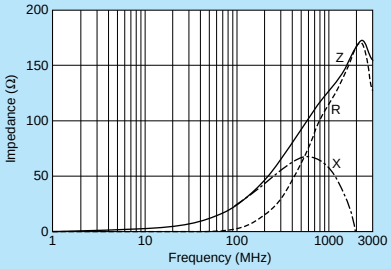
BLM03BD601SN1



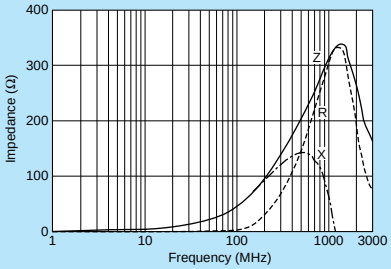
BLM03BB100SN1



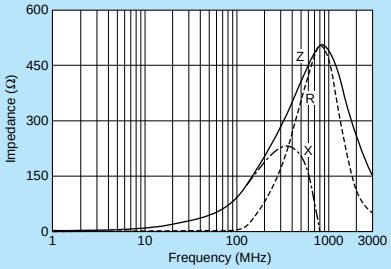
BLM03BB220SN1



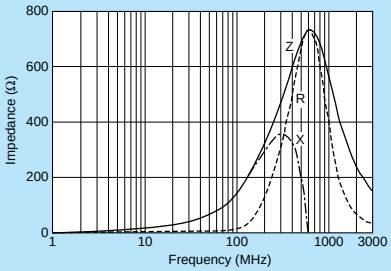
BLM03BB470SN1



BLM03BB750SN1



BLM03BB121SN1

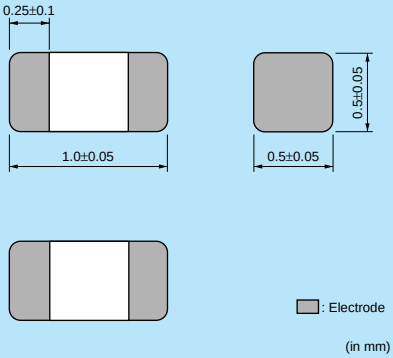


BLM15B Series (0402 Size)

Reflow OK

0402 size for high speed signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

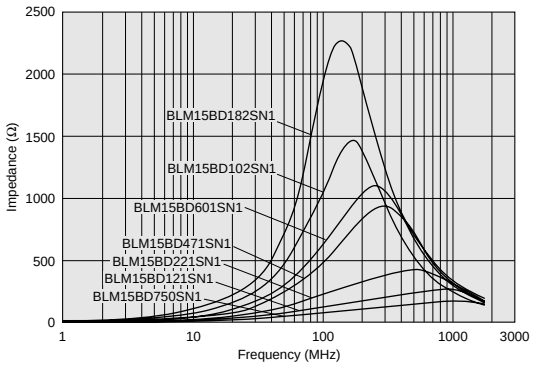
Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15BD750SN1☐	75ohm±25%	300mA	0.20ohm	-55°C to +125°C	Kit
BLM15BD121SN1☐	120ohm±25%	300mA	0.30ohm	-55°C to +125°C	Kit
BLM15BD221SN1☐	220ohm±25%	300mA	0.40ohm	-55°C to +125°C	Kit
BLM15BD471SN1☐	470ohm±25%	200mA	0.60ohm	-55°C to +125°C	Kit
BLM15BD601SN1☐	600ohm±25%	200mA	0.65ohm	-55°C to +125°C	Kit
BLM15BD102SN1☐	1000ohm±25%	200mA	0.90ohm	-55°C to +125°C	Kit
BLM15BD182SN1☐	1800ohm±25%	100mA	1.40ohm	-55°C to +125°C	Kit
BLM15BB050SN1☐	5ohm±25%	500mA	0.08ohm	-55°C to +125°C	Kit
BLM15BB100SN1☐	10ohm±25%	300mA	0.10ohm	-55°C to +125°C	Kit
BLM15BB220SN1☐	22ohm±25%	300mA	0.20ohm	-55°C to +125°C	Kit
BLM15BB470SN1☐	47ohm±25%	300mA	0.35ohm	-55°C to +125°C	Kit
BLM15BB750SN1☐	75ohm±25%	300mA	0.40ohm	-55°C to +125°C	Kit
BLM15BB121SN1☐	120ohm±25%	300mA	0.55ohm	-55°C to +125°C	Kit
BLM15BB221SN1☐	220ohm±25%	200mA	0.80ohm	-55°C to +125°C	Kit
BLM15BA050SN1☐	5ohm±25%	300mA	0.10ohm	-55°C to +125°C	Kit
BLM15BA100SN1☐	10ohm±25%	300mA	0.20ohm	-55°C to +125°C	Kit
BLM15BA220SN1☐	22ohm±25%	300mA	0.30ohm	-55°C to +125°C	Kit
BLM15BA330SN1☐	33ohm±25%	300mA	0.40ohm	-55°C to +125°C	Kit
BLM15BA470SN1☐	47ohm±25%	200mA	0.60ohm	-55°C to +125°C	Kit
BLM15BA750SN1☐	75ohm±25%	200mA	0.80ohm	-55°C to +125°C	Kit

Number of Circuits: 1

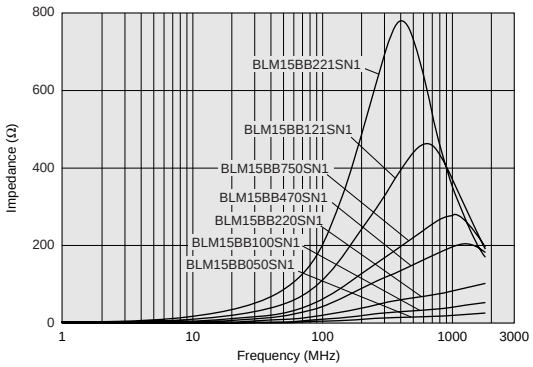
Continued on the following page.

■ Impedance-Frequency Characteristics (Main Items)

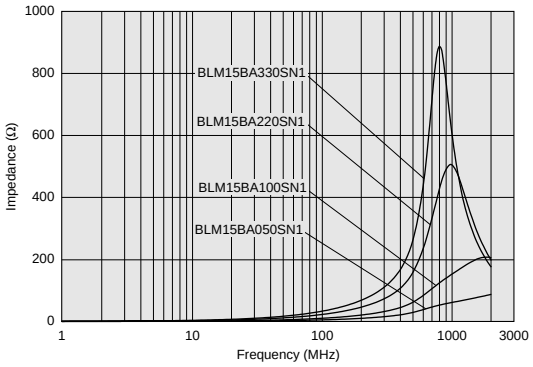
BLM15BD Series



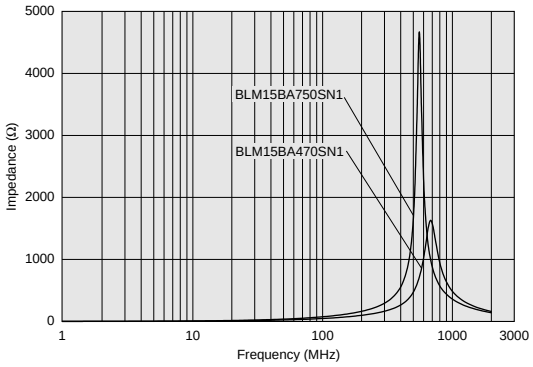
BLM15BB Series



BLM15BA Series

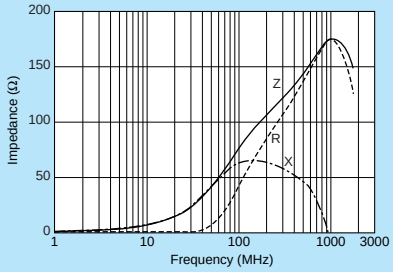


BLM15BA Series

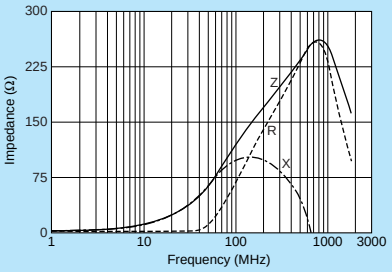


■ Impedance-Frequency Characteristics

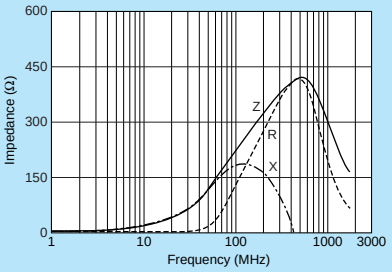
BLM15BD750SN1



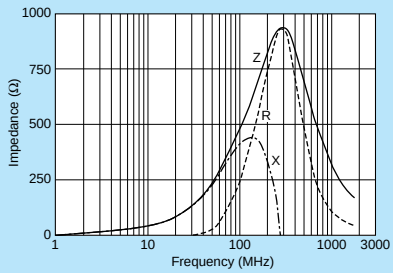
BLM15BD121SN1



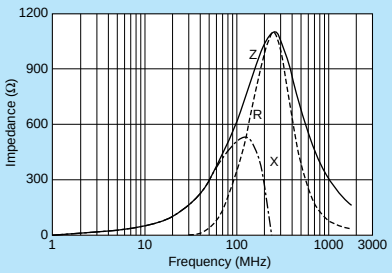
BLM15BD221SN1



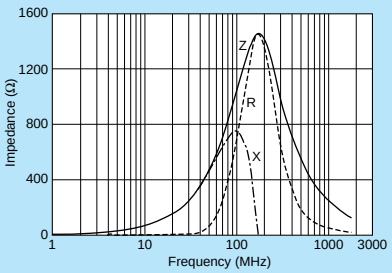
BLM15BD471SN1



BLM15BD601SN1



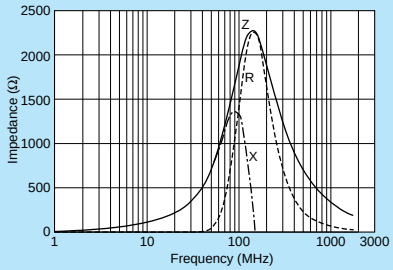
BLM15BD102SN1



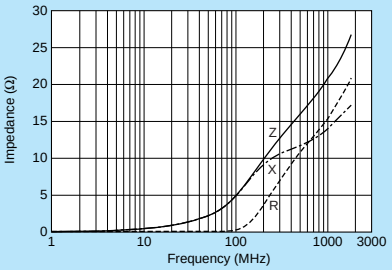
Continued on the following page.

■ Impedance-Frequency Characteristics

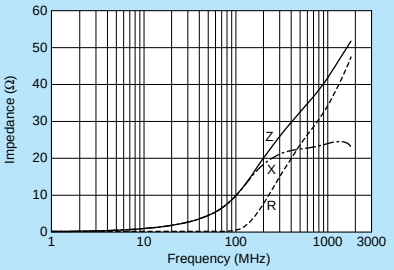
BLM15BD182SN1



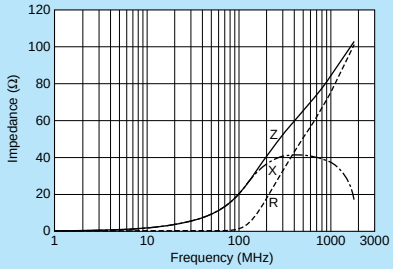
BLM15BB050SN1



BLM15BB100SN1



BLM15BB220SN1



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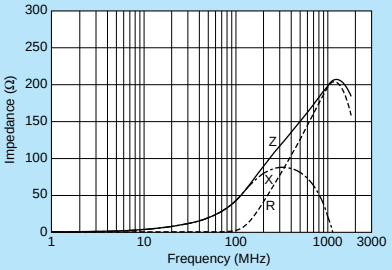

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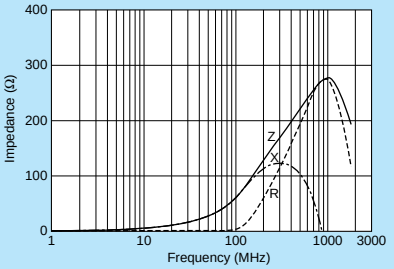

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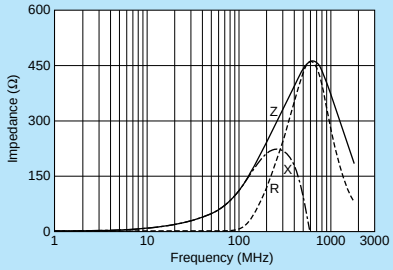

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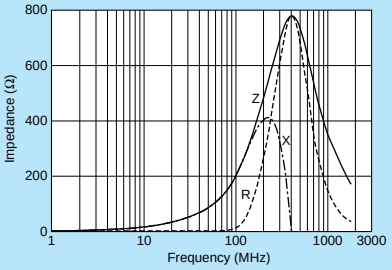

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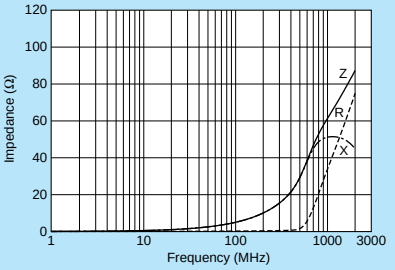

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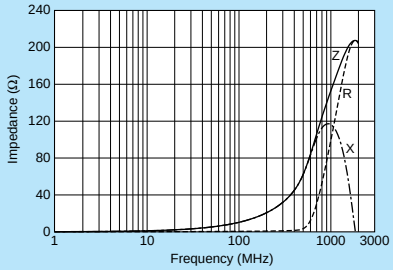

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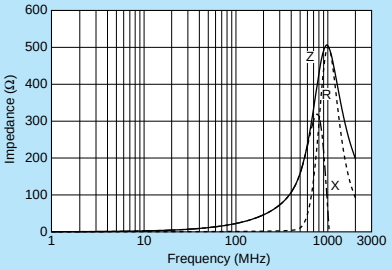

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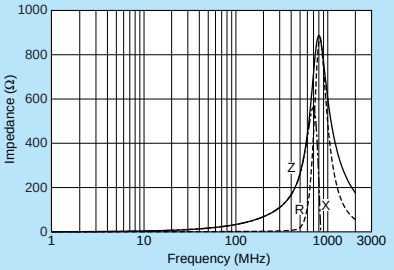

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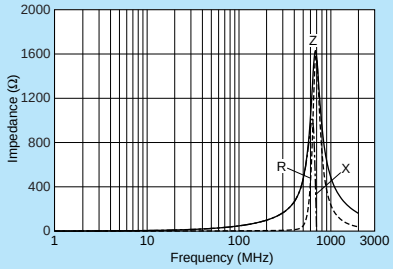

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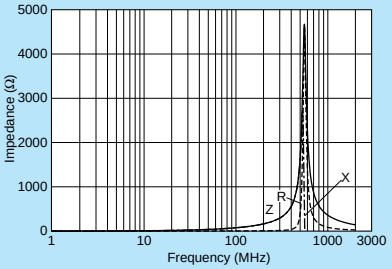
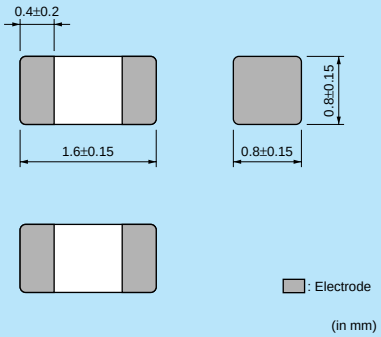


BLM18B Series (0603 Size)

Flow OK Reflow OK

0603 size for high speed signal lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

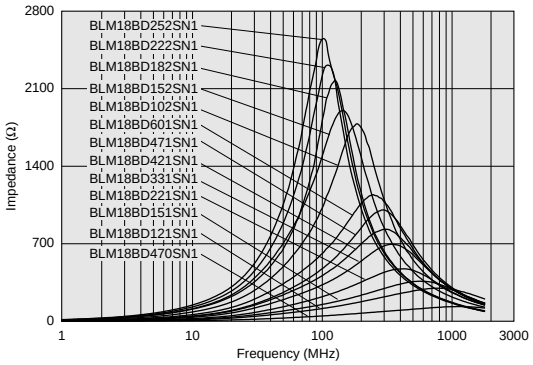
Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18BD470SN1□	47ohm±25%	500mA	0.30ohm	-55°C to +125°C	Kit
BLM18BD121SN1□	120ohm±25%	200mA	0.40ohm	-55°C to +125°C	Kit
BLM18BD151SN1□	150ohm±25%	200mA	0.40ohm	-55°C to +125°C	Kit
BLM18BD221SN1□	220ohm±25%	200mA	0.45ohm	-55°C to +125°C	Kit
BLM18BD331SN1□	330ohm±25%	200mA	0.50ohm	-55°C to +125°C	Kit
BLM18BD421SN1□	420ohm±25%	200mA	0.55ohm	-55°C to +125°C	Kit
BLM18BD471SN1□	470ohm±25%	200mA	0.55ohm	-55°C to +125°C	Kit
BLM18BD601SN1□	600ohm±25%	200mA	0.65ohm	-55°C to +125°C	Kit
BLM18BD102SN1□	1000ohm±25%	100mA	0.85ohm	-55°C to +125°C	Kit
BLM18BD152SN1□	1500ohm±25%	50mA	1.20ohm	-55°C to +125°C	Kit
BLM18BD182SN1□	1800ohm±25%	50mA	1.50ohm	-55°C to +125°C	Kit
BLM18BD222SN1□	2200ohm±25%	50mA	1.50ohm	-55°C to +125°C	Kit
BLM18BD252SN1□	2500ohm±25%	50mA	1.50ohm	-55°C to +125°C	Kit
BLM18BB050SN1□	5ohm±25%	700mA	0.05ohm	-55°C to +125°C	Kit
BLM18BB100SN1□	10ohm±25%	700mA	0.10ohm	-55°C to +125°C	Kit
BLM18BB220SN1□	22ohm±25%	600mA	0.20ohm	-55°C to +125°C	Kit
BLM18BB470SN1□	47ohm±25%	550mA	0.25ohm	-55°C to +125°C	Kit
BLM18BB600SN1□	60ohm±25%	550mA	0.25ohm	-55°C to +125°C	Kit
BLM18BB750SN1□	75ohm±25%	500mA	0.30ohm	-55°C to +125°C	Kit
BLM18BB121SN1□	120ohm±25%	500mA	0.30ohm	-55°C to +125°C	Kit
BLM18BB141SN1□	140ohm±25%	450mA	0.35ohm	-55°C to +125°C	
BLM18BB151SN1□	150ohm±25%	450mA	0.37ohm	-55°C to +125°C	Kit
BLM18BB221SN1□	220ohm±25%	450mA	0.45ohm	-55°C to +125°C	Kit
BLM18BB331SN1□	330ohm±25%	400mA	0.58ohm	-55°C to +125°C	Kit
BLM18BB471SN1□	470ohm±25%	300mA	0.85ohm	-55°C to +125°C	Kit
BLM18BA050SN1□	5ohm±25%	500mA	0.20ohm	-55°C to +125°C	Kit
BLM18BA100SN1□	10ohm±25%	500mA	0.25ohm	-55°C to +125°C	Kit
BLM18BA220SN1□	22ohm±25%	500mA	0.35ohm	-55°C to +125°C	
BLM18BA470SN1□	47ohm±25%	300mA	0.55ohm	-55°C to +125°C	Kit
BLM18BA750SN1□	75ohm±25%	300mA	0.70ohm	-55°C to +125°C	Kit
BLM18BA121SN1□	120ohm±25%	200mA	0.90ohm	-55°C to +125°C	Kit

Number of Circuits: 1

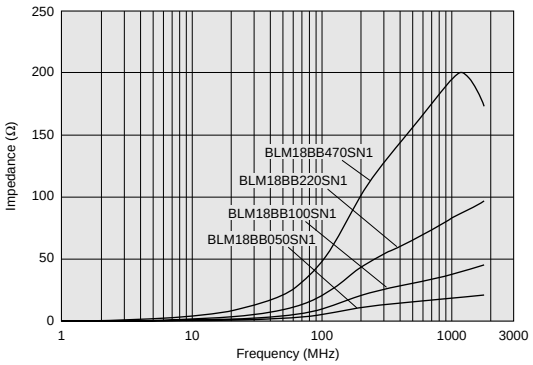
Continued on the following page.

■ Impedance-Frequency Characteristics (Main Items)

BLM18BD Series



BLM18BB Series



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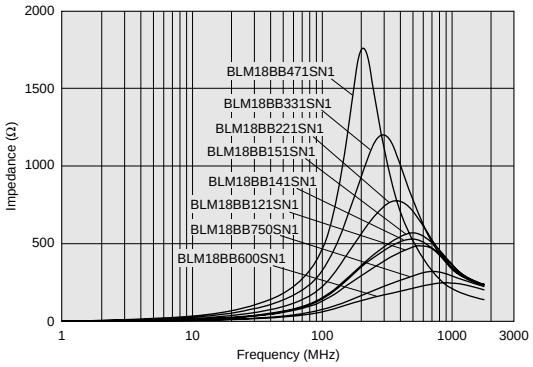

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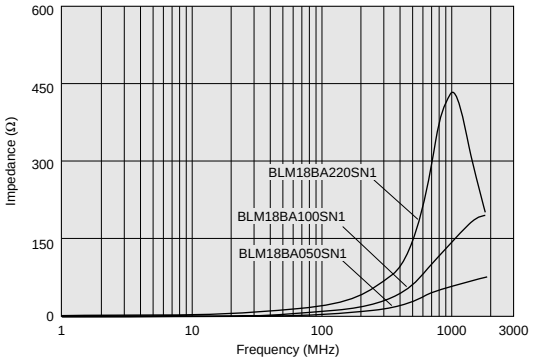
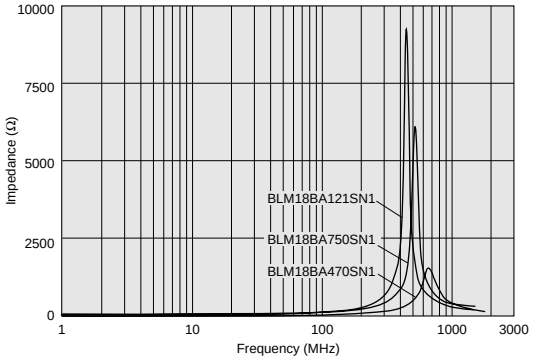


BLM18BA Series



■ Impedance-Frequency Characteristics

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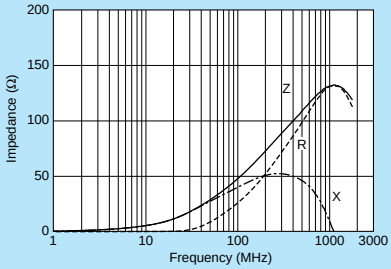

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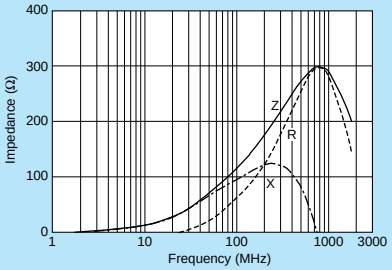

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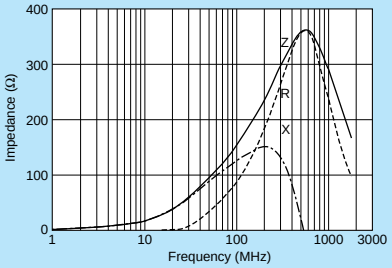

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■ Impedance-Frequency Characteristics

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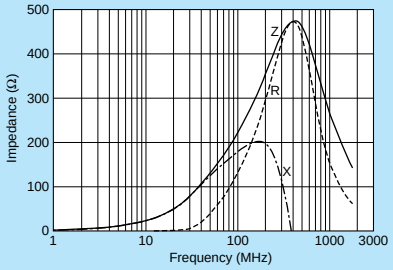

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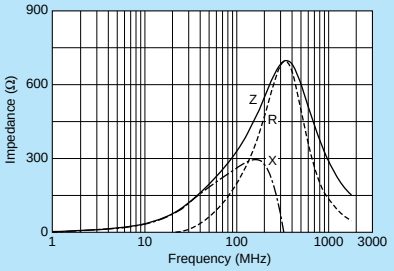

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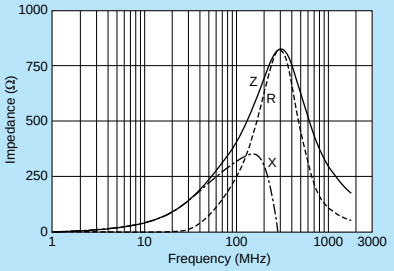

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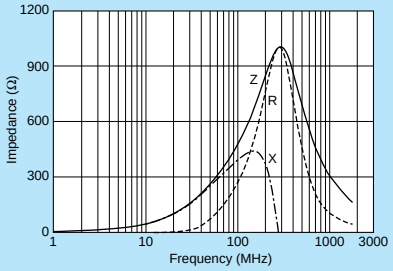

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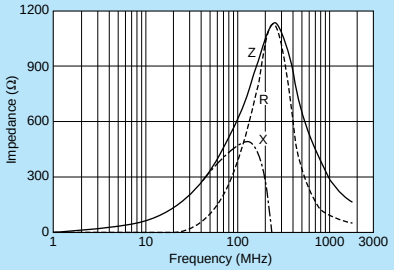

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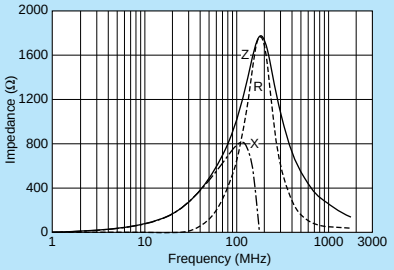

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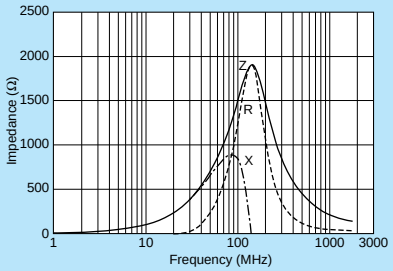

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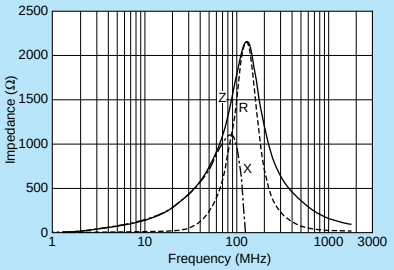

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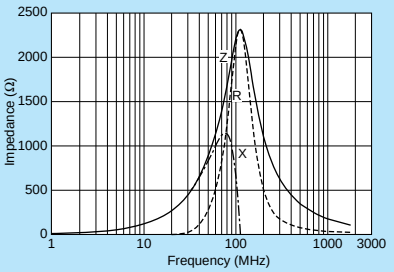

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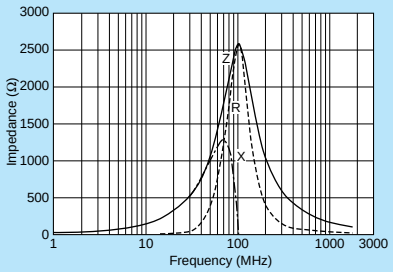

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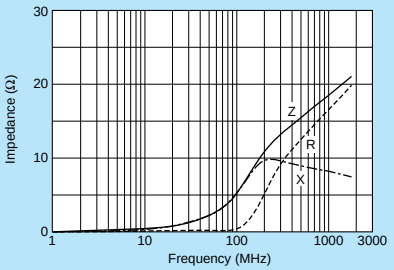

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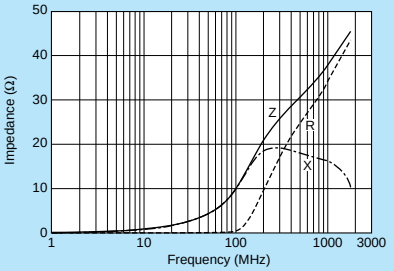

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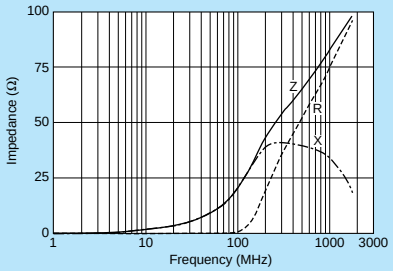

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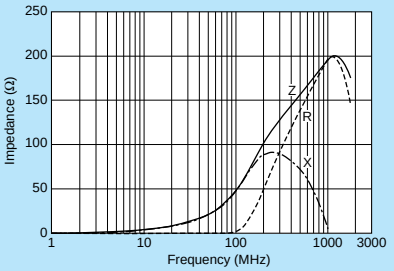

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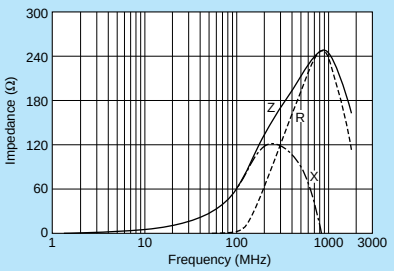

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■ Impedance-Frequency Characteristics

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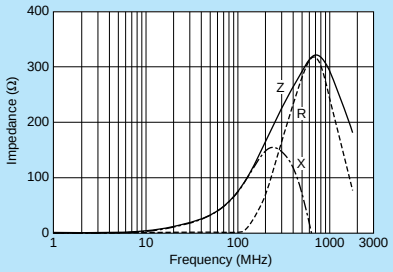

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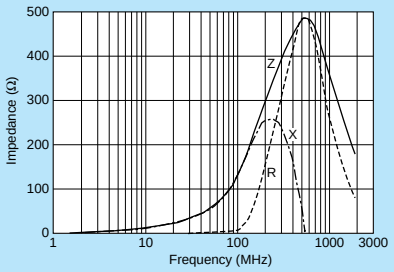

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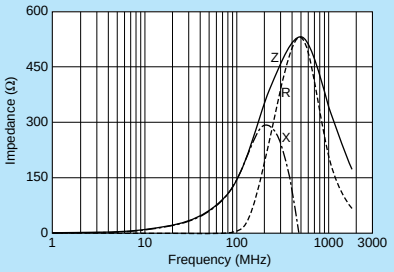

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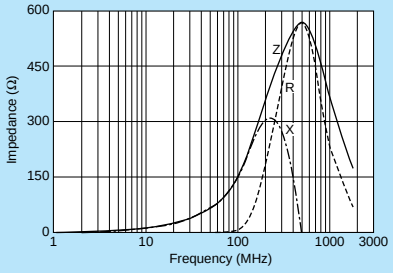

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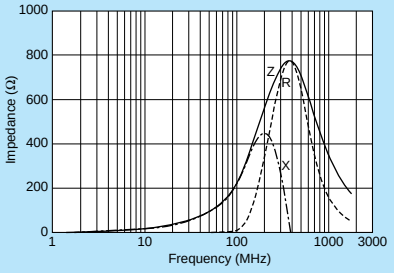

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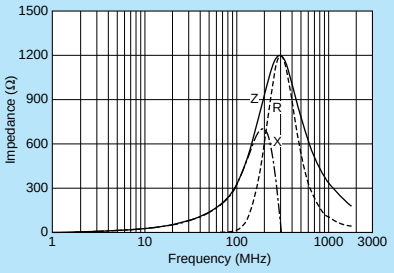

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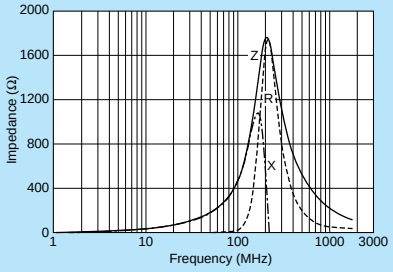

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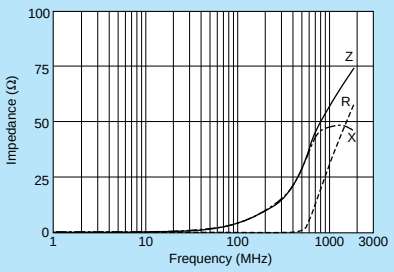

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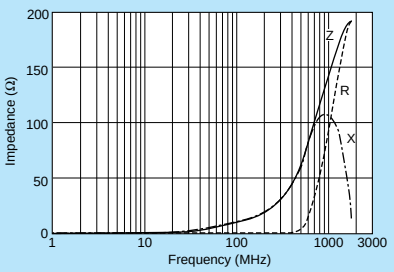

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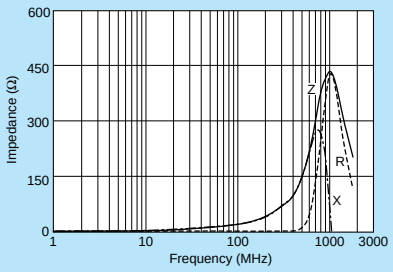

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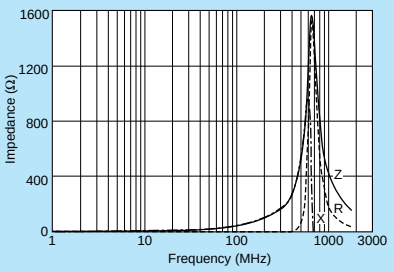

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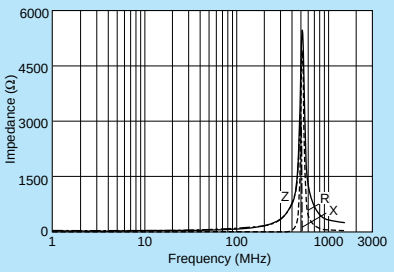

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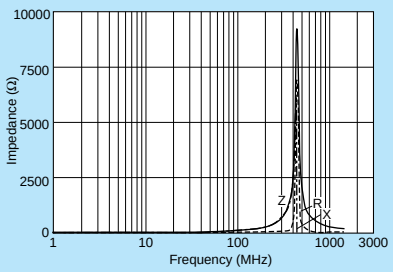
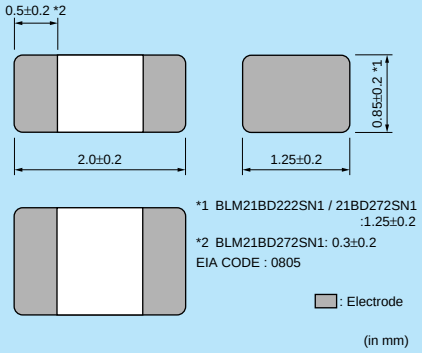


BLM21B Series (0805 Size)

Flow OK Reflow OK

0805 size for high speed signal lines.

■ Dimensions



*1 BLM21BD222SN1 / 21BD272SN1 :1.25±0.2
*2 BLM21BD272SN1: 0.3±0.2
EIA CODE : 0805

: Electrode

(in mm)

■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

• All except **BLM21BD222SN1/21BD272SN1**

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

• **BLM21BD222SN1/21BD272SN1** only

Code	Packaging	Minimum Quantity
L	180mm Reel Plastic Tape	3000
K	330mm Reel Plastic Tape	10000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

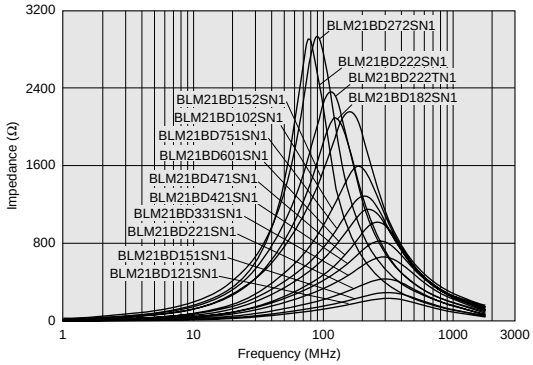
Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM21BD121SN1☐	120ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM21BD151SN1☐	150ohm±25%	200mA	0.25ohm	-55°C to +125°C	
BLM21BD221SN1☐	220ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM21BD331SN1☐	330ohm±25%	200mA	0.30ohm	-55°C to +125°C	
BLM21BD421SN1☐	420ohm±25%	200mA	0.30ohm	-55°C to +125°C	Kit
BLM21BD471SN1☐	470ohm±25%	200mA	0.35ohm	-55°C to +125°C	Kit
BLM21BD601SN1☐	600ohm±25%	200mA	0.35ohm	-55°C to +125°C	Kit
BLM21BD751SN1☐	750ohm±25%	200mA	0.40ohm	-55°C to +125°C	
BLM21BD102SN1☐	1000ohm±25%	200mA	0.40ohm	-55°C to +125°C	Kit
BLM21BD152SN1☐	1500ohm±25%	200mA	0.45ohm	-55°C to +125°C	Kit
BLM21BD182SN1☐	1800ohm±25%	200mA	0.50ohm	-55°C to +125°C	Kit
BLM21BD222TN1☐	2200ohm±25%	200mA	0.60ohm	-55°C to +125°C	Kit
BLM21BD222SN1☐	2250ohm(Typ.)	200mA	0.60ohm	-55°C to +125°C	Kit
BLM21BD272SN1☐	2700ohm±25%	200mA	0.80ohm	-55°C to +125°C	Kit
BLM21BB050SN1☐	5ohm±25%	500mA	0.07ohm	-55°C to +125°C	Kit
BLM21BB600SN1☐	60ohm±25%	200mA	0.20ohm	-55°C to +125°C	Kit
BLM21BB750SN1☐	75ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM21BB121SN1☐	120ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM21BB151SN1☐	150ohm±25%	200mA	0.25ohm	-55°C to +125°C	
BLM21BB201SN1☐	200ohm±25%	200mA	0.35ohm	-55°C to +125°C	
BLM21BB221SN1☐	220ohm±25%	200mA	0.35ohm	-55°C to +125°C	Kit
BLM21BB331SN1☐	330ohm±25%	200mA	0.40ohm	-55°C to +125°C	Kit
BLM21BB471SN1☐	470ohm±25%	200mA	0.45ohm	-55°C to +125°C	Kit

Number of Circuits: 1

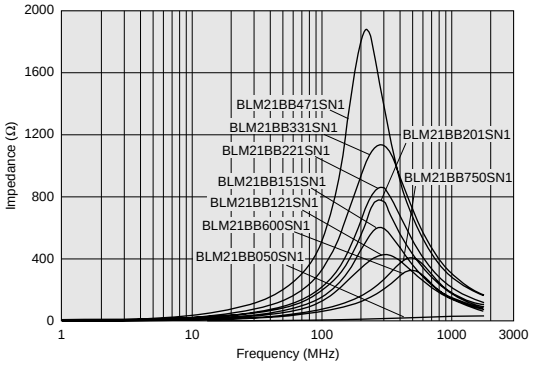
Continued on the following page.

Impedance-Frequency Characteristics (Main Items)

BLM21BD Series

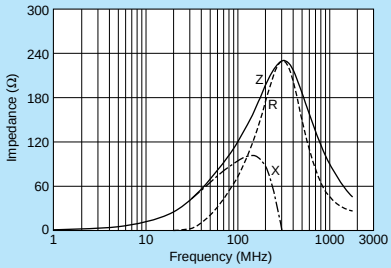


BLM21BB Series

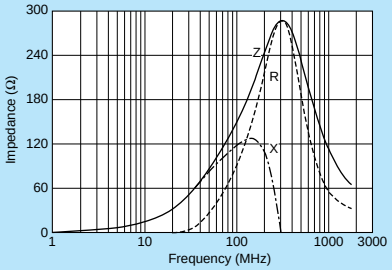


Impedance-Frequency Characteristics

BLM21BD121SN1



BLM21BD151SN1



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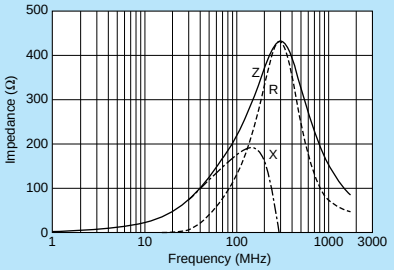

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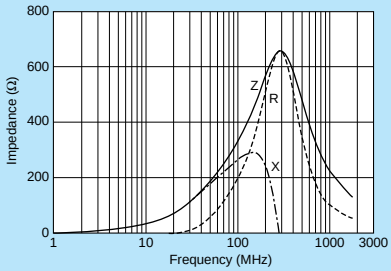
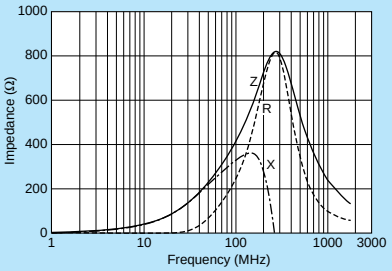
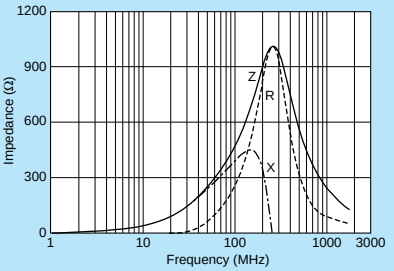


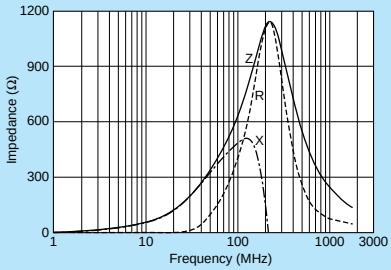
BLM21BD421SN1



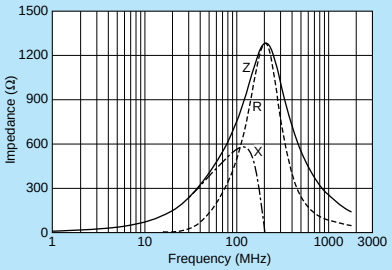
BLM21BD471SN1



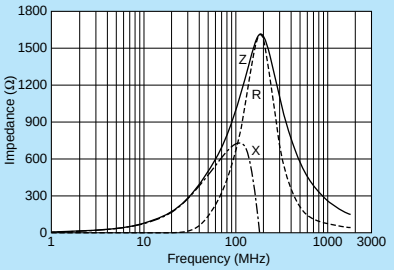
BLM21BD601SN1



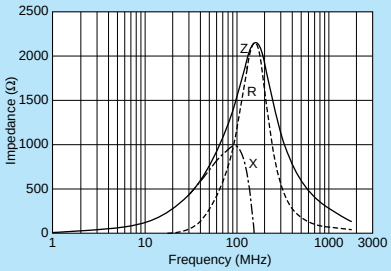
BLM21BD751SN1



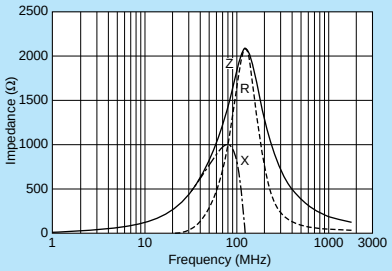
BLM21BD102SN1



BLM21BD152SN1



BLM21BD182SN1



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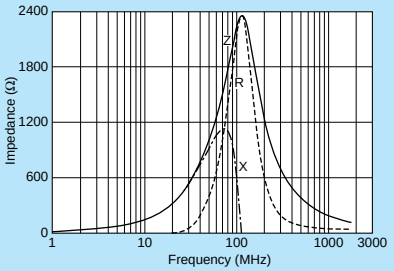
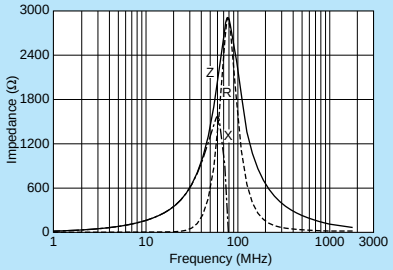


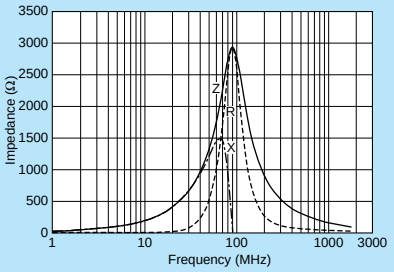
Continued on the following page.

Impedance-Frequency Characteristics

BLM21BD222SN1



BLM21BD272SN1



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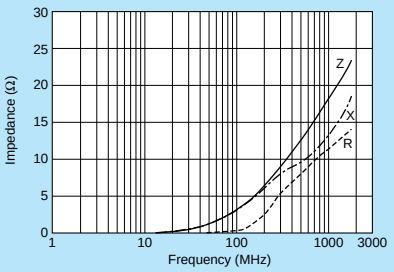

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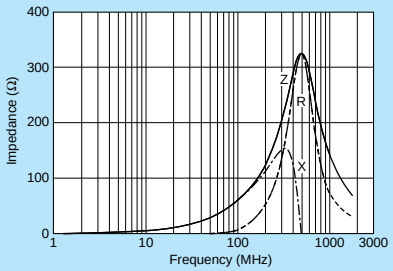

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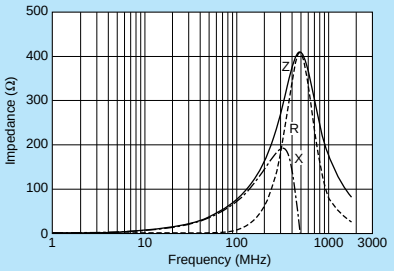
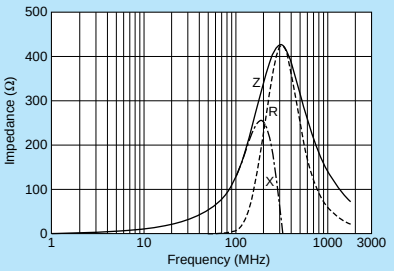
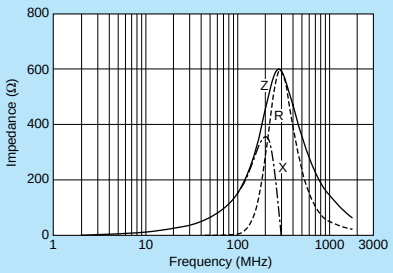


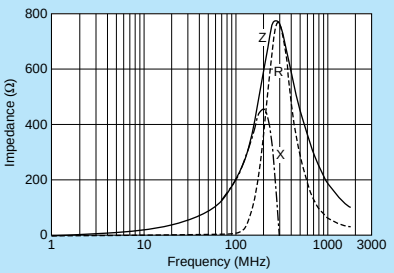
BLM21BB121SN1



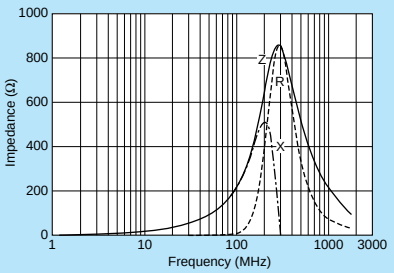
BLM21BB151SN1



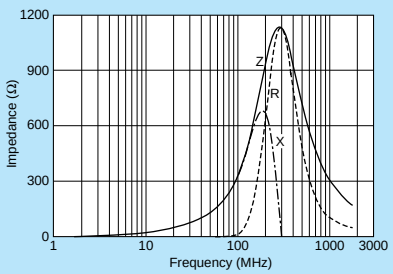
BLM21BB201SN1



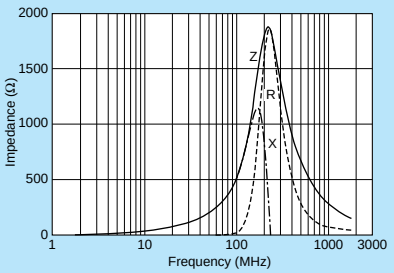
BLM21BB221SN1



BLM21BB331SN1



BLM21BB471SN1

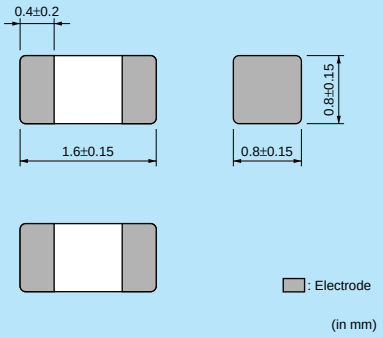


BLM18R Series (0603 Size)

Flow OK Reflow OK

For digital I/F. Reduce the distortion of waveform created by resonance.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

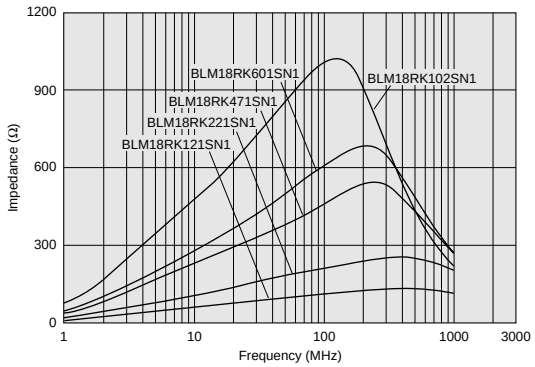
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18RK121SN1□	120ohm±25%	200mA	0.25ohm	-55°C to +125°C	Kit
BLM18RK221SN1□	220ohm±25%	200mA	0.30ohm	-55°C to +125°C	
BLM18RK471SN1□	470ohm±25%	200mA	0.50ohm	-55°C to +125°C	Kit
BLM18RK601SN1□	600ohm±25%	200mA	0.60ohm	-55°C to +125°C	Kit
BLM18RK102SN1□	1000ohm±25%	200mA	0.80ohm	-55°C to +125°C	Kit

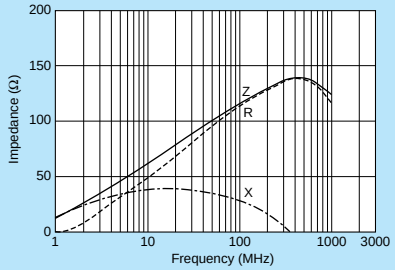
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

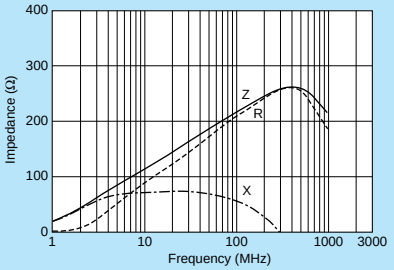


■ Impedance-Frequency Characteristics

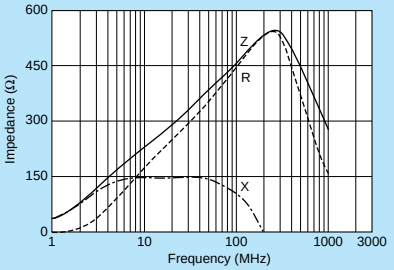
BLM18RK121SN1



BLM18RK221SN1



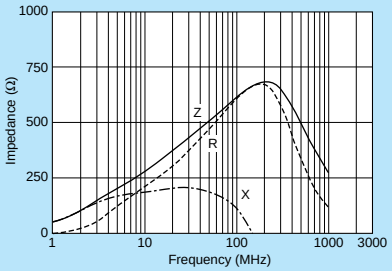
BLM18RK471SN1



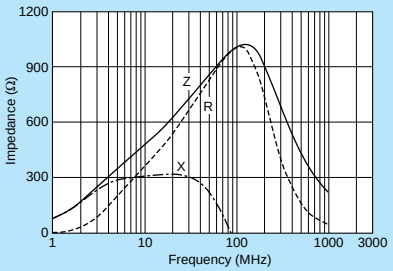
Continued on the following page.

■ Impedance-Frequency Characteristics

BLM18RK601SN1



BLM18RK102SN1

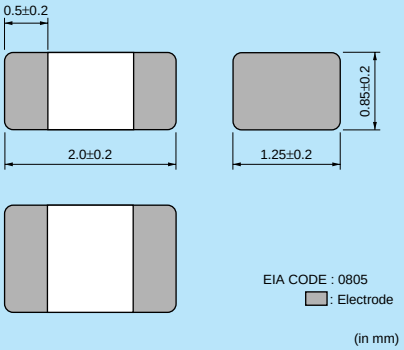


BLM21R Series (0805 Size)

Flow OK Reflow OK

For digital I/F. Reduce the distortion of waveform created by resonance.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

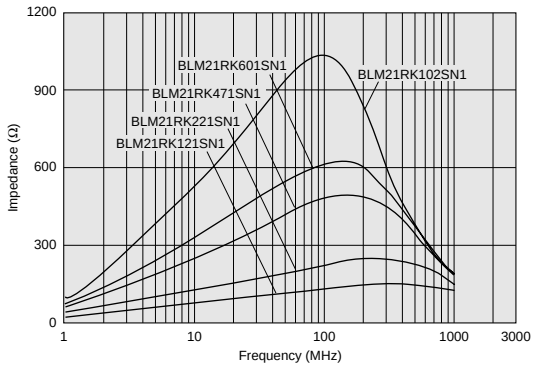
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range
BLM21RK121SN1☐	120ohm±25%	200mA	0.15ohm	-55°C to +125°C
BLM21RK221SN1☐	220ohm±25%	200mA	0.20ohm	-55°C to +125°C
BLM21RK471SN1☐	470ohm±25%	200mA	0.25ohm	-55°C to +125°C
BLM21RK601SN1☐	600ohm±25%	200mA	0.30ohm	-55°C to +125°C
BLM21RK102SN1☐	1000ohm±25%	200mA	0.50ohm	-55°C to +125°C

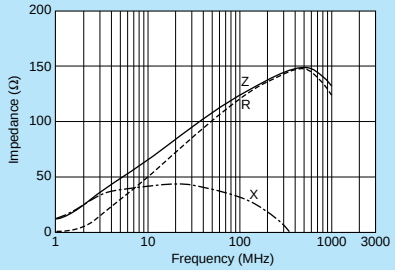
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

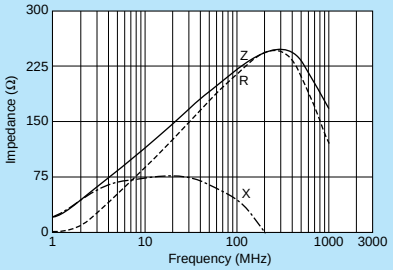


■ Impedance-Frequency Characteristics

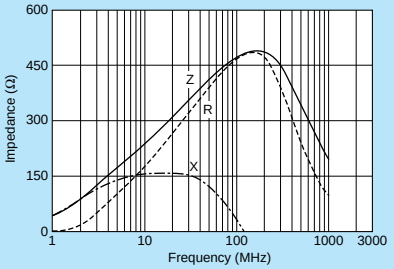
BLM21RK121SN1



BLM21RK221SN1



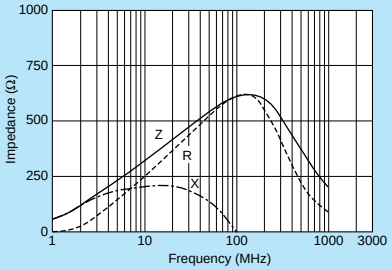
BLM21RK471SN1



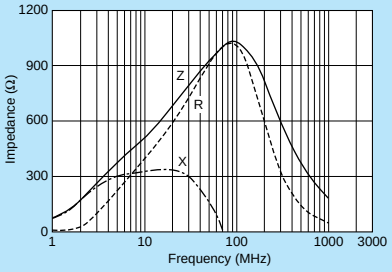
Continued on the following page.

■ Impedance-Frequency Characteristics

BLM21RK601SN1

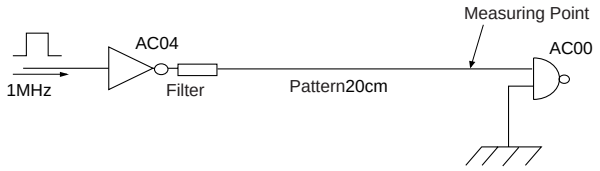


BLM21RK102SN1



Waveform Distortion Suppressing Performance of BLM□□R Series

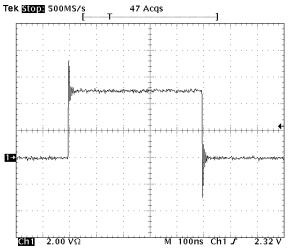
Measuring Circuits

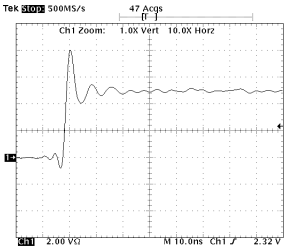


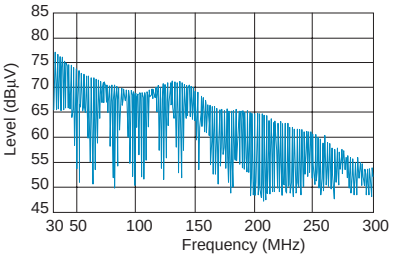
Type of Filter	EMI Suppression Effect / Description

Initial (No filter)

Signal waveform (100nsec/div, 2V/div) | Expand (10nsec/div, 2V/div) | Spectrum



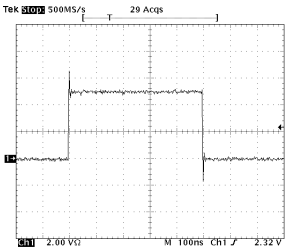


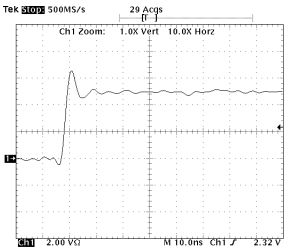


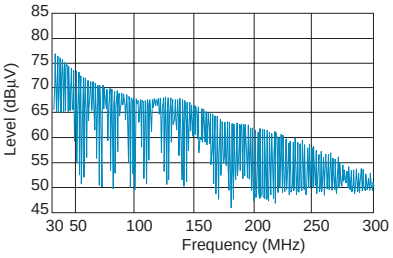
Ringing is caused on the signal waveform.
Such ringing contains several hundred MHz harmonic components and generates noise.

Resister (47Ω) is used

Signal waveform (100nsec/div, 2V/div) | Expand (10nsec/div, 2V/div) | Spectrum



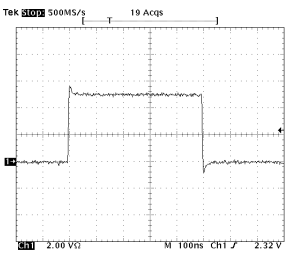


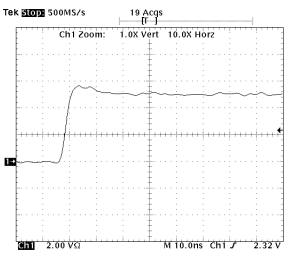


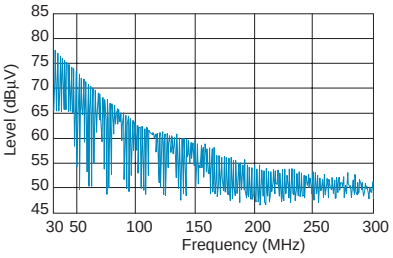
Comparing initial waveform, ringing is suppressed a little.
However there still remains high level waveform distortion.

BLM18RK221SN1 (220Ω at 100MHz) is used

Signal waveform (100nsec/div, 2V/div) | Expand (10nsec/div, 2V/div) | Spectrum







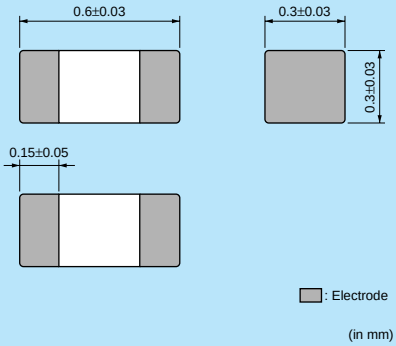
BLM18R has excellent performance for noise suppression and waveform distortion suppression.
BLM18R suppresses drastically not only spectrum level in more than 100MHz range but waveform distortion.

BLM03P Series (0201 Size)

Hi Power Reflow OK

0201 size for power lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	15000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

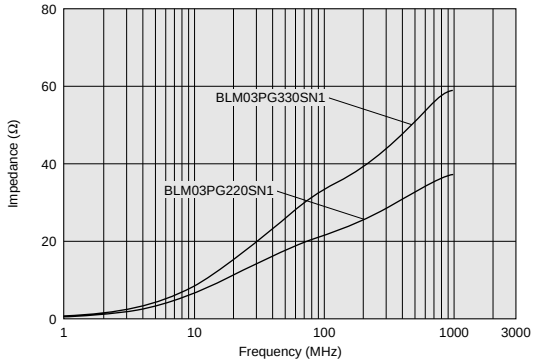
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM03PG220SN1☐	22ohm±25%	900mA	0.065ohm	-55°C to +125°C	Kit
BLM03PG330SN1☐	33ohm±25%	750mA	0.090ohm	-55°C to +125°C	Kit

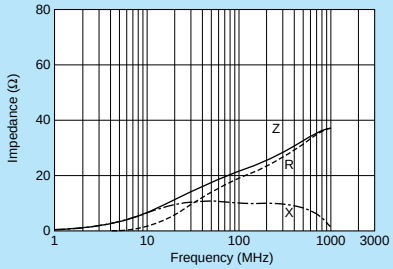
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

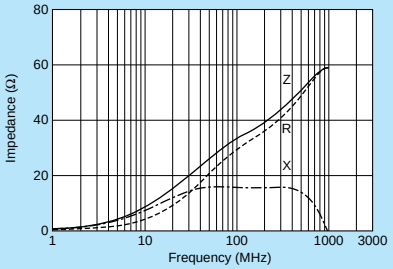


■ Impedance-Frequency Characteristics

BLM03PG220SN1



BLM03PG330SN1

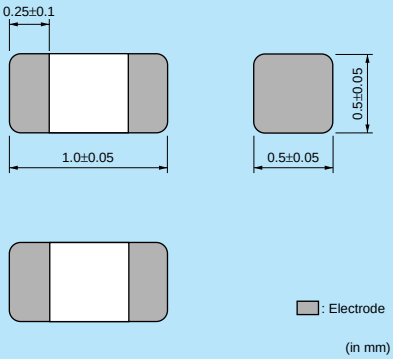


BLM15P Series (0402 Size)

Hi Power Reflow OK

0402 size for power lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

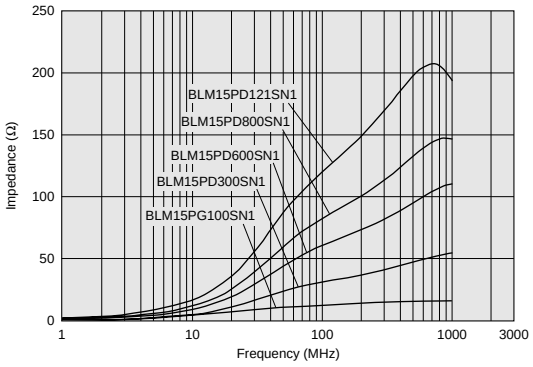
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15PG100SN1☐	10ohm(Typ.)	1000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM15PD300SN1☐	30ohm±25%	2200mA	0.035ohm	-55°C to +125°C	Kit ≧1A
BLM15PD600SN1☐	60ohm±25%	1700mA	0.06ohm	-55°C to +125°C	Kit ≧1A
BLM15PD800SN1☐	80ohm±25%	1500mA	0.07ohm	-55°C to +125°C	Kit ≧1A
BLM15PD121SN1☐	120ohm±25%	1300mA	0.09ohm	-55°C to +125°C	Kit ≧1A

Number of Circuits: 1

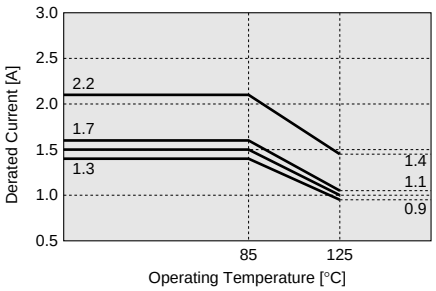
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM15PD series.
Please apply the derating curve shown in chart according to the operating temperature.

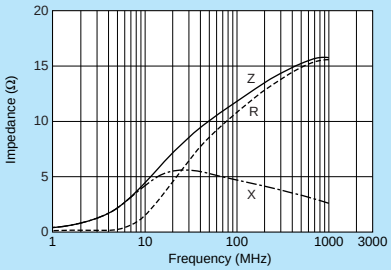
Derating



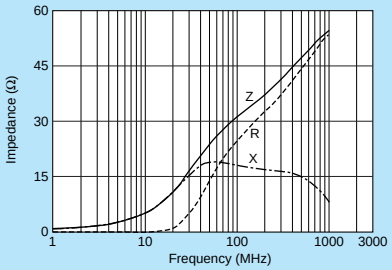
Continued on the following page.

■ Impedance-Frequency Characteristics

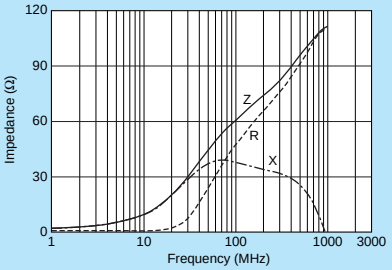
BLM15PG100SN1



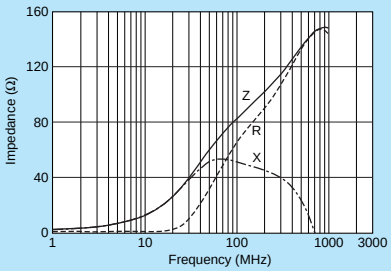
BLM15PD300SN1



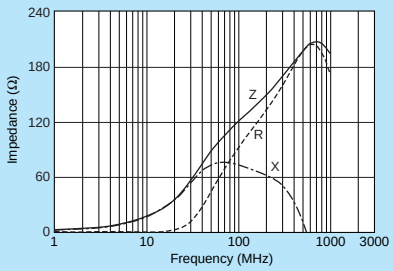
BLM15PD600SN1



BLM15PD800SN1



BLM15PD121SN1

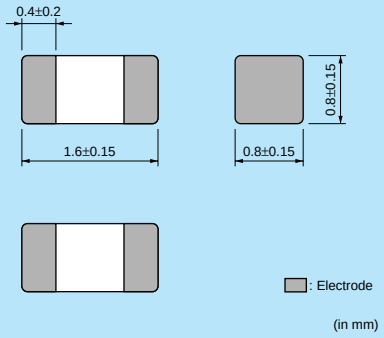


BLM18P Series (0603 Size)

Hi Power Flow OK Reflow OK

0603 size for power lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

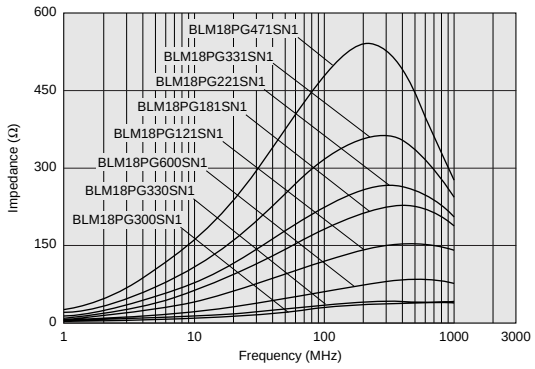
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18PG300SN1□	30ohm(Typ.)	1000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM18PG330SN1□	33ohm±25%	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM18PG600SN1□	60ohm(Typ.)	500mA	0.10ohm	-55°C to +125°C	Kit
BLM18PG121SN1□	120ohm±25%	2000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM18PG181SN1□	180ohm±25%	1500mA	0.09ohm	-55°C to +125°C	Kit ≧1A
BLM18PG221SN1□	220ohm±25%	1400mA	0.10ohm	-55°C to +125°C	Kit ≧1A
BLM18PG331SN1□	330ohm±25%	1200mA	0.15ohm	-55°C to +125°C	Kit ≧1A
BLM18PG471SN1□	470ohm±25%	1000mA	0.20ohm	-55°C to +125°C	Kit ≧1A

Number of Circuits: 1

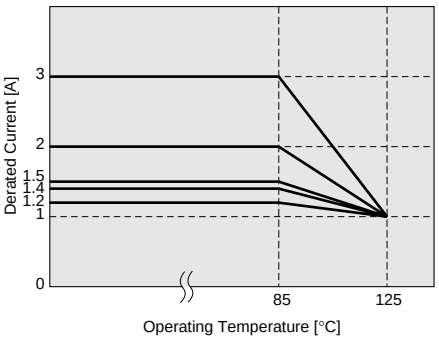
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM18PG series.
Please apply the derating curve shown in chart according to the operating temperature.

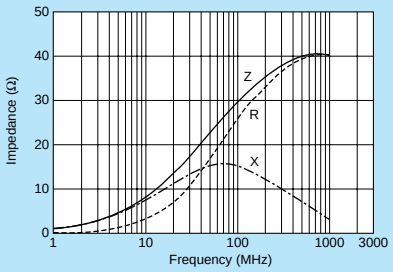
Derating



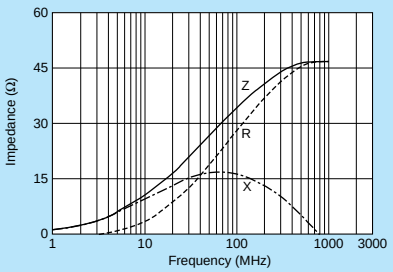
Continued on the following page.

■ Impedance-Frequency Characteristics

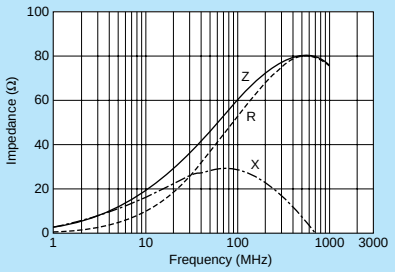
BLM18PG300SN1



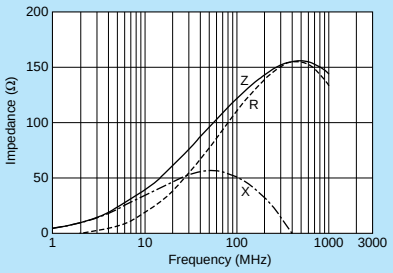
BLM18PG330SN1



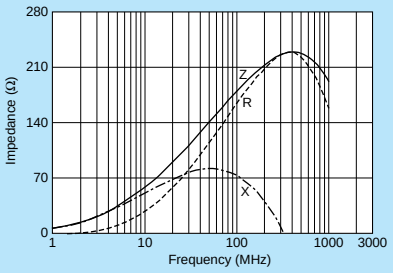
BLM18PG600SN1



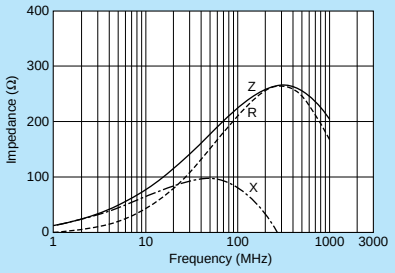
BLM18PG121SN1



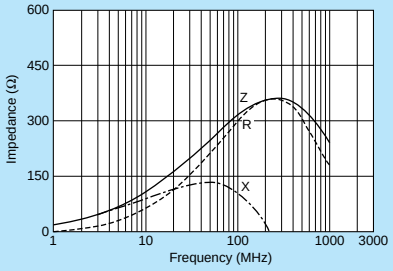
BLM18PG181SN1



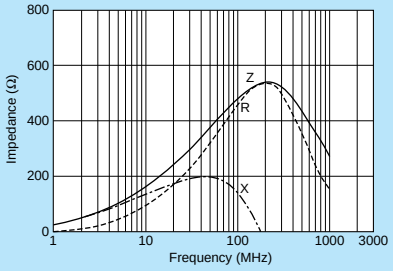
BLM18PG221SN1



BLM18PG331SN1



BLM18PG471SN1

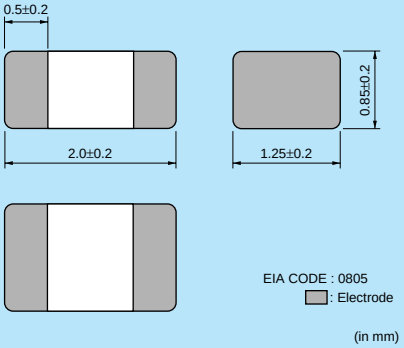


BLM21P Series (0805 Size)

Hi Power Flow OK Reflow OK

0805 size for power lines.

■ Dimensions



EIA CODE : 0805
: Electrode

(in mm)

■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

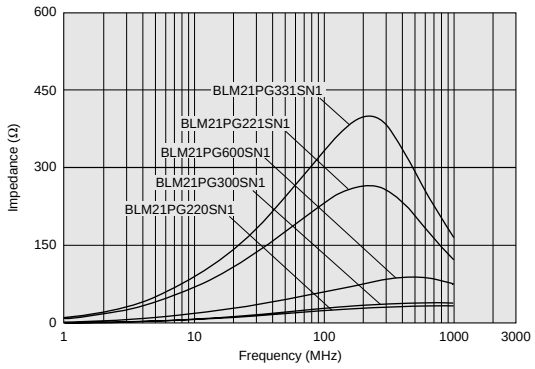
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM21PG220SN1☐	22ohm±25%	6000mA	0.01ohm	-55°C to +125°C	Kit ≧3A
BLM21PG300SN1☐	30ohm(Typ.)	3000mA	0.015ohm	-55°C to +125°C	Kit ≧3A
BLM21PG600SN1☐	60ohm±25%	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM21PG221SN1☐	220ohm±25%	2000mA	0.050ohm	-55°C to +125°C	Kit ≧1A
BLM21PG331SN1☐	330ohm±25%	1500mA	0.09ohm	-55°C to +125°C	Kit ≧1A

Number of Circuits: 1

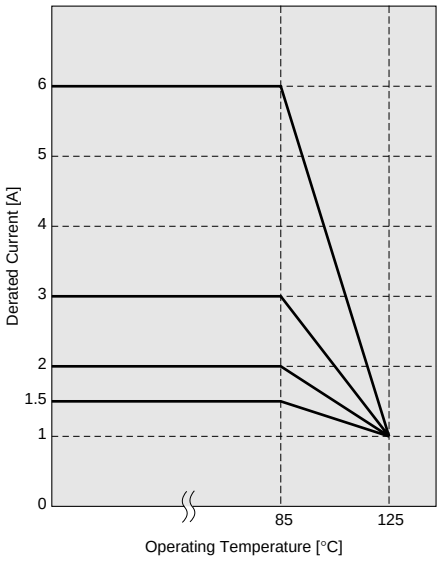
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM21PG series.
Please apply the derating curve shown in chart according to the operating temperature.

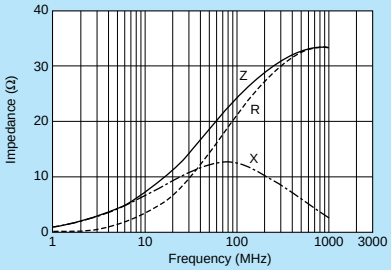
Derating



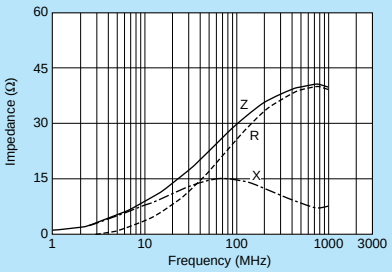
Continued on the following page.

■ Impedance-Frequency Characteristics

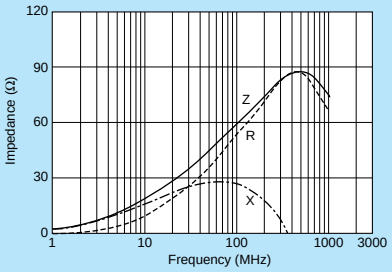
BLM21PG220SN1



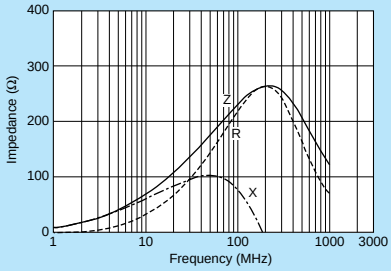
BLM21PG300SN1



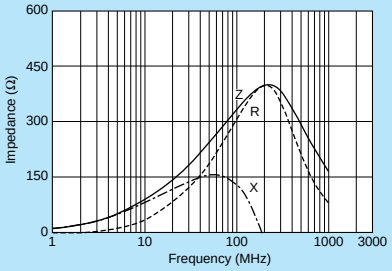
BLM21PG600SN1



BLM21PG221SN1



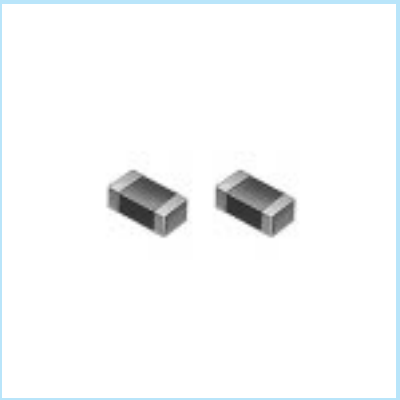
BLM21PG331SN1



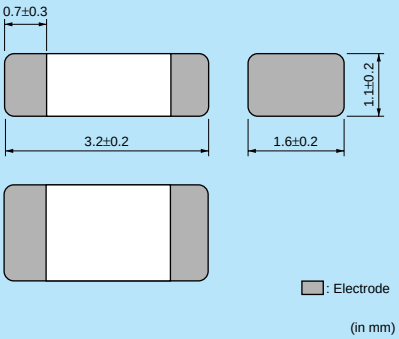
BLM31P Series (1206 Size)

Hi Power Flow OK Reflow OK

1206 size for power lines.



■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
K	330mm Reel Embossed Tape	10000
B	Bulk(Bag)	1000

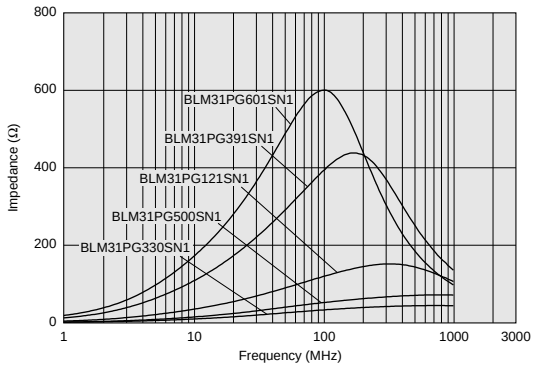
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM31PG330SN1☐	33ohm±25%	6000mA	0.01ohm	-55°C to +125°C	Kit ≧3A
BLM31PG500SN1☐	50ohm(Typ.)	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM31PG121SN1☐	120ohm±25%	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM31PG391SN1☐	390ohm±25%	2000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM31PG601SN1☐	600ohm±25%	1500mA	0.09ohm	-55°C to +125°C	Kit ≧1A

Number of Circuits: 1

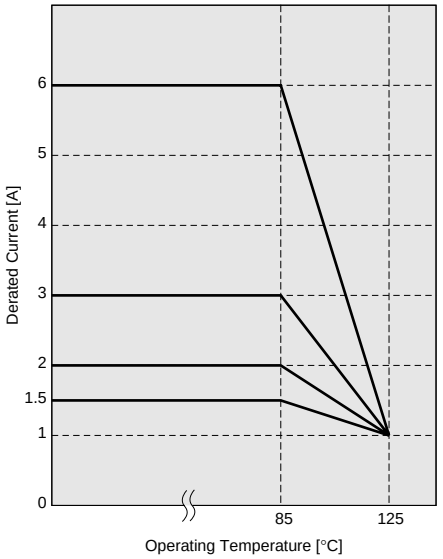
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM31PG series.
Please apply the derating curve shown in chart according to the operating temperature.

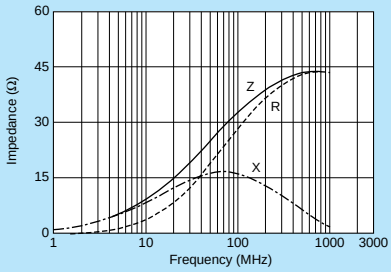
Derating



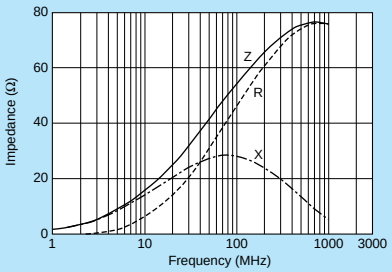
Continued on the following page.

■ Impedance-Frequency Characteristics

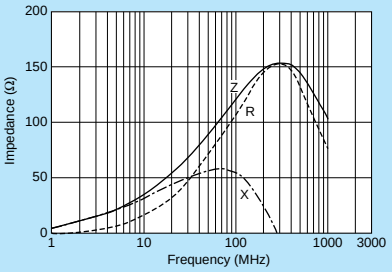
BLM31PG330SN1



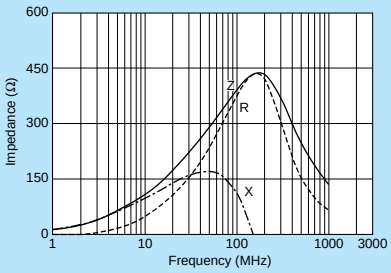
BLM31PG500SN1



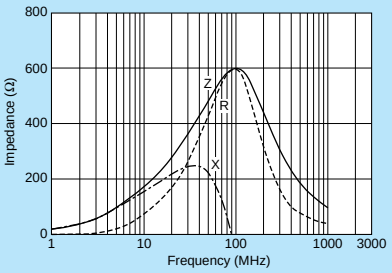
BLM31PG121SN1



BLM31PG391SN1



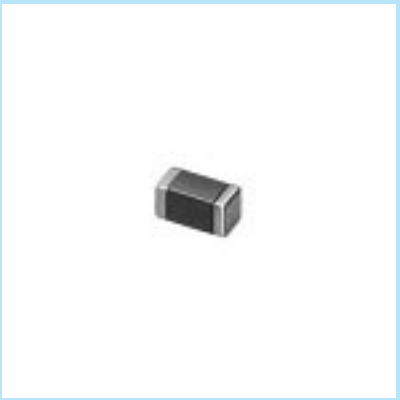
BLM31PG601SN1



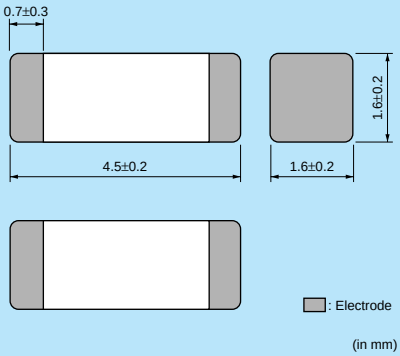
BLM41P Series (1806 Size)

Hi Power | Flow OK | Reflow OK

1806 size for power lines.



■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	2500
K	330mm Reel Embossed Tape	8000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

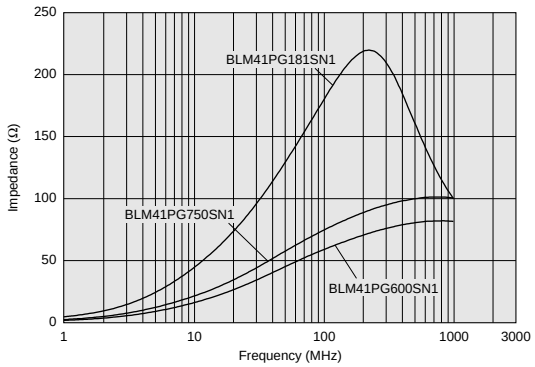
■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM41PG600SN1☐	60ohm(Typ.)	6000mA	0.01ohm	-55°C to +125°C	Kit ≧3A
BLM41PG750SN1☐	75ohm(Typ.)	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM41PG181SN1☐	180ohm±25%	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM41PG471SN1☐	470ohm±25%	2000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM41PG102SN1☐	1000ohm±25%	1500mA	0.09ohm	-55°C to +125°C	Kit ≧1A

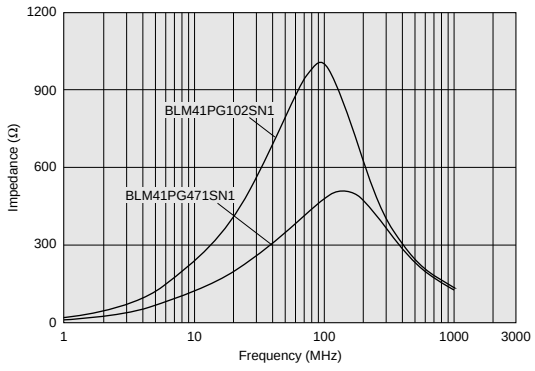
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

BLM41PG Series



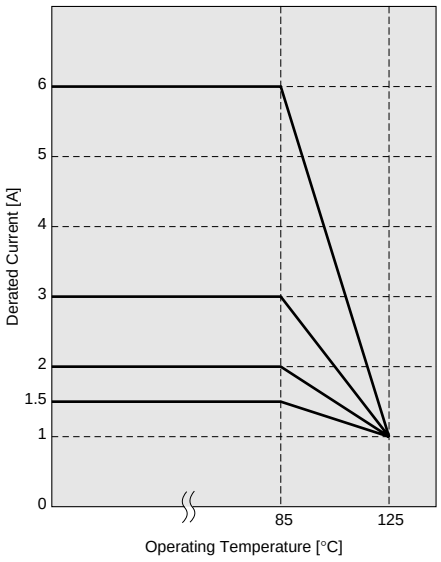
BLM41PG Series



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM41PG series.
Please apply the derating curve shown in chart according to the operating temperature.

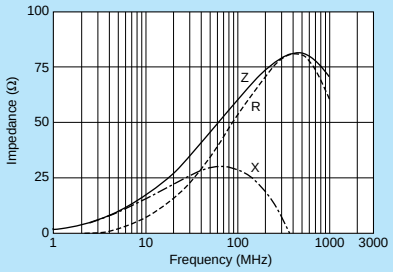
Derating



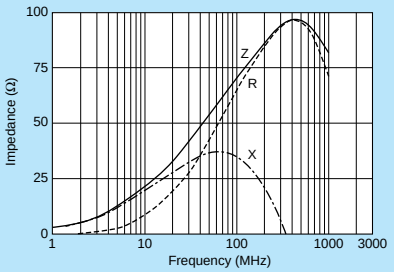
Continued on the following page.

■ Impedance-Frequency Characteristics

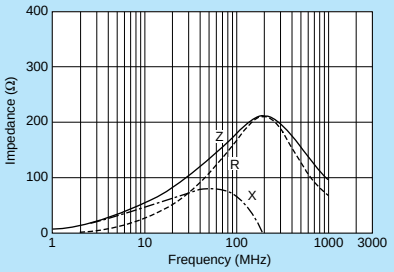
BLM41PG600SN1



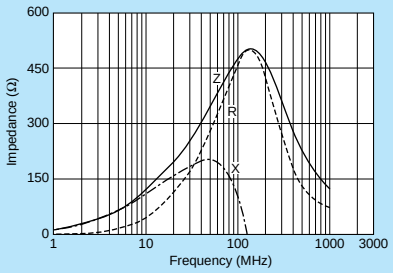
BLM41PG750SN1



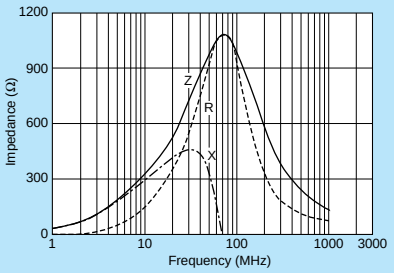
BLM41PG181SN1



BLM41PG471SN1



BLM41PG102SN1

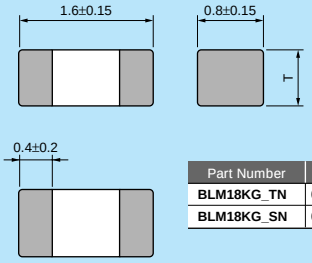


BLM18K Series (0603 Size)

Hi Power | Flow OK | Reflow OK

6A Max, high performance type for power lines up to 600ohm.

■ Dimensions



Part Number	T
BLM18KG_TN	0.6±0.15
BLM18KG_SN	0.8±0.15

: Electrode

(in mm)

■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

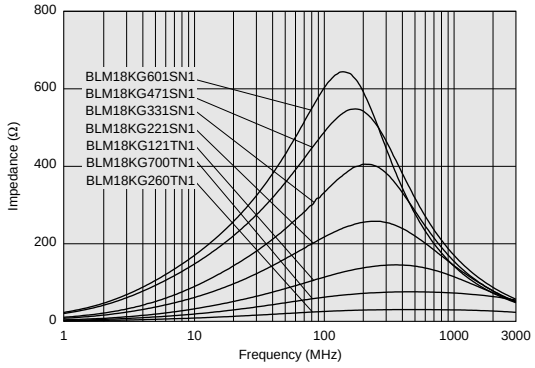
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18KG260TN1□	26ohm±25%	6000mA	0.007ohm	-55°C to +125°C	Kit ≧3A
BLM18KG700TN1□	70ohm±25%	3500mA	0.022ohm	-55°C to +125°C	Kit ≧3A
BLM18KG121TN1□	120ohm±25%	3000mA	0.030ohm	-55°C to +125°C	Kit ≧3A
BLM18KG221SN1□	220ohm±25%	2200mA	0.050ohm	-55°C to +125°C	Kit ≧1A
BLM18KG331SN1□	330ohm±25%	1700mA	0.080ohm	-55°C to +125°C	Kit ≧1A
BLM18KG471SN1□	470ohm±25%	1500mA	0.130ohm	-55°C to +125°C	Kit ≧1A
BLM18KG601SN1□	600ohm±25%	1300mA	0.150ohm	-55°C to +125°C	Kit ≧1A

Number of Circuits: 1

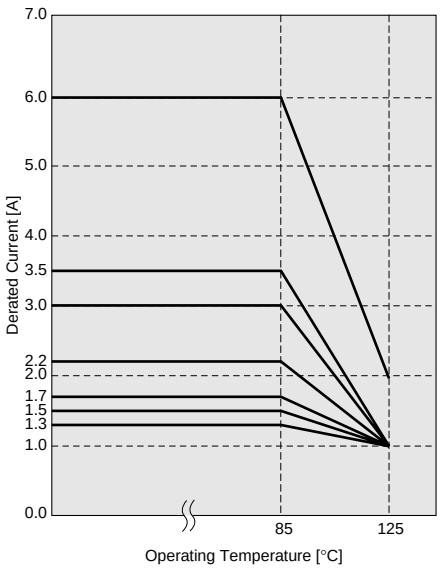
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM18KG series.
Please apply the derating curve shown in chart according to the operating temperature.

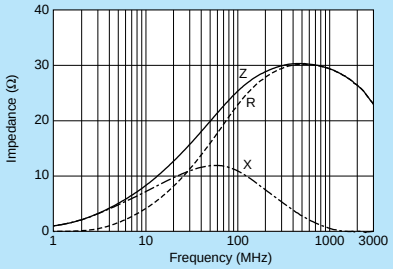
Derating



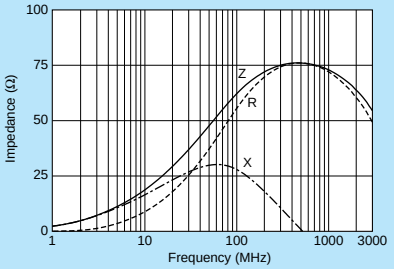
Continued on the following page.

■ Impedance-Frequency Characteristics

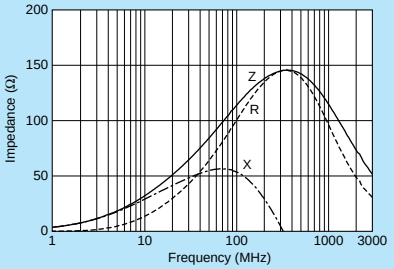
BLM18KG260TN1



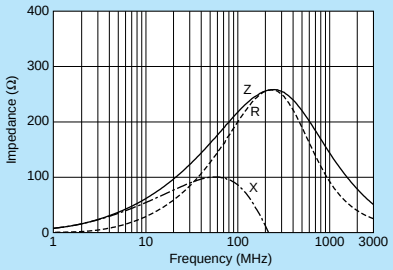
BLM18KG700TN1



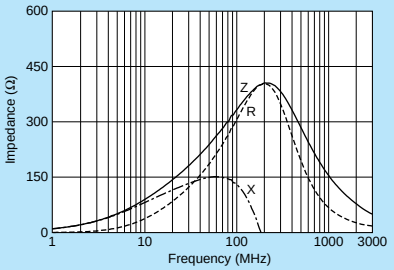
BLM18KG121TN1



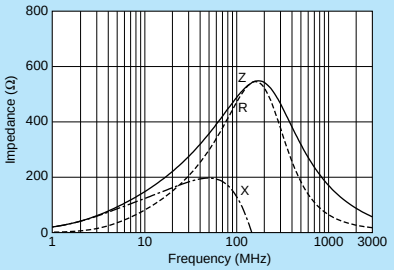
BLM18KG221SN1



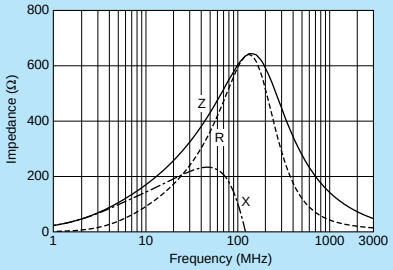
BLM18KG331SN1



BLM18KG471SN1



BLM18KG601SN1

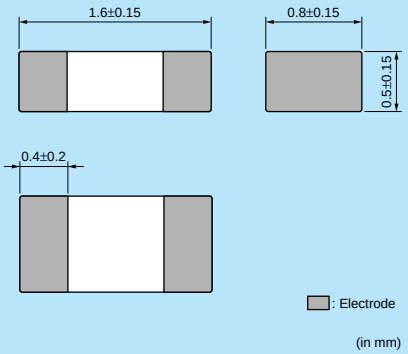


BLM18S Series (0603 Size)

Hi Power | Flow OK | Reflow OK

6A Max, high performance type for power lines.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	30000
B	Bulk(Bag)	1000

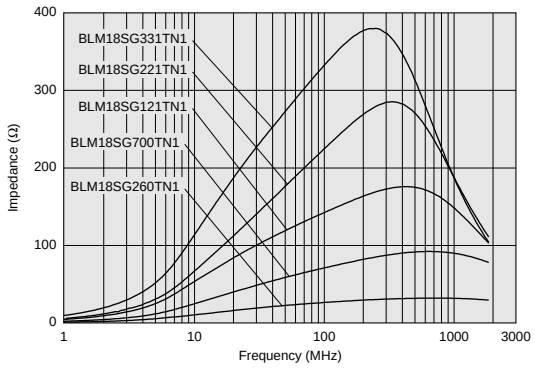
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18SG260TN1☐	26ohm±25%	6000mA	0.007ohm	-55°C to +125°C	Kit ≧3A
BLM18SG700TN1☐	70ohm±25%	4000mA	0.020ohm	-55°C to +125°C	Kit ≧3A
BLM18SG121TN1☐	120ohm±25%	3000mA	0.025ohm	-55°C to +125°C	Kit ≧3A
BLM18SG221TN1☐	220ohm±25%	2500mA	0.040ohm	-55°C to +125°C	Kit ≧1A
BLM18SG331TN1☐	330ohm±25%	1500mA	0.070ohm	-55°C to +125°C	Kit ≧1A

Number of Circuits: 1

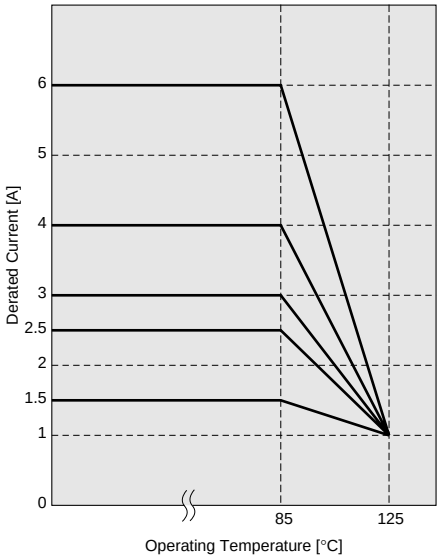
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM18SG series.
Please apply the derating curve shown in chart according to the operating temperature.

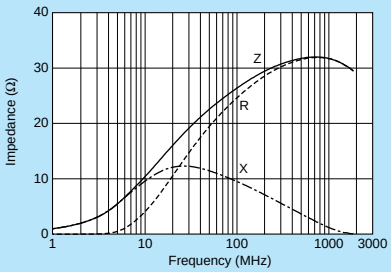
Derating



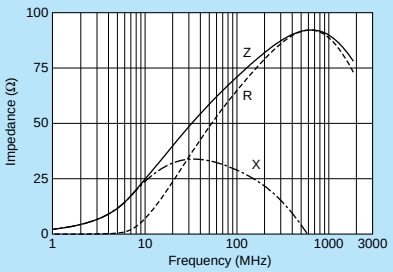
Continued on the following page.

■ Impedance-Frequency Characteristics

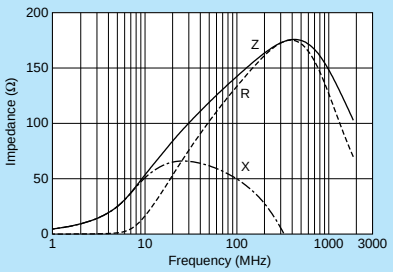
BLM18SG260TN1



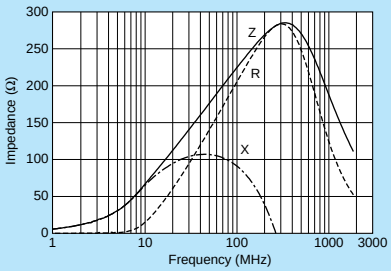
BLM18SG700TN1



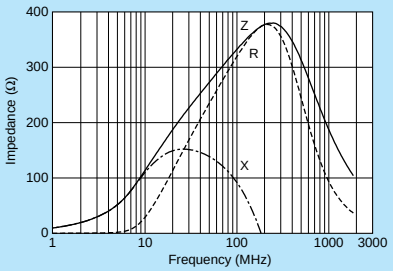
BLM18SG121TN1



BLM18SG221TN1



BLM18SG331TN1

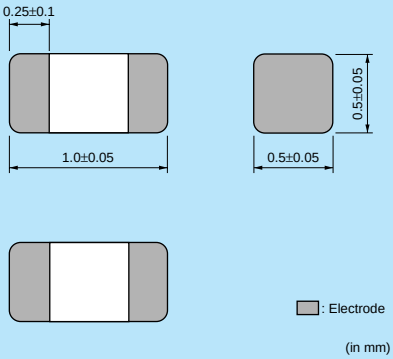


BLM15H Series (0402 Size)

GHz Reflow OK

0402 size for GHz band noise.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

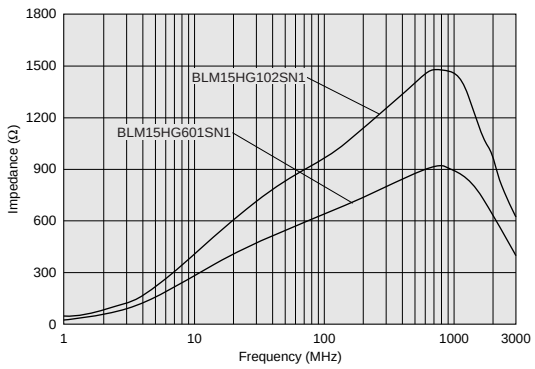
■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Impedance (at 1GHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15HG601SN1☐	600ohm±25%	1000ohm±40%	300mA	0.7ohm	-55°C to +125°C	Kit
BLM15HG102SN1☐	1000ohm±25%	1400ohm±40%	250mA	1.1ohm	-55°C to +125°C	Kit
BLM15HD601SN1☐	600ohm±25%	1400ohm±40%	300mA	0.85ohm	-55°C to +125°C	Kit
BLM15HD102SN1☐	1000ohm±25%	2000ohm±40%	250mA	1.25ohm	-55°C to +125°C	Kit
BLM15HD182SN1☐	1800ohm±25%	2700ohm±40%	200mA	2.2ohm	-55°C to +125°C	Kit
BLM15HB121SN1☐	120ohm±25%	500ohm±40%	300mA	0.7ohm	-55°C to +125°C	Kit
BLM15HB221SN1☐	220ohm±25%	900ohm±40%	250mA	1.0ohm	-55°C to +125°C	Kit

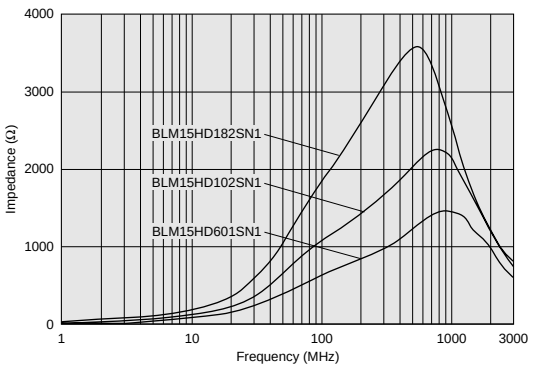
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

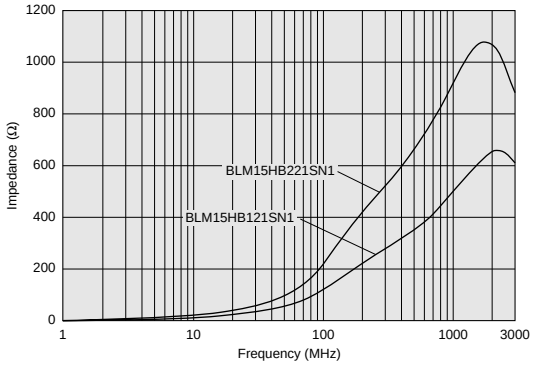
BLM15HG Series



BLM15HD Series



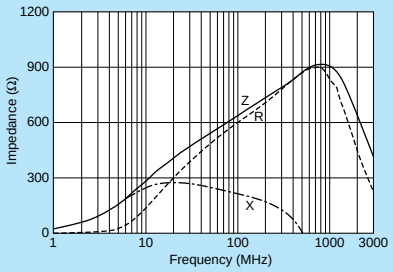
BLM15HB Series



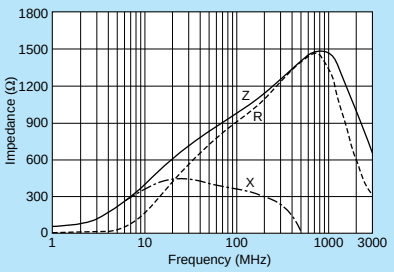
Continued on the following page.

■ Impedance-Frequency Characteristics

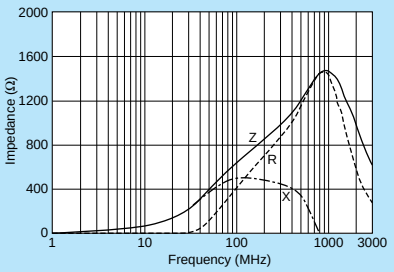
BLM15HG601SN1



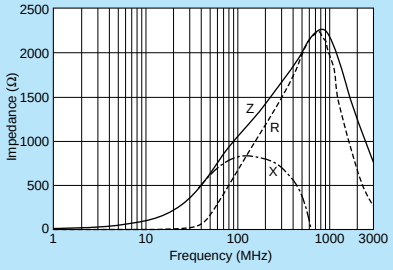
BLM15HG102SN1



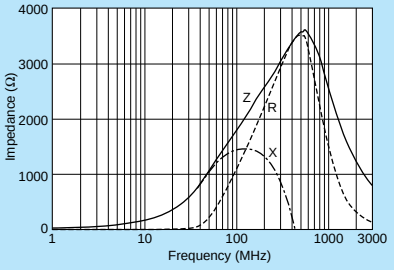
BLM15HD601SN1



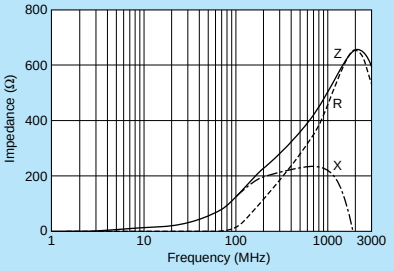
BLM15HD102SN1



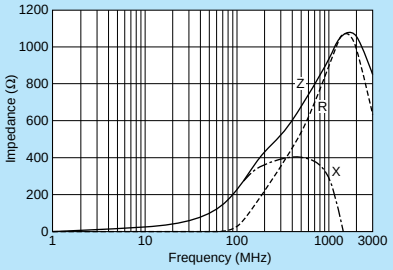
BLM15HD182SN1



BLM15HB121SN1



BLM15HB221SN1

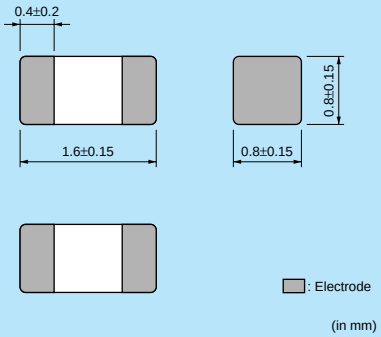


BLM18H Series (0603 Size)

GHz | Hi Power | Flow OK | Reflow OK

0603 size for GHz band noise.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

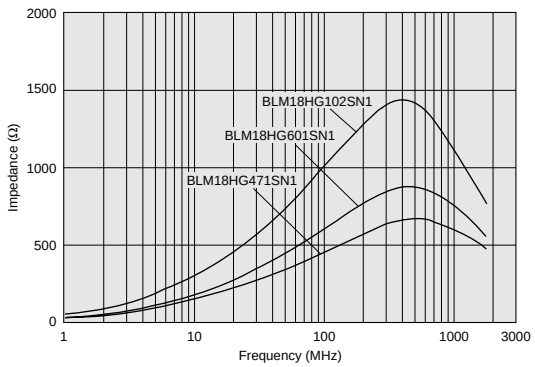
■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Impedance (at 1GHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18HG471SN1☐	470ohm±25%	600ohm(Typ.)	200mA	0.85ohm	-55°C to +125°C	Kit
BLM18HG601SN1☐	600ohm±25%	700ohm(Typ.)	200mA	1.00ohm	-55°C to +125°C	Kit
BLM18HG102SN1☐	1000ohm±25%	1000ohm(Typ.)	100mA	1.60ohm	-55°C to +125°C	Kit
BLM18HE601SN1☐	600ohm±25%	600ohm(Typ.)	800mA	0.25ohm	-55°C to +125°C	Kit
BLM18HE102SN1☐	1000ohm±25%	1000ohm(Typ.)	600mA	0.35ohm	-55°C to +125°C	Kit
BLM18HE152SN1☐	1500ohm±25%	1500ohm(Typ.)	500mA	0.50ohm	-55°C to +125°C	Kit
BLM18HD471SN1☐	470ohm±25%	1000ohm(Typ.)	100mA	1.20ohm	-55°C to +125°C	Kit
BLM18HD601SN1☐	600ohm±25%	1200ohm(Typ.)	100mA	1.50ohm	-55°C to +125°C	Kit
BLM18HD102SN1☐	1000ohm±25%	1700ohm(Typ.)	50mA	1.80ohm	-55°C to +125°C	Kit
BLM18HB121SN1☐	120ohm±25%	500ohm±40%	200mA	0.50ohm	-55°C to +125°C	Kit
BLM18HB221SN1☐	220ohm±25%	1100ohm±40%	100mA	0.80ohm	-55°C to +125°C	Kit
BLM18HB331SN1☐	330ohm±25%	1600ohm±40%	50mA	1.20ohm	-55°C to +125°C	Kit
BLM18HK331SN1☐	330ohm±25%	400ohm±40%	200mA	0.50ohm	-55°C to +125°C	Kit
BLM18HK471SN1☐	470ohm±25%	600ohm±40%	200mA	0.70ohm	-55°C to +125°C	Kit
BLM18HK601SN1☐	600ohm±25%	700ohm±40%	100mA	0.90ohm	-55°C to +125°C	Kit
BLM18HK102SN1☐	1000ohm±25%	1200ohm±40%	50mA	1.50ohm	-55°C to +125°C	Kit

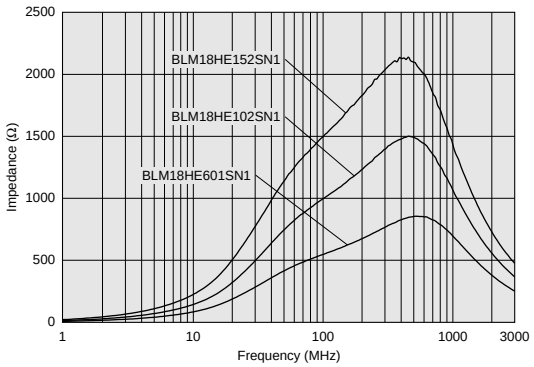
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

BLM18HG Series



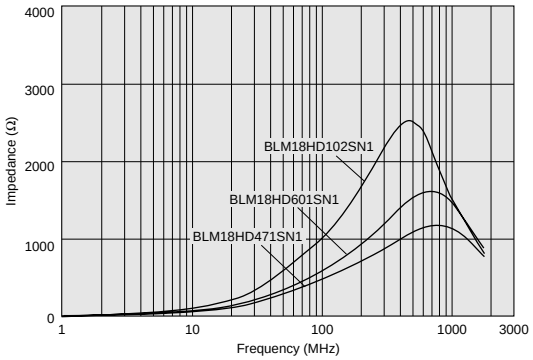
BLM18HE Series



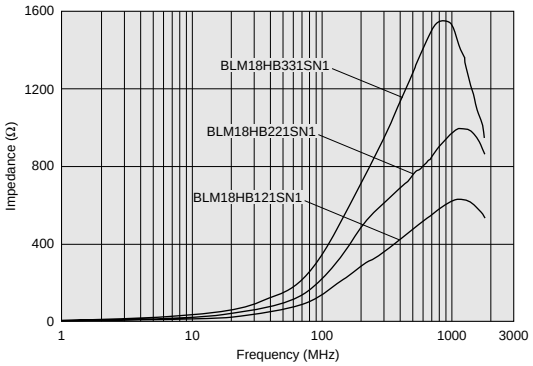
Continued on the following page.

■ Impedance-Frequency Characteristics (Main Items)

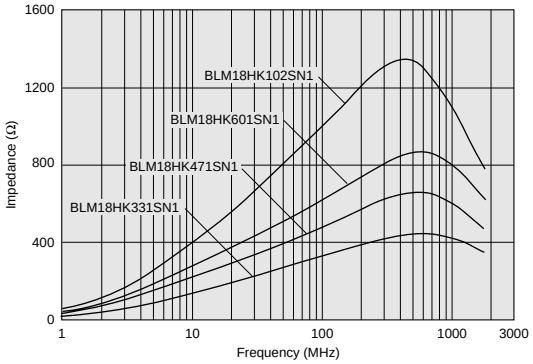
BLM18HD Series



BLM18HB Series



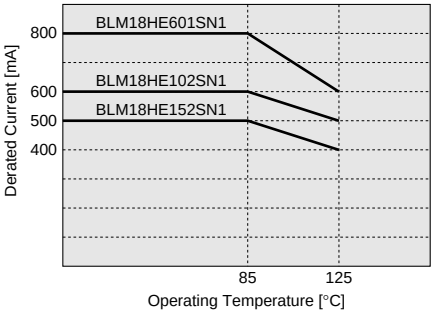
BLM18HK Series



■ Notice (Rating)

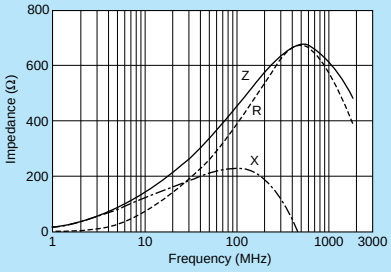
In operating temperature exceeding +85°C, derating of current is necessary for BLM18HE series.
Please apply the derating curve shown in chart according to the operating temperature.

Derating

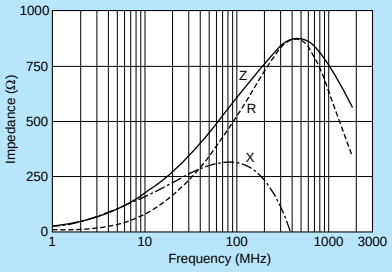


■ Impedance-Frequency Characteristics

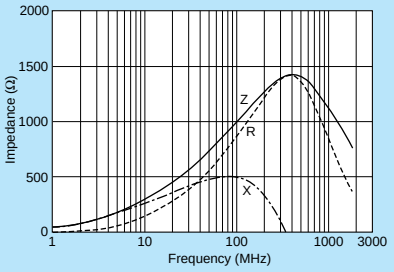
BLM18HG471SN1



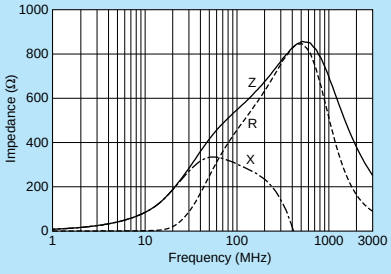
BLM18HG601SN1



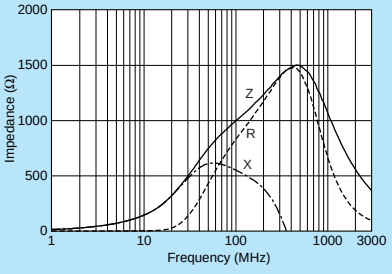
BLM18HG102SN1



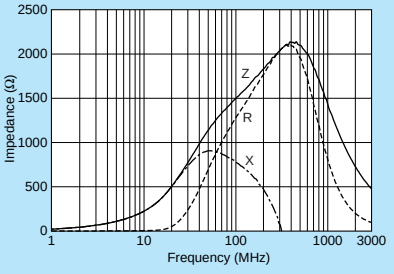
BLM18HE601SN1



BLM18HE102SN1



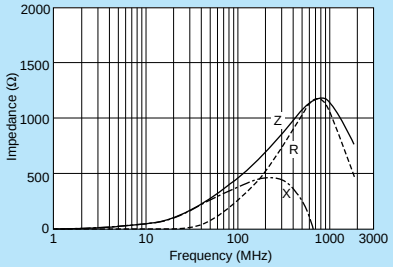
BLM18HE152SN1



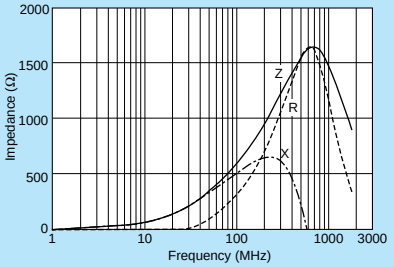
Continued on the following page.

■ Impedance-Frequency Characteristics

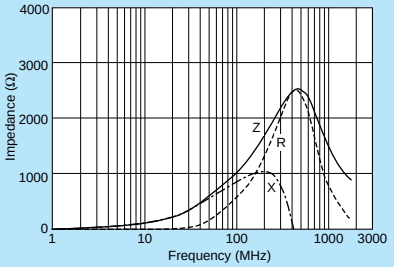
BLM18HD471SN1



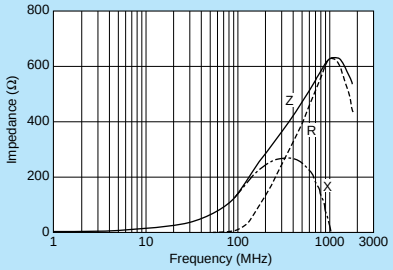
BLM18HD601SN1



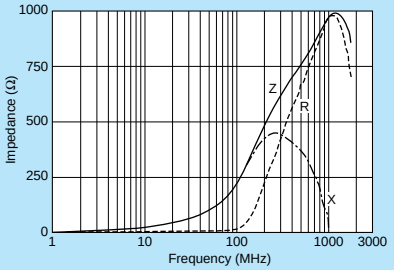
BLM18HD102SN1



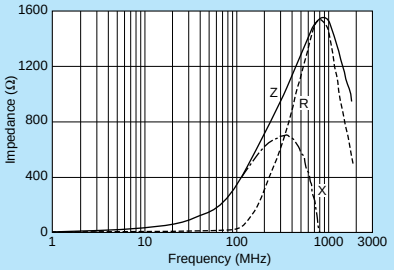
BLM18HB121SN1



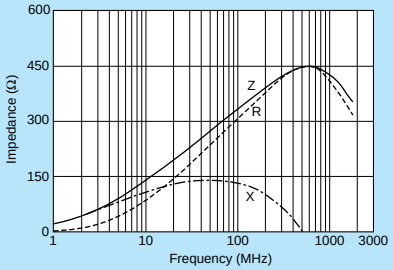
BLM18HB221SN1



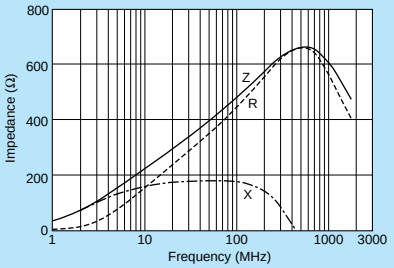
BLM18HB331SN1



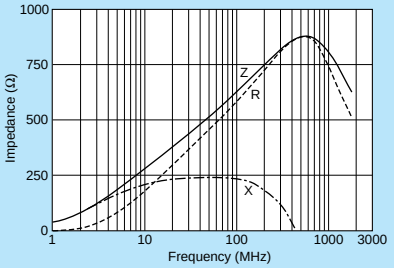
BLM18HK331SN1



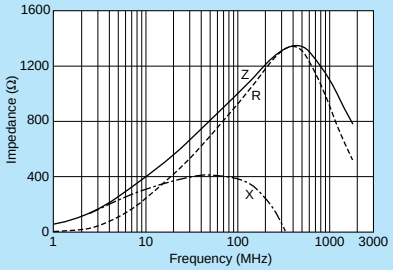
BLM18HK471SN1



BLM18HK601SN1

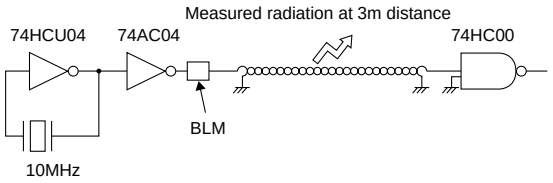


BLM18HK102SN1



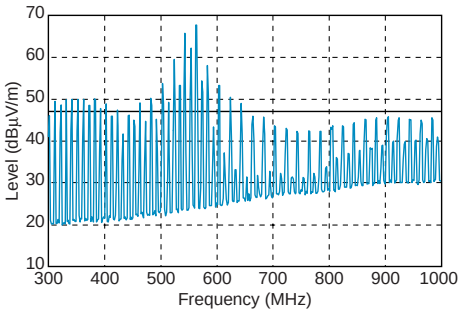
Noise Suppression in UHF Range

Testing Circuit

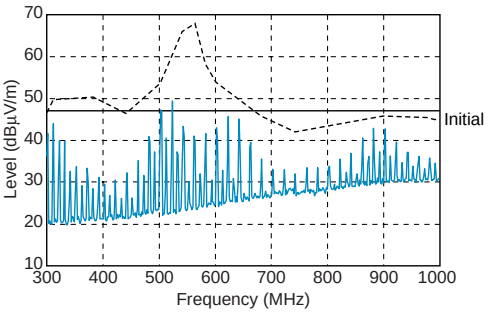


Type of Filter	EMI Suppression Effect / Description

Initial
(No filter)

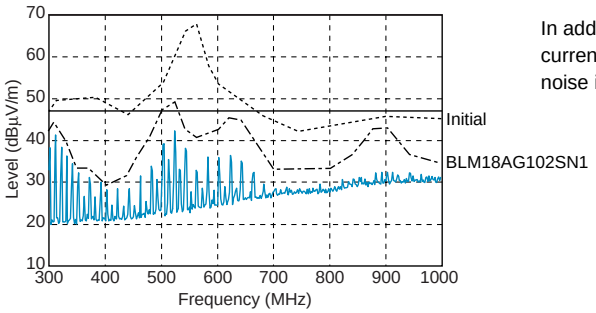


Conventional Type
BLM18AG102SN1
(1000Ω at 100MHz)



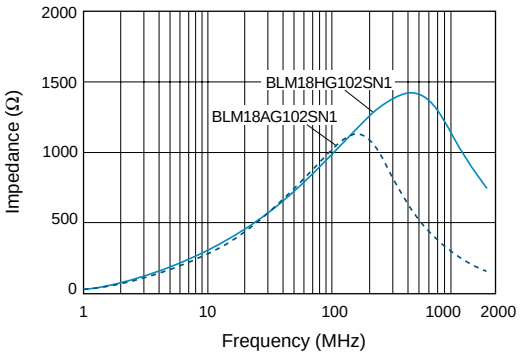
Current BLM are effective in suppressing noise in the range between 300MHz and 700MHz.

for GHz Noise Suppression
BLM18HG102SN1
(1000Ω at 100MHz)



In addition to the effectiveness of current BLM, BLM18HG suppresses noise in the range beyond 700MHz.

Comparison between BLM18HG102SN1 and BLM18AG102SN1 (Current Item)

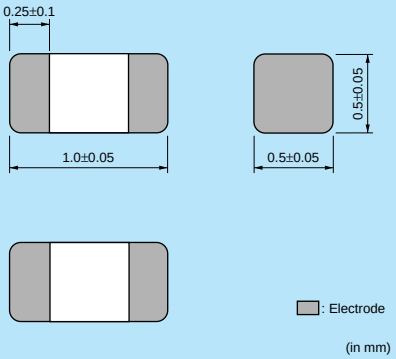


BLM15E Series (0402 Size)

GHz Hi Power Reflow OK

For GHz band noise, also capable to large current.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

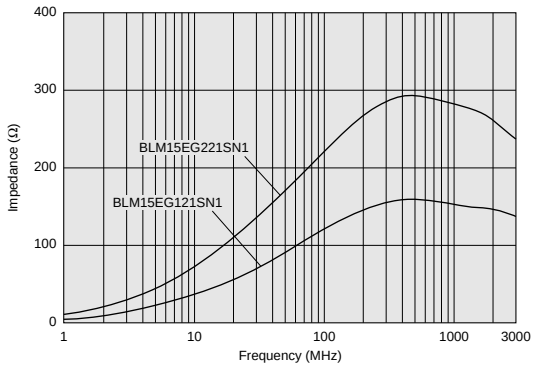
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Impedance (at 1GHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15EG121SN1□	120ohm±25%	145ohm(Typ.)	1500mA	0.095ohm	-55°C to +125°C	Kit ≧1A
BLM15EG221SN1□	220ohm±25%	270ohm(Typ.)	700mA	0.28ohm	-55°C to +125°C	Kit

Number of Circuits: 1

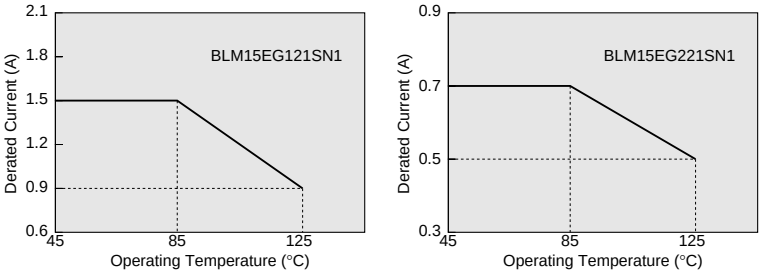
■ Impedance-Frequency Characteristics (Main Items)



■ Notice (Rating)

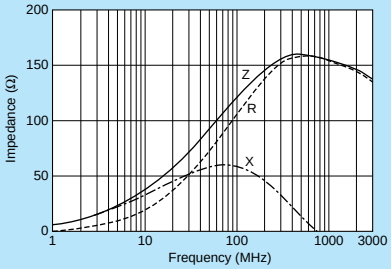
In operating temperature exceeding +85°C, derating of current is necessary for BLM15E series.
Please apply the derating curve shown in chart according to the operating temperature.

Derating

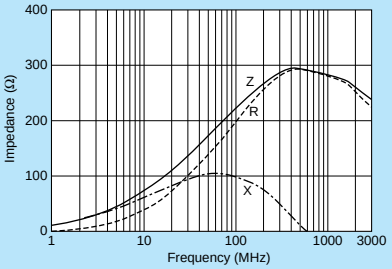


■ Impedance-Frequency Characteristics

BLM15EG121SN1



BLM15EG221SN1

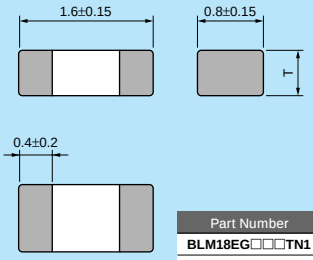


BLM18E Series (0603 Size)

GHz Hi Power Flow OK Reflow OK

For GHz band noise, also capable to large current.

■ Dimensions



Part Number	T
BLM18EG□□□TN1	0.5±0.15
BLM18EG□□□SN1	0.8±0.15

: Electrode

(in mm)

■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

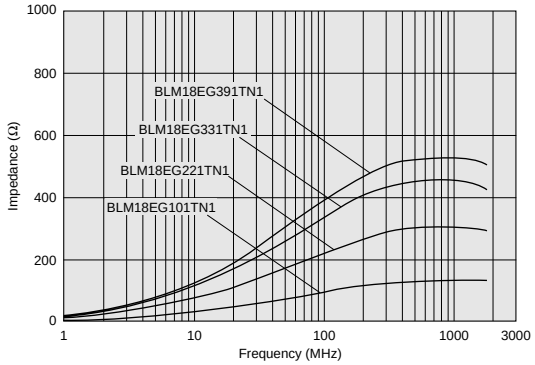
■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Impedance (at 1GHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18EG101TN1□	100ohm±25%	140ohm(Typ.)	2000mA	0.045ohm	-55°C to +125°C	Kit ≧1A
BLM18EG121SN1□	120ohm±25%	145ohm(Typ.)	2000mA	0.04ohm	-55°C to +125°C	Kit ≧1A
BLM18EG221SN1□	220ohm±25%	260ohm(Typ.)	2000mA	0.05ohm	-55°C to +125°C	Kit ≧1A
BLM18EG221TN1□	220ohm±25%	300ohm(Typ.)	1000mA	0.15ohm	-55°C to +125°C	Kit ≧1A
BLM18EG331TN1□	330ohm±25%	450ohm(Typ.)	500mA	0.21ohm	-55°C to +125°C	Kit
BLM18EG391TN1□	390ohm±25%	520ohm(Typ.)	500mA	0.3ohm	-55°C to +125°C	Kit
BLM18EG471SN1□	470ohm±25%	550ohm(Typ.)	500mA	0.21ohm	-55°C to +125°C	Kit
BLM18EG601SN1□	600ohm±25%	700ohm(Typ.)	500mA	0.35ohm	-55°C to +125°C	Kit

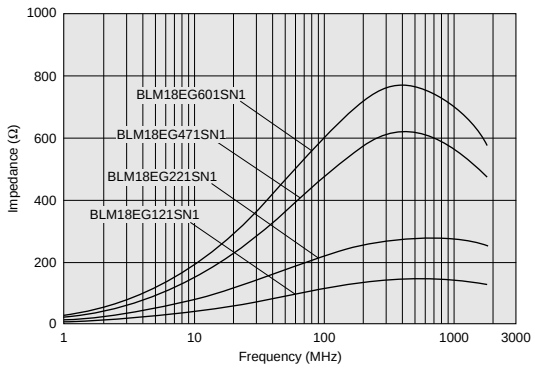
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

BLM18EG_TN Series



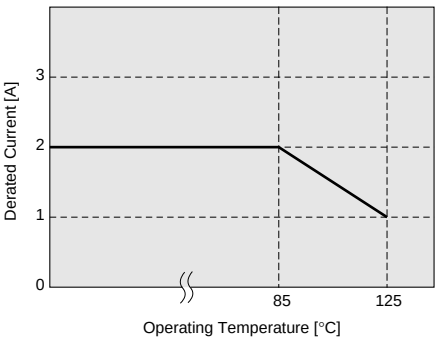
BLM18EG_SN Series



■ Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for BLM18EG series.
Please apply the derating curve shown in chart according to the operating temperature.

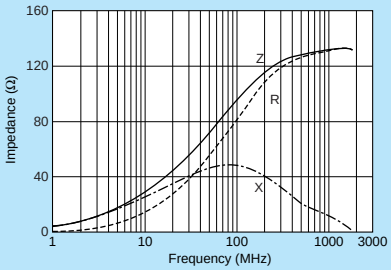
Derating



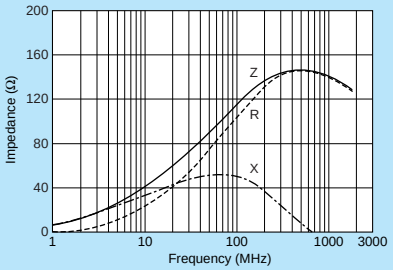
Continued on the following page.

■ Impedance-Frequency Characteristics

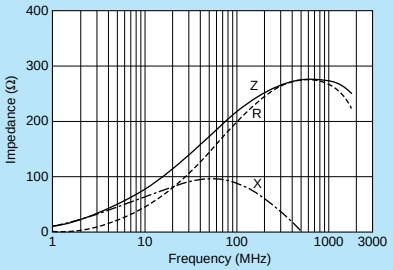
BLM18EG101TN1



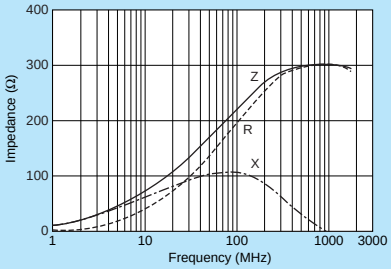
BLM18EG121SN1



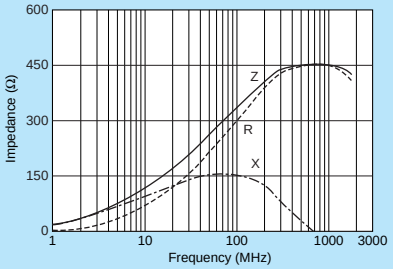
BLM18EG221SN1



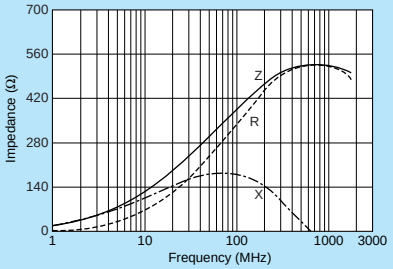
BLM18EG221TN1



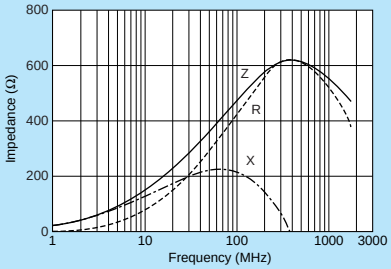
BLM18EG331TN1



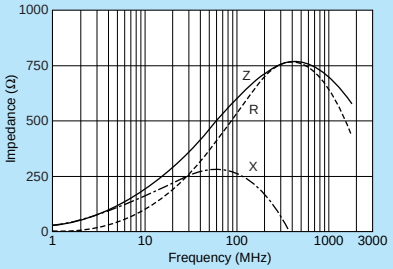
BLM18EG391TN1



BLM18EG471SN1



BLM18EG601SN1

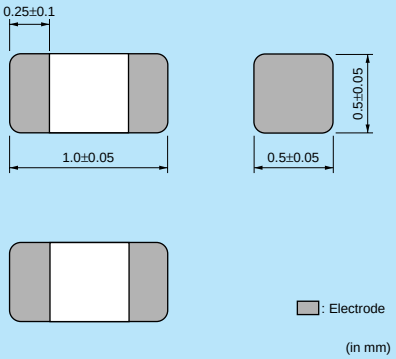


BLM15G Series (0402 Size)

Hi-GHz Reflow OK

Available up to high-GHz band noise.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

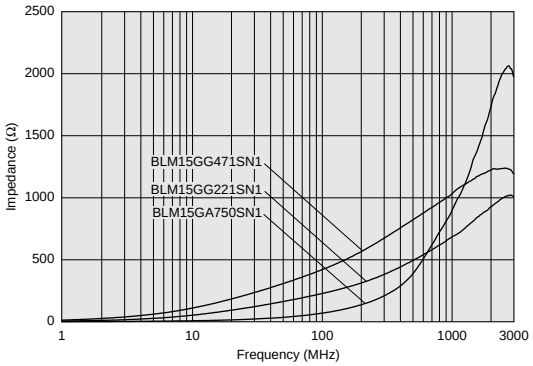
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Impedance (at 1GHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM15GG221SN1□	220ohm±25%	600ohm±40%	300mA	0.7ohm	-55°C to +125°C	Kit
BLM15GG471SN1□	470ohm±25%	1200ohm±40%	200mA	1.3ohm	-55°C to +125°C	Kit
BLM15GA750SN1□	75ohm±25%	1000ohm±40%	200mA	1.3ohm	-55°C to +125°C	Kit

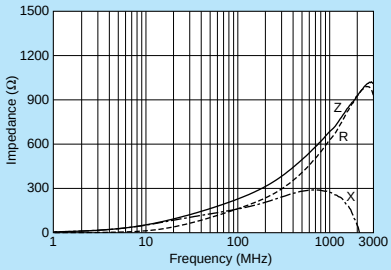
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)

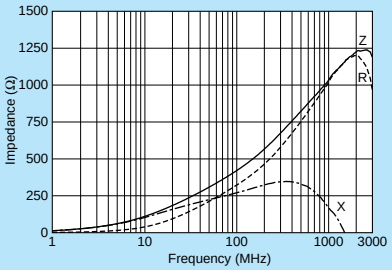


■ Impedance-Frequency Characteristics

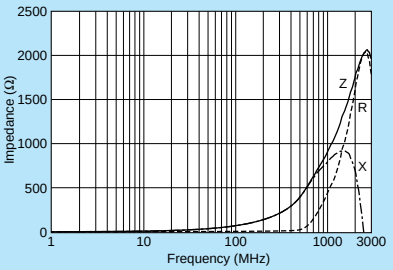
BLM15GG221SN1



BLM15GG471SN1



BLM15GA750SN1

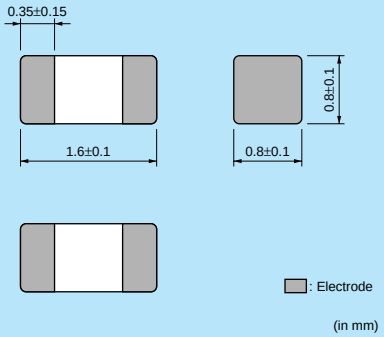


BLM18G Series (0603 Size)

Hi-GHz Reflow OK

Available up to high-GHz band noise.

■ Dimensions



■ Equivalent Circuit

(Resistance element becomes dominant at high frequencies.)

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

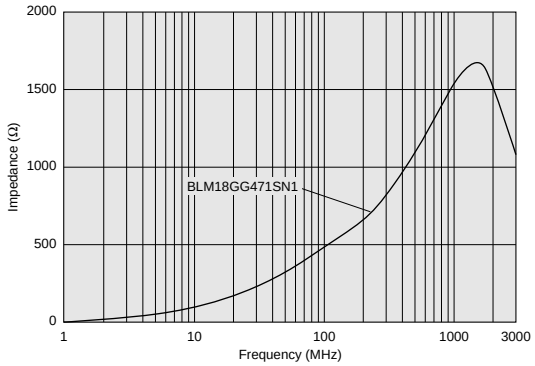
Refer to pages from p.82 to p.85 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Impedance (at 1GHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range	
BLM18GG471SN1□	470ohm±25%	1800ohm±30%	200mA	1.30ohm	-55°C to +125°C	Kit

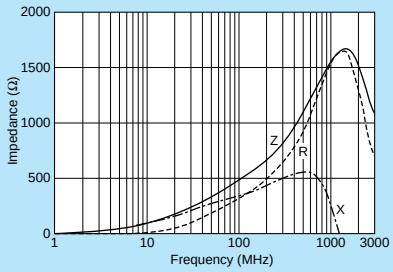
Number of Circuits: 1

■ Impedance-Frequency Characteristics (Main Items)



■ Impedance-Frequency Characteristics

BLM18GG471SN1

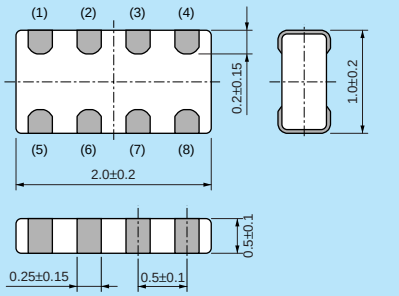


BLA2AA/BLA2AB Series (0804 Size)

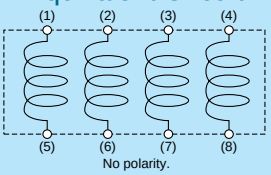
Reflow OK

4-lines array, 0804 size.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
J	330mm Reel Paper Tape	50000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

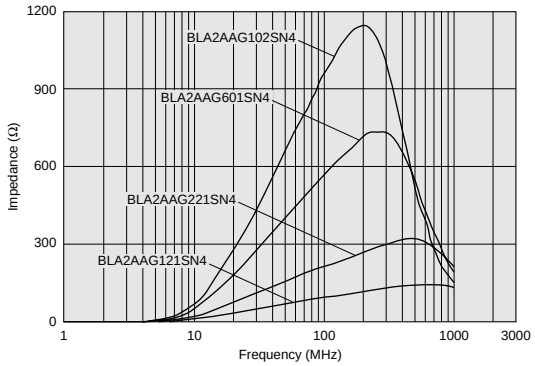
■ Rated Value (□: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range
BLA2AAG121SN4□	120ohm±25%	100mA	0.50ohm	-55°C to +125°C
BLA2AAG221SN4□	220ohm±25%	50mA	0.70ohm	-55°C to +125°C
BLA2AAG601SN4□	600ohm±25%	50mA	1.10ohm	-55°C to +125°C
BLA2AAG102SN4□	1000ohm±25%	50mA	1.30ohm	-55°C to +125°C
BLA2ABB100SN4□	10ohm±25%	200mA	0.1ohm	-55°C to +125°C
BLA2ABB220SN4□	22ohm±25%	200mA	0.2ohm	-55°C to +125°C
BLA2ABB470SN4□	47ohm±25%	200mA	0.35ohm	-55°C to +125°C
BLA2ABB121SN4□	120ohm±25%	50mA	0.60ohm	-55°C to +125°C
BLA2ABB221SN4□	220ohm±25%	50mA	0.90ohm	-55°C to +125°C
BLA2ABD750SN4□	75ohm±25%	200mA	0.20ohm	-55°C to +125°C
BLA2ABD121SN4□	120ohm±25%	200mA	0.35ohm	-55°C to +125°C
BLA2ABD221SN4□	220ohm±25%	100mA	0.40ohm	-55°C to +125°C
BLA2ABD471SN4□	470ohm±25%	100mA	0.65ohm	-55°C to +125°C
BLA2ABD601SN4□	600ohm±25%	100mA	0.80ohm	-55°C to +125°C
BLA2ABD102SN4□	1000ohm±25%	50mA	1.00ohm	-55°C to +125°C

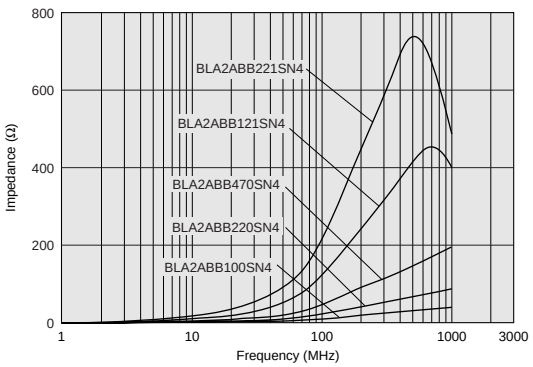
Number of Circuits: 4

■ Impedance-Frequency Characteristics (Main Items)

BLA2AAG Series



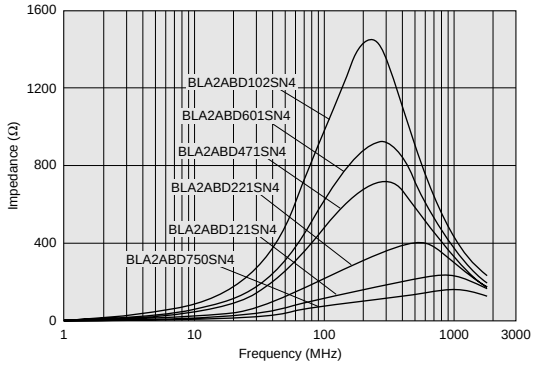
BLA2ABB Series



Continued on the following page.

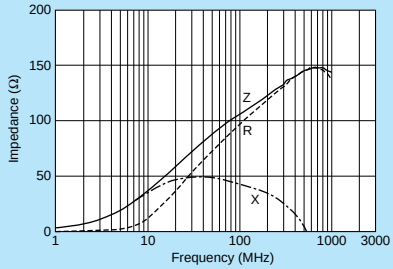
■ Impedance-Frequency Characteristics (Main Items)

BLA2ABD Series

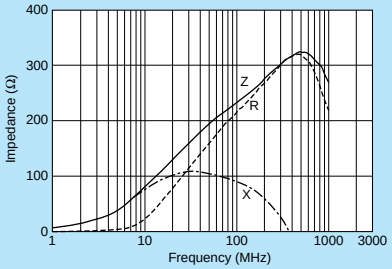


■ Impedance-Frequency Characteristics

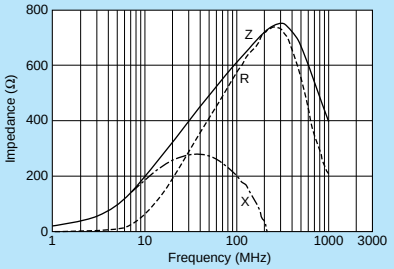
BLA2AAG121SN4



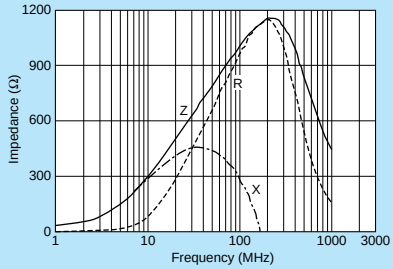
BLA2AAG221SN4



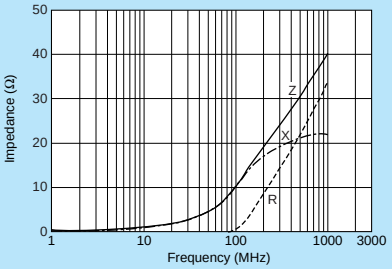
BLA2AAG601SN4



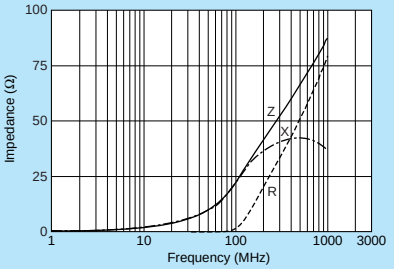
BLA2AAG102SN4



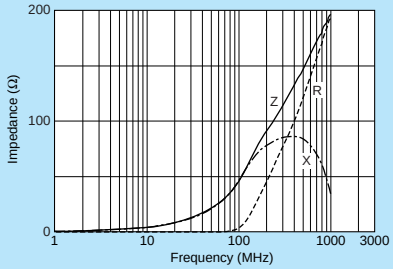
BLA2ABB100SN4



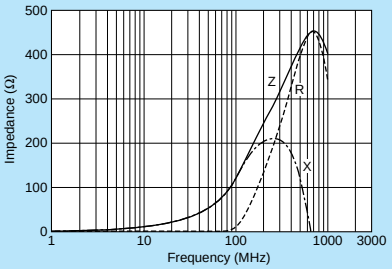
BLA2ABB220SN4



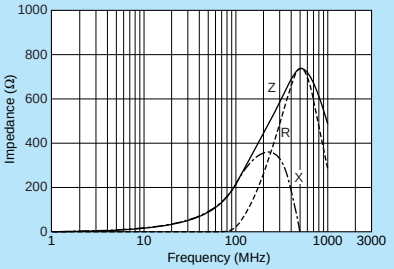
BLA2ABB470SN4



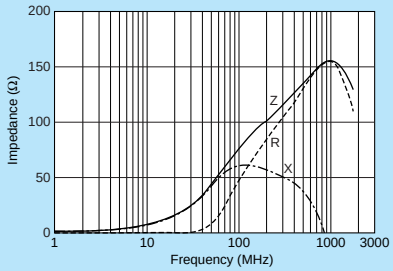
BLA2ABB121SN4



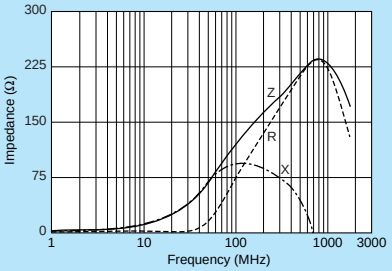
BLA2ABB221SN4



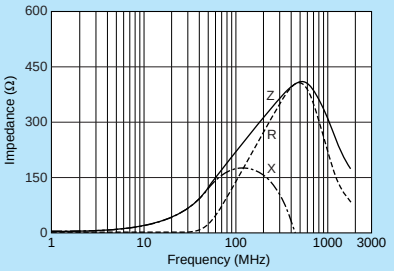
BLA2ABD750SN4



BLA2ABD121SN4



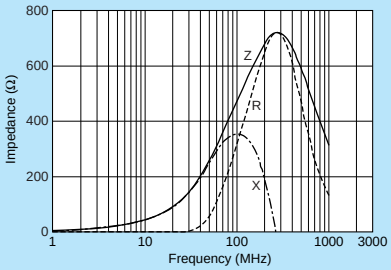
BLA2ABD221SN4



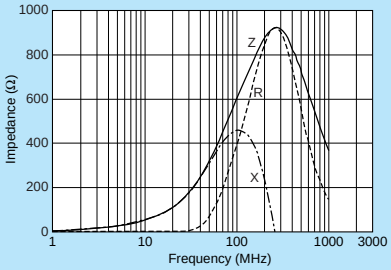
Continued on the following page.

■ Impedance-Frequency Characteristics

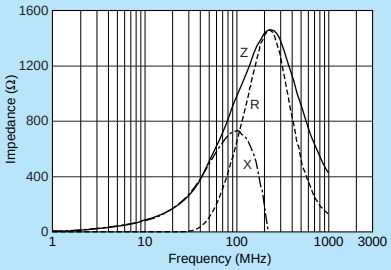
BLA2ABD471SN4



BLA2ABD601SN4



BLA2ABD102SN4

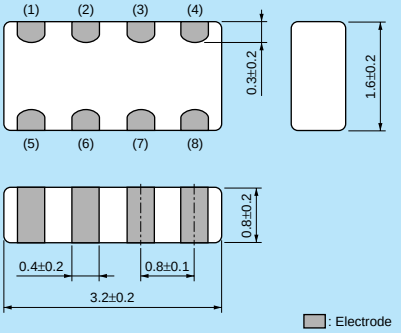


BLA31A/BLA31B Series (1206 Size)

Flow OK Reflow OK

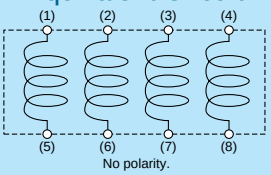
4-lines array, 1206 size.

■ Dimensions



(in mm)

■ Equivalent Circuit



No polarity.

■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
J	330mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

Refer to pages from p.82 to p.85 for mounting information.

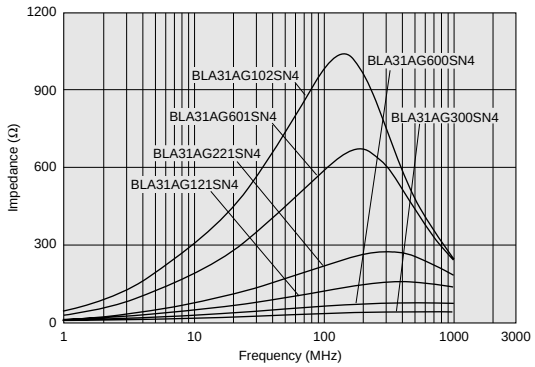
■ Rated Value (☐: packaging code)

Part Number	Impedance (at 100MHz/20°C)	Rated Current	DC Resistance (max.)	Operating Temperature Range
BLA31AG300SN4☐	30ohm±25%	200mA	0.10ohm	-55°C to +125°C
BLA31AG600SN4☐	60ohm±25%	200mA	0.15ohm	-55°C to +125°C
BLA31AG121SN4☐	120ohm±25%	150mA	0.20ohm	-55°C to +125°C
BLA31AG221SN4☐	220ohm±25%	150mA	0.25ohm	-55°C to +125°C
BLA31AG601SN4☐	600ohm±25%	100mA	0.35ohm	-55°C to +125°C
BLA31AG102SN4☐	1000ohm±25%	50mA	0.45ohm	-55°C to +125°C
BLA31BD121SN4☐	120ohm±25%	150mA	0.30ohm	-55°C to +125°C
BLA31BD221SN4☐	220ohm±25%	150mA	0.35ohm	-55°C to +125°C
BLA31BD471SN4☐	470ohm±25%	100mA	0.40ohm	-55°C to +125°C
BLA31BD601SN4☐	600ohm±25%	100mA	0.45ohm	-55°C to +125°C
BLA31BD102SN4☐	1000ohm±25%	50mA	0.55ohm	-55°C to +125°C

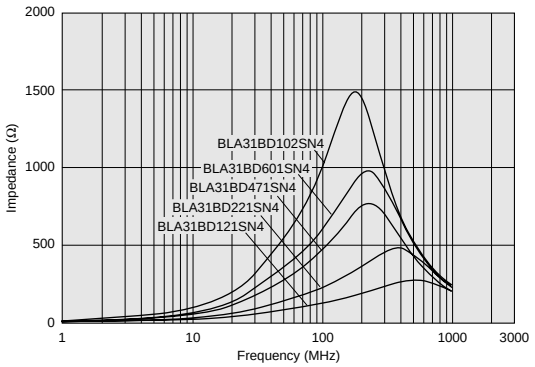
Number of Circuits: 4

■ Impedance-Frequency Characteristics (Main Items)

BLA31AG Series



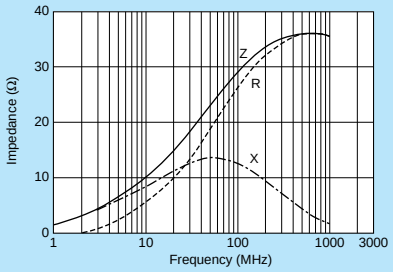
BLA31BD Series



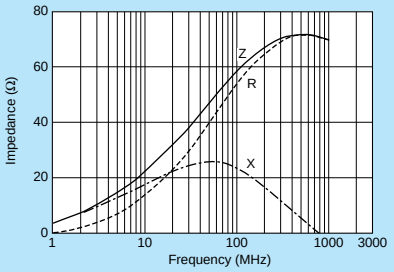
Continued on the following page.

■ Impedance-Frequency Characteristics

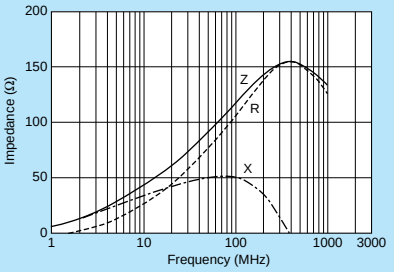
BLA31AG300SN4



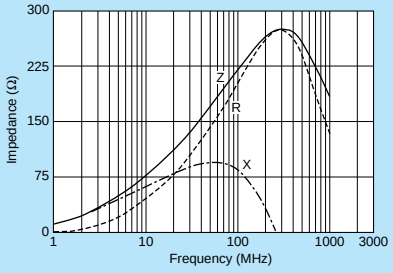
BLA31AG600SN4



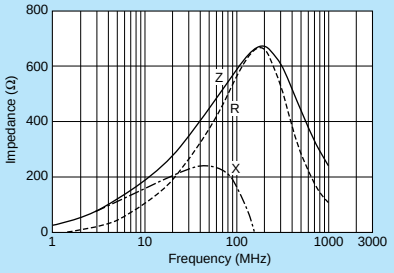
BLA31AG121SN4



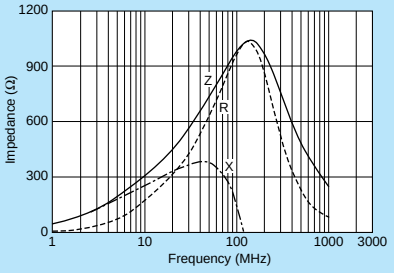
BLA31AG221SN4



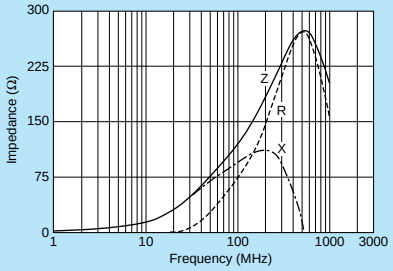
BLA31AG601SN4



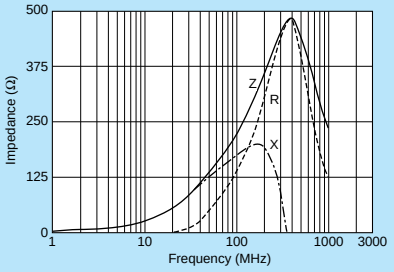
BLA31AG102SN4



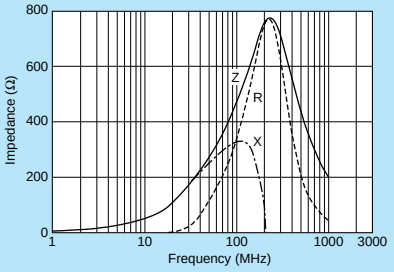
BLA31BD121SN4



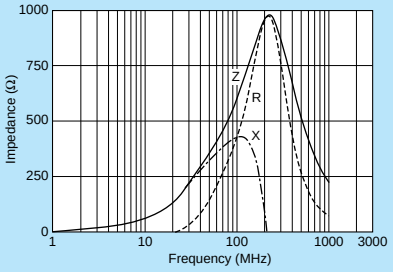
BLA31BD221SN4



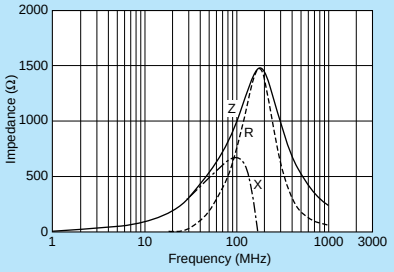
BLA31BD471SN4



BLA31BD601SN4



BLA31BD102SN4



⚠Caution

● Rating

1. About the Rated Current
   Do not use products beyond the rated current as this may create excessive heat and deteriorate the insulation resistance.
2. About the Excessive Surge Current
   Excessive surge current (pulse current or rush current) than specified rated current applied to the product may cause a critical failure, such as an open circuit, burnout caused by excessive temperature rise. Please contact us in advance in case of applying the surge current.

● Soldering and Mounting

• Self-heating
Please provide special attention when mounting chip ferrite beads BLM_AX/P/K/S series in close proximity to other products that radiate heat.
The heat generated by other products may deteriorate the insulation resistance and cause excessive heat in this component.

Notice

● Storage and Operating Conditions

<Operating Environment>
Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.
Do not use products in the environment close to the organic solvent.
<Storage and Handling Requirements>
1. Storage Period
   BLM15E/15H/15G series should be used within 12 months, the other series should be used within 6 months.
   Solderability should be checked if this period is exceeded.
2. Storage Conditions
   (1) Storage temperature: -10 to +40˚C
   Relative humidity: 30 to 70%
   Avoid sudden changes in temperature and humidity.
   (2) Do not store products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

● Notice (Soldering and Mounting)

1. Cleaning
   Failure and degradation of a product are caused by the cleaning method. When you clean in conditions that are not in mounting information, please contact Murata engineering.
2. Soldering
   Reliability decreases with improper soldering methods. Please solder by the standard soldering conditions shown in mounting information.
3. Other
   Noise suppression levels resulting from Murata's EMI suppression filters EMIFIL® may vary, depending on the circuits and ICs used, type of noise, mounting pattern, mounting location, and other operating conditions. Be sure to check and confirm in advance the noise suppression effect of each filter, in actual circuits, etc. before applying the filter in a commercial-purpose equipment design.

● Handling

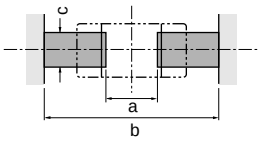
• Resin Coating
Using resin for coating/molding products may affect the products performance.
So please pay careful attention in selecting resin.
Prior to use, please make the reliability evaluation with the product mounted in your application set.

1. Standard Land Pattern Dimensions

Land Pattern + Solder Resist
Land Pattern Solder Resist
(in mm)

BLM02
BLM03
BLM15
(Except **BLM 15_AN1** series)
BLM18
BLM21
BLM31
BLM41

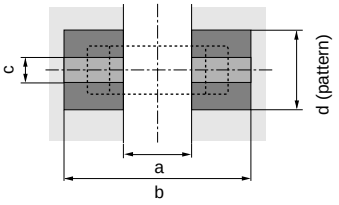
●Reflow and Flow
BLM Series



Type	Soldering	a	b	c
BLM02	Reflow	0.16-0.2	0.4-0.56	0.2-0.23
BLM03	Reflow	0.2-0.3	0.6-0.9	0.3
BLM15	Reflow	0.4	1.2-1.4	0.5
BLM18	Flow (except 18G)	0.7	2.2-2.6	0.7
	Reflow		1.8-2.0	
BLM21	Flow/ Reflow	1.2	3.0-4.0	1.0

• Except BLM03PG/15AX·PD·PG/18PG·KG·SG/21PG. And BLM02/03/15/18G is specially adapted for reflow soldering.

BLM□□AX/P/K/S



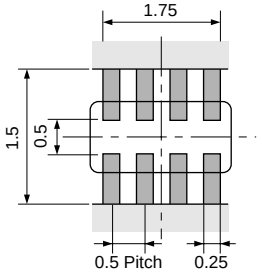
Type	Rated Current (A)	Soldering	a	b	c	Land Pad Thickness and Dimension d		
						18µm	35µm	70µm
BLM03PG	0.75/0.9	Reflow	0.2-0.3	0.6-0.9	0.3	0.3	0.3	0.3
BLM15AX	1.5max.	Reflow	0.4	1.2-1.4	0.5	0.5	0.5	0.5
BLM15P□	2.2max.					1.2	0.7	0.5
BLM18PG	0.5-1.5	Flow/ Reflow	0.7	Flow 2.2-2.6 Reflow 1.8-2.0	0.7	0.7	0.7	0.7
	1.7-2.5					1.2	0.7	0.7
BLM18KG	3-4					2.4	1.2	0.7
BLM18SG	6					6.4	3.3	1.65
BLM21PG	1.5		1.2	3.0-4.0	1.0	1.0	1.0	1.0
	2					1.2	1.0	1.0
	3					2.4	1.2	1.0
	6					6.4	3.3	1.65
BLM31PG	1.5/2		2.0	4.2-5.2	1.2	1.2	1.2	1.2
	3					2.4	1.2	1.2
	6					6.4	3.3	1.65
BLM41PG	1.5/2		3.0	5.5-6.5		1.2	1.2	1.2
	3					2.4	1.2	1.2
	6					6.4	3.3	1.65

• Do not apply narrower pattern than listed above to BLM□□AX/P/K/S.
Narrow pattern can cause excessive heat or open circuit.

BLA2A
BLA31

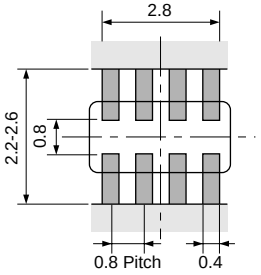
●Reflow Soldering

BLA2A



●Reflow and Flow

BLA31



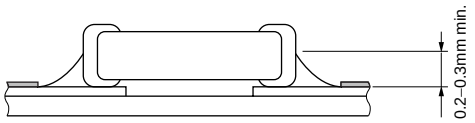
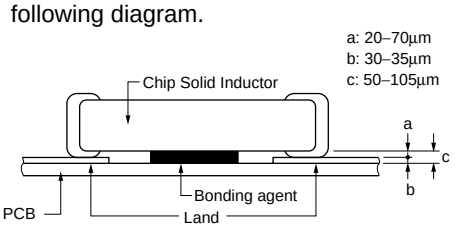
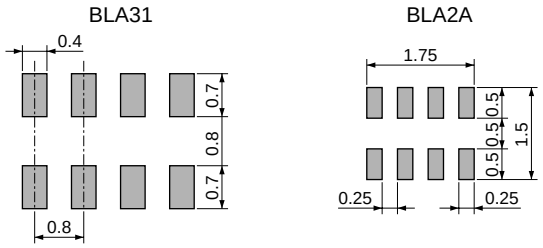
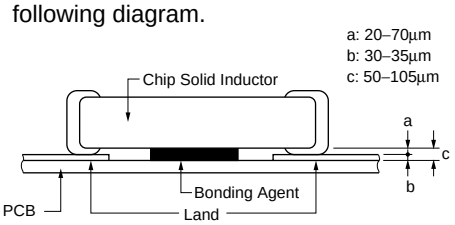
• If there are high amounts of self-heating on pattern, the contact points of PCB and part may become damaged.

2. Solder Paste Printing and Adhesive Application

When reflow soldering the chip ferrite beads, the printing must be conducted in accordance with the following cream solder printing conditions.
If too much solder is applied, the chip will be prone to damage by mechanical and thermal stress from the PCB and may crack.
Standard land dimensions should be used for resist and copper foil patterns.

When flow soldering the chip ferrite beads, apply the adhesive in accordance with the following conditions.
If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability.
In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering process.

(in mm)

Series	Solder Paste Printing	Adhesive Application
BLM (Except **BLM 15_AN1** series)	●Ensure that solder is applied smoothly to a minimum height of 0.2mm to 0.3mm at the end surface of the part. ●Guideline of solder paste thickness: 50-80µm: BLM02 100-150µm: BLM03 100-200µm: BLM15/18/21/31/41 	■ BLM18/21/31/41 Series (Except BLM18G Series) Coating amount is illustrated in the following diagram. 
BLA	●Guideline of solder paste thickness: 100-150µm: BLA2A 150-200µm: BLA31 	■ BLA31 Series Coating amount is illustrated in the following diagram. 

3. Standard Soldering Conditions

(1) Soldering Methods

Use flow and reflow soldering methods only.
Use standard soldering conditions when soldering chip ferrite beads.
In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

Solder: Use Sn-3.0Ag-0.5Cu solder. Use of Sn-Zn based solder will deteriorate performance of products. If using BLA series with Sn-Zn based solder, please contact Murata in advance.

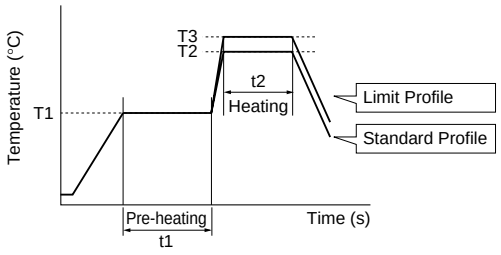
Flux:

- Use Rosin-based flux.
  In case of using RA type solder, products should be cleaned completely with no residual flux.
- Do not use strong acidic flux (with chlorine content exceeding 0.20wt%)
- Do not use water-soluble flux.

For additional mounting methods, please contact Murata.

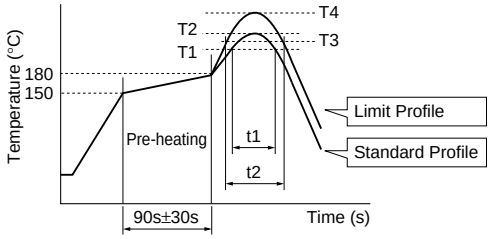
(2) Soldering Profile

●Flow Soldering profile
(Sn-3.0Ag-0.5Cu Solder)



Series	Pre-heating		Standard Profile			Limit Profile		
			Heating		Cycle of Flow	Heating		Cycle of Flow
	Temp. (T1)	Time. (t1)	Temp. (T2)	Time. (t2)		Temp. (T3)	Time. (t2)	
BLM (Except **BLM02/03/15/18G**) **BLA31**	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	2 times max.

●Reflow Soldering Profile
(Sn-3.0Ag-0.5Cu Solder)



Series	Standard Profile				Limit Profile			
	Heating		Peak Temperature (T2)	Cycle of Reflow	Heating		Peak Temperature (T4)	Cycle of Reflow
	Temp. (T1)	Time. (t1)			Temp. (T3)	Time. (t2)		
BLM **BLA**	220°C min.	30 to 60s	245±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.

(3) Reworking with Solder Iron

The following conditions must be strictly followed when using a soldering iron.(Except BLM02 Series)
Pre-heating: 150°C 60s min.
Soldering iron power output / Tip diameter:
80W max. / ø3mm max.
Temperature of soldering iron tip / Soldering time / Times:
350°C max. / 3-4s / 2 times
Do not allow the tip of the soldering iron to directly contact the chip.
For additional methods of reworking with a soldering iron, please contact Murata engineering.

4. Cleaning

Following conditions should be observed when cleaning chip ferrite beads.

(1) Cleaning Temperature: 60°C max. (40°C max. for alcohol type cleaner)

(2) Ultrasonic
Output: 20W/liter max.
Duration: 5 minutes max.
Frequency: 28 to 40kHz

(3) Cleaning Agent
The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production.

(a) Alcohol cleaning agent
Isopropyl alcohol (IPA)
(b) Aqueous cleaning agent
Pine Alpha ST-100S

(4) Ensure that flux residue is completely removed.
Component should be thoroughly dried after aqueous agent has been removed with deionized water.

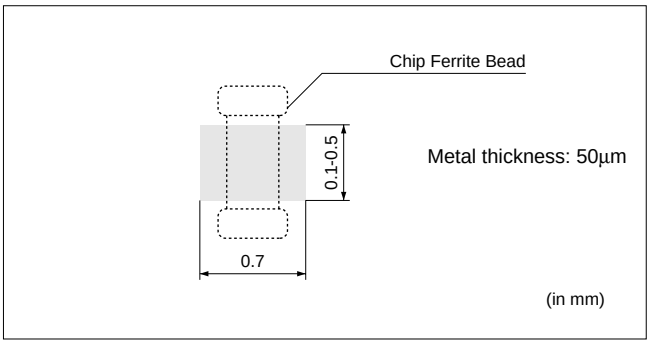
(5) BLM_G type is processed with resin. On rinsing the product, using water for ultrasonic cleaning may affect the resin quality used for the product by water element. In case of set cleaning conditions, please make sure the reliability according to the cleaning conditions.

5. Mounting of BLM15_AN1 Series

BLM15_AN1 is series for wire bonding mounting.

(1) Die Bonding Mounting

(a) Dimension of Standard Metal Mask



(b) Die Bonding Agent

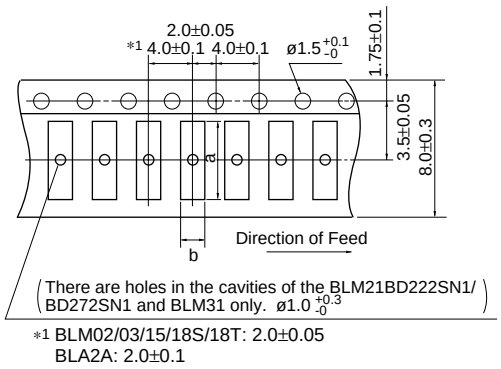
● Use adhesive for die bonding for which the curing temperature is 200°C or less.

(c) Notice

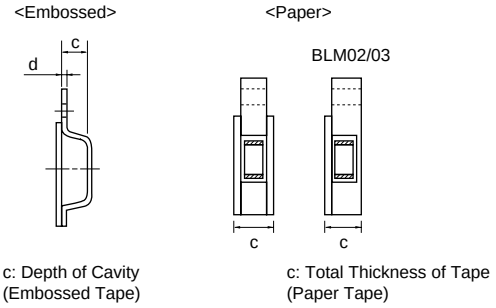
● Use a flat surface of substrate for bonding mounting. Slant mounting of product may affect the wire bonding.

● Adhesive for die bonding may affect the mounting reliability in wire bonding.
Make sure of the mounting reliability with the adhesive to be used in advance.

■ Minimum Quantity and Dimensions of 8mm Width Paper / Embossed Tape



*1 BLM02/03/15/18S/18T: 2.0±0.05
BLA2A: 2.0±0.1



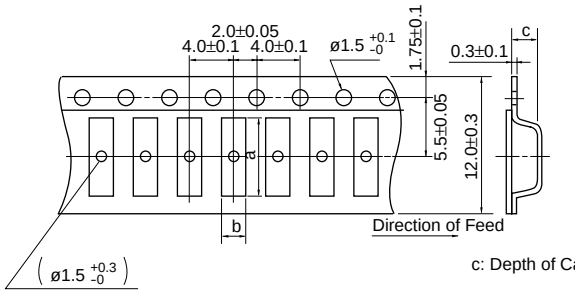
c: Depth of Cavity (Embossed Tape)

c: Total Thickness of Tape (Paper Tape)

Part Number	Cavity Size (mm)				Minimum Qty. (pcs.)				
					ø180mm Reel		ø330mm Reel		Bulk
	a	b	c	d	Paper Tape	Embossed Tape	Paper Tape	Embossed Tape	
BLM02	0.45	0.25	0.40 max.	-	20000	-	-	-	1000
BLM03	0.70	0.40	0.55 max.	-	15000	-	50000	-	1000
BLM15	1.15	0.65	0.8 max.	-	10000	-	50000	-	1000
BLM18	1.85	1.05	1.1 max.	-	4000	-	10000	-	1000
BLM18EG/KG_TN	1.85	1.05	0.85 max.	-	4000	-	10000	-	1000
BLM18EG/KG_SN			1.1 max.						
BLM18S	1.85	1.05	0.90 max.	-	10000	-	30000	-	1000
BLM18T	1.85	1.05	0.90 max.	-	10000	-	-	-	1000
BLM21	2.25	1.45	1.1 max.	-	4000	-	10000	-	1000
BLM31	3.5	1.9	1.3	0.2	-	3000	-	10000	1000
BLM21BD222SN1/272SN1	2.25	1.45	1.3	0.2	-	3000	-	10000	1000
BLA2A	2.2	1.2	0.8 max.	-	10000	-	50000	-	1000
BLA31	3.4	1.8	1.1 max.	-	4000	-	10000	-	1000

(in mm)

■ Minimum Quantity and Dimensions of 12mm Width Embossed Tape



c: Depth of Cavity

Part Number	Cavity Size			Minimum Qty. (pcs.)		
	a	b	c	ø180mm Reel	ø330mm Reel	Bulk
BLM41	4.8	1.9	1.75	2500	8000	1000

(in mm)

"Minimum Quantity" means the number of units of each delivery or order. The quantity should be an integral multiple of the "Minimum Quantity".

●EKEMBL03D (Chip Ferrite Beads 01005 Size / 0201 Size)

No.	Part Number	Quantity (pcs.)	Impedance typ. (at 100MHz, 20 degrees C)	Rated Current (mA)	DC Resistance (Ω) max.
1	**BLM02AG100SN1**	10	10Ω (Typ.)	500	0.1
2	**BLM02AG700SN1**	10	70Ω±25%	250	0.5
3	**BLM02AG121SN1**	10	120Ω±25%	200	0.8
4	**BLM03AG100SN1**	10	10Ω (Typ.)	500	0.1
5	**BLM03AG700SN1**	10	70Ω (Typ.)	200	0.4
6	**BLM03AG800SN1**	10	80Ω±25%	200	0.4
7	**BLM03AG121SN1**	10	120Ω±25%	200	0.5
8	**BLM03AG241SN1**	10	240Ω±25%	200	0.8
9	**BLM03AG601SN1**	10	600Ω±25%	100	1.5
10	**BLM03AG102SN1**	10	1000Ω±25%	100	2.5
11	**BLM03BB100SN1**	10	10Ω±25%	300	0.4
12	**BLM03BB220SN1**	10	22Ω±25%	200	0.5
13	**BLM03BB470SN1**	10	47Ω±25%	200	0.7
14	**BLM03BB750SN1**	10	75Ω±25%	200	1.0
15	**BLM03BB121SN1**	10	120Ω±25%	100	1.5
16	**BLM03BD750SN1**	10	75Ω±25%	300	0.4
17	**BLM03BD121SN1**	10	120Ω±25%	250	0.5
18	**BLM03BD241SN1**	10	240Ω±25%	200	0.8
19	**BLM03BD471SN1**	10	470Ω±25%	215	1.5
20	**BLM03BD601SN1**	10	600Ω±25%	200	1.7
21	**BLM03PG220SN1**	10	22Ω±25%	900	0.065
22	**BLM03PG330SN1**	10	33Ω±25%	750	0.090

●EKEMBL15K (Chip Ferrite Beads 0402 Size)

No.	Part Number	Quantity (pcs.)	Impedance typ. (at 100MHz, 20 degrees C)	Rated Current (mA)	DC Resistance (Ω) max.
1	**BLM15AG100SN1**	10	10Ω (Typ.)	1000	0.05
2	**BLM15AG700SN1**	10	70Ω (Typ.)	500	0.15
3	**BLM15AG121SN1**	10	120Ω±25%	500	0.25
4	**BLM15AG221SN1**	10	220Ω±25%	300	0.35
5	**BLM15AG601SN1**	10	600Ω±25%	300	0.60
6	**BLM15AG102SN1**	10	1000Ω±25%	200	1.00
7	**BLM15AX100SN1**	10	10Ω (Typ.)	1740	0.02
8	**BLM15AX700SN1**	10	70Ω±25%	780	0.10
9	**BLM15AX121SN1**	10	120Ω±25%	680	0.13
10	**BLM15AX221SN1**	10	220Ω±25%	580	0.18
11	**BLM15AX601SN1**	10	600Ω±25%	420	0.34
12	**BLM15AX102SN1**	10	1000Ω±25%	350	0.49
13	**BLM15BA050SN1**	10	5Ω±25%	300	0.10
14	**BLM15BA100SN1**	10	10Ω±25%	300	0.20
15	**BLM15BA220SN1**	10	22Ω±25%	300	0.30
16	**BLM15BA330SN1**	10	33Ω±25%	300	0.40
17	**BLM15BA470SN1**	10	47Ω±25%	200	0.60
18	**BLM15BA750SN1**	10	75Ω±25%	200	0.80
19	**BLM15BB050SN1**	10	5Ω±25%	500	0.08
20	**BLM15BB100SN1**	10	10Ω±25%	300	0.10
21	**BLM15BB220SN1**	10	22Ω±25%	300	0.20
22	**BLM15BB470SN1**	10	47Ω±25%	300	0.35
23	**BLM15BB750SN1**	10	75Ω±25%	300	0.40
24	**BLM15BB121SN1**	10	120Ω±25%	300	0.55
25	**BLM15BB221SN1**	10	220Ω±25%	200	0.80
26	**BLM15BD750SN1**	10	75Ω±25%	300	0.20
27	**BLM15BD121SN1**	10	120Ω±25%	300	0.30
28	**BLM15BD221SN1**	10	220Ω±25%	300	0.40
29	**BLM15BD471SN1**	10	470Ω±25%	200	0.60
30	**BLM15BD601SN1**	10	600Ω±25%	200	0.65
31	**BLM15BD102SN1**	10	1000Ω±25%	200	0.90
32	**BLM15BD182SN1**	10	1800Ω±25%	100	1.40
33	**BLM15HD601SN1**	10	600Ω±25%	300	0.85
34	**BLM15HD102SN1**	10	1000Ω±25%	250	1.25
35	**BLM15HD182SN1**	10	1800Ω±25%	200	2.20
36	**BLM15HG601SN1**	10	600Ω±25%	300	0.70
37	**BLM15HG102SN1**	10	1000Ω±25%	250	1.10
38	**BLM15HB121SN1**	10	120Ω±25%	300	0.70
39	**BLM15HB221SN1**	10	220Ω±25%	250	1.00
40	**BLM15EG121SN1**	10	120Ω±25%	1500	0.095

Continued on the following page.

Chip Ferrite Bead
Chip EMIFIL®
Chip Common Mode Choke Coil
Block Type EMIFIL®
Microwave Absorber

Continued from the preceding page.

No.	Part Number	Quantity (pcs.)	Impedance typ. (at 100MHz, 20 degrees C)	Rated Current (mA)	DC Resistance (Ω) max.
41	**BLM15EG221SN1**	10	220Ω±25%	700	0.28
42	**BLM15GG221SN1**	10	220Ω±25%	300	0.70
43	**BLM15GG471SN1**	10	470Ω±25%	200	1.30
44	**BLM15GA750SN1**	10	75Ω±25%	200	1.30
45	**BLM15PG100SN1**	10	10Ω (Typ.)	1000	0.05
46	**BLM15PD300SN1**	10	30Ω±25%	2200	0.035
47	**BLM15PD600SN1**	10	60Ω±25%	1700	0.06
48	**BLM15PD800SN1**	10	80Ω±25%	1500	0.07
49	**BLM15PD121SN1**	10	120Ω±25%	1300	0.09

●EKEMBL18G (Chip Ferrite Beads 0603 Size)

No.	Part Number	Quantity (pcs.)	Impedance typ. (at 100MHz, 20 degrees C)	Rated Current (mA)	DC Resistance (Ω) max.
1	**BLM18AG121SN1**	10	120Ω±25%	500	0.18
2	**BLM18AG151SN1**	10	150Ω±25%	500	0.25
3	**BLM18AG221SN1**	10	220Ω±25%	500	0.25
4	**BLM18AG331SN1**	10	330Ω±25%	500	0.30
5	**BLM18AG471SN1**	10	470Ω±25%	500	0.35
6	**BLM18AG601SN1**	10	600Ω±25%	500	0.38
7	**BLM18AG102SN1**	10	1000Ω±25%	400	0.50
8	**BLM18BA050SN1**	10	5Ω±25%	500	0.20
9	**BLM18BA100SN1**	10	10Ω±25%	500	0.25
10	**BLM18BA470SN1**	10	47Ω±25%	300	0.55
11	**BLM18BA750SN1**	10	75Ω±25%	300	0.70
12	**BLM18BA121SN1**	10	120Ω±25%	200	0.90
13	**BLM18BB050SN1**	10	5Ω±25%	700	0.05
14	**BLM18BB100SN1**	10	10Ω±25%	700	0.10
15	**BLM18BB220SN1**	10	22Ω±25%	600	0.20
16	**BLM18BB470SN1**	10	47Ω±25%	550	0.25
17	**BLM18BB600SN1**	10	60Ω±25%	550	0.25
18	**BLM18BB750SN1**	10	75Ω±25%	500	0.30
19	**BLM18BB121SN1**	10	120Ω±25%	500	0.30
20	**BLM18BB151SN1**	10	150Ω±25%	450	0.37
21	**BLM18BB221SN1**	10	220Ω±25%	450	0.45
22	**BLM18BB331SN1**	10	330Ω±25%	400	0.58
23	**BLM18BB471SN1**	10	470Ω±25%	300	0.85
24	**BLM18BD470SN1**	10	47Ω±25%	200	0.30
25	**BLM18BD121SN1**	10	120Ω±25%	200	0.40
26	**BLM18BD151SN1**	10	150Ω±25%	200	0.40
27	**BLM18BD221SN1**	10	220Ω±25%	200	0.45
28	**BLM18BD331SN1**	10	330Ω±25%	200	0.50
29	**BLM18BD421SN1**	10	420Ω±25%	200	0.55
30	**BLM18BD471SN1**	10	470Ω±25%	200	0.55
31	**BLM18BD601SN1**	10	600Ω±25%	200	0.65
32	**BLM18BD102SN1**	10	1000Ω±25%	100	0.85
33	**BLM18BD152SN1**	10	1500Ω±25%	50	1.20
34	**BLM18BD182SN1**	10	1800Ω±25%	50	1.50
35	**BLM18BD222SN1**	10	2200Ω±25%	50	1.50
36	**BLM18BD252SN1**	10	2500Ω±25%	50	1.50
37	**BLM18PG300SN1**	10	30Ω (Typ.)	1000	0.05
38	**BLM18PG330SN1**	10	33Ω±25%	3000	0.025
39	**BLM18PG600SN1**	10	60Ω (Typ.)	500	0.10
40	**BLM18PG121SN1**	10	120Ω±25%	2000	0.05
41	**BLM18PG181SN1**	10	180Ω±25%	1500	0.09
42	**BLM18PG221SN1**	10	220Ω±25%	1400	0.10
43	**BLM18PG331SN1**	10	330Ω±25%	1200	0.15
44	**BLM18PG471SN1**	10	470Ω±25%	1000	0.20
45	**BLM18KG260TN1**	10	26Ω±25%	6000	0.007
46	**BLM18KG700TN1**	10	70Ω±25%	3500	0.022
47	**BLM18KG121TN1**	10	120Ω±25%	3000	0.030
48	**BLM18KG221SN1**	10	220Ω±25%	2200	0.050
49	**BLM18KG331SN1**	10	330Ω±25%	1700	0.080
50	**BLM18KG471SN1**	10	470Ω±25%	1500	0.130
51	**BLM18KG601SN1**	10	600Ω±25%	1300	0.150
52	**BLM18SG260TN1**	10	26Ω±25%	6000	0.007
53	**BLM18SG700TN1**	10	70Ω±25%	4000	0.020
54	**BLM18SG121TN1**	10	120Ω±25%	3000	0.025
55	**BLM18SG221TN1**	10	220Ω±25%	2500	0.040
56	**BLM18SG331TN1**	10	330Ω±25%	1500	0.070
57	**BLM18RK121SN1**	10	120Ω±25%	200	0.25
58	**BLM18RK471SN1**	10	470Ω±25%	200	0.5
59	**BLM18RK601SN1**	10	600Ω±25%	200	0.6
60	**BLM18RK102SN1**	10	1000Ω±25%	200	0.8

●EKEMBL8GA (Chip Ferrite Beads 0603 Size / for High Frequency Type)

No.	Part Number	Quantity (pcs.)	Impedance (at 100MHz, 20 degrees C)	Impedance (at 1GHz, 20 degrees C)	Rated Current (mA)	DC Resistance (Ω) max.
1	**BLM18HG471SN1**	10	470Ω±25%	600Ω (Typ.)	200	0.85
2	**BLM18HG601SN1**	10	600Ω±25%	700Ω (Typ.)	200	1.00
3	**BLM18HG102SN1**	10	1000Ω±25%	1000Ω (Typ.)	100	1.60
4	**BLM18HB121SN1**	10	120Ω±25%	500Ω±40%	200	0.50
5	**BLM18HB221SN1**	10	220Ω±25%	1100Ω±40%	100	0.80
6	**BLM18HB331SN1**	10	330Ω±25%	1600Ω±40%	50	1.20
7	**BLM18HD471SN1**	10	470Ω±25%	1000Ω (Typ.)	100	1.20
8	**BLM18HD601SN1**	10	600Ω±25%	1200Ω (Typ.)	100	1.50
9	**BLM18HD102SN1**	10	1000Ω±25%	1700Ω (Typ.)	50	1.80
10	**BLM18HE601SN1**	10	600Ω±25%	600Ω (Typ.)	800	0.25
11	**BLM18HE102SN1**	10	1000Ω±25%	1000Ω (Typ.)	600	0.35
12	**BLM18HE152SN1**	10	1500Ω±25%	1500Ω (Typ.)	500	0.50
13	**BLM18HK331SN1**	10	330Ω±25%	400Ω (Typ.)	200	0.50
14	**BLM18HK471SN1**	10	470Ω±25%	600Ω (Typ.)	200	0.70
15	**BLM18HK601SN1**	10	600Ω±25%	700Ω (Typ.)	100	0.90
16	**BLM18HK102SN1**	10	1000Ω±25%	1200Ω (Typ.)	50	1.50
17	**BLM18EG101TN1**	10	100Ω±25%	140Ω (Typ.)	2000	0.045
18	**BLM18EG121SN1**	10	120Ω±25%	145Ω (Typ.)	2000	0.04
19	**BLM18EG221TN1**	10	220Ω±25%	300Ω (Typ.)	1000	0.15
20	**BLM18EG221SN1**	10	220Ω±25%	260Ω (Typ.)	2000	0.05
21	**BLM18EG331TN1**	10	330Ω±25%	450Ω (Typ.)	500	0.21
22	**BLM18EG391TN1**	10	390Ω±25%	520Ω (Typ.)	500	0.30
23	**BLM18EG471SN1**	10	470Ω±25%	550Ω (Typ.)	500	0.21
24	**BLM18EG601SN1**	10	600Ω±25%	700Ω (Typ.)	500	0.35
25	**BLM18GG471SN1**	10	470Ω±25%	1800Ω±30%	200	1.30

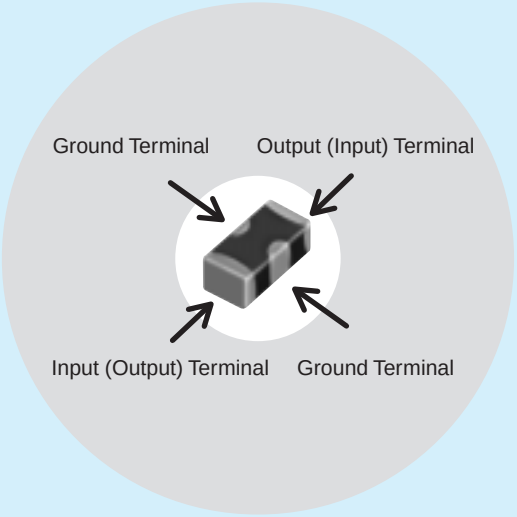
●EKEMBL21D (Chip Ferrite Beads 0805 Size / for Large-current P Type)

No.	Part Number	Quantity (pcs.)	Impedance typ. (at 100MHz, 20 degrees C)	Rated Current (mA)	DC Resistance (Ω) max.
1	**BLM21AG121SN1**	10	120Ω±25%	200	0.15
2	**BLM21AG151SN1**	10	150Ω±25%	200	0.15
3	**BLM21AG221SN1**	10	220Ω±25%	200	0.20
4	**BLM21AG331SN1**	10	330Ω±25%	200	0.25
5	**BLM21AG471SN1**	10	470Ω±25%	200	0.25
6	**BLM21AG601SN1**	10	600Ω±25%	200	0.30
7	**BLM21AG102SN1**	10	1000Ω±25%	200	0.45
8	**BLM21BB050SN1**	10	5Ω±25%	500	0.07
9	**BLM21BB600SN1**	10	60Ω±25%	200	0.20
10	**BLM21BB750SN1**	10	75Ω±25%	200	0.25
11	**BLM21BB121SN1**	10	120Ω±25%	200	0.25
12	**BLM21BB221SN1**	10	220Ω±25%	200	0.35
13	**BLM21BB331SN1**	10	330Ω±25%	200	0.40
14	**BLM21BB471SN1**	10	470Ω±25%	200	0.45
15	**BLM21BD121SN1**	10	120Ω±25%	200	0.25
16	**BLM21BD221SN1**	10	220Ω±25%	200	0.25
17	**BLM21BD421SN1**	10	420Ω±25%	200	0.30
18	**BLM21BD471SN1**	10	470Ω±25%	200	0.35
19	**BLM21BD601SN1**	10	600Ω±25%	200	0.35
20	**BLM21BD102SN1**	10	1000Ω±25%	200	0.40
21	**BLM21BD152SN1**	10	1500Ω±25%	200	0.45
22	**BLM21BD182SN1**	10	1800Ω±25%	200	0.50
23	**BLM21BD222SN1**	10	2250Ω (Typ.)	200	0.60
24	**BLM21BD222TN1**	10	2200Ω±25%	200	0.60
25	**BLM21BD272SN1**	10	2700Ω±25%	200	0.80
26	**BLM21PG220SN1**	10	22Ω±25%	6000	0.01
27	**BLM21PG300SN1**	10	30Ω (Typ.)	3000	0.015
28	**BLM21PG600SN1**	10	60Ω±25%	3000	0.025
29	**BLM21PG221SN1**	10	220Ω±25%	2000	0.050
30	**BLM21PG331SN1**	10	330Ω±25%	1500	0.09
31	**BLM31PG330SN1**	10	33Ω±25%	6000	0.01
32	**BLM31PG500SN1**	10	50Ω (Typ.)	3000	0.025
33	**BLM31PG121SN1**	10	120Ω±25%	3000	0.025
34	**BLM31PG391SN1**	10	390Ω (Typ.)	2000	0.05
35	**BLM31PG601SN1**	10	600Ω (Typ.)	1500	0.09
36	**BLM41PG600SN1**	10	60Ω (Typ.)	6000	0.01
37	**BLM41PG750SN1**	10	75Ω (Typ.)	3000	0.025
38	**BLM41PG181SN1**	10	180Ω (Typ.)	3000	0.025
39	**BLM41PG471SN1**	10	470Ω (Typ.)	2000	0.05
40	**BLM41PG102SN1**	10	1000Ω (Typ.)	1500	0.09

Memo

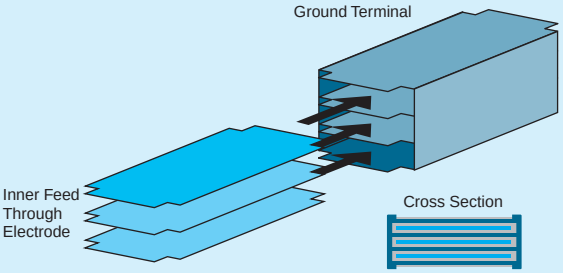
NF□

Chip EMIFIL®

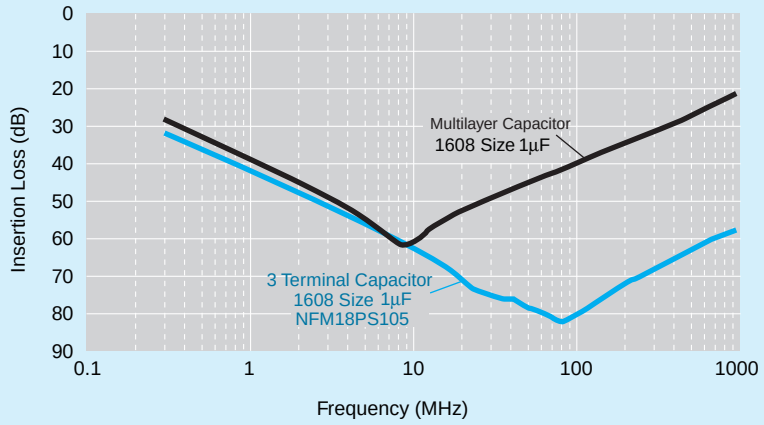


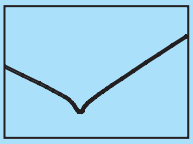
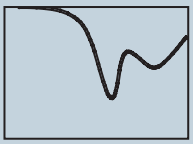
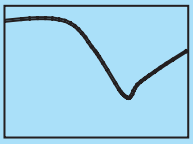
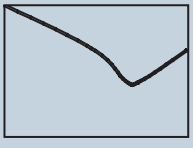
Example of 3 Terminal Capacitor Structure

Chip 3 terminal capacitor is chip shaped 3 terminal capacitor designed for noise suppression. Its inner structure like feed through capacitor makes its ground impedance quite low. Owing to this structure, 3 terminal capacitor has good noise suppression effect at high frequency range up to several hundred MHz.



Series	Equivalent Circuit	Part Number
NFM Series (3 terminal capacitor)		NFM18CC NFM21CC NFM18PC NFM18PS NFM21PC
NFL / NFW Series (LC filter)		NFL18ST
		NFL18SP NFL21SP NFW31SP
		NFA21S NFA18S
NFR Series (RC filter)		NFR21GD NFA31GD
NFE Series (Feed through capacitor with ferrite cores)		NFE31PT NFE61PT



Insertion Loss Sample	Features			Applications	Example
	Standard of 3 terminal capacitor	**NFM_CC**	Standard type with varied capacitance	Noise suppression in low speed signal lines	Low speed interface lines, sensors
		NFM_PC	Meet large current, high capacitance available, for power lines	Noise suppression in power lines	Individual IC power lines
	Sharp insertion loss curve enables low damage to signal waveform	**NFL_ST**	T-type filter, effective in low impedance circuits	Noise suppression in high speed signal lines	High speed interface lines Bus lines LCD lines Camera I/Fs High speed analog lines RGB / D terminal
		NFL_SP	π-type filter, effective in high impedance circuits		
		NFW_SP	π-type filter, designed for low impedance circuits		
		NFA_SL	4-line array, suitable for bus lines or flat cables		
	Limit noise using resistor, also loop back to ground			Noise suppression in signal line with unstable ground	Interface lines Clock lines
	Meet large current, good high frequency performance because of its feed through structure			Noise suppression in power lines / low impedance lines	Various power lines, sensors

Capacitor

(Part Number)

NF	M	3D	CC	102	R	1H	3	L
❶	❷	❸	❹	❺	❻	❼	❽	❾

❶Product ID

Product ID	
NF	Chip EMIFIL®

❷Structure

Code	Structure
M	Capacitor Type
A	Capacitor Array Type

❸Dimensions (L×W)

Code	Dimensions (L×W)	EIA
18	1.6×0.8mm	0603
21	2.0×1.25mm	0805
3D	3.2×1.25mm	1205
31	3.2×1.6mm	1206
41	4.5×1.6mm	1806
55	5.7×5.0mm	2220

❹Features

Code	Features
CC	Capacitor Type for Signal Lines
PC	Capacitor Type for Large Current
PS	High Loss Type for Large Current

❺Capacitance

Expressed by three figures. The unit is in pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❻Characteristics

Code	Capacitance Change (Temperature Characteristics)
B	±10%, ±12.5%, +10/-13%
F	+30/-80%, +30/-84%
R	±15%, +15/-18%
U	-750 ±120ppm/°C
S	+350 to -1000ppm/°C

❼Rated Voltage

Code	Rated Voltage
0J	6.3V
1A	10V
1C	16V
1E	25V
1H	50V
2A	100V

❽Electrode/Others (**NFM** Series)

Code	Electrode	Series
3	Sn Plating	**NFM** (Except **NFM55**)
4	Solder Coating	**NFM55**

❽Number of Circuits (**NFA□□CC** Series)

Code	Number of Circuits
4	4 Circuits

❾Packaging

Code	Packaging	Series
L	Embossed Taping (ø180mm Reel)	**NFM3D/NFM31/NFM41/NFM55**
B	Bulk	All series
D	Paper Taping (ø180mm Reel)	**NFM18/NFM21/NFA□□CC**

LC Combined (1)

(Part Number)

NF	L	18	ST	107	X	1C	3	L
❶	❷	❸	❹	❺	❻	❼	❽	❾

❶Product ID

Product ID	
NF	Chip EMIFIL®

❷Structure

Code	Structure
L	Maltilayer, LC Combined Type
W	Wire Wound, LC Combined Type
E	Block, LC Combined Type

❸Dimensions (L×W)

Code	Dimensions (L×W)	EIA
18	1.6×0.8mm	0603
21	2.0×1.25mm	0805
31	3.2×1.6mm	1206
61	6.8×1.6mm	2606

❹Features

Code	Features
SP	π Circuit for Signal Lines
ST	T Circuit for Signal Lines
PT	T Circuit for Large Current

❺Cut-off Frequency (**NFL/NFW** Series)

Expressed by three figures. The unit is in hertz (Hz). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❺Capacitance (**NFE** Series)

Expressed by three figures. The unit is in pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❻Characteristics (**NFL/NFW** Series)

Code	Characteristics
X	Cut-off Frequency

❻Characteristics (**NFE** Series)

Code	Capacitance Change (Temperature Characteristics)
B	±10%
C	±20%, ±22%
D	+20/-30%, +22/-33%
E	+20/-55%, +22/-56%
F	+30/-80%, +22/-82%
R	±15%
U	-750 ±120ppm/ ˚C
Z	Other

❼Rated Voltage

Code	Rated Voltage
1A	10V
1C	16V
1E	25V
1H	50V
2A	100V

❽Electrode

Code	Electrode	Series
3/7	Sn Plating	**NFL**
4	Lead Free Solder Coating	**NFW**
9	Others	**NFE**

❾Packaging

Code	Packaging	Series
K	Embossed Taping (ø330mm Reel)	**NFW31/NFE**
L	Embossed Taping (ø180mm Reel)	**NFW31/NFE**
B	Bulk	**NFL18/NFL21/NFE**
D	Paper Taping (ø180mm Reel)	**NFL18/NFL21**

LC Combined (2)

(Part Number)

NF	A	21	SL	207	X	1A	4	5	L
❶	❷	❸	❹	❺	❻	❼	❽	❾	❿

❶Product ID

Product ID	
NF	Chip EMIFIL®

❷Structure

Code	Structure
A	Array Type

❸Dimensions (L×W)

Code	Dimensions (L×W)	EIA
18	1.6×0.8mm	0603
21	2.0×1.25mm	0805

❹Features (1)

Code	Features
SL	L Circuit for Signal Lines

❺Cut-off Frequency

Expressed by three figures. The unit is in hertz (Hz). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❻Features (2)

Code	Features
X	Expressed by a letter
V	

❼Rated Voltage

Code	Rated Voltage
1A	10V

❽Number of Circuits

Code	Number of Circuits
4	4 Circuits

❾Dimensions (T)

Code	Dimensions (T)
5	Low Profile
8	Standard

❿Packaging

Code	Packaging
B	Bulk
L	Embossed Taping (ø180mm Reel)

RC Combined

(Part Number)

NF	R	21	GD	470	470	2	L
❶	❷	❸	❹	❺	❻	❼	❽

❶Product ID

Product ID	
NF	Chip EMIFIL®

❷Structure

Code	Structure
R	RC Combined Type
A	RC Combined Array Type

❸Dimensions (L×W)

Code	Dimensions (L×W)	EIA
21	2.0×1.25mm	0805
31	3.2×1.6mm	1206

❹Features

Code	Features
GD	RC Combined Type for Signal Lines

❺Capacitance

Expressed by three figures. The unit is in pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❻Resistance

Expressed by three-digit alphanumerics. The unit is in ohm (Ω). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures. If there is a decimal point, it is expressed by the capital letter "**R**". In this case, all figures are significant digits.

❼Electrode/Others (**NFR** Series)

Code	Electrode
2	Sn Plating

❼Number of Circuits (**NFA□□GD** Series)

Code	Number of Circuits
4	4 Circuits

❽Packaging

Code	Packaging	Series
L	Embossed Taping (ø180mm Reel)	**NFR**
B	Bulk	All Series
D	Paper Taping (ø180mm Reel)	**NFA□□GD**

Type	Size (Inch)	Part Number	Rated Voltage	Capacitance	Nominal Cut-off Frequency	Rated Current	New / Kit / ≧1A / ≧3A / DTV / Flow / ReFlow
Capacitor Type	p100 0603	NFM18CC220U1C3	16Vdc	22pF+20%-20%	-	400mA	Kit ReFlow
		NFM18CC470U1C3	16Vdc	47pF+20%-20%	-	400mA	Kit ReFlow
		NFM18CC101R1C3	16Vdc	100pF+20%-20%	-	500mA	Kit ReFlow
		NFM18CC221R1C3	16Vdc	220pF+20%-20%	-	500mA	Kit ReFlow
		NFM18CC471R1C3	16Vdc	470pF+20%-20%	-	500mA	Kit ReFlow
		NFM18CC102R1C3	16Vdc	1000pF+20%-20%	-	600mA	Kit ReFlow
		NFM18CC222R1C3	16Vdc	2200pF+20%-20%	-	700mA	Kit ReFlow
		NFM18CC223R1C3	16Vdc	22000pF+20%-20%	-	1000mA	Kit ≧1A ReFlow
	p101 0805	NFM21CC220U1H3	50Vdc	22pF+20%-20%	-	700mA	Kit ReFlow
		NFM21CC470U1H3	50Vdc	47pF+20%-20%	-	700mA	Kit ReFlow
		NFM21CC101U1H3	50Vdc	100pF+20%-20%	-	700mA	Kit ReFlow
		NFM21CC221R1H3	50Vdc	220pF+20%-20%	-	700mA	Kit ReFlow
		NFM21CC471R1H3	50Vdc	470pF+20%-20%	-	1000mA	Kit ≧1A ReFlow
		NFM21CC102R1H3	50Vdc	1000pF+20%-20%	-	1000mA	Kit ≧1A ReFlow
		NFM21CC222R1H3	50Vdc	2200pF+20%-20%	-	1000mA	Kit ≧1A ReFlow
		NFM21CC223R1H3	50Vdc	22000pF+20%-20%	-	2000mA	Kit ≧1A ReFlow
	p102 1205	NFM3DCC220U1H3	50Vdc	22pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC470U1H3	50Vdc	47pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC101U1H3	50Vdc	100pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC221R1H3	50Vdc	220pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC471R1H3	50Vdc	470pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC102R1H3	50Vdc	1000pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC222R1H3	50Vdc	2200pF+50%-20%	-	300mA	Flow ReFlow
		NFM3DCC223R1H3	50Vdc	22000pF+50%-20%	-	300mA	Flow ReFlow
	p103 1806	NFM41CC220U2A3	100Vdc	22pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC470U2A3	100Vdc	47pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC101U2A3	100Vdc	100pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC221U2A3	100Vdc	220pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC471R2A3	100Vdc	470pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC102R2A3	100Vdc	1000pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC222R2A3	100Vdc	2200pF+50%-20%	-	300mA	Flow ReFlow
		NFM41CC223R2A3	100Vdc	22000pF+50%-20%	-	300mA	Flow ReFlow
Capacitor Array Type	p104 1206	NFA31CC220S1E4	25Vdc	22pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC470S1E4	25Vdc	47pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC101S1E4	25Vdc	100pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC221S1E4	25Vdc	220pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC471R1E4	25Vdc	470pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC102R1E4	25Vdc	1000pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC222R1E4	25Vdc	2200pF+20%-20%	-	200mA	Kit ReFlow
		NFA31CC223R1C4	16Vdc	22000pF+20%-20%	-	200mA	Kit ReFlow
Capacitor Type for Large Current	p105 0603	NFM18PS474R0J3	6.3Vdc	0.47µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM18PS105R0J3	6.3Vdc	1.0µF+20%-20%	-	2A	Kit ≧1A ReFlow
	p106	NFM18PC104R1C3	16Vdc	0.1µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM18PC224R0J3	6.3Vdc	0.22µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM18PC474R0J3	6.3Vdc	0.47µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM18PC105R0J3	6.3Vdc	1.0µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM18PC225B0J3	6.3Vdc	2.2µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM18PC225B1A3	10Vdc	2.2µF+20%-20%	-	4A	Kit ≧3A ReFlow
	p107 0805	NFM21PC104R1E3	25Vdc	0.1µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM21PC224R1C3	16Vdc	0.22µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM21PC474R1C3	16Vdc	0.47µF+20%-20%	-	2A	Kit ≧1A ReFlow
		NFM21PC105B1A3	10Vdc	1.0µF+20%-20%	-	4A	Kit ≧3A ReFlow
		NFM21PC105B1C3	16Vdc	1.0µF+20%-20%	-	4A	Kit ≧3A ReFlow
		NFM21PC225B0J3	6.3Vdc	2.2µF+20%-20%	-	4A	Kit ≧3A ReFlow
		NFM21PC475B1A3	10Vdc	4.7µF+20%-20%	-	6A	Kit ≧3A ReFlow
	1205 p108	NFM3DPC223R1H3	50Vdc	0.022µF+20%-20%	-	2A	≧1A ReFlow
	1206 p109	NFM31PC276B0J3	6.3Vdc	27µF+20%-20%	-	6A	Kit ≧3A Flow ReFlow
	p110 1806	NFM41PC204F1H3	50Vdc	0.2µF+80%-20%	-	2A	Kit ≧1A Flow ReFlow
		NFM41PC155B1E3	25Vdc	1.5µF+20%-20%	-	6A	Kit ≧3A Flow ReFlow
	2220 p111	NFM55PC155F1H4	50Vdc	1.5µF+80%-20%	-	6A	≧3A ReFlow

Continued on the following page.

Type	Size (Inch)	Part Number	Rated Voltage	Capacitance	Nominal Cut-off Frequency	Rated Current	New	Kit	≧1A ≧3A	DTV	Flow	ReFlow
T Circuit Filter Feed Through Type for Large Current	1206 p112	NFE31PT220R1E9	25Vdc	22pF+30%-30%	-	6A			≧3A		Flow	ReFlow
		NFE31PT470C1E9	25Vdc	47pF+50%-20%	-	6A			≧3A		Flow	ReFlow
		NFE31PT101C1E9	25Vdc	100pF+80%-20%	-	6A			≧3A		Flow	ReFlow
		NFE31PT221D1E9	25Vdc	220pF+50%-20%	-	6A			≧3A		Flow	ReFlow
		NFE31PT471F1E9	25Vdc	470pF+50%-20%	-	6A			≧3A		Flow	ReFlow
		NFE31PT152Z1E9	25Vdc	1500pF+50%-20%	-	6A		Kit	≧3A		Flow	ReFlow
		NFE31PT222Z1E9	25Vdc	2200pF+50%-50%	-	6A		Kit	≧3A		Flow	ReFlow
	2706 p113	NFE61PT330B1H9	50Vdc	33pF+30%-30%	-	2A			≧1A		Flow	ReFlow
		NFE61PT680B1H9	50Vdc	68pF+30%-30%	-	2A			≧1A		Flow	ReFlow
		NFE61PT101Z1H9	50Vdc	100pF+30%-30%	-	2A			≧1A		Flow	ReFlow
		NFE61PT181B1H9	50Vdc	180pF+30%-30%	-	2A			≧1A		Flow	ReFlow
		NFE61PT361B1H9	50Vdc	360pF+20%-20%	-	2A			≧1A		Flow	ReFlow
		NFE61PT681B1H9	50Vdc	680pF+30%-30%	-	2A			≧1A		Flow	ReFlow
		NFE61PT102E1H9	50Vdc	1000pF+80%-20%	-	2A		Kit	≧1A		Flow	ReFlow
		NFE61PT472C1H9	50Vdc	4700pF+80%-20%	-	2A		Kit	≧1A		Flow	ReFlow
LC Combined Multilayer Type	0603 p114 p115	NFL18ST207X1C3	16Vdc	25pF+20%-20%	200MHz	150mA		Kit				ReFlow
		NFL18ST307X1C3	16Vdc	18pF+20%-20%	300MHz	200mA		Kit				ReFlow
		NFL18ST507X1C3	16Vdc	10pF+20%-20%	500MHz	200mA		Kit				ReFlow
		NFL18SP157X1A3	10Vdc	34pF+20%-20%	150MHz	100mA		Kit				ReFlow
		NFL18SP207X1A3	10Vdc	24pF+20%-20%	200MHz	100mA		Kit				ReFlow
		NFL18SP307X1A3	10Vdc	19pF+20%-20%	300MHz	100mA		Kit				ReFlow
		NFL18SP507X1A3	10Vdc	11pF+20%-20%	500MHz	100mA		Kit				ReFlow
	0805 p116	NFL21SP106X1C3	16Vdc	670pF+20%-20%	10MHz	100mA		Kit				ReFlow
		NFL21SP206X1C7	16Vdc	240pF+20%-20%	20MHz	100mA		Kit				ReFlow
		NFL21SP506X1C3	16Vdc	84pF+20%-20%	50MHz	150mA		Kit				ReFlow
		NFL21SP706X1C3	16Vdc	76pF+20%-20%	70MHz	150mA		Kit				ReFlow
		NFL21SP107X1C3	16Vdc	44pF+20%-20%	100MHz	200mA		Kit				ReFlow
		NFL21SP157X1C3	16Vdc	28pF+20%-20%	150MHz	200mA		Kit				ReFlow
		NFL21SP207X1C3	16Vdc	22pF+20%-20%	200MHz	250mA		Kit				ReFlow
		NFL21SP307X1C3	16Vdc	19pF+10%-10%	300MHz	300mA		Kit				ReFlow
		NFL21SP407X1C3	16Vdc	16pF+10%-10%	400MHz	300mA		Kit				ReFlow
		NFL21SP507X1C3	16Vdc	12pF+10%-10%	500MHz	300mA		Kit				ReFlow
LC Combined Array Type	0603 p117	NFA18SL137V1A45	10Vdc	-	130MHz	50mA		Kit		DTV		ReFlow
		NFA18SL187V1A45	10Vdc	-	180MHz	50mA		Kit		DTV		ReFlow
		NFA18SL207V1A45	10Vdc	-	200MHz	50mA		Kit		DTV		ReFlow
		NFA18SL307V1A45	10Vdc	-	300MHz	100mA		Kit				ReFlow
		NFA18SL407V1A45	10Vdc	-	400MHz	100mA		Kit				ReFlow
		NFA18SL487V1A45	10Vdc	-	480MHz	100mA		Kit				ReFlow
		NFA18SL506X1A45	10Vdc	-	50MHz	25mA	New	Kit				ReFlow
	0805 p119	NFA21SL287V1A45	10Vdc	-	280MHz	100mA		Kit				ReFlow
		NFA21SL317V1A45	10Vdc	-	310MHz	100mA		Kit				ReFlow
		NFA21SL337V1A45	10Vdc	-	330MHz	100mA		Kit				ReFlow
		NFA21SL287V1A48	10Vdc	-	280MHz	100mA		Kit				ReFlow
		NFA21SL317V1A48	10Vdc	-	310MHz	100mA		Kit				ReFlow
		NFA21SL337V1A48	10Vdc	-	330MHz	100mA		Kit				ReFlow
		NFA21SL207X1A45	10Vdc	-	200MHz	100mA		Kit				ReFlow
		NFA21SL307X1A45	10Vdc	-	300MHz	100mA		Kit				ReFlow
		NFA21SL506X1A48	10Vdc	-	50MHz	20mA		Kit				ReFlow
		NFA21SL806X1A48	10Vdc	-	80MHz	20mA		Kit				ReFlow
		NFA21SL207X1A48	10Vdc	-	200MHz	100mA		Kit				ReFlow
		NFA21SL307X1A48	10Vdc	-	300MHz	100mA		Kit				ReFlow
LC Combined Wire Wound Type	1206 p121	NFW31SP106X1E4	-	-	10MHz	-		Kit			Flow	ReFlow
		NFW31SP206X1E4	-	-	20MHz	-		Kit			Flow	ReFlow
		NFW31SP506X1E4	-	-	50MHz	-		Kit			Flow	ReFlow
		NFW31SP107X1E4	-	-	100MHz	-		Kit			Flow	ReFlow
		NFW31SP157X1E4	-	-	150MHz	-		Kit			Flow	ReFlow
		NFW31SP207X1E4	-	-	200MHz	-		Kit			Flow	ReFlow
		NFW31SP307X1E4	-	-	300MHz	-		Kit			Flow	ReFlow
		NFW31SP407X1E4	-	-	400MHz	-		Kit			Flow	ReFlow
		NFW31SP507X1E4	-	-	500MHz	-		Kit			Flow	ReFlow

Continued on the following page.

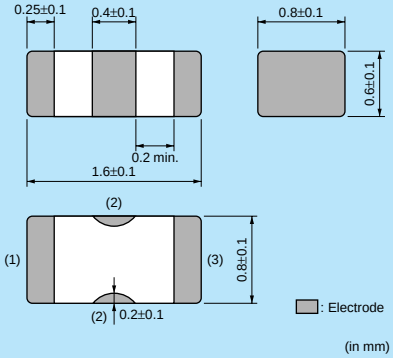
Type	Size (Inch)	Part Number	Rated Voltage	Capacitance	Nominal Cut-off Frequency	Rated Current	New / Kit / ≥1A / ≥3A / DTV / Flow / ReFlow
RC Combined Type	0805 *p123*	**NFR21GD1002202**	50Vdc	10pF+20%-20%	-	50mA	ReFlow
		NFR21GD1004702	50Vdc	10pF+20%-20%	-	35mA	ReFlow
		NFR21GD4702202	50Vdc	47pF+20%-20%	-	50mA	ReFlow
		NFR21GD4704702	50Vdc	47pF+20%-20%	-	35mA	ReFlow
		NFR21GD4706802	50Vdc	47pF+20%-20%	-	30mA	ReFlow
		NFR21GD4701012	50Vdc	47pF+20%-20%	-	25mA	ReFlow
		NFR21GD1012202	50Vdc	100pF+20%-20%	-	50mA	ReFlow
		NFR21GD1014702	50Vdc	100pF+20%-20%	-	35mA	ReFlow
		NFR21GD1016802	50Vdc	100pF+20%-20%	-	30mA	ReFlow
		NFR21GD1011012	50Vdc	100pF+20%-20%	-	25mA	ReFlow
RC Combined Array Type	1206 *p124*	**NFA31GD1006R84**	6Vdc	10pF+20%-20%	-	50mA	Kit ReFlow
		NFA31GD1004704	6Vdc	10pF+20%-20%	-	20mA	Kit ReFlow
		NFA31GD1001014	6Vdc	10pF+20%-20%	-	15mA	Kit ReFlow
		NFA31GD4706R84	6Vdc	47pF+20%-20%	-	50mA	Kit ReFlow
		NFA31GD4703304	6Vdc	47pF+20%-20%	-	20mA	Kit ReFlow
		NFA31GD4704704	6Vdc	47pF+20%-20%	-	20mA	Kit ReFlow
		NFA31GD4701014	6Vdc	47pF+20%-20%	-	15mA	Kit ReFlow
		NFA31GD1016R84	6Vdc	100pF+20%-20%	-	50mA	Kit ReFlow
		NFA31GD1014704	6Vdc	100pF+20%-20%	-	20mA	Kit ReFlow
		NFA31GD1011014	6Vdc	100pF+20%-20%	-	15mA	Kit ReFlow

NFM18C Series (0603 Size)

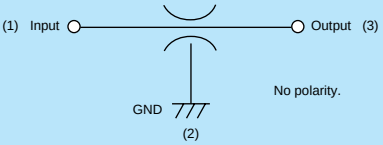
Reflow OK

0603 size general 3-terminal capacitor.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	500

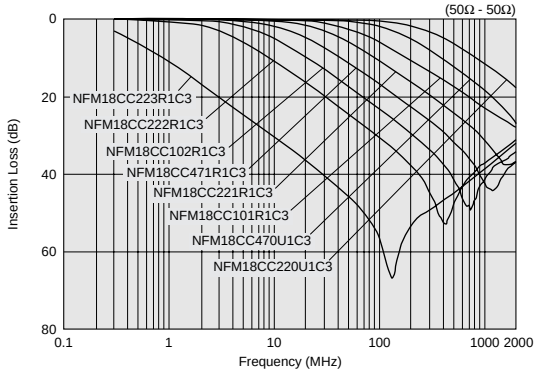
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM18CC220U1C3☐	22pF+20%-20%	400mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC470U1C3☐	47pF+20%-20%	400mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC101R1C3☐	100pF+20%-20%	500mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC221R1C3☐	220pF+20%-20%	500mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC471R1C3☐	470pF+20%-20%	500mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC102R1C3☐	1000pF+20%-20%	600mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC222R1C3☐	2200pF+20%-20%	700mA	16Vdc	1000M ohm	-55°C to +125°C	Kit
NFM18CC223R1C3☐	22000pF+20%-20%	1000mA	16Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

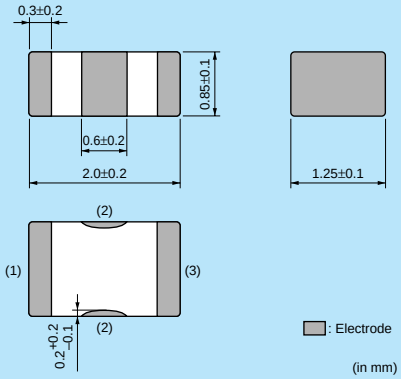


NFM21C Series (0805 Size)

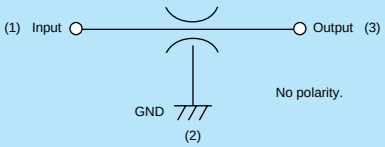
Reflow OK

0805 size general 3-terminal capacitor.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	500

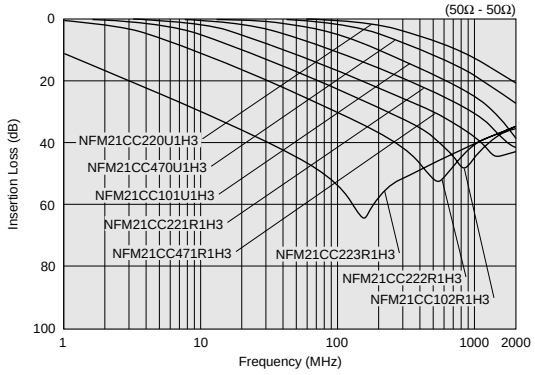
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM21CC220U1H3☐	22pF+20%-20%	700mA	50Vdc	1000M ohm	-55°C to +125°C	Kit
NFM21CC470U1H3☐	47pF+20%-20%	700mA	50Vdc	1000M ohm	-55°C to +125°C	Kit
NFM21CC101U1H3☐	100pF+20%-20%	700mA	50Vdc	1000M ohm	-55°C to +125°C	Kit
NFM21CC221R1H3☐	220pF+20%-20%	700mA	50Vdc	1000M ohm	-55°C to +125°C	Kit
NFM21CC471R1H3☐	470pF+20%-20%	1000mA	50Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM21CC102R1H3☐	1000pF+20%-20%	1000mA	50Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM21CC222R1H3☐	2200pF+20%-20%	1000mA	50Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM21CC223R1H3☐	22000pF+20%-20%	2000mA	50Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

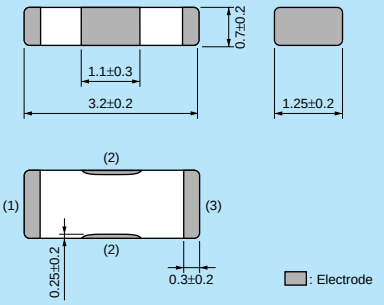


NFM3DC Series (1205 Size)

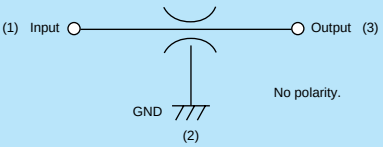
Flow OK Reflow OK

1205 size general 3-terminal capacitor.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	500

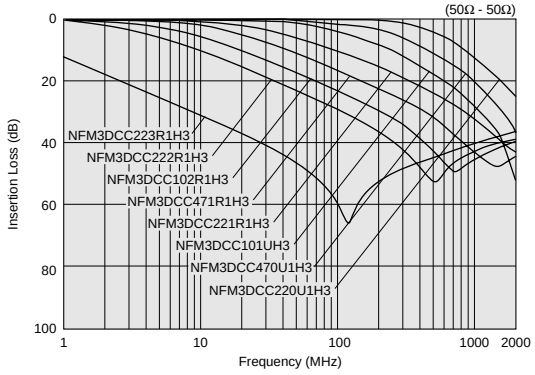
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range
NFM3DCC220U1H3☐	22pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC470U1H3☐	47pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC101U1H3☐	100pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC221R1H3☐	220pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC471R1H3☐	470pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC102R1H3☐	1000pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC222R1H3☐	2200pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C
NFM3DCC223R1H3☐	22000pF+50%-20%	300mA	50Vdc	1000M ohm	-55°C to +125°C

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

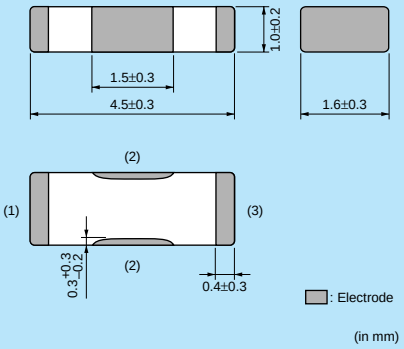


NFM41C Series (1806 Size)

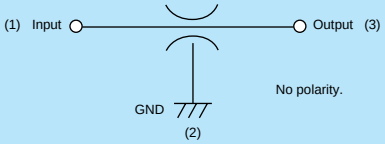
Flow OK Reflow OK

1806 size general 3-terminal capacitor.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	500

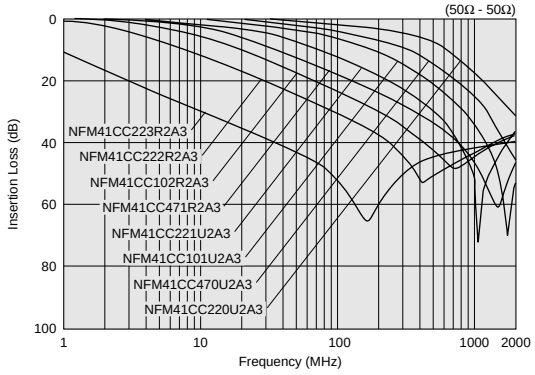
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range
NFM41CC220U2A3☐	22pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC470U2A3☐	47pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC101U2A3☐	100pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC221U2A3☐	220pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC471R2A3☐	470pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC102R2A3☐	1000pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC222R2A3☐	2200pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C
NFM41CC223R2A3☐	22000pF+50%-20%	300mA	100Vdc	10000M ohm	-55°C to +125°C

Number of Circuit: 1

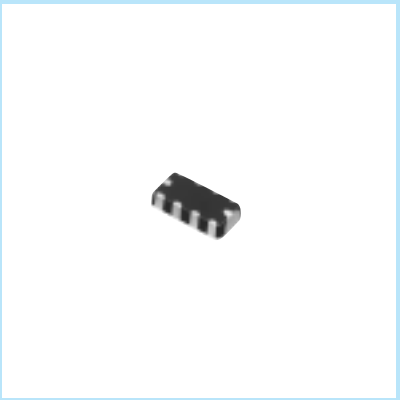
■ Insertion Loss Characteristics (Main Items)



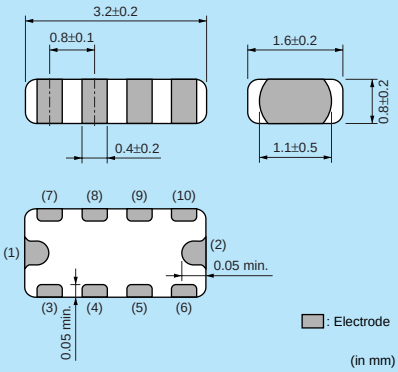
NFA31C Series (1206 Size)

Reflow OK

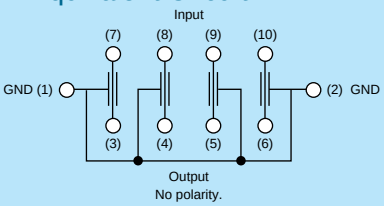
4-lines chip 3-terminal capacitor array, 1206 size.



■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	100

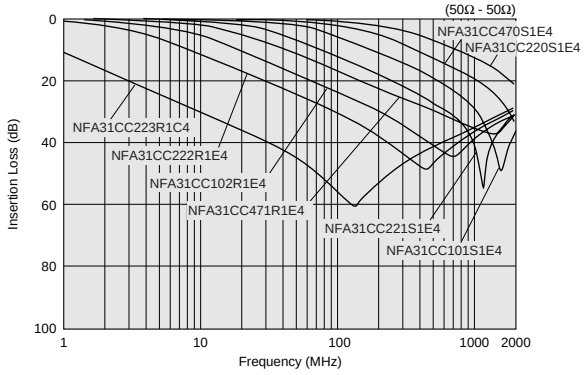
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFA31CC220S1E4□	22pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC470S1E4□	47pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC101S1E4□	100pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC221S1E4□	220pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC471R1E4□	470pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC102R1E4□	1000pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC222R1E4□	2200pF+20%-20%	200mA	25Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31CC223R1C4□	22000pF+20%-20%	200mA	16Vdc	1000M ohm	-40°C to +85°C	Kit

Number of Circuit: 4

■ Insertion Loss Characteristics (Main Items)

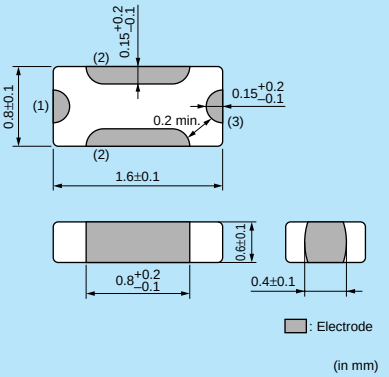


NFM18PS Series (0603 Size)

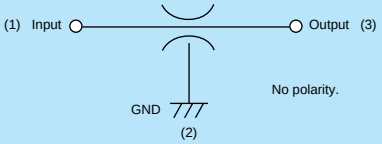
Hi Power Reflow OK

3-terminal capacitor for power lines whose ground impedance has reduced.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	500

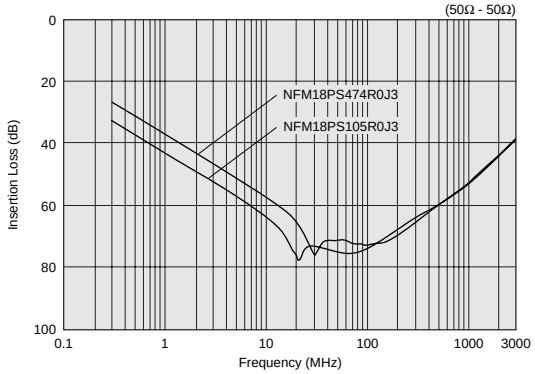
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM18PS474R0J3□	0.47µF+20%-20%	2A	6.3Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM18PS105R0J3□	1.0µF+20%-20%	2A	6.3Vdc	500M ohm	-55°C to +105°C	Kit ≧1A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)



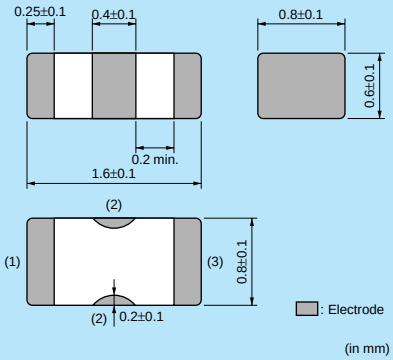
NFM18PC Series (0603 Size)

Hi Power Reflow OK

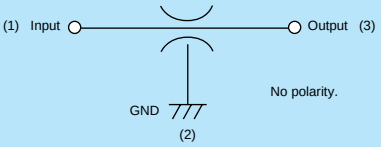
4A max, 0603 size chip 3-terminal capacitor for power lines.

NFM18PC (0.1 to 0.47µF, 2.2µF-6.3V)

■ Dimensions



■ Equivalent Circuit

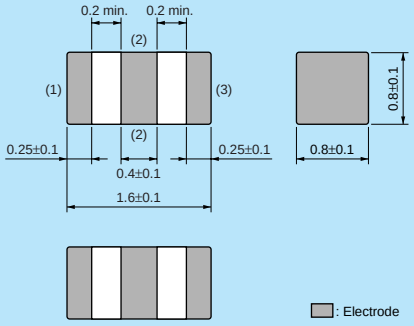


■ Packaging

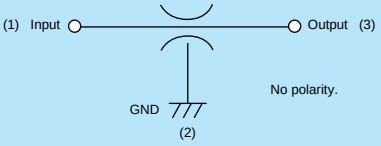
Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	500

NFM18PC (1µF, 2.2µF-10V)

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	500

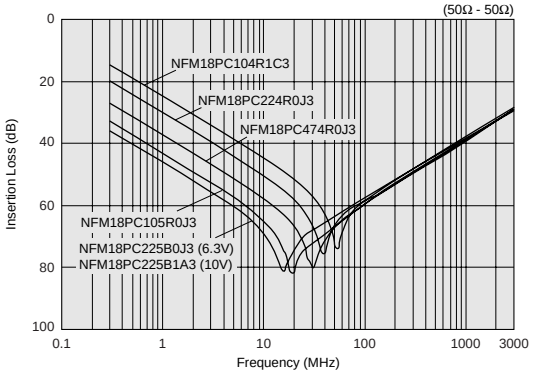
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM18PC104R1C3☐	0.1µF+20%-20%	2A	16Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM18PC224R0J3☐	0.22µF+20%-20%	2A	6.3Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM18PC474R0J3☐	0.47µF+20%-20%	2A	6.3Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM18PC105R0J3☐	1.0µF+20%-20%	2A	6.3Vdc	500M ohm	-55°C to +105°C	Kit ≧1A
NFM18PC225B0J3☐	2.2µF+20%-20%	2A	6.3Vdc	200M ohm	-40°C to +85°C	Kit ≧1A
NFM18PC225B1A3☐	2.2µF+20%-20%	4A	10Vdc	200M ohm	-40°C to +85°C	Kit ≧3A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

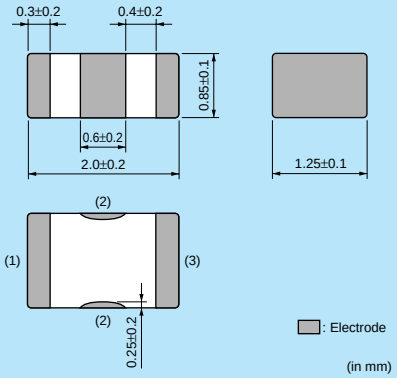


NFM21P Series (0805 Size)

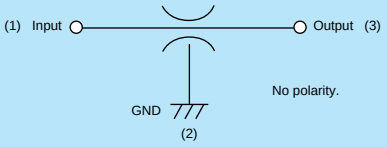
Hi Power Reflow OK

6A max, 0805 size chip 3-terminal capacitor for power lines.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	500

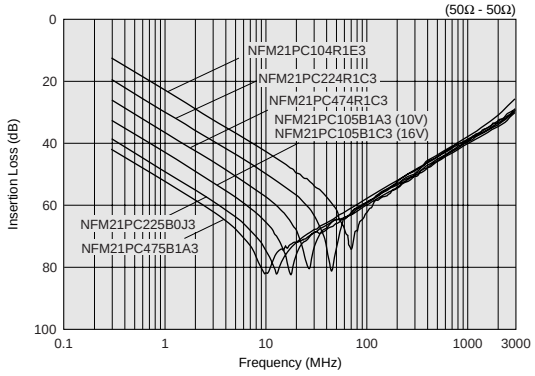
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM21PC104R1E3□	0.1µF+20%-20%	2A	25Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM21PC224R1C3□	0.22µF+20%-20%	2A	16Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM21PC474R1C3□	0.47µF+20%-20%	2A	16Vdc	1000M ohm	-55°C to +125°C	Kit ≧1A
NFM21PC105B1A3□	1.0µF+20%-20%	4A	10Vdc	500M ohm	-40°C to +85°C	Kit ≧3A
NFM21PC105B1C3□	1.0µF+20%-20%	4A	16Vdc	500M ohm	-40°C to +85°C	Kit ≧3A
NFM21PC225B0J3□	2.2µF+20%-20%	4A	6.3Vdc	200M ohm	-40°C to +85°C	Kit ≧3A
NFM21PC475B1A3□	4.7µF+20%-20%	6A	10Vdc	100M ohm	-40°C to +85°C	Kit ≧3A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

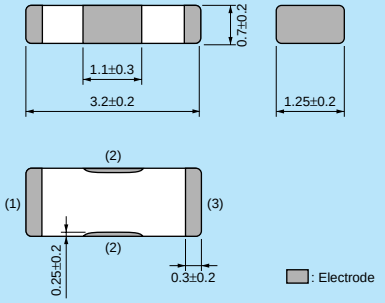


NFM3DP Series (1205 Size)

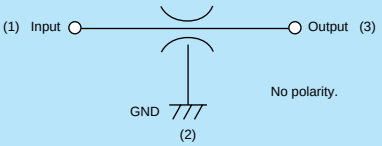
Hi Power Reflow OK

1205 size 3-terminal capacitor for power lines.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	500

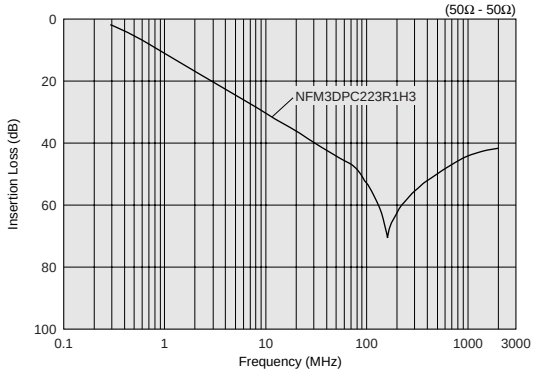
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM3DPC223R1H3□	0.022µF+20%-20%	2A	50Vdc	1000M ohm	-55°C to +125°C	≧1A

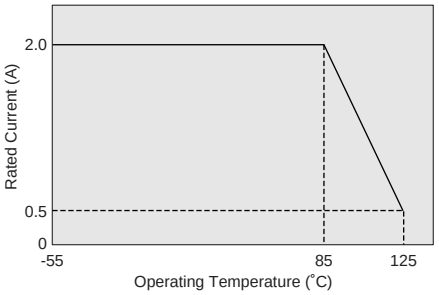
Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)



■ Notice (Rating)

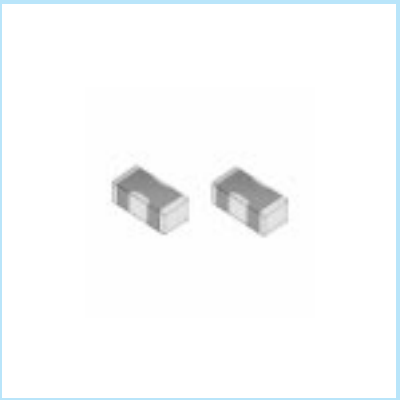
When NFM3DP series is used in operating temperatures exceeding +85°C, derating of current is necessary.
Please apply the derating curve shown in chart according to the operating temperature.



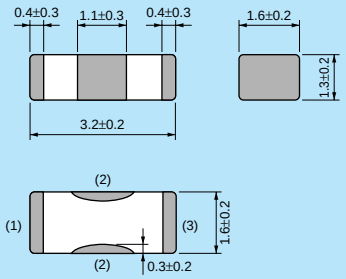
NFM31P Series (1206 Size)

Hi Power Flow OK Reflow OK

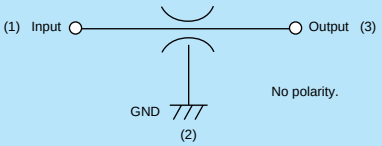
6A/27microF, 1206 size chip 3-terminal capacitor for power lines.



■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	500

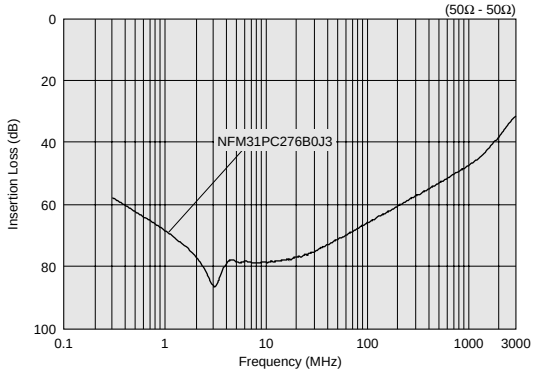
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM31PC276B0J3□	27µF+20%-20%	6A	6.3Vdc	20M ohm	-40°C to +85°C	Kit ≧3A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

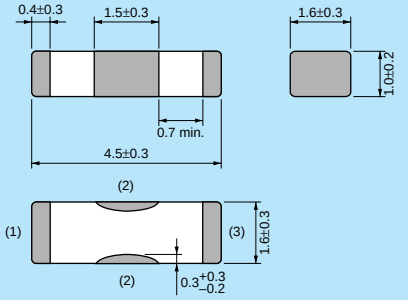


NFM41P Series (1806 Size)

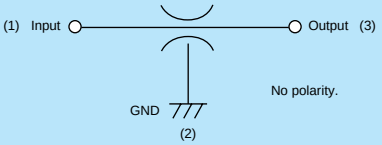
Hi Power Flow OK Reflow OK

6A max, 1806 size chip 3-terminal capacitor for power lines.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	500

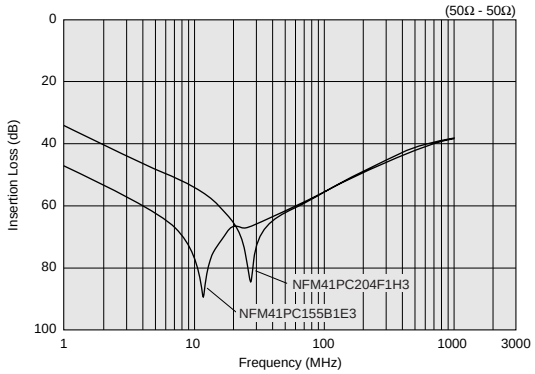
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM41PC204F1H3□	0.2µF+80%-20%	2A	50Vdc	1000M ohm	-55°C to +85°C	Kit ≧1A
NFM41PC155B1E3□	1.5µF+20%-20%	6A	25Vdc	300M ohm	-55°C to +85°C	Kit ≧3A

Number of Circuit: 1

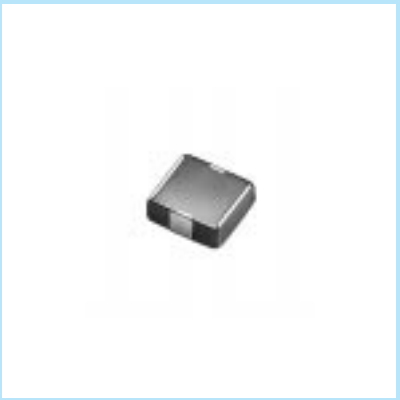
■ Insertion Loss Characteristics (Main Items)



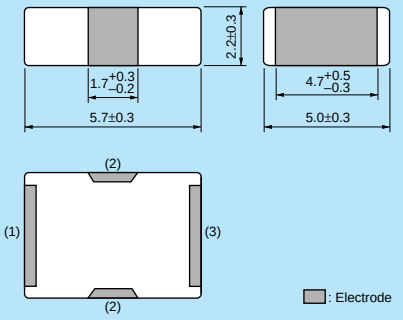
NFM55P Series (2220 Size)

Hi Power Reflow OK

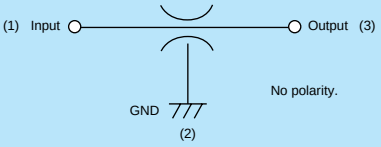
50V / 6A / 1.5microF, large capacitance chip 3-terminal capacitor.



■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	500
B	Bulk(Bag)	100

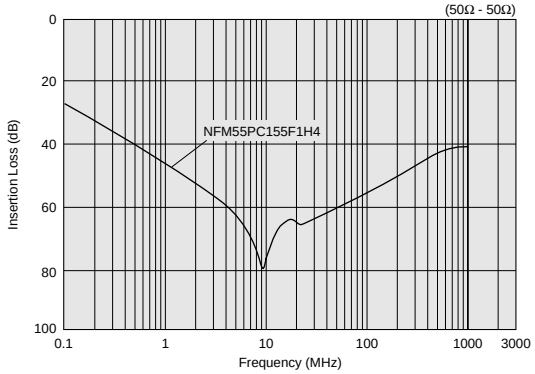
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFM55PC155F1H4□	1.5µF+80%-20%	6A	50Vdc	100M ohm	-55°C to +85°C	≧3A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

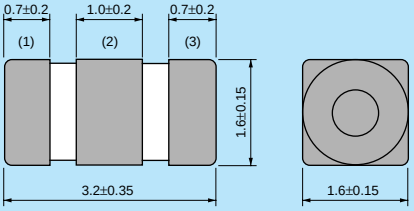


NFE31P Series (1206 Size)

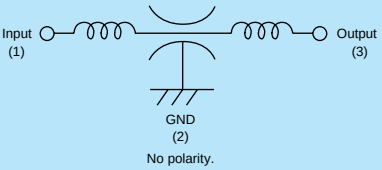
Hi Power Flow OK Reflow OK

Meet 6A, T-type filter with built-in ferrite bead.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	2000
K	330mm Reel Embossed Tape	8000
B	Bulk(Bag)	500

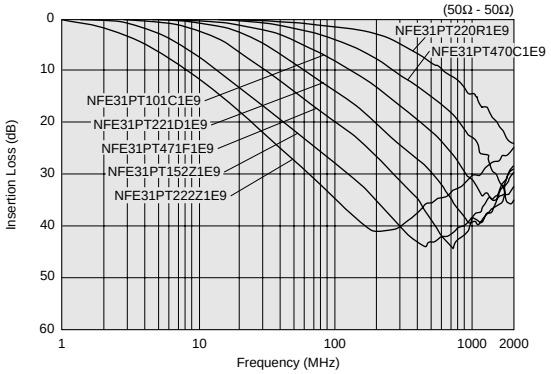
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFE31PT220R1E9☐	22pF+30%-30%	6A	25Vdc	1000M ohm	-40°C to +85°C	≧3A
NFE31PT470C1E9☐	47pF+50%-20%	6A	25Vdc	1000M ohm	-40°C to +85°C	≧3A
NFE31PT101C1E9☐	100pF+80%-20%	6A	25Vdc	1000M ohm	-40°C to +85°C	≧3A
NFE31PT221D1E9☐	220pF+50%-20%	6A	25Vdc	1000M ohm	-40°C to +85°C	≧3A
NFE31PT471F1E9☐	470pF+50%-20%	6A	25Vdc	1000M ohm	-40°C to +85°C	≧3A
NFE31PT152Z1E9☐	1500pF+50%-20%	6A	25Vdc	1000M ohm	-40°C to +85°C	Kit ≧3A
NFE31PT222Z1E9☐	2200pF+50%-50%	6A	25Vdc	1000M ohm	-40°C to +85°C	Kit ≧3A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

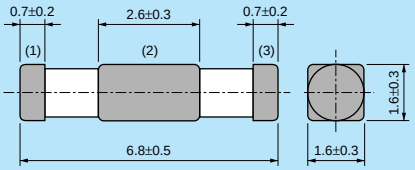


NFE61P Series (2706 Size)

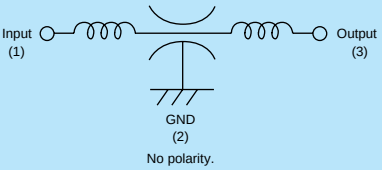
Hi Power Flow OK Reflow OK

T-type filter with built-in ferrite bead.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	2500
K	330mm Reel Embossed Tape	8000
B	Bulk(Bag)	500

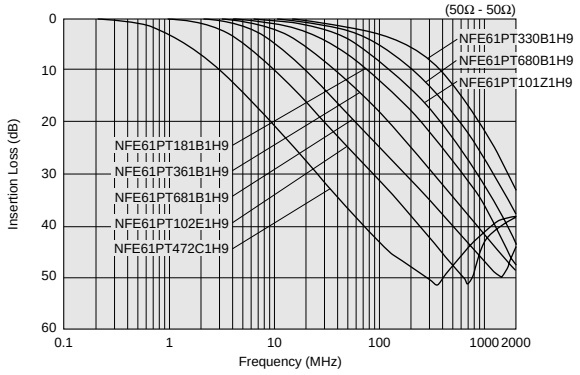
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Capacitance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFE61PT330B1H9☐	33pF+30%-30%	2A	50Vdc	1000M ohm	-25°C to +85°C	≧1A
NFE61PT680B1H9☐	68pF+30%-30%	2A	50Vdc	1000M ohm	-25°C to +85°C	≧1A
NFE61PT101Z1H9☐	100pF+30%-30%	2A	50Vdc	1000M ohm	-25°C to +85°C	≧1A
NFE61PT181B1H9☐	180pF+30%-30%	2A	50Vdc	1000M ohm	-25°C to +85°C	≧1A
NFE61PT361B1H9☐	360pF+20%-20%	2A	50Vdc	1000M ohm	-25°C to +85°C	≧1A
NFE61PT681B1H9☐	680pF+30%-30%	2A	50Vdc	1000M ohm	-25°C to +85°C	≧1A
NFE61PT102E1H9☐	1000pF+80%-20%	2A	50Vdc	1000M ohm	-25°C to +85°C	Kit ≧1A
NFE61PT472C1H9☐	4700pF+80%-20%	2A	50Vdc	1000M ohm	-25°C to +85°C	Kit ≧1A

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)

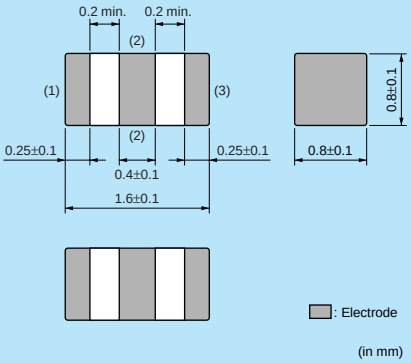


NFL18ST Series (0603 Size)

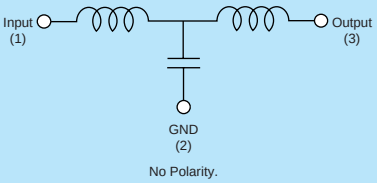
Reflow OK

T-type LC filter. Reduce waveform distortion of high speed signal.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	1000

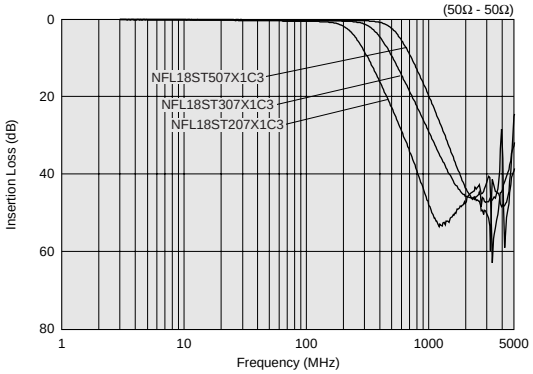
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Nominal Cut-off Frequency	Capacitance	Inductance	Rated Voltage	Rated Current	Insulation Resistance (min.)	Operating Temperature Range	
NFL18ST207X1C3☐	200MHz	25pF+20%-20%	110nH+20%-20%	16Vdc	150mA	1000M ohm	-55°C to +125°C	Kit
NFL18ST307X1C3☐	300MHz	18pF+20%-20%	62nH+20%-20%	16Vdc	200mA	1000M ohm	-55°C to +125°C	Kit
NFL18ST507X1C3☐	500MHz	10pF+20%-20%	43nH+20%-20%	16Vdc	200mA	1000M ohm	-55°C to +125°C	Kit

Number of Circuits: 1

■ Insertion Loss Characteristics (Main Items)

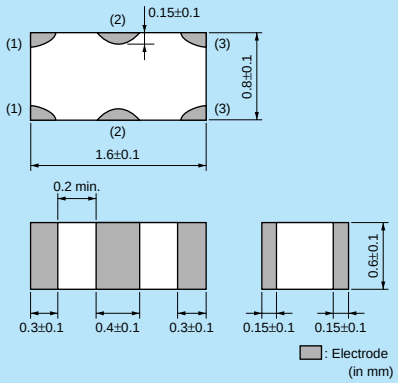


NFL18SP Series (0603 Size)

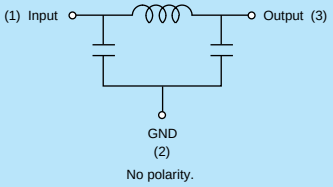
Reflow OK

PI-type LC filter. Reduce waveform distortion of high speed signal.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	1000

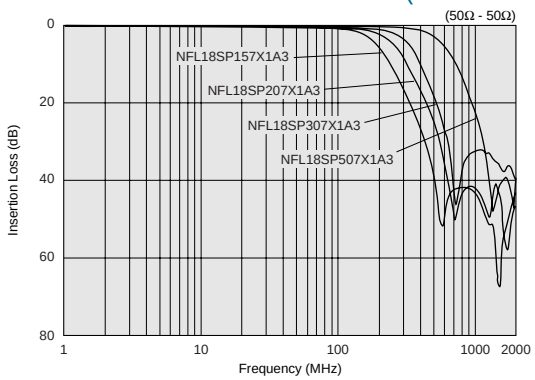
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Nominal Cut-off Frequency	Capacitance	Inductance	Rated Voltage	Rated Current	Insulation Resistance (min.)	Operating Temperature Range	
NFL18SP157X1A3☐	150MHz	34pF+20%-20%	100nH+20%-20%	10Vdc	100mA	1000M ohm	-55°C to +125°C	Kit
NFL18SP207X1A3☐	200MHz	24pF+20%-20%	80nH+20%-20%	10Vdc	100mA	1000M ohm	-55°C to +125°C	Kit
NFL18SP307X1A3☐	300MHz	19pF+20%-20%	60nH+20%-20%	10Vdc	100mA	1000M ohm	-55°C to +125°C	Kit
NFL18SP507X1A3☐	500MHz	11pF+20%-20%	38nH+20%-20%	10Vdc	100mA	1000M ohm	-55°C to +125°C	Kit

Number of Circuits: 1

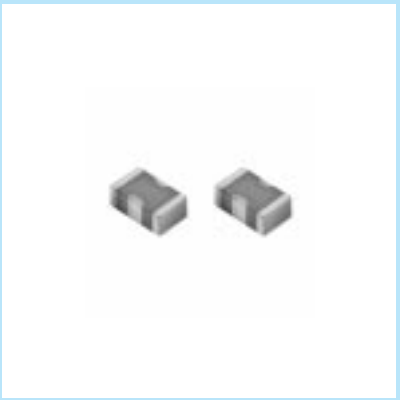
■ Insertion Loss Characteristics (Main Items)



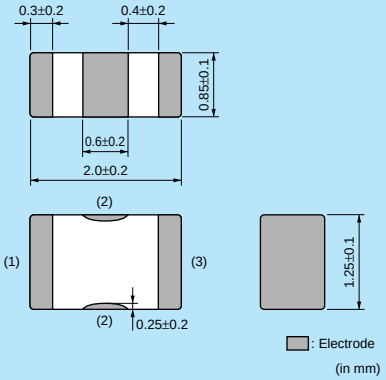
NFL21SP Series (0805 Size)

Reflow OK

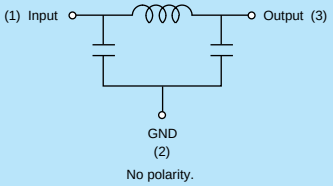
PI-type LC filter. Reduce waveform distortion of high speed signal.



■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	1000

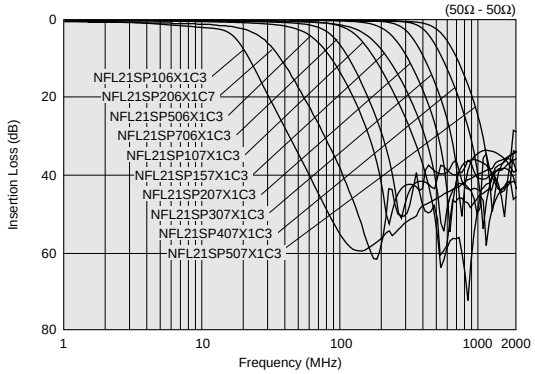
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Nominal Cut-off Frequency	Capacitance	Inductance	Rated Voltage	Rated Current	Insulation Resistance (min.)	Operating Temperature Range	
NFL21SP106X1C3□	10MHz	670pF+20%-20%	680nH+20%-20%	16Vdc	100mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP206X1C7□	20MHz	240pF+20%-20%	700nH+20%-20%	16Vdc	100mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP506X1C3□	50MHz	84pF+20%-20%	305nH+20%-20%	16Vdc	150mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP706X1C3□	70MHz	76pF+20%-20%	185nH+20%-20%	16Vdc	150mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP107X1C3□	100MHz	44pF+20%-20%	135nH+20%-20%	16Vdc	200mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP157X1C3□	150MHz	28pF+20%-20%	128nH+20%-20%	16Vdc	200mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP207X1C3□	200MHz	22pF+20%-20%	72nH+20%-20%	16Vdc	250mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP307X1C3□	300MHz	19pF+10%-10%	45nH+10%-10%	16Vdc	300mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP407X1C3□	400MHz	16pF+10%-10%	34nH+10%-10%	16Vdc	300mA	1000M ohm	-55°C to +125°C	Kit
NFL21SP507X1C3□	500MHz	12pF+10%-10%	31nH+10%-10%	16Vdc	300mA	1000M ohm	-55°C to +125°C	Kit

Number of Circuits: 1

■ Insertion Loss Characteristics (Main Items)



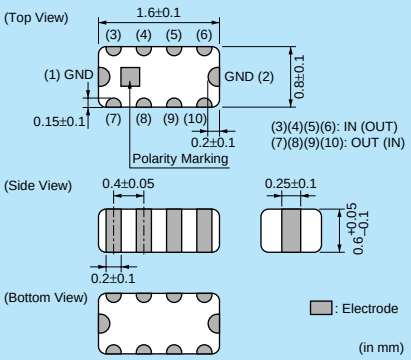
NFA18SL Series (0603 Size)

Reflow OK

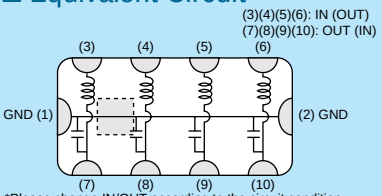
L-type LC filter 4-lines array for mobile phones.

NFA18SL 137/187/207 V1A45
NFA18SL506X1A45

■ Dimensions



■ Equivalent Circuit



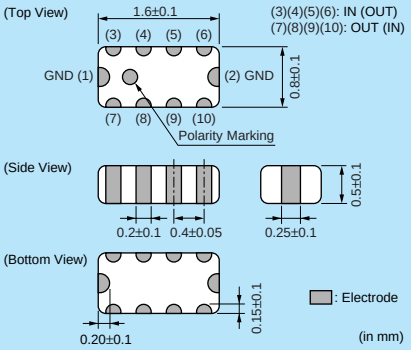
*Please change IN/OUT according to the circuit condition.

■ Packaging

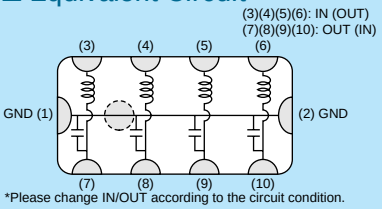
Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	1000

NFA18SL 307/407/487 V1A45

■ Dimensions



■ Equivalent Circuit



*Please change IN/OUT according to the circuit condition.

■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	1000

Refer to pages from p.126 to p.131 for mounting information.

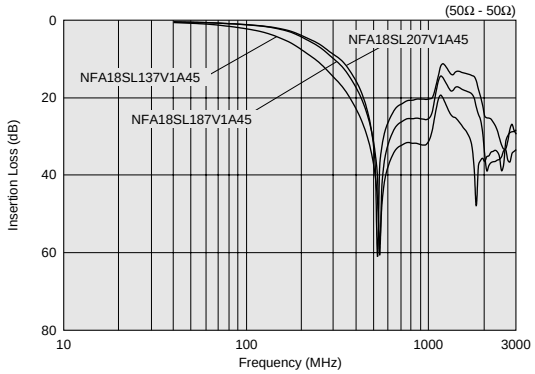
■ Rated Value (☐: packaging code)

Part Number	Nominal Cut-off Frequency	Insertion Loss (Cut-off Frequency)	Insertion Loss at 470MHz (min.)	Insertion Loss at 800MHz (min.)	Insertion Loss at 900MHz (min.)	Rated Voltage	Rated Current	Insulation Resistance (min.)	Withstand Voltage	
NFA18SL137V1A45☐	130MHz	6dBmax	25dB	-	25dB	10Vdc	50mA	1000M ohm	30Vdc	Kit DTV
NFA18SL187V1A45☐	180MHz	6dBmax	20dB	-	20dB	10Vdc	50mA	1000M ohm	30Vdc	Kit DTV
NFA18SL207V1A45☐	200MHz	6dBmax	15dB	-	15dB	10Vdc	50mA	1000M ohm	30Vdc	Kit DTV
NFA18SL307V1A45☐	300MHz	6dBmax	-	20dB	20dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA18SL407V1A45☐	400MHz	6dBmax	-	18dB	18dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA18SL487V1A45☐	480MHz	6dBmax	-	15dB	15dB	10Vdc	100mA	1000M ohm	30Vdc	Kit

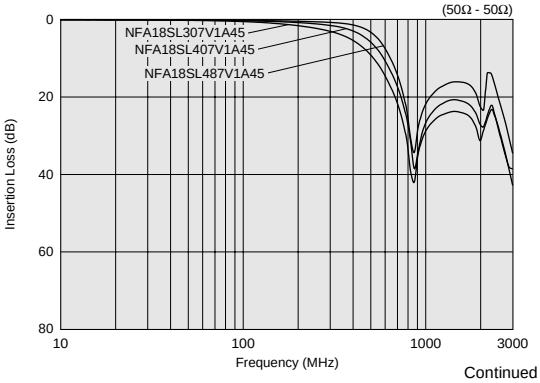
Operating Temperature Range: -40°C to +85°C (NFA18SL 137/187/207 V1A45), -55°C to +125°C (NFA18SL 307/407/487 V1A45) Number of Circuits: 4

■ Insertion Loss Characteristics (Main Items)

NFA18SL 137/187/207 V1A45



NFA18SL 307/407/487 V1A45



Continued on the following page.

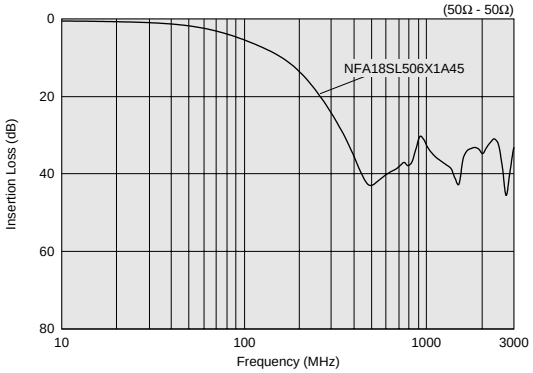
■ Rated Value (☐: packaging code)

Part Number	Nominal Cut-off Frequency	Insertion Loss (Cut-off Frequency)	Insertion Loss at 500MHz (min.)	Insertion Loss at 1000MHz (min.)	Rated Voltage	Rated Current	Insulation Resistance (min.)	Withstand Voltage	
NFA18SL506X1A45☐	50MHz	6dBmax	30dB	25dB	10Vdc	25mA	1000M ohm	30Vdc	New Kit

Operating Temperature Range: -40°C to +85°C Number of Circuits: 4

■ Insertion Loss Characteristics (Main Items)

NFA18SL_X

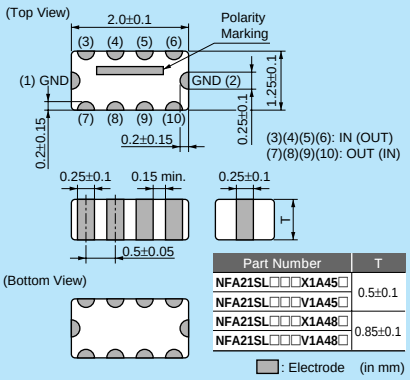


NFA21SL Series (0805 Size)

Reflow OK

L-type LC filter 4-lines array for mobile phones.

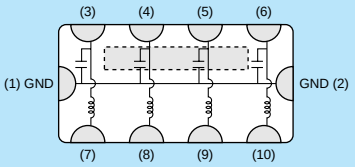
■ Dimensions



Part Number	T
NFA21SL□□□X1A45□	0.5±0.1
NFA21SL□□□V1A45□	
NFA21SL□□□X1A48□	0.85±0.1
NFA21SL□□□V1A48□	

: Electrode (in mm)

■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	1000

Refer to pages from p.126 to p.131 for mounting information.

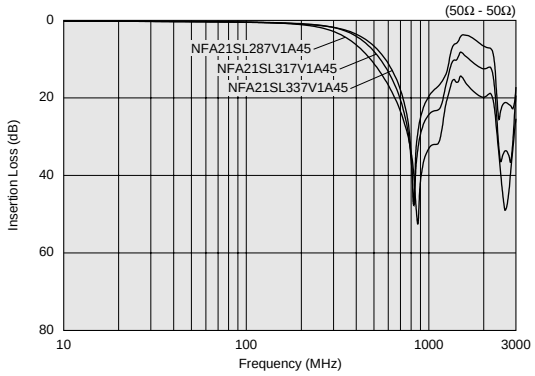
■ Rated Value (□: packaging code)

Part Number	Nominal Cut-off Frequency	Insertion Loss (Cut-off Frequency)	Insertion Loss at 800MHz (min.)	Insertion Loss at 900MHz (min.)	Rated Voltage	Rated Current	Insulation Resistance (min.)	Withstand Voltage	
NFA21SL287V1A45□	280MHz	6dBmax	25dB	25dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL317V1A45□	310MHz	6dBmax	20dB	20dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL337V1A45□	330MHz	6dBmax	15dB	15dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL287V1A48□	280MHz	6dBmax	25dB	25dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL317V1A48□	310MHz	6dBmax	20dB	20dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL337V1A48□	330MHz	6dBmax	20dB	20dB	10Vdc	100mA	1000M ohm	30Vdc	Kit

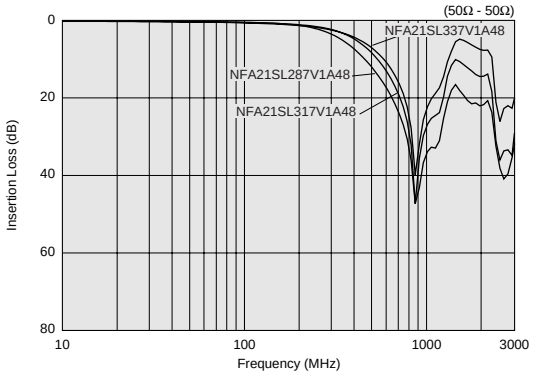
Operating Temperature Range: -55°C to +125°C Number of Circuits: 4

■ Insertion Loss Characteristics (Main Items)

NFA21SL_V1A45



NFA21SL_V1A48



Continued on the following page.

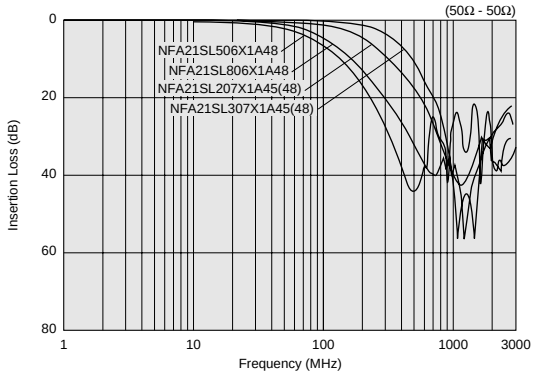
■ Rated Value (☐: packaging code)

Part Number	Nominal Cut-off Frequency	Insertion Loss (Cut-off Frequency)	Insertion Loss at 500MHz (min.)	Insertion Loss at 800MHz (min.)	Insertion Loss at 1000MHz (min.)	Rated Voltage	Rated Current	Insulation Resistance (min.)	Withstand Voltage	
NFA21SL207X1A45☐	200MHz	2 to 7	13dB	25dB	25dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL307X1A45☐	300MHz	2 to 7	7dB	20dB	25dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL506X1A48☐	50MHz	0 to 6	30dB	-	20dB	10Vdc	20mA	1000M ohm	30Vdc	Kit
NFA21SL806X1A48☐	80MHz	2 to 7	25dB	-	25dB	10Vdc	20mA	1000M ohm	30Vdc	Kit
NFA21SL207X1A48☐	200MHz	2 to 7	13dB	25dB	25dB	10Vdc	100mA	1000M ohm	30Vdc	Kit
NFA21SL307X1A48☐	300MHz	2 to 7	7dB	20dB	25dB	10Vdc	100mA	1000M ohm	30Vdc	Kit

Operating Temperature Range: -55°C to +125°C Number of Circuits: 4

■ Insertion Loss Characteristics (Main Items)

NFA21SL_X

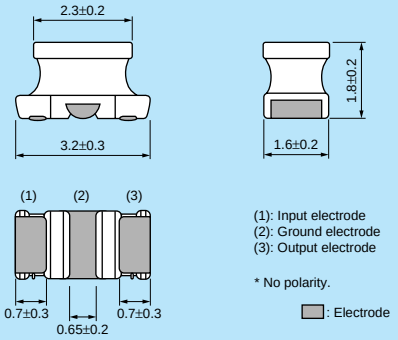


NFW31S Series (1206 Size)

Flow OK Reflow OK

Wire-wound PI-type LC filter.

■ Dimensions



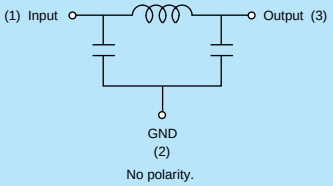
(1): Input electrode
(2): Ground electrode
(3): Output electrode

* No polarity.

: Electrode

(in mm)

■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	2000
K	330mm Reel Embossed Tape	7500

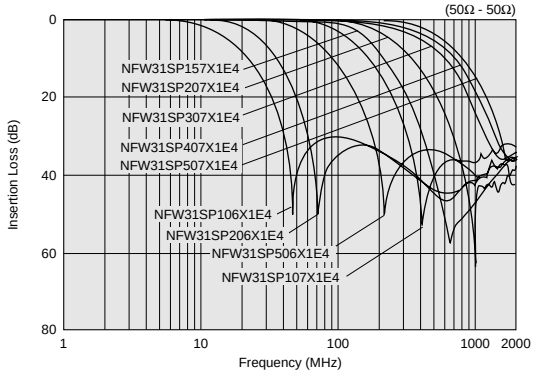
Refer to pages from p.126 to p.131 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Nominal Cut-off Frequency	Insertion Loss at 10MHz	Insertion Loss at 20MHz	Insertion Loss at 50MHz	Insertion Loss at 100MHz	Insertion Loss at 150MHz	Insertion Loss at 200MHz	Insertion Loss at 300MHz	Insertion Loss at 400MHz	Insertion Loss at 500MHz	Insertion Loss at 1000MHz	
NFW31SP106X1E4☐	10MHz	6dBmax.	5dBmin.	25dBmin.	25dBmin.	-	25dBmin.	-	-	30dBmin.	30dBmin.	Kit
NFW31SP206X1E4☐	20MHz	-	6dBmax.	5dBmin.	25dBmin.	-	25dBmin.	-	-	30dBmin.	30dBmin.	Kit
NFW31SP506X1E4☐	50MHz	-	-	6dBmax.	10dBmin.	-	30dBmin.	-	-	30dBmin.	30dBmin.	Kit
NFW31SP107X1E4☐	100MHz	-	-	-	6dBmax.	-	5dBmin.	-	-	20dBmin.	30dBmin.	Kit
NFW31SP157X1E4☐	150MHz	-	-	-	-	6dBmax.	-	10dBmin.	20dBmin	30dBmin.	30dBmin.	Kit
NFW31SP207X1E4☐	200MHz	-	-	-	-	-	6dBmax.	-	-	10dBmin.	30dBmin.	Kit
NFW31SP307X1E4☐	300MHz	-	-	-	-	-	-	6dBmax.	-	5dBmin.	15dBmin.	Kit
NFW31SP407X1E4☐	400MHz	-	-	-	-	-	-	-	6dBmax.	-	10dBmin.	Kit
NFW31SP507X1E4☐	500MHz	-	-	-	-	-	-	-	-	6dBmax.	10dBmin.	Kit

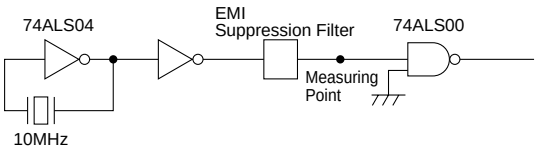
Rated Current: 200mA Rated Voltage: 25Vdc Operating Temperature Range: -40°C to +85°C Number of Circuit: 1

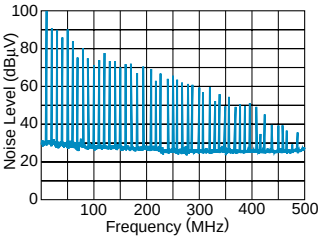
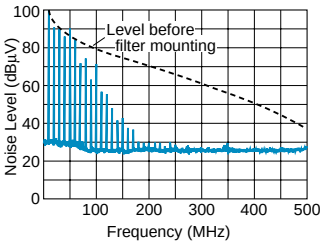
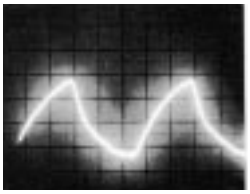
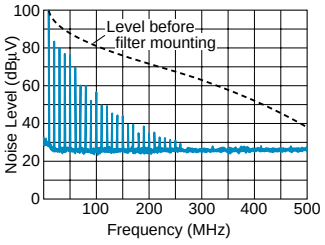
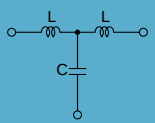
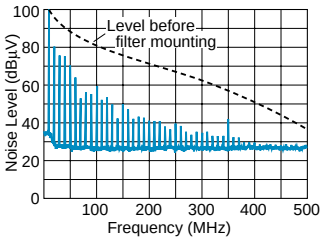
■ Insertion Loss Characteristics (Main Items)



Example of EMI Suppression in an Actual Circuit

Measuring Circuit



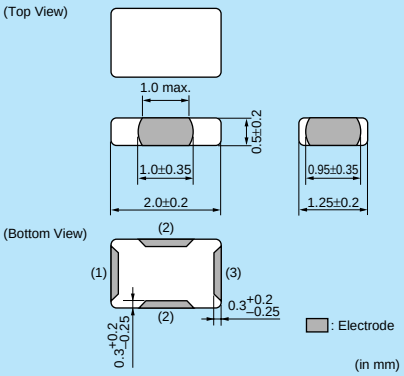
Type of Filter	Signal Wave Form (20ns/div, 1V/div) / EMI Suppression Effect / Description
Signal Waveform and Noise Spectrum before Filter Mounting	 Signal Waveform (20ns/div, 1V/div)  Noise Spectrum (10:1 Active Probe)
NFW31S Series (Cut-off frequency 50MHz)	  NFW31S's steep attenuation characteristic means excellent EMI suppression without waveform cornering.
Conventional Chip Solid Type EMI Filter (**NFM41CC** 470pF) 	  3-terminal capacitors suppress signal frequencies as EMI frequencies so the signal waveform is distorted.
Filter Combined with Conventional LCs  L: Chip Inductor C: Chip Capacitor (270pF)	  Combinations of inductors and capacitors can yield a steep attenuation characteristic, but they require a great deal more mounting space. Moreover, at high frequencies the EMI suppression is less than that obtained by NFW31S.

NFR21G Series (0805 Size)

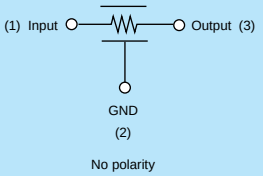
Reflow OK

3-terminal RC filter, damp the noise current and return back to ground.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	4000
B	Bulk(Bag)	500

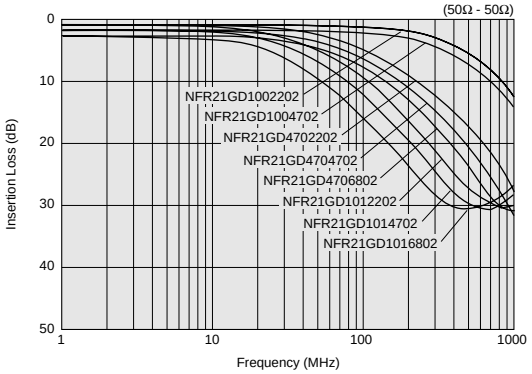
Refer to pages from p.126 to p.131 for mounting information.

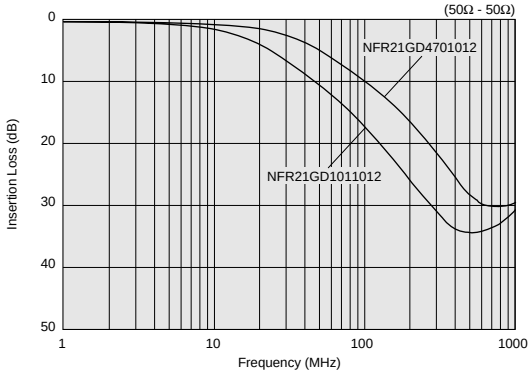
■ Rated Value (□: packaging code)

Part Number	Capacitance	Resistance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range
NFR21GD1002202□	10pF+20%-20%	22ohm+30%-30%	50mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD1004702□	10pF+20%-20%	47ohm+30%-30%	35mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD4702202□	47pF+20%-20%	22ohm+30%-30%	50mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD4704702□	47pF+20%-20%	47ohm+30%-30%	35mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD4706802□	47pF+20%-20%	68ohm+30%-30%	30mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD4701012□	47pF+20%-20%	100ohm+30%-30%	25mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD1012202□	100pF+20%-20%	22ohm+30%-30%	50mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD1014702□	100pF+20%-20%	47ohm+30%-30%	35mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD1016802□	100pF+20%-20%	68ohm+30%-30%	30mA	50Vdc	1000M ohm	-40°C to +85°C
NFR21GD1011012□	100pF+20%-20%	100ohm+30%-30%	25mA	50Vdc	1000M ohm	-40°C to +85°C

Number of Circuit: 1

■ Insertion Loss Characteristics (Main Items)



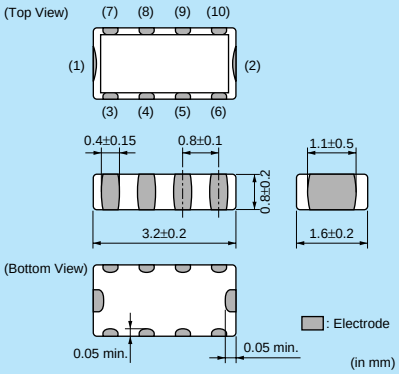


NFA31G Series (1206 Size)

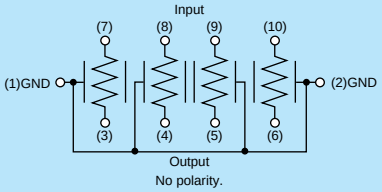
Reflow OK

3-terminal RC filter array.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	4000
B	Bulk(Bag)	100

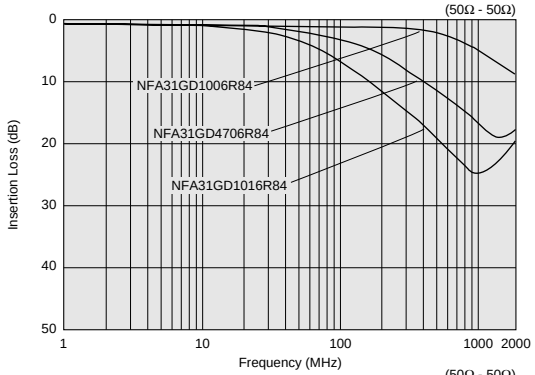
Refer to pages from p.126 to p.131 for mounting information.

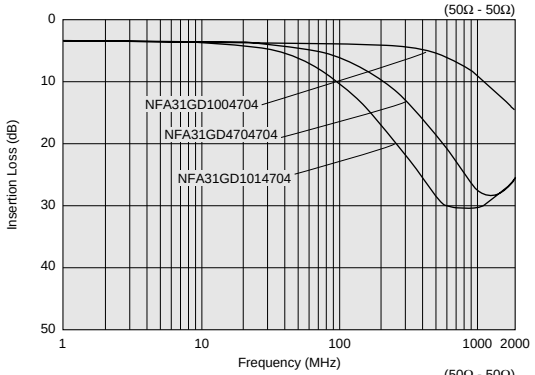
■ Rated Value (□: packaging code)

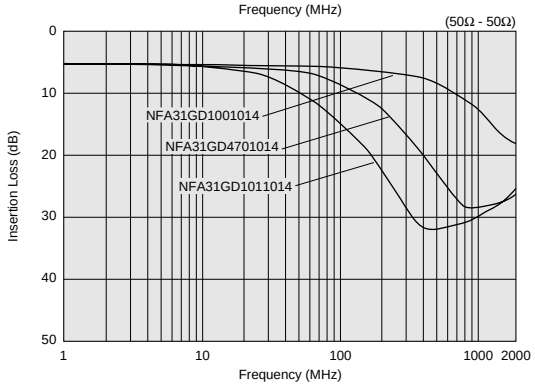
Part Number	Capacitance	Resistance	Rated Current	Rated Voltage	Insulation Resistance (min.)	Operating Temperature Range	
NFA31GD1006R84□	10pF+20%-20%	6.8ohm+40%-40%	50mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD1004704□	10pF+20%-20%	47ohm+30%-30%	20mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD1001014□	10pF+20%-20%	100ohm+30%-30%	15mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD4706R84□	47pF+20%-20%	6.8ohm+40%-40%	50mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD4703304□	47pF+20%-20%	33ohm+30%-30%	20mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD4704704□	47pF+20%-20%	47ohm+30%-30%	20mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD4701014□	47pF+20%-20%	100ohm+30%-30%	15mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD1016R84□	100pF+20%-20%	6.8ohm+40%-40%	50mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD1014704□	100pF+20%-20%	47ohm+30%-30%	20mA	6Vdc	1000M ohm	-40°C to +85°C	Kit
NFA31GD1011014□	100pF+20%-20%	100ohm+30%-30%	15mA	6Vdc	1000M ohm	-40°C to +85°C	Kit

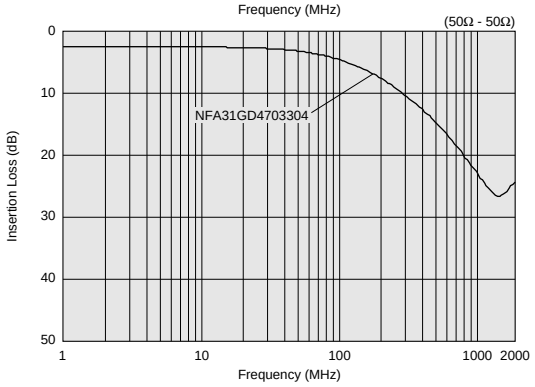
Number of Circuit: 4

■ Insertion Loss Characteristics (Main Items)









⚠Caution/Notice

⚠Caution

● Rating

Do not use products beyond the rated current and rated voltage as this may create excessive heat and deteriorate the insulation resistance.

● Soldering and Mounting

• Self-heating

Please provide special attention when mounting chip EMIFIL® NFM_P series in close proximity to other products that radiate heat.
The heat generated by other products may deteriorate the insulation resistance and cause excessive heat in this component.

Notice

● Storage and Operating Conditions

<Operating Environment>
Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.
Do not use products in the environment close to the organic solvent.
<Storage and Handling Requirements>
1. Storage Period
   NFM55P series should be used within 6 months, the other series should be used within 12 months. Solderability should be checked if this period is exceeded.
2. Storage Conditions
   (1) Storage temperature: -10 to +40˚C
   Relative humidity: 30 to 70%
   Avoid sudden changes in temperature and humidity.
   (2) Do not store products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

● Notice (Soldering and Mounting)

1. Cleaning
   Failure and degradation of a product are caused by the cleaning method. When you clean in conditions that are not in mounting information, please contact Murata engineering.
2. Soldering
   Reliability decreases with improper soldering methods. Please solder by the standard soldering conditions shown in mounting information.
3. Other
   Noise suppression levels resulting from Murata's EMI suppression filters EMIFIL® may vary, depending on the circuits and ICs used, type of noise, mounting pattern, mounting location, and other operating conditions. Be sure to check and confirm in advance the noise suppression effect of each filter, in actual circuits, etc. before applying the filter in a commercial-purpose equipment design.

● Handling

1. Resin Coating
   Using resin for coating/molding products may affect the products performance.
   So please pay careful attention in selecting resin.
   Prior to use, please make the reliability evaluation with the product mounted in your application set.
2. Caution for Use (NFW Series)
   When you hold products with a tweezer, please hold by the sides. Sharp materials, such as a pair of tweezers, should not touch the winding portion to prevent breaking the wire. Mechanical shock should not be applied to the products mounted on the board to prevent breaking the core.

1. Standard Land Pattern Dimensions

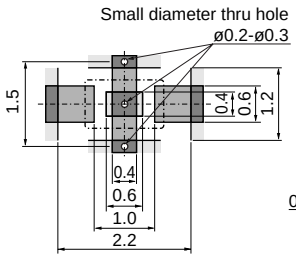
NF□ series suppress noise by conducting the high-frequency noise element to ground. Therefore, to obtain maximum performance from these filters, the ground pattern should be made as large as possible during the PCB design stage. As shown below, one side of the PCB is used for chip mounting, and the other is used for grounding.
Small diameter feedthrough holes are then used to connect the grounds on each side of the PCB. This reduces the high-frequency impedance of the grounding and maximizes the filter's performance.

Land Pattern + Solder Resist
Land Pattern
Solder Resist
(in mm)

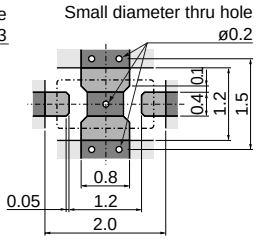
NFM18
NFL18
NFM55P

Reflow Soldering

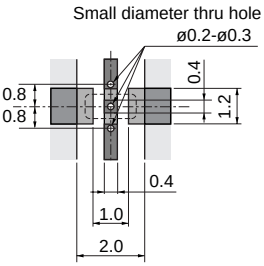
NFM18C/NFM18PC/ NFL18ST



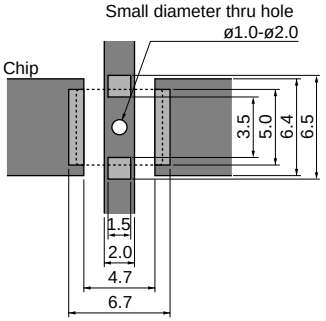
NFM18PS



NFL18SP



NFM55P



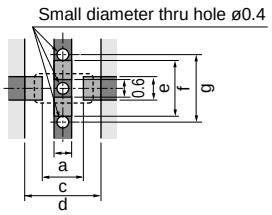
• NF□18, NFM55P are specially adapted for reflow soldering.

Please contact us if using thinner land pad than 18µm.

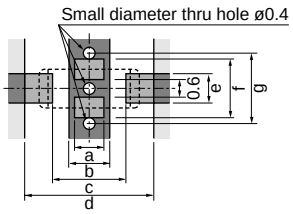
NFM21
NFM3D
NFM31P
NFM41
NFR21G
NFL21S

● Reflow Soldering Chip mounting side

NFM21C/NFR21G NFM21P/NFL21S



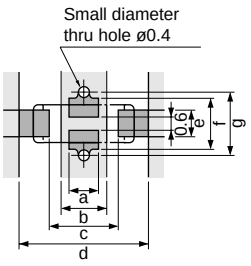
NFM3DC/NFM3DP/ NFM31P NFM41C/NFM41P



Part Number	Size (mm)						
	a	b	c	d	e	f	g
NFM21C/NFR21G NFM21P/NFL21S	0.6	-	1.4	2.6	0.8	1.9	2.3
NFM3DC/NFM3DP	1.0	1.4	2.5	4.4	1.0	2.0	2.4
NFM31P	1.0	1.4	2.5	4.4	1.2	2.6	3.0
NFM41C/NFM41P	1.5	2.0	3.5	6.0	1.2	2.6	3.0

• NF□21 is specially adapted for reflow soldering.

● Flow Soldering
Chip mounting side



Part Number	Size (mm)						
	a	b	c	d	e	f	g
NFM3DC NFM3DP	1.0	1.4	2.5	4.4	1.0	2.0	2.4
NFM31P	1.0	1.4	2.5	4.4	1.2	2.6	3.0
NFM41C NFM41P	1.5	2.0	3.5	6.0	1.2	2.6	3.0

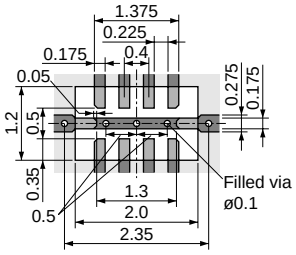
Continued on the following page.

Land Pattern + Solder Resist
Land Pattern Solder Resist
(in mm)

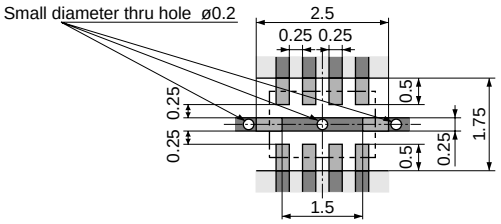
NFA18S
NFA21S

Reflow Soldering

NFA18S

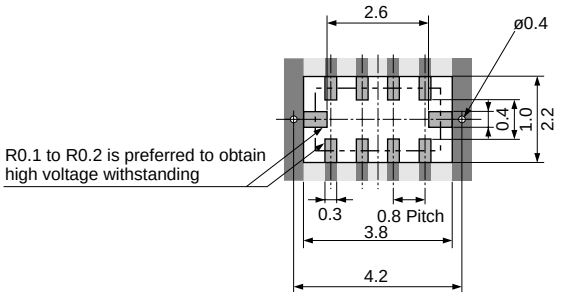


NFA21S

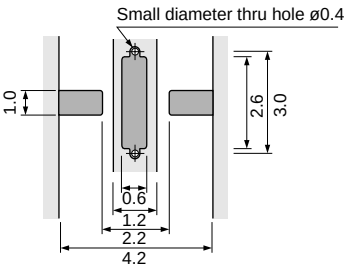


NFA31G
NFA31C
NFW31S
NFE31P

● Reflow Soldering NFA31G/31C

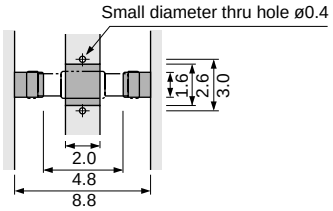


● Reflow and Flow NFW31S
● Reflow Soldering NFE31P

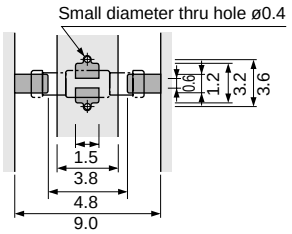


NFE61P

● Reflow Soldering



● Flow Soldering



2. Solder Paste Printing and Adhesive Application

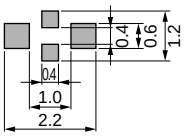
When reflow soldering the chip EMI suppression filter, the printing must be conducted in accordance with the following cream solder printing conditions.
If too much solder is applied, the chip will be prone to damage by mechanical and thermal stress from the PCB and may crack.
Standard land dimensions should be used for resist and copper foil patterns.

When flow soldering the EMI suppression filter, apply the adhesive in accordance with the following conditions.
If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability.
In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering process.

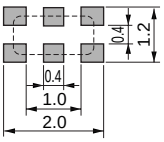
(in mm)

Series	Solder Paste Printing	Adhesive Application
NFM **NFR** **NFL**	●Guideline of solder paste thickness: 100-150µm: NFM18/21/3D/31P, NFR, NFL 150-200µm: NFM55P 100-200µm: NFM41	■ NFM3D/31P/41 Series Apply 0.1mg for NFM41C/41 and 0.06mg for NFM3D/NFM31P of bonding agent at each chip. Do not cover electrodes.

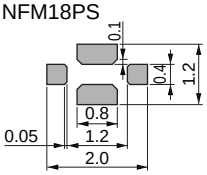
NFM18C/18PC
NFL18ST



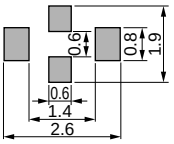
NFL18SP



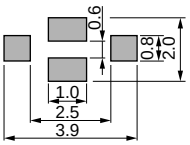
NFM18PS



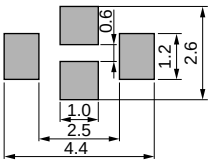
NFM21C/21P
NFR21G/NFL21S



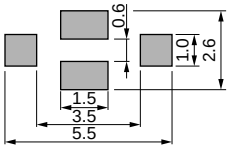
NFM3DC/3DP



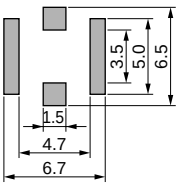
NFM31P

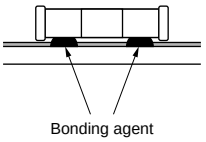


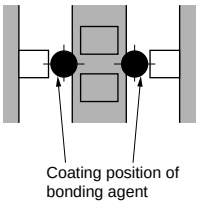
NFM41C/41P



NFM55P

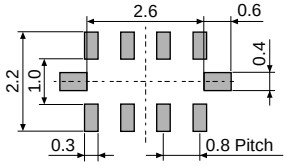
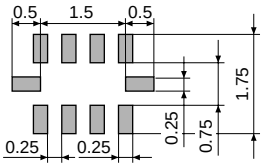
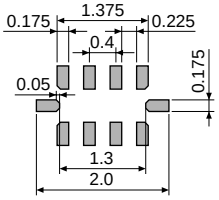
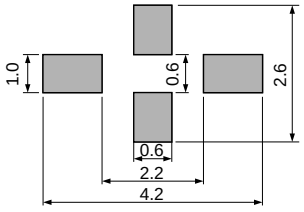
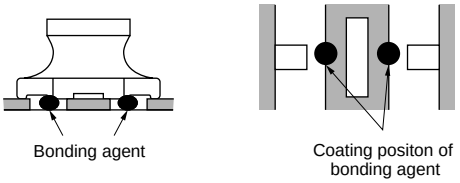
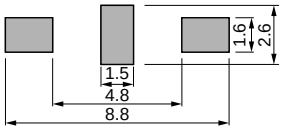
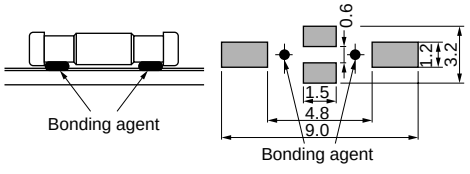






Continued on the following page.

(in mm)

Series	Solder Paste Printing	Adhesive Application
NFA	●Guideline of solder paste thickness: 100-200µm: NFA31G/31C 100-150µm: NFA18S/21S NFA31G/31C  NFA21S  NFA18S  	
NFW31S **NFE31P**	●Guideline of solder paste thickness: 150-200µm  	■ NFW31S Series Apply 0.2mg of bonding agent at each chip. 
NFE61P	●Guideline of solder paste thickness: 150-200µm  	Apply 1.0mg of bonding agent at each chip. 

3. Standard Soldering Conditions

(1) Soldering Methods

Use flow and reflow soldering methods only.
Use standard soldering conditions when soldering chip EMI suppression filters.
In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

Solder: Use Sn-3.0Ag-0.5Cu solder. Use of Sn-Zn based solder will deteriorate performance of products.
If using NFM series with Sn-Zn based solder, please contact Murata in advance.

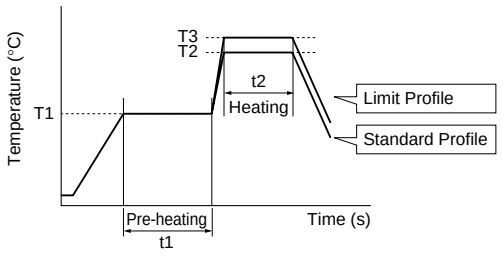
Flux:

- Use Rosin-based flux.
  In case of using RA type solder, products should be cleaned completely with no residual flux.
- Do not use strong acidic flux (with chlorine content exceeding 0.20wt%)
- Do not use water-soluble flux.

For additional mounting methods, please contact Murata.

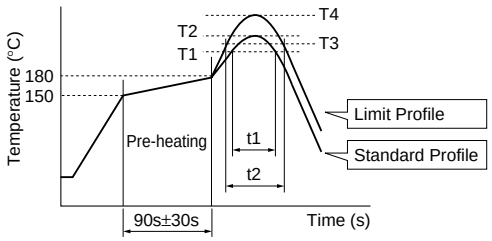
(2) Soldering Profile

●Flow Soldering Profile
(Sn-3.0Ag-0.5Cu Solder)



Series	Pre-heating		Standard Profile			Limit Profile		
			Heating		Cycle of Flow	Heating		Cycle of Flow
	Temp. (T1)	Time. (t1)	Temp. (T2)	Time. (t2)		Temp. (T3)	Time. (t2)	
NFM3DC/3DP/31PC NFM41C/41P NFE61P	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	2 times max.
NFW31S	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	1 time

●Reflow Soldering Profile
(Sn-3.0Ag-0.5Cu Solder)



Series	Standard Profile				Limit Profile			
	Heating		Peak Temperature (T2)	Cycle of Reflow	Heating		Peak Temperature (T4)	Cycle of Reflow
	Temp. (T1)	Time. (t1)			Temp. (T3)	Time. (t2)		
NFA, NFE NFL, NFM (Except NFM55P) NFR	220°C min.	30 to 60s	245±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.
NFW31S, NFM55P	220°C min.	30 to 60s	245±3°C	2 times max.	230°C min.	60s max.	260°C/10s	1 time

(3) Reworking with Solder Iron

The following conditions must be strictly followed when using a soldering iron.

Pre-heating: 150°C 60s min.*1

*1 NFM55P: 100°C/60s+200°C/60s

Soldering iron power output / Tip diameter:

30W max. / ø3mm max.

Temperature of soldering iron tip / Soldering time / Times:

350°C max. / 3-4s / 2 times*2

*2 NFE31PT152Z1E9: 280°C max. / 10s max. / 2 times

Do not allow the tip of the soldering iron to directly contact the chip.

For additional methods of reworking with a soldering iron, please contact Murata engineering.

4. Cleaning

Following conditions should be observed when cleaning chip EMI filter.

(1) Cleaning Temperature: 60°C max. (40°C max. for alcohol type cleaner)

(2) Ultrasonic

Output: 20W/liter max.

Duration: 5 minutes max.

Frequency: 28 to 40kHz

(3) Cleaning Agent

The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production.

(a) Alcohol cleaning agent

Isopropyl alcohol (IPA)

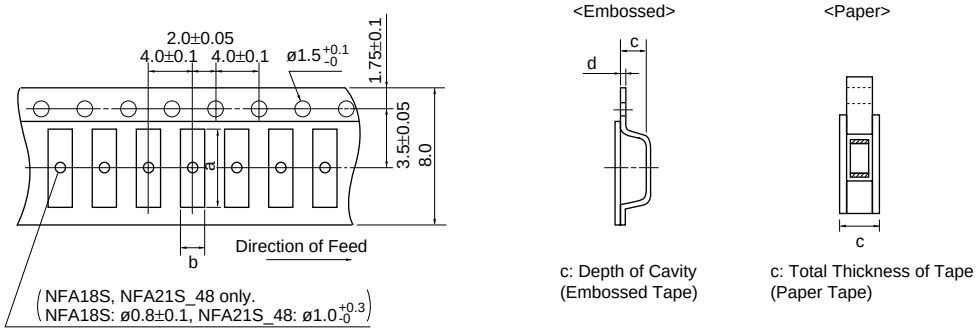
(b) Aqueous cleaning agent

Pine Alpha ST-100S

(4) Ensure that flux residue is completely removed.

Component should be thoroughly dried after aqueous agent has been removed with deionized water.

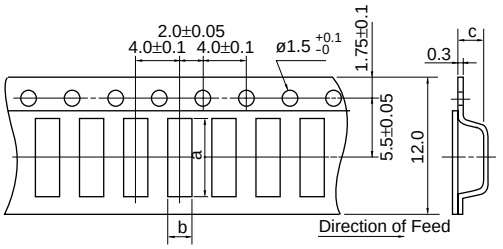
■ Minimum Quantity and Dimensions of 8mm Width Paper / Embossed Tape



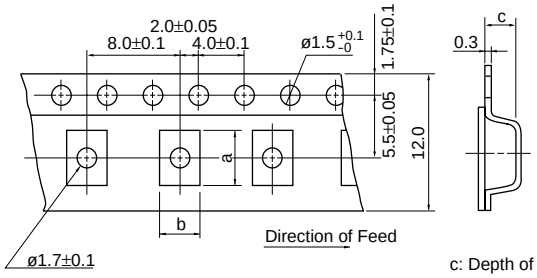
Part Number	Cavity Size				Minimum Qty. (pcs.)				
					ø180mm Reel		ø330mm Reel		Bulk
	a	b	c	d	Paper Tape	Embossed Tape	Paper Tape	Embossed Tape	
NFM18C/ NFM18PC (Except 105R/225B1A)/ NFM18PS	1.85	1.05	0.9 max.	-	4000	-	-	-	500
NFM18PC105R/225B1A			1.1 max.	-	4000	-	-	-	500
NFL18SP	1.85	1.05	0.9 max.	-	4000	-	-	-	1000
NFL18ST			1.1 max.						
NFL21SP	2.3	1.55	1.1 max.						
NFM21	2.3	1.55	1.1 max.	-	4000	-	-	-	500
NFM3DC/3DP	3.4	1.4	0.85	0.2	-	4000	-	-	500
NFM31P	3.5	1.9	1.5	0.25	-	3000	-	-	500
NFA18S	1.8	1.0	0.7	0.25	-	4000	-	-	1000
NFA21S_45	2.30	1.55	0.7	0.25	-	4000	-	-	1000
NFA21S_48	2.25	1.45	1.05	0.25	-	4000	-	-	1000
NFA31G/31C	3.5	2.0	1.1 max.	-	4000	-	-	-	100
NFE31P	3.6	1.8	1.85	0.2	-	2000	-	8000	500
NFR21G	2.3	1.55	0.7	0.25	-	4000	-	-	500
NFW31S	3.6	1.9	2.0	0.2	-	2000	-	7500	-

(in mm)

■ Minimum Quantity and Dimensions of 12mm Width Embossed Tape



Part Number	Cavity Size			Minimum Qty. (pcs.)		
	a	b	c	ø180mm Reel	ø330mm Reel	Bulk
NFM41	4.8	1.8	1.1	4000	-	500
NFE61	7.2	1.9	1.75	2500	8000	500



Part Number	Cavity Size			Minimum Qty. (pcs.)		
	a	b	c	ø180mm Reel	ø330mm Reel	Bulk
NFM55P	6.0	5.3	2.5	500	-	100

(in mm)

"Minimum Quantity" means the number of units of each delivery or order. The quantity should be an integral multiple of the "Minimum Quantity".

●EKEMNFMCB (Chip EMIFIL® Capacitor Type for Signal Lines)

No.	Part Number	Quantity (pcs.)	Capacitance	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)
1	NFM18CC220U1C3	10	22pF±20%	16	400	1000
2	NFM18CC470U1C3	10	47pF±20%	16	400	1000
3	NFM18CC101R1C3	10	47pF±20%	16	500	1000
4	NFM18CC221R1C3	10	100pF±20%	16	500	1000
5	NFM18CC471R1C3	10	220pF±20%	16	500	1000
6	NFM18CC102R1C3	10	470pF±20%	16	600	1000
7	NFM18CC222R1C3	10	1000pF±20%	16	700	1000
8	NFM18CC223R1C3	10	2200pF±20%	16	1000	1000
9	NFM21CC220U1H3	10	22000pF±20%	50	700	1000
10	NFM21CC470U1H3	10	22pF±20%	50	700	1000
11	NFM21CC101U1H3	10	100pF±20%	50	700	1000
12	NFM21CC221R1H3	10	220pF±20%	50	700	1000
13	NFM21CC471R1H3	10	470pF±20%	50	1000	1000
14	NFM21CC102R1H3	10	1000pF±20%	50	1000	1000
15	NFM21CC222R1H3	10	2200pF±20%	50	1000	1000
16	NFM21CC223R1H3	10	22000pF±20%	50	2000	1000

●EKEMFA31D (Chip EMIFIL® Capacitor Array Type/ RC Combined Array Type)

No.	Part Number	Quantity (pcs.)	Capacitance	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)
1	NFA31CC220S1E4	10	22pF±20%	25	200	1000
2	NFA31CC470S1E4	10	47pF±20%	25	200	1000
3	NFA31CC101S1E4	10	100pF±20%	25	200	1000
4	NFA31CC221S1E4	10	220pF±20%	25	200	1000
5	NFA31CC471R1E4	10	470pF±20%	25	200	1000
6	NFA31CC102R1E4	10	1000pF±20%	25	200	1000
7	NFA31CC222R1E4	10	2200pF±20%	25	200	1000
8	NFA31CC223R1C4	10	22000pF±20%	16	200	1000
9	NFA31GD1006R84	10	10pF±20%	6	50	1000
10	NFA31GD1004704	10	10pF±20%	6	20	1000
11	NFA31GD1001014	10	10pF±20%	6	15	1000
12	NFA31GD4706R84	10	47pF±20%	6	50	1000
13	NFA31GD4703304	10	47pF±20%	6	20	1000
14	NFA31GD4704704	10	47pF±20%	6	20	1000
15	NFA31GD4701014	10	47pF±20%	6	15	1000
16	NFA31GD1016R84	10	100pF±20%	6	50	1000
17	NFA31GD1014704	10	100pF±20%	6	20	1000
18	NFA31GD1011014	10	100pF±20%	6	15	1000

●EKEMFL18E (Chip EMIFIL® LC Combined Type)

No.	Part Number	Quantity (pcs.)	Cut-off Frequency	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)	DC Resistance (Ω) max.
1	NFL18ST207X1C3	10	200MHz	16	150	1000	3.5
2	NFL18ST307X1C3	10	300MHz	16	200	1000	1.8
3	NFL18ST507X1C3	10	500MHz	16	200	1000	1.5
4	NFL18SP157X1A3	10	150MHz	10	100	1000	3.0
5	NFL18SP207X1A3	10	200MHz	10	100	1000	3.0
6	NFL18SP307X1A3	10	300MHz	10	100	1000	3.0
7	NFL18SP507X1A3	10	500MHz	10	100	1000	2.0
8	NFL21SP106X1C3	10	10MHz	16	100	1000	8.5
9	NFL21SP206X1C7	10	20MHz	16	100	1000	8.5
10	NFL21SP506X1C3	10	50MHz	16	150	1000	3.5
11	NFL21SP706X1C3	10	70MHz	16	150	1000	3.0
12	NFL21SP107X1C3	10	100MHz	16	200	1000	2.0
13	NFL21SP157X1C3	10	150MHz	16	200	1000	2.0
14	NFL21SP207X1C3	10	200MHz	16	250	1000	1.5
15	NFL21SP307X1C3	10	300MHz	16	300	1000	1.2
16	NFL21SP407X1C3	10	400MHz	16	300	1000	1.2
17	NFL21SP507X1C3	10	500MHz	16	300	1000	1.2

Continued on the following page.

Chip Ferrite Bead
Chip EMIFIL®
Chip Common Mode Choke Coil
Block Type EMIFIL®
Microwave Absorber

Continued from the preceding page.

No.	Part Number	Quantity (pcs.)	Cut-off Frequency	Attenuation (dB min.)										Rated Current	Rated Voltage
				10MHz	20MHz	50MHz	100MHz	150MHz	200MHz	300MHz	400MHz	500MHz	1GHz		
18	NFW31SP106X1E4	10	10MHz	6dB max.	5	25	25	-	25	-	-	30	30	200mA	25V
19	NFW31SP206X1E4	10	20MHz	-	6dB max.	5	25	-	25	-	-	30	30	200mA	25V
20	NFW31SP506X1E4	10	50MHz	-	-	6dB max.	10	-	30	-	-	30	30	200mA	25V
21	NFW31SP107X1E4	10	100MHz	-	-	-	6dB max.	-	5	-	-	20	30	200mA	25V
22	NFW31SP157X1E4	10	150MHz	-	-	-	-	6dB max.	-	10	20	30	30	200mA	25V
23	NFW31SP207X1E4	10	200MHz	-	-	-	-	-	6dB max.	-	-	10	30	200mA	25V
24	NFW31SP307X1E4	10	300MHz	-	-	-	-	-	-	6dB max.	-	5	15	200mA	25V
25	NFW31SP407X1E4	10	400MHz	-	-	-	-	-	-	-	6dB max.	-	10	200mA	25V
26	NFW31SP507X1E4	10	500MHz	-	-	-	-	-	-	-	-	6dB max.	10	200mA	25V

●EKEMFA20F (Chip EMIFIL® LC Combined Array Type)

No.	Part Number	Quantity (pcs.)	Cut-off Frequency	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)
1	NFA18SL506X1A45	10	50MHz	10	25	1000
2	NFA18SL137V1A45	10	130MHz	10	50	1000
3	NFA18SL187V1A45	10	180MHz	10	50	1000
4	NFA18SL207V1A45	10	200MHz	10	50	1000
5	NFA18SL307V1A45	10	300MHz	10	100	1000
6	NFA18SL407V1A45	10	400MHz	10	100	1000
7	NFA18SL487V1A45	10	480MHz	10	100	1000
8	NFA18SD187X1A45	10	180MHz	10	25	1000
9	NFA18SD207X1A45	10	200MHz	10	25	1000
10	NFA21SL506X1A48	10	200MHz	10	25	1000
11	NFA21SL806X1A48	10	80MHz	10	20	1000
12	NFA21SL207X1A45	10	200MHz	10	100	1000
13	NFA21SL207X1A48	10	200MHz	10	100	1000
14	NFA21SL307X1A45	10	300MHz	10	100	1000
15	NFA21SL307X1A48	10	300MHz	10	100	1000
16	NFA21SL287V1A45	10	280MHz	10	100	1000
17	NFA21SL287V1A48	10	280MHz	10	100	1000
18	NFA21SL317V1A45	10	310MHz	10	100	1000
19	NFA21SL317V1A48	10	310MHz	10	100	1000
20	NFA21SL337V1A45	10	330MHz	10	100	1000
21	NFA21SL337V1A48	10	330MHz	10	100	1000

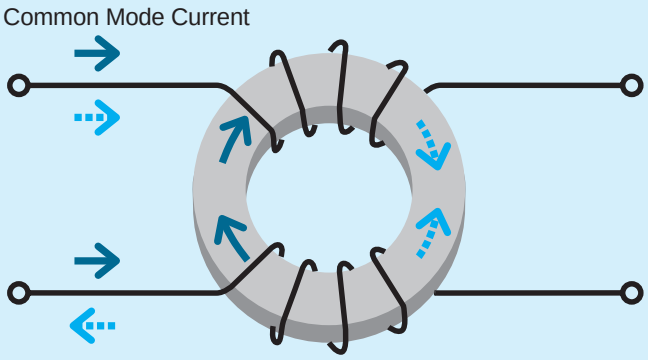
●EKEMNFMPH (Chip EMIFIL® for Large Current)

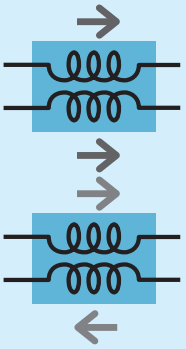
No.	Part Number	Quantity (pcs.)	Capacitance	Rated Voltage (Vdc)	Rated Current (A)	Insulation Resistance (MΩ min.)
1	NFM18PC104R1C3	10	0.1μF±20%	16	2	1000
2	NFM18PC224R0J3	10	0.22μF±20%	6.3	2	1000
3	NFM18PC474R0J3	10	0.47μF±20%	6.3	2	1000
4	NFM18PC105R0J3	10	1μF±20%	6.3	2	500
5	NFM18PC225B0J3	10	2.2μF±20%	6.3	2	200
6	NFM18PC225B1A3	10	2.2μF±20%	10	4	200
7	NFM18PS474R0J3	10	0.47μF±20%	6.3	2	1000
8	NFM18PS105R0J3	10	1μF±20%	6.3	2	500
9	NFM21PC104R1E3	10	0.1μF±20%	25	2	1000
10	NFM21PC224R1C3	10	0.22μF±20%	16	2	1000
11	NFM21PC474R1C3	10	0.47μF±20%	16	2	1000
12	NFM21PC105B1A3	10	1μF±20%	10	4	500
13	NFM21PC105B1C3	10	1μF±20%	16	4	500
14	NFM21PC225B0J3	10	2.2μF±20%	6.3	4	200
15	NFM21PC475B1A3	10	4.7μF±20%	10	6	100
16	NFE31PC276B0J3	10	27μF±20%	6.3	6	20
17	NFE31PT152Z1E9	10	1500pF +50/-20%	25	6	1000
18	NFE31PT222Z1E9	10	2200pF±50%	25	6	1000
19	NFE61PT102E1H9	10	1000pF +80/-20%	50	2	1000
20	NFE61PT472C1H9	10	4700pF +80/-20%	50	2	1000
21	NFM41PC204F1H3	10	0.2μF +80/-20%	50	2	1000
22	NFM41PC155B1E3	10	1.5μF±20%	25	6	300

DL□

Chip Common Mode Choke Coil

DL□ Series Introduction





Magnetic flux by common mode current is added each other and create impedance

Magnetic flux by differential mode current is canceled each other and do not create impedance

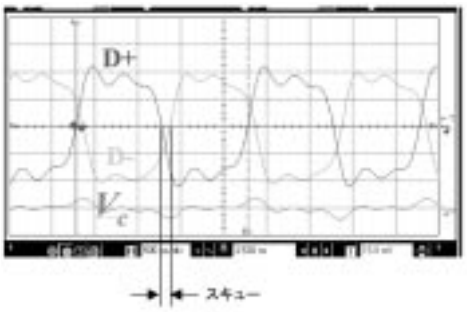
Category	Features, Classification	Structure	Part Number	Comments
High cut-off frequency High Coupling for high speed differential signal lines	Ultra high cut-off frequency for high speed differential signal lines	Film type	DLP11SA	Low profile, small size, suitable for mobile equipments. Tight terminal pitch enables high density layout. Ultra high cut-off frequency and its matching to line impedance enables good transmission of high speed signal.
		Wound type	DLW21SN_HQ2	Ultra high self resonance frequency enables high cut-off frequency. Its matching to line impedance enables good transmission of high speed signal.
	High cut-off frequency for high speed differential signal lines	Film type	DLP0NS DLP11SN DLP2AD DLW21SN_SQ2	Low profile, small size, suitable for mobile equipments. Tight terminal pitch enables high density layout. High cut-off frequency enables good transmission of high speed signal.
		Wound type	DLW31S DLW21H	Ultra high self resonance frequency enables high cut-off frequency. DLW21H is designed as low profile type.
	for general differential signal lines	Film type	DLP31S DLP31D	Low profile,small size, suitable for mobile equipments. Tight terminal pitch enables high density layout.
Large current High coupling for power lines		Wound type	DLW5AH DLW5BS DLW5BT	Large current (6A max.) , suitable for input connector from an AC adaptor. DLW5BT is low profile type.
Relative high differential mode impedance Low coupling for audio lines		Multilayer type	DLM11G DLM2HG	Modified its differential mode impedance higher than other common mode choke coils, this feature makes possible to suppress both common mode and differential mode noise. DLM2HG can meet stereo 3 lines which contain a ground line.

Skew Improve Effect of Common Mode Choke Coil

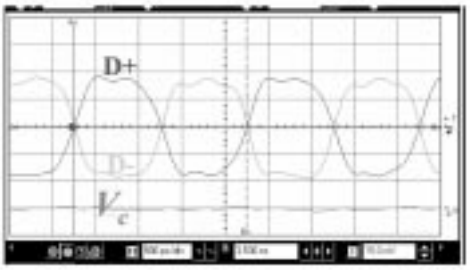
Example of Skew Improvement by Common Mode Choke Coil
(Test using pulse generator waveform)

Waveform is equivalent to 1000Mbps signal

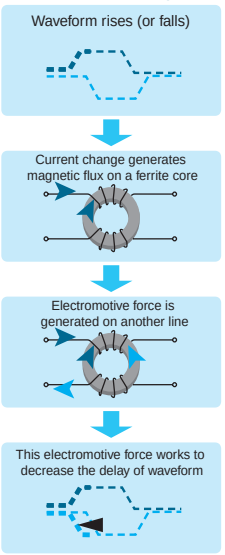
Waveform with intentionally made skew (skew: 100ps)



Skew is improved by common mode choke coil

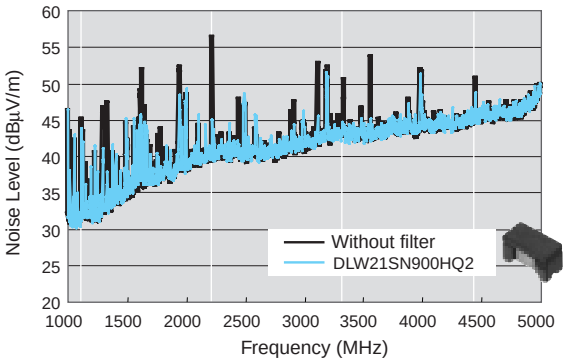


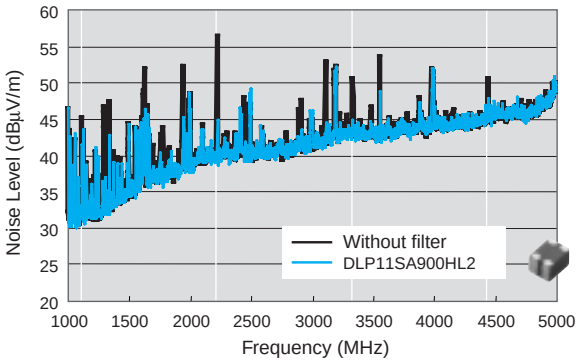
Mechanism of Skew Improvement



Noise Suppression of Common Mode Choke Coil in HDMI Line

Device under test / Transmitter : game machine Receiver : projector
Cable / HDMI categoly2 3m cable
Test resolution / 1080p Deep color 12bit (Data 1.11GHz) DVD play mode

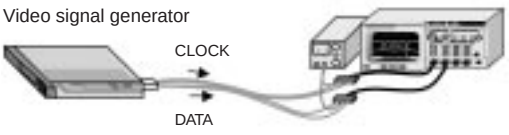


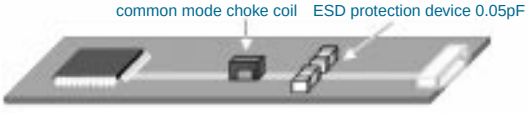


Test Example of HDMI1.3 Waveform Transmission

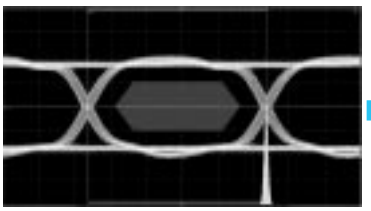
~Using ESD protection device 0.05pF~

Signal frequency : 1.11GHz (Deep color 12bit)

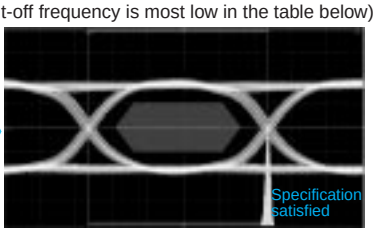




ESD protection device only



with film type DLP11SN900HL2
(Cut-off frequency is most low in the table below)



	Wound Type DLW21SN900HQ2	Film Type DLP11SA900HL2	Film Type Array DLP2ADN900HL4
Cut-off Frequency	Over 10GHz	Around 6GHz	Around 4GHz
Judge	Specification satisfied	Specification satisfied	Specification satisfied
Transition Time	Rise time: 83.4ps Fall time: 77.4ps	Rise time: 90.4ps Fall time: 85.5ps	Rise time: 100ps Fall time: 97.4ps

Each of common mode choke coil can keep waveform, satisfy the specification.

Part Numbering

(Part Number)

DL	W	21	S	N	371	S	Q	2	L
❶	❷	❸	❹	❺	❻	❼	❽	❾	❿

❶Product ID

Product ID	
DL	Chip Common Mode Choke Coils

❷Structure

Code	Structure
W	Wire Wound Type
M	Multilayer Type
P	Film Type

❸Dimensions (L×W)

Code	Dimensions (L×W)	EIA
0N	0.85×0.65mm	03025
11	1.25×1.0mm	0504
21	2.0×1.2mm	0805
31	3.2×1.6mm	1206
2A	2.0×1.0mm	0804
2H	2.5×2.0mm	1008
5A	5.0×3.6mm	2014
5B	5.0×5.0mm	2020

❹Features (1)

Code	Type
S	Magnetically Shielded One Circuit Type
D	Magnetically Shielded Two Circuit Type
H	Open Magnetic One Circuit Type
G	Magnetically Monolithic Type (sectional winding)
T	Magnetically Shielded One Circuit Low Profile Type

❺Category

Code	Category
A	Expressed by a letter.
N	
R	

❻Impedance

Typical impedance at 100MHz is expressed by three figures. The unit is in ohm (Ω). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

❼Circuit

Code	Circuit
S	Expressed by a letter.
M	
H	

❽Features (2)

Code	Features
L	Expressed by a letter.
Q	
Z	

❾Number of Signal Lines

Code	Number of Signal Lines
2	Two Lines
3	Three Lines
4	Four Lines

❿Packaging

Code	Packaging	Series
K	Embossed Taping (ø330mm Reel)	**DLW5AH/DLW5BS/DLW5BT**
L	Embossed Taping (ø180mm Reel)	All Series
B	Bulk	All Series

DL□ Chip Common Mode Choke Coil Series Line Up

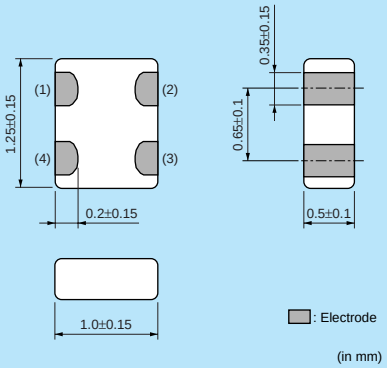
Type	Size (Inch)	Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Kit	≥1A	≥3A	HD	UD	Zmatch	Flow	ReFlow
Multilayer Type for Audio Lines	0504 p140	DLM11GN601SZ2	600ohm±25%	100mA								ReFlow
	1008 p141	DLM2HGN601SZ3	600ohm±25%	100mA							Flow	ReFlow
Film Type for Differential Signal Lines	03025 p142	DLP0NSN670HL2	67ohm±20%	110mA	Kit			HD		Zmatch		ReFlow
		DLP0NSN900HL2	90ohm±20%	100mA	Kit			HD		Zmatch		ReFlow
		DLP0NSN121HL2	120ohm±20%	90mA	Kit			HD		Zmatch		ReFlow
	0504 p143	DLP11SN670SL2	67ohm±20%	180mA	Kit			HD				ReFlow
		DLP11SN121SL2	120ohm±20%	140mA	Kit			HD				ReFlow
		DLP11SN161SL2	160ohm±20%	120mA	Kit			HD				ReFlow
		DLP11SN900HL2	90ohm±20%	150mA	Kit			HD		Zmatch		ReFlow
		DLP11SN201HL2	200ohm±20%	110mA	Kit			HD		Zmatch		ReFlow
		DLP11SN241HL2	240ohm±20%	100mA	Kit			HD		Zmatch		ReFlow
		DLP11SN281HL2	280ohm±20%	90mA	Kit			HD		Zmatch		ReFlow
		DLP11SN331HL2	330ohm±20%	80mA	Kit			HD		Zmatch		ReFlow
		DLP11SA350HL2	35ohm±20%	170mA	Kit			UD		Zmatch		ReFlow
		DLP11SA670HL2	67ohm±20%	150mA	Kit			UD		Zmatch		ReFlow
		DLP11SA900HL2	90ohm±20%	150mA	Kit			UD		Zmatch		ReFlow
	1206 p145	DLP31SN121ML2	120ohm±20%	100mA				HD				ReFlow
		DLP31SN221ML2	220ohm±20%	100mA				HD				ReFlow
		DLP31SN551ML2	550ohm±20%	100mA				HD				ReFlow
Film Array Type for Differential Signal Lines	0804 p146	DLP2ADN670HL4	67ohm±20%	140mA	Kit			HD		Zmatch		ReFlow
		DLP2ADN900HL4	90ohm±20%	130mA	Kit			HD		Zmatch		ReFlow
		DLP2ADN121HL4	120ohm±20%	120mA	Kit			HD		Zmatch		ReFlow
		DLP2ADN161HL4	160ohm±20%	100mA	Kit			HD		Zmatch		ReFlow
		DLP2ADN201HL4	200ohm±20%	90mA	Kit			HD		Zmatch		ReFlow
		DLP2ADN241HL4	240ohm±20%	80mA	Kit			HD		Zmatch		ReFlow
		DLP2ADN281HL4	280ohm±20%	80mA	Kit			HD		Zmatch		ReFlow
	1206 p147	DLP31DN900ML4	90ohm±20%	160mA				HD				ReFlow
		DLP31DN131ML4	130ohm±20%	120mA				HD				ReFlow
		DLP31DN201ML4	200ohm±20%	100mA				HD				ReFlow
		DLP31DN321ML4	320ohm±20%	80mA				HD				ReFlow
		DLP31DN441ML4	440ohm±20%	70mA				HD				ReFlow
Wire Wound Type for Differential Signal Lines	0805 p148	DLW21SN670SQ2	67ohm±25%	400mA	Kit			HD				ReFlow
		DLW21SN900SQ2	90ohm±25%	330mA	Kit			HD				ReFlow
		DLW21SN121SQ2	120ohm±25%	370mA	Kit			HD				ReFlow
		DLW21SN181SQ2	180ohm±25%	330mA	Kit			HD				ReFlow
		DLW21SN261SQ2	260ohm±25%	300mA	Kit			HD				ReFlow
		DLW21SN371SQ2	370ohm±25%	280mA	Kit			HD				ReFlow
		DLW21SN670HQ2	67ohm±25%	320mA	Kit			UD		Zmatch		ReFlow
		DLW21SN900HQ2	90ohm±25%	280mA	Kit			UD		Zmatch		ReFlow
		DLW21SN121HQ2	120ohm±25%	280mA	Kit			UD		Zmatch		ReFlow
		DLW21SR670HQ2	67ohm±25%	400mA	Kit			UD		Zmatch		ReFlow
	p150	DLW21HN670SQ2	67ohm±25%	330mA	Kit			HD				ReFlow
		DLW21HN900SQ2	90ohm±25%	330mA	Kit			HD				ReFlow
		DLW21HN121SQ2	120ohm±25%	280mA	Kit			HD				ReFlow
		DLW21HN181SQ2	180ohm±25%	250mA	Kit			HD				ReFlow
	1206 p151	DLW31SN900SQ2	90ohm±25%	370mA				HD				ReFlow
		DLW31SN161SQ2	160ohm±25%	340mA				HD				ReFlow
		DLW31SN261SQ2	260ohm±25%	310mA				HD				ReFlow
		DLW31SN601SQ2	600ohm±25%	260mA				HD				ReFlow
		DLW31SN102SQ2	1000ohm±25%	230mA				HD				ReFlow
		DLW31SN222SQ2	2200ohm±25%	200mA				HD				ReFlow
Wire Wound Type for Large Current	2014 p152	DLW5AHN402SQ2	4000ohm(Typ.)	200mA	Kit							ReFlow
	2020 p152	DLW5BSN191SQ2	190ohm(Typ.)	5000mA	Kit	≥3A						ReFlow
		DLW5BSN351SQ2	350ohm(Typ.)	2000mA	Kit	≥1A						ReFlow
		DLW5BSN102SQ2	1000ohm(Typ.)	1500mA	Kit	≥1A						ReFlow
		DLW5BSN152SQ2	1500ohm(Typ.)	1000mA	Kit	≥1A						ReFlow
		DLW5BSN302SQ2	3000ohm(Typ.)	500mA	Kit							ReFlow
	p153	DLW5BTN101SQ2	100ohm(Typ.)	6000mA	Kit	≥3A						ReFlow
		DLW5BTN251SQ2	250ohm(Typ.)	5000mA	Kit	≥3A						ReFlow
		DLW5BTN501SQ2	500ohm(Typ.)	4000mA	Kit	≥3A						ReFlow
		DLW5BTN102SQ2	1000ohm(Typ.)	2000mA	Kit	≥1A						ReFlow
		DLW5BTN142SQ2	1400ohm(Typ.)	1500mA	Kit	≥1A						ReFlow

DLM11G Series (0504 Size)

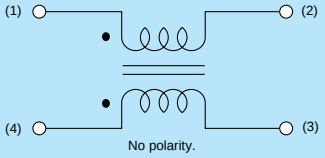
Reflow OK

Audio line common choke also effective to differential mode.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
D	180mm Reel Paper Tape	10000
B	Bulk(Bag)	1000

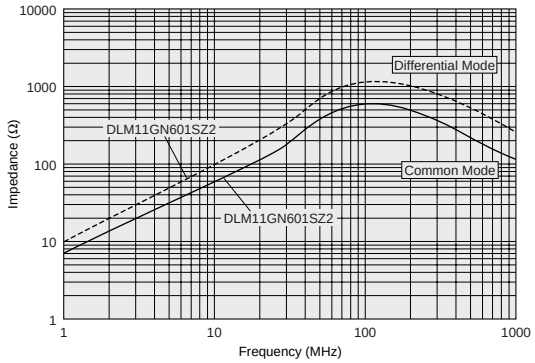
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance
DLM11GN601SZ2□	600ohm±25%	100mA	5Vdc	100M ohm	25Vdc	0.8ohm max.

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1

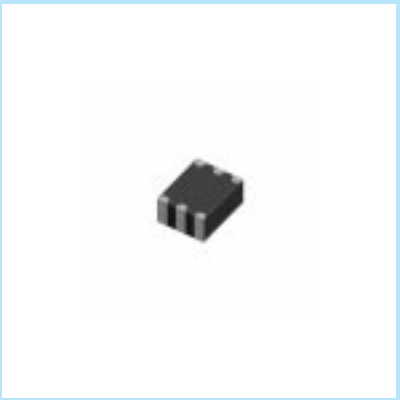
■ Impedance-Frequency Characteristics (Main Items)



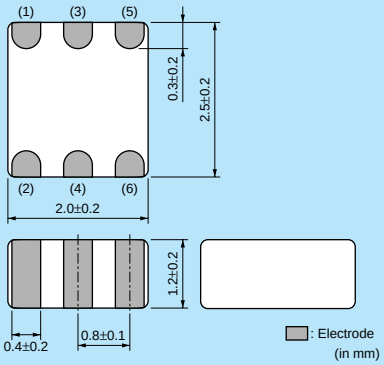
DLM2HG Series (1008 Size)

Flow OK Reflow OK

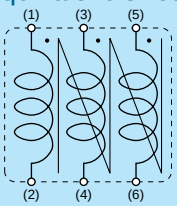
3 line audio common mode choke coil.



■ Dimensions



■ Equivalent Circuit



No polarity.

■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	1000

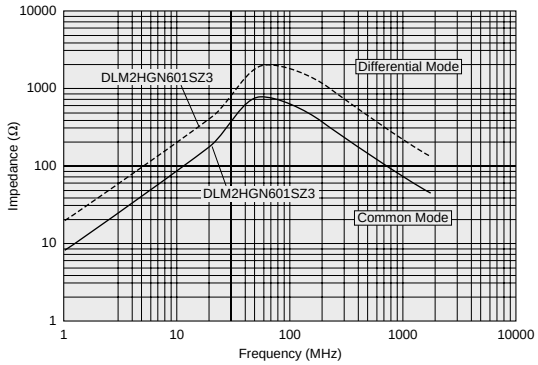
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance
DLM2HGN601SZ3□	600ohm±25%	100mA	16Vdc	100M ohm	100Vdc	0.40ohm max.

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1

■ Impedance-Frequency Characteristics (Main Items)

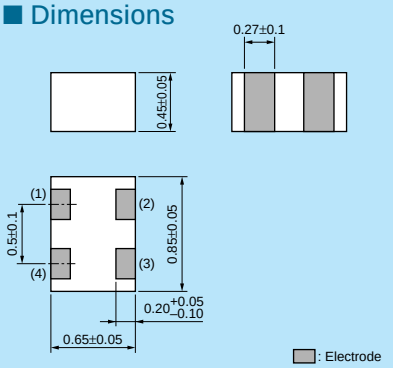


DLP0NS Series (03025 Size)

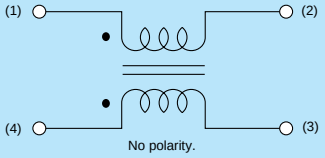
Reflow OK

03025 size, very small chip common mode choke coil, Cut-off frequency 3GHz max.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	5000
B	Bulk(Bag)	500

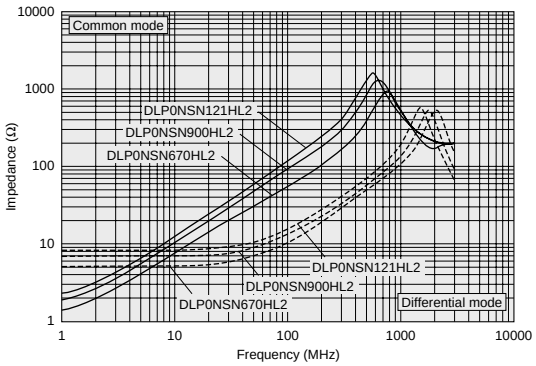
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

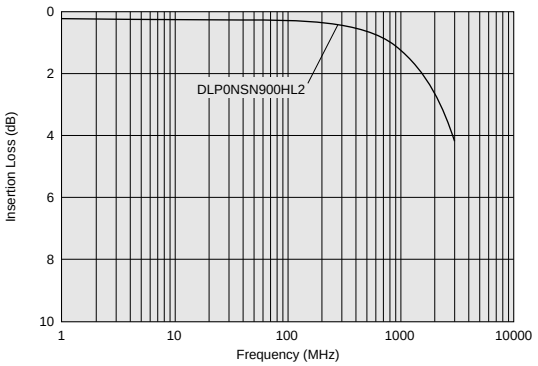
Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLP0NSN670HL2□	67ohm±20%	110mA	5Vdc	100M ohm	12.5Vdc	2.4ohm±25%	Kit HD Imp Match
DLP0NSN900HL2□	90ohm±20%	100mA	5Vdc	100M ohm	12.5Vdc	3.0ohm±25%	Kit HD Imp Match
DLP0NSN121HL2□	120ohm±20%	90mA	5Vdc	100M ohm	12.5Vdc	3.8ohm±25%	Kit HD Imp Match

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

■ Impedance-Frequency Characteristics (Main Items)



■ Differential Mode Transmission Characteristics (Typ.)

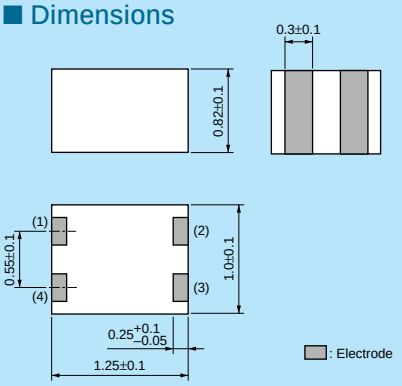


DLP11S Series (0504 Size)

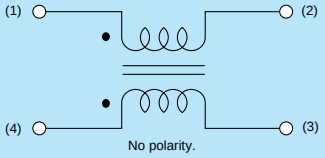
Reflow OK

6GHz cut-off frequency (for HDMI) is available.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	500

Refer to pages from p.155 to p.158 for mounting information.

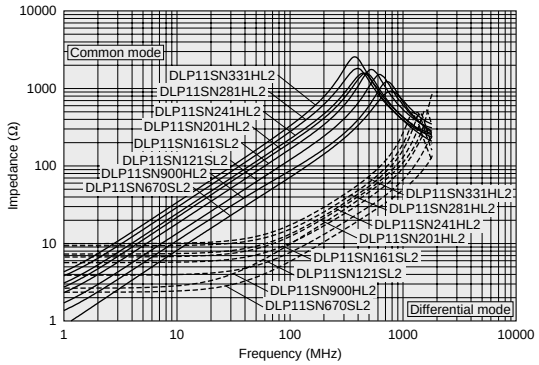
■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLP11SN670SL2□	67ohm±20%	180mA	5Vdc	100M ohm	12.5Vdc	1.3ohm±25%	Kit HD
DLP11SN121SL2□	120ohm±20%	140mA	5Vdc	100M ohm	12.5Vdc	2.0ohm±25%	Kit HD
DLP11SN161SL2□	160ohm±20%	120mA	5Vdc	100M ohm	12.5Vdc	2.7ohm±25%	Kit HD
DLP11SN900HL2□	90ohm±20%	150mA	5Vdc	100M ohm	12.5Vdc	1.5ohm±25%	Kit HD Imp Match
DLP11SN201HL2□	200ohm±20%	110mA	5Vdc	100M ohm	12.5Vdc	3.1ohm±25%	Kit HD Imp Match
DLP11SN241HL2□	240ohm±20%	100mA	5Vdc	100M ohm	12.5Vdc	3.5ohm±25%	Kit HD Imp Match
DLP11SN281HL2□	280ohm±20%	90mA	5Vdc	100M ohm	12.5Vdc	4.2ohm±25%	Kit HD Imp Match
DLP11SN331HL2□	330ohm±20%	80mA	5Vdc	100M ohm	12.5Vdc	4.9ohm±25%	Kit HD Imp Match
DLP11SA350HL2□	35ohm±20%	170mA	5Vdc	100M ohm	12.5Vdc	0.9ohm±25%	Kit UD Imp Match
DLP11SA670HL2□	67ohm±20%	150mA	5Vdc	100M ohm	12.5Vdc	1.2ohm±25%	Kit UD Imp Match
DLP11SA900HL2□	90ohm±20%	150mA	5Vdc	100M ohm	12.5Vdc	1.4ohm±25%	Kit UD Imp Match

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

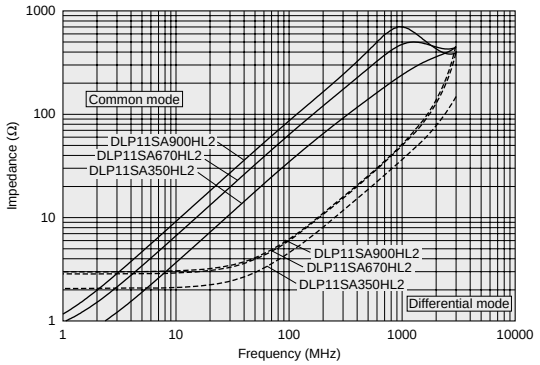
■ Impedance-Frequency Characteristics

DLP11SN Series



■ Impedance-Frequency

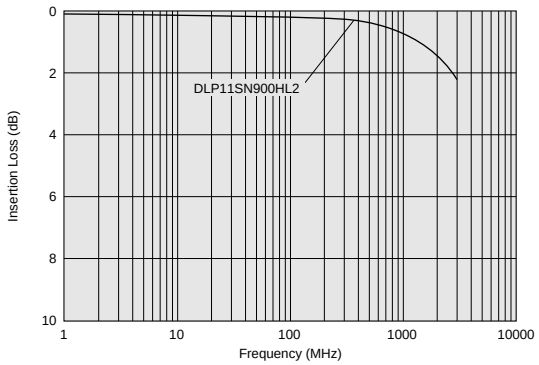
DLP11SA Series



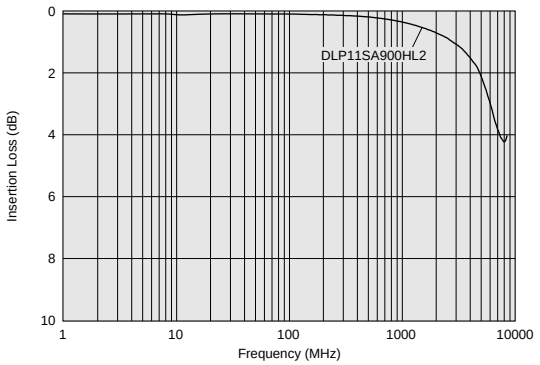
Continued on the following page.

■ Differential Mode Transmission Characteristics (Typ.)

DLP11SN Series



DLP11SA Series

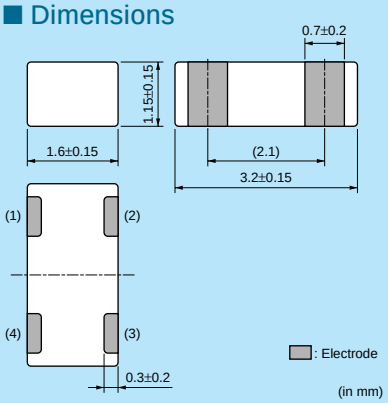


DLP31S Series (1206 Size)

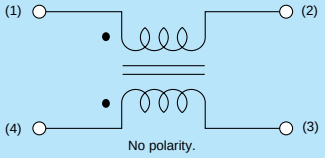
Reflow OK

1206 size film type chip common mode choke coil.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	500

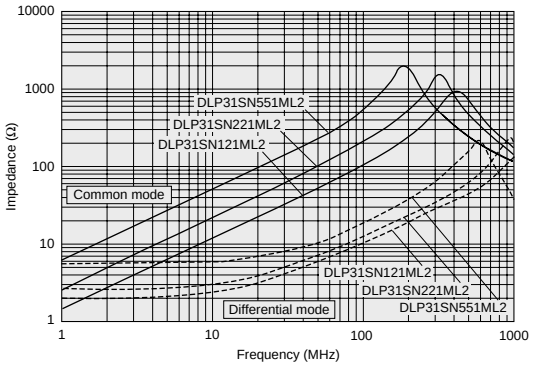
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLP31SN121ML2□	120ohm±20%	100mA	16Vdc	100M ohm	40Vdc	2.0ohm max.	HD
DLP31SN221ML2□	220ohm±20%	100mA	16Vdc	100M ohm	40Vdc	2.5ohm max.	HD
DLP31SN551ML2□	550ohm±20%	100mA	16Vdc	100M ohm	40Vdc	3.6ohm max.	HD

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

■ Impedance-Frequency Characteristics (Main Items)

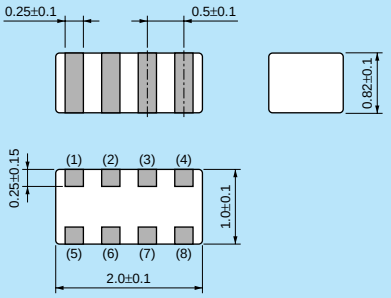


DLP2AD Series (0804 Size)

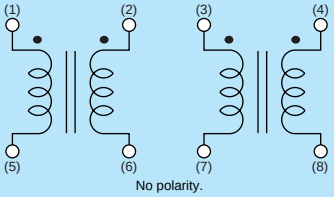
Reflow OK

2 circuit built-in, 0804 size, HDMI adapted type available, cut-off frequency 3GHz max.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	500

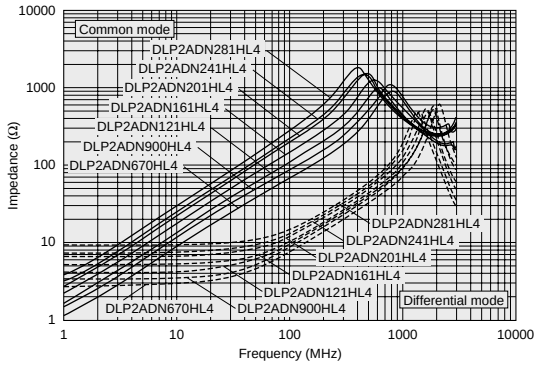
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

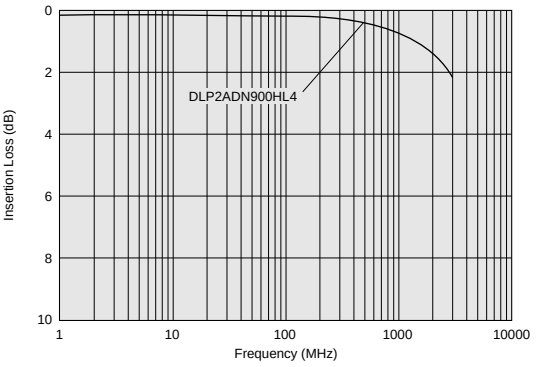
Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLP2ADN670HL4□	67ohm±20%	140mA	5Vdc	100M ohm	12.5Vdc	1.3ohm±25%	Kit HD ImpMatch
DLP2ADN900HL4□	90ohm±20%	130mA	5Vdc	100M ohm	12.5Vdc	1.7ohm±25%	Kit HD ImpMatch
DLP2ADN121HL4□	120ohm±20%	120mA	5Vdc	100M ohm	12.5Vdc	2.0ohm±25%	Kit HD ImpMatch
DLP2ADN161HL4□	160ohm±20%	100mA	5Vdc	100M ohm	12.5Vdc	2.5ohm±25%	Kit HD ImpMatch
DLP2ADN201HL4□	200ohm±20%	90mA	5Vdc	100M ohm	12.5Vdc	3.2ohm±25%	Kit HD ImpMatch
DLP2ADN241HL4□	240ohm±20%	80mA	5Vdc	100M ohm	12.5Vdc	3.8ohm±25%	Kit HD ImpMatch
DLP2ADN281HL4□	280ohm±20%	80mA	5Vdc	100M ohm	12.5Vdc	4.6ohm±25%	Kit HD ImpMatch

Operating Temperature Range: -40°C to +85°C Number of Circuit: 2 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

■ Impedance-Frequency Characteristics (Main Items)



■ Differential Mode Transmission Characteristics (Typ.)

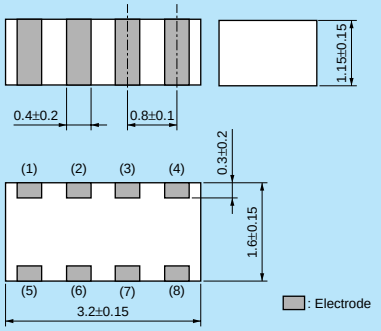


DLP31D Series (1206 Size)

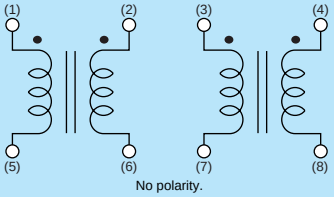
Reflow OK

2 circuit built-in, 1206 size, meet IEEE1394,USB,LVDS.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	500

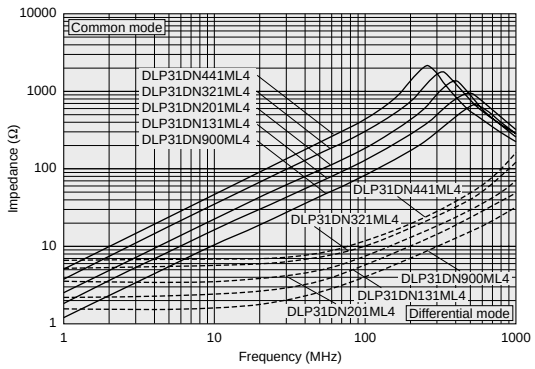
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLP31DN900ML4☐	90ohm±20%	160mA	10Vdc	100M ohm	25Vdc	1.1ohm max.	HD
DLP31DN131ML4☐	130ohm±20%	120mA	10Vdc	100M ohm	25Vdc	1.6ohm max.	HD
DLP31DN201ML4☐	200ohm±20%	100mA	10Vdc	100M ohm	25Vdc	2.2ohm max.	HD
DLP31DN321ML4☐	320ohm±20%	80mA	10Vdc	100M ohm	25Vdc	3.5ohm max.	HD
DLP31DN441ML4☐	440ohm±20%	70mA	10Vdc	100M ohm	25Vdc	4.3ohm max.	HD

Operating Temperature Range: -40°C to +85°C Number of Circuit: 2 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

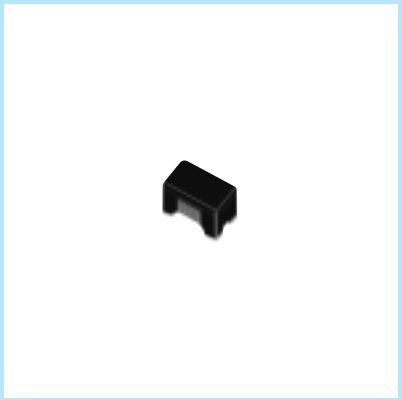
■ Impedance-Frequency Characteristics (Main Items)



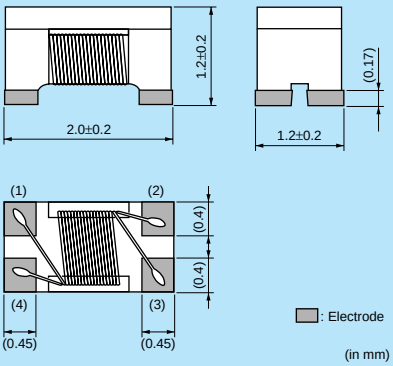
DLW21S Series (0805 Size)

Reflow OK

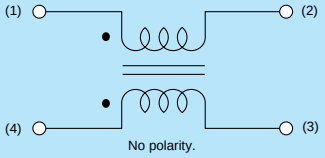
Wire-wound common choke, HDMI available type prepaird.



■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	2000
B	Bulk(Bag)	500

Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

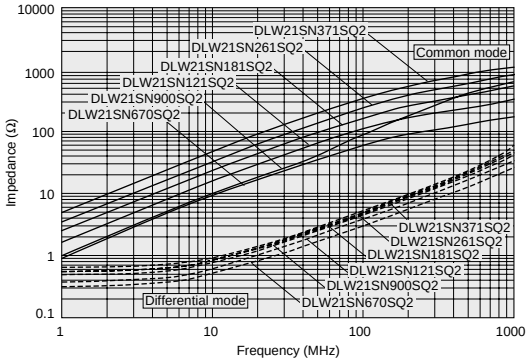
Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW21SN670SQ2□	67ohm±25%	400mA	50Vdc	10M ohm	125Vdc	0.25ohm max.	Kit HD
DLW21SN900SQ2□	90ohm±25%	330mA	50Vdc	10M ohm	125Vdc	0.35ohm max.	Kit HD
DLW21SN121SQ2□	120ohm±25%	370mA	50Vdc	10M ohm	125Vdc	0.30ohm max.	Kit HD
DLW21SN181SQ2□	180ohm±25%	330mA	50Vdc	10M ohm	125Vdc	0.35ohm max.	Kit HD
DLW21SN261SQ2□	260ohm±25%	300mA	50Vdc	10M ohm	125Vdc	0.40ohm max.	Kit HD
DLW21SN371SQ2□	370ohm±25%	280mA	50Vdc	10M ohm	125Vdc	0.45ohm max.	Kit HD
DLW21SN670HQ2□	67ohm±25%	320mA	20Vdc	10M ohm	50Vdc	0.31ohm max.	Kit UD Imp Match
DLW21SN900HQ2□	90ohm±25%	280mA	20Vdc	10M ohm	50Vdc	0.41ohm max.	Kit UD Imp Match
DLW21SN121HQ2□	120ohm±25%	280mA	20Vdc	10M ohm	50Vdc	0.41ohm max.	Kit UD Imp Match
DLW21SR670HQ2□	67ohm±25%	400mA	20Vdc	10M ohm	50Vdc	0.25ohm max.	Kit UD Imp Match

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

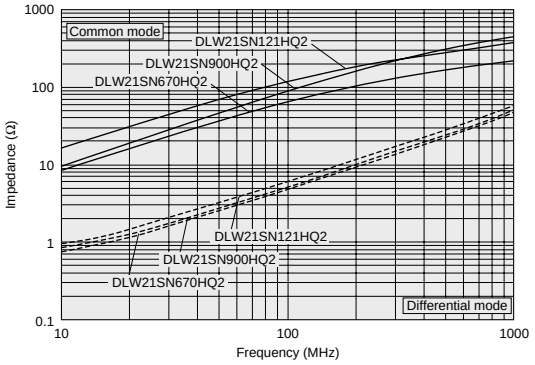
DLW21SR670HQ2 is designed to correct line impedance when ESD protection device is also used.

■ Impedance-Frequency Characteristics (Main Items)

DLW21SN_SQ2 Series



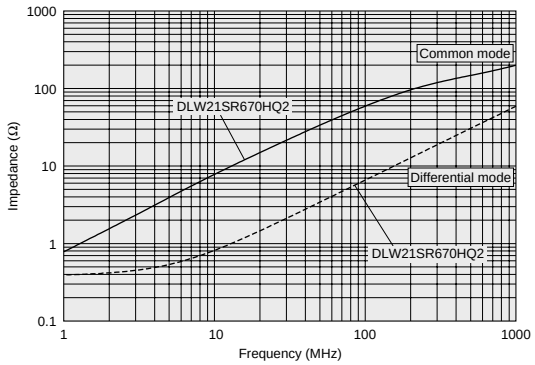
DLW21SN_HQ2 Series



Continued on the following page.

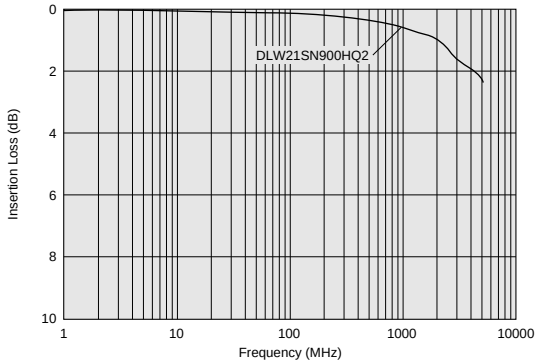
■ Impedance-Frequency Characteristics (Main Items)

DLW21SR_HQ2 Series



■ Differential Mode Transmission Characteristics (Typ.)

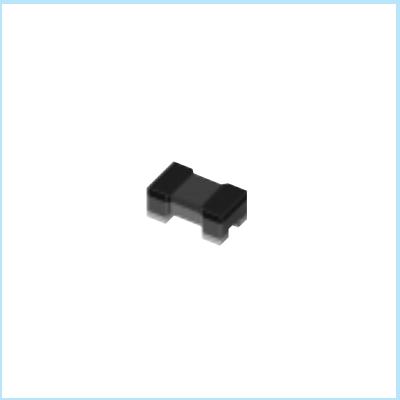
DLW21SN_HQ2 Series



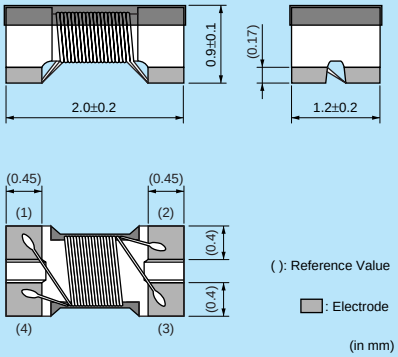
DLW21H Series (0805 Size)

Reflow OK

Low profile wire-wound common choke coil.



■ Dimensions

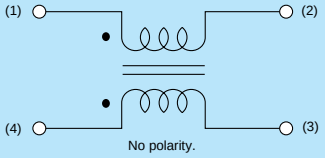


( ): Reference Value

: Electrode

(in mm)

■ Equivalent Circuit



No polarity.

■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	3000
B	Bulk(Bag)	500

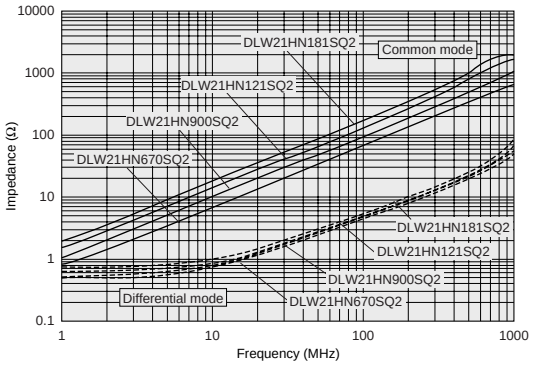
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW21HN670SQ2□	67ohm±25%	330mA	50Vdc	10M ohm	125Vdc	0.35ohm max.	Kit HD
DLW21HN900SQ2□	90ohm±25%	330mA	50Vdc	10M ohm	125Vdc	0.35ohm max.	Kit HD
DLW21HN121SQ2□	120ohm±25%	280mA	50Vdc	10M ohm	125Vdc	0.45ohm max.	Kit HD
DLW21HN181SQ2□	180ohm±25%	250mA	50Vdc	10M ohm	125Vdc	0.50ohm max.	Kit HD

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

■ Impedance-Frequency Characteristics (Main Items)

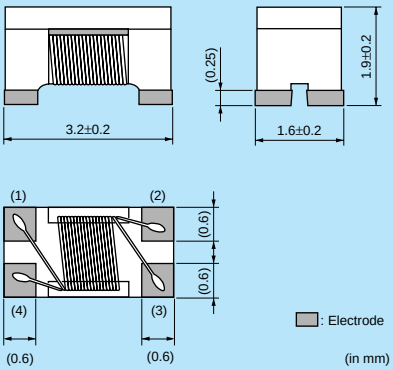


DLW31S Series (1206 Size)

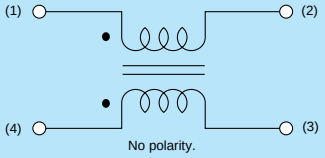
Reflow OK

1206 size wire-wound common mode choke coil.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	2000
B	Bulk(Bag)	500

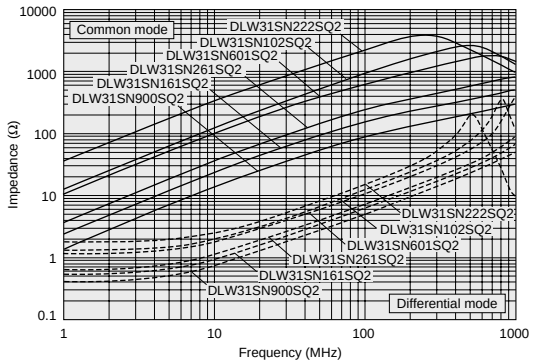
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW31SN900SQ2☐	90ohm±25%	370mA	50Vdc	10M ohm	125Vdc	0.3ohm max.	HD
DLW31SN161SQ2☐	160ohm±25%	340mA	50Vdc	10M ohm	125Vdc	0.4ohm max.	HD
DLW31SN261SQ2☐	260ohm±25%	310mA	50Vdc	10M ohm	125Vdc	0.5ohm max.	HD
DLW31SN601SQ2☐	600ohm±25%	260mA	50Vdc	10M ohm	125Vdc	0.8ohm max.	HD
DLW31SN102SQ2☐	1000ohm±25%	230mA	50Vdc	10M ohm	125Vdc	1.0ohm max.	HD
DLW31SN222SQ2☐	2200ohm±25%	200mA	50Vdc	10M ohm	125Vdc	1.2ohm max.	HD

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1 HD: for high speed differential signal lines UD: for ultra high speed differential signal lines

■ Impedance-Frequency Characteristics



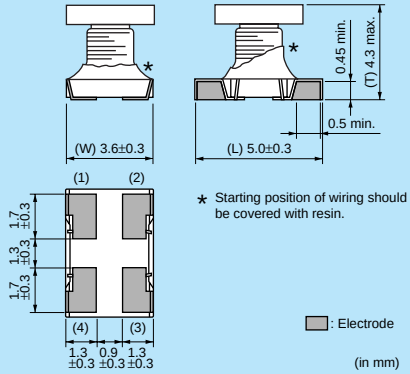
DLW5AH/DLW5BS Series (2014/2020 Size)

Hi Power Reflow OK

5A max, common mode choke coil for power lines.

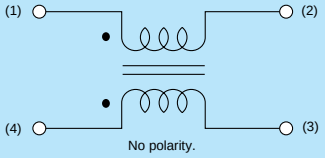
DLW5AH

■ Dimensions



* Starting position of wiring should be covered with resin.

■ Equivalent Circuit

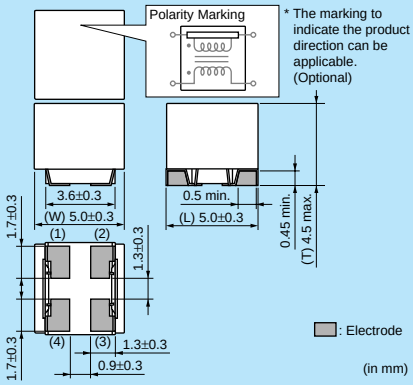


■ Packaging

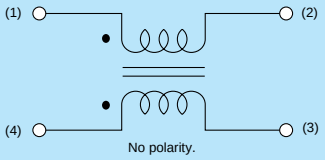
Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	400
K	330mm Reel Embossed Tape	1500
B	Bulk(Bag)	100

DLW5BS

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	400
K	330mm Reel Embossed Tape	1500
B	Bulk(Bag)	100

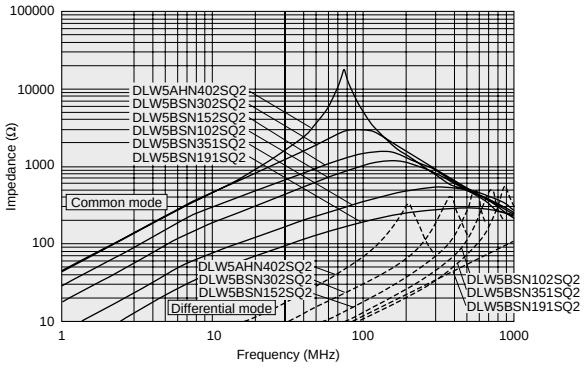
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (☐: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW5AHN402SQ2☐	4000ohm(Typ.)	200mA	50Vdc	10M ohm	125Vdc	3.0ohm max.	Kit
DLW5BSN191SQ2☐	190ohm(Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.02ohm max.	Kit ≧3A
DLW5BSN351SQ2☐	350ohm(Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.04ohm max.	Kit ≧1A
DLW5BSN102SQ2☐	1000ohm(Typ.)	1500mA	50Vdc	10M ohm	125Vdc	0.06ohm max.	Kit ≧1A
DLW5BSN152SQ2☐	1500ohm(Typ.)	1000mA	50Vdc	10M ohm	125Vdc	0.1ohm max.	Kit ≧1A
DLW5BSN302SQ2☐	3000ohm(Typ.)	500mA	50Vdc	10M ohm	125Vdc	0.3ohm max.	Kit

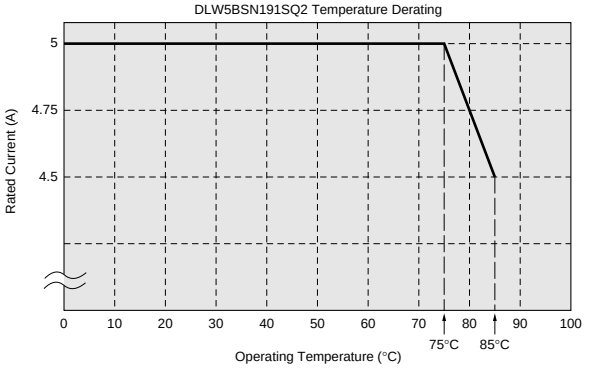
Operating Temperature Range: -25°C to +85°C Number of Circuit: 1

■ Impedance-Frequency Characteristics (Main Items)



■ Derating of Rated Current

DLW5BSN191

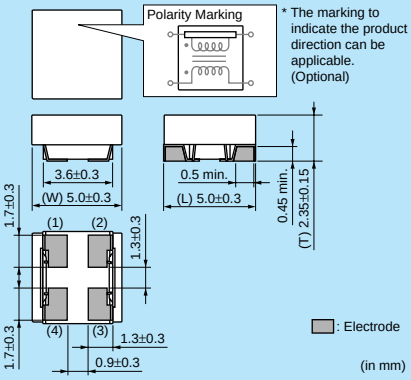


DLW5BT Series (2020 Size)

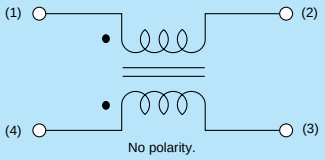
Hi Power Reflow OK

Low profile wire-wound common choke coil for power lines.

■ Dimensions



■ Equivalent Circuit



■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	700
K	330mm Reel Embossed Tape	2500
B	Bulk(Bag)	100

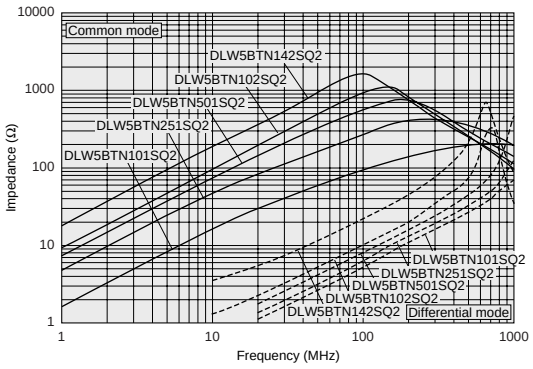
Refer to pages from p.155 to p.158 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW5BTN101SQ2□	100ohm(Typ.)	6000mA	50Vdc	10M ohm	125Vdc	0.009ohm±40%	Kit ≧3A
DLW5BTN251SQ2□	250ohm(Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.014ohm±40%	Kit ≧3A
DLW5BTN501SQ2□	500ohm(Typ.)	4000mA	50Vdc	10M ohm	125Vdc	0.019ohm±40%	Kit ≧3A
DLW5BTN102SQ2□	1000ohm(Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.024ohm±40%	Kit ≧1A
DLW5BTN142SQ2□	1400ohm(Typ.)	1500mA	50Vdc	10M ohm	125Vdc	0.040ohm±40%	Kit ≧1A

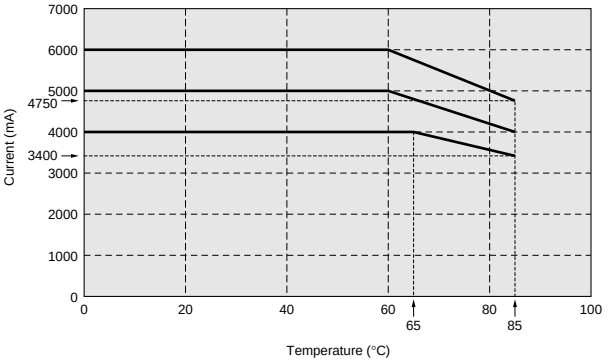
Operating Temperature Range: -25°C to +85°C Number of Circuit: 1

■ Impedance-Frequency Characteristics (Main Items)



■ Derating of Rated Current

DLW5BTN101/251/501



⚠Caution

● Rating

Do not use products beyond the rated current and rated voltage as this may create excessive heat and deteriorate the insulation resistance.

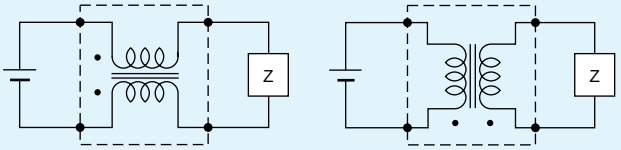
● Soldering and Mounting

1. Self-heating

Please provide special attention when mounting chip common mode choke coils DLW5 series in close proximity to other products that radiate heat.
The heat generated by other products may deteriorate the insulation resistance and cause excessive heat in this component.

2. Mounting Direction

Mount Chip Common Mode Choke Coils in right direction. Wrong direction, which is 90 degrees rotated from right direction, causes not only open or short circuit but also flames or other serious trouble.



right direction　　wrong direction

Notice

● Storage and Operating Conditions

<Operating Environment>
Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.
Do not use products in the environment close to the organic solvent.
<Storage and Handling Requirements>
1. Storage Period
DLW11G/DLM2HG series should be used within 6 months, the other series should be used within 12 months.
Solderability should be checked if this period is exceeded.
2. Storage Conditions
(1) Storage temperature: -10 to +40˚C

Relative humidity: 30 to 70%
Avoid sudden changes in temperature and humidity.
(2) Do not store products in a chemical atmosphere

● Notice (Soldering and Mounting)

1. Cleaning
Failure and degradation of a product are caused by the cleaning method. When you clean in conditions that are not in mounting information, please contact Murata engineering.
2. Soldering
Reliability decreases with improper soldering methods. Please solder by the standard soldering conditions shown in mounting information.
3. Other
Noise suppression levels resulting from Murata's EMI suppression filters EMIFIL® may vary, depending on the circuits and ICs used, type of noise, mounting pattern, mounting location, and other operating conditions. Be sure to check and confirm in advance the noise suppression effect of each filter, in actual circuits, etc. before applying the filter in a commercial-purpose equipment design.

● Handling

1. Resin Coating (Except DLW Series.)
Using resin for coating/molding products may affect the products performance.
So please pay careful attention in selecting resin.
Prior to use, please make the reliability evaluation with the product mounted in your application set.
2. Resin Coating (DLW Series)
The impedance value may change due to high cure-stress of resin to be used for coating/molding products. An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating condition etc. Some resin contains some impurities or chloride possible to generate chlorine by hydrolysis under some operating condition may cause corrosion of wire of coil, leading to open circuit.
So, please pay your careful attention in selecting resin in case of coating/molding the products with the resin.
Prior to use the coating resin, please make sure no reliability issue is observed by evaluating products mounted on your board.
3. Caution for Use (DLW Series)
When you hold products with a tweezer, please hold by the sides. Sharp materials, such as a pair of tweezers, should not touch the winding portion to prevent breaking the wire. Mechanical shock should not be applied to the products mounted on the board to prevent breaking the core.

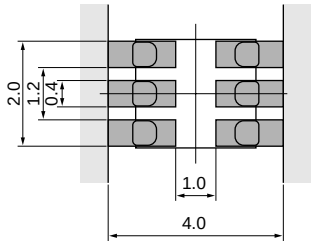
1. Standard Land Pattern Dimensions

Land Pattern + Solder Resist
Land Pattern
Solder Resist
(in mm)

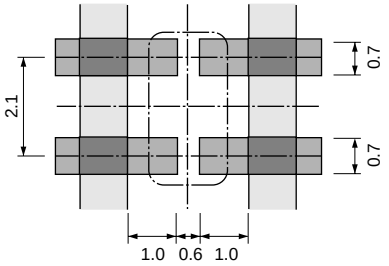
DLM11G
DLM2HG
DLP0NS
DLP11S
DLP2AD
DLP31S
DLP31D
DLW21S
DLW21H
DLW31SN
DLW5AH
DLW5B

●Reflow and Flow

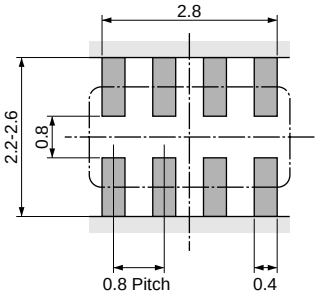
DLM2HG



DLP31S

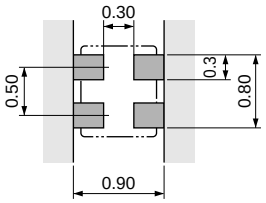


DLP31D

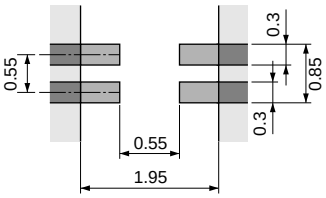


●Reflow Soldering

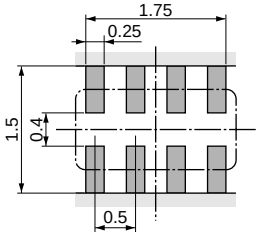
DLP0NS



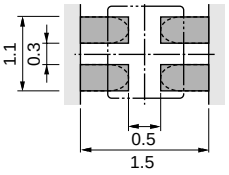
DLP11S



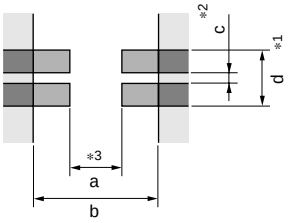
DLP2AD



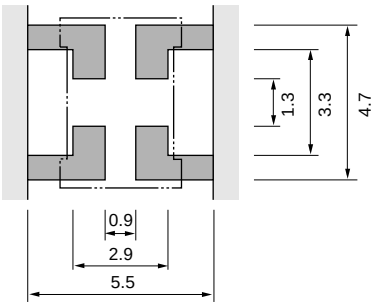
DLM11G



DLW21S/21H/31SN



DLW5AH/5B



Series	a	b	c	d
DLW21S/H	0.8	2.6	0.4	1.2
DLW31SN	1.6	3.7	0.4	1.6

*1: If the pattern is made with wider than 1.2mm (DLW21) / 1.6mm (DLW31S) it may result in components turning around, because melting speed is different. In the worst case, short circuit between lines may occur.
*2: If the pattern is made with less than 0.4mm, in the worst case, short circuit between lines may occur due to spread of soldering paste or mount placing accuracy.
*3: If the pattern is made with wider than 0.8mm (DLW21) / 1.6mm (DLW31SN), the bending strength will be reduced. Do not use gild pattern; excess soldering heat may dissolve metal of a copper wire.

2. Solder Paste Printing and Adhesive Application

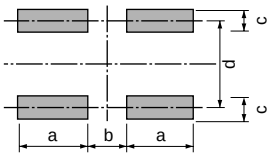
When reflow soldering the chip common mode choke coils, the printing must be conducted in accordance with the following cream solder printing conditions.
If too much solder is applied, the chip will be prone to damage by mechanical and thermal stress from the PCB and may crack.
Standard land dimensions should be used for resist and copper foil patterns.

When flow soldering the chip common mode choke coils, apply the adhesive in accordance with the following conditions.
If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability. In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering process.

(in mm)

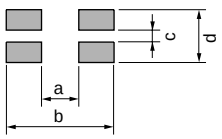
Series	Solder Paste Printing	Adhesive Application
DLP **DLW** **DLM**	●Guideline of solder paste thickness: 100-150µm: DLW21S/21H/31S, DLP0NS/11S/2AD/DLM11G 150-200µm: DLP31D/31S, DLM2HG, DLW5AH/5BS/5BT *Solderability is subject to reflow conditions and thermal conductivity. Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.	■ DLP31S/DLM2HG/DLP31D Apply 0.3mg of bonding agent at each chip.

DLP0NS/11S/31S/DLM11G



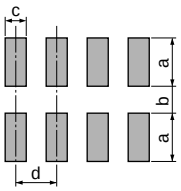
Series	a	b	c	d
DLP0NS	0.3	0.3	0.3	0.5
DLP11S	0.7	0.55	0.3	0.55
DLP31S	1.0	0.6	0.7	2.1
DLM11G	0.5	0.5	0.4	0.7

DLW21S/21H/31S



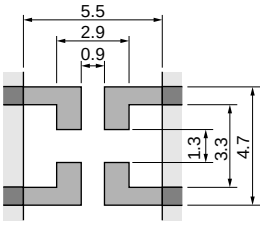
Series	a	b	c	d
DLW21S/H	0.8	2.6	0.5	1.2
DLW31S	1.6	3.7	0.4	1.6

DLP2AD/31D

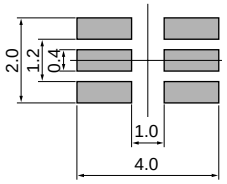


Series	a	b	c	d
DLP2AD	0.55	0.4	0.25	0.5
DLP31D	1.0	0.8	0.4	0.8

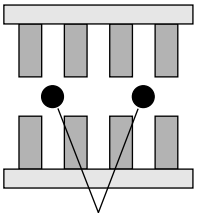
DLW5AH/5BS/5BT



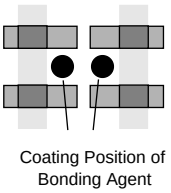
DLM2HG



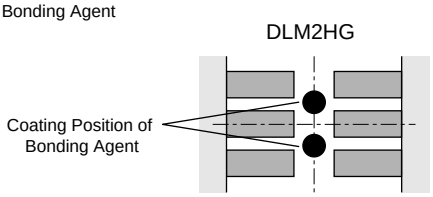
DLP31D



DLP31S



DLM2HG



3. Standard Soldering Conditions

(1) Soldering Methods

Use flow and reflow soldering methods only.
Use standard soldering conditions when soldering chip common mode choke coils.
In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

Solder: Use Sn-3.0Ag-0.5Cu solder. Use of Sn-Zn based solder will deteriorate performance of products.
If using DLP/DLM series with Sn-Zn based solder, please contact Murata in advance.

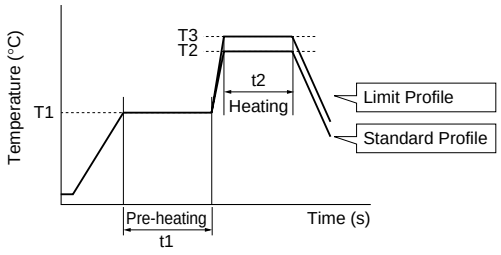
Flux:

- Use Rosin-based flux.
  In case of DLW21/31 series, use Rosin-based flux with converting chlorine content of 0.06 to 0.1wt%.
  In case of using RA type solder, products should be cleaned completely with no residual flux.
- Do not use strong acidic flux (with chlorine content exceeding 0.20wt%)
- Do not use water-soluble flux.

For additional mounting methods, please contact Murata.

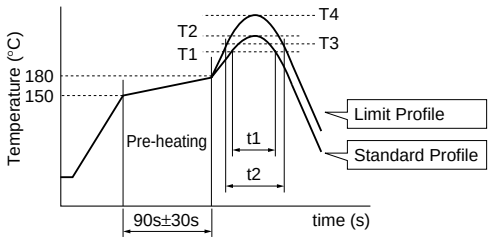
(2) Soldering Profile

●Flow Soldering Profile
(Sn-3.0Ag-0.5Cu Solder)



Series	Pre-heating		Standard Profile			Limit Profile		
			Heating		Cycle of Flow	Heating		Cycle of Flow
	Temp. (T1)	Time. (t1)	Temp. (T2)	Time. (t2)		Temp. (T3)	Time. (t2)	
DLM2HG DLP31D/31S	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	2 times max.

●Reflow Soldering Profile
(Sn-3.0Ag-0.5Cu Solder)



Series	Standard Profile				Limit Profile			
	Heating		Peak Temperature (T2)	Cycle of Reflow	Heating		Peak Temperature (T4)	Cycle of Reflow
	Temp. (T1)	Time. (t1)			Temp. (T3)	Time. (t2)		
DLM/DLP DLW21/31	220°C min.	30 to 60s	245±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.
DLW5A/5B	220°C min.	30 to 60s	250±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.

(3) Reworking with Solder Iron

The following conditions must be strictly followed when using a soldering iron.

Pre-heating: 150°C 60s min.

Soldering iron power output / Tip diameter:

30W max. / ø3mm max.

Temperature of soldering iron tip / Soldering time / Times:

350°C max. / 3-4s / 2 times*1

*1 DLP0NS, DLP11S, DLP2AD: 380°C max. / 3-4s / 2 times

Do not allow the tip of the soldering iron to directly contact the chip.

For additional methods of reworking with a soldering iron, please contact Murata engineering.

4. Cleaning

Following conditions should be observed when cleaning chip EMI filter.

(1) Cleaning Temperature: 60°C max. (40°C max. for alcohol type cleaner)

(2) Ultrasonic

Output: 20W/liter max.

Duration: 5 minutes max.

Frequency: 28 to 40kHz

(3) Cleaning agent

The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production.

Do not clean DLW (except DLW21H) series.

Before cleaning, please contact Murata engineering.

(a) Alcohol cleaning agent

Isopropyl alcohol (IPA)

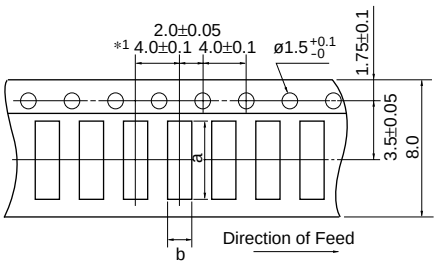
(b) Aqueous cleaning agent

Pine Alpha ST-100S

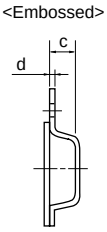
(4) Ensure that flux residue is completely removed.

Component should be thoroughly dried after aqueous agent has been removed with deionized water.

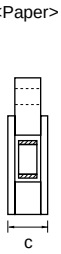
■ Minimum Quantity and Dimensions of 8mm Width Paper / Embossed Tape



*1 DLM11G: 2.0±0.05



c: Depth of Cavity (Embossed Tape)

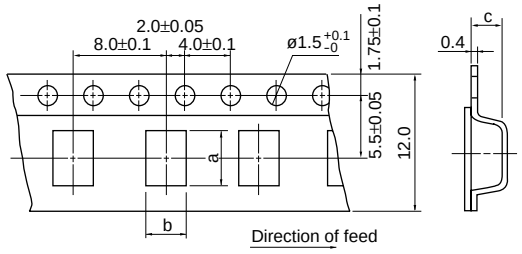


c: Total Thickness of Tape (Paper Tape)

Part Number	Cavity Size				Minimum Qty. (pcs.)				
					ø180mm Reel		ø330mm Reel		Bulk
	a	b	c	d	Paper Tape	Embossed Tape	Paper Tape	Embossed Tape	
DLM11G	1.45	1.2	0.8 max.	-	10000	-	-	-	1000
DLM2HG	2.75	2.25	1.3	0.25	-	3000	-	-	1000
DLP0NS	0.95	0.75	0.55	0.25	-	5000	-	-	500
DLP11S	1.4	1.2	0.98	0.25	-	3000	-	-	500
DLP2AD	2.2	1.2	0.98	0.25	-	3000	-	-	500
DLP31D/31S	3.5	1.9	1.3	0.25	-	3000	-	-	500
DLW21S	2.25	1.45	1.4	0.3	-	2000	-	-	500
DLW21H	2.3	1.55	1.1	0.25	-	3000	-	-	500
DLW31S	3.6	2.0	2.1	0.3	-	2000	-	-	500

(in mm)

■ Minimum Quantity and Dimensions of 12mm Width Embossed Tape



c: Depth of Cavity

Part Number	Cavity Size			Minimum Qty. (pcs.)		
	a	b	c	ø180mm Reel	ø330mm Reel	Bulk
DLW5AH	5.4	4.1	4.4	400	1500	100
DLW5BS	5.5	5.4	4.7	400	1500	100
DLW5BT	5.5	5.4	2.7	700	2500	100

(in mm)

"Minimum Quantity" means the number of units of each delivery or order. The quantity should be an integral multiple of the "Minimum Quantity".

●EKEMDL21J (Chip Common Mode Choke Coils)

No.	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)
1	**DLW21HN670SQ2**	10	67Ω±25%	50	330	10
2	**DLW21HN900SQ2**	10	90Ω±25%	50	330	10
3	**DLW21HN121SQ2**	10	120Ω±25%	50	280	10
4	**DLW21HN181SQ2**	10	180Ω±25%	50	250	10
5	**DLW21SN670SQ2**	10	67Ω±25%	50	400	10
6	**DLW21SN900SQ2**	10	90Ω±25%	50	330	10
7	**DLW21SN121SQ2**	10	120Ω±25%	50	370	10
8	**DLW21SN181SQ2**	10	180Ω±25%	50	330	10
9	**DLW21SN261SQ2**	10	260Ω±25%	50	300	10
10	**DLW21SN371SQ2**	10	370Ω±25%	50	280	10
11	**DLW21SN670HQ2**	10	67Ω±25%	20	320	10
12	**DLW21SN900HQ2**	10	90Ω±25%	20	280	10
13	**DLW21SN121HQ2**	10	120Ω±25%	20	280	10
14	**DLW21SR670HQ2**	10	67Ω±25%	20	400	10
15	**DLP0NSN670HL2**	10	67Ω±20%	5	110	100
16	**DLP0NSN900HL2**	10	90Ω±20%	5	100	100
17	**DLP0NSN121HL2**	10	120Ω±20%	5	90	100
18	**DLP11SN670SL2**	10	67Ω±20%	5	180	100
19	**DLP11SN121SL2**	10	120Ω±20%	5	140	100
20	**DLP11SN161SL2**	10	160Ω±20%	5	120	100
21	**DLP11SN900HL2**	10	90Ω±20%	5	150	100
22	**DLP11SN201HL2**	10	200Ω±20%	5	110	100
23	**DLP11SN241HL2**	10	240Ω±20%	5	100	100
24	**DLP11SN281HL2**	10	280Ω±20%	5	90	100
25	**DLP11SN331HL2**	10	330Ω±20%	5	80	100
26	**DLP11SA350HL2**	10	35Ω±25%	5	170	100
27	**DLP11SA670HL2**	10	67Ω±25%	5	150	100
28	**DLP11SA900HL2**	10	90Ω±25%	5	150	100
29	**DLP2ADN670HL4**	10	67Ω±20%	5	140	100
30	**DLP2ADN900HL4**	10	90Ω±20%	5	130	100
31	**DLP2ADN121HL4**	10	120Ω±20%	5	120	100
32	**DLP2ADN161HL4**	10	160Ω±20%	5	100	100
33	**DLP2ADN201HL4**	10	200Ω±20%	5	90	100
34	**DLP2ADN241HL4**	10	240Ω±20%	5	80	100
35	**DLP2ADN281HL4**	10	280Ω±20%	5	80	100

●EKEMDCC5B (Chip Common Mode Choke Coils for DC Power Line / SMD Block type EMIFIL® for Power Line)

No.	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)
1	**DLW5AHN402SQ2**	5	4000Ω (Typ.)	50	200	10
2	**DLW5BSN191SQ2**	5	190Ω (Typ.)	50	5000	10
3	**DLW5BSN351SQ2**	5	350Ω (Typ.)	50	2000	10
4	**DLW5BSN102SQ2**	5	1000Ω (Typ.)	50	1500	10
5	**DLW5BSN152SQ2**	5	1500Ω (Typ.)	50	1000	10
6	**DLW5BSN302SQ2**	5	3000Ω (Typ.)	50	500	10
7	**DLW5BTN101SQ2**	5	100Ω (Typ.)	50	6000	10
8	**DLW5BTN251SQ2**	5	250Ω (Typ.)	50	5000	10
9	**DLW5BTN501SQ2**	5	500Ω (Typ.)	50	4000	10
10	**DLW5BTN102SQ2**	5	1000Ω (Typ.)	50	2000	10
11	**DLW5BTN142SQ2**	5	1400Ω (Typ.)	50	1500	10

No.	Part Number	Quantity (pcs.)	Insertion Loss	Rated Voltage (Vdc)	Rated Current (A)	Insulation Resistance (MΩ min.)
12	**BNX022-01**	5	1MHz to 1GHz: 35dB min.	50	10	500
13	**BNX023-01**	5	1MHz to 1GHz: 35dB min.	100	15	500

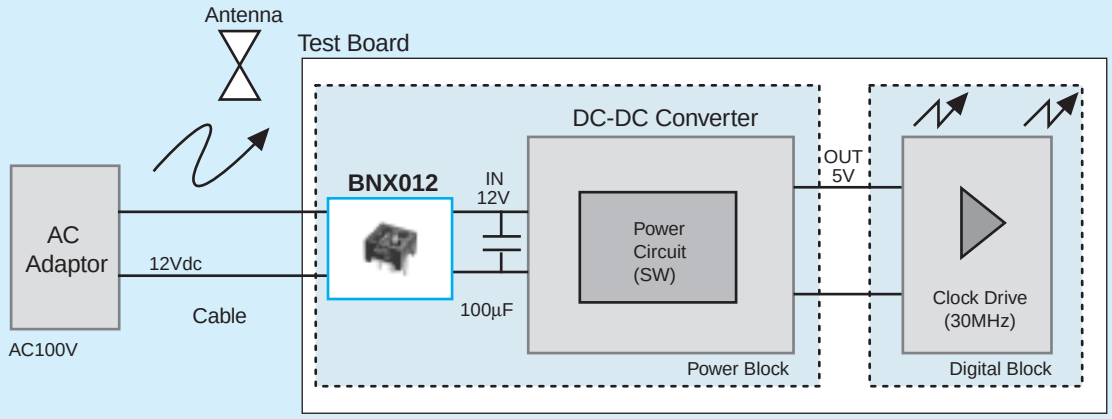
BNX

Block Type EMIFIL®

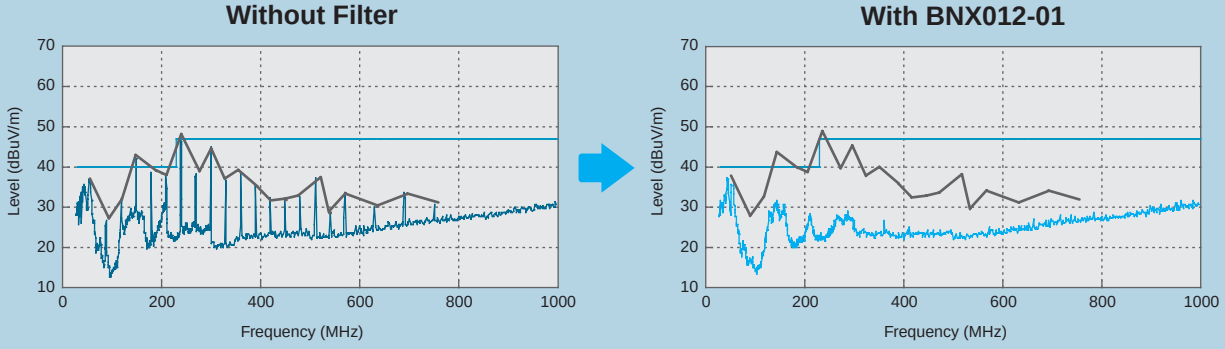
muRata

Type	Part Number	Rated Voltage	Effective Frequency Range	Rated Current	Kit ≧3A Flow ReFlow
SMD Type p165	**BNX022-01**	50Vdc	1MHz to 1GHz:35dB min.	10A	Kit ≧3A ReFlow
	BNX023-01	100Vdc	1MHz to 1GHz:35dB min.	15A	Kit ≧3A ReFlow
Lead Type p166	**BNX002-01**	50Vdc	1MHz to 1GHz:40dB min.	10A	Kit ≧3A Flow
	BNX003-01	150Vdc	5MHz to 1GHz:40dB min.	10A	Kit ≧3A Flow
	BNX005-01	50Vdc	1MHz to 1GHz:40dB min.	15A	Kit ≧3A Flow
Lead Type Low Profile p167	**BNX012-01**	50Vdc	1MHz to 1GHz:40dB min.	15A	Kit ≧3A Flow
	BNX016-01	25Vdc	100kHz to 1GHz:40dB min.	15A	Kit ≧3A Flow

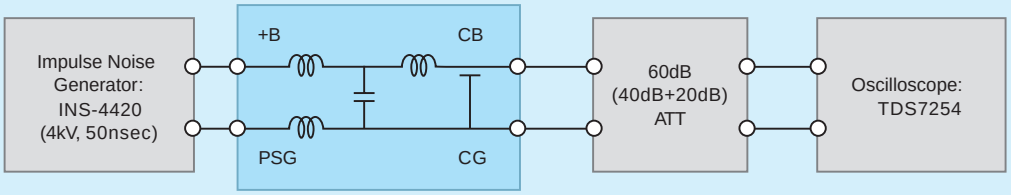
Noise Suppression of Radiation Noise from Power Line Cable



■Test Result

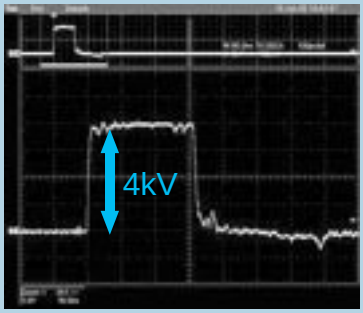


Impulse Noise Countermeasure



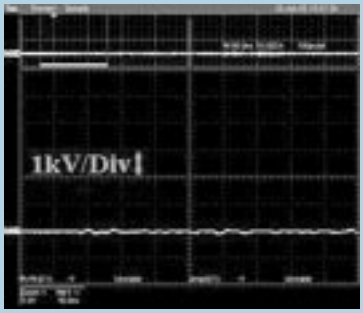
BNX

■Without Filter

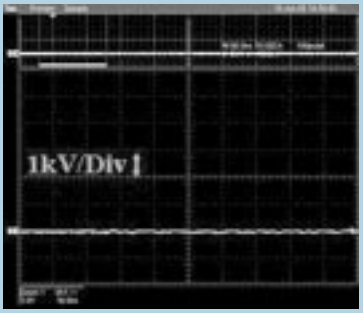


Applied Impulse Voltage: 4kV/50nS
Y-AXIS: 1kV/div

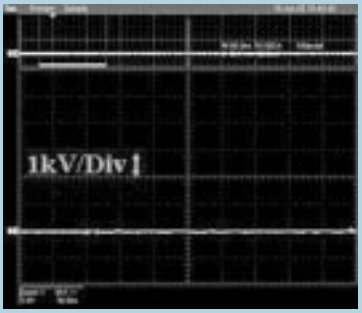
■With Filter



BNX002-01

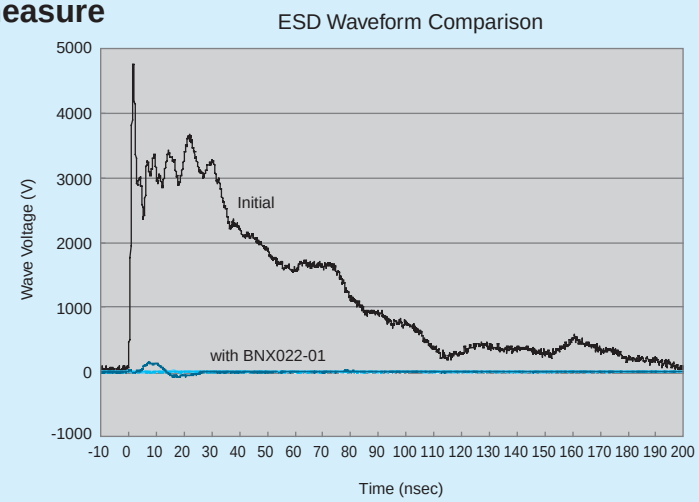


BNX012-01



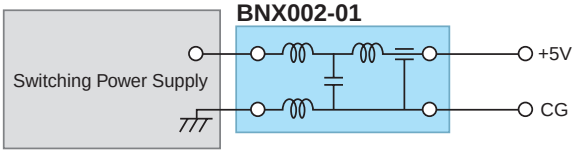
BNX022-01

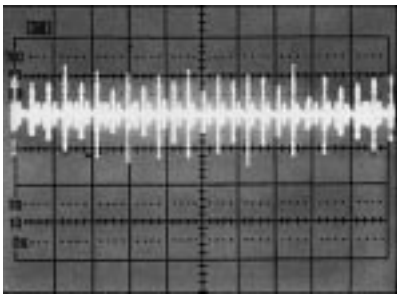
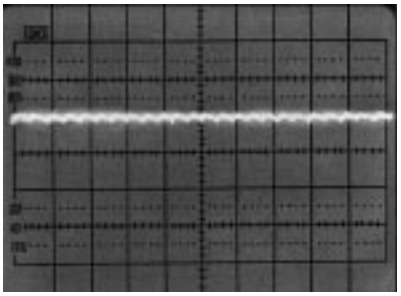
ESD Countermeasure



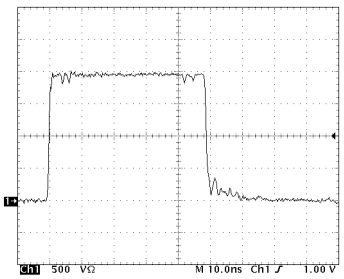
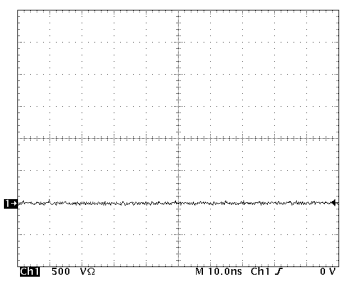
Suppression of Ripple Noise of DC Side in the Switching Power Supply

Test Circuit



Type of Filter	EMI Suppression Effect / Description
Without Filter	+5.0V→ 50µs/div 0.2V/div  There is high frequency noise of 0.5V maximum.
When **BNX002-01** is used	+5.0V→ 50µs/div 0.2V/div  BNX002-01 can suppress most of noise.

Example of Impulse Noise Suppression

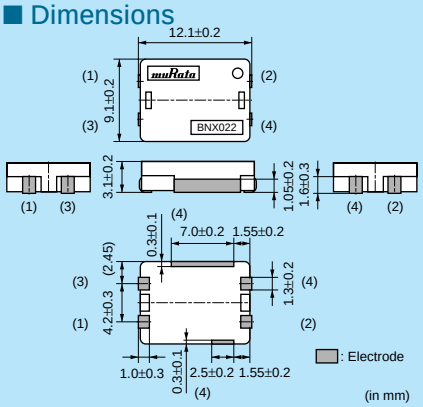
Type of Filter	EMI Suppression Effect
Without Filter	 Impulse Noise 2000V/50ns Y-axis: 500V/div X-axis: 10ns/sec
When **BNX002** is used	 Y-axis: 500V/div X-axis: 10ns/sec

BNX02□ Series

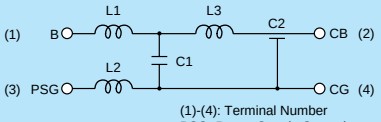
Hi Power Reflow OK

SMD package of block type EMIFIL®.

■ Dimensions



■ Equivalent Circuit



(1)-(4): Terminal Number
PSG: Power Supply Ground
CG: Circuit Ground
CB: Circuit+B

■ Packaging

Code	Packaging	Minimum Quantity
L	180mm Reel Embossed Tape	400
K	330mm Reel Embossed Tape	1500
B	Bulk(Bag)	100

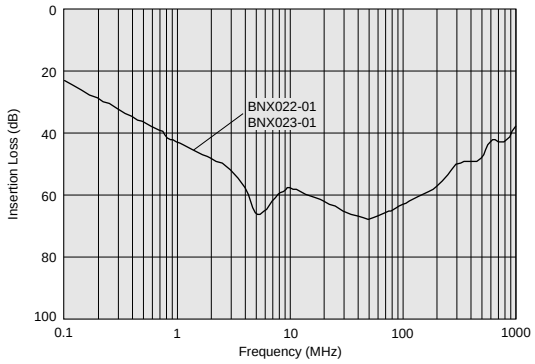
Refer to pages from p.170 to p.173 for mounting information.

■ Rated Value (□: packaging code)

Part Number	Rated Voltage	Withstand Voltage	Rated Current	Insulation Resistance (min.)	Insertion Loss (20 to 25 degrees C line impedance=50 ohm)	
BNX022-01□	50Vdc	125Vdc	10A	500M ohm	1MHz to 1GHz:35dB min.	Kit ≧3A
BNX023-01□	100Vdc	250Vdc	15A	500M ohm	1MHz to 1GHz:35dB min.	Kit ≧3A

Operating Temperature Range: -40°C to +125°C

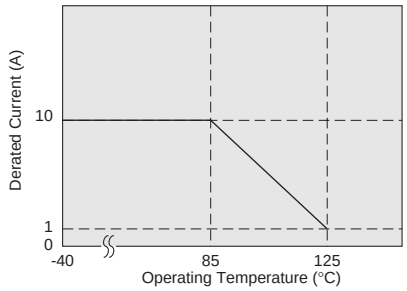
■ Insertion Loss Characteristics



■ Notice (Rating)

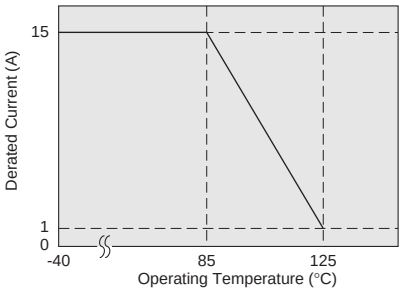
In operating temperatures exceeding +85°C, derating of current is necessary for BNX022 series. Please apply the derating curve shown in chart according to the operating temperature.

Derating



In operating temperatures exceeding +85°C, derating of current is necessary for BNX023 series. Please apply the derating curve shown in chart according to the operating temperature.

Derating

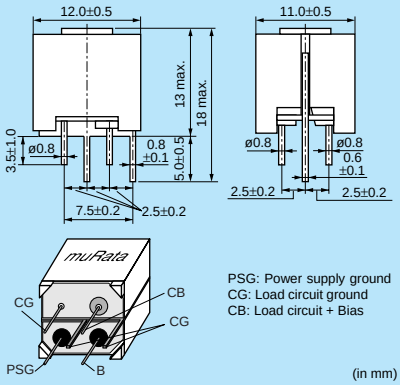


BNX00□ Series

Large insertion loss from several hundred kHz to several GHz.

BNX002/BNX003

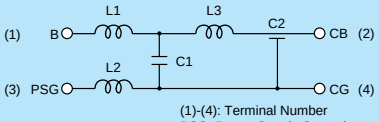
■ Dimensions



PSG: Power supply ground
CG: Load circuit ground
CB: Load circuit + Bias

(in mm)

■ Equivalent Circuit



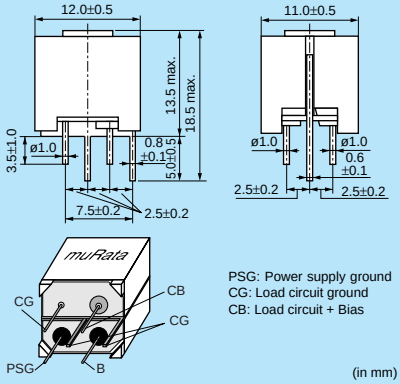
(1)-(4): Terminal Number
PSG: Power Supply Ground
CG: Circuit Ground
CB: Circuit+B

■ Packaging

Code	Packaging	Minimum Quantity
-	Box	100

BNX005

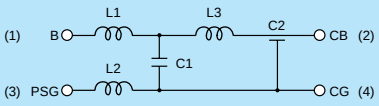
■ Dimensions



PSG: Power supply ground
CG: Load circuit ground
CB: Load circuit + Bias

(in mm)

■ Equivalent Circuit



(1)-(4): Terminal Number
PSG: Power Supply Ground
CG: Circuit Ground
CB: Circuit+B

■ Packaging

Code	Packaging	Minimum Quantity
-	Box	100

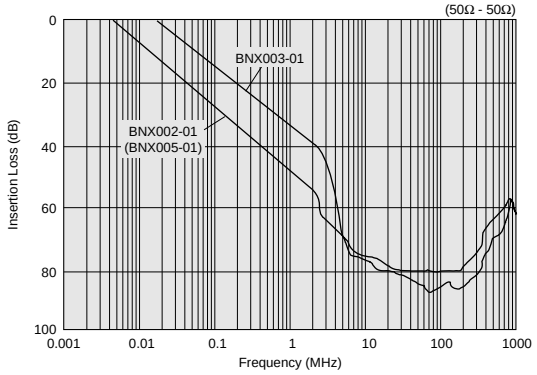
Refer to pages from p.170 to p.173 for mounting information.

■ Rated Value

Part Number	Rated Voltage	Withstand Voltage	Rated Current	Insulation Resistance (min.)	Insertion Loss (20 to 25 degrees C line impedance=50 ohm)	
BNX002-01	50Vdc	125Vdc	10A	100M ohm	1MHz to 1GHz:40dB min.	Kit ≧3A
BNX003-01	150Vdc	375Vdc	10A	100M ohm	5MHz to 1GHz:40dB min.	Kit ≧3A
BNX005-01	50Vdc	125Vdc	15A	100M ohm	1MHz to 1GHz:40dB min.	Kit ≧3A

Operating Temperature Range: -30°C to +85°C

■ Insertion Loss Characteristics

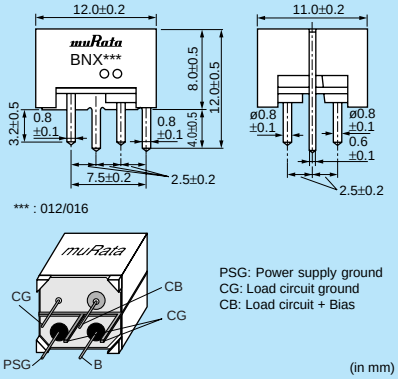


BNX01□ Series

Hi Power Flow OK

Low profile version of BNX series.

■ Dimensions

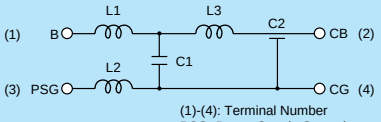


*** : 012/016

PSG: Power supply ground
CG: Load circuit ground
CB: Load circuit + Bias

(in mm)

■ Equivalent Circuit



(1)-(4): Terminal Number
PSG: Power Supply Ground
CG: Circuit Ground
CB: Circuit+B

■ Packaging

Code	Packaging	Minimum Quantity
-	Box	150

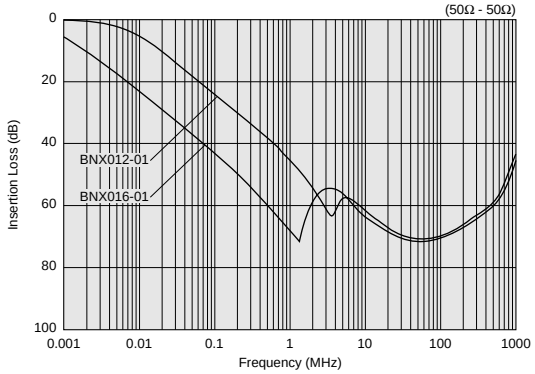
Refer to pages from p.170 to p.173 for mounting information.

■ Rated Value

Part Number	Rated Voltage	Withstand Voltage	Rated Current	Insulation Resistance (min.)	Insertion Loss (20 to 25 degrees C line impedance=50 ohm)	
BNX012-01	50Vdc	125Vdc	15A	500M ohm	1MHz to 1GHz:40dB min.	Kit ≧3A
BNX016-01	25Vdc	62.5Vdc	15A	50M ohm	100kHz to 1GHz:40dB min.	Kit ≧3A

Operating Temperature Range: -40°C to +125°C

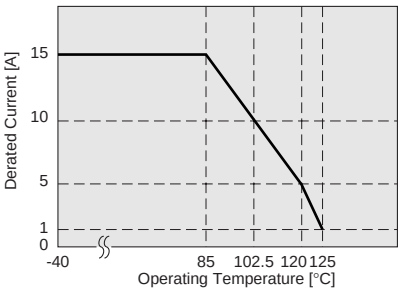
■ Insertion Loss Characteristics



■ Notice (Rating)

In operating temperatures exceeding +85°C, derating of current is necessary for BNX01□ series. Please apply the derating curve shown in chart according to the operating temperature.

Derating



● Connecting ± power line

In case of using ± power line, please connect to each terminal as shown.

Power Supply (BNX Input)		BNX			Circuit (BNX Output)
Power Supply +Bias	-	B	CB	-	Load Circuit +Bias
Power Supply Ground	-	PSG	CG	-	Load Circuit Ground
Power Supply -Bias	-	B	CB	-	Load Circuit -Bias
Power Supply Ground	-	PSG	CG	-	Load Circuit Ground

⚠Caution

● Rating

Do not use products beyond the rated current and rated voltage as this may create excessive heat and deteriorate the insulation resistance.

Notice

● Storage and Operating Conditions

<Operating Environment>
Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.
Do not use products in the environment close to the organic solvent.
<Storage and Handling Requirements>
1. Storage Period
   BNX series should be used within 12 months. Solderability should be checked if this period is exceeded.
2. Storage Conditions
   (1) Storage temperature: -10 to +40˚C
   Relative humidity: 30 to 70%
   Avoid sudden changes in temperature and humidity.
   (2) Do not store products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

● Notice (Soldering and Mounting)

1. Cleaning
   Do not clean BNX series (SMD Type).
   Before cleaning, please contact Murata engineering.
2. Soldering
   Reliability decreases with improper soldering methods. Please solder by the standard soldering conditions shown in mounting information.
3. Other
   Noise suppression levels resulting from Murata's EMI suppression filters EMIFIL® may vary, depending on the circuits and ICs used, type of noise, mounting pattern, mounting location, and other operating conditions. Be sure to check and confirm in advance the noise suppression effect of each filter, in actual circuits, etc. before applying the filter in a commercial-purpose equipment design.

● Handling

• Resin Coating
Using resin for coating/molding products may affect the products performance.
So please pay careful attention in selecting resin.
Prior to use, please make the reliability evaluation with the product mounted in your application set.

⚠Caution

● Rating

Do not use products beyond the rated current and rated voltage as this may create excessive heat and deteriorate the insulation resistance.

Notice

● Storage and Operating Conditions

<Operating Environment>

1. Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.
2. Do not use products near water, oil or organic solvents.

<Storage and Handling Requirements>

1. Storage Period
   BNX Series should be used within 12 months. Solderability should be checked if this period is exceeded.
2. Storage Conditions
   (1) Storage temperature: -10 to +40˚C
   Relative humidity: 30 to 70%
   Avoid sudden changes in temperature and humidity.
   (2) Do not store products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

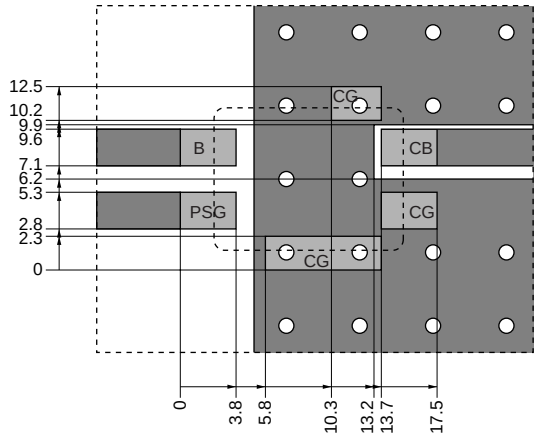
● Notice (Soldering and Mounting)

1. Cleaning
   Failure and degradation of a product are caused by the cleaning method. When you clean in conditions that are not in mounting information, please contact Murata engineering.
2. Soldering
   Reliability decreases with improper soldering methods. Please solder by the standard soldering conditions shown in mounting information.
3. Other
   Noise suppression levels resulting from Murata's EMI suppression filters EMIFIL® may vary, depending on the circuits and ICs used, type of noise, mounting pattern, lead wire length, mounting location, and other operating conditions. Be sure to check and confirm in advance the noise suppression effect of each filter, in actual circuits, etc. before applying the filter in a commercial-purpose equipment design.

1. Standard Land Pattern Dimensions

Land Pattern + Solder Resist
Land Pattern Solder Resist
(in mm)

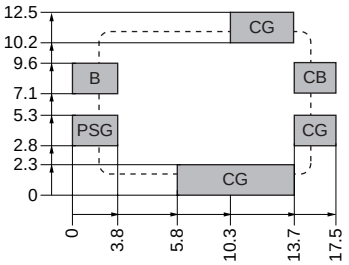
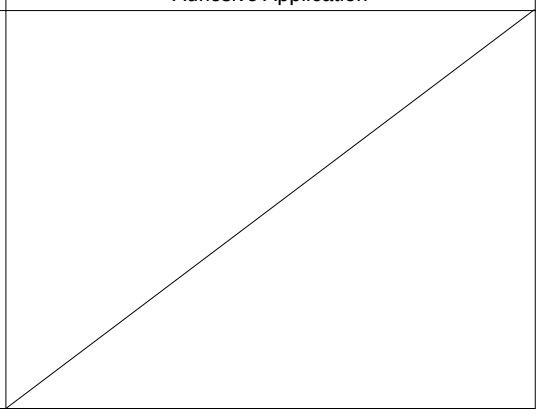
BNX022
BNX023



(1) A double-sided print board (or multilayer board) as shown in the left figure is designed, and please apply a soldering Cu electrode with a product electrode to a "Land Pattern", apply resist to a "Land Pattern + Solder Resist" at Cu electrode.
(2) Please drop CG on a ground electrode on the back layer (the same also in a multilayer case) by the through hole. And a surface grand electrode layer may also take a large area as much as possible.
(3) It is recommended to use a double-sided printed circuit board with BNX mounting on one side and the ground pattern on the other in order to maximize filtering performance, multiple feed through holes are required to maximize the BNX's connection to ground.
(4) The ground pattern should be designed to be as large as possible to achieve maximum filtering performance.

2. Solder Paste Printing and Adhesive Application

When reflow soldering the block type EMIFIL®, the printing must be conducted in accordance with the following cream solder printing conditions.
If too much solder is applied, the chip will be prone to damage by mechanical and thermal stress from the PCB and may crack.
Standard land dimensions should be used for resist and copper foil patterns.

Series	Solder Paste Printing	Adhesive Application
BNX022 **BNX023**	●Guideline of solder paste thickness: 150-200µm 	

3. Standard Soldering Conditions

(1) Soldering Methods
Use reflow soldering methods only.
Use standard soldering conditions when soldering block type EMIFIL® SMD type.
In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

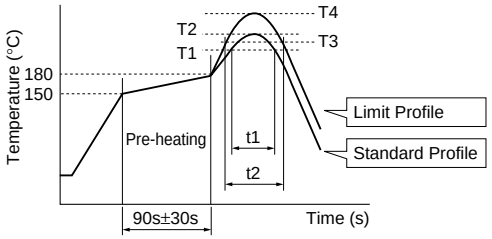
Solder: Use Sn-3.0Ag-0.5Cu solder. Use of Sn-Zn based solder will deteriorate performance of products.

Flux:
● Use Rosin-based flux.
In case of using RA type solder, products should be cleaned completely with no residual flux.
● Do not use strong acidic flux (with chlorine content exceeding 0.20wt%)
● Do not use water-soluble flux.

For additional mounting methods, please contact Murata.

(2) Soldering Profile

●Reflow Soldering Profile
(Sn-3.0Ag-0.5Cu solder)



Series	Standard Profile				Limit Profile			
	Heating		Peak Temperature (T2)	Cycle of Reflow	Heating		Peak Temperature (T4)	Cycle of Reflow
	Temp. (T1)	Time. (t1)			Temp. (T3)	Time. (t2)		
BNX022/023	220°C min.	30 to 60s	250±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.

(3) Reworking with Solder Iron

The following conditions must be strictly followed when using a soldering iron.
Pre-heating: 150°C 60s min.
Soldering iron power output: 100W max.
Temperature of soldering iron tip / Soldering time / Times:
450°C max. / 5s max. / 1 time

Do not allow the tip of the soldering iron to directly contact the chip.
For additional methods of reworking with a soldering iron, please contact Murata engineering.

4. Cleaning

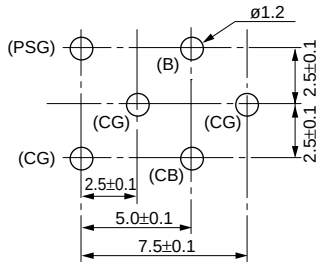
Do not clean BNX022/023 series. In case of cleaning, please contact Murata engineering.

1. Mounting Hole

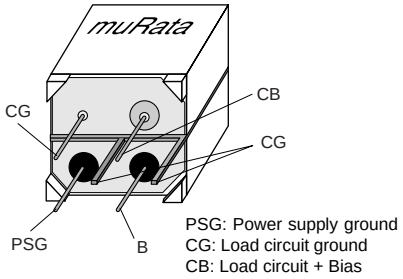
■ Mounting holes should be designed as specified below.

BNX00□/01□

Component Side



Terminal Layout (Bottom figure)



2. Using the Block Type EMIFIL® (Lead Type) Effectively

(1) How to use effectively

This product effectively prevents undesired radiation and external noise from going out / entering the circuit by grounding the high frequency components which cause noise problems. Therefore, grounding conditions may affect the performance of the filter and attention should be paid to the following for effective use.

(a) Design maximized grounding area in the P.C. board, and grounding pattern for all the grounding terminals of the product to be connected. (Please follow the specified recommendations.)

(b) Minimize the distance between ground of the P.C. board and the ground plate of the product. (Recommend unsing the through hole connection between grounding area both of component side and bottom side.)

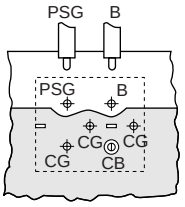
(c) Insert the terminals into the holes on P.C. board completely.

(d) Don't connect PSG terminal with CG terminal directly. (See the item 1. Terminal Layout)

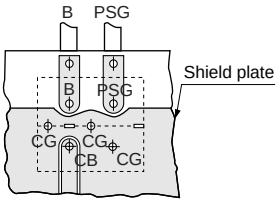
P. C. Board Patterns

Use a bilateral P.C. board. Insert the BNX into the P.C.board until the root of the terminal is secured, then solder.

(1) Component Side View



(2) Bottom View



Copper foil pattern

(2) Self-heating

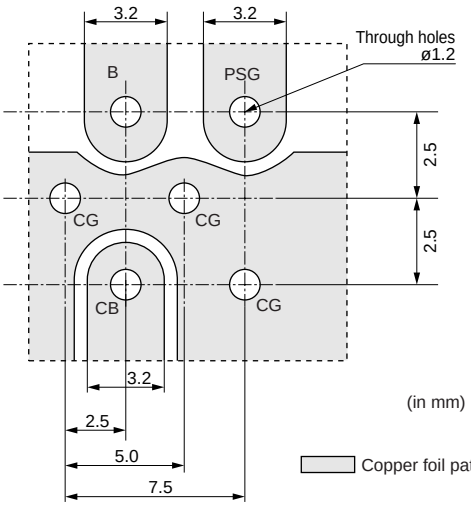
Though this product has a large rated current, localized selfheating may be caused depending on soldering conditions. To avoid this, attention should be paid to the following:

(a) Use P.C. board with our recommendation on hole diameter / land pattern dimensions, mentioned in the right hand drawing, especially for 4 terminals which pass current.

(b) Solder the terminals to the P.C. board with soldercover area at least 90%. Otherwise, excess self-heating at connection between terminals and P.C. board may lead to smoke and / or fire of the product even when operating at rated current.

(c) After installing this product in your product, please make sure the self-heating is within the rated current recommended.

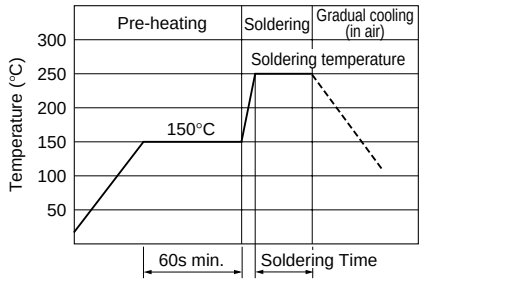
Recommended Land Pattern



Copper foil pattern

3. Soldering

(1) Use Sn-3.0Ag-0.5Cu solder.
(2) Use Rosin-based flux. Do not use strong acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).
(3) Products and the leads should not be subjected to any mechanical stress during the soldering process, or while subjected to the equivalent high temperatures.
(4) Standard flow soldering profile

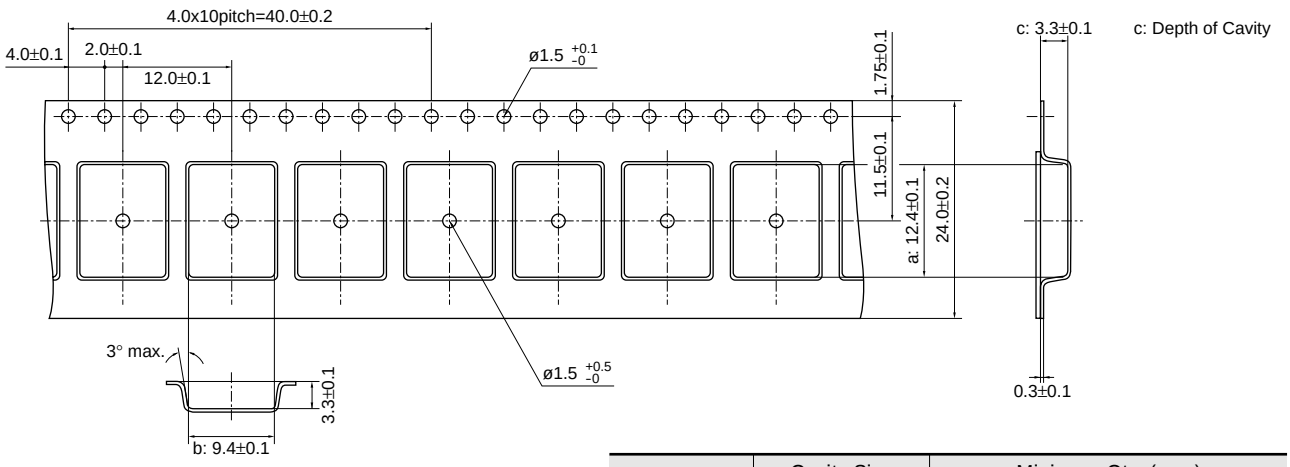


Solder	Soldering Temperature	Soldering Time
Sn-3.0Ag-0.5Cu solder	250 to 260˚C	4 to 6s

4. Cleaning

Clean the block Type EMIFIL®(Lead Type) in the following conditions.
(1) Cleaning temperature should be limited to 60°C max. (40°C max for alcohol type cleaner).
(2) Ultrasonic cleaning should comply with the following conditions, avoiding the resonance phenomenon at the mounted products and P.C.B.
Power: 20W/liter max.
Frequency: 28 to 40kHz
Time: 5 min. max.
(3) Cleaner
(a) Alcohol type cleaner
Isopropyl alcohol (IPA)
(b) Aqueous agent
Pine Alpha ST-100S
(4) There should be no residual flux or residual cleaner left after cleaning.
In the case of using aqueous agent, products should be dried completely after rinsing with de-ionized water in order to remove the cleaner.
(5) The surface of products may become dirty after cleaning, but there is no deterioration on mechanical, electrical characteristics and reliability.
(6) Other cleaning: Please contact us.

■ Minimum Quantity and Dimensions of 24mm Width Embossed Tape



Part Number	Cavity Size			Minimum Qty. (pcs.)		
	a	b	c	ø180mm Reel	ø330mm Reel	Bulk
BNX022/023	12.4	9.4	3.3	400	1500	100

(in mm)

"Minimum Quantity" means the number of units of each delivery or order. The quantity should be an integral multiple of the "Minimum Quantity".

●EKEPBNX0A

No.	Part Number	Quantity (pcs.)	Insertion Loss	Rated Voltage (Vdc)	Rated Current (A)	Insulation Resistance (MΩ min.)
1	**BNX002-01**	1	1MHz to 1GHz : 40dB min.	50	10	100
2	**BNX012-01**	1	1MHz to 1GHz : 40dB min.	50	15	500
3	**BNX016-01**	1	100kHz to 1GHz : 40dB min.	25	15	50
4	**BNX012H01**	1	1MHz to 1GHz : 40dB min.	50	15	500
5	**BNX022-01**	3	1MHz to 1GHz : 35dB min.	50	10	500
6	**BNX023-01**	3	1MHz to 1GHz : 35dB min.	100	15	500
7	**BNX024H01**	3	100kHz to 1GHz : 35dB min.	50	15	100
8	**BNX025H01**	3	50kHz to 1GHz : 35dB min.	25	15	50

●EKEPBLCKA

No.	Part Number	Quantity (pcs.)	Insertion Loss	Rated Voltage (Vdc)	Rated Current (A)	Insulation Resistance (MΩ min.)
1	**BNX002-01**	1	1MHz to 1GHz : 40dB min.	50	10	100
2	**BNX003-01**	1	5MHz to 1GHz : 40dB min.	150	10	100
3	**BNX005-01**	1	1MHz to 1GHz : 40dB min.	50	15	100
4	**BNX012-01**	1	1MHz to 1GHz : 40dB min.	50	15	500
5	**BNX016-01**	1	100kHz to 1GHz : 40dB min.	25	15	50
6	**BNX012H01**	1	1MHz to 1GHz : 40dB min.	50	15	500
7	**BNP002-02**	1	20MHz to 500MHz : 40dB min.	50	10	1000
8	**BNX022-01**	3	1MHz to 1GHz : 35dB min.	50	10	500
9	**BNX023-01**	3	1MHz to 1GHz : 35dB min.	100	15	500
10	**BNX024H01**	3	100kHz to 1GHz : 35dB min.	50	15	100
11	**BNX025H01**	3	50kHz to 1GHz : 35dB min.	25	15	50

●EKEMDCC5B (Chip Common Mode Choke Coils for DC Power Line / SMD Block type EMIFIL® for Power Line)

No.	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Current (mA)	Insulation Resistance (MΩ min.)
1	**DLW5AHN402SQ2**	5	4000Ω (Typ.)	50	200	10
2	**DLW5BSN191SQ2**	5	190Ω (Typ.)	50	5000	10
3	**DLW5BSN351SQ2**	5	350Ω (Typ.)	50	2000	10
4	**DLW5BSN102SQ2**	5	1000Ω (Typ.)	50	1500	10
5	**DLW5BSN152SQ2**	5	1500Ω (Typ.)	50	1000	10
6	**DLW5BSN302SQ2**	5	3000Ω (Typ.)	50	500	10
7	**DLW5BTN101SQ2**	5	100Ω (Typ.)	50	6000	10
8	**DLW5BTN251SQ2**	5	250Ω (Typ.)	50	5000	10
9	**DLW5BTN501SQ2**	5	500Ω (Typ.)	50	4000	10
10	**DLW5BTN102SQ2**	5	1000Ω (Typ.)	50	2000	10
11	**DLW5BTN142SQ2**	5	1400Ω (Typ.)	50	1500	10

No.	Part Number	Quantity (pcs.)	Insertion Loss	Rated Voltage (Vdc)	Rated Current (A)	Insulation Resistance (MΩ min.)
12	**BNX022-01**	5	1MHz to 1GHz: 35dB min.	50	10	500
13	**BNX023-01**	5	1MHz to 1GHz: 35dB min.	100	15	500

Memo

EA

Microwave Absorber

(Part Number)

EA	1026	A	160	M	200	200
❶	❷	❸	❹	❺	❻	❼

❶Product ID

Product ID	
EA	Microwave Absorber

❷Sheet Type

Code	Sheet Type
10□□	Iron carbonyl type (UL certified type/non Halogen type)
2070	Metal Flake Powder (non Halogen type)
2100	Metal Flake Powder (UL certified type)
2200	Metal Flake Powder (UL certified type/non Halogen type)
3008	Magnetic material (UL certified type/non Halogen type)

❸Adhesive Tape Type

Code	Adhesive Tape Type
A	Standard tape type (non Halogen type)
B	Thin Adhesive tape type (non Halogen type)
L	No tape type
U	UL certified type (non Halogen type)

❹Sheet Thickness

Expressed by 3 digits including the second decimal place in mm.

Ex.)

Code	Sheet Thickness
020	0.20mm

❺Unit of Dimension

One capital lettler expresses Unit of Dimension (❻) and Dimensions Length (❼).

Code	Unit of Dimension
M	in mm (Standard)
C	in cm (Standard)

Standard shape is a rectangle.
Please contact us for other shapes.

❻Dimension (Length)

Expressed by 3 digits including the first decimal place.

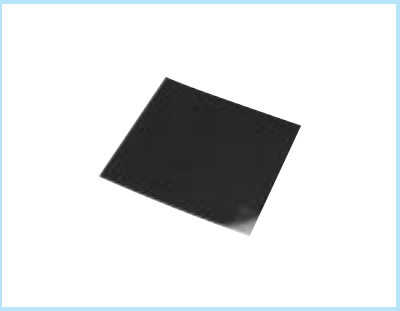
❼Dimension (Width)

Expressed by 3 digits including the first decimal place.

Ex.)

Code	Dimension (Length × Width)
M300150	30.0×15.0 mm
C150100	15.0×10.0 cm

EA10 Series



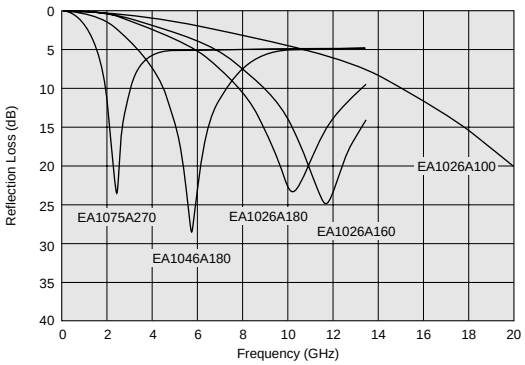
■ Packaging

When inquiring, please contact us with size code, refering to "Part Numbering".

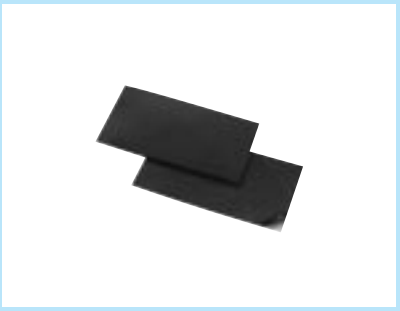
■ Rated Value

Part Number	Applicable Frequency (Typ.)	Thickness (Typ.)	Flame Class	Halogen	Operating Temperature Range
EA1026A100	20.0GHz	1.0mm	UL94V-0	Halogen Free	-40 to +80°C
EA1026A160	11.5GHz	1.6mm	UL94V-0	Halogen Free	-40 to +80°C
EA1026A180	10.0GHz	1.8mm	UL94V-0	Halogen Free	-40 to +80°C
EA1046A180	5.8GHz	1.8mm	UL94V-0	Halogen Free	-40 to +80°C
EA1075A270	2.5GHz	2.7mm	UL94V-0	Halogen Free	-40 to +80°C

■ Reflection Loss (Typ.)



EA20/EA21/EA22 Series



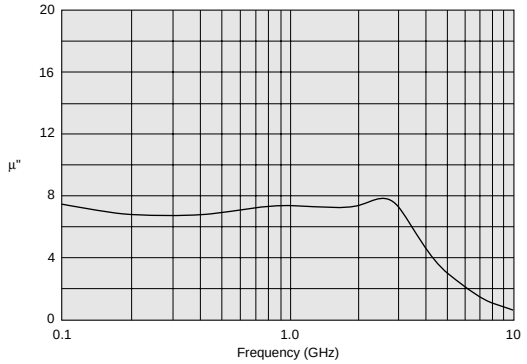
■ Packaging

When inquiring, please contact us with size code, refering to "Part Numbering".

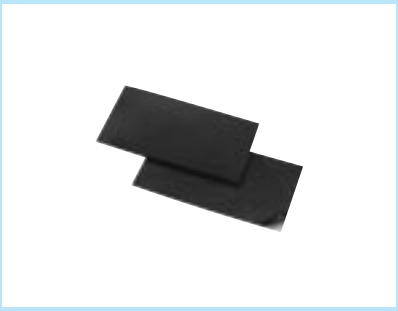
■ Rated Value

Part Number	Applicable Frequency (Typ.)	Thickness (Typ.)	Flame Class	Halogen	Operating Temperature Range
EA2070A020	0.1 to 3.0GHz	0.20mm	-	Halogen Free	-40 to +120°C
EA2070A050	0.1 to 3.0GHz	0.50mm	-	Halogen Free	-40 to +120°C
EA2070A100	0.1 to 3.0GHz	1.00mm	-	Halogen Free	-40 to +120°C
EA2070B005	0.1 to 3.0GHz	0.05mm	-	Halogen Free	-40 to +120°C
EA2070B010	0.1 to 3.0GHz	0.10mm	-	Halogen Free	-40 to +120°C
EA2070B013	0.1 to 3.0GHz	0.13mm	-	Halogen Free	-40 to +120°C
EA2070B020	0.1 to 3.0GHz	0.20mm	-	Halogen Free	-40 to +120°C
EA2070B050	0.1 to 3.0GHz	0.50mm	-	Halogen Free	-40 to +120°C
EA2100A020	0.1 to 3.0GHz	0.20mm	UL94V-0	-	-40 to +120°C
EA2100A050	0.1 to 3.0GHz	0.50mm	UL94V-0	-	-40 to +120°C
EA2100A100	0.1 to 3.0GHz	1.00mm	UL94V-0	-	-40 to +120°C
EA2100B020	0.1 to 3.0GHz	0.20mm	UL94V-0	-	-40 to +120°C
EA2100B050	0.1 to 3.0GHz	0.50mm	UL94V-0	-	-40 to +120°C
EA2100B100	0.1 to 3.0GHz	1.00mm	UL94V-0	-	-40 to +120°C
EA2200A010	0.1 to 3.0GHz	0.1mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200A020	0.1 to 3.0GHz	0.2mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200A050	0.1 to 3.0GHz	0.5mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200A100	0.1 to 3.0GHz	1.0mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200B010	0.1 to 3.0GHz	0.1mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200B020	0.1 to 3.0GHz	0.2mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200B050	0.1 to 3.0GHz	0.5mm	UL94V-0	Halogen Free	-40 to +120°C
EA2200B100	0.1 to 3.0GHz	1.0mm	UL94V-0	Halogen Free	-40 to +120°C

■ Magnetic Permeability-Reluctance



EA30 Series



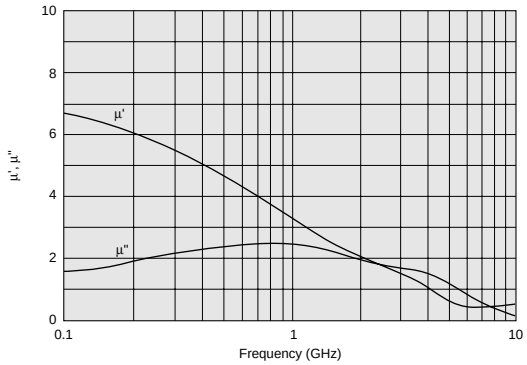
■ Packaging

When inquiring, please contact us with size code, refering to "Part Numbering".

■ Rated Value

Part Number	Applicable Frequency (Typ.)	Thickness (Typ.)	Flame Class	Halogen	Operating Temperature Range
EA3008U025	0.1 to 3.0GHz	0.25mm	UL94V-0	Halogen Free	-40 to +120°C
EA3008U035	0.1 to 3.0GHz	0.35mm	UL94V-0	Halogen Free	-40 to +120°C
EA3008U050	0.1 to 3.0GHz	0.50mm	UL94V-0	Halogen Free	-40 to +120°C
EA3008U100	0.1 to 3.0GHz	1.00mm	UL94V-0	Halogen Free	-40 to +120°C
EA3008U250	0.1 to 3.0GHz	2.50mm	UL94V-0	Halogen Free	-40 to +120°C

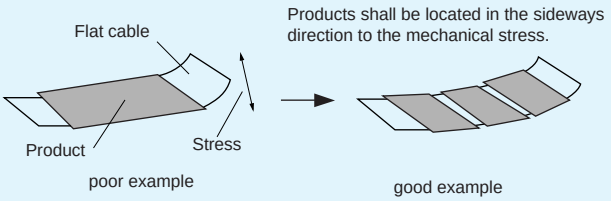
■ Magnetic Permeability-Reluctance (Typ.)



Notice

● Storage and Operating Conditions

1. Adhesive Tape Stress
   This product is designed for using the adhesive tape to hold itself to the object.
   And please avoid causing mechanical stress by bending or variation of the object.



2. Cleaning
   Avoid cleaning product.
3. Handling of the Product
   Adhesive tape must be clean to maintain the quality of tape.
   And please wipe off any dirt, dust and any kind of oil from the surface of the object before use.
4. Storage Conditions
(1) Storage Period
   Products which were inspected in Murata over 6 months ago should be examined and used. This can be confirmed with inspection No. marked on the container.
   Adhesiveness should be checked if this period is exceeded.
(2) Storage Conditions
   · Products should be stored in the warehouse on the following conditions.
      Temperature: -10 to +40˚C
      Humidity: 30 to 70% relative humidity
      No rapid change on temperature and humidity
   · Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.

Product Guide by Size

Which Size? inch (mm)	Inductor Type	Capacitor Type: Simple Capacitor	Capacitor Type: LC(RC) Combined	Capacitor Type: T Circuit Filter Feed Through Type	Common Mode Choke Coils	Block Type L×W×T(mm)
01005 (0402)	BLM02A p20					
0201 (0603)	BLM03A p21 BLM03B p33 BLM03P p50					
03025 (0806)					DLP0NS p142	12×11×max18 p166 BNX002-01 BNX003-01 Lead
0402 (1005)	BLM15A p23 BLM15B p35 BLM15P p51 BLM15HG p65 BLM15HD p65 BLM15HB p65 BLM15EG p71 BLM15GG p74 BLM15GA p74					
0504 (1210)					DLM11G p140 DLP11S p143	
0603 (1608)	BLM18A p28 BLM18B p38 BLM18T p32 BLM18R p45 BLM18P p53 BLM18K p61 BLM18S p63 BLM18HG p67 BLM18HE p67 BLM18HD p67 BLM18HB p67 BLM18HK p67 BLM18EG p72 BLM18GG p75	NFM18C p100 NFM18P p105	NFL18ST p114 NFL18SP p115			12×11×max18.5 p166 BNX005-01 Lead
Array			NFA18S p117			
0804 (2010) Array	BLA2AA p76 BLA2AB p76				DLP2AD p146	12×11×12 p167 BNX012-01 BNX016-01 Lead
0805 (2012)	BLM21A p30 BLM21B p42 BLM21R p47 BLM21P p55	NFM21C p101 NFM21P p107	NFL21S p116 NFR21G p123 NFA21S p119		DLW21S p148 DLW21H p150	
Array						
1008 (2520)					DLM2HG p141	
1205 (3212)		NFM3DC p102 NFM3DP p108				
1206 (3216)	BLM31P p57	NFM31P p109	NFW31S p121	NFE31P p112	DLP31S p145 DLW31S p151	9.1×12.1×3.1 p165 BNX022-01 BNX023-01 SMD
Array	BLA31A p79 BLA31B p79		NFA31C p104 NFA31G p124		DLP31D p147	
1806 (4516)	BLM41P p59	NFM41C p103 NFM41P p110				
2014 (5036)					DLW5AH p152	
2020 (5050)					DLW5BS p152 DLW5BT p153	
2220 (5750)		NFM55P p111				
2706 (6816)				NFE61P p113		

Part Number Quick Reference

BL□ Series

NF□ Series

DL□ Series

BNX Series

EA Series

Alphabetic Product Name Index

EMC Innovative Solutions

muRata

Murata EMI Filter Selection Simulator

New products are available

1 Select circuit.
(Select a new simulation circuit from File menu.)

2 Enter "Input Signal".

3 Set Driver IC.

4 Select filter.
(EMI filters or/and chip capacitor from the pull-down list.)

5 Set Transmission Line.

6 Set Receiver IC.

7 Click measuring point.
(Only for chip ferrite bead)

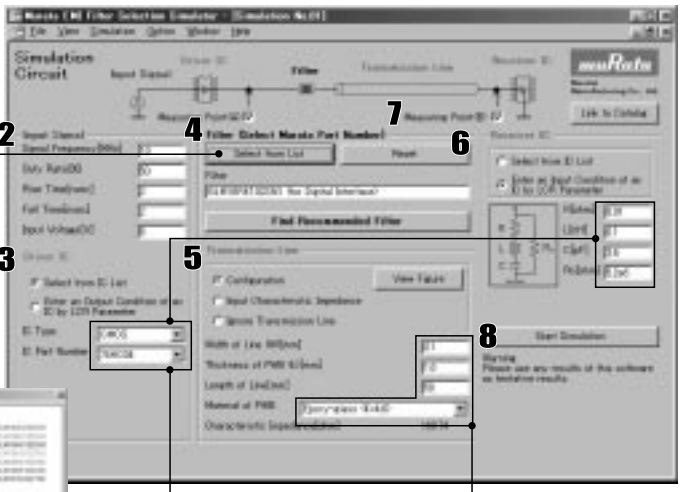
8 Click "Start Simulation" button.

9 Simulation results are displayed.

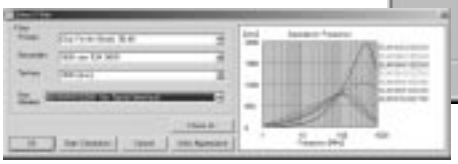
- **Simulation results with various charts are quickly displayed on your PC.**
- **Results can be displayed in standard format or user defined scaling.**
- **Simulates various types of circuits such as Differential Mode Transmission, ceramic capacitor, EMIFIL®, three terminal capacitor and chip ferrite beads.**
- **Provides a simulation function that selects best suited Chip EMIFIL®.**

1 Select circuit.

Select a new simulation circuit from File menu.



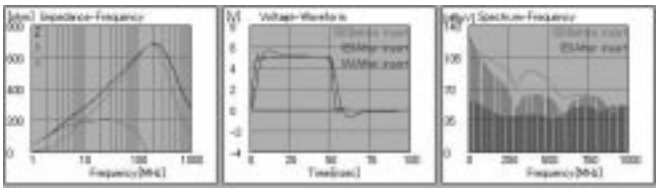
4 Filters can be selected from "frequency-impedance characteristics" charts.



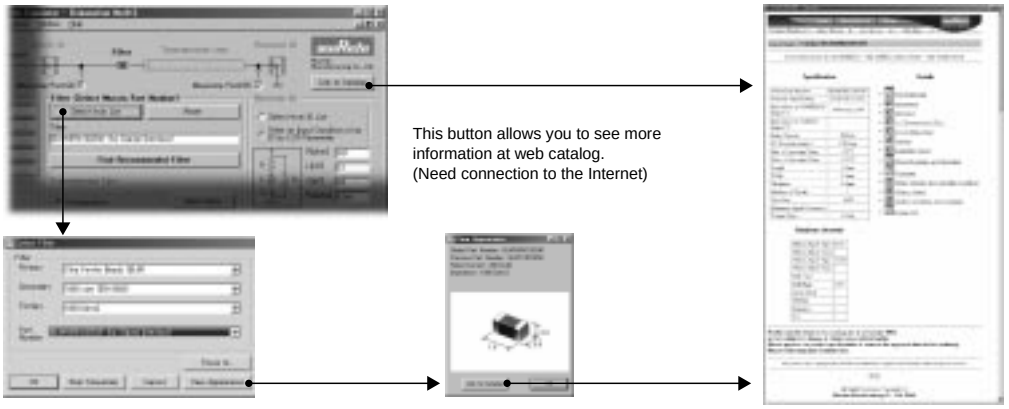
Two ways of setting the driver/receiver IC parameter
The logic IC of TTL and CMOS can be selected from pull-down list or the LCR values can also be created.

Impedance automatically calculated.
Impedance characteristics of transmission line are automatically calculated.

9 Simulation results are shown in the window.



Link to the web catalog is available



This button allows you to see more information at web catalog.
(Need connection to the Internet)

EMIFIL® is the trademark of Murata Manufacturing Co., Ltd.

This simulator can be downloaded from Murata's website. **http://www.murata.com/designlib/mefss/**

Please refer to catalogs below for ferrite cores and leaded EMIFIL®.

Ferrite Core

Ferrite Core for EMI Suppression

Contents
- Thin Type Sandwich Core <FSSA>
- Core for Flat Cables <FSRC>
- Plate Core <FSSA>
- Beads Core <FSRH>
- Ring Core <FSRB>
- Multi Hole Core <FSMA/FSSA>

Lead Type EMIFIL®

EMI Suppression Filters (Lead Type EMIFIL®)

Contents
- Ferrite Beads Inductors <BL01/02/03>
- Disc Type EMIFIL®<DS□6/DS□9>
- EMIGUARD®(EMIFIL® with Varistor Function) <VF□3/VF□6/VF□9>
- Common Mode Choke Coils <PLT>

⚠Note:

1. Export Control
   <For customers outside Japan>
   No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.
   <For customers in Japan>
   For products which are controlled items subject to the “Foreign Exchange and Foreign Trade Law” of Japan, the export license specified by the law is required for export.
2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.
   ① Aircraft equipment ② Aerospace equipment
   ③ Undersea equipment ④ Power plant equipment
   ⑤ Medical equipment ⑥ Transportation equipment (vehicles, trains, ships, etc.)
   ⑦ Traffic signal equipment ⑧ Disaster prevention / crime prevention equipment
   ⑨ Data-processing equipment ⑩ Application of similar complexity and/or reliability requirements to the applications listed above
3. Product specifications in this catalog are as of January 2009. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.
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