

## Surface Mount Type

Series : **FP** Type : **V**

**High temperature**

**Lead-Free reflow (suffix : A\*)**



### Features

- Low ESR (30 % to 50 % less than FK series)
- Endurance : 105 °C 2000 h
- Vibration-proof product is available upon request. (08 mm and larger)
- RoHS compliant

### Specifications

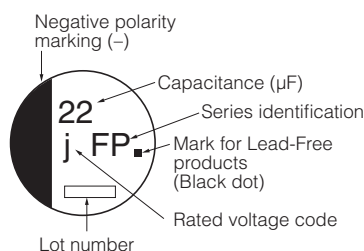
Category temperature range	-55 °C to +105 °C							
Rated voltage range	6.3 V.DC to 50 V.DC							
Capacitance range	10 µF to 1800 µF							
Capacitance tolerance	±20 % (120 Hz/+20 °C)							
Leakage current	I ≤ 0.01 CV or 3 (µA) After 2 minutes (whichever is greater)							
Dissipation factor (tan δ)	Please see the attached characteristics list							
Characteristics at low temperature	V.DC	6.3	10	16	25	35	50	(Impedance ratio at 120 Hz)
	Z(-25 °C)/Z(+20 °C)	2	2	2	2	2	2	
	Z(-40°C)/Z(+20 °C)	3	3	3	3	3	3	
	Z(-55°C)/Z(+20 °C)	4	4	4	3	3	3	
Endurance	After applying rated working voltage at +105 °C ±2 °C for 2000 hours the capacitors shall meet the limits specified below. Post-test requirement at +20 °C							
	Capacitance change	Within ±30 % of the initial value						
	tan δ	≤200 % of the initial limit						
Shelf life	After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)							
	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.							
Resistance to soldering heat	Capacitance change	Within ±10 % of the initial value						
	tan δ	Within the initial limit						
	DC leakage current	Within the initial limit						
AEC-Q200	AEC-Q200 compliant							

### Frequency correction factor for ripple current

Capacitance (µF)	Frequency (Hz)			
	120	1 k	10 k	100 k to
10 to 470	0.65	0.85	0.95	1.00
560 to 1800	0.75	0.90	0.95	1.00

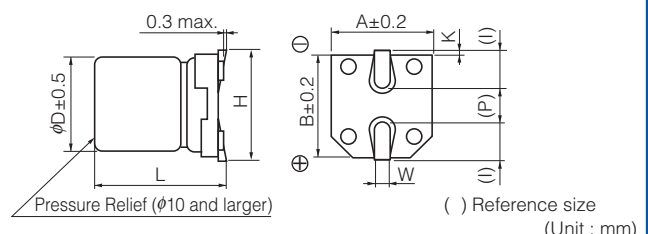
### Marking

Example : 6.3 V.DC 22 µF  
Marking color : BLACK



R. Voltage (V.DC)	6.3	10	16	25	35	50
Code	j	A	C	E	V	H

### Dimensions



Size code	φD	L	A, B	H	I	W	P	K
B	4.0	5.8±0.30	4.3	5.5 max.	1.8	0.65±0.1	1.0	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
C	5.0	5.8±0.30	5.3	6.5 max.	2.2	0.65±0.1	1.5	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
D	6.3	5.8±0.30	6.6	7.8 max.	2.6	0.65±0.1	1.8	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
D8	6.3	7.7±0.30	6.6	7.8 max.	2.6	0.65±0.1	1.8	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
E	8.0	6.2±0.30	8.3	9.5 max.	3.4	0.65±0.1	2.2	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
F	8.0	10.2±0.30	8.3	10.0 max.	3.4	0.90±0.2	3.1	0.70±0.20
G	10.0	10.2±0.30	10.3	12.0 max.	3.5	0.90±0.2	4.6	0.70±0.20

## Characteristics list

Endurance : 105 °C 2000 h

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty	
		φD	L		Ripple current (100 kHz) (+105 °C) (mA r.m.s.)	ESR (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)			Taping (pcs)	
6.3	22	4	5.8	B	160	0.85	0.26	EEEEFP0J220AR	(5)	2000	
	47	4	5.8	(B)	160	0.85	0.26	EEEEFPJ470UAR	(5)	2000	
		5	5.8	C	240	0.36	0.26	EEEEFP0J470AR	(5)	1000	
	100	5	5.8	(C)	240	0.36	0.26	EEEEFPJ101UAR	(5)	1000	
		6.3	5.8	D	300	0.26	0.26	EEEEFP0J101AP	(5)	1000	
	220	6.3	5.8	D	300	0.26	0.26	EEEEFP0J221AP	(5)	1000	
	330	6.3	7.7	D8	600	0.16	0.26	EEEEFPJ331XAP	(5)	900	
		8	6.2	E	500	0.18	0.26	EEEEFP0J331AP	(6)	1000	
	470	8	10.2	F	850	0.08	0.26	EEEEFP0J471AP	(6)	500	
	1000	8	10.2	F	850	0.08	0.26	EEEEFP0J102AP	(6)	500	
1500	10	10.2	G	1190	0.06	0.26	EEEEFP0J152AP	(6)	500		
1800	10	10.2	(G)	850	0.08	0.26	EEEEFPJ182UAP	(6)	500		
10	22	4	5.8	B	160	0.85	0.19	EEEEFP1A220AR	(5)	2000	
	33	4	5.8	(B)	160	0.85	0.19	EEEEFPA330UAR	(5)	2000	
		5	5.8	C	240	0.36	0.19	EEEEFP1A330AR	(5)	1000	
	150	6.3	5.8	D	300	0.26	0.19	EEEEFP1A151AP	(5)	1000	
	220	6.3	7.7	D8	600	0.16	0.19	EEEEFPA221XAP	(5)	900	
		8	6.2	E	500	0.18	0.19	EEEEFP1A221AP	(6)	1000	
	330	8	10.2	F	850	0.08	0.19	EEEEFP1A331AP	(6)	500	
	470	8	10.2	F	850	0.08	0.19	EEEEFP1A471AP	(6)	500	
	680	8	10.2	F	850	0.08	0.19	EEEEFP1A681AP	(6)	500	
	1000	10	10.2	G	1190	0.06	0.19	EEEEFP1A102AP	(6)	500	
1200	10	10.2	(G)	850	0.08	0.19	EEEEFPA122UAP	(6)	500		
16	10	4	5.8	B	160	0.85	0.16	EEEEFP1C100AR	(5)	2000	
	22	4	5.8	(B)	160	0.85	0.16	EEEEFPC220UAR	(5)	2000	
		5	5.8	C	240	0.36	0.16	EEEEFP1C220AR	(5)	1000	
	47	5	5.8	(C)	240	0.36	0.16	EEEEFPC470UAR	(5)	1000	
		6.3	5.8	D	300	0.26	0.16	EEEEFP1C470AP	(5)	1000	
	68	6.3	5.8	D	300	0.26	0.16	EEEEFP1C680AP	(5)	1000	
	100	6.3	5.8	D	300	0.26	0.16	EEEEFP1C101AP	(5)	1000	
		6.3	7.7	D8	600	0.16	0.16	EEEEFPC101XAP	(5)	900	
	150	6.3	7.7	D8	600	0.16	0.16	EEEEFPC151XAP	(5)	900	
	220	6.3	7.7	D8	600	0.16	0.16	EEEEFPC221XAP	(5)	900	
		8	6.2	E	500	0.18	0.16	EEEEFP1C221AP	(6)	1000	
	330	8	10.2	F	850	0.08	0.16	EEEEFP1C331AP	(6)	500	
	470	8	10.2	F	850	0.08	0.16	EEEEFP1C471AP	(6)	500	
680	10	10.2	G	1190	0.06	0.16	EEEEFP1C681AP	(6)	500		
820	10	10.2	(G)	850	0.08	0.16	EEEEFPC821UAP	(6)	500		
25	10	4	5.8	B	160	0.85	0.14	EEEEFP1E100AR	(5)	2000	
	22	5	5.8	C	240	0.36	0.14	EEEEFP1E220AR	(5)	1000	
		5	5.8	(C)	240	0.36	0.14	EEEEFPE330UAR	(5)	1000	
	33	6.3	5.8	D	300	0.26	0.14	EEEEFP1E330AP	(5)	1000	
		47	6.3	5.8	D	300	0.26	0.14	EEEEFP1E470AP	(5)	1000
	68	6.3	5.8	D	300	0.26	0.14	EEEEFP1E680AP	(5)	1000	
	100	6.3	7.7	D8	600	0.16	0.14	EEEEFPE101XAP	(5)	900	
		8	6.2	E	500	0.18	0.14	EEEEFP1E101AP	(6)	1000	
	150	8	10.2	F	850	0.08	0.14	EEEEFP1E151AP	(6)	500	
	220	8	10.2	F	850	0.08	0.14	EEEEFP1E221AP	(6)	500	
	330	8	10.2	F	850	0.08	0.14	EEEEFP1E331AP	(6)	500	
	470	10	10.2	G	1190	0.06	0.14	EEEEFP1E471AP	(6)	500	
	560	10	10.2	(G)	850	0.08	0.14	EEEEFPE561UAP	(6)	500	

\* Size code( ) : Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J → J, 1A → A, 1C → C, 1E → E, 1V → V

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

· When requesting vibration-proof product, please put the last "V" instead to "P"

## Characteristics list

Endurance : 105 °C 2000 h

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty	
		φD	L		Ripple current (100 kHz) (+105 °C) (mA r.m.s.)	ESR (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)			Taping (pcs)	
35	10	4	5.8	(B)	160	0.85	0.12	EEEEPV100UAR	(5)	2000	
	22	5	5.8	C	240	0.36	0.12	EEEEP1V220AR	(5)	1000	
	33	6.3	5.8	D	300	0.26	0.12	EEEEP1V330AP	(5)	1000	
	47	6.3	5.8	D	300	0.26	0.12	EEEEP1V470AP	(5)	1000	
	68	6.3	7.7	D8	600	0.16	0.12	EEEEPV680XAP	(5)	900	
	100	6.3	7.7	D8	600	0.16	0.12	EEEEPV101XAP	(5)	900	
		8	10.2	F	850	0.08	0.12	EEEEP1V101AP	(6)	500	
	150	8	10.2	F	850	0.08	0.12	EEEEP1V151AP	(6)	500	
	220	8	10.2	F	850	0.08	0.12	EEEEP1V221AP	(6)	500	
	330	10	10.2	G	1190	0.06	0.12	EEEEP1V331AP	(6)	500	
390	10	10.2	(G)	850	0.08	0.12	EEEEPV391UAP	(6)	500		
50	100	8	10.2	F	670	0.18	0.10	EEEEP1H101AP	(6)	500	
	220	10	10.2	G	900	0.12	0.10	EEEEP1H221AP	(6)	500	

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