CCG15-48-**D

EVALUATION DATA

型式データ

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使用記号 Terminology used

		定義 Definition	
Vin	·····	入力電圧	Input voltage
+Vo, -Vo	·····	出力電圧	Output voltage
Vrc	·····	RC電圧	RC voltage
Iin	·····	入力電流	Input current
+Io, -Io	·····	出力電流	Output current
Ta	·····	周囲温度	Ambient temperature
f	·····	周波数	Frequency

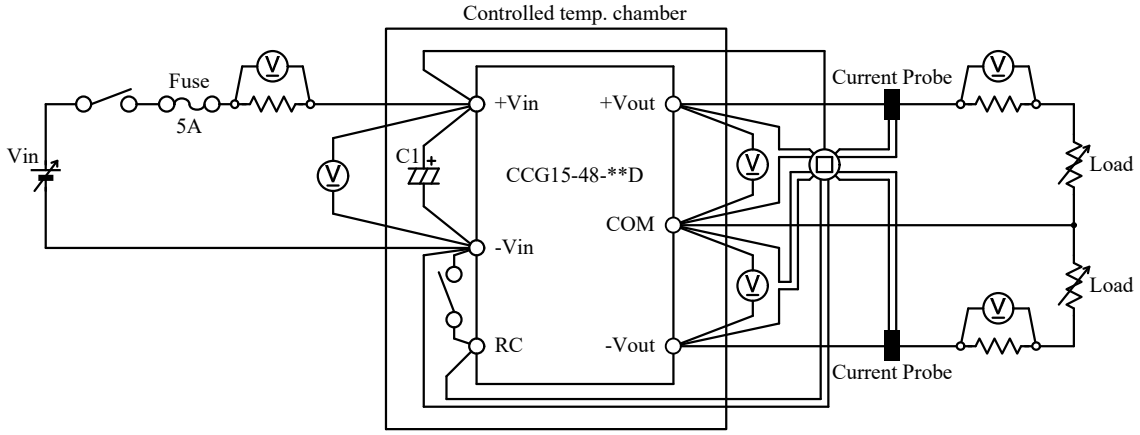
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

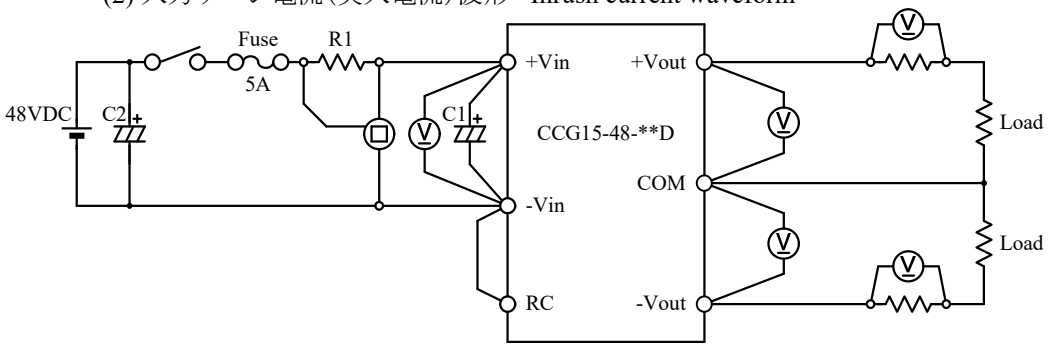
1-1. 測定回路 Measurement Circuits

(1) 静特性 、待機電力特性、通電ドリフト特性、その他特性

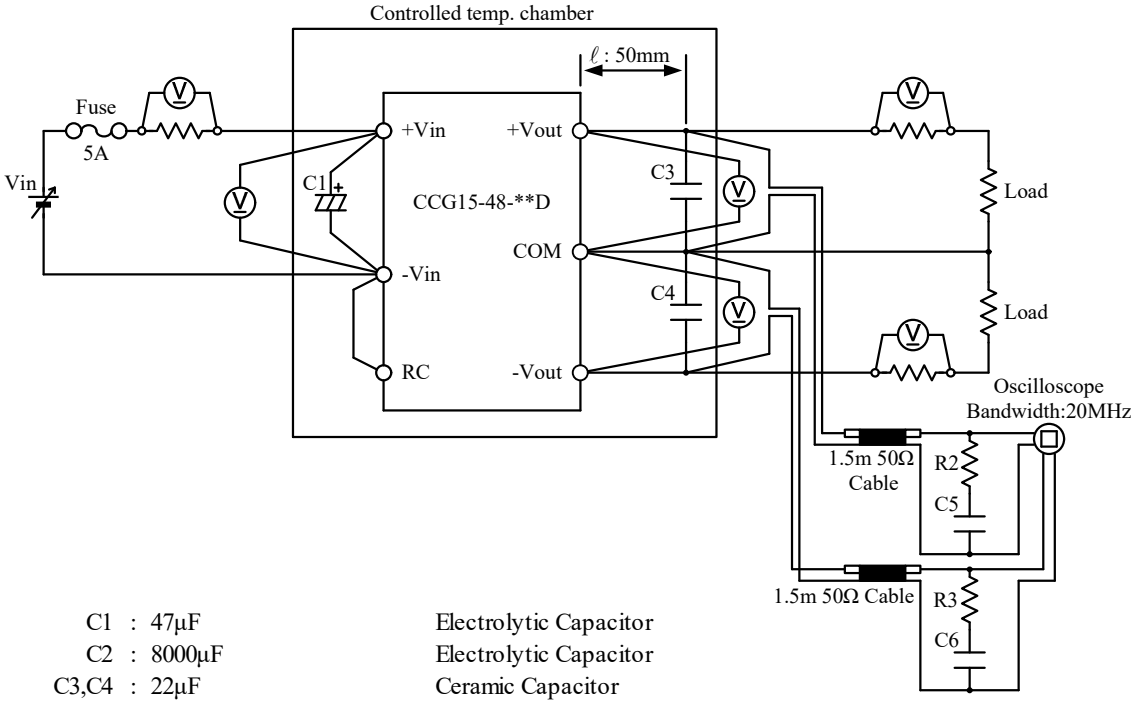
Steady state, Standby power, Warm up voltage drift and Other characteristics



(2) 入力サージ電流(突入電流)波形 Inrush current waveform



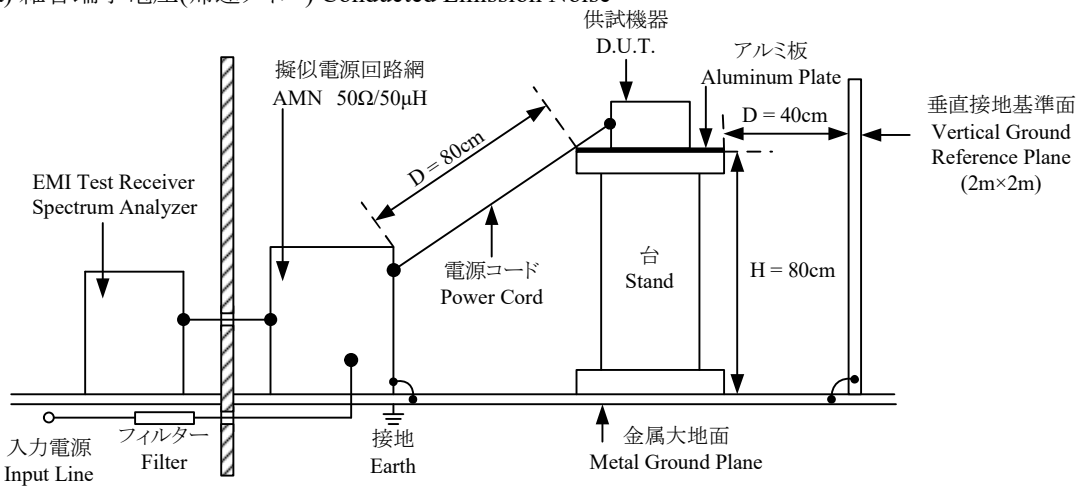
(3) 出力リップル、ノイズ電圧、波形 Output ripple and noise voltage and waveform



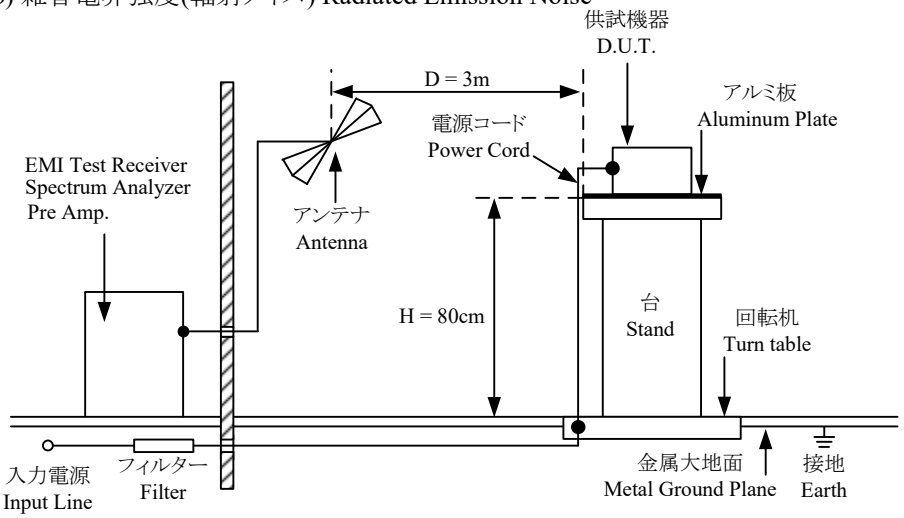
C1	: 47µF	Electrolytic Capacitor
C2	: 8000µF	Electrolytic Capacitor
C3,C4	: 22µF	Ceramic Capacitor
C5,C6	: 4700pF	Ceramic Capacitor
R1	: 0.01Ω	
R2,R3	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

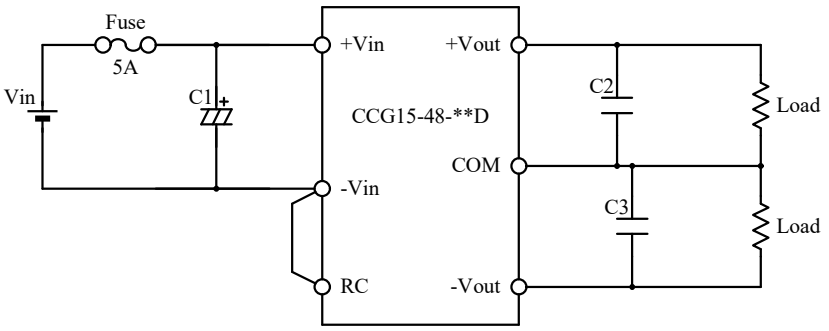
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(b) 雑音電界強度(輻射ノイズ) Radiated Emission Noise



VCCI class A 対応アプリケーション　VCCI class A application system



C1 ： 82μF　　Electrolytic Capacitor
C2,C3 ： 22μF　　Ceramic Capacitor

1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740 / DL1740E
2	DIGITAL MULTIMETER	AGILENT	34970A
3	CURRENT PROBE	YOKOGAWA ELECT.	701932
4	CURRENT PROBE	AGILENT	N2774A
5	SHUNT RESISTER	YOKOGAWA ELECT.	2215
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-200L / FK-600L
7	CVCF	TAKASAGO	AA2000XG
8	CVCF	NF	ES1000S / ES10000S
9	DC POWER SUPPLY	TDK-Lambda	Z+100-8
10	CONTROLLED TEMP. CHAMBER	ESPEC	SU-261 / SU-641
11	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
12	PRE AMP.	SONOMA	310N
13	AMN	KIKUSUI	KNW-242C
14	ANTENNA	SCHWARZBECK	BBA9106/VHA9103
15	ANTENNA	SCHWARZBECK	UHALP9107

2. 特性データ Characteristics

2-1. 静特性 Steady state characteristics

(1) 入力・負荷・温度変動 Regulation - line and load, Temperature drift

±12V

1. Regulation - line and load

Condition Ta : 25 ºC

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	12.061V	12.064V	12.079V	12.072V	18mV	0.150%
50%	12.046V	12.048V	12.049V	12.051V	5mV	0.042%
100%	12.045V	12.047V	12.049V	12.049V	4mV	0.033%
Load	16mV	17mV	30mV	23mV		
regulation	0.133%	0.142%	0.250%	0.192%		

・-Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-12.068V	-12.070V	-12.058V	-12.065V	12mV	0.100%
50%	-12.077V	-12.079V	-12.079V	-12.078V	2mV	0.017%
100%	-12.076V	-12.076V	-12.076V	-12.077V	1mV	0.008%
Load	9mV	9mV	21mV	13mV		
regulation	0.075%	0.075%	0.175%	0.108%		

・+Vo to -Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	24.129V	24.134V	24.136V	24.137V	8mV	0.067%
50%	24.123V	24.126V	24.128V	24.129V	6mV	0.050%
100%	24.121V	24.124V	24.125V	24.126V	5mV	0.042%
Load	8mV	10mV	11mV	11mV		
regulation	0.067%	0.083%	0.092%	0.092%		

2. Temperature drift

Conditions Vin : 48 VDC
Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	12.034V	12.049V	12.071V	37mV	0.308%
-Vo	-12.059V	-12.076V	-12.101V	42mV	0.350%
+Vo to -Vo	24.093V	24.125V	24.173V	80mV	0.667%

3. Load Regulation - Unbalance load

Conditions Ta : 25 ºC

・-Io : 100%

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	12.202V	12.202V	12.202V	12.200V
100%	12.069V	12.068V	12.068V	12.067V
Load	133mV	134mV	134mV	133mV
regulation	1.108%	1.117%	1.117%	1.108%

・+Io : 100%

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	-12.196V	-12.199V	-12.200V	-12.201V
100%	-12.072V	-12.074V	-12.075V	-12.075V
Load	124mV	125mV	125mV	126mV
regulation	1.033%	1.042%	1.042%	1.050%

±15V 1. Regulation - line and load Condition Ta : 25 ºC

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	15.071V	15.076V	15.073V	15.083V	12mV	0.080%
50%	15.056V	15.057V	15.057V	15.055V	2mV	0.013%
100%	15.058V	15.055V	15.053V	15.050V	8mV	0.053%
Load	15mV	21mV	20mV	33mV		
regulation	0.100%	0.140%	0.133%	0.220%		

・-Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-15.050V	-15.046V	-15.048V	-15.040V	10mV	0.067%
50%	-15.063V	-15.065V	-15.064V	-15.062V	3mV	0.020%
100%	-15.060V	-15.065V	-15.067V	-15.064V	7mV	0.047%
Load	13mV	19mV	19mV	24mV		
regulation	0.087%	0.127%	0.127%	0.160%		

・+Vo to -Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	30.120V	30.122V	30.121V	30.123V	3mV	0.020%
50%	30.119V	30.121V	30.121V	30.117V	4mV	0.027%
100%	30.118V	30.120V	30.120V	30.114V	6mV	0.040%
Load	2mV	2mV	1mV	9mV		
regulation	0.013%	0.013%	0.007%	0.060%		

2. Temperature drift Conditions Vin : 48 VDC
Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	15.053V	15.053V	15.078V	25mV	0.167%
-Vo	-15.070V	-15.067V	-15.092V	25mV	0.167%
+Vo to -Vo	30.123V	30.120V	30.170V	50mV	0.333%

3. Load Regulation - Unbalance load Conditions Ta : 25 ºC

・-Io : 100%

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	15.211V	15.208V	15.208V	15.205V
100%	15.071V	15.067V	15.065V	15.062V
Load	140mV	141mV	143mV	143mV
regulation	0.933%	0.940%	0.953%	0.953%

・+Io : 100%

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	-15.193V	-15.194V	-15.195V	-15.194V
100%	-15.071V	-15.076V	-15.079V	-15.077V
Load	122mV	118mV	116mV	117mV
regulation	0.813%	0.787%	0.773%	0.780%

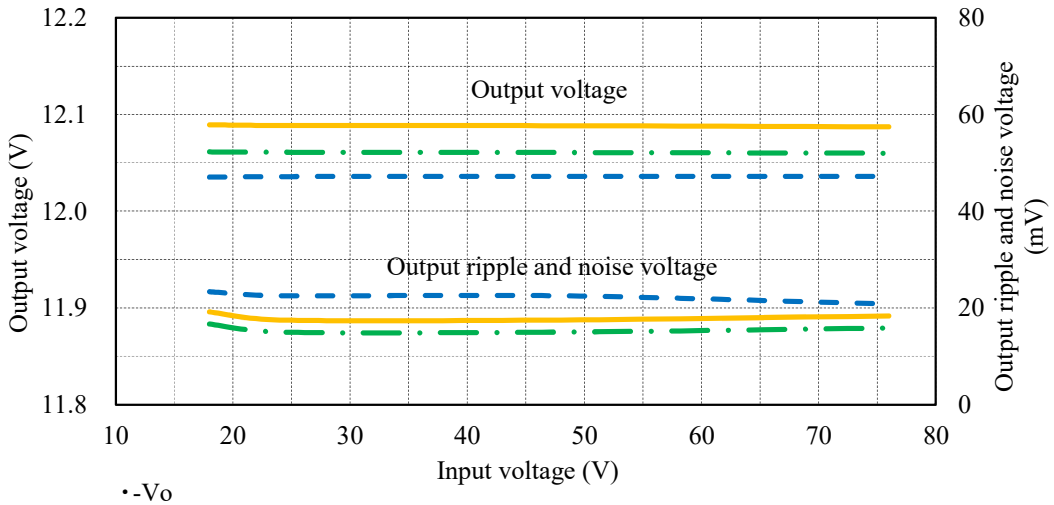
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

Output voltage and Output ripple and noise voltage vs. Input voltage

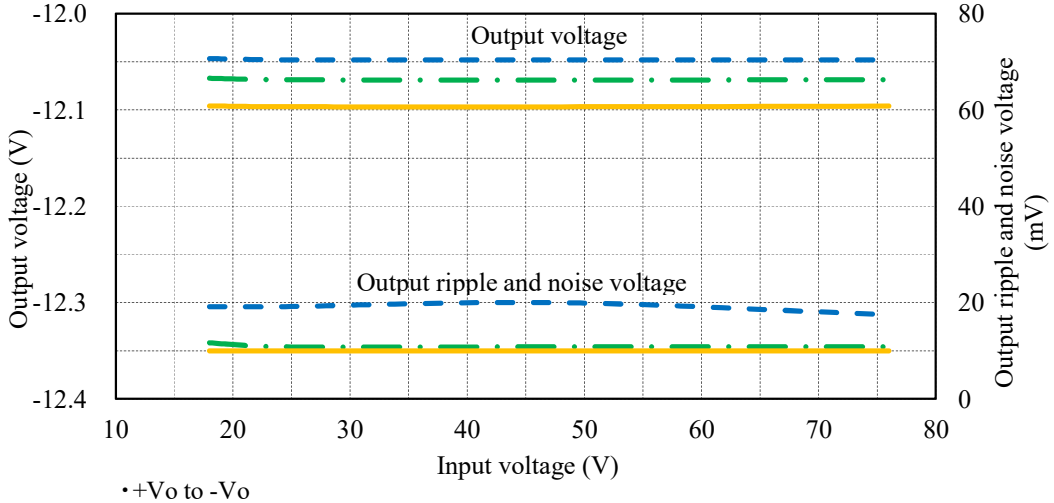
Conditions Io : 100 %
Ta : -40 ºC
: 25 ºC
: 85 ºC

±12V

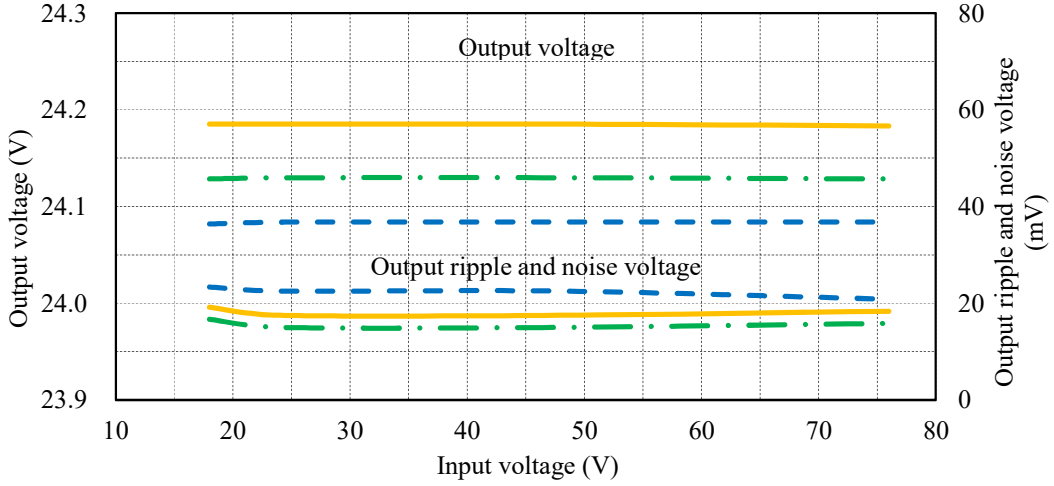
・+Vo



・-Vo



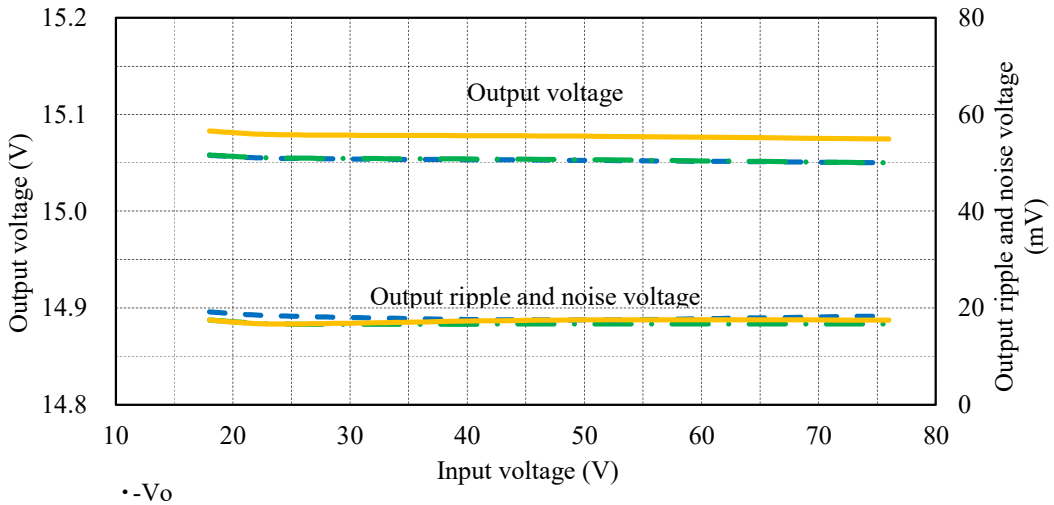
・+Vo to -Vo



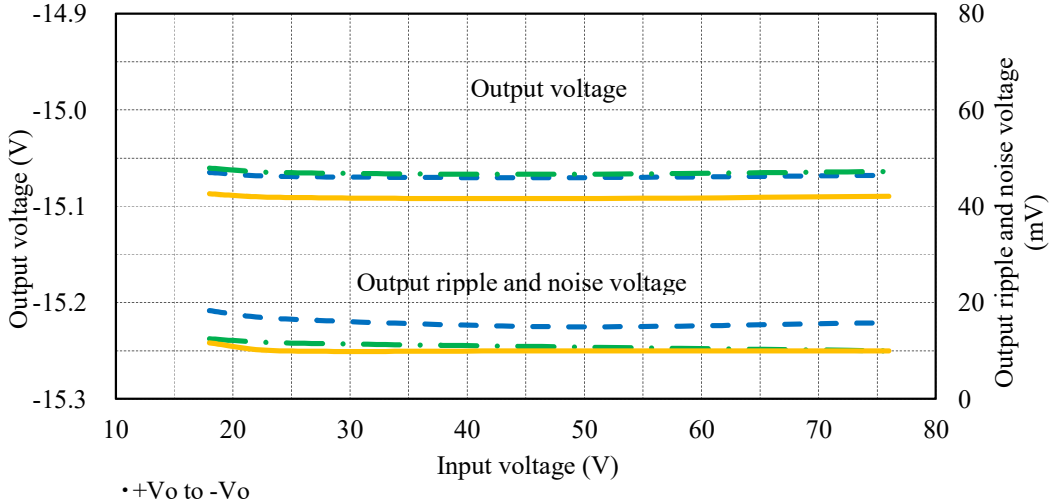
Conditions Io : 100 %
Ta : -40 ºC
: 25 ºC
: 85 ºC

±15V

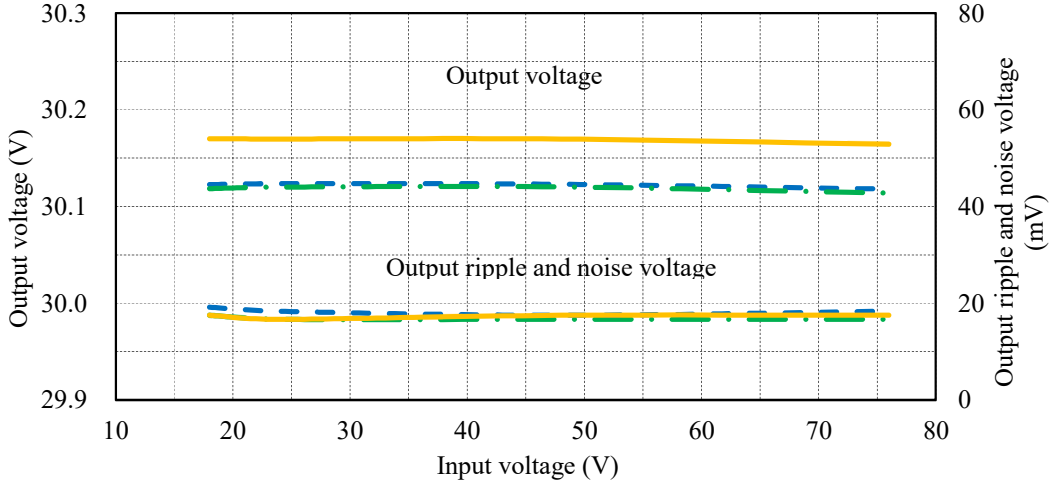
・+Vo



・-Vo



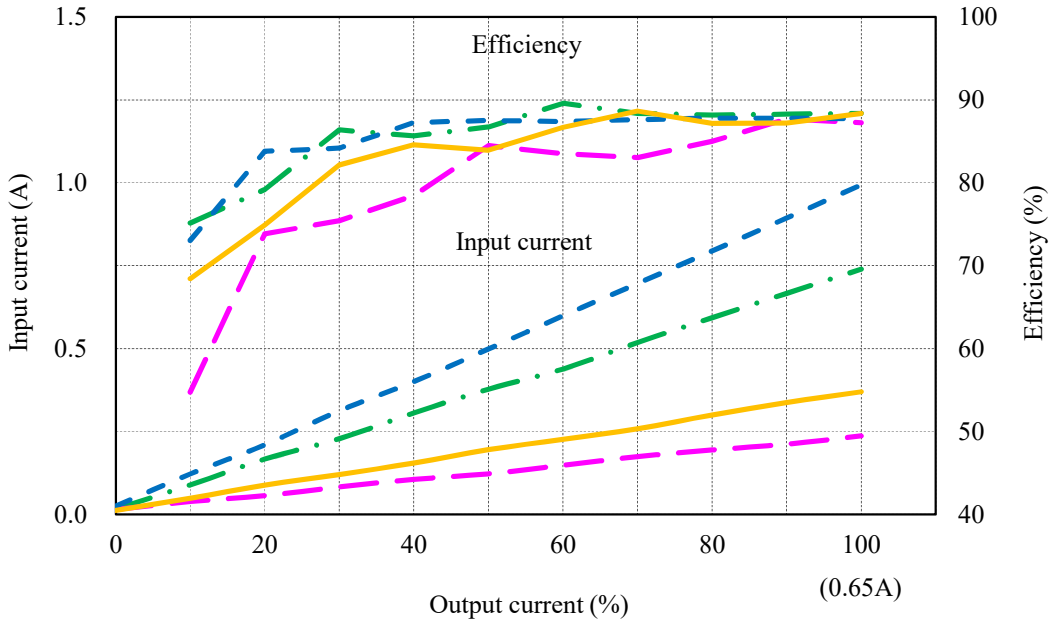
・+Vo to -Vo



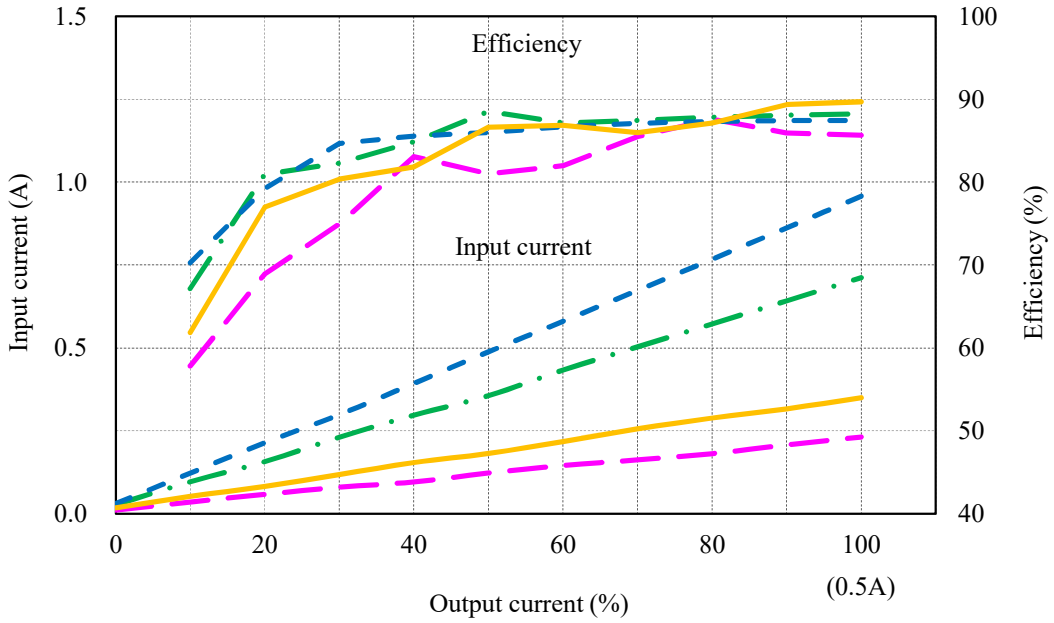
(3) 入力電流･効率 対 出力電流　Input current and Efficiency vs. Output current

Conditions　Vin　:　18 VDC
:　24 VDC
:　48 VDC
:　76 VDC
Ta　:　25 ºC

±12V



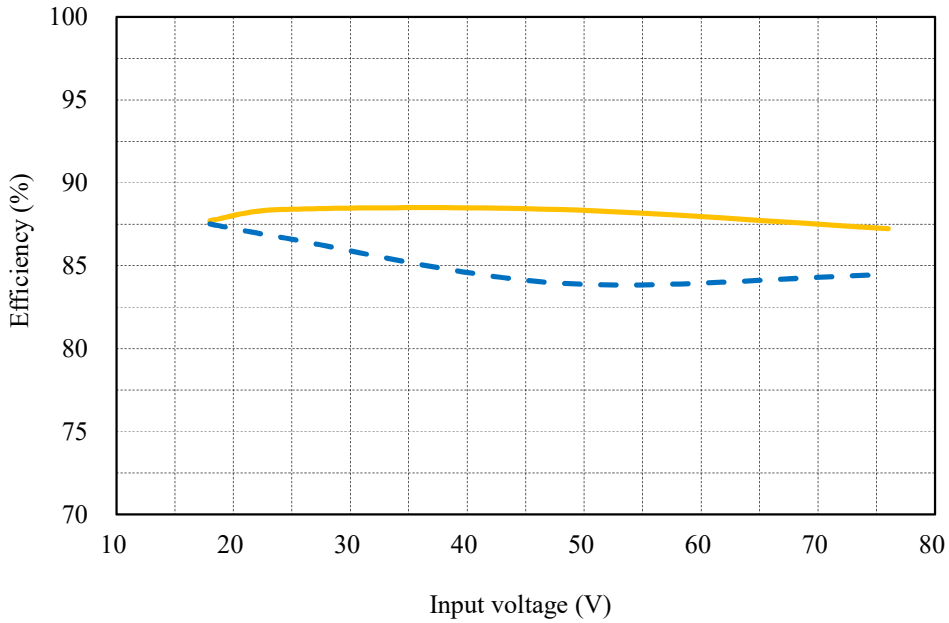
±15V



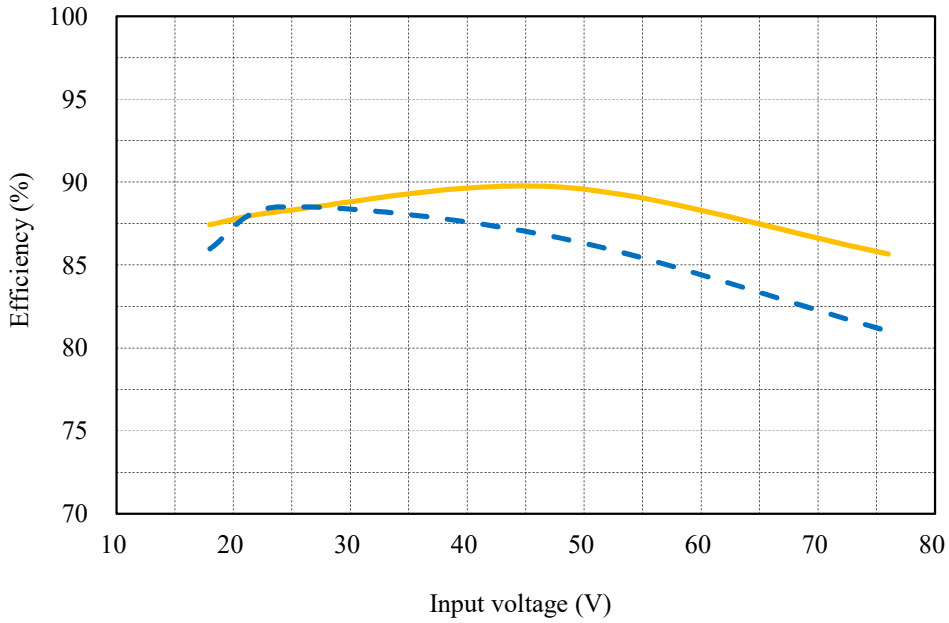
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

Conditions Io : 50 %
: 100 %
Ta : 25 ºC

±12V



±15V



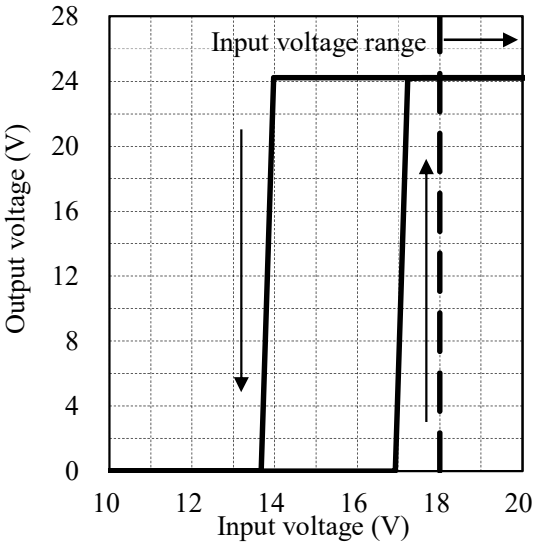
(5) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

出力電圧 対 入力電圧
Output voltage vs. Input voltage

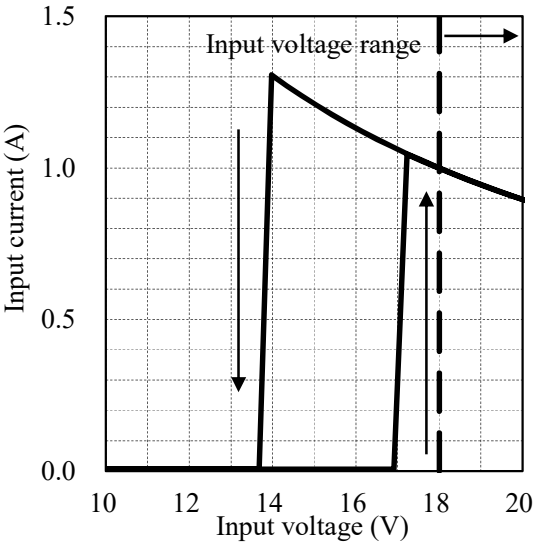
入力電流 対 入力電圧
Input current vs. Input voltage

Conditions Io : 100 %
Ta : 25 ºC

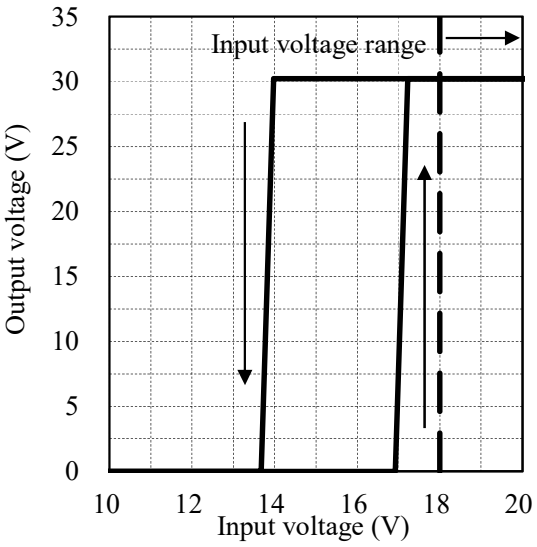
±12V



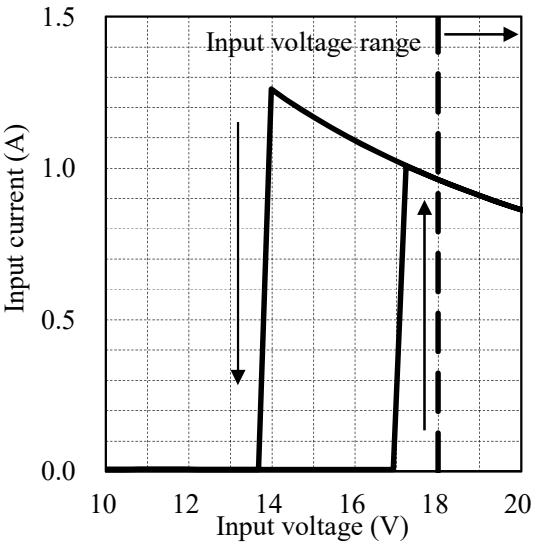
±12V



±15V



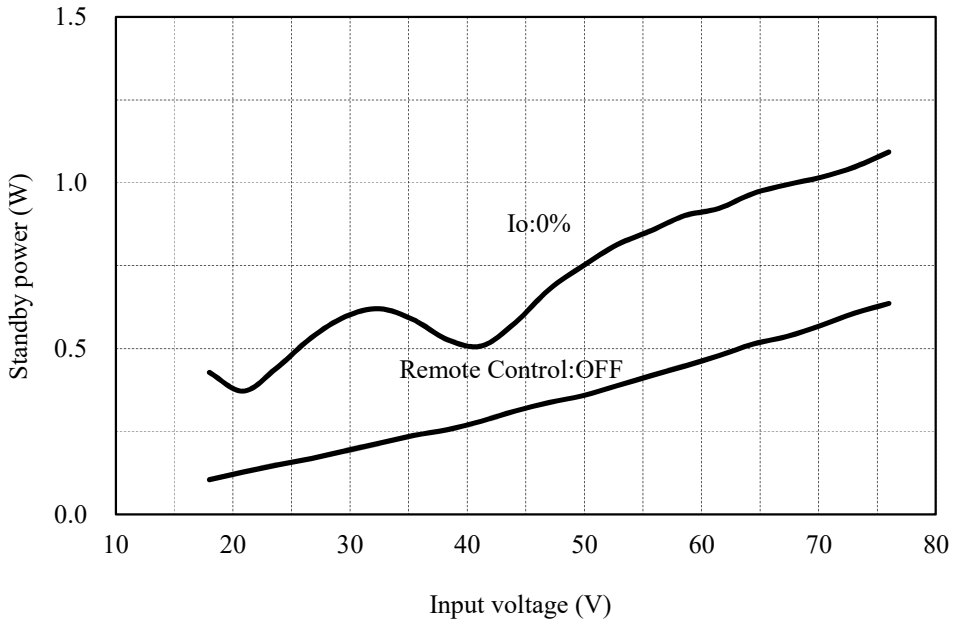
±15V



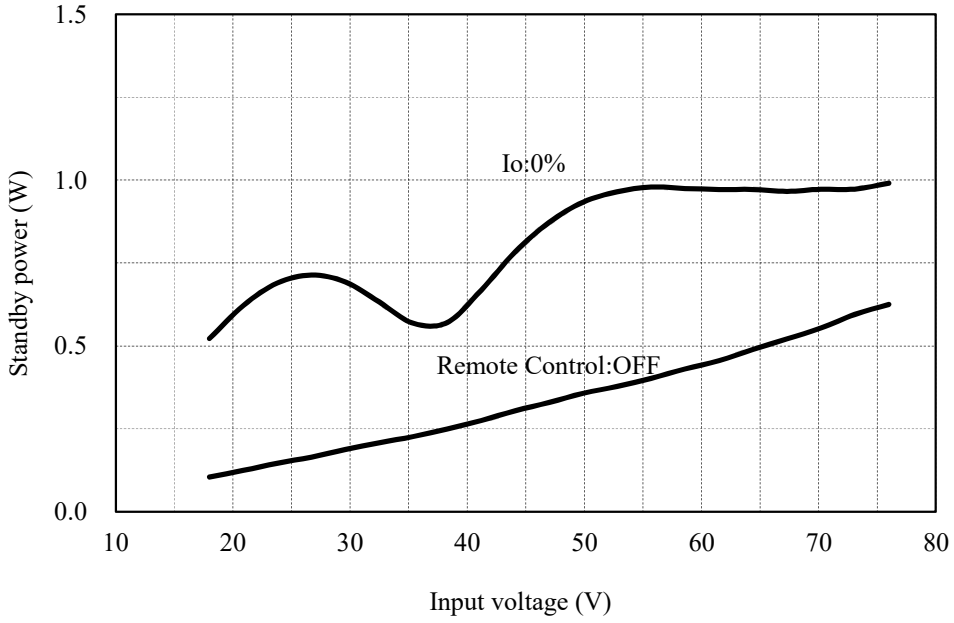
2-2. 待機電力特性 Standby power characteristics

Conditions Ta : 25 ºC

±12V



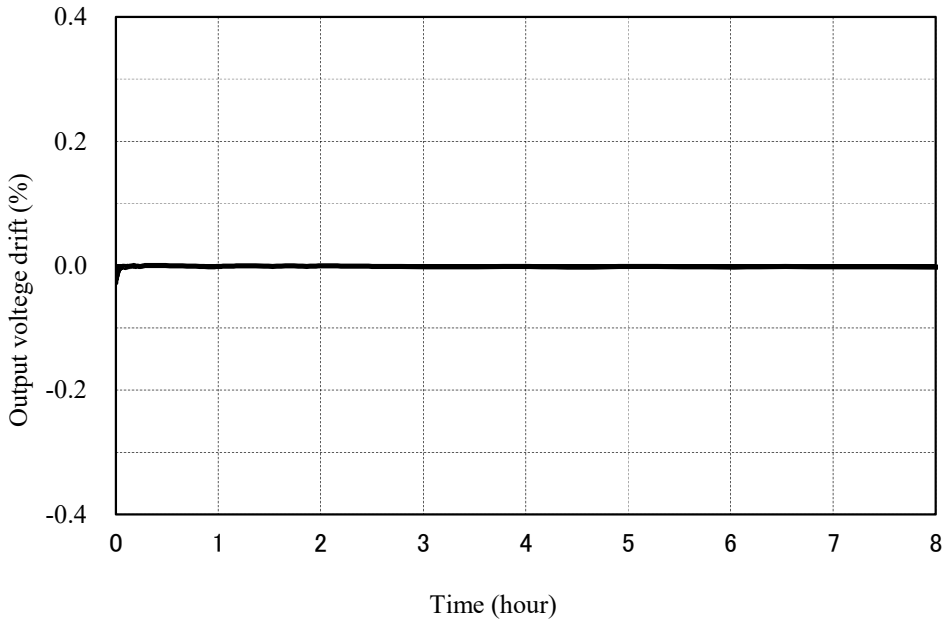
±15V



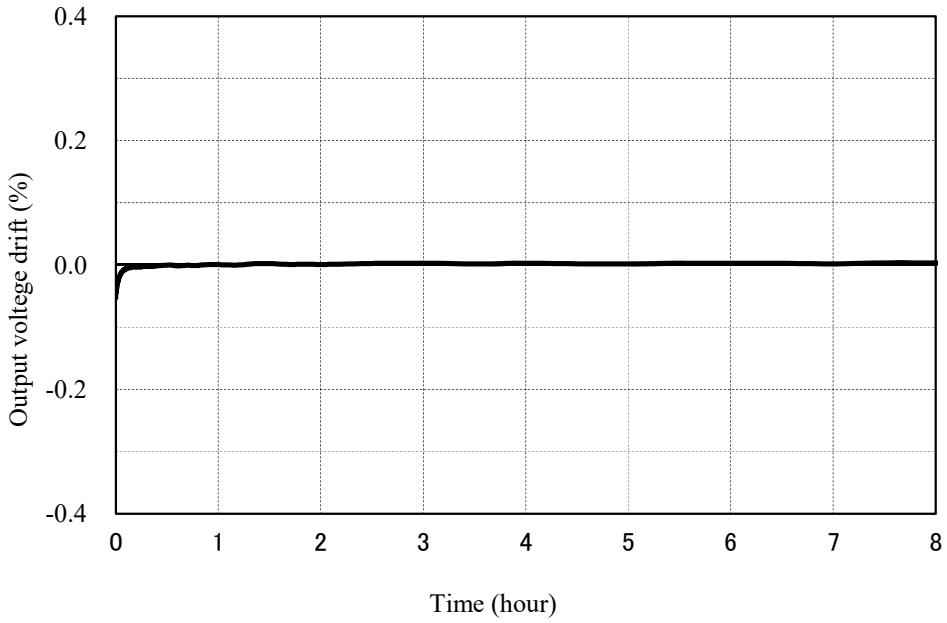
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



±15V



2-4. 過電流保護特性 Over current protection (OCP) characteristics

入力電圧依存性

Input voltage dependence

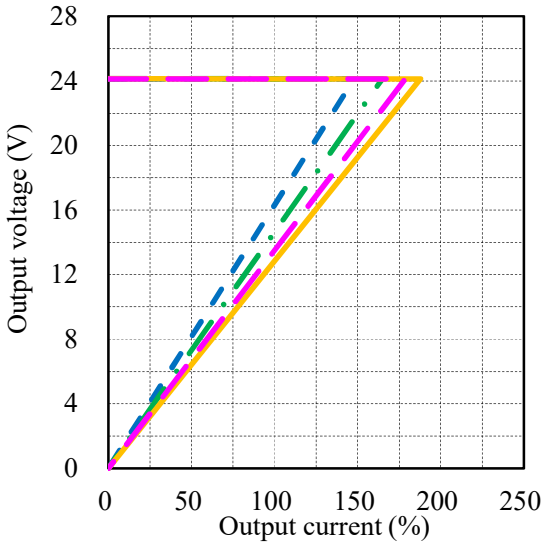
Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 ºC

周囲温度依存性

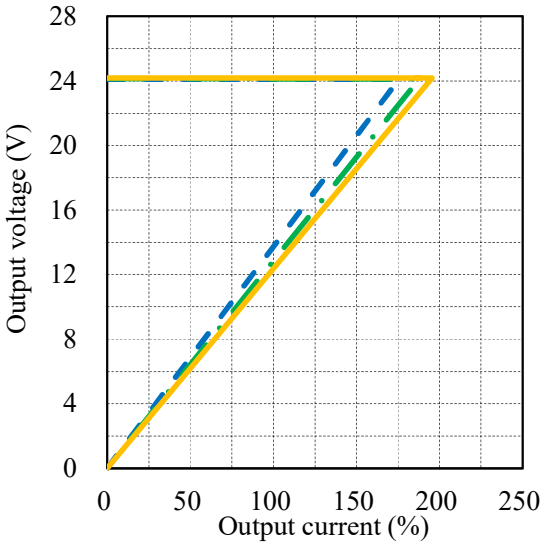
Ambient temperature dependence

Conditions Vin : 48 VDC
Ta : -40 ºC
: 25 ºC
: 85 ºC

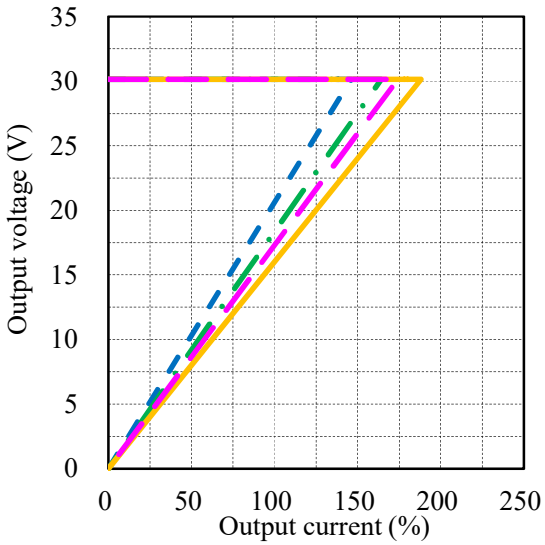
±12V



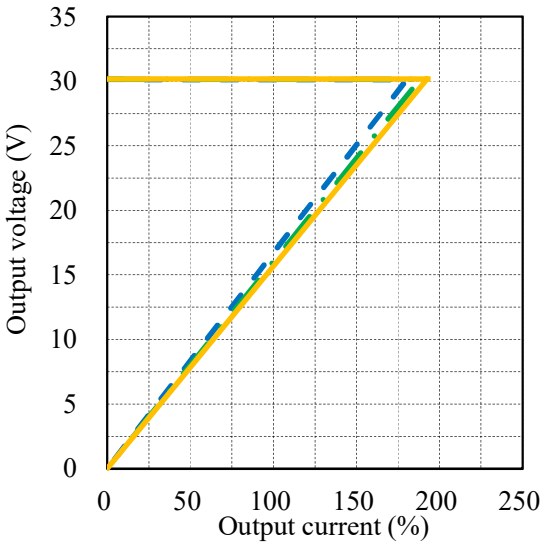
±12V



±15V



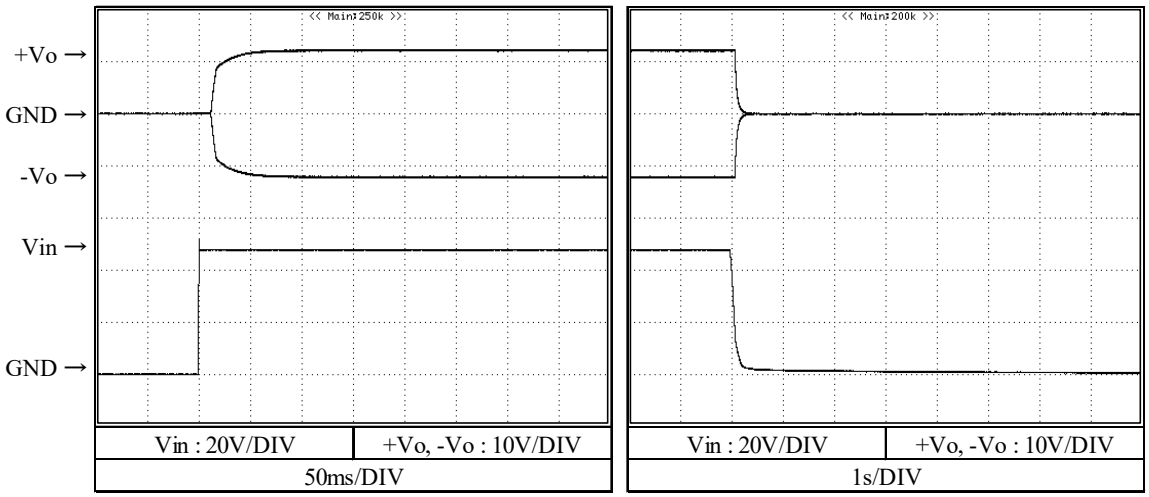
±15V



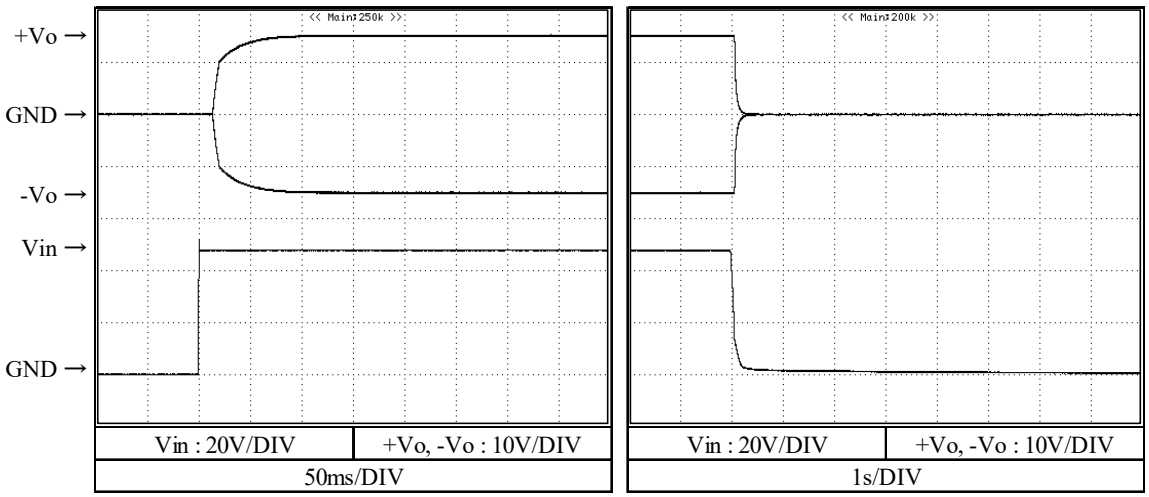
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 ºC

±12V



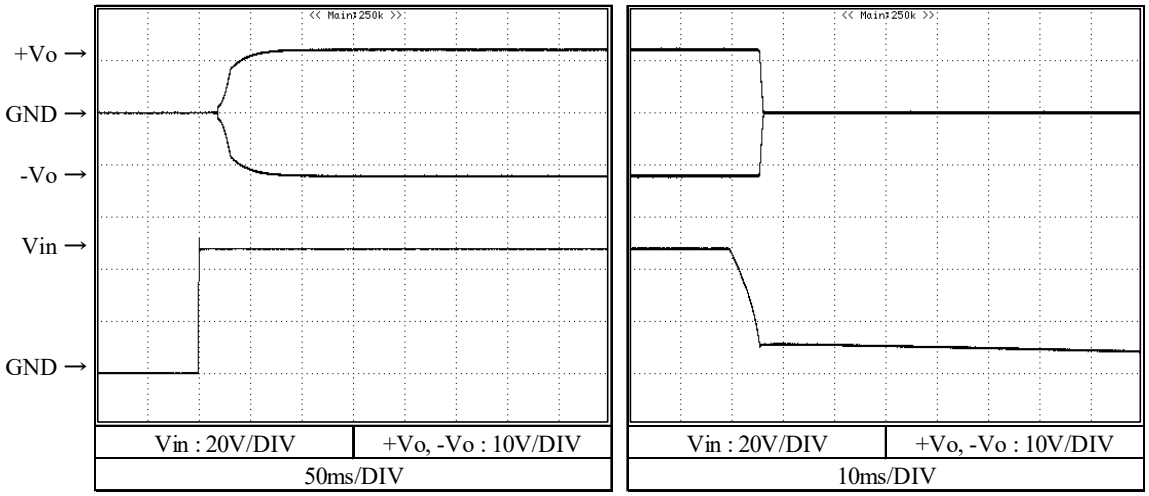
±15V



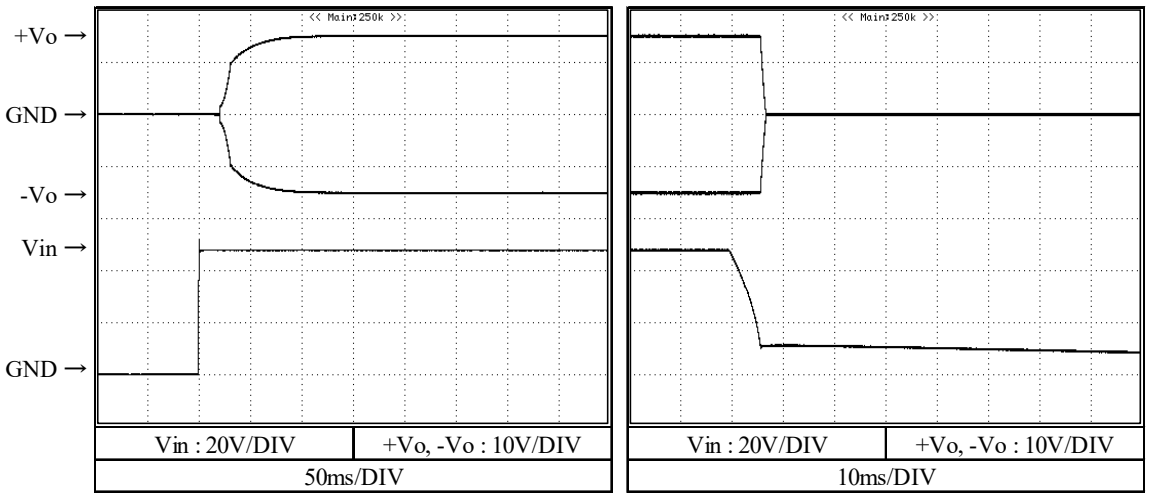
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



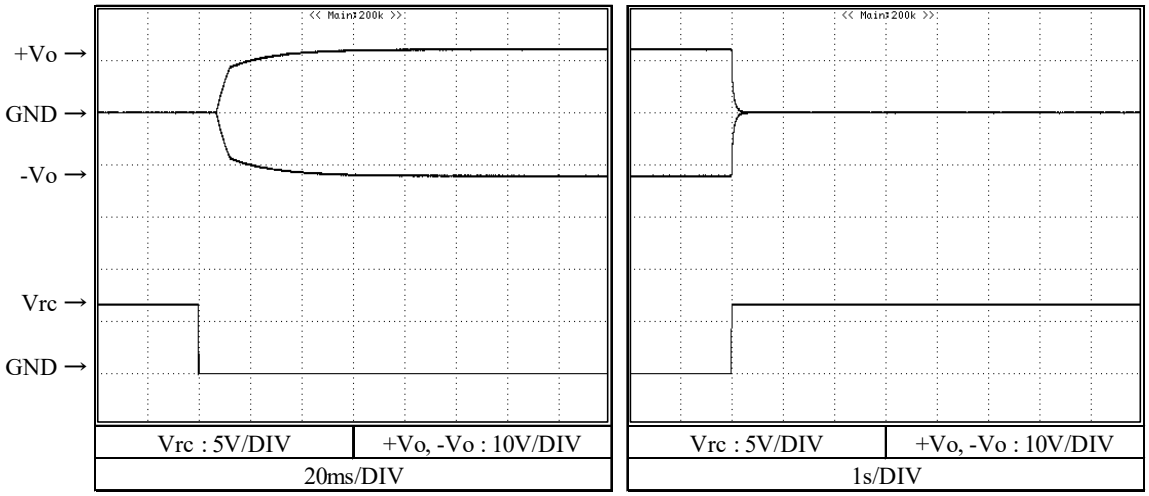
±15V



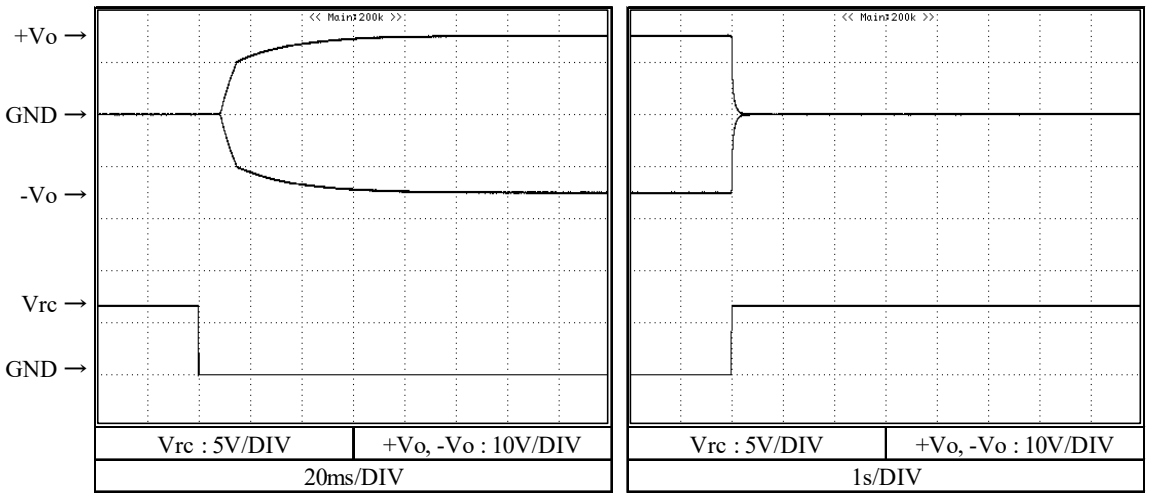
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 ºC

±12V



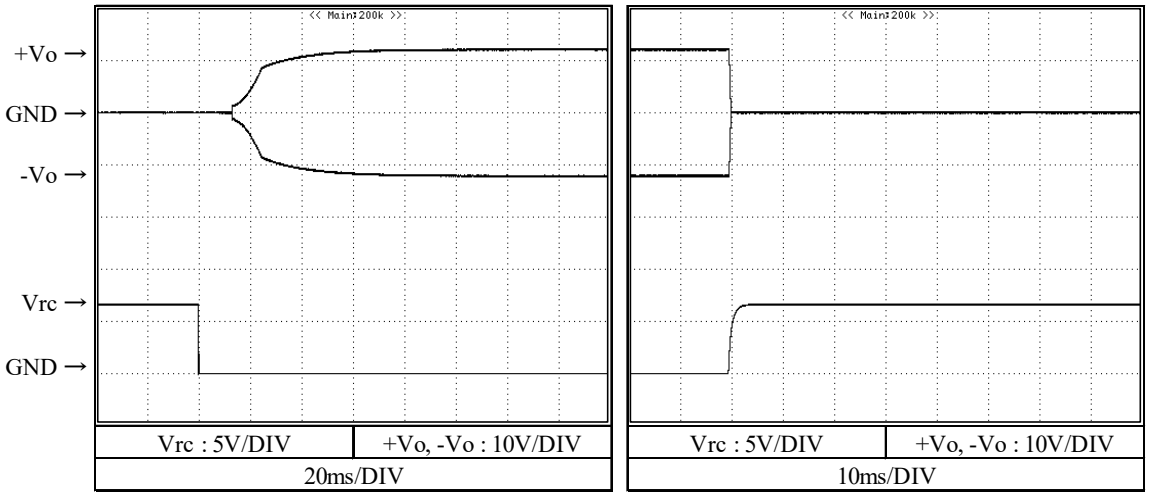
±15V



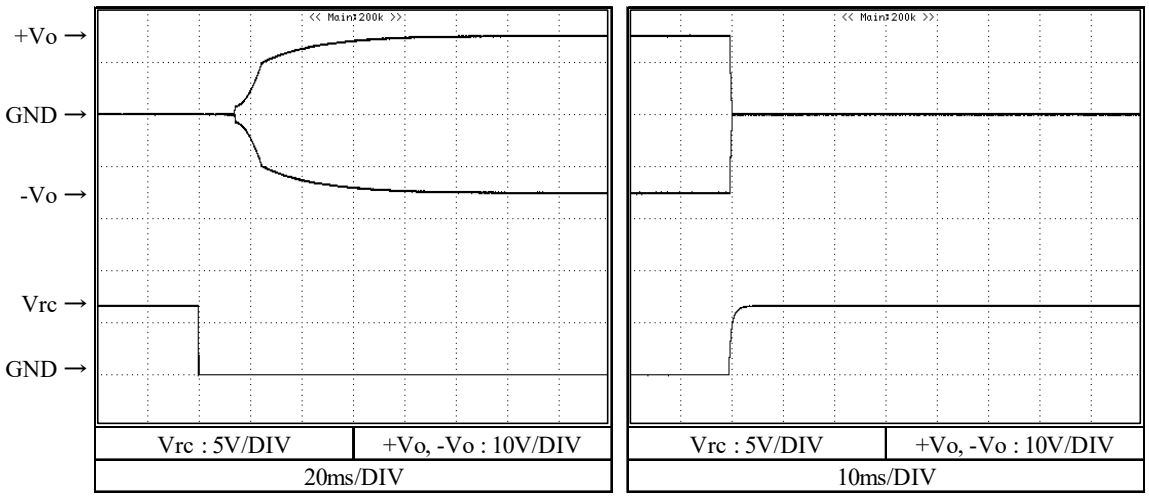
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



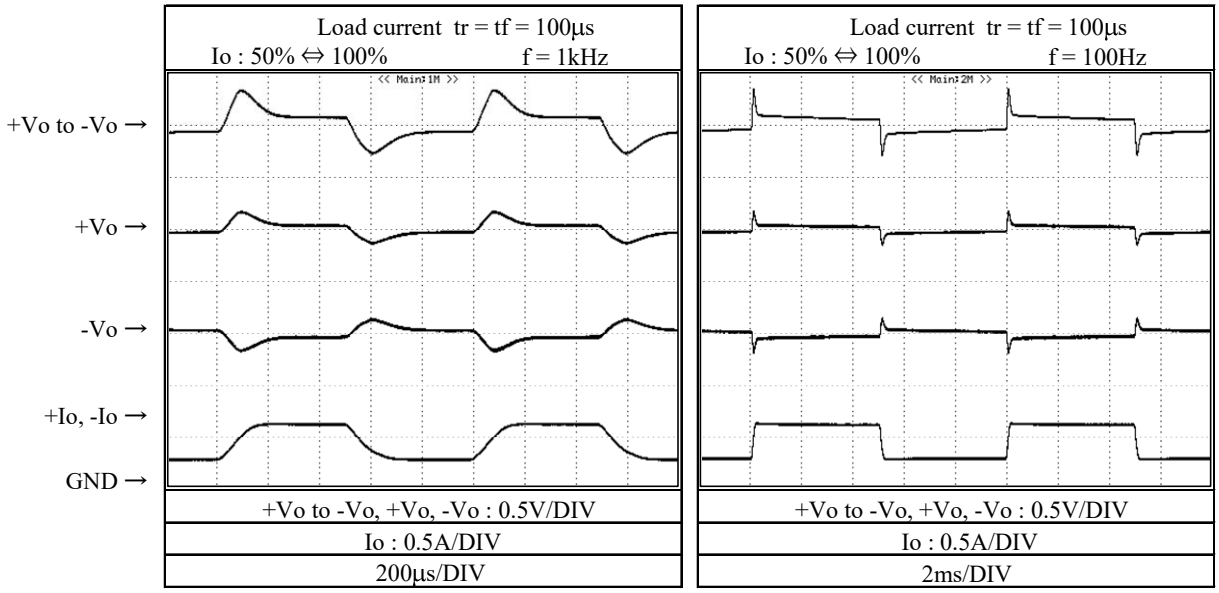
±15V



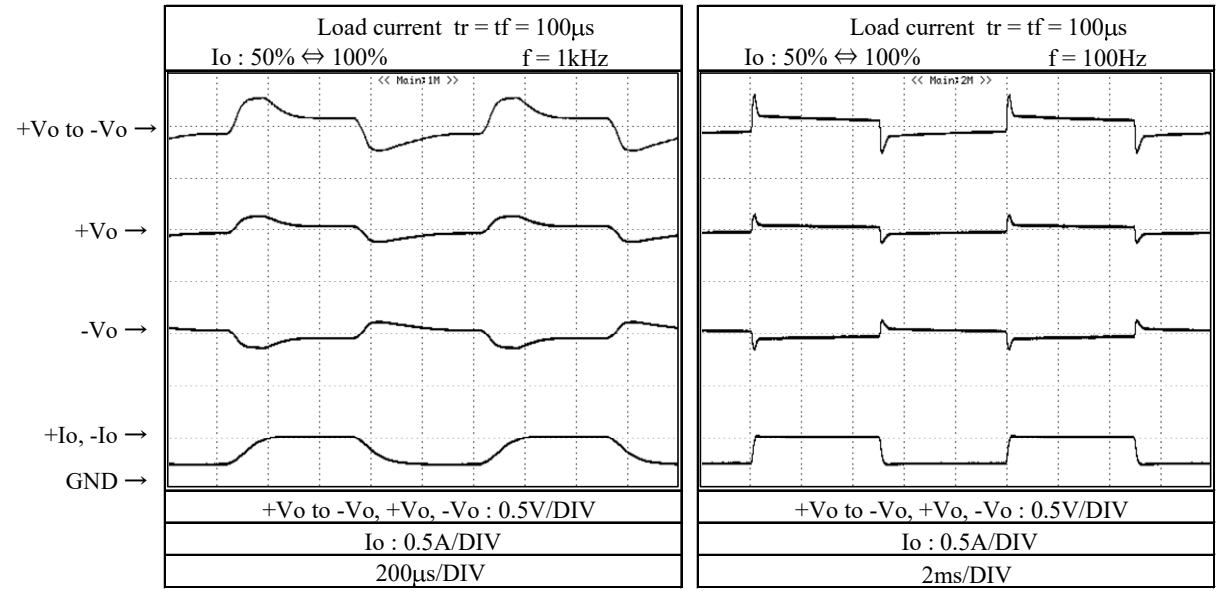
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 48 VDC
Ta : 25 ºC

±12V



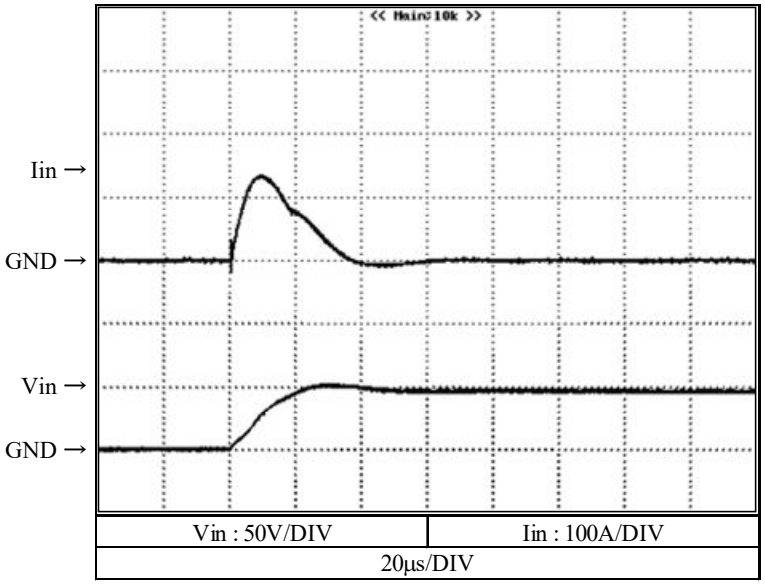
±15V



2-7. 入力サージ電流(突入電流)特性 Inrush current characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

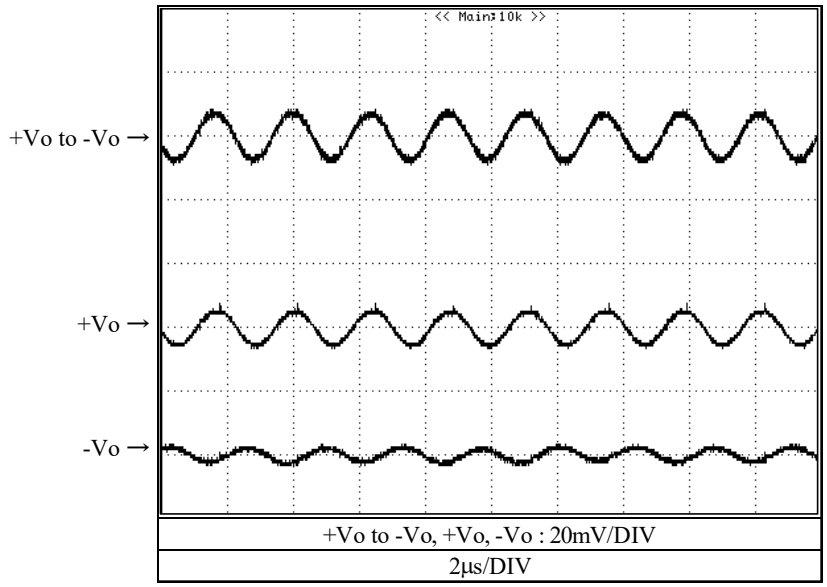
±12V



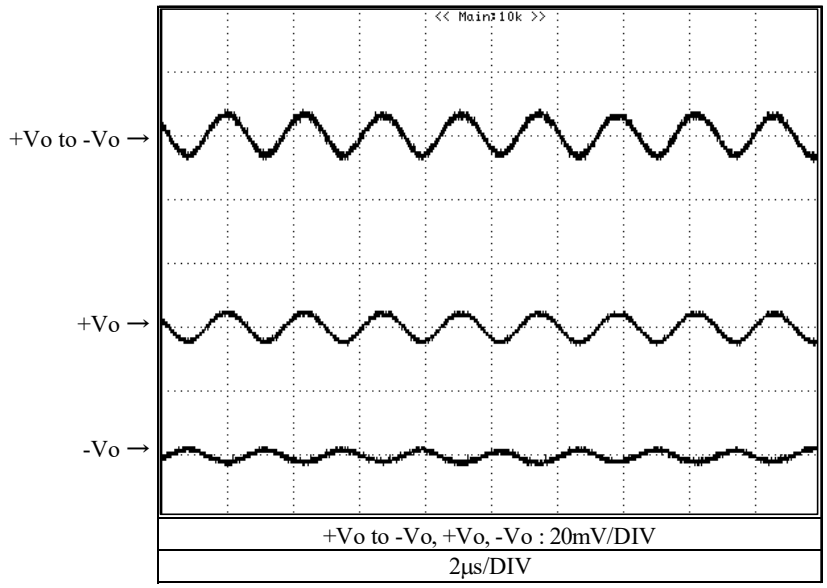
2-8. 出力リップル、ノイズ波形 Output ripple and noise waveform

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



±15V



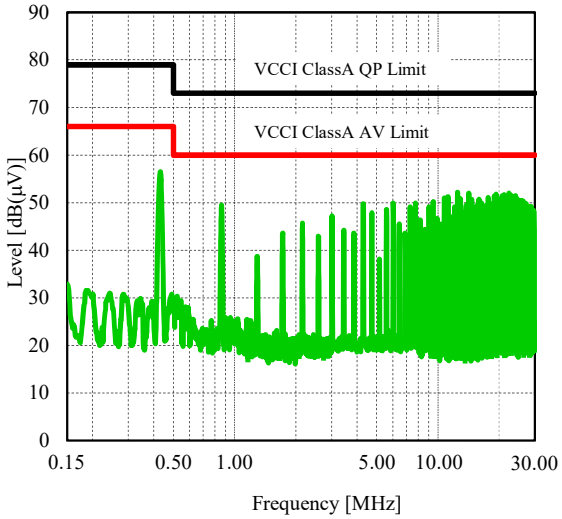
2-9. EMI特性 Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 (帰還ノイズ) Conducted Emission Noise

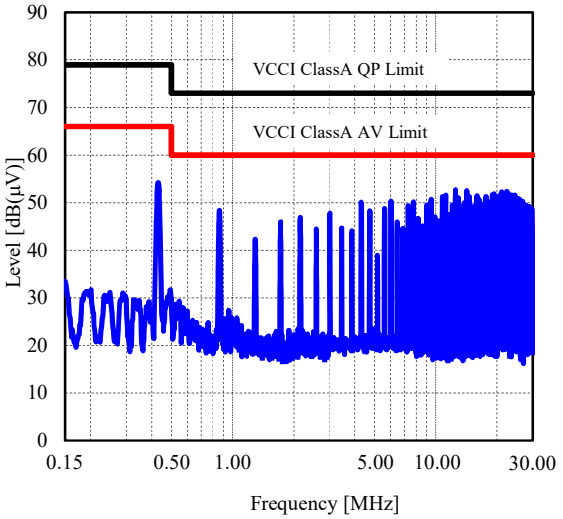
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V

+Vin

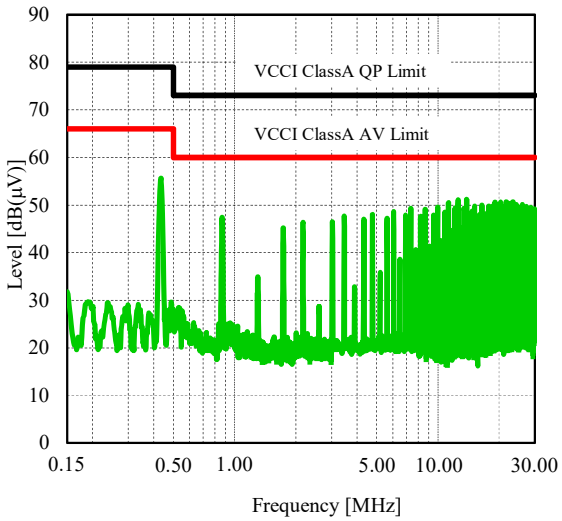


-Vin

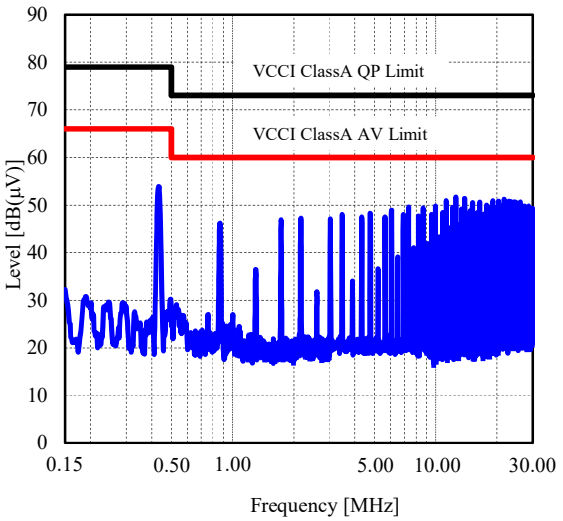


±15V

+Vin



-Vin



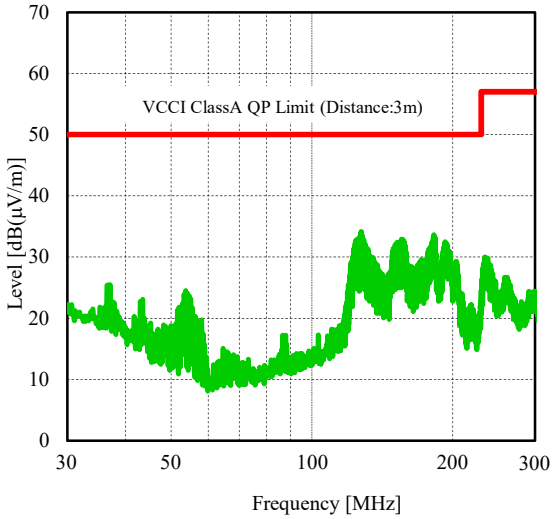
2-9. EMI特性 Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise

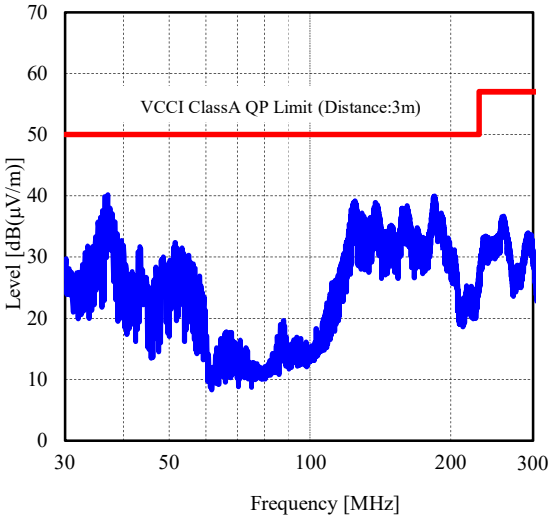
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V

HORIZONTAL

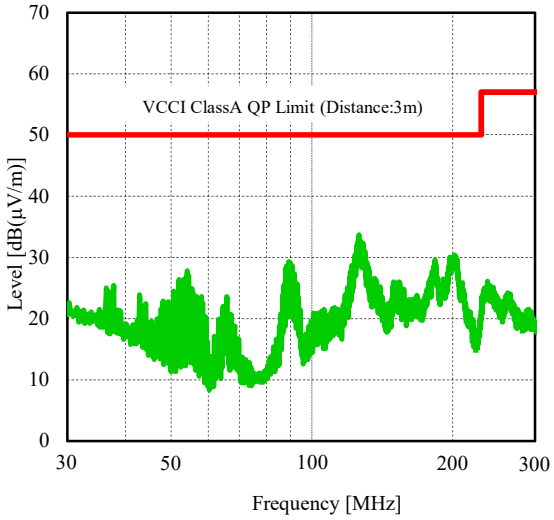


VERTICAL



±15V

HORIZONTAL



VERTICAL