CCG3-48-xxD

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
V_{RC}	・・・・・	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

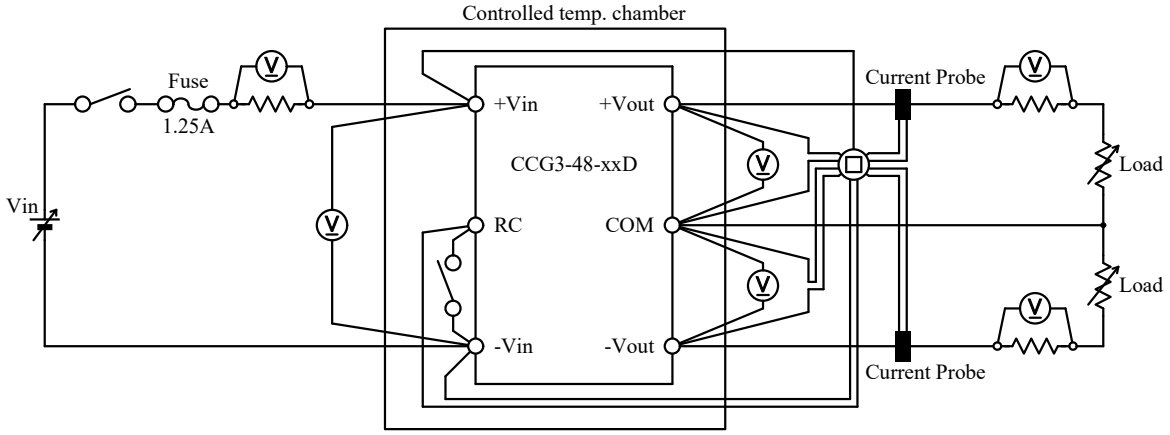
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

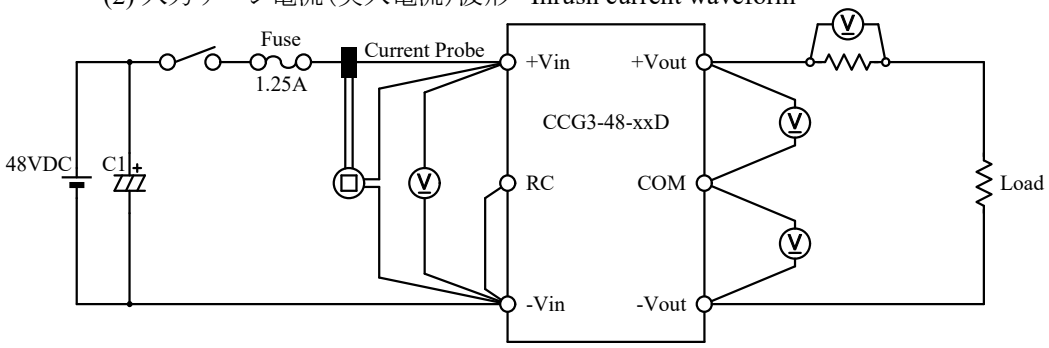
1-1. 測定回路 Measurement Circuits

(1) 静特性 、待機電力特性、通電ドリフト特性、その他特性

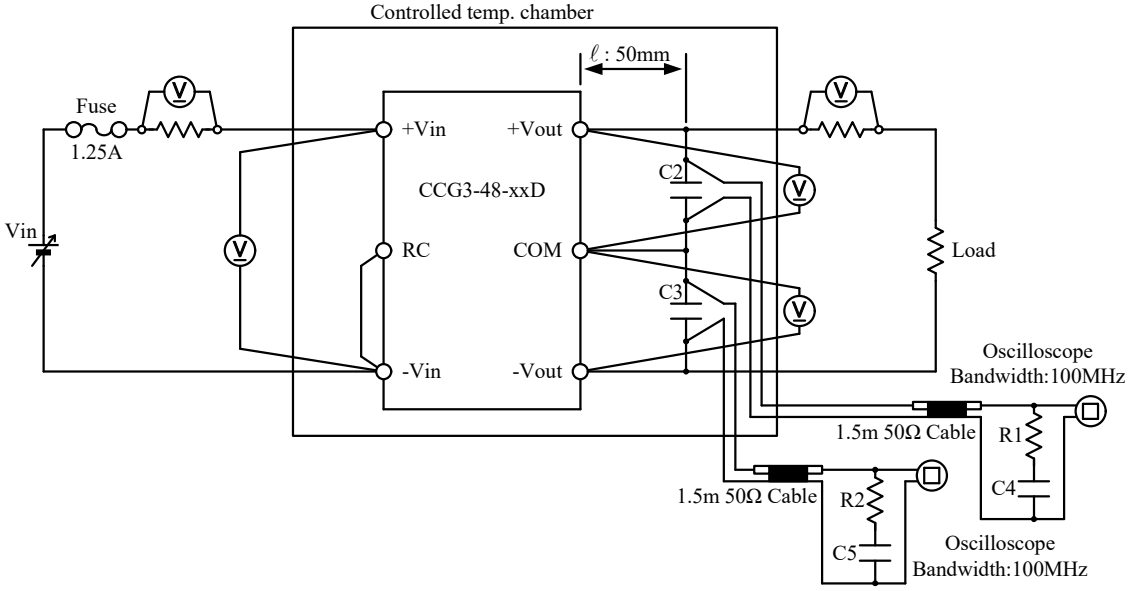
Steady state, Standby power, Warm up voltage drift and Other characteristics



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



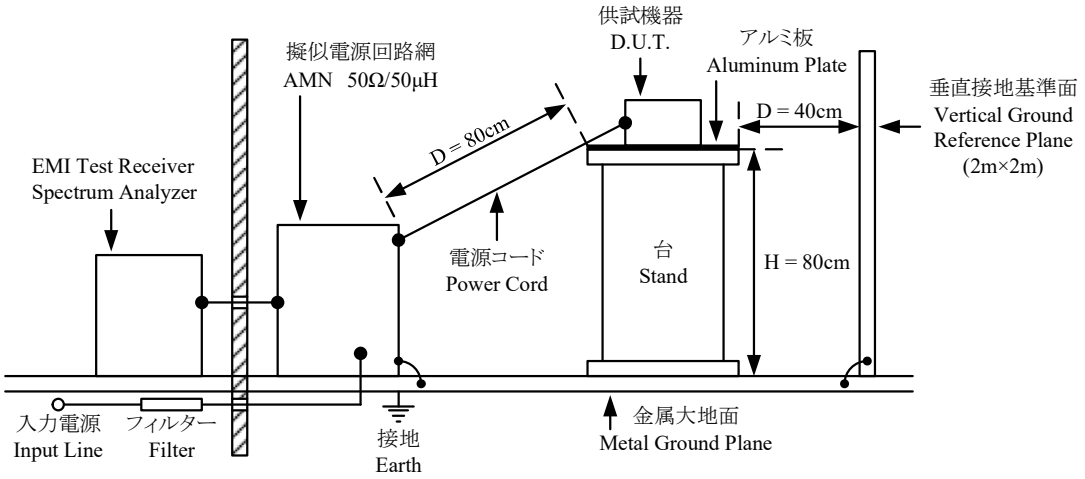
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



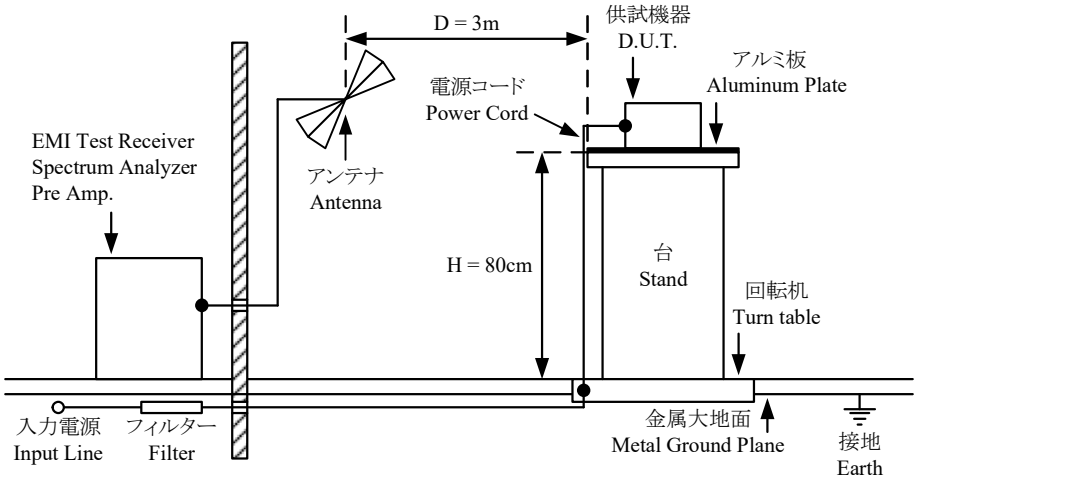
C1	: 4000μF	Electrolytic Capacitor
C2, C3	: 1μF	Ceramic Capacitor
C4, C5	: 4700pF	Ceramic Capacitor
R1, R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

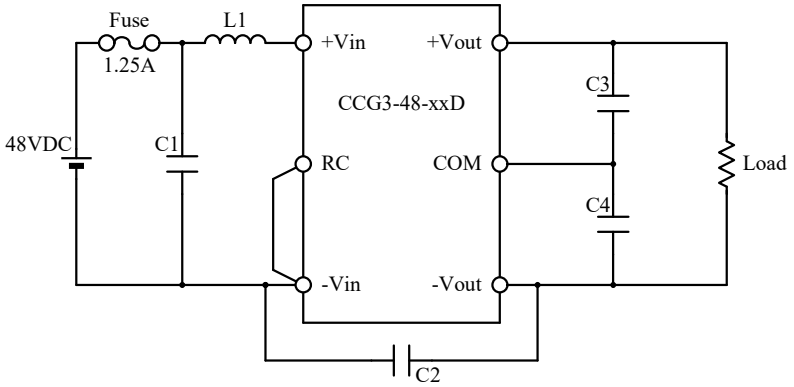
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	: 100V 2.2μF	Ceramic Capacitor	(C3216X7S2A225K, TDK)
C2	: 2kV 1000pF	Ceramic Capacitor	(C4520X7R3D102K, TDK)
C3	: 25V 10μF	Ceramic Capacitor	(C3216X7R1E106K, TDK)
C4	: 25V 10μF	Ceramic Capacitor	(C3216X7R1E106K, TDK)
L1	: 22μH 650mA	Normal Mode Choke Coil	(LQH32PB220MNC, MURATA)

1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740E / DL1740EL
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	KIKUSUI	PLZ-164WL
7	CVCF	NF	ES10000S
8	DC POWER SUPPLY	TDK-Lambda	GEN80-9.5 / GENH80-9.5
9	DC POWER SUPPLY	TAKASAGO	EX-750H2
10	CONTROLLED TEMP. CHAMBER	ESPEC	SU-261 / SU-262
11	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESR3
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 °C

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	12.0358V	12.0359V	12.0365V	12.0368V	1.0mV	0.008%
50%(0.065A)	12.0340V	12.0343V	12.0334V	12.0332V	1.1mV	0.009%
100%(0.13A)	12.0255V	12.0292V	12.0329V	12.0324V	7.4mV	0.062%
Load regulation	10.3mV	6.7mV	3.6mV	4.4mV		
	0.086%	0.056%	0.030%	0.037%		

・−Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-12.0397V	-12.0398V	-12.0392V	-12.0389V	0.9mV	0.007%
50%(0.065A)	-12.0413V	-12.0410V	-12.0422V	-12.0427V	1.7mV	0.014%
100%(0.13A)	-12.0501V	-12.0464V	-12.0431V	-12.0437V	7.0mV	0.058%
Load regulation	10.4mV	6.6mV	3.9mV	4.8mV		
	0.087%	0.055%	0.033%	0.040%		

・+Vo to −Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	24.0755V	24.0757V	24.0758V	24.0757V	0.3mV	0.001%
50%(0.065A)	24.0752V	24.0752V	24.0756V	24.0759V	0.7mV	0.003%
100%(0.13A)	24.0756V	24.0756V	24.0760V	24.0761V	0.5mV	0.002%
Load regulation	0.4mV	0.5mV	0.4mV	0.4mV		
	0.002%	0.002%	0.002%	0.002%		

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

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	12.0041V	12.0329V	12.0128V	28.8mV	0.240%
-Vo	-12.0076V	-12.0431V	-12.0297V	35.5mV	0.296%
+Vo to -Vo	24.0117V	24.0760V	24.0425V	64.3mV	0.268%

3. Load Regulation - Unbalance load Condition Ta : 25 °C

・+Vo (-Io : 100%)

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.026A)	12.1421V	12.1373V	12.1373V	12.1354V
100%(0.13A)	12.0253V	12.0292V	12.0292V	12.0322V
Load regulation	116.8mV	108.1mV	108.1mV	103.2mV
	0.973%	0.901%	0.901%	0.860%

・−Vo (+Io : 100%)

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.026A)	-12.1610V	-12.1564V	-12.1564V	-12.1576V
100%(0.13A)	-12.0509V	-12.0470V	-12.0470V	-12.0442V
Load regulation	110.1mV	109.4mV	109.4mV	113.4mV
	0.917%	0.912%	0.912%	0.945%

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

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	14.9333V	14.9317V	14.9299V	14.9294V	3.9mV	0.026%
50%(0.05A)	14.9355V	14.9368V	14.9351V	14.9332V	3.6mV	0.024%
100%(0.1A)	14.9276V	14.9324V	14.9367V	14.9350V	9.1mV	0.061%
Load	7.9mV	5.1mV	6.8mV	5.6mV		
regulation	0.053%	0.034%	0.045%	0.037%		

・−Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-14.9624V	-14.9634V	-14.9651V	-14.9659V	3.5mV	0.023%
50%(0.05A)	-14.9599V	-14.9585V	-14.9603V	-14.9617V	3.2mV	0.021%
100%(0.1A)	-14.9676V	-14.9627V	-14.9582V	-14.9594V	9.4mV	0.063%
Load	7.7mV	4.9mV	6.9mV	6.5mV		
regulation	0.051%	0.033%	0.046%	0.043%		

・+Vo to −Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	29.8957V	29.8952V	29.8950V	29.8953V	0.7mV	0.002%
50%(0.05A)	29.8955V	29.8954V	29.8954V	29.8948V	0.7mV	0.002%
100%(0.1A)	29.8953V	29.8950V	29.8949V	29.8944V	0.9mV	0.003%
Load	0.4mV	0.4mV	0.5mV	0.9mV		
regulation	0.001%	0.001%	0.002%	0.003%		

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

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	14.9156V	14.9367V	14.8908V	45.9mV	0.306%
-Vo	-14.9324V	-14.9582V	-14.9143V	43.9mV	0.293%
+Vo to -Vo	29.8480V	29.8949V	29.8051V	89.8mV	0.299%

3. Load Regulation - Unbalance load Condition Ta : 25 °C

・+Vo (-Io : 100%)

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.02A)	15.0401V	15.0344V	15.0344V	15.0302V
100%(0.1A)	14.9268V	14.9321V	14.9321V	14.9349V
Load	113.3mV	102.3mV	102.3mV	95.3mV
regulation	0.755%	0.682%	0.682%	0.635%

・−Vo (+Io : 100%)

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.02A)	-15.0766V	-15.0703V	-15.0703V	-15.0739V
100%(0.1A)	-14.9675V	-14.9627V	-14.9627V	-14.9594V
Load	109.1mV	107.6mV	107.6mV	114.5mV
regulation	0.727%	0.717%	0.717%	0.763%

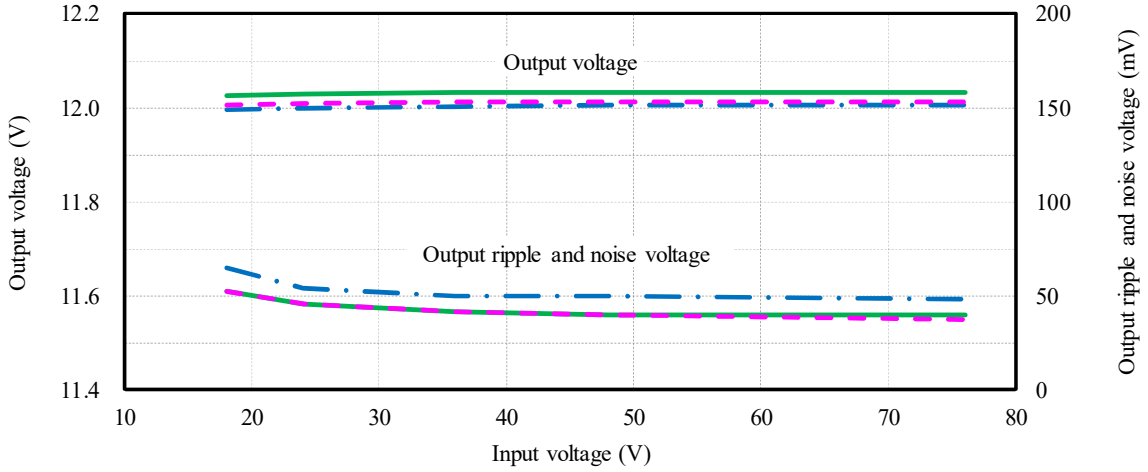
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

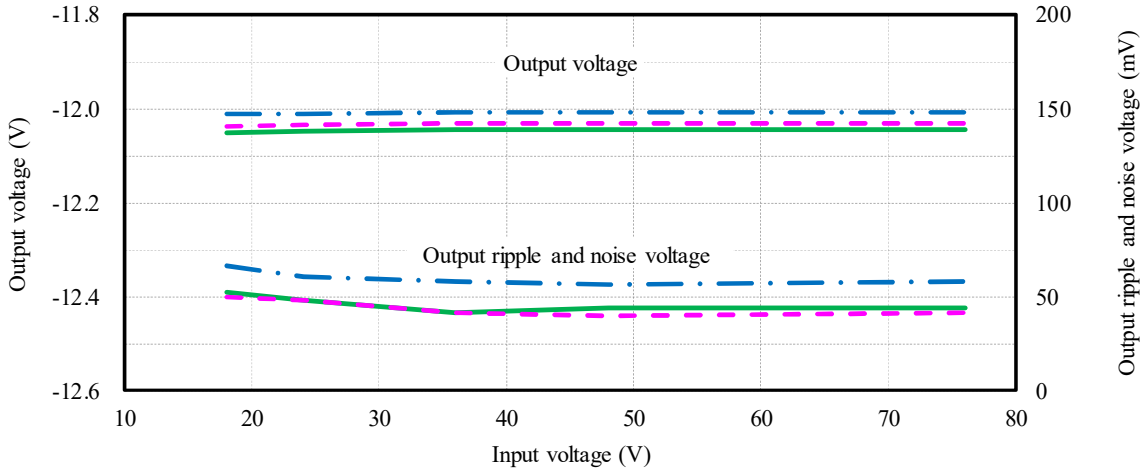
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 85 °C

±12V

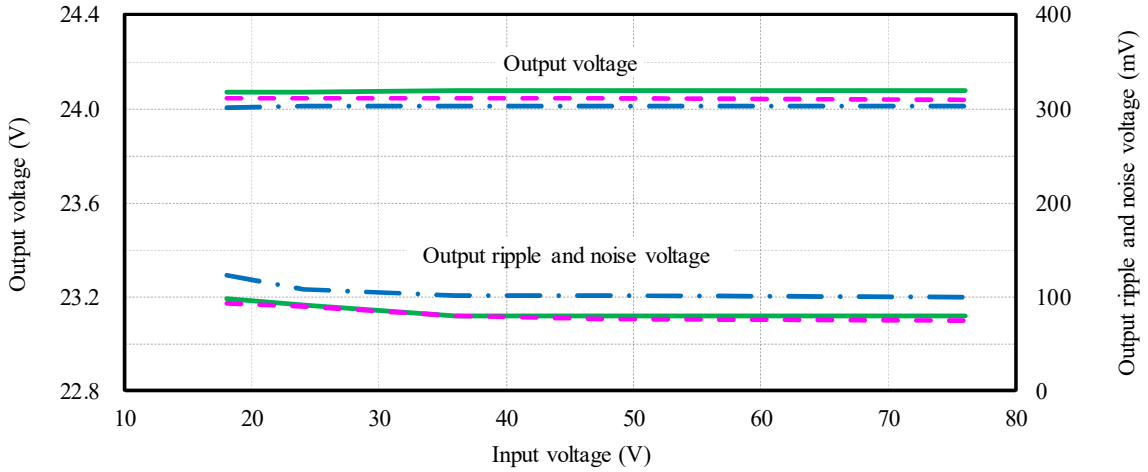
・+Vo



・−Vo



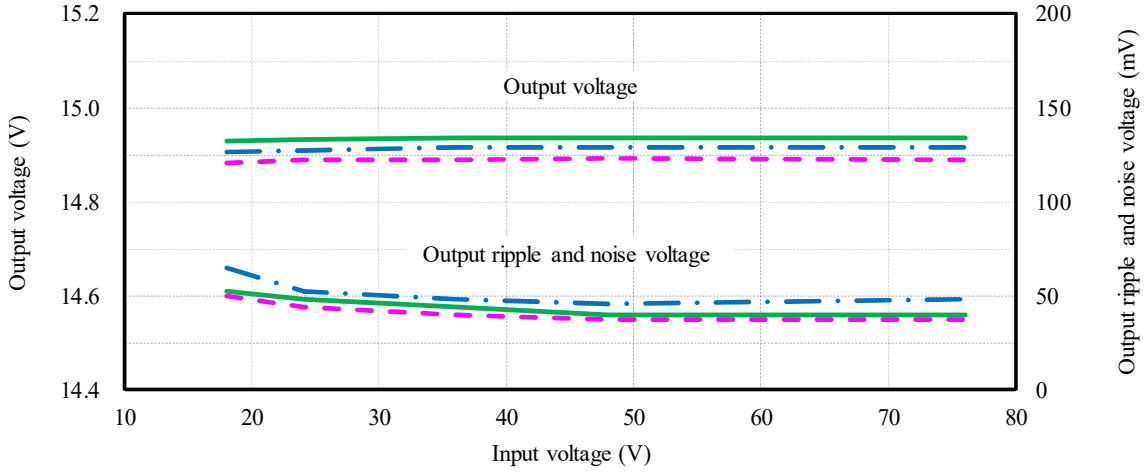
・+Vo to -Vo



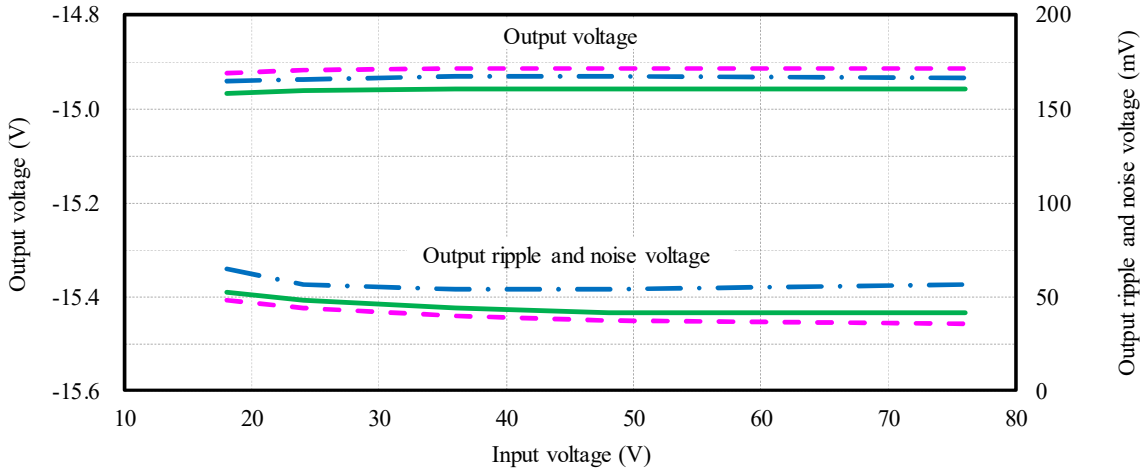
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 85 °C

±15V

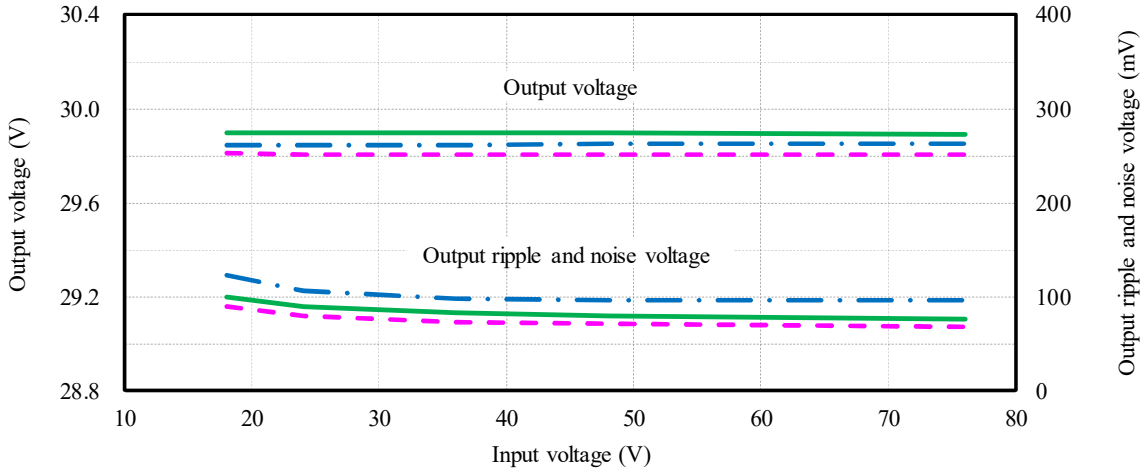
・+Vo



・−Vo



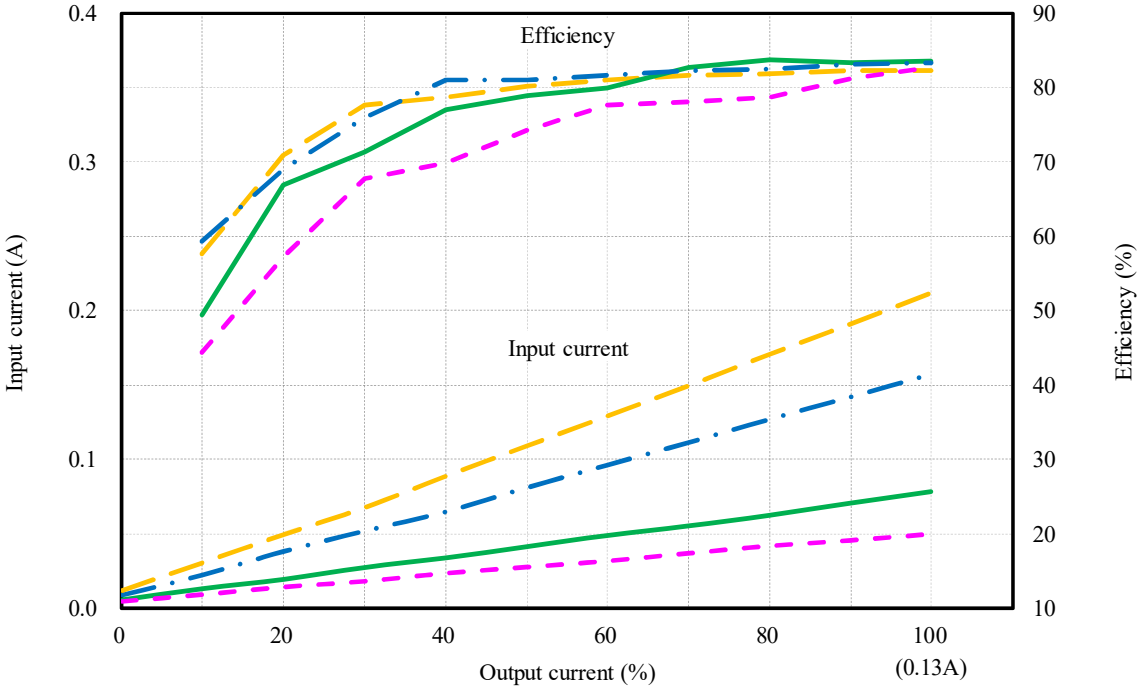
・+Vo to -Vo



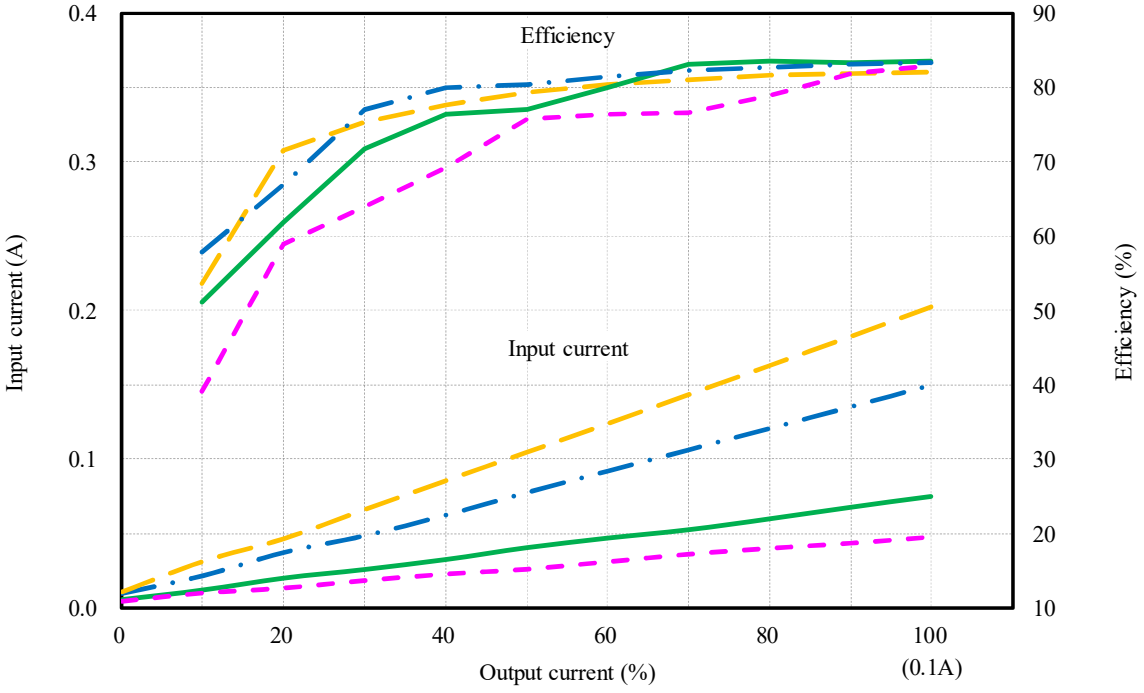
(3) 入力電流･効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 °C

±12V



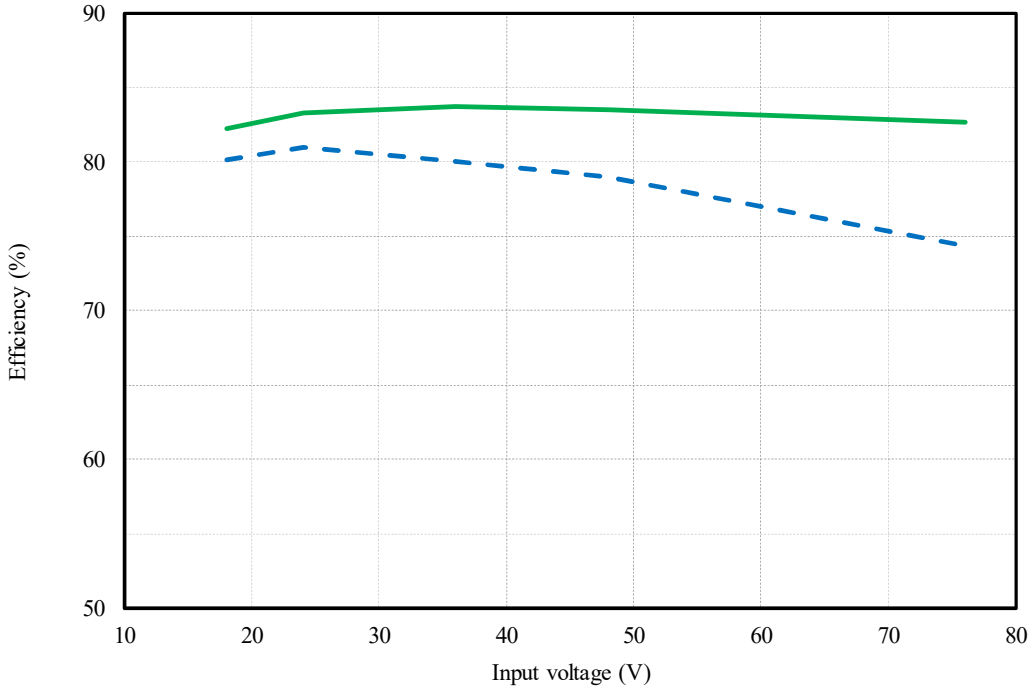
±15V



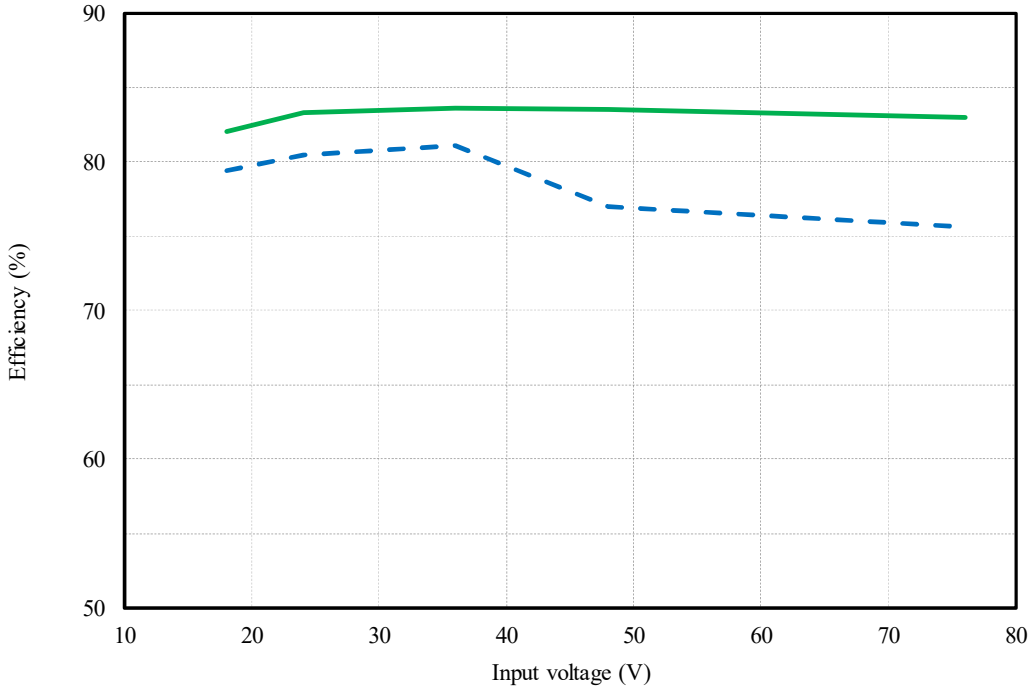
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

Conditions Io : 50 %
: 100 %
Ta : 25 °C

±12V



±15V



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

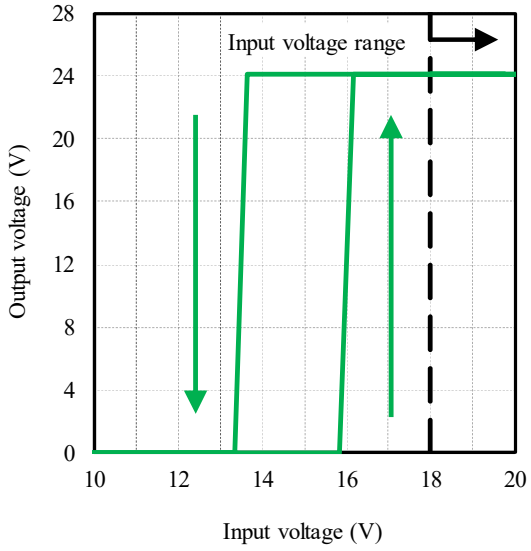
出力電圧 対 入力電圧
Output voltage vs. Input voltage

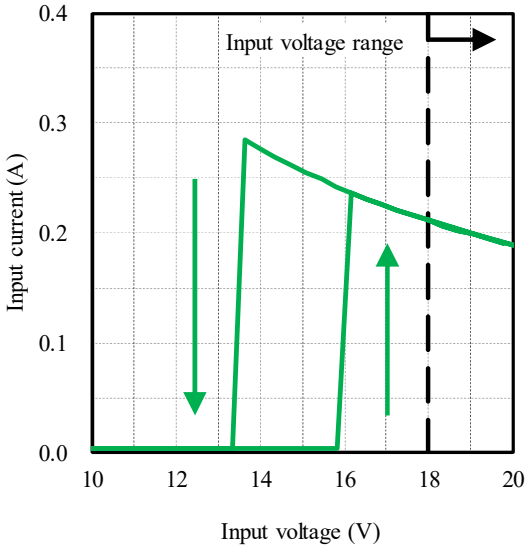
Conditions Io : 100 %
Ta : 25 °C

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

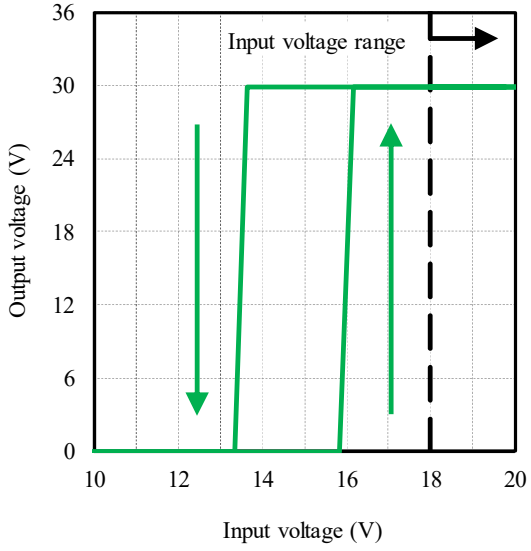
Conditions Io : 100 %
Ta : 25 °C

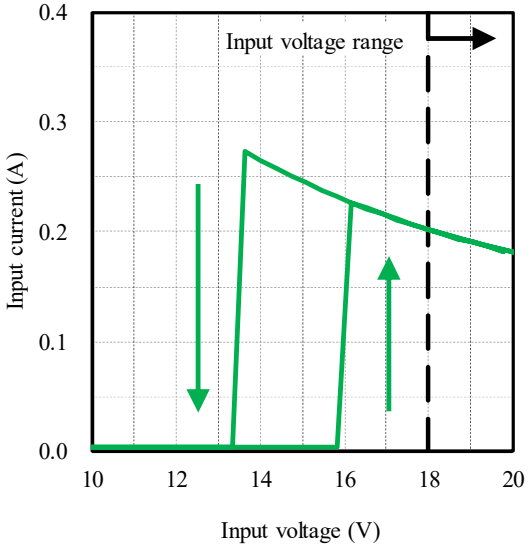
±12V





±15V

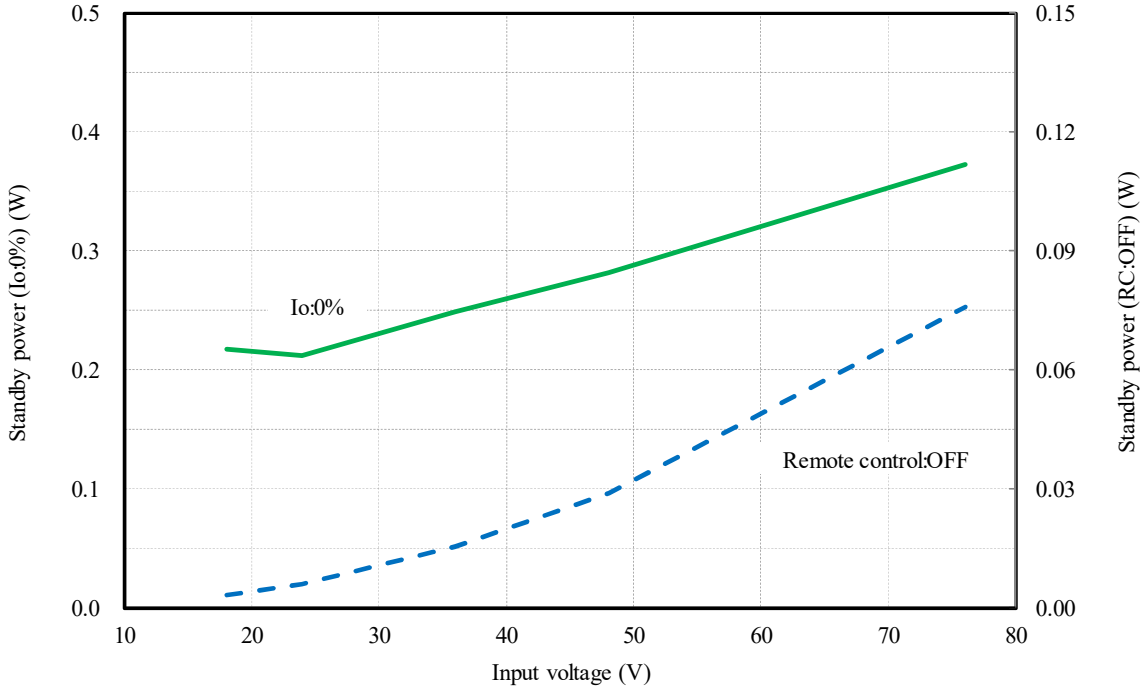




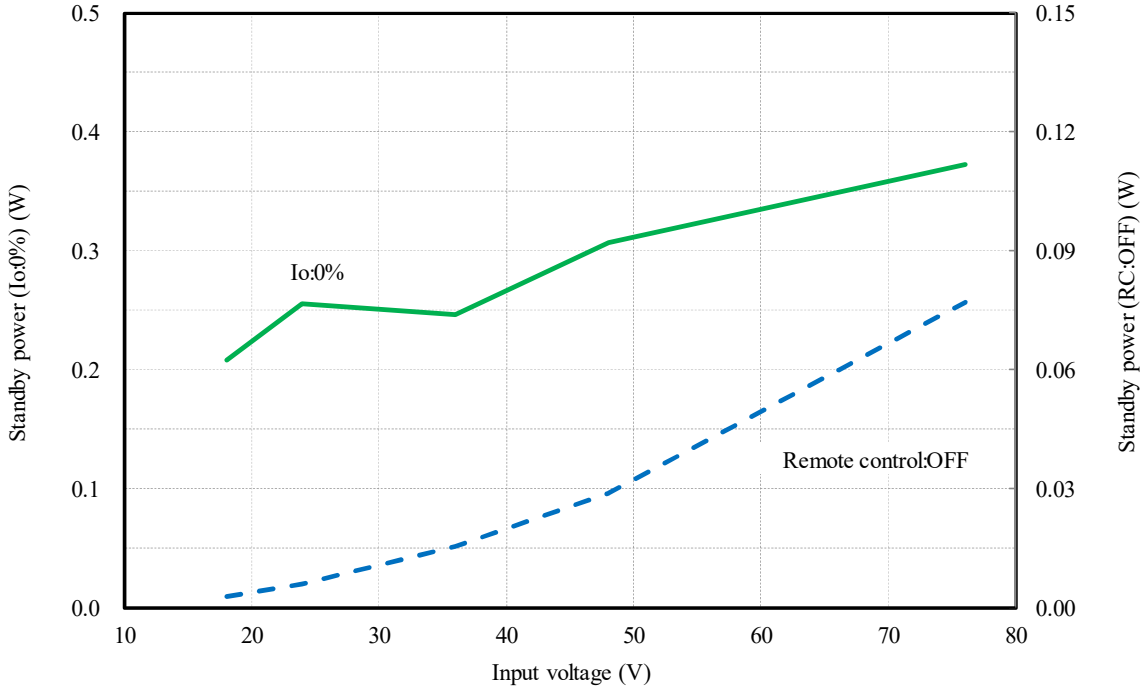
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



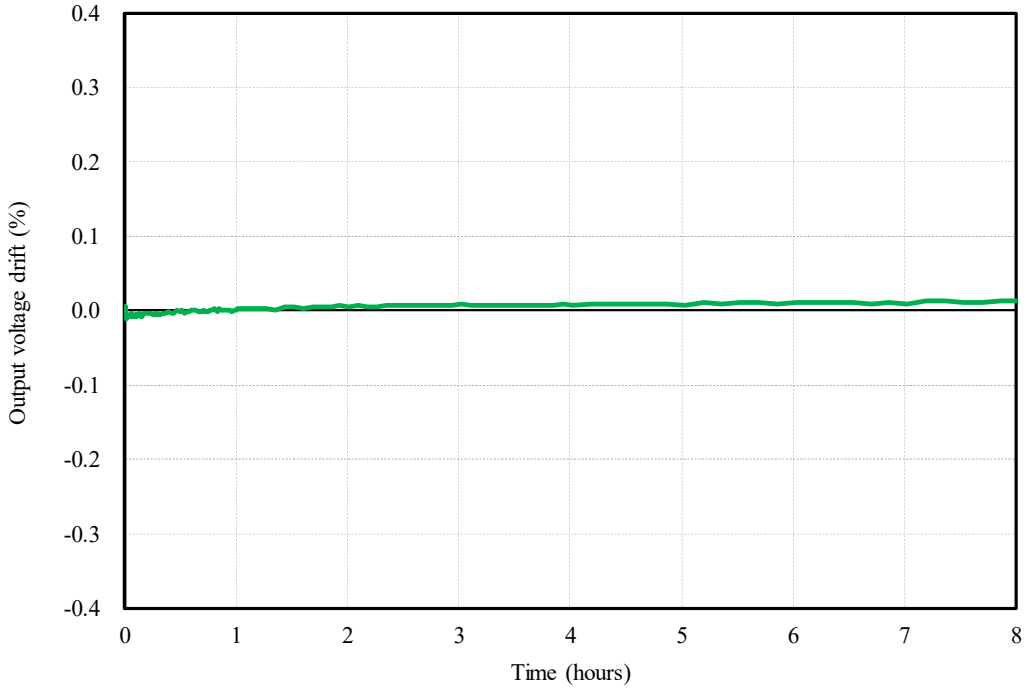
±15V



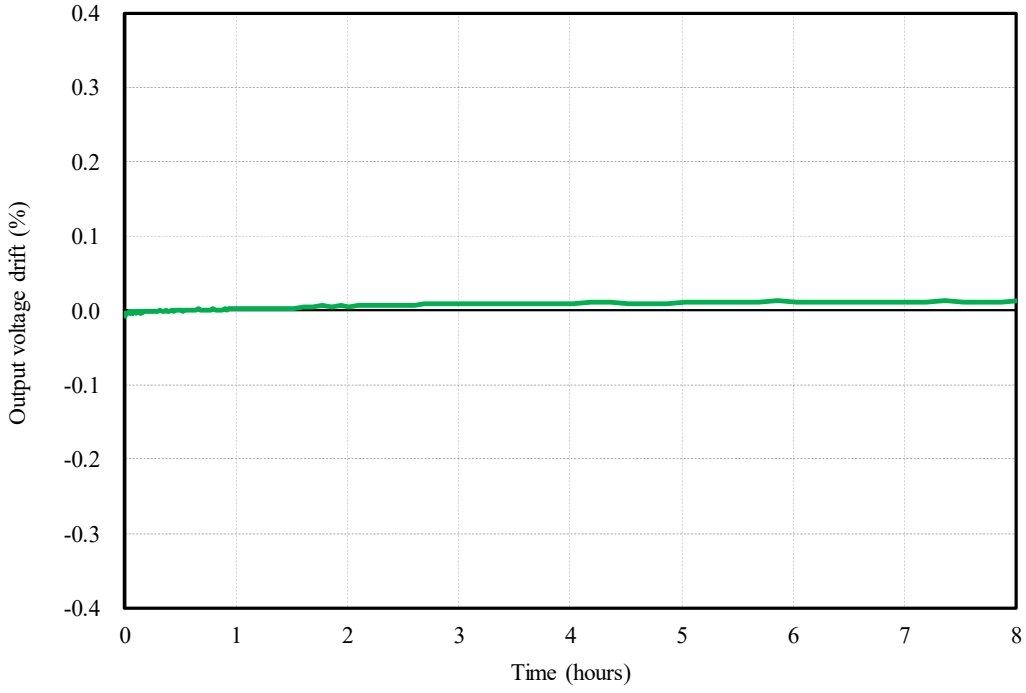
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



±15V



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

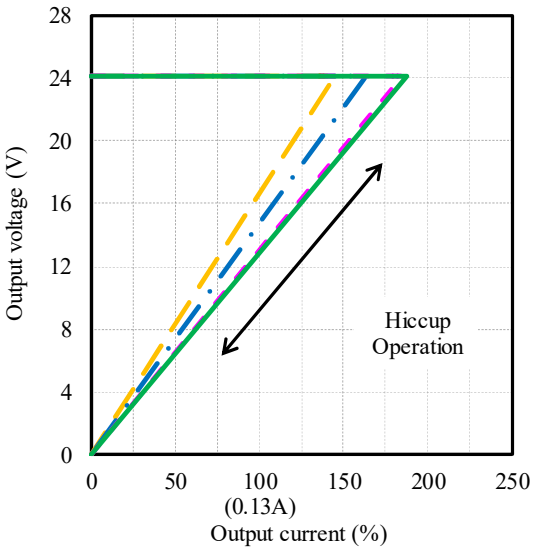
入力電圧依存性
Input voltage dependence

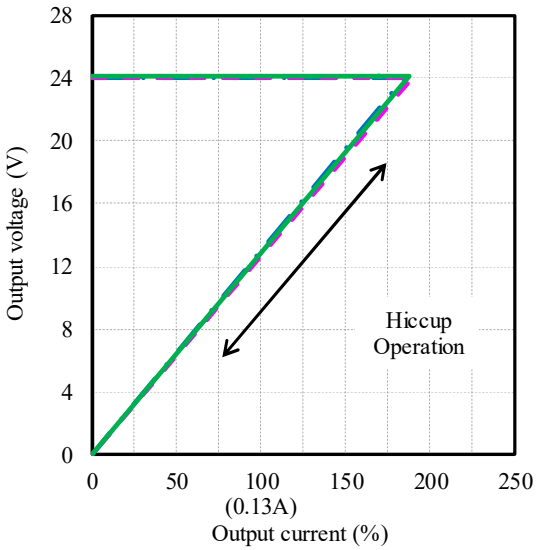
Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

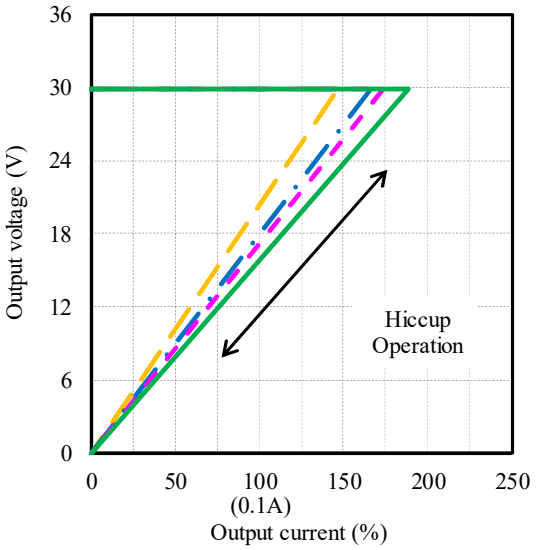
Conditions Vin : 48 VDC
Ta : -40 °C
: 25 °C
: 85 °C

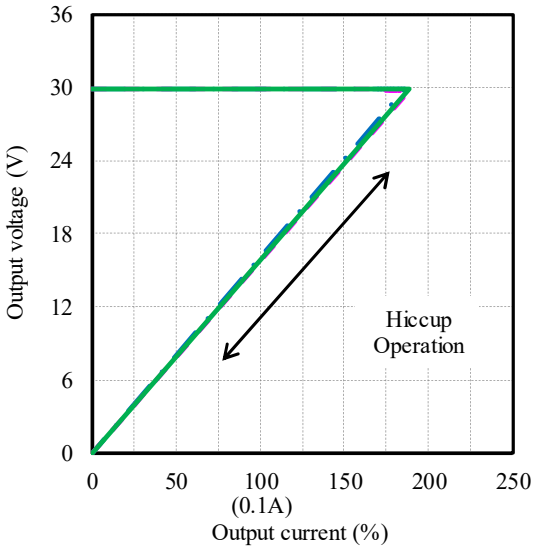
±12V





±15V

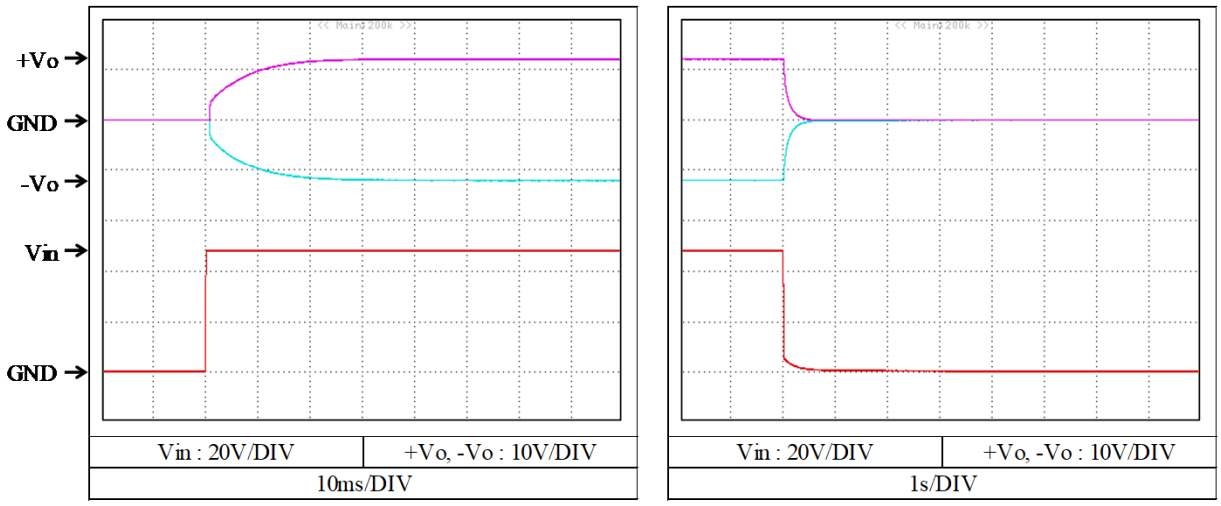




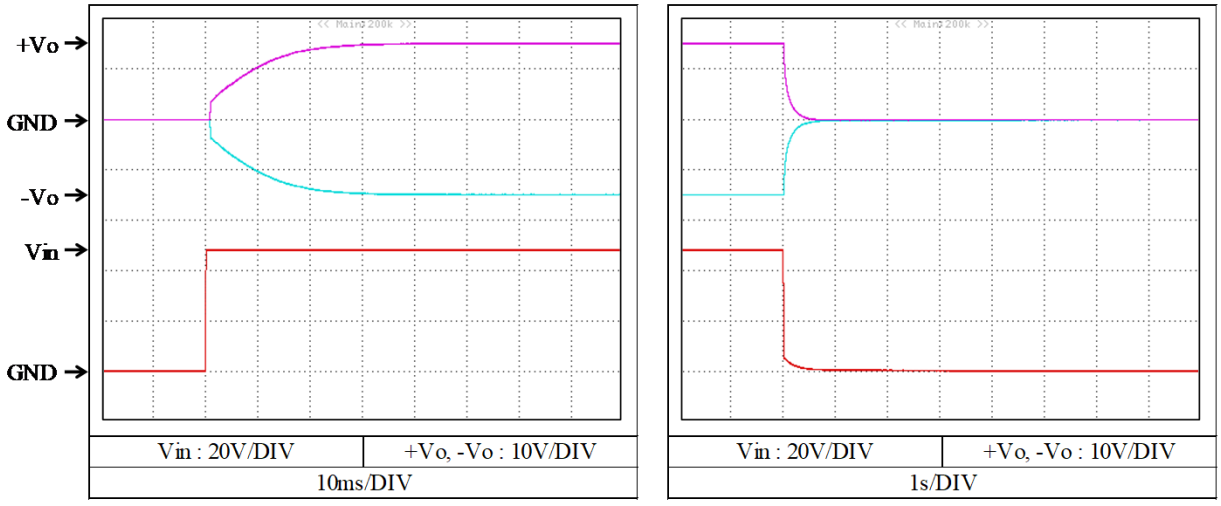
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 °C

±12V



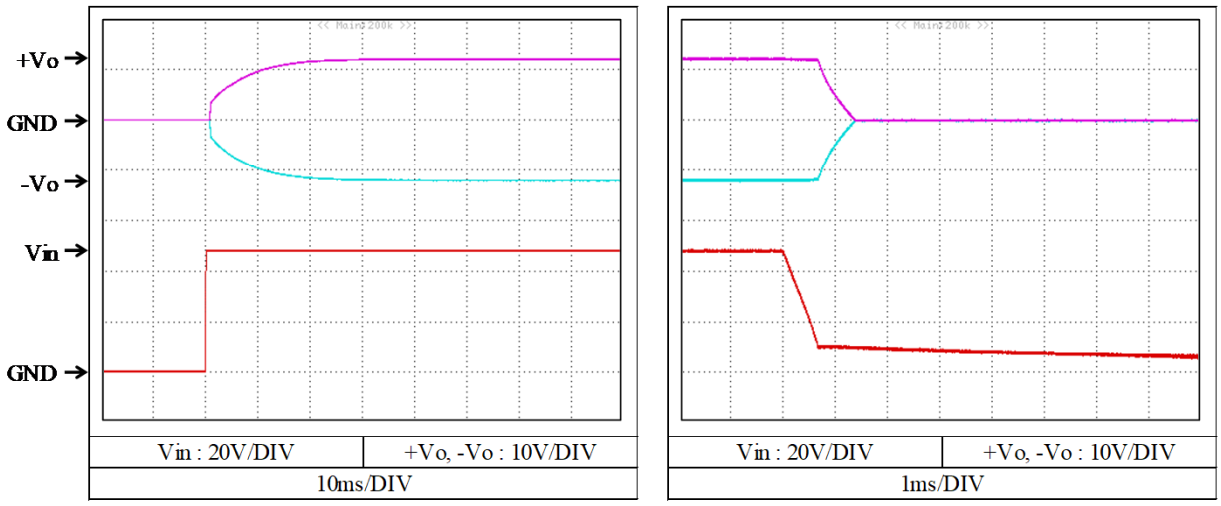
+15V



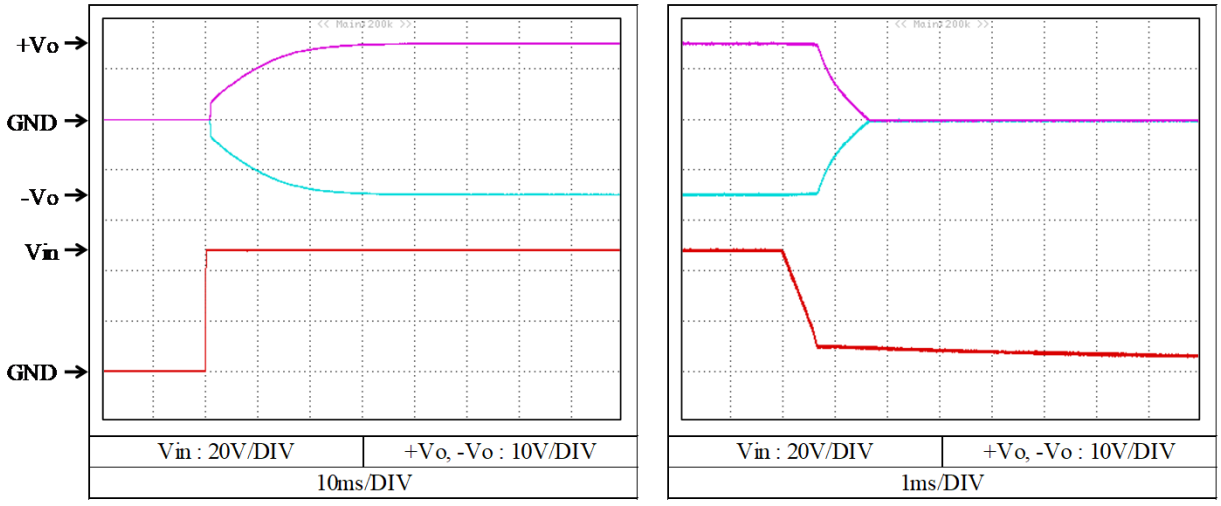
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

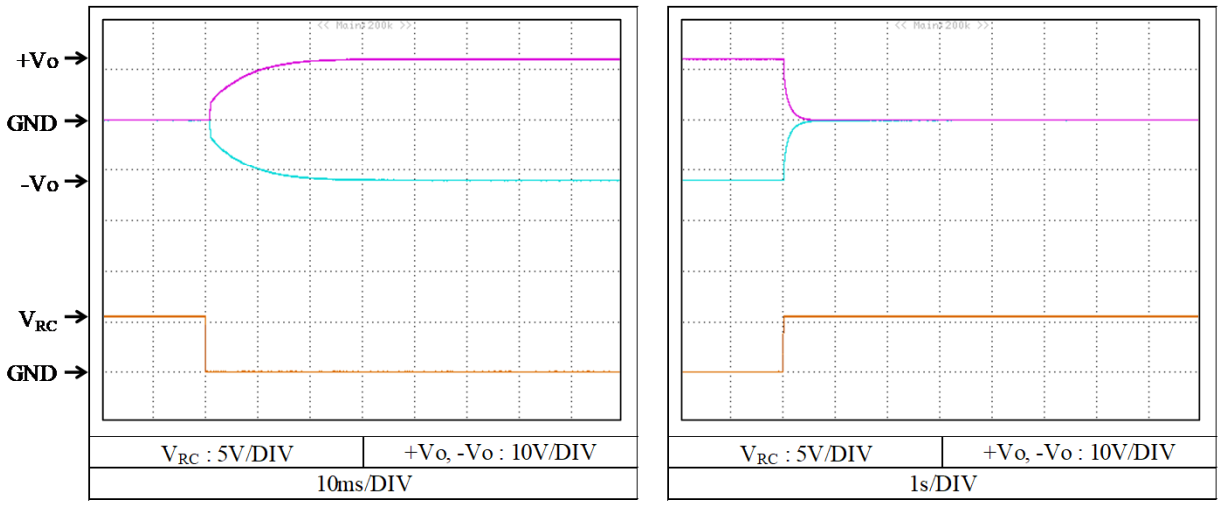


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

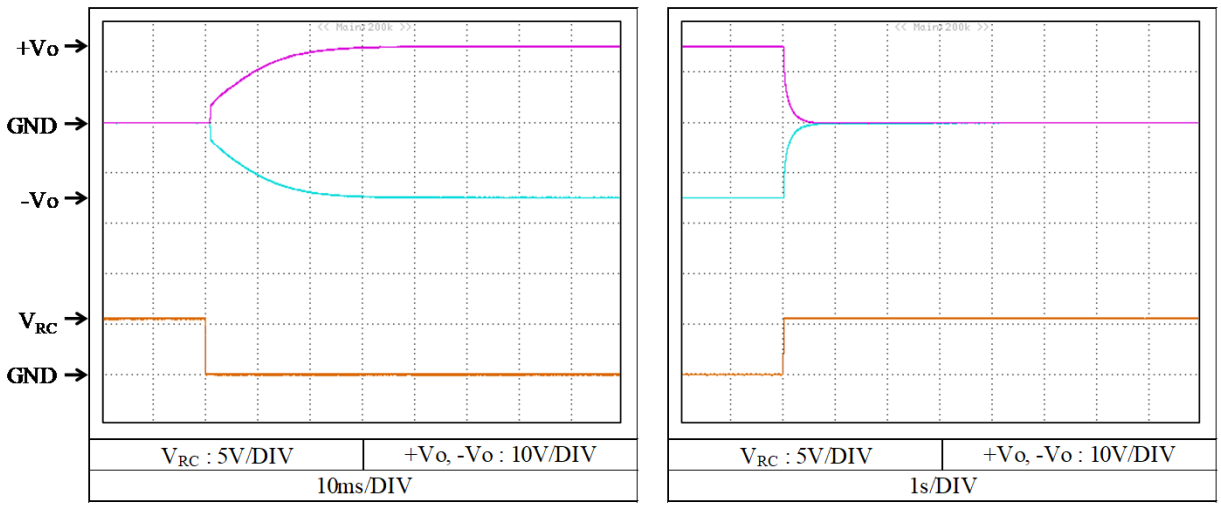
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 °C

±12V



+15V

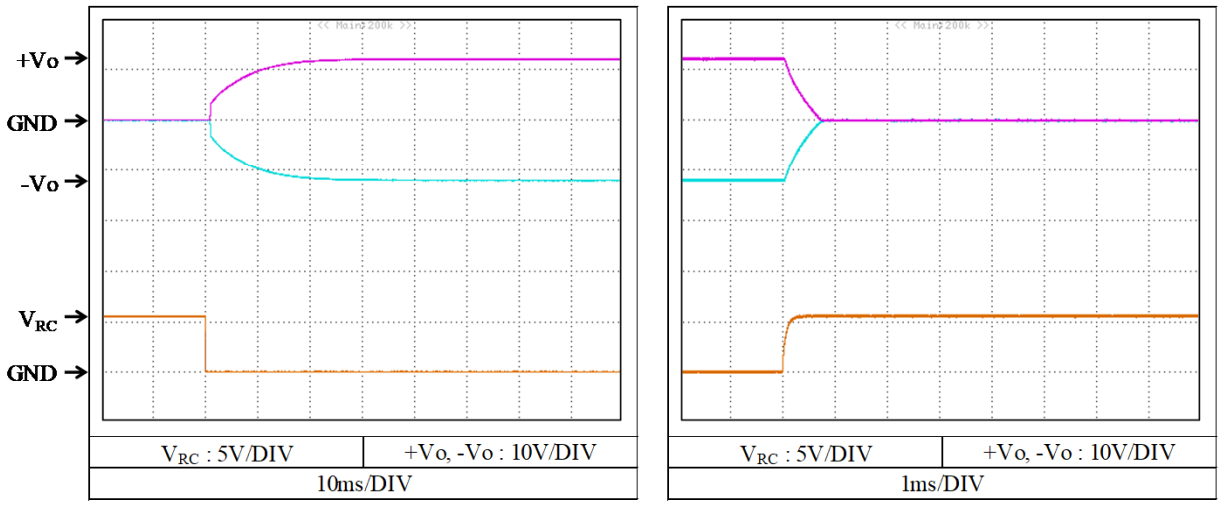


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

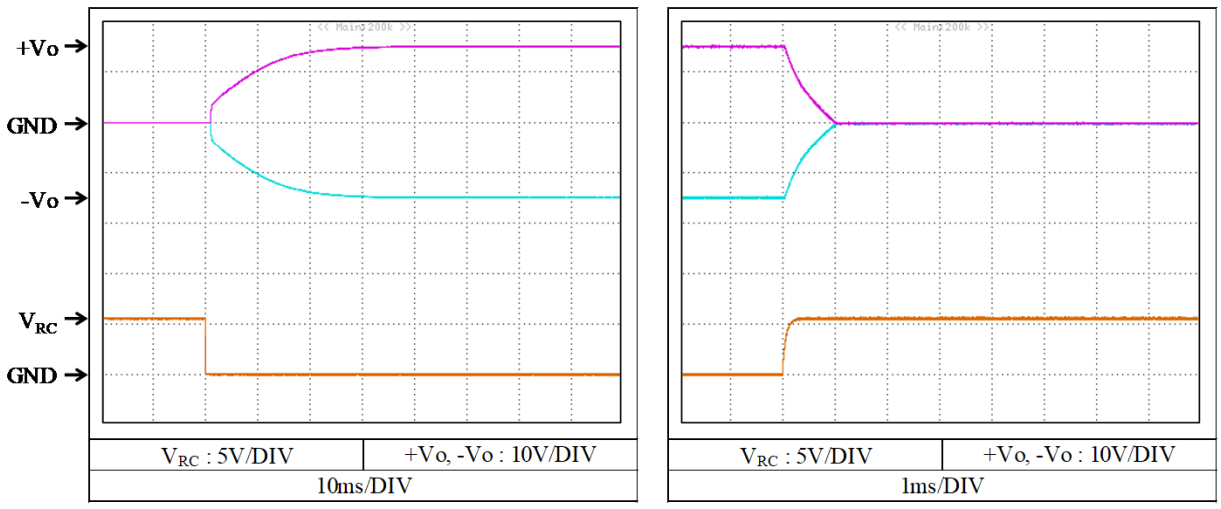
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



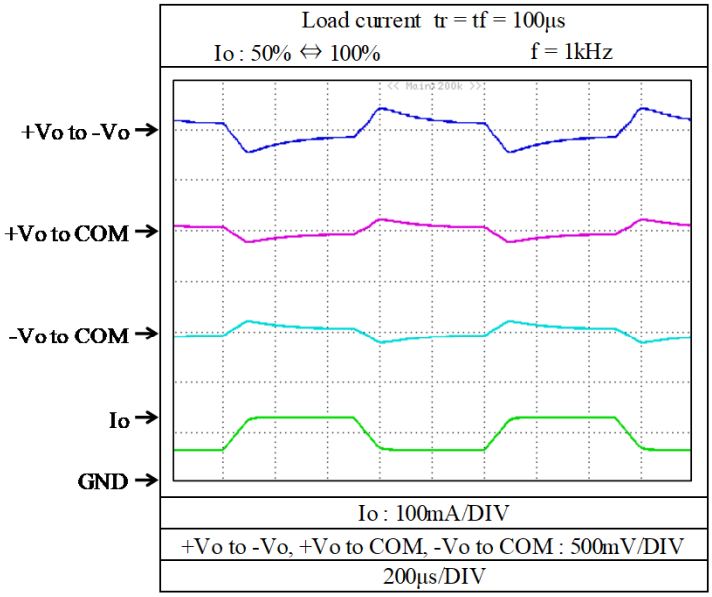
+15V



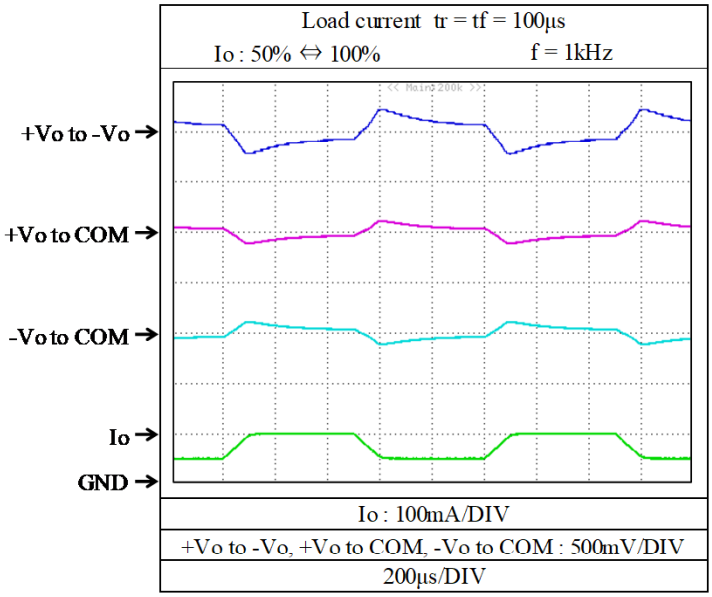
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 48 VDC
Ta : 25 °C

±12V



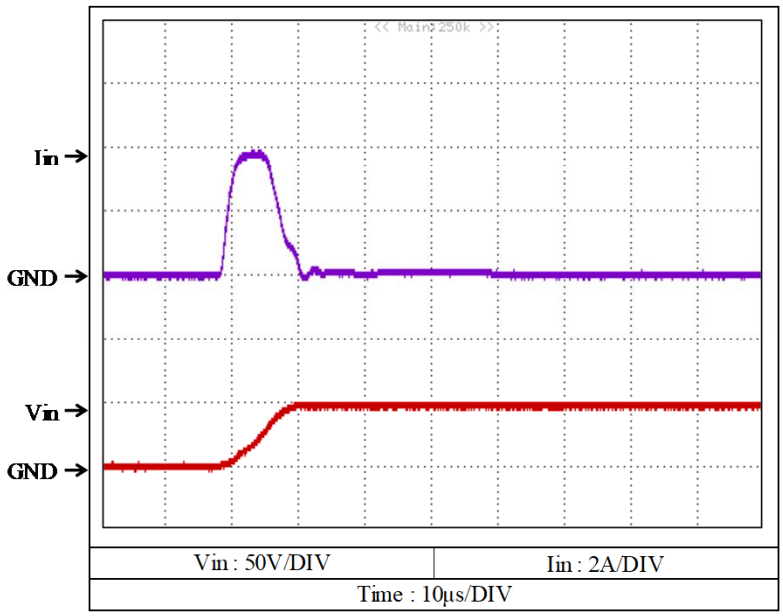
+15V



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 °C

CCG3-48-05S

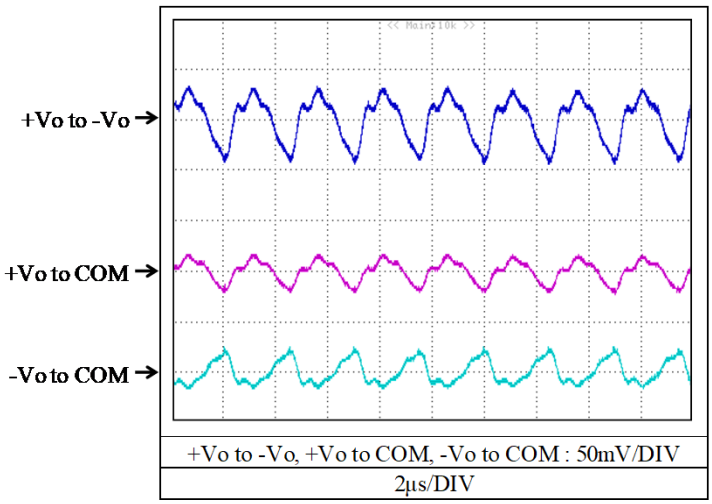


CCG3-48-xxDの入力サージ電流特性は CCG3-48-05S と同等です。
CCG3-48-xxD have the same Inrush current characteristics as CCG3-48-05S data.

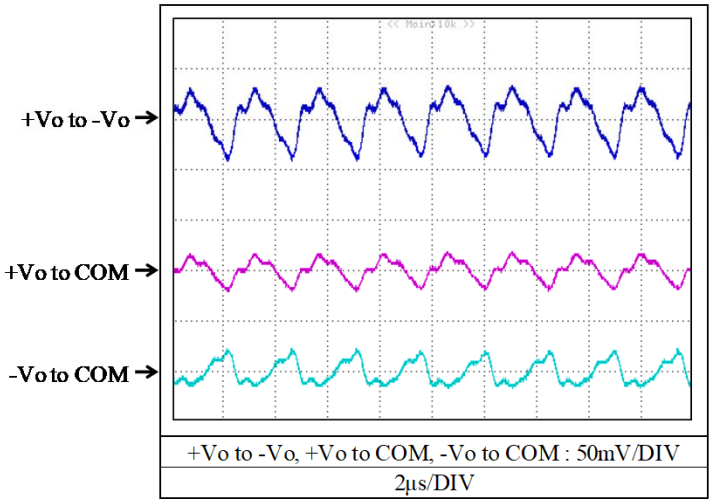
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

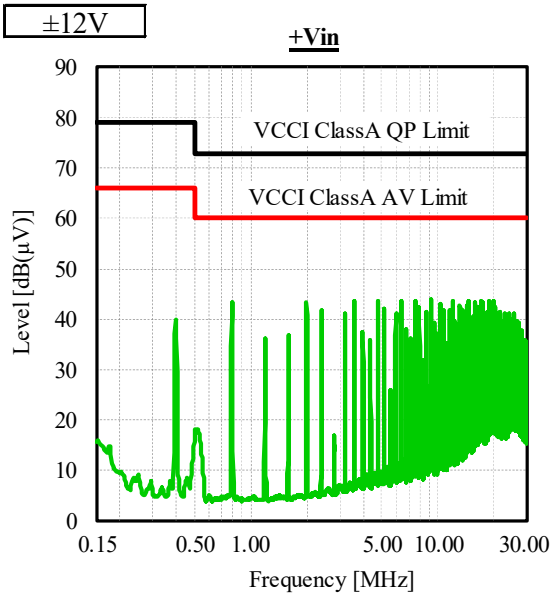


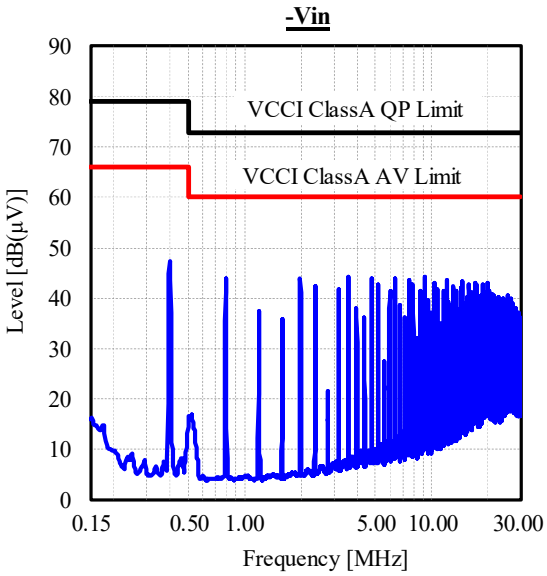
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

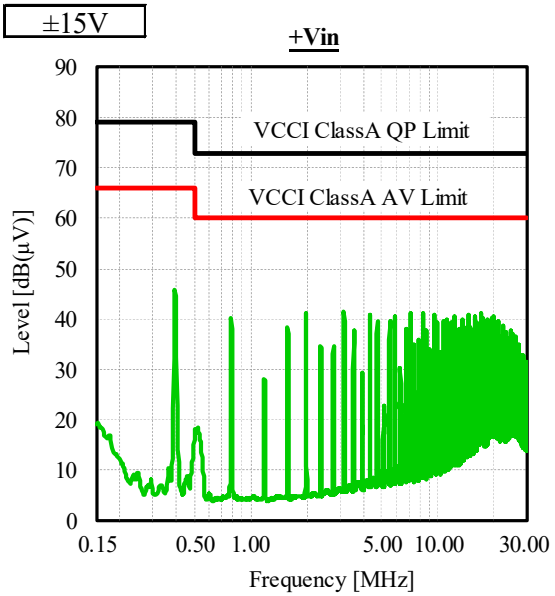
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

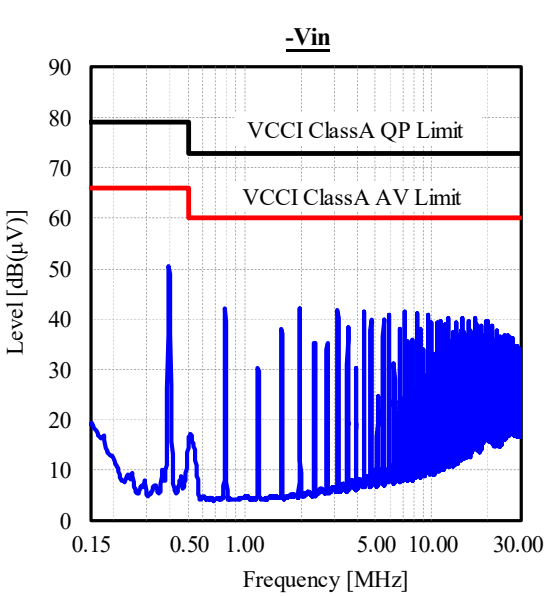
±12V





±15V





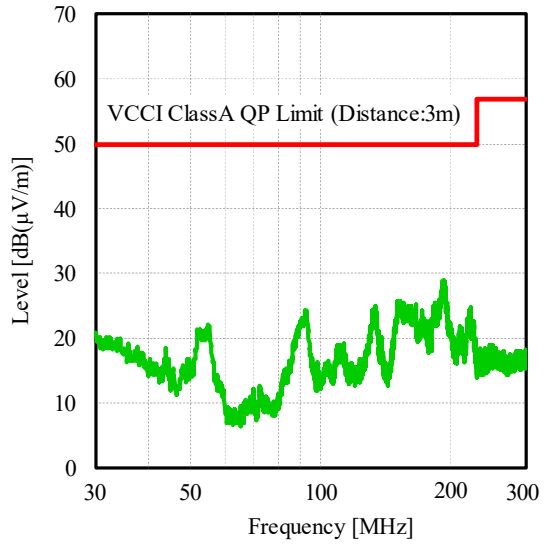
表示はQP値
Indication is QP values.

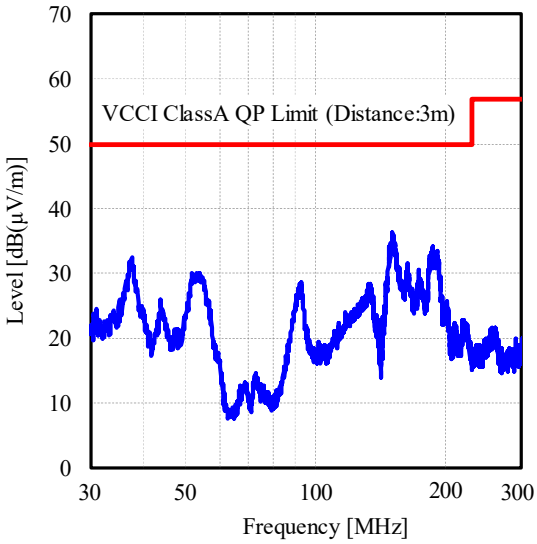
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

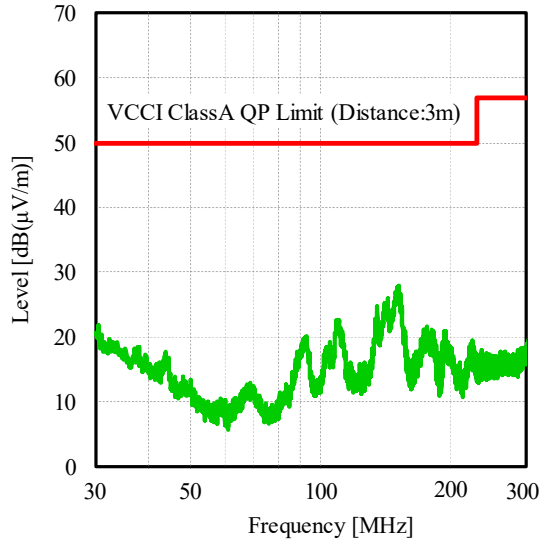
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

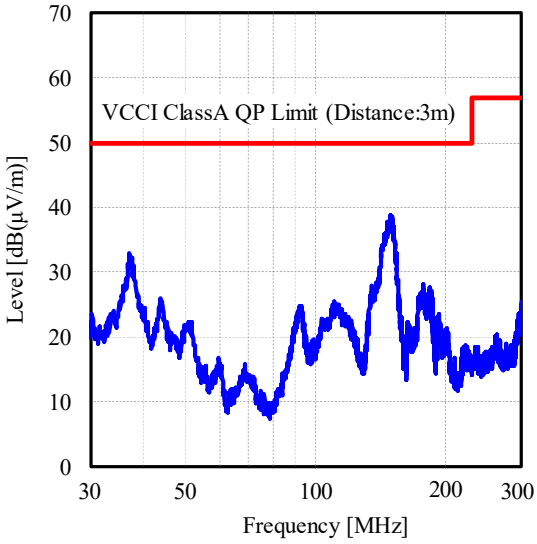
±12V





±15V





表示はピーク値
Indication is peak values.