CCG3-12-xxD

EVALUATION DATA

型式データ

INDEX

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

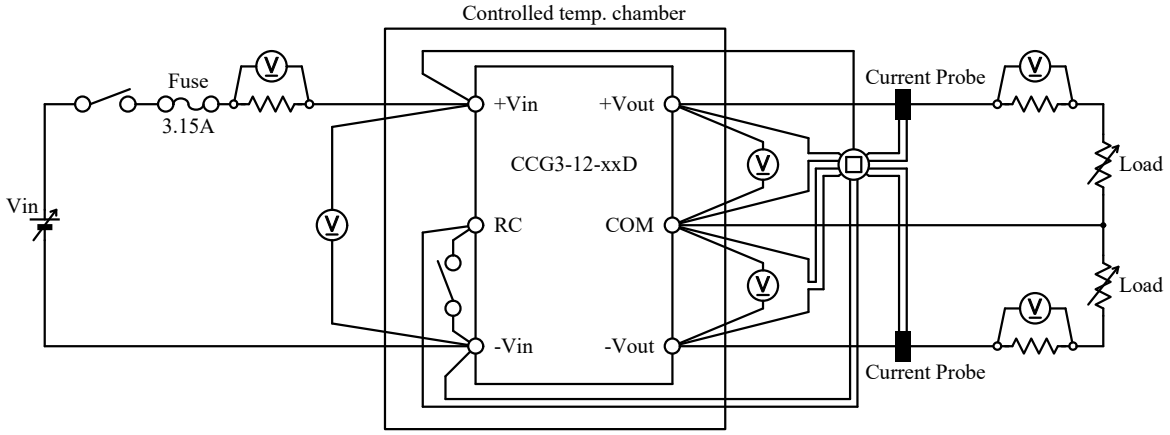
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

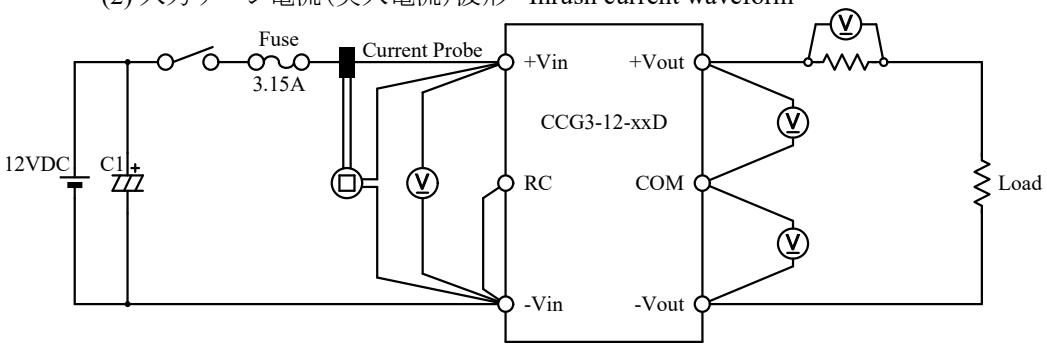
1-1. 測定回路 Measurement Circuits

(1) 静特性 、待機電力特性、通電ドリフト特性、その他特性

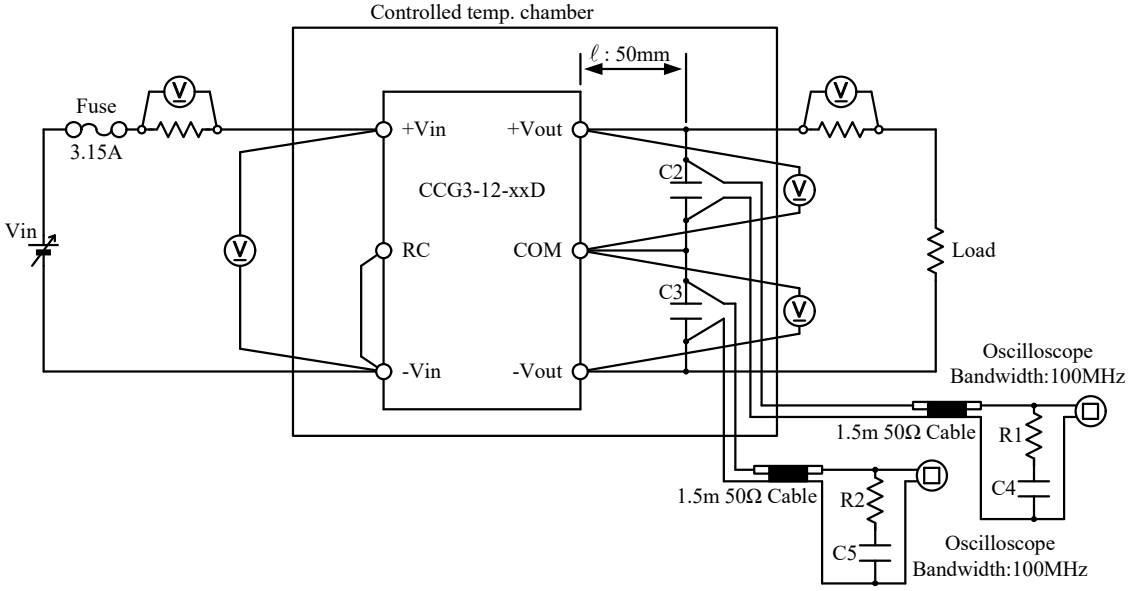
Steady state, Standby power, Warm up voltage drift and Other characteristics



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



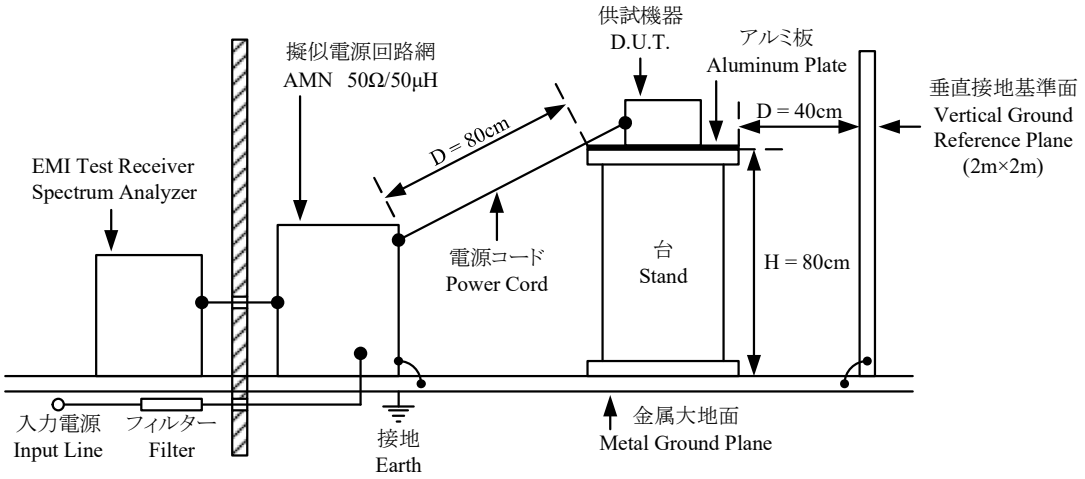
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



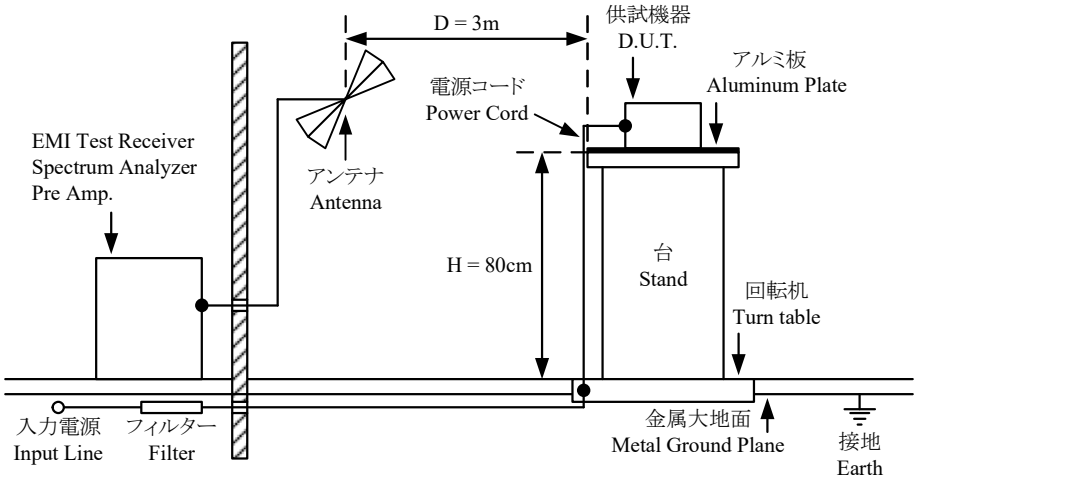
C1	: 4000μF	Electrolytic Capacitor
C2, C3	: 1μF	Ceramic Capacitor
C4, C5	: 4700pF	Ceramic Capacitor
R1, R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

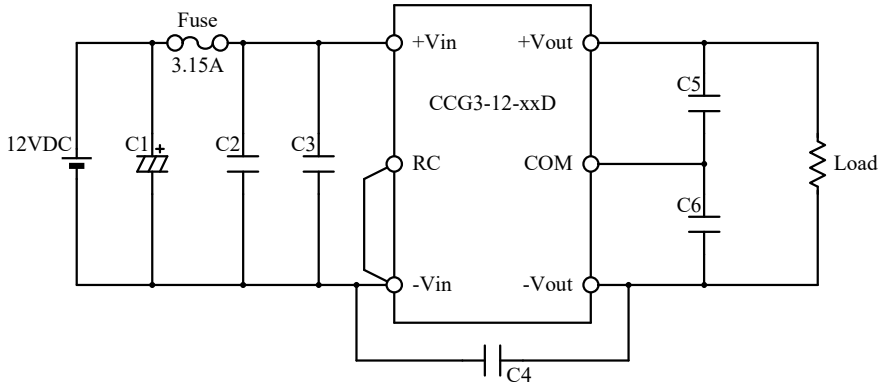
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	: 25V	100μF	Electrolytic Capacitor	(ELXZ250ELL101MFB5D, Nippon Chemi-Con)
C2	: 25V	10μF	Ceramic Capacitor	(C3216X7R1E106K, TDK)
C3	: 25V	10μF	Ceramic Capacitor	(C3216X7R1E106K, TDK)
C4	: 2kV	1000pF	Ceramic Capacitor	(C4520X7R3D102K, TDK)
C5	: 25V	10μF	Ceramic Capacitor	(C3216X7R1E106K, TDK)
C6	: 25V	10μF	Ceramic Capacitor	(C3216X7R1E106K, TDK)

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	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	12.0448V	12.0439V	12.0341V	12.0365V	10.7mV	0.089%
50%(0.065A)	12.0628V	12.0630V	12.0621V	12.0592V	3.8mV	0.032%
100%(0.13A)	12.0612V	12.0615V	12.0623V	12.0622V	1.1mV	0.009%
Load regulation	18.0mV	19.1mV	28.2mV	25.7mV		
	0.150%	0.159%	0.235%	0.214%		

・−Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	-12.0541V	-12.0551V	-12.0651V	-12.0627V	11.0mV	0.092%
50%(0.065A)	-12.0359V	-12.0359V	-12.0370V	-12.0396V	3.7mV	0.031%
100%(0.13A)	-12.0376V	-12.0372V	-12.0368V	-12.0370V	0.8mV	0.007%
Load regulation	18.2mV	19.2mV	28.3mV	25.7mV		
	0.152%	0.160%	0.236%	0.214%		

・+Vo to −Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	24.0988V	24.0990V	24.0991V	24.0992V	0.4mV	0.002%
50%(0.065A)	24.0987V	24.0989V	24.0990V	24.0988V	0.3mV	0.001%
100%(0.13A)	24.0988V	24.0987V	24.0990V	24.0991V	0.4mV	0.002%
Load regulation	0.1mV	0.3mV	0.1mV	0.4mV		
	0.000%	0.001%	0.000%	0.002%		

2. Temperature drift Conditions Vin : 12 VDC
Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	12.0261V	12.0623V	12.0417V	36.2mV	0.302%
-Vo	-11.9981V	-12.0368V	-12.0176V	38.7mV	0.322%
+Vo to -Vo	24.0241V	24.0990V	24.0594V	74.9mV	0.312%

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

・+Vo (-Io : 100%)

+Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.026A)	12.1729V	12.1668V	12.1668V	12.1584V
100%(0.13A)	12.0611V	12.0616V	12.0616V	12.0623V
Load regulation	111.8mV	105.2mV	105.2mV	96.1mV
	0.932%	0.877%	0.877%	0.801%

・−Vo (+Io : 100%)

-Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.026A)	-12.1477V	-12.1426V	-12.1426V	-12.1420V
100%(0.13A)	-12.0383V	-12.0377V	-12.0377V	-12.0373V
Load regulation	109.4mV	104.9mV	104.9mV	104.7mV
	0.912%	0.874%	0.874%	0.872%

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

・+Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	14.9553V	14.9533V	14.9487V	14.9445V	10.8mV	0.072%
50%(0.05A)	14.9725V	14.9720V	14.9685V	14.9655V	7.0mV	0.047%
100%(0.1A)	14.9727V	14.9723V	14.9707V	14.9699V	2.8mV	0.019%
Load	17.4mV	19.0mV	22.0mV	25.4mV		
regulation	0.116%	0.127%	0.147%	0.169%		

・−Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	-14.9607V	-14.9628V	-14.9673V	-14.9714V	10.7mV	0.071%
50%(0.05A)	-14.9436V	-14.9438V	-14.9474V	-14.9505V	6.9mV	0.046%
100%(0.1A)	-14.9434V	-14.9440V	-14.9451V	-14.9460V	2.6mV	0.017%
Load	17.3mV	19.0mV	22.2mV	25.4mV		
regulation	0.115%	0.127%	0.148%	0.169%		

・+Vo to −Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	29.9160V	29.9160V	29.9160V	29.9159V	0.1mV	0.000%
50%(0.05A)	29.9161V	29.9158V	29.9159V	29.9160V	0.3mV	0.001%
100%(0.1A)	29.9161V	29.9162V	29.9158V	29.9159V	0.4mV	0.001%
Load	0.1mV	0.4mV	0.2mV	0.1mV		
regulation	0.000%	0.001%	0.001%	0.000%		

2. Temperature drift Conditions Vin : 12 VDC
Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	14.9376V	14.9707V	14.9406V	33.1mV	0.221%
-Vo	-14.9098V	-14.9451V	-14.9165V	35.3mV	0.235%
+Vo to -Vo	29.8474V	29.9158V	29.8571V	68.4mV	0.228%

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

・+Vo (-Io : 100%)

+Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.02A)	15.0803V	15.0735V	15.0735V	15.0525V
100%(0.1A)	14.9721V	14.9719V	14.9719V	14.9699V
Load	108.2mV	101.6mV	101.6mV	82.6mV
regulation	0.721%	0.677%	0.677%	0.551%

・−Vo (+Io : 100%)

-Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.02A)	-15.0510V	-15.0451V	-15.0451V	-15.0417V
100%(0.1A)	-14.9436V	-14.9441V	-14.9441V	-14.9460V
Load	107.4mV	101.0mV	101.0mV	95.7mV
regulation	0.716%	0.673%	0.673%	0.638%

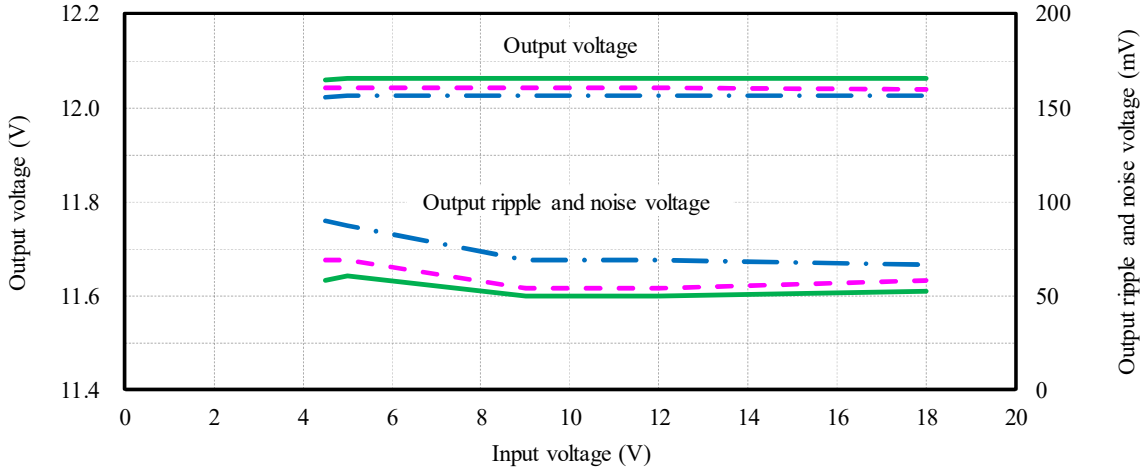
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

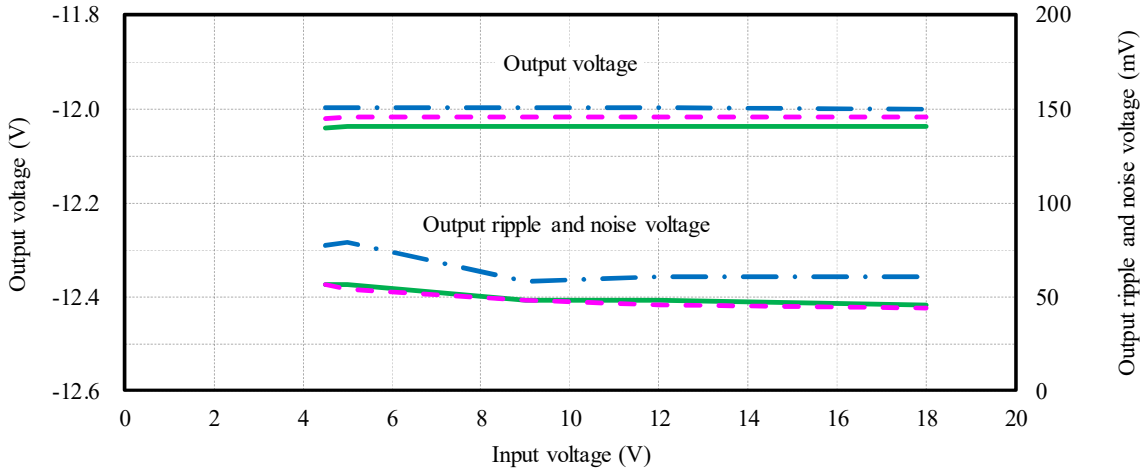
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 85 °C

±12V

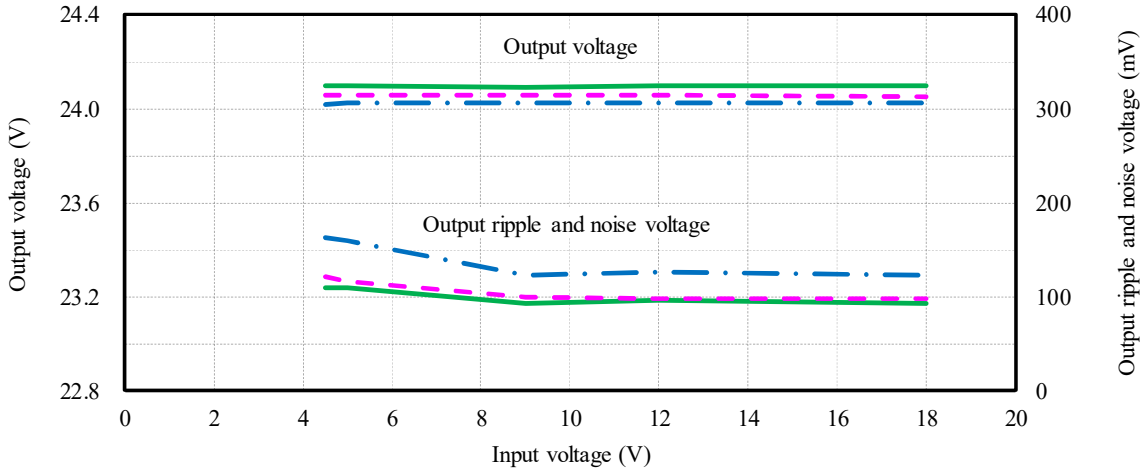
・+Vo



・−Vo



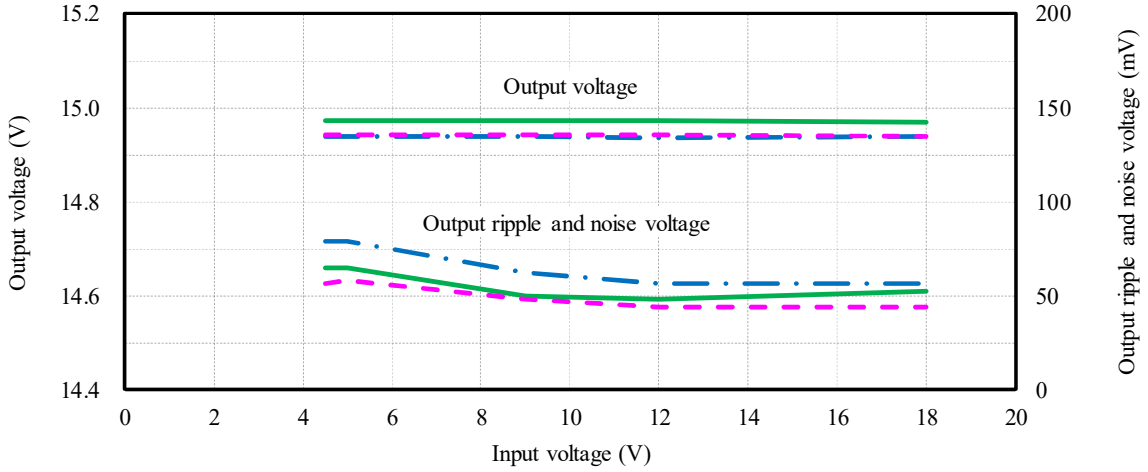
・+Vo to -Vo



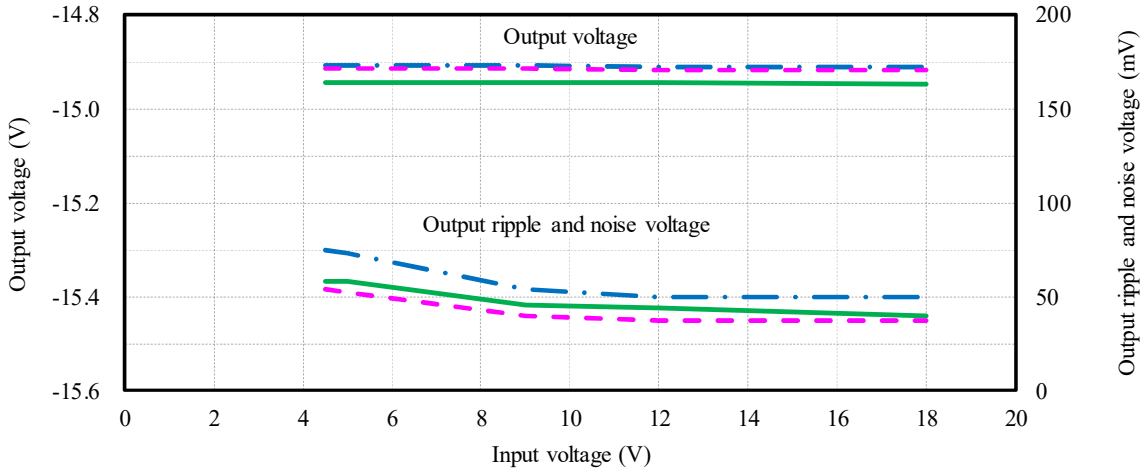
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 85 °C

±15V

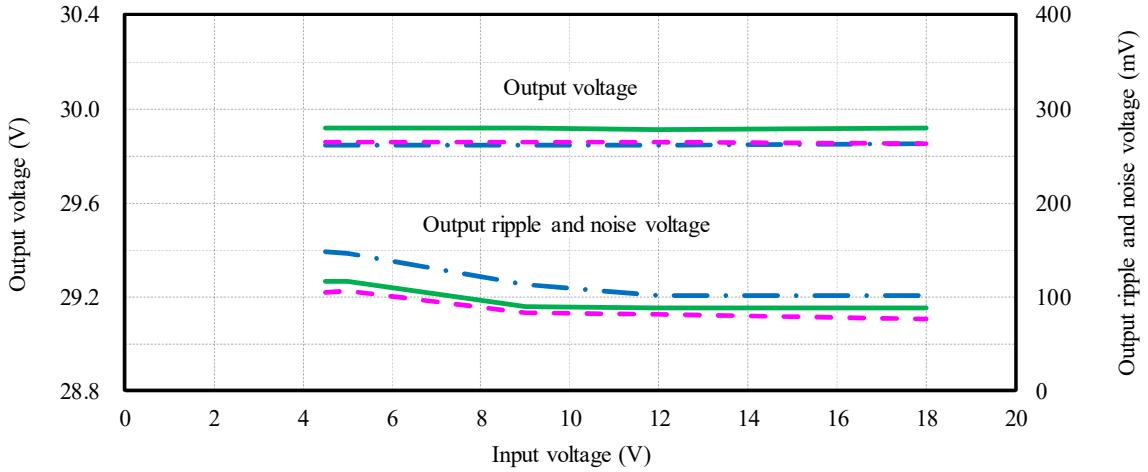
・+Vo



・−Vo



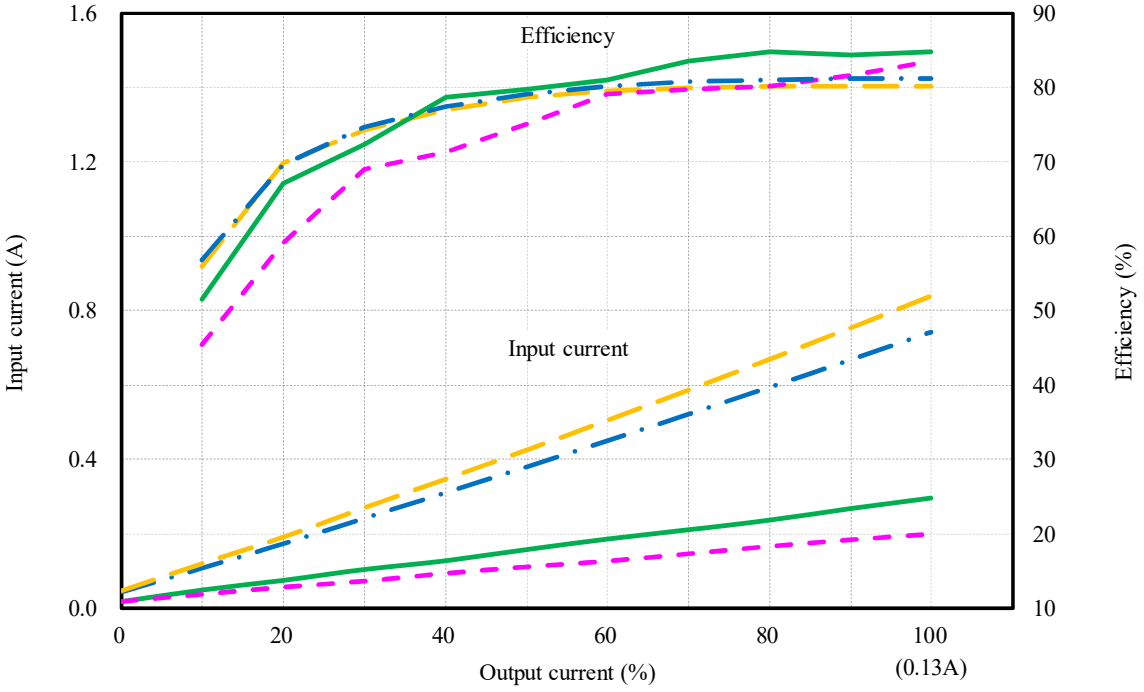
・+Vo to -Vo



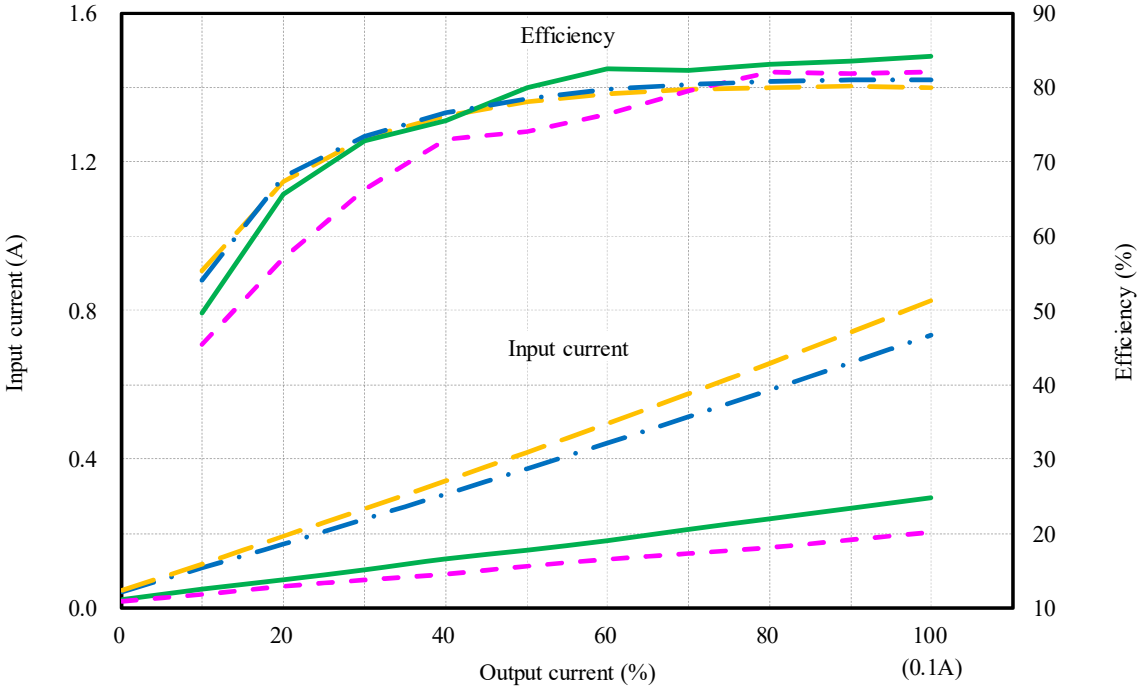
(3) 入力電流･効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 4.5 VDC
: 5 VDC
: 12 VDC
: 18 VDC
Ta : 25 °C

±12V



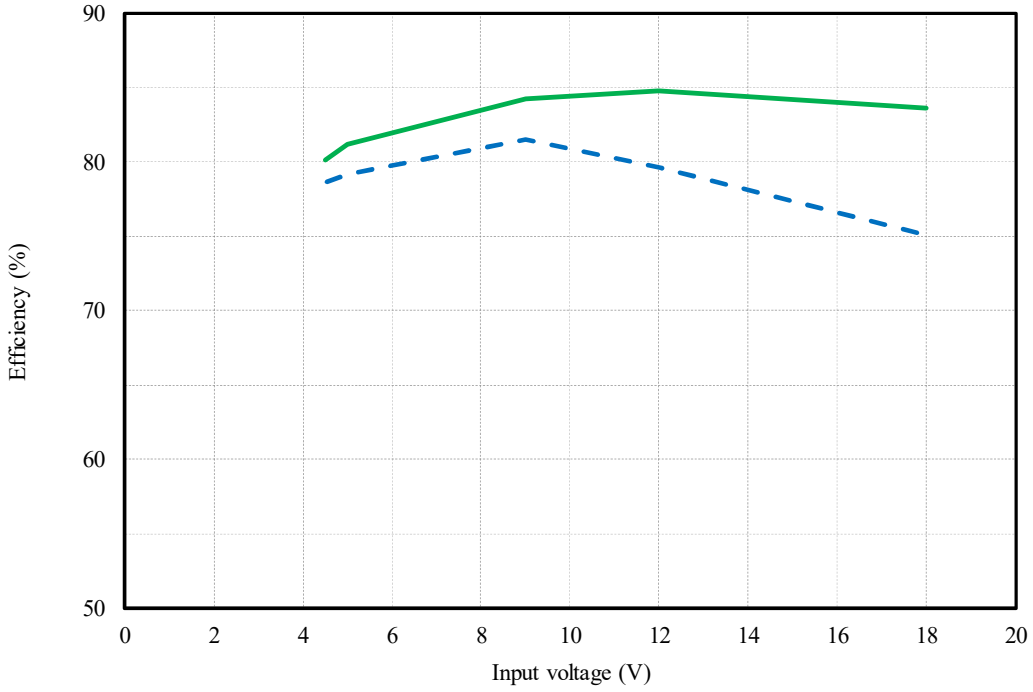
±15V



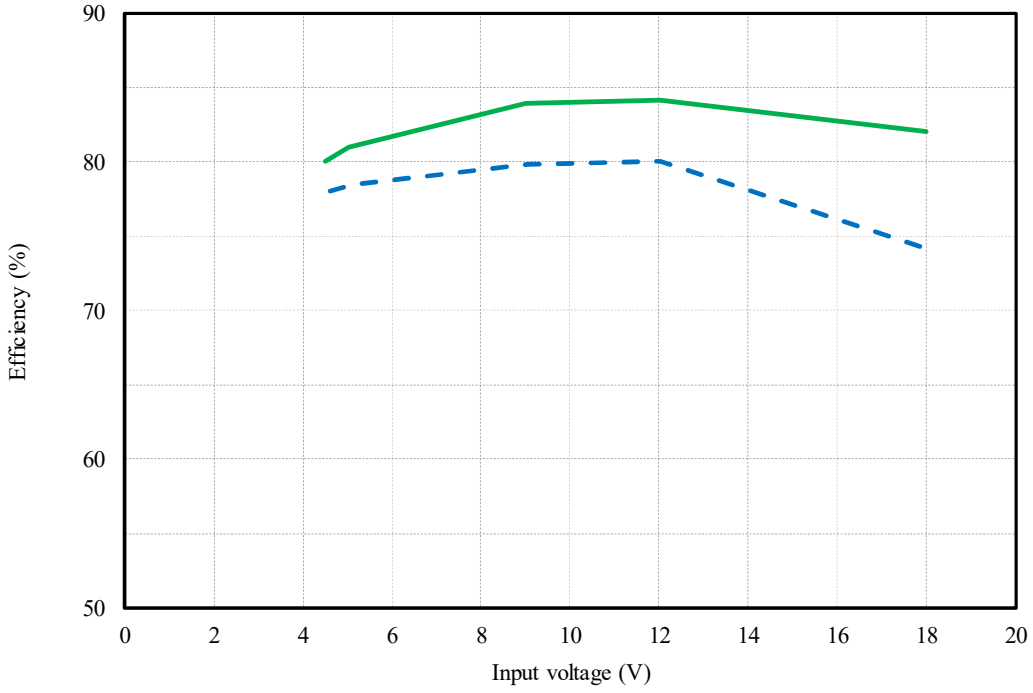
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

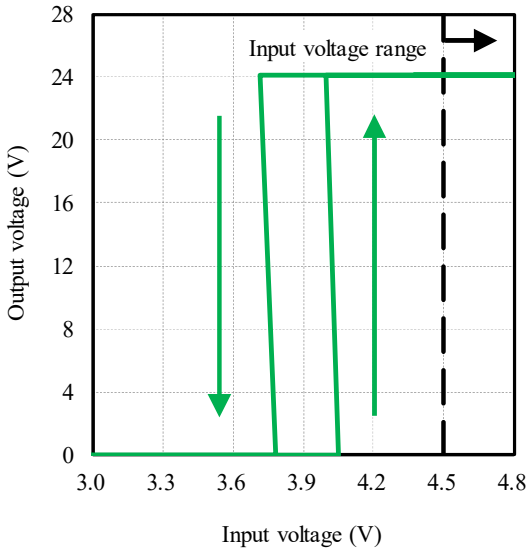
出力電圧 対 入力電圧
Output voltage vs. Input voltage

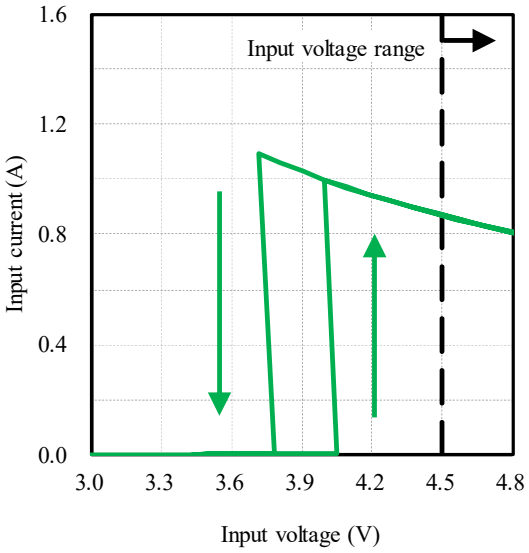
Conditions Io : 100 %
Ta : 25 °C

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

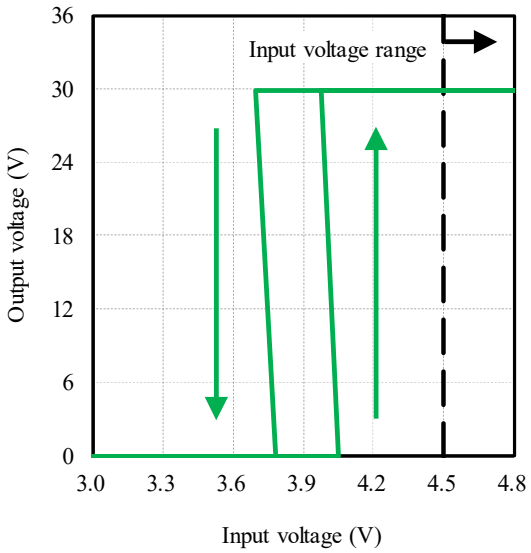
Conditions Io : 100 %
Ta : 25 °C

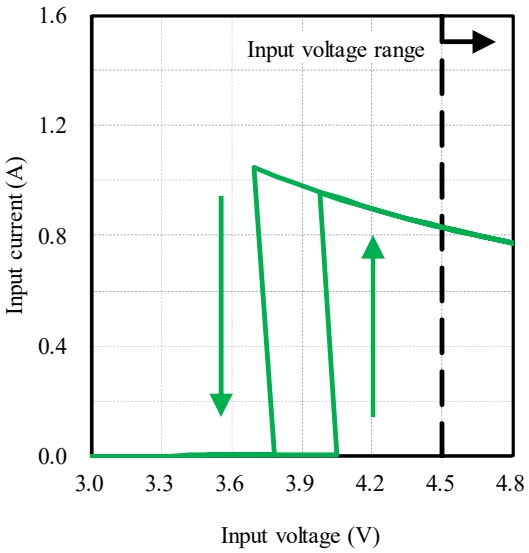
±12V





±15V

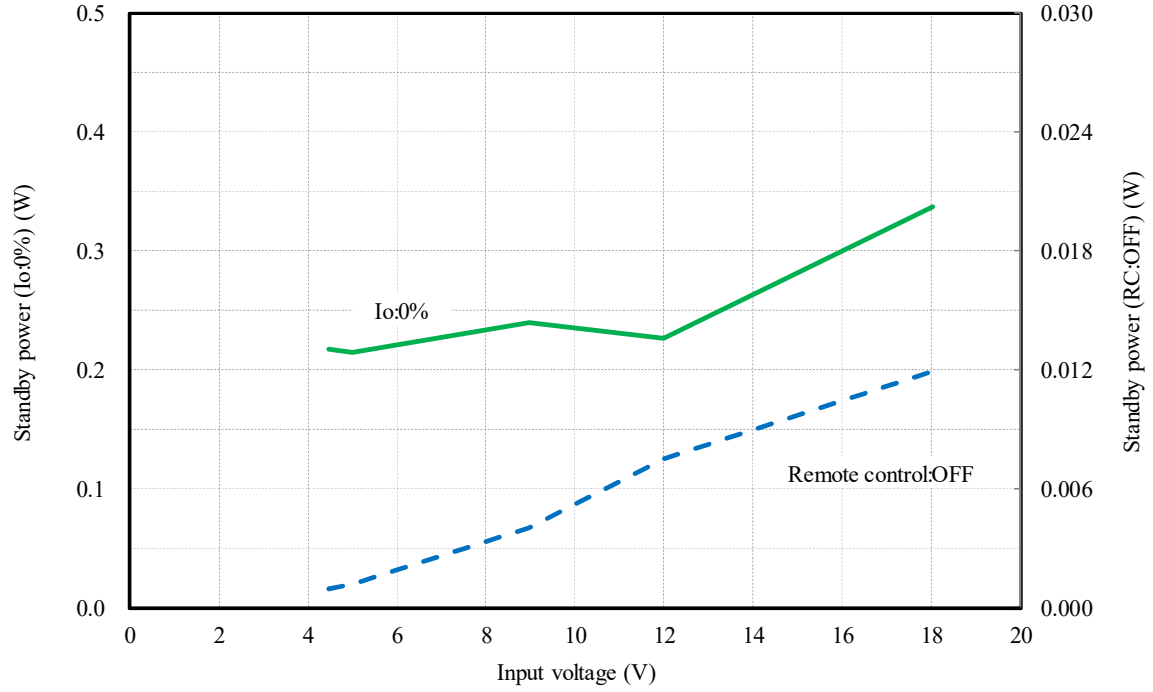




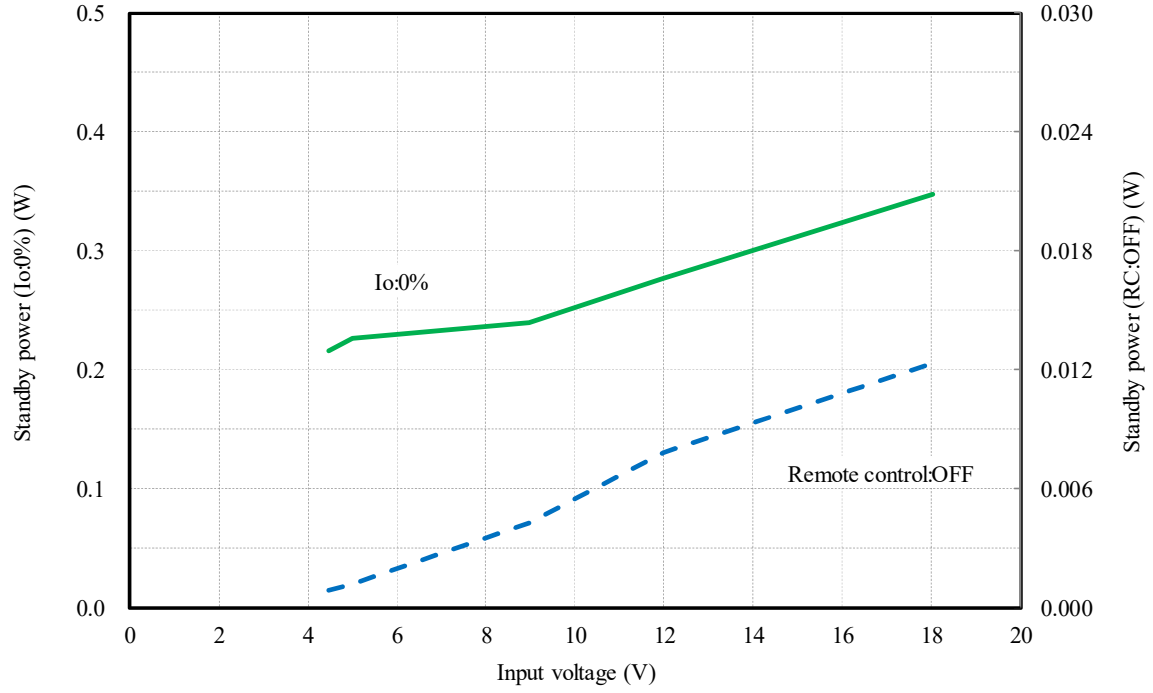
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



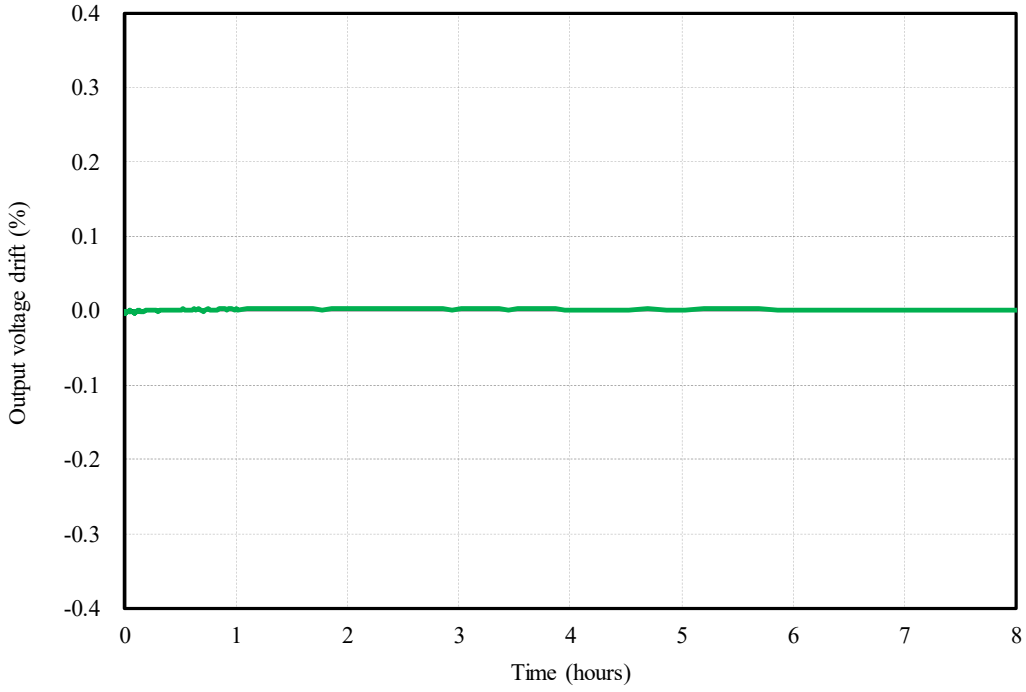
±15V



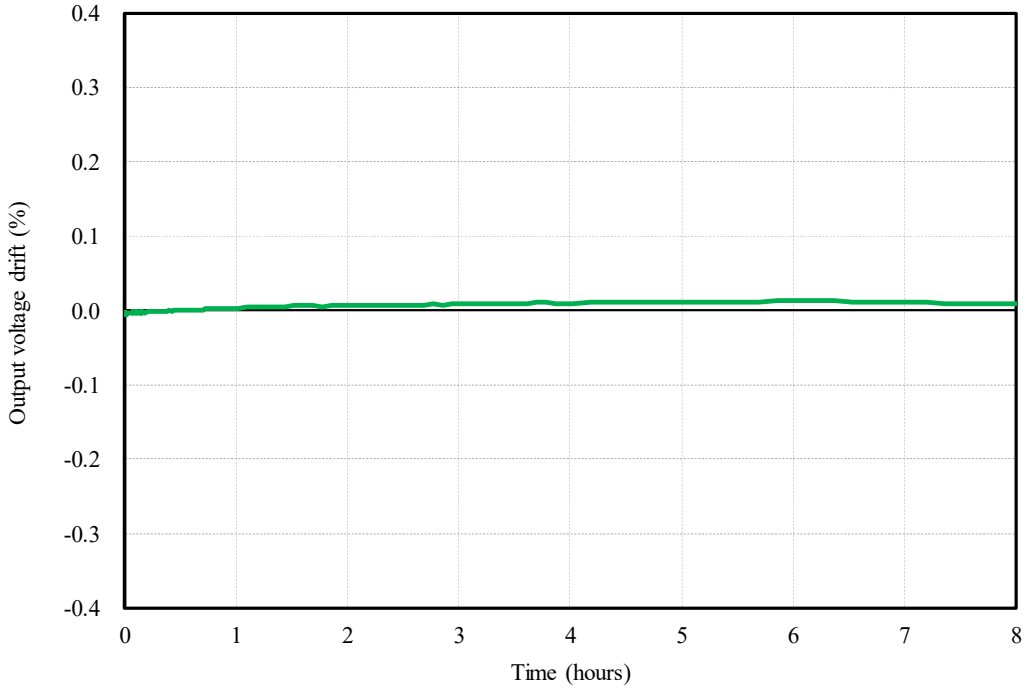
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 °C

±12V



±15V



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

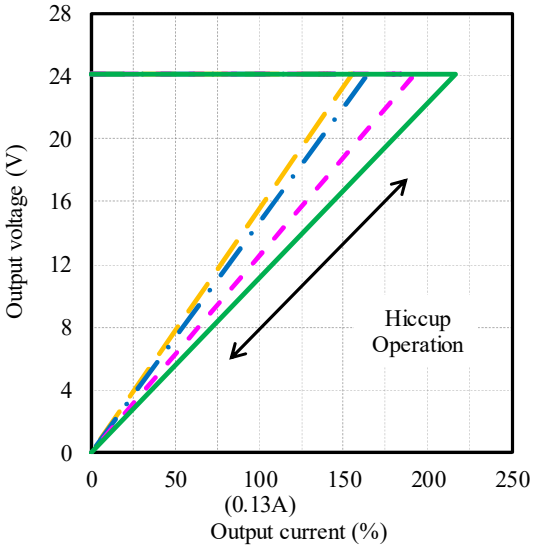
入力電圧依存性
Input voltage dependence

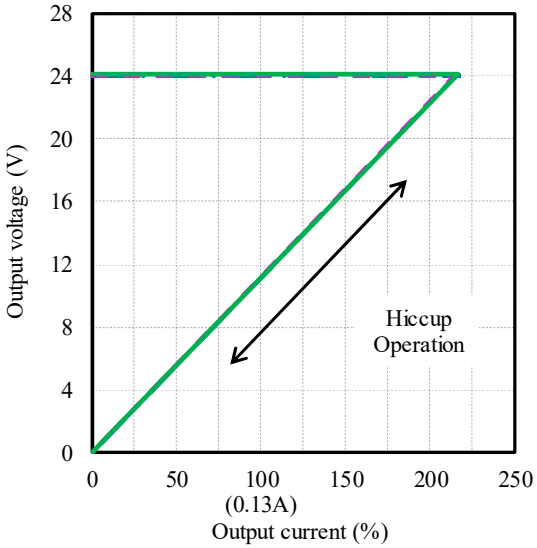
Conditions Vin : 4.5 VDC
: 5 VDC
: 12 VDC
: 18 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

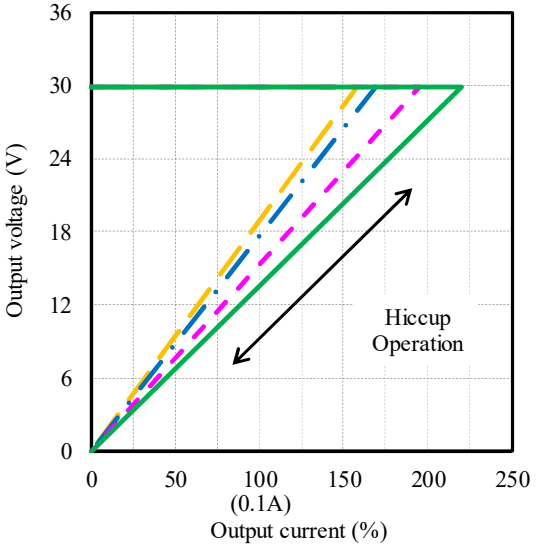
Conditions Vin : 12 VDC
Ta : -40 °C
: 25 °C
: 85 °C

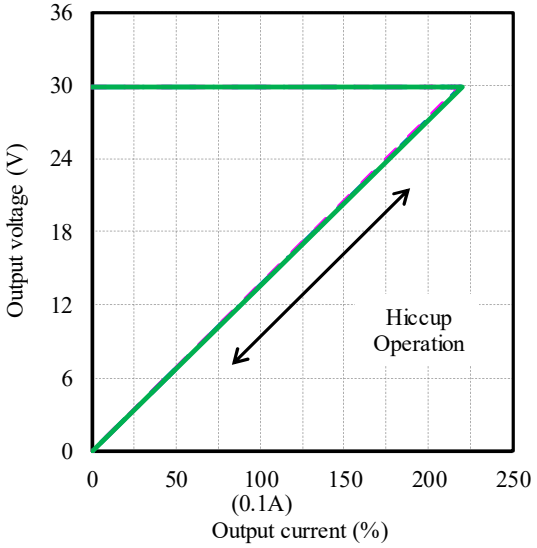
±12V





±15V

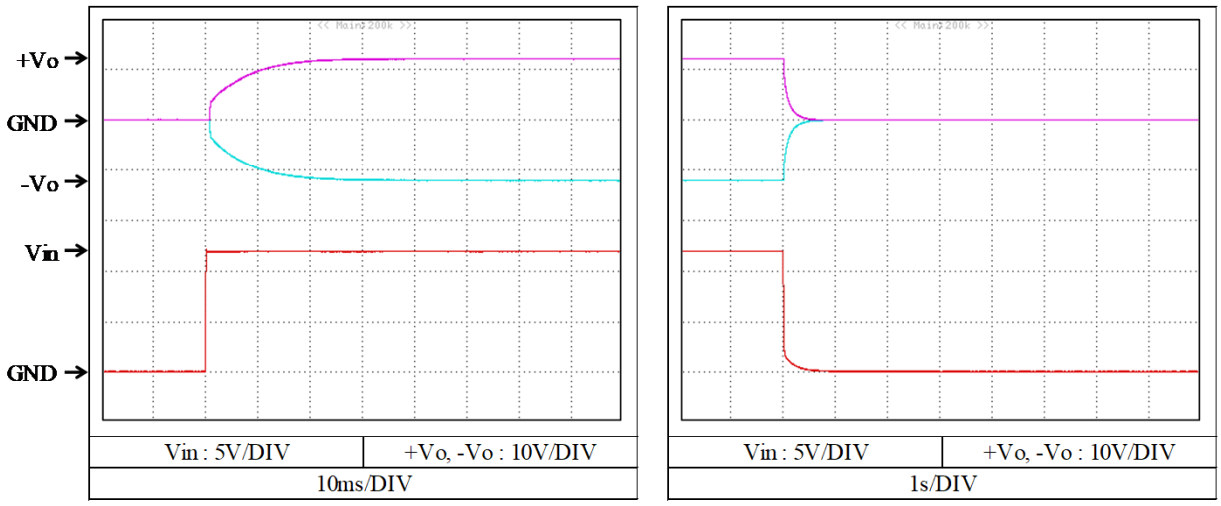




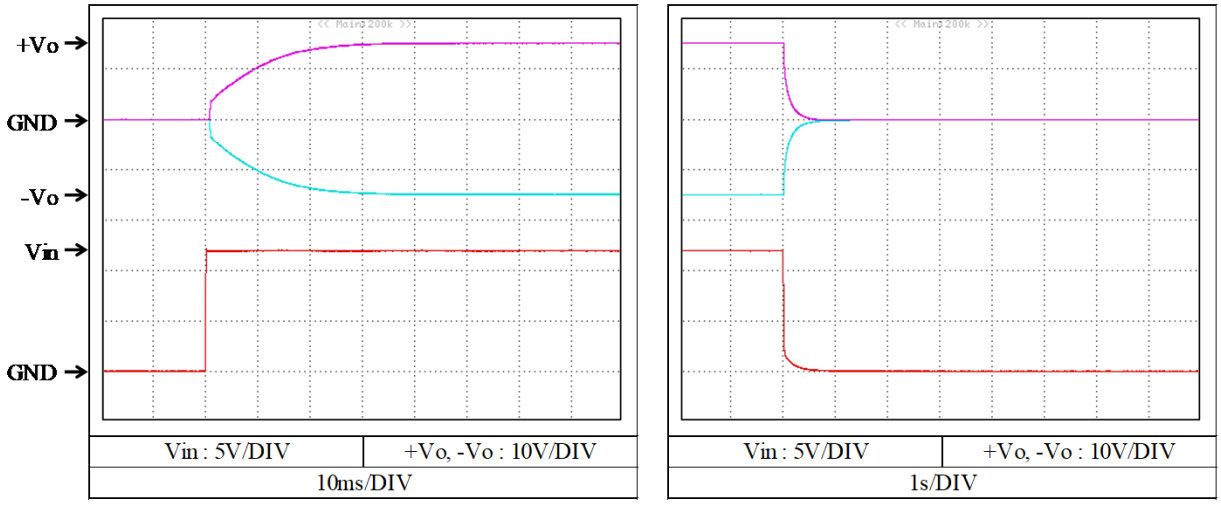
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 12 VDC
Io : 0 %
Ta : 25 °C

±12V



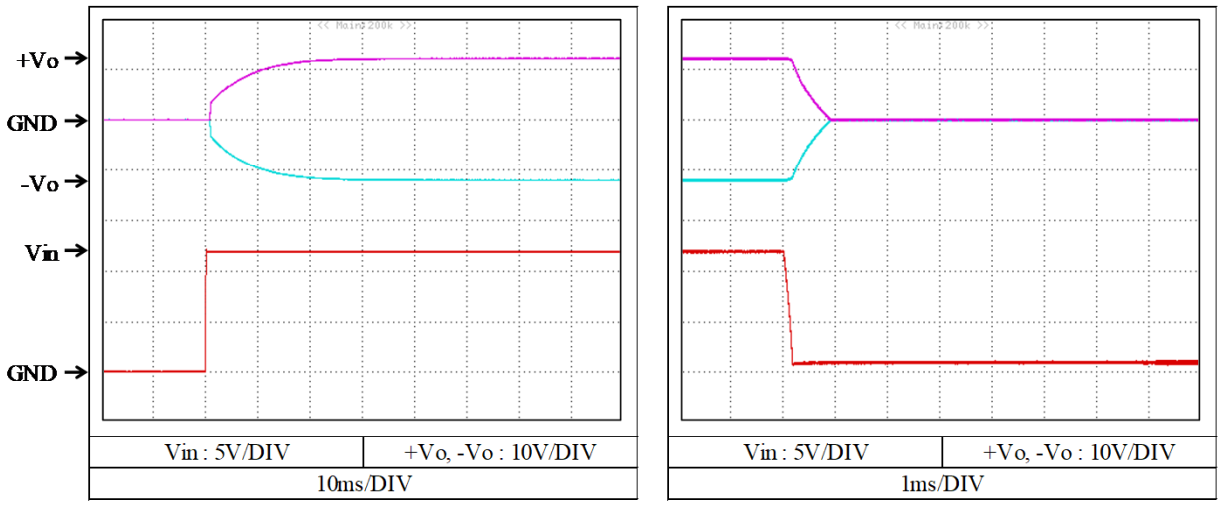
+15V



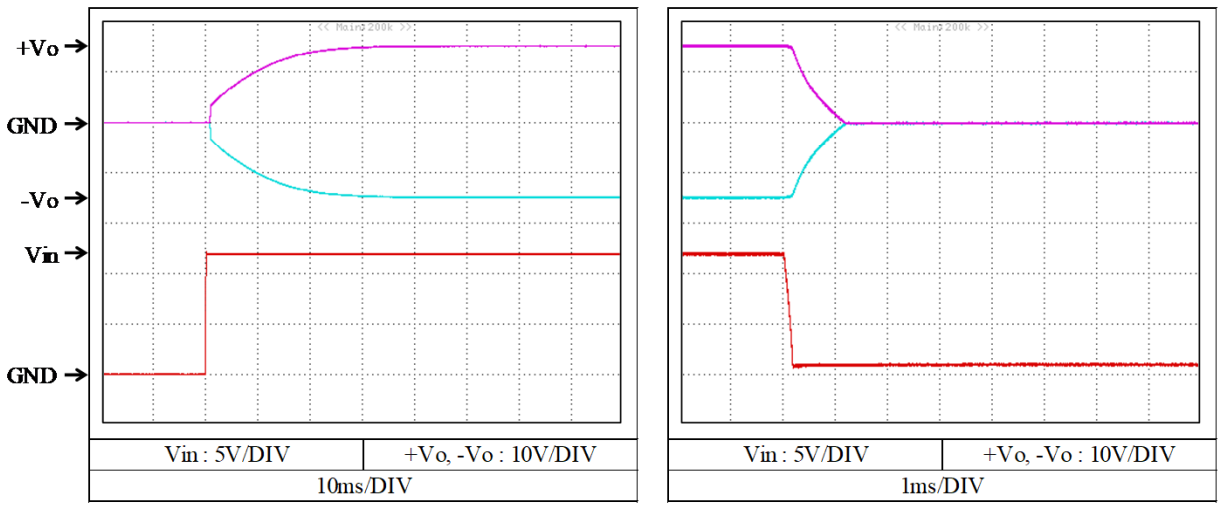
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

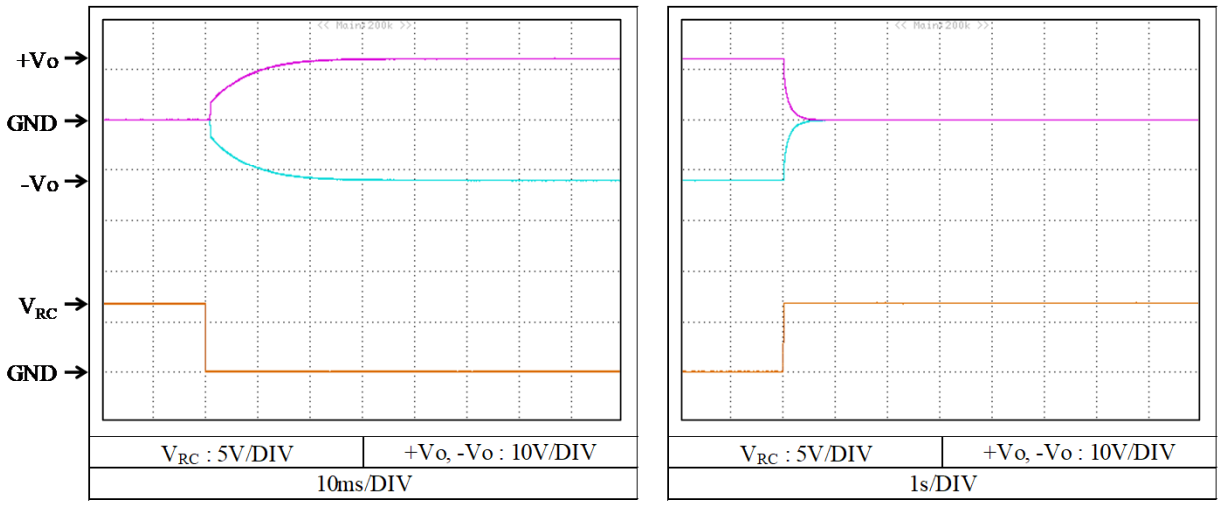


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

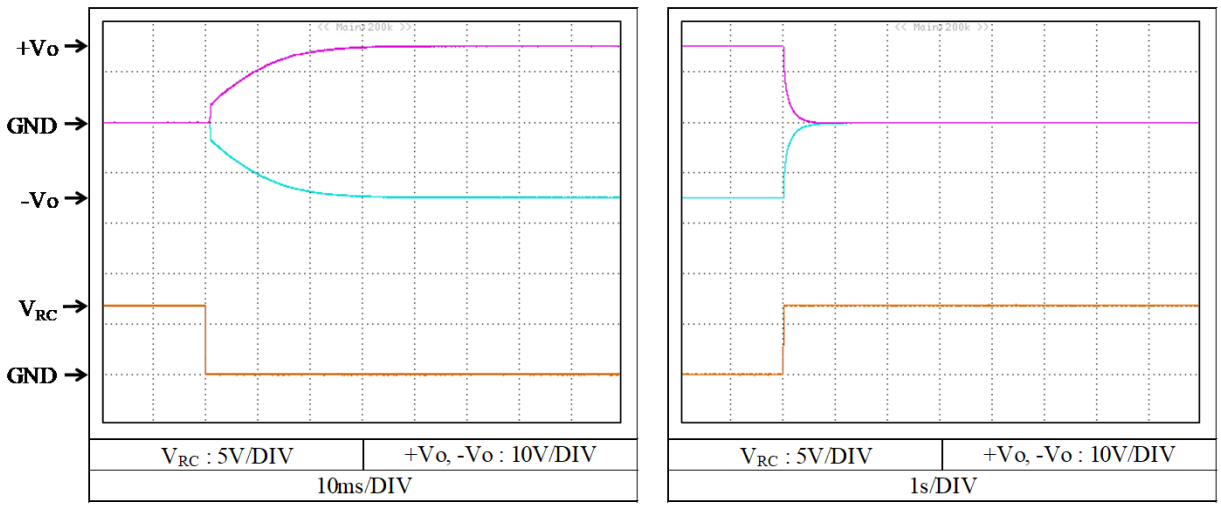
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 12 VDC
Io : 0 %
Ta : 25 °C

±12V



+15V

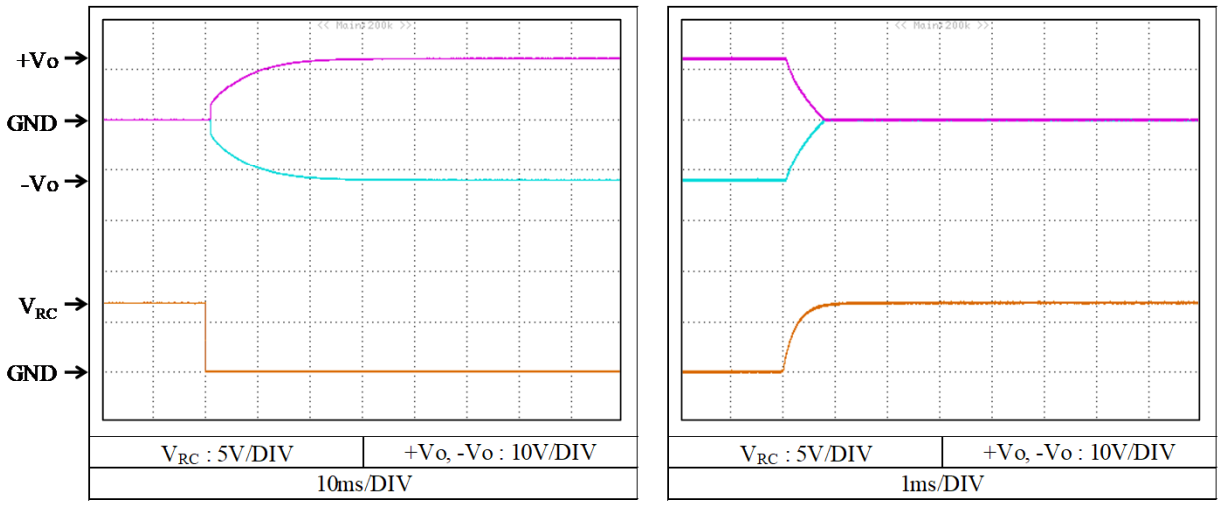


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

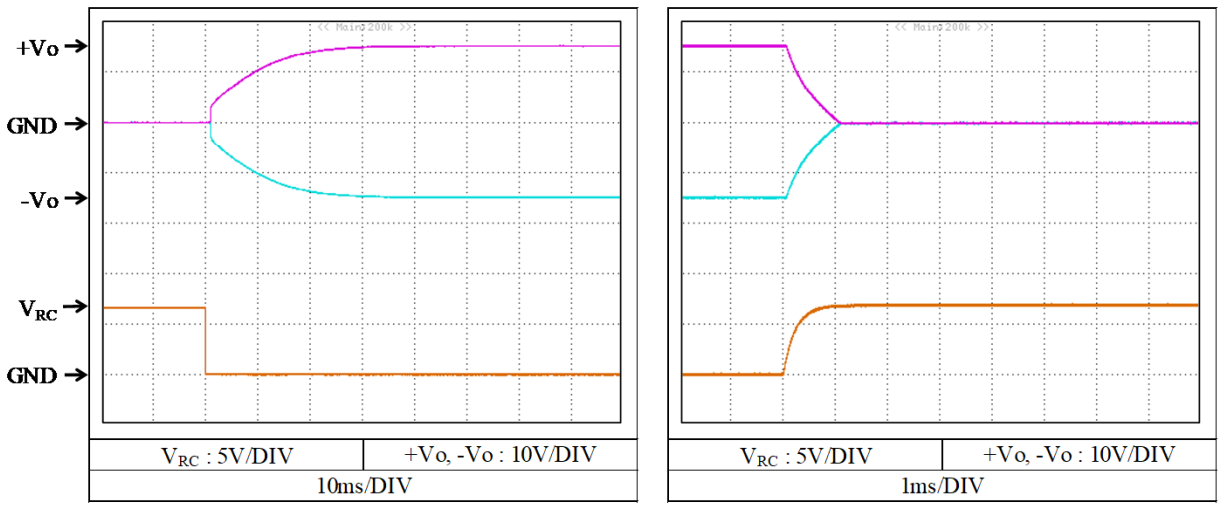
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 °C

±12V



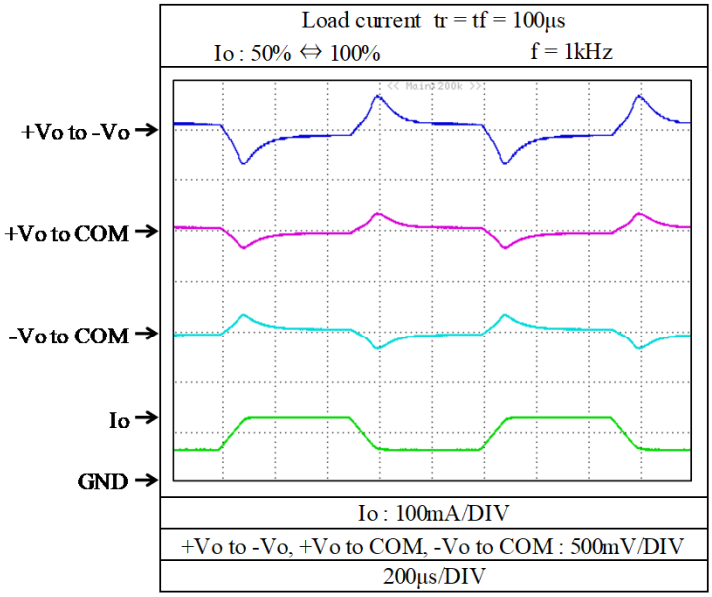
+15V



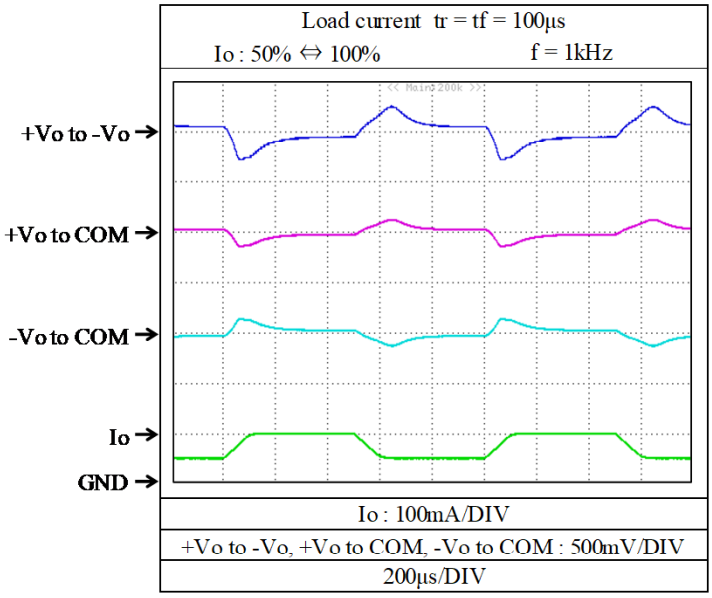
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 12 VDC
Ta : 25 °C

±12V



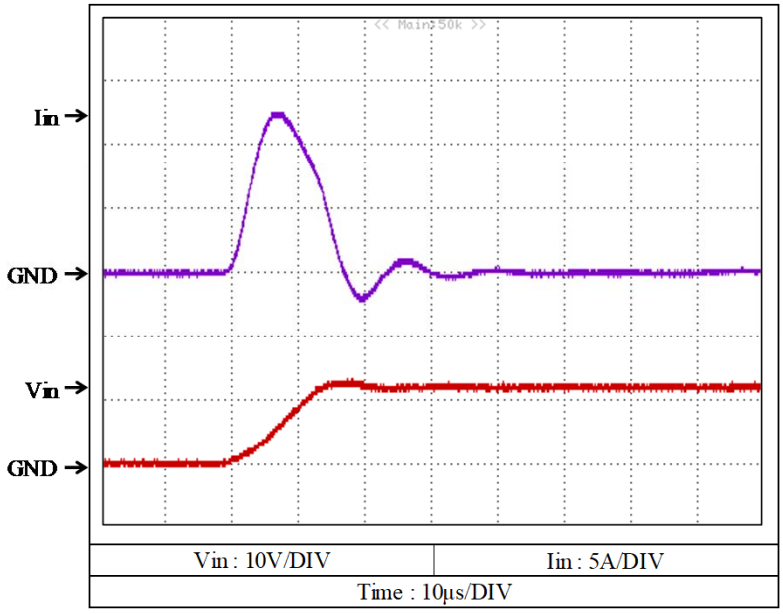
+15V



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

Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 °C

CCG3-12-05S

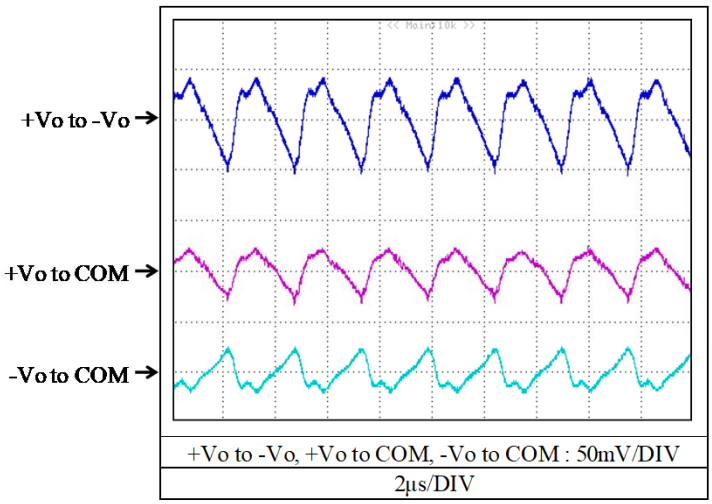


CCG3-12-xxDの入力サージ電流特性は CCG3-12-05S と同等です。
CCG3-12-xxD have the same Inrush current characteristics as CCG3-12-05S data.

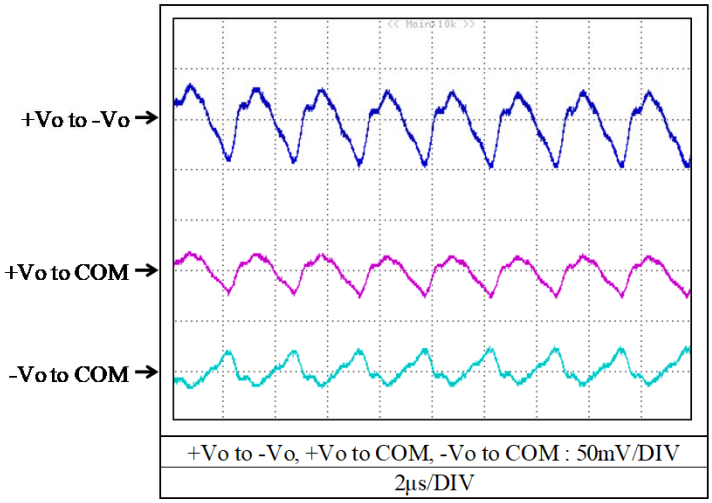
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

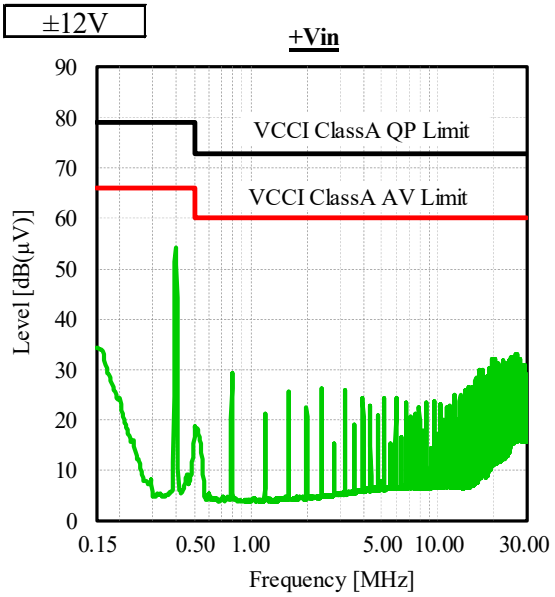


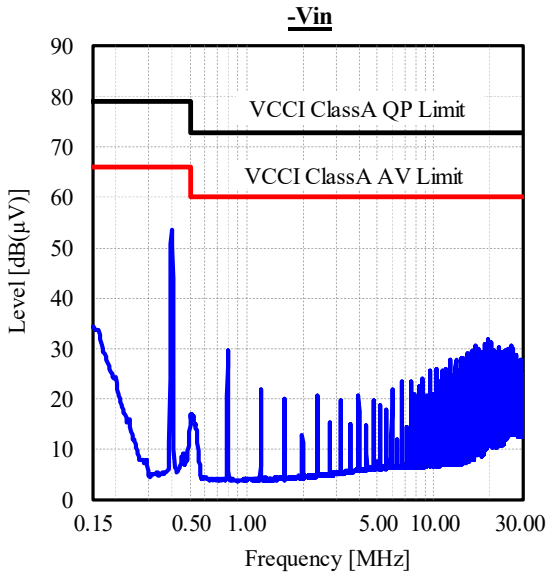
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

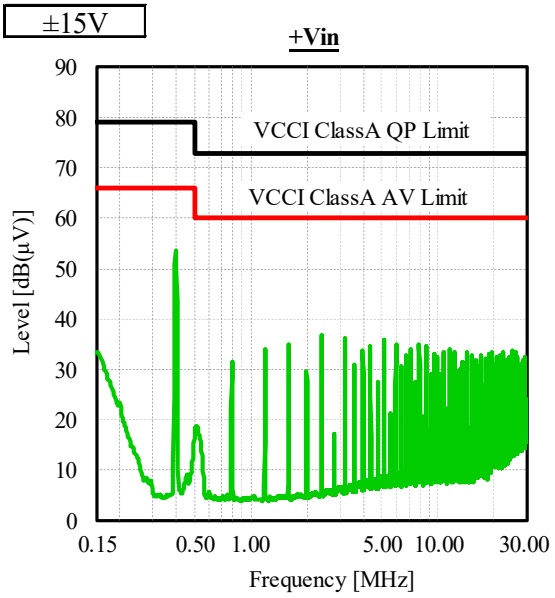
Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 ºC

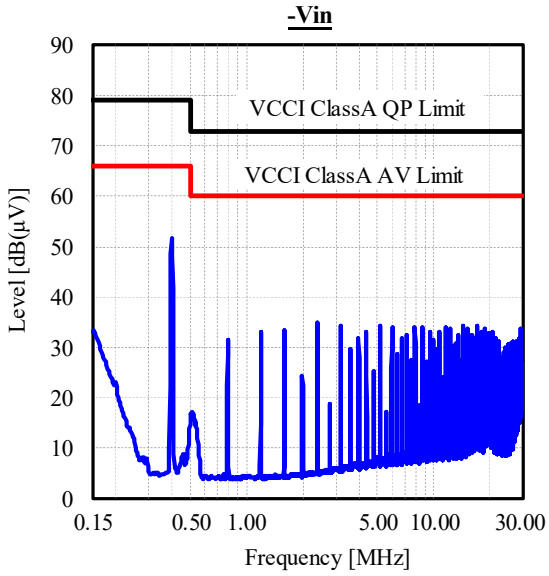
±12V





±15V





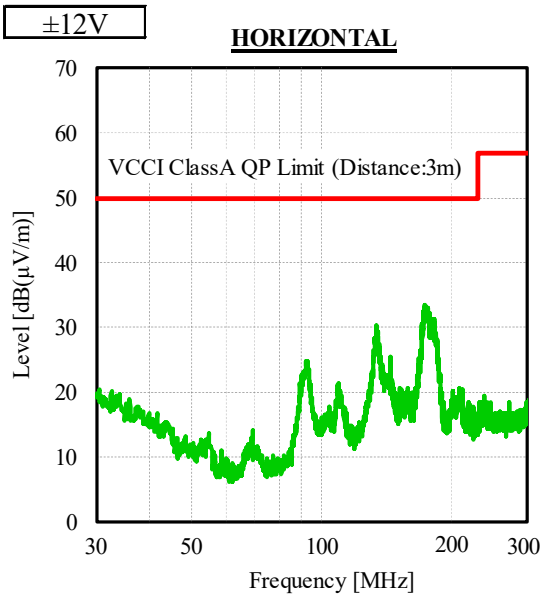
表示はQP値
Indication is QP values.

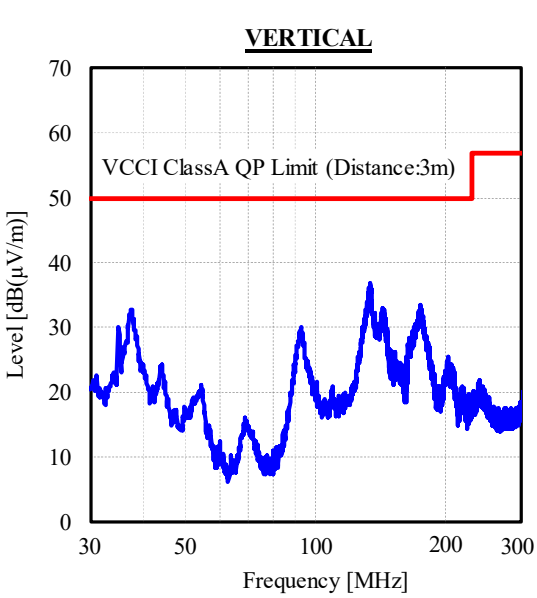
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

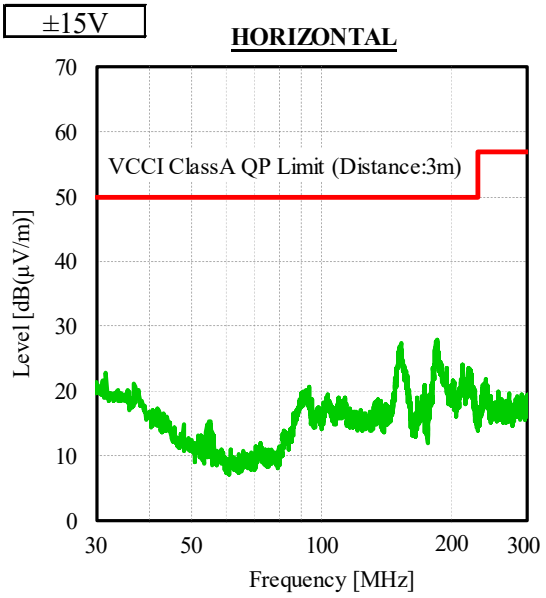
Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 ºC

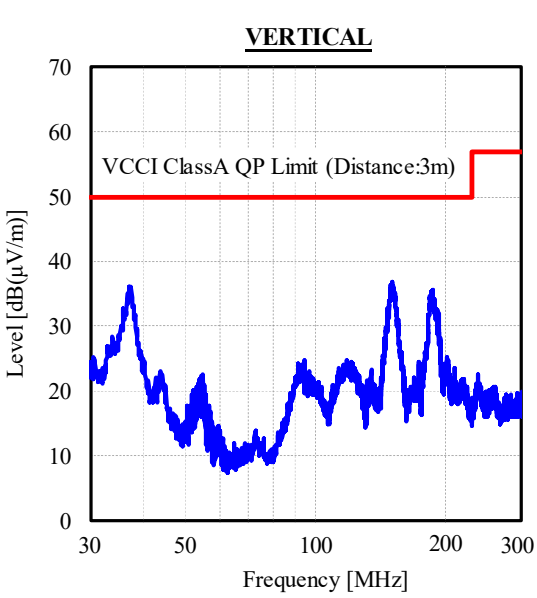
±12V





±15V





表示はピーク値
Indication is peak values.