CCG1R5-12-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

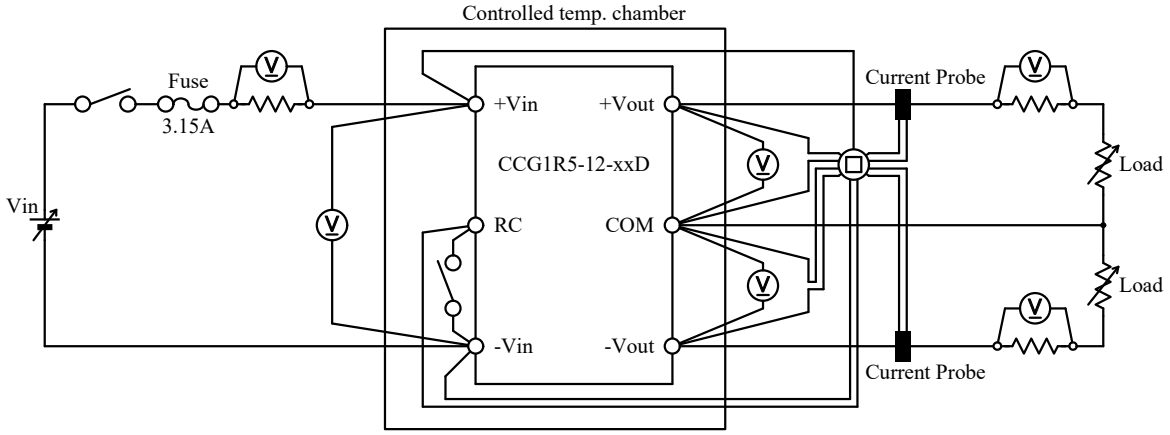
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

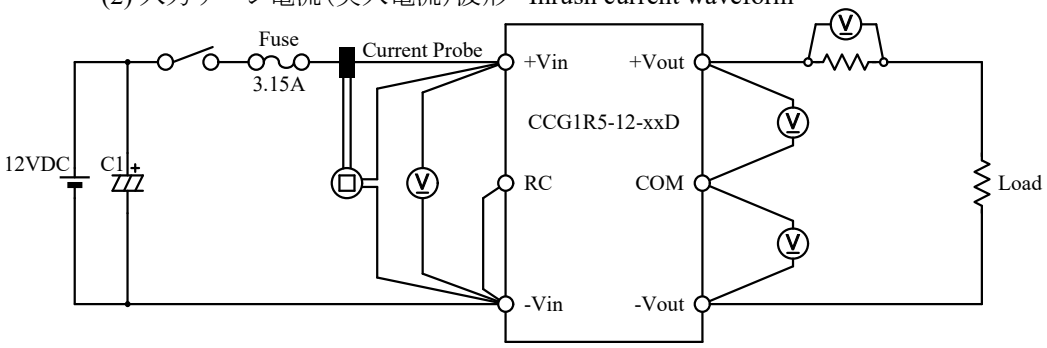
1-1. 測定回路 Measurement Circuits

(1) 静特性 、待機電力特性、通電ドリフト特性、その他特性

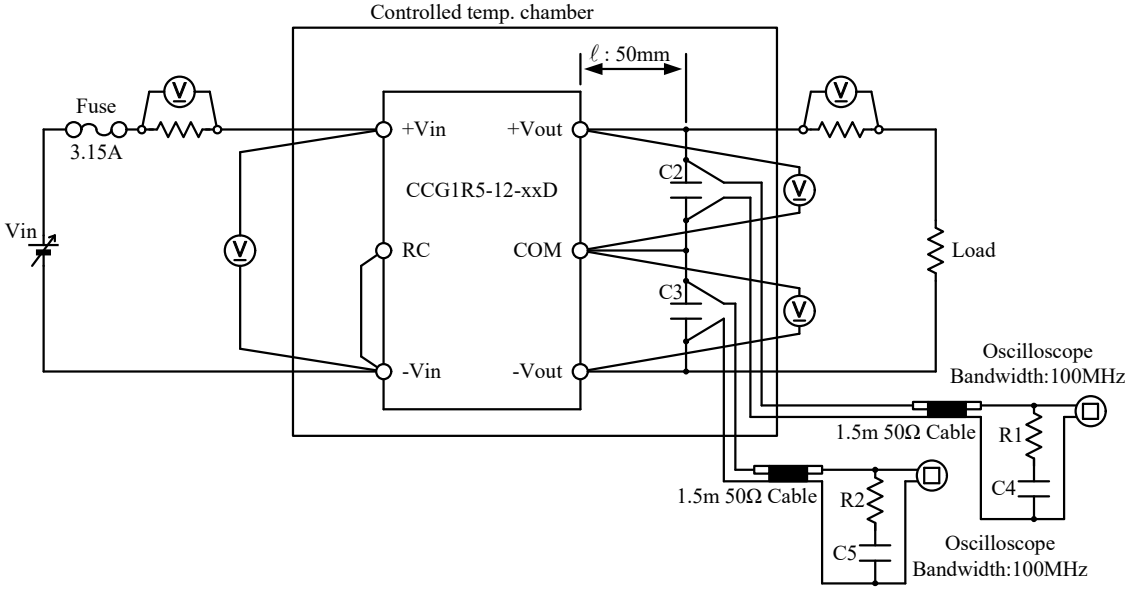
Steady state, Standby power, Warm up voltage drift and Other characteristics



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



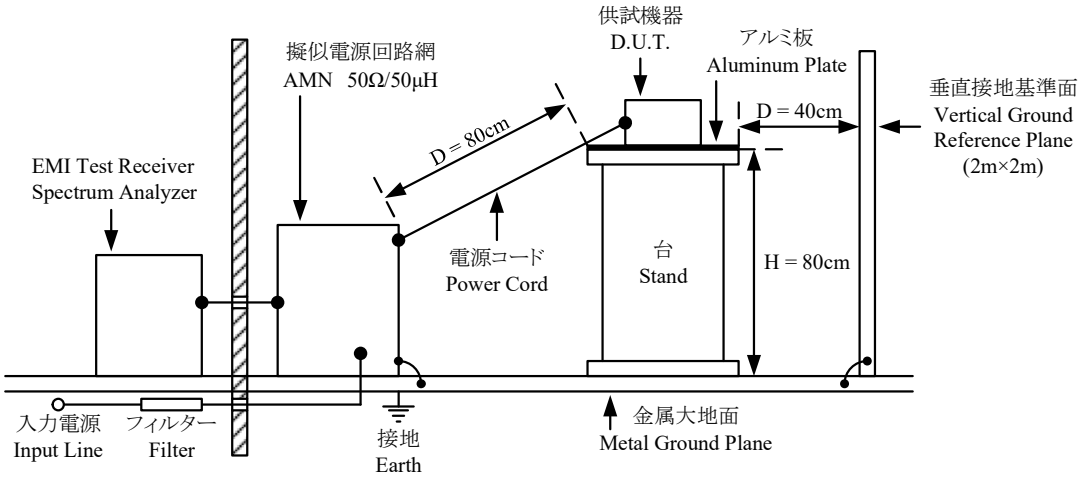
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



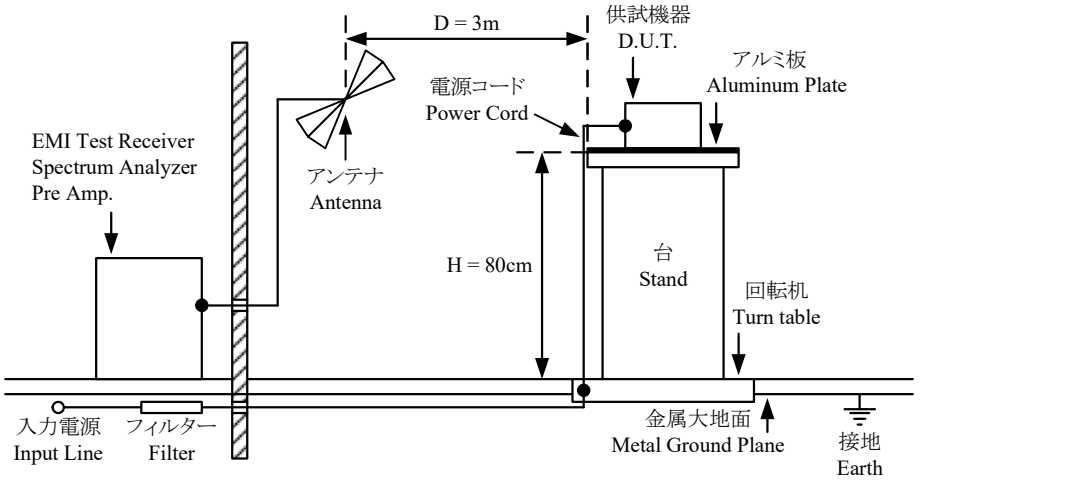
C1	: 4000μF	Electrolytic Capacitor
C2, C3	: 1μF	Ceramic Capacitor
C4, C5	: 4700pF	Ceramic Capacitor
R1, R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

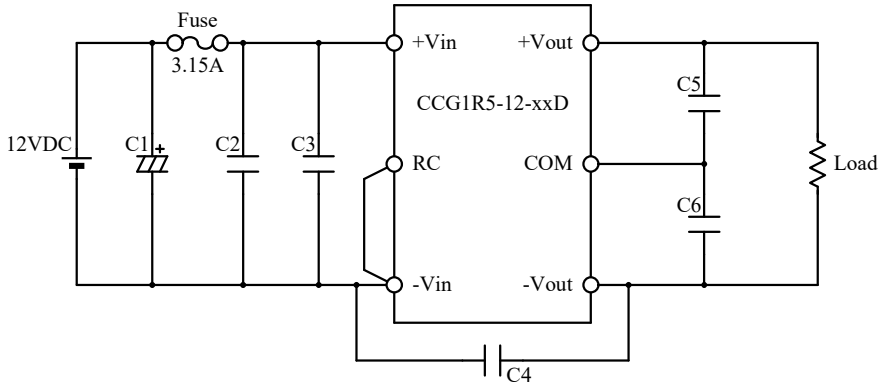
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	47μF	Electrolytic Capacitor	(ELXZ250ELL470MFB5D, 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%	12.0226V	12.0224V	12.0117V	12.0069V	15.7mV	0.131%
50%(32.5mA)	12.0293V	12.0292V	12.0247V	12.0229V	6.4mV	0.053%
100%(65mA)	12.0289V	12.0285V	12.0268V	12.0256V	3.3mV	0.027%
Load regulation	6.7mV	6.8mV	15.1mV	18.7mV		
	0.056%	0.057%	0.126%	0.156%		

・−Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	-12.0145V	-12.0148V	-12.0256V	-12.0303V	15.8mV	0.132%
50%(32.5mA)	-12.0080V	-12.0081V	-12.0125V	-12.0144V	6.4mV	0.053%
100%(65mA)	-12.0088V	-12.0089V	-12.0107V	-12.0120V	3.2mV	0.027%
Load regulation	6.5mV	6.7mV	14.9mV	18.3mV		
	0.054%	0.056%	0.124%	0.153%		

・+Vo to −Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	24.0371V	24.0372V	24.0373V	24.0372V	0.2mV	0.001%
50%(32.5mA)	24.0373V	24.0373V	24.0372V	24.0373V	0.1mV	0.000%
100%(65mA)	24.0376V	24.0374V	24.0375V	24.0376V	0.2mV	0.001%
Load regulation	0.5mV	0.2mV	0.3mV	0.4mV		
	0.002%	0.001%	0.001%	0.002%		

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

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	11.9962V	12.0268V	12.0071V	30.6mV	0.255%
-Vo	-11.9779V	-12.0107V	-11.9919V	32.8mV	0.273%
+Vo to -Vo	23.9740V	24.0375V	23.9990V	63.5mV	0.265%

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

・+Vo (-Io : 100%)

+Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(13mA)	12.1082V	12.1035V	12.1035V	12.0897V
100%(65mA)	12.0285V	12.0285V	12.0285V	12.0253V
Load regulation	79.7mV	75.0mV	75.0mV	64.4mV
	0.664%	0.625%	0.625%	0.537%

・−Vo (+Io : 100%)

-Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(13mA)	-12.0867V	-12.0827V	-12.0827V	-12.0848V
100%(65mA)	-12.0091V	-12.0091V	-12.0091V	-12.0122V
Load regulation	77.6mV	73.6mV	73.6mV	72.6mV
	0.647%	0.613%	0.613%	0.605%

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

・+Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	14.9609V	14.9627V	14.9596V	14.9591V	3.6mV	0.024%
50%(25mA)	14.9661V	14.9676V	14.9633V	14.9599V	7.7mV	0.051%
100%(50mA)	14.9655V	14.9655V	14.9643V	14.9645V	1.2mV	0.008%
Load regulation	5.2mV	4.9mV	4.7mV	5.4mV		
	0.035%	0.033%	0.031%	0.036%		

・−Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	-14.9630V	-14.9650V	-14.9677V	-14.9691V	6.1mV	0.041%
50%(25mA)	-14.9585V	-14.9605V	-14.9649V	-14.9672V	8.7mV	0.058%
100%(50mA)	-14.9628V	-14.9624V	-14.9621V	-14.9648V	2.7mV	0.018%
Load regulation	4.5mV	4.5mV	5.6mV	4.3mV		
	0.030%	0.030%	0.037%	0.029%		

・+Vo to −Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	29.9239V	29.9277V	29.9274V	29.9282V	4.3mV	0.014%
50%(25mA)	29.9247V	29.9281V	29.9282V	29.9270V	3.5mV	0.012%
100%(50mA)	29.9282V	29.9279V	29.9264V	29.9293V	2.9mV	0.010%
Load regulation	4.3mV	0.4mV	1.8mV	2.3mV		
	0.014%	0.001%	0.006%	0.008%		

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

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	14.9049V	14.9643V	14.9563V	59.4mV	0.396%
-Vo	-14.9000V	-14.9621V	-14.9548V	62.1mV	0.414%
+Vo to -Vo	29.8049V	29.9264V	29.9110V	121.5mV	0.405%

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

・+Vo (-Io : 100%)

+Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(10mA)	15.0449V	15.0404V	15.0404V	15.0228V
100%(50mA)	14.9653V	14.9654V	14.9654V	14.9643V
Load regulation	79.6mV	75.0mV	75.0mV	58.5mV
	0.531%	0.500%	0.500%	0.390%

・−Vo (+Io : 100%)

-Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(10mA)	-15.0384V	-15.0340V	-15.0340V	-15.0328V
100%(50mA)	-14.9635V	-14.9630V	-14.9630V	-14.9647V
Load regulation	74.9mV	71.0mV	71.0mV	68.1mV
	0.499%	0.473%	0.473%	0.454%

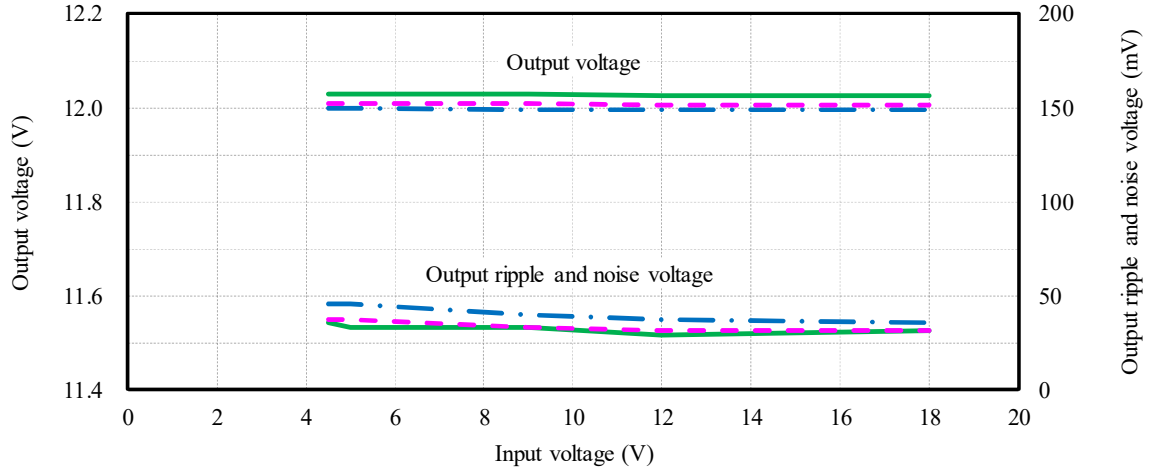
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

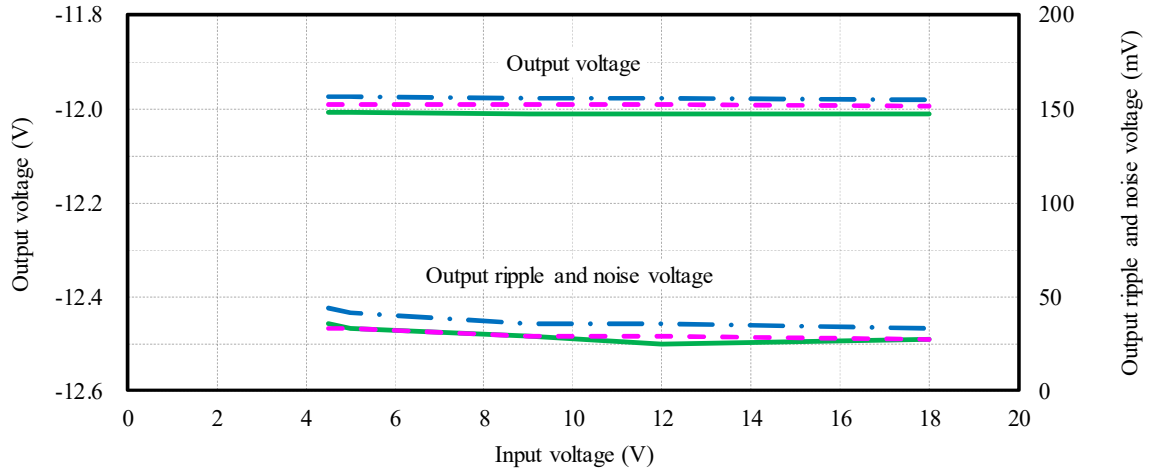
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 85 °C

±12V

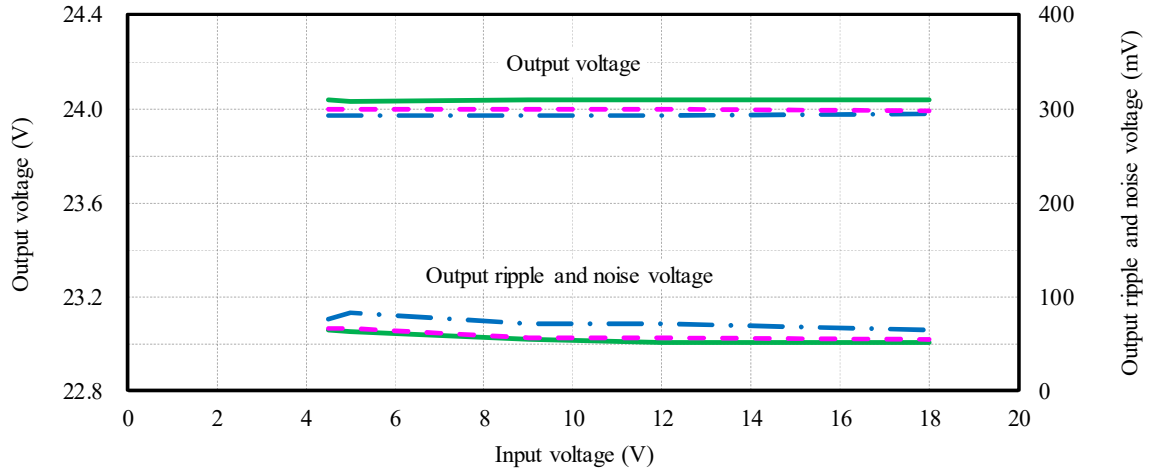
・+Vo



・−Vo



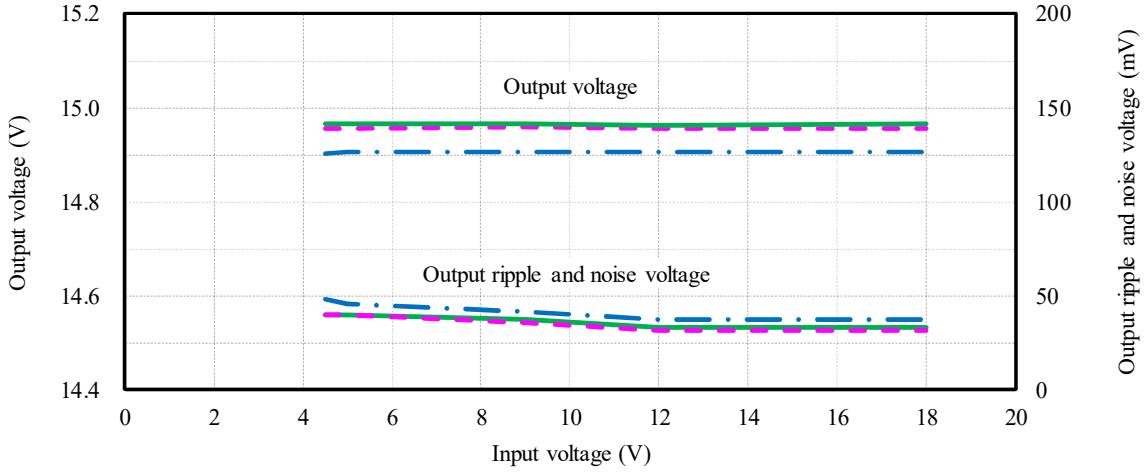
・+Vo to -Vo



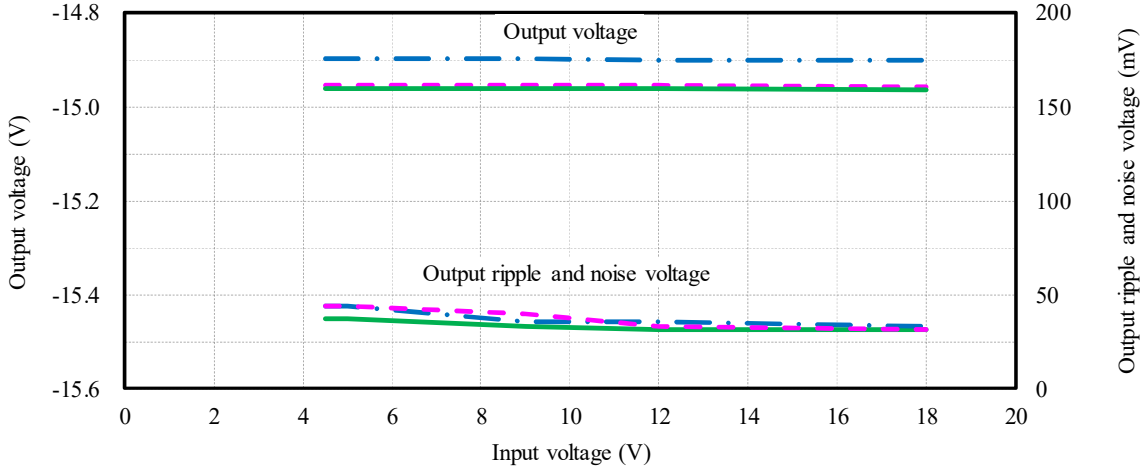
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 85 °C

±15V

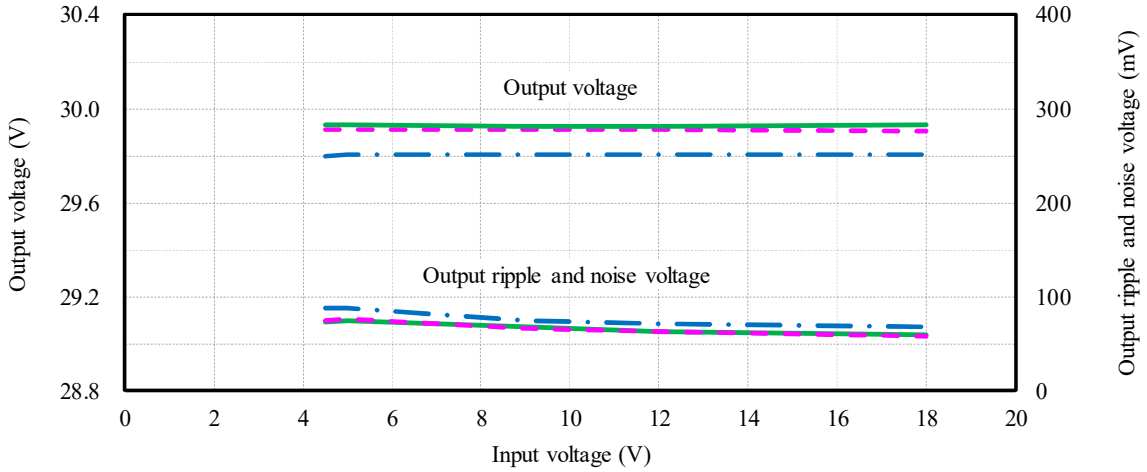
・+Vo



・−Vo



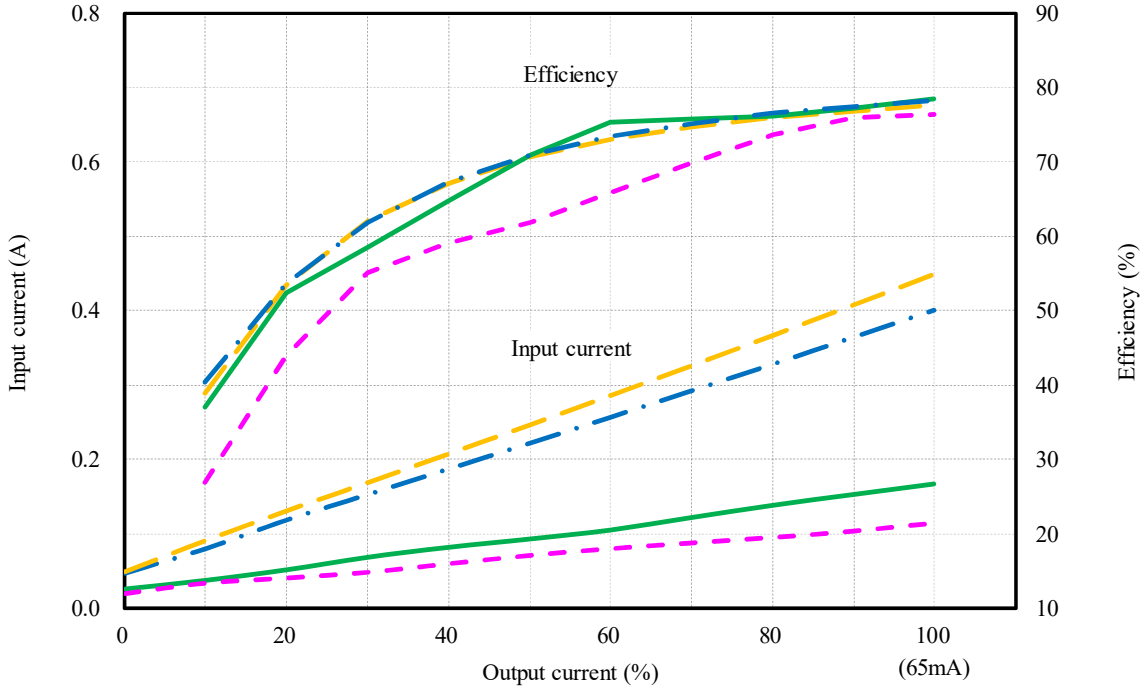
・+Vo to -Vo



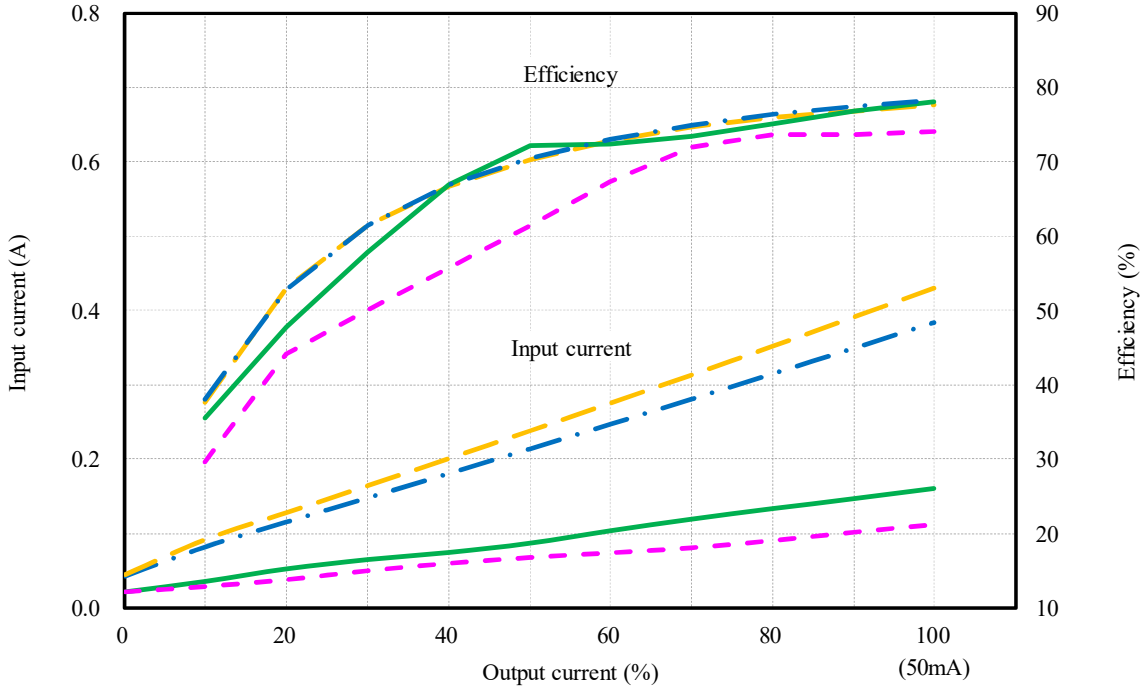
(3) 入力電流･効率 対 出力電流 Input current and Efficiency vs. Output current

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

±12V



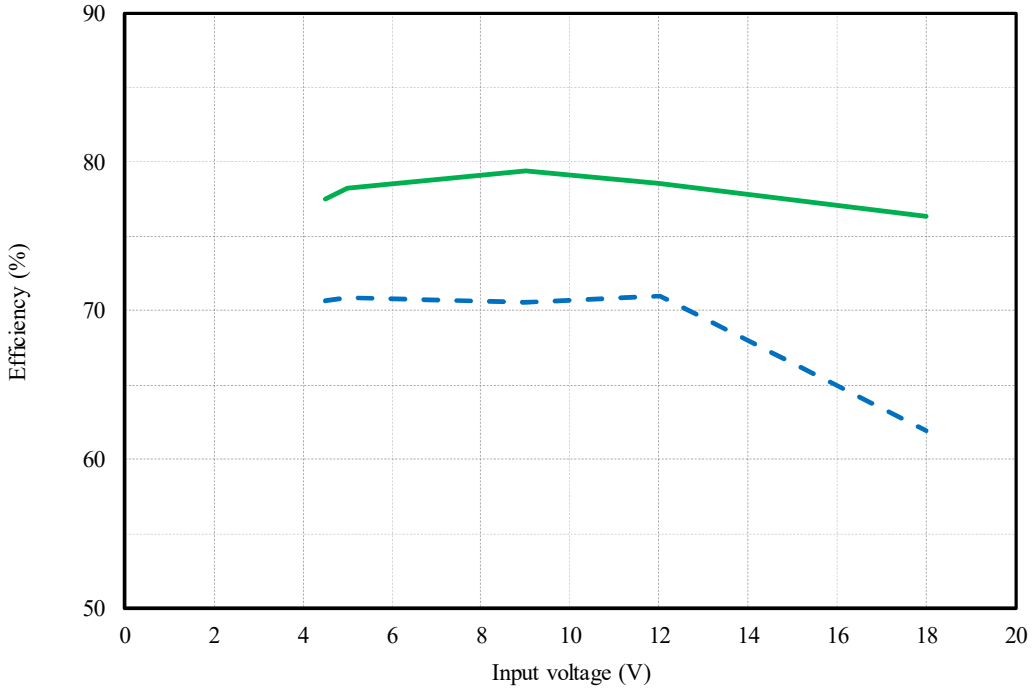
±15V



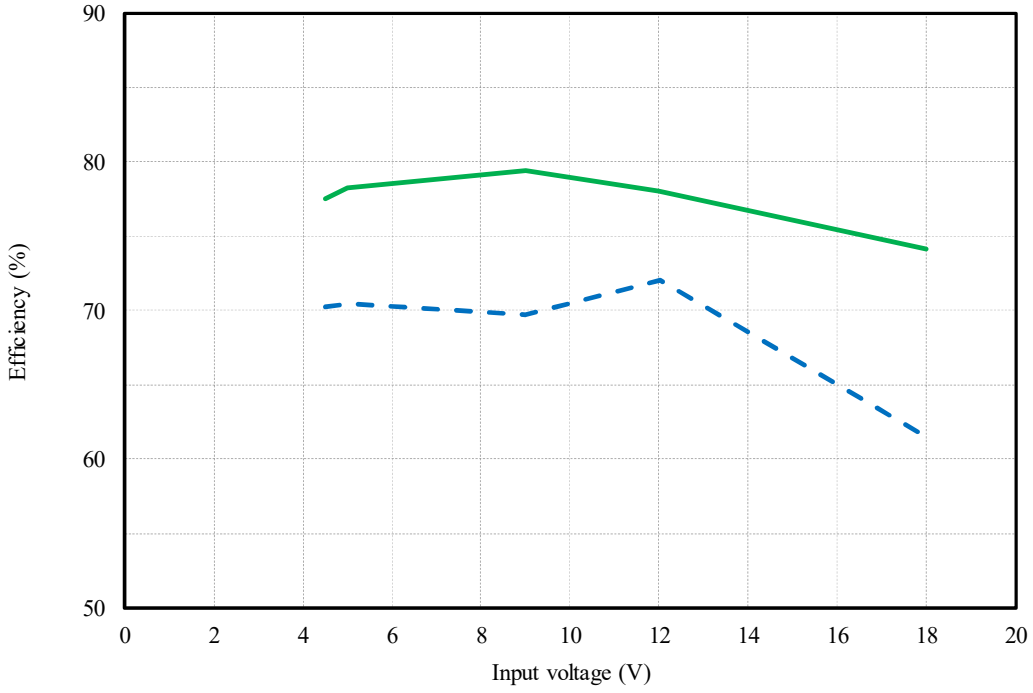
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

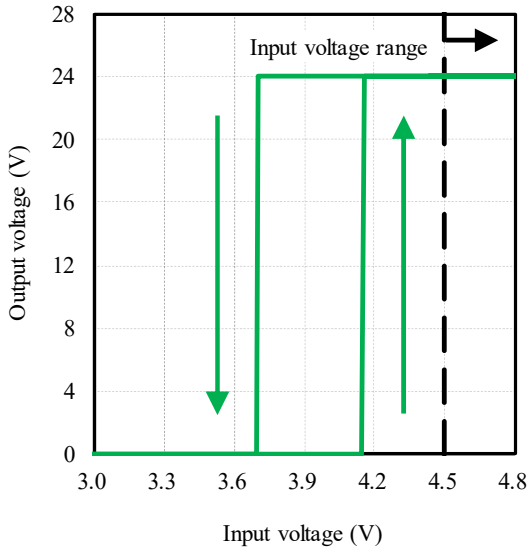
出力電圧 対 入力電圧
Output voltage vs. Input voltage

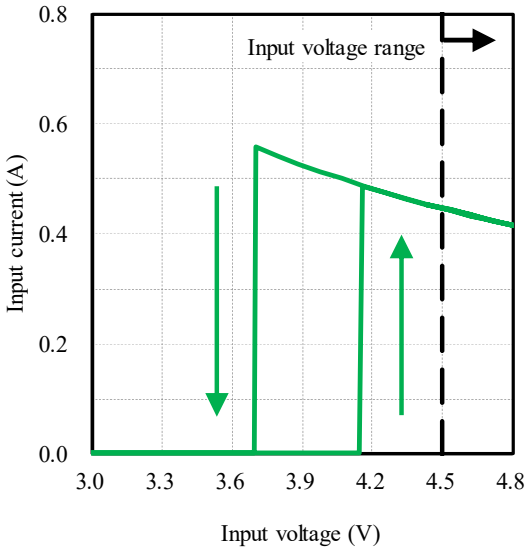
Conditions Io : 100 %
Ta : 25 °C

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

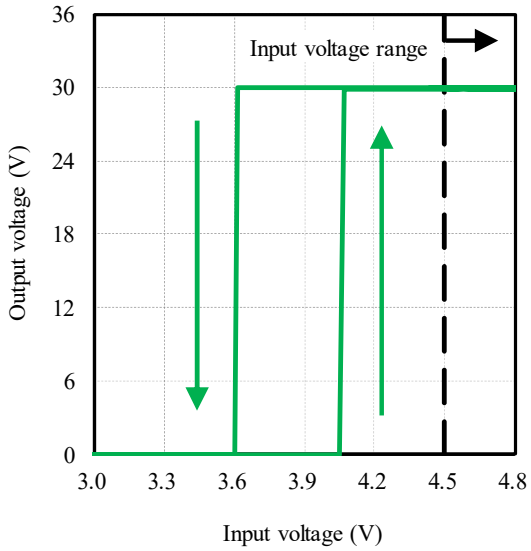
Conditions Io : 100 %
Ta : 25 °C

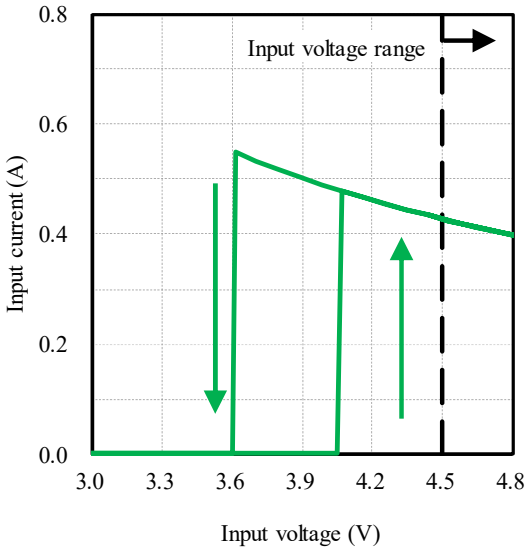
±12V





±15V

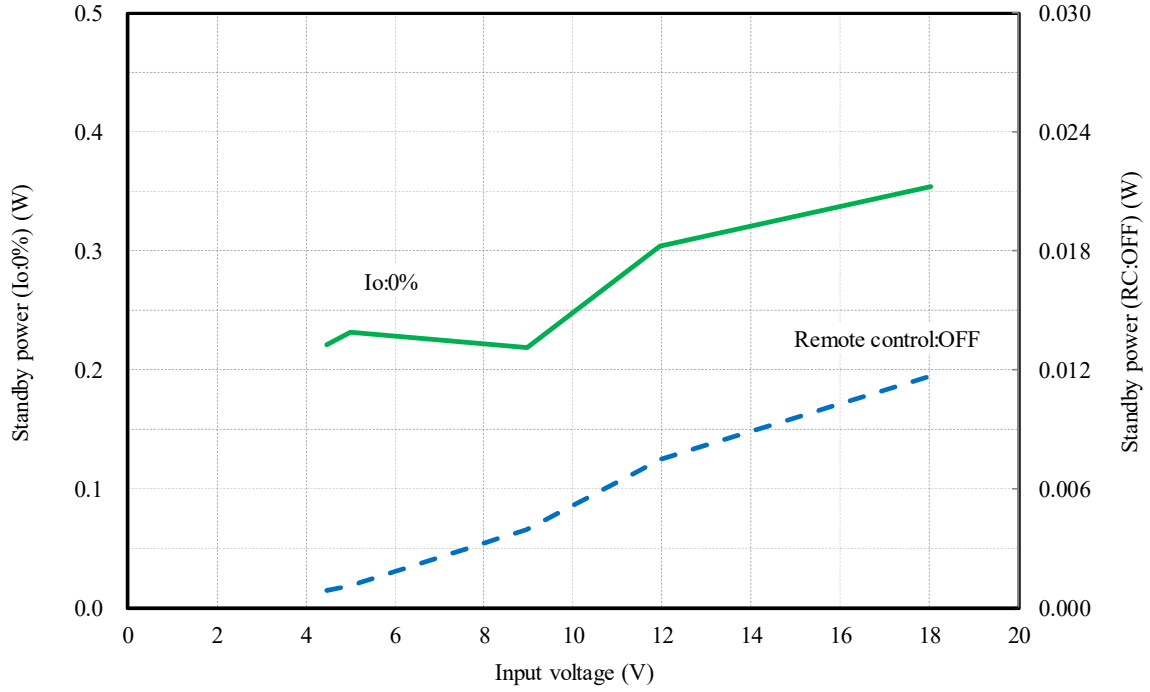




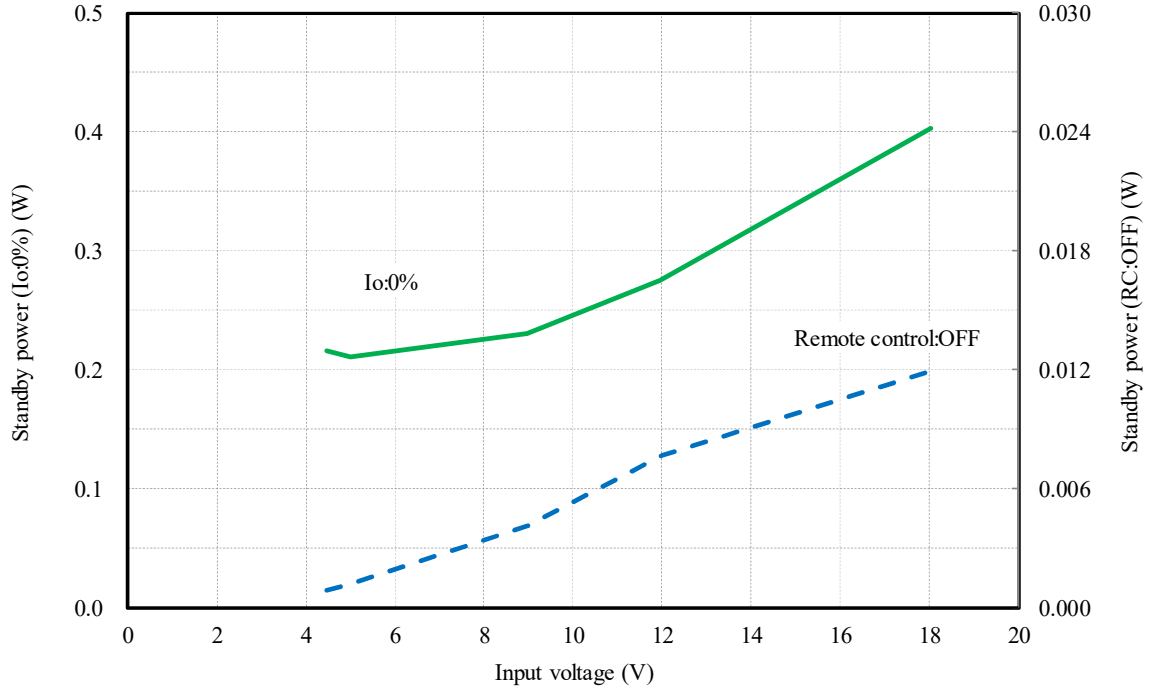
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



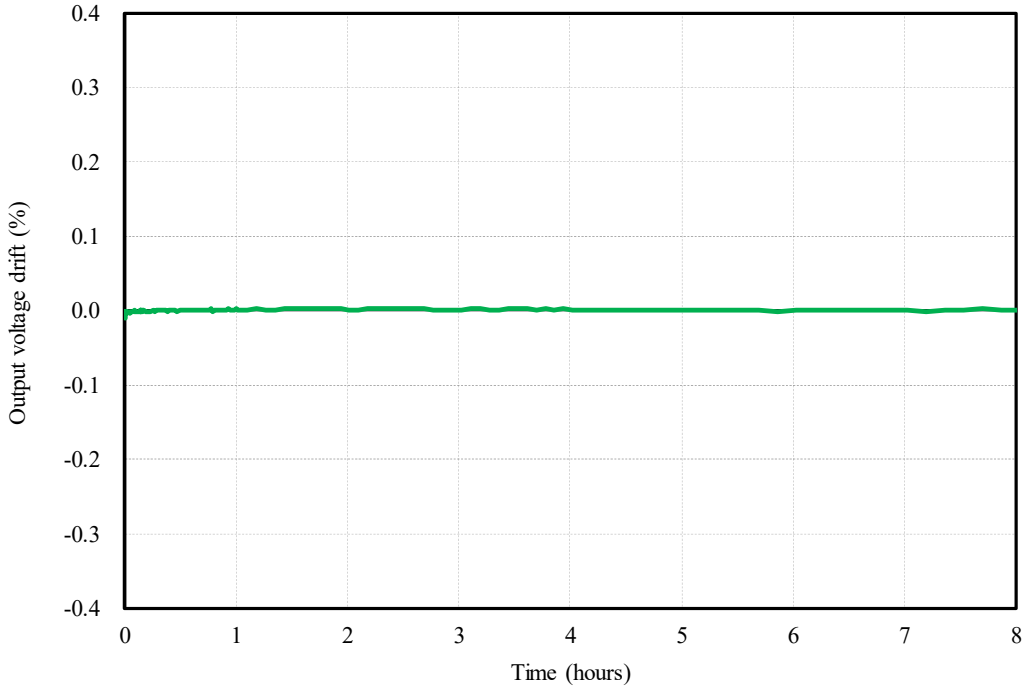
±15V



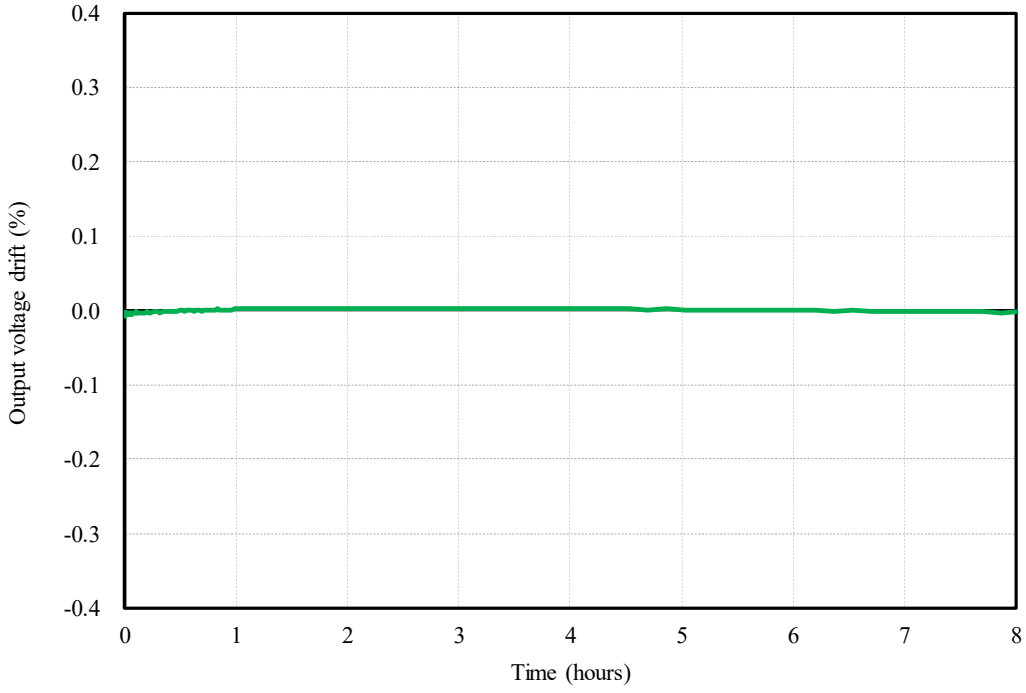
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

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

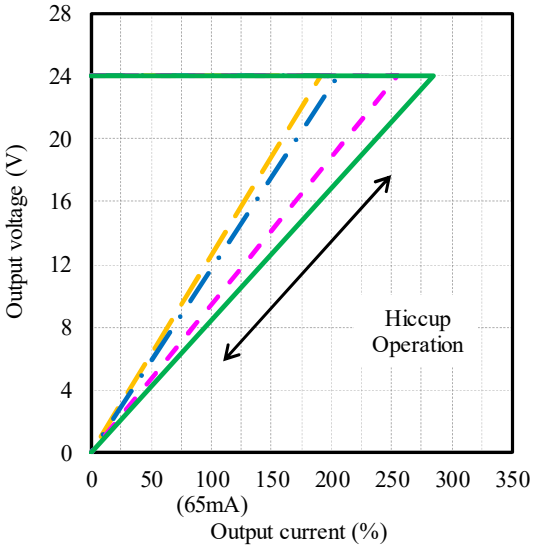
入力電圧依存性
Input voltage dependence

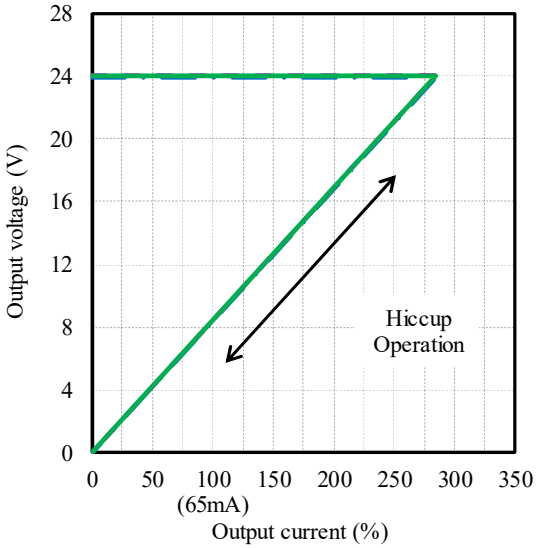
Conditions Vin : 4.5 VDC
: 5 VDC
: 12 VDC
: 18 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

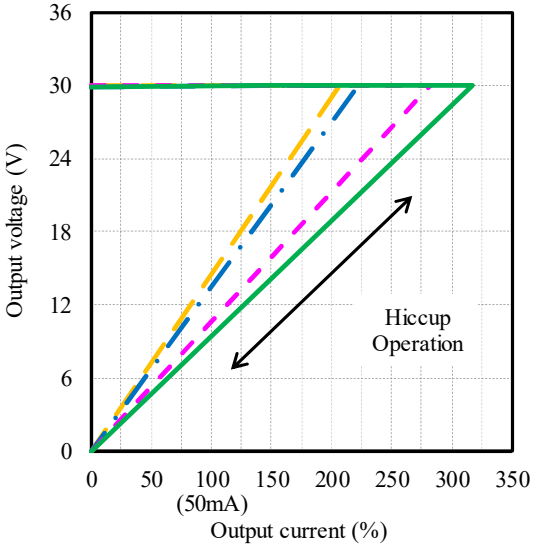
Conditions Vin : 12 VDC
Ta : -40 °C
: 25 °C
: 85 °C

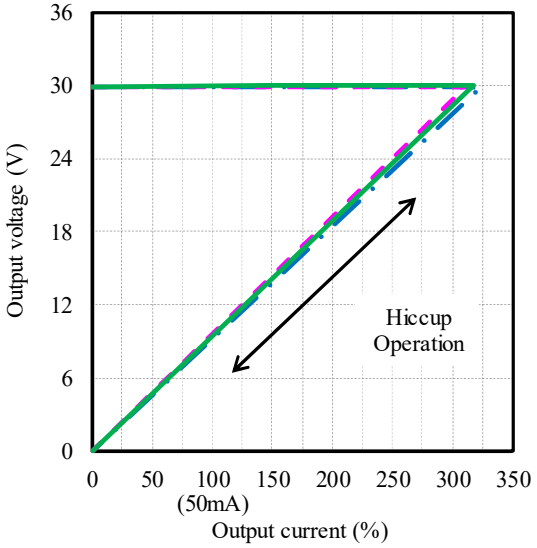
±12V





±15V

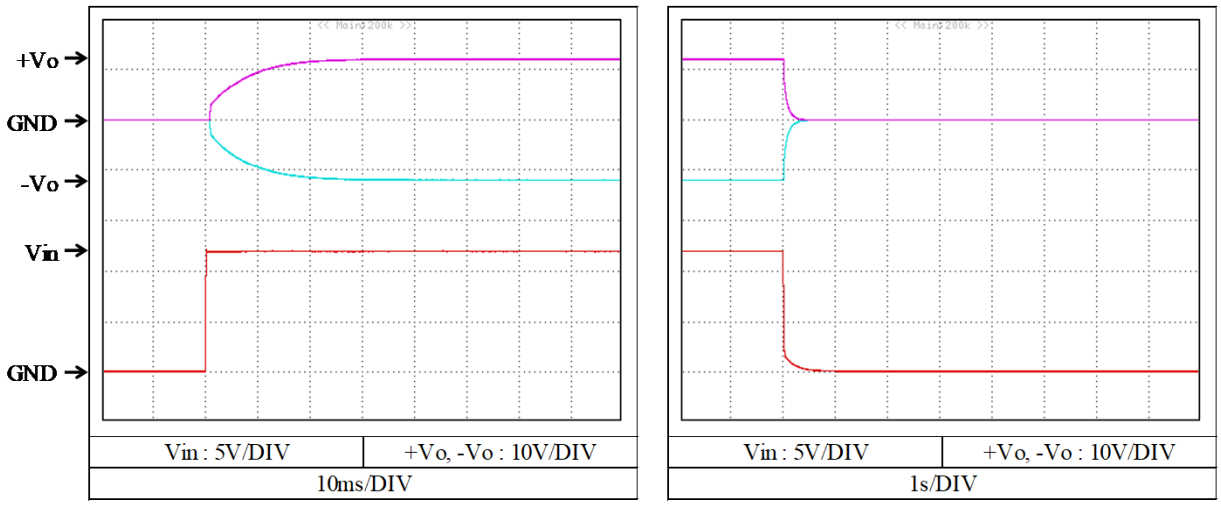




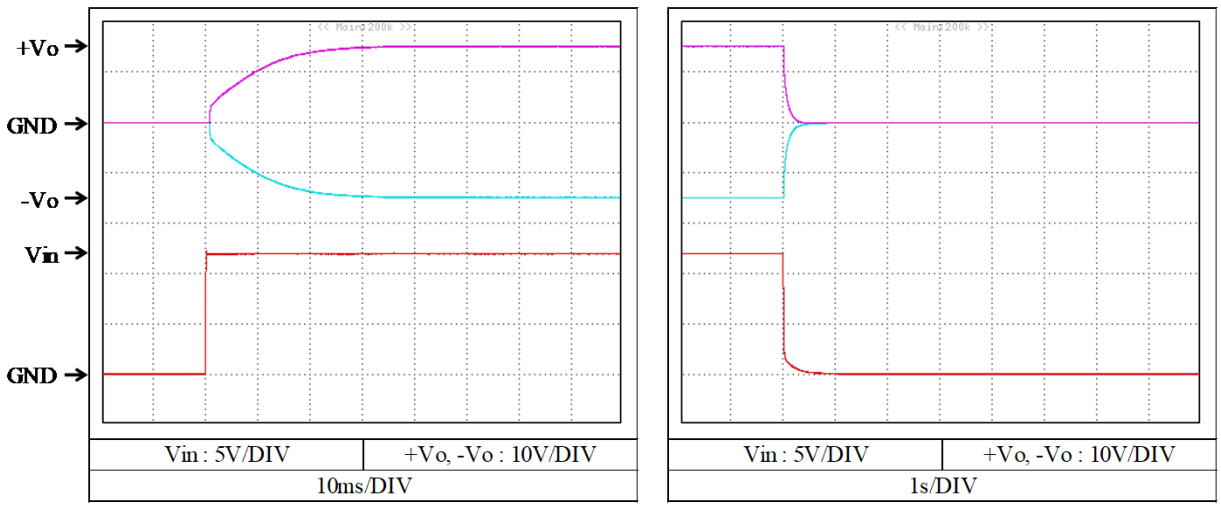
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V



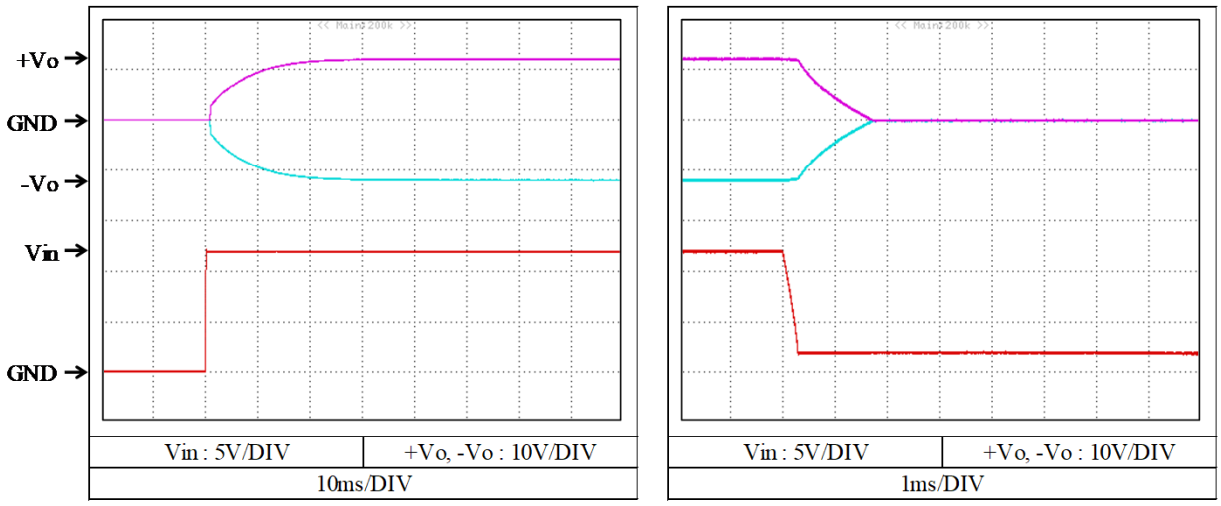
+15V



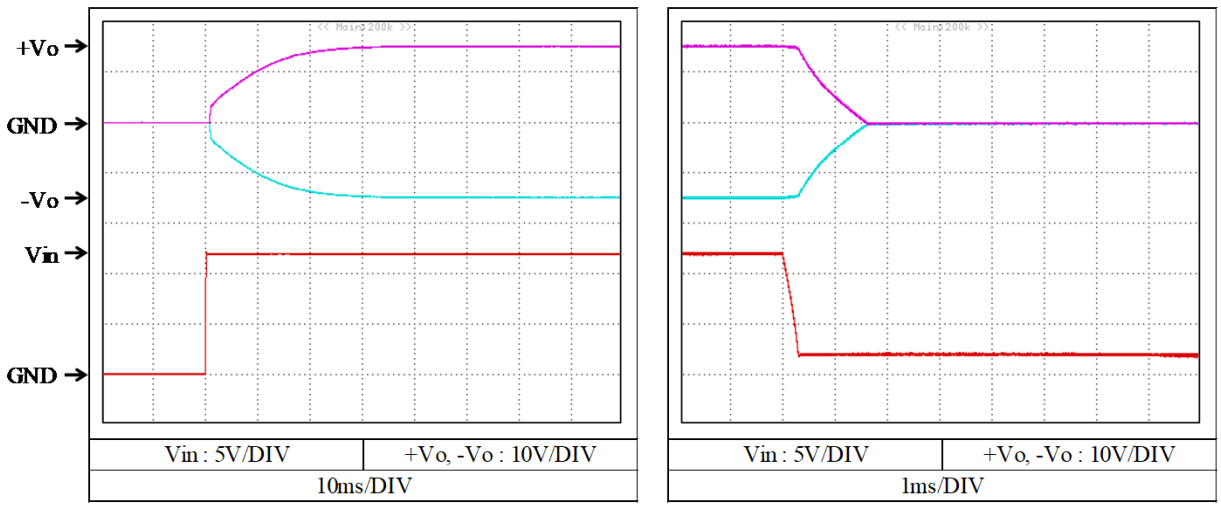
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V



+15V

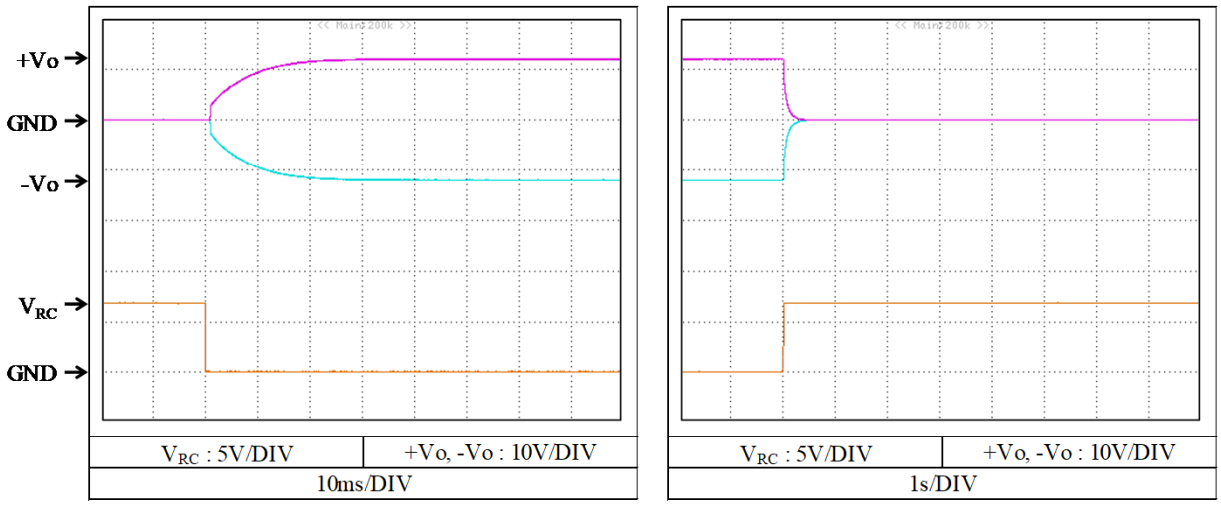


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

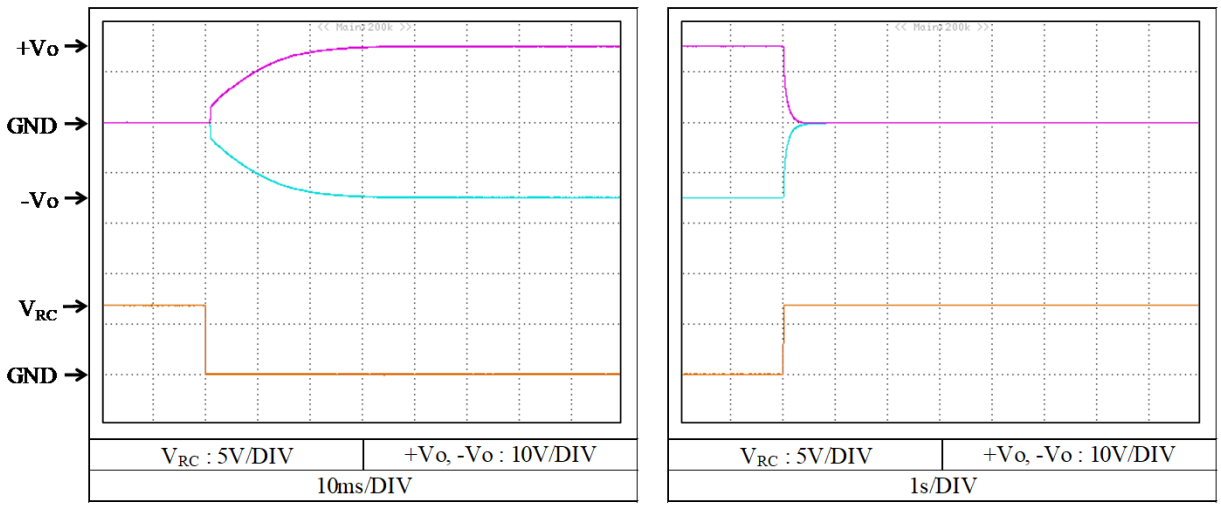
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

±12V



+15V

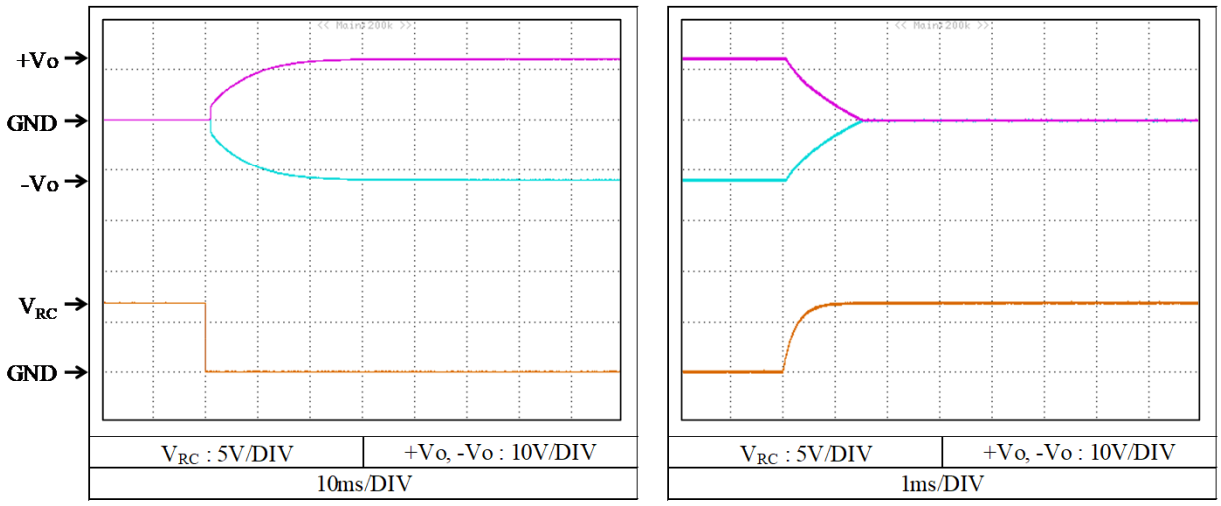


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

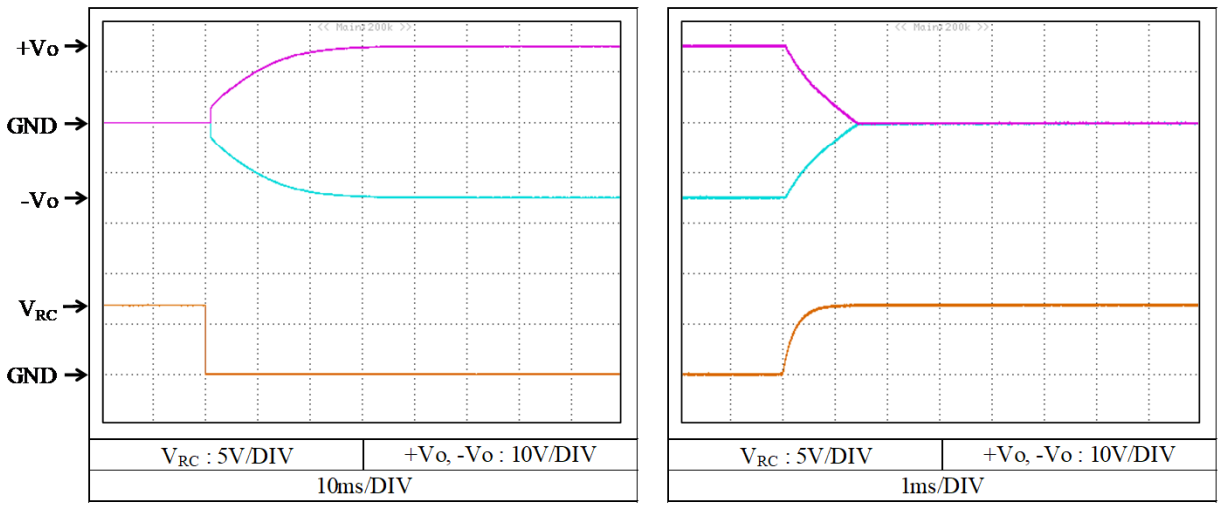
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

±12V



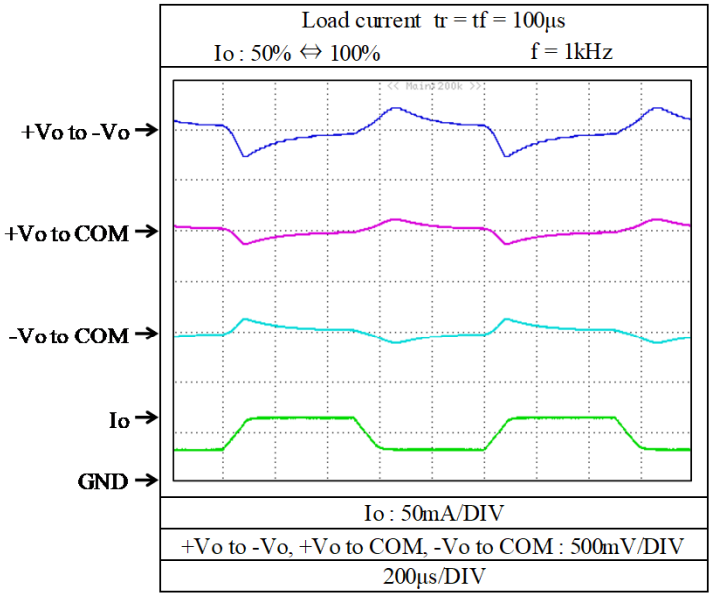
+15V



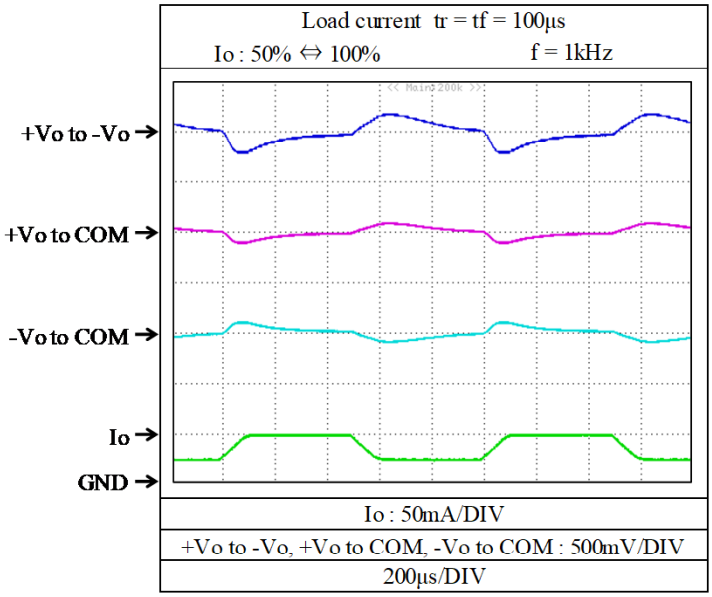
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 12 VDC
Ta : 25 °C

±12V



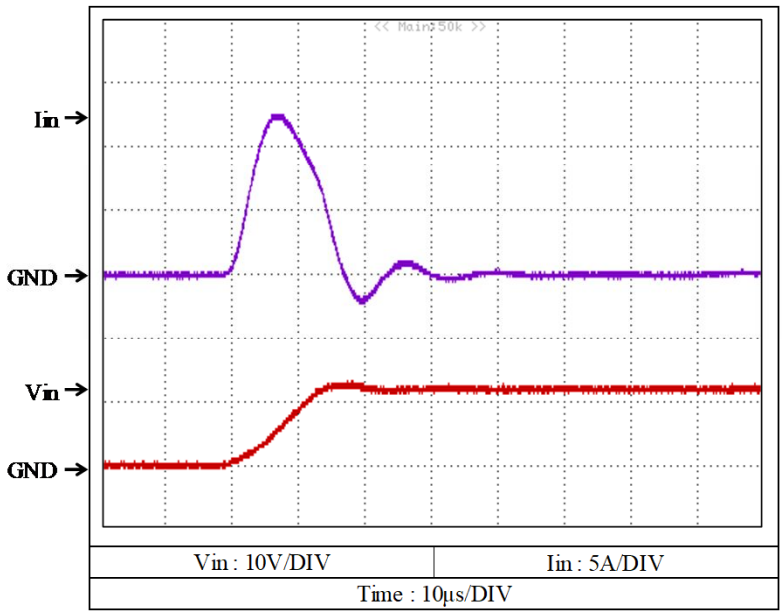
+15V



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

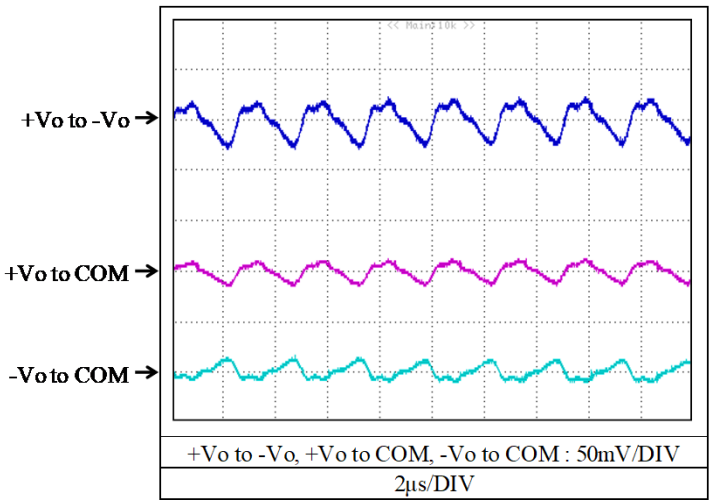


CCG1R5-12-xxDの入力サージ電流特性は CCG3-12-05S と同等です。
CCG1R5-12-xxD have the same Inrush current characteristics as CCG3-12-05S data.

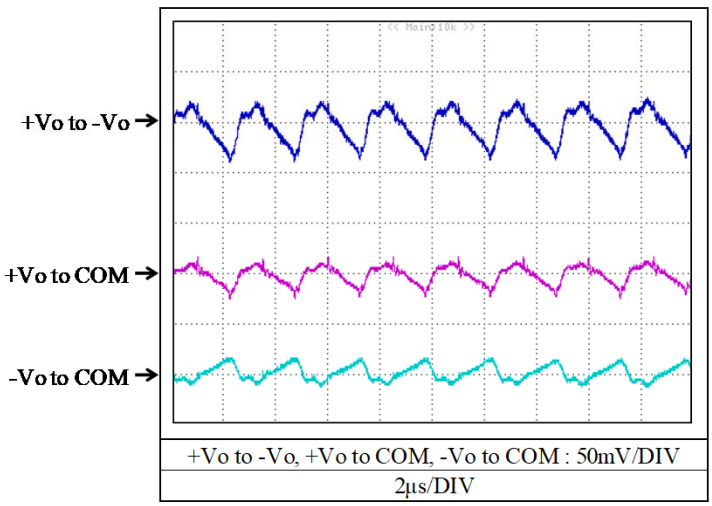
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

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

±12V



+15V

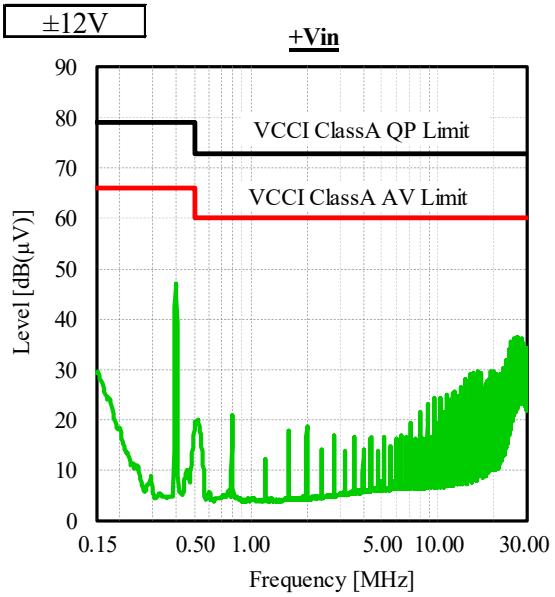


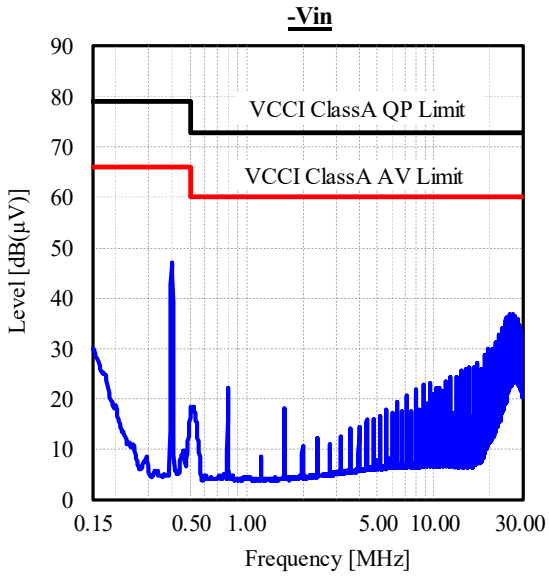
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

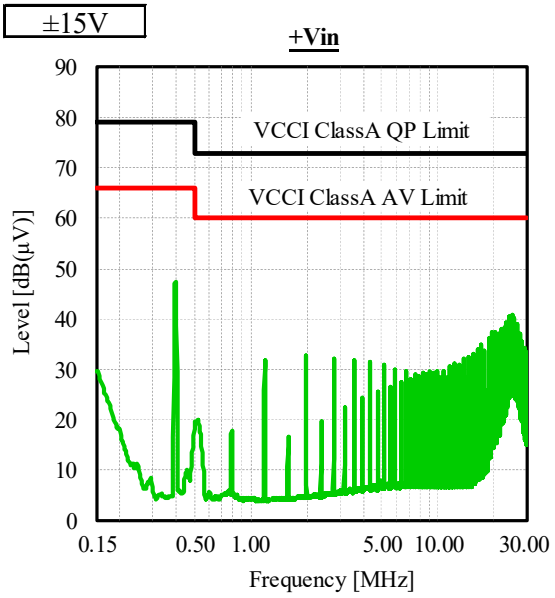
Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 ºC

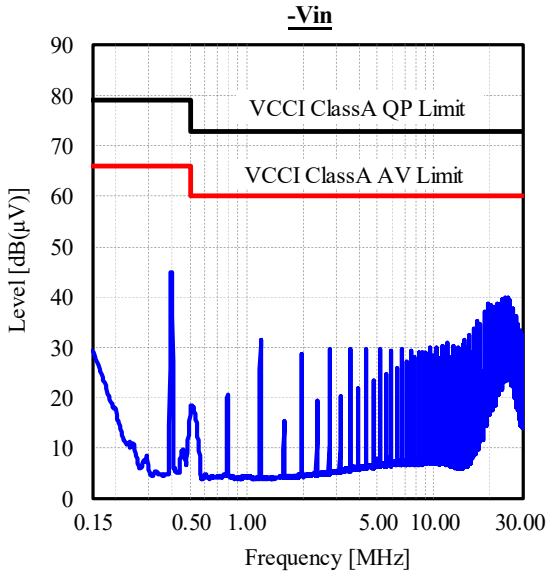
±12V





±15V





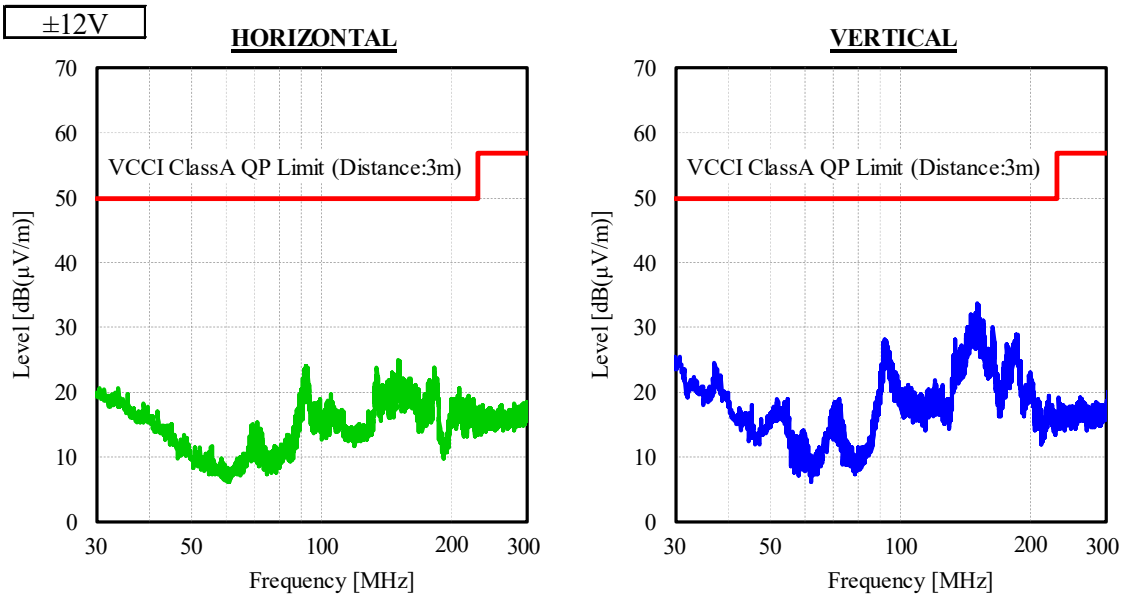
表示はQP値
Indication is QP values.

2-9. EMI特性 Electro-Magnetic Interference characteristics

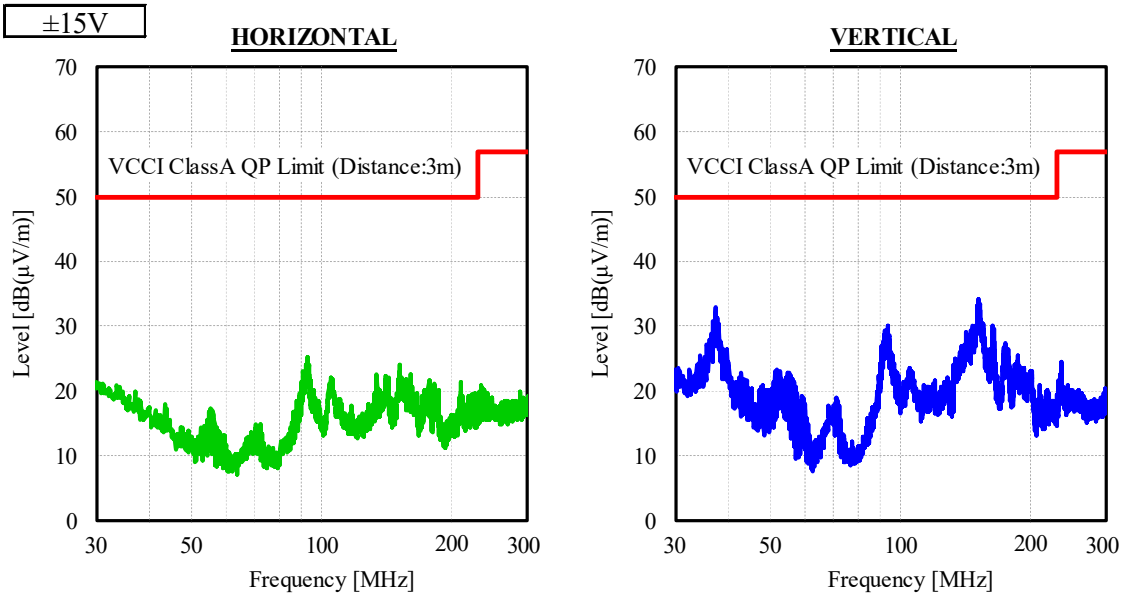
(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise

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

±12V



±15V



表示はピーク値
Indication is peak values.