CCG6-12-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

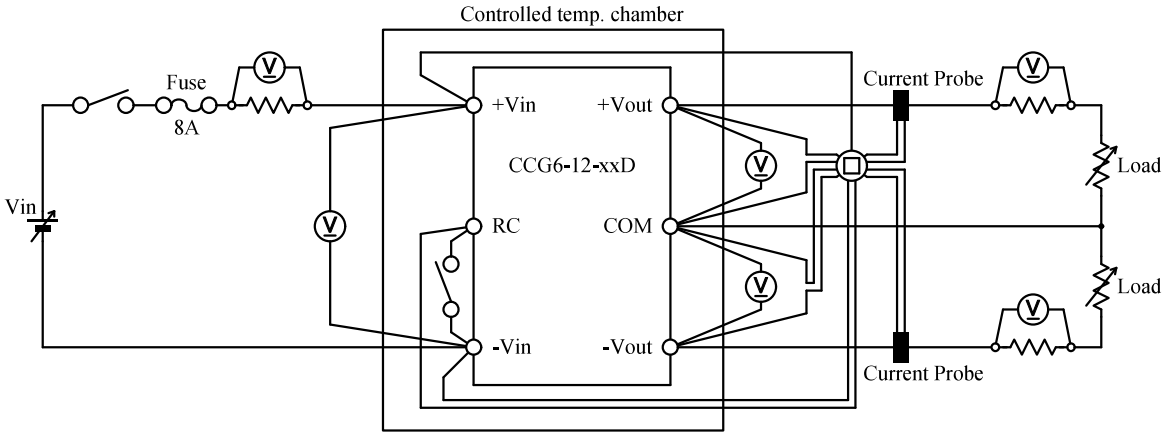
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

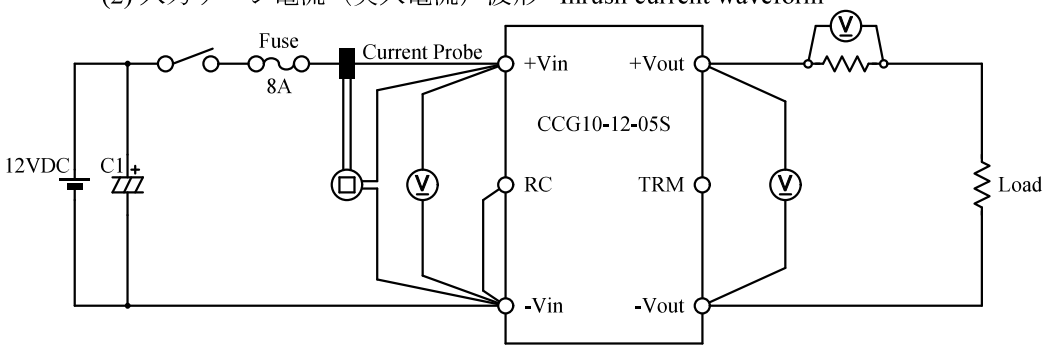
1-1. 測定回路 Measurement Circuits

(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



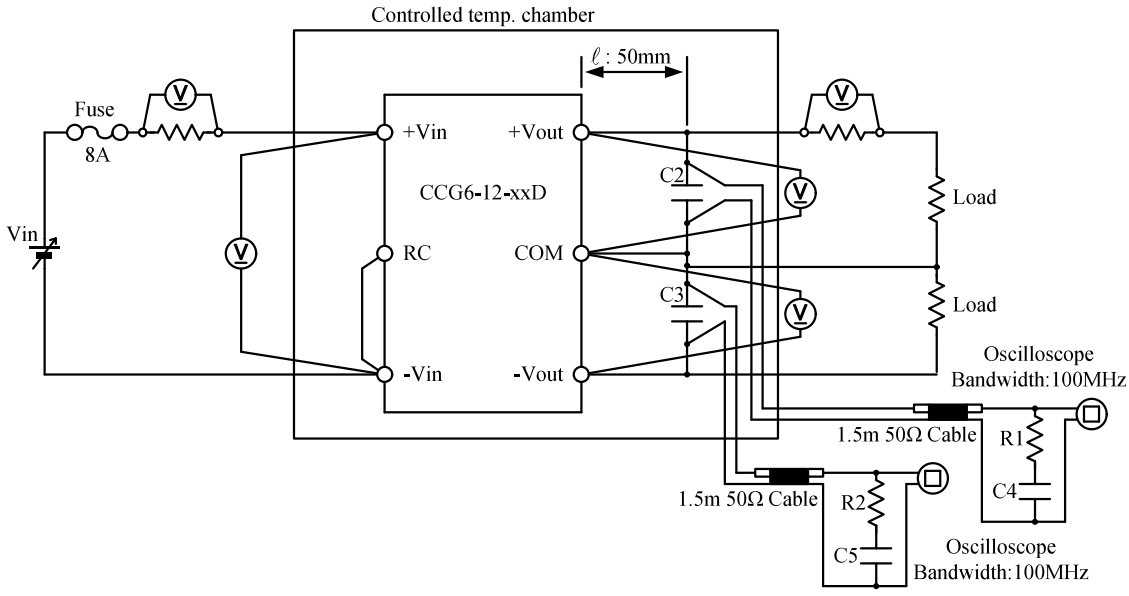
(2) 入力サージ電流（突入電流）波形 Inrush current waveform



CCG6-12-xxDの入力サージ電流特性はCCG10-12-05Sと同等です。

CCG6-12-xxD have the same Inrush current characteristics as CCG10-12-05S data.

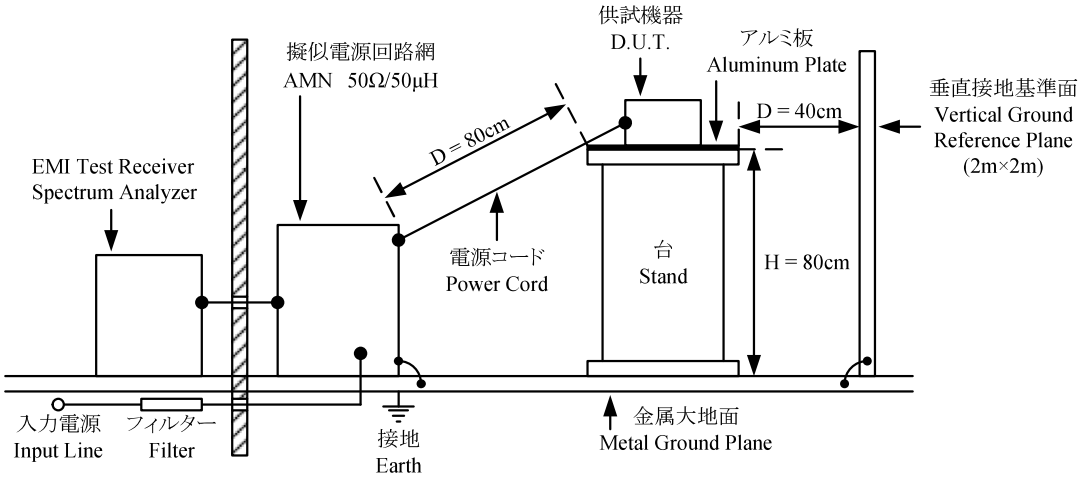
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



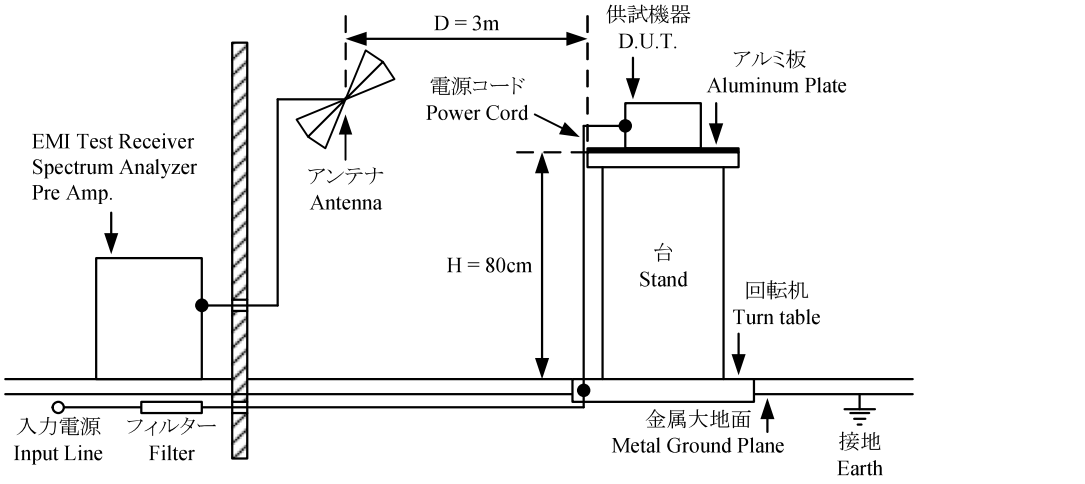
C1	: 4000uF	Electrolytic Capacitor
C2,C3	: 1uF	Ceramic Capacitor
C4,C5	: 4700pF	Ceramic Capacitor
R1,R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

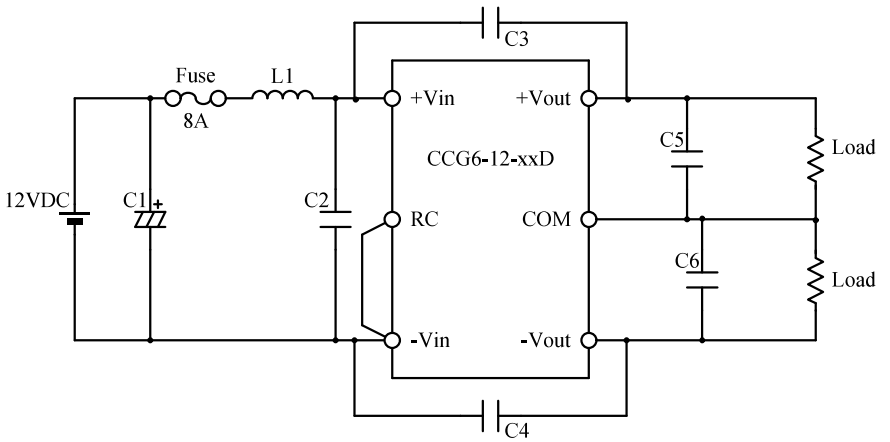
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	220uF	Electrolytic Capacitor	(ELXZ250ELL221MH12D,Nippon Chemi-con)
C2	: 50V	10uF	Ceramic Capacitor	(C3216X7R1H106KT,TDK)
C3	: 2kV	470pF	Ceramic Capacitor	(C3216X7S3D471K130AA,TDK)
C4	: 2kV	470pF	Ceramic Capacitor	(C3216X7S3D471K130AA,TDK)
C5	: 25V	10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
C6	: 25V	10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
L1	: 5A	1.5uH	Normal Mode Choke Coil	(LQH5BPN1R5NT0L,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	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	11.9816V	11.9805V	11.9821V	11.9787V	3.4mV	0.028%
50%(0.125A)	12.0069V	12.0071V	12.0049V	12.0022V	4.9mV	0.041%
100%(0.25A)	12.0120V	12.0110V	12.0061V	12.0057V	6.3mV	0.053%
Load	30.4mV	30.5mV	24.0mV	27.0mV		
regulation	0.253%	0.254%	0.200%	0.225%		

・−Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	-11.9988V	-12.0009V	-11.9993V	-12.0025V	3.7mV	0.031%
50%(0.125A)	-11.9725V	-11.9731V	-11.9755V	-11.9778V	5.3mV	0.044%
100%(0.25A)	-11.9681V	-11.9694V	-11.9744V	-11.9750V	6.9mV	0.057%
Load	30.7mV	31.5mV	24.9mV	27.5mV		
regulation	0.256%	0.262%	0.208%	0.229%		

・+Vo to −Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	23.9804V	23.9813V	23.9814V	23.9812V	1.0mV	0.004%
50%(0.125A)	23.9794V	23.9802V	23.9803V	23.9800V	0.9mV	0.004%
100%(0.25A)	23.9801V	23.9804V	23.9805V	23.9808V	0.7mV	0.003%
Load	1.0mV	1.1mV	1.1mV	1.2mV		
regulation	0.004%	0.005%	0.005%	0.005%		

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

Ta	-40°C	25°C	80°C	Temperature stability	
+Vo	11.9464V	12.0061V	11.9980V	59.7mV	0.497%
-Vo	-11.9143V	-11.9744V	-11.9668V	60.1mV	0.501%
+Vo to -Vo	23.8607V	23.9805V	23.9648V	119.8mV	0.499%

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

・+Vo (-Io : 100%)

+Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.05A)	12.1287V	12.1229V	12.1229V	12.1127V
100%(0.25A)	12.0132V	12.0123V	12.0123V	12.0063V
Load	115.5mV	110.6mV	110.6mV	106.4mV
regulation	0.963%	0.922%	0.922%	0.887%

・−Vo (+Io : 100%)

-Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.05A)	-12.0879V	-12.0842V	-12.0842V	-12.0835V
100%(0.25A)	-11.9681V	-11.9693V	-11.9693V	-11.9752V
Load	119.8mV	114.9mV	114.9mV	108.3mV
regulation	0.998%	0.957%	0.957%	0.903%

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

・+Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	14.9805V	14.9813V	14.9824V	14.9839V	3.4mV	0.023%
50%(0.1A)	14.9754V	14.9754V	14.9744V	14.9741V	1.3mV	0.009%
100%(0.2A)	14.9761V	14.9757V	14.9748V	14.9739V	2.2mV	0.015%
Load	5.1mV	5.9mV	8.0mV	10.0mV		
regulation	0.034%	0.039%	0.053%	0.067%		

・−Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	-14.9795V	-14.9795V	-14.9785V	-14.9769V	2.6mV	0.017%
50%(0.1A)	-14.9845V	-14.9850V	-14.9862V	-14.9863V	1.8mV	0.012%
100%(0.2A)	-14.9846V	-14.9852V	-14.9860V	-14.9869V	2.3mV	0.015%
Load	5.1mV	5.7mV	7.7mV	10.0mV		
regulation	0.034%	0.038%	0.051%	0.067%		

・+Vo to −Vo

Io \ Vin	4.5VDC	5VDC	12VDC	18VDC	Line regulation	
0%	29.9600V	29.9608V	29.9610V	29.9608V	1.0mV	0.003%
50%(0.1A)	29.9599V	29.9604V	29.9607V	29.9604V	0.8mV	0.003%
100%(0.2A)	29.9607V	29.9610V	29.9608V	29.9608V	0.3mV	0.001%
Load	0.8mV	0.6mV	0.3mV	0.4mV		
regulation	0.003%	0.002%	0.001%	0.001%		

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

Ta	-40°C	25°C	80°C	Temperature stability	
+Vo	14.8967V	14.9748V	14.9660V	78.1mV	0.521%
-Vo	-14.9068V	-14.9860V	-14.9796V	79.2mV	0.528%
+Vo to -Vo	29.8035V	29.9608V	29.9456V	157.3mV	0.524%

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

・+Vo (-Io : 100%)

+Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.04A)	15.0931V	15.0868V	15.0868V	15.0751V
100%(0.2A)	14.9772V	14.9766V	14.9766V	14.9750V
Load	115.9mV	110.2mV	110.2mV	100.1mV
regulation	0.773%	0.735%	0.735%	0.667%

・−Vo (+Io : 100%)

-Io \ Vin	4.5VDC	5VDC	12VDC	18VDC
20%(0.04A)	-15.1002V	-15.0946V	-15.0946V	-15.0865V
100%(0.2A)	-14.9856V	-14.9858V	-14.9858V	-14.9871V
Load	114.6mV	108.8mV	108.8mV	99.4mV
regulation	0.764%	0.725%	0.725%	0.663%

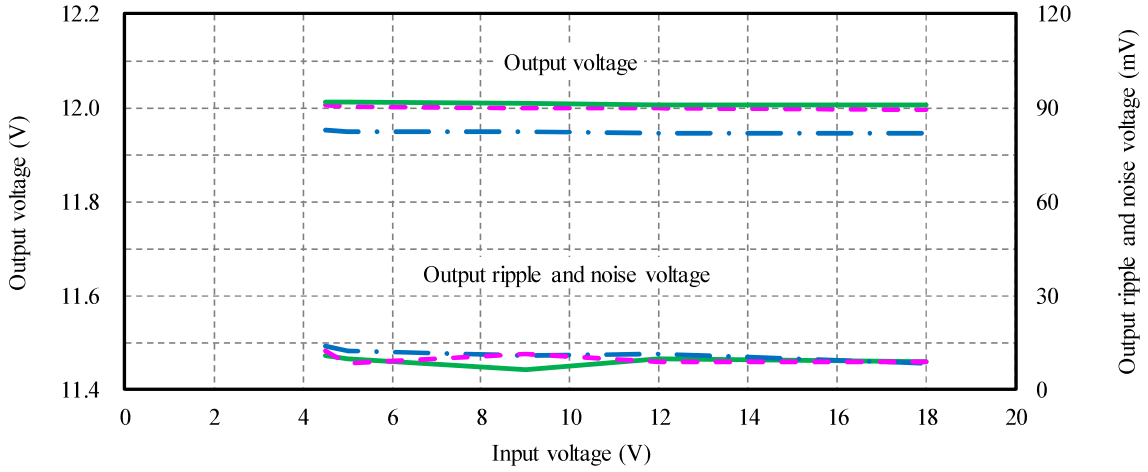
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

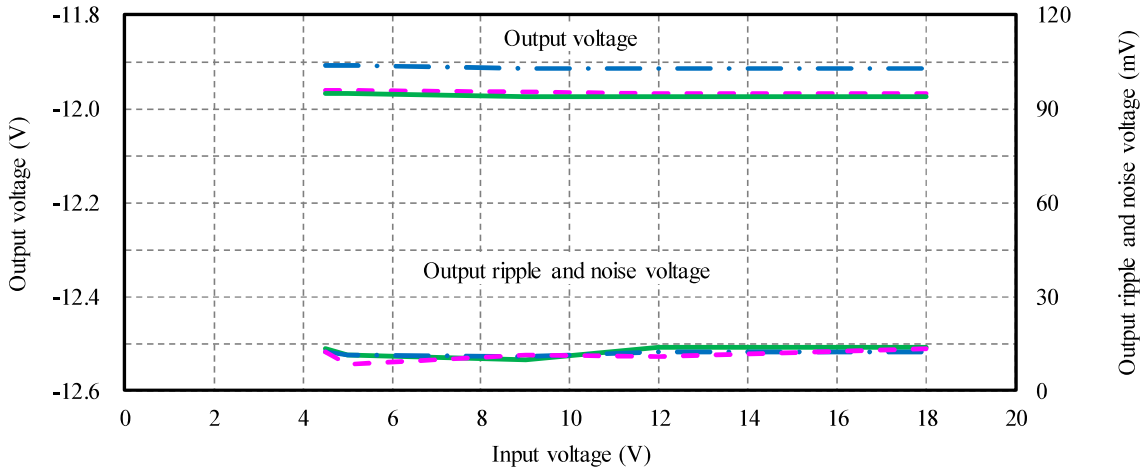
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 80 °C

±12V

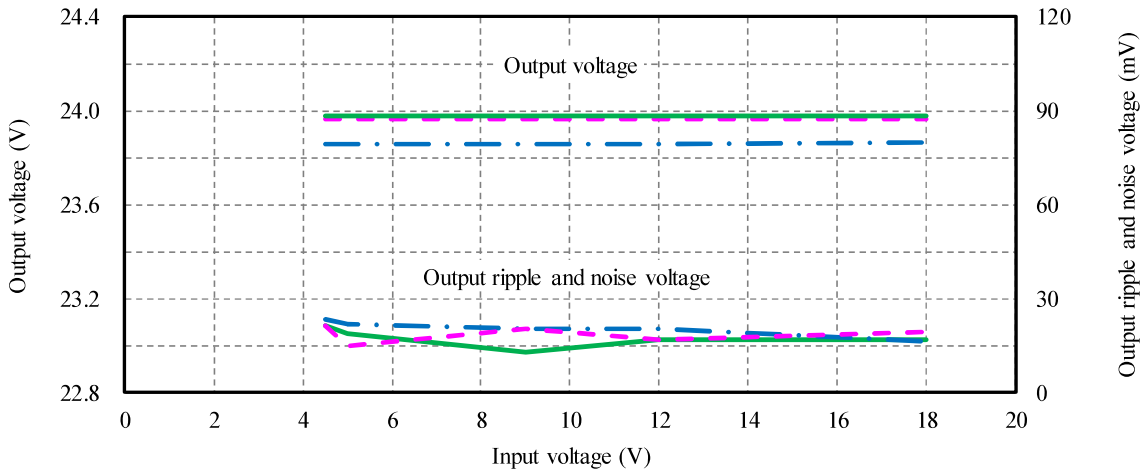
・+Vo



・−Vo



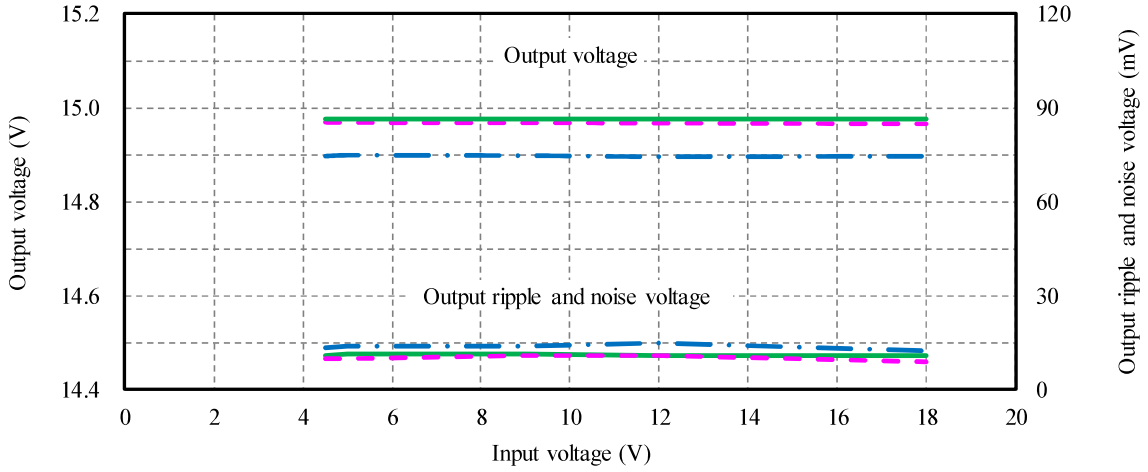
・+Vo to -Vo



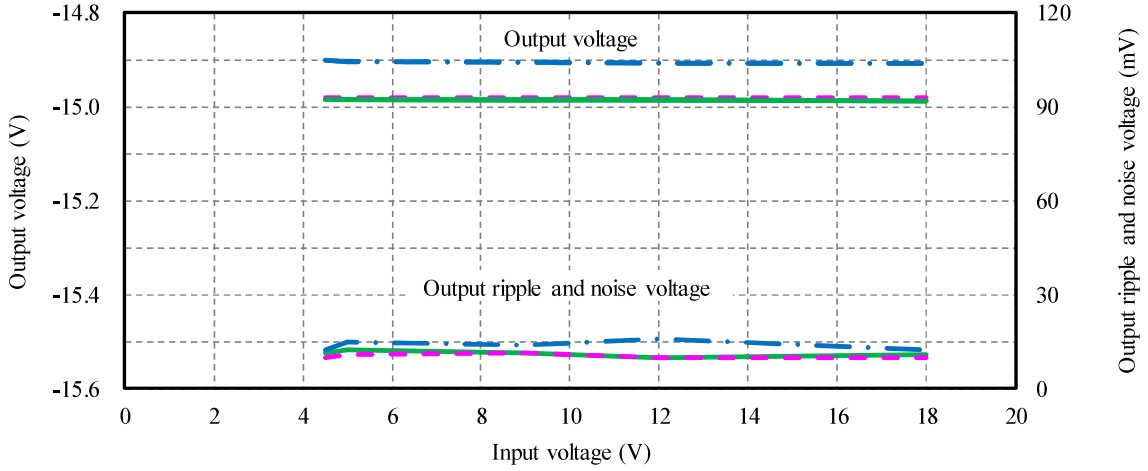
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 80 °C

±15V

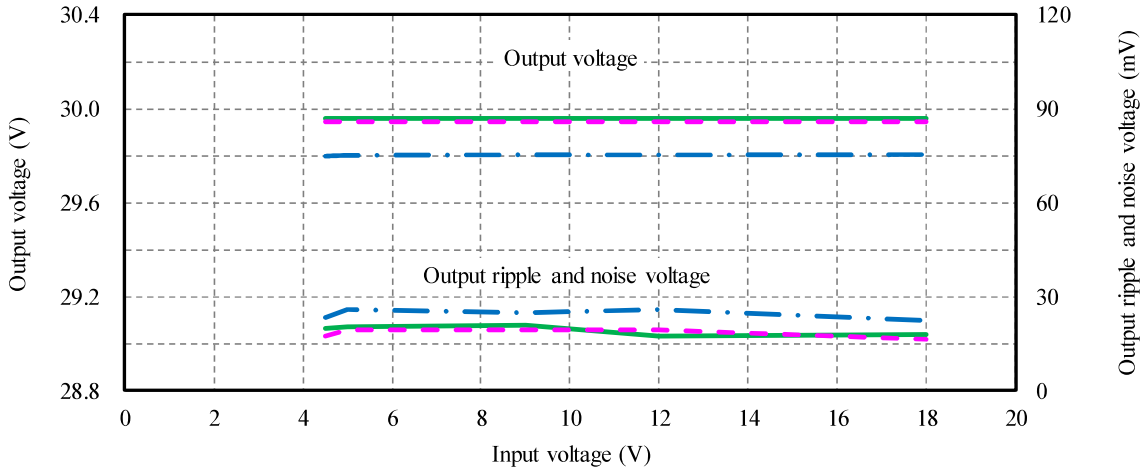
・+Vo



・−Vo



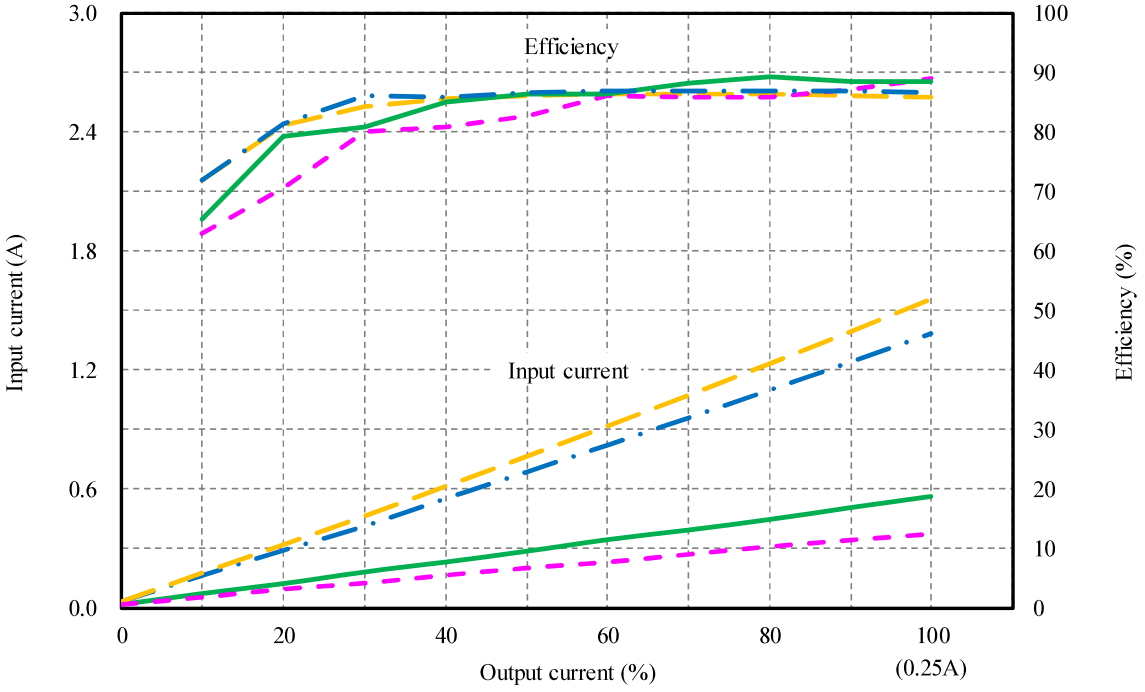
・+Vo to -Vo



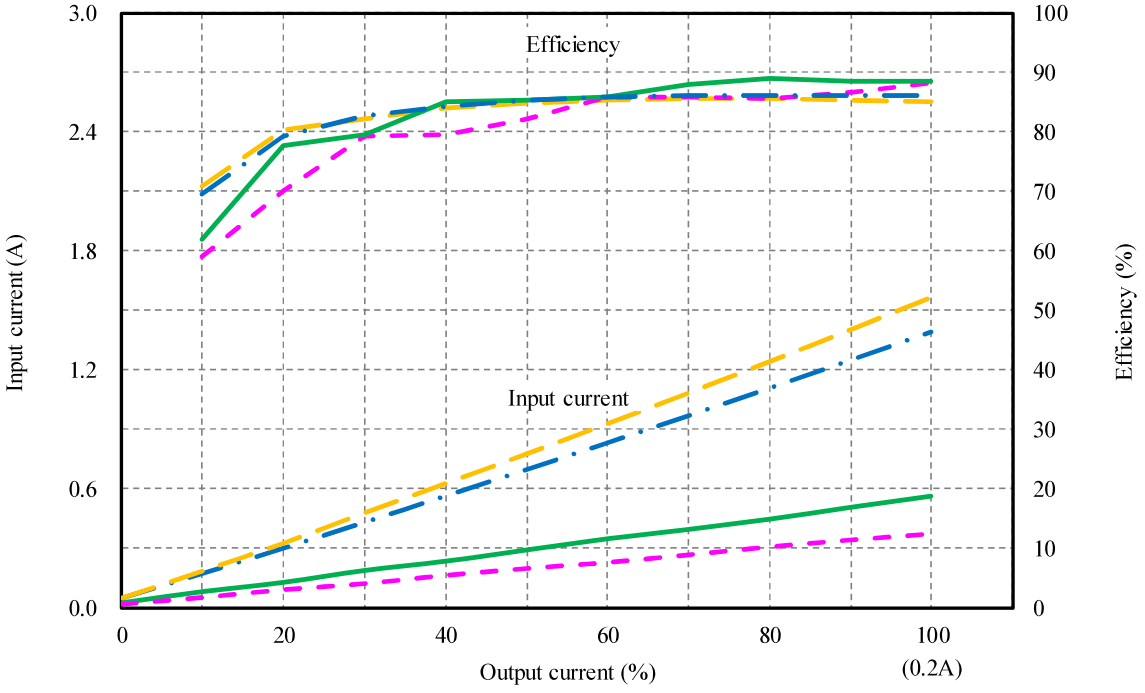
(3) 入力電流･効率 対 出力電流　Input current and Efficiency vs. Output current

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

±12V



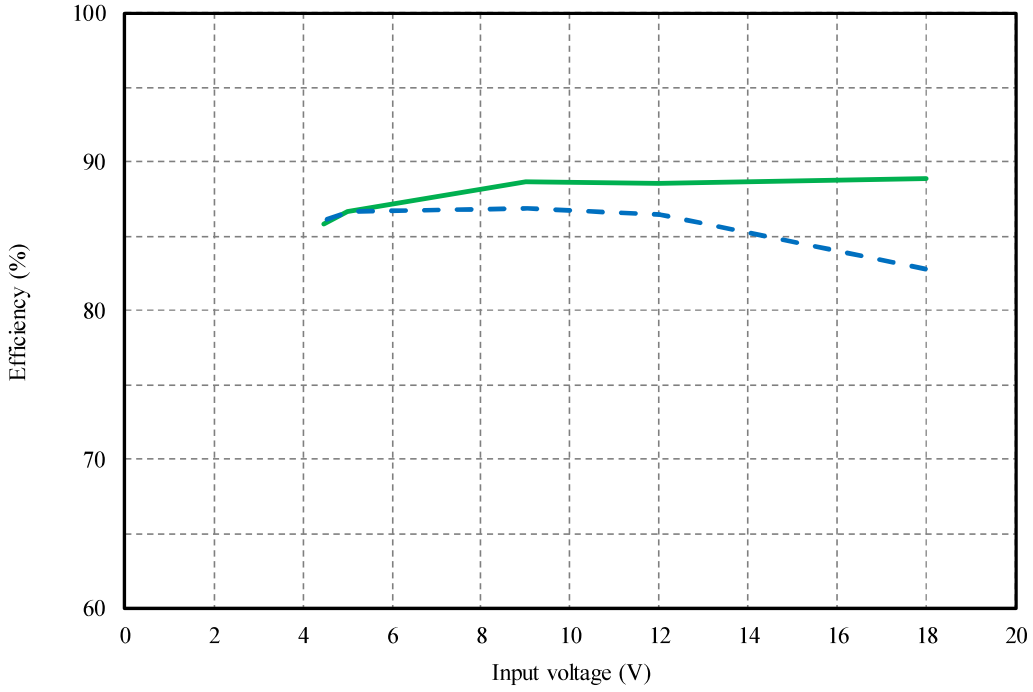
±15V



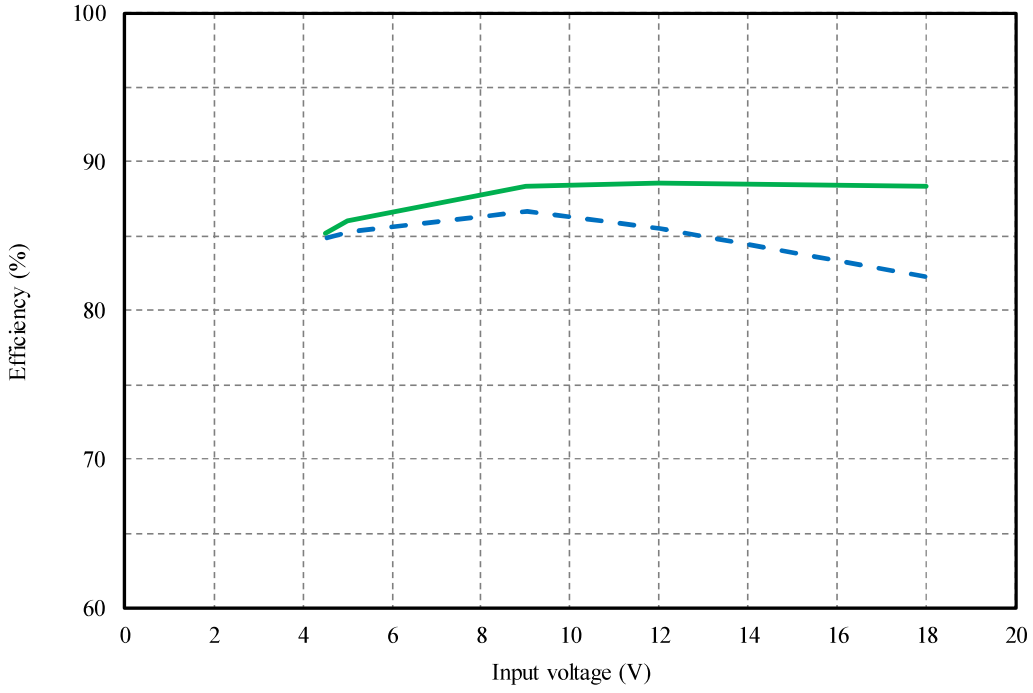
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

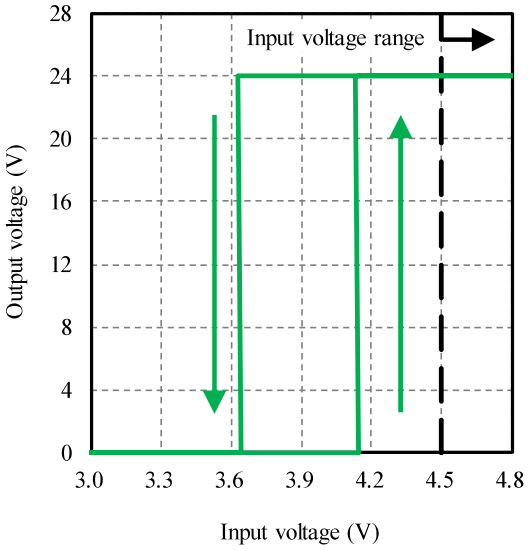
出力電圧 対 入力電圧
Output voltage vs. Input voltage

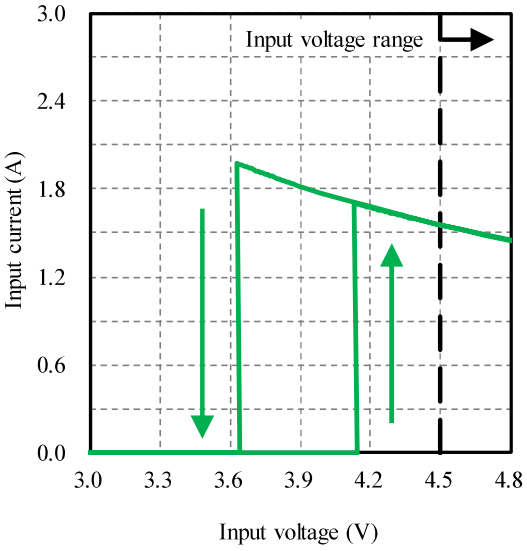
Conditions Io : 100 %
Ta : 25 °C

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

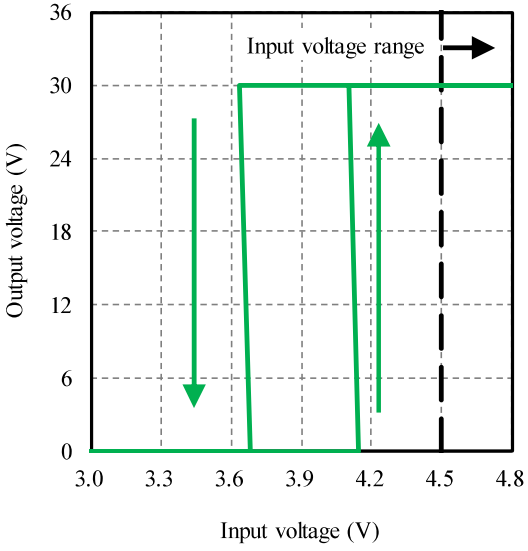
Conditions Io : 100 %
Ta : 25 °C

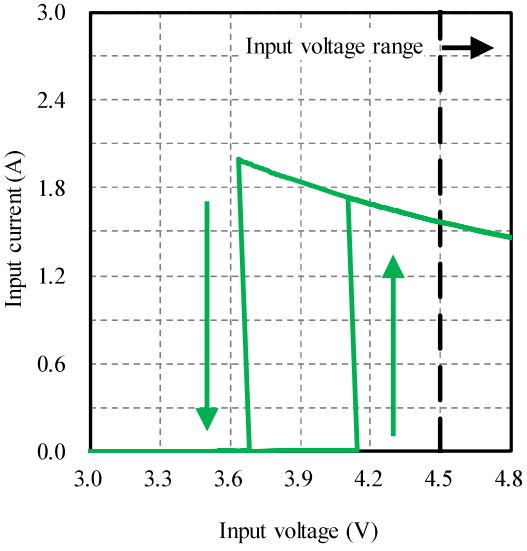
±12V





±15V

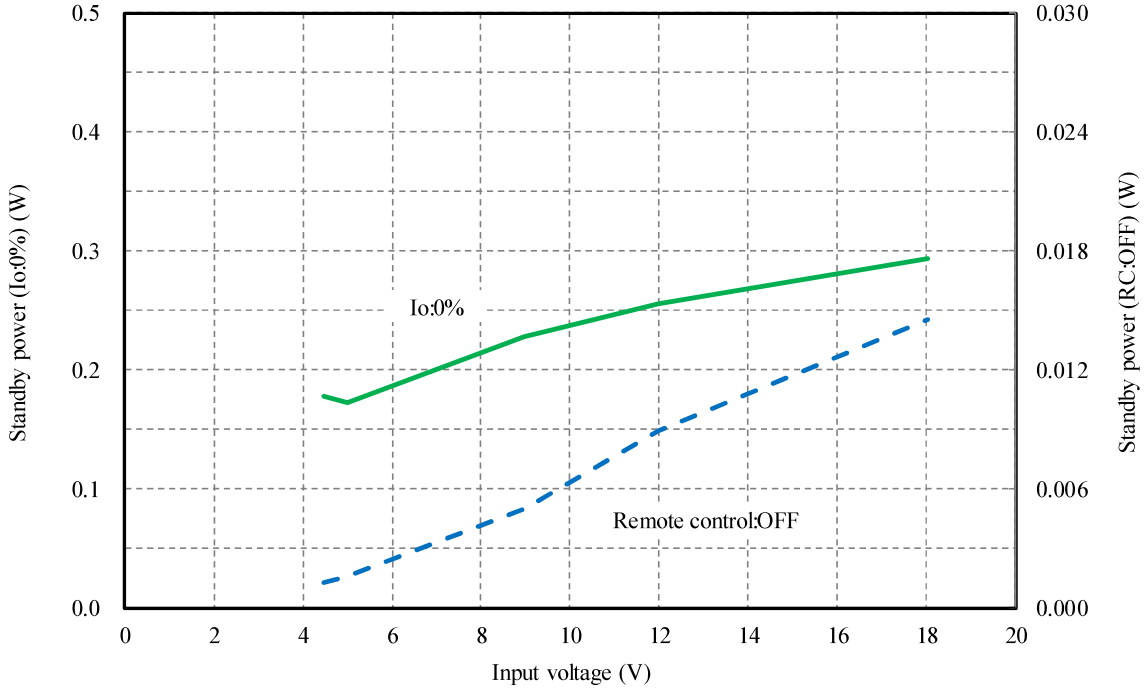




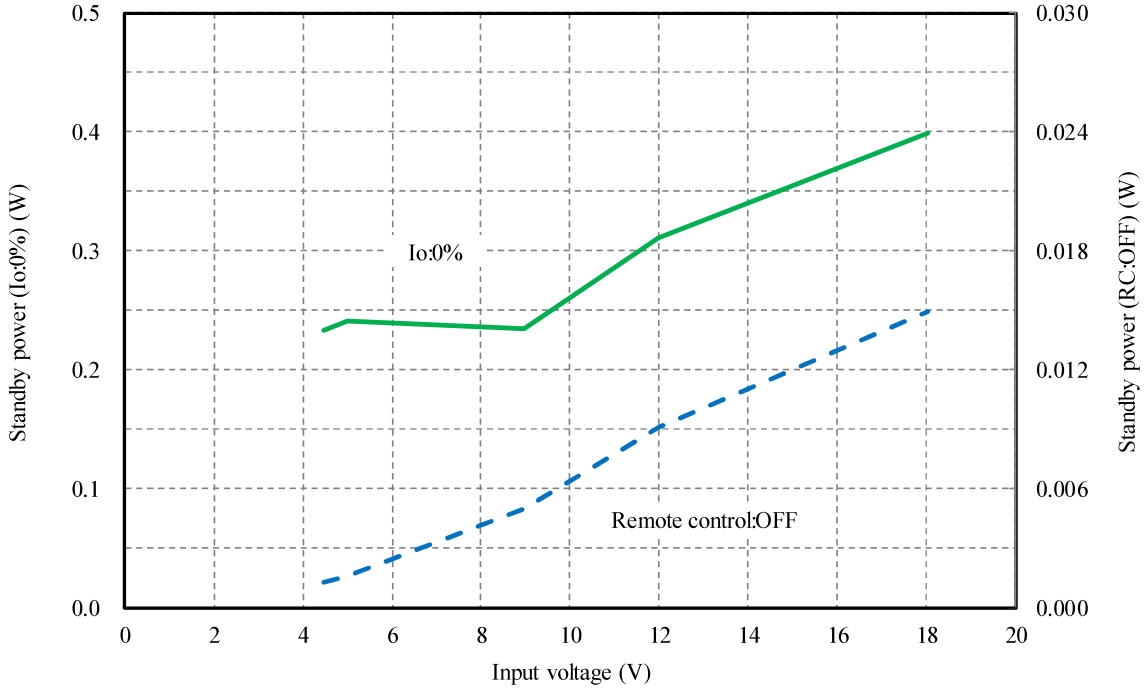
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



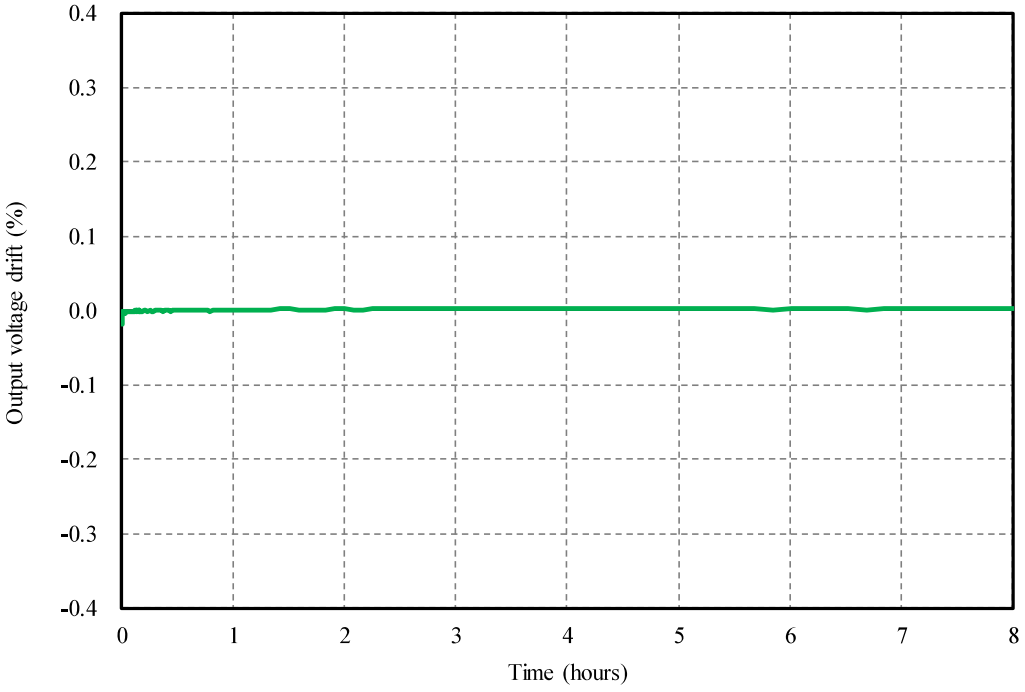
±15V



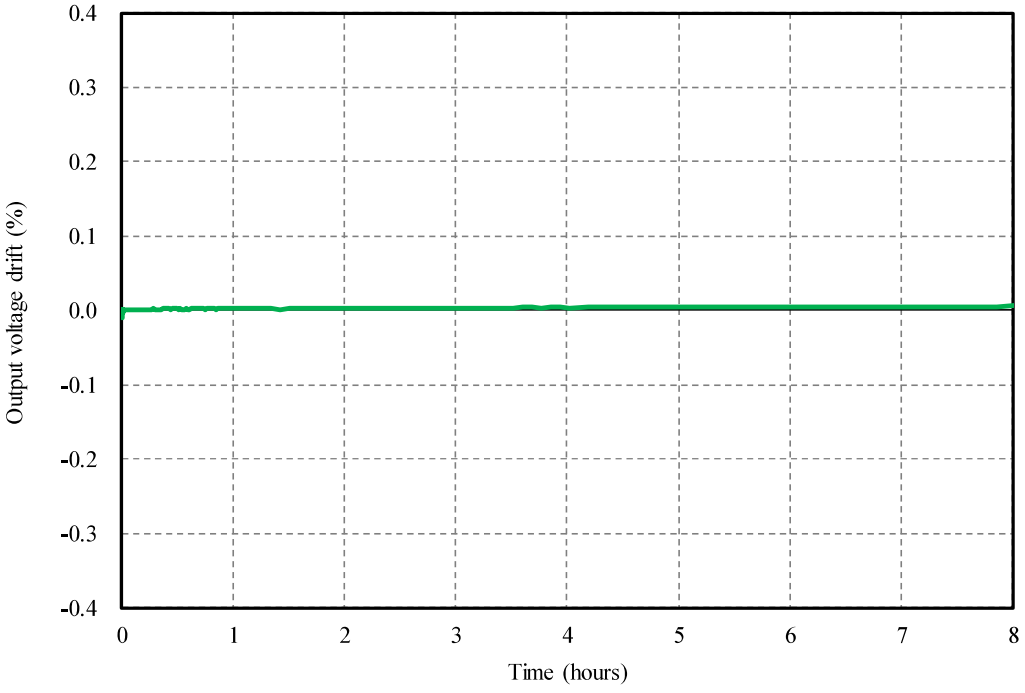
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

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

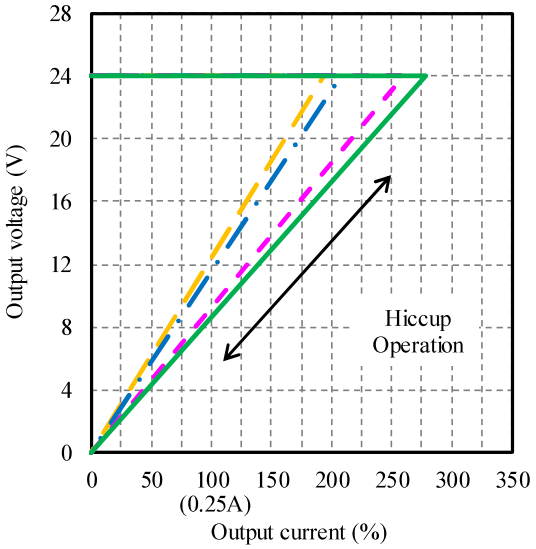
入力電圧依存性
Input voltage dependence

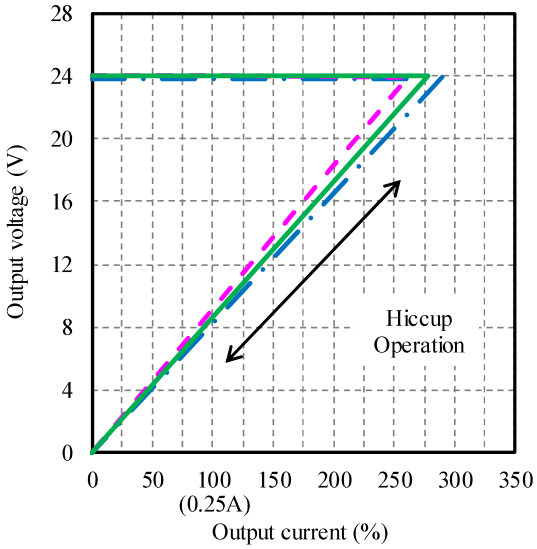
Conditions Vin : 4.5 VDC
: 5 VDC
: 12 VDC
: 18 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

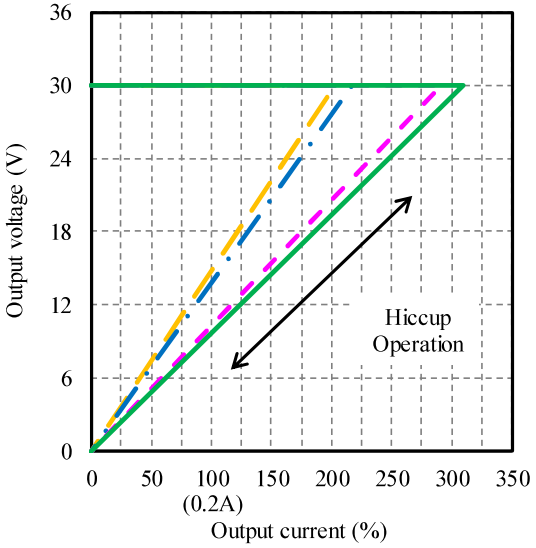
Conditions Vin : 12 VDC
Ta : -40 °C
: 25 °C
: 80 °C

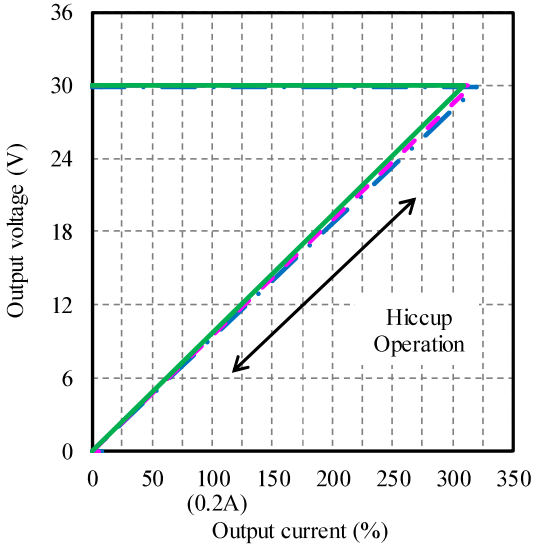
±12V





±15V

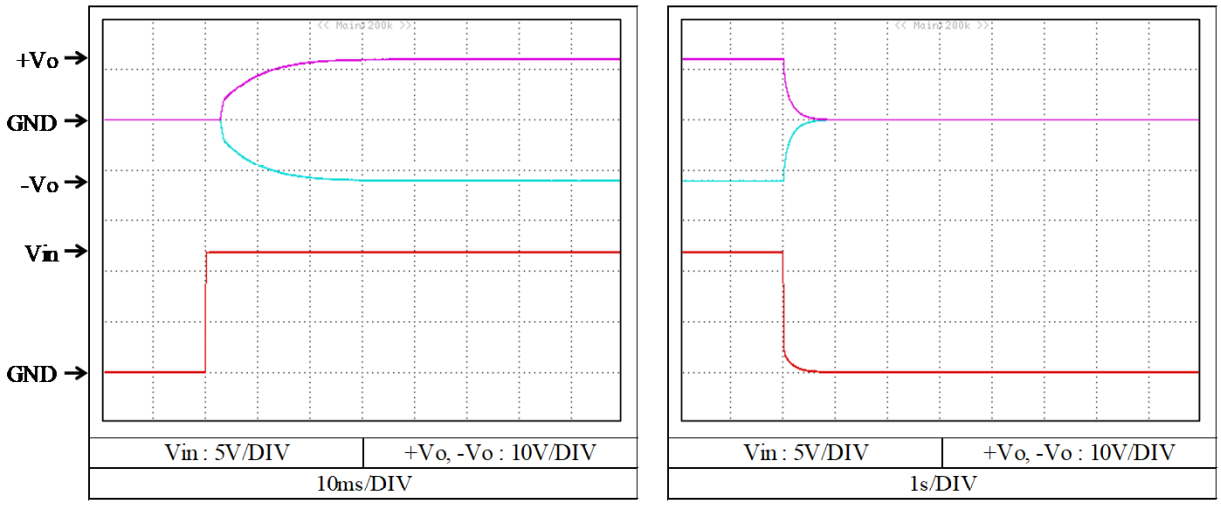




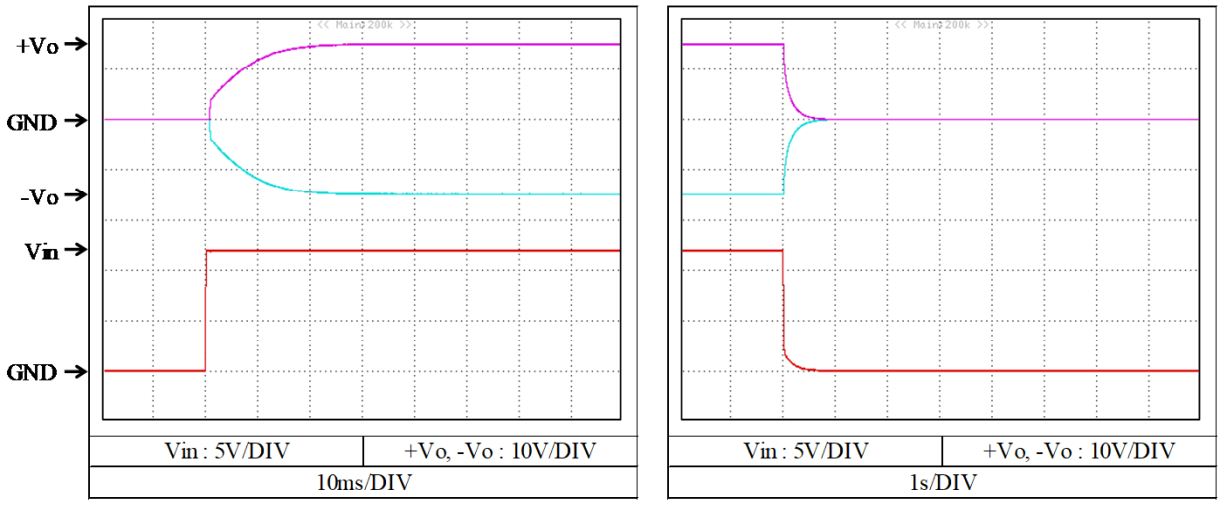
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V



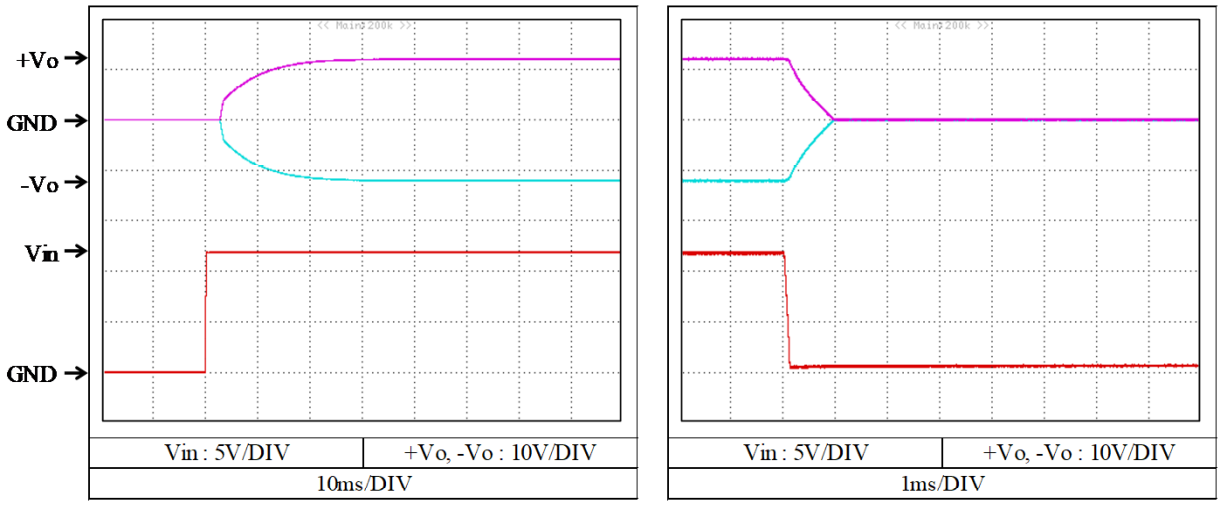
+15V



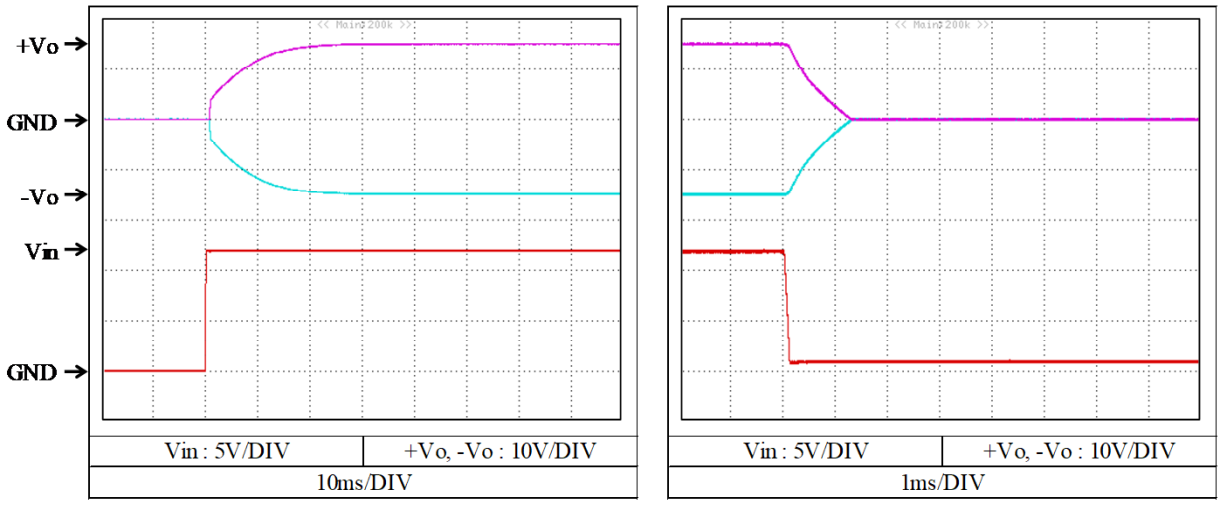
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V



+15V

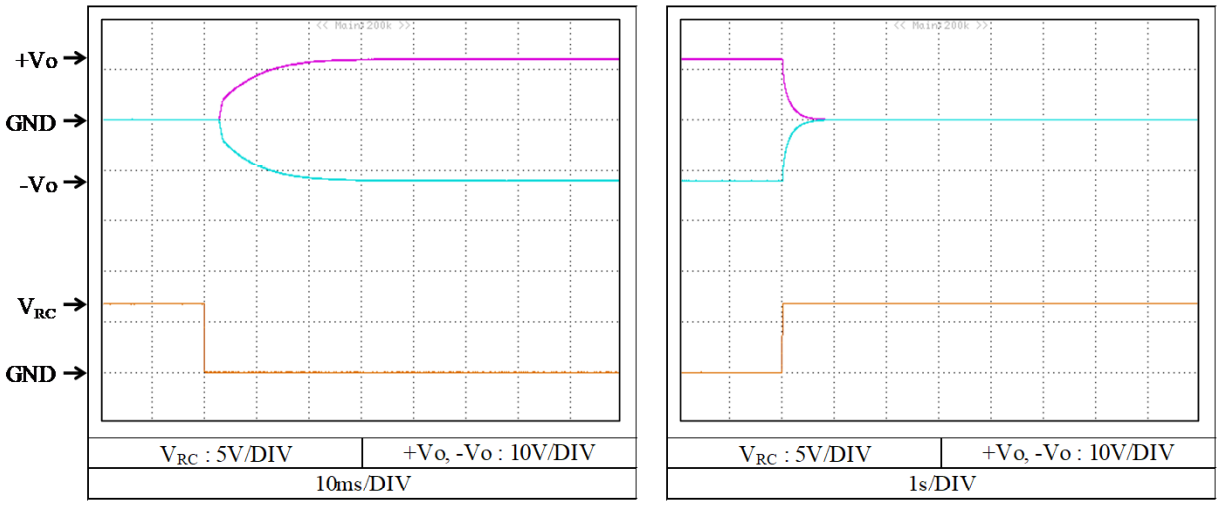


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

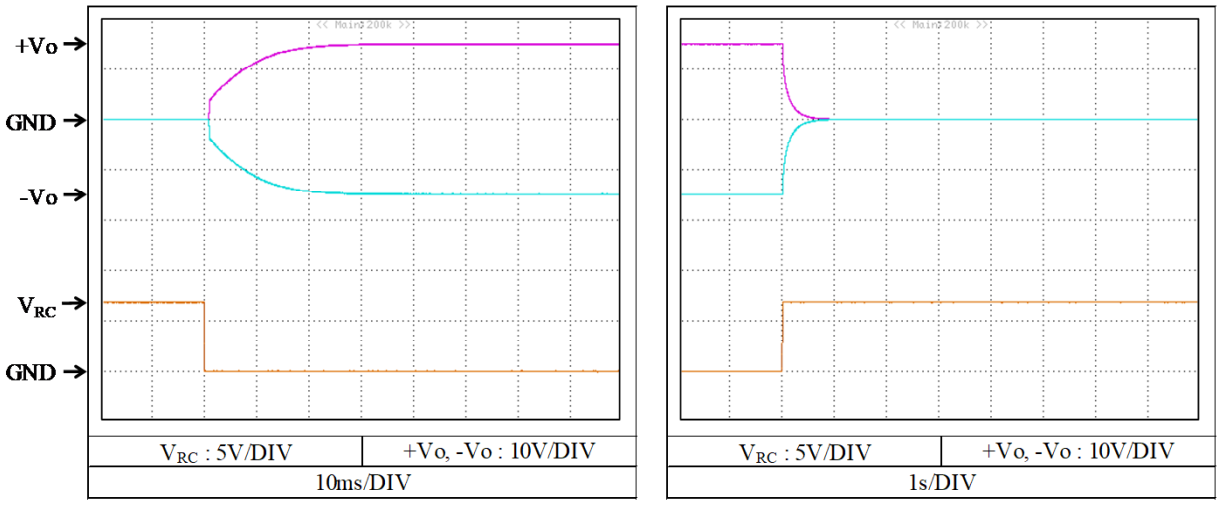
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

±12V



+15V

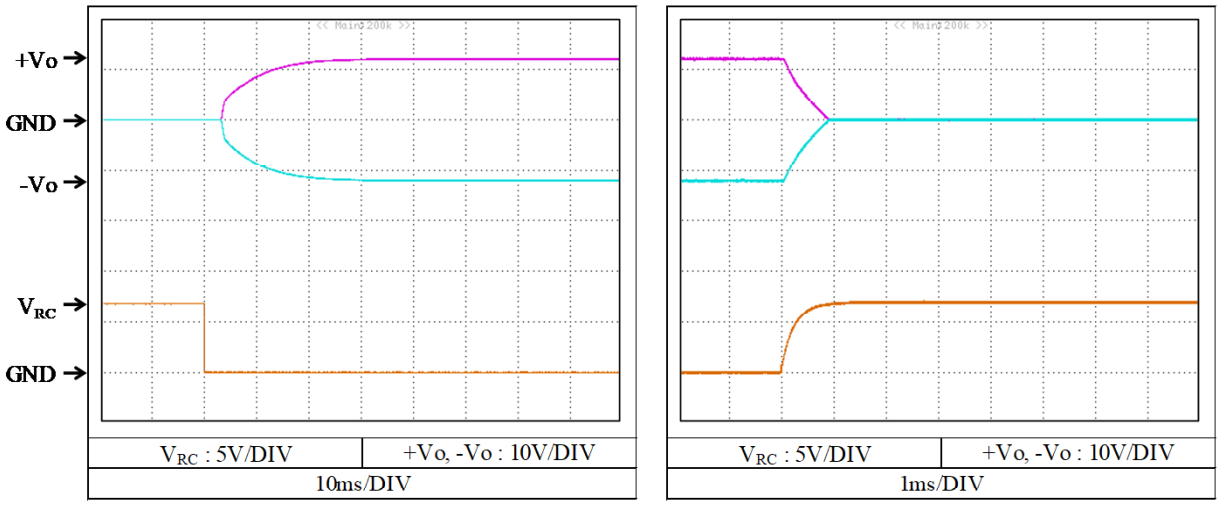


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

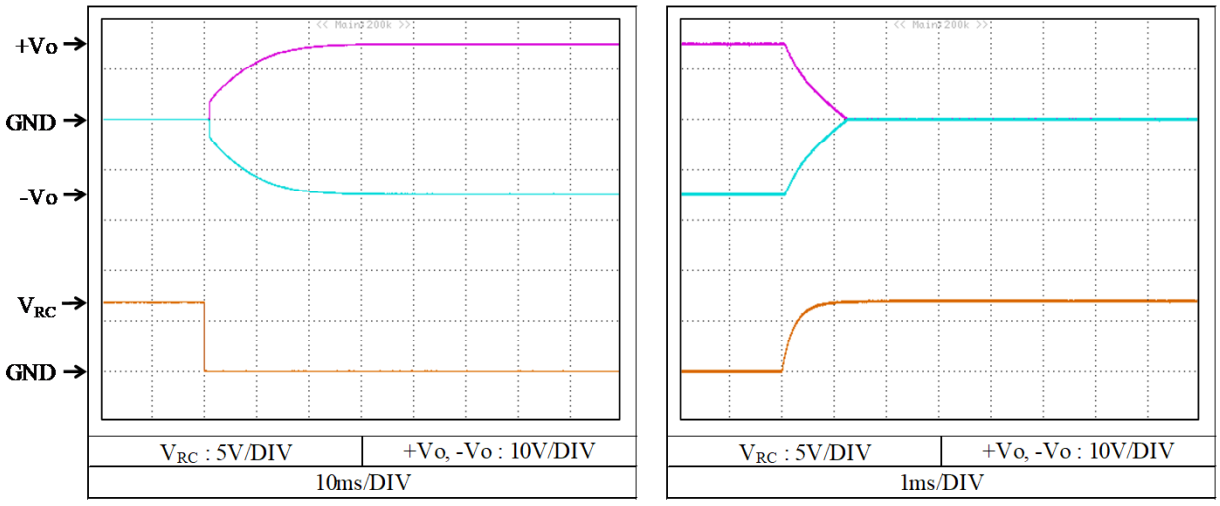
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

±12V



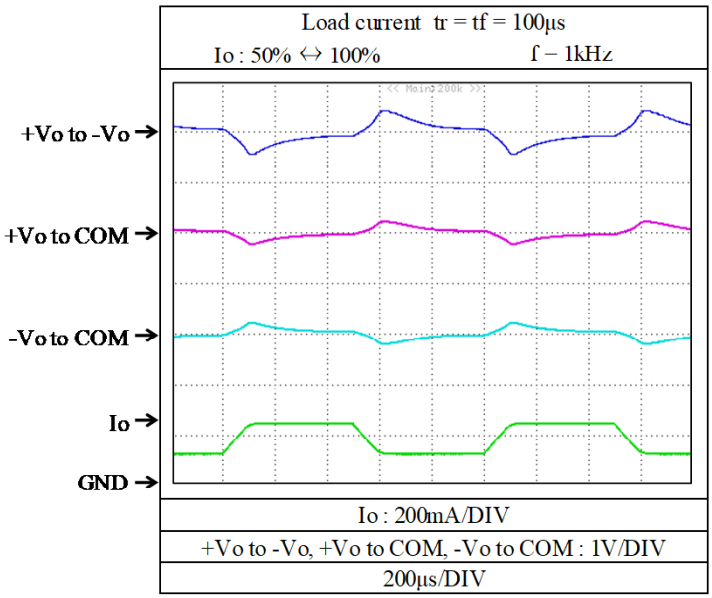
+15V



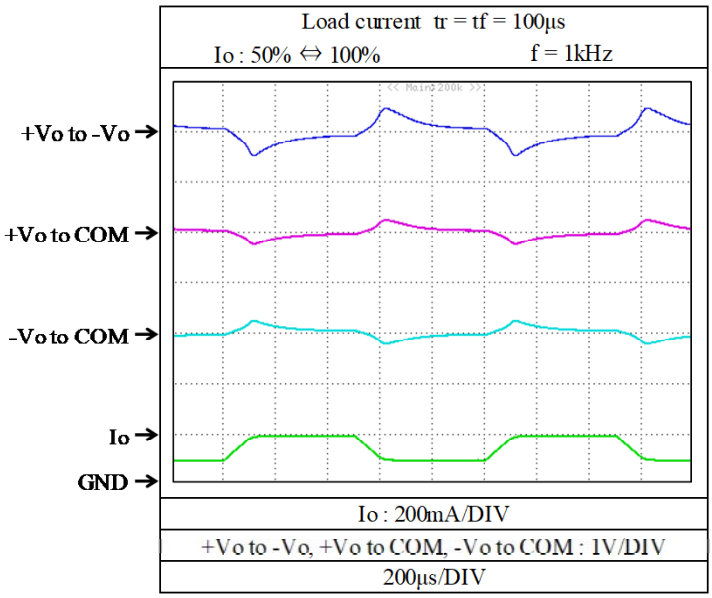
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 12 VDC
Ta : 25 °C

±12V



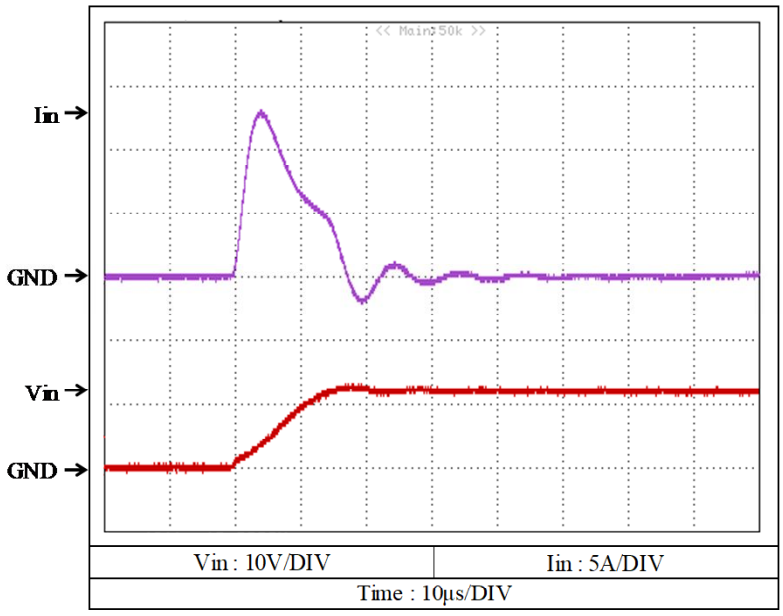
+15V



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

CCG10-12-05S

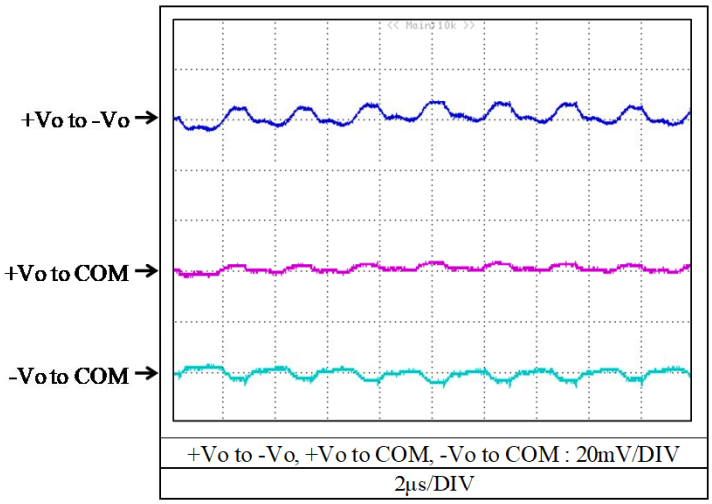


CCG6-12-xxDの入力サージ電流特性は CCG10-12-05S と同等です。
CCG6-12-xxD have the same Inrush current characteristics as CCG10-12-05S data.

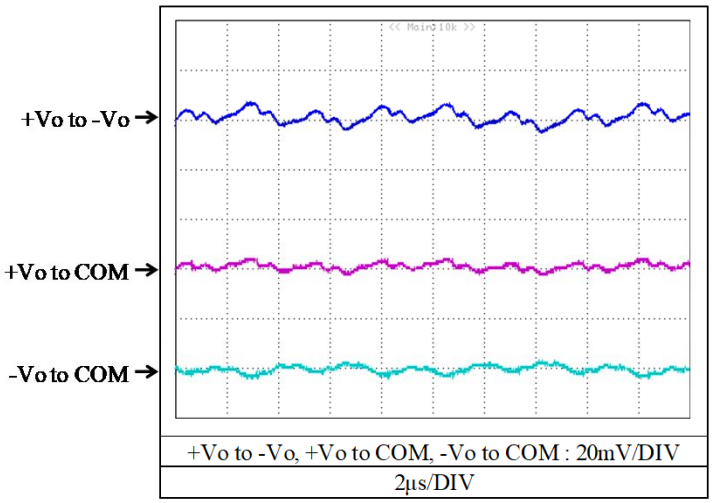
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

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

±12V



+15V

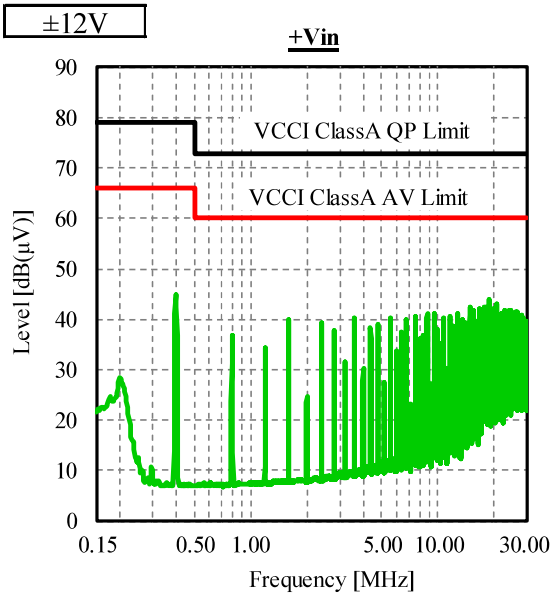


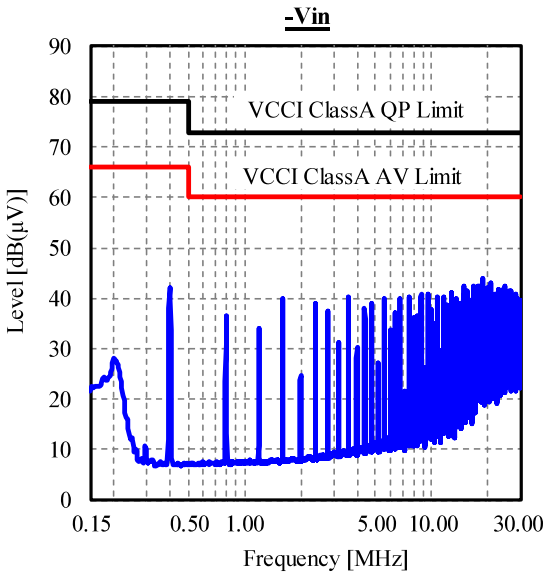
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

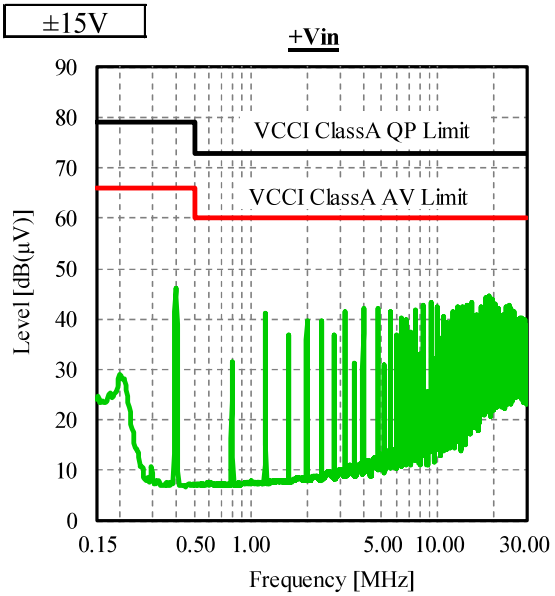
Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 ℃

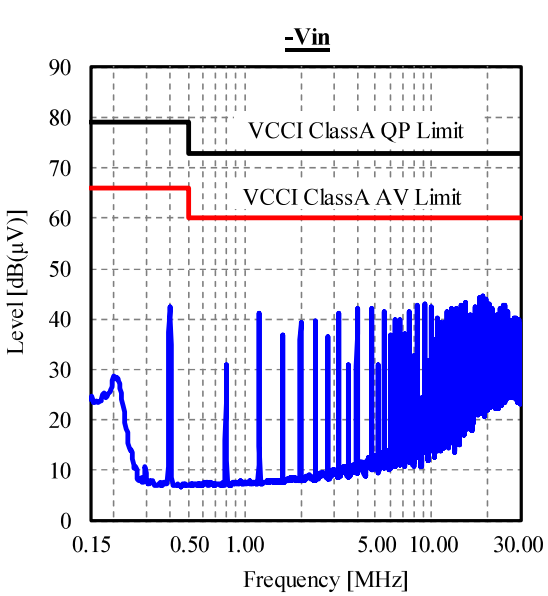
±12V





±15V





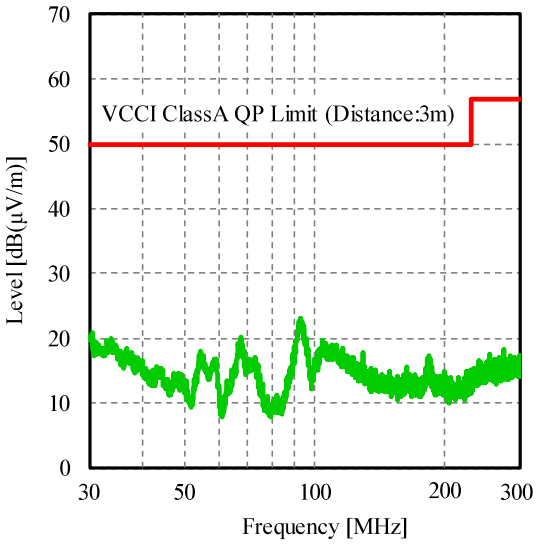
表示はQP値
Indication is QP values.

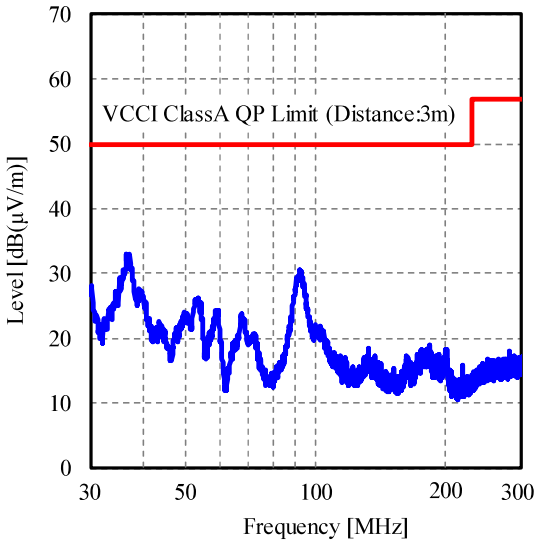
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

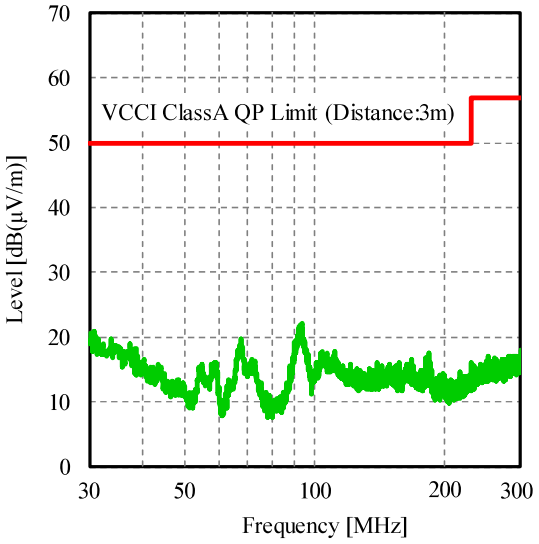
Conditions Vin : 12 VDC
Io : 100 %
Ta : 25 ℃

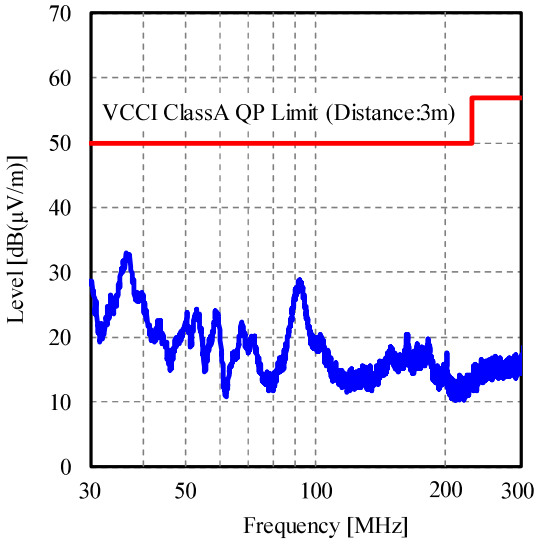
±12V





±15V





表示はピーク値
Indication is peak values.