CCG6-24-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

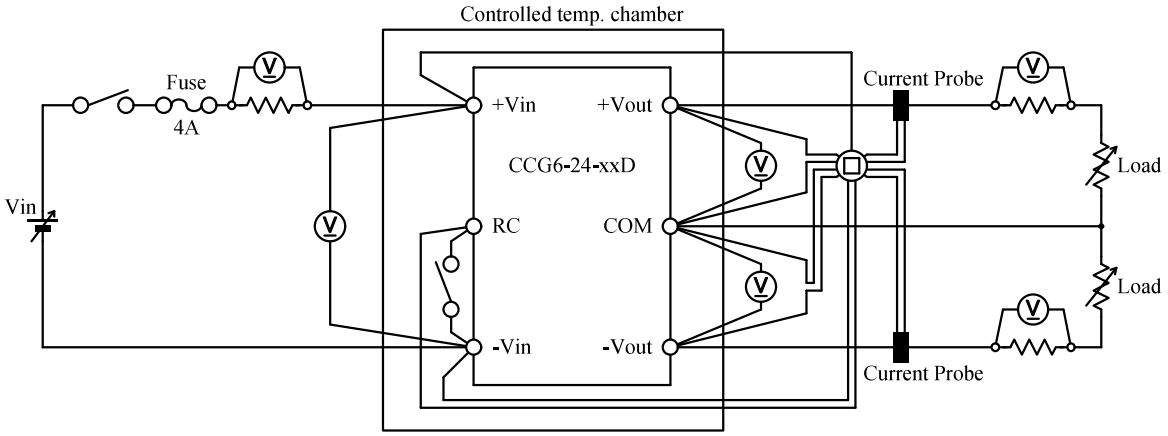
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

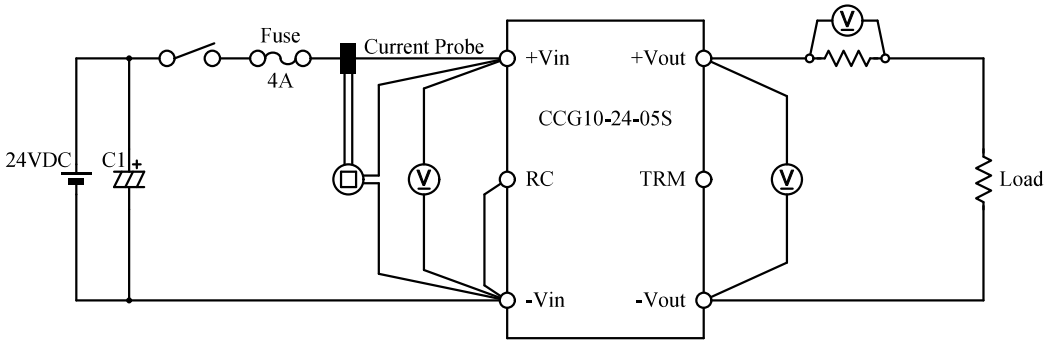
1-1. 測定回路 Measurement Circuits

(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



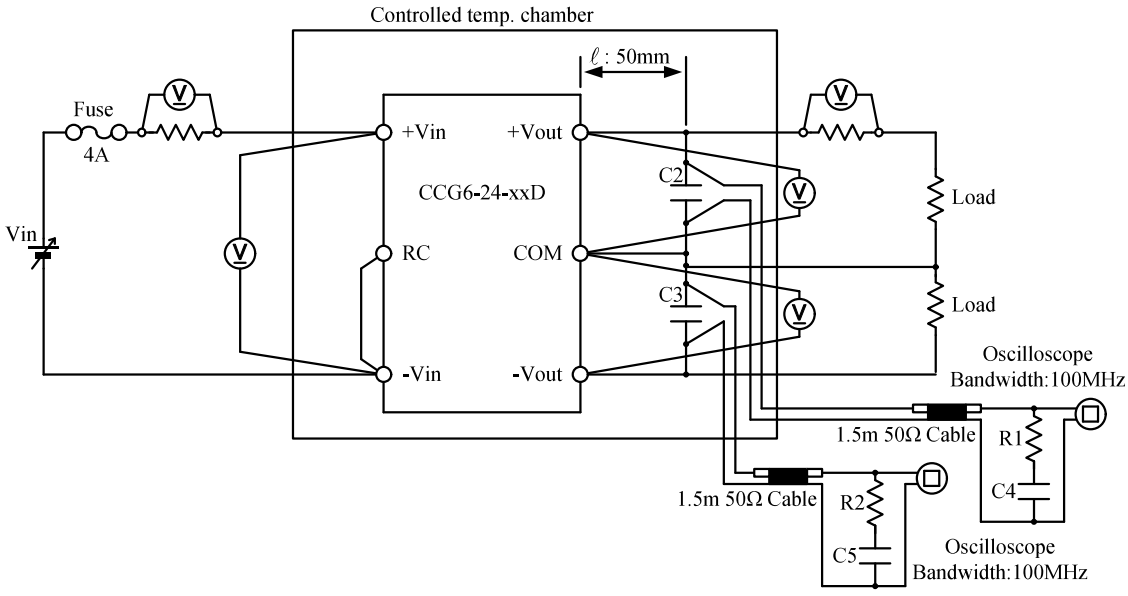
(2) 入力サージ電流（突入電流）波形 Inrush current waveform



CCG6-24-xxDの入力サージ電流特性はCCG10-24-05Sと同等です。

CCG6-24-xxD have the same Inrush current characteristics as CCG10-24-05S data.

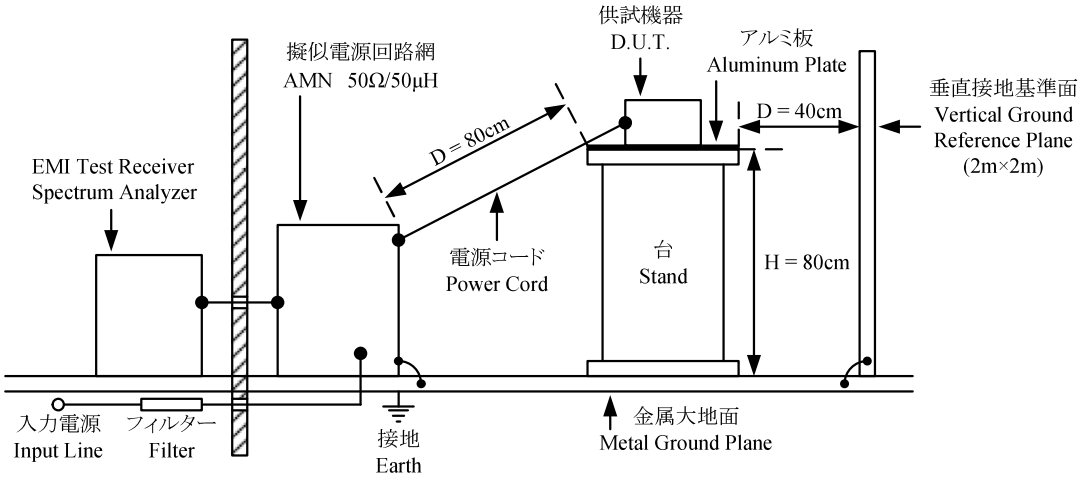
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



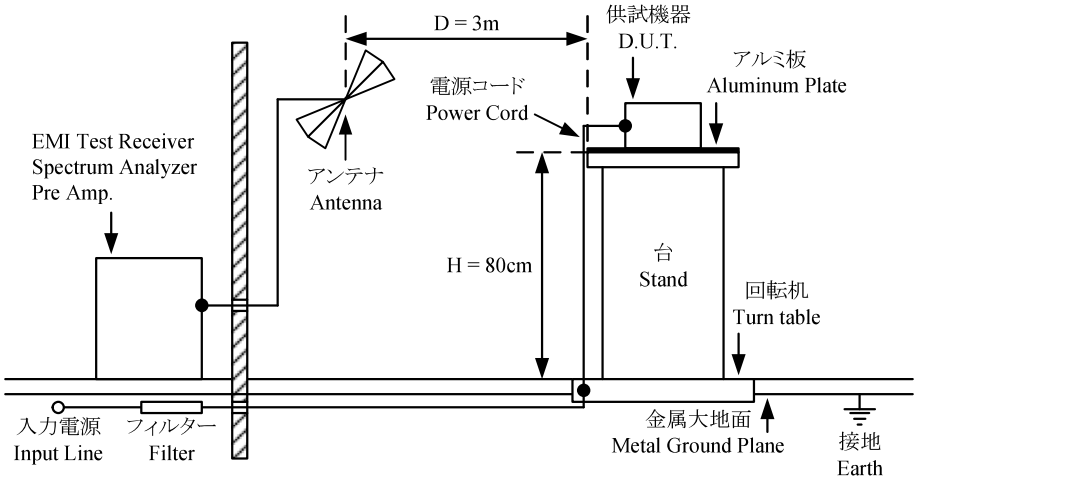
C1	: 4000uF	Electrolytic Capacitor
C2,C3	: 1uF	Ceramic Capacitor
C4,C5	: 4700pF	Ceramic Capacitor
R1,R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

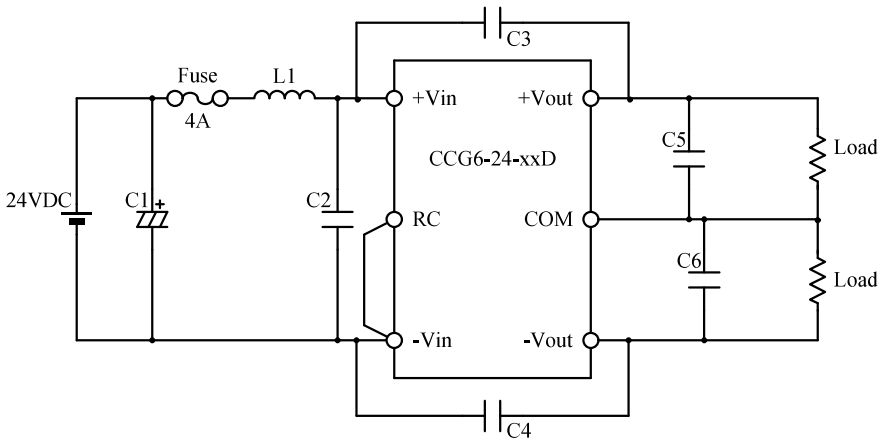
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	:	50V	100uF	Electrolytic Capacitor	(ELXZ500ELL101MH12D,Nippon Chemi-con)
C2	:	50V	10uF	Ceramic Capacitor	(C3216X7R1H106KT,TDK)
C3	:	2kV	1000pF	Ceramic Capacitor	(C3225X7S3D102K200AA,TDK)
C4	:	2kV	1000pF	Ceramic Capacitor	(C3225X7S3D102K200AA,TDK)
C5	:	25V	10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
C6	:	25V	10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
L1	:	2A	10uH	Normal Mode Choke Coil	(LQH5BPN100MT0L,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	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	11.9743V	11.9745V	11.9739V	11.9745V	0.6mV	0.005%
50%(0.125A)	11.9779V	11.9788V	11.9768V	11.9758V	3.0mV	0.025%
100%(0.25A)	11.9762V	11.9784V	11.9795V	11.9783V	3.3mV	0.027%
Load	3.6mV	4.3mV	5.6mV	3.8mV		
regulation	0.030%	0.036%	0.047%	0.032%		

・−Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	-11.9860V	-11.9867V	-11.9875V	-11.9864V	1.5mV	0.013%
50%(0.125A)	-11.9810V	-11.9809V	-11.9831V	-11.9841V	3.2mV	0.027%
100%(0.25A)	-11.9833V	-11.9817V	-11.9808V	-11.9822V	2.5mV	0.021%
Load	5.0mV	5.8mV	6.7mV	4.2mV		
regulation	0.042%	0.048%	0.056%	0.035%		

・+Vo to −Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	23.9602V	23.9612V	23.9614V	23.9609V	1.2mV	0.005%
50%(0.125A)	23.9590V	23.9597V	23.9599V	23.9599V	0.9mV	0.004%
100%(0.25A)	23.9595V	23.9601V	23.9603V	23.9605V	1.0mV	0.004%
Load	1.2mV	1.5mV	1.5mV	1.0mV		
regulation	0.005%	0.006%	0.006%	0.004%		

2. Temperature drift　　Conditions　Vin :　24 VDC
Io :　100 %

Ta	-40°C	25°C	80°C	Temperature stability	
+Vo	11.9195V	11.9795V	11.9806V	61.1mV	0.509%
-Vo	-11.9188V	-11.9808V	-11.9820V	63.2mV	0.527%
+Vo to -Vo	23.8383V	23.9603V	23.9627V	124.4mV	0.518%

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

・+Vo (-Io : 100%)

+Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.05A)	12.0770V	12.0683V	12.0683V	12.0624V
100%(0.25A)	11.9775V	11.9795V	11.9795V	11.9794V
Load	99.5mV	88.8mV	88.8mV	83.0mV
regulation	0.829%	0.740%	0.740%	0.692%

・−Vo (+Io : 100%)

-Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.05A)	-12.0849V	-12.0774V	-12.0774V	-12.0800V
100%(0.25A)	-11.9839V	-11.9821V	-11.9821V	-11.9824V
Load	101.0mV	95.3mV	95.3mV	97.6mV
regulation	0.842%	0.794%	0.794%	0.813%

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

・+Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	15.0060V	15.0048V	14.9979V	14.9962V	9.8mV	0.065%
50%(0.1A)	15.0139V	15.0141V	15.0117V	15.0113V	2.8mV	0.019%
100%(0.2A)	15.0136V	15.0142V	15.0142V	15.0127V	1.5mV	0.010%
Load regulation	7.9mV	9.4mV	16.3mV	16.5mV		
	0.053%	0.063%	0.109%	0.110%		

・−Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	-15.0097V	-15.0114V	-15.0178V	-15.0198V	10.1mV	0.067%
50%(0.1A)	-15.0027V	-15.0029V	-15.0045V	-15.0051V	2.4mV	0.016%
100%(0.2A)	-15.0041V	-15.0034V	-15.0029V	-15.0041V	1.2mV	0.008%
Load regulation	7.0mV	8.5mV	14.9mV	15.7mV		
	0.047%	0.057%	0.099%	0.105%		

・+Vo to −Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	30.0157V	30.0162V	30.0157V	30.0160V	0.5mV	0.002%
50%(0.1A)	30.0166V	30.0170V	30.0162V	30.0164V	0.8mV	0.003%
100%(0.2A)	30.0176V	30.0176V	30.0171V	30.0168V	0.8mV	0.003%
Load regulation	1.9mV	1.4mV	1.4mV	0.8mV		
	0.006%	0.005%	0.005%	0.003%		

2. Temperature drift Conditions Vin : 24 VDC
Io : 100 %

Ta	-40°C	25°C	80°C	Temperature stability	
+Vo	14.9429V	15.0142V	14.9919V	71.3mV	0.475%
-Vo	-14.9285V	-15.0029V	-14.9833V	74.4mV	0.496%
+Vo to -Vo	29.8714V	30.0171V	29.9752V	145.7mV	0.486%

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

・+Vo (-Io : 100%)

+Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.04A)	15.1234V	15.1124V	15.1124V	15.1067V
100%(0.2A)	15.0143V	15.0147V	15.0147V	15.0136V
Load regulation	109.1mV	97.7mV	97.7mV	93.1mV
	0.727%	0.651%	0.651%	0.621%

・−Vo (+Io : 100%)

-Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.04A)	-15.1140V	-15.1042V	-15.1042V	-15.1051V
100%(0.2A)	-15.0043V	-15.0032V	-15.0032V	-15.0037V
Load regulation	109.7mV	101.0mV	101.0mV	101.4mV
	0.731%	0.673%	0.673%	0.676%

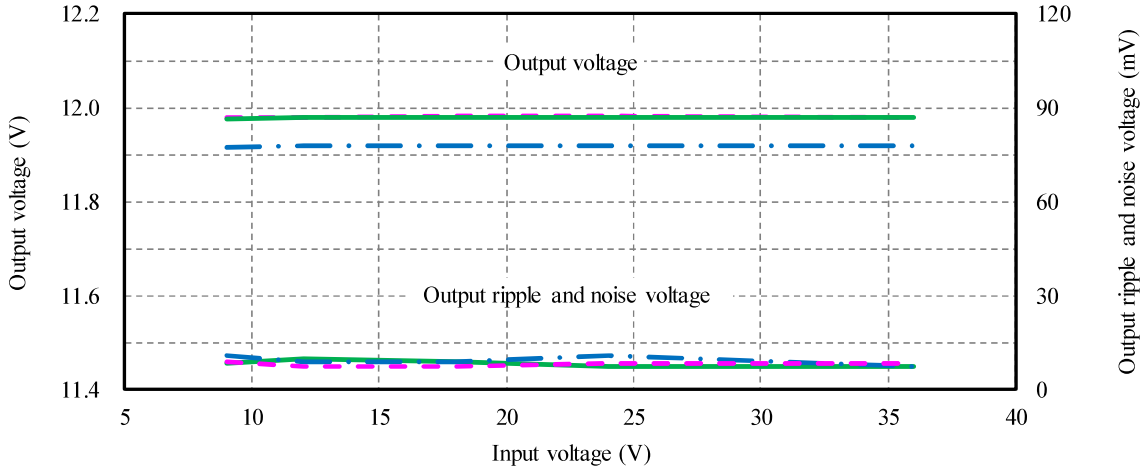
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

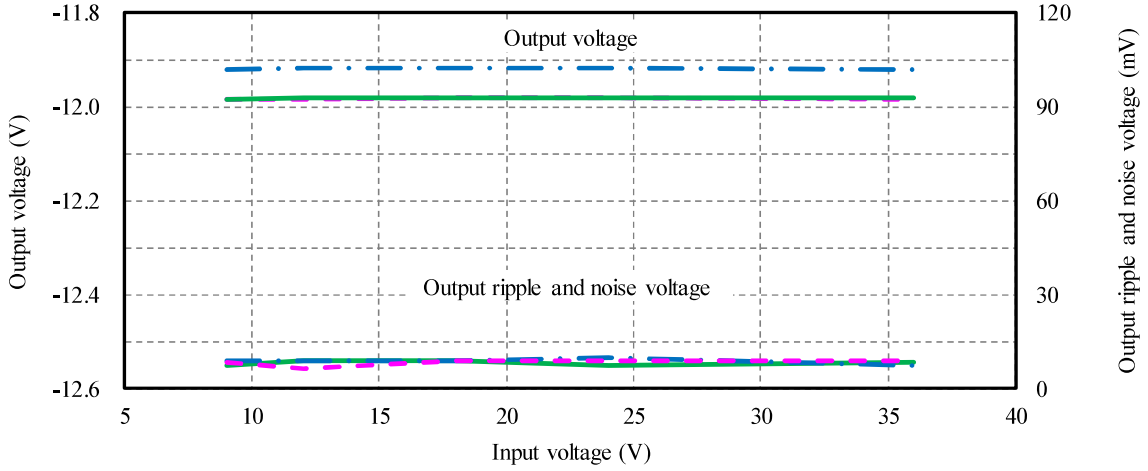
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 80 °C

±12V

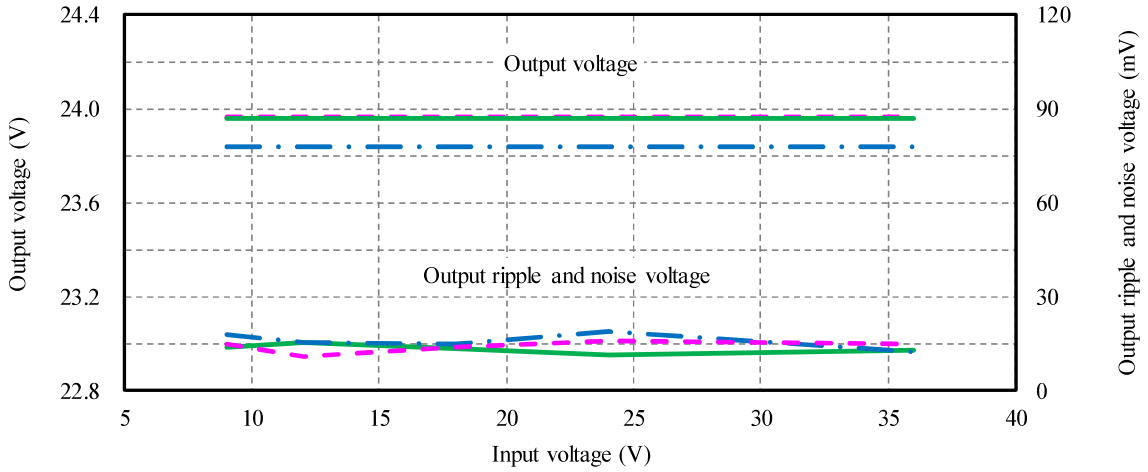
・+Vo



・−Vo



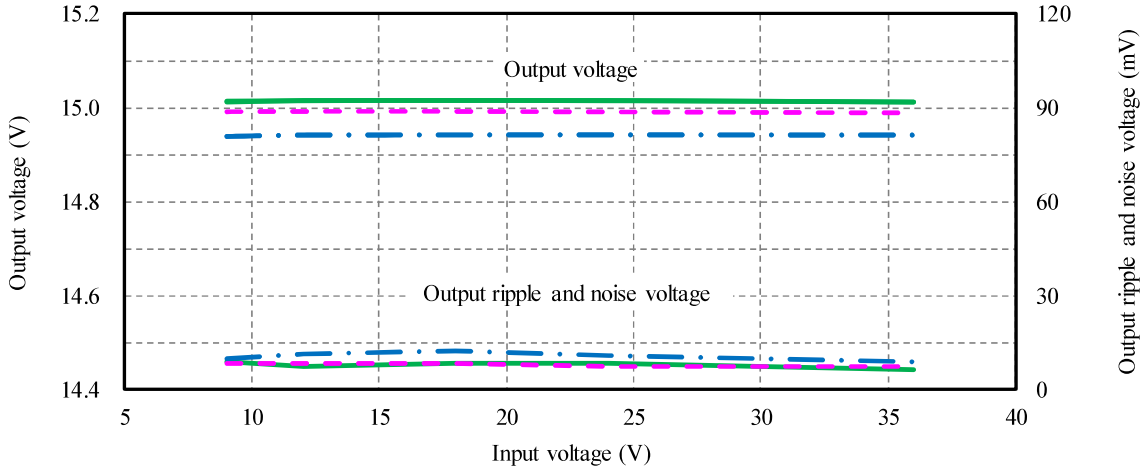
・+Vo to -Vo



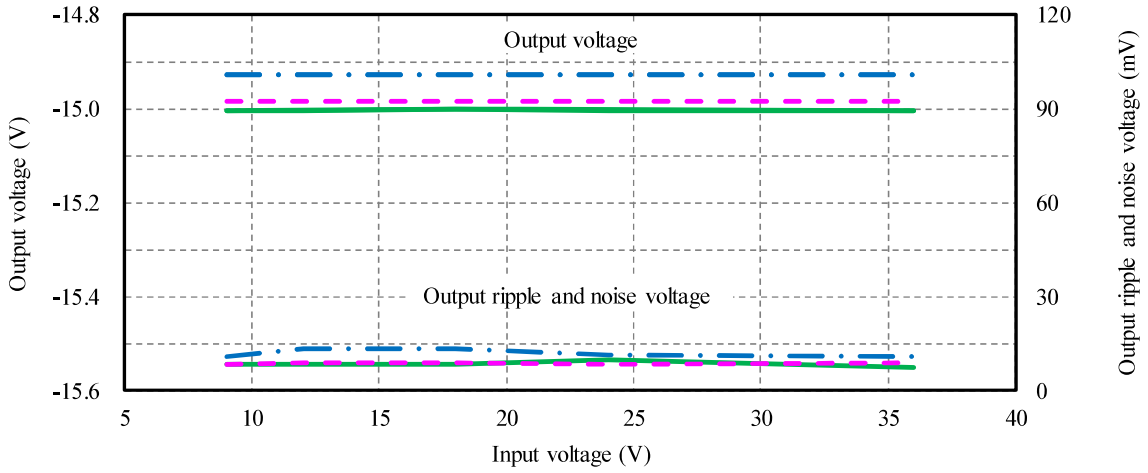
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 80 °C

±15V

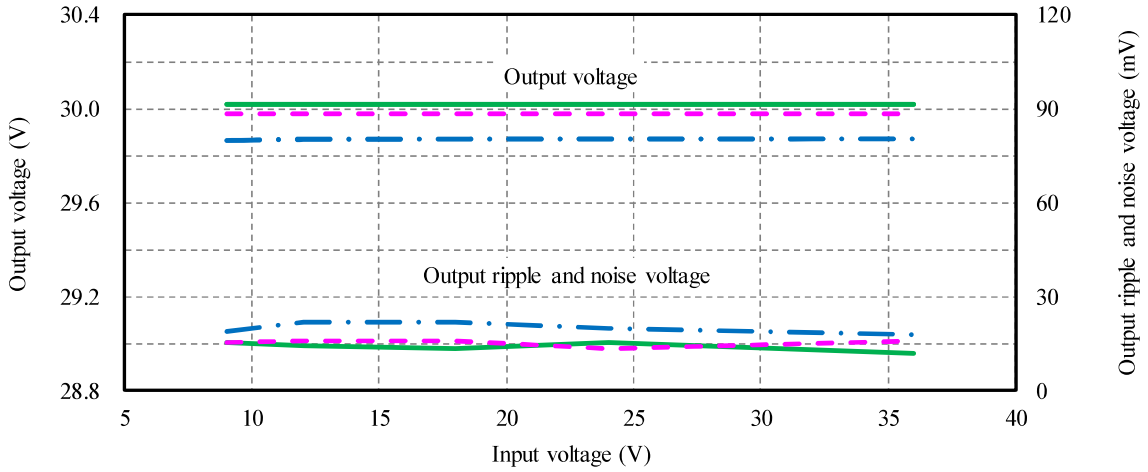
・+Vo



・−Vo



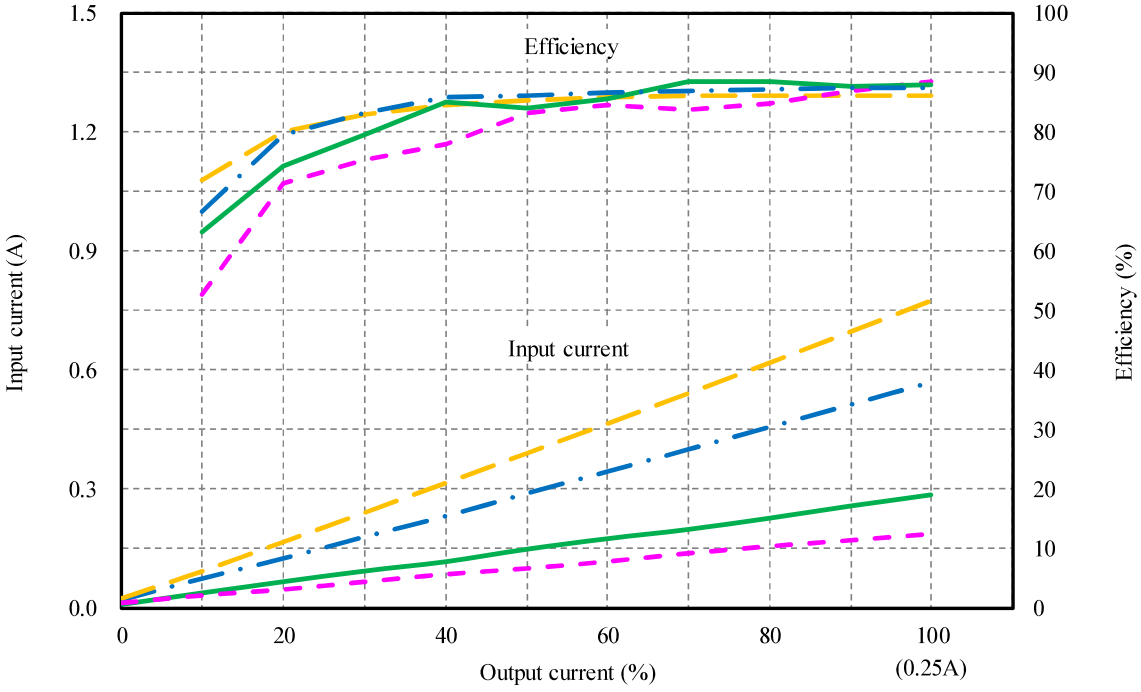
・+Vo to -Vo



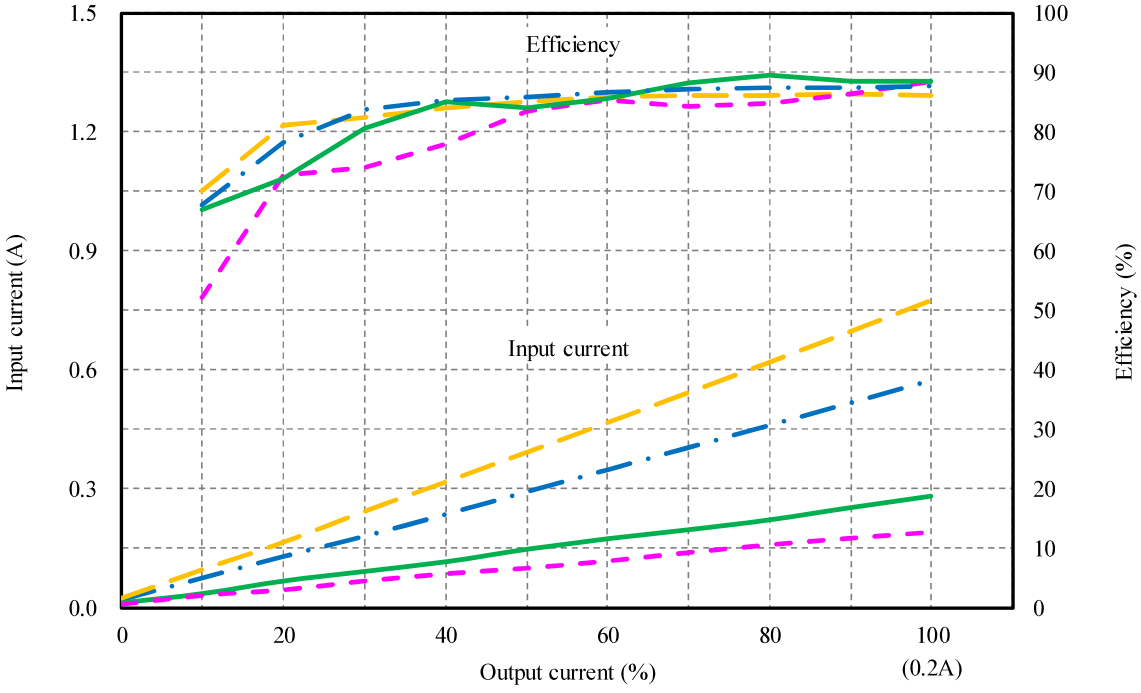
(3) 入力電流･効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

±12V



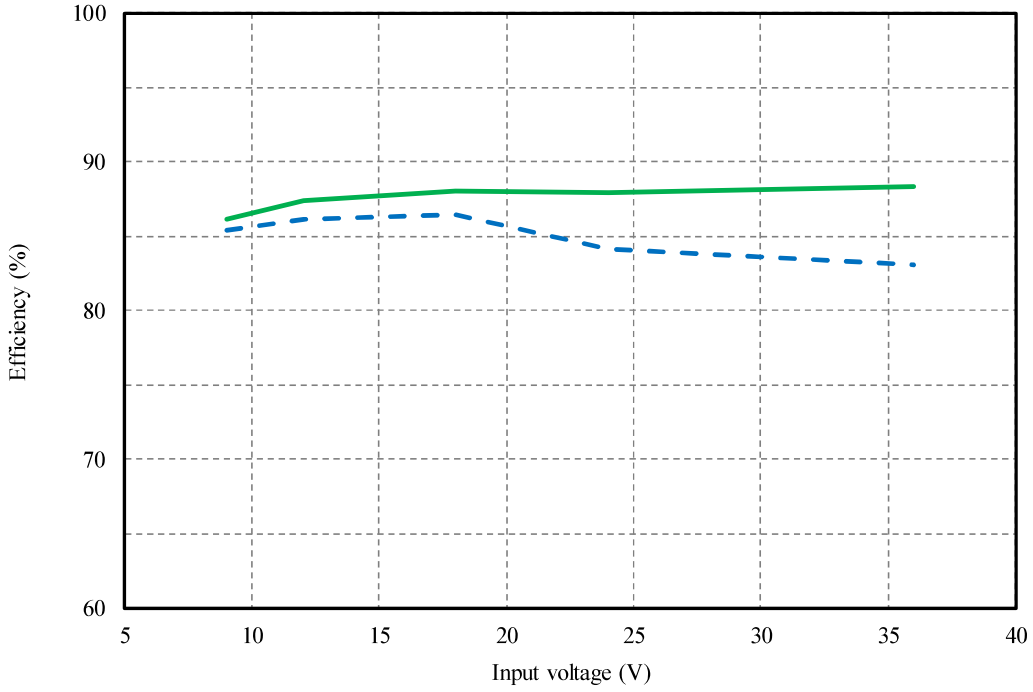
±15V



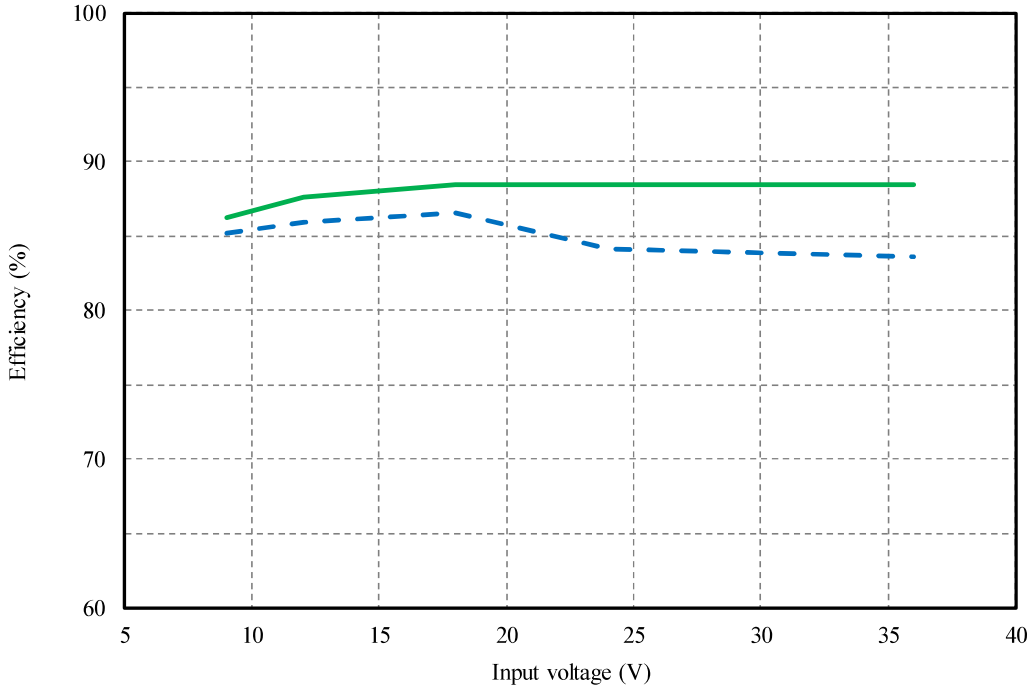
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

±12V



±15V

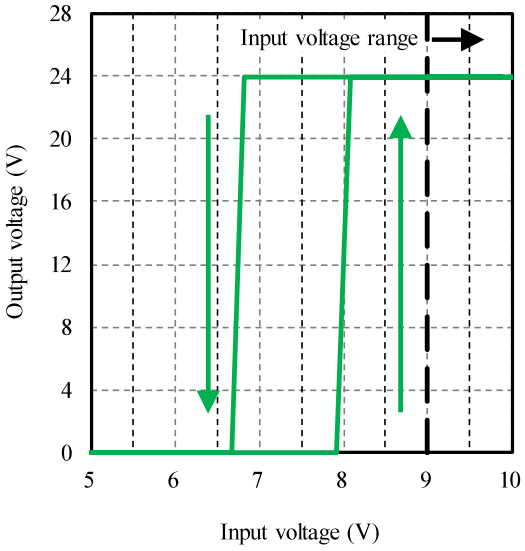


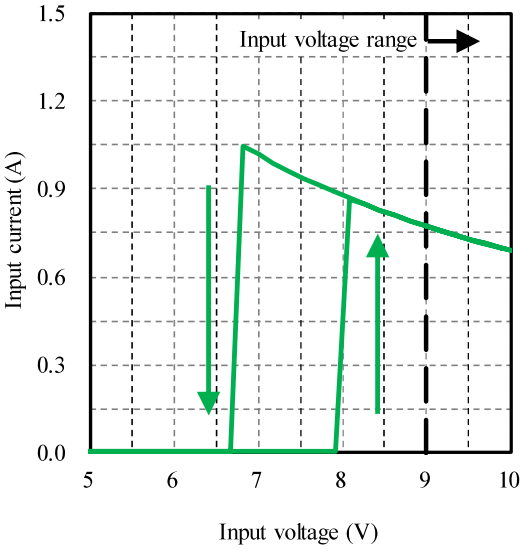
(5) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

出力電圧 対 入力電圧
Output voltage vs. Input voltage
Conditions Io : 100 %
Ta : 25 °C

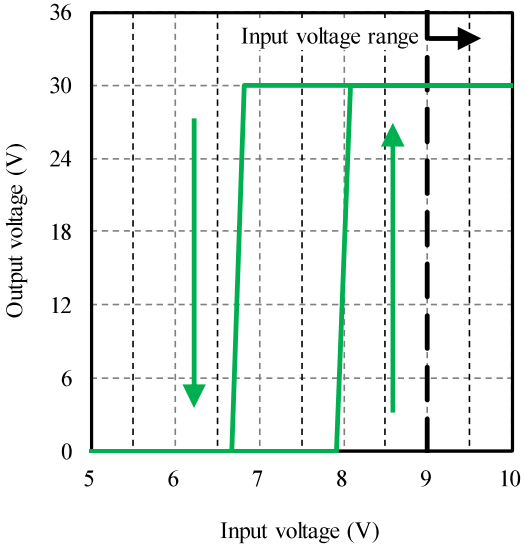
入力電流 対 入力電圧
Input current vs. Input voltage
Conditions Io : 100 %
Ta : 25 °C

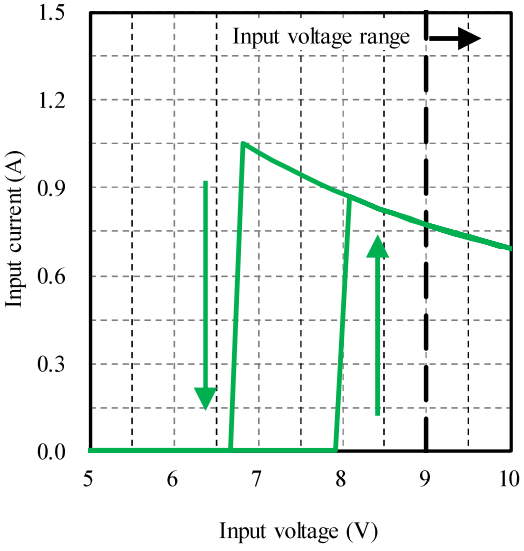
±12V





±15V

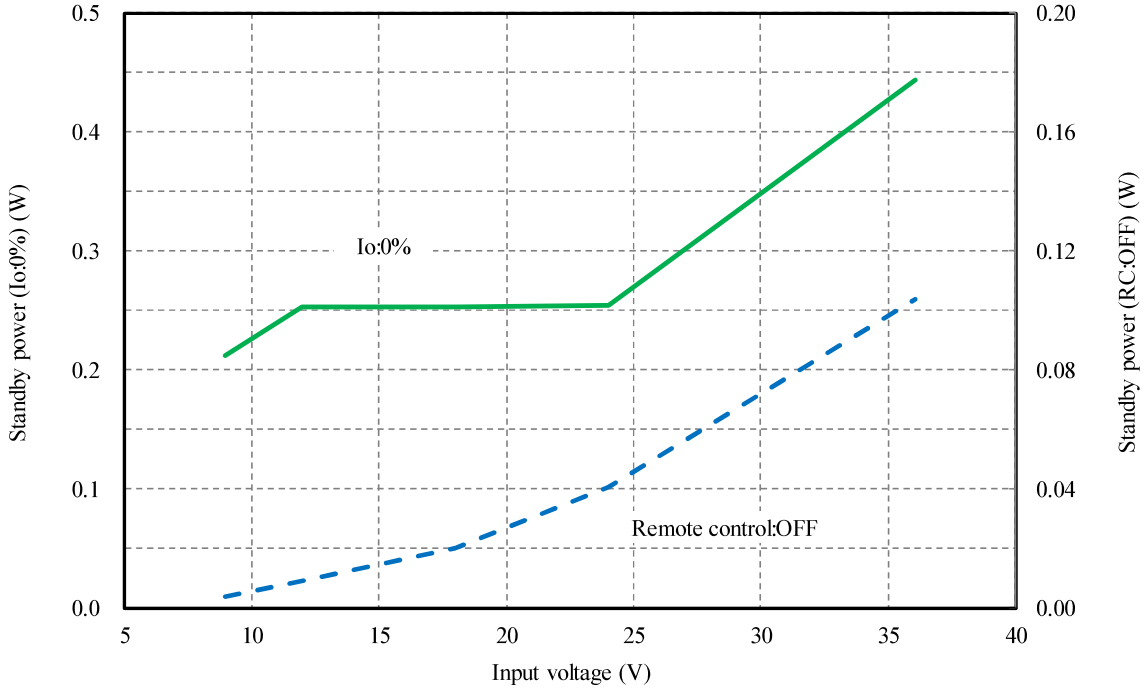




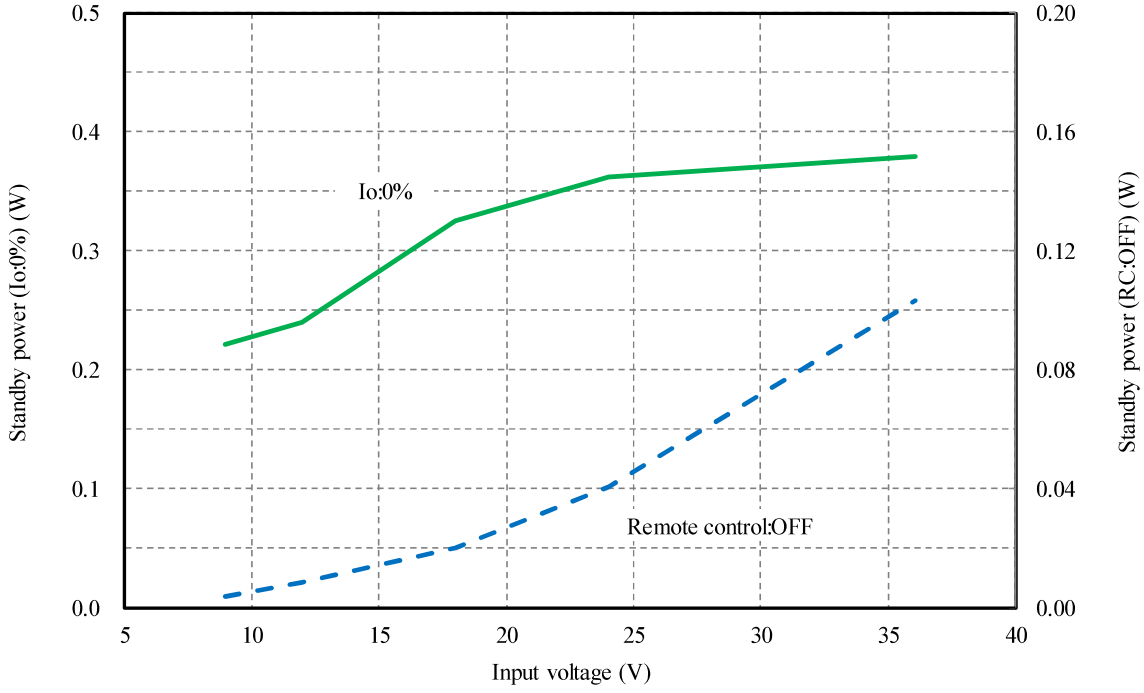
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



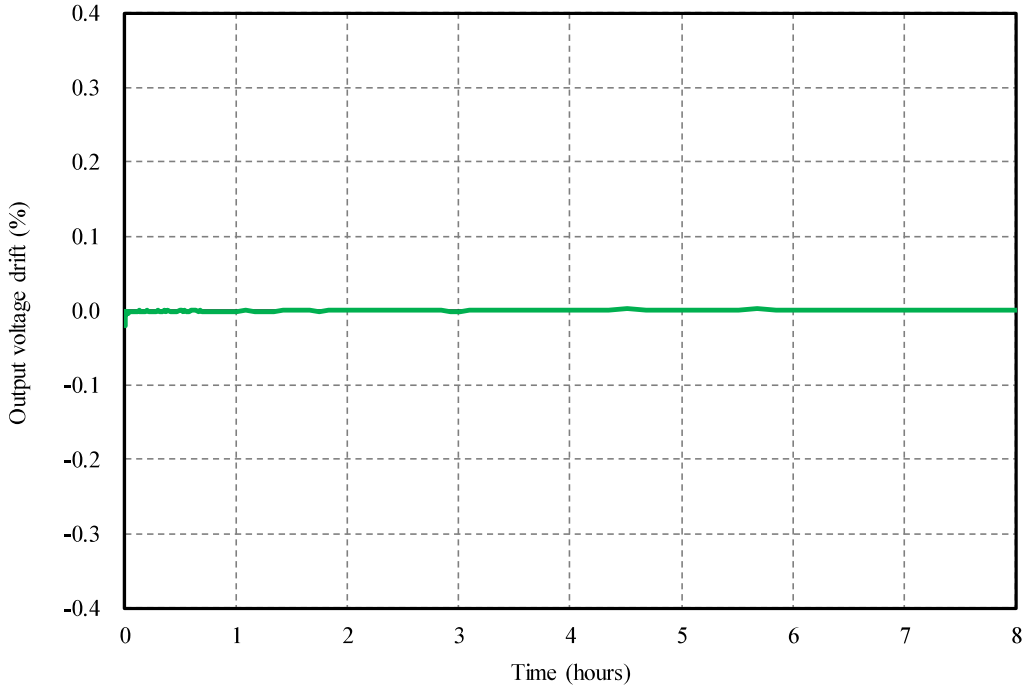
±15V



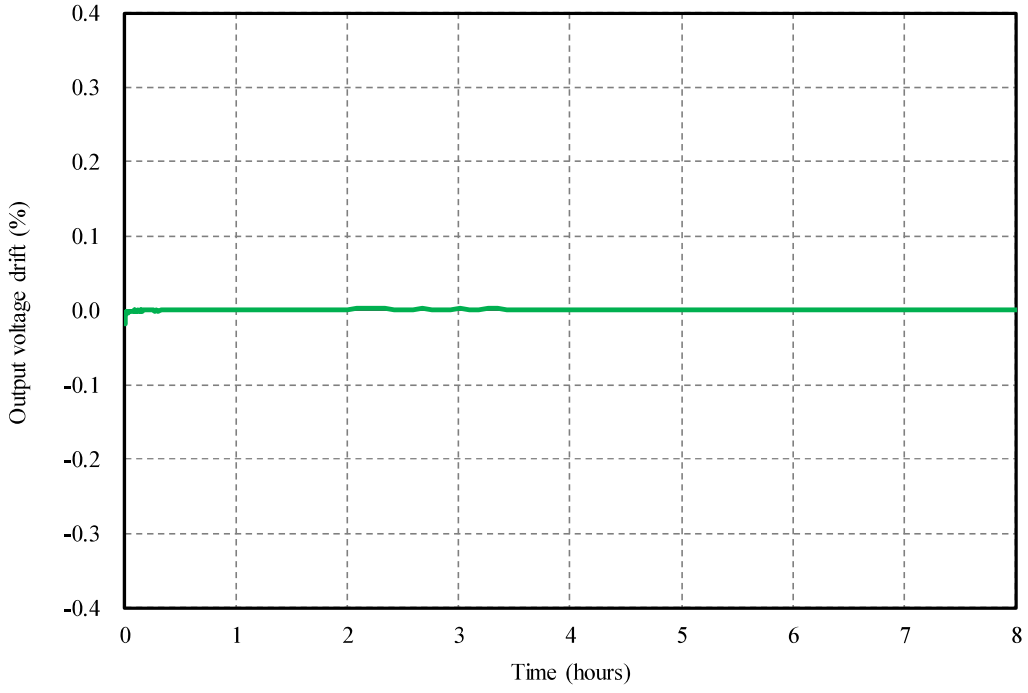
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

±12V



±15V



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

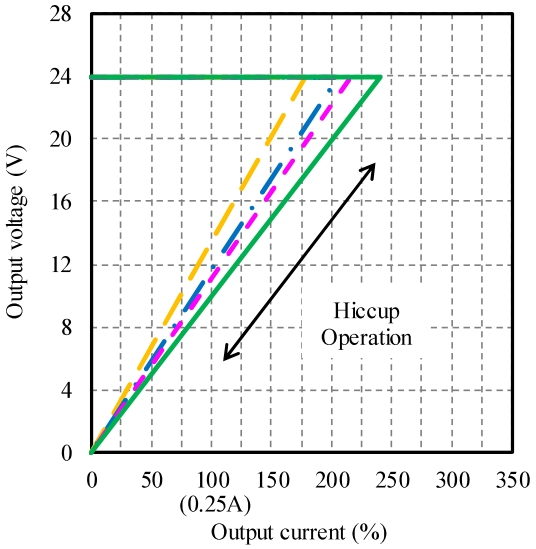
入力電圧依存性
Input voltage dependence

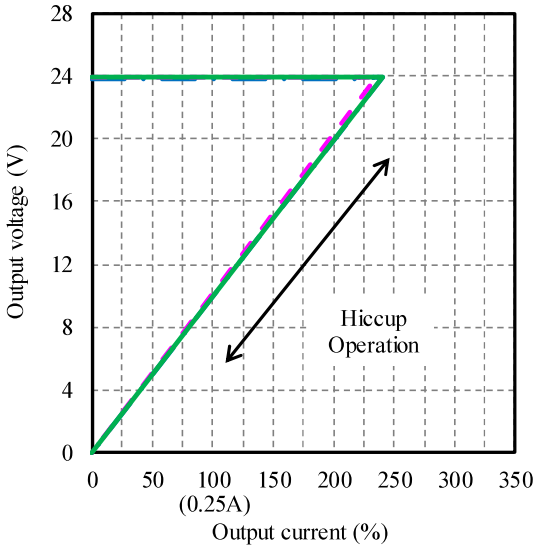
Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

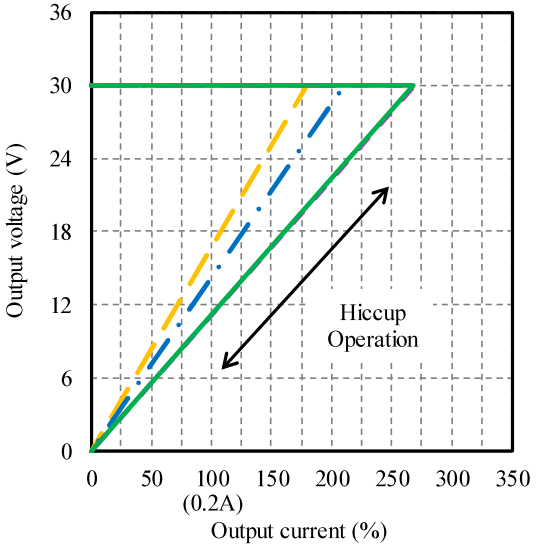
Conditions Vin : 24 VDC
Ta : -40 °C
: 25 °C
: 80 °C

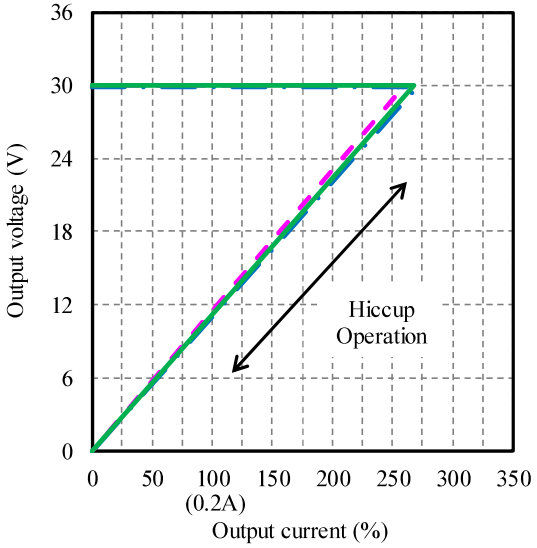
±12V





±15V

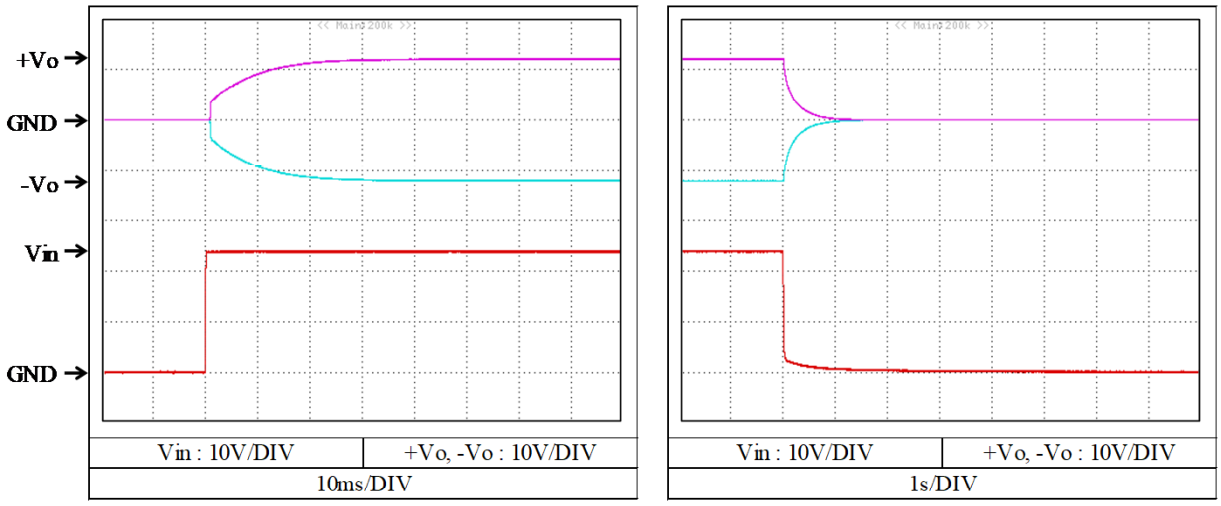




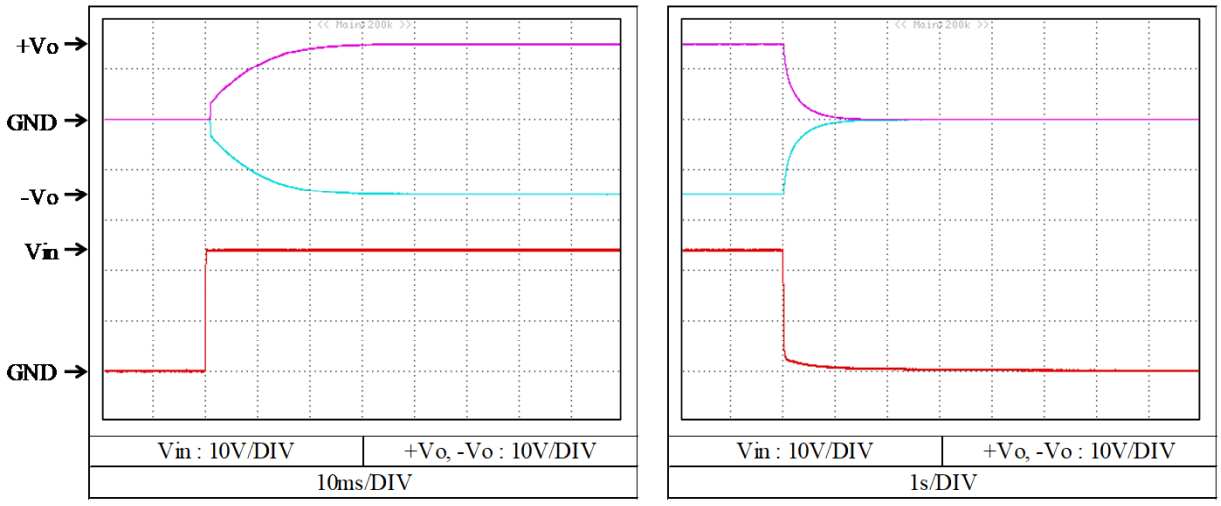
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC
Io : 0 %
Ta : 25 °C

±12V



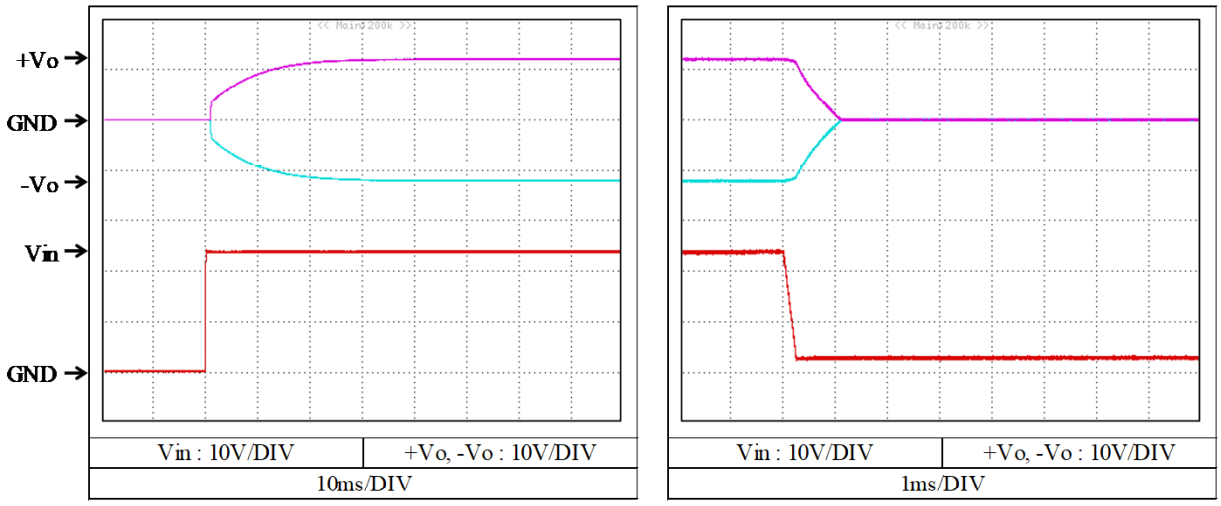
+15V



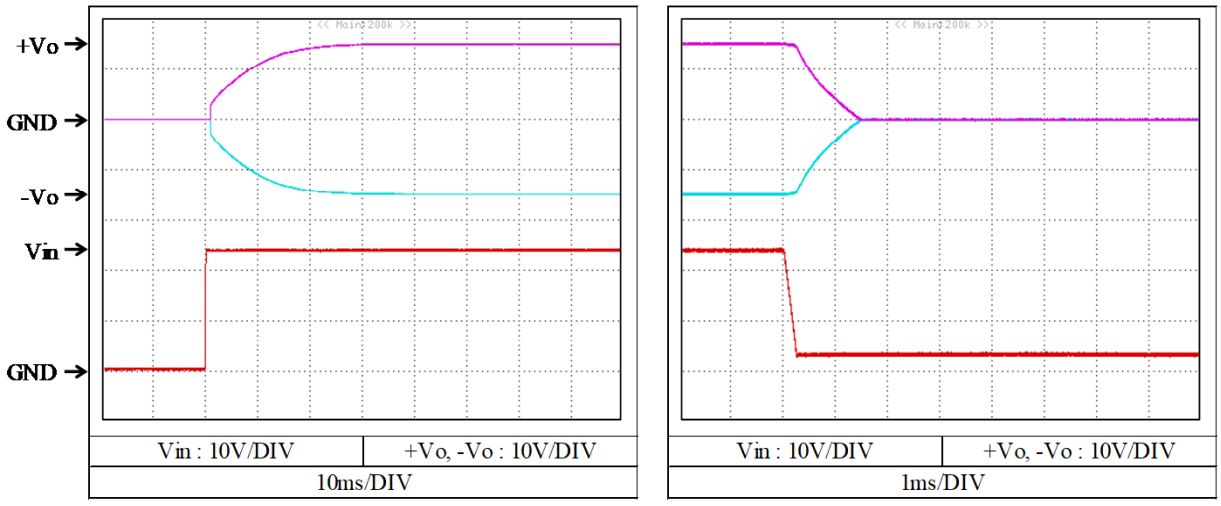
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

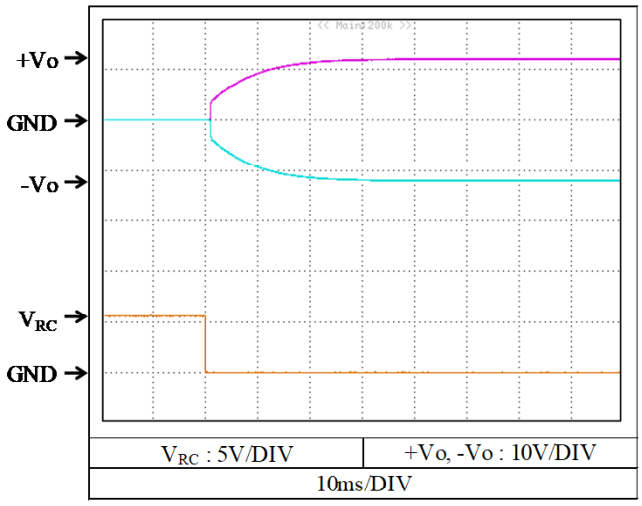


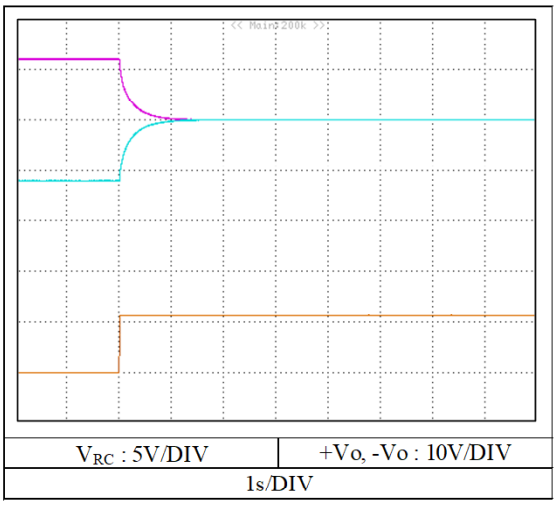
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

Output rise and fall characteristics with REMOTE ON/OFF CONTROL

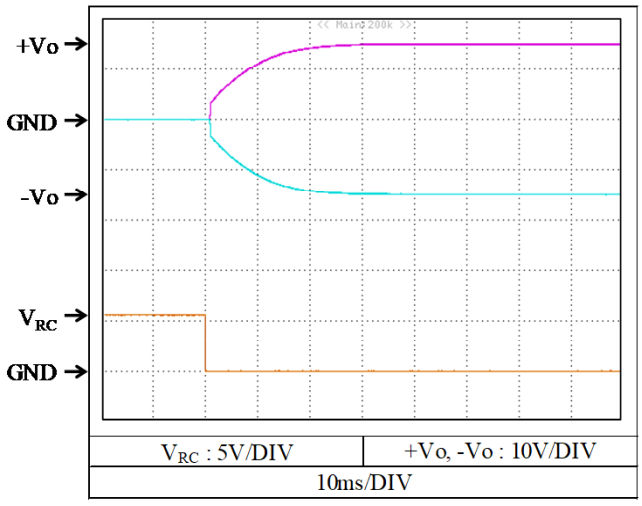
Conditions Vin : 24 VDC
Io : 0 %
Ta : 25 °C

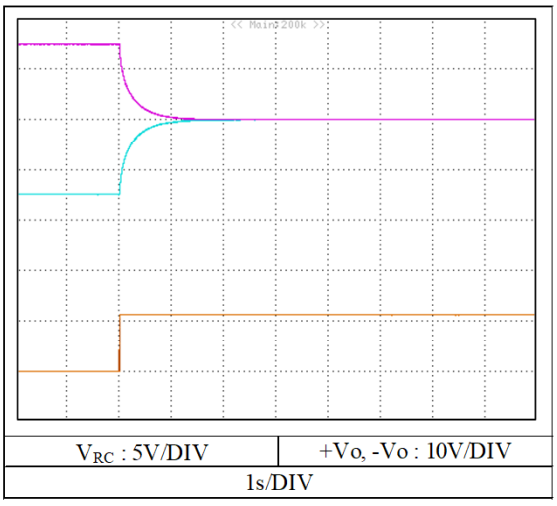
±12V





+15V



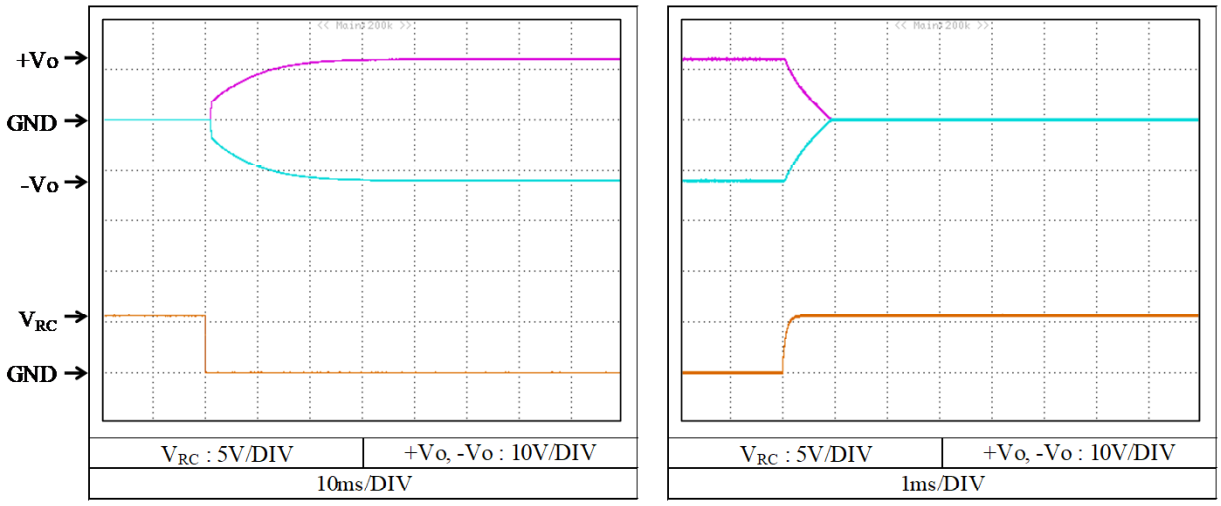


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

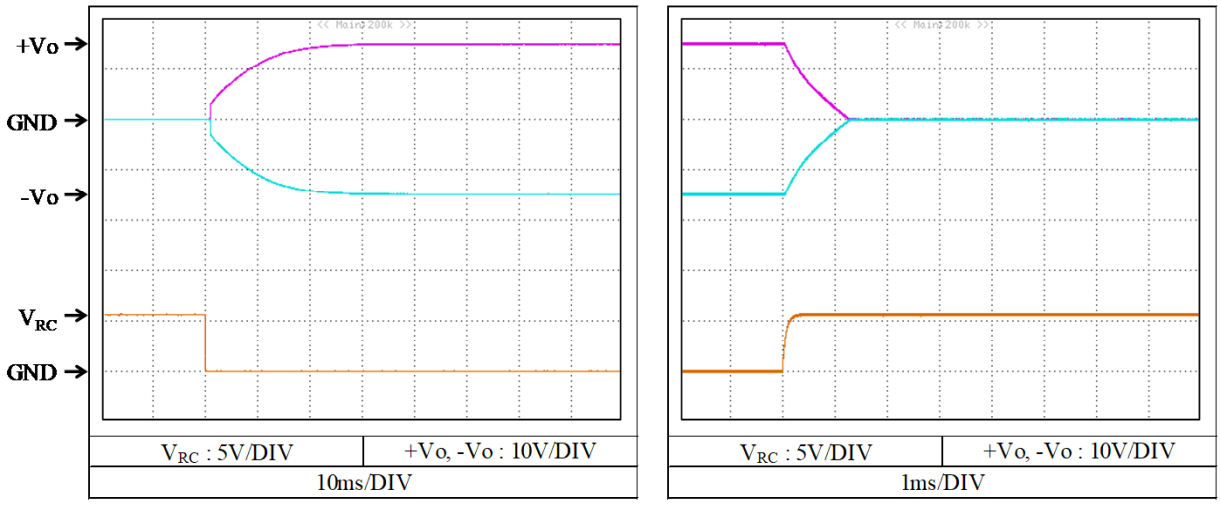
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

±12V



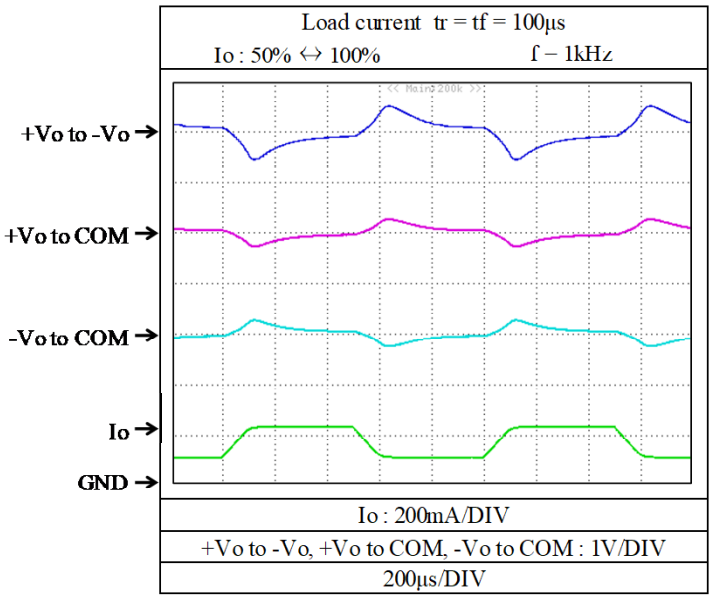
+15V



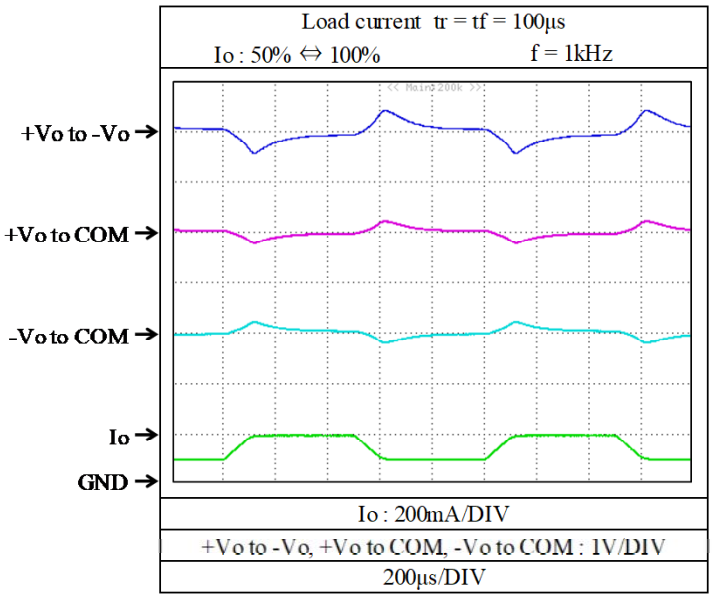
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 24 VDC
Ta : 25 °C

±12V



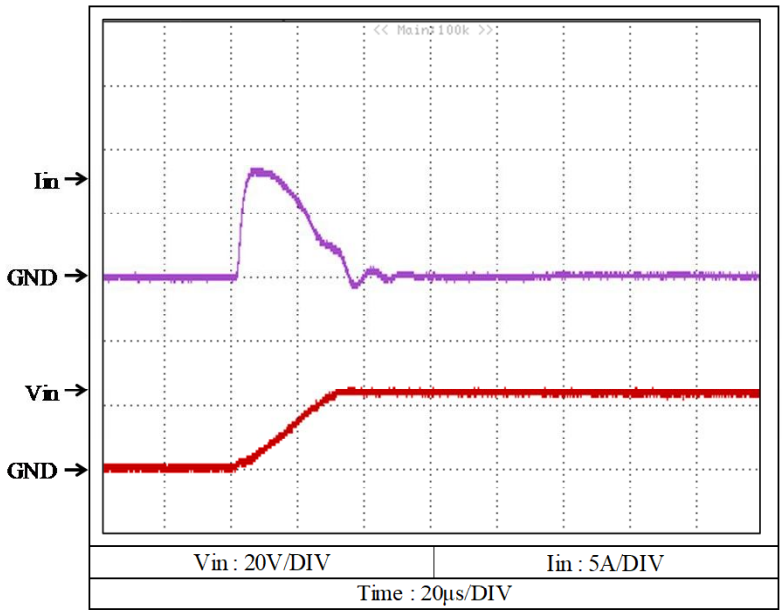
+15V



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

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

CCG10-24-05S

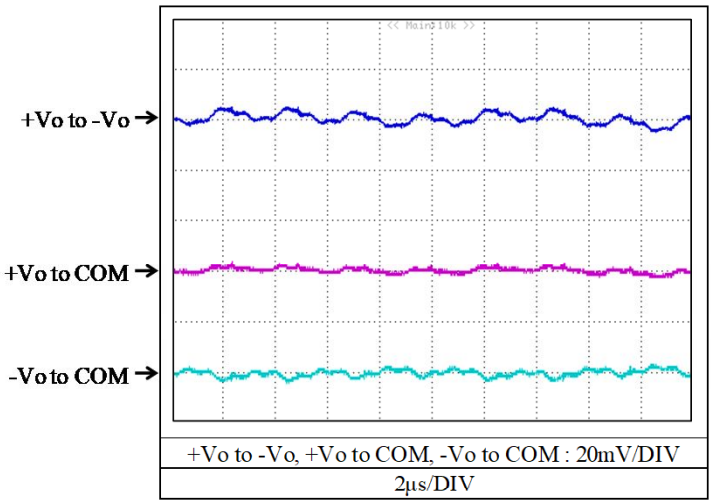


CCG6-24-xxDの入力サージ電流特性は CCG10-24-05S と同等です。
CCG6-24-xxD have the same Inrush current characteristics as CCG10-24-05S data.

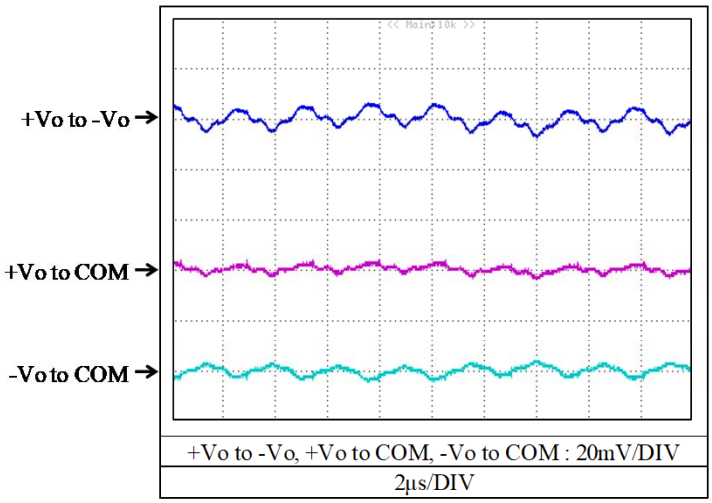
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

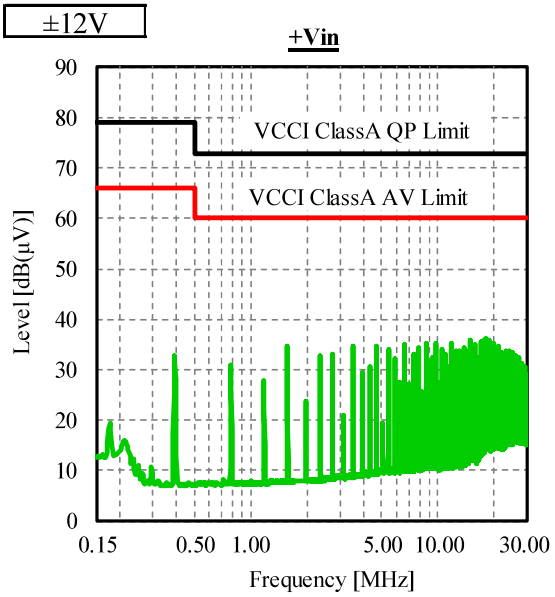


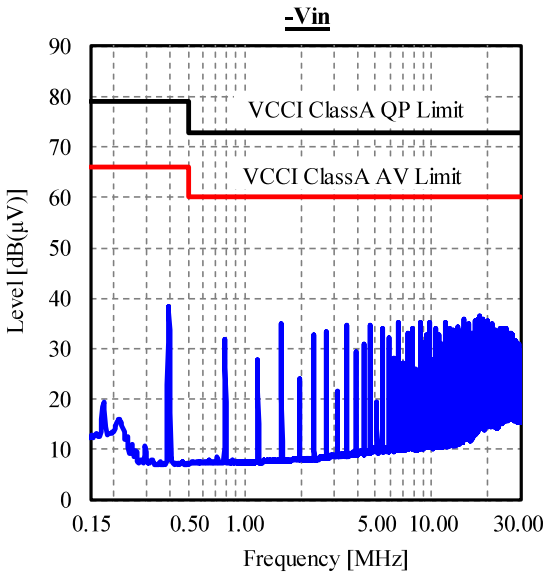
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

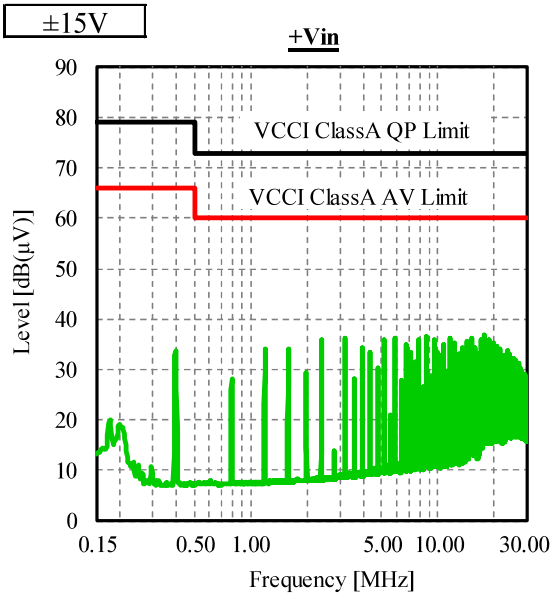
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 ℃

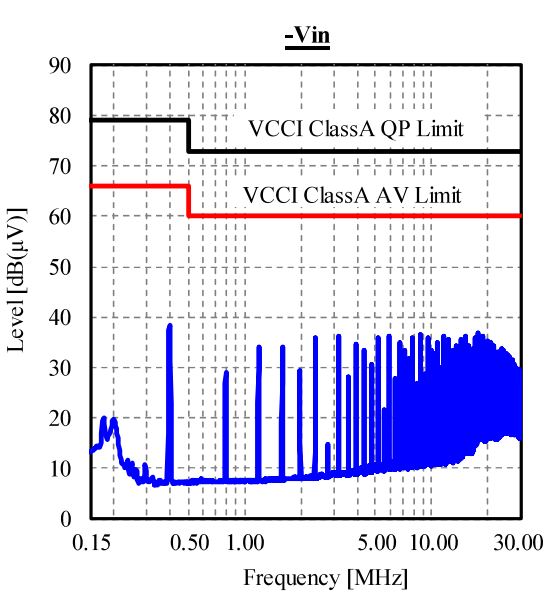
±12V





±15V





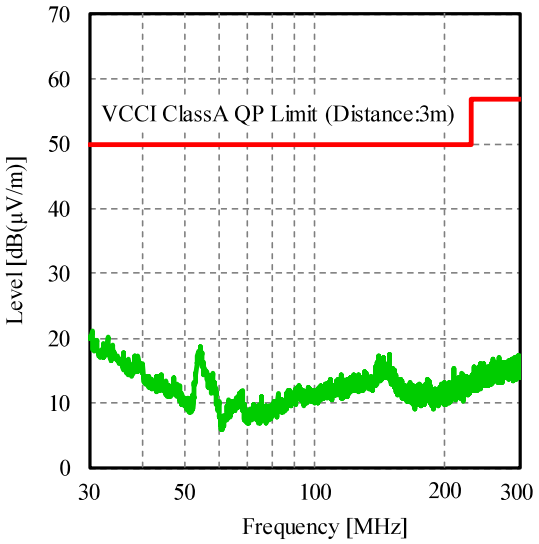
表示はQP値
Indication is QP values.

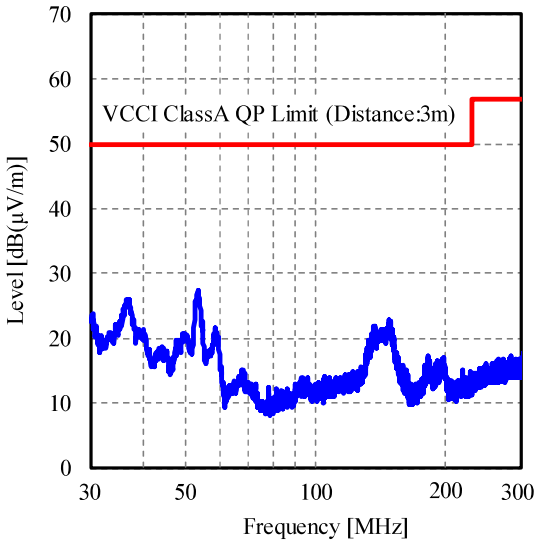
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

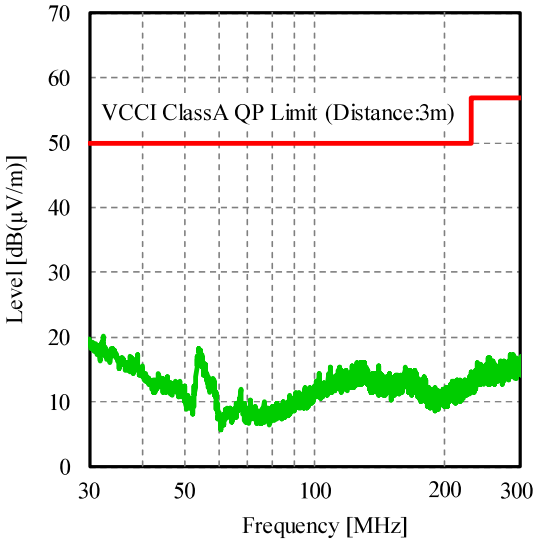
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 ℃

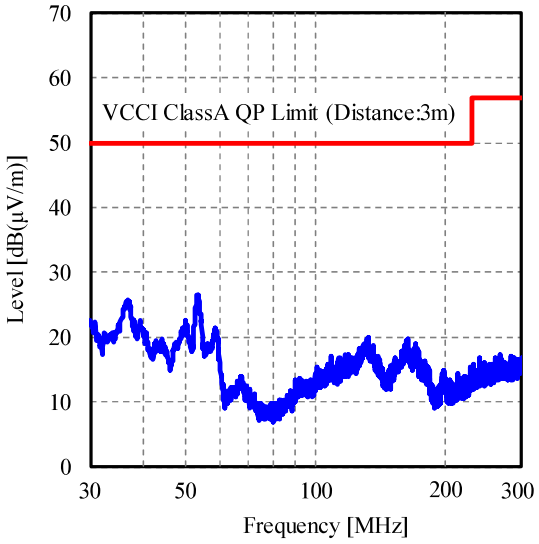
±12V





±15V





表示はピーク値
Indication is peak values.