CCGS30-24-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
COM	・・・・・	出力共通GND	Output common GND
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

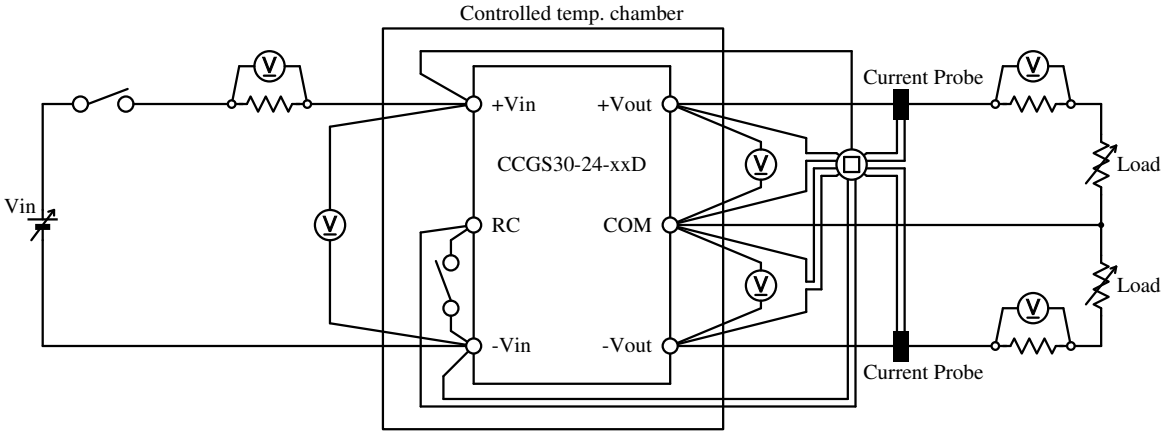
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

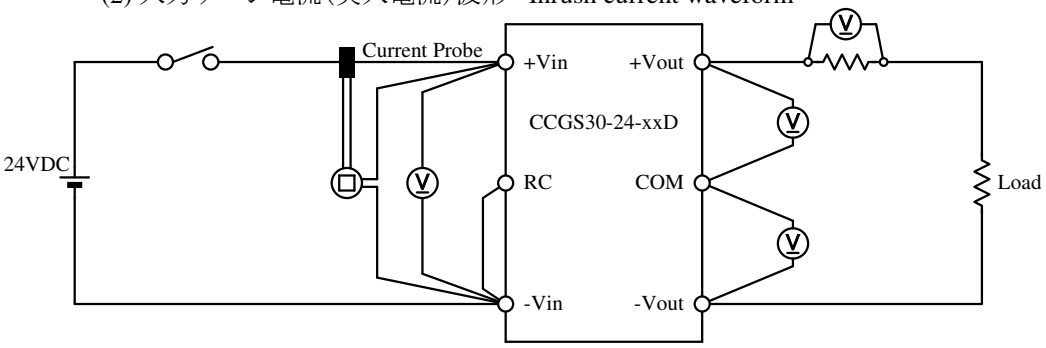
1-1. 測定回路 Measurement Circuits

(1) 静特性 、待機電力特性、通電ドリフト特性、その他特性

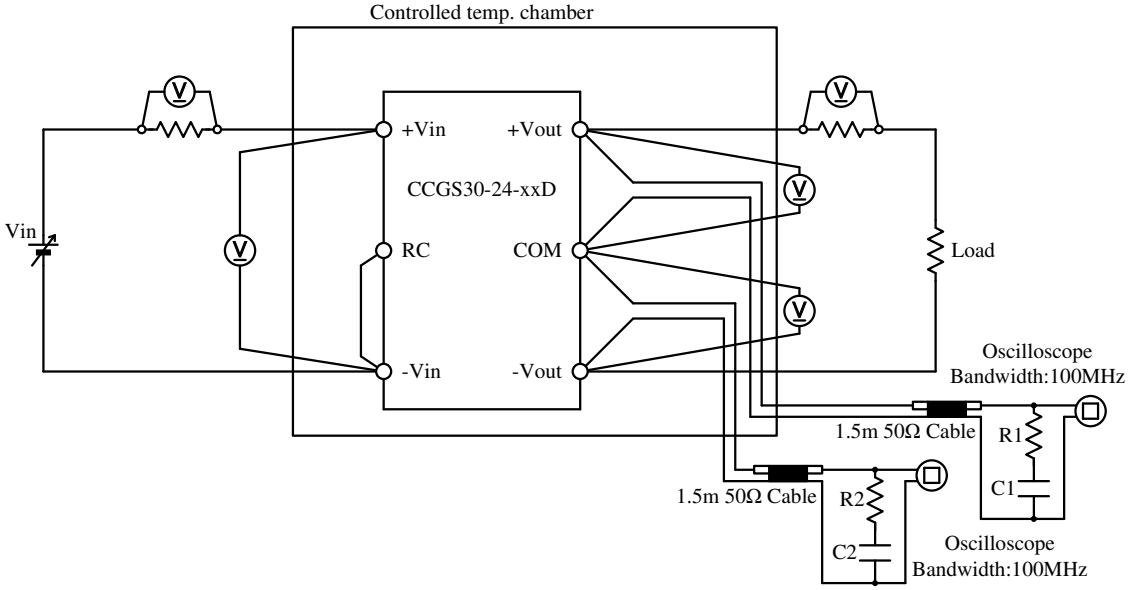
Steady state, Standby power, Warm up voltage drift and Other characteristics



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



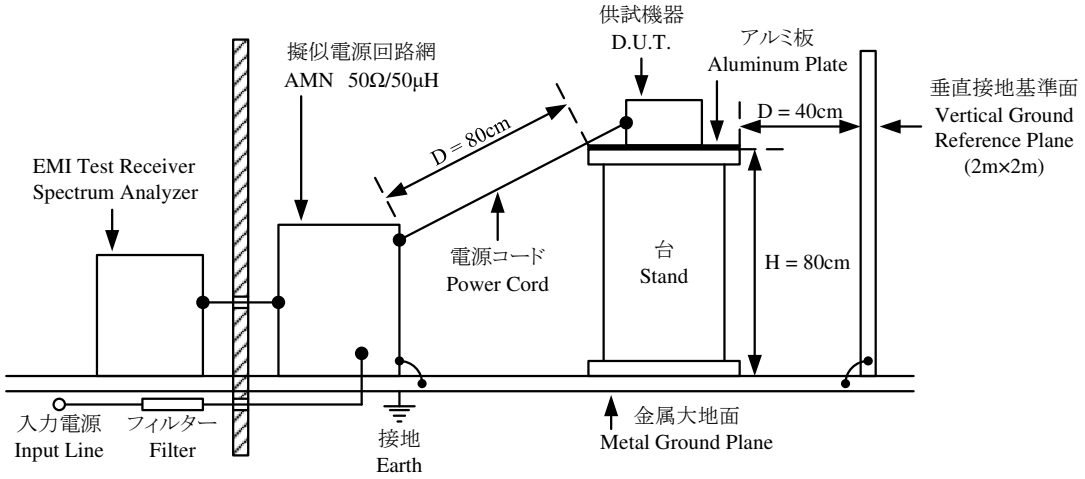
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



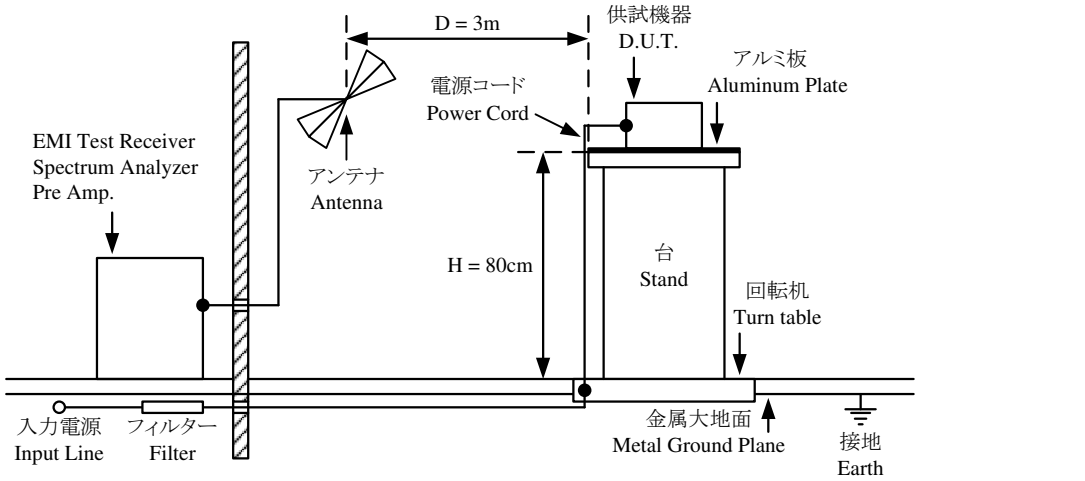
C1, C2 : 4700pF Ceramic Capacitor
R1, R2 : 50Ω

(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



1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DLM2054
2	DIGITAL MULTIMETER	AGILENT	34970A
3	CURRENT PROBE	YOKOGAWA ELECT.	70193
4	CURRENT PROBE	HIOKI	3273
5	SHUNT RESISTER	YOKOGAWA ELECT.	2215
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-200L
7	DYNAMIC DUMMY LOAD	KIKUSUI	PLZ-164WL
8	CVCF	NF	ES10000S
9	DC POWER SUPPLY	TDK-Lambda	Z+100-8
10	CONTROLLED TEMP. CHAMBER	ESPEC	SU-261
11	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESR3
12	PRE AMP.	SONOMA	310N
13	AMN	KIKUSUI	KNW-242C
14	ANTENNA	SCHWARZBECK	BBA9106
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 to COM

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	12.052V	12.046V	12.022V	12.033V	30.4mV	0.253%
50%(0.625A)	12.062V	12.063V	12.061V	12.060V	3.4mV	0.028%
100%(1.25A)	12.064V	12.064V	12.063V	12.060V	3.9mV	0.032%
Load regulation	11.5mV	18.1mV	40.4mV	27.2mV		
	0.096%	0.151%	0.337%	0.227%		

・−Vo to COM

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	-12.034V	-12.044V	-12.068V	-12.057V	34.1mV	0.284%
50%(0.625A)	-12.017V	-12.019V	-12.021V	-12.021V	3.9mV	0.033%
100%(1.25A)	-12.012V	-12.014V	-12.015V	-12.016V	4.0mV	0.033%
Load regulation	22.3mV	30.5mV	52.8mV	41.0mV		
	0.186%	0.254%	0.440%	0.342%		

・+Vo to −Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	24.087V	24.090V	24.090V	24.090V	3.7mV	0.015%
50%(0.625A)	24.079V	24.082V	24.081V	24.081V	3.1mV	0.013%
100%(1.25A)	24.076V	24.078V	24.078V	24.076V	2.1mV	0.009%
Load regulation	10.8mV	12.4mV	12.4mV	13.7mV		
	0.045%	0.052%	0.052%	0.057%		

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

Ta	-20°C	25°C	70°C	Temperature stability	
+Vo to COM	12.055V	12.063V	12.072V	16.6mV	0.138%
-Vo to COM	-12.011V	-12.015V	-12.020V	8.8mV	0.073%
+Vo to -Vo	24.066V	24.078V	24.091V	25.5mV	0.106%

3. Load Regulation - Unbalance load Conditions Ta : 25 °C
-Io : 100 %

・+Vo to COM

+Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.25A)	11.921V	11.924V	11.921V	11.919V
100%(1.25A)	12.068V	12.067V	12.066V	12.064V
Load regulation	146.8mV	143.6mV	145.0mV	145.7mV
	1.223%	1.197%	1.208%	1.214%

Conditions Ta : 25 °C
+Io : 100 %

・−Vo to COM

-Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.25A)	11.877V	11.881V	11.882V	11.881V
100%(1.25A)	12.013V	12.016V	12.018V	12.019V
Load regulation	136.8mV	134.8mV	135.4mV	137.1mV
	1.140%	1.123%	1.128%	1.142%

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

・+Vo to COM

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	15.062V	15.060V	15.051V	15.040V	22.5mV	0.150%
50%(0.5A)	15.063V	15.062V	15.058V	15.057V	5.6mV	0.037%
100%(1A)	15.065V	15.064V	15.062V	15.059V	6.5mV	0.043%
Load regulation	3.4mV	3.9mV	10.8mV	19.4mV		
	0.023%	0.026%	0.072%	0.129%		

・−Vo to COM

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	-15.040V	-15.042V	-15.047V	-15.056V	15.7mV	0.105%
50%(0.5A)	-15.032V	-15.033V	-15.034V	-15.035V	2.6mV	0.017%
100%(1A)	-15.030V	-15.030V	-15.032V	-15.032V	2.7mV	0.018%
Load regulation	10.9mV	11.8mV	14.6mV	23.9mV		
	0.073%	0.079%	0.097%	0.159%		

・+Vo to −Vo

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	30.102V	30.102V	30.098V	30.096V	6.6mV	0.022%
50%(0.5A)	30.095V	30.095V	30.092V	30.092V	3.2mV	0.011%
100%(1A)	30.095V	30.094V	30.094V	30.091V	3.8mV	0.013%
Load regulation	7.4mV	7.9mV	6.0mV	4.6mV		
	0.025%	0.026%	0.020%	0.015%		

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

Ta	-20°C	25°C	70°C	Temperature stability	
+Vo to COM	15.034V	15.062V	15.091V	57.1mV	0.381%
-Vo to COM	-15.005V	-15.032V	-15.059V	54.1mV	0.361%
+Vo to -Vo	30.039V	30.094V	30.150V	111.0mV	0.370%

3. Load Regulation - Unbalance load Conditions Ta : 25 °C
-Io : 100 %

・+Vo to COM

+Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.2A)	14.914V	14.916V	14.913V	14.911V
100%(1A)	15.060V	15.061V	15.062V	15.059V
Load regulation	145.9mV	145.3mV	148.5mV	148.3mV
	0.973%	0.969%	0.990%	0.989%

Conditions Ta : 25 °C
+Io : 100 %

・−Vo to COM

-Io \ Vin	9VDC	12VDC	24VDC	36VDC
20%(0.2A)	14.881V	14.886V	14.890V	14.889V
100%(1A)	15.022V	15.026V	15.030V	15.031V
Load regulation	140.8mV	140.0mV	140.1mV	141.6mV
	0.939%	0.933%	0.934%	0.944%

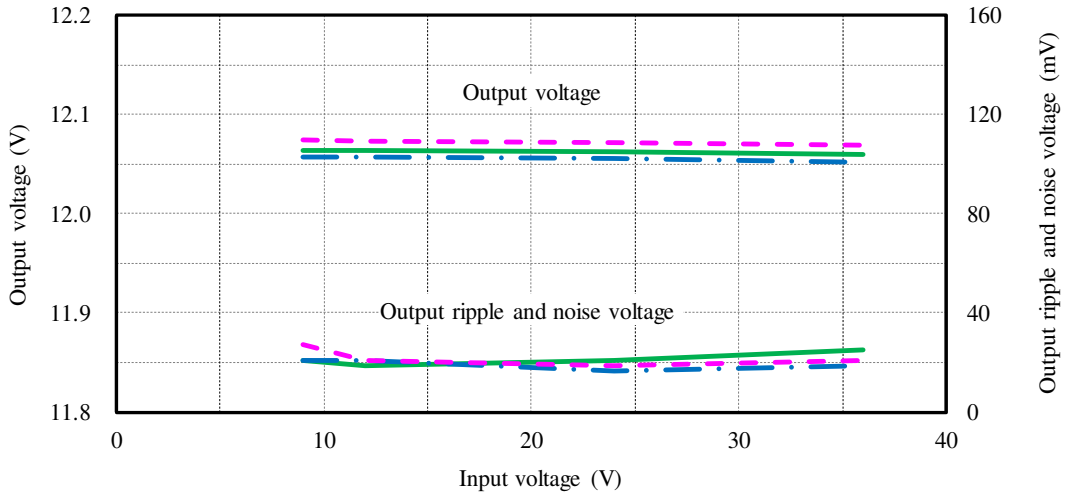
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

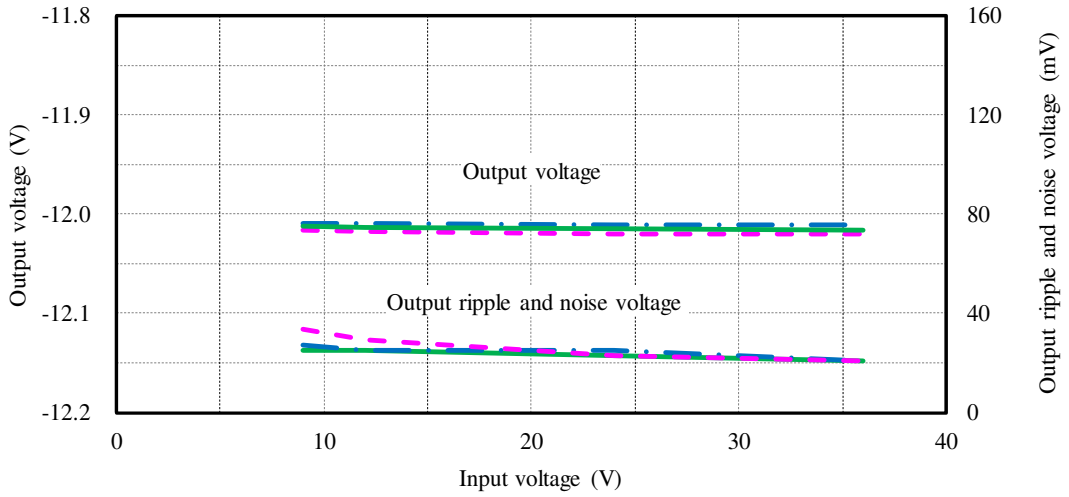
Conditions Io : 100 %
Ta : -20 °C
: 25 °C
: 70 °C

±12V

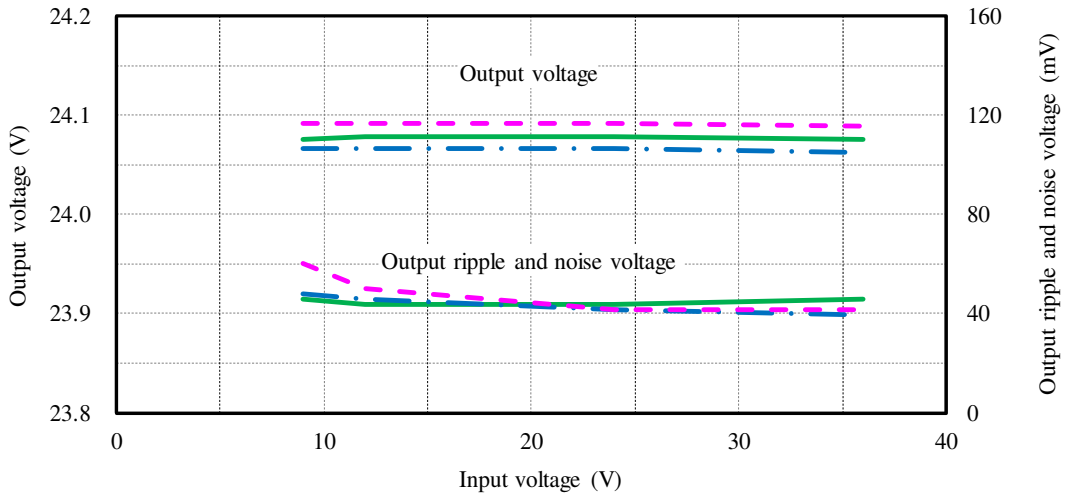
・+Vo to COM



・−Vo to COM



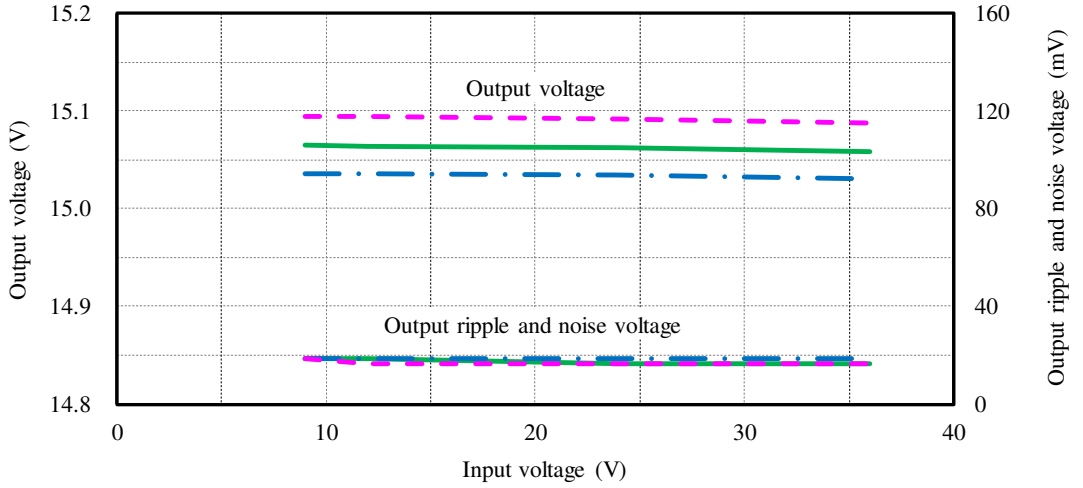
・+Vo to -Vo



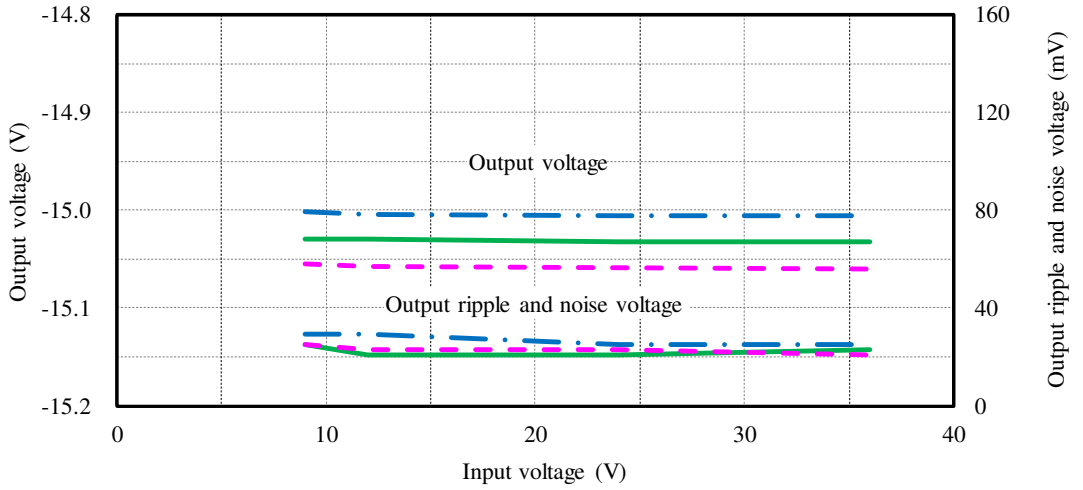
Conditions Io : 100 %
Ta : -20 °C
: 25 °C
: 70 °C

±15V

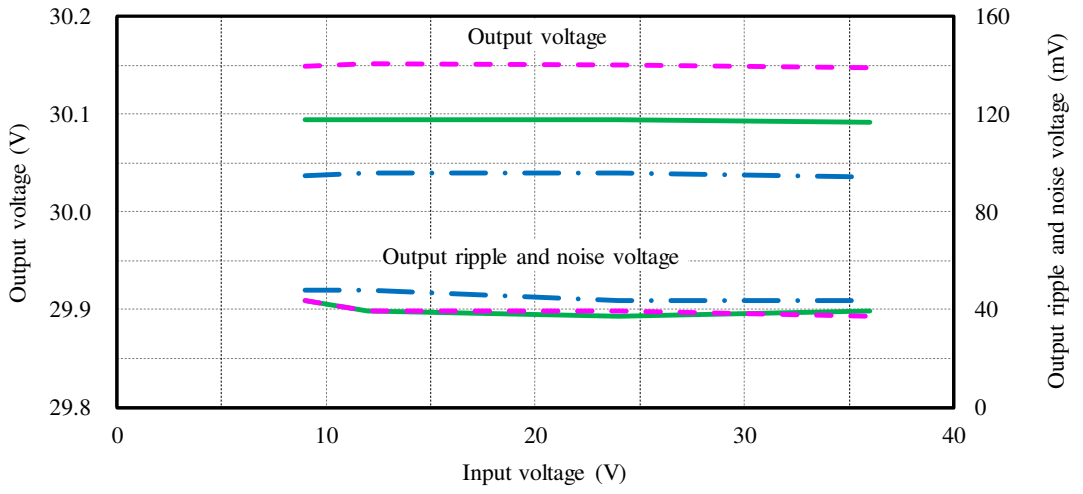
・+Vo to COM



・−Vo to COM



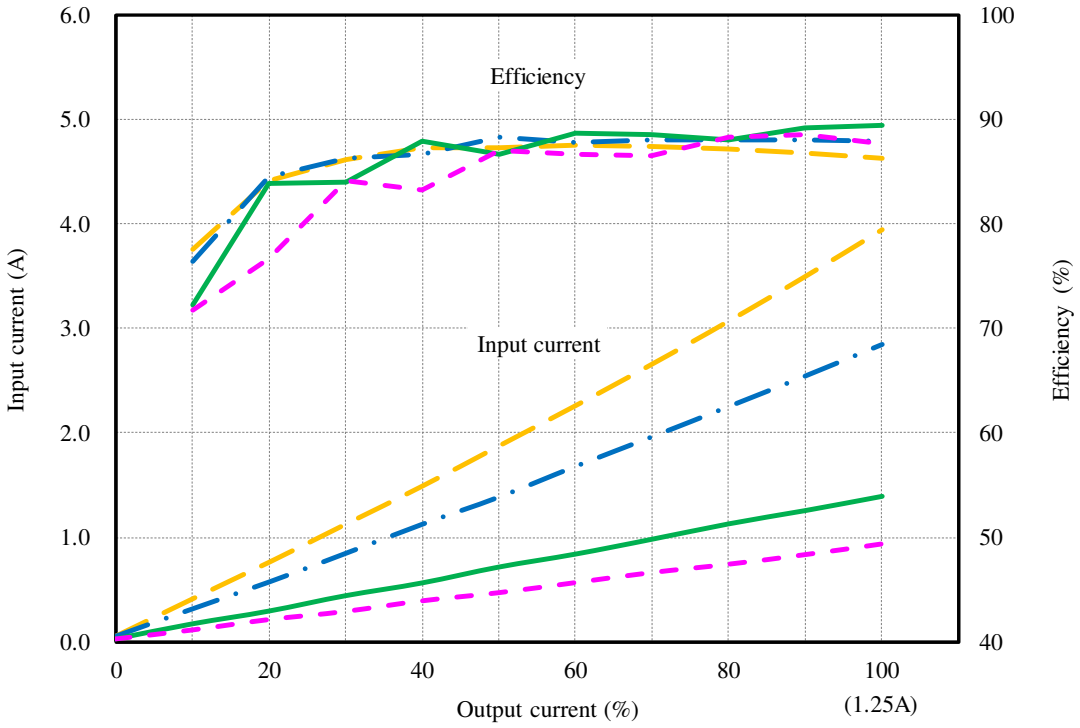
・+Vo to -Vo



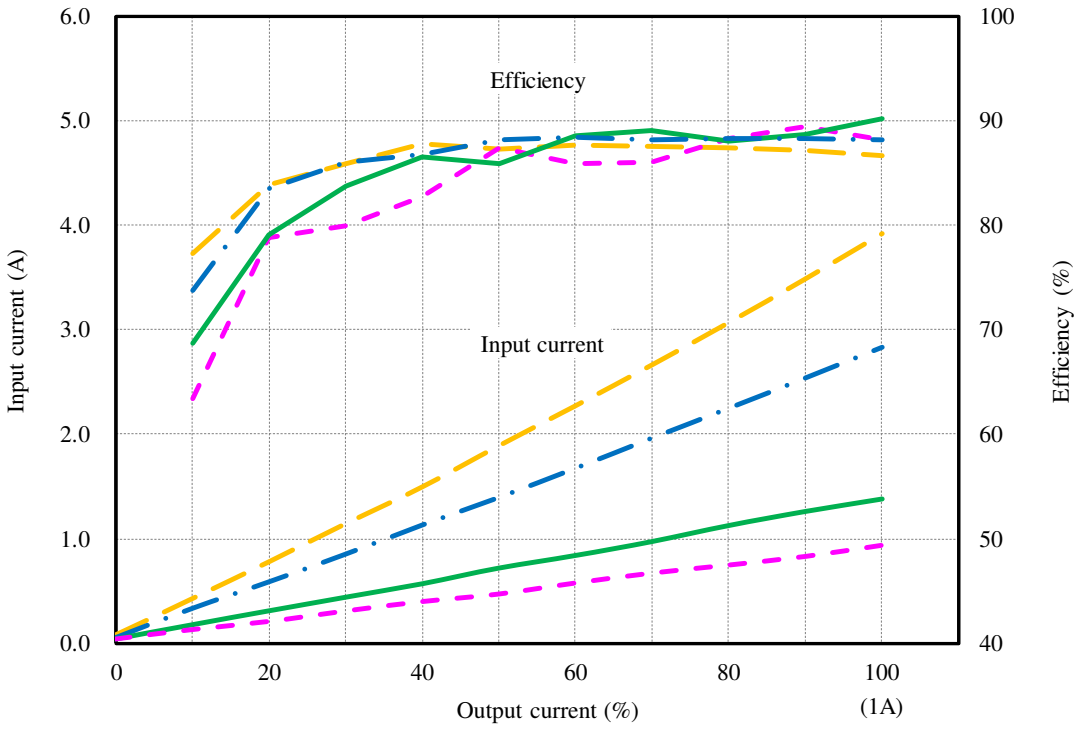
(3) 入力電流･効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 ℃

±12V



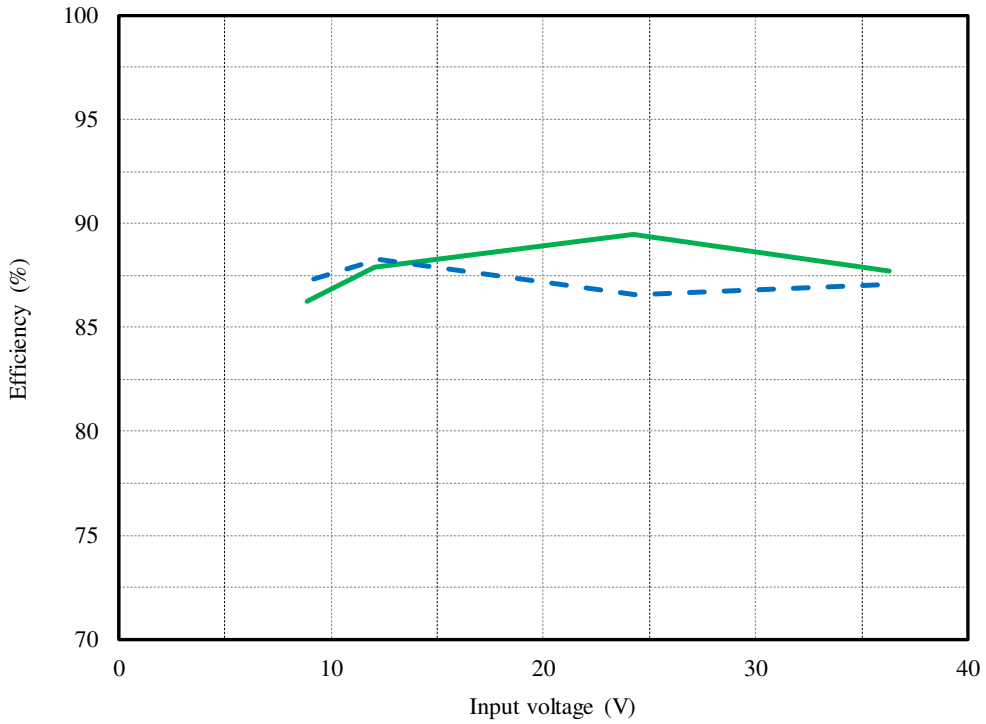
±15V



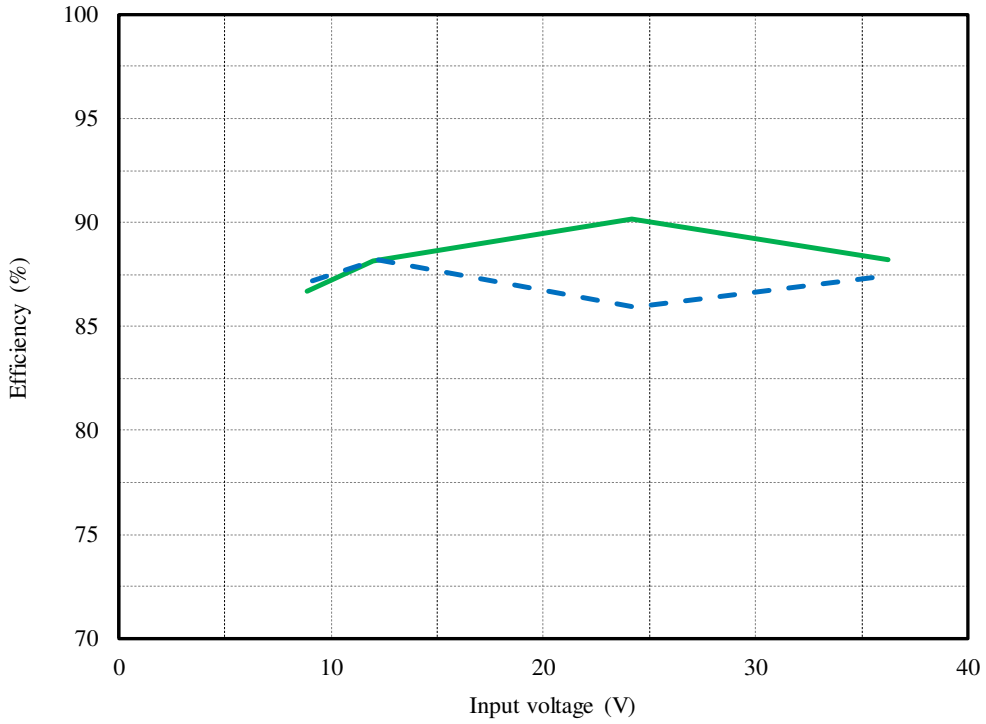
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

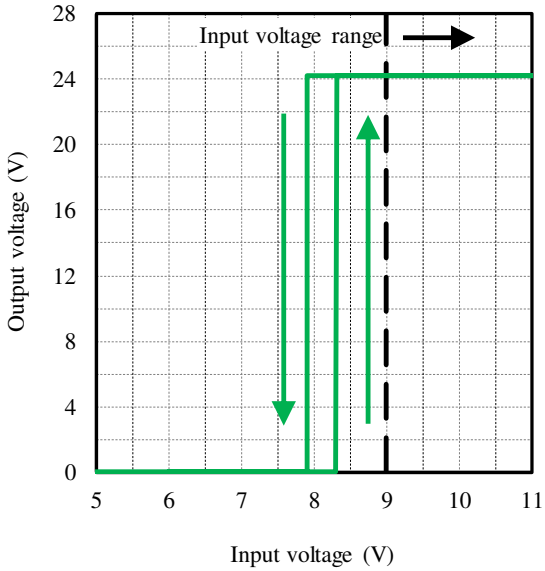
出力電圧 対 入力電圧
Output voltage vs. Input voltage

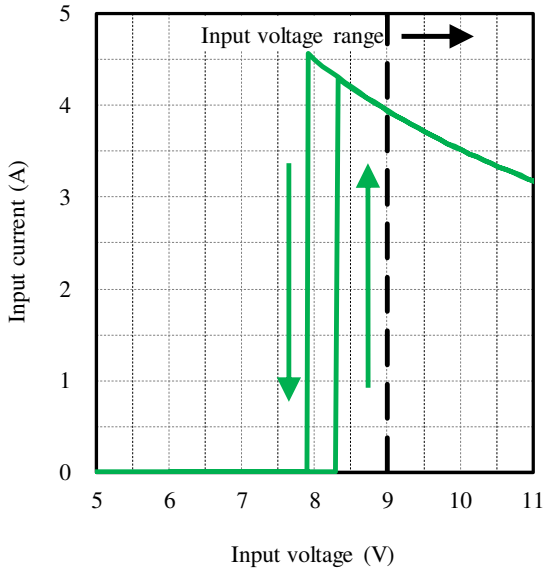
Conditions Io : 100 %
Ta : 25 °C

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

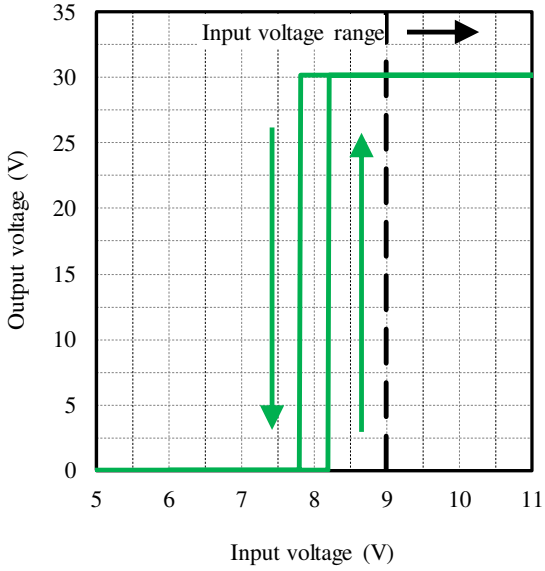
Conditions Io : 100 %
Ta : 25 °C

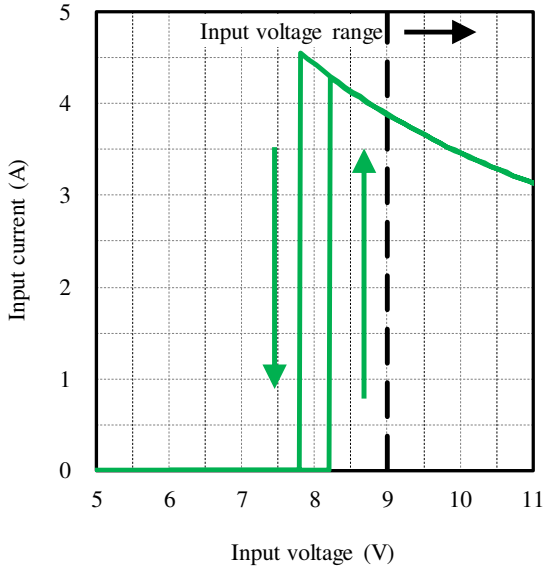
±12V





±15V

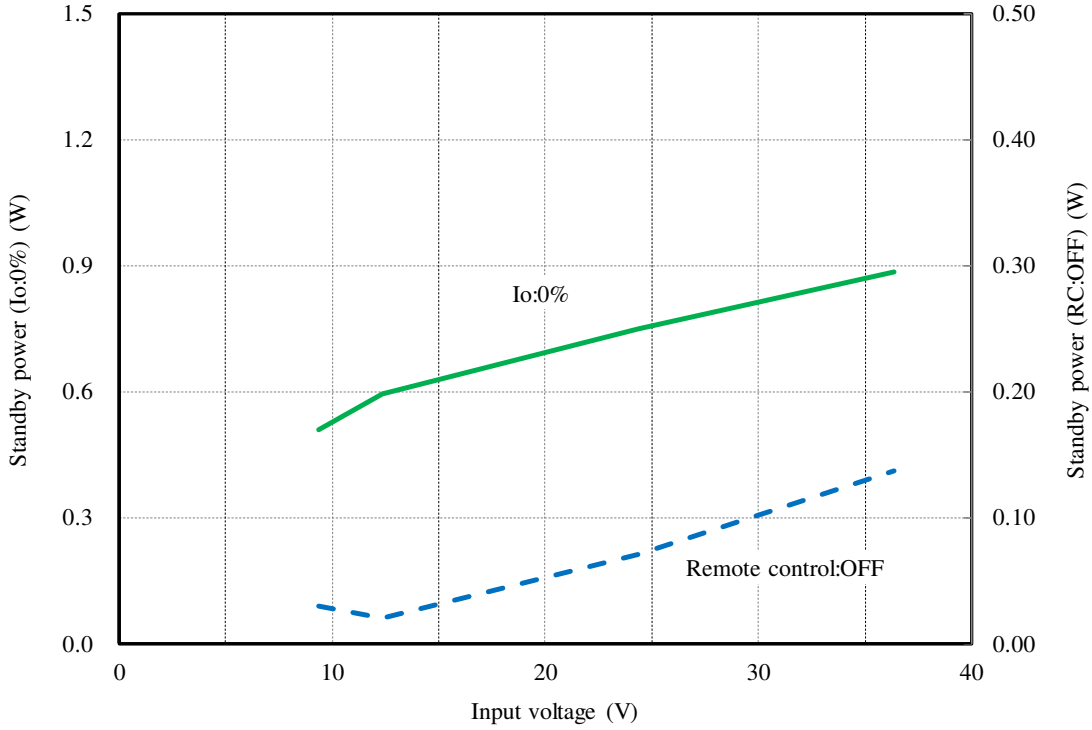




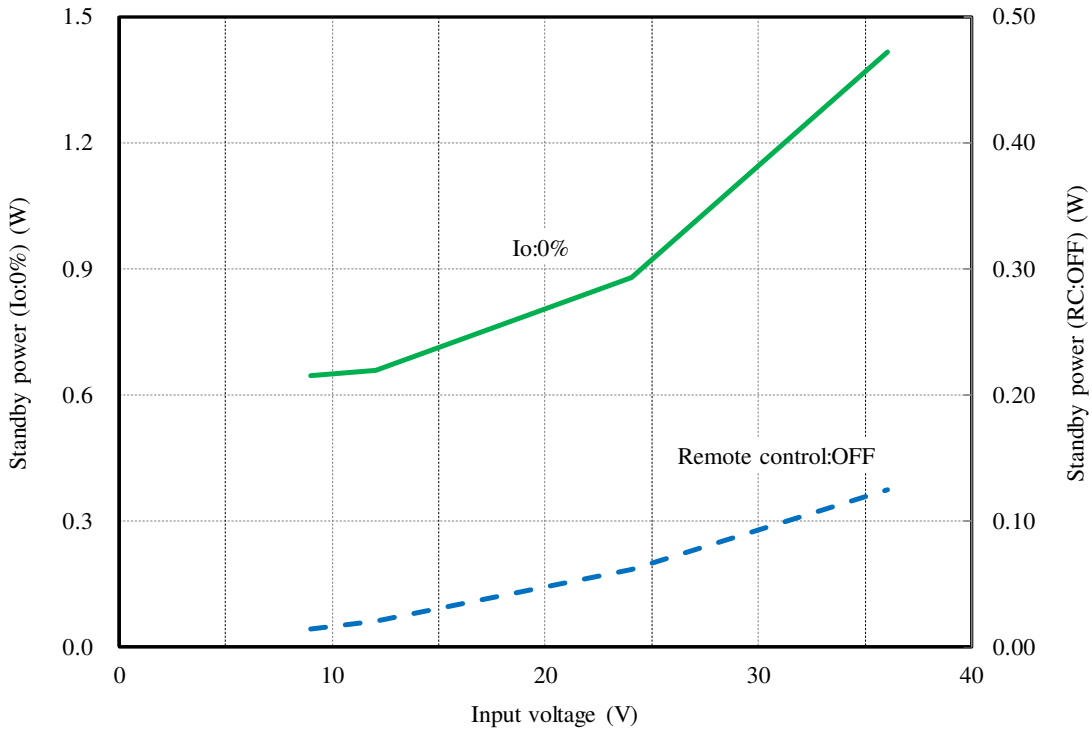
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



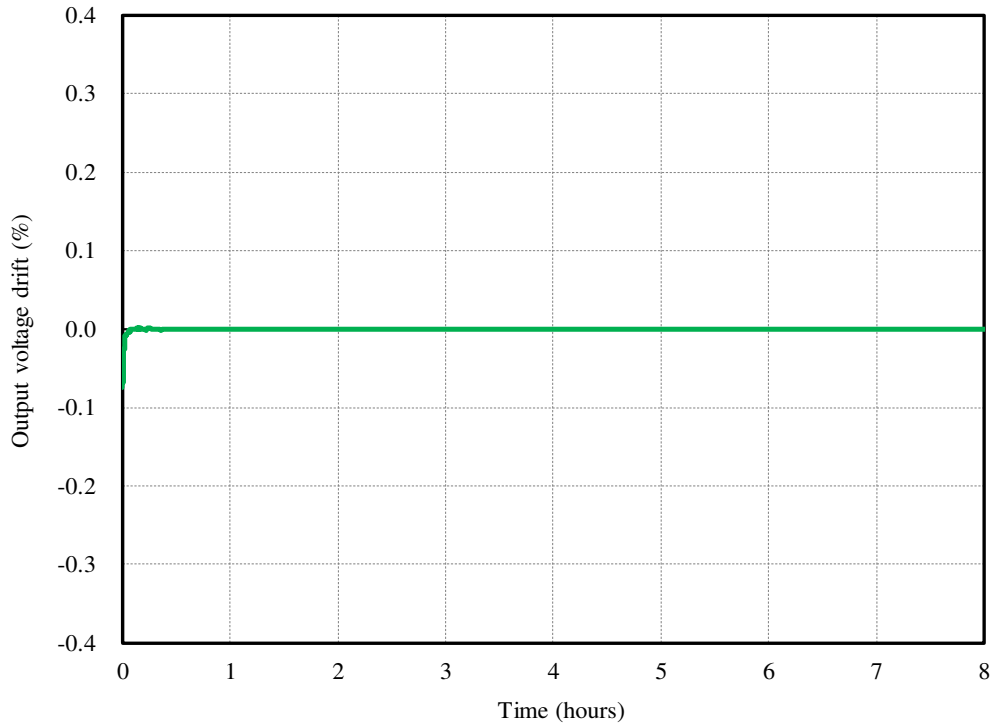
±15V



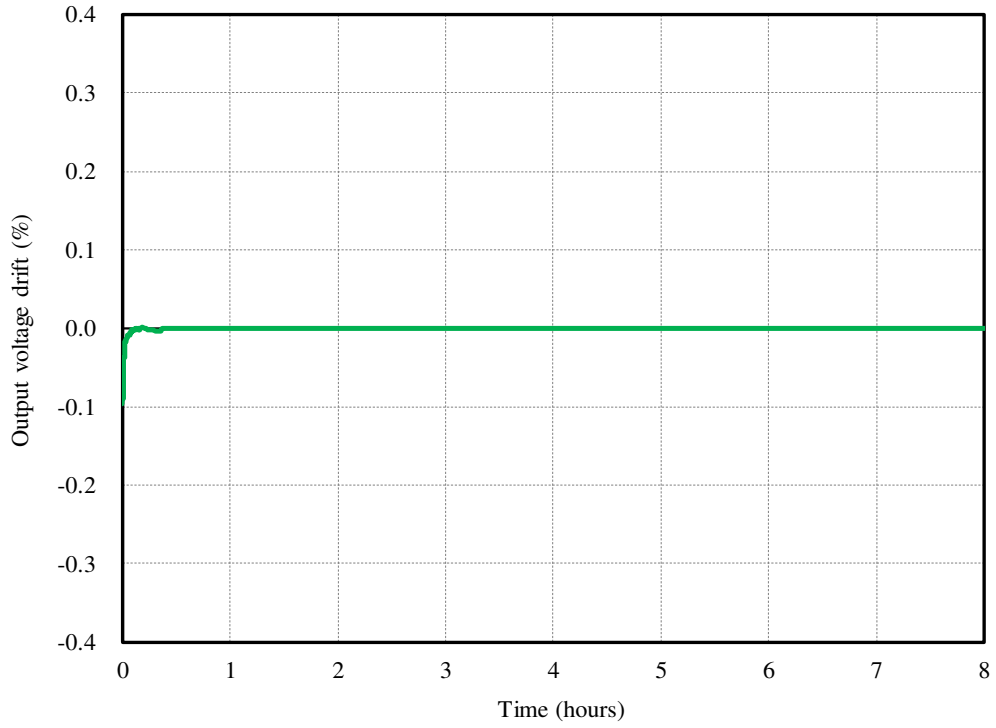
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

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

±12V



±15V

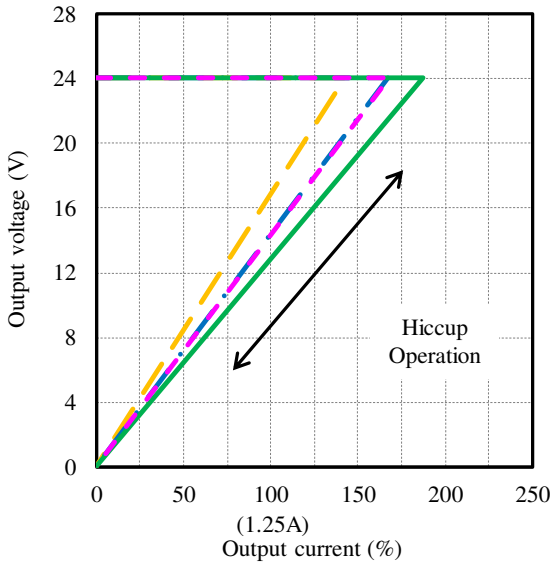


2-4. 過電流保護特性 Over current protection (OCP) characteristics

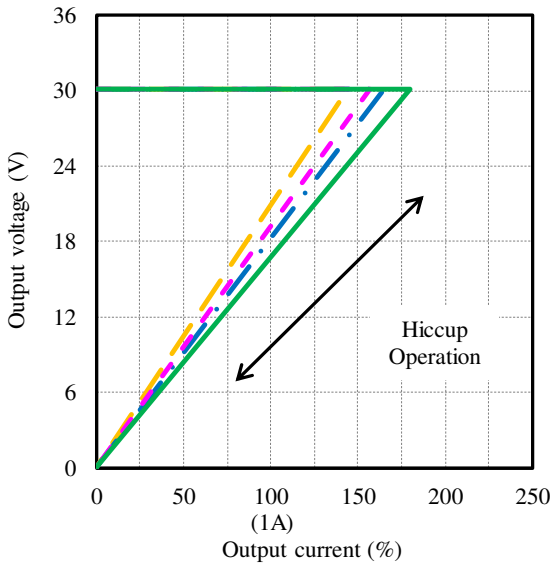
入力電圧依存性
Input voltage dependence

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

±12V

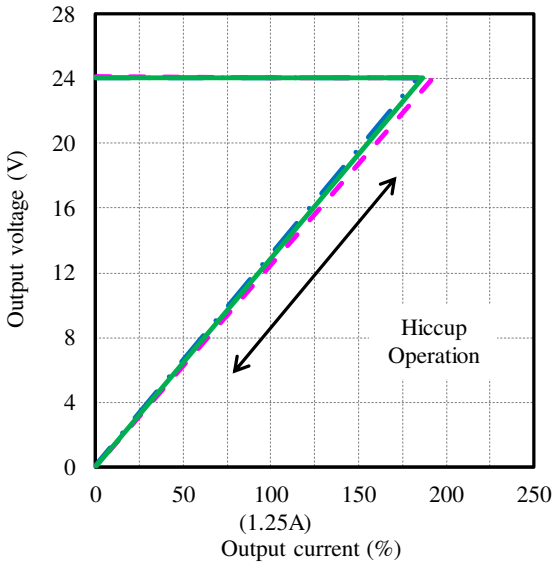


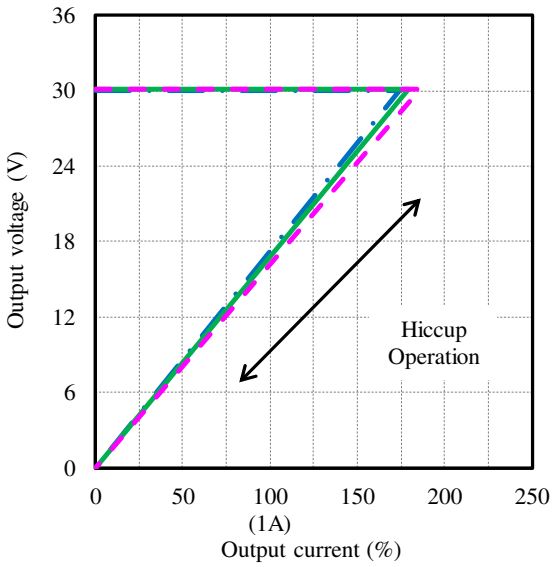
±15V



周囲温度依存性
Ambient temperature dependence

Conditions Vin : 24 VDC
Ta : -20 °C
: 25 °C
: 70 °C

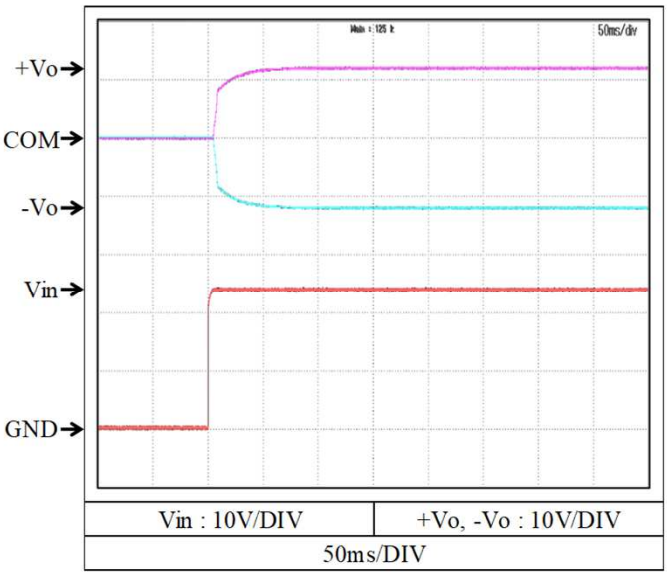




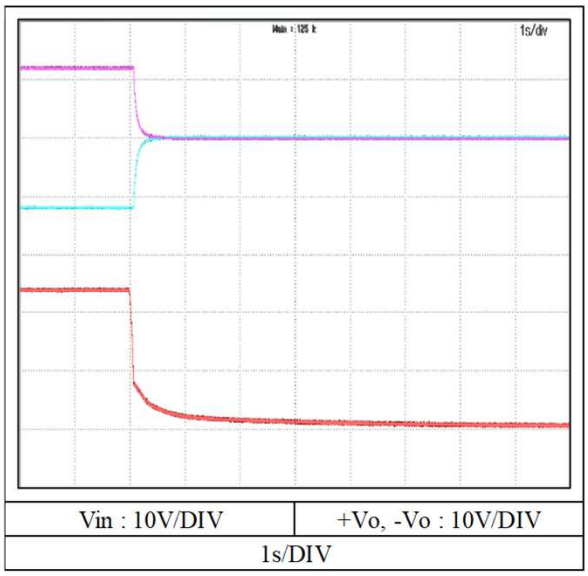
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V

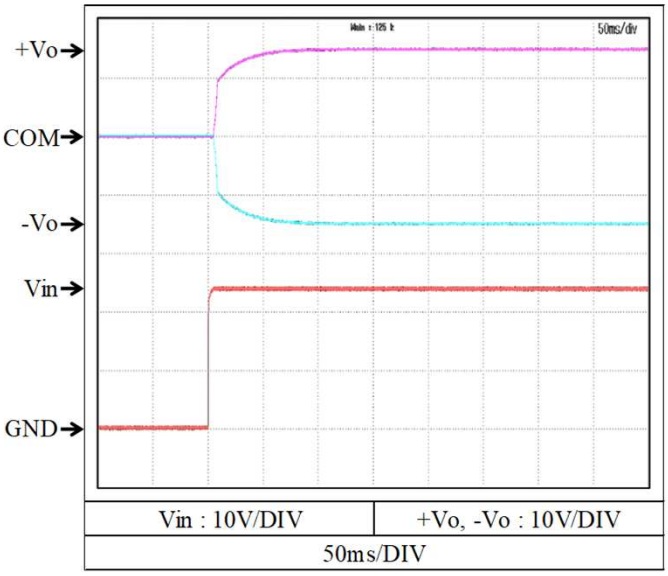


Vin : 10V/DIV | +Vo, -Vo : 10V/DIV
50ms/DIV

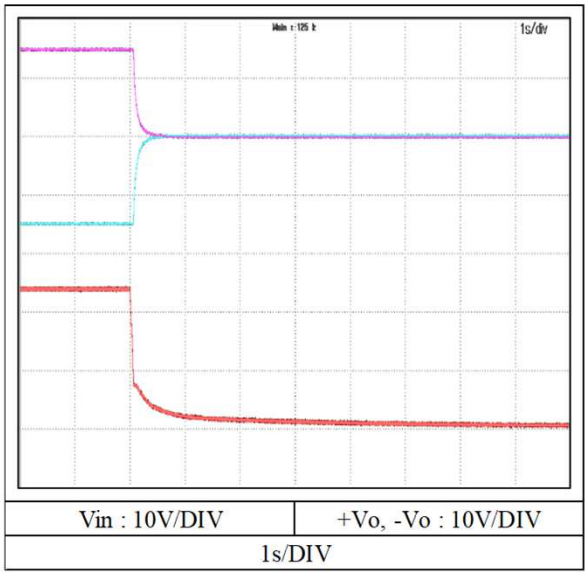


Vin : 10V/DIV | +Vo, -Vo : 10V/DIV
1s/DIV

±15V



Vin : 10V/DIV | +Vo, -Vo : 10V/DIV
50ms/DIV

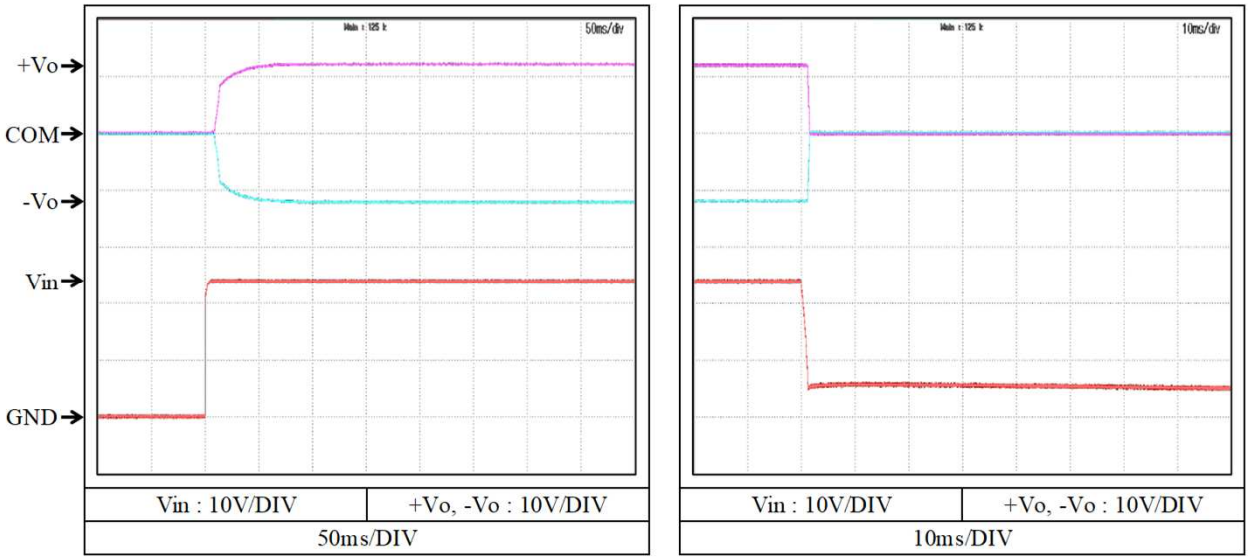


Vin : 10V/DIV | +Vo, -Vo : 10V/DIV
1s/DIV

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

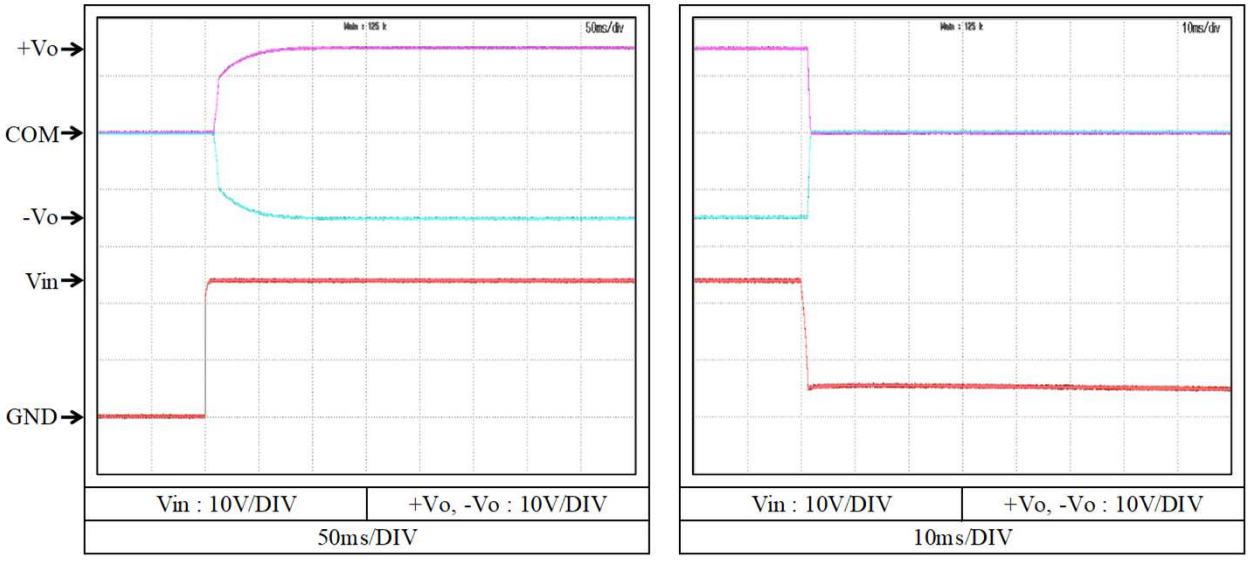
±12V



Vin : 10V/DIV	+Vo, -Vo : 10V/DIV
50ms/DIV	

Vin : 10V/DIV	+Vo, -Vo : 10V/DIV
10ms/DIV	

±15V



Vin : 10V/DIV	+Vo, -Vo : 10V/DIV
50ms/DIV	

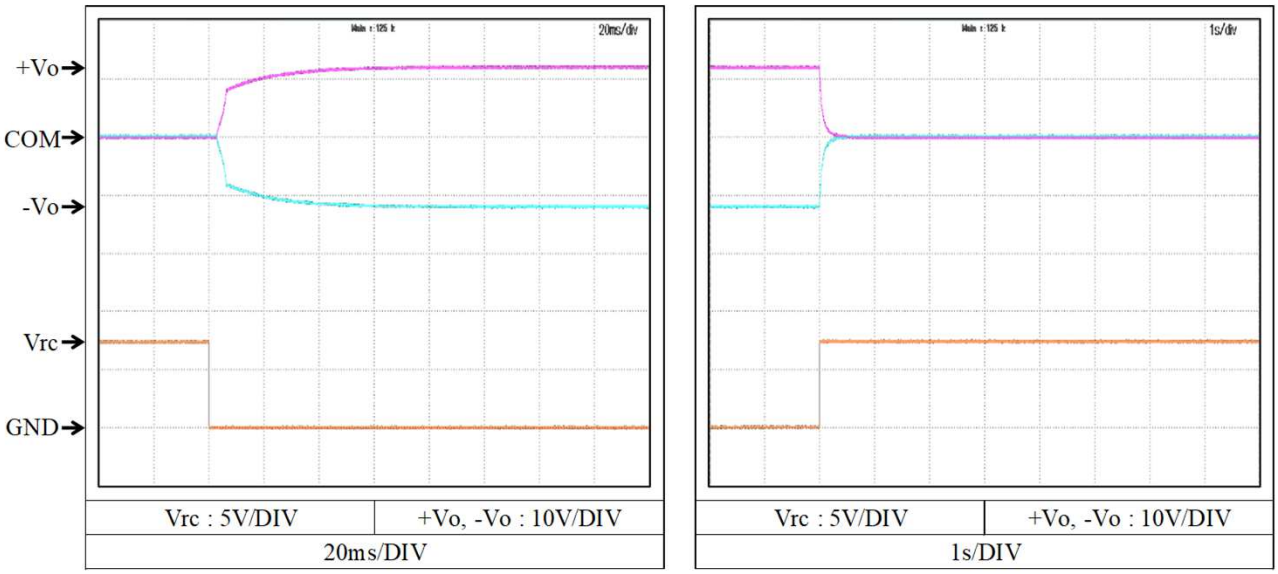
Vin : 10V/DIV	+Vo, -Vo : 10V/DIV
10ms/DIV	

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

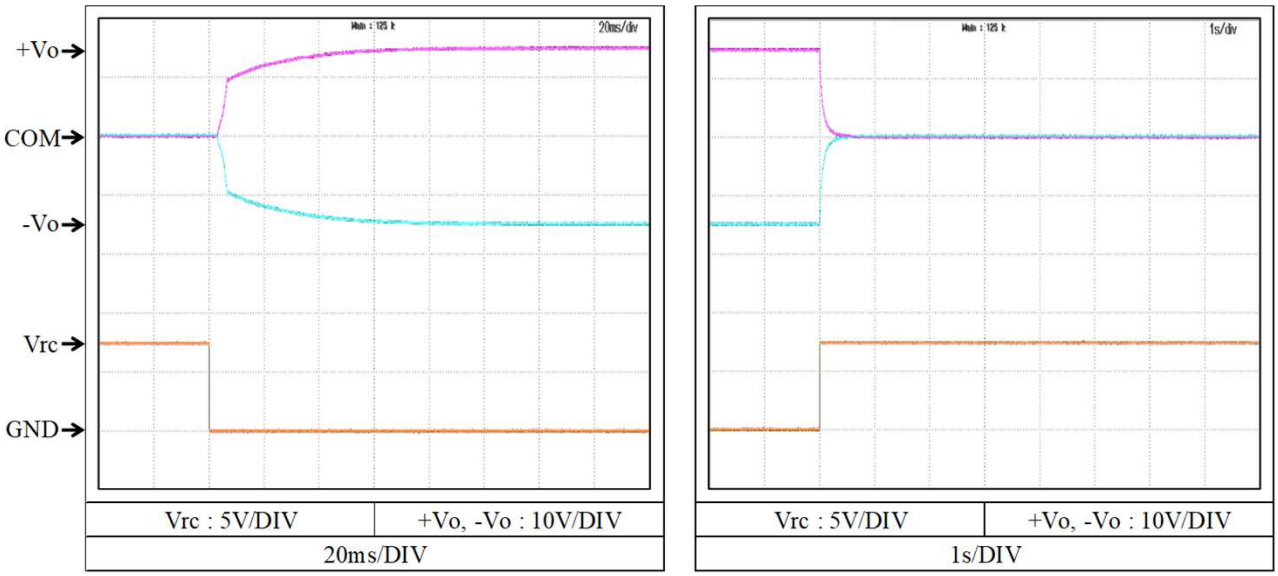
±12V



Vrc : 5V/DIV	+Vo, -Vo : 10V/DIV
20ms/DIV	

Vrc : 5V/DIV	+Vo, -Vo : 10V/DIV
1s/DIV	

±15V



Vrc : 5V/DIV	+Vo, -Vo : 10V/DIV
20ms/DIV	

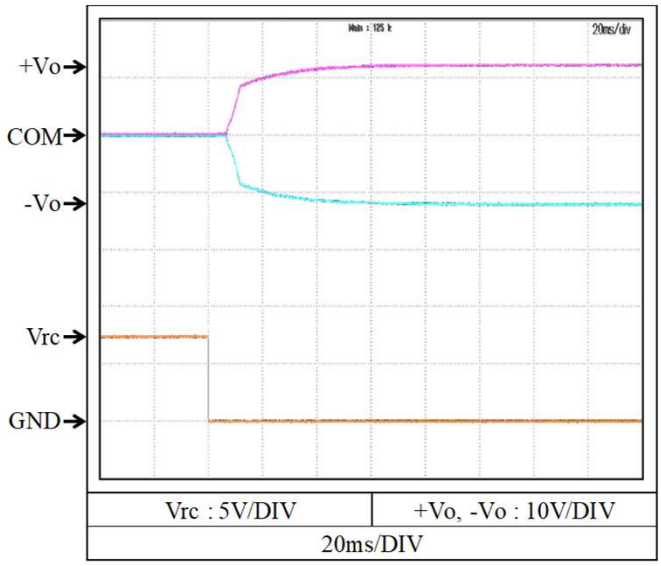
Vrc : 5V/DIV	+Vo, -Vo : 10V/DIV
1s/DIV	

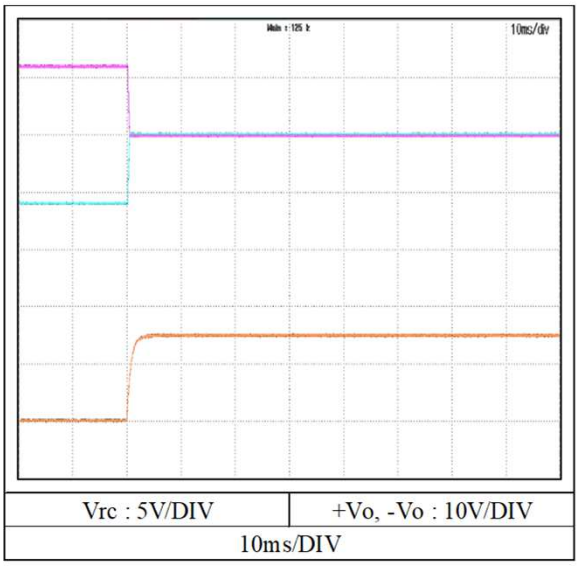
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

Output rise and fall characteristics with REMOTE ON/OFF CONTROL

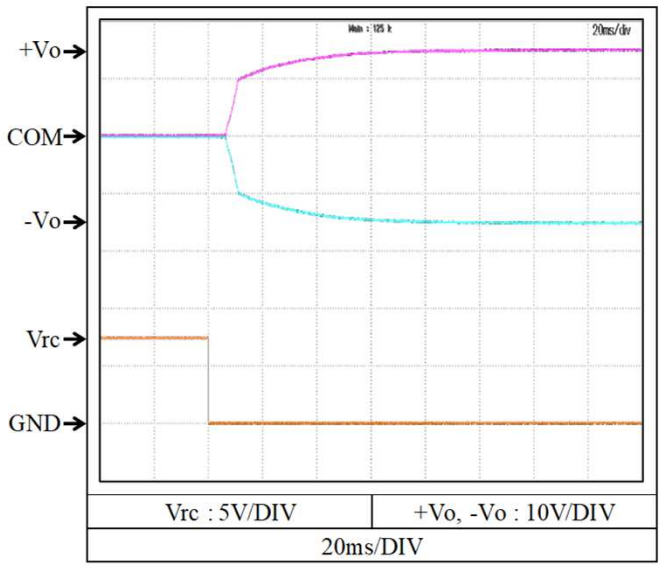
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

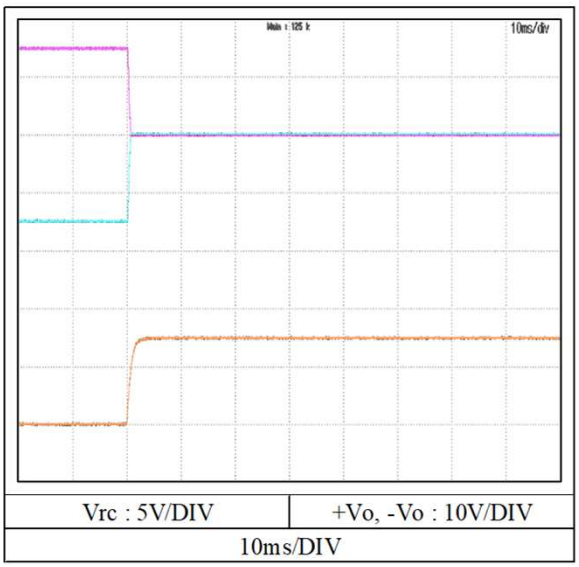
±12V





±15V

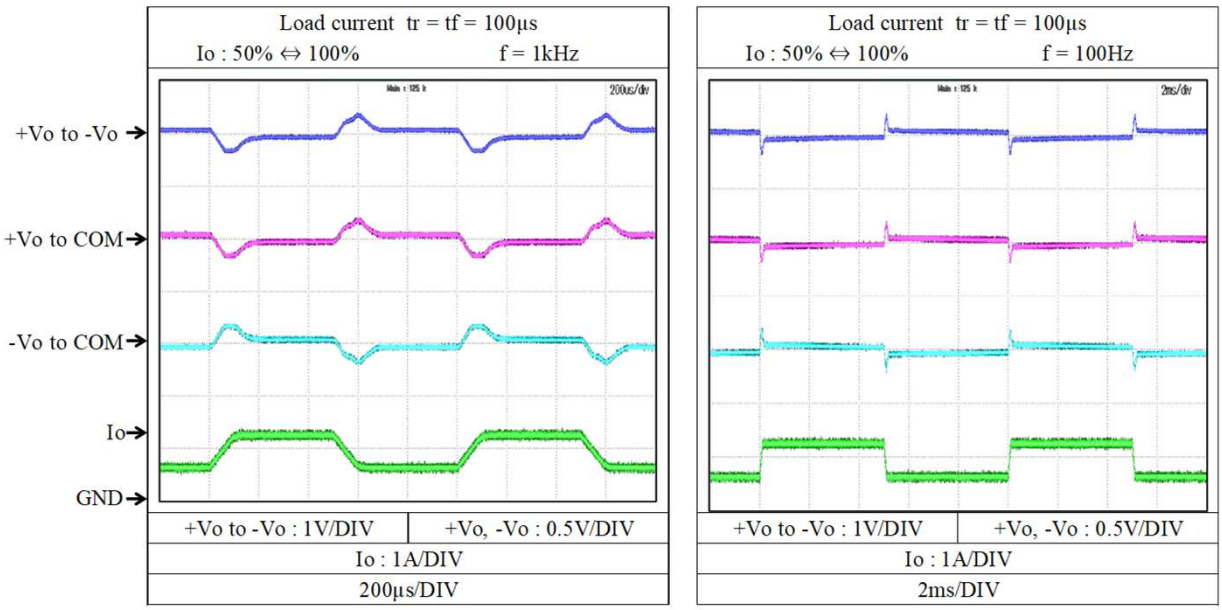




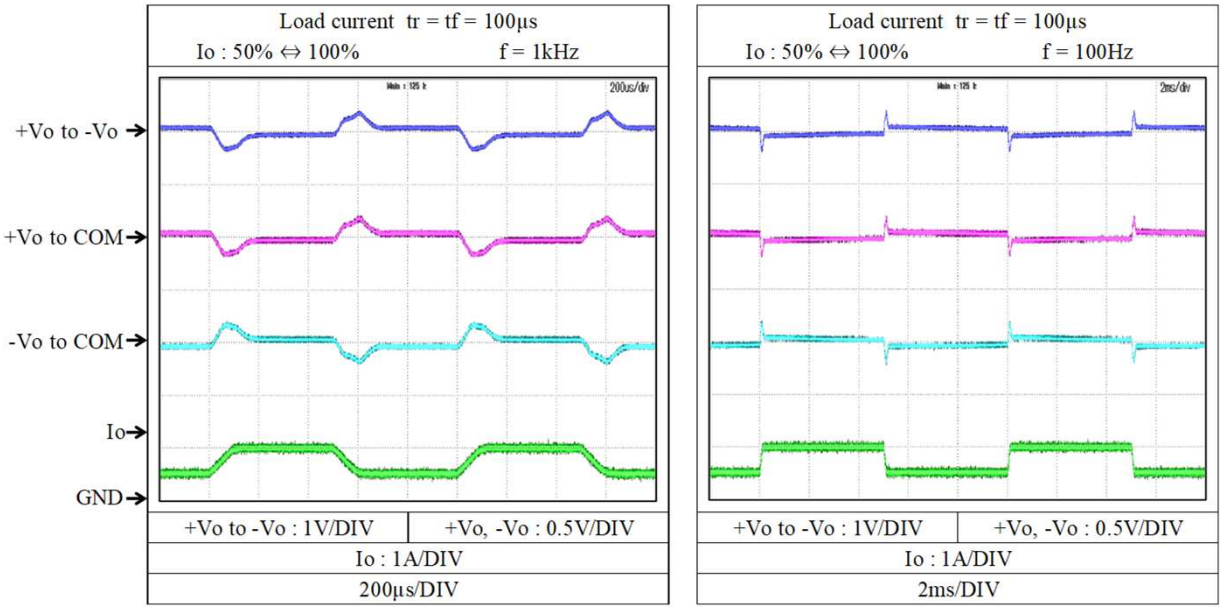
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 24 VDC
Ta : 25 ℃

±12V



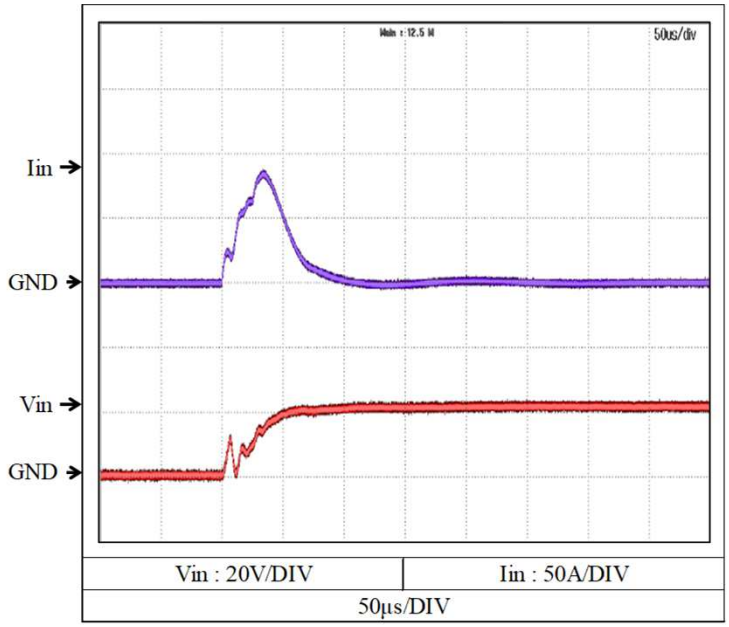
±15V



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

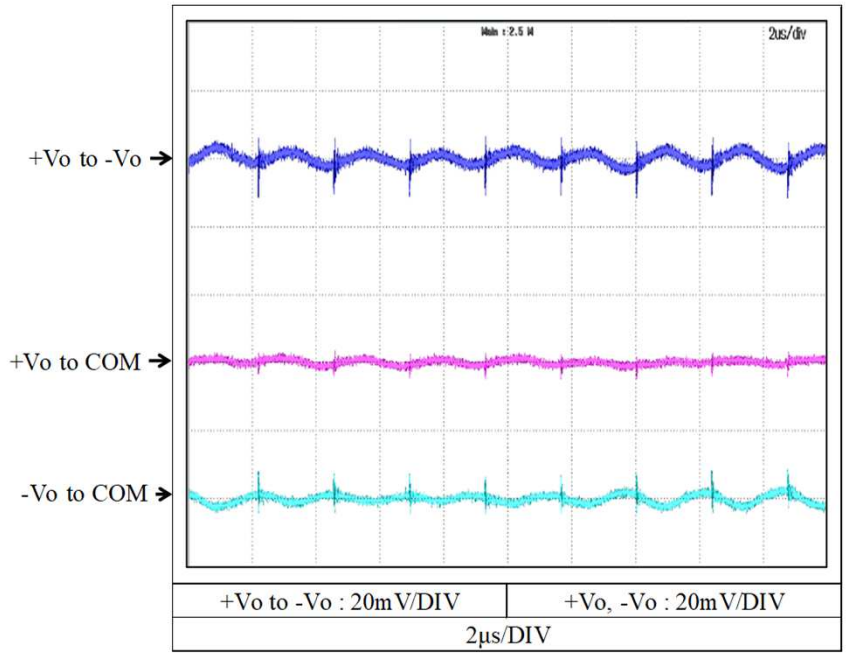
±12V



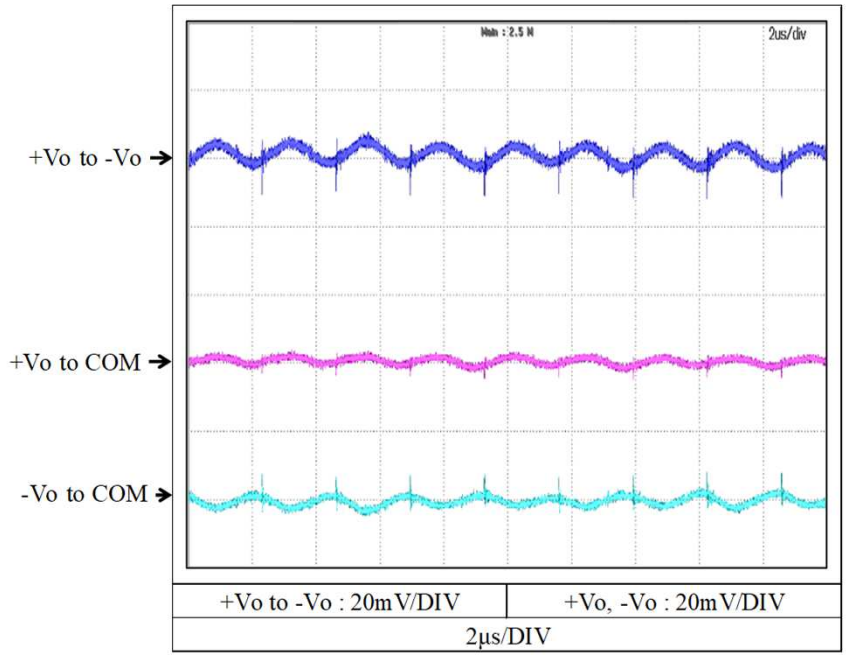
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

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

±12V



±15V

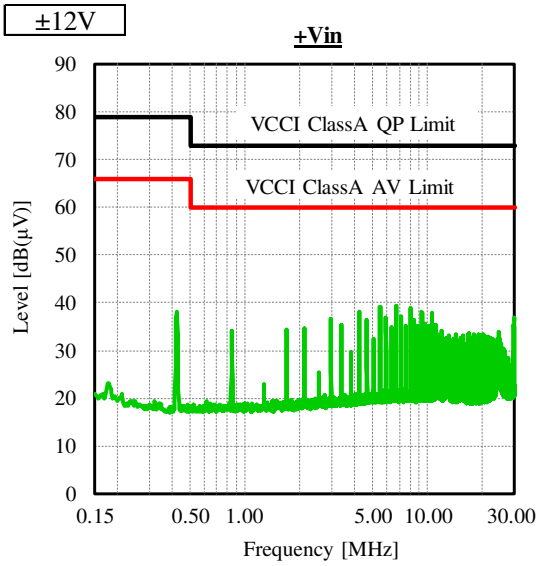


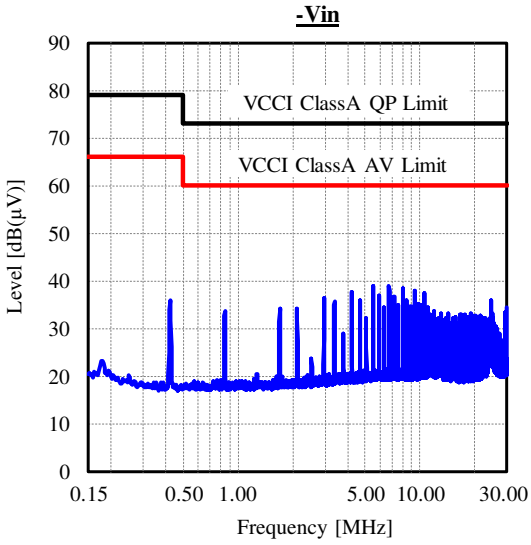
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

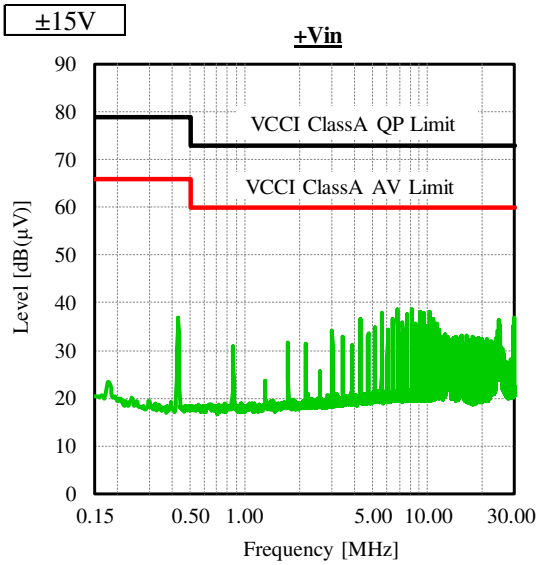
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 ℃

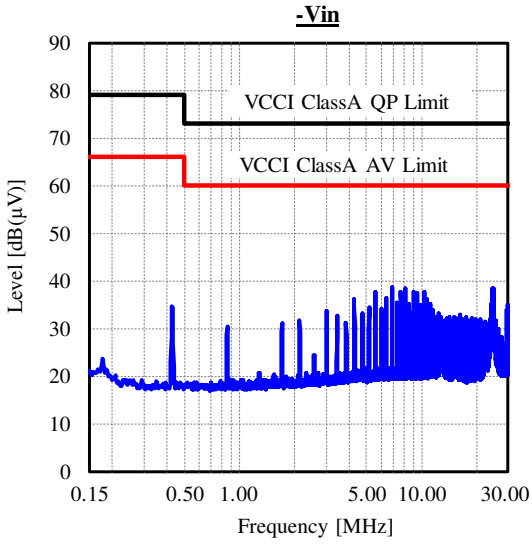
±12V





±15V





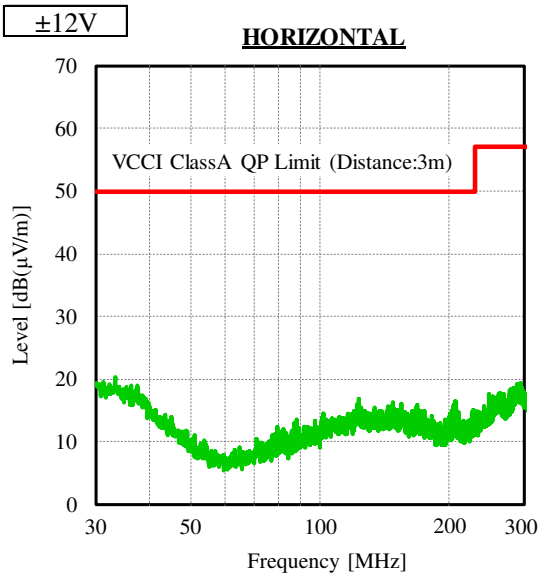
表示はQP値
Indication is QP values.

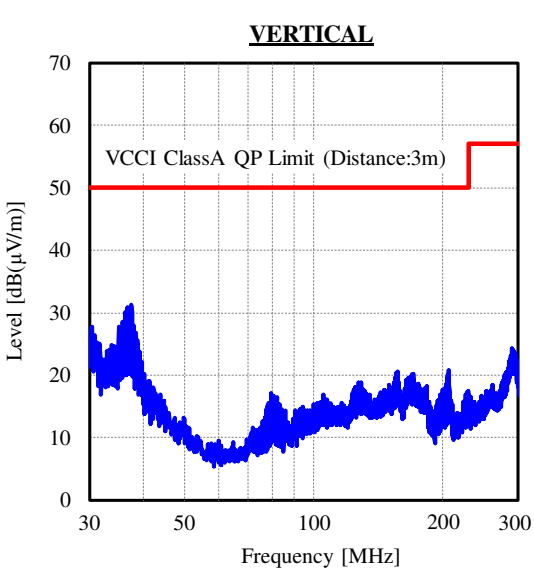
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

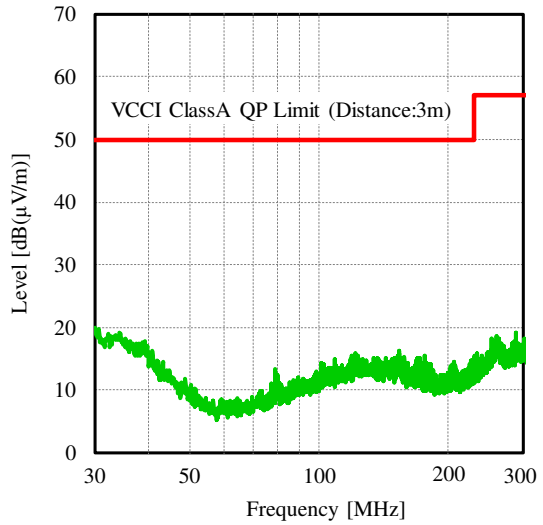
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 ℃

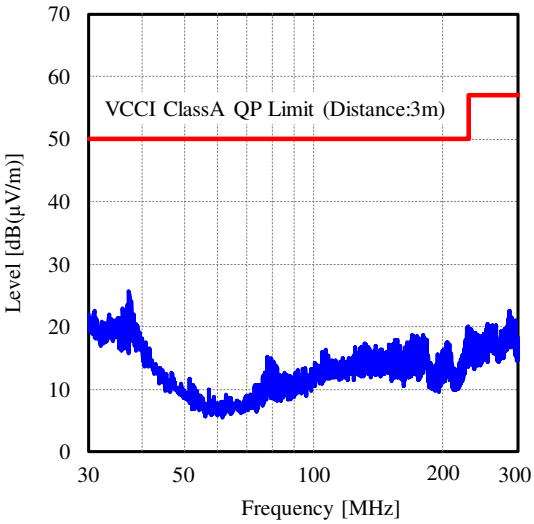
±12V





±15V





表示はピーク値
Indication is peak values.