

CCGS15-48-xxD

EVALUATION DATA

型式データ

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使用記号 Terminology used

定義 Definition		
V _{in}		入力電圧 Input voltage
+V _o , -V _o		出力電圧 Output voltage
COM		出力共通GND Output common GND
V _{RC}		RC電圧 RC voltage
I _{in}		入力電流 Input current
+I _o , -I _o		出力電流 Output current
T _a		周囲温度 Ambient temperature
f		周波数 Frequency

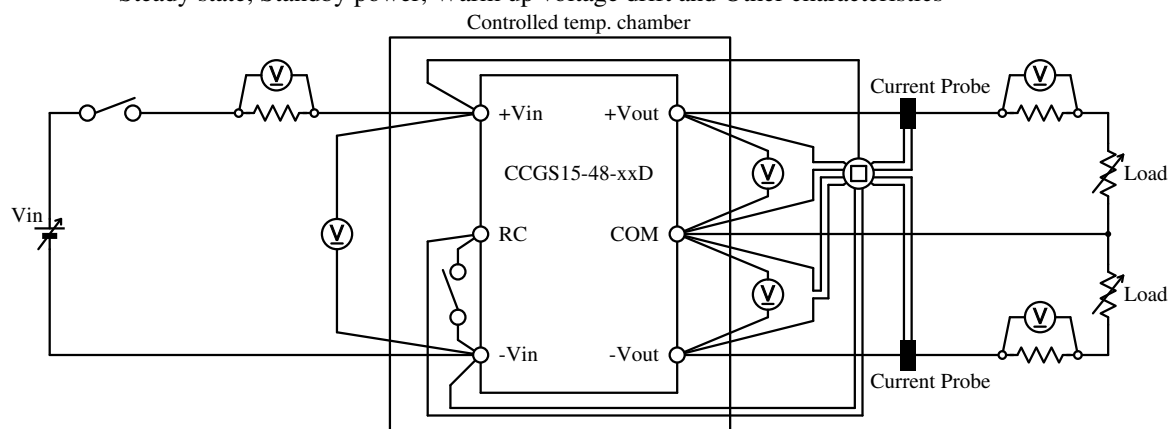
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

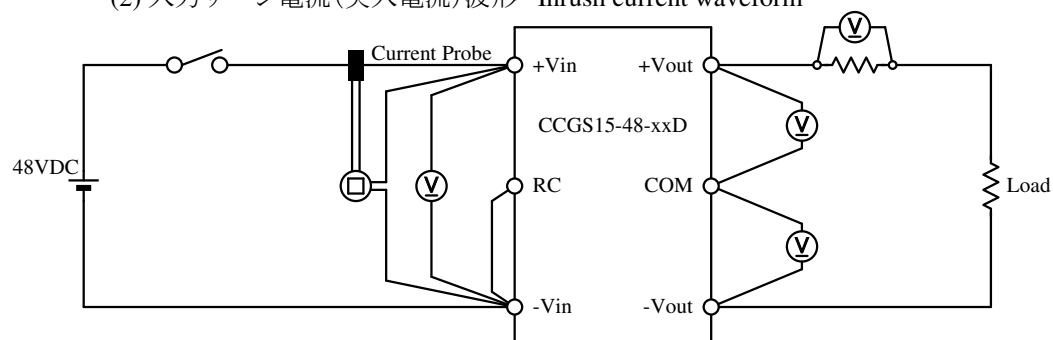
1-1. 測定回路 Measurement Circuits

(1) 静特性、待機電力特性、通電ドリフト特性、その他特性

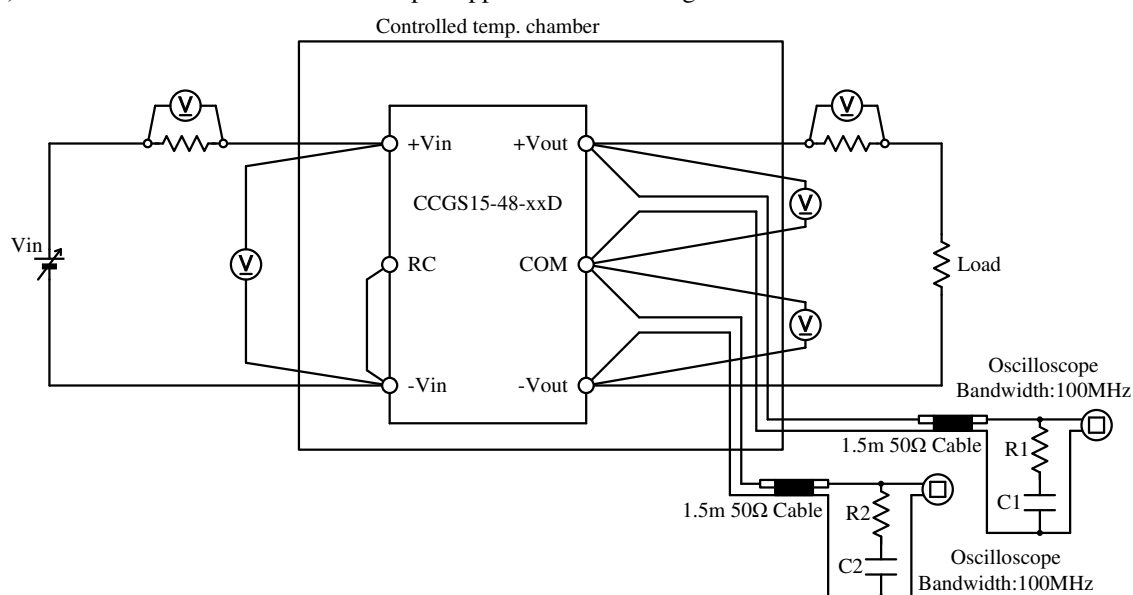
Steady state, Standby power, Warm up voltage drift and Other characteristics



(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



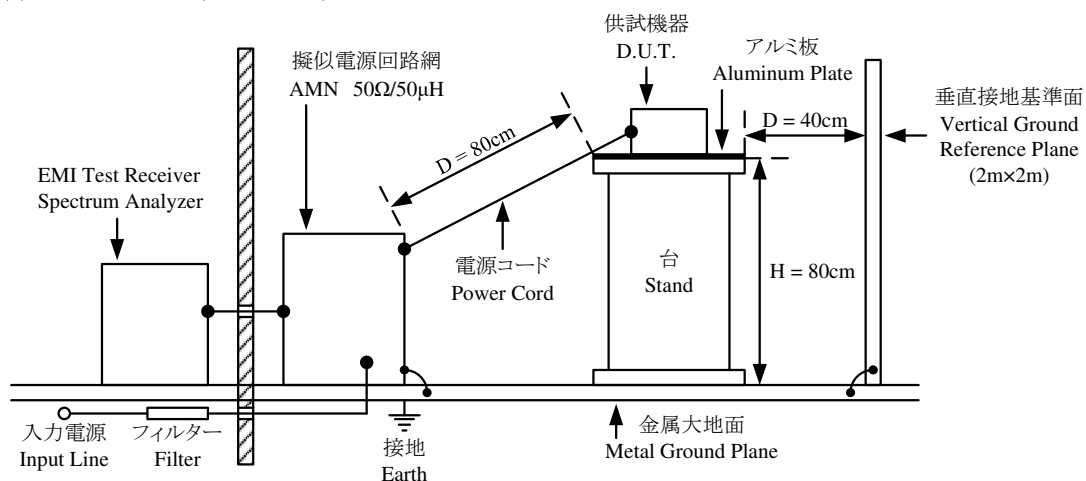
C1, C2 : 4700pF

R1, R2 : 50Ω

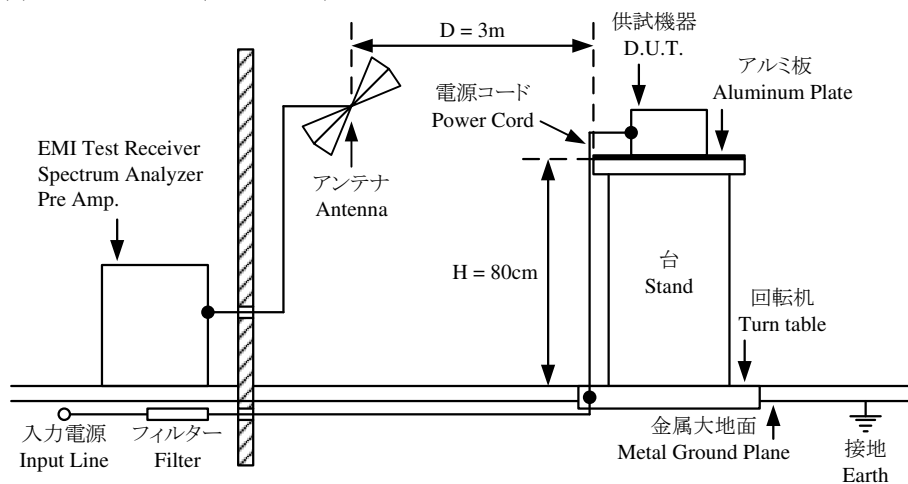
Ceramic Capacitor

(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	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	12.136V	12.139V	12.142V	12.142V	6.5mV	0.054%
50%(0.325A)	12.131V	12.133V	12.133V	12.134V	2.3mV	0.019%
100%(0.65A)	12.132V	12.132V	12.132V	12.133V	1.0mV	0.008%
Load regulation	4.6mV	7.6mV	10.9mV	8.9mV		
	0.038%	0.063%	0.091%	0.074%		

•-Vo to COM

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-12.128V	-12.129V	-12.127V	-12.127V	2.4mV	0.020%
50%(0.325A)	-12.129V	-12.130V	-12.130V	-12.130V	1.4mV	0.012%
100%(0.65A)	-12.127V	-12.129V	-12.130V	-12.130V	2.6mV	0.022%
Load regulation	1.6mV	1.3mV	3.5mV	3.8mV		
	0.013%	0.011%	0.029%	0.032%		

•+Vo to -Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	24.264V	24.268V	24.269V	24.268V	4.8mV	0.020%
50%(0.325A)	24.260V	24.263V	24.263V	24.264V	3.7mV	0.015%
100%(0.65A)	24.259V	24.261V	24.261V	24.263V	3.2mV	0.013%
Load regulation	5.0mV	7.4mV	7.8mV	5.6mV		
	0.021%	0.031%	0.033%	0.023%		

2. Temperature drift

Conditions Vin : 48 VDC

Io : 100 %

Ta	-20°C	25°C	70°C	Temperature stability	
+Vo to COM	12.114V	12.132V	12.152V	37.5mV	0.312%
-Vo to COM	-12.114V	-12.130V	-12.148V	33.3mV	0.278%
+Vo to -Vo	24.229V	24.261V	24.300V	70.8mV	0.295%

3. Load Regulation - Unbalance load

Conditions Ta : 25 °C

-Io : 100 %

•+Vo to COM

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.13A)	12.002V	12.002V	12.002V	12.002V
100%(0.65A)	12.129V	12.129V	12.130V	12.131V
Load regulation	126.7mV	126.9mV	127.7mV	129.2mV
	1.056%	1.058%	1.064%	1.077%

Conditions Ta : 25 °C

+Io : 100 %

•-Vo to COM

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.13A)	11.994V	11.993V	11.993V	11.993V
100%(0.65A)	12.124V	12.127V	12.128V	12.129V
Load regulation	130.2mV	133.3mV	134.2mV	135.2mV
	1.085%	1.111%	1.118%	1.127%

$\pm 15V$

1. Regulation - line and load

Condition Ta : 25 °C

• +Vo to COM

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	15.183V	15.190V	15.193V	15.202V	19.2mV	0.128%
50%(0.25A)	15.148V	15.150V	15.150V	15.149V	1.9mV	0.013%
100%(0.5A)	15.156V	15.146V	15.142V	15.140V	16.0mV	0.107%
Load regulation	34.5mV 0.230%	43.8mV 0.292%	51.2mV 0.341%	61.7mV 0.411%		

• -Vo to COM

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-15.124V	-15.121V	-15.119V	-15.110V	13.8mV	0.092%
50%(0.25A)	-15.155V	-15.158V	-15.157V	-15.158V	2.8mV	0.019%
100%(0.5A)	-15.148V	-15.161V	-15.166V	-15.167V	18.7mV	0.125%
Load regulation	31.5mV 0.210%	40.1mV 0.267%	47.4mV 0.316%	56.9mV 0.379%		

• +Vo to -Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	30.306V	30.311V	30.311V	30.312V	5.4mV	0.018%
50%(0.25A)	30.303V	30.308V	30.307V	30.307V	4.7mV	0.016%
100%(0.5A)	30.304V	30.307V	30.308V	30.307V	3.4mV	0.011%
Load regulation	3.0mV 0.010%	3.6mV 0.012%	4.0mV 0.013%	4.8mV 0.016%		

2. Temperature drift

Conditions Vin : 48 VDC

Io : 100 %

Ta	-20°C	25°C	70°C	Temperature stability	
+Vo to COM	15.117V	15.142V	15.177V	60.1mV	0.401%
-Vo to COM	-15.152V	-15.166V	-15.196V	43.3mV	0.289%
+Vo to -Vo	30.269V	30.308V	30.372V	103.4mV	0.345%

3. Load Regulation - Unbalance load

Conditions Ta : 25 °C

-Io : 100 %

• +Vo to COM

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.1A)	15.040V	15.041V	15.041V	15.038V
100%(0.5A)	15.195V	15.184V	15.180V	15.178V
Load regulation	154.9mV 1.033%	142.9mV 0.953%	139.2mV 0.928%	139.6mV 0.931%

Conditions Ta : 25 °C

+Io : 100 %

• -Vo to COM

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.1A)	14.985V	14.989V	14.987V	14.984V
100%(0.5A)	15.182V	15.194V	15.199V	15.199V
Load regulation	196.9mV 1.313%	205.7mV 1.371%	211.7mV 1.411%	215.1mV 1.434%

(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

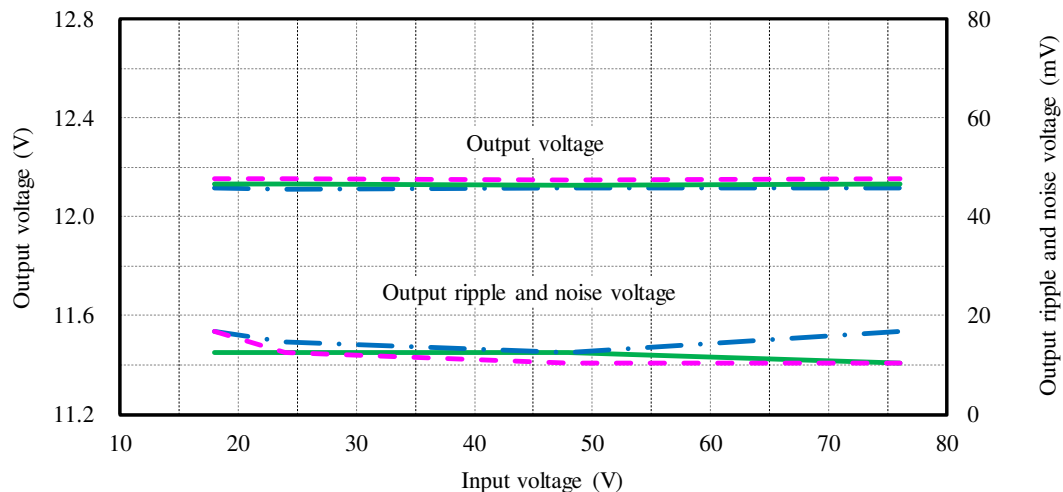
Conditions I_o : 100 % T_a : -20 °C

: 25 °C

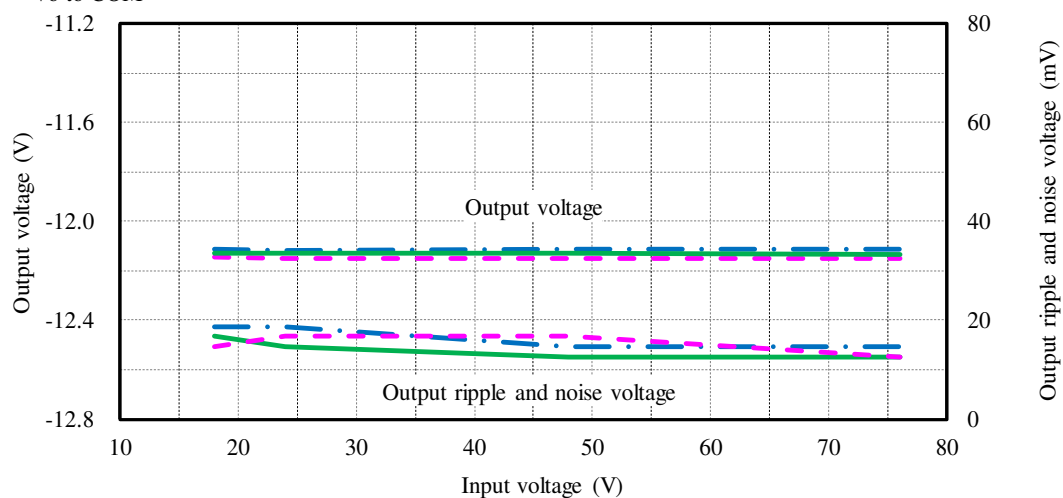
: 70 °C

 $\pm 12V$

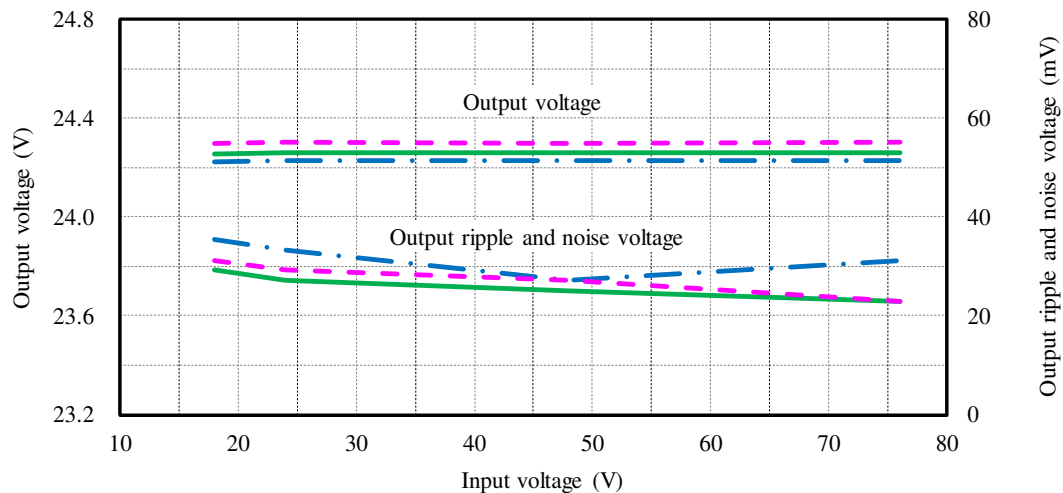
• +Vo to COM



• -Vo to COM



• +Vo to -Vo

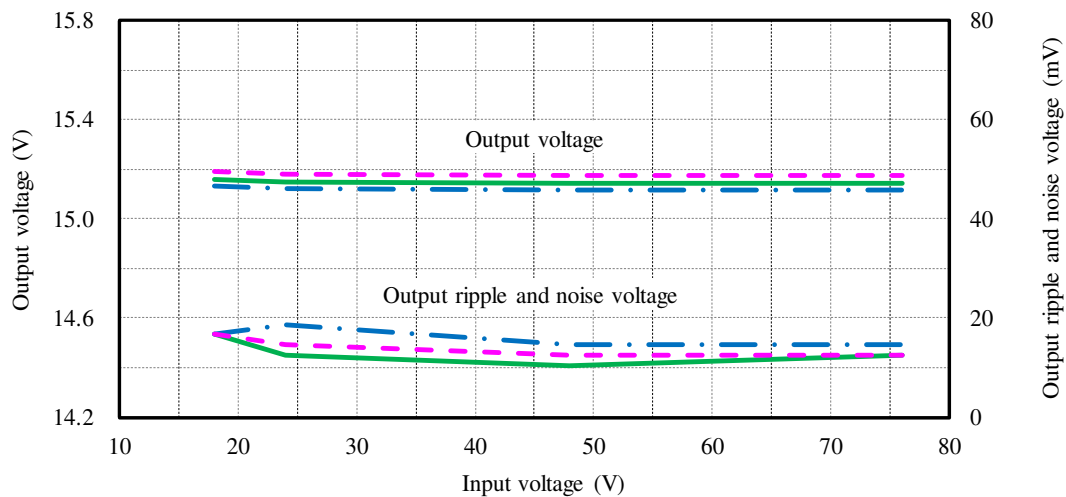


Conditions I_o : 100 % T_a : -40 °C

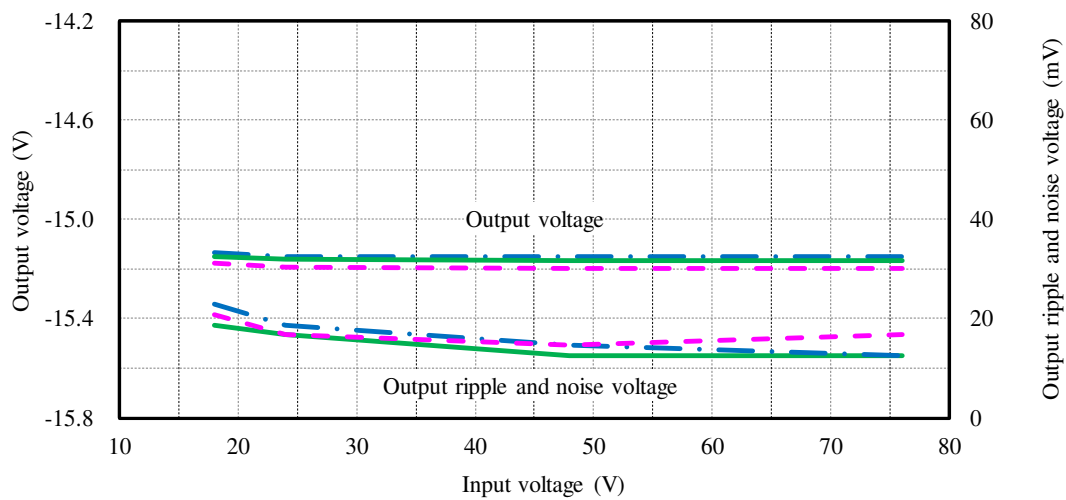
: 25 °C

: 85 °C

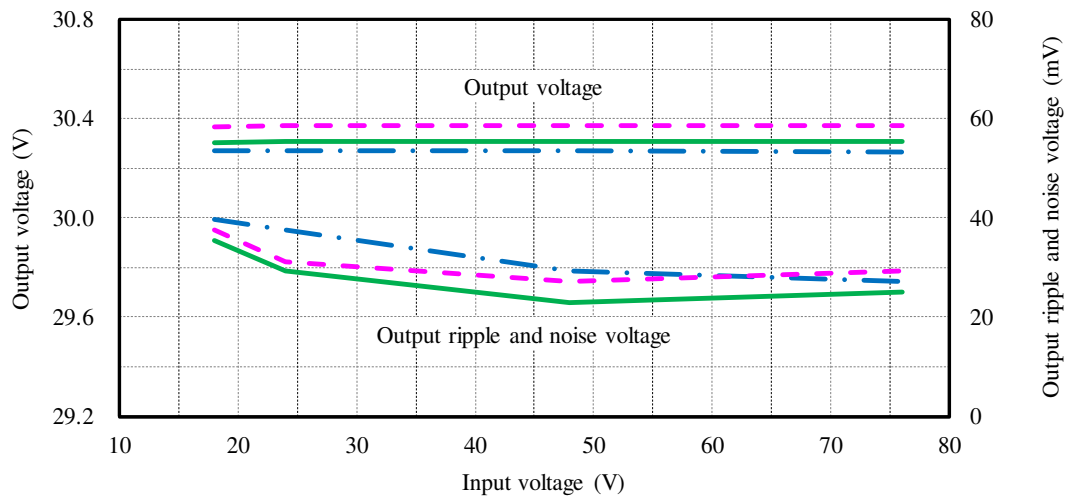
±15V
 • +Vo to COM



• -Vo to COM



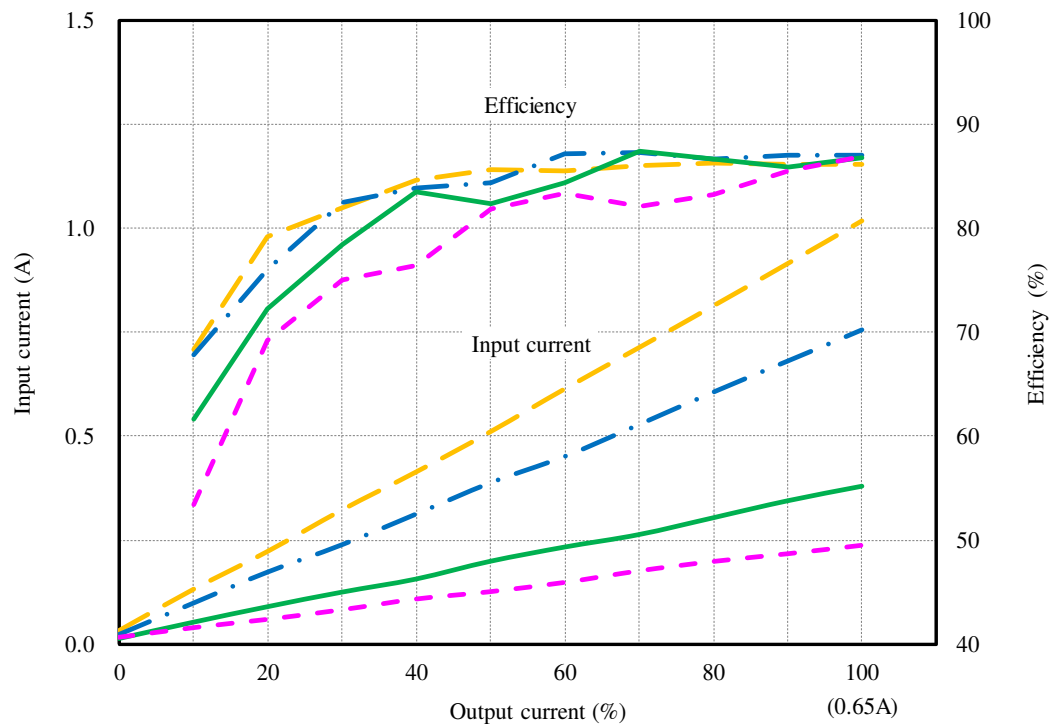
• +Vo to -Vo



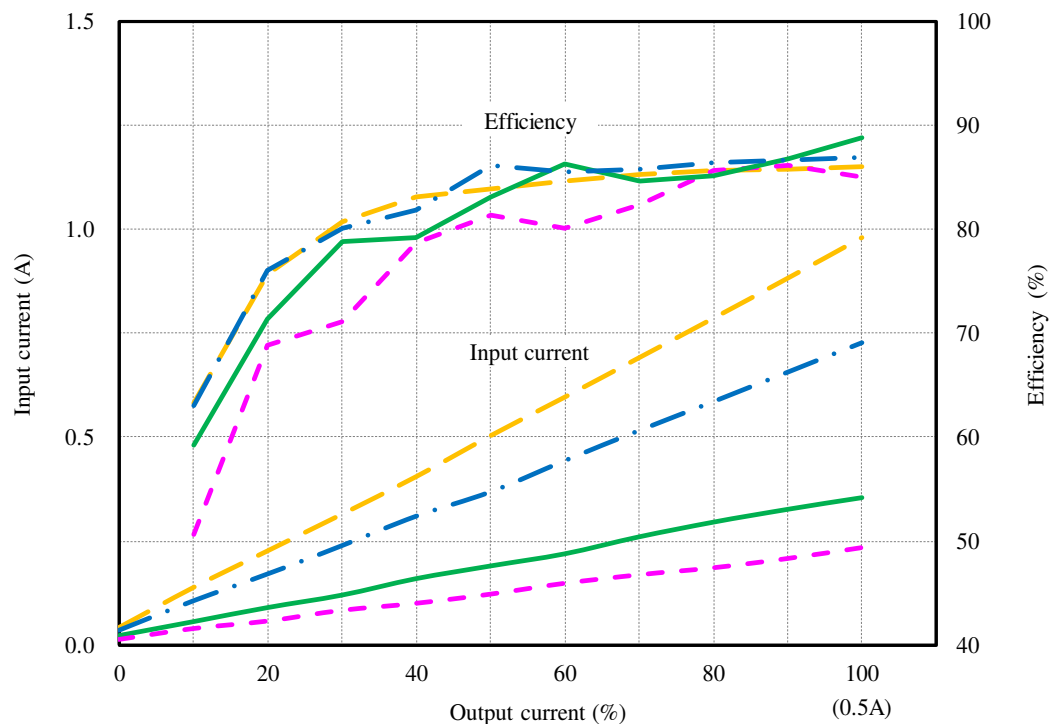
(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 18 VDC
 : 24 VDC
 : 48 VDC
 : 76 VDC
 Ta : 25 °C

±12V



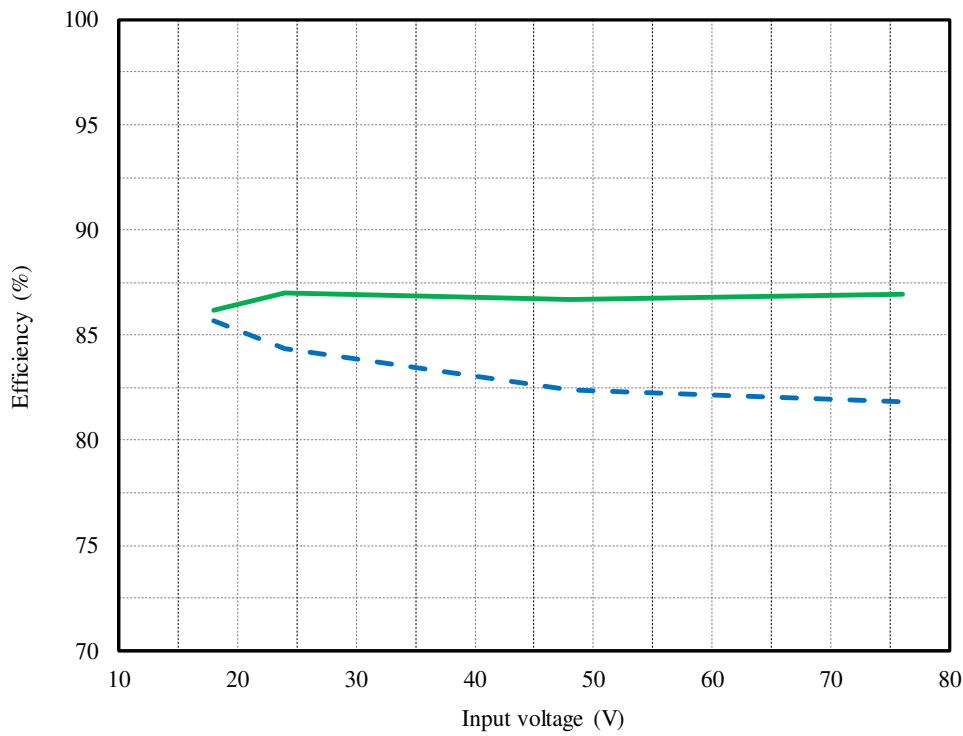
±15V



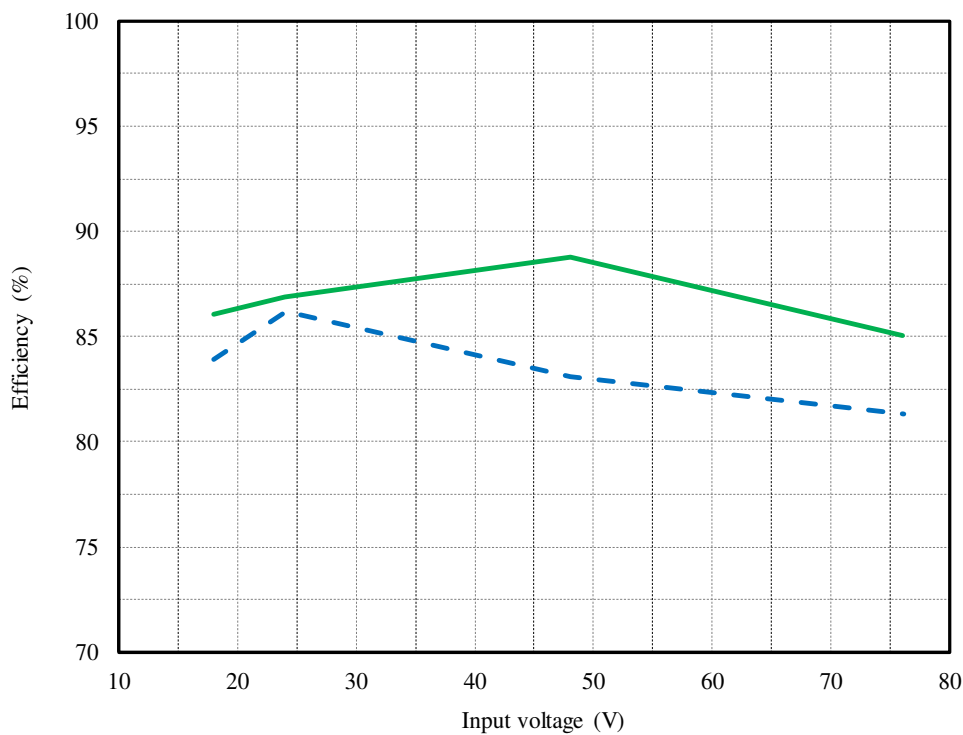
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

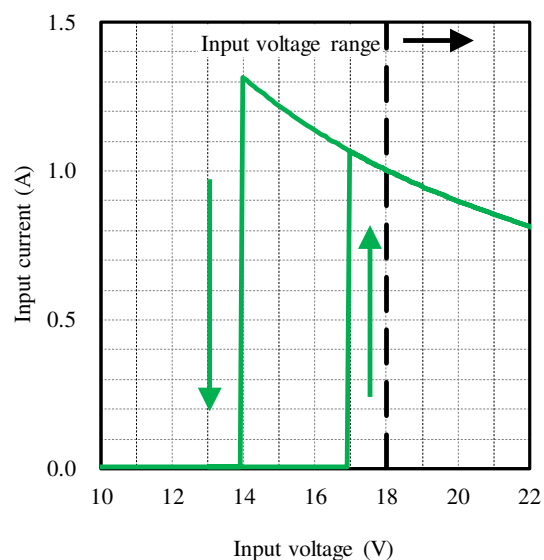
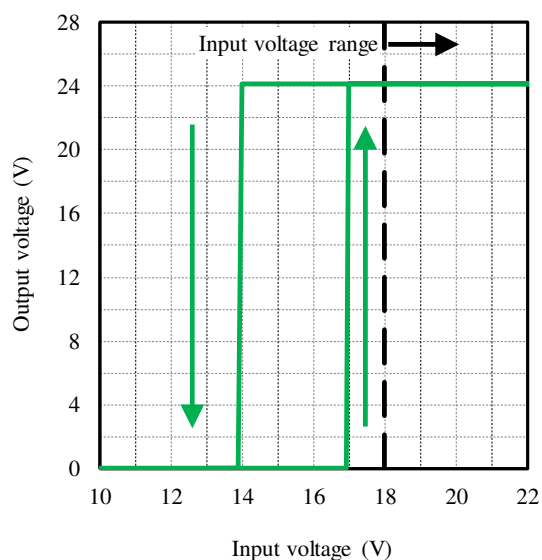
出力電圧 対 入力電圧
Output voltage vs. Input voltage

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

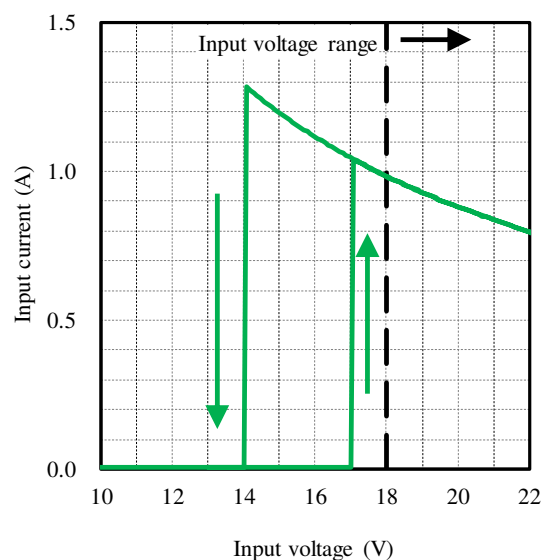
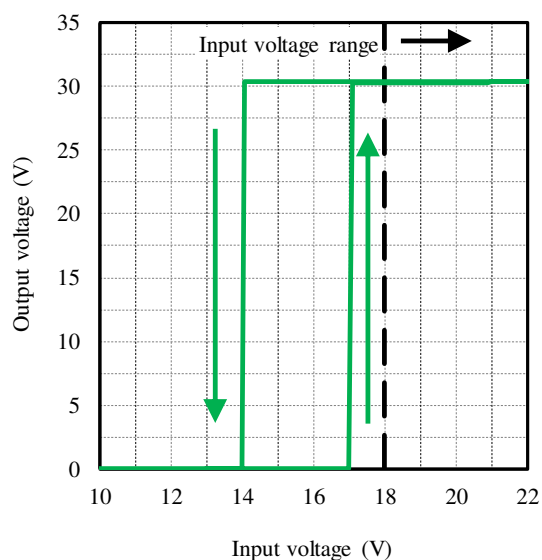
Conditions I_o : 100 %
 T_a : 25 °C

Conditions I_o : 100 %
 T_a : 25 °C

±12V

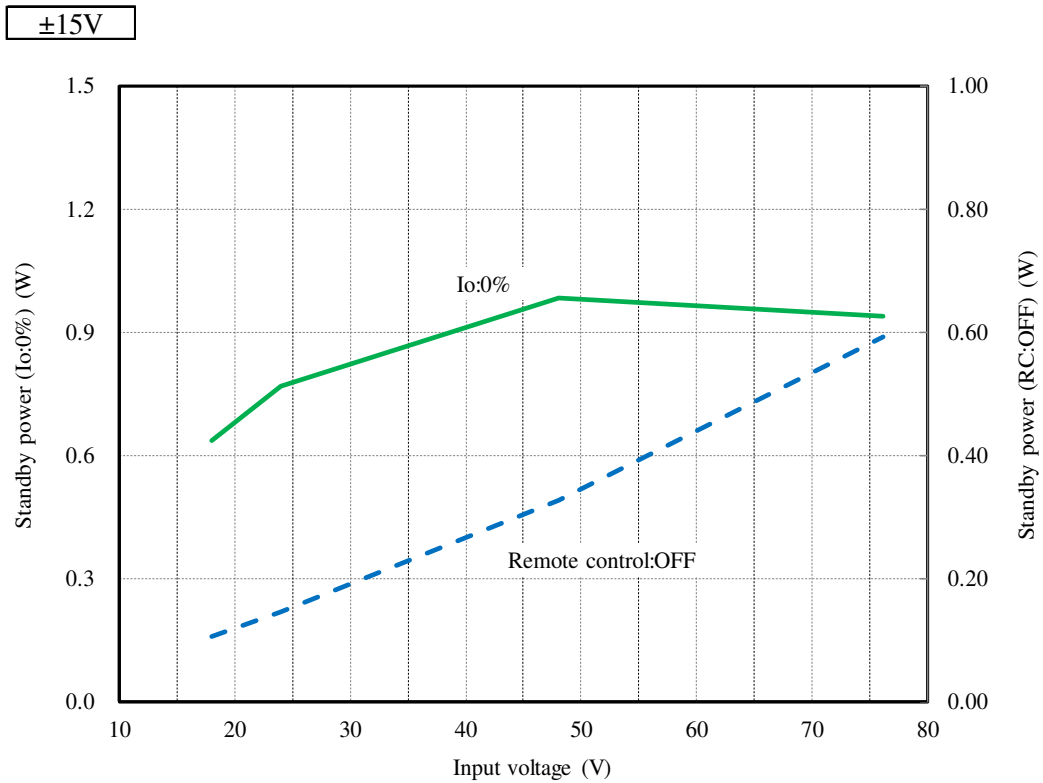
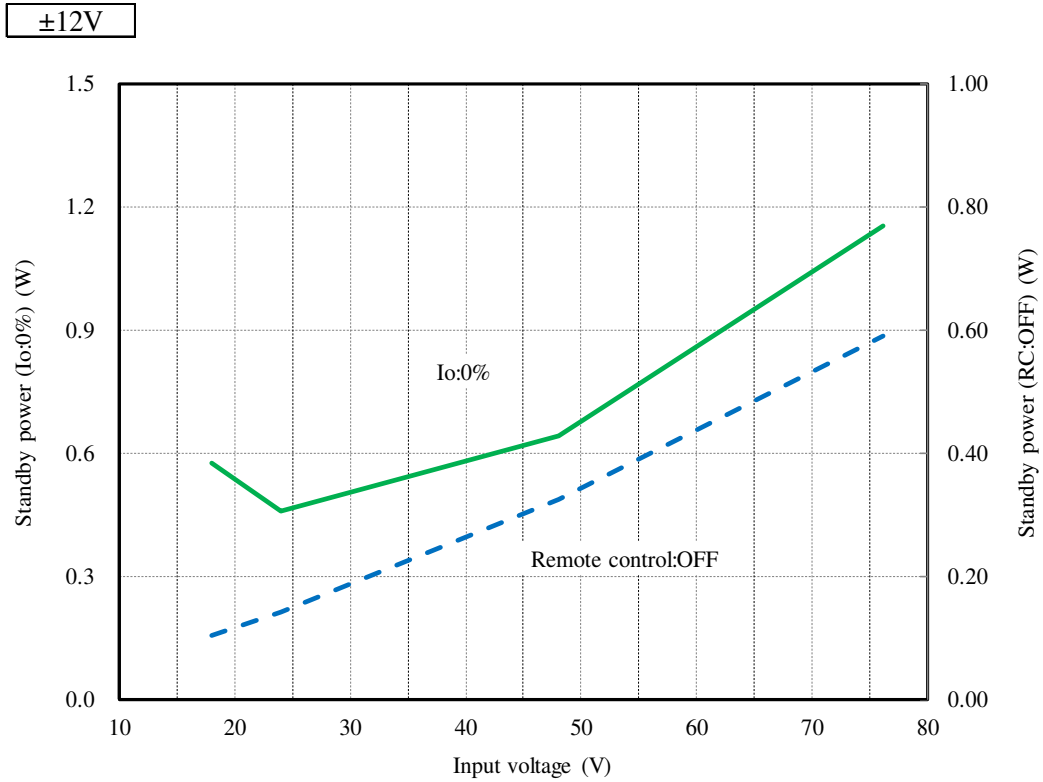


±15V

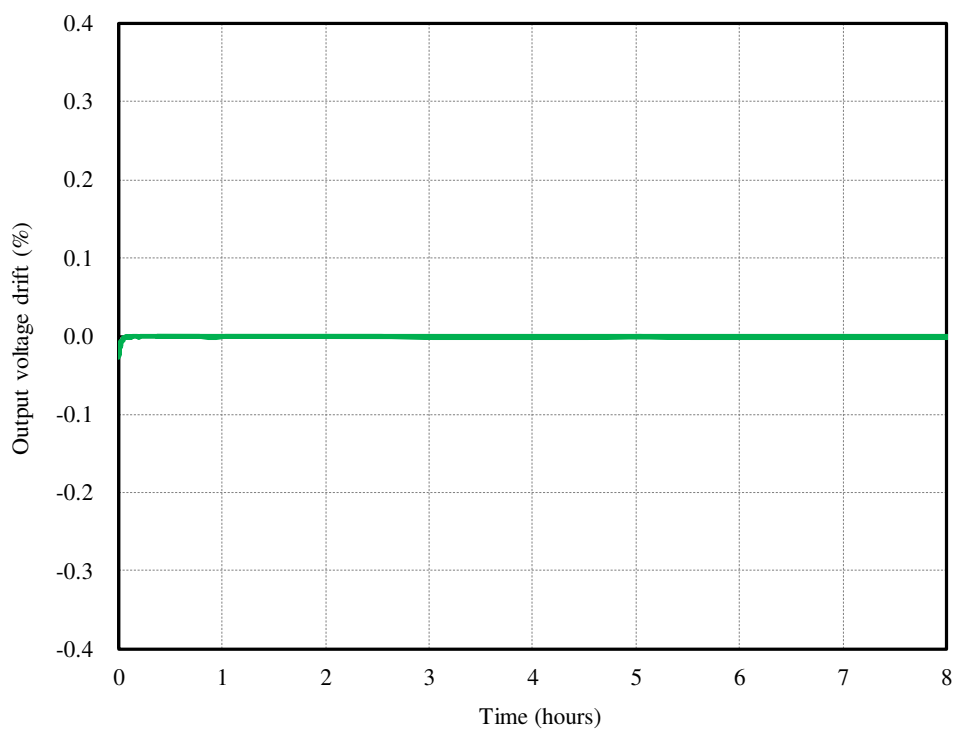
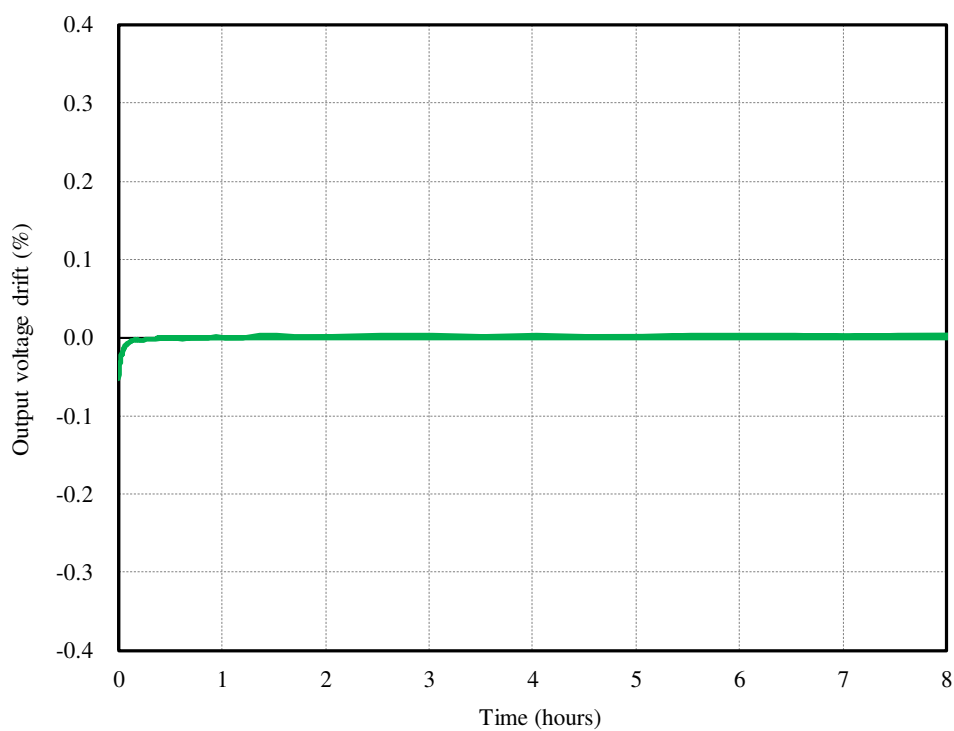


2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C



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

Conditions V_{in} : 48 VDC I_o : 100 % T_a : 25 °C $\pm 12V$  $\pm 15V$ 

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

入力電圧依存性

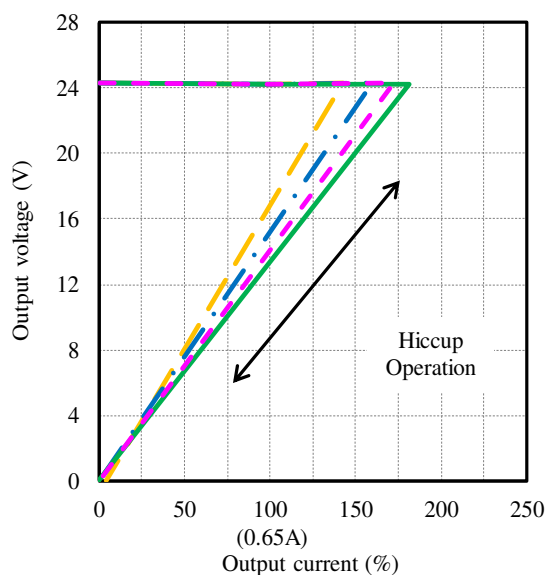
Input voltage dependence

周囲温度依存性

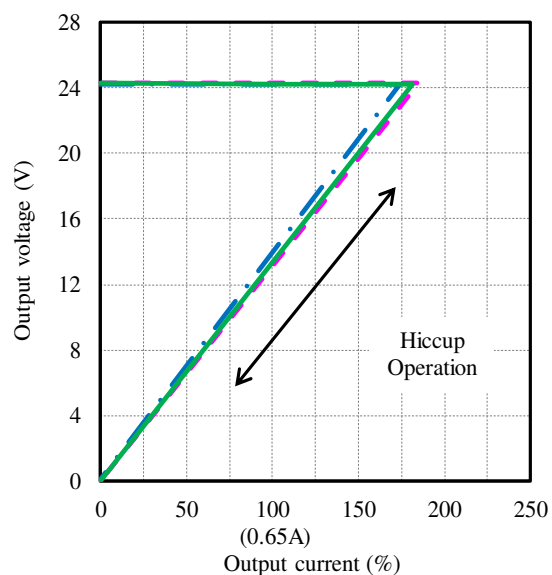
Ambient temperature dependence

Conditions V_{in} : 18 VDC — — —
 : 24 VDC — · —
 : 48 VDC — — —
 : 76 VDC — — —
 T_a : 25 °C

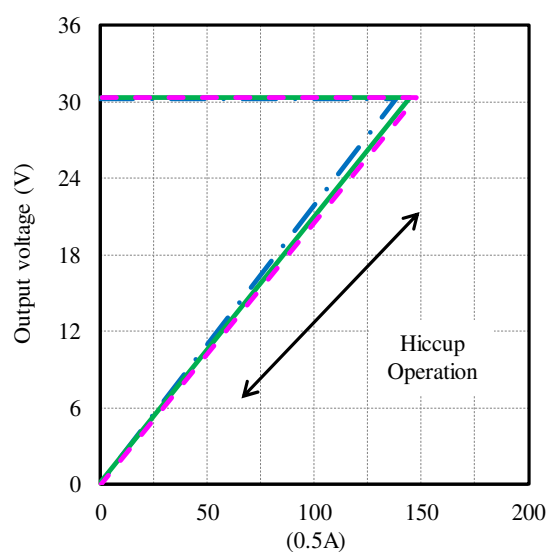
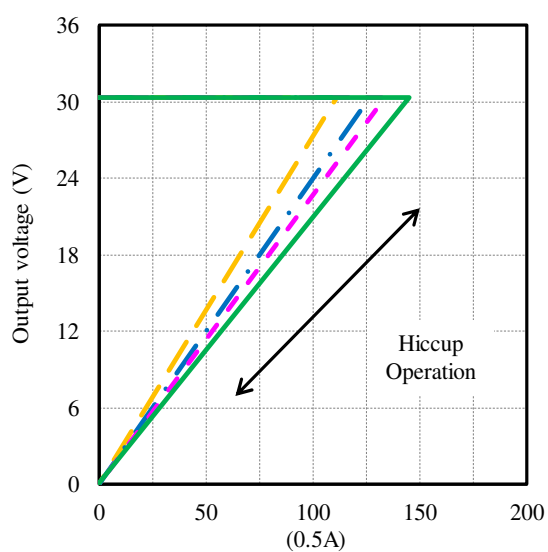
±12V



Conditions V_{in} : 48 VDC
 T_a : -20 °C — · —
 : 25 °C — — —
 : 70 °C — — · —

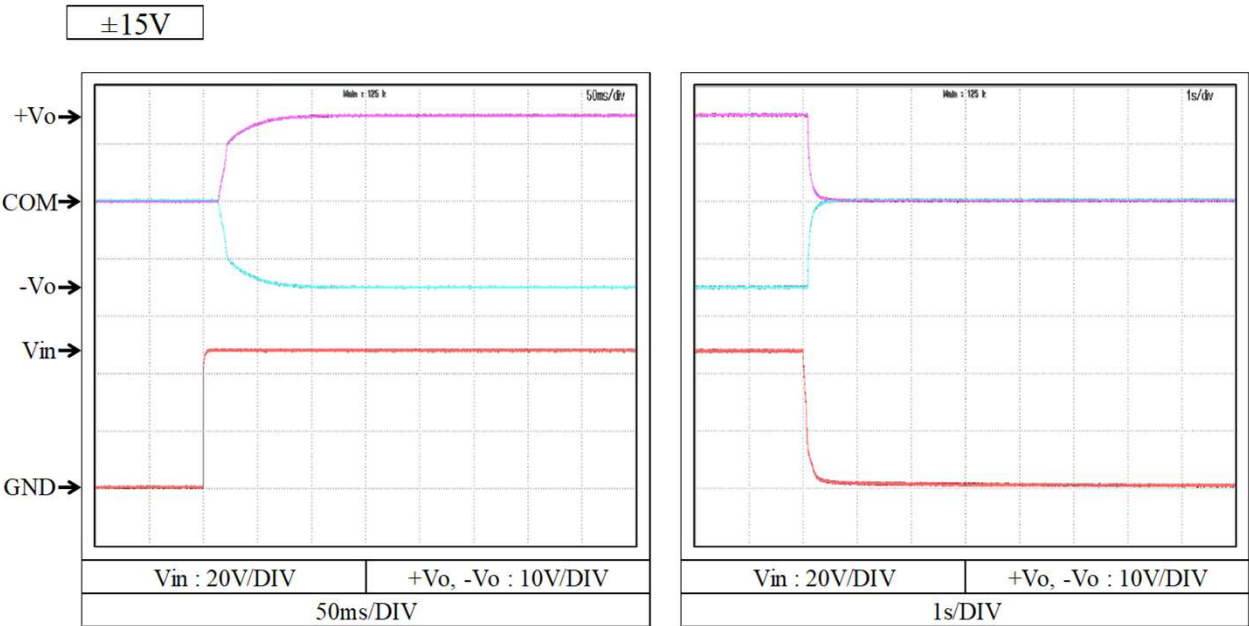
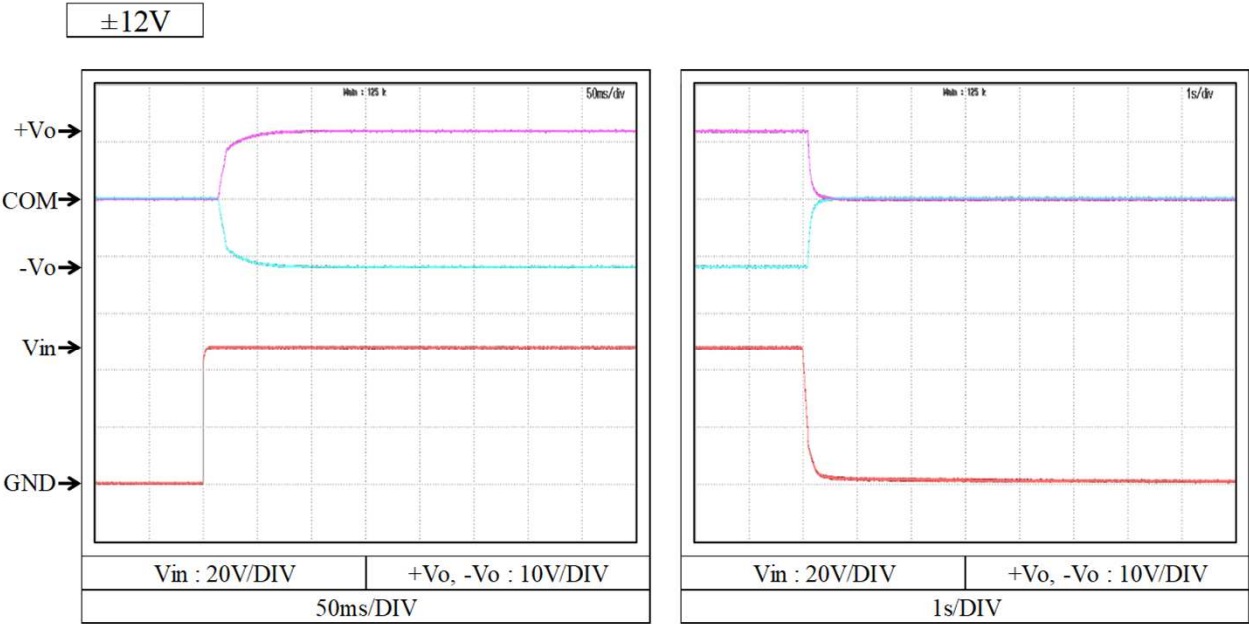


±15V



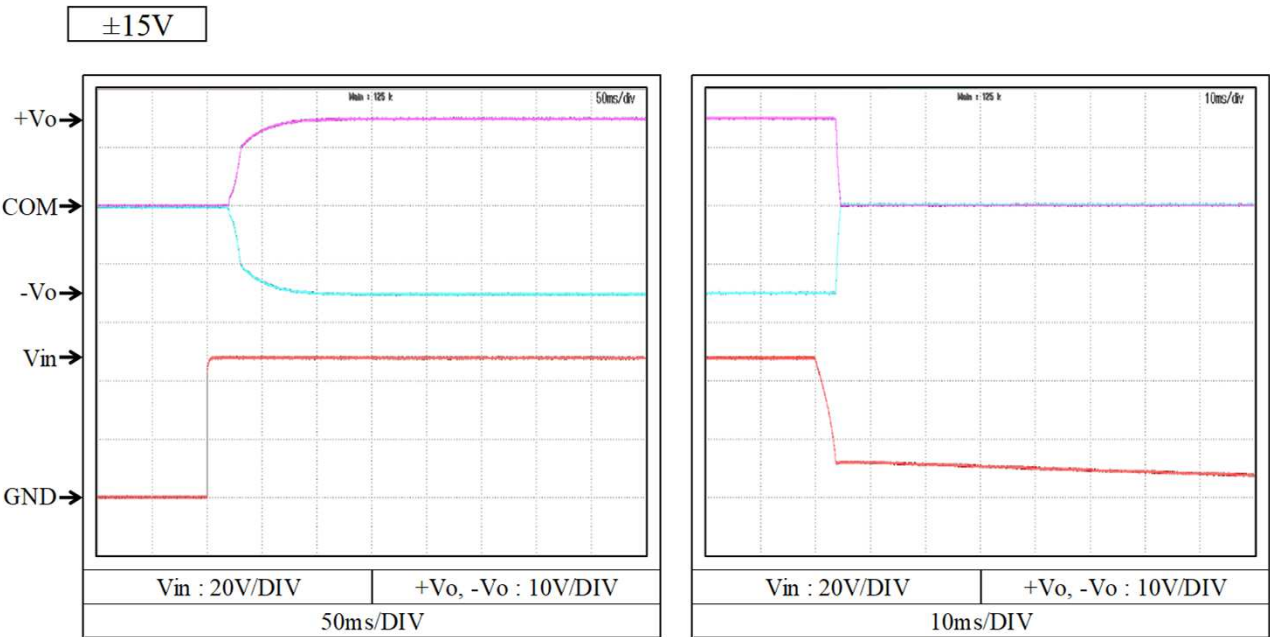
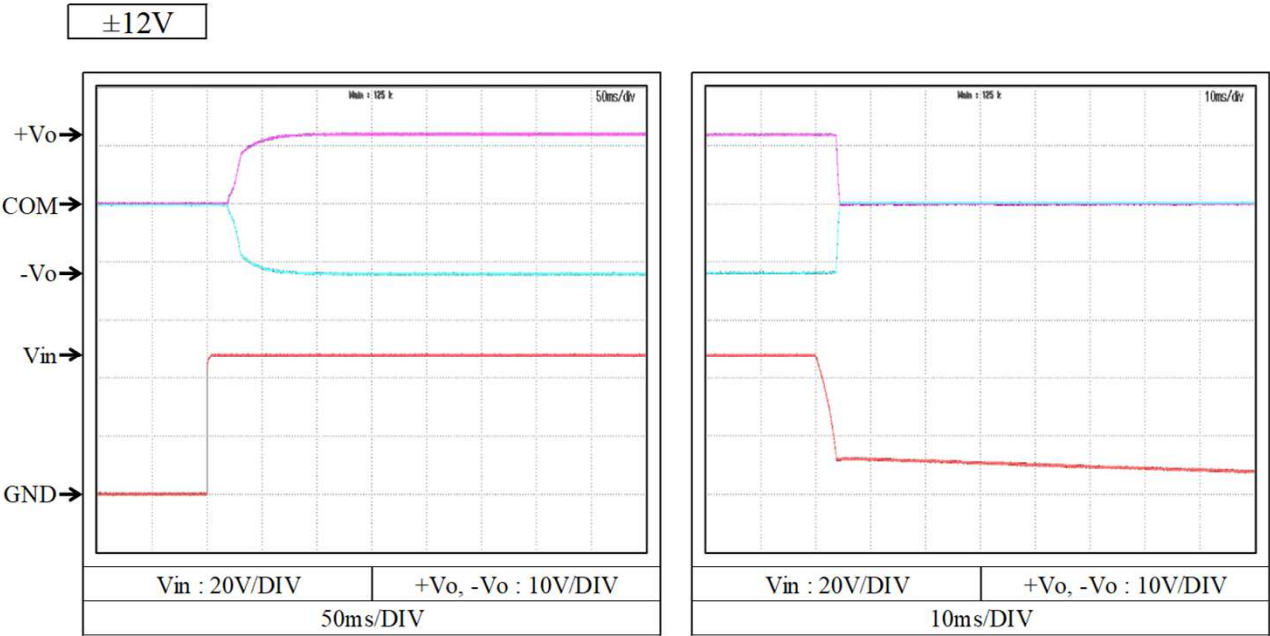
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
 Io : 0 %
 Ta : 25 °C



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

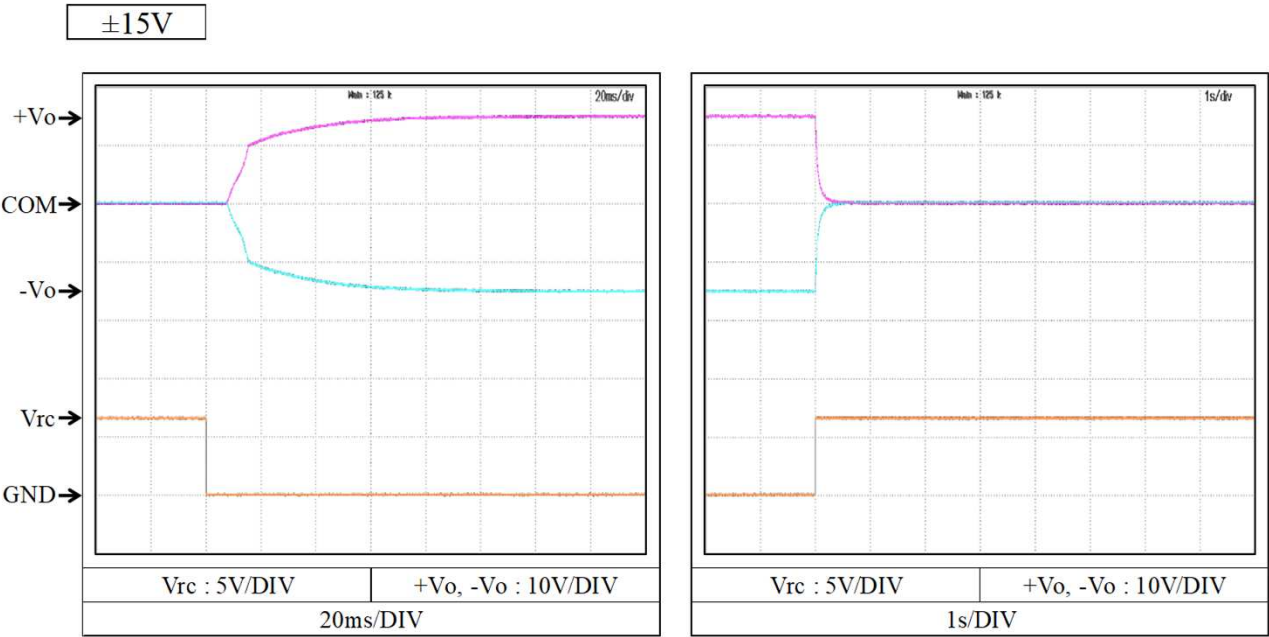
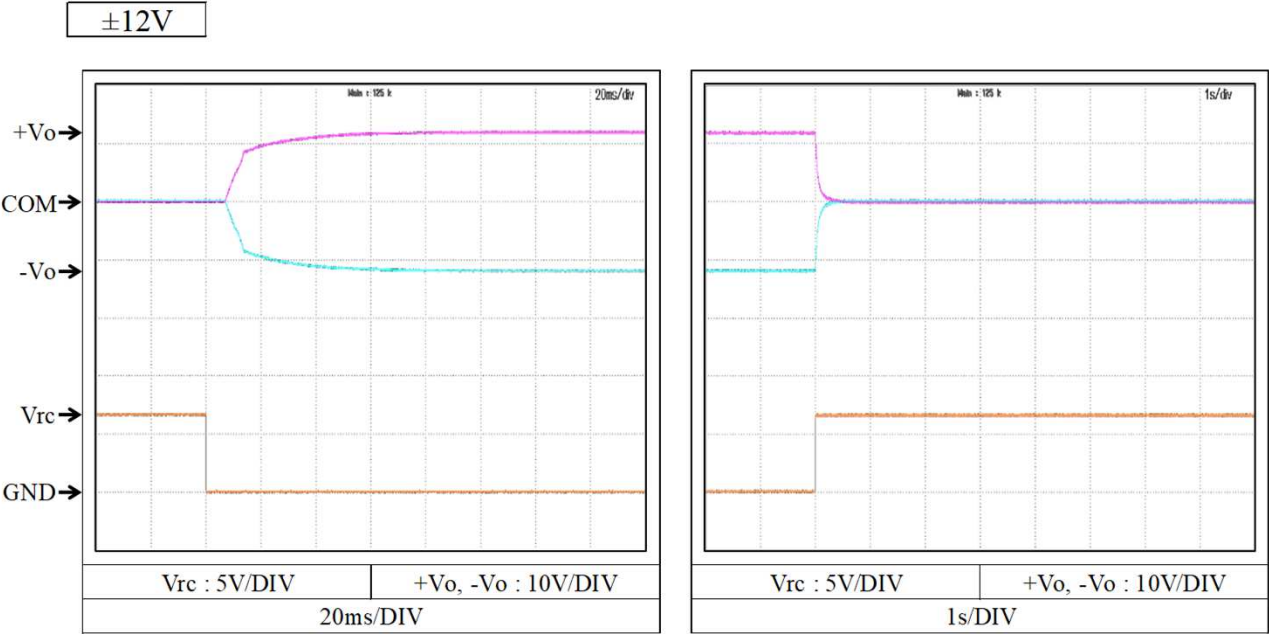
Conditions V_{in} : 48 VDC
 I_o : 100 %
 T_a : 25 °C



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)

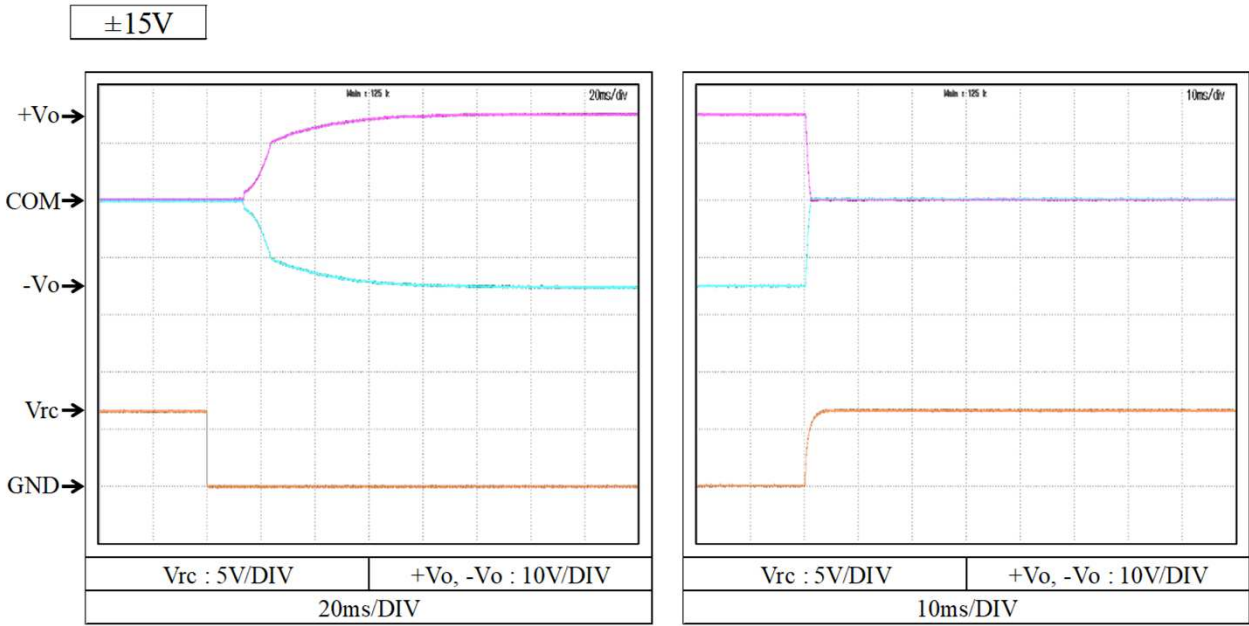
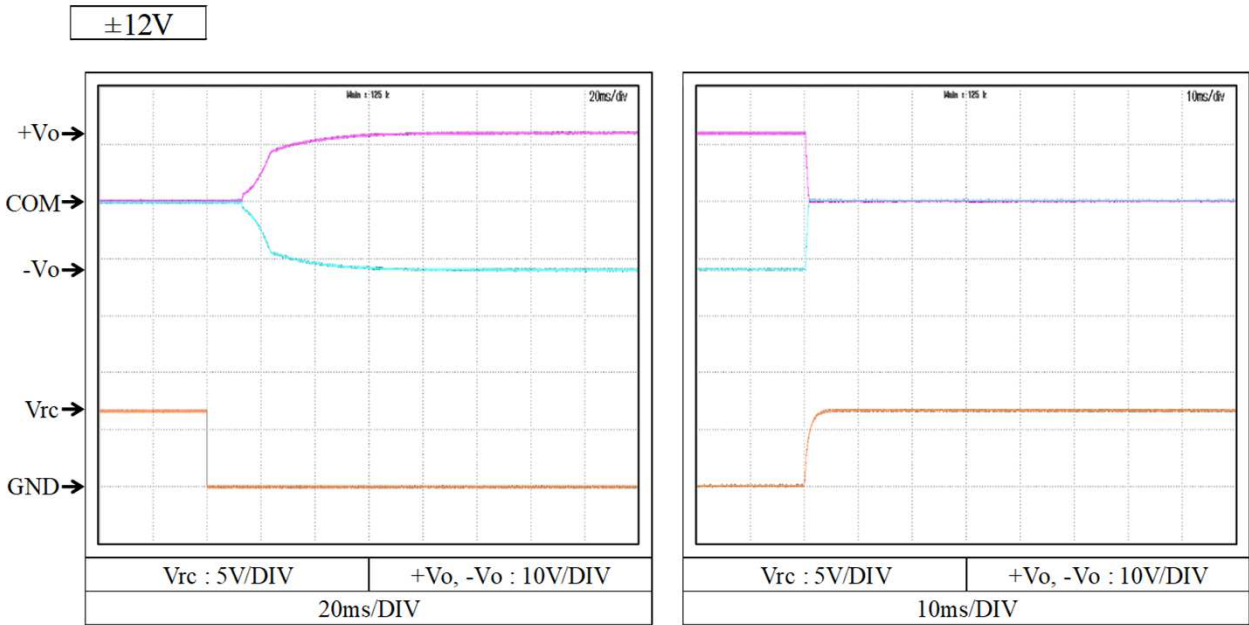
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions V_{in} : 48 VDC
 I_o : 0 %
 T_a : 25 °C



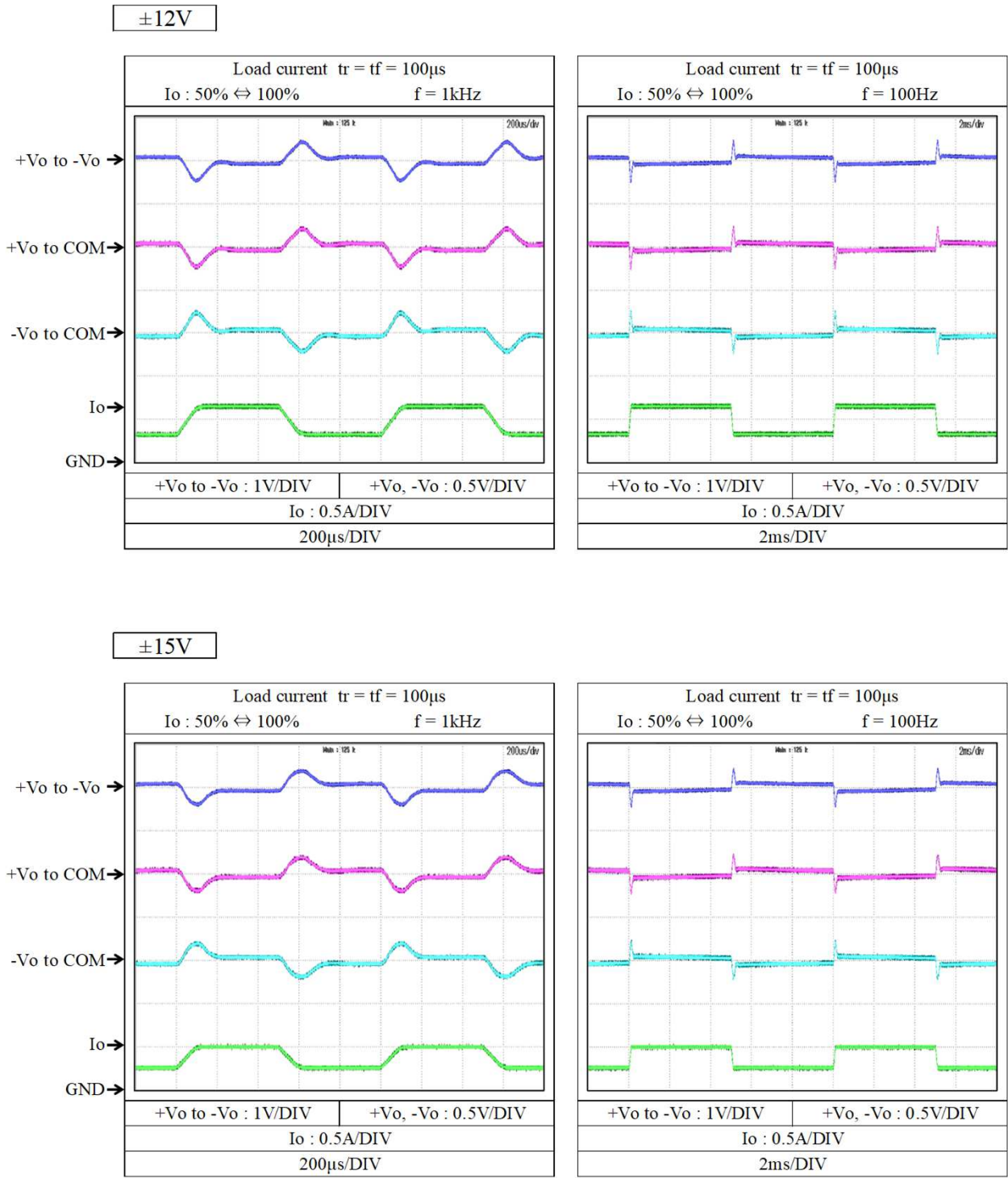
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
 Io : 100 %
 Ta : 25 °C



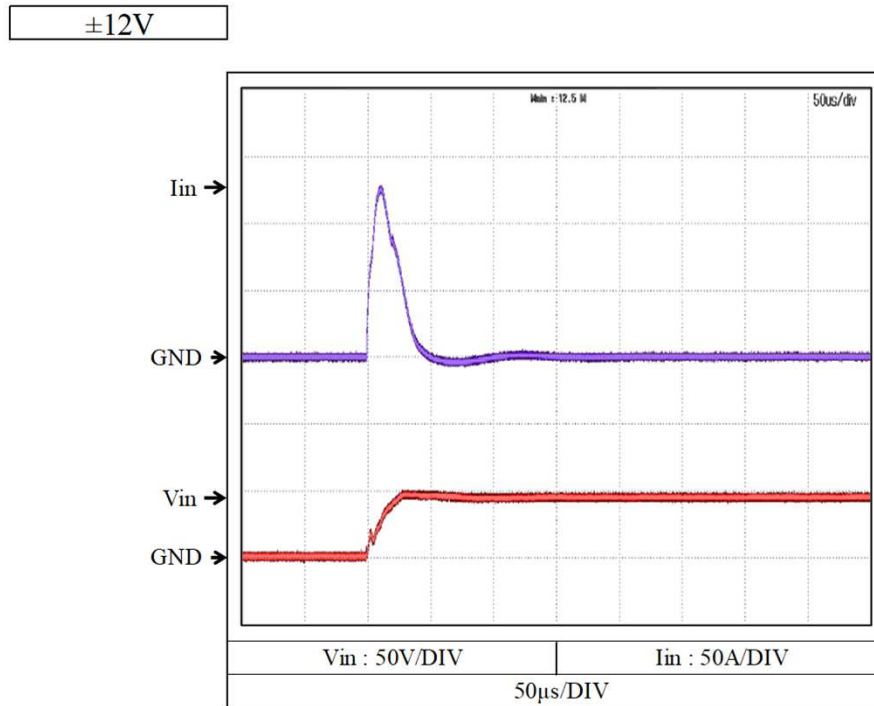
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 48 VDC
 Ta : 25 °C



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

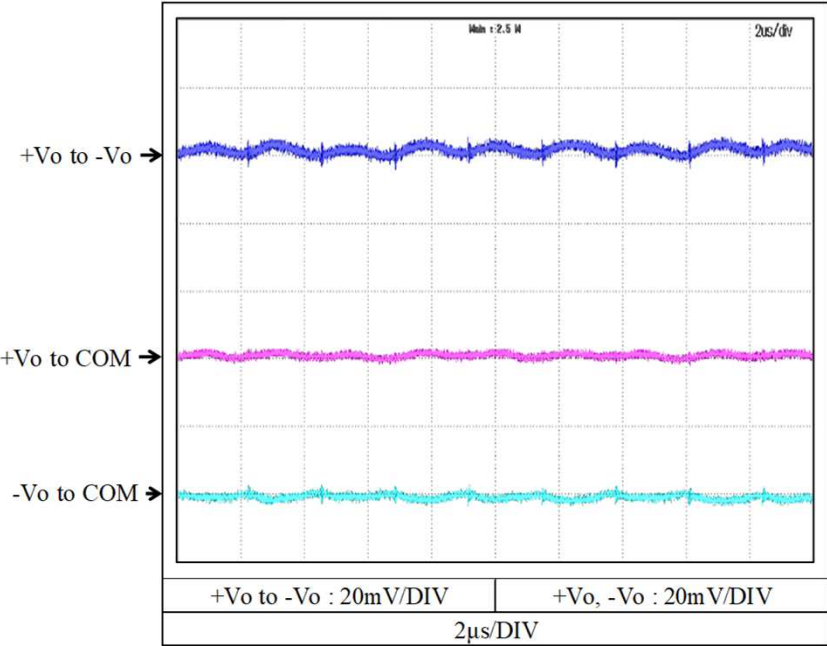
Conditions V_{in} : 48 VDC
 I_o : 100 %
 T_a : 25 °C



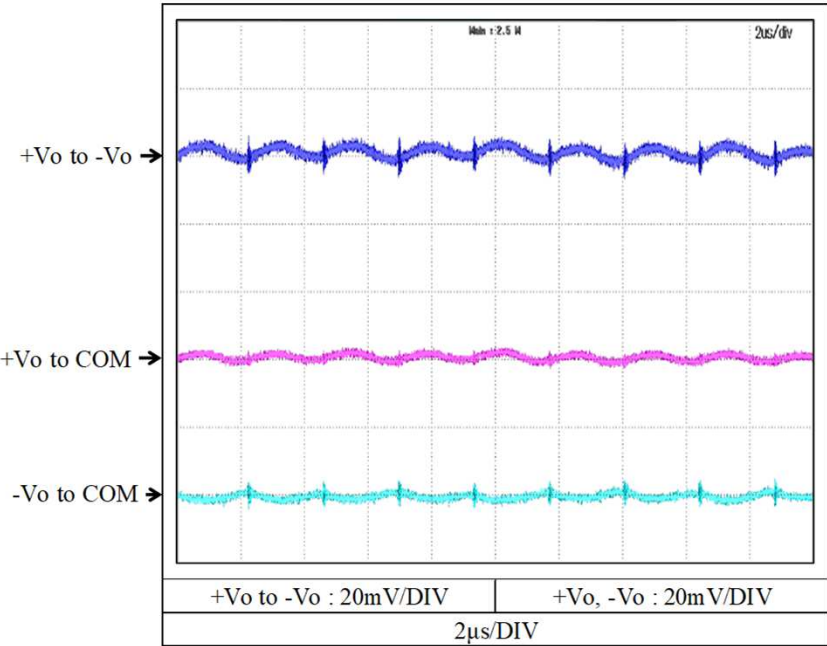
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

Conditions V_{in} : 48 VDC
 I_o : 100 %
 T_a : 25 °C

±12V



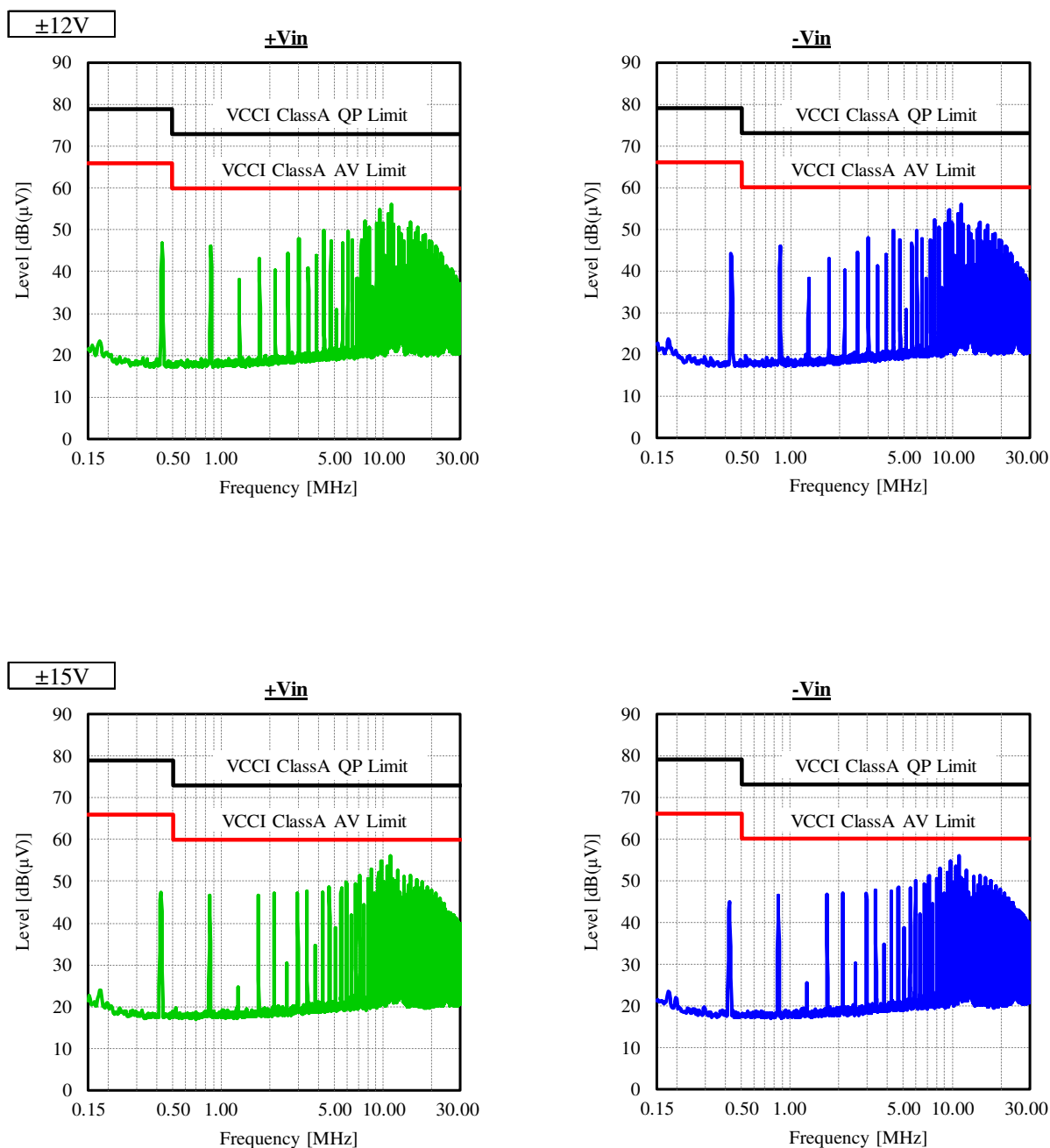
±15V



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 V_{in} : 48 VDC
 I_o : 100 %
 T_a : 25 °C

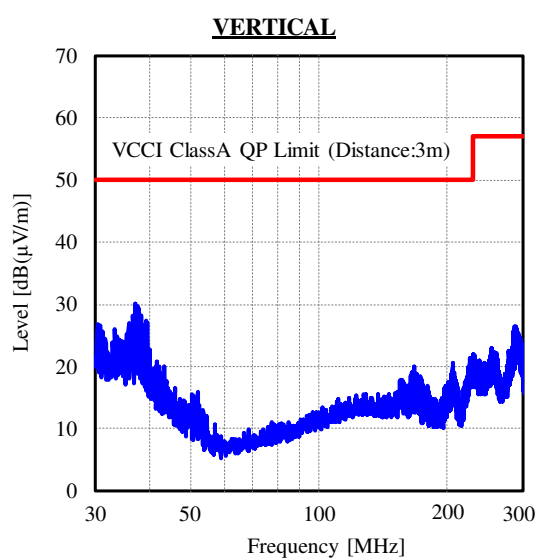
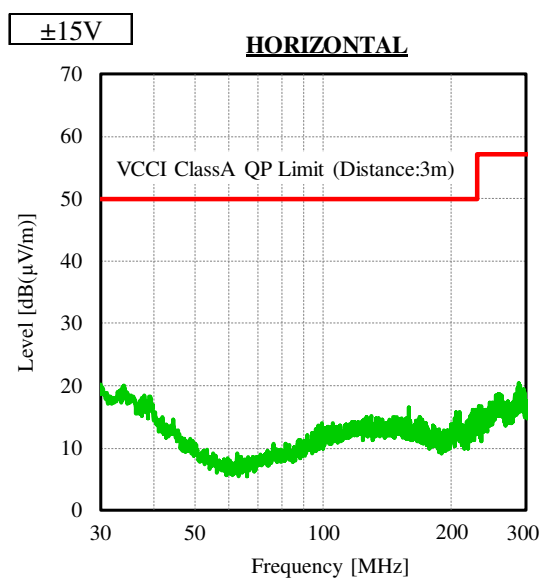
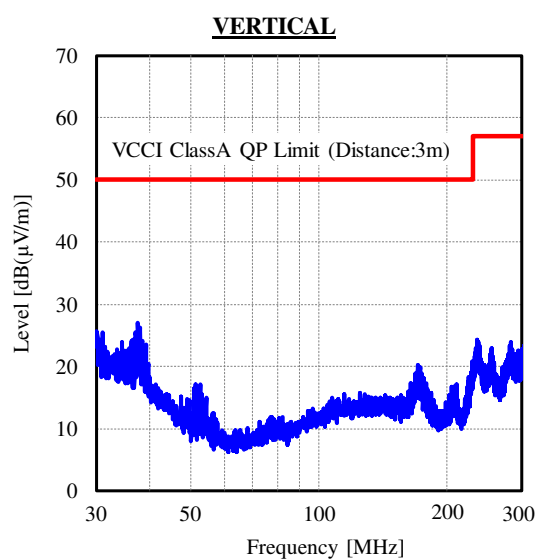
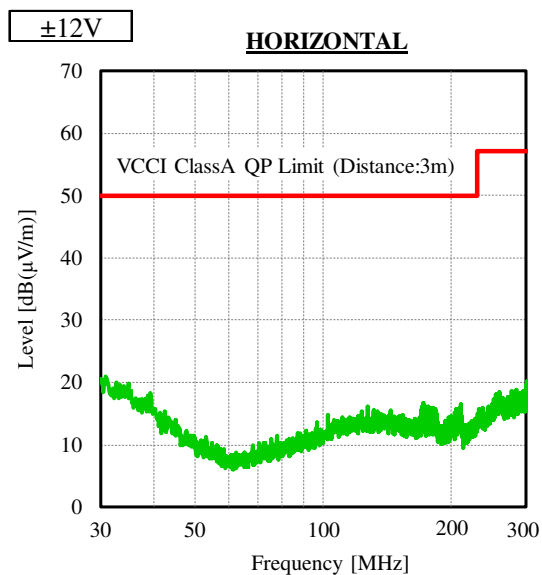


表示はQP値
 Indication is QP values.

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 V_{in} : 48 VDC
 I_o : 100 %
 T_a : 25 °C



表示はピーク値
 Indication is peak values.