

CCGS15-48-xxS

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	 出力電圧	Output voltage
V _{RC}	 RC電圧	RC voltage
I _{in}	 入力電流	Input current
I _o	 出力電流	Output current
T _a	 周囲温度	Ambient temperature
f	 周波数	Frequency

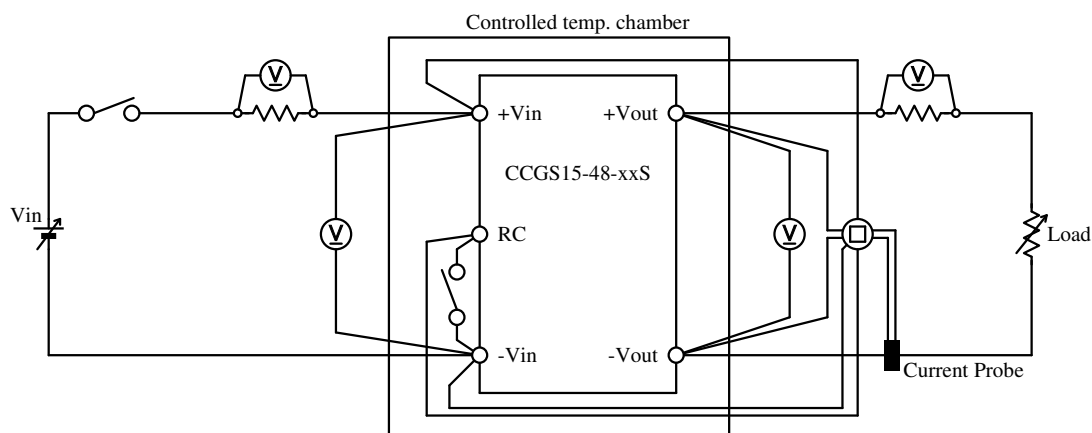
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

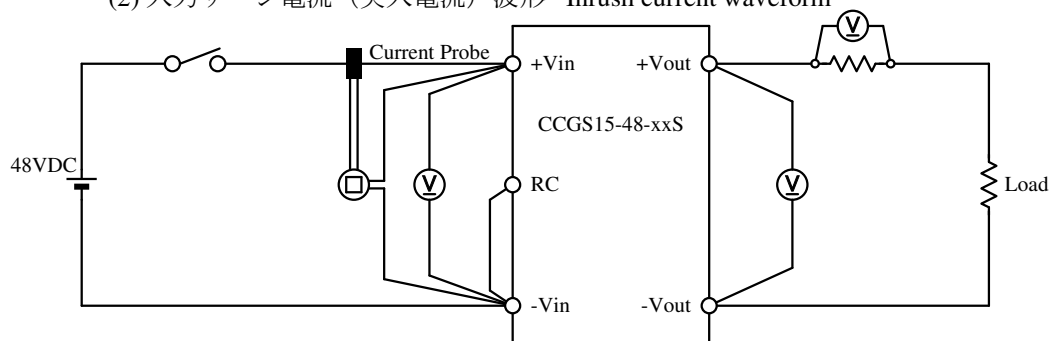
1-1. 測定回路 Measurement Circuits

(1) 静特性、待機電力特性、通電ドリフト特性、その他特性

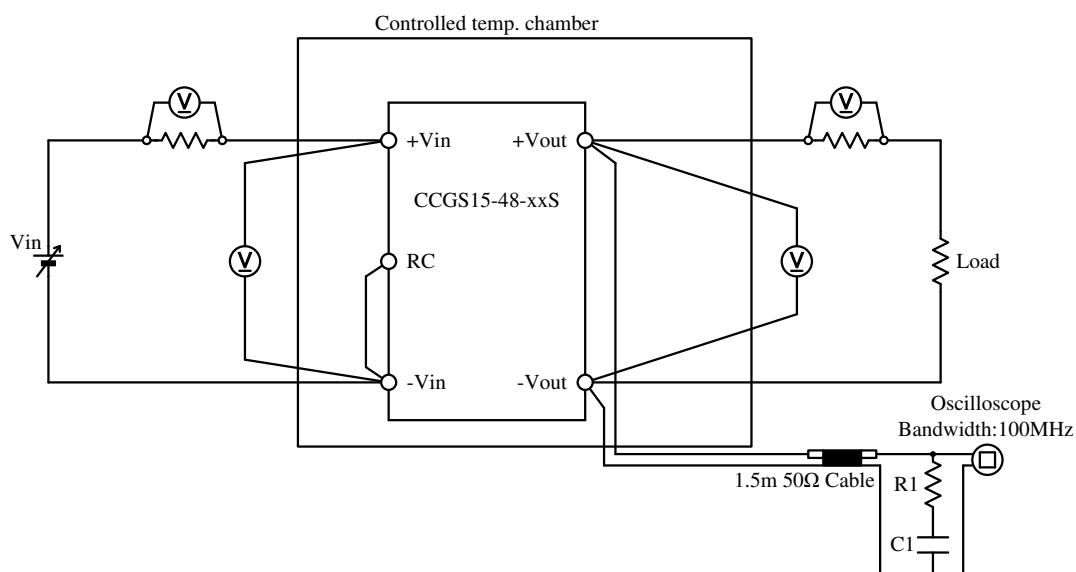
Steady state, Standby power, Warm up voltage drift and Other characteristics



(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



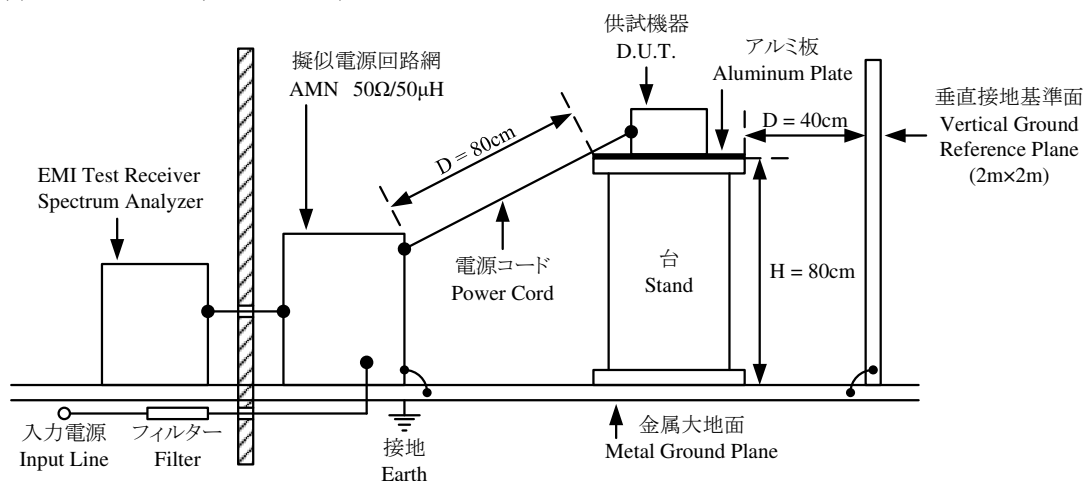
$C1$: 4700pF

$R1$: 50Ω

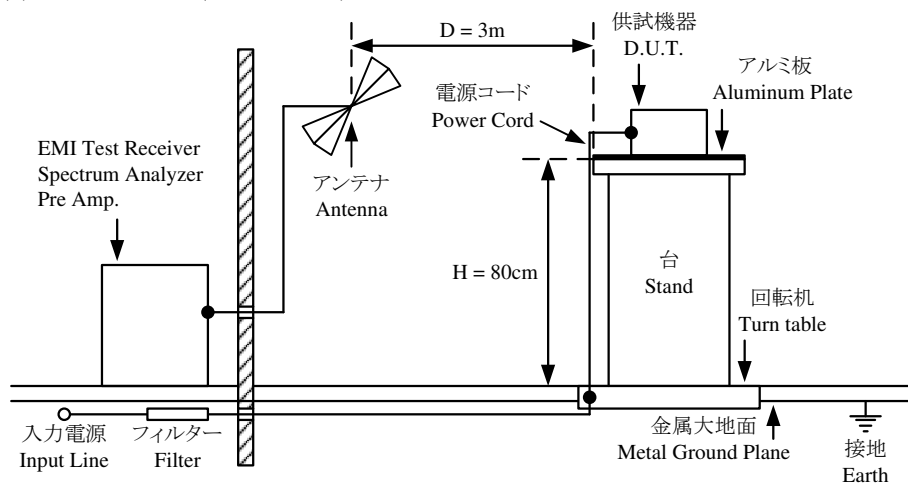
Ceramic Capacitor

(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

3.3V

1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	3.3044V	3.3048V	3.3047V	3.3044V	0.4mV	0.012%
50% (2A)	3.2908V	3.2911V	3.2912V	3.2910V	0.4mV	0.012%
100% (4A)	3.2772V	3.2773V	3.2770V	3.2765V	0.8mV	0.024%
Load regulation	27.2mV	27.5mV	27.7mV	27.9mV		
	0.824%	0.833%	0.839%	0.845%		

2. Temperature drift

Conditions Vin : 48 VDC

Io : 100 %

Ta	-20°C	25°C	70°C	Temperature stability	
Vo	3.2668V	3.2770V	3.2749V	10.2mV	0.309%

5V

1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	4.9996V	4.9998V	4.9991V	4.9977V	2.1mV	0.042%
50% (1.5A)	4.9898V	4.9900V	4.9896V	4.9886V	1.4mV	0.028%
100% (3A)	4.9797V	4.9796V	4.9788V	4.9782V	1.5mV	0.030%
Load regulation	19.9mV	20.2mV	20.3mV	19.5mV		
	0.398%	0.404%	0.406%	0.390%		

2. Temperature drift

Conditions Vin : 48 VDC

Io : 100 %

Ta	-20°C	25°C	70°C	Temperature stability	
Vo	4.9666V	4.9788V	4.9728V	12.2mV	0.244%

12V

1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	12.0503V	12.0526V	12.0528V	12.0528V	2.5mV	0.021%
50% (0.65A)	12.0464V	12.0476V	12.0477V	12.0479V	1.5mV	0.013%
100% (1.3A)	12.0429V	12.0440V	12.0442V	12.0447V	1.8mV	0.015%
Load regulation	7.4mV	8.6mV	8.6mV	8.1mV		
	0.062%	0.072%	0.072%	0.067%		

2. Temperature drift

Conditions Vin : 48 VDC

Io : 100 %

Ta	-20°C	25°C	70°C	Temperature stability	
Vo	12.0315V	12.0442V	12.0677V	36.2mV	0.302%

15V

1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	15.0487V	15.0506V	15.0511V	15.0507V	2.4mV	0.016%
50% (0.5A)	15.0455V	15.0468V	15.0464V	15.0465V	1.3mV	0.009%
100% (1A)	15.0430V	15.0440V	15.0437V	15.0440V	1.0mV	0.007%
Load regulation	5.7mV	6.6mV	7.4mV	6.7mV		
	0.038%	0.044%	0.049%	0.045%		

2. Temperature drift

Conditions Vin : 48 VDC

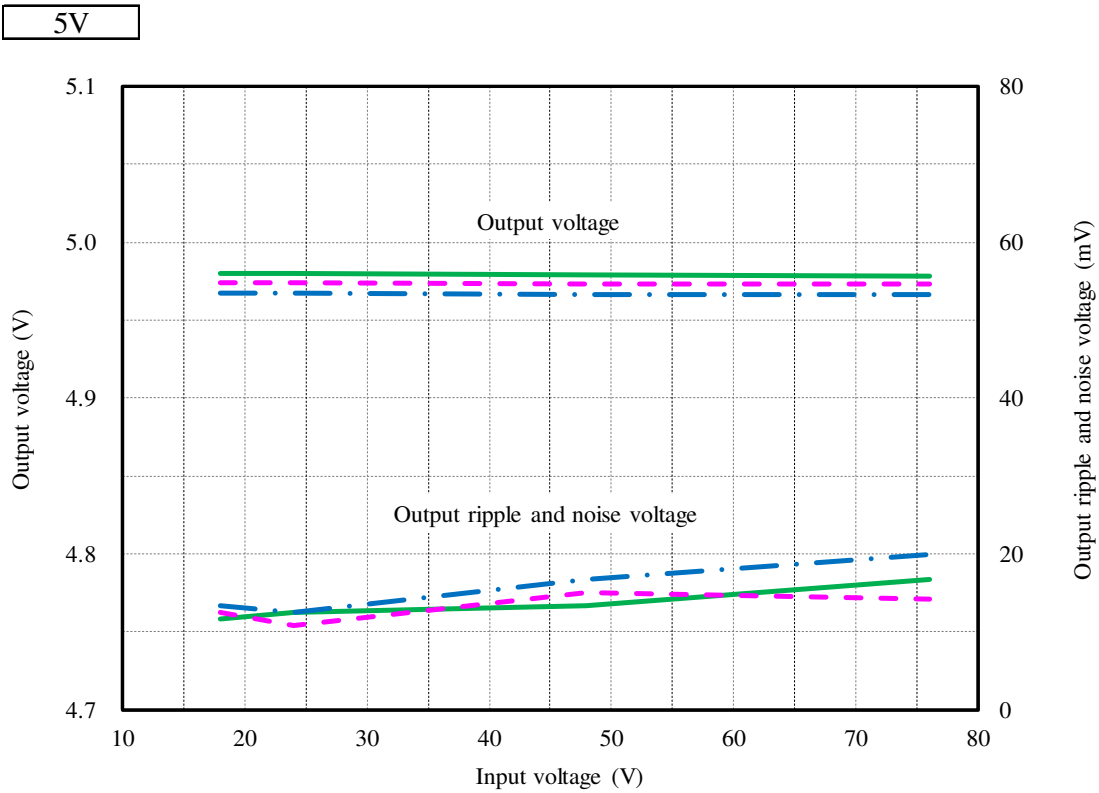
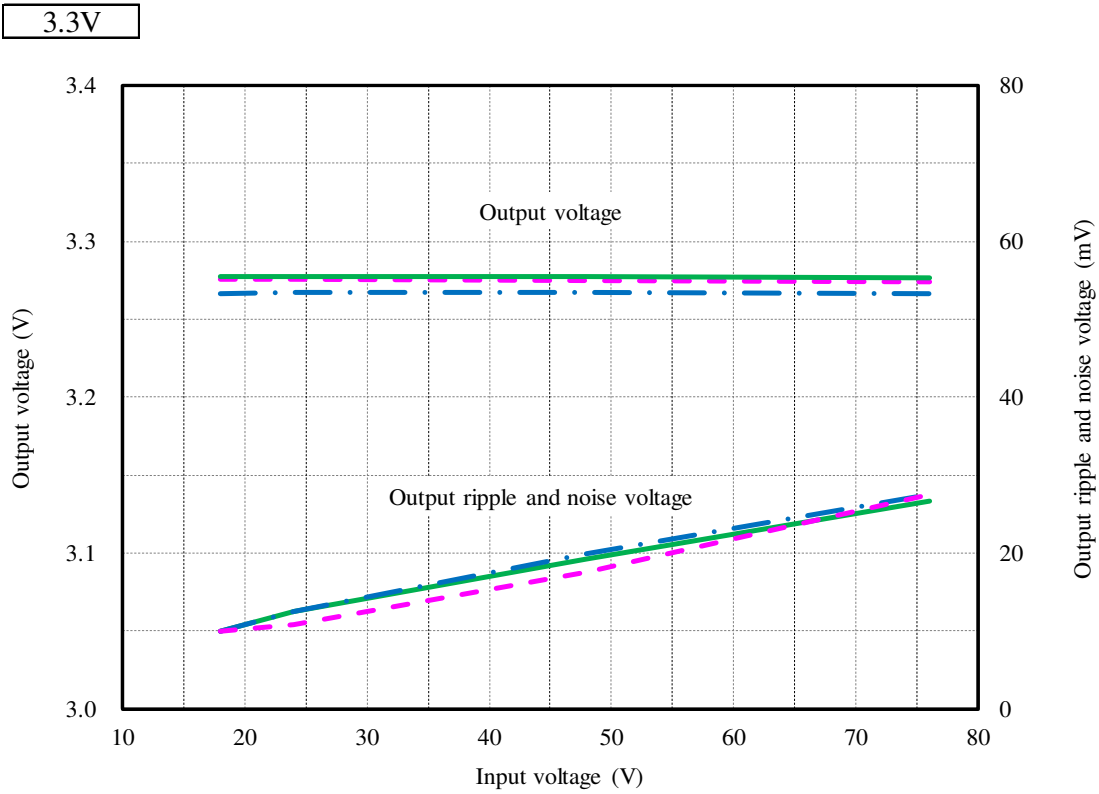
Io : 100 %

Ta	-20°C	25°C	70°C	Temperature stability	
Vo	15.0363V	15.0437V	15.0596V	23.3mV	0.155%

(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

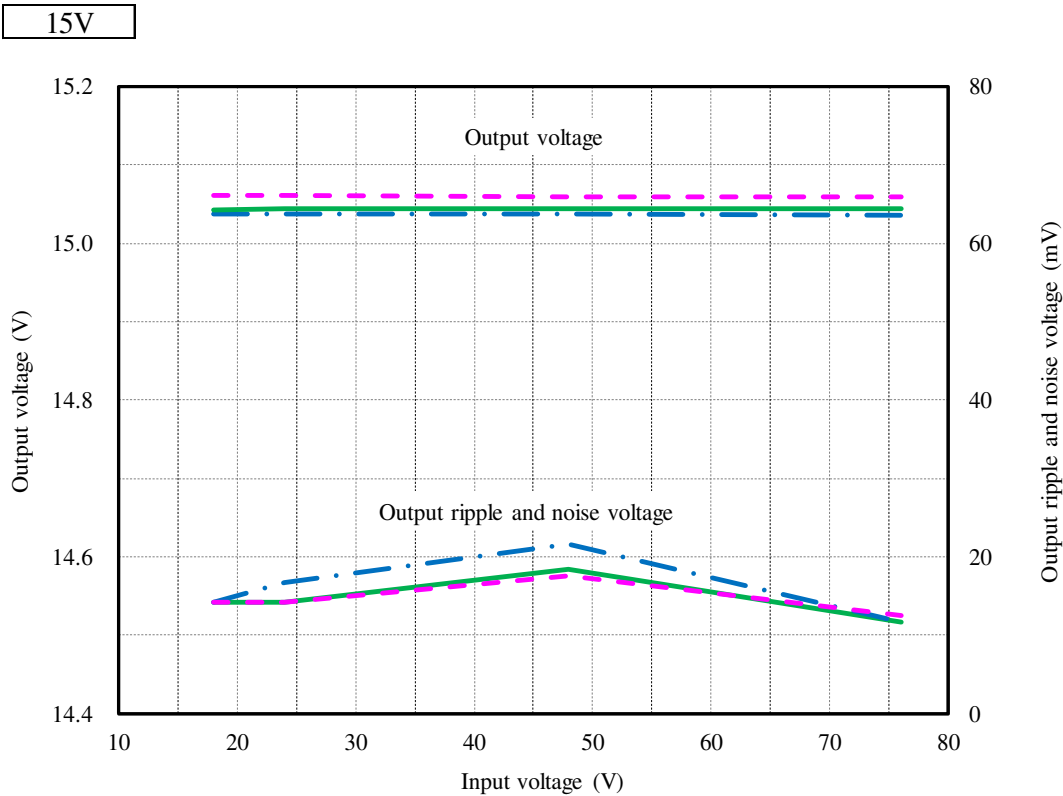
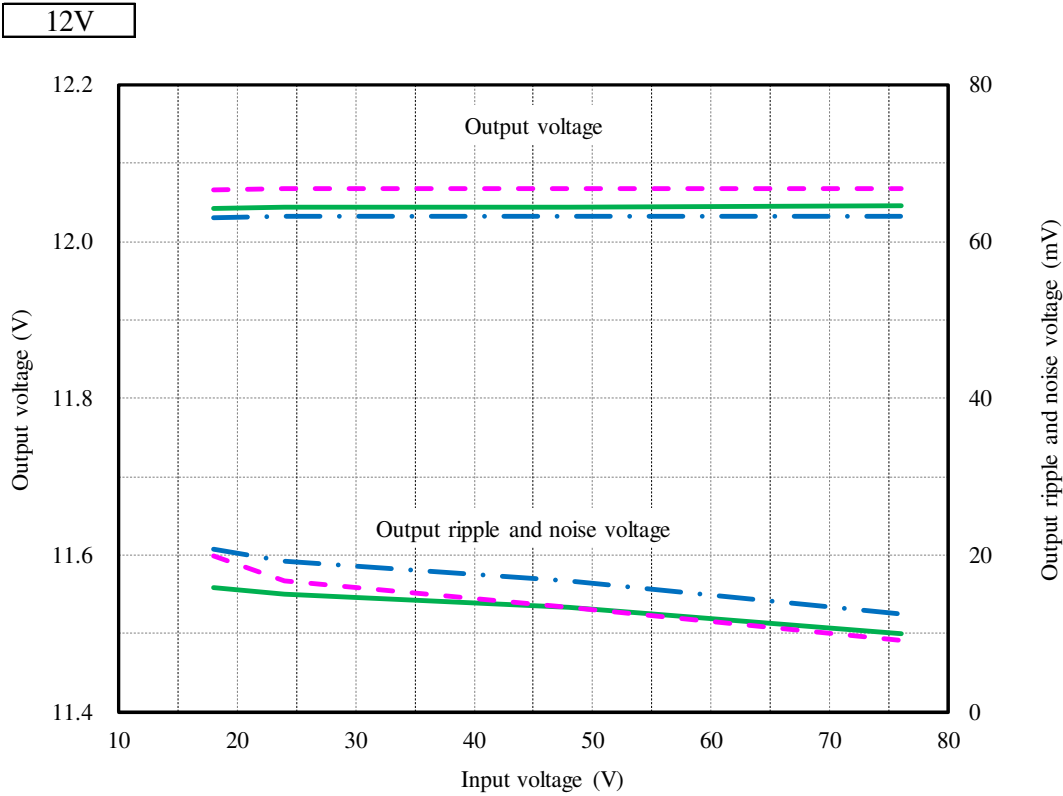
Conditions Io : 100 %
 Ta : -20 °C
 : 25 °C
 : 70 °C



(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

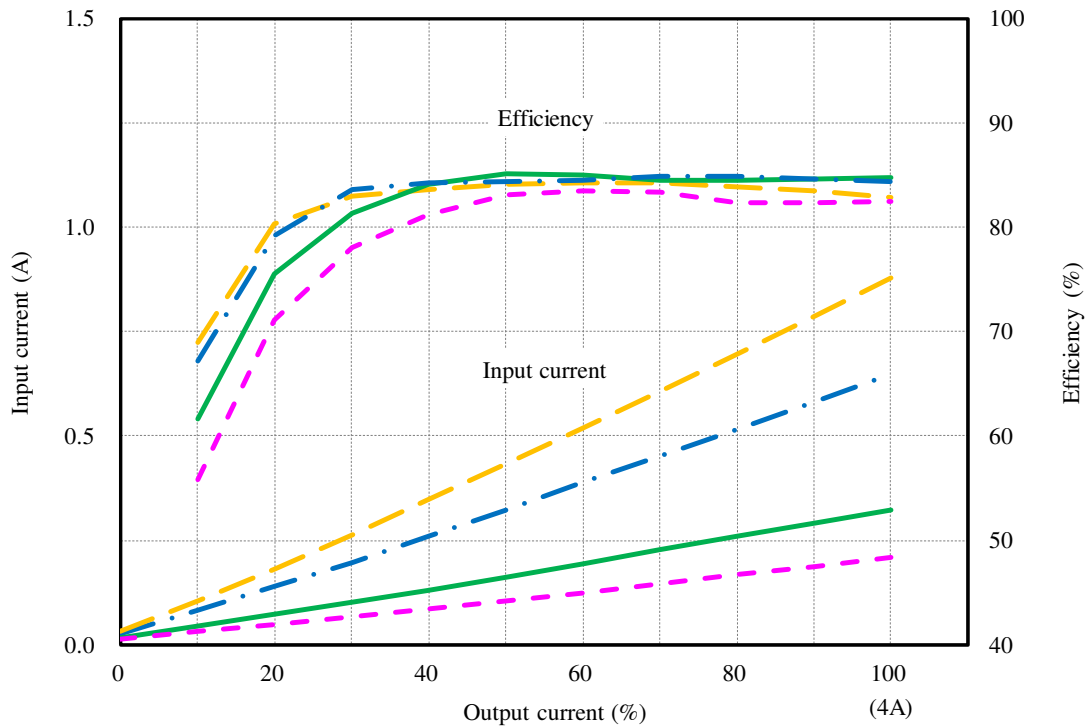
Conditions Io : 100 %
Ta : -20 °C
 : 25 °C
 : 70 °C



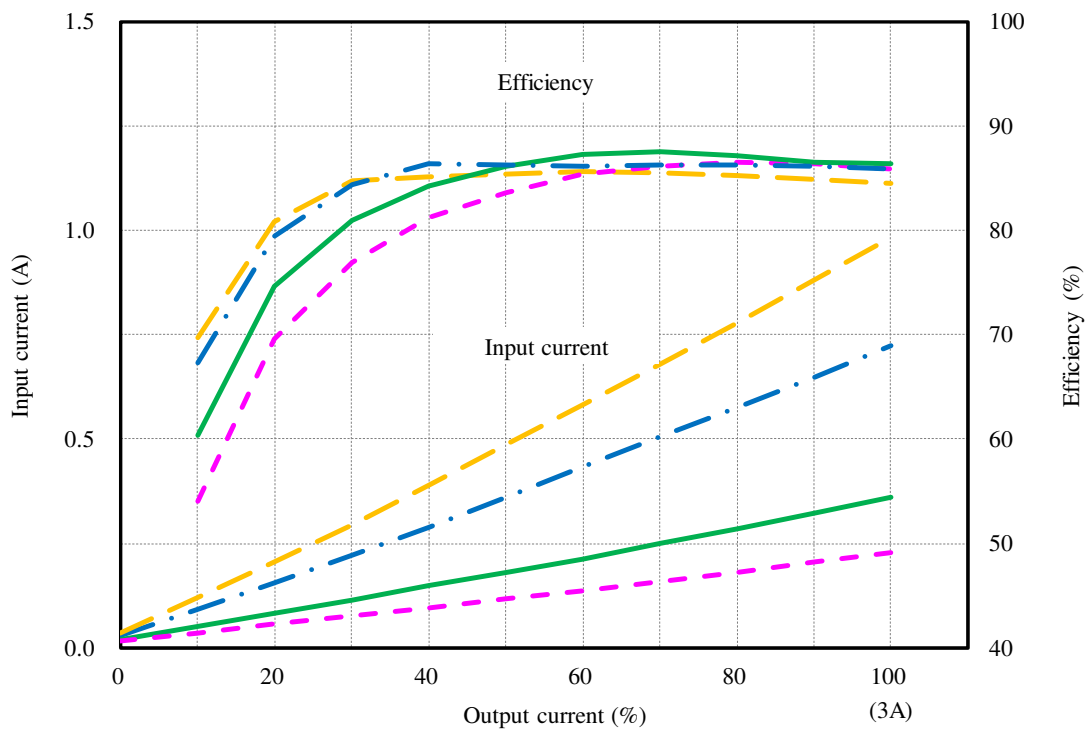
(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current

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

3.3V



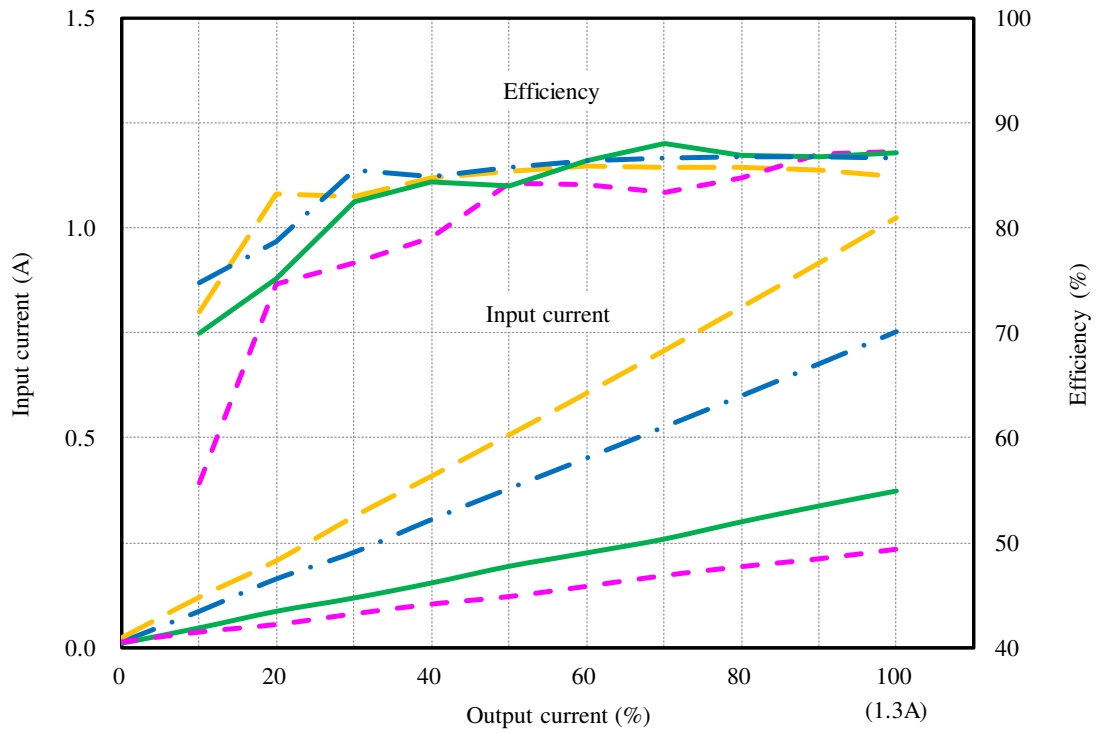
5V



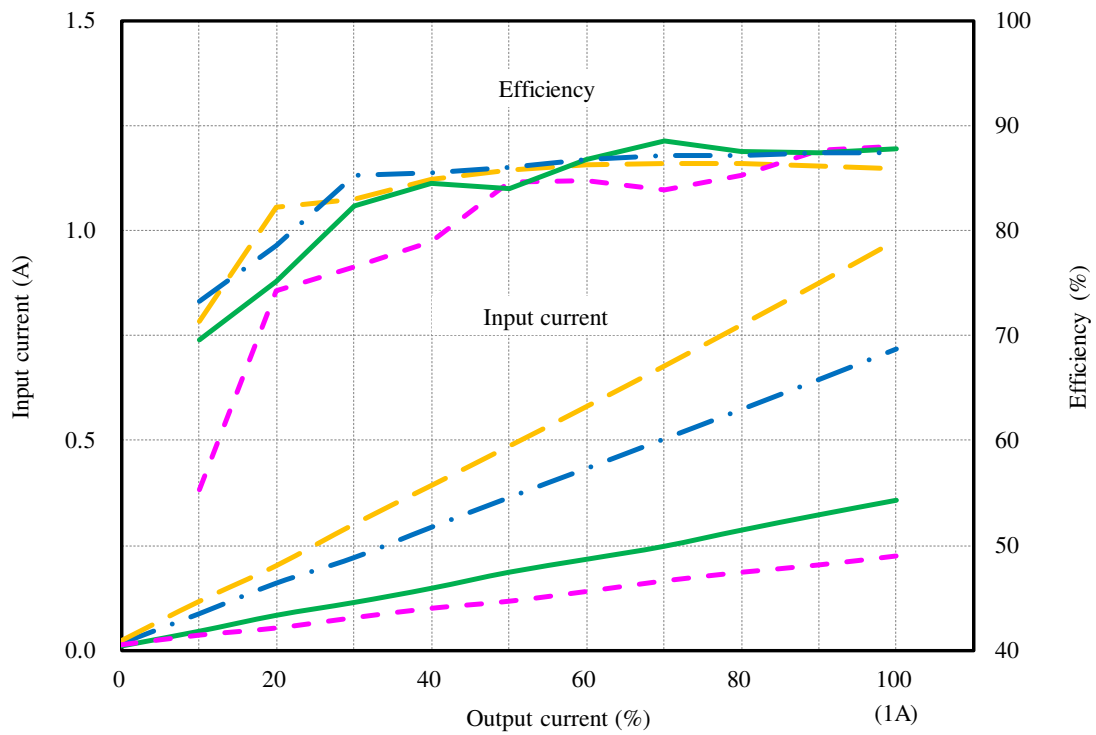
(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current

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

12V



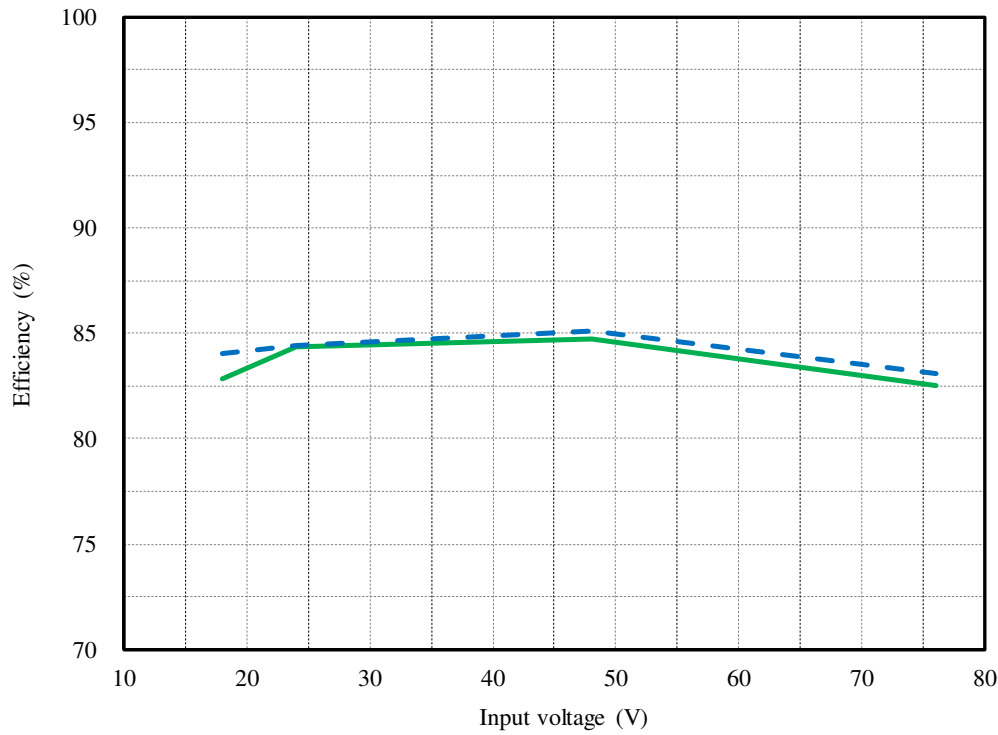
15V



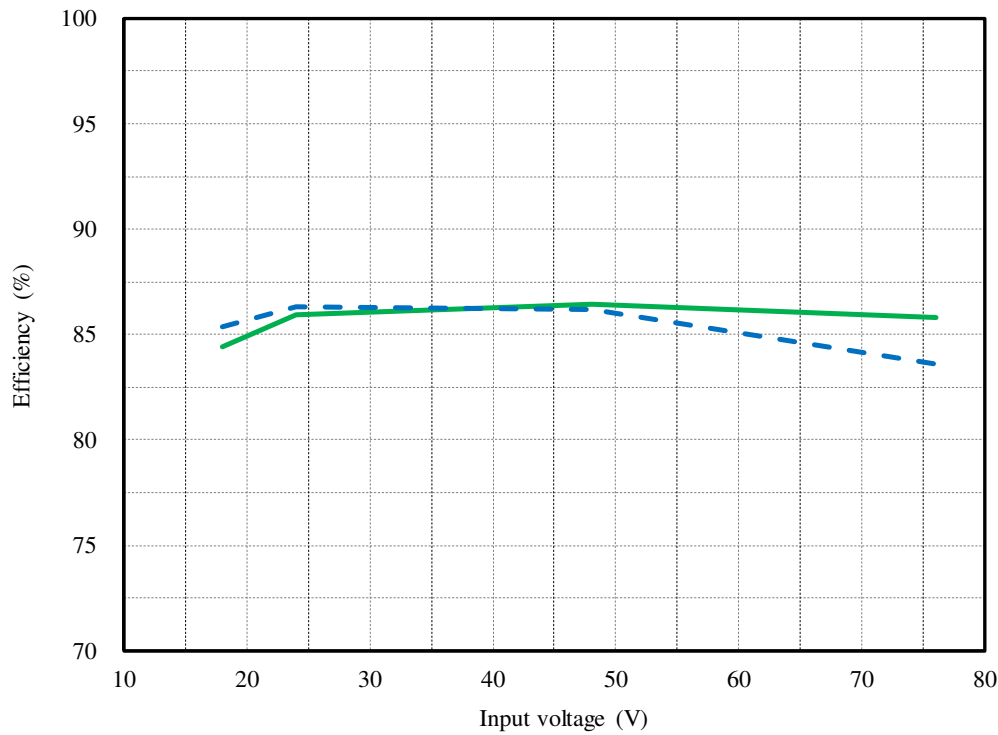
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

3.3V



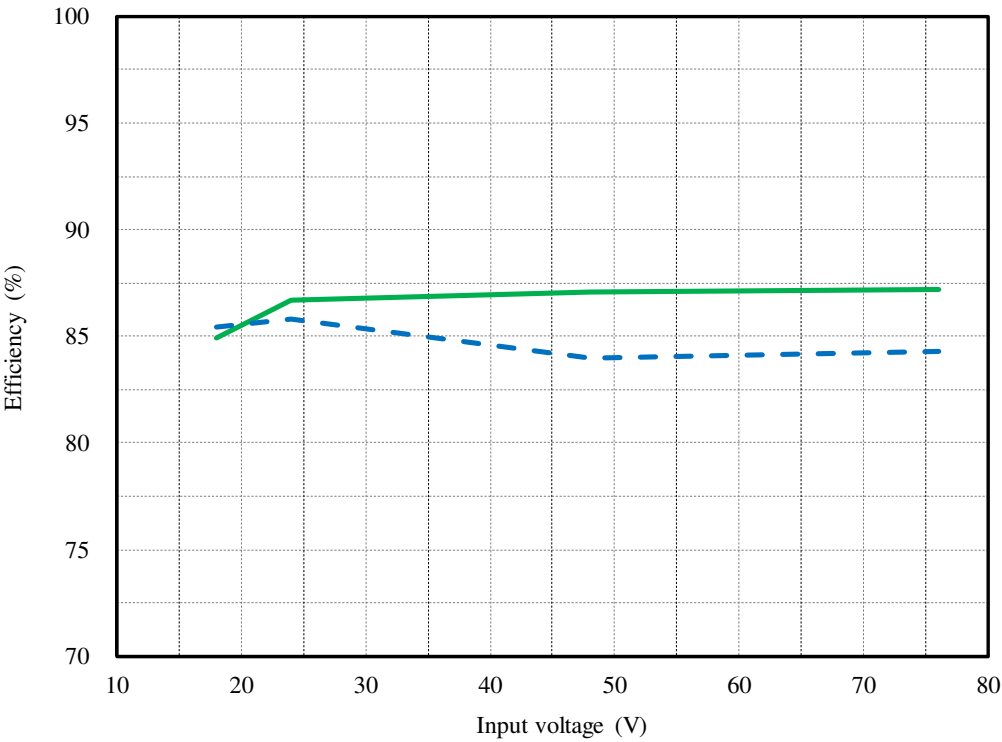
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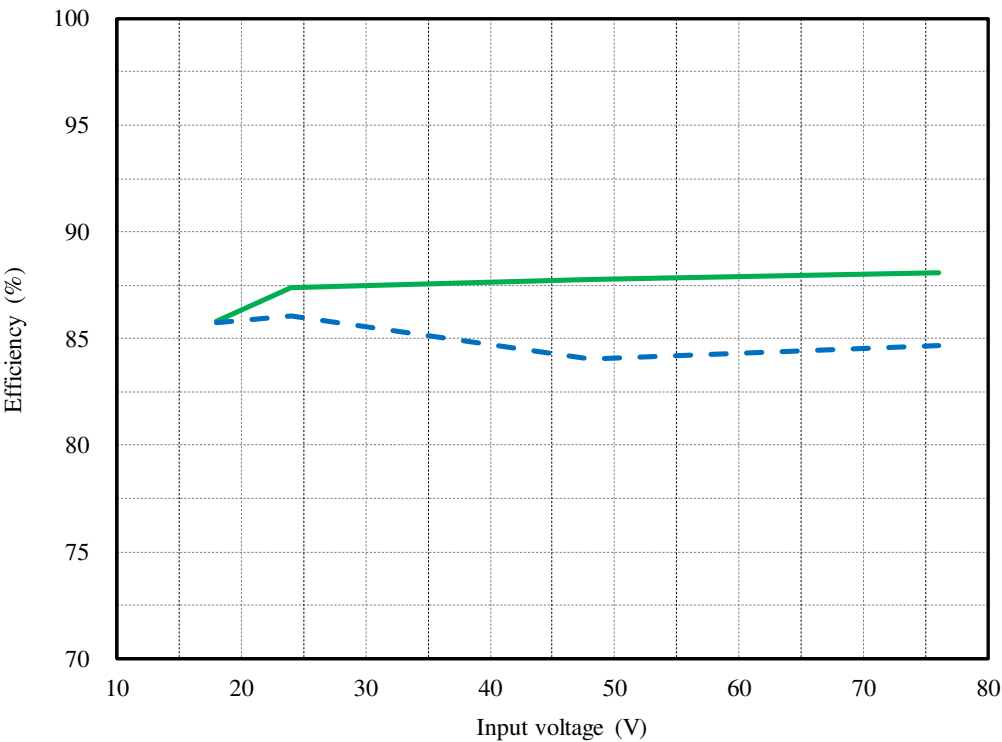
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

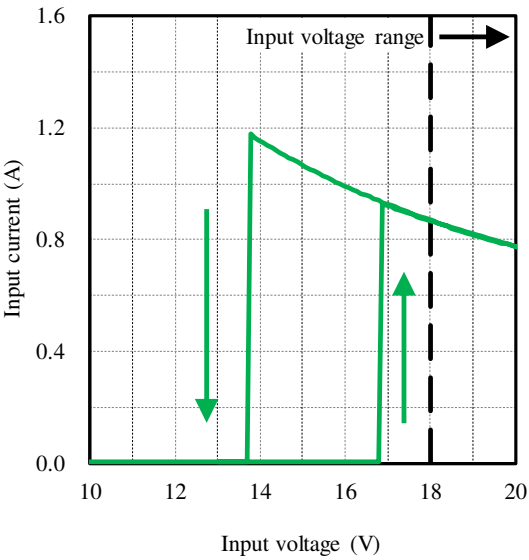
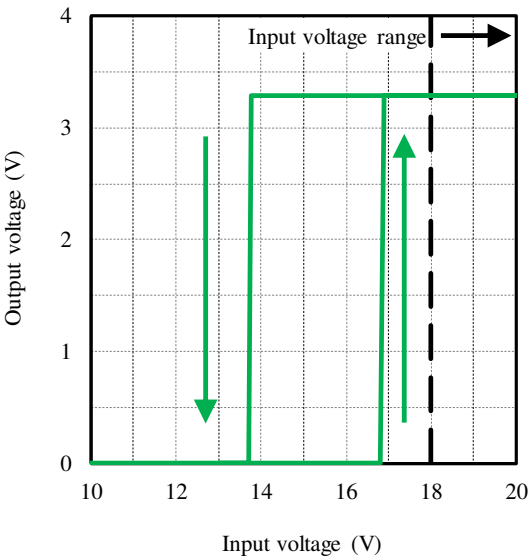
出力電圧 対 入力電圧
Output voltage vs. Input voltage

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

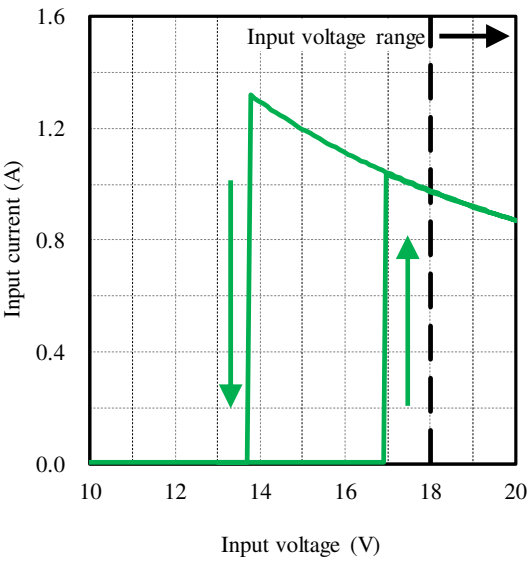
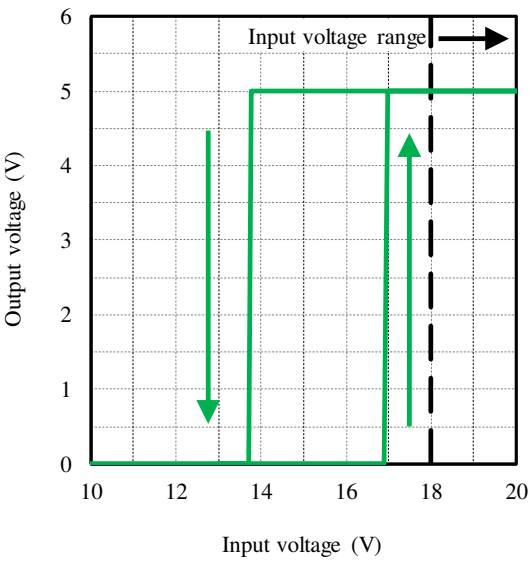
Conditions I_o : 100 %
 T_a : 25 °C

Conditions I_o : 100 %
 T_a : 25 °C

3.3V



5V



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

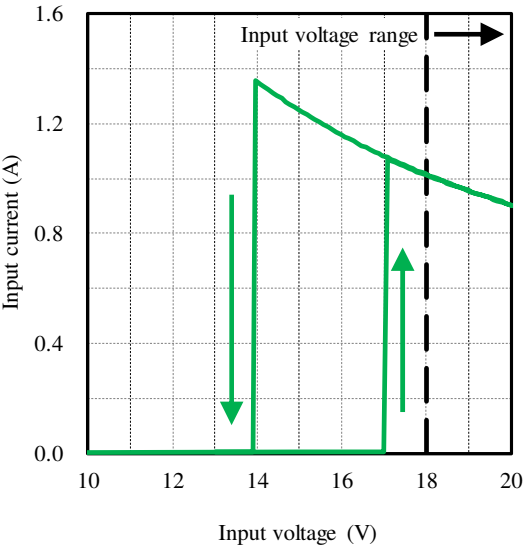
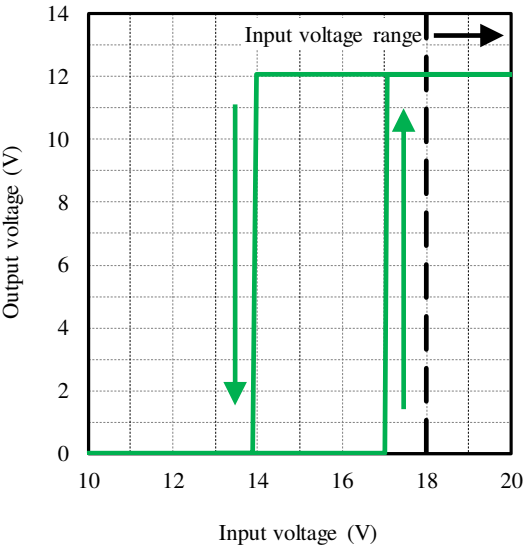
出力電圧 対 入力電圧
Output voltage vs. Input voltage

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

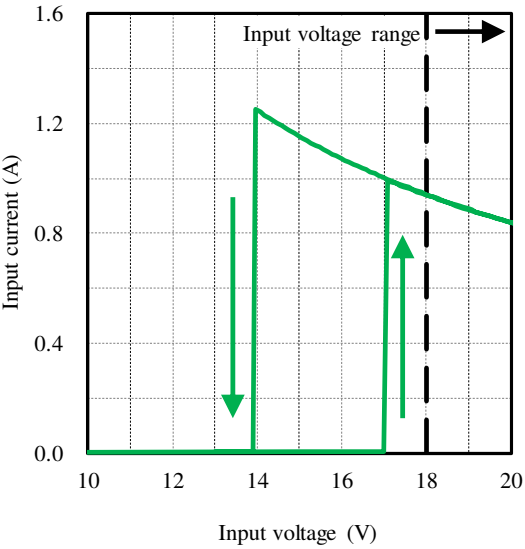
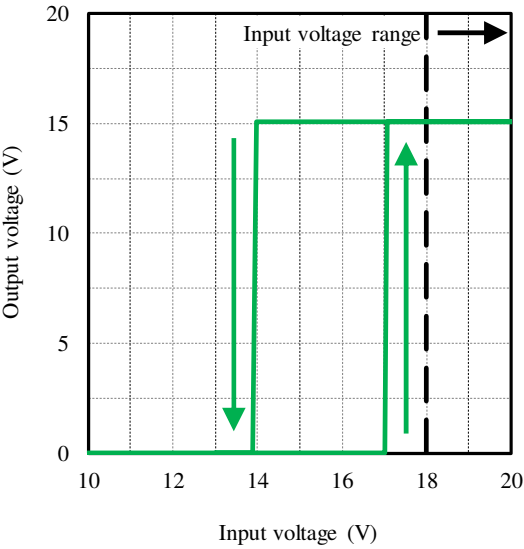
Conditions I_o : 100 %
 T_a : 25 °C

Conditions I_o : 100 %
 T_a : 25 °C

12V



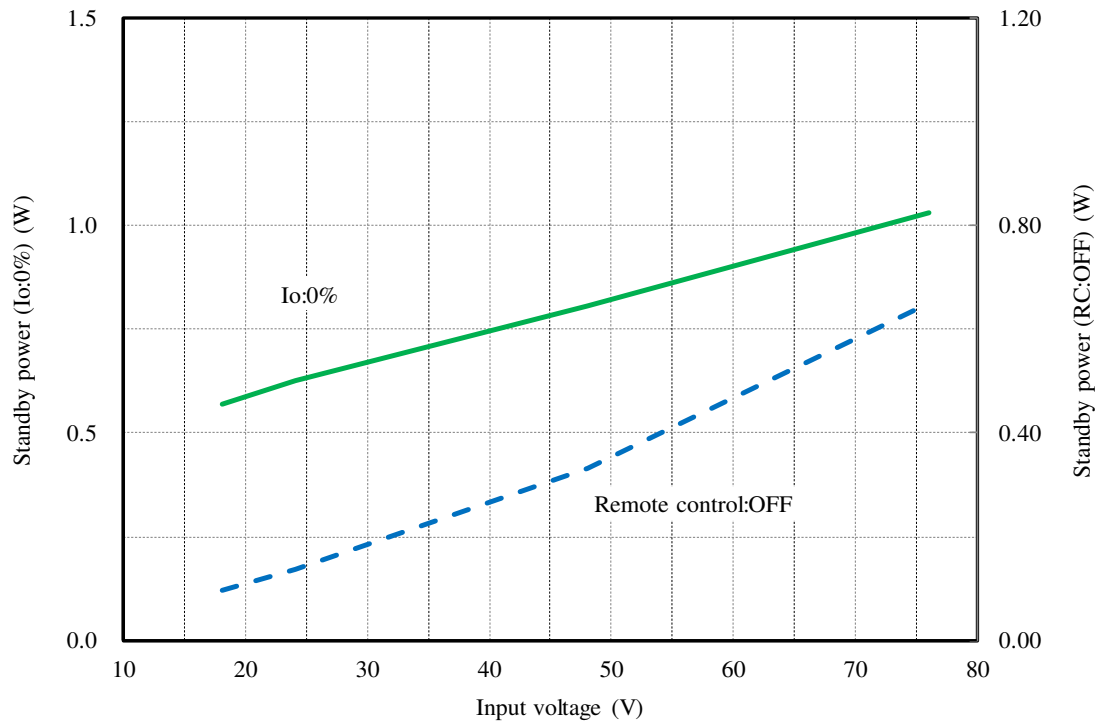
15V



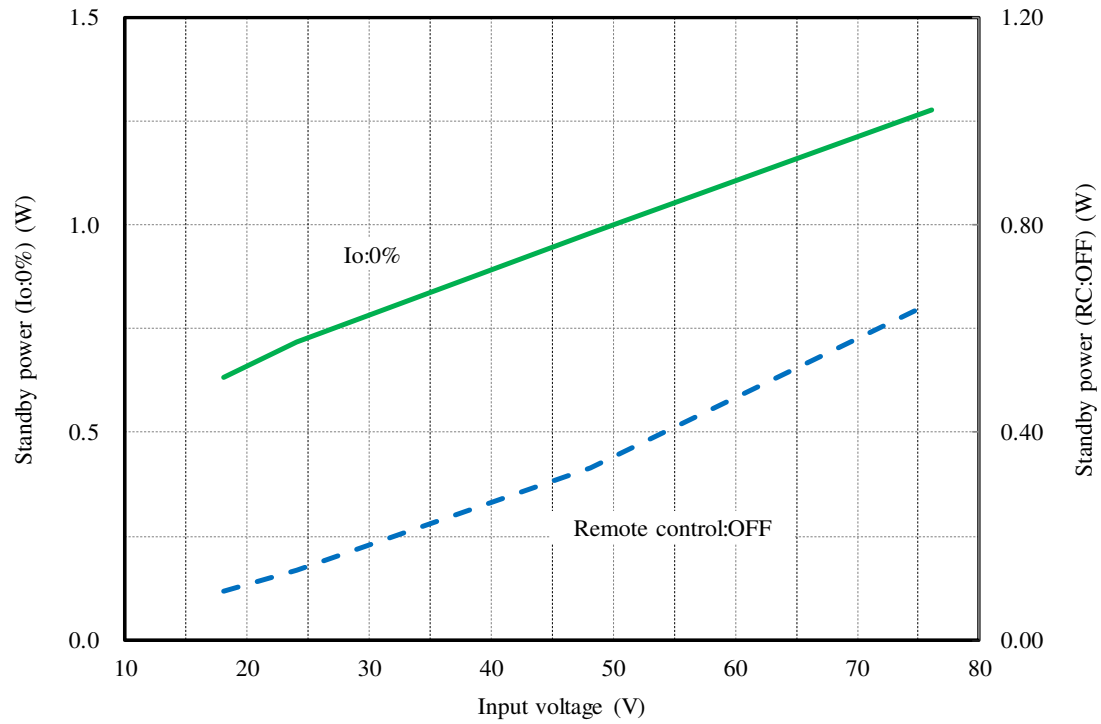
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

3.3V



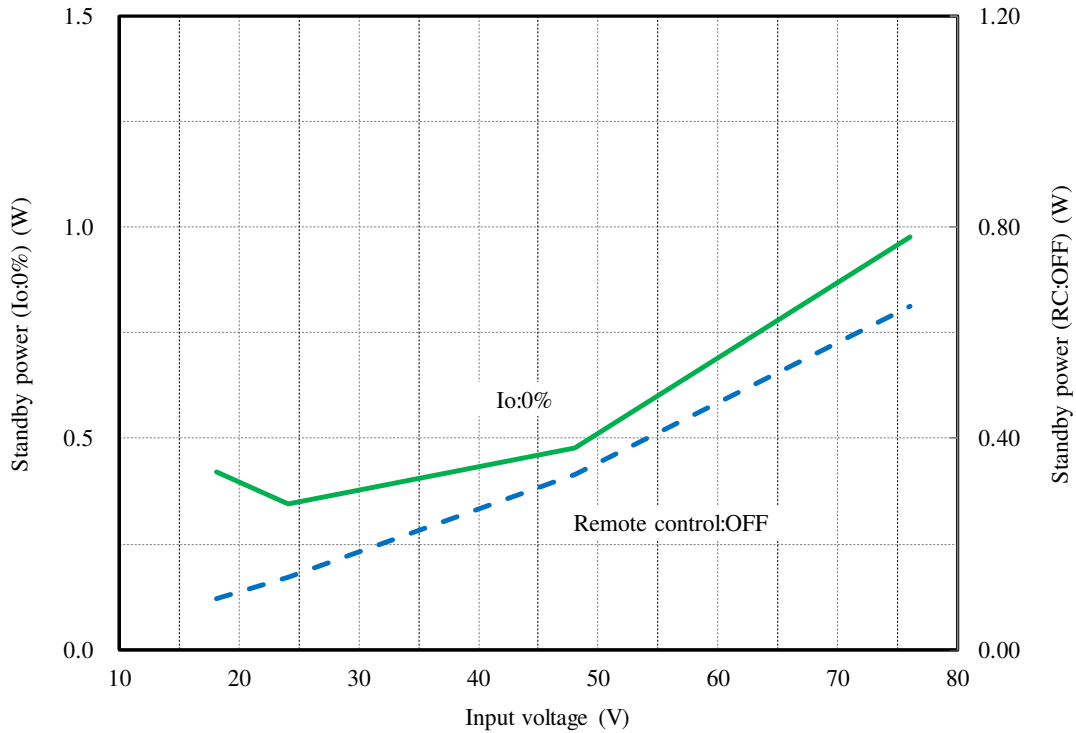
5V



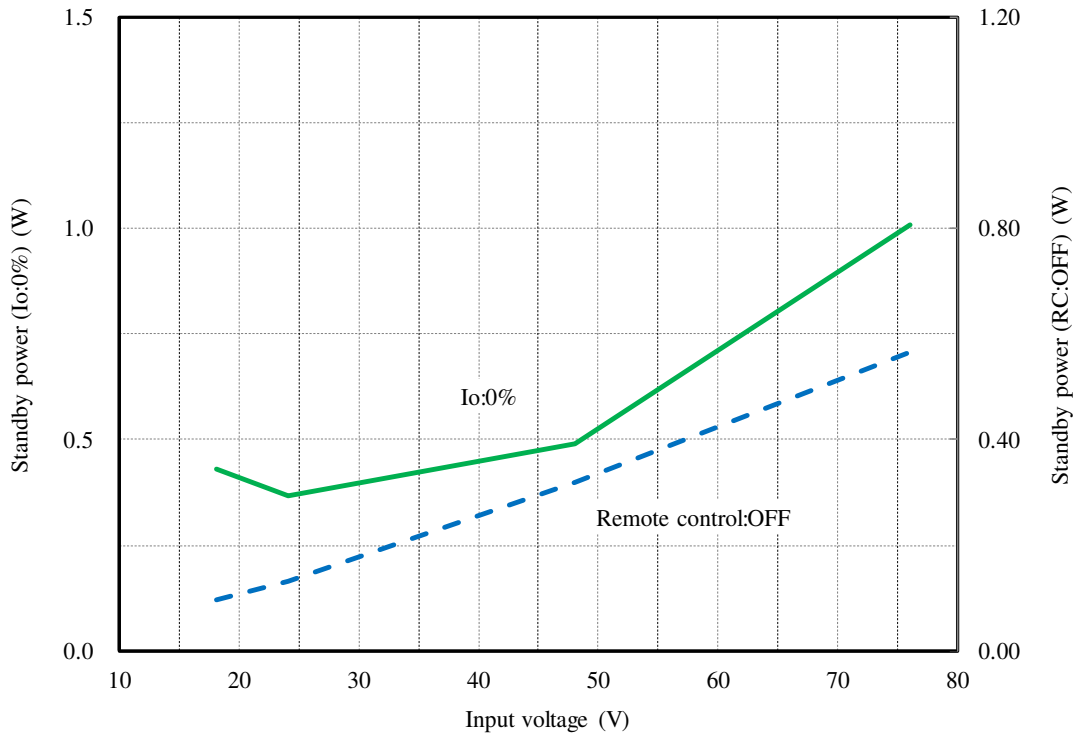
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

12V



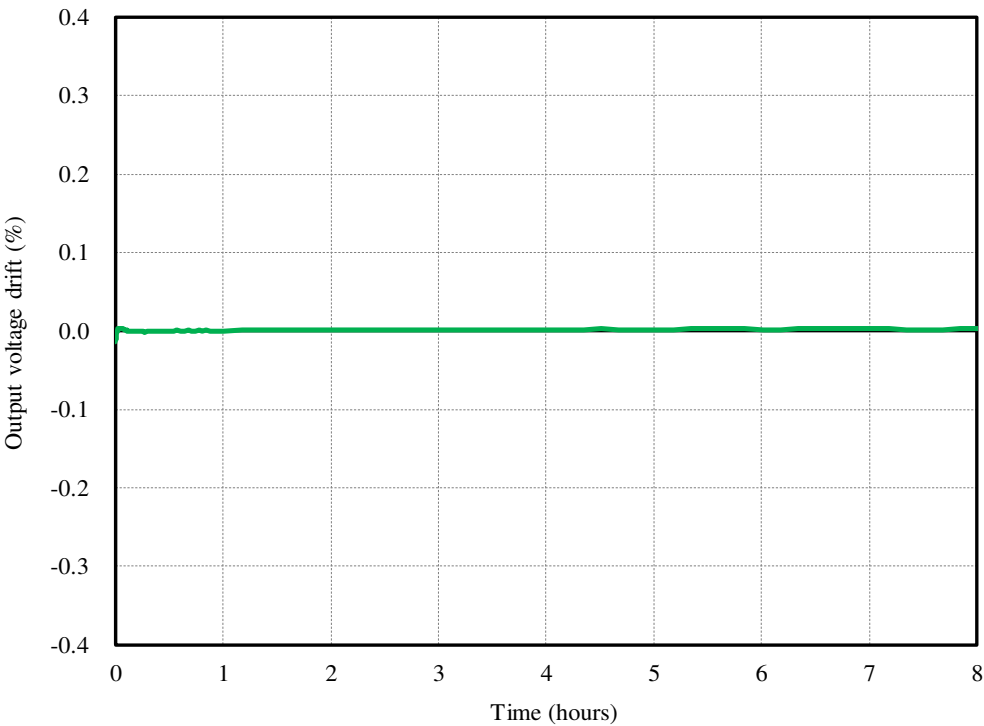
15V



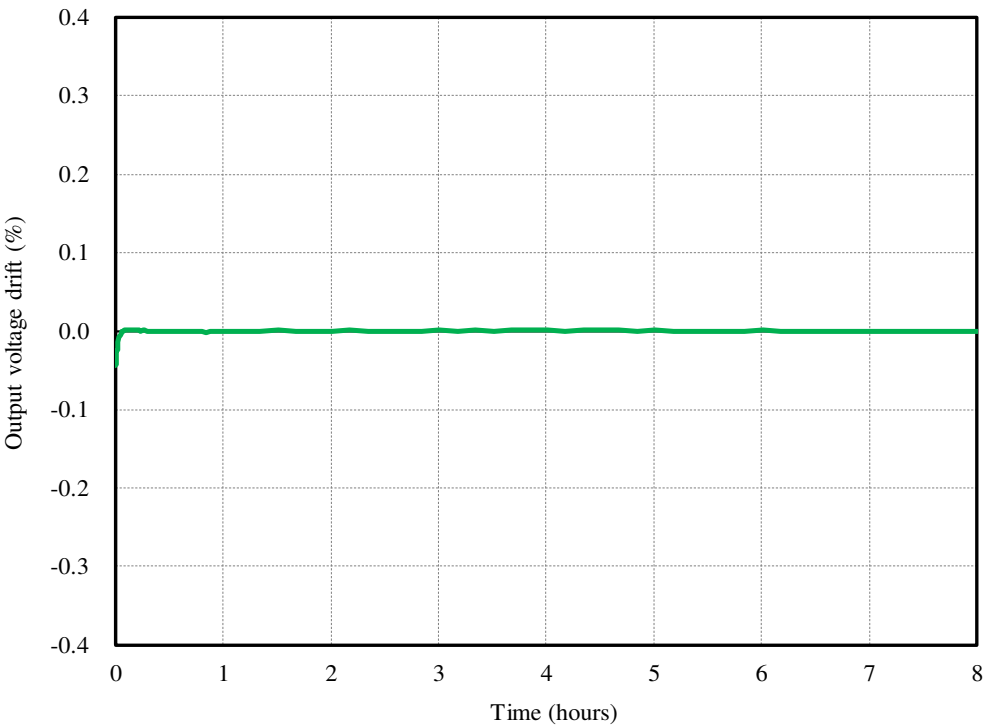
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

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

3.3V



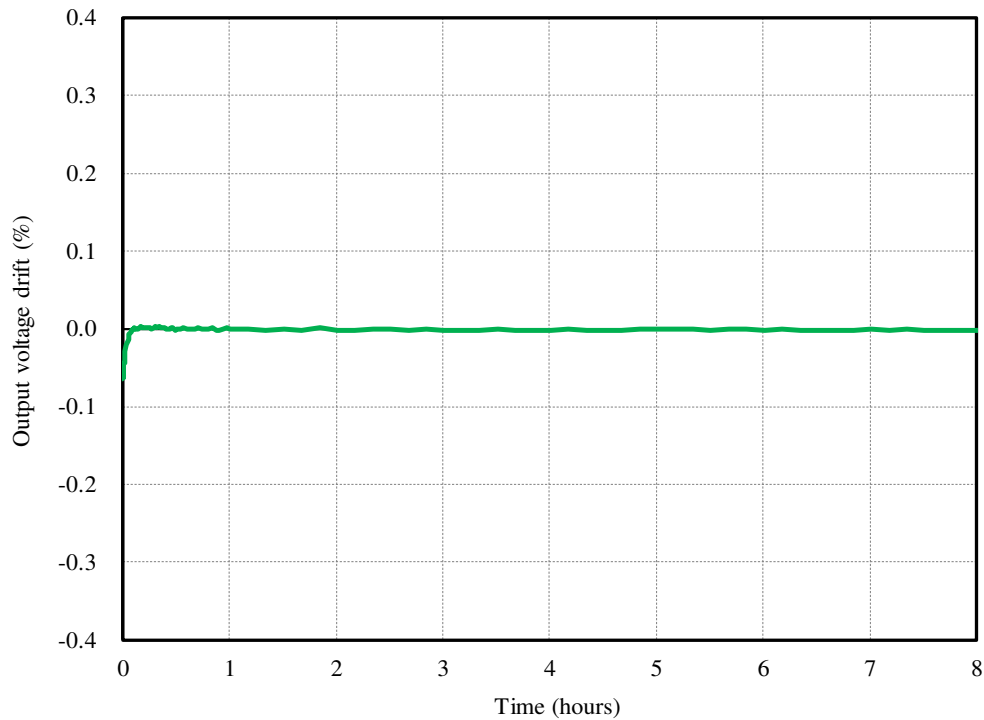
5V



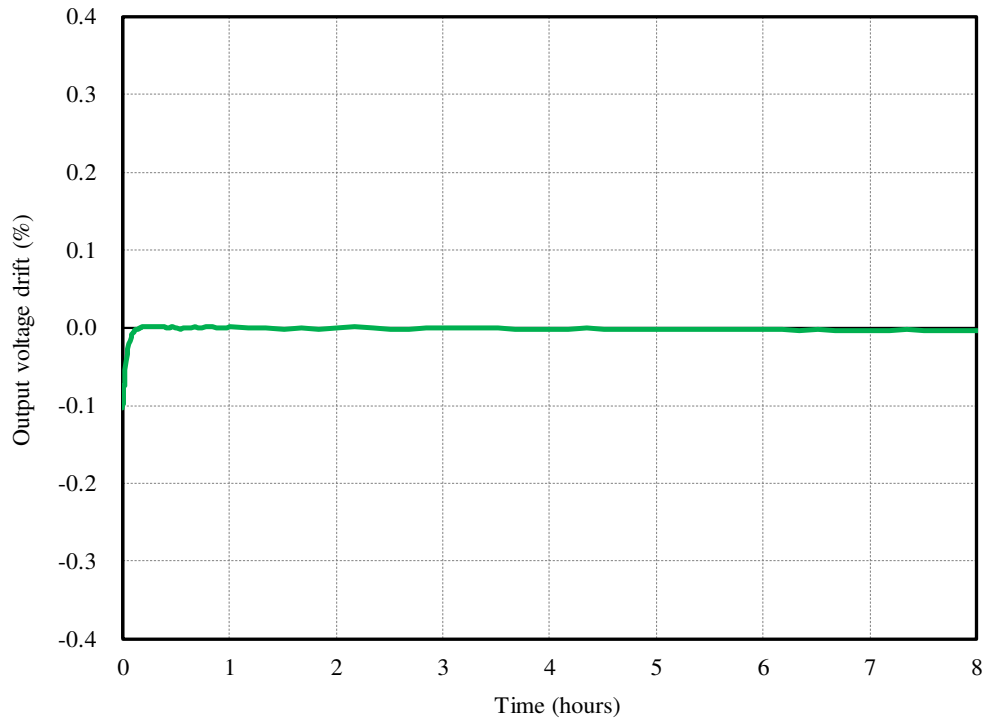
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

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

12V



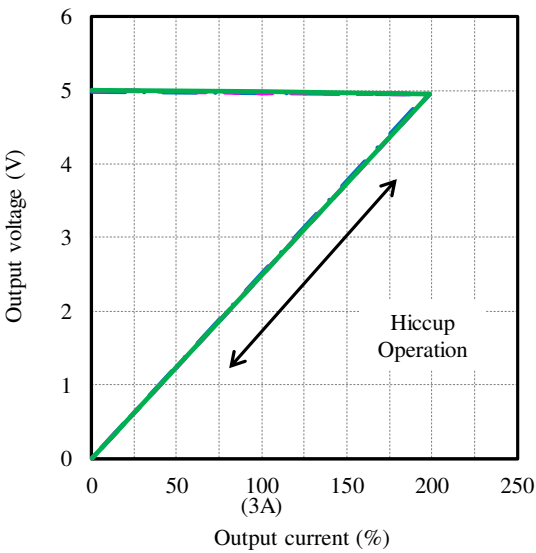
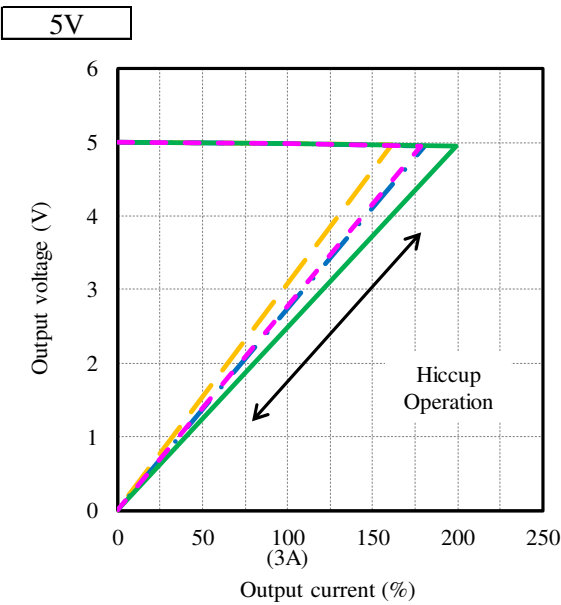
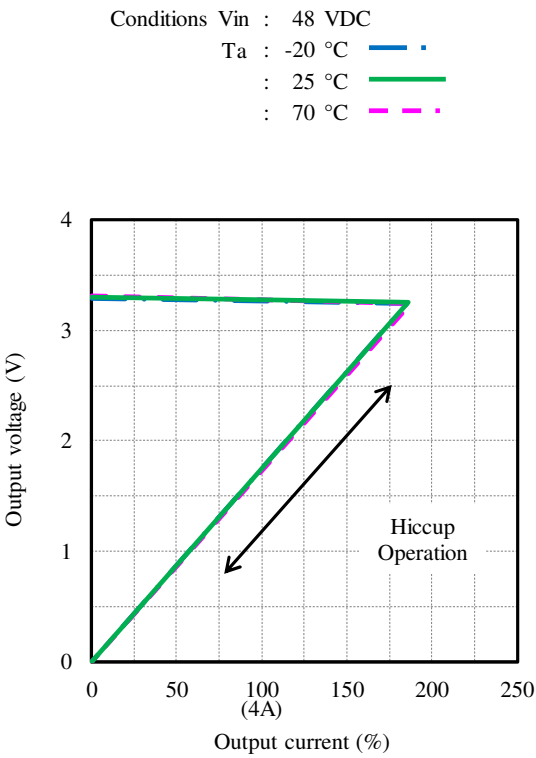
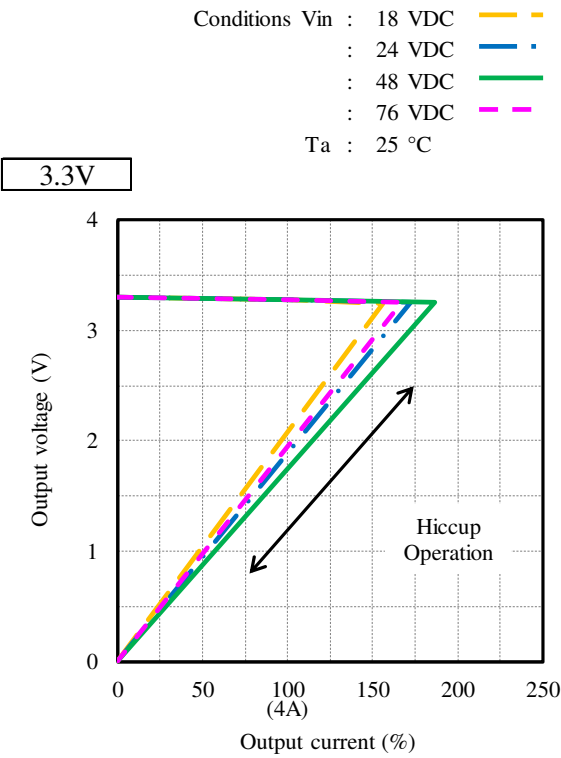
15V



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

入力電圧依存性
Input voltage dependence

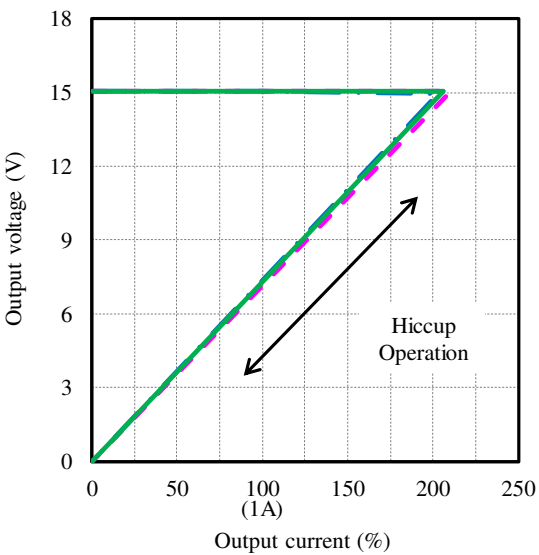
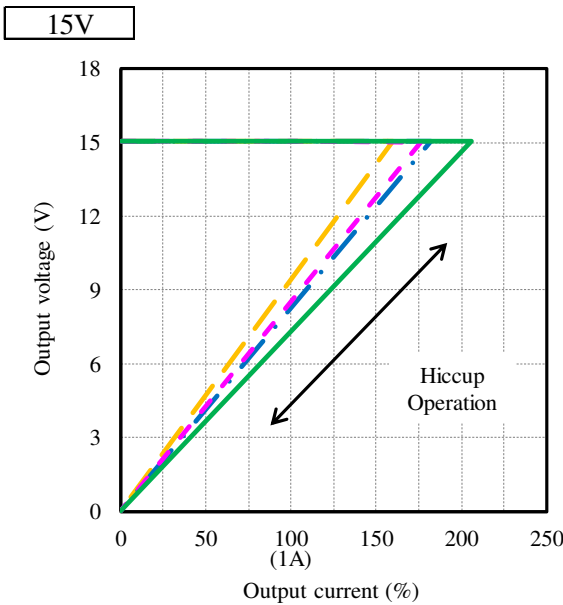
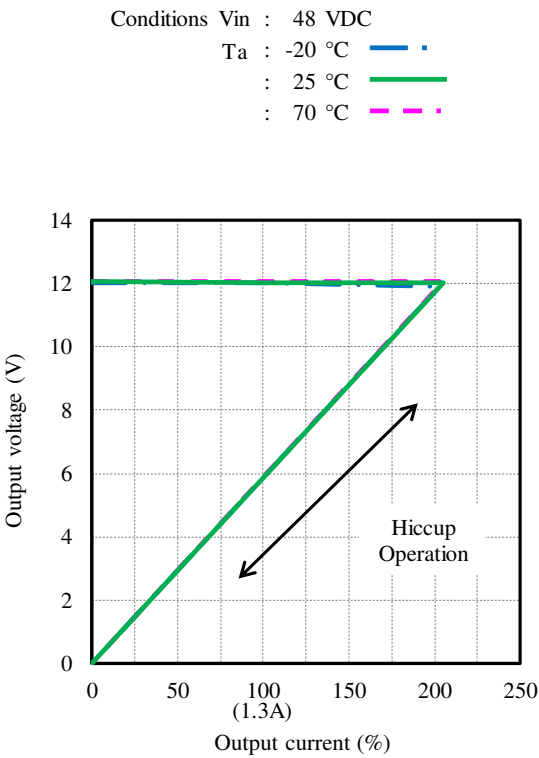
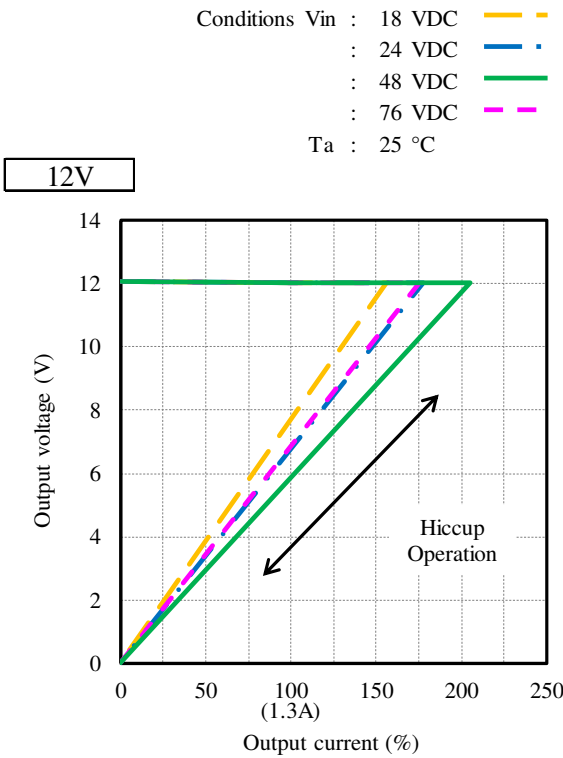
周囲温度依存性
Ambient temperature dependence



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

入力電圧依存性
Input voltage dependence

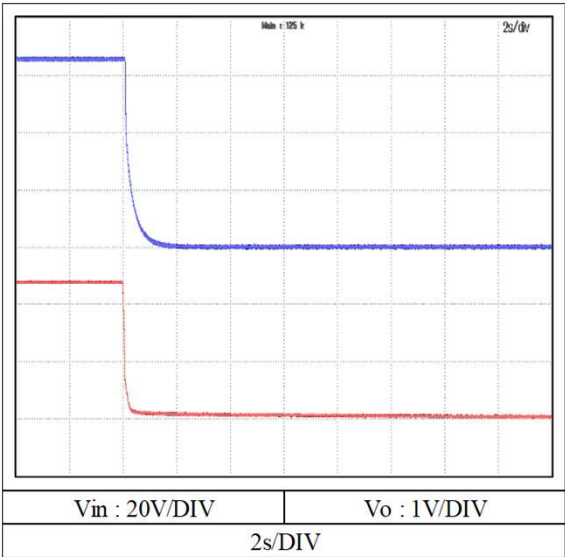
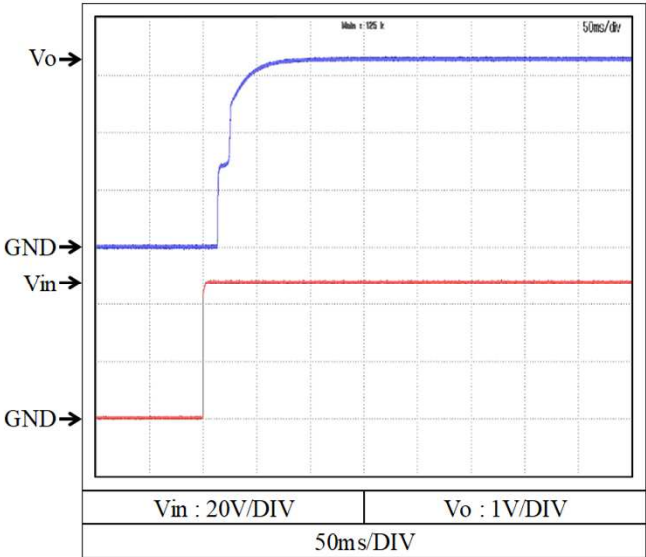
周囲温度依存性
Ambient temperature dependence



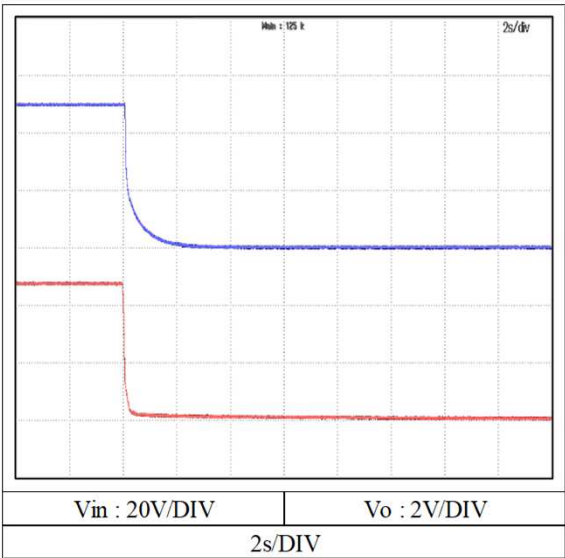
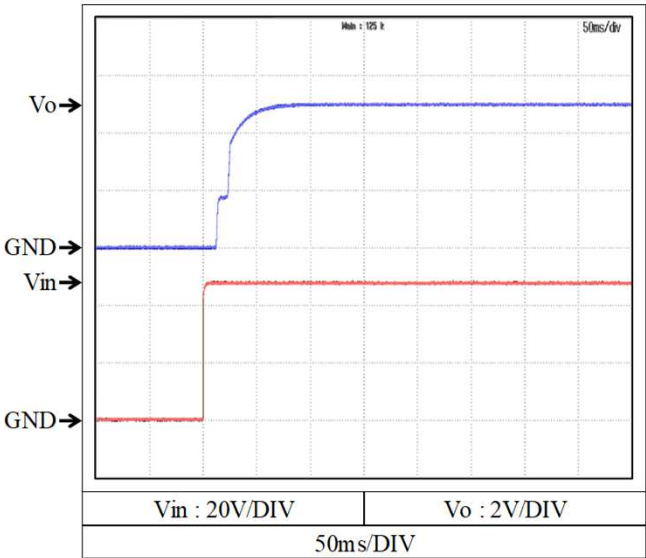
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

3.3V



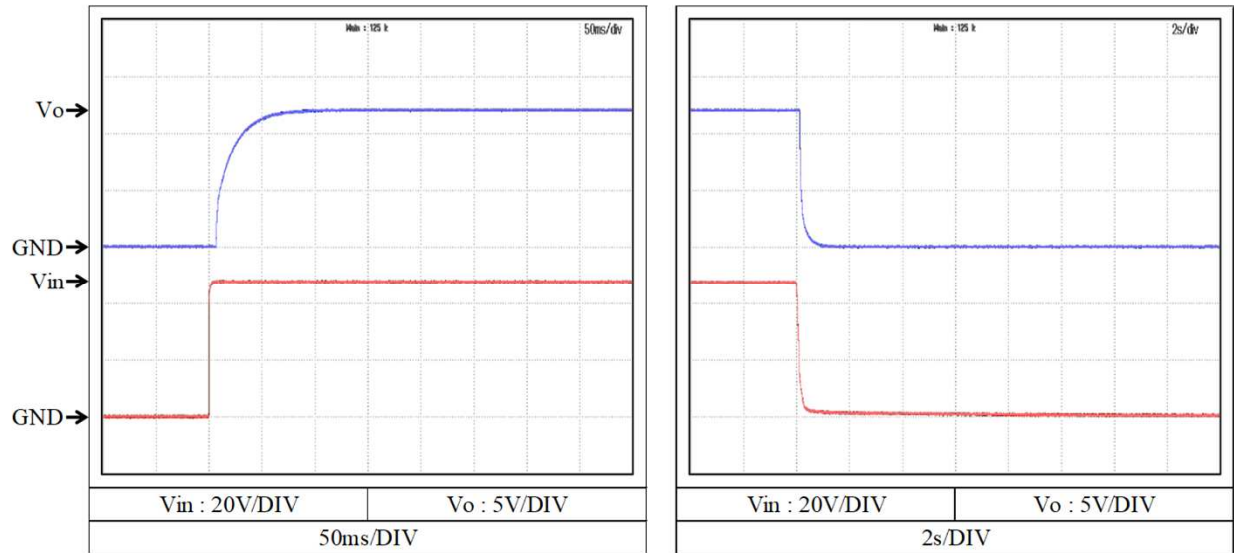
5V



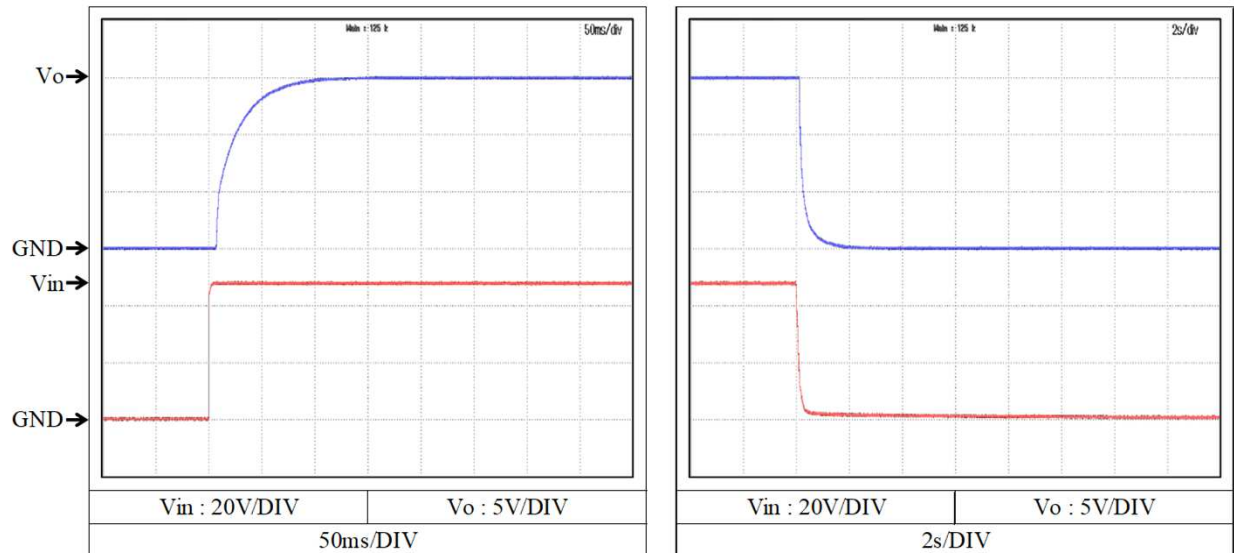
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

12V



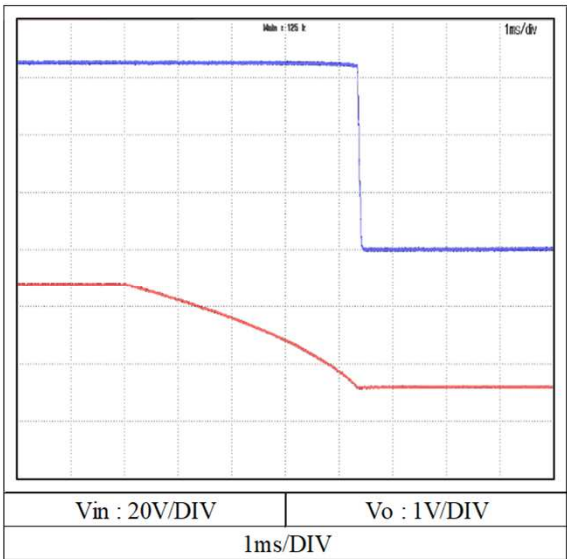
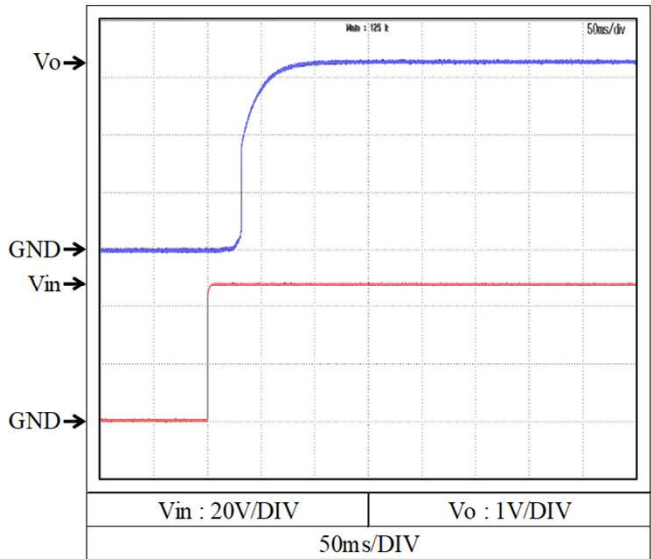
15V



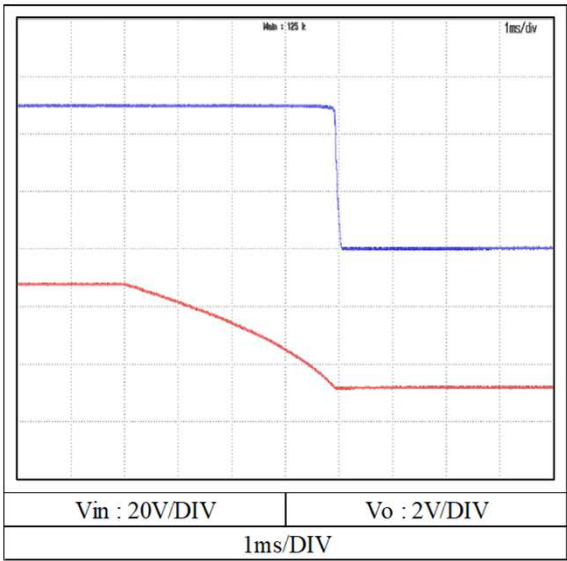
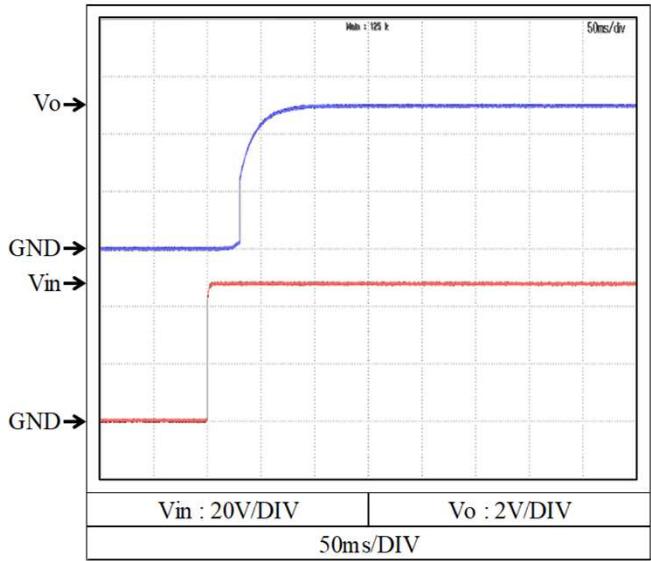
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

3.3V

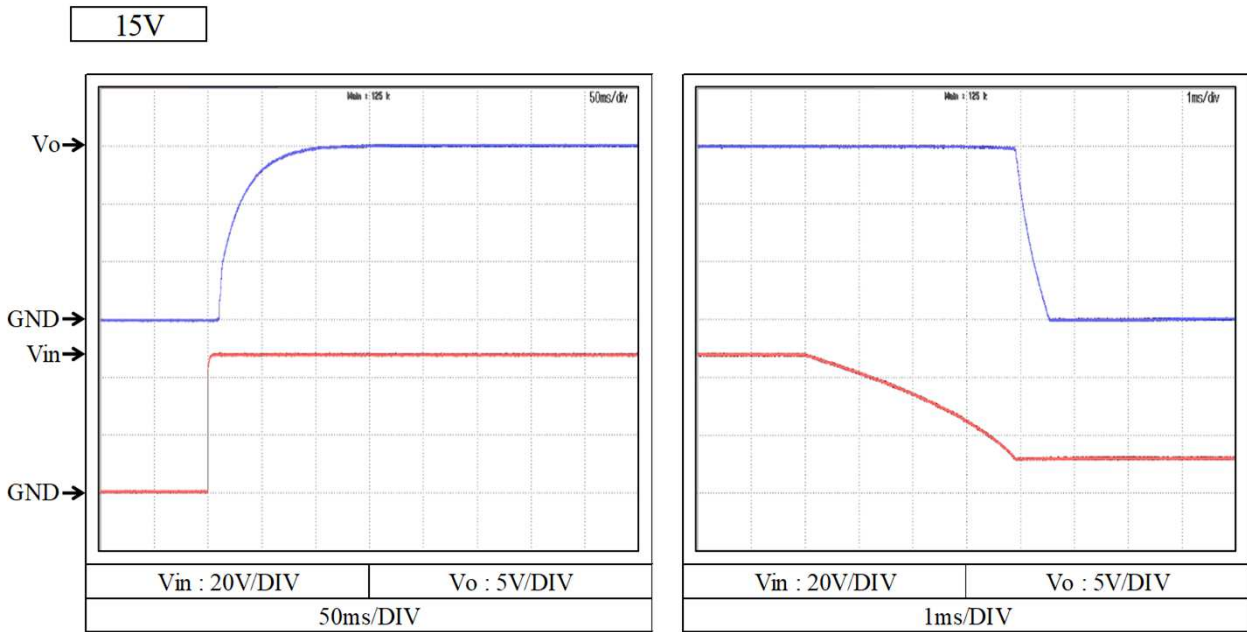
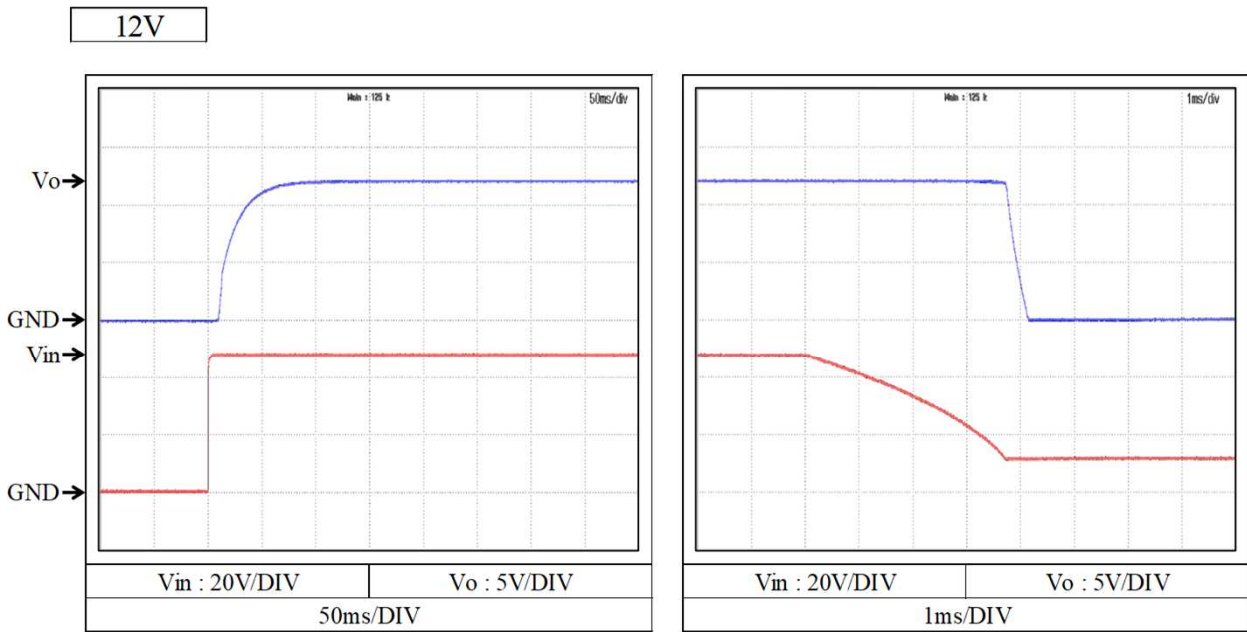


5V



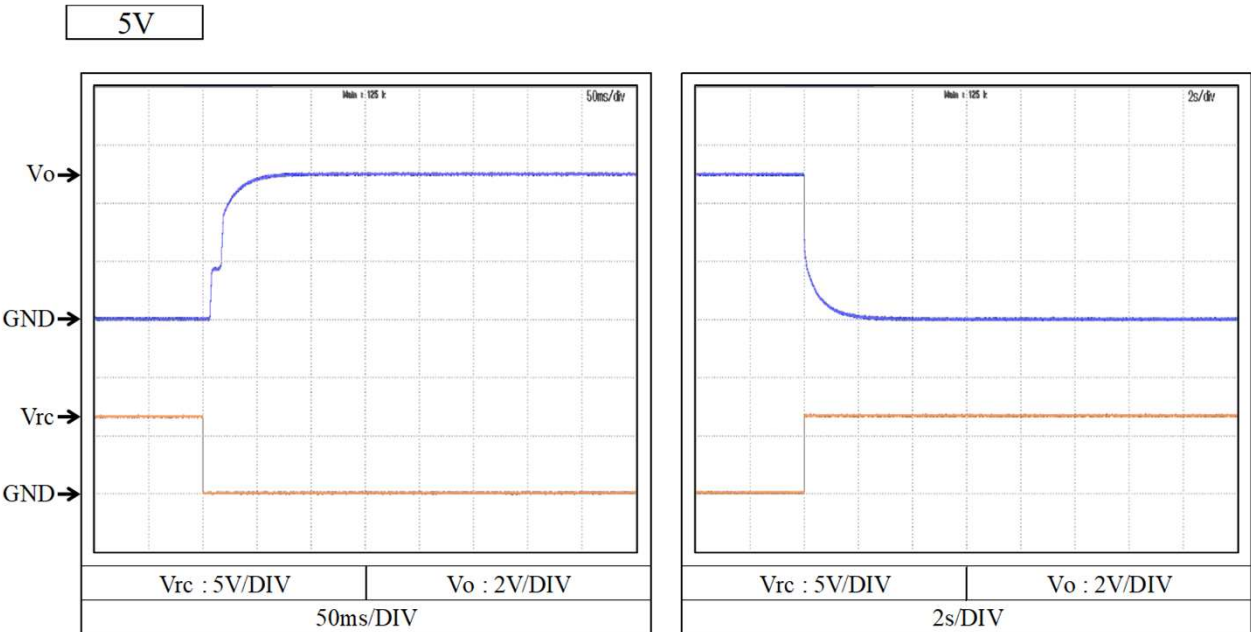
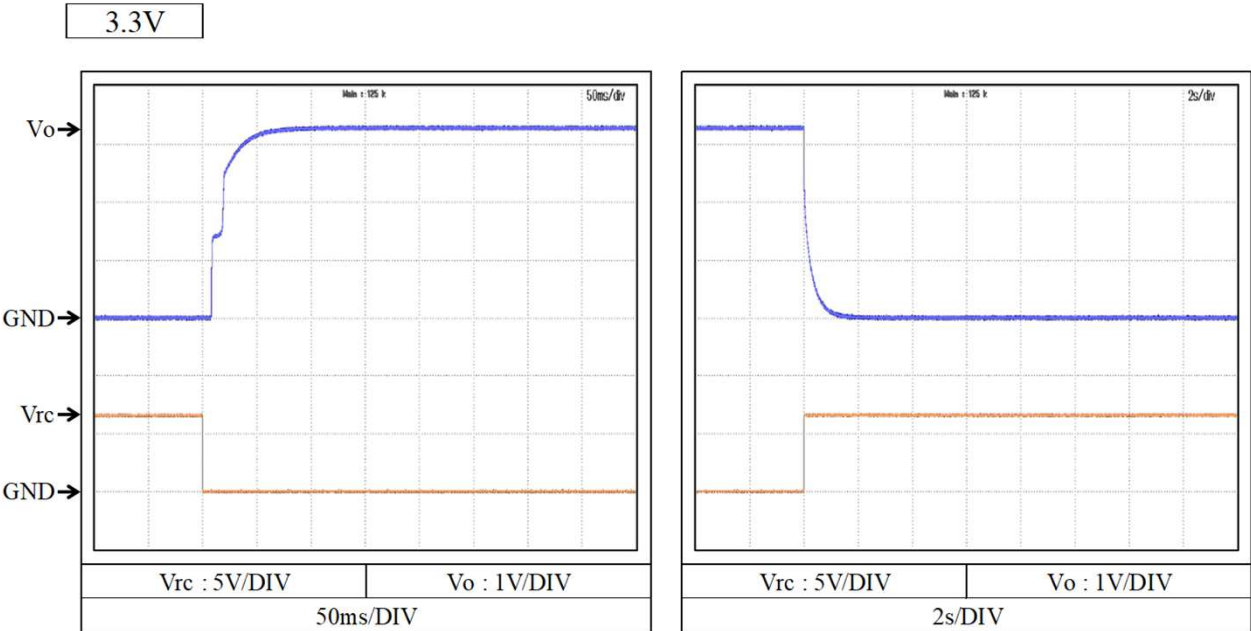
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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



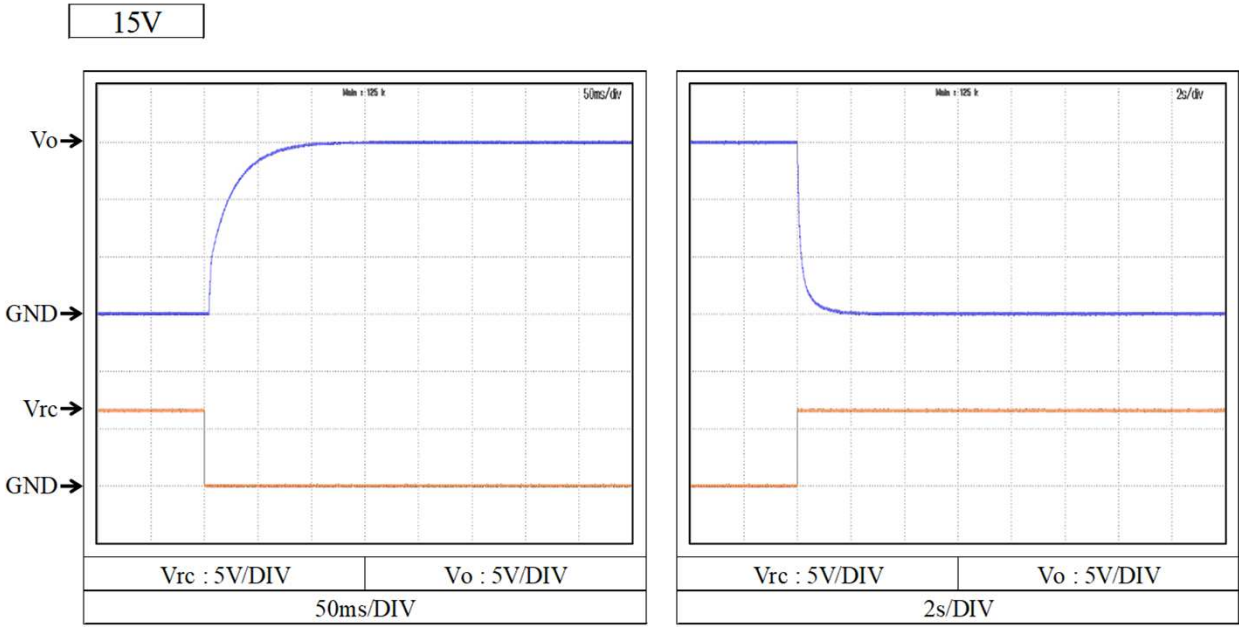
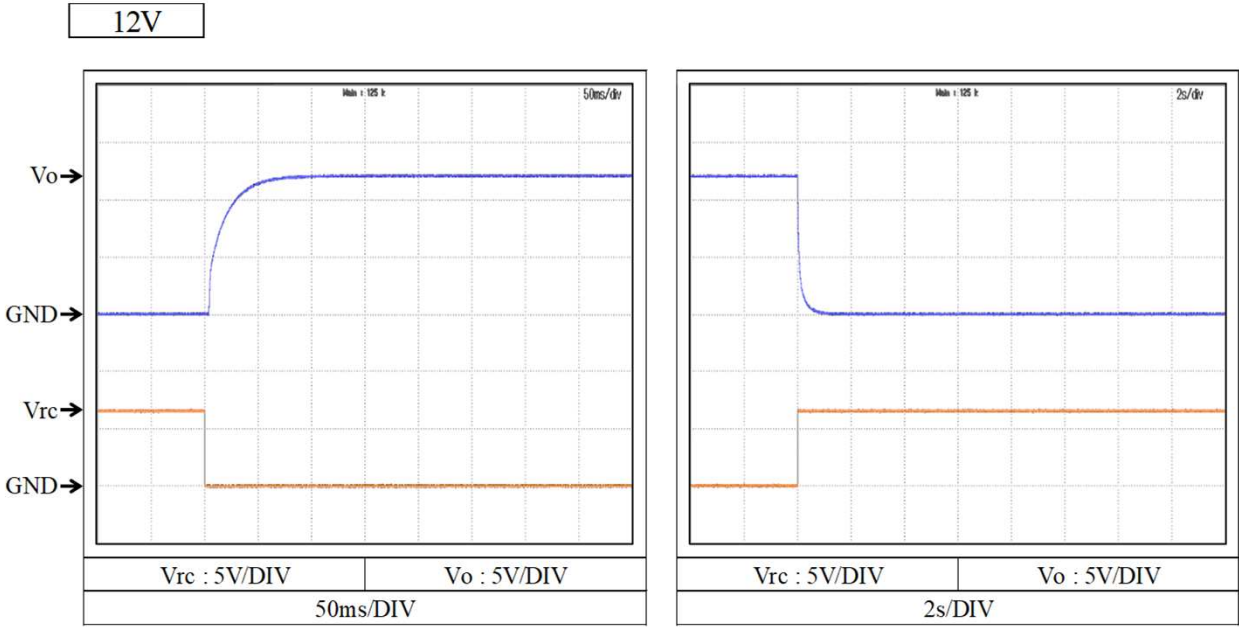
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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



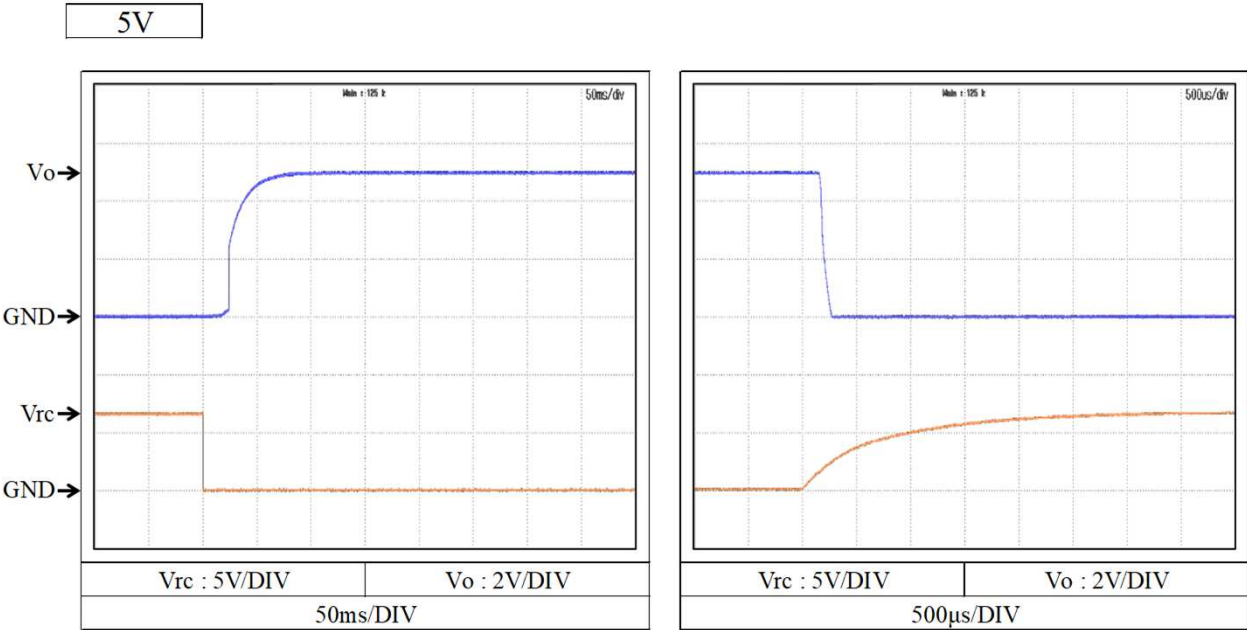
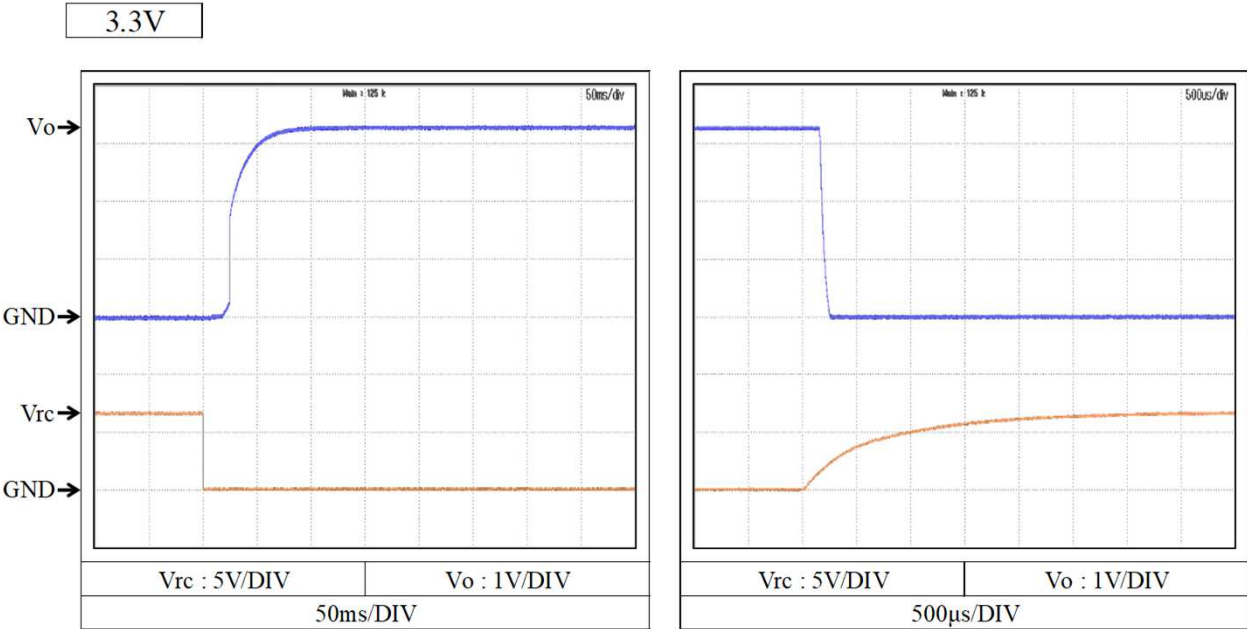
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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



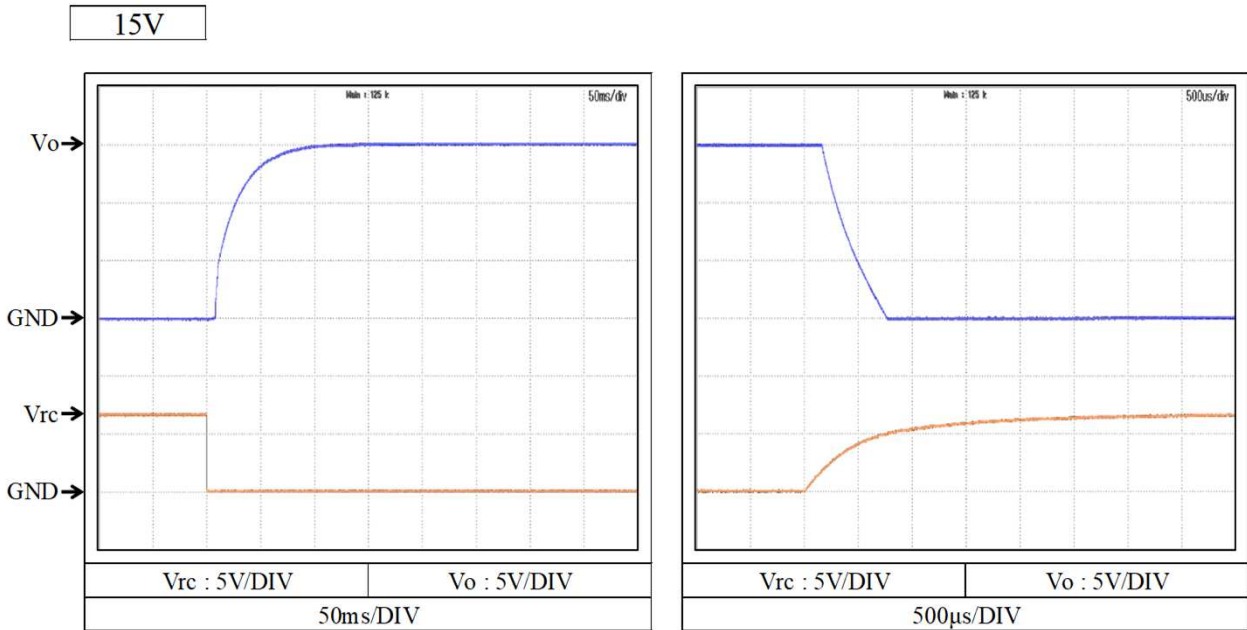
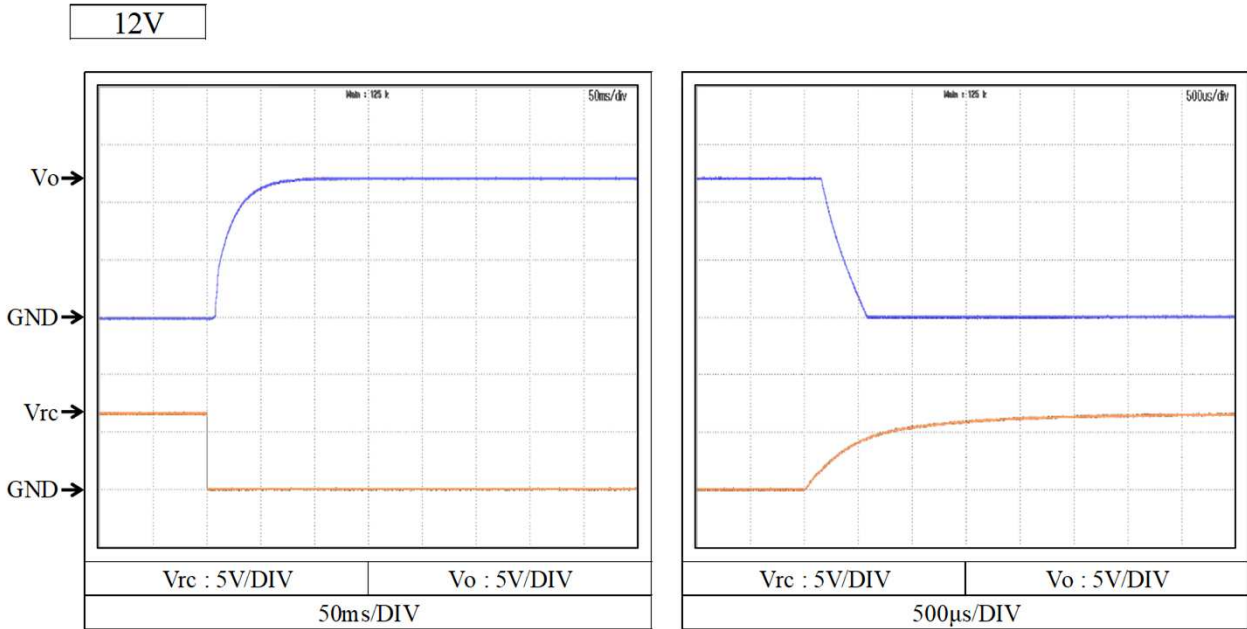
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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



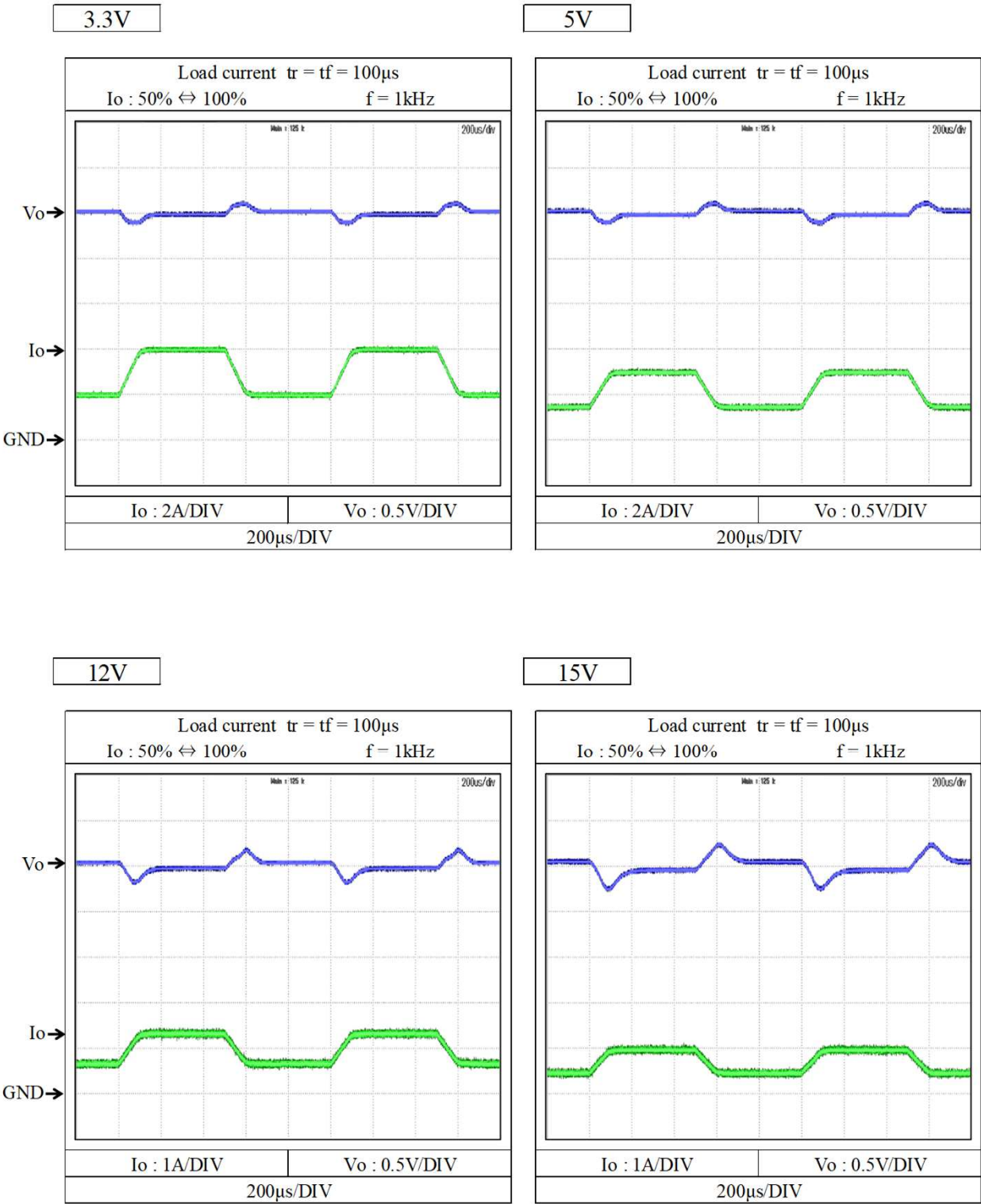
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

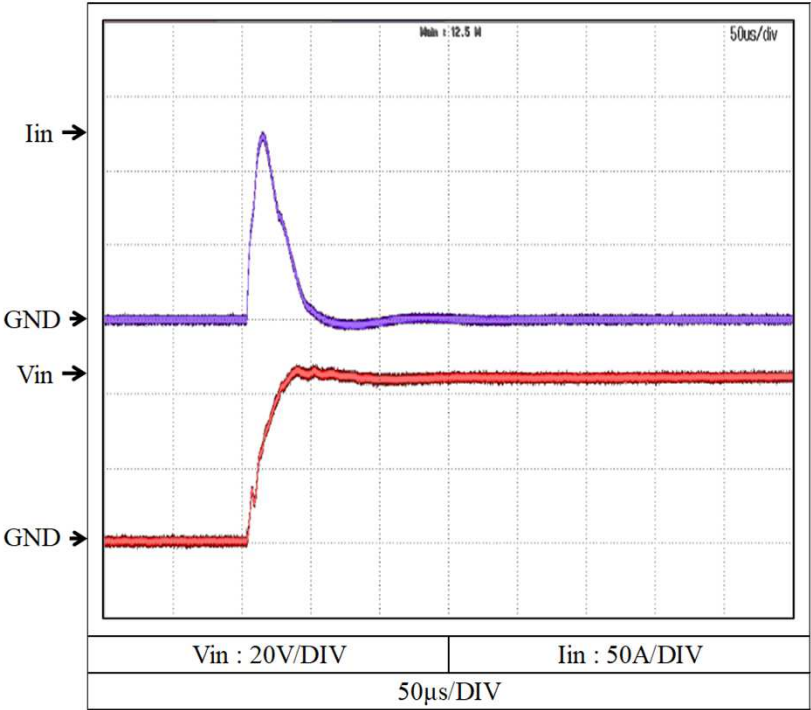
Conditions Vin : 48 VDC
Ta : 25 °C



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

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

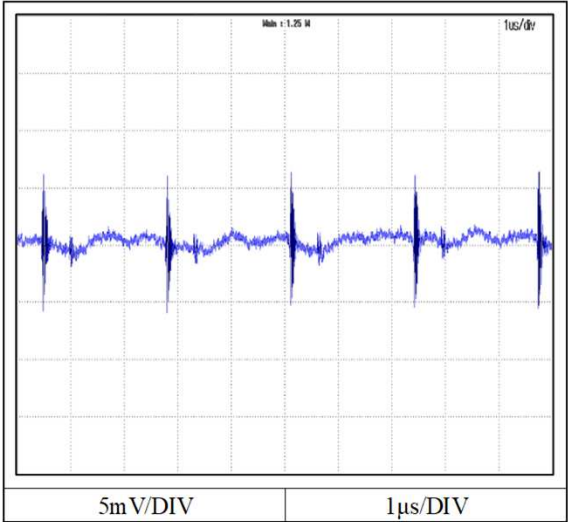
5V



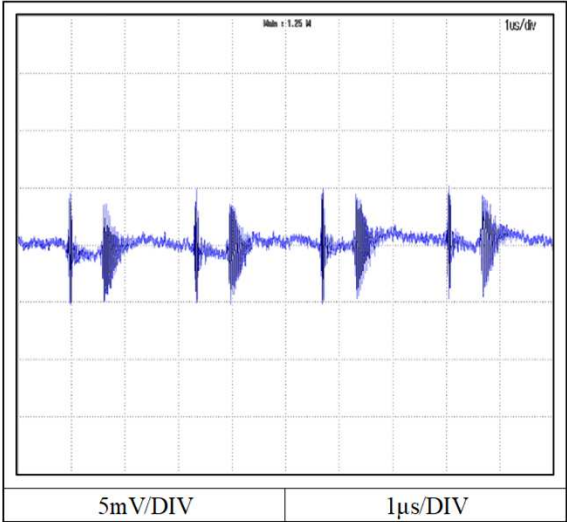
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

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

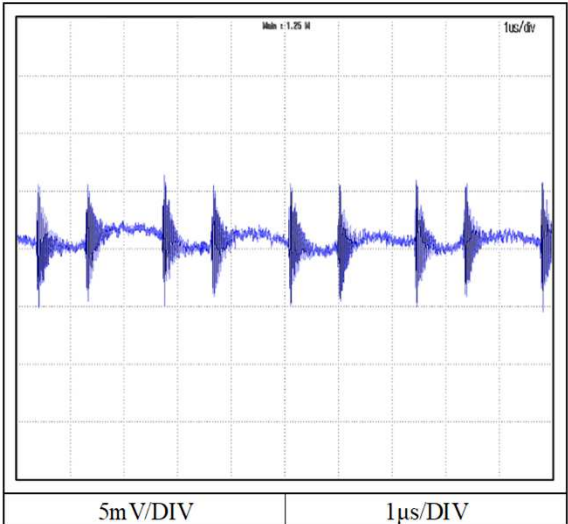
3.3V



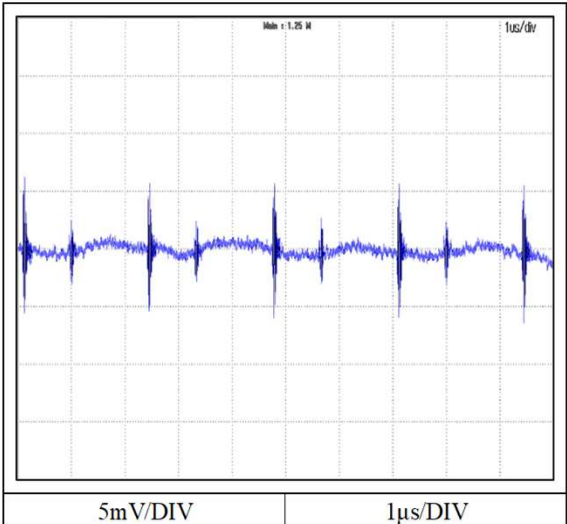
5V



12V



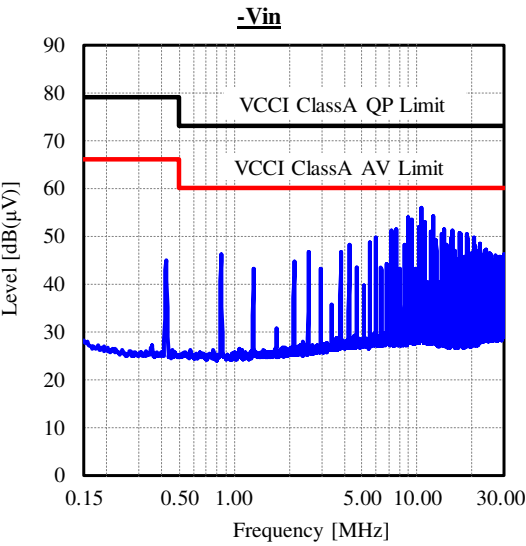
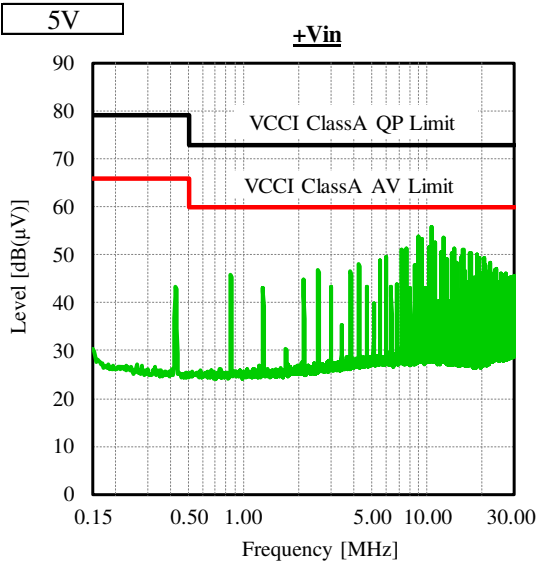
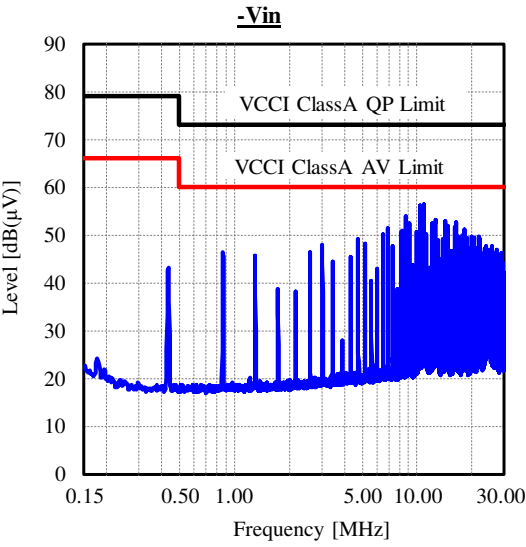
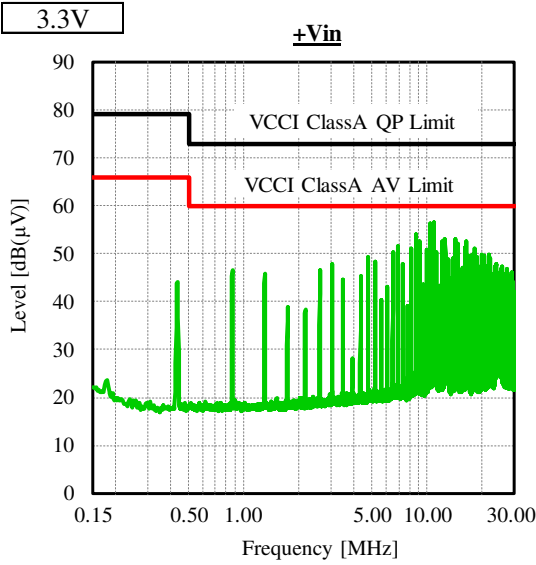
15V



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 : 48 VDC
Io : 100 %
Ta : 25 °C

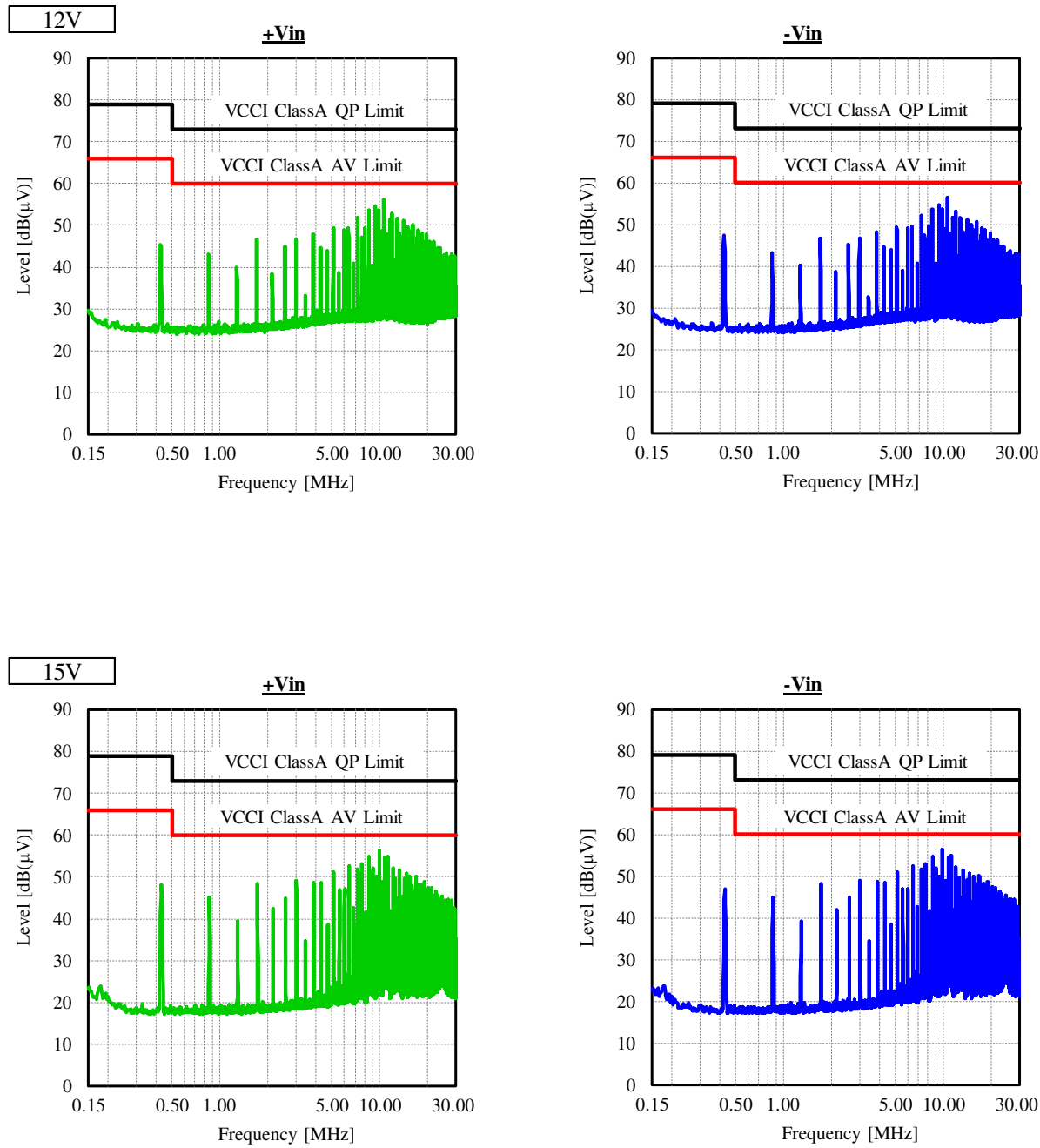


表示はQP値
Indication is QP values.

2-9. EMI特性 Electro-Magnetic Interference characteristics

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

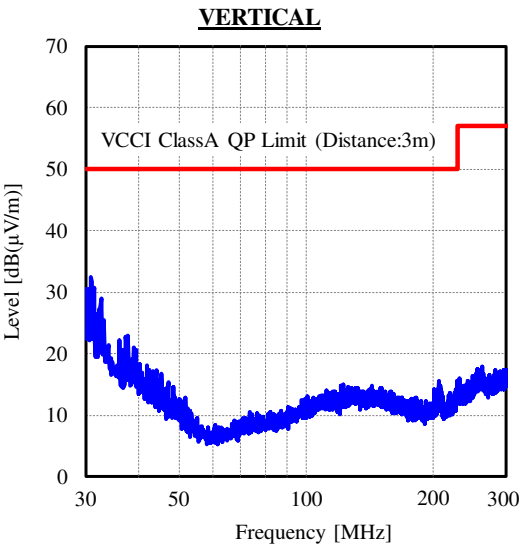
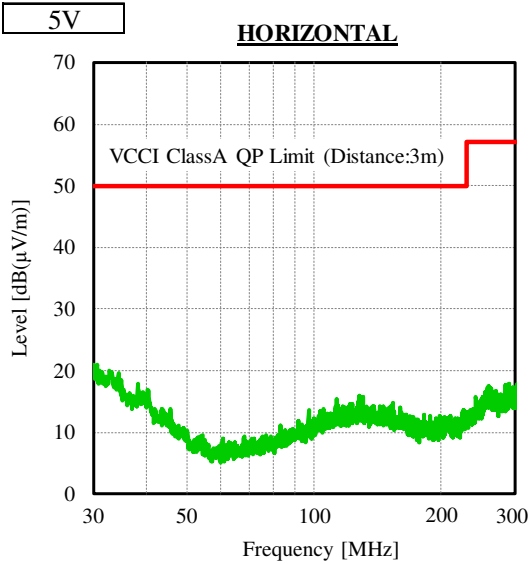
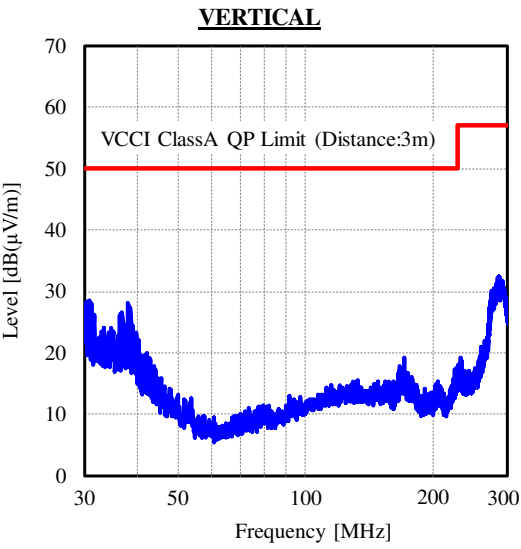
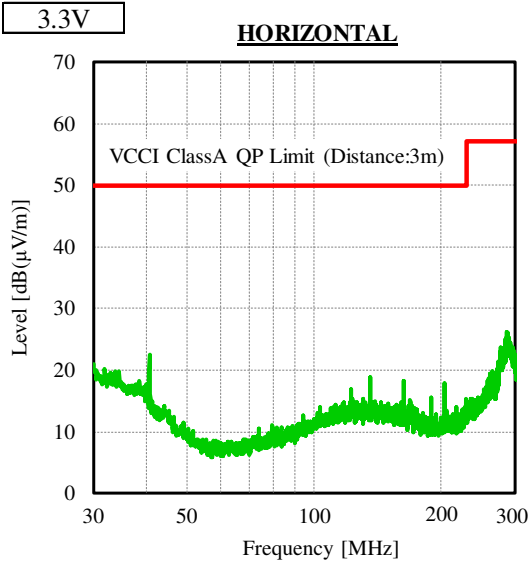
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C



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

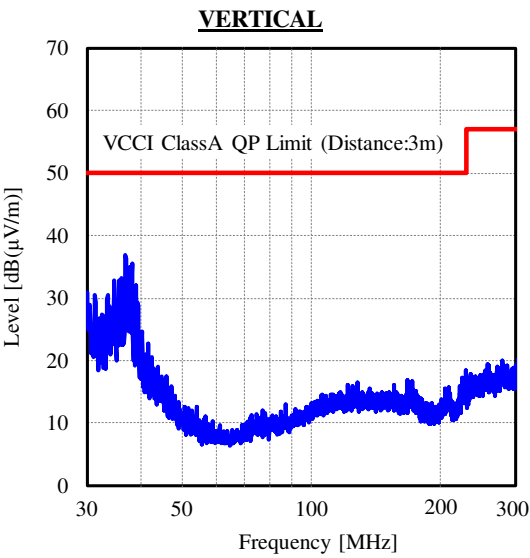
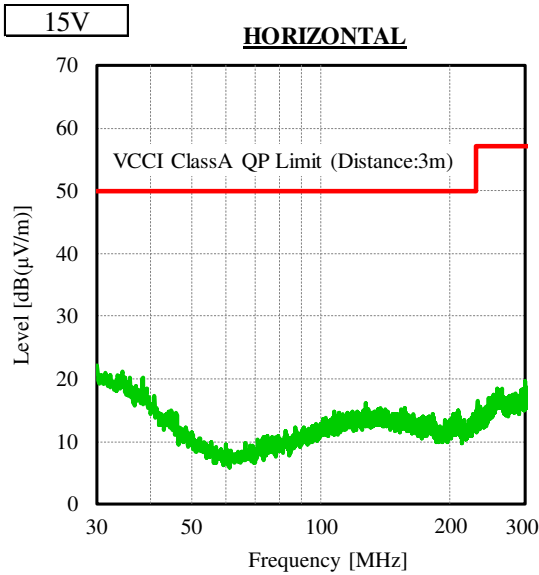
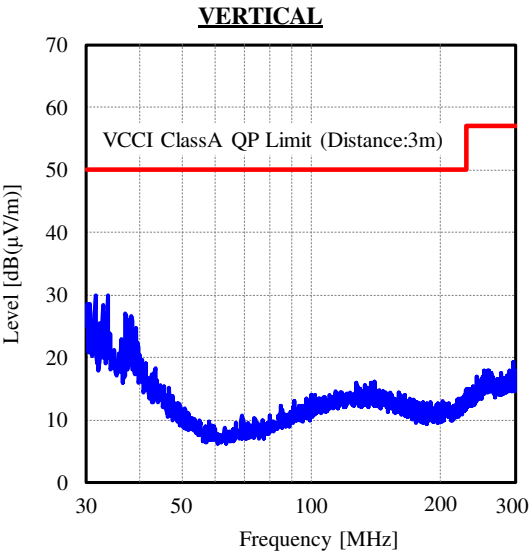
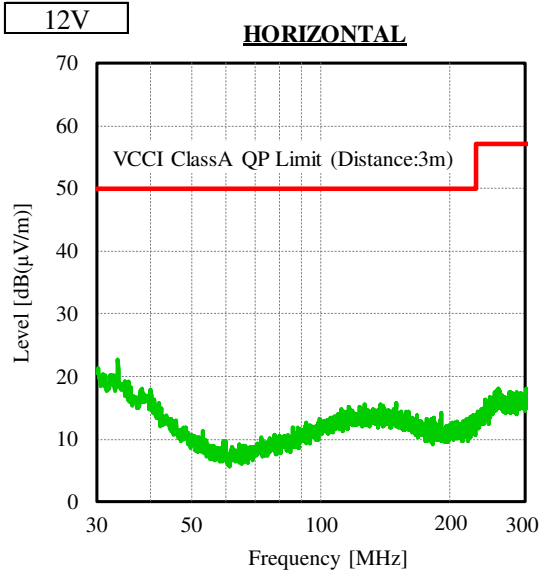
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C



表示はピーク値
Indication is peak 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 : 48 VDC
Io : 100 %
Ta : 25 °C



表示はピーク値
Indication is peak values.