

CN300B110-*

EVALUATION DATA

型式データ

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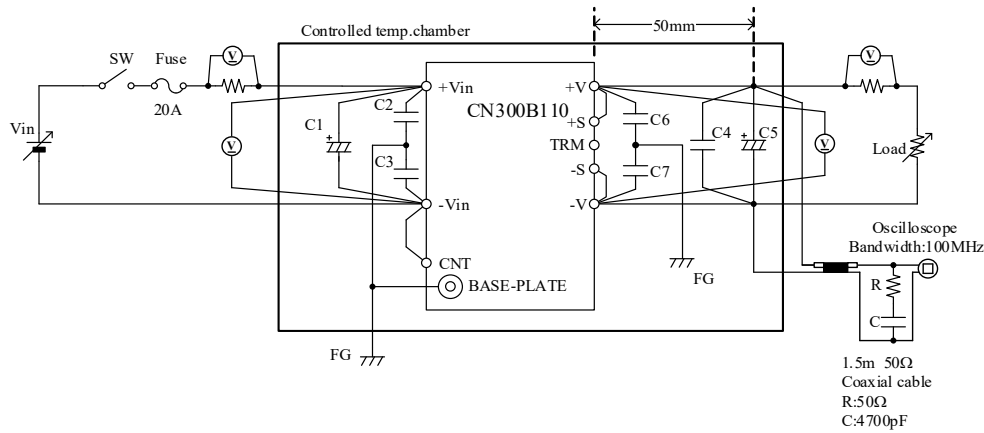
使用記号 Terminology used

Definition		
V_{in}	入力電圧	Input voltage
V_o	出力電圧	Output voltage
V_{cnt}	CNT電圧	CNT voltage
I_{in}	入力電流	Input current
I_o	出力電流	Output current
T_{bp}	ベースプレート温度	Base-plate temperature
T_a	周囲温度	Ambient temperature
f	周波数	Frequency

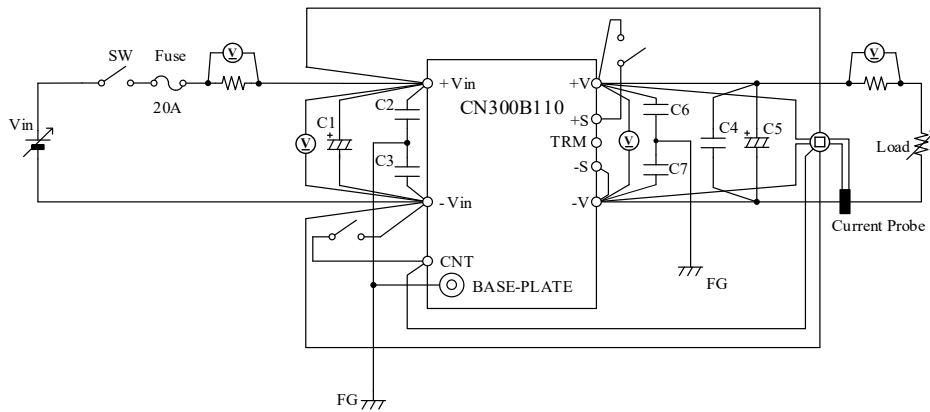
1. 評価方法 Evaluation Method

1.1 測定回路 Measurement Circuits

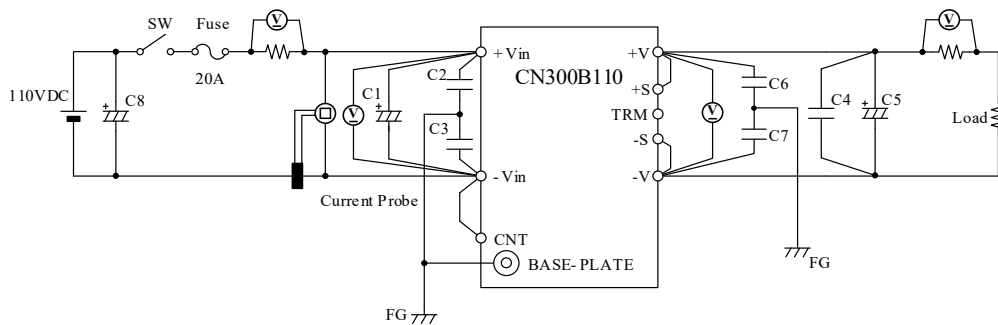
- (1) 静特性、過電流保護特性、出力リップル・ノイズ波形
Steady state characteristics, Over current protection (OCP) characteristics and Output ripple and noise waveform



- (2) 過渡応答、過電圧保護特性、その他
Dynamic response, Over voltage protection (OVP) characteristics and Other characteristics



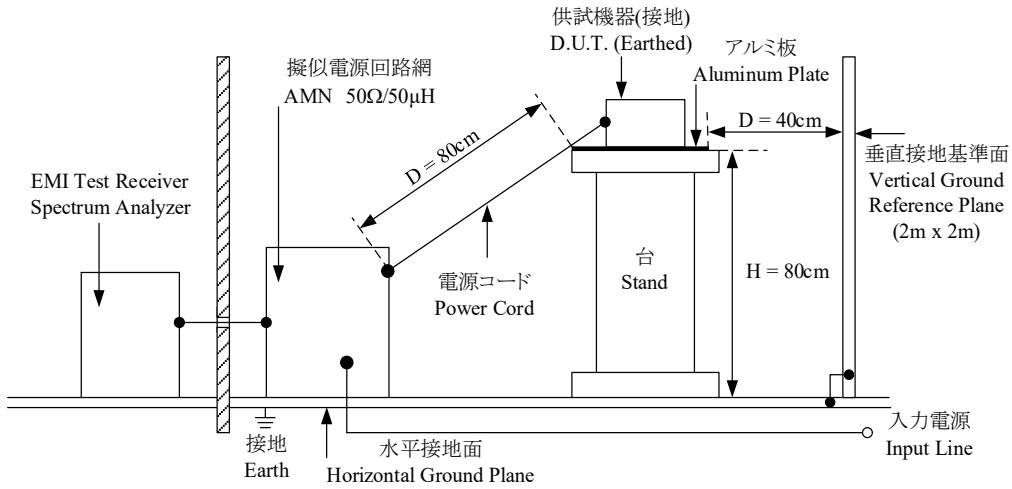
- (3) 入力サージ電流 (突入電流) 特性
Inrush current characteristics



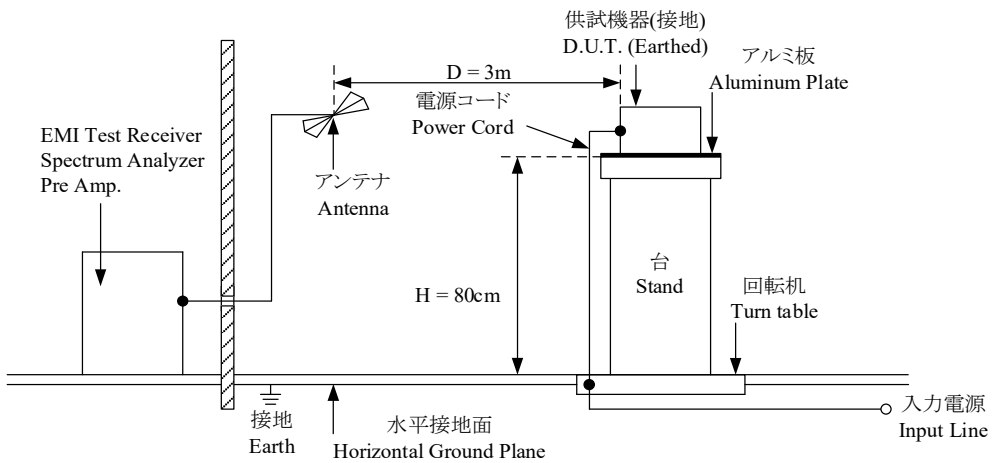
C1 : 220 μ F Electrolytic Capacitor	C5 : 12V- 1000 μ F Electrolytic Capacitor
C2,C3 : 4700pF Ceramic Capacitor	: 13.8V- 1000 μ F Electrolytic Capacitor
C4 : 10 μ F Ceramic Capacitor	: 15V- 1000 μ F Electrolytic Capacitor
C6,C7 : 0.022 μ F Film Capacitor	: 24V- 470 μ F Electrolytic Capacitor
C8 : 20000 μ F Electrolytic Capacitor	

(4) EMI特性 Electro-Magnetic Interference characteristics

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

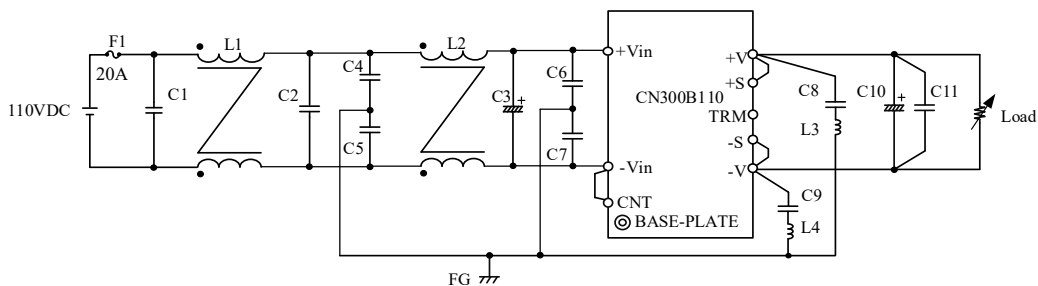


(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise



*入出力ケーブルとしてシールドケーブルを使用
Shielded cable used to input and output cable.

VCCI class A対応アプリケーションシステム
VCCI class A application system



- | | |
|-----------------------------------|--|
| F1 : 500VDC, 20A (WN30-20) | C10 : 12V- 1000μF Electrolytic Capacitor |
| C1,C2 : 1μF Film Capacitor | : 13.8V- 1000μF Electrolytic Capacitor |
| C3 : 220μF Electrolytic Capacitor | : 15V- 1000μF Electrolytic Capacitor |
| C4,C5 : 2200pF Ceramic Capacitor | : 24V- 470μF Electrolytic Capacitor |
| C6,C7 : 4700pF Ceramic Capacitor | L1 : 1mH |
| C8,C9 : 0.1μF Ceramic Capacitor | L2 : 2.5mH |
| C11 : 10μF Ceramic Capacitor | L3,L4 : Bead Core (HF57BB3.35X2X2) |

*詳細なパラメータ情報については、次ページをご参照ください。

Refer to the next page for detailed parameter information.

*詳細な周辺パラメータ情報(参照用)

The detailed peripheral parameter information (for reference)

	SYMBOL	PRODUCT TYPE	ITEM DESCRIPTION	NOTE	MANUFACTURER	
1	F1	Fuse	WN30-20	500VDC, 20A	WALTER	
2	C1,C2	Film Capacitor	LE105-MX-C3.5	310V, 1 μ	OKAYA	
3	C3	Electrolytic Capacitor	EKXJ201ELL221MK40S	200V, 220 μ	NI-CHEMI	
4	C4,C5	Ceramic Capacitor	DE1E3KX222MJ4BN04F	250V, 2200p	MURATA	
5	C6,C7	Ceramic Capacitor	DE1E3KX472MJ4BN04F	250V, 4700p	MURATA	
6	C8,C9	Ceramic Capacitor	RDER72J104K8K1C11B	630VDC, 0.1 μ	MURATA	
7	C10	12V Model	Electrolytic Capacitor	ELXY250ELL102MK25S	25V, 1000 μ	NI-CHEMI
8		13.8V Model	Electrolytic Capacitor	ELXY250ELL102MK25S	25V, 1000 μ	NI-CHEMI
9		15V Model	Electrolytic Capacitor	ELXY250ELL102MK25S	25V, 1000 μ	NI-CHEMI
10		24V Model	Electrolytic Capacitor	ELXY500ELL471MK25S	50V, 470 μ	NI-CHEMI
11	C11	Ceramic Capacitor	GRM32ER71H106KA12L	50V, 10 μ	MURATA	
12	L1	Noise Filter Coil	CH5A5009	1mH	TNC	
13	L2	Noise Filter Coil	CH5A2025	2.5mH	TNC	
14	L3,L4	Bead Core	HF57BB3.35X2X2		TDK	

1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	AMN	SCHWARZBECK	NNLK8121
2	ANTENNA(BI-LOG ANTENNA)	TESEQ	CBL6111D
3	CONTROLLED TEMP. CHAMBER	ESPEC CORP.	SU-662
4	CURRENT PROBE	YOKOGAWA	701930
5	CURRENT PROBE AMPLIFIER	YOKOGAWA	700938
6	CVCF	KIKUSUI	PCR2000L
7	DC POWER SUPPLY	TDK-Lambda	GEN200-25
8	DIGITAL MULTIMETER	Agilent	34970A
9	DIGITAL POWER METER	YOKOGAWA	WT210
10	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA	DLM2054
11	DYNAMIC DUMMY LOAD	Chroma	63030
12	EMI TEST RECEIVER SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
13	PRE AMP.	SONOMA	310N
14	SHUNT RESISTER	YOKOGAWA ELECT.	2215

2. 特性データ Characteristics

2.1 静特性 Steady state data

(1) 入力変動、負荷変動、温度変動 Line regulation, Load regulation, Temperature drift

12V

1. Line regulation and Load regulation

Condition Tbp : 25°C

Io \ Vin	43VDC	72VDC	110VDC	160VDC	Line regulation	
0%	12.043V	12.043V	12.043V	12.043V	0mV	0.000%
50%	12.043V	12.043V	12.043V	12.043V	0mV	0.000%
100%	12.042V	12.042V	12.042V	12.042V	0mV	0.000%
Load regulation	1mV	1mV	1mV	1mV		
	0.008%	0.008%	0.008%	0.008%		

2. Temperature drift

Conditions Vin : 110VDC

Io : 100%

Tbp	-40°C	+25°C	+100°C	Temperature stability	
Vo	12.073V	12.042V	11.926V	147mV	1.227%

13.8V

1. Line regulation and Load regulation

Condition Tbp : 25°C

Io \ Vin	48.2VDC	72VDC	110VDC	160VDC	Line regulation	
0%	13.808V	13.807V	13.807V	13.806V	2mV	0.014%
50%	13.808V	13.807V	13.807V	13.806V	2mV	0.014%
100%	13.807V	13.806V	13.805V	13.805V	2mV	0.014%
Load regulation	1mV	1mV	2mV	1mV		
	0.007%	0.007%	0.014%	0.007%		

2. Temperature drift

Conditions Vin : 110VDC

Io : 100%

Tbp	-40°C	+25°C	+100°C	Temperature stability	
Vo	13.833V	13.805V	13.668V	166mV	1.200%

(1) 入力変動、負荷変動、温度変動 Line regulation, Load regulation, Temperature drift

15V

1. Line regulation and Load regulation

Condition Tbp : 25°C

Io \ Vin	43VDC	72VDC	110VDC	160VDC	Line regulation	
0%	15.031V	15.031V	15.031V	15.031V	0mV	0.000%
50%	15.031V	15.031V	15.031V	15.030V	1mV	0.007%
100%	15.031V	15.030V	15.031V	15.030V	1mV	0.007%
Load regulation	0mV	1mV	0mV	1mV		
	0.000%	0.007%	0.000%	0.007%		

2. Temperature drift

Conditions Vin : 110VDC

Io : 100%

Tbp	-40°C	+25°C	+100°C	Temperature stability	
Vo	15.060V	15.031V	14.876V	184mV	1.226%

24V

1. Line regulation and Load regulation

Condition Tbp : 25°C

Io \ Vin	43VDC	72VDC	110VDC	160VDC	Line regulation	
0%	24.002V	24.002V	24.003V	24.002V	1mV	0.004%
50%	24.002V	24.002V	24.002V	24.002V	0mV	0.000%
100%	24.001V	24.002V	24.002V	24.001V	1mV	0.004%
Load regulation	1mV	0mV	1mV	1mV		
	0.004%	0.000%	0.004%	0.004%		

2. Temperature drift

Conditions Vin : 110VDC

Io : 100%

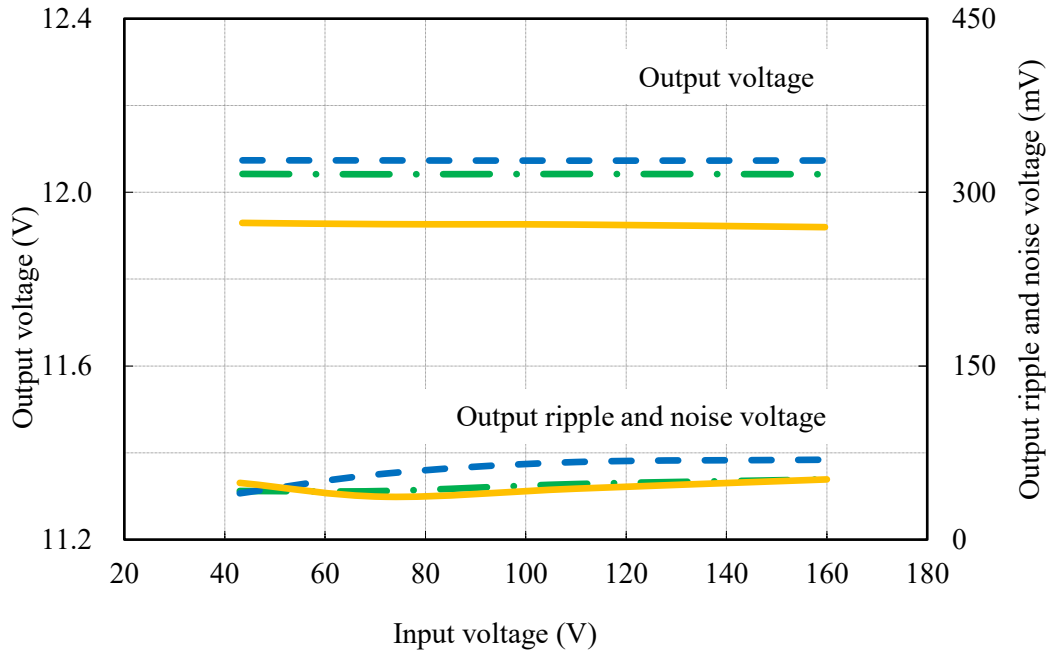
Tbp	-40°C	+25°C	+100°C	Temperature stability	
Vo	23.996V	24.002V	23.809V	193mV	0.804%

(2) 出力電圧、出力リップル・ノイズ電圧 対 入力電圧

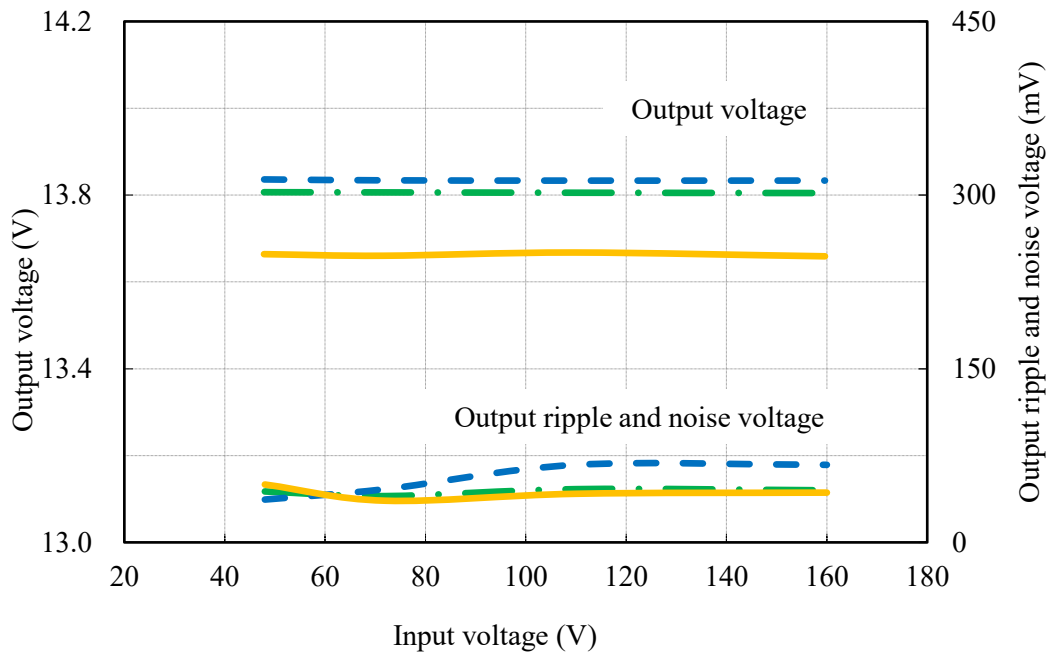
Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions
 I_o : 100 %
 T_{bp} : -40 °C ---
 : 25 °C -.-
 : 100 °C —

12V



13.8V

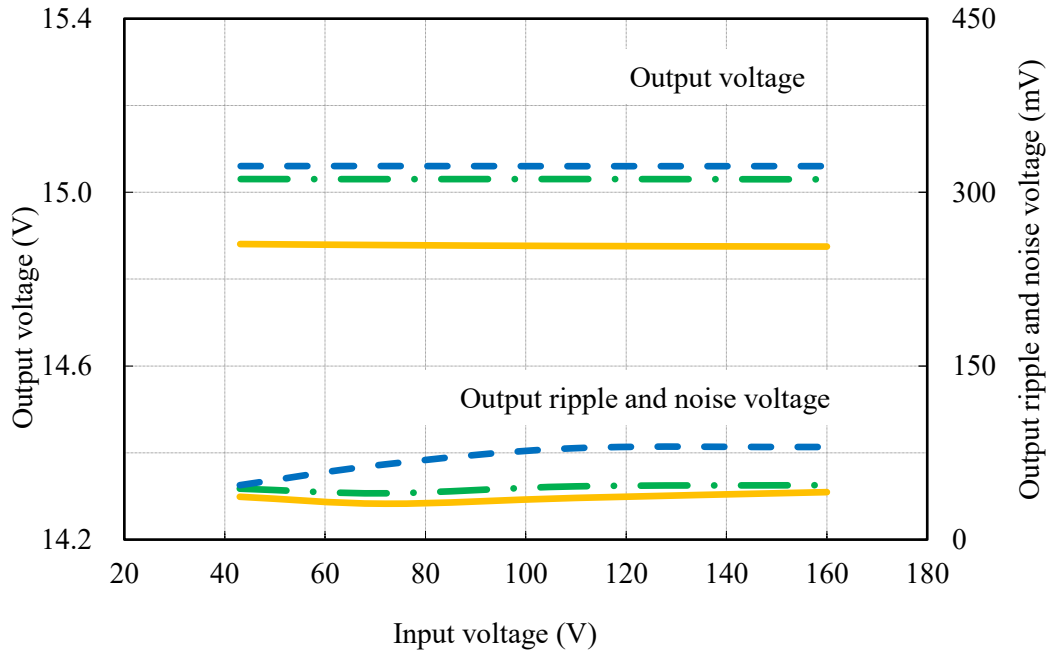


(2) 出力電圧、出力リップル・ノイズ電圧 対 入力電圧

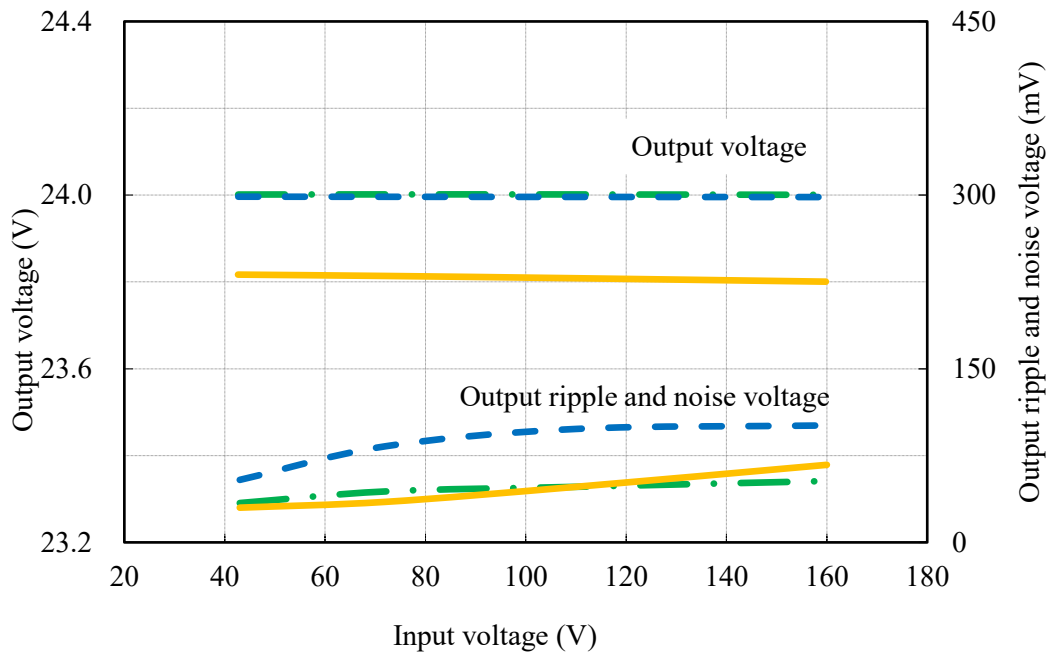
Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions
 I_o : 100 %
 T_{bp} : -40 °C ---
 : 25 °C -.-
 : 100 °C —

15V



24V

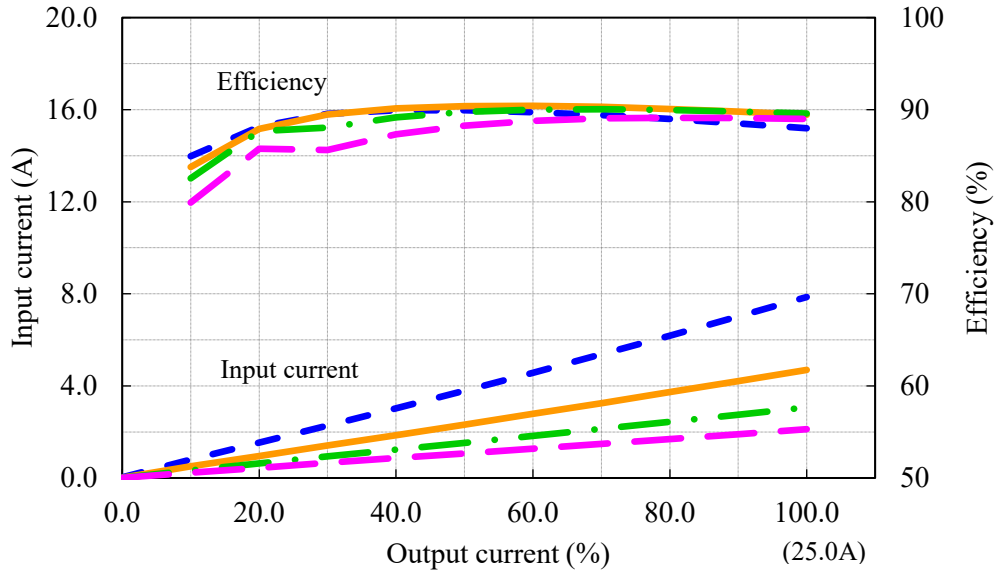


(3) 入力電流、効率 対 出力電流

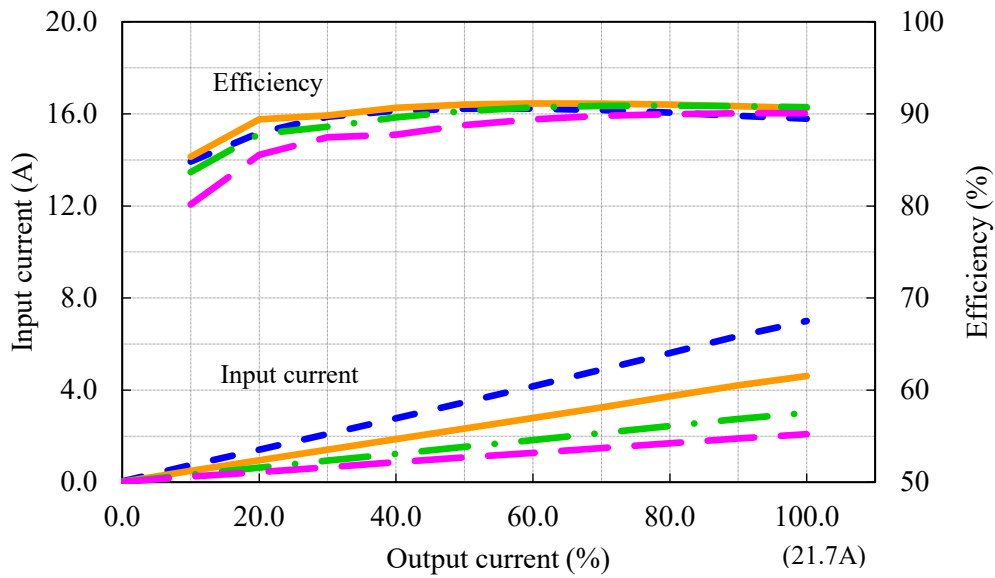
Input current and Efficiency vs. Output current

Conditions Vin : 43 VDC ---
 : 72 VDC —
 : 110 VDC - · - ·
 : 160 VDC - · - ·
 Tbp : 25 °C

12V



13.8V

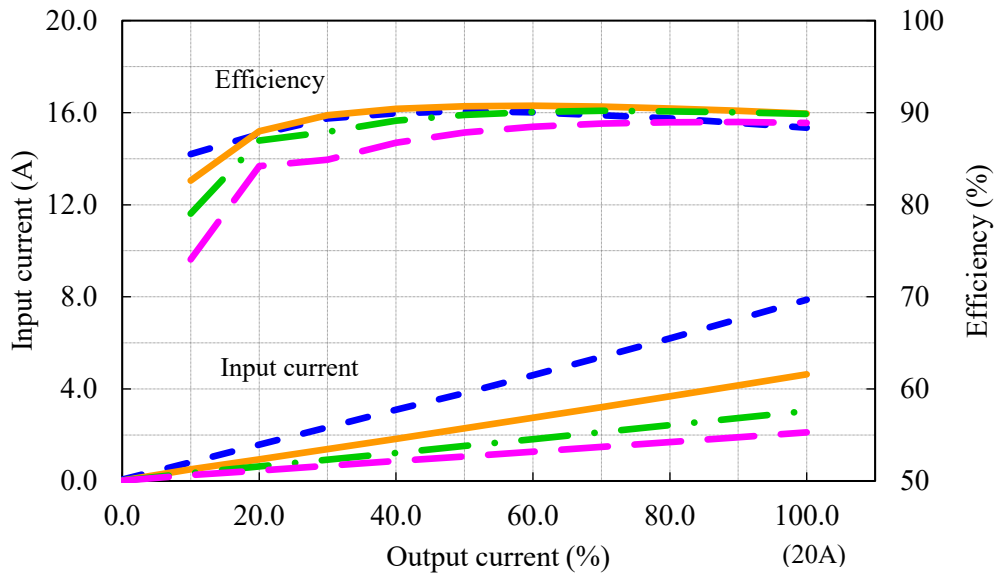


(3) 入力電流、効率 対 出力電流

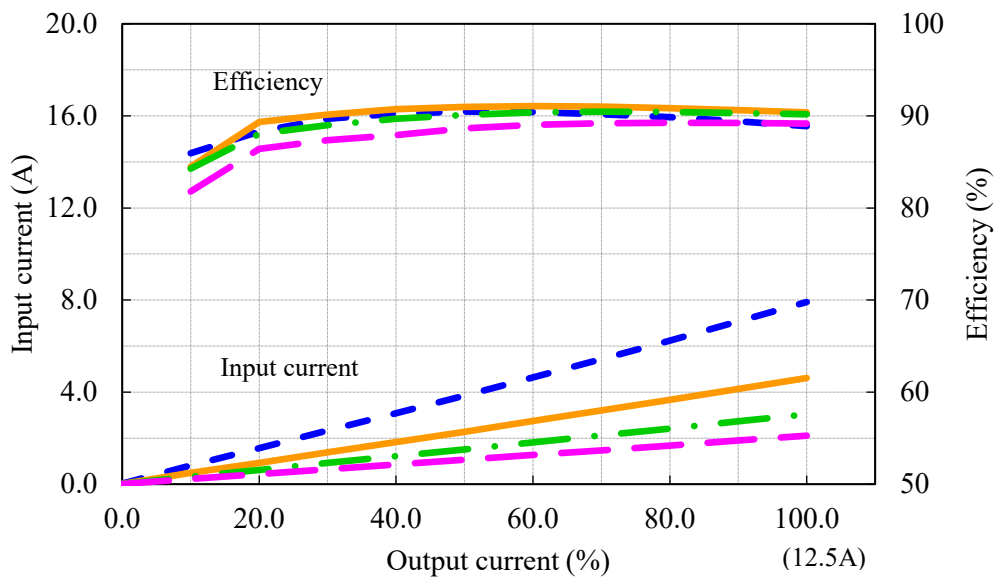
Input current and Efficiency vs. Output current

Conditions Vin : 43 VDC ---
 : 72 VDC —
 : 110 VDC - · - ·
 : 160 VDC - · - ·
 Tbp : 25 °C

15V



24V

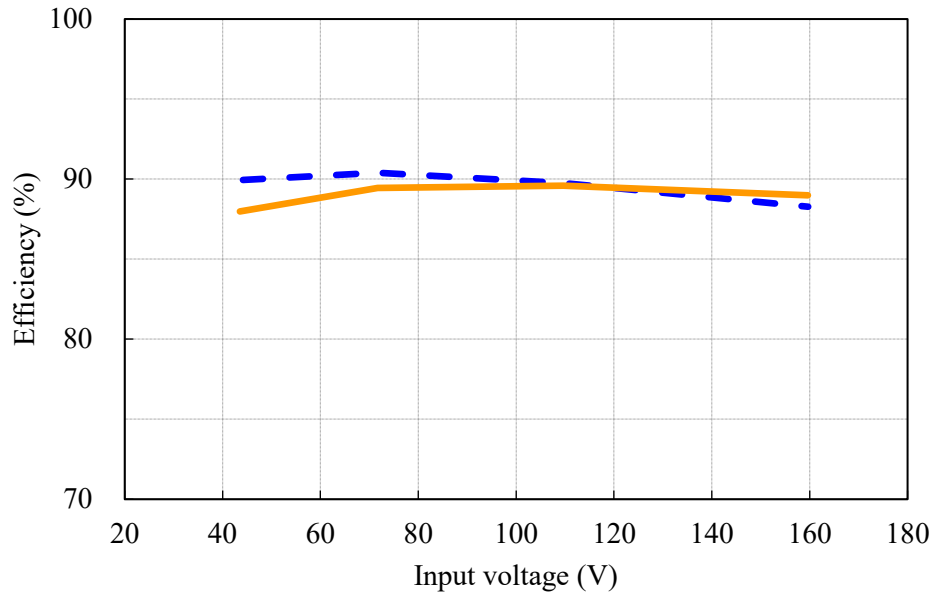


(4) 効率 対 入力電圧

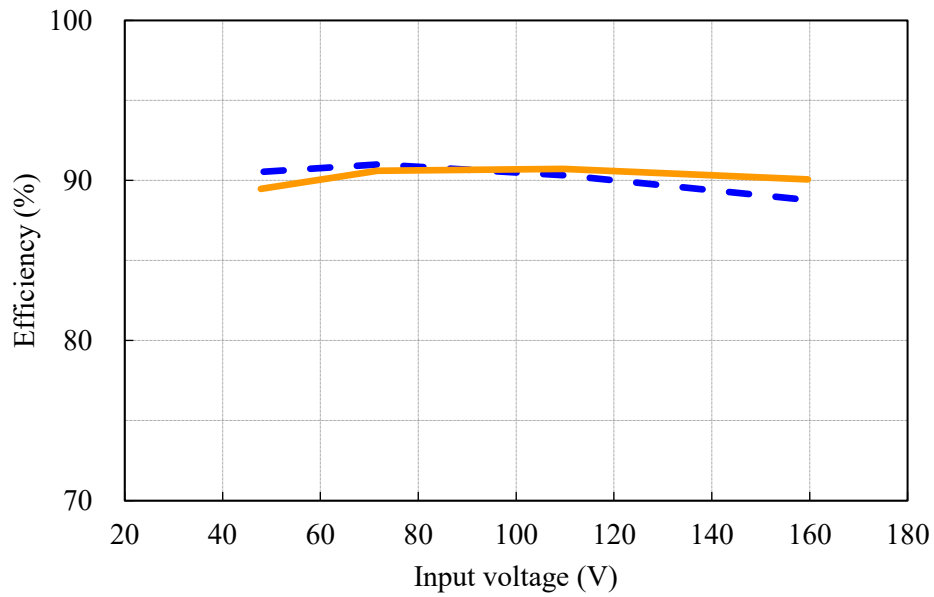
Efficiency vs. Input voltage

Conditions I_o : 50 % - - - -
 : 100 % ————
 T_{bp} : 25 °C

12V



13.8V

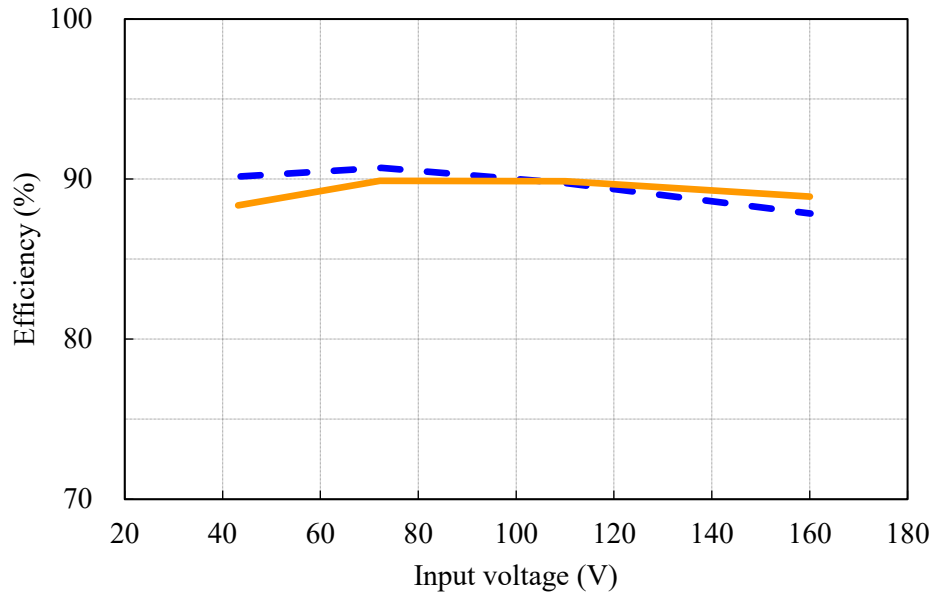


(4) 効率 対 入力電圧

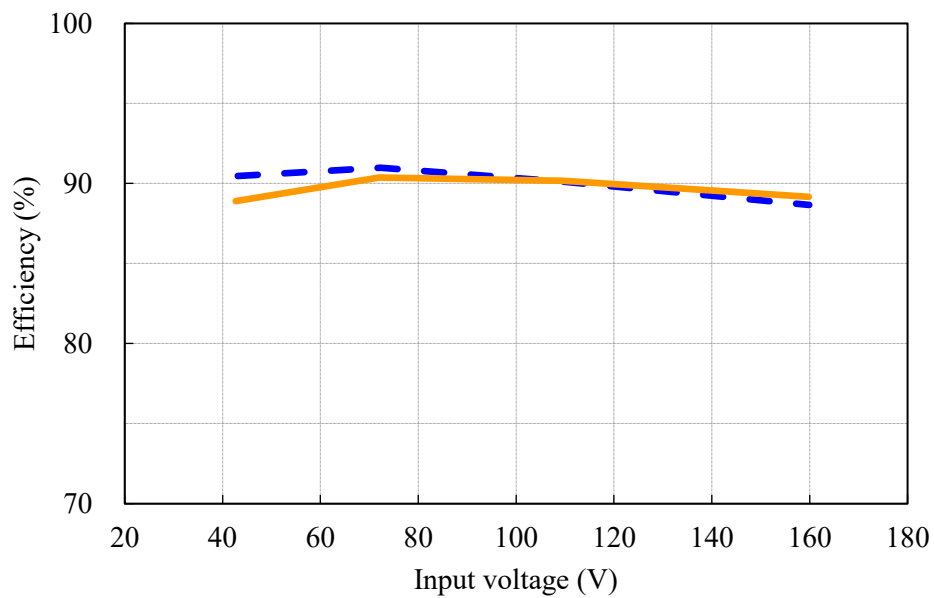
Efficiency vs. Input voltage

Conditions I_o : 50 % - - - -
 : 100 % ————
 T_{bp} : 25 °C

15V



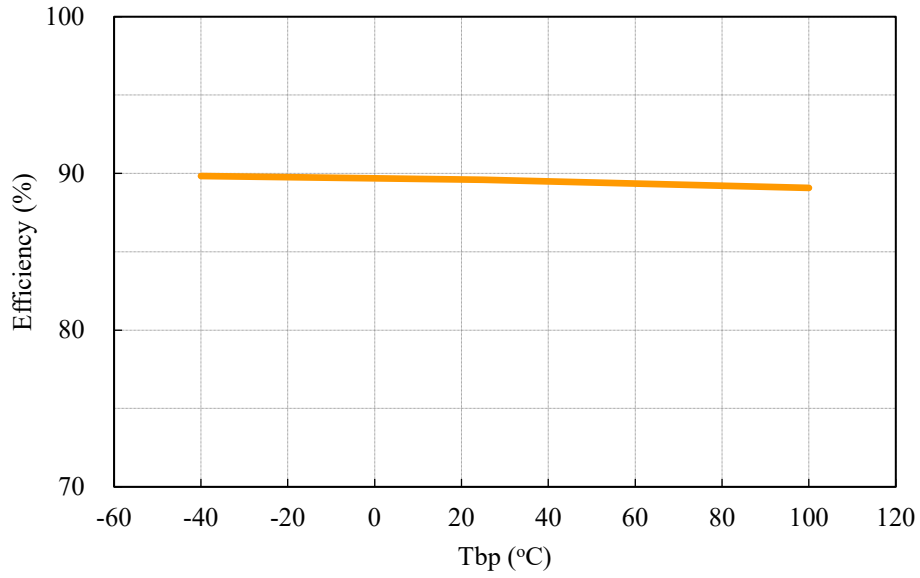
24V



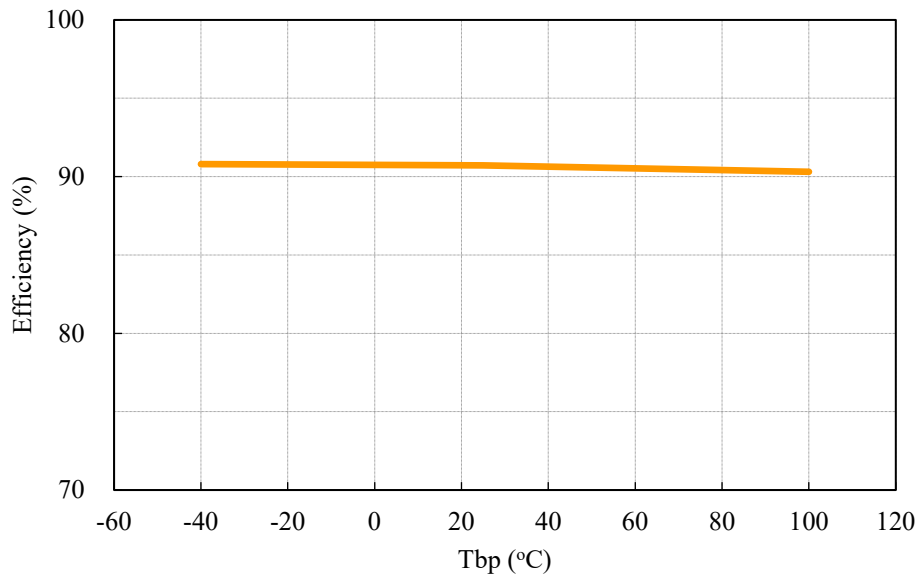
(5) 効率 対 ベースプレート温度
Efficiency vs. Base-plate temperature

Conditions Vin : 110 VDC
Io : 100 %

12V



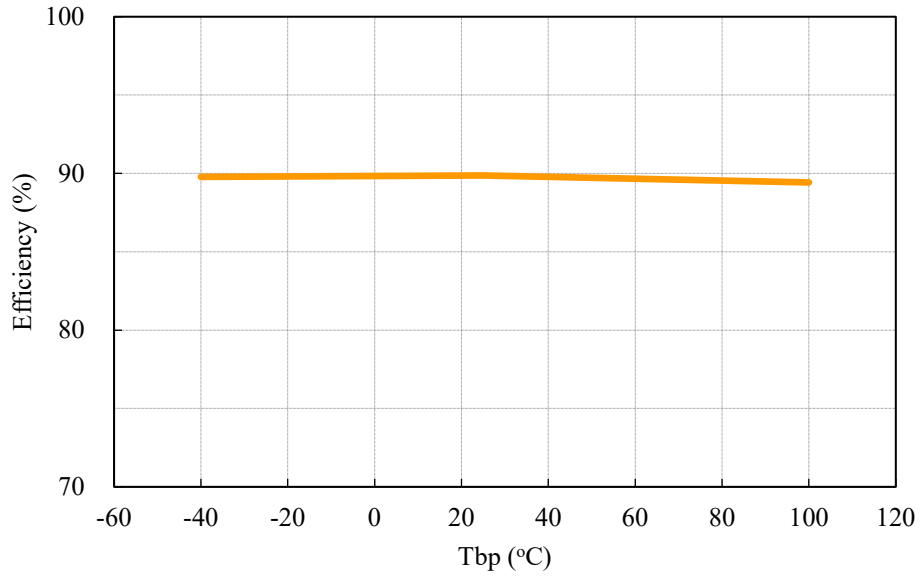
13.8V



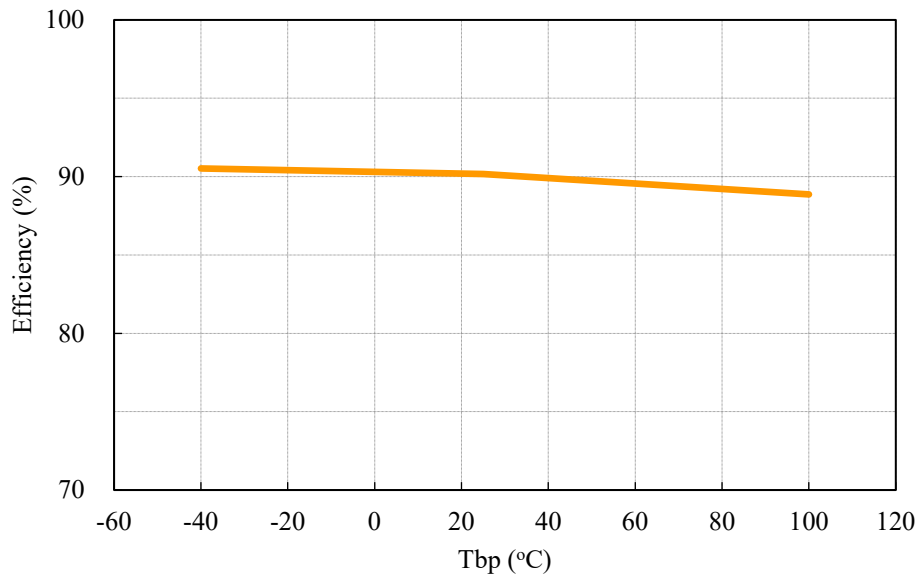
(5) 効率 対 ベースプレート温度
Efficiency vs. Base-plate temperature

Conditions Vin : 110 VDC
Io : 100 %

15V



24V



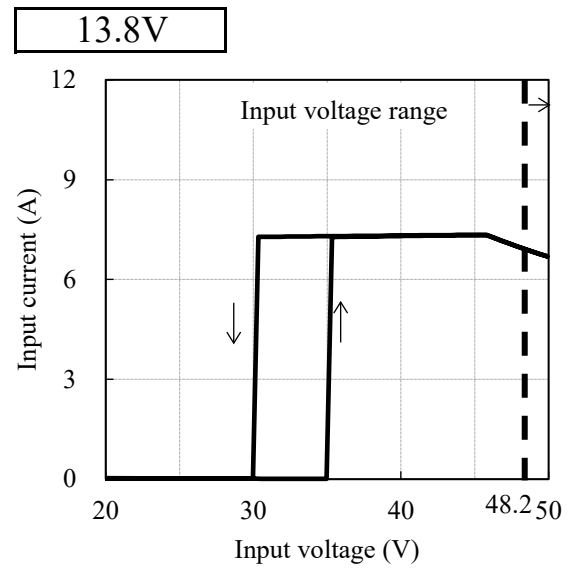
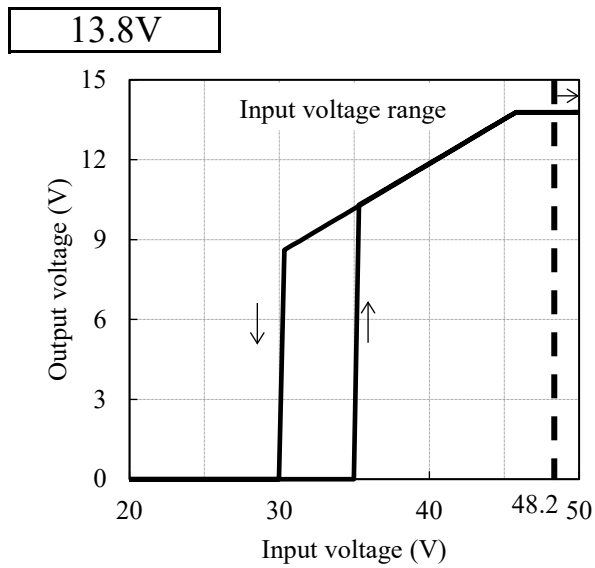
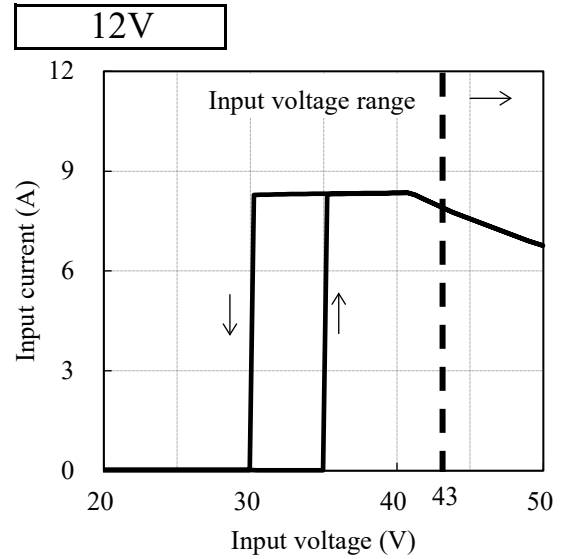
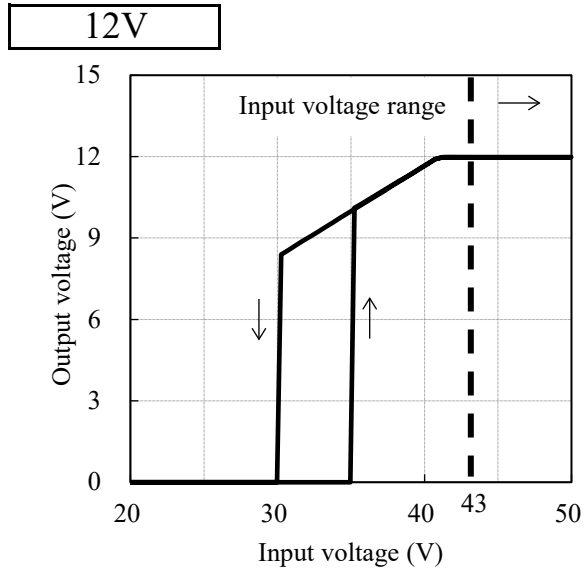
(6) 起動、停止電圧特性
Start and Stop voltage characteristics

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

Conditions I_o : 100 %
 T_{bp} : 25 °C

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

Conditions I_o : 100 %
 T_{bp} : 25 °C



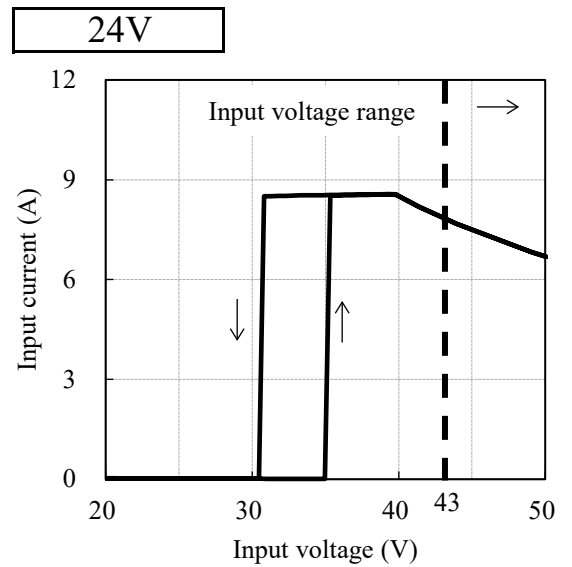
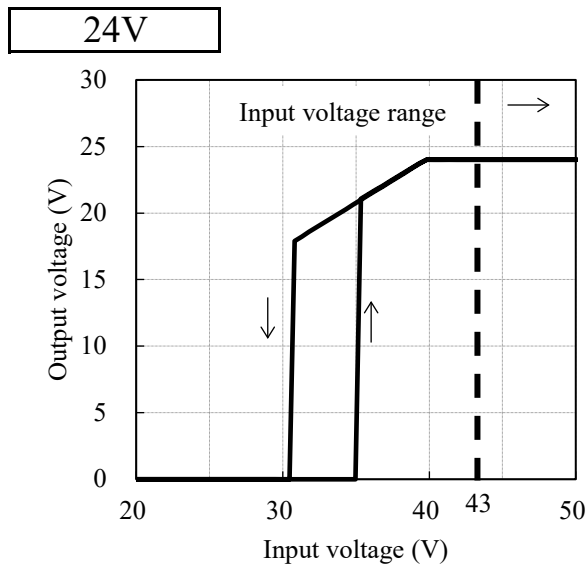
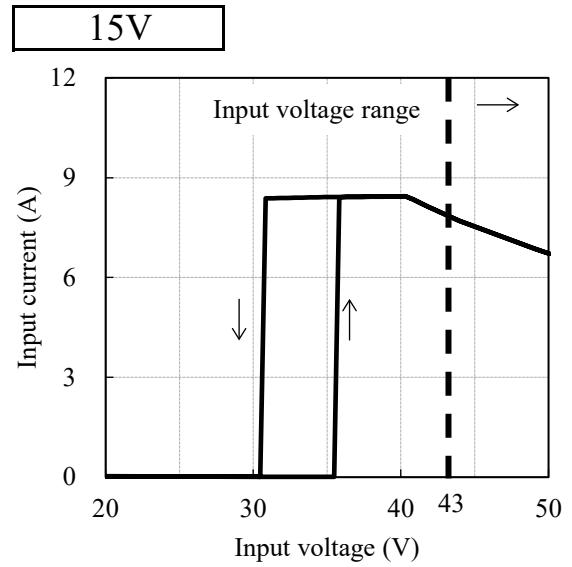
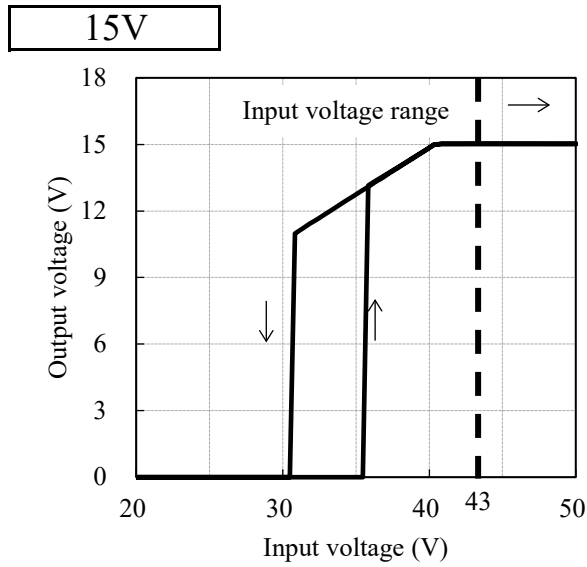
(6) 起動、停止電圧特性
Start and Stop voltage characteristics

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

Conditions I_o : 100 %
 T_{bp} : 25 °C

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

Conditions I_o : 100 %
 T_{bp} : 25 °C



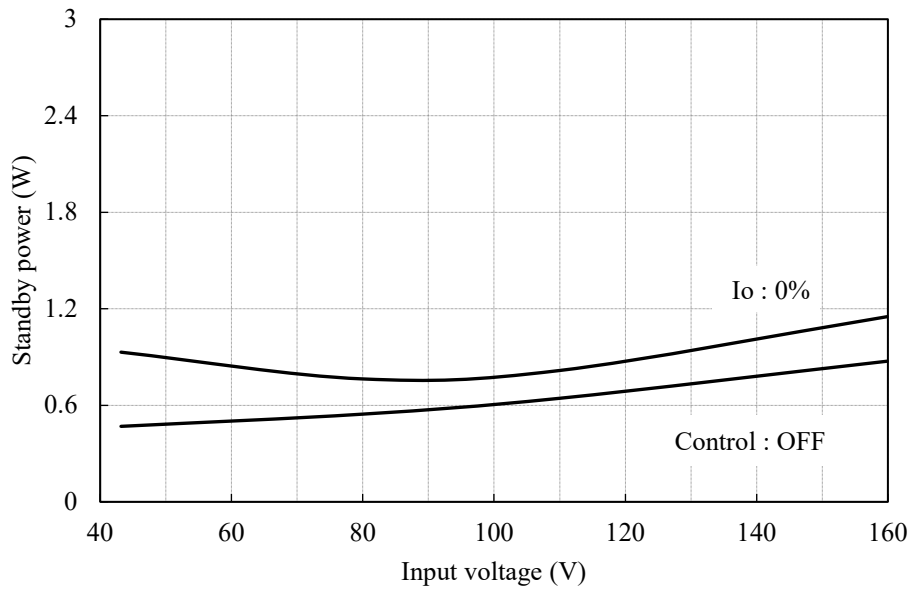
2.2 待機電力特性

Standby power characteristics

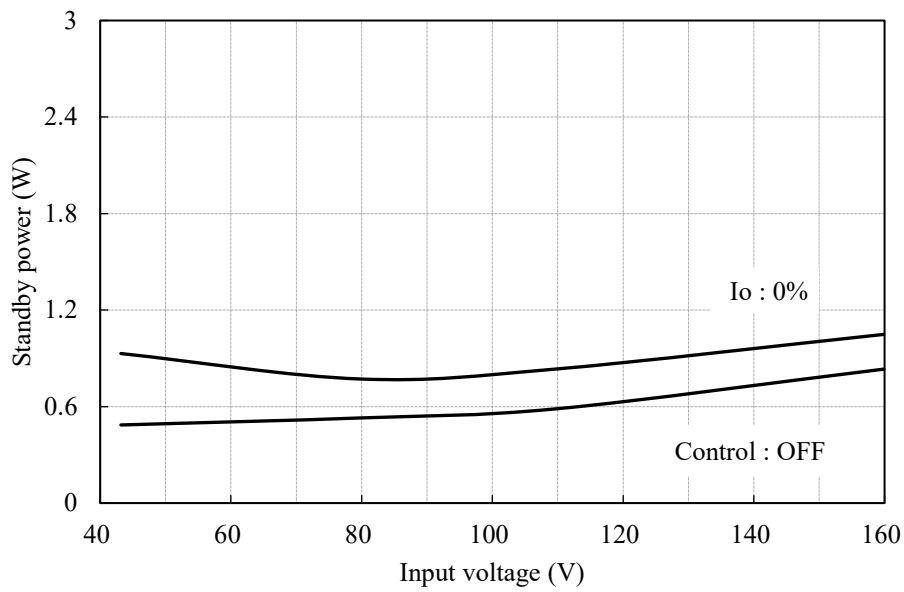
Conditions

Tbp: 25°C

12V



13.8V



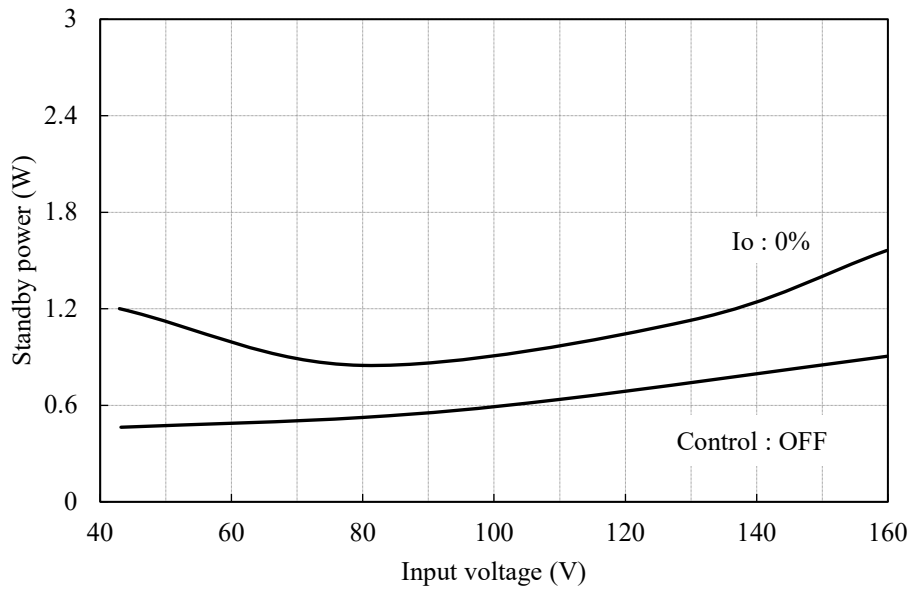
2.2 待機電力特性

Standby power characteristics

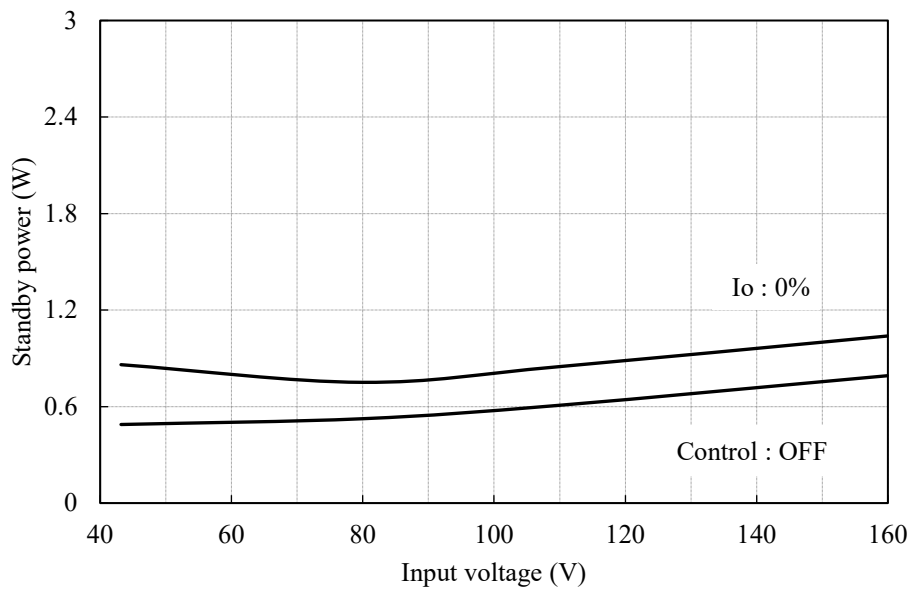
Conditions

Tbp: 25°C

15V



24V



2.3 通電ドリフト特性

Warm up voltage drift characteristics

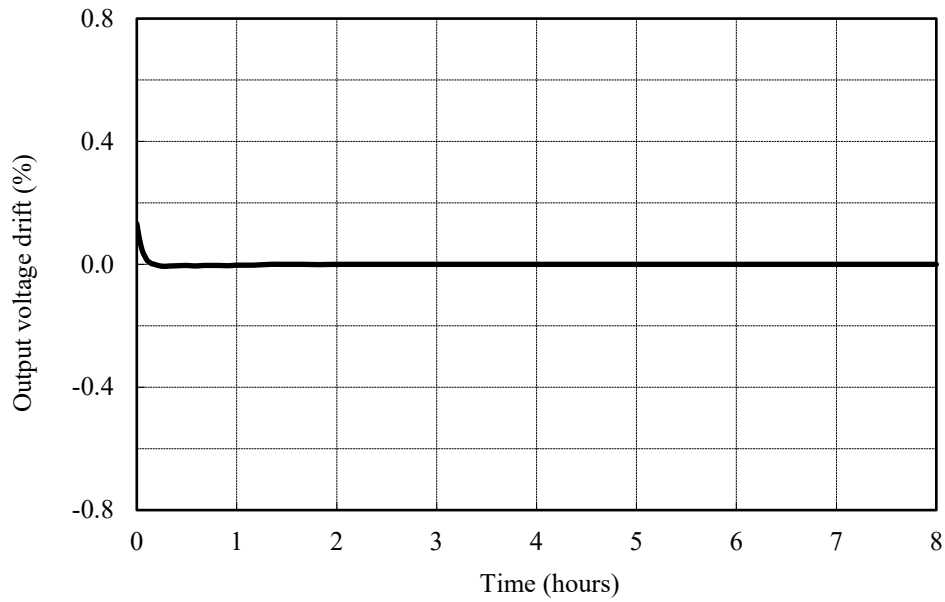
Conditions

Vin : 110VDC

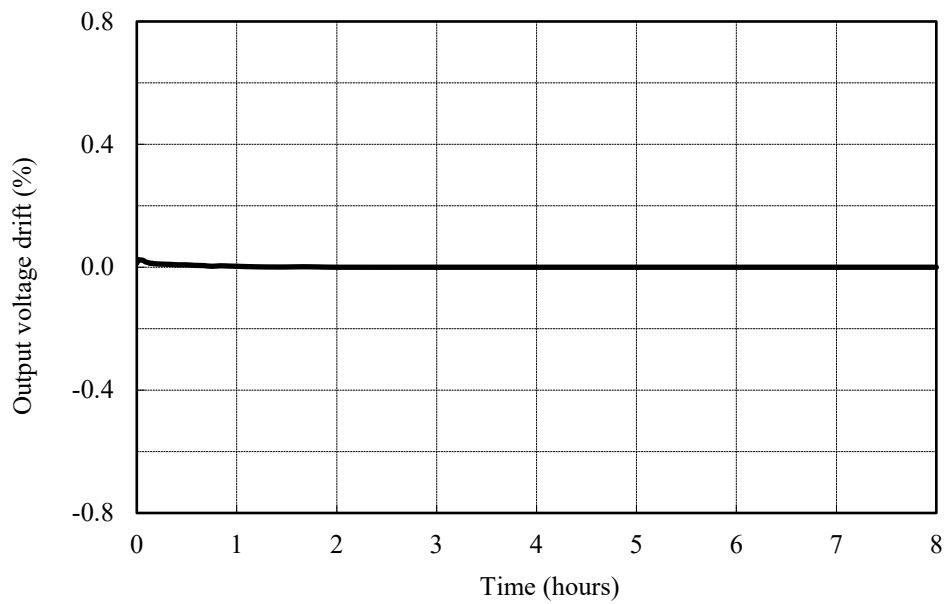
Io : 100%

Ta : 25°C

12V



13.8V



2.3 通電ドリフト特性

Warm up voltage drift characteristics

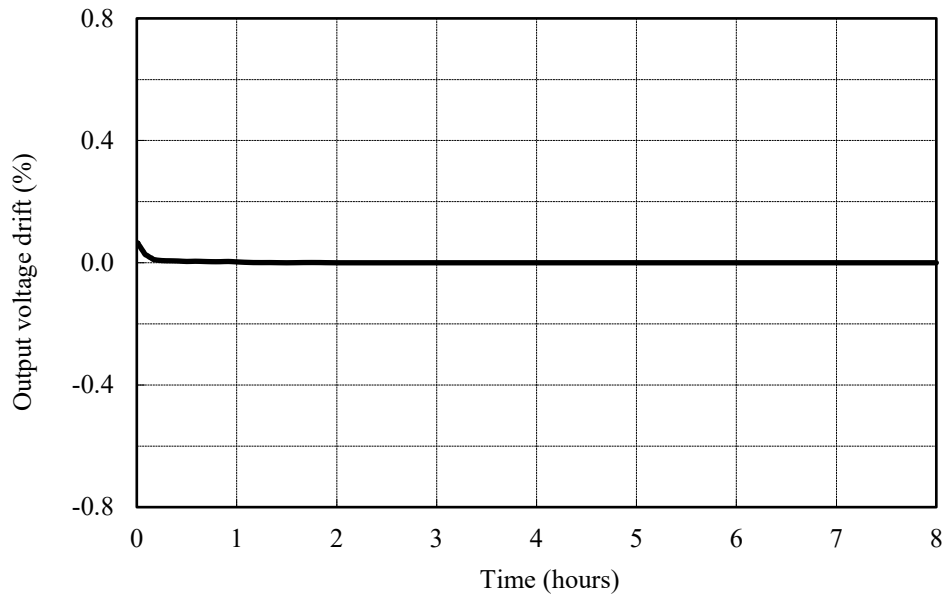
Conditions

Vin : 110VDC

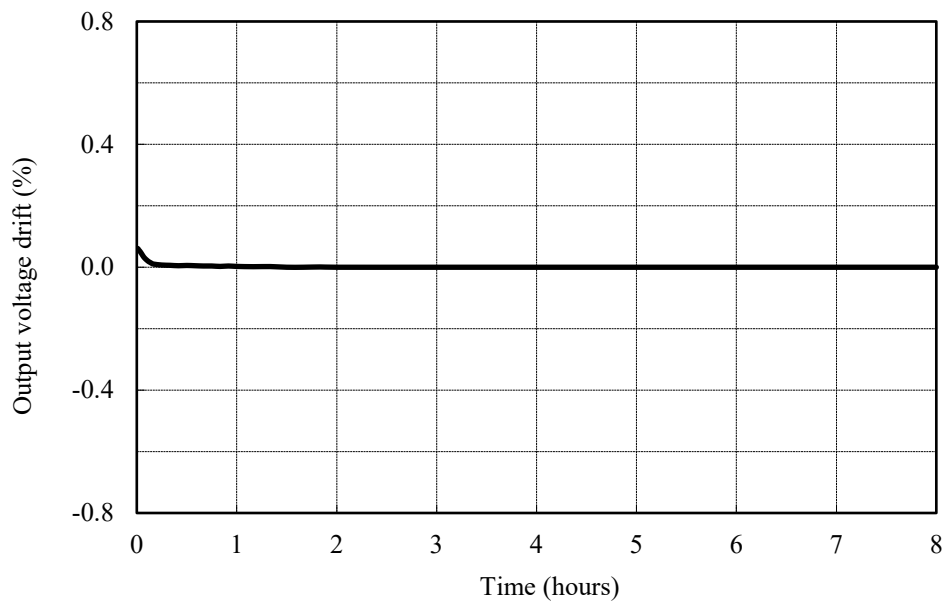
Io : 100%

Ta : 25°C

15V



24V



2.4 過電流保護特性

Over current protection (OCP) characteristics

入力電圧依存性

Input voltage dependence

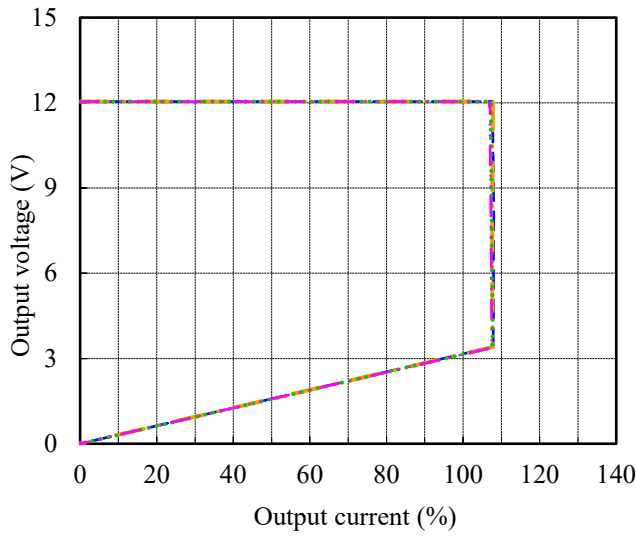
Conditions Vin : 43 VDC ---
 : 72 VDC -.-
 : 110 VDC ...
 : 160 VDC -.-
 Tbp : 25 °C

ベースプレート温度依存性

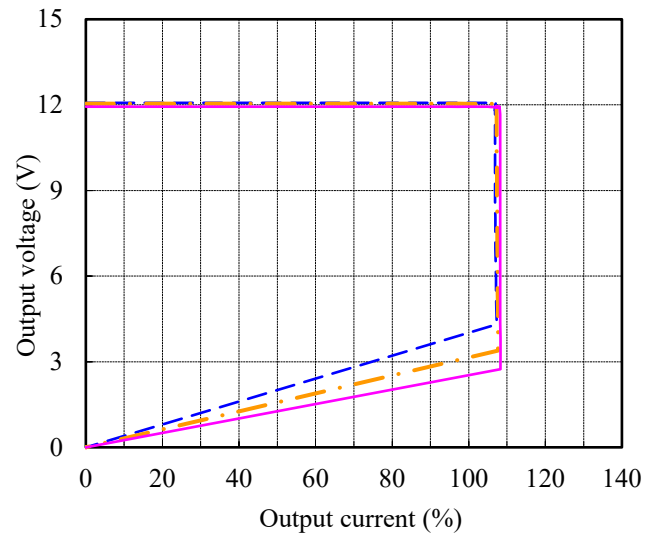
Base-plate temperature dependence

Conditions Vin : 110 VDC
 Tbp : -40 °C ---
 : 25 °C -.-
 : 100 °C ---

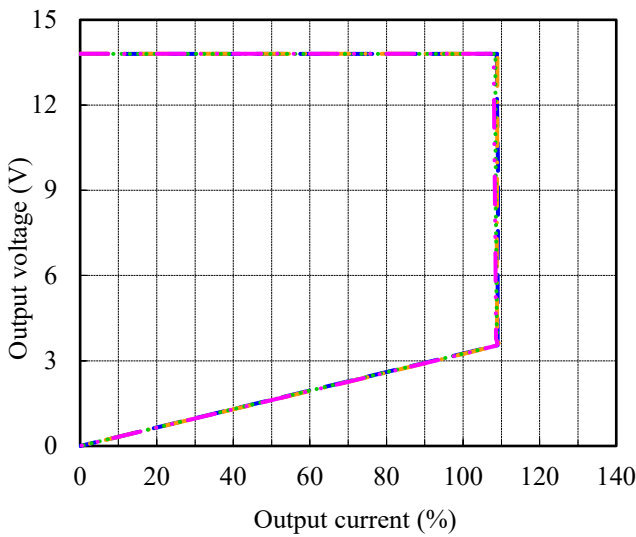
12V



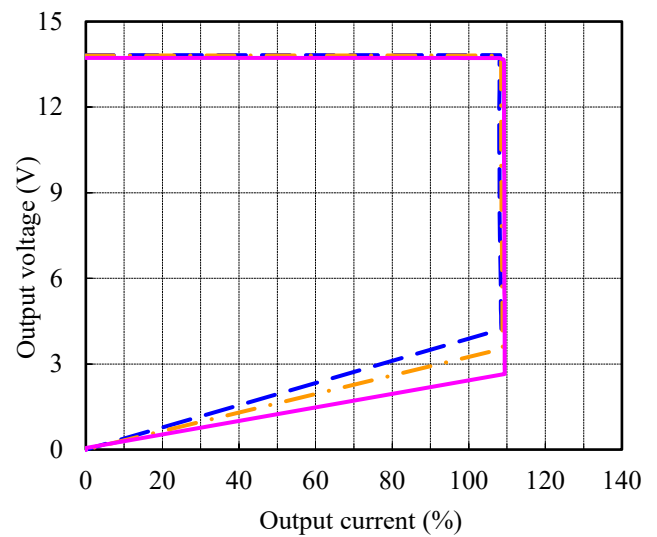
12V



13.8V



13.8V



2.4 過電流保護特性

Over current protection (OCP) characteristics

入力電圧依存性

Input voltage dependence

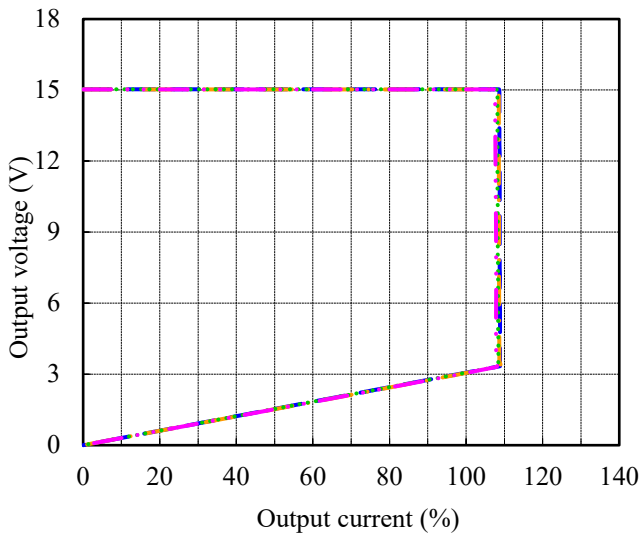
Conditions Vin : 43 VDC ---
 : 72 VDC -.-
 : 110 VDC ...
 : 160 VDC -.-
 Tbp : 25 °C

ベースプレート温度依存性

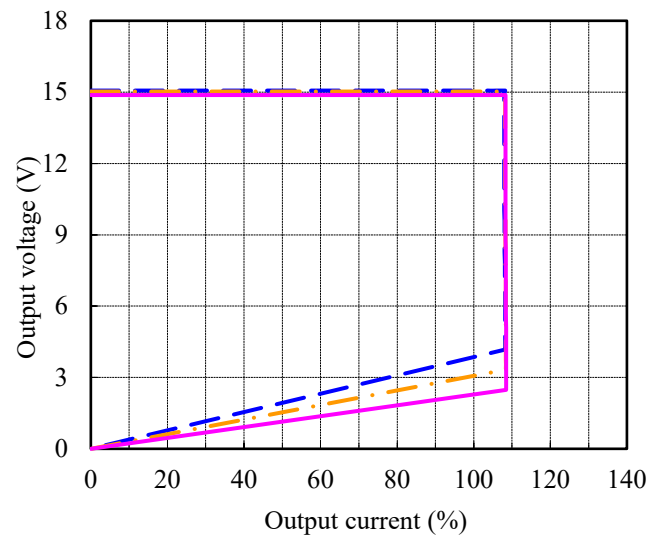
Base-plate temperature dependence

Conditions Vin : 110 VDC
 Tbp : -40 °C ---
 : 25 °C -.-
 : 100 °C ---

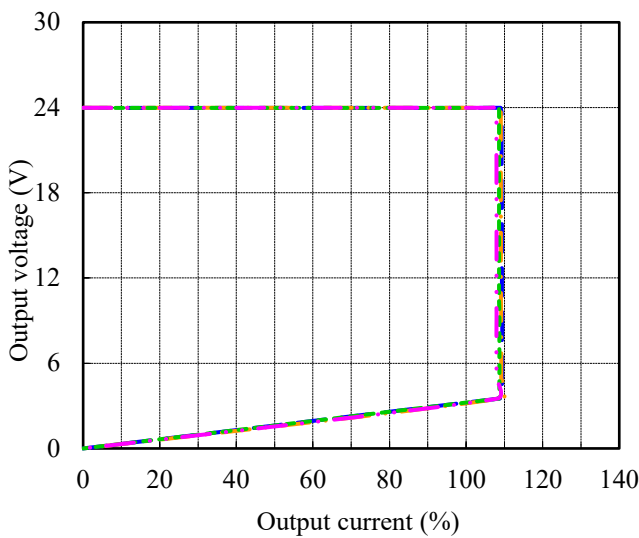
15V



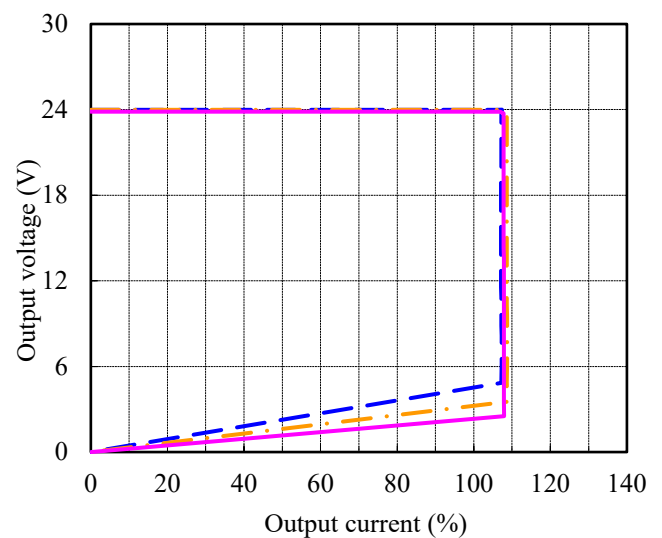
15V



24V



24V

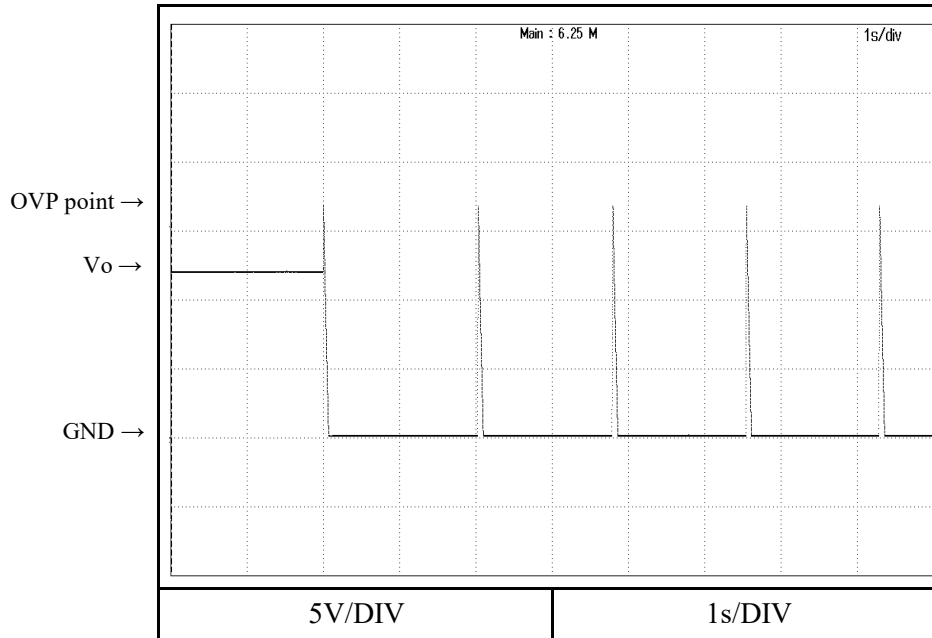


2.5 過電圧保護特性

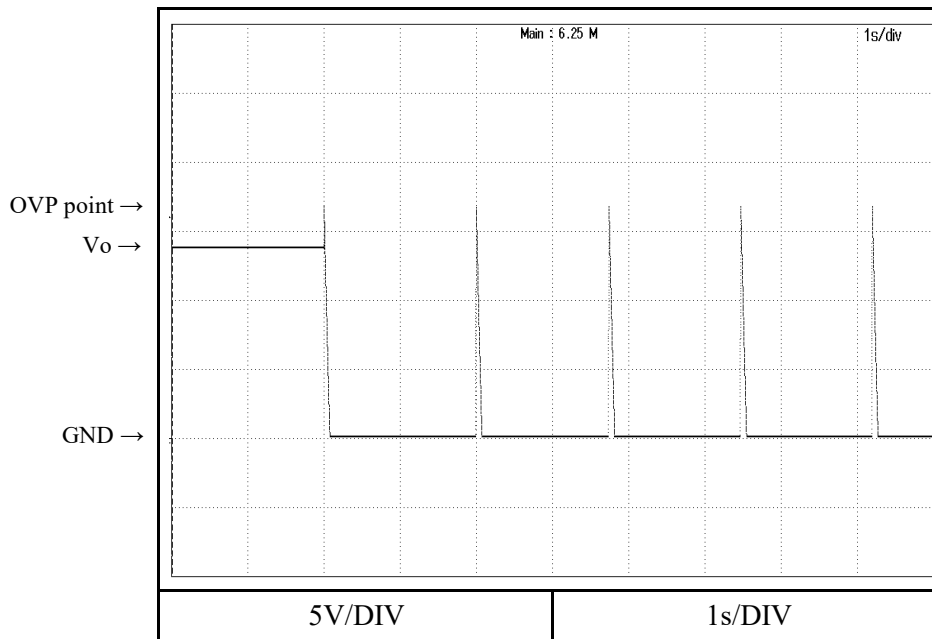
Over voltage protection (OVP) characteristics

Conditions Vin : 110 VDC
 Io : 1%
 Tbp : 25°C

12V



13.8V

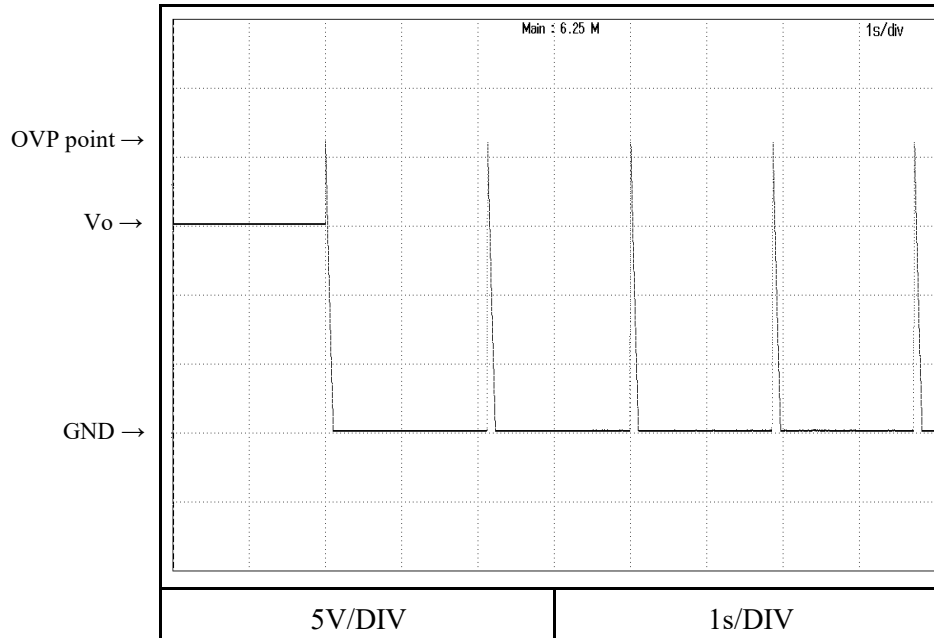


2.5 過電圧保護特性

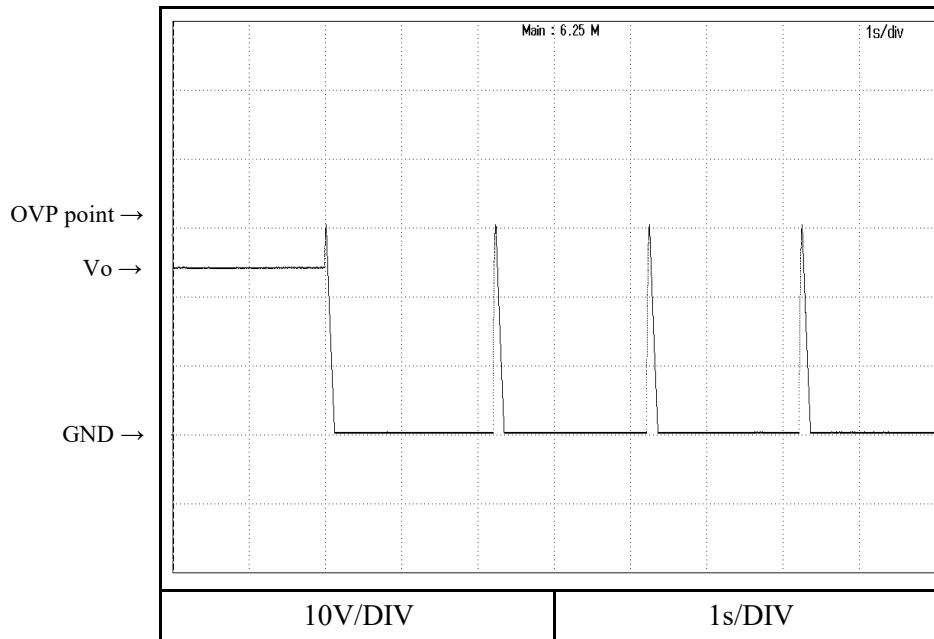
Over voltage protection (OVP) characteristics

Conditions Vin : 110 VDC
 Io : 1%
 Tbp : 25°C

15V



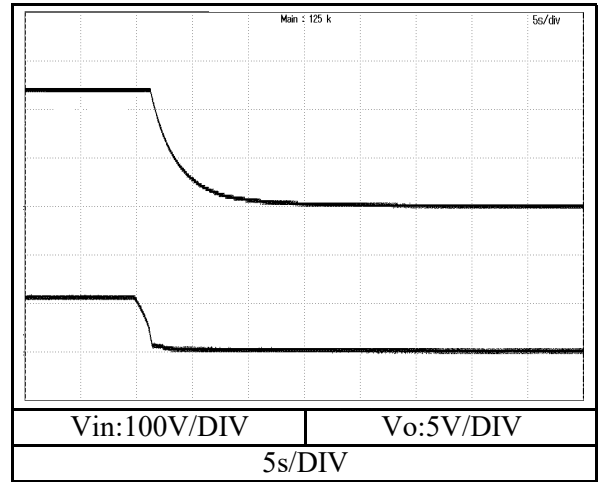
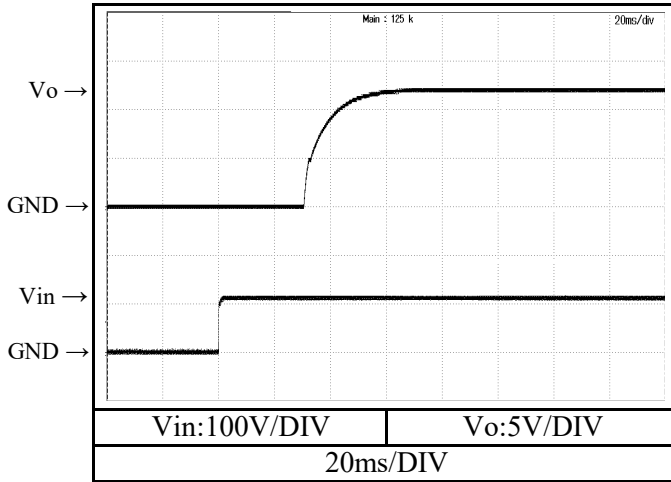
24V



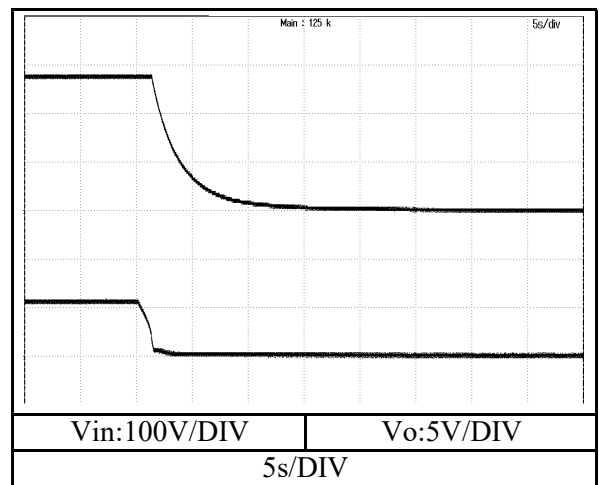
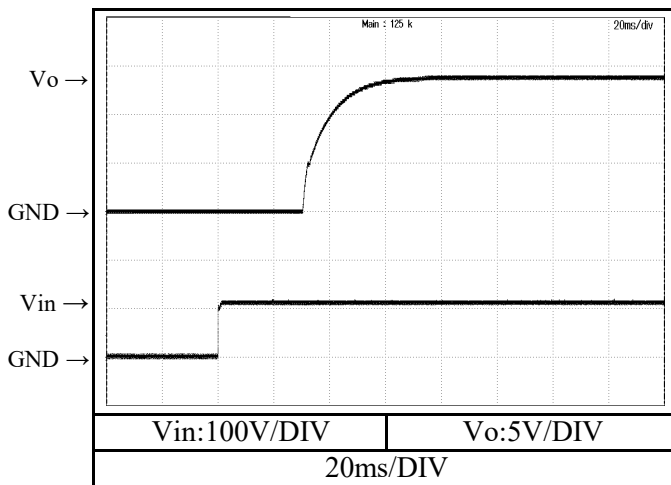
2.6 出力立ち上がり、立ち下がり特性
Output rise and fall characteristics

Conditions $V_{in} : 110 \text{ VDC}$
 $I_o : 0 \%$
 $T_{bp} : 25^\circ\text{C}$

12V



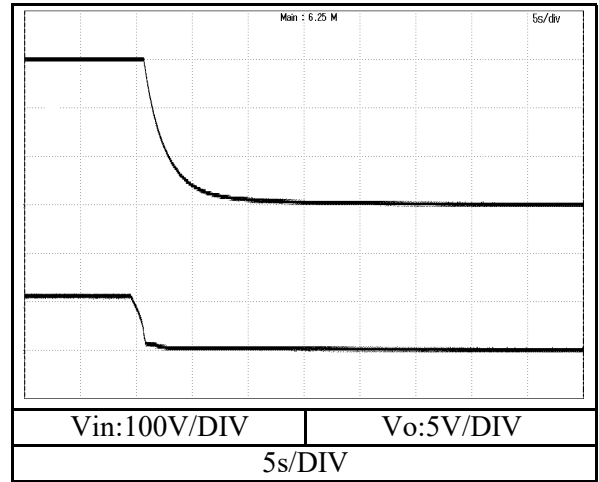
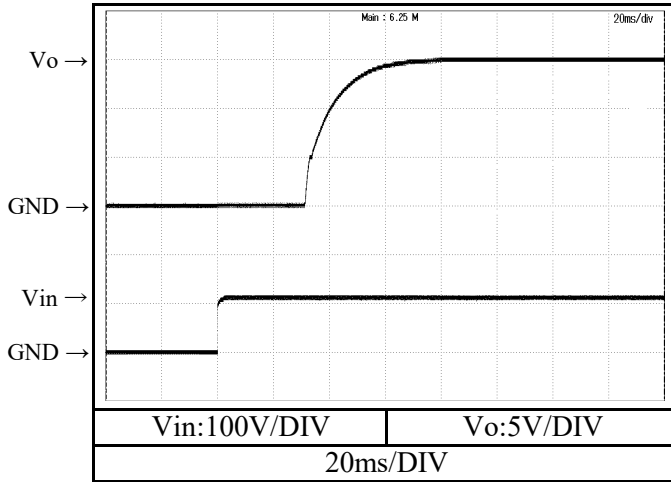
13.8V



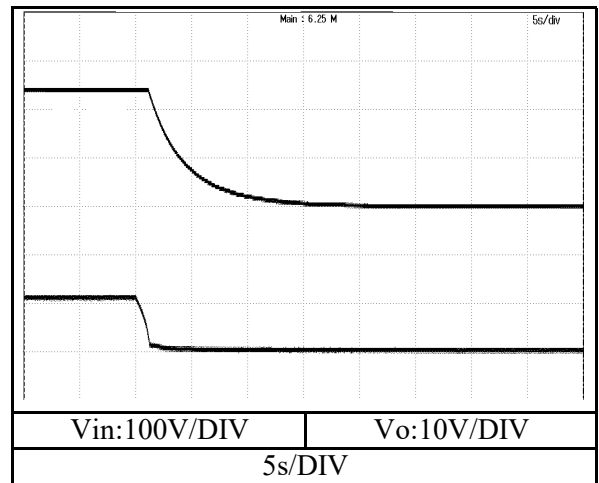
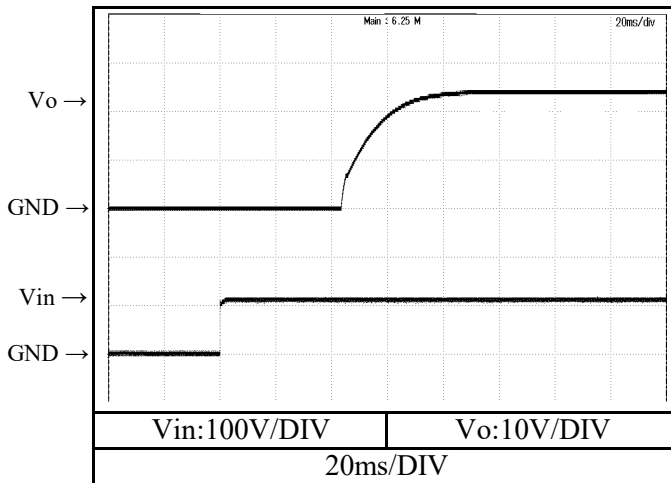
2.6 出力立ち上がり、立ち下がり特性
Output rise and fall characteristics

Conditions $V_{in} : 110 \text{ VDC}$
 $I_o : 0 \%$
 $T_{bp} : 25^\circ\text{C}$

15V



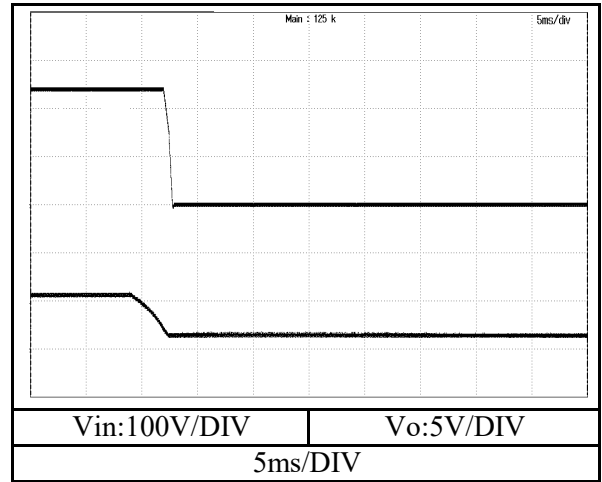
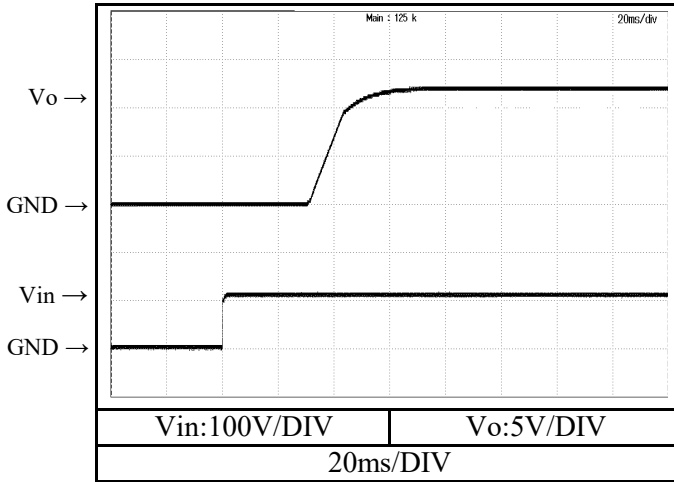
24V



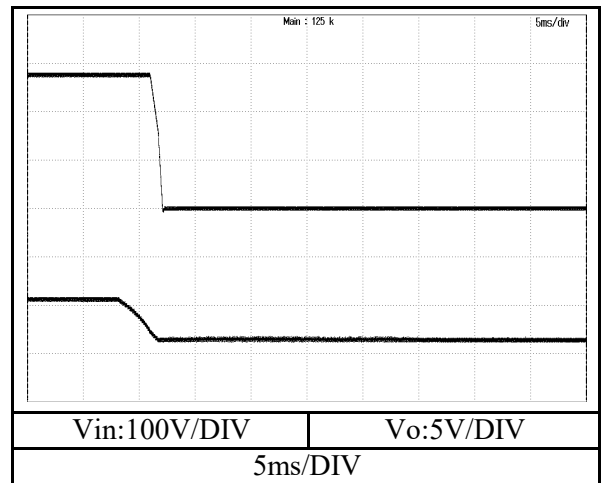
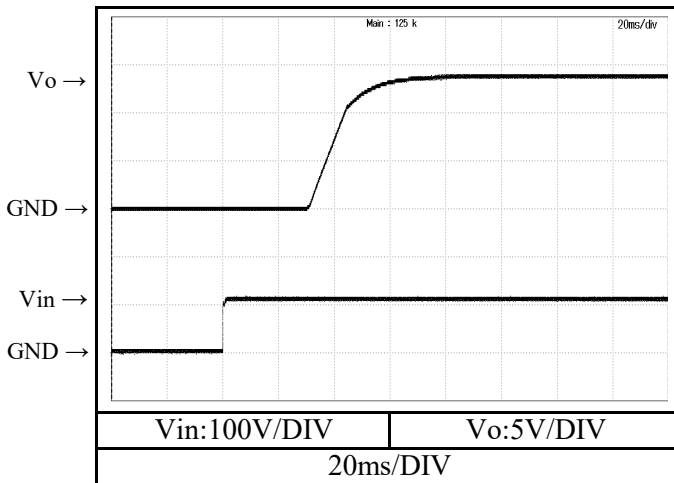
2.6 出力立ち上がり、立ち下がり特性
Output rise and fall characteristics

Conditions $V_{in} : 110 \text{ VDC}$
 $I_o : 100 \%$
 $T_{bp} : 25^\circ\text{C}$

12V



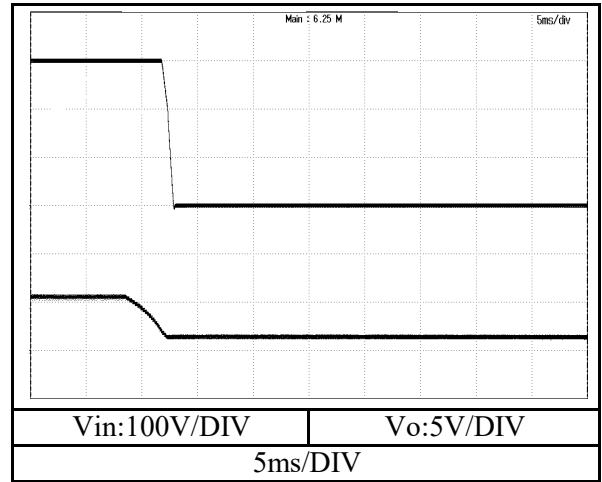
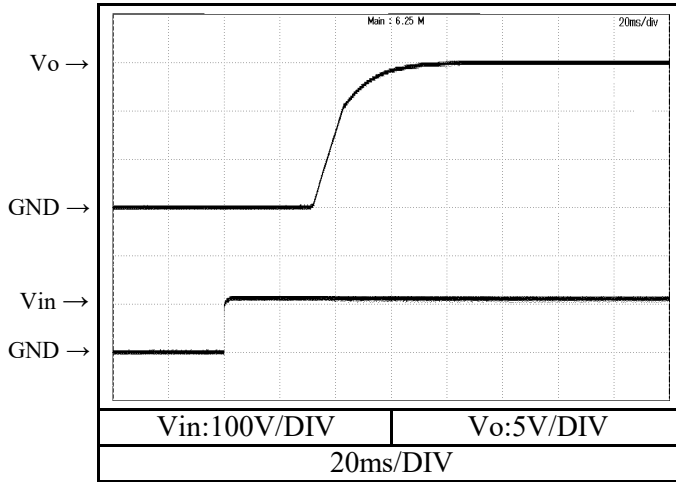
13.8V



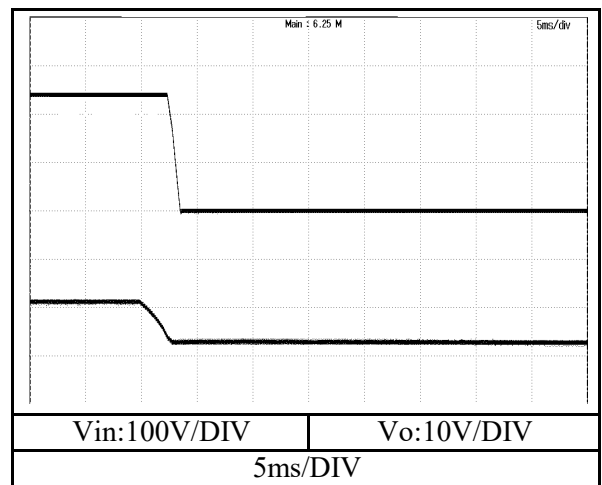
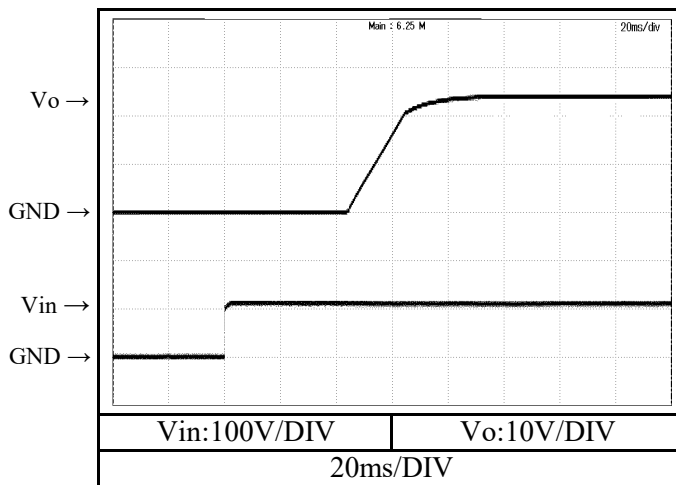
2.6 出力立ち上がり、立ち下がり特性
Output rise and fall characteristics

Conditions Vin : 110 VDC
Io : 100 %
Tbp : 25°C

15V



24V



2.6 出力立ち上がり、立ち下がり特性 (ON/OFFコントロール時)

Output rise and fall characteristics with ON/OFF CONTROL

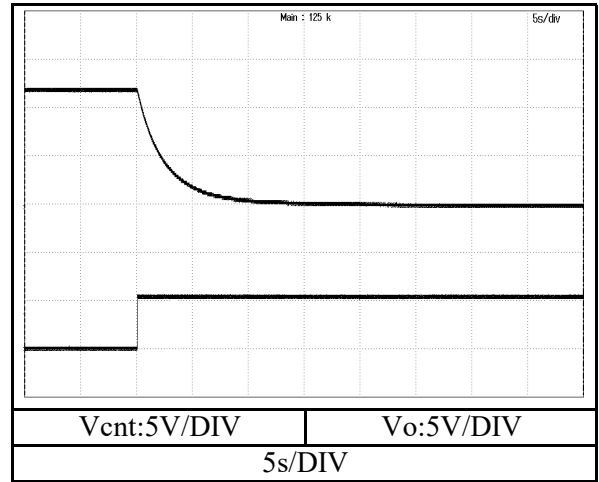
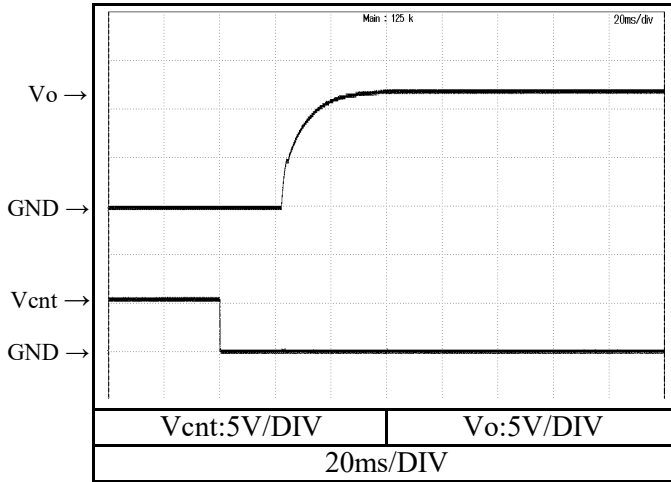
Conditions

V_{in} : 110 VDC

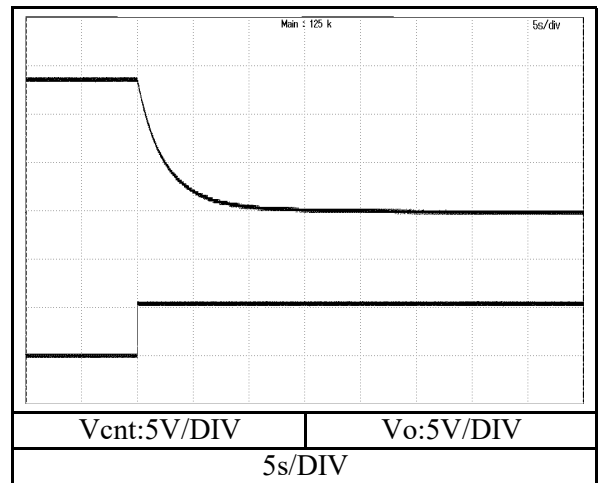
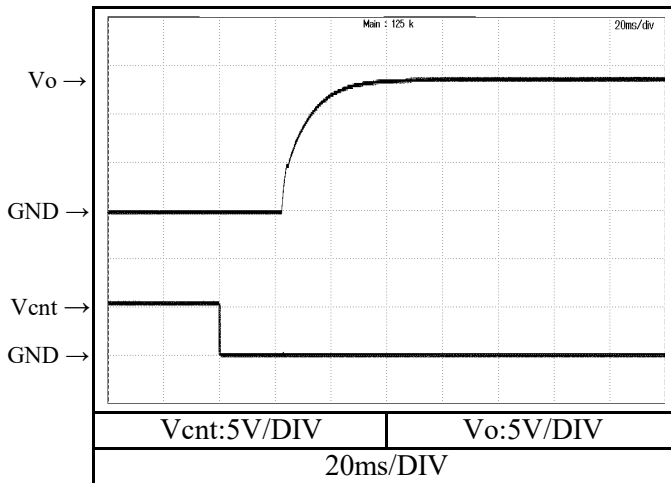
I_o : 0 %

T_{bp} : 25°C

12V



13.8V



2.6 出力立ち上がり、立ち下がり特性 (ON/OFFコントロール時)

Output rise and fall characteristics with ON/OFF CONTROL

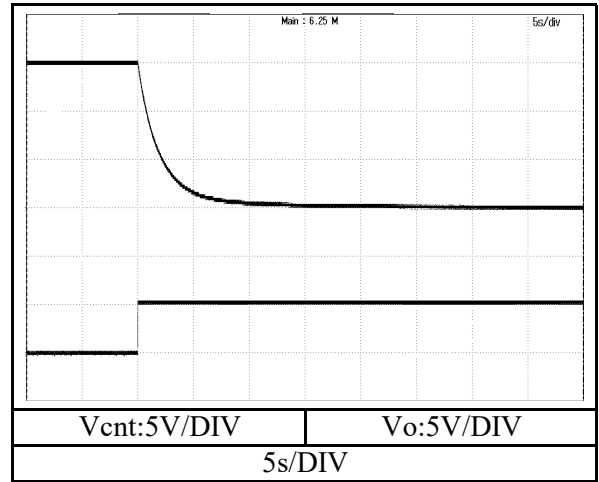
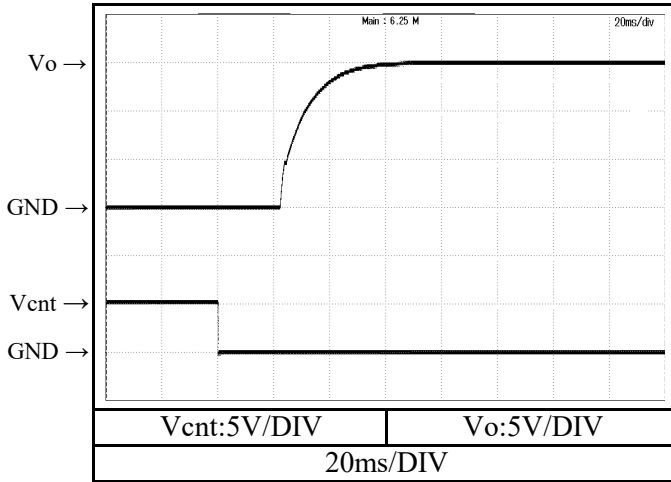
Conditions

V_{in} : 110 VDC

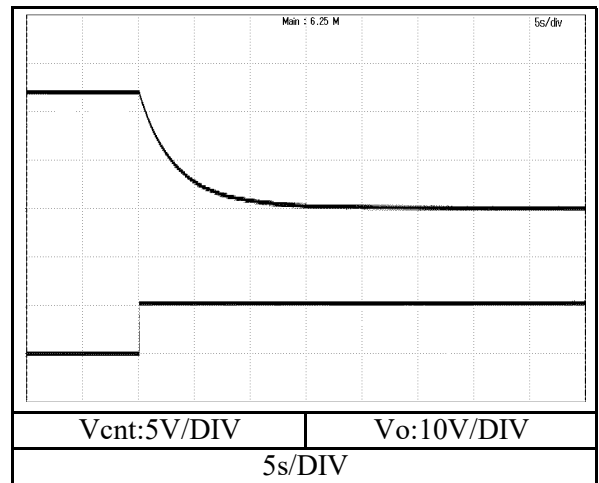
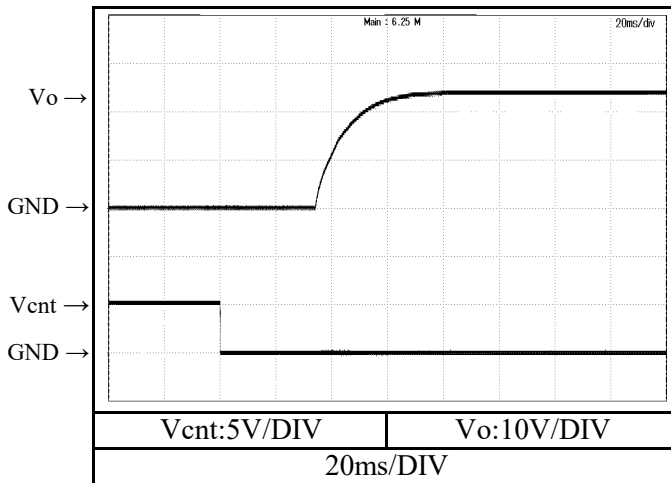
I_o : 0 %

T_{bp} : 25°C

15V



24V



2.6 出力立ち上がり、立ち下がり特性 (ON/OFFコントロール時)

Output rise and fall characteristics with ON/OFF CONTROL

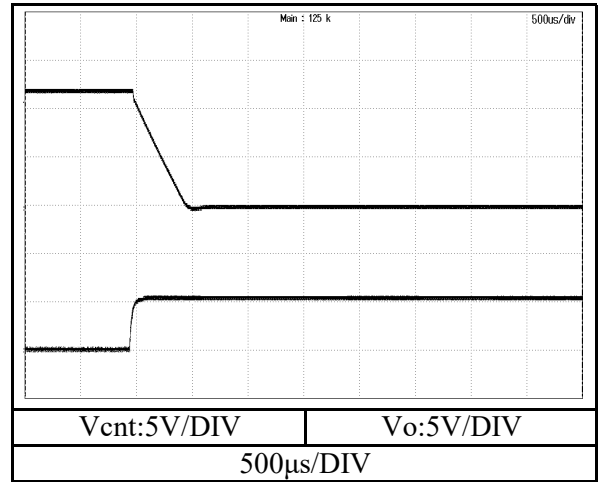
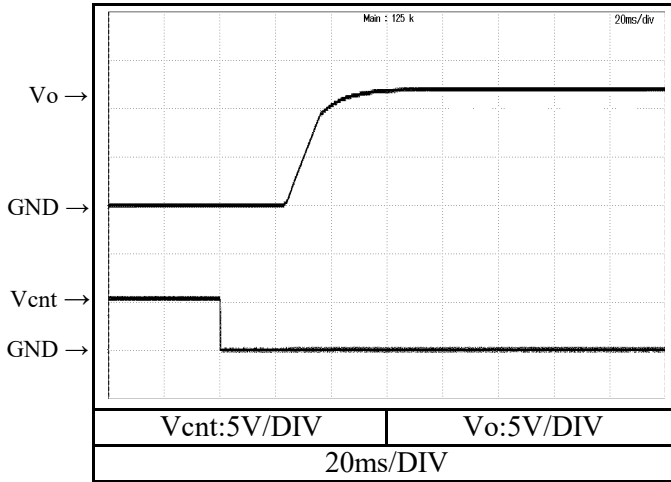
Conditions

V_{in} : 110 VDC

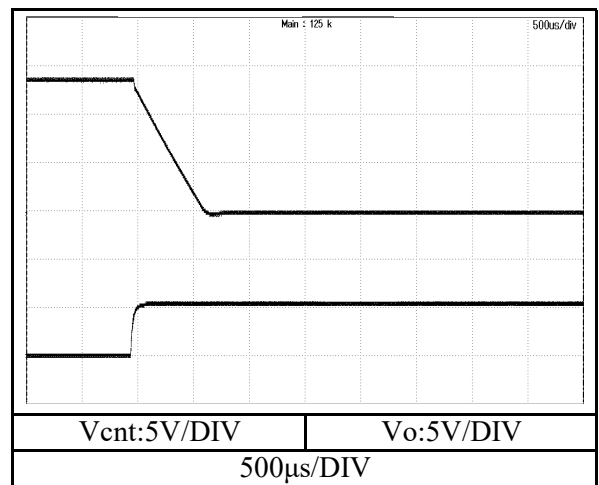
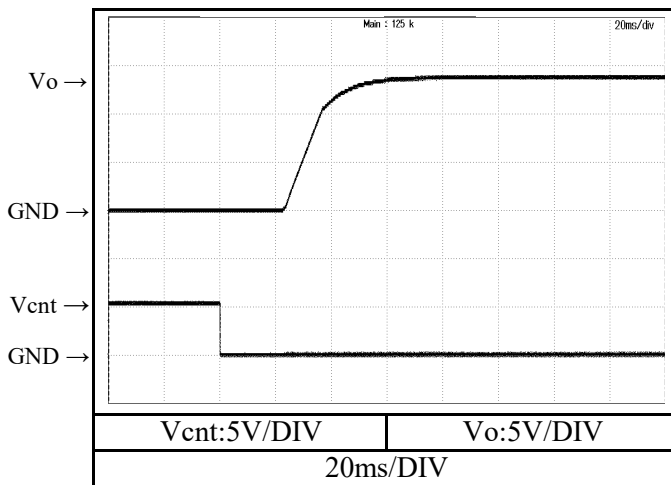
I_o : 100 %

T_{bp} : 25°C

12V



13.8V



2.6 出力立ち上がり、立ち下がり特性 (ON/OFFコントロール時)

Output rise and fall characteristics with ON/OFF CONTROL

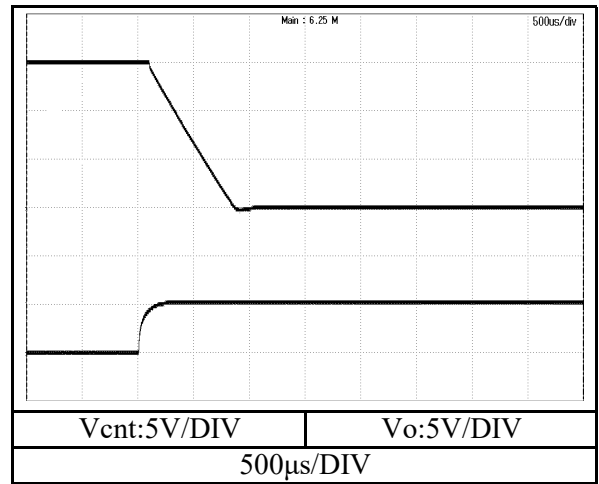
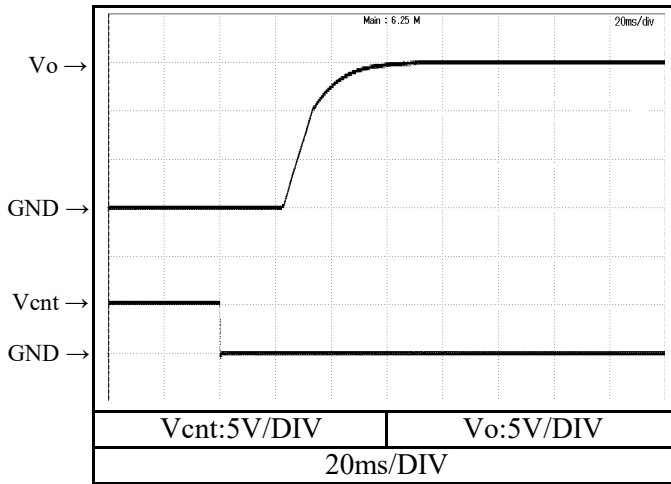
Conditions

V_{in} : 110 VDC

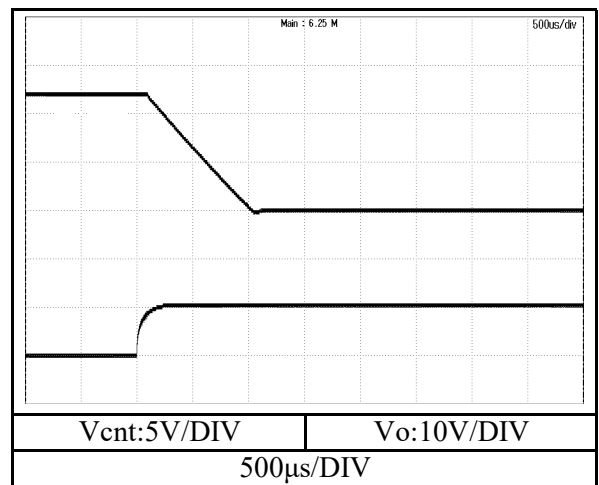
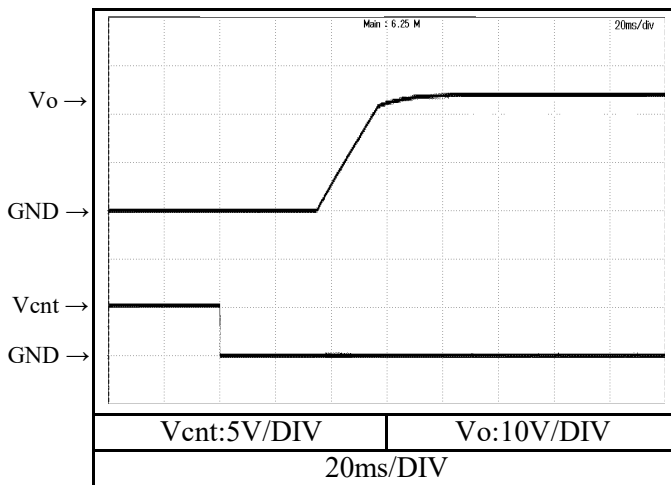
I_o : 100 %

T_{bp} : 25°C

15V



24V



2.7 過渡応答(負荷急変)特性

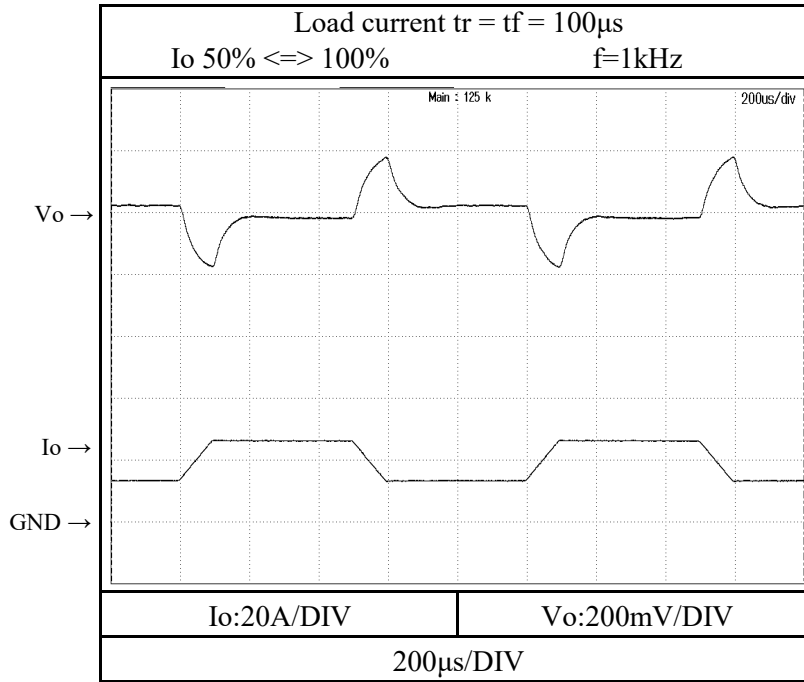
Dynamic load response characteristics

Conditions

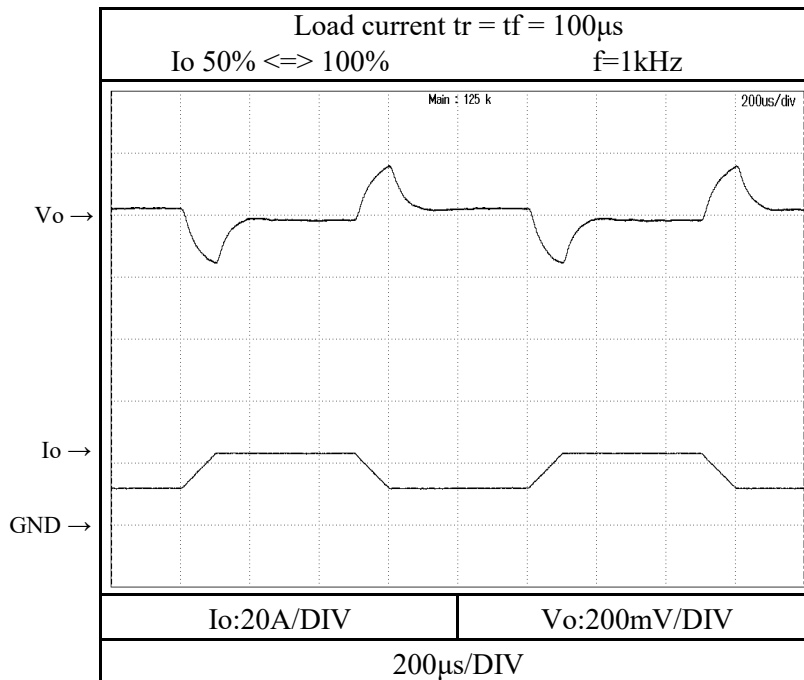
V_{in} : 110VDC

T_{bp} : 25°C

12V



13.8V



2.7 過渡応答(負荷急変)特性

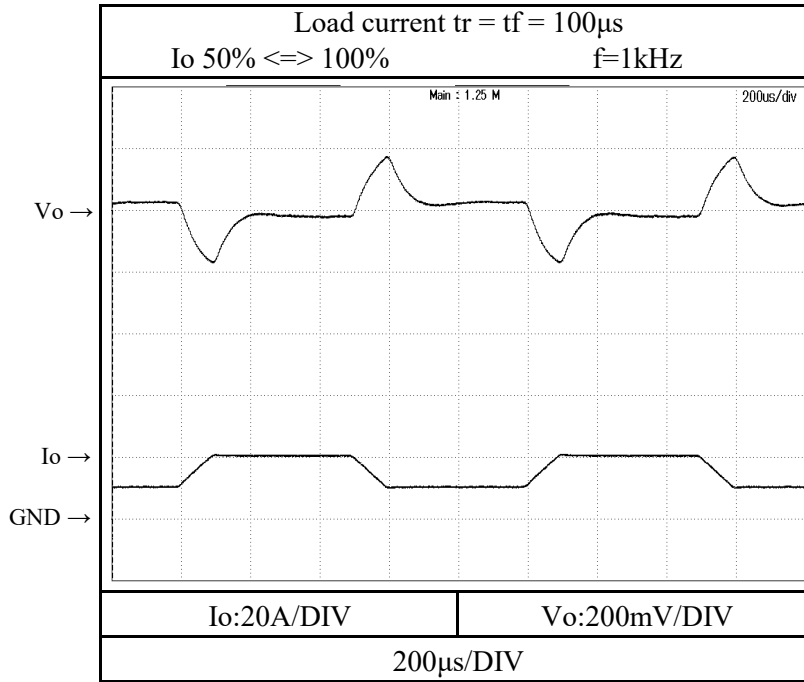
Dynamic load response characteristics

Conditions

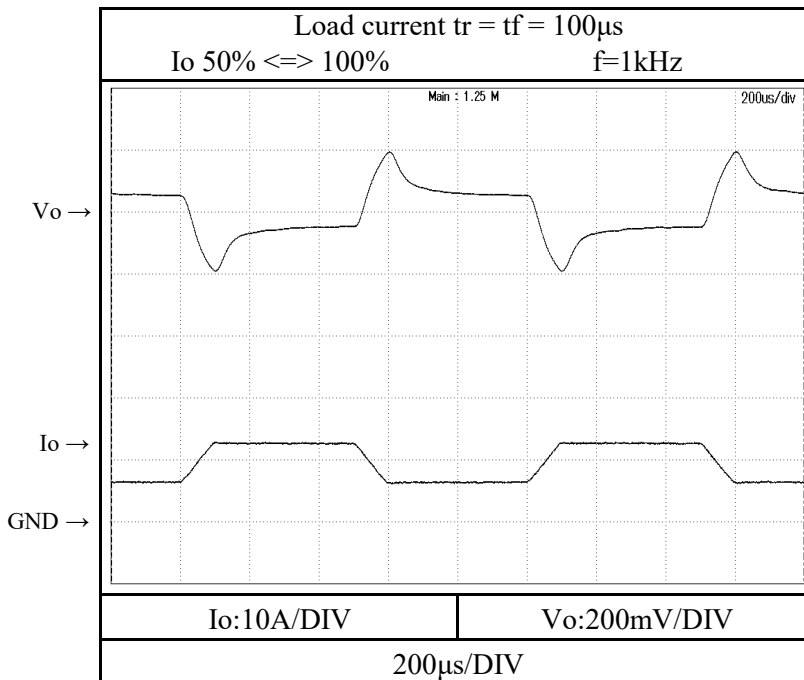
V_{in} : 110VDC

T_{bp} : 25°C

15V



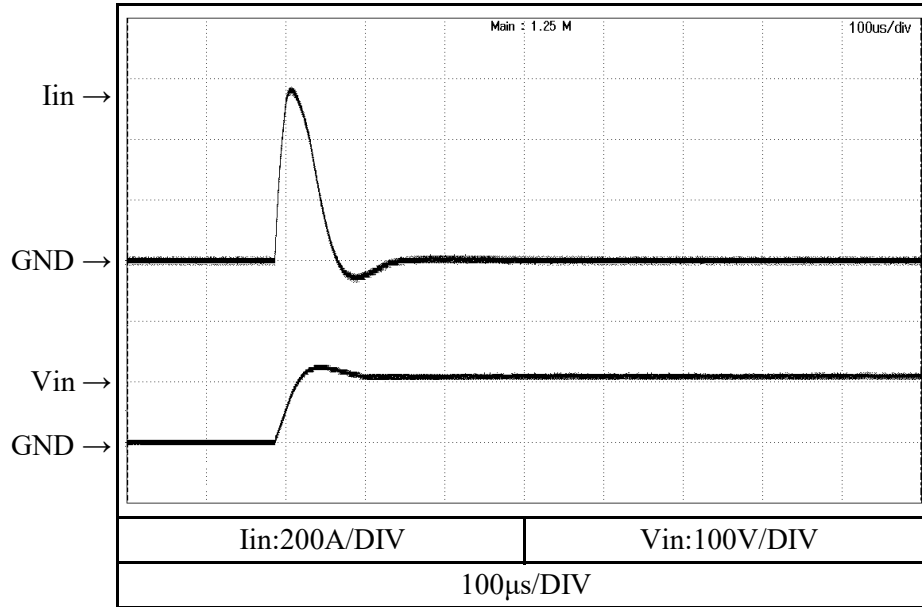
24V



2.8 入力サージ電流(突入電流)特性
Inrush current characteristics

Conditions Vin : 110 VDC
Io : 100%
Tbp : 25°C

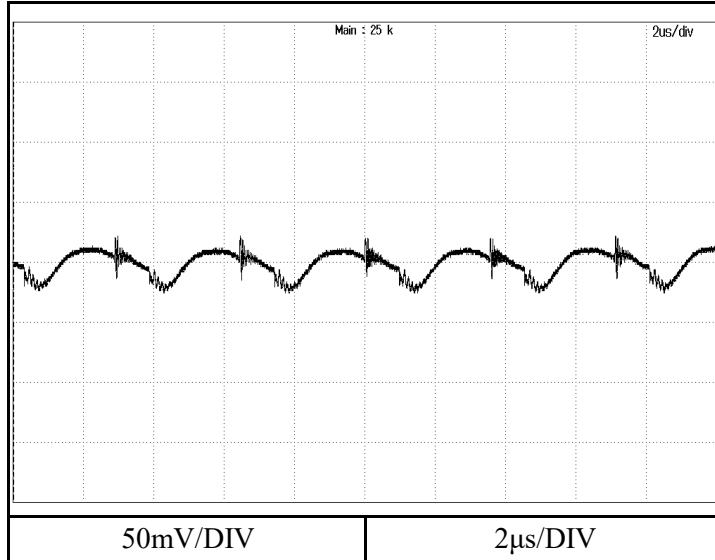
24V



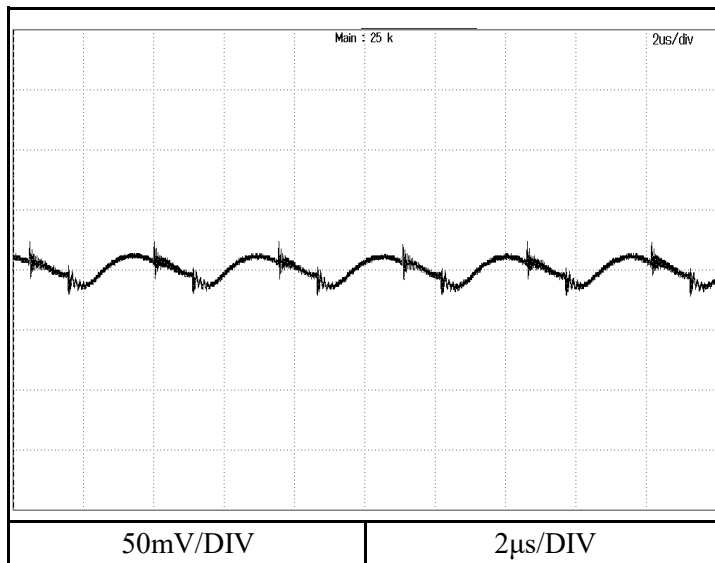
2.9 出力リップル・ノイズ波形
Output ripple and noise waveform

Conditions V_{in} : 110VDC
 I_o : 100%
 T_{bp} : 25°C

12V



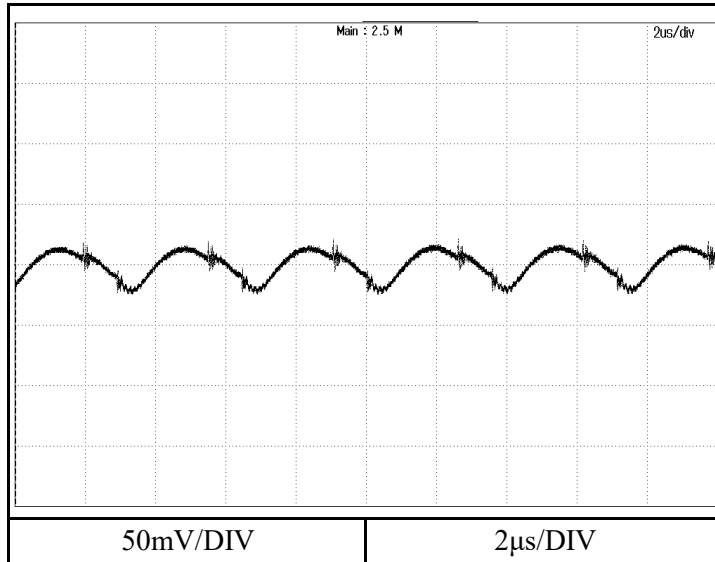
13.8V



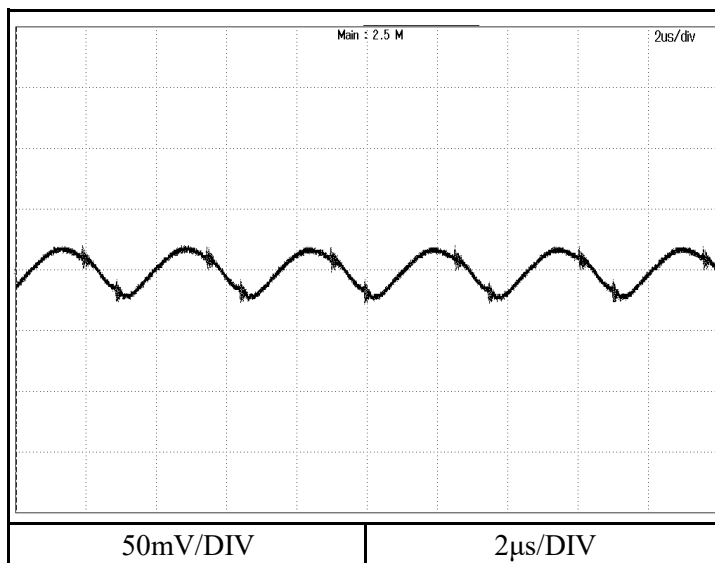
2.9 出力リップル・ノイズ波形
Output ripple and noise waveform

Conditions Vin : 110VDC
Io : 100%
Tbp : 25°C

15V



24V



2.10 EMI特性

Electro-Magnetic Interference characteristics

(a) 雑音端子電圧(帰還ノイズ)

Conducted Emission Noise

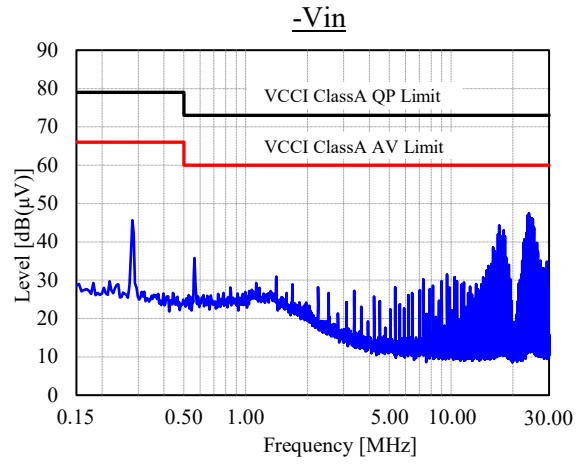
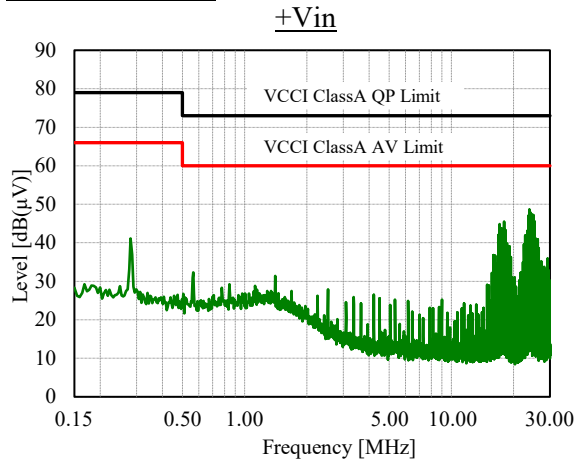
Conditions

Vin : 110 VDC

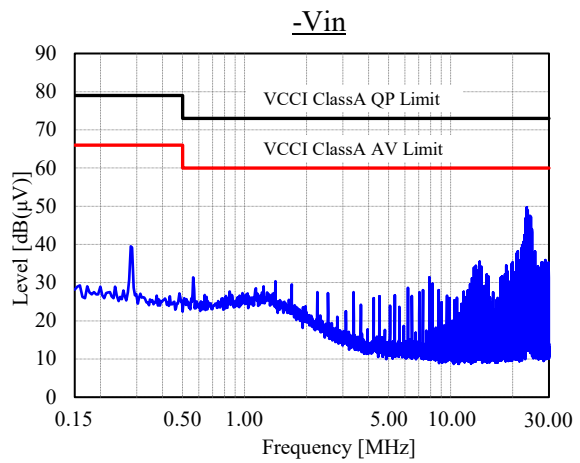
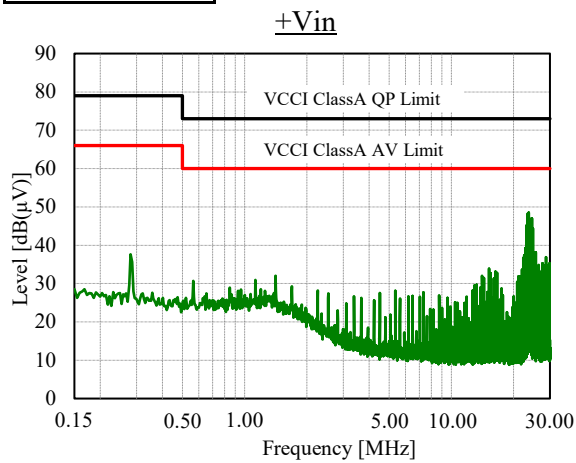
Io : 100%

Tbp : 25°C

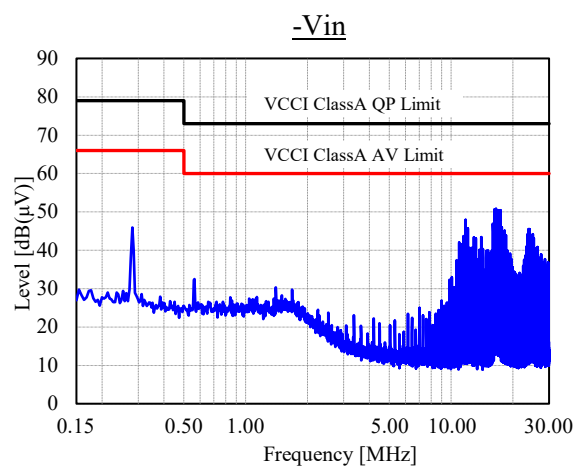
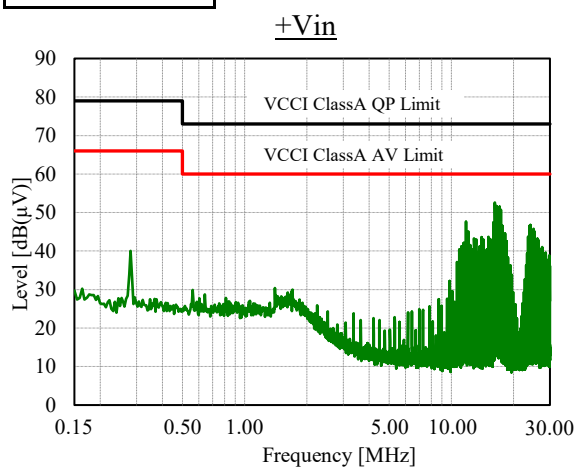
12V



15V



24V



2.10 EMI特性

Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ)

Radiated Emission Noise

Conditions

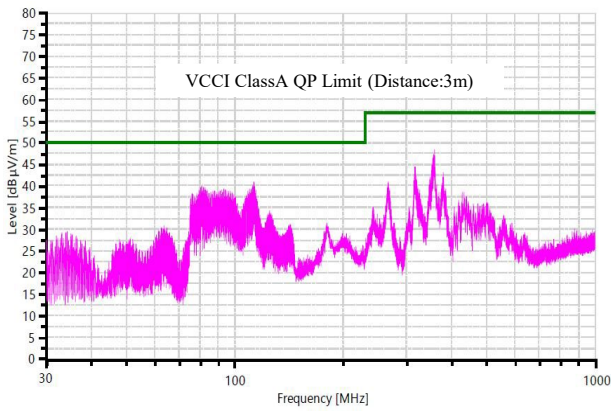
Vin : 110 VDC

Io : 100%

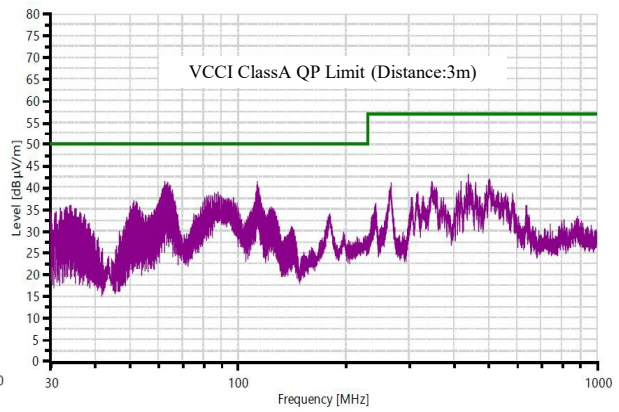
Tbp : 25°C

12V

HORIZONTAL

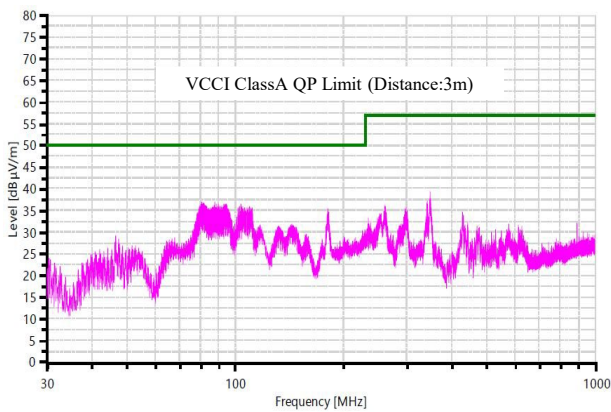


VERTICAL

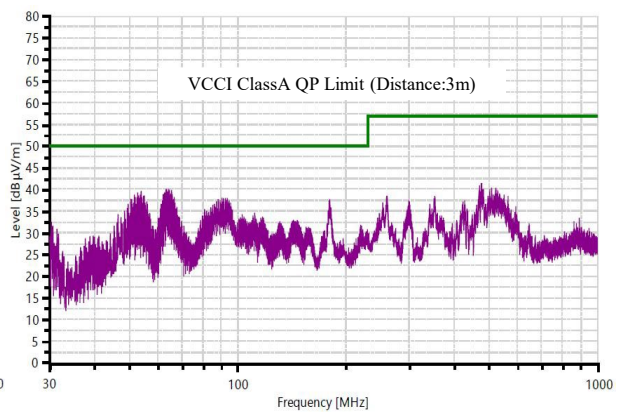


15V

HORIZONTAL

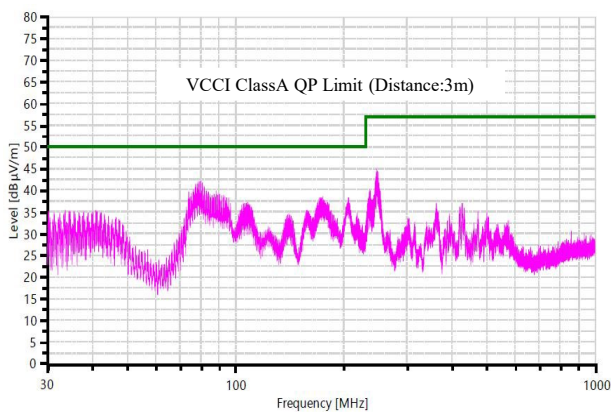


VERTICAL



24V

HORIZONTAL



VERTICAL

