

# PH600A280

## 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
$V_{cnt}$	.....	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

※ 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。

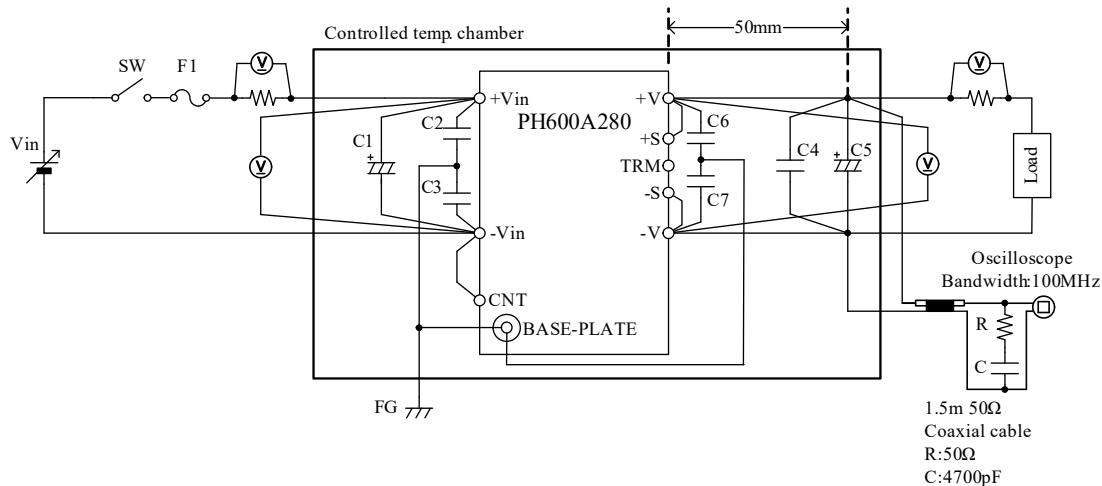
Test results are reference data based on our measurement condition.

# 1. 測定方法 Evaluation Method

## 1-1. 測定回路 Measurement Circuits

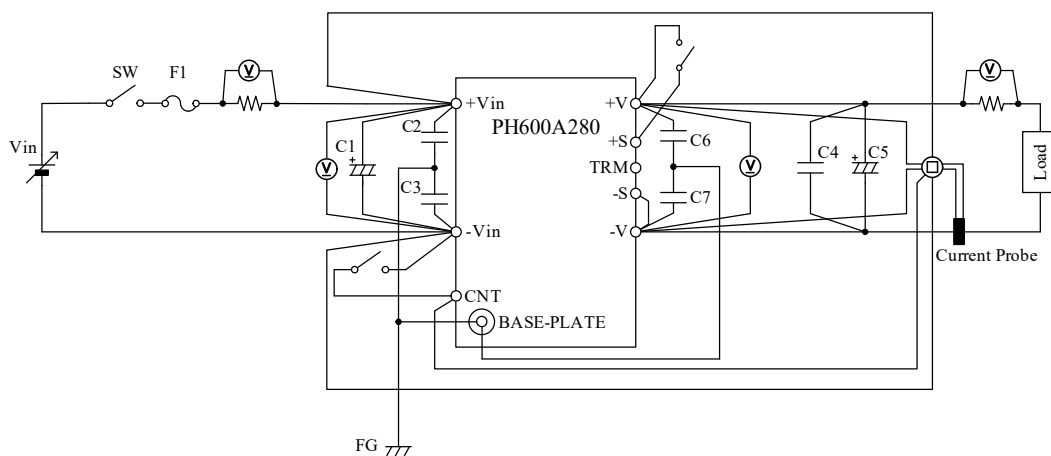
### (1) 静特性、過電流保護特性、出力リップル・ノイズ波形

Steady state characteristics, Over current protection (OCP) characteristics, and Output ripple and noise waveforms



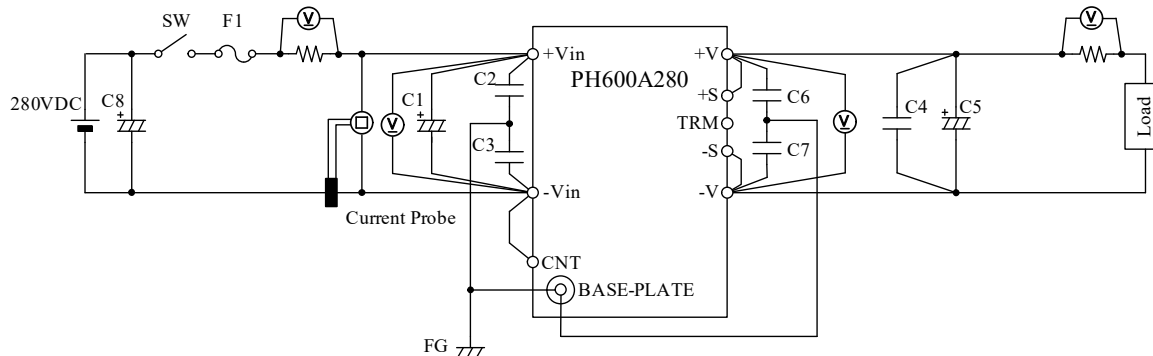
### (2) 過渡応答、過電圧保護特性、その他

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

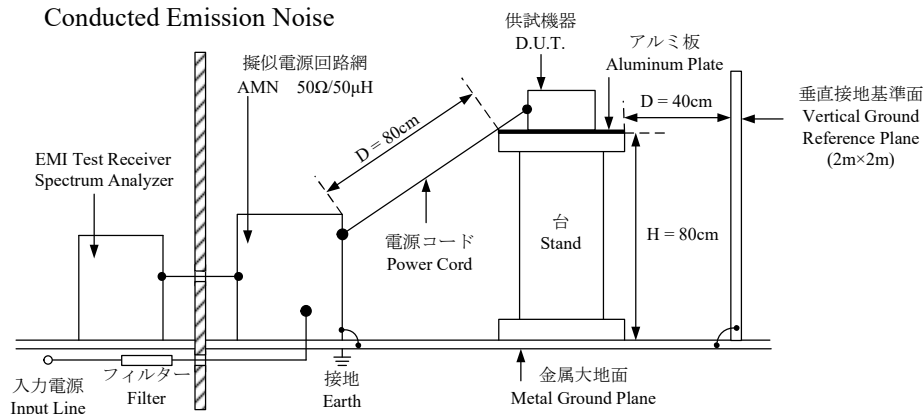


- |                                  |                                    |
|----------------------------------|------------------------------------|
| C1 : 22μF Electrolytic Capacitor | C2, C3 : 330pF Ceramic Capacitor   |
| C4 : 2.2μF Ceramic Capacitor     | C5 : 820μF Electrolytic Capacitor  |
| C6, C7 : 0.022μF Film Capacitor  | C8 : 1650μF Electrolytic Capacitor |
| F1 : 450VDC , 6.3A               |                                    |

(4) EMI特性 Electro-Magnetic Interference characteristics

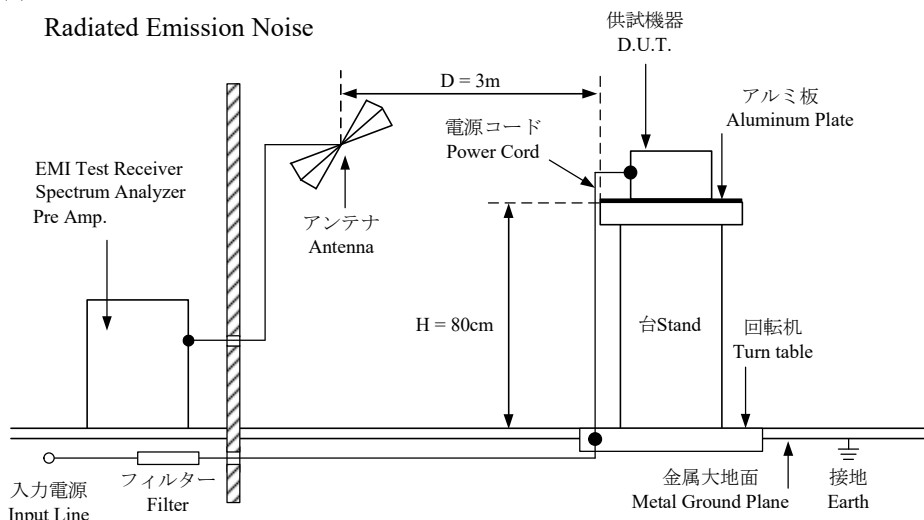
(a) 雑音端子電圧(帰還ノイズ)

Conducted Emission Noise



(b) 雑音電界強度(輻射ノイズ)

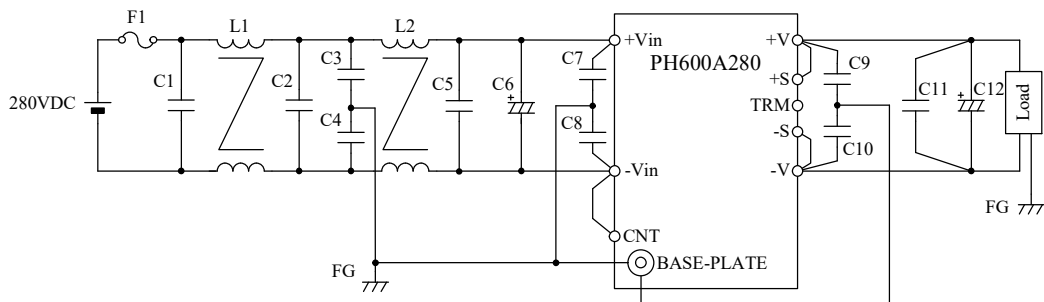
Radiated Emission Noise



\* 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



- |  |  |
|--|--|
| C1, C2, C5 : 0.68μF Film Capacitor       | (LE684-MX, OKAYA)                      |
| C3, C4, C7, C8 : 680pF Ceramic Capacitor | (CD45-B2GA681K-GKA, TDK)               |
| C6 : 22μF Electrolytic Capacitor         | (EGXE451ELL220ML25S, Nippon Chemi-con) |
| C9, C10 : 0.022μF Film Capacitor         | (HHC630V223J, OKAYA)                   |
| C11 : 2.2μF Ceramic Capacitor            | (C3225X7R2A225KT, TDK)                 |
| C12 : 820μF Electrolytic Capacitor       | (ELXZ500ELL821MK35S, Nippon Chemi-con) |
| L1 : 5.5mH                               | (SCR31B-105-1R4A055JH, NEC TOKIN)      |
| L2 : 3.5mH                               | (SCR25B-105-1R3A035JH, NEC TOKIN)      |
| F1 : 6.3A                                | (BDH63, DAITO)                         |

## 1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	AMN	SCHWARZBECK	NNLK8121
2	ANTENNA	TESEQ	CBL6111D
3	CONTROLLED TEMP. CHAMBER	ESPEC CORP.	SU-261
4	CURRENT PROBE	YOKOGAWA ELECT.	701929
5	CURRENT PROBE	YOKOGAWA ELECT.	701931
6	CVCF	KIKUSUI	PCR2000L / PCR4000L
7	CVCF	NF	ES10000S
8	DC POWER SUPPLY	TDK-Lambda	Gen600-5.5
9	DIGITAL MULTIMETER	Agilent	34970A
10	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110 / WT210
11	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DLM2054
12	DIGITAL MULTIMETER	Agilent	34401A
13	DYNAMIC DUMMY LOAD	TAKASAGO	FK-1000L
14	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESR3
15	PRE AMP.	SONOMA	310N
16	SHUNT RESISTOR	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

24V

1. Regulation - line and load

Condition Tbp : 25°C

Io \ Vin	200VDC	280VDC	360VDC	425VDC	Line regulation	
0%	23.985V	23.985V	23.986V	23.986V	1mV	0.004%
50%	23.985V	23.985V	23.986V	23.985V	1mV	0.004%
100%	23.985V	23.985V	23.986V	23.986V	1mV	0.004%
Load regulation	0mV	0mV	0mV	1mV		
	0.000%	0.000%	0.000%	0.004%		

2. Temperature drift

Conditions Vin=280VDC  
Io =100%

Tbp	-40°C	+25°C	+100°C	Temperature stability	
Vo	23.969V	23.985V	24.095V	126mV	0.525%

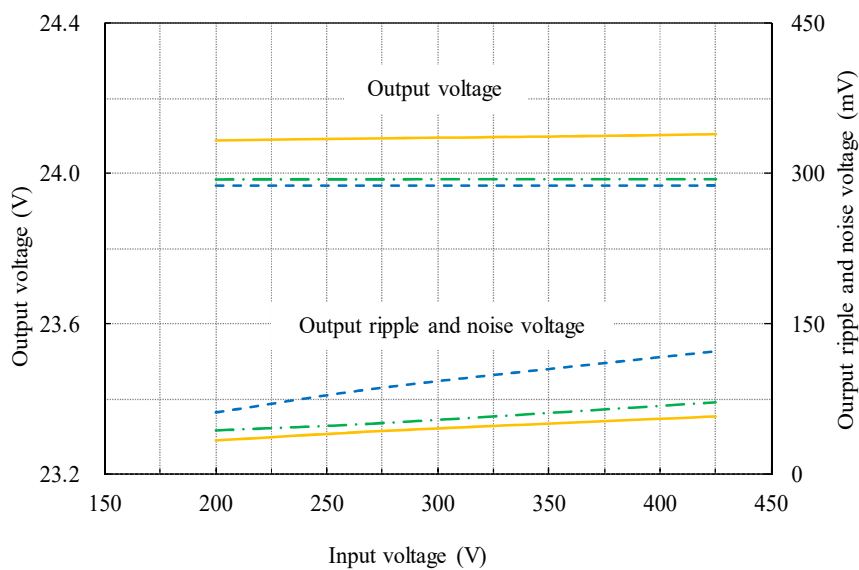
(2) 出力電圧、出力リップル・ノイズ電圧 対 入力電圧

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

Conditions Io : 100%

Tbp: -40°C ---  
 25°C -.-.-  
 100°C —

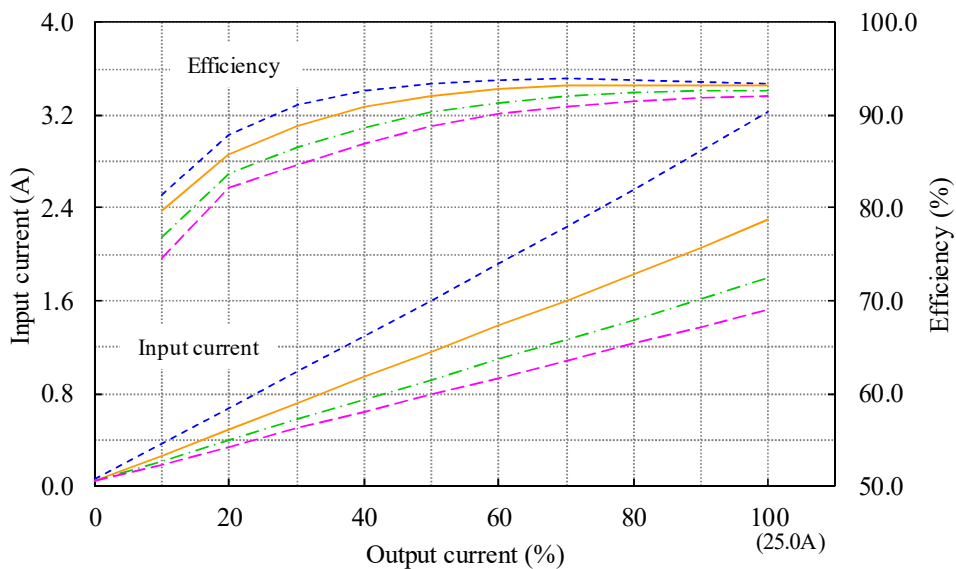
24V



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

Conditions Vin : 200 VDC  
 280 VDC  
 360 VDC  
 425 VDC  
 Tbp: 25 °C

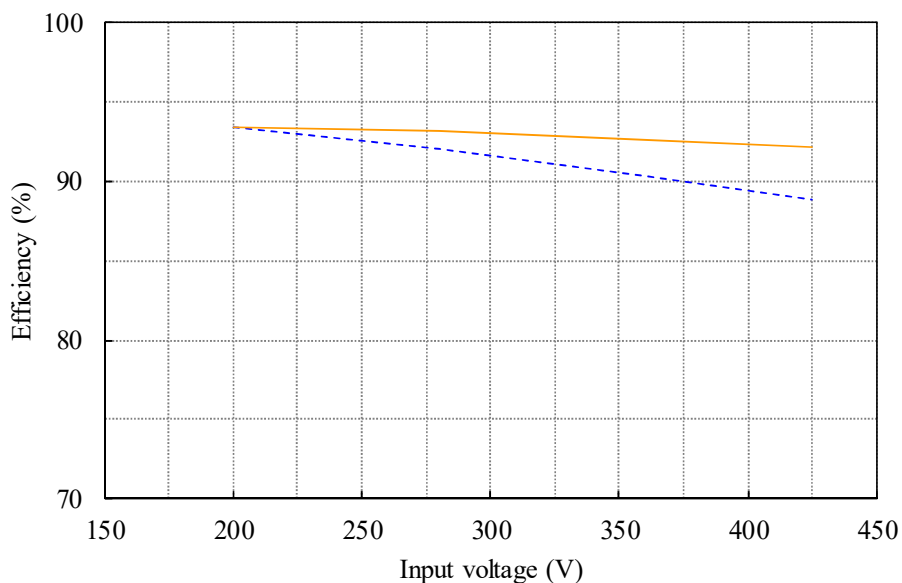
24V



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

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

24V

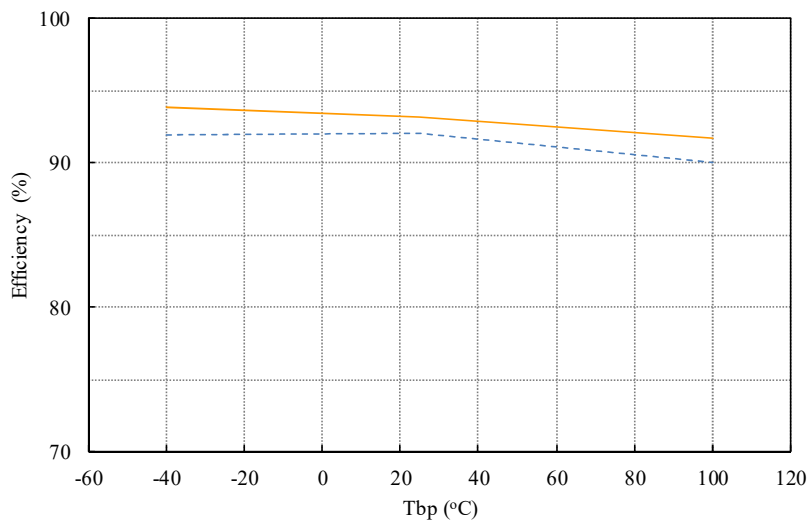




(5) 効率 対 ベースプレート温度 Efficiency vs. Base-plate temperature

Conditions  $V_{in}$  : 280 VDC  
 $I_o$  : 50 % ---  
 100 % ———

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

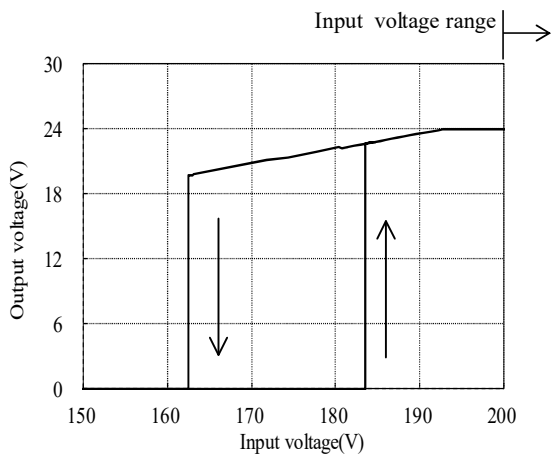
入力電流 対 入力電圧

Input current vs. Input voltage

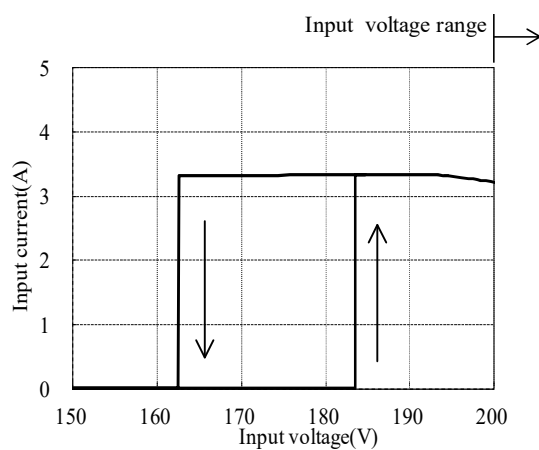
Conditions  $I_o$  : 100 %

$T_{bp}$  : 25 °C

24V

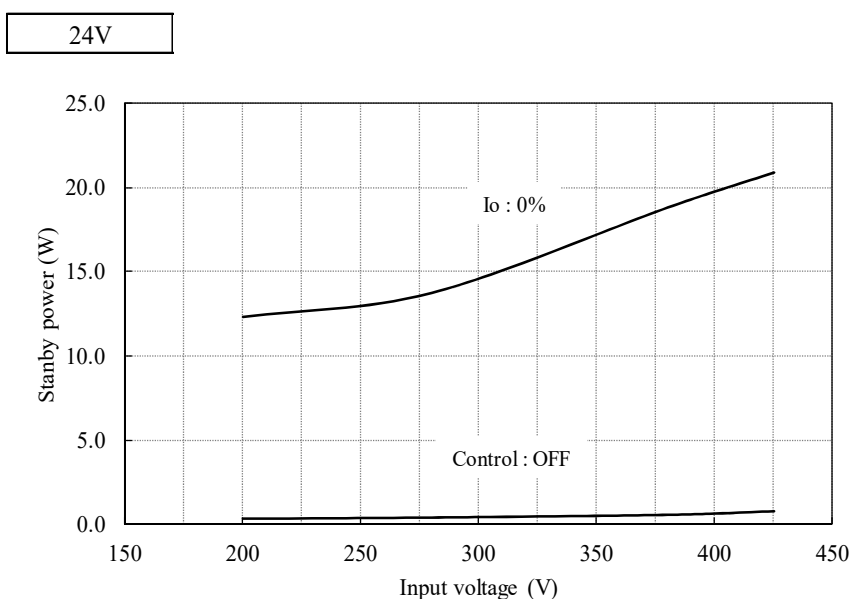


24V



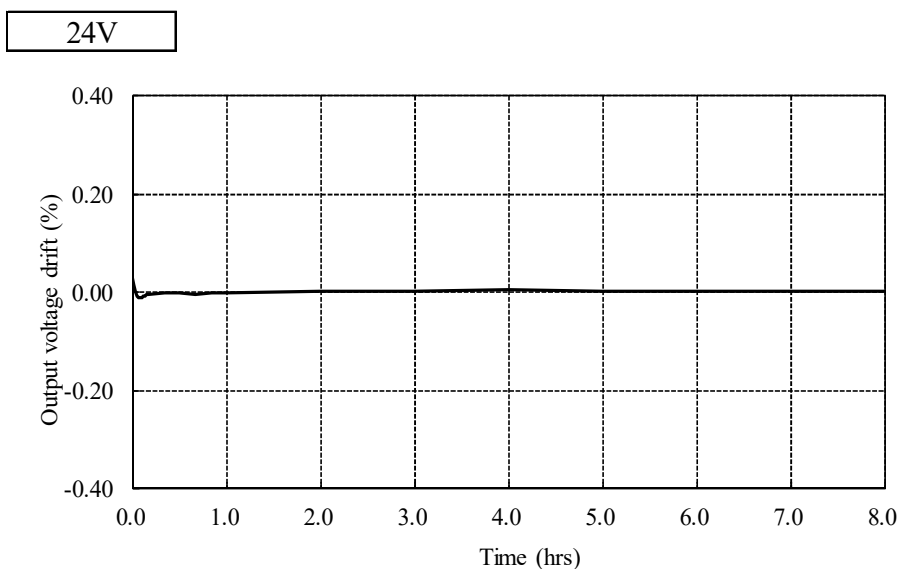
2-2. 待機電力特性 Standby power characteristics

Condition Tbp: 25 °C



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

Conditions Vin : 280 VDC  
Io : 100 %  
Ta : 25 °C



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

入力電圧依存性

Input voltage dependence

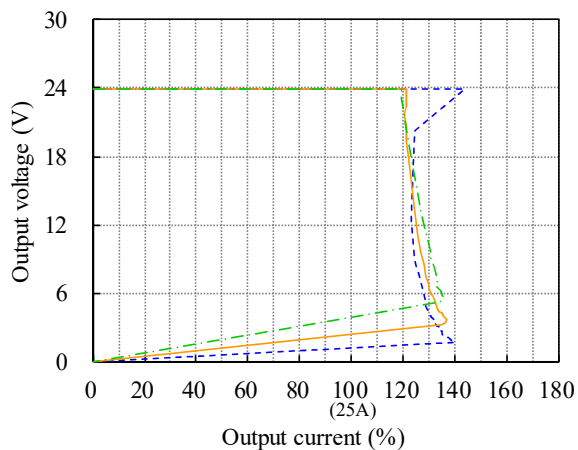
Conditions Vin : 200 VDC ---  
 280 VDC —  
 425 VDC - - -  
 Tbp: 25 °C

ベースプレート温度依存性

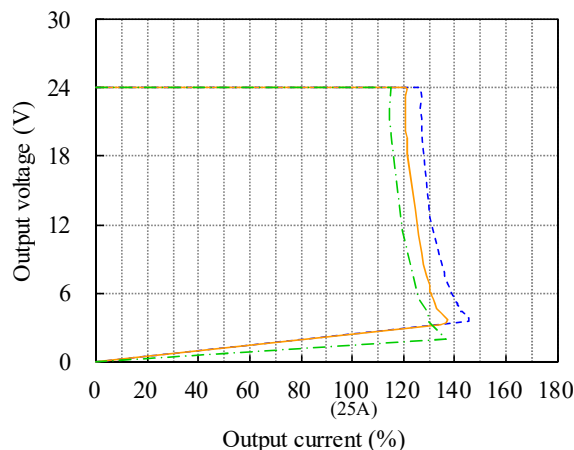
Base-plate temperature dependence

Conditions Vin : 280 VDC  
 Tbp: -40 °C ---  
 25 °C —  
 100 °C - - -

24V



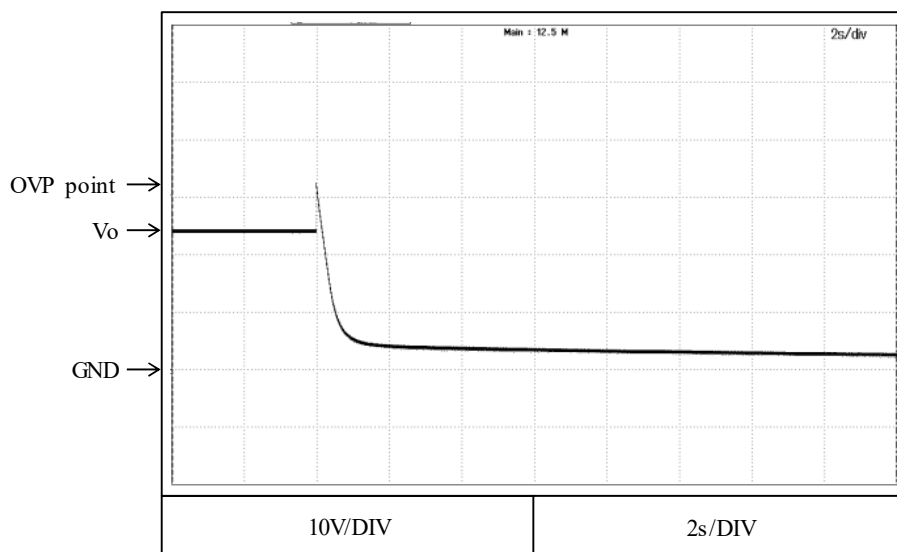
24V



2-5. 過電圧保護特性 Over voltage protection (OVP) characteristics

Conditions Vin : 280 VDC  
 Io : 0 %  
 Tbp: 25 °C

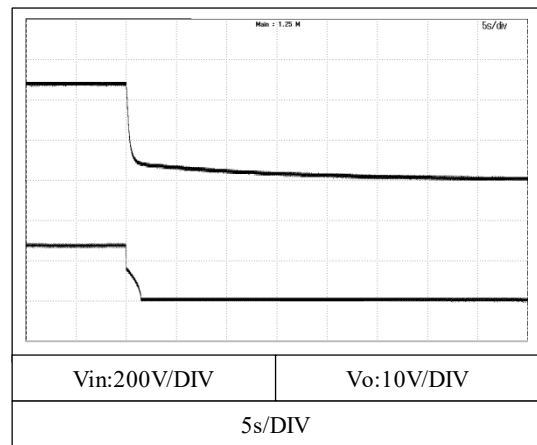
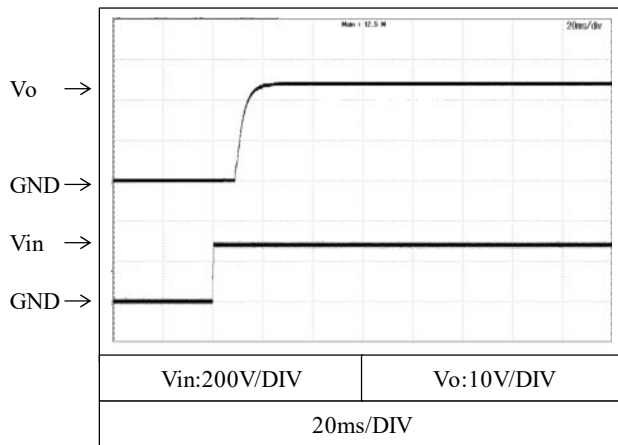
24V



2-6. 出力立ち上がり、立ち下がり特性 Output rise and fall characteristics

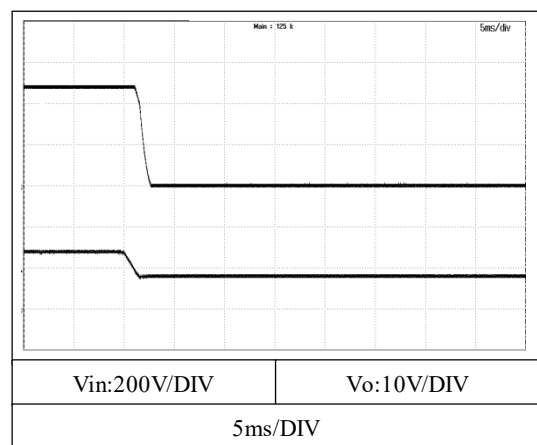
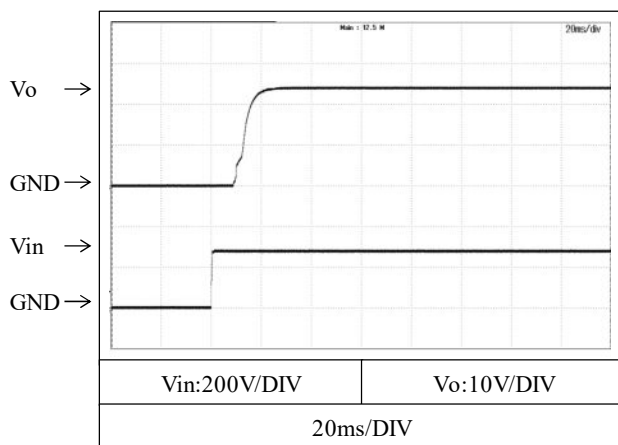
Conditions Vin : 280 VDC  
 Io : 0 %  
 Tbp: 25 °C

24V



Conditions Vin : 280 VDC  
 Io : 100 %  
 Tbp: 25 °C

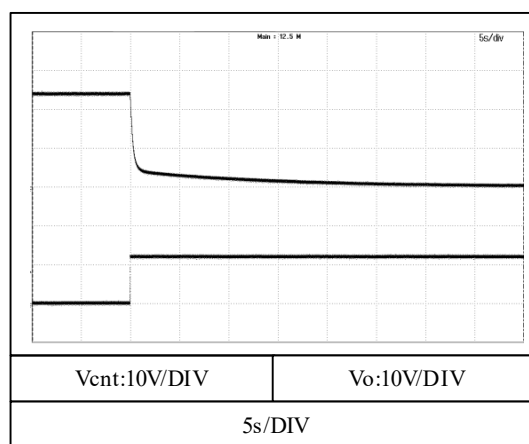
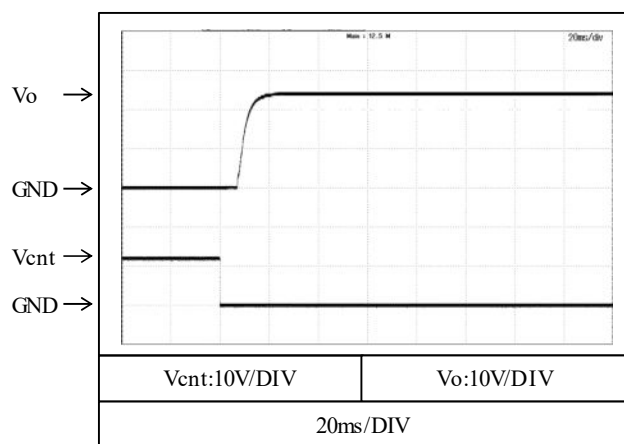
24V



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

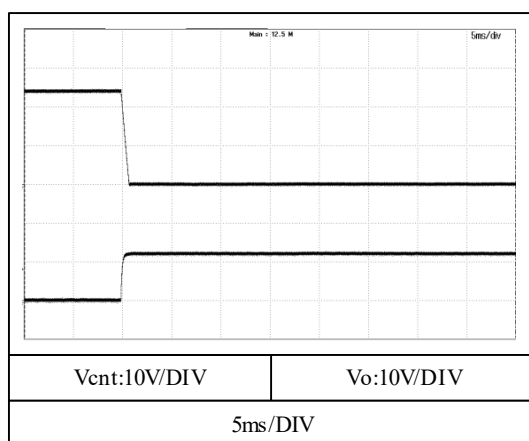
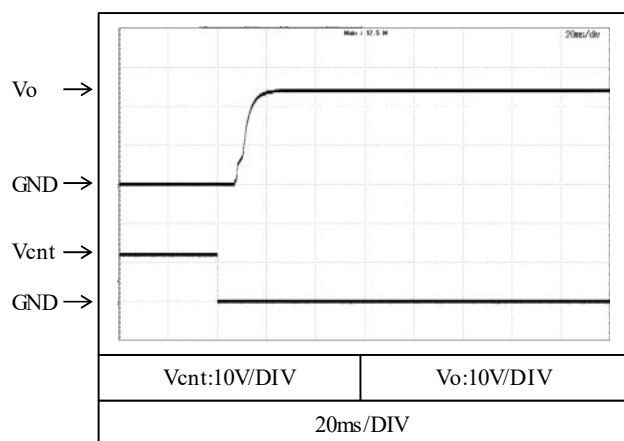
Conditions Vin : 280 VDC  
Io : 0 %  
Tbp: 25 °C

24V



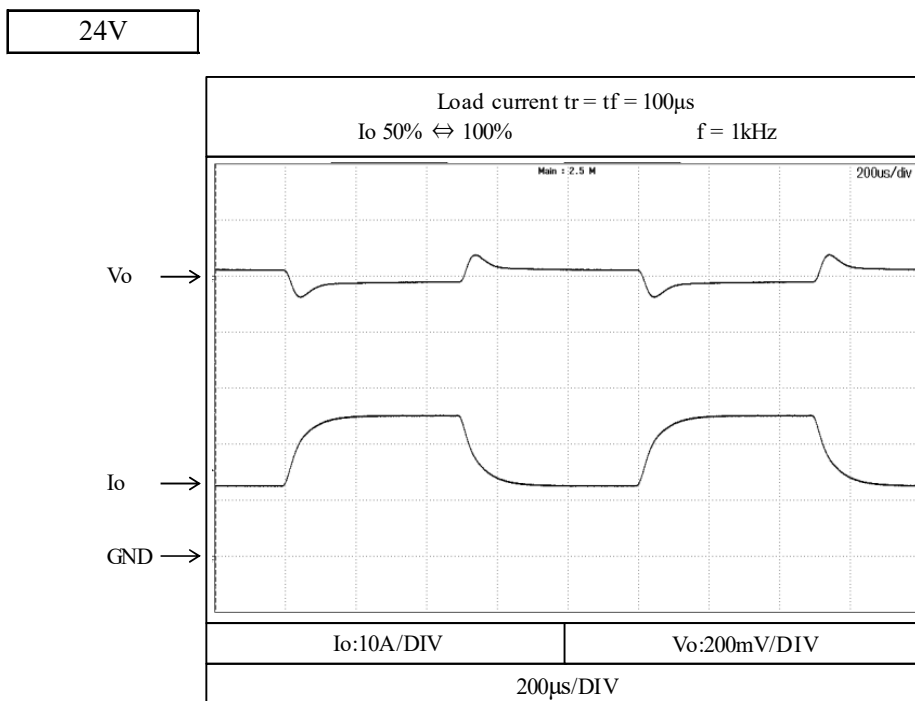
Conditions Vin : 280 VDC  
Io : 100 %  
Tbp: 25 °C

24V



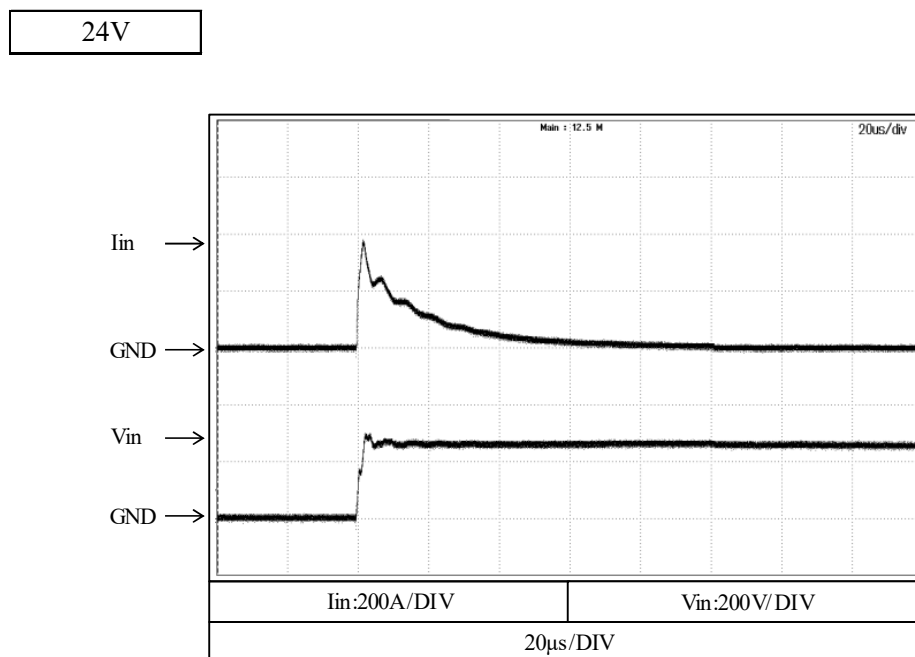
2-7. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 280 VDC  
Tbp: 25 °C



2-8. 入力サージ電流(突入電流)特性 Inrush current characteristics

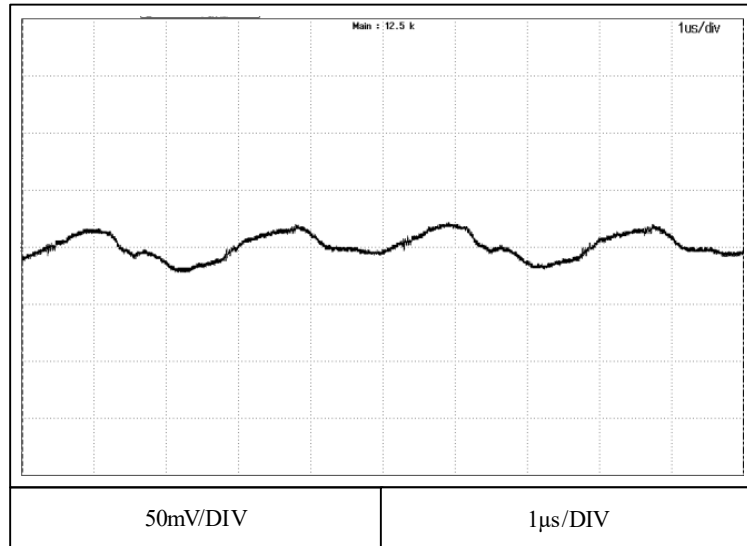
Conditions Vin : 280 VDC  
Io : 100 %  
Tbp: 25 °C



2-9. 出力リップル・ノイズ特性 Output ripple and noise waveform

Conditions Vin : 280 VDC  
Io : 100 %  
Tbp: 25 °C

24V

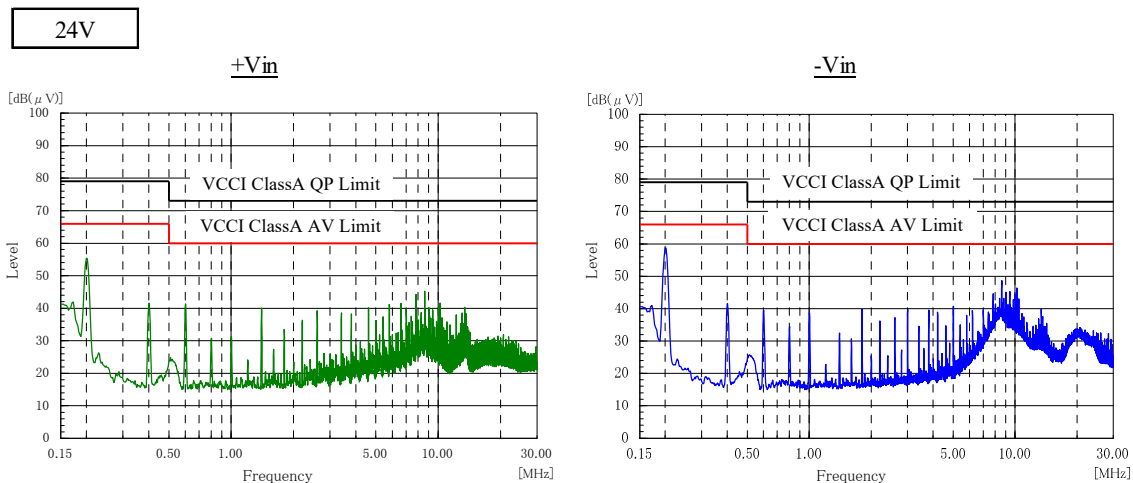


2-10. EMI特性 Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission Noise

Conditions Vin : 280 VDC  
Io : 100 %  
Tbp: 25 °C



(b) 雑音電界強度 (輻射ノイズ)

Radiated Emission Noise

Conditions Vin : 280 VDC  
Io : 100 %  
Tbp: 25 °C

