

# RDS30-24

## EVALUATION DATA

### 型式データ

DWG No. B027-53-01		
APPD	CHK	DWG
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10. Dec. '10	6. Dec. '10	3. Dec. '10

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## 使用記号 Terminology used

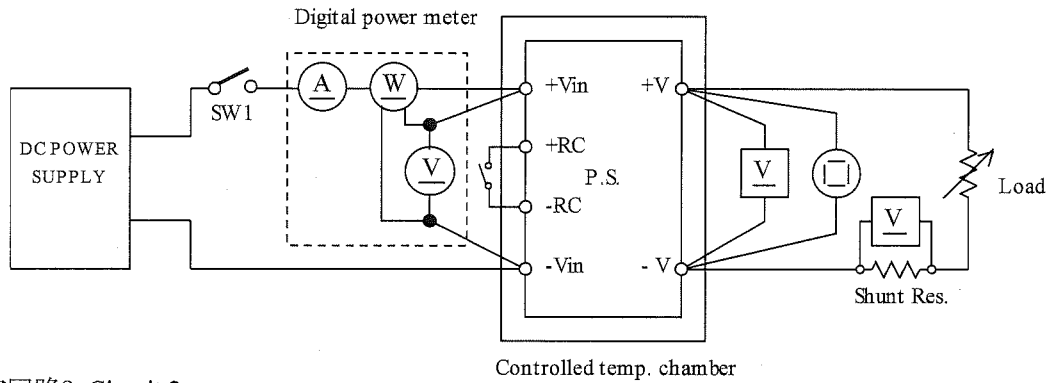
	Definition	
Vin	..... 入力電圧	Input voltage
Vout	..... 出力電圧	Output voltage
Iin	..... 入力電流	Input current
Iout	..... 出力電流	Output current
Ta	..... 周囲温度	Ambient temperature
f	..... 周波数	Frequency
CNT (RC)	..... ON/OFF コントロール	ON/OFF control

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

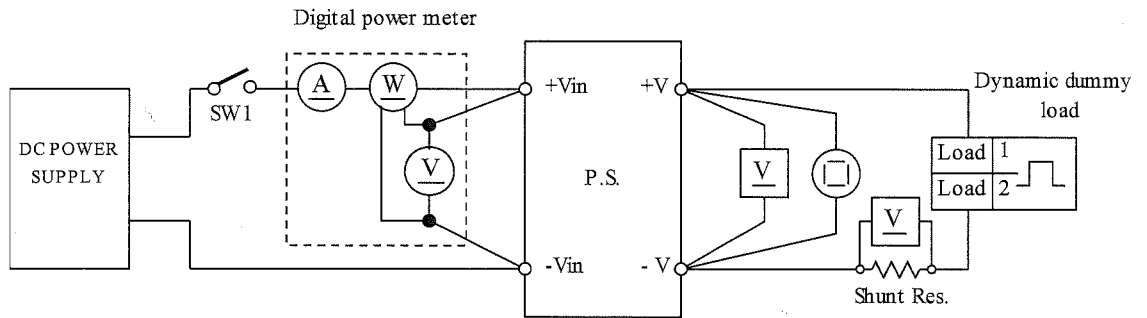
測定回路1 Circuit 1

- |                                                                                                                                              |                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>・ 静特性</li> <li>・ 過電流保護特性</li> <li>・ 過電圧保護特性</li> <li>・ 出力立ち上がり・立ち下がり特性</li> <li>・ 出力保持時間特性</li> </ul> | <ul style="list-style-type: none"> <li>Steady state data</li> <li>Over current protection (OCP) characteristics</li> <li>Over voltage protection (OVP) characteristics</li> <li>Output rise/fall characteristics</li> <li>Hold up time characteristics</li> </ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

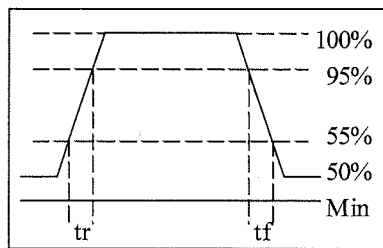


測定回路2 Circuit 2

- |                                                                    |                                       |
|--------------------------------------------------------------------|---------------------------------------|
| <ul style="list-style-type: none"> <li>・ 過渡応答 (負荷急変) 特性</li> </ul> | Dynamic load response characteristics |
|--------------------------------------------------------------------|---------------------------------------|

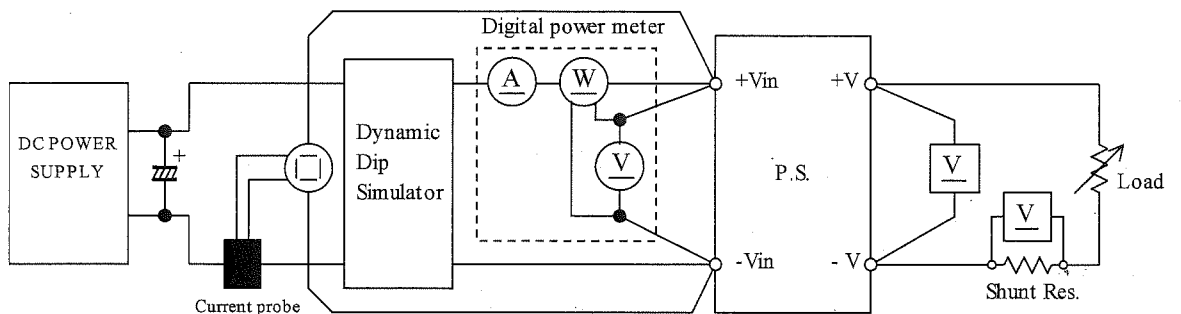


Output current waveform  
Iout 50% <math>\leftrightarrow</math> 100%



測定回路3 Circuit 3

- |                                                                       |                                |
|-----------------------------------------------------------------------|--------------------------------|
| <ul style="list-style-type: none"> <li>・ 入力サージ電流 (突入電流) 特性</li> </ul> | Inrush current characteristics |
|-----------------------------------------------------------------------|--------------------------------|

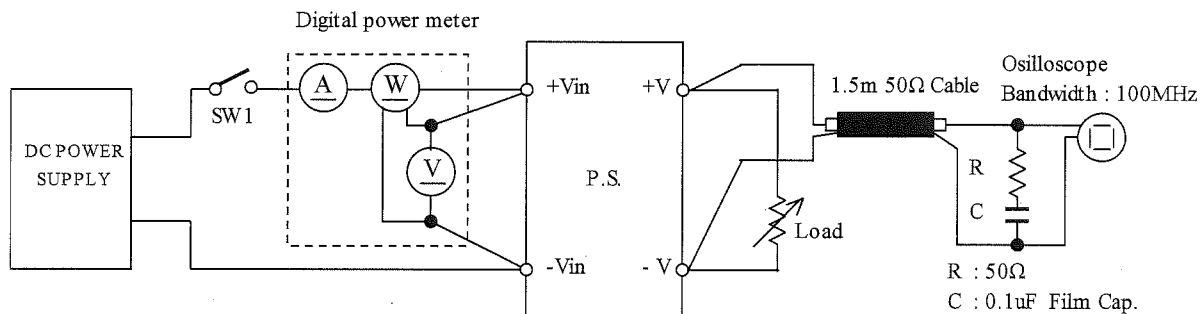


測定回路4 Circuit 4

- 出力リップル、ノイズ特性

Output ripple and noise waveform

Normal Mode (JEITA Standard RC-9131A)

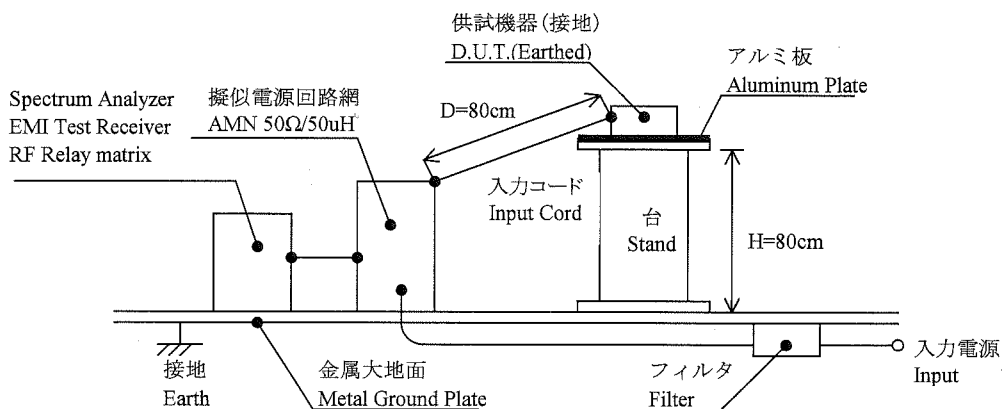


測定構成 Configuration

- E M I 特性  
雑音端子電圧 (帰還ノイズ)

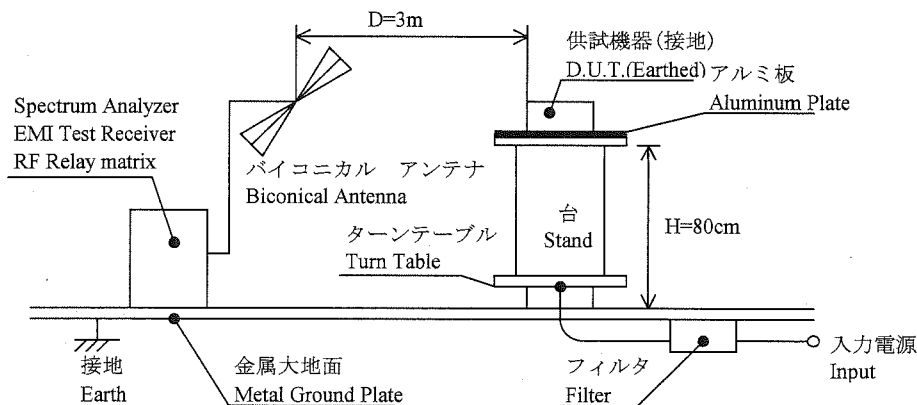
Electro-Magnetic Interference characteristics

Conducted Emission Noise



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	TEKTRONIX	TDS220
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740EL
3	DIGITAL MULTIMETER	AGILENT	34970A
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110
5	CURRENT PROBE/AMPLIFIER	YOKOGAWA ELECT.	701930
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-400L
7	DYNAMIC DUMMY LOAD	KEISOKU GIKEN	ELL-354
8	CVCF	TAKASAGO	AA2000XG
9	DYNAMIC DIP SIMULATOR	CYBERNETICS	PSA-210
10	CONTROLLED TEMP. CHAMBER	ESPEC	SU-641
11	SPECTRUM ANALYZER EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI
12	RF SELECTOR	TOYO, CORP	NS4900
13	AMN	SCHWARZBECK	NNLK8121
14	ANTENNA (BICONICAL ANTENNA)	TESEQ	CBL6111D

## 2.1 静特性 Steady state data

(1) 入力・負荷・温度変動／出力起動・低下電圧

Regulation - line and load, Temperature drift / Start up voltage and Drop out voltage

5V

## 1. Regulation - line and load

Condition

Ta : 25 °C

Iout \ Vin	18VDC	24VDC	32VDC	line regulation	
0%	5.034V	5.044V	5.045V	11mV	0.220%
50%	5.013V	5.017V	5.019V	6mV	0.120%
100%	4.996V	4.999V	5.001V	5mV	0.100%
load regulation	38mV	45mV	44mV		
	0.760%	0.900%	0.880%		

## 2. Temperature drift

Conditions

Vin : 24 VDC

Iout : 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	5.009V	4.999V	4.984V	25mV	0.500%

## 3. Start up voltage and Drop out voltage

Conditions

Ta : 25 °C

Iout : 100 %

Start up voltage (Vin)	16.1VDC
Drop out voltage (Vin)	13.3VDC

12V

## 1. Regulation - line and load

Condition

Ta : 25 °C

Iout \ Vin	18VDC	24VDC	32VDC	line regulation	
0%	12.057V	12.055V	12.056V	2mV	0.017%
50%	12.054V	12.050V	12.048V	6mV	0.050%
100%	12.044V	12.041V	12.040V	4mV	0.033%
load regulation	13mV	14mV	16mV		
	0.108%	0.117%	0.133%		

24V

## 1. Regulation - line and load

Condition

Ta : 25 °C

Iout \ Vin	18VDC	24VDC	32VDC	line regulation	
0%	23.999V	23.967V	23.963V	36mV	0.150%
50%	23.996V	23.981V	23.972V	24mV	0.100%
100%	23.991V	23.971V	23.967V	24mV	0.100%
load regulation	8mV	14mV	9mV		
	0.033%	0.058%	0.038%		

## 2. Temperature drift

Conditions

Vin : 24 VDC

Iout : 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	24.106V	23.971V	23.928V	178mV	0.742%

## 3. Start up voltage and Drop out voltage

Conditions

Ta : 25 °C

Iout : 100 %

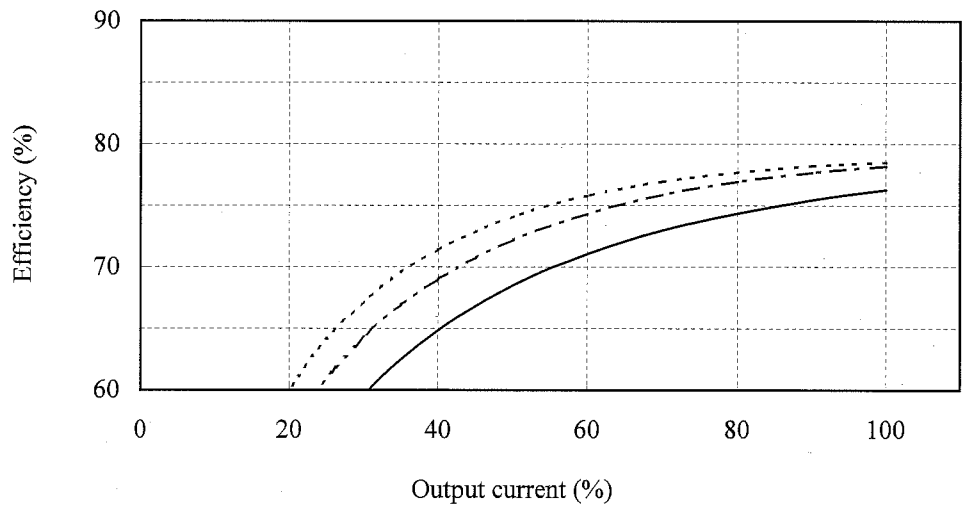
Start up voltage (Vin)	16.2VDC
Drop out voltage (Vin)	13.2VDC

(2) 効率対出力電流

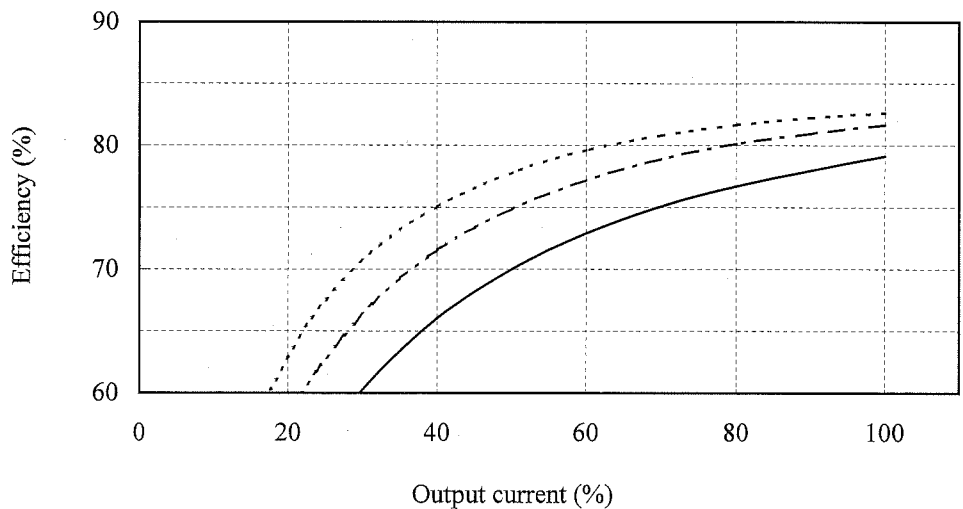
Efficiency vs. Output current

Conditions Vin : 18 VDC -----  
 24 VDC - - - - -  
 32 VDC ————  
 Ta : 25 °C

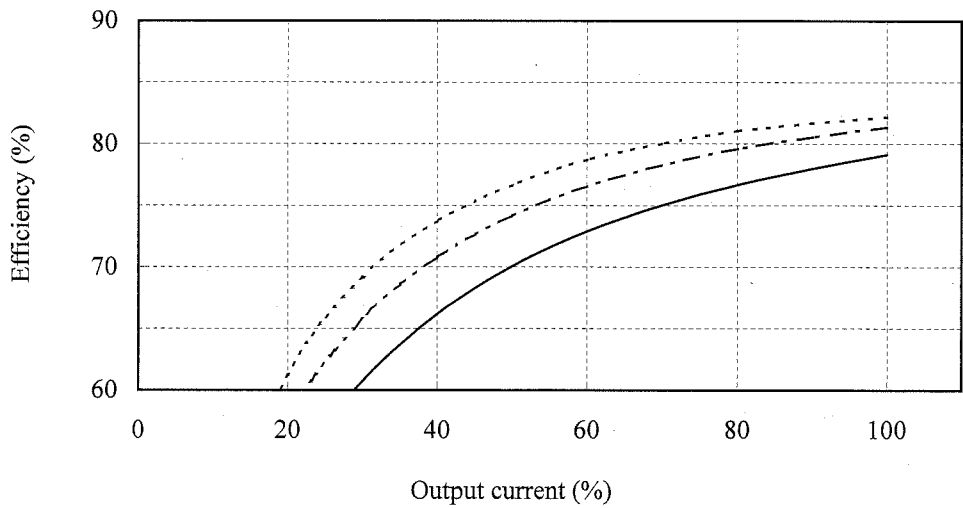
5V



12V



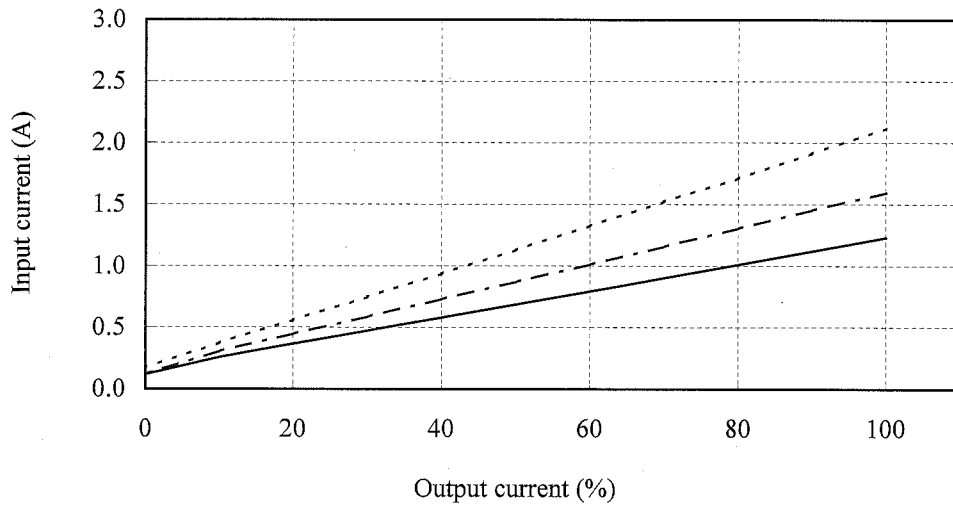
24V



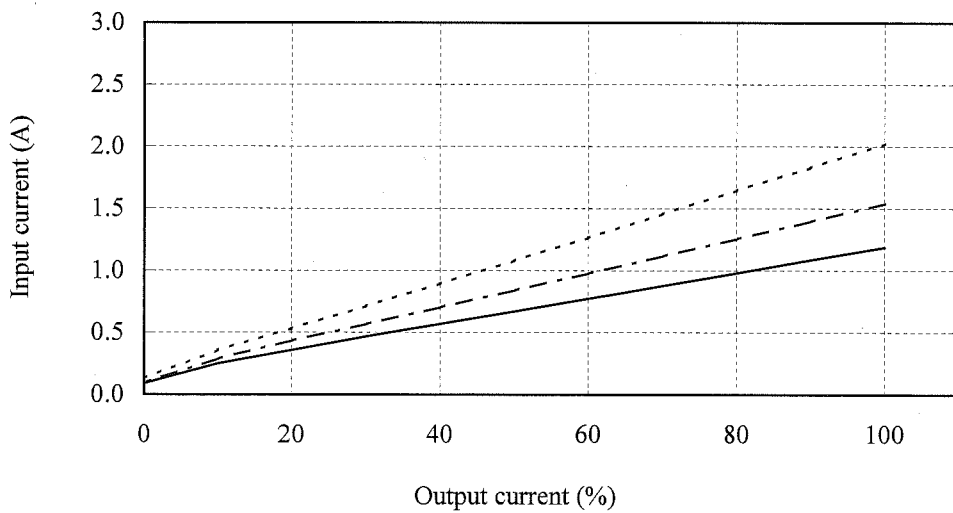
(3) 入力電流対出力電流  
Input current vs. Output current

Conditions Vin : 18 VDC -----  
24 VDC - - - - -  
32 VDC ————  
Ta : 25 °C

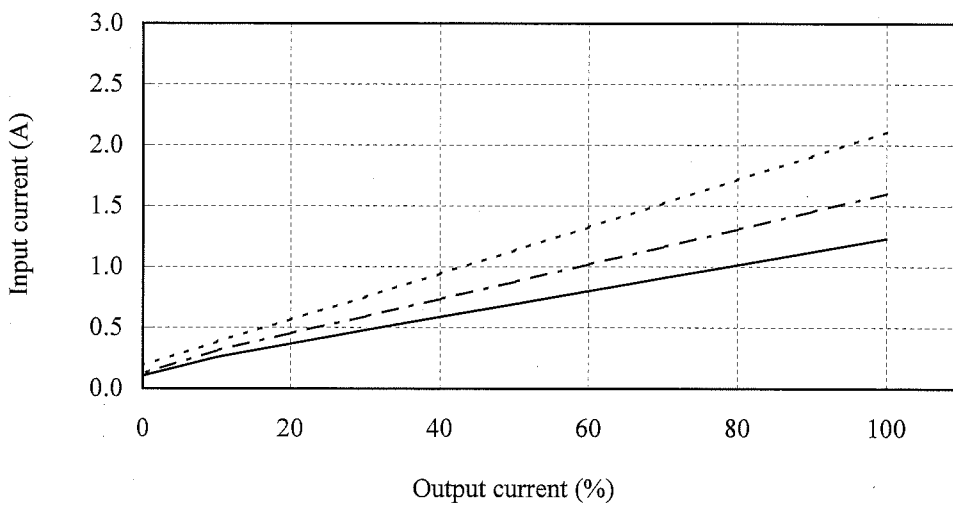
5V



12V



24V





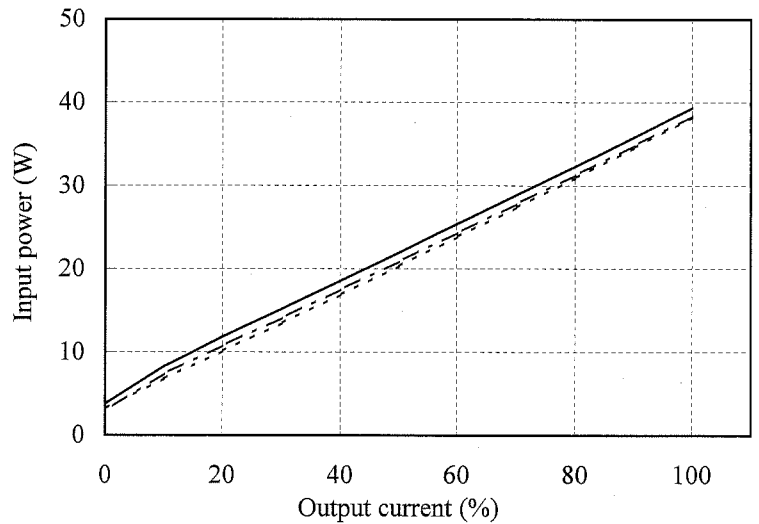
(4) 入力電力対出力電流  
Input power vs. Output current

Conditions Vin : 18 VDC -----  
24 VDC - - - - -  
32 VDC ————  
Ta : 25 °C

5V

Conditions Iout : 0%	
Vin	Input power
18VDC	3.2W
24VDC	2.9W
32VDC	3.8W

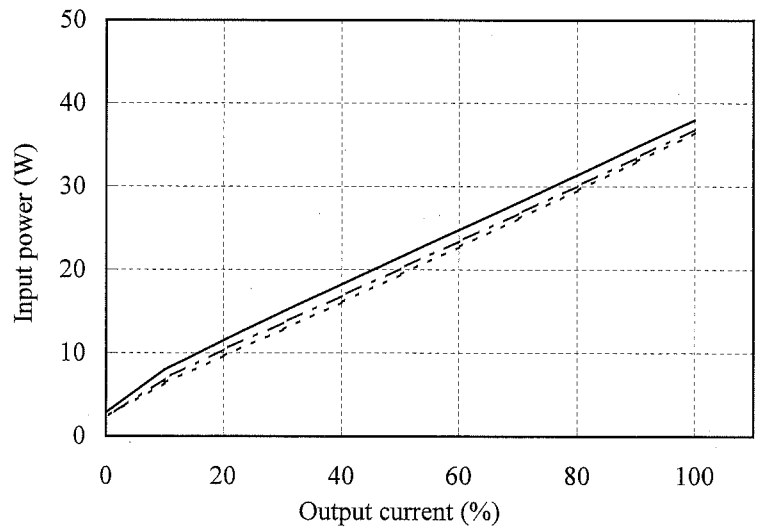
Conditions CNT (RC) : OFF	
Vin	Input power
18VDC	0.2W
24VDC	0.4W
32VDC	0.8W



12V

Conditions Iout : 0%	
Vin	Input power
18VDC	2.3W
24VDC	2.3W
32VDC	2.9W

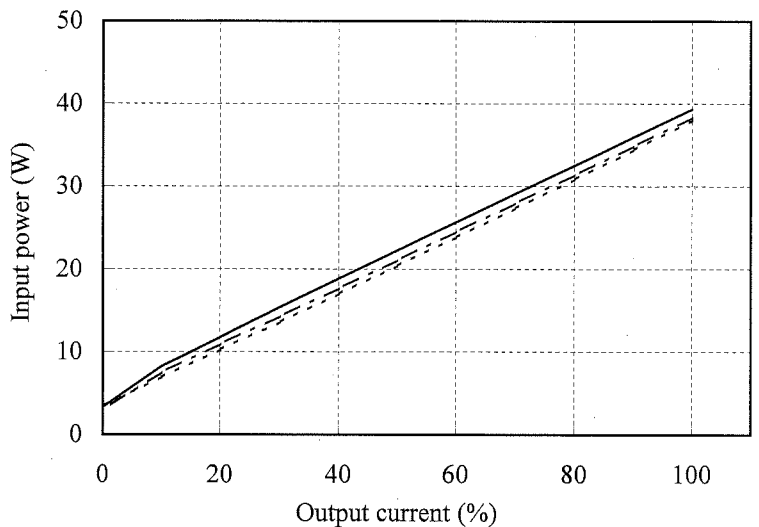
Conditions CNT (RC) : OFF	
Vin	Input power
18VDC	0.2W
24VDC	0.4W
32VDC	0.8W



24V

Conditions Iout : 0%	
Vin	Input power
18VDC	3.4W
24VDC	2.9W
32VDC	3.3W

Conditions CNT (RC) : OFF	
Vin	Input power
18VDC	0.2W
24VDC	0.4W
32VDC	0.8W

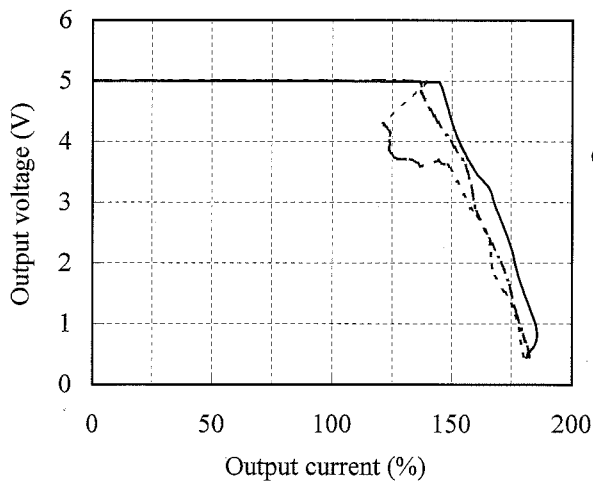


2.2 過電流保護特性

Over current protection (OCP) characteristics

Conditions Vin : 18 VDC -----  
 24 VDC - - - - -  
 32 VDC ————  
 Ta : 25 °C

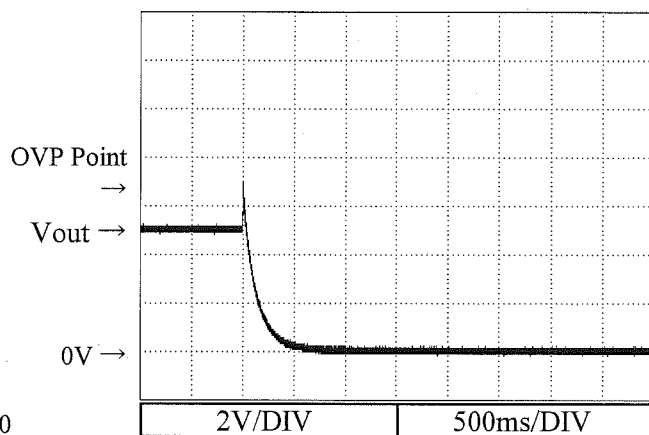
5V



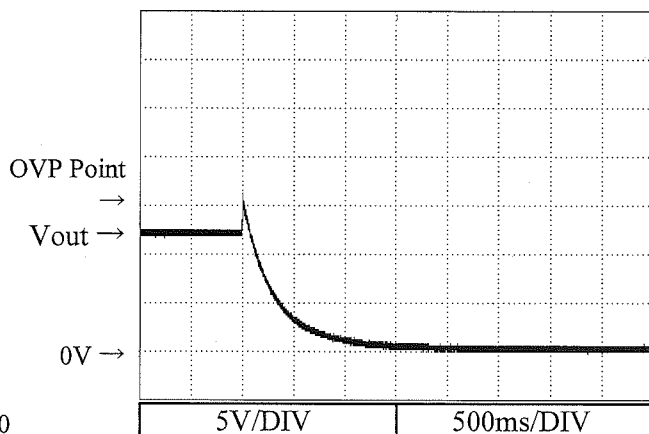
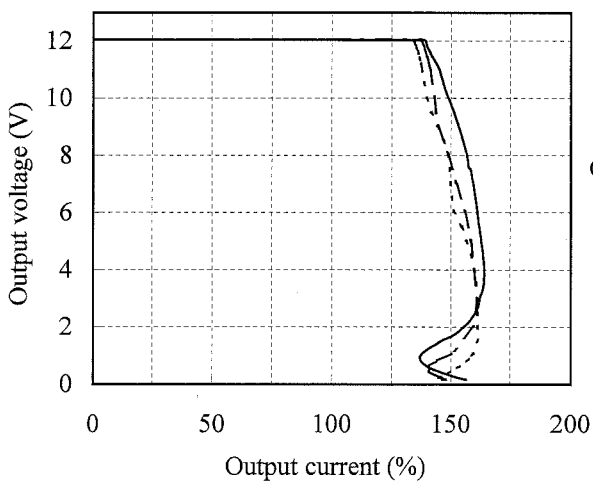
2.3 過電圧保護特性

Over voltage protection (OVP) characteristics

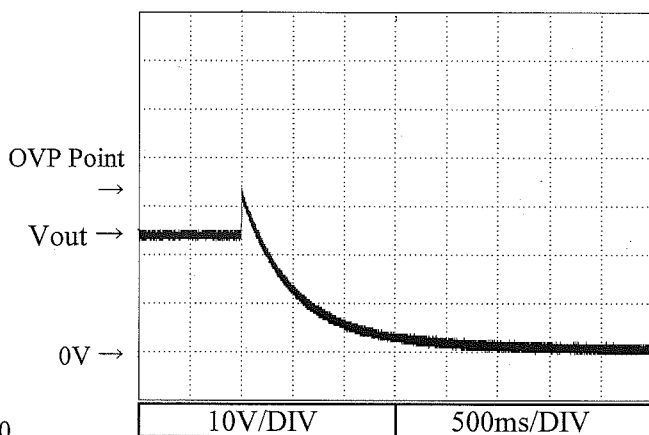
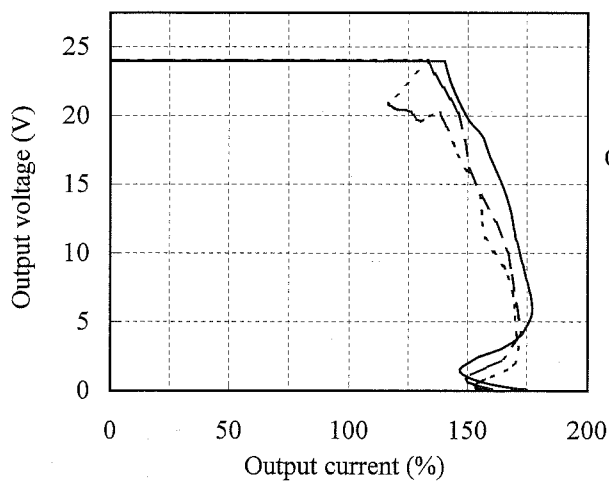
Conditions Vin : 24 VDC  
 Iout : 0 %  
 Ta : 25 °C



12V



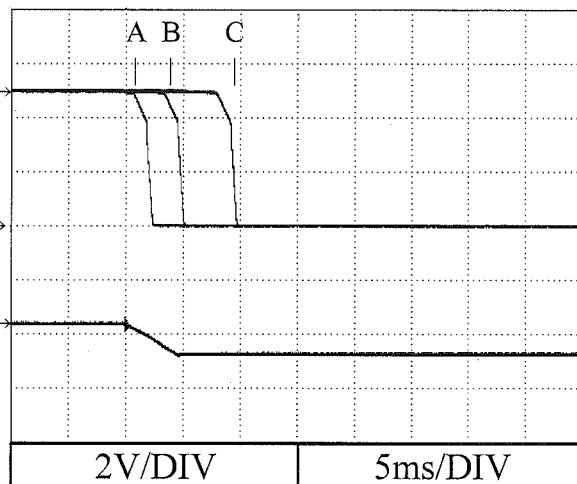
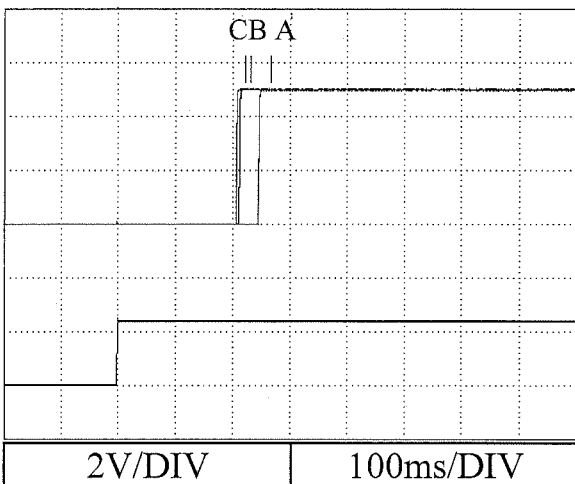
24V



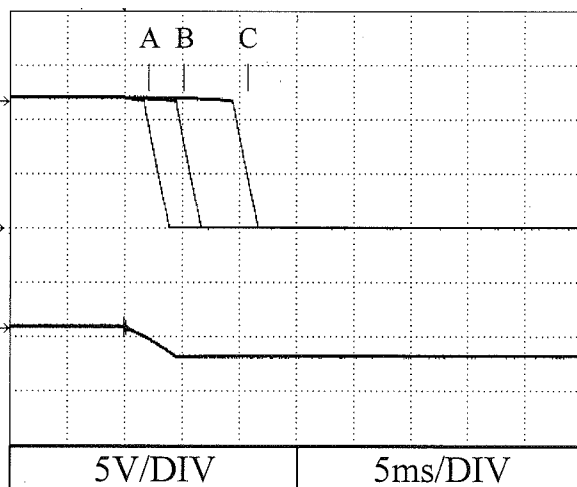
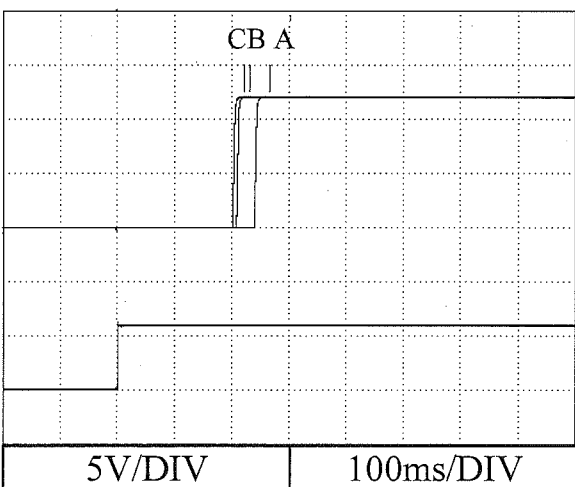
2.4 出力立ち上がり・立ち下がり特性  
Output rise/fall characteristics

Conditions Vin : 18 VDC (A)  
24 VDC (B)  
32 VDC (C)  
Iout : 100 %  
Ta : 25 °C

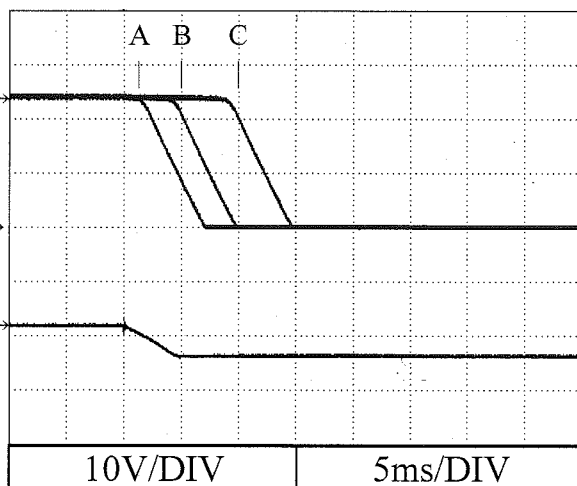
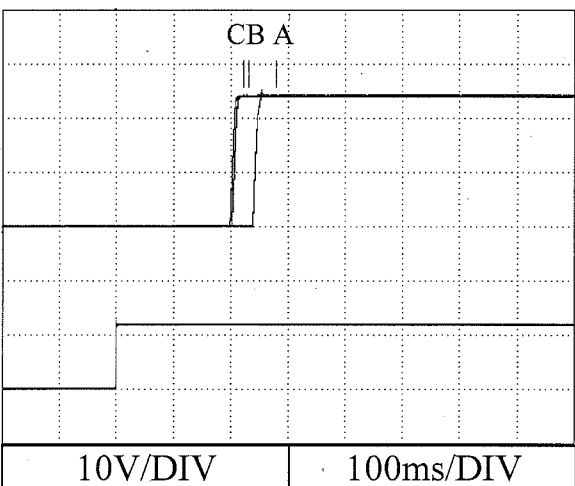
5V



12V



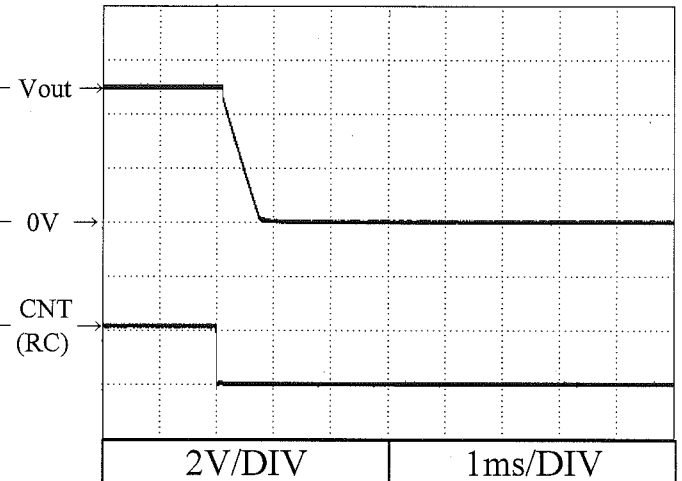
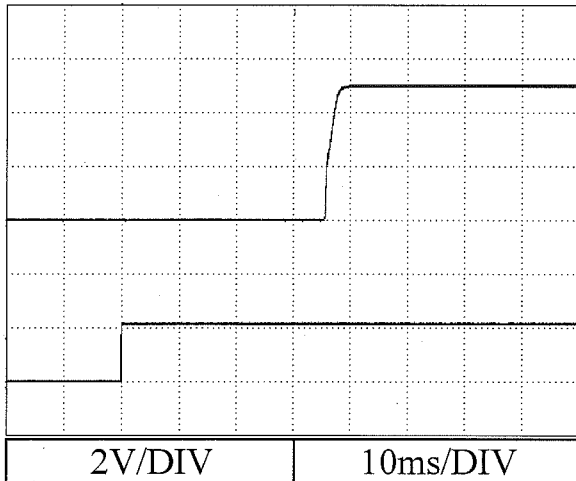
24V



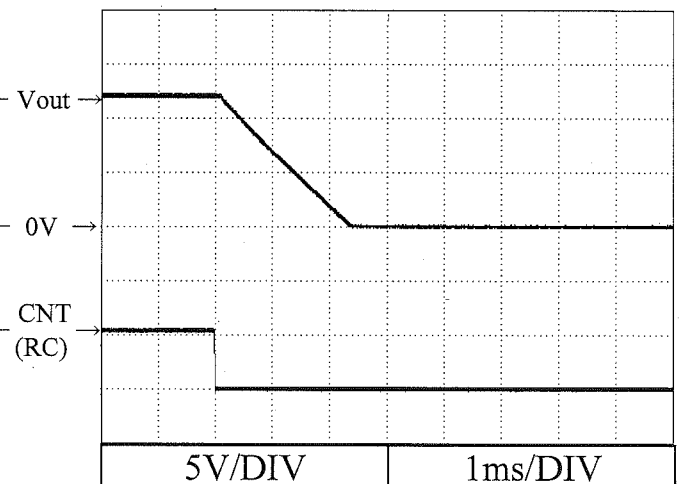
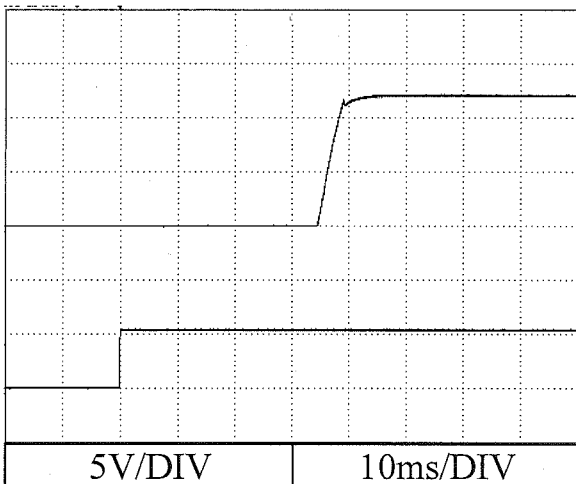
2.5 ON/OFFコントロール時出力立ち上がり・立ち下がり特性  
Output rise/fall characteristics with ON/OFF control

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

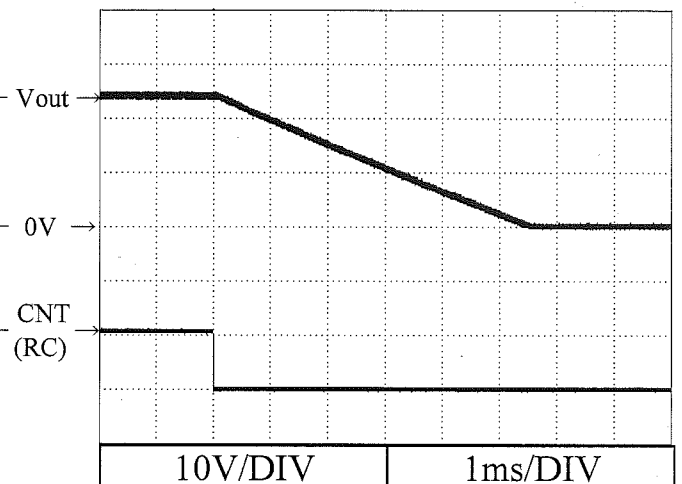
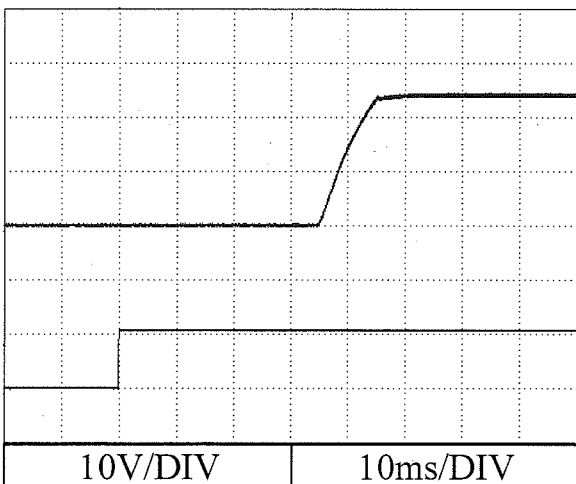
5V



12V



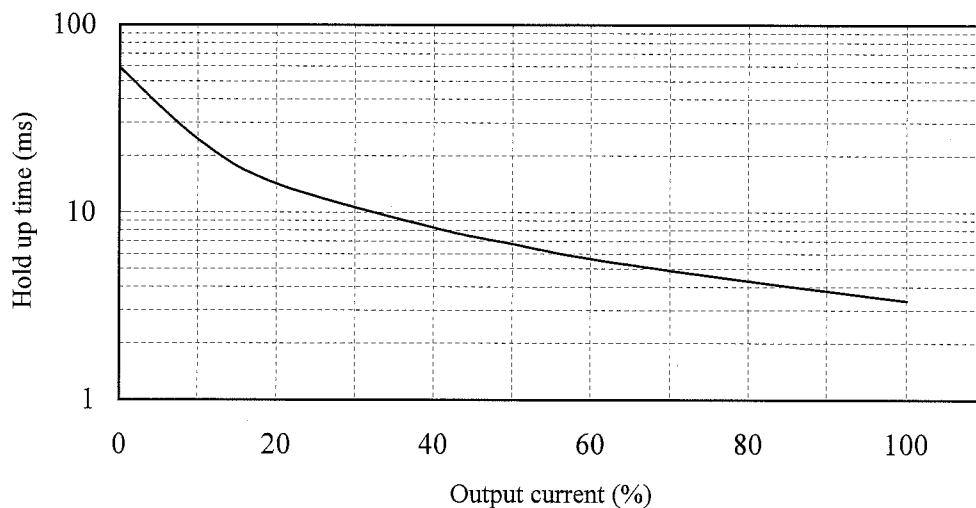
24V



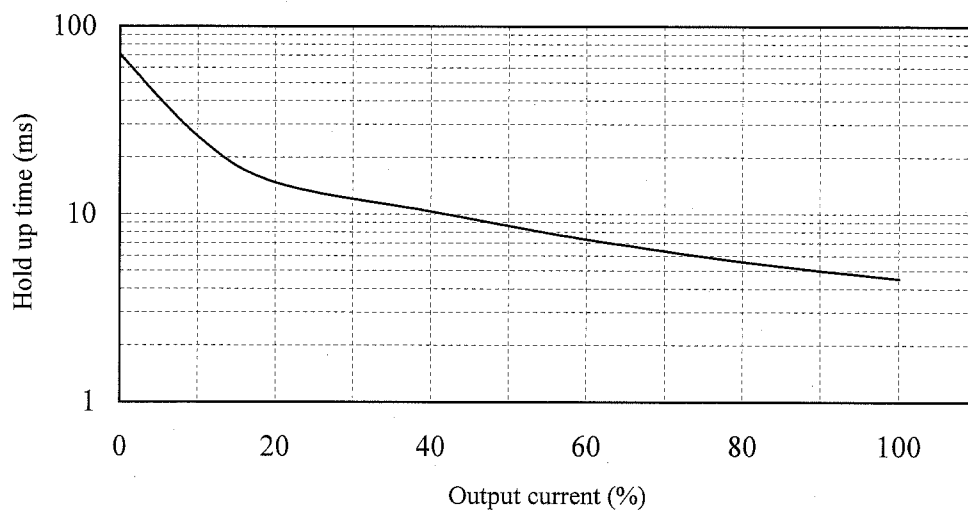
2.6 出力保持時間特性  
Hold up time characteristics

Conditions Vin : 24 VDC  
Ta : 25 °C

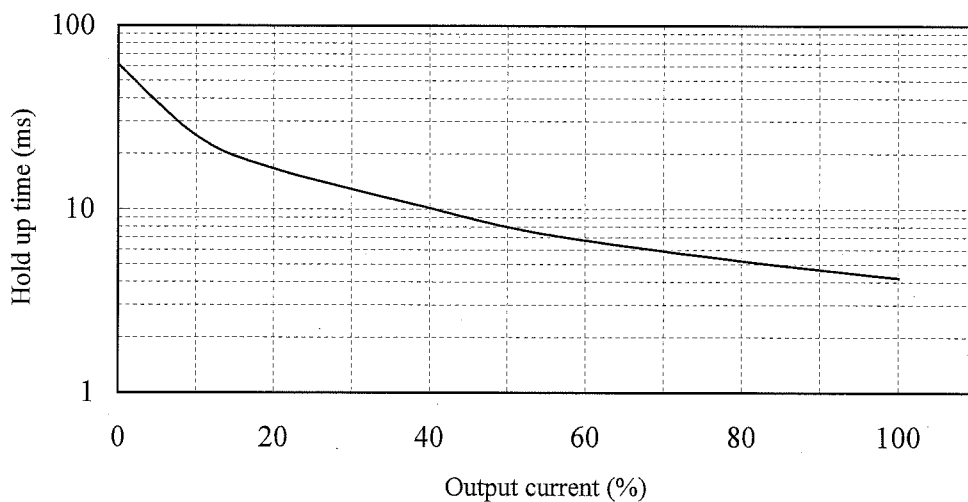
5V



12V



24V



2.7 過渡応答 (負荷急変) 特性

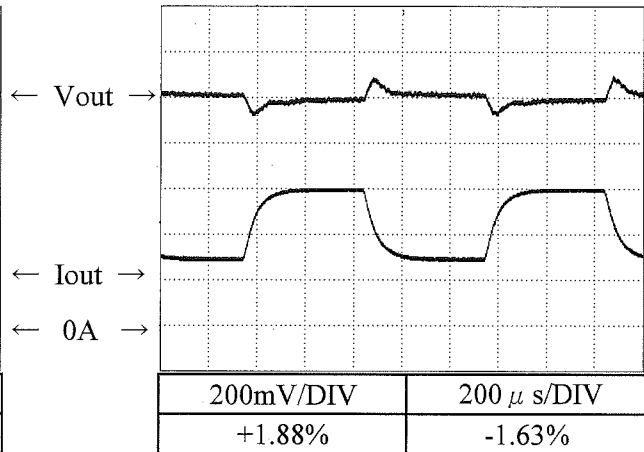
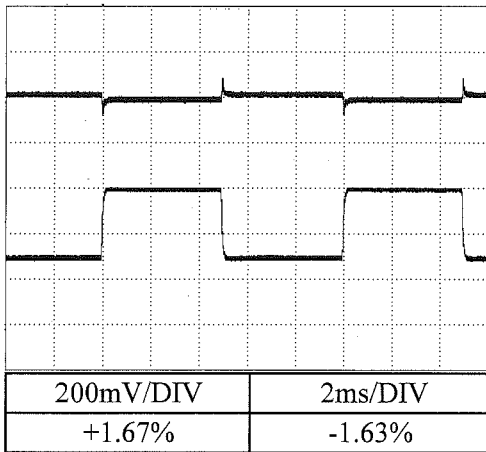
Dynamic load response characteristics

Conditions Vin : 24 VDC  
 Io : 50 % ↔ 100 %  
 (tr = tf = 100us)  
 Ta : 25 °C

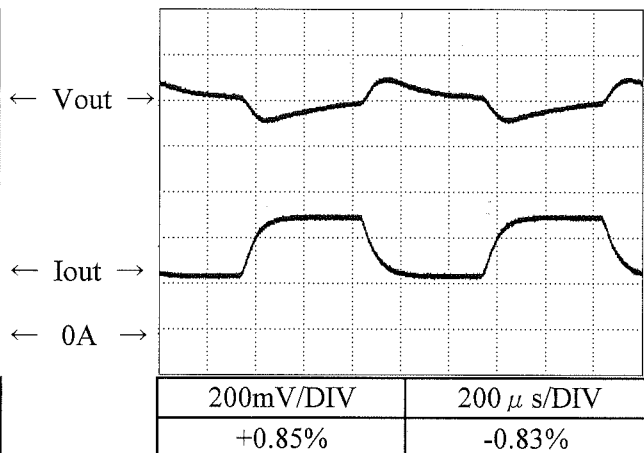
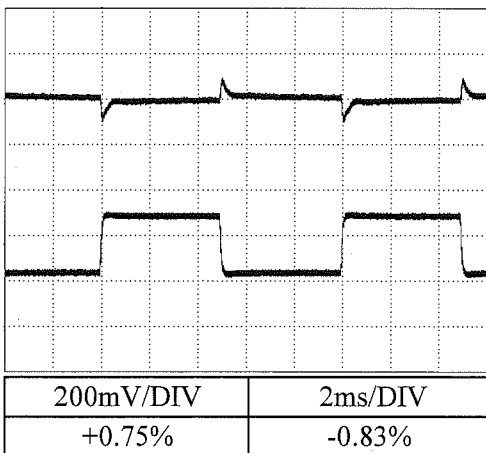
f = 100Hz

f = 1kHz

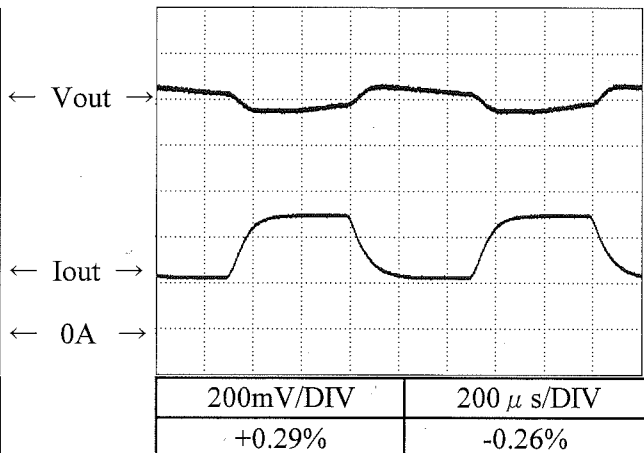
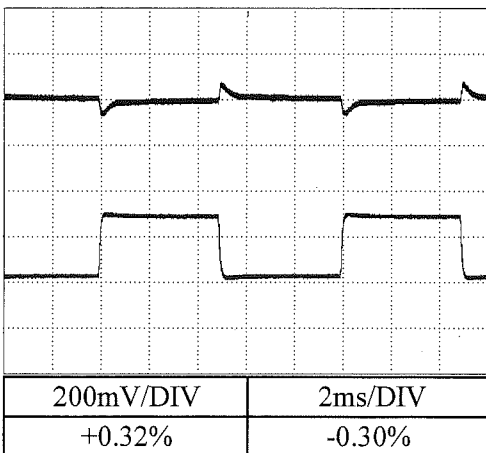
5V



12V



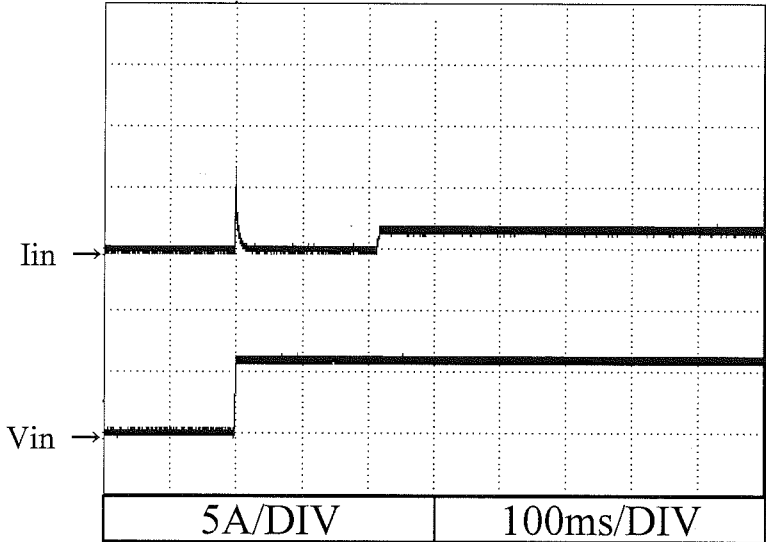
24V



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

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

5V

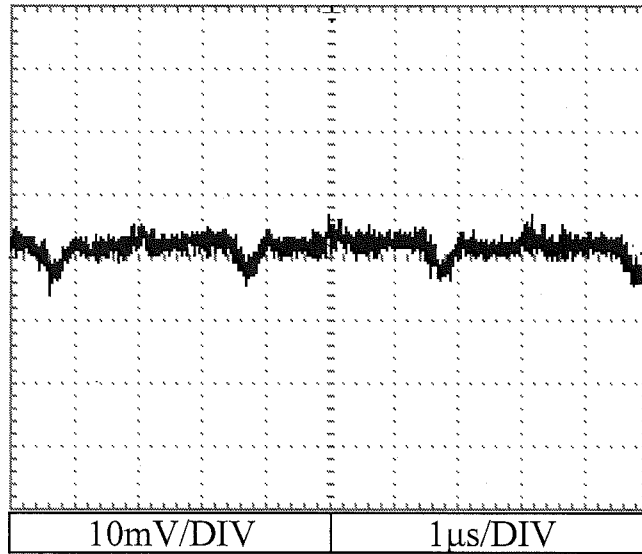


2.9 出力リップル、ノイズ波形  
Output ripple and noise waveform

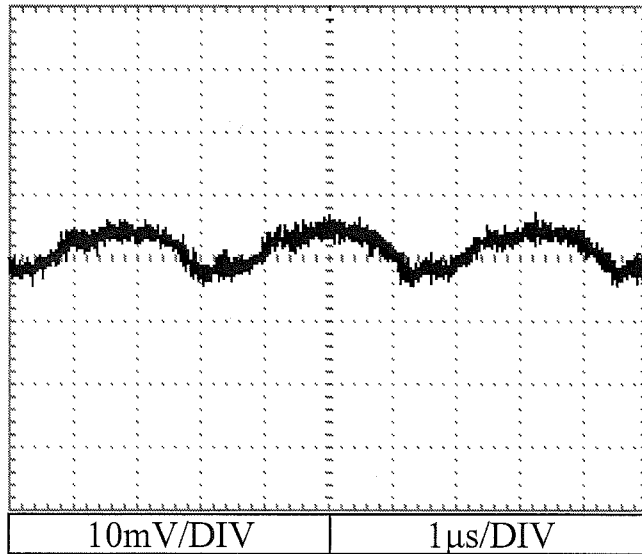
Conditions Vin : 24 VDC  
Iout : 100 %  
Ta : 25 °C

NORMAL MODE

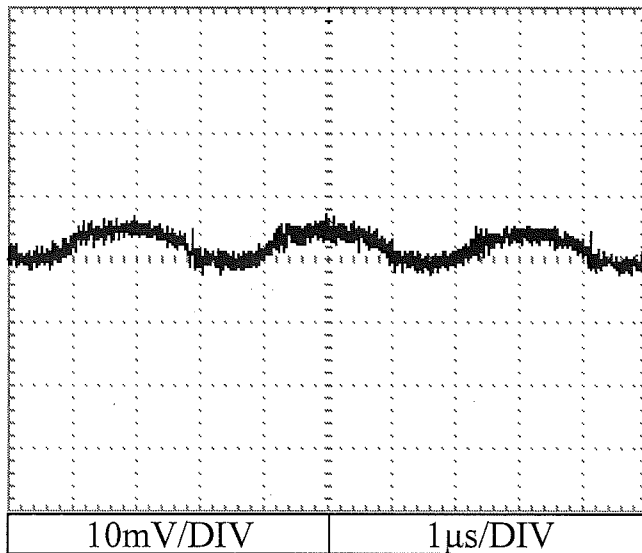
5V



12V



24V





2.10 EMI 特性

Electro-Magnetic Interference characteristics

雑音端子電圧

Conducted Emission

Conditions

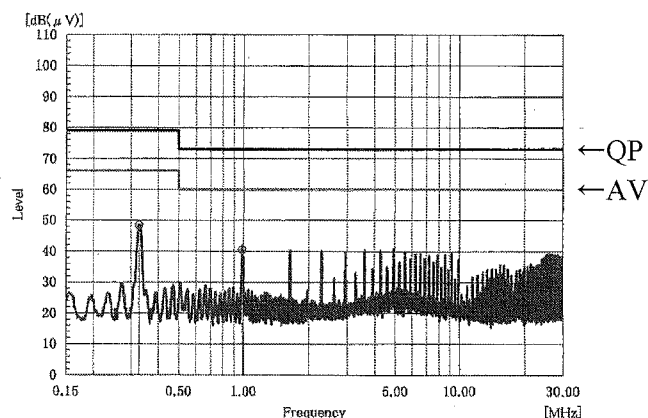
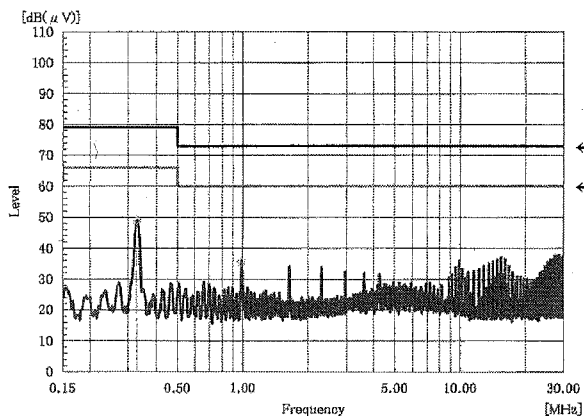
Vin : 24 VDC

Iout : 100 %

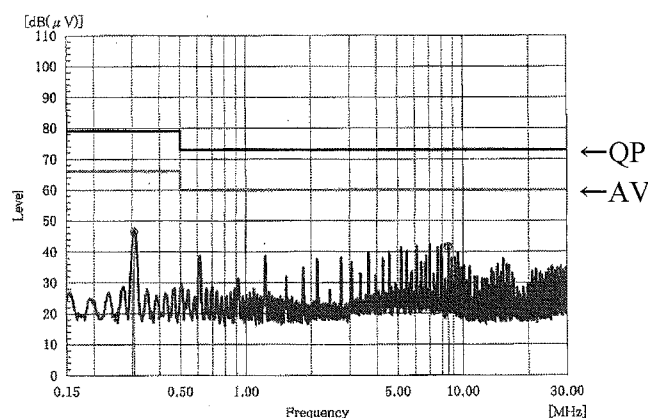
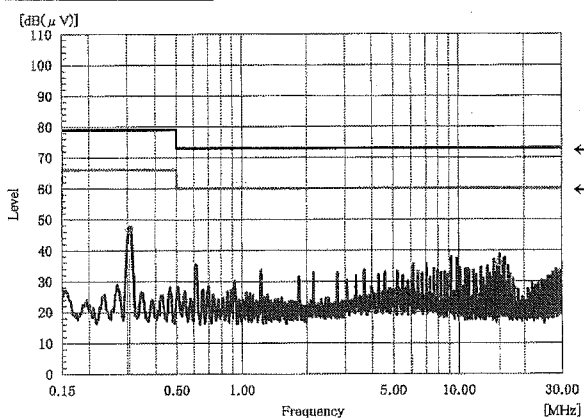
Phase : N (-Vin side)

Phase : L (+Vin side)

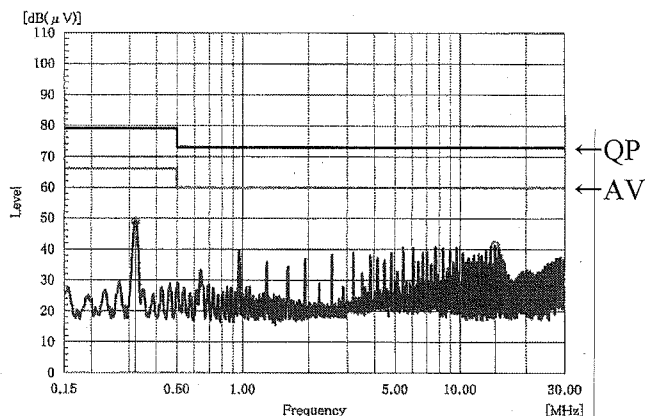
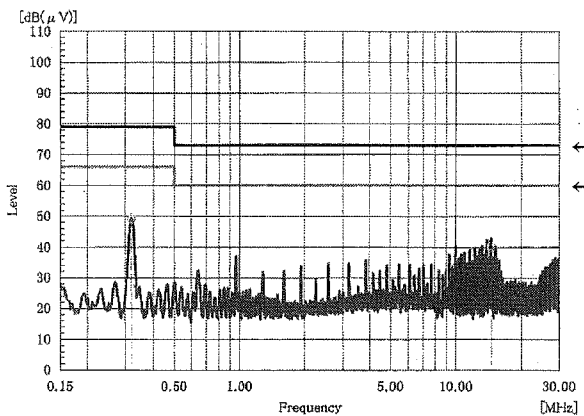
5V



12V



24V



EN55011-A,EN55022-Aの限界値はVCCI class Aの限界値と同じです。

Limit of EN55011-A,EN55022-A are same as its VCCI class A.

表示はピーク値です。

Indication is peak values.

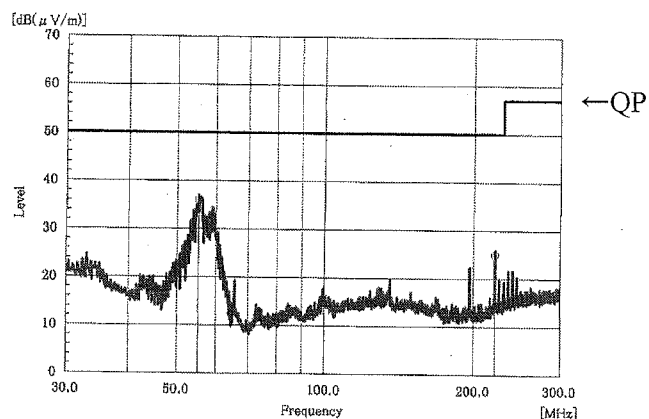
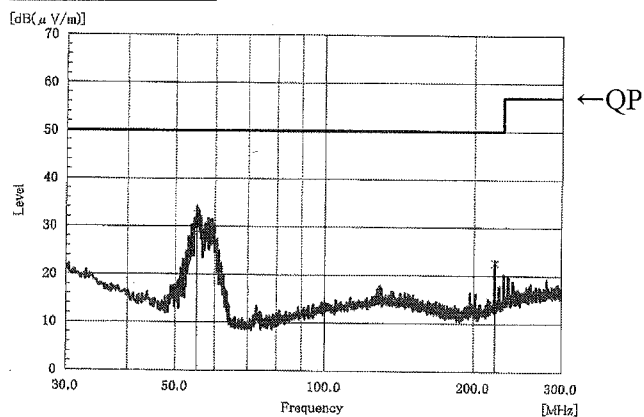
雑音電界強度  
Radiated Emission

Conditions Vin : 24 VDC  
Iout : 100 %

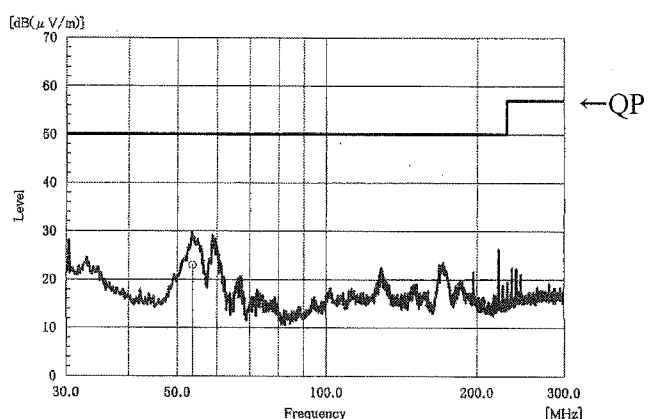
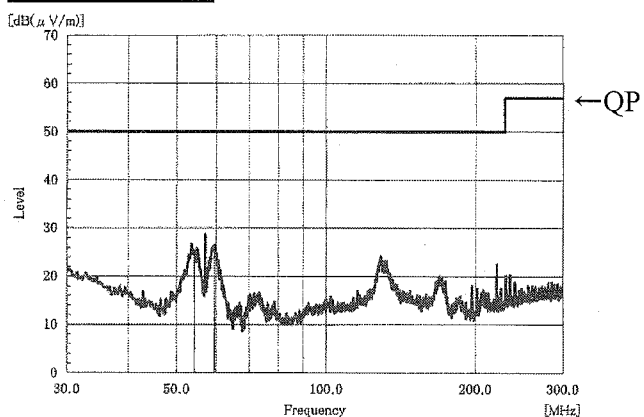
HORIZONTAL

VERTICAL

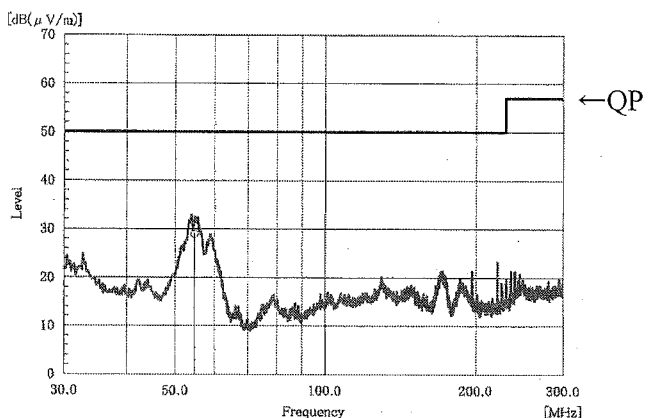
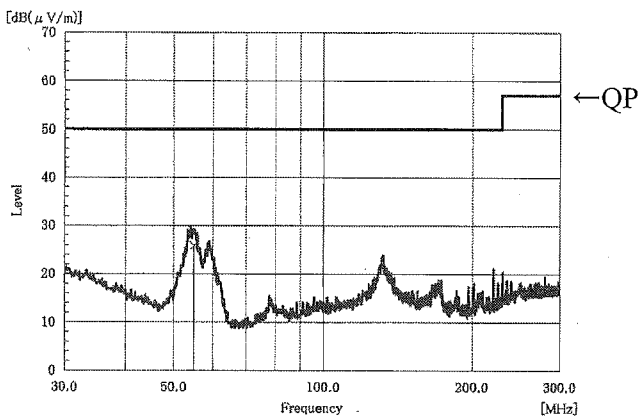
5V



12V



24V



EN55011-A,EN55022-Aの限界値はVCCI class Aの限界値と同じです。  
Limit of EN55011-A,EN55022-A are same as its VCCI class A.

表示はピーク値です。  
Indication is peak values.