

RDS30-48

EVALUATION DATA

型式データ

DWG No. B027-53-01/48		
APPD	CHK	DWG
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14. Oct. '11	14. Oct. '11	14. Oct. '11

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略称記号説明	Abbreviation	Symbol	Description
Vin		入力電圧
Vout		出力電圧
In		入力電流
Iout		出力電流
Ta		周囲温度
f		周波数
CNT (RC)		ON/OFF制御
EMI		電磁妨害(干渉)
			Input voltage
			Output voltage
			Input current
			Output current
			Ambient temperature
			Frequency
			ON/OFF control
			Electro-Magnetic Interference

1. 測定方法 Evaluation Method

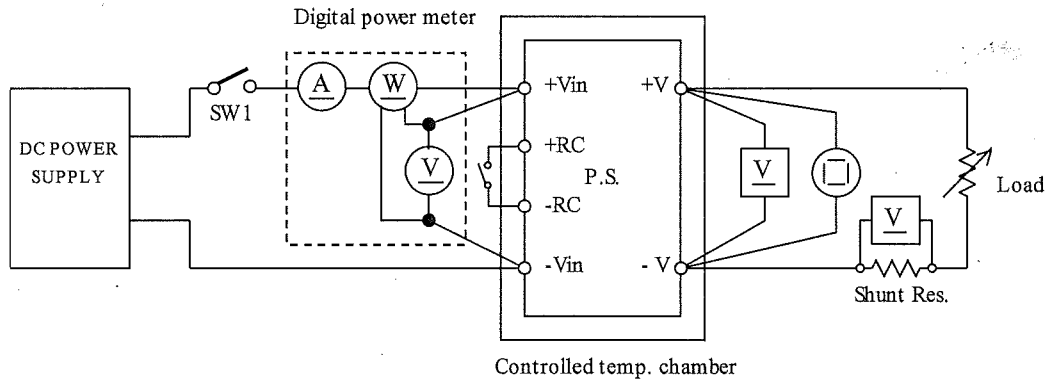
1.1 測定回路 Measurement Circuit

測定回路 1

- ・ 静特性
- ・ 過電流保護特性
- ・ 過電圧保護特性
- ・ 出力立ち上がり・立ち下がり特性
- ・ 出力保持時間特性

Measurement Circuit 1

- Steady State Characteristics
- Over Current Protection (OCP) Characteristics
- Over Voltage Protection (OVP) Characteristics
- Output Rise / Fall Characteristics
- Hold up Time Characteristics

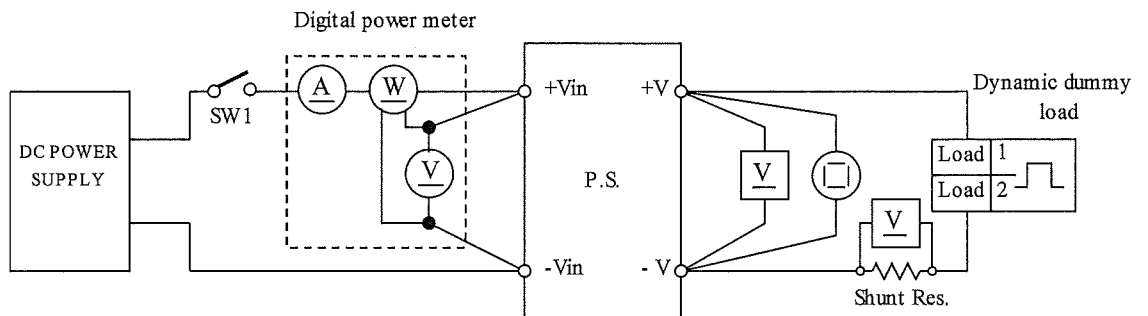


測定回路 2

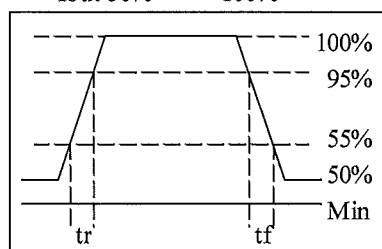
- ・ 過渡応答 (負荷急変) 特性

Measurement Circuit 2

- Dynamic Load Response Characteristics



Output current waveform
Iout 50% \rightleftharpoons 100%

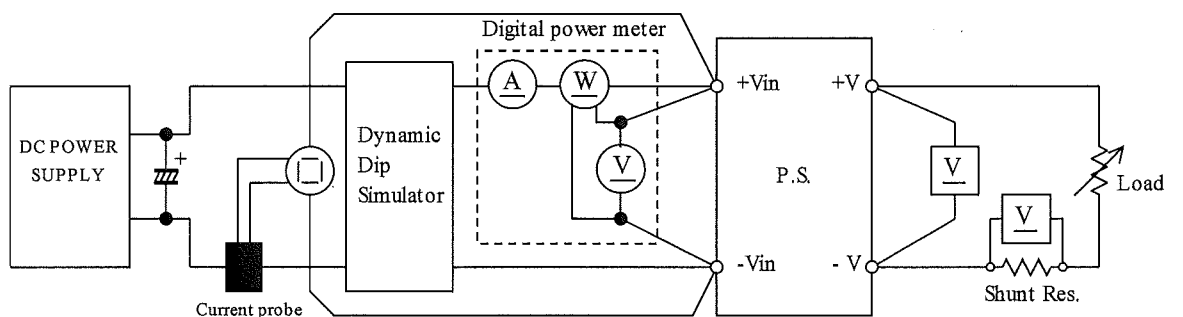


測定回路 3

- ・ 入力サージ電流 (突入電流) 特性

Measurement Circuit 3

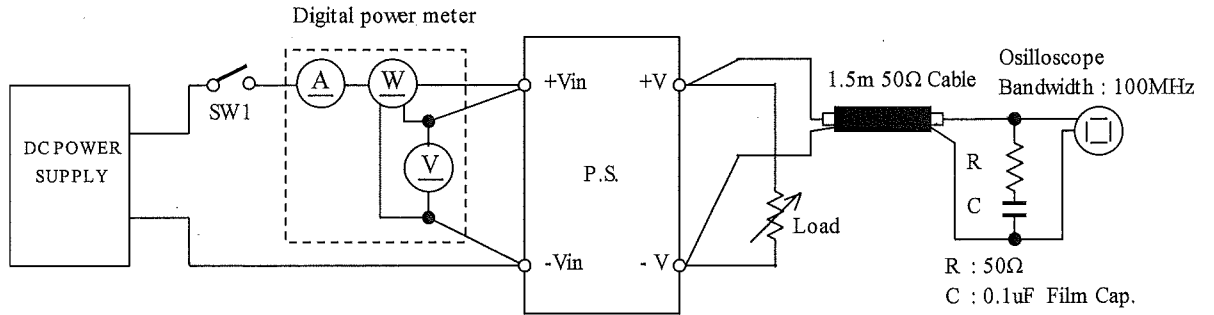
- Inrush Current Characteristics



測定回路 4

Measurement Circuit 4

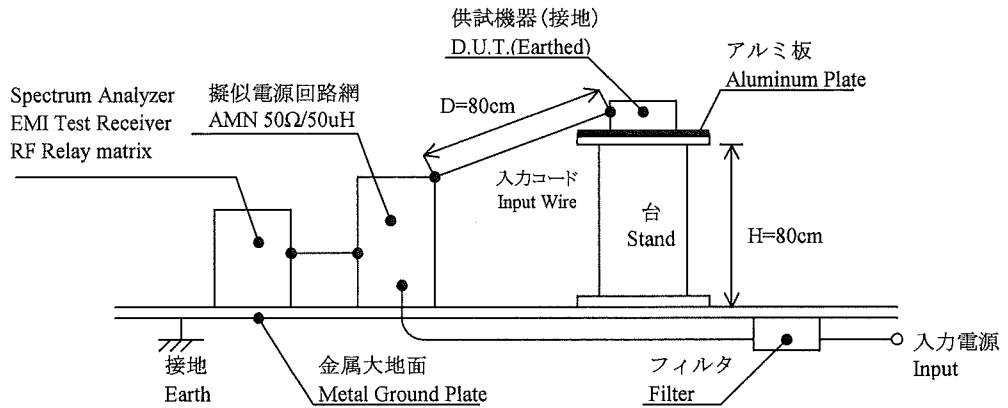
- 出力リップル、ノイズ特性 Output Ripple and Noise Waveform
- ノーマルモード (JEITA Standard RC-9131A) Normal Mode (JEITA Standard RC-9131A)



測定構成図

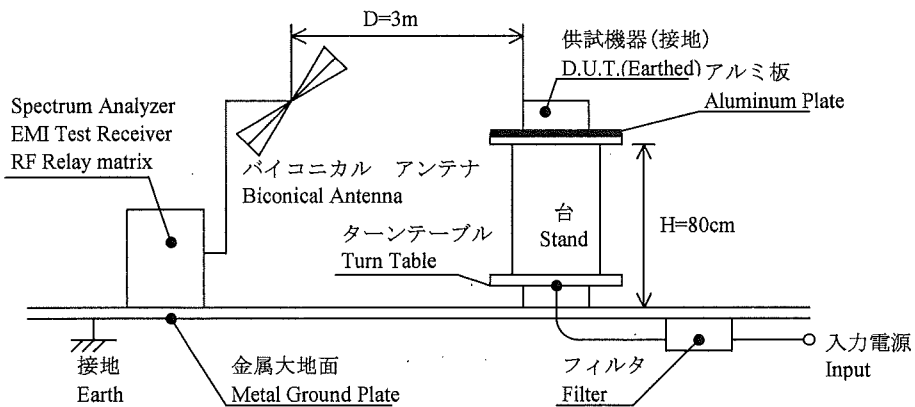
Measurement System

- EMI 特性 EMI Characteristics
- 雑音端子電圧 (帰還ノイズ) Conducted Emission Noise



雑音電界強度 (輻射ノイズ)

Radiated Emission Noise



1.2 測定機器リスト Measurement Equipment List

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE (1)	YOKOGAWA ELECTRIC	DL1740EL
2	DIGITAL STORAGE OSCILLOSCOPE (2)	KENWOOD	CS-5400
3	DIGITAL MULTIMETER	AGILENT	34970A
4	DIGITAL POWER METER	YOKOGAWA ELECTRIC	WT210
5	CURRENT PROBE (1)	TECTRONIX	A6302
6	CURRENT PROBE (2)	TECTRONIX	A6303
7	CURRENT PROBE AMPLIFIER	TECTRONIX	TM502A
8	ELECTRIC LOAD (1)	TAKASAGO	FK-600L
9	ELECTRIC LOAD (2)	TAKAMIZAWA	PSA-150D
10	DC POWER SUPPLY	KENWOOD	PD56-10D
11	CVCF (AC/DC POWER SUPPLY)	NF CORPOLATION	EPO2000S
12	DYNAMIC DIP SIMULATOR	TAKAMIZAWA	PSA-200A
13	CONTROLLED TEMP. CHAMBER	ESPEC	PL-4G
14	HYBLID RECORDER	YOKOGAWA ELECTRIC	DR230
15	SPECTRUM ANALYZER EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI
16	RF SELECTOR	TOYO CORPOLATION	NS4900
17	AMN	SCHWARZBECK	NNLK8121
18	ANTENNA (BICONICAL ANTENNA)	TESEQ	CBL6111D

2. 特性データ

Characteristics Data

2.1 静特性 Steady State Characteristics

(1) 入力・負荷・温度変動/出力起動・低下電圧

Line and Load Regulation, Temperature Drift, Start up and Drop out Input Voltage

5V

1. Line and Load Regulation

Condition

Ta :

25 °C

Iout \ Vin	36VDC	48VDC	63VDC	Line Regulation	
0%	5.033V	5.035V	5.036V	3mV	0.060%
50%	5.016V	5.016V	5.016V	0mV	0.000%
100%	4.998V	4.998V	4.999V	1mV	0.020%
Load Regulation	35mV	37mV	37mV		
	0.700%	0.740%	0.740%		

2. Temperature Drift

Conditions

Vin :

48 VDC

Iout :

100 %

Ta	-20°C	+25°C	+50°C	Temperature Stability	
Vout	4.992V	4.998V	4.988V	10mV	0.200%

3. Start up and Drop out Input Voltage

Conditions

Ta :

25 °C

Iout :

100 %

Start up voltage (Vin)	30.5VDC
Drop out voltage (Vin)	28.5VDC

12V

1. Line and Load Regulation

Condition

Ta :

25 °C

Iout \ Vin	36VDC	48VDC	63VDC	Line Regulation	
0%	12.013V	12.001V	12.000V	13mV	0.108%
50%	12.006V	12.000V	11.995V	11mV	0.092%
100%	11.998V	11.991V	11.986V	12mV	0.100%
Load Regulation	15mV	10mV	14mV		
	0.125%	0.083%	0.117%		

24V

1. Line and Load Regulation

Condition

Ta :

25 °C

Iout \ Vin	36VDC	48VDC	63VDC	Line Regulation	
0%	23.973V	23.958V	23.950V	23mV	0.096%
50%	23.970V	23.961V	23.953V	17mV	0.071%
100%	23.967V	23.955V	23.944V	23mV	0.096%
Load Regulation	6mV	6mV	9mV		
	0.025%	0.025%	0.038%		

2. Temperature Drift

Conditions

Vin :

48 VDC

Iout :

100 %

Ta	-20°C	+25°C	+50°C	Temperature Stability	
Vout	24.109V	23.955V	23.894V	215mV	0.896%

3. Start up and Drop out Input Voltage

Conditions

Ta :

25 °C

Iout :

100 %

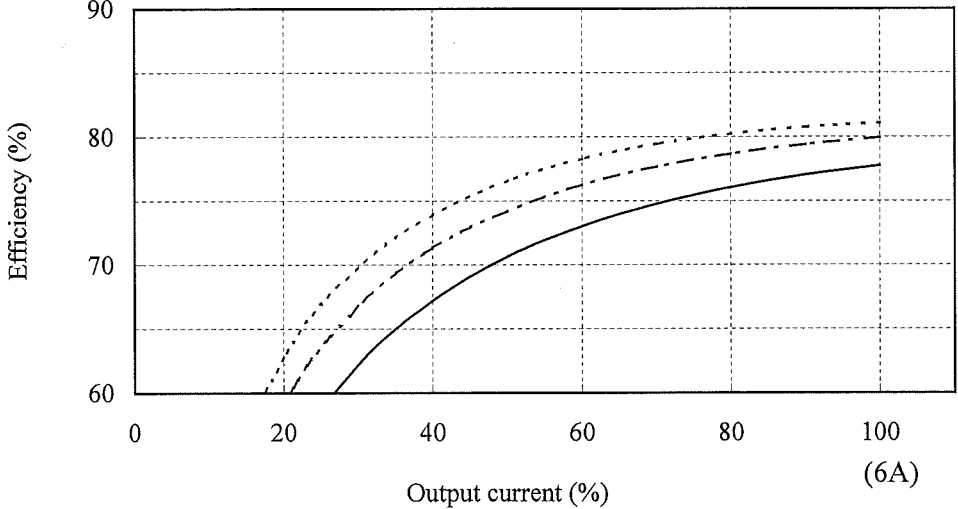
Start up voltage (Vin)	30.9VDC
Drop out voltage (Vin)	27.6VDC

(2) 出力電流 対 効率

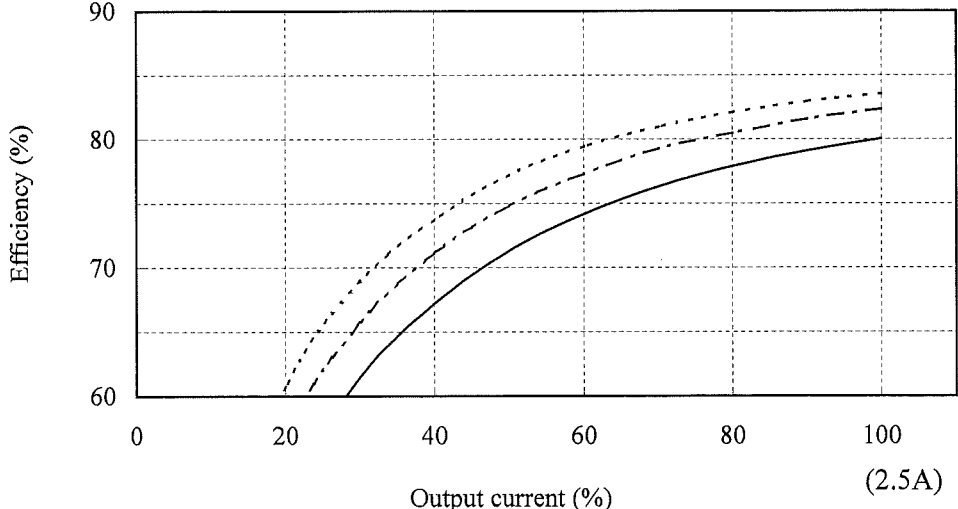
Efficiency vs. Output Current

Conditions Vin : 36 VDC -----
48 VDC - - - - -
63 VDC ————
Ta : 25 °C

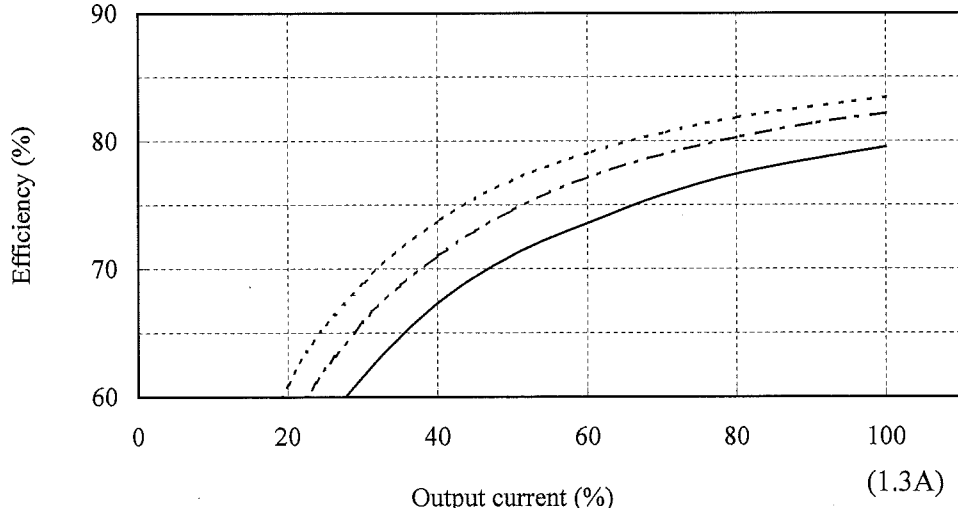
5V



12V



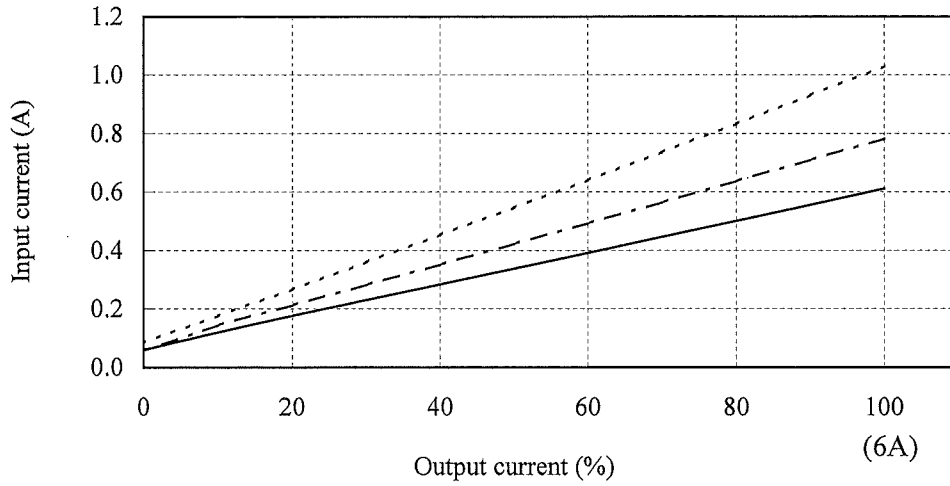
24V



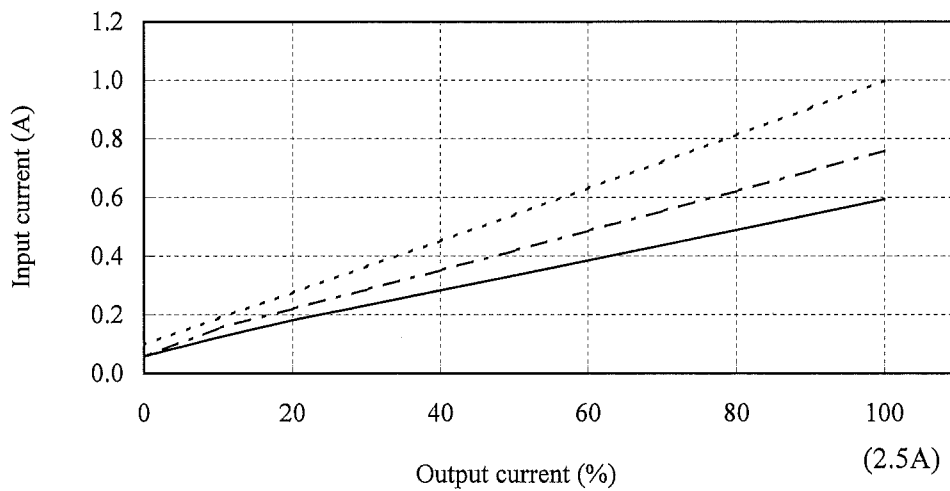
(3) 出力電流 対 入力電流
Input Current vs. Output Current

Conditions Vin : 36 VDC -----
48 VDC -.-.-.-
63 VDC ————
Ta : 25 °C

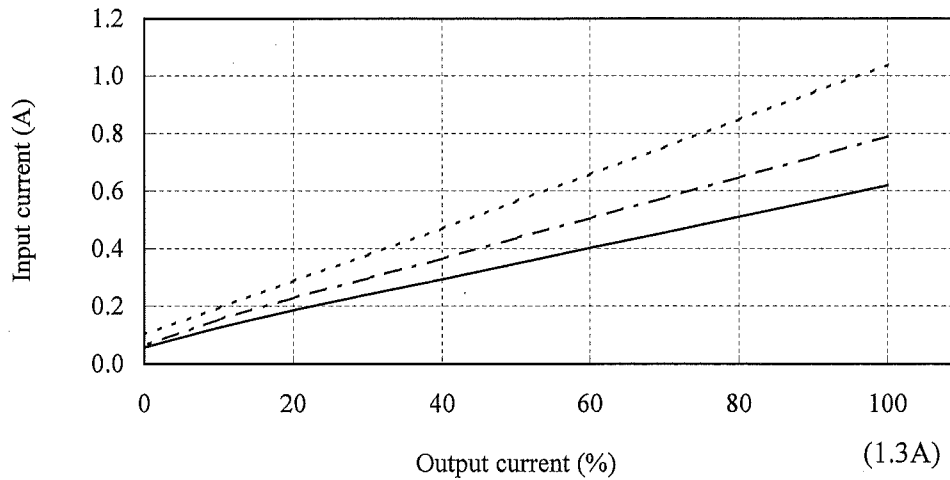
5V



12V



24V



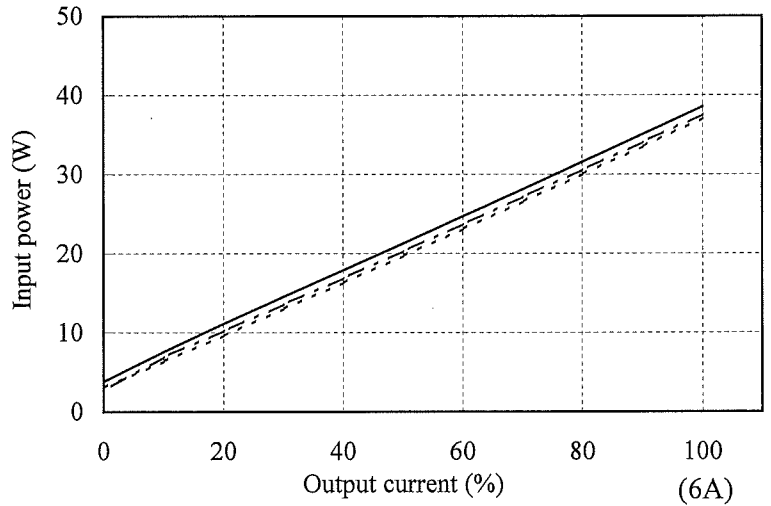
(4) 出力電流 対 入力電力
Input Power vs. Output Current

Conditions Vin : 36 VDC ----
48 VDC - - - -
63 VDC ————
Ta : 25 °C

5V

Condition Iout : 0%	
Vin	Input power
36VDC	3.1W
48VDC	2.7W
63VDC	3.8W

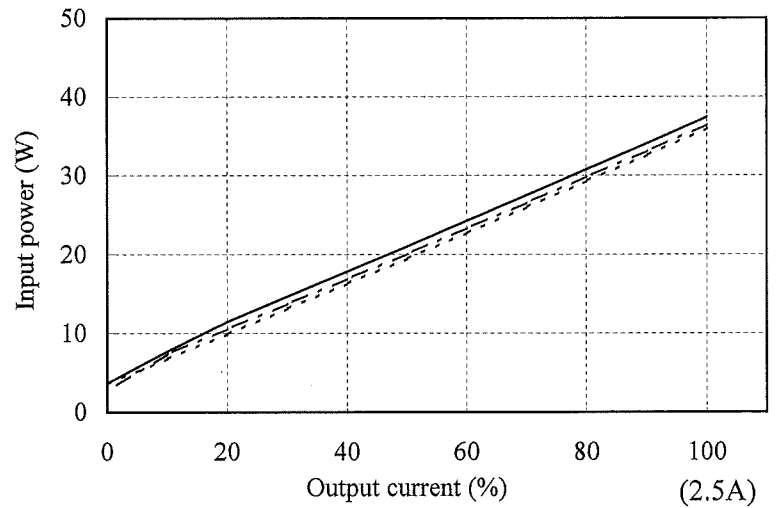
Condition CNT (RC) : OFF	
Vin	Input power
36VDC	0.23W
48VDC	0.43W
63VDC	0.82W



12V

Condition Iout : 0%	
Vin	Input power
36VDC	3.6W
48VDC	2.7W
63VDC	3.7W

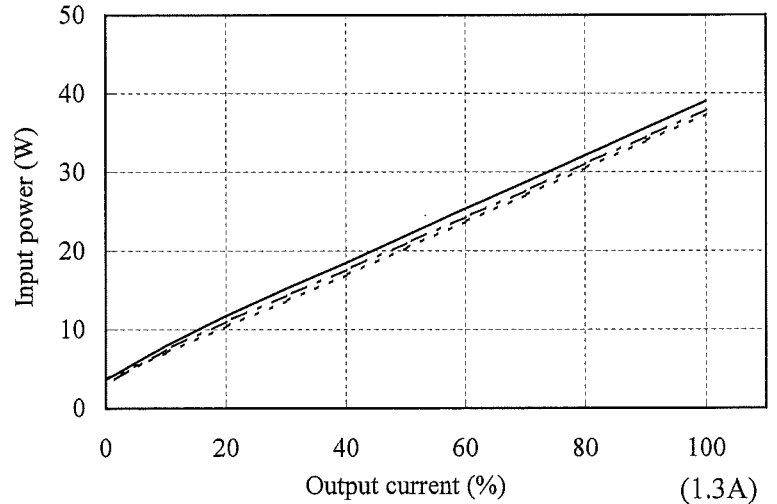
Condition CNT (RC) : OFF	
Vin	Input power
36VDC	0.23W
48VDC	0.43W
63VDC	0.82W



24V

Condition Iout : 0%	
Vin	Input power
36VDC	3.7W
48VDC	3.0W
63VDC	3.7W

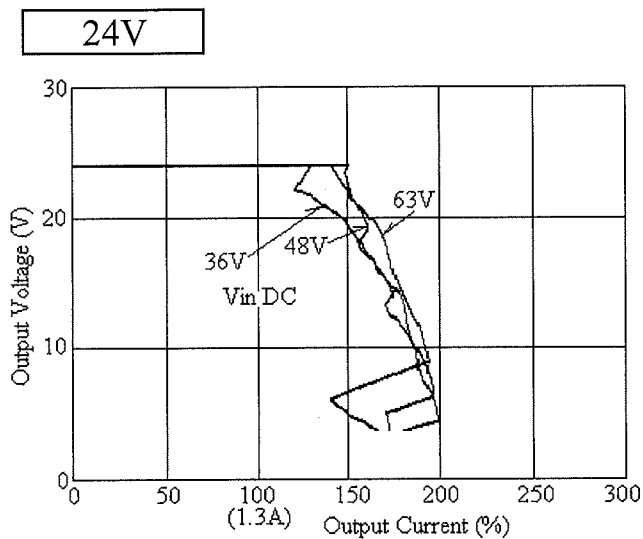
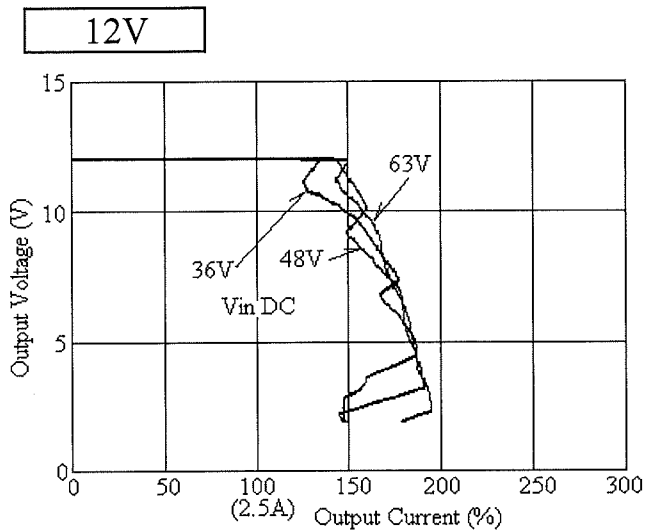
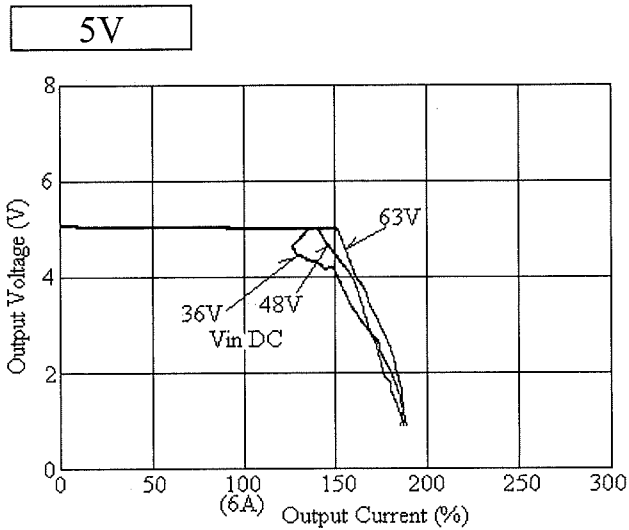
Condition CNT (RC) : OFF	
Vin	Input power
36VDC	0.23W
48VDC	0.43W
63VDC	0.82W



2.2 過電流保護特性

Over Current Protection (OCP) Characteristics

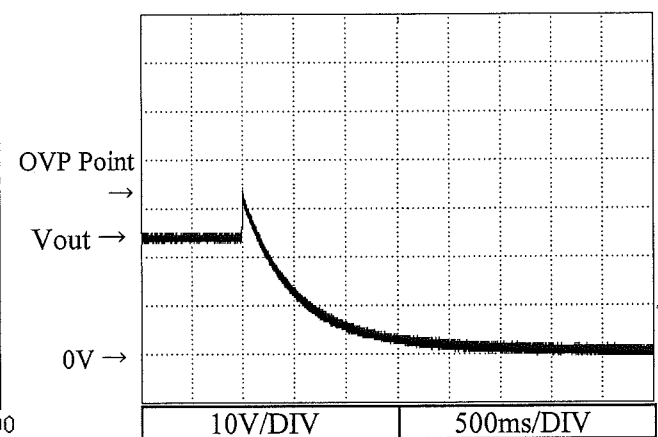
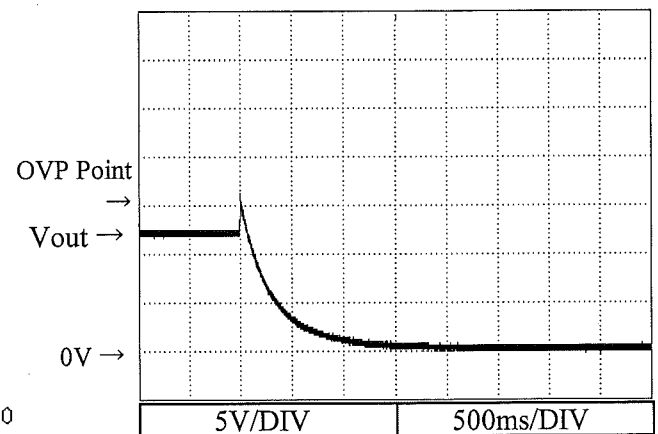
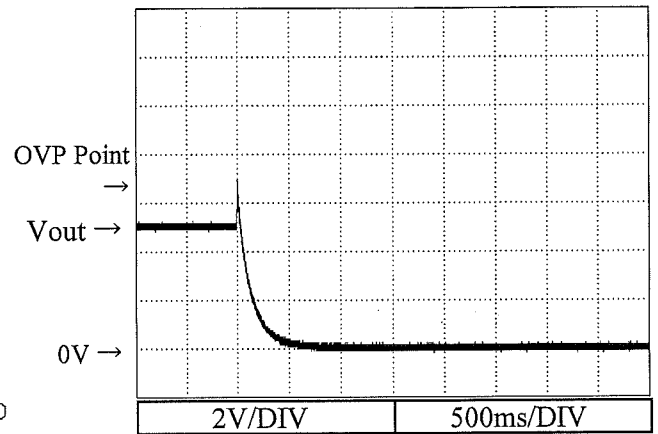
Conditions Vin : 36,48,63VDC
Ta : 25 °C



2.3 過電圧保護特性

Over Voltage Protection (OVP) Characteristics

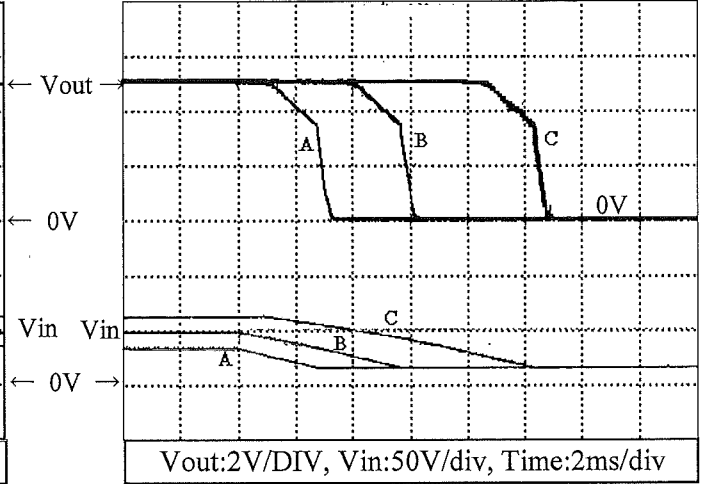
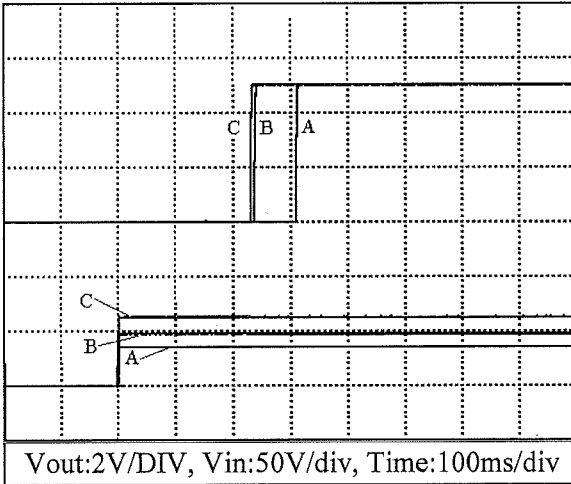
Conditions Vin : 48 VDC
Iout : 0 %
Ta : 25 °C



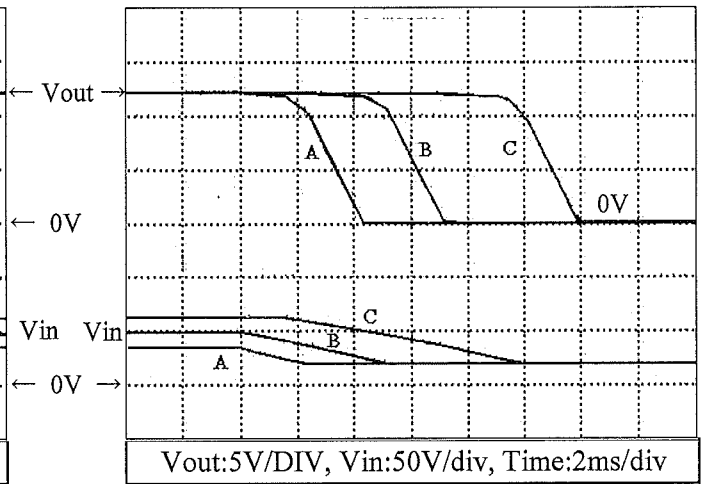
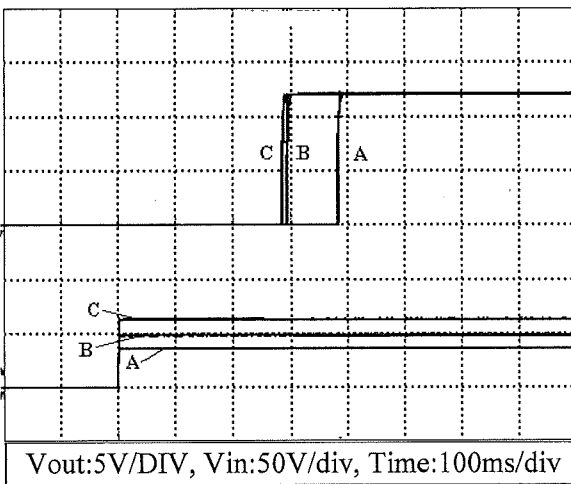
2.4 出力立ち上がり・立ち下がり特性 Output Rise / Fall Characteristics

Conditions Vin : 36 VDC (A)
48 VDC (B)
63 VDC (C)
Iout : 100 %
Ta : 25 °C

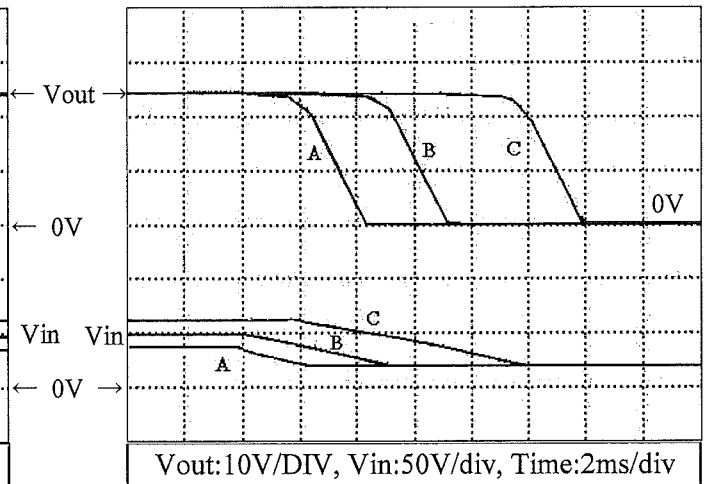
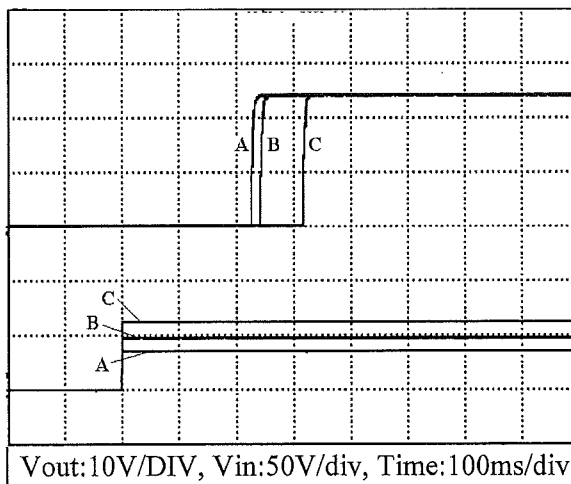
5V



12V



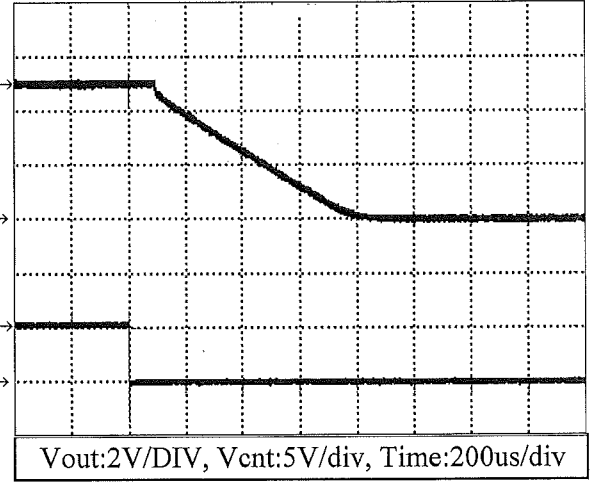
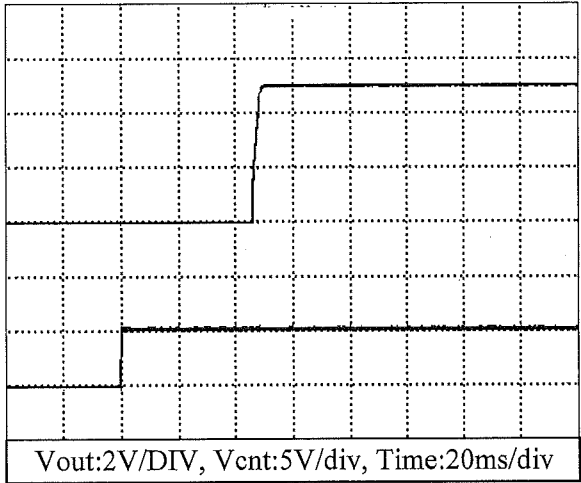
24V



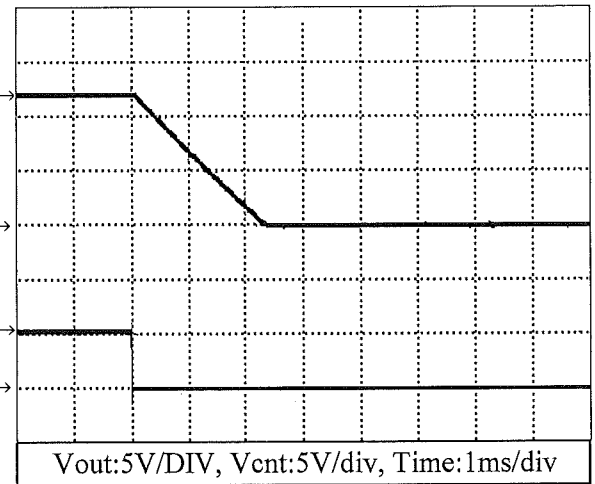
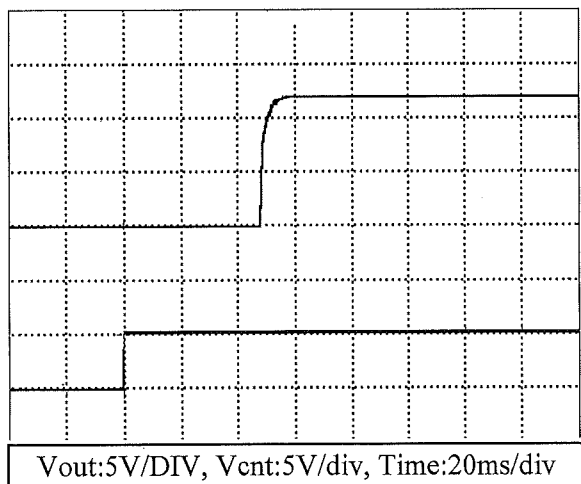
2.5 ON/OFF制御時 出力立ち上がり・立ち下がり特性
Output Rise / Fall Characteristics with ON/OFF Control

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

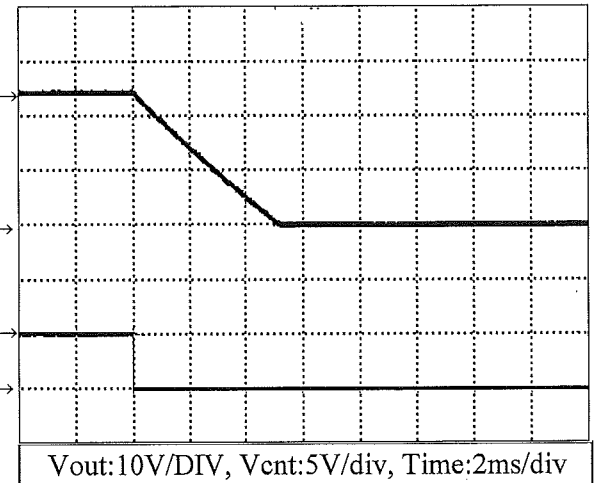
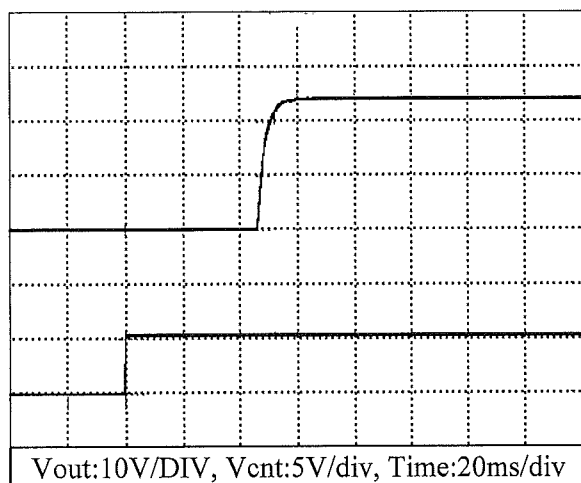
5V



12V



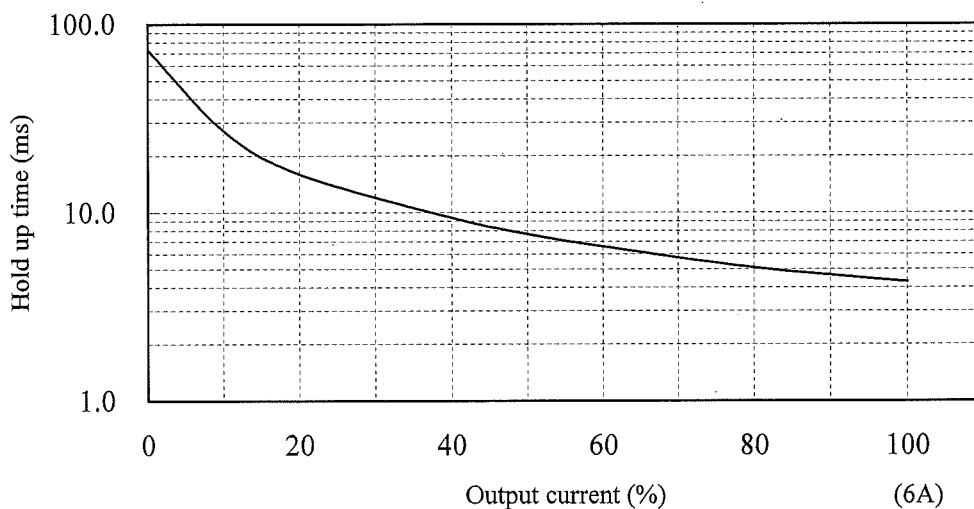
24V



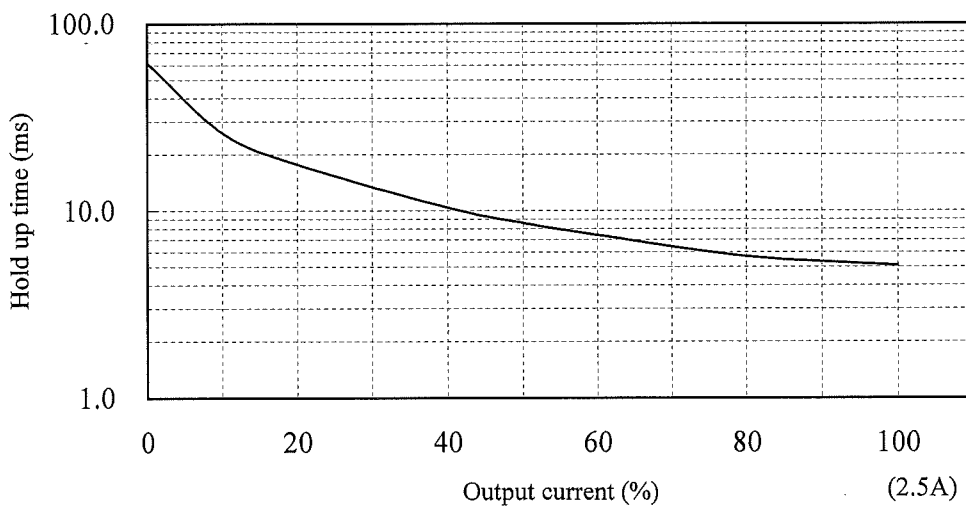
2.6 出力保持時間特性
Hold up Time Characteristics

Conditions Vin : 48 VDC
Ta : 25 °C

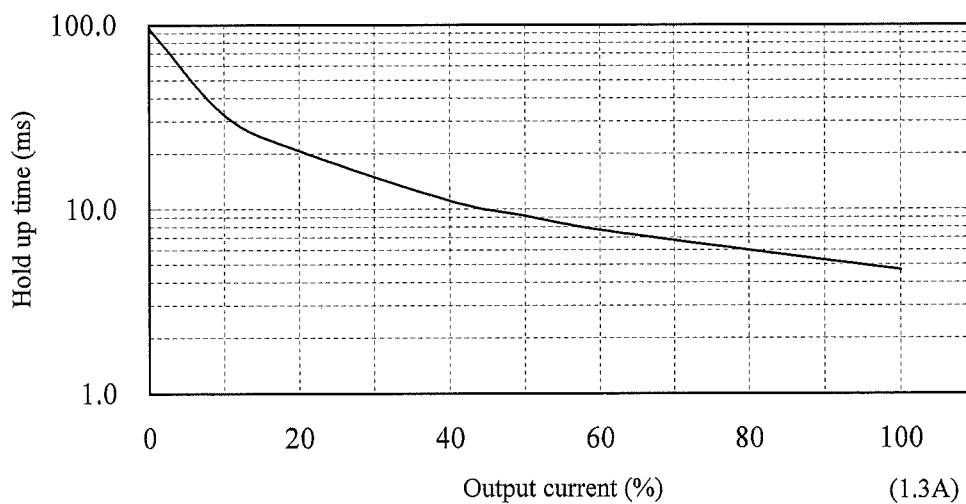
5V



12V



24V



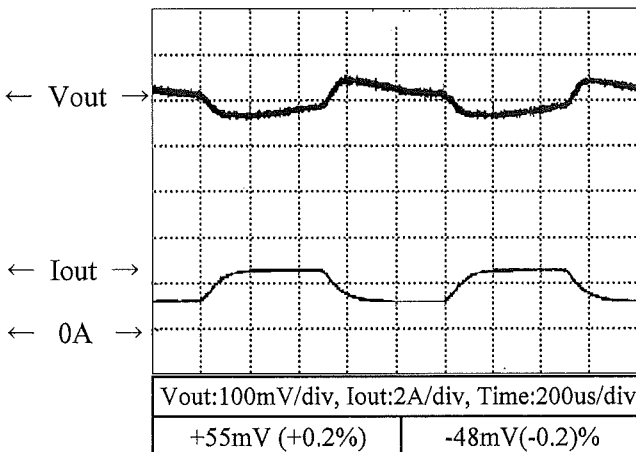
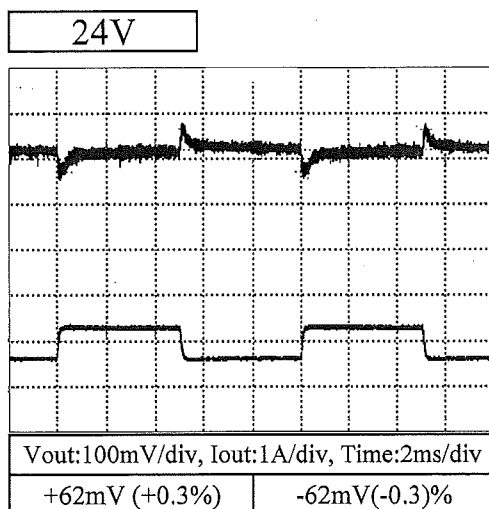
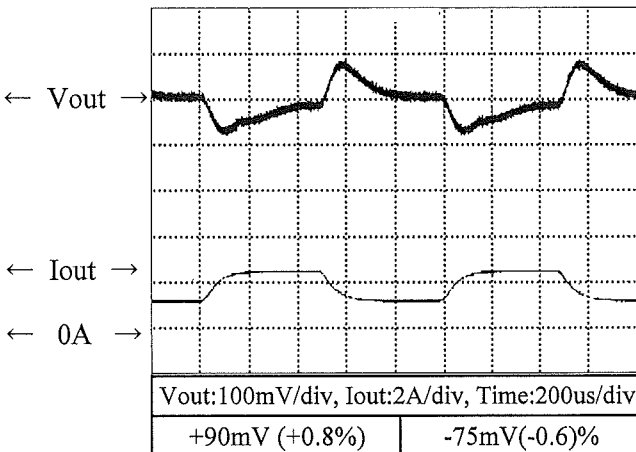
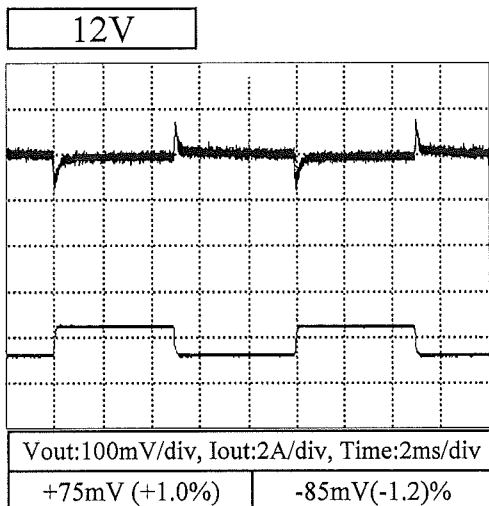
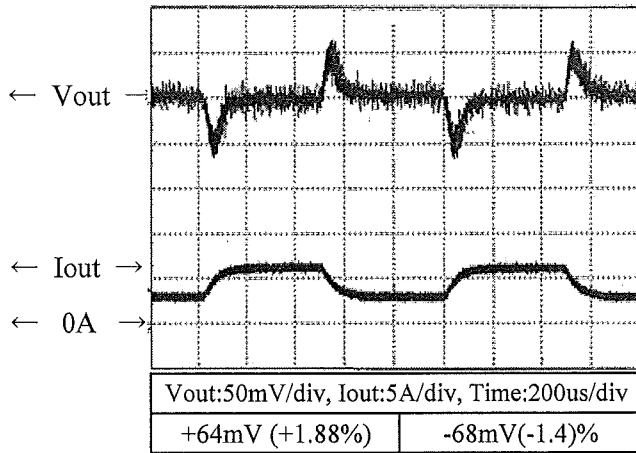
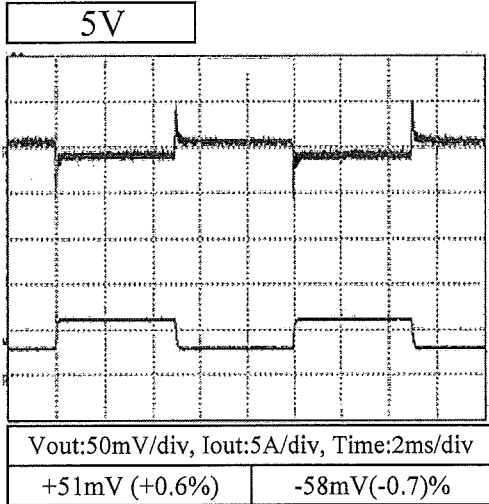
2.7 過渡応答（負荷急変）特性

Dynamic Load Response Characteristics

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

f = 100Hz

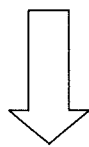
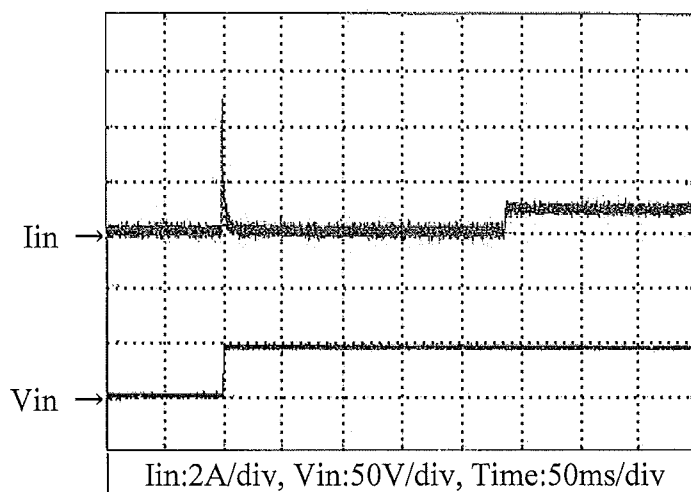
f = 1kHz



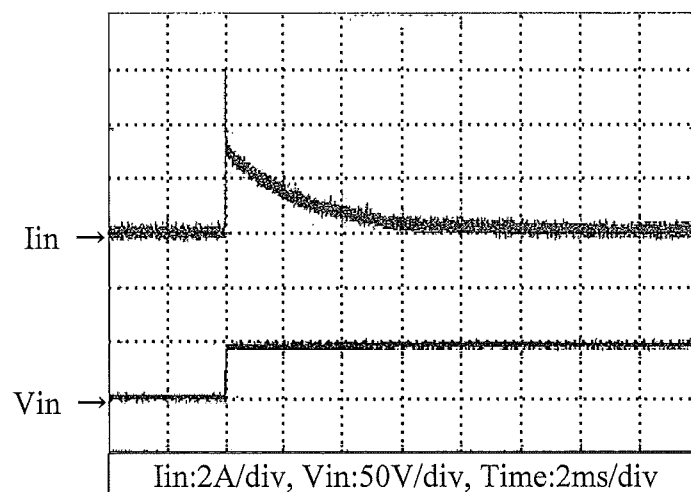
2.8 入力サージ電流（突入電流）特性 Inrush Current Characteristics

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

5V



時間軸拡大
Time Axes Zoom in



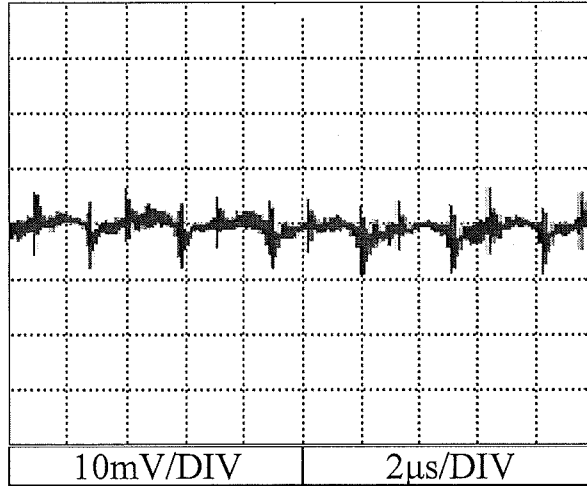
本特性は、いずれの出力電圧モデルにおいても同様となります。
This characteristics is same for each output model.

2.9 出力リップル・ノイズ波形
Output Ripple and Noise Waveform

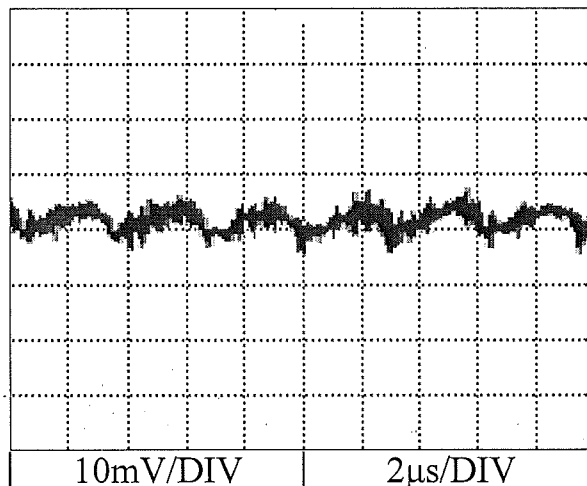
Conditions Vin : 48 VDC
Iout : 100 %
Ta : 25 °C

ノーマルモード
NORMAL MODE

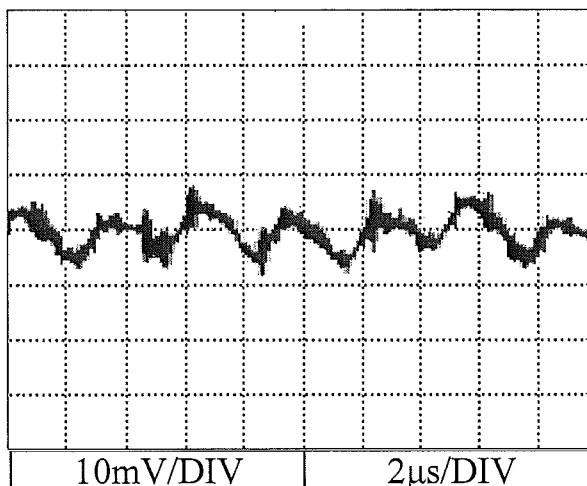
5V



12V



24V



2.10 EMI 特性

EMI Characteristics

雑音端子電圧

Conducted Emission Noise

Conditions

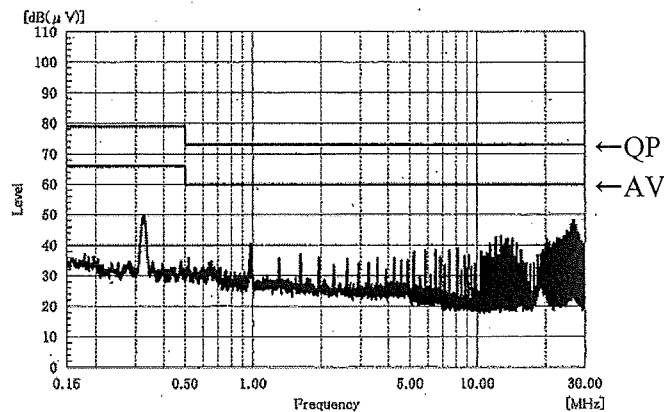
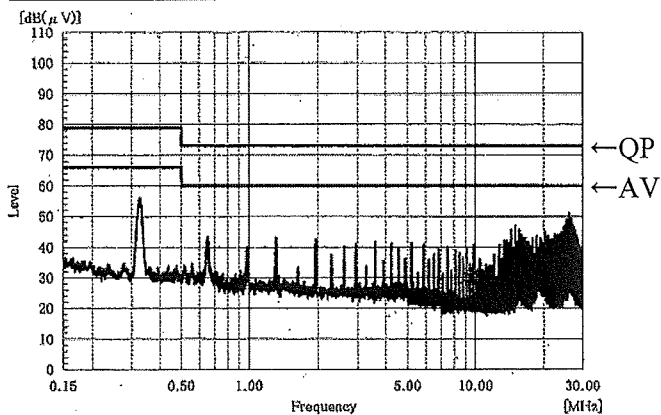
Vin : 48 VDC

Iout : 100 %

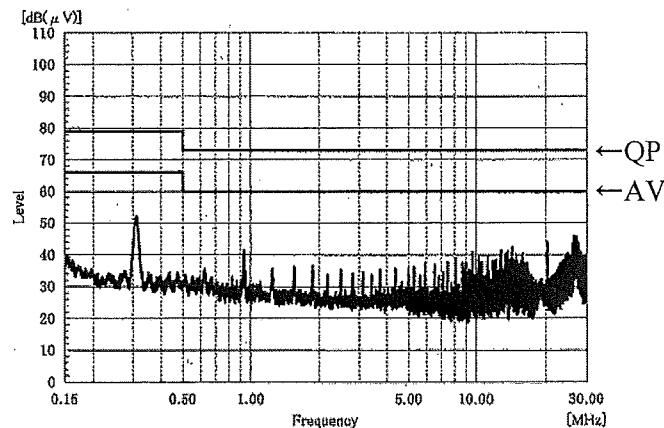
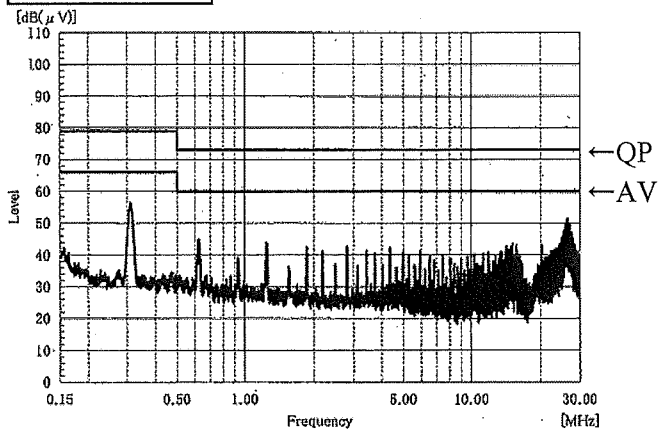
Phase : N (-Vin side)

Phase : L (+Vin side)

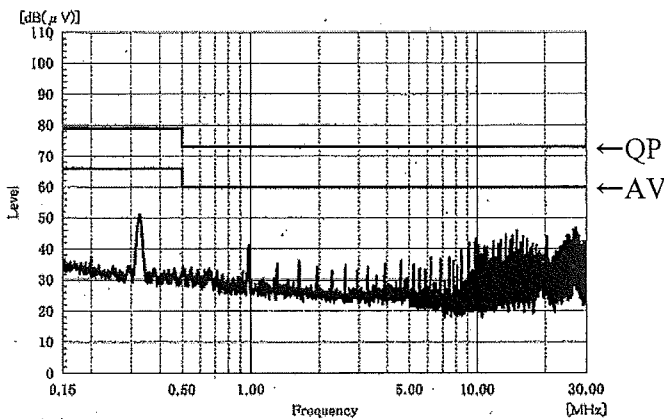
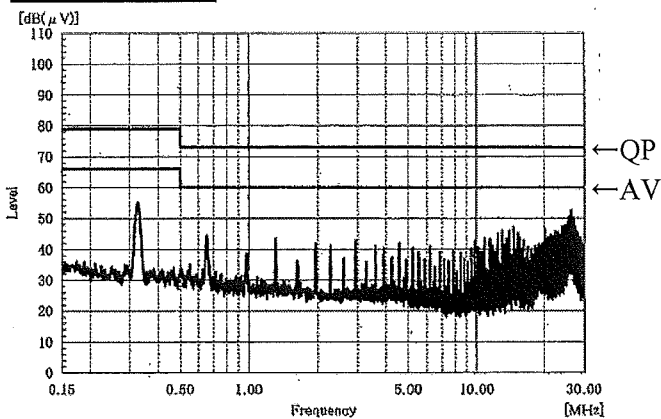
5V



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 Noise

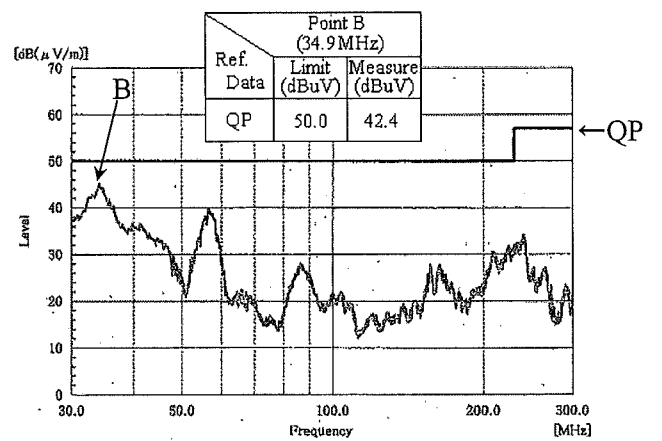
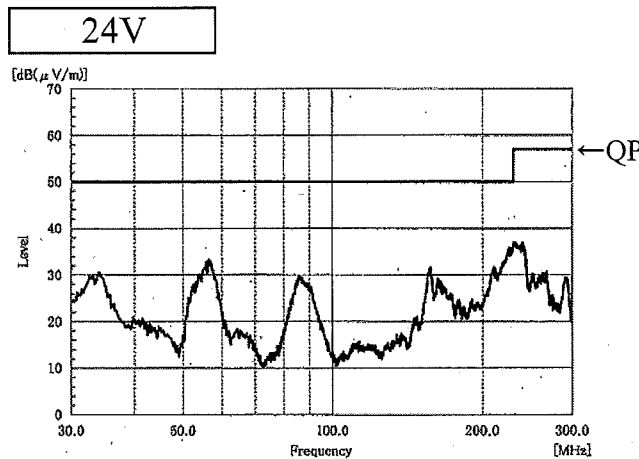
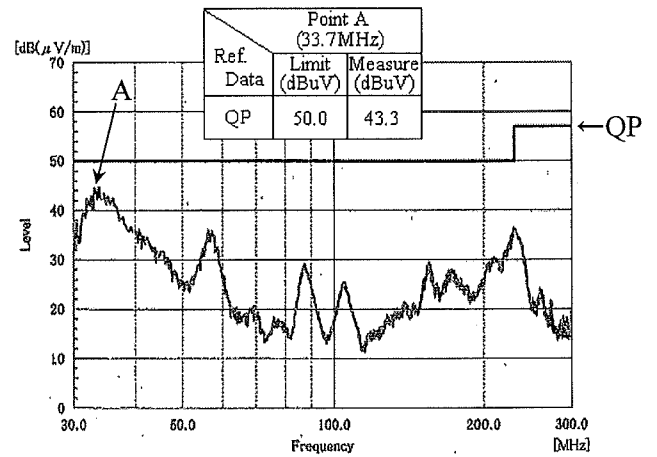
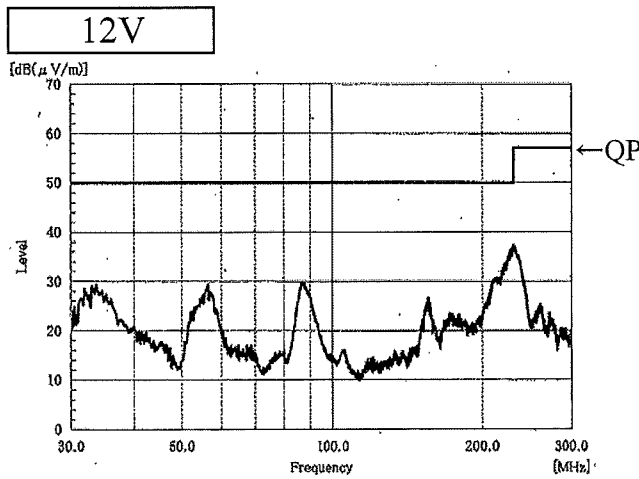
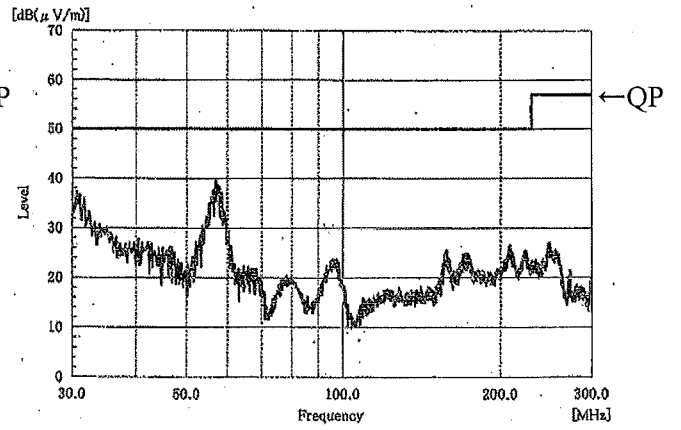
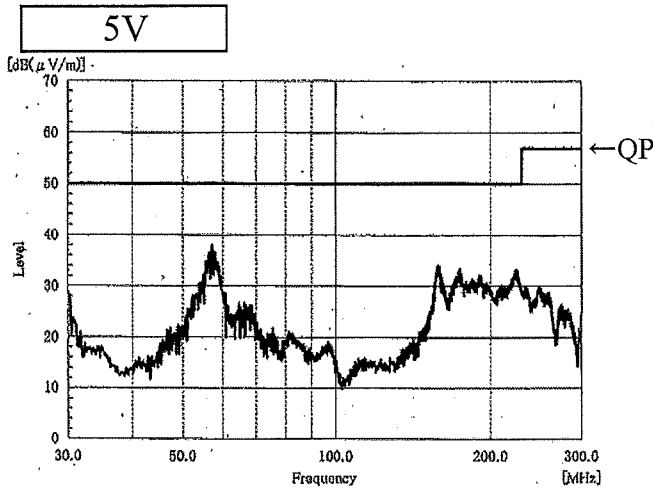
Conditions

Vin : 48 VDC

Iout : 100 %

HORIZONTAL

VERTICAL



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.