

ZWS100B

EVALUATION DATA

型式データ

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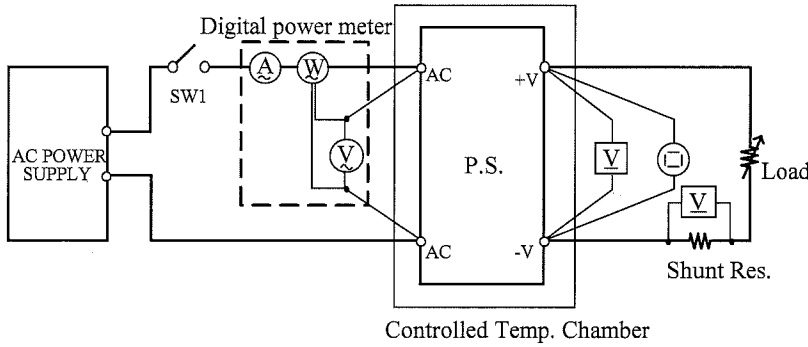
使用記号 Terminology used

	定義	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

1. 測定方法 Evaluation Method
 1.1 測定回路 Circuit used for determination

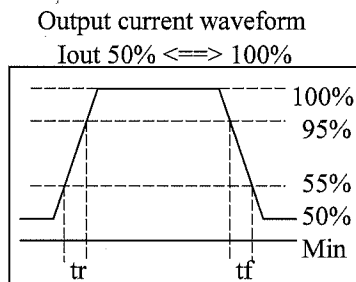
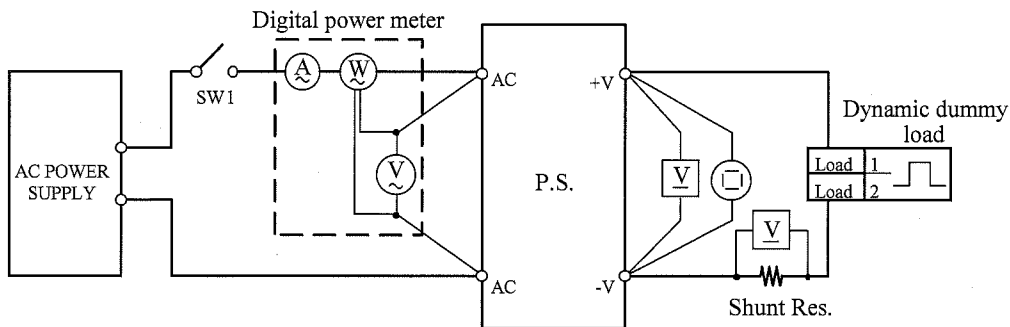
測定回路1 Circuit 1 used for determination

- ・ 静特性 Steady state data
- ・ 過電流保護特性 Over current protection (OCP) characteristics
- ・ 過電圧保護特性 Over voltage protection (OVP) characteristics
- ・ 出力立ち上がり特性 Output rise characteristics
- ・ 出力立ち下がり特性 Output fall characteristics
- ・ 出力保持時間特性 Hold up time characteristics



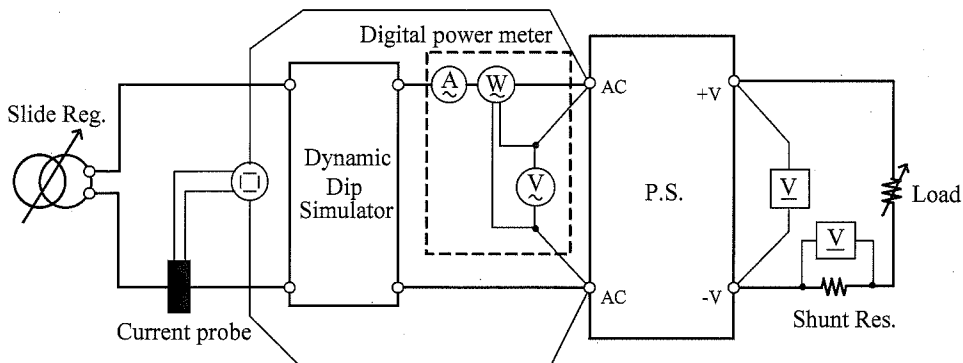
測定回路2 Circuit 2 used for determination

- ・ 過渡応答(負荷急変) 特性 Dynamic load response characteristics



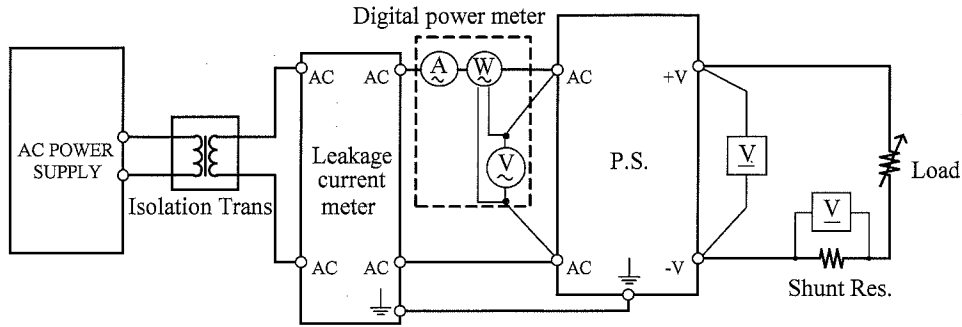
測定回路3 Circuit 3 used for determination

- ・ 入力サージ電流(突入電流) 波形 Inrush current waveform



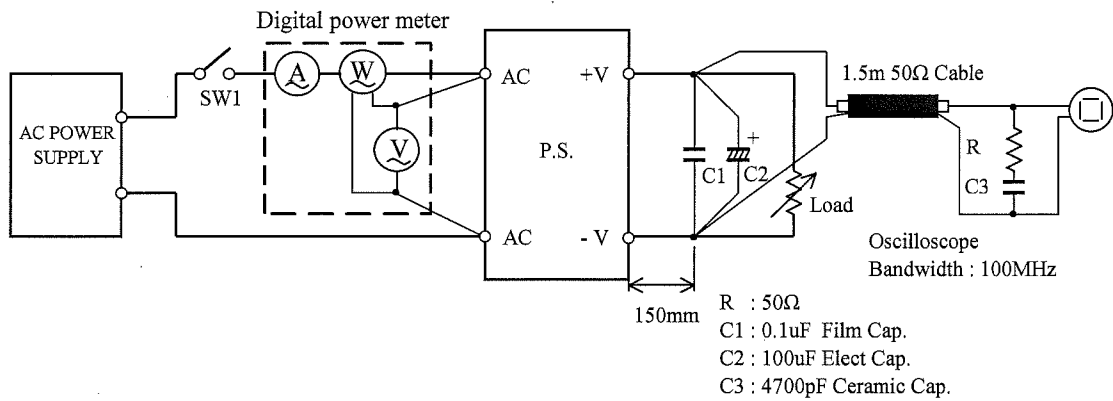
測定回路4 Circuit 4 used for determination

- ・リーク電流特性 Leakage current characteristics



測定回路5 Circuit 5 used for determination

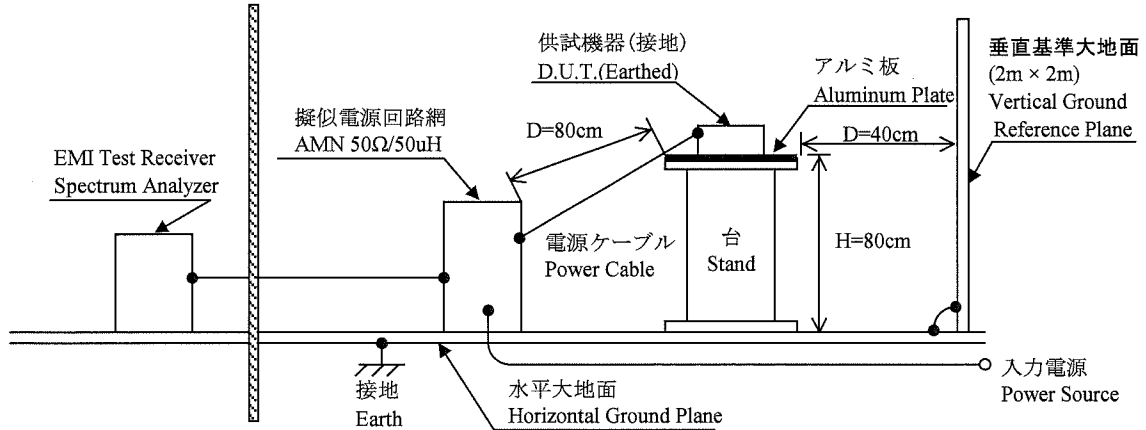
- ・出力リップル、ノイズ波形 Output ripple and noise waveform



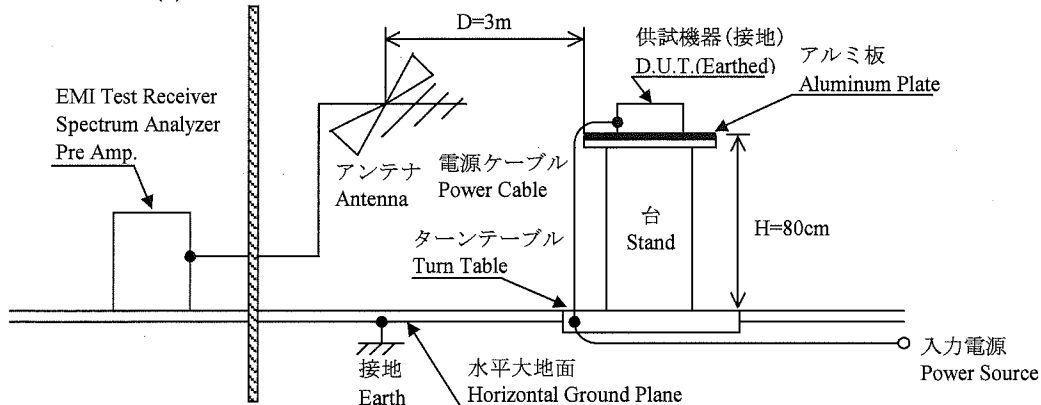
測定構成 Configuration used for determination

- ・EMI特性 Electro-Magnetic Interference characteristics

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



- (b) 雑音電界強度 (放射ノイズ) Radiated Emission



1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS3012
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL9040L
3	DIGITAL MULTIMETER	AGILENT	34970A
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
5	CURRENT PROBE	YOKOGAWA ELECT.	701928 / 701930
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-200L / FK-400L
7	DUMMY LOAD	PCN	RHF250 SIRIES
8	SLIDE REGULATOR	MATSUNAGA	S3-24100
9	CVCF	TAKASAGO	AA2000XG
10	CVCF	KIKUSUI	PCR4000L
11	CVCF	NF	ES10000S
12	LEAKAGE CURRENT METER	HIOKI	3156
13	DYNAMIC DIP SIMULATOR	TAKAMISAWA	PSA-210
14	CONTROLLED TEMP. CHAMBER	ESPEC	SU-641 / SH-240
15	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
16	PRE AMP.	SONOMA	310N
17	AMN	SCHWARZBECK	NNLK8121
18	ANTENNA	SCHWARZBECK	CBL6111D

2.1 静特性 Steady state data

(1) 入力・負荷・温度変動／出力起動・遮断電圧

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	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	5.012V	5.011V	5.012V	5.013V	2mV	0.040%
50%	5.011V	5.010V	5.010V	5.011V	1mV	0.020%
100%	5.009V	5.009V	5.009V	5.010V	1mV	0.020%
load	3mV	2mV	3mV	3mV		
regulation	0.060%	0.040%	0.060%	0.060%		

2. Temperature drift

Conditions Vin : 100 VAC

Iout : 100 %

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	5.018V	5.009V	5.005V	13mV	0.260%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100 %

Start up voltage (Vin)	76VAC
Drop out voltage (Vin)	71VAC

12V

1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	12.009V	12.008V	12.009V	12.010V	2mV	0.017%
50%	12.007V	12.006V	12.007V	12.008V	2mV	0.017%
100%	12.006V	12.004V	12.005V	12.006V	2mV	0.017%
load	3mV	4mV	4mV	4mV		
regulation	0.025%	0.033%	0.033%	0.033%		

2. Temperature drift

Conditions Vin : 100 VAC

Iout : 100 %

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	11.994V	12.004V	11.999V	10mV	0.083%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100 %

Start up voltage (Vin)	76VAC
Drop out voltage (Vin)	70VAC

24V

1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	23.984V	23.983V	23.986V	23.986V	3mV	0.013%
50%	23.983V	23.982V	23.985V	23.985V	3mV	0.013%
100%	23.981V	23.981V	23.984V	23.984V	3mV	0.013%
load	3mV	2mV	2mV	2mV		
regulation	0.013%	0.008%	0.008%	0.008%		

2. Temperature drift

Conditions Vin : 100 VAC

Iout : 100 %

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	24.002V	23.981V	23.975V	27mV	0.113%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100 %

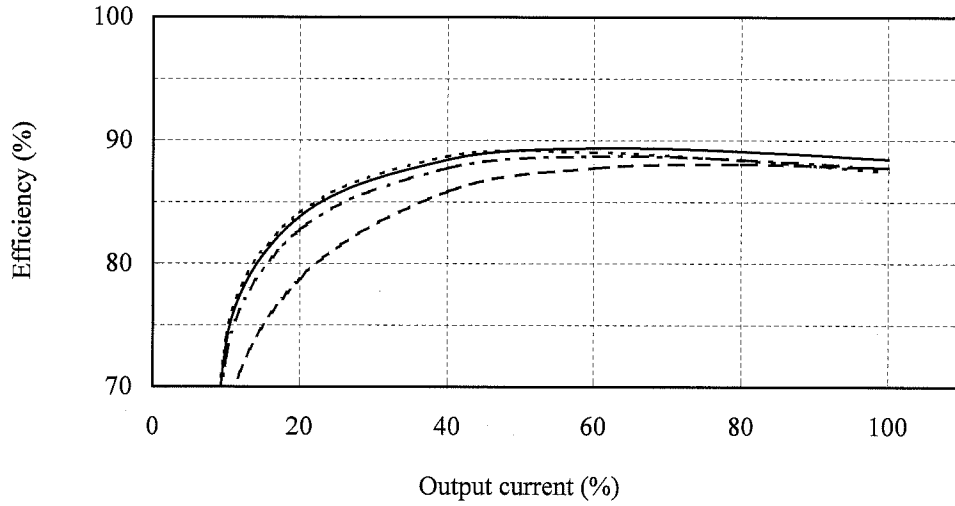
Start up voltage (Vin)	75VAC
Drop out voltage (Vin)	73VAC

(2) 効率対出力電流

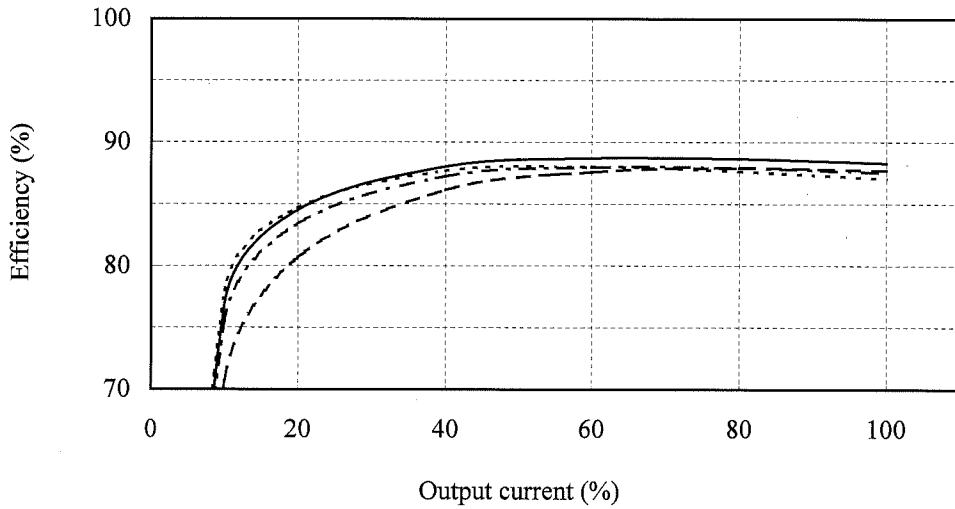
Efficiency vs. Output current

Conditions Vin : 85 VAC -----
 : 100 VAC -.-.-.-
 : 200 VAC _____
 : 265 VAC -.-.-.-
 Ta : 25 °C

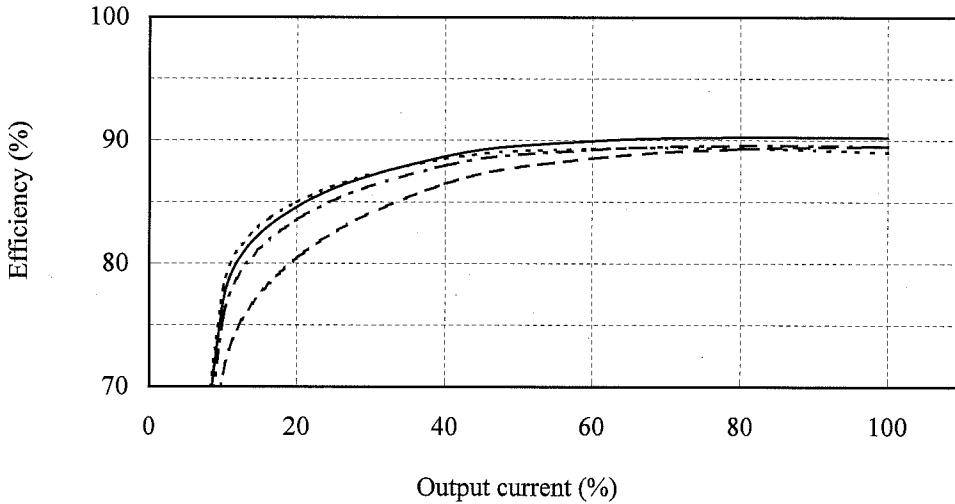
5V



12V



24V



(3) 入力電流対出力電流

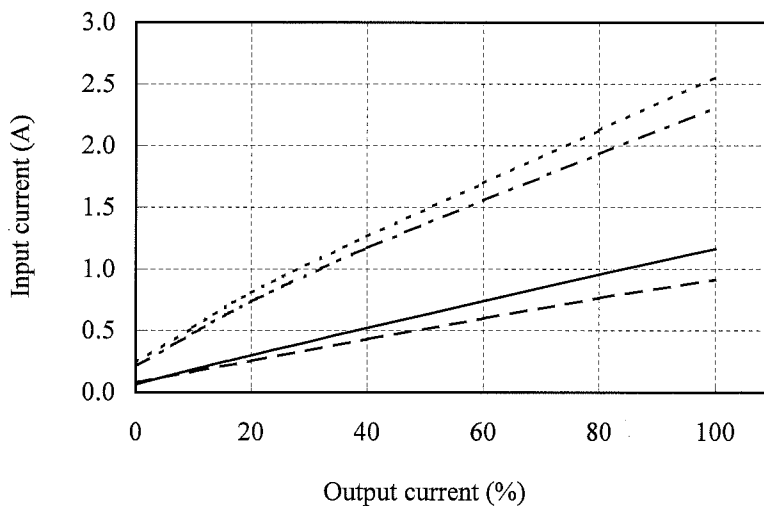
Input current vs. Output current

Conditions Vin : 85 VAC -----
 : 100 VAC - - - - -
 : 200 VAC ————
 : 265 VAC - - - - -
 Ta : 25 °C

5V

Io: 0%

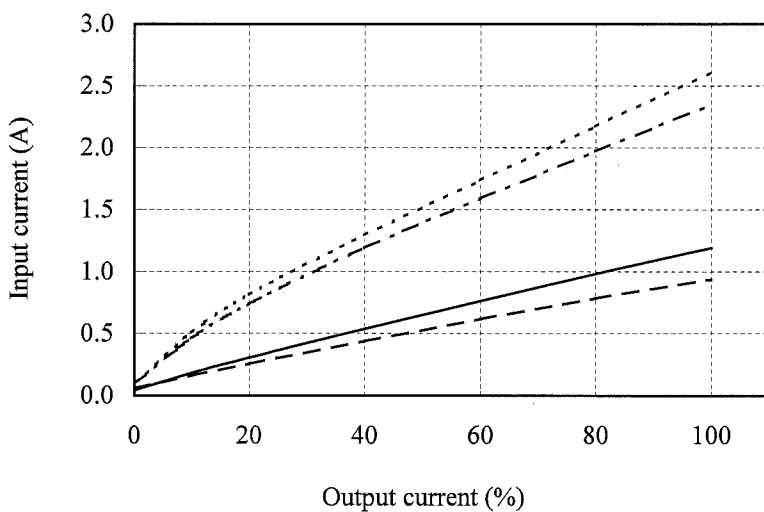
Vin	Input current
85VAC	0.24A
100VAC	0.21A
200VAC	0.07A
265VAC	0.08A



12V

Io: 0%

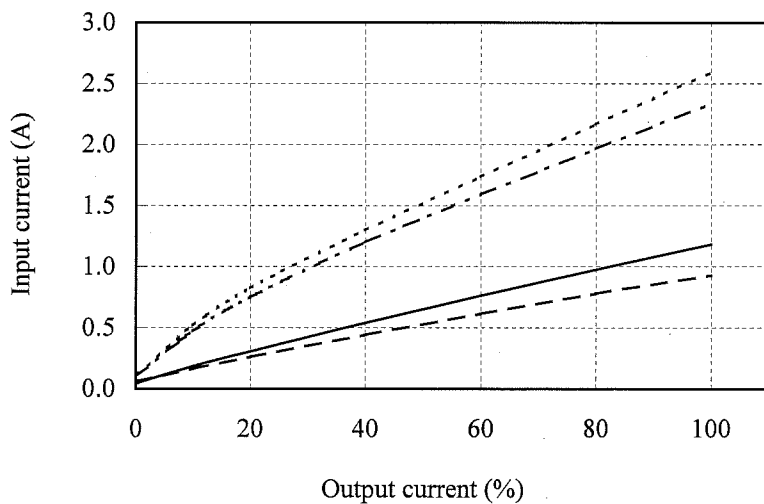
Vin	Input current
85VAC	0.09A
100VAC	0.09A
200VAC	0.04A
265VAC	0.06A



24V

Io: 0%

Vin	Input current
85VAC	0.11A
100VAC	0.10A
200VAC	0.04A
265VAC	0.06A



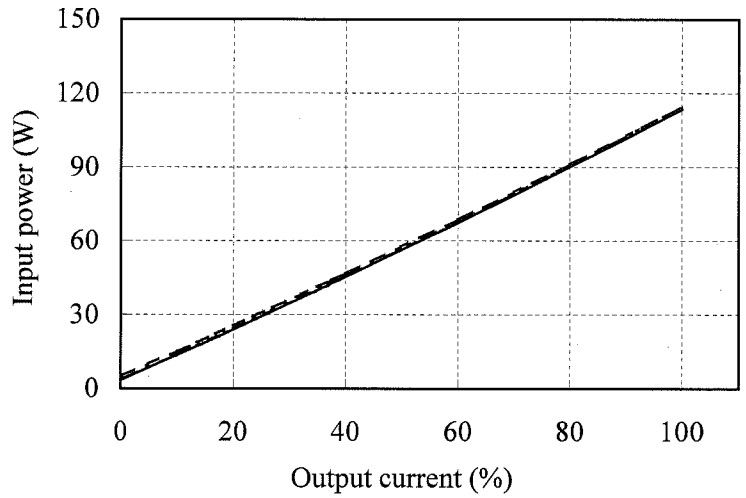
(4) 入力電力対出力電流
Input power vs. Output current

Conditions Vin : 85 VAC -----
 : 100 VAC - - - - -
 : 200 VAC ————
 : 265 VAC - - - - -
 Ta : 25 °C

5V

Io: 0%

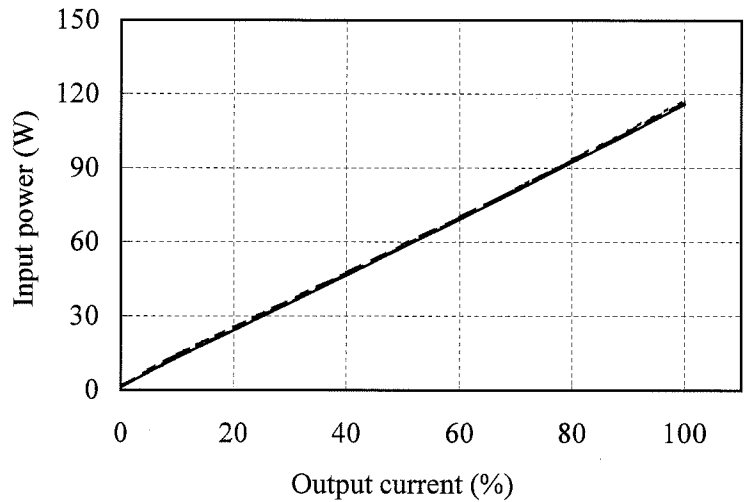
Vin	Input power
85VAC	3.7W
100VAC	3.6W
200VAC	3.3W
265VAC	5.0W



12V

Io: 0%

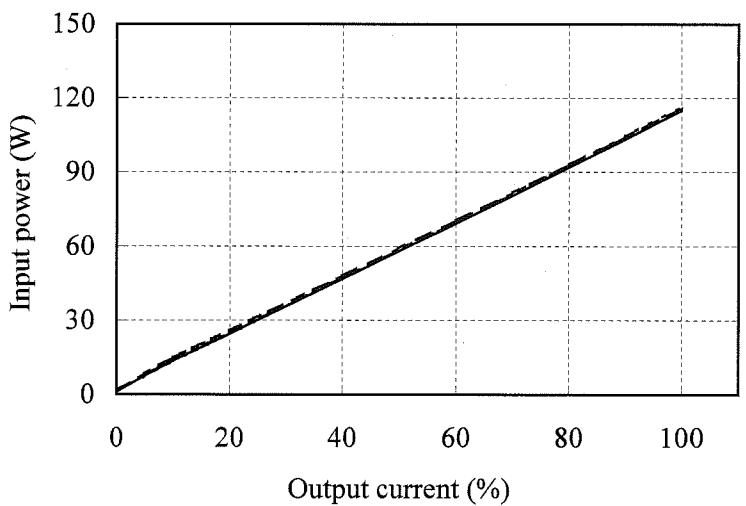
Vin	Input power
85VAC	1.0W
100VAC	1.2W
200VAC	1.1W
265VAC	1.5W



24V

Io: 0%

Vin	Input power
85VAC	1.2W
100VAC	1.3W
200VAC	1.1W
265VAC	1.6W



2.2 過電流保護特性

Over current protection (OCP) characteristics

2.3 過電圧保護特性

Over voltage protection (OVP) characteristics

Conditions Vin : 100 VAC

Ta : -10 °C

25 °C

50 °C

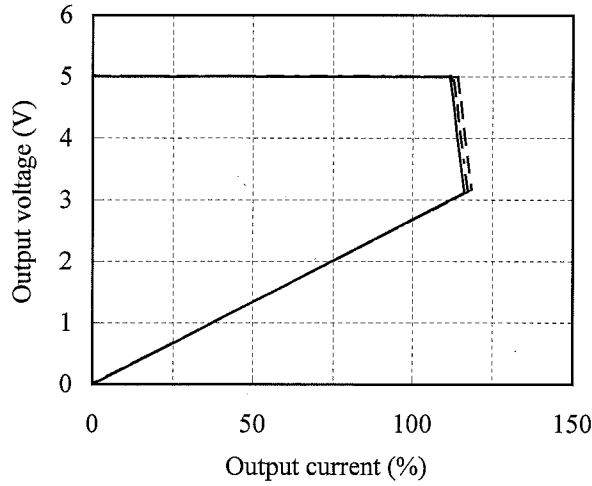
- - -
—

Conditions Vin : 100 VAC

Iout : 0 %

Ta : 25 °C

5V

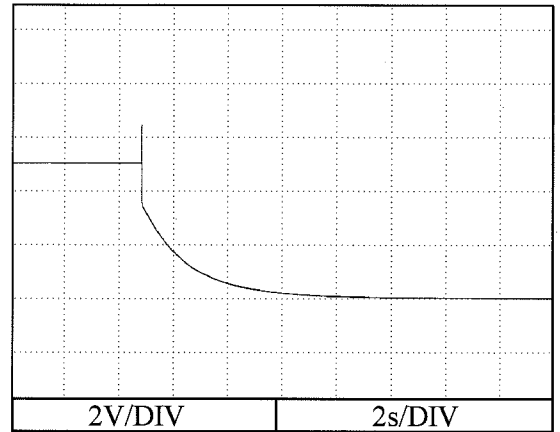


OVP Point

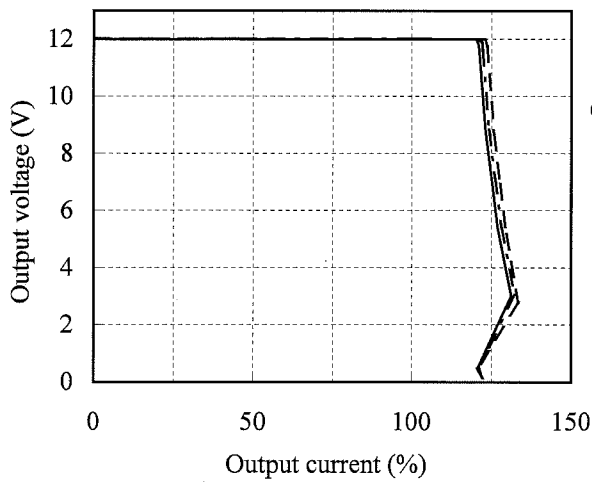
→

Vout →

0V →



12V

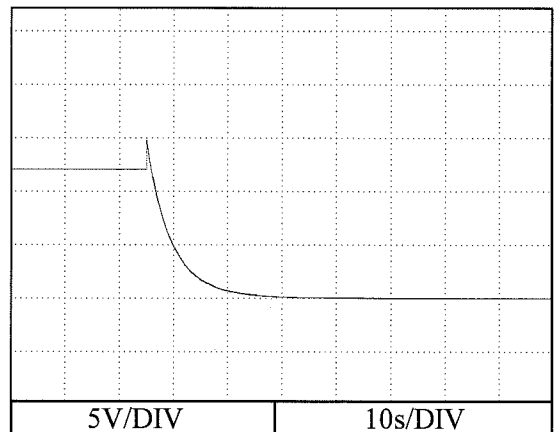


OVP Point

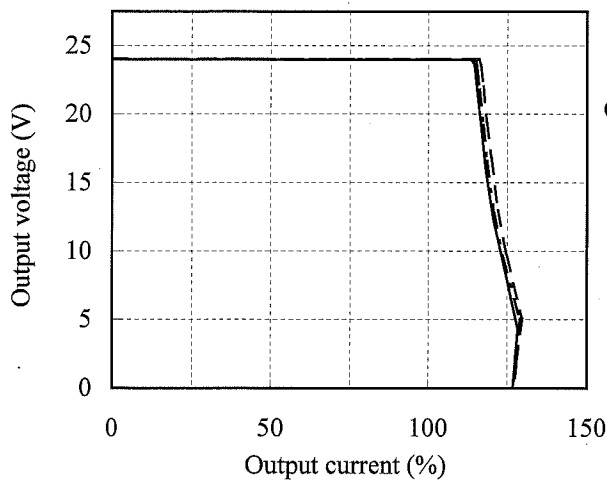
→

Vout →

0V →



24V

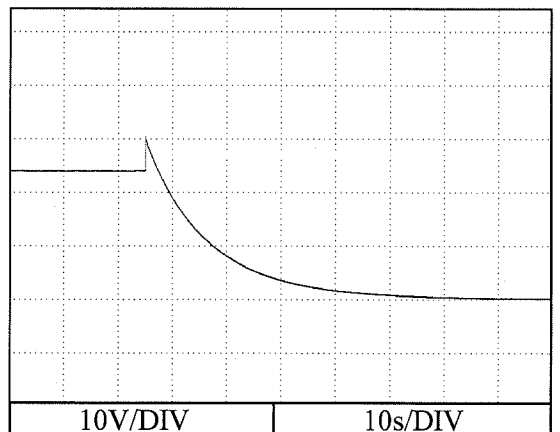


OVP Point

→

Vout →

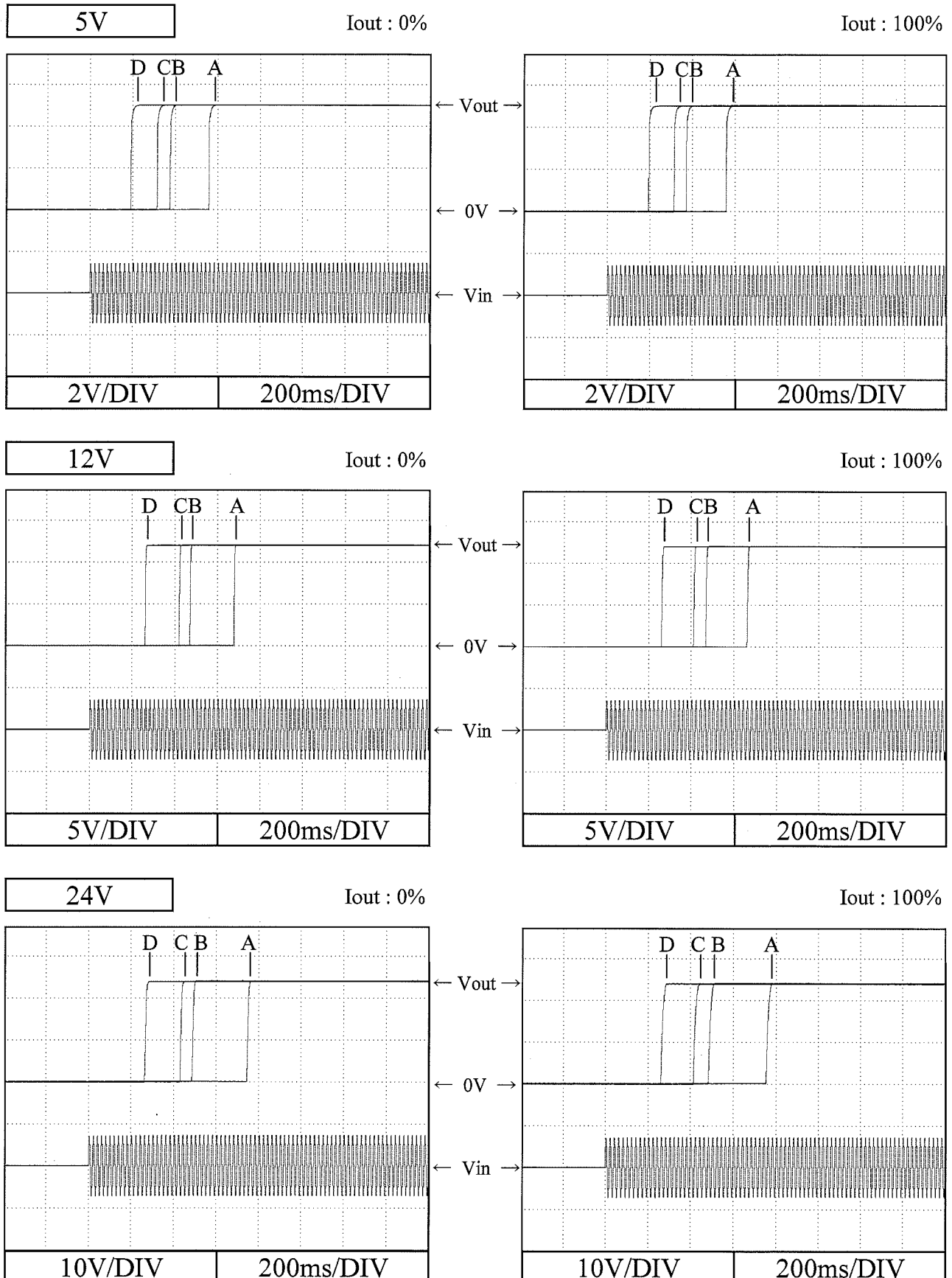
0V →



2.4 出力立ち上がり特性

Output rise characteristics

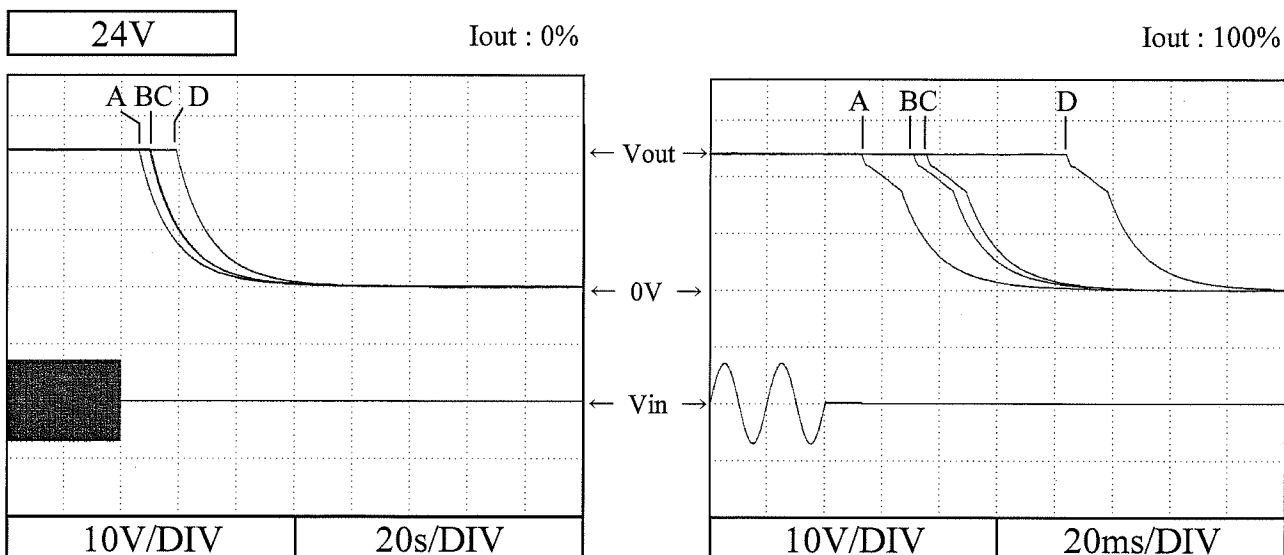
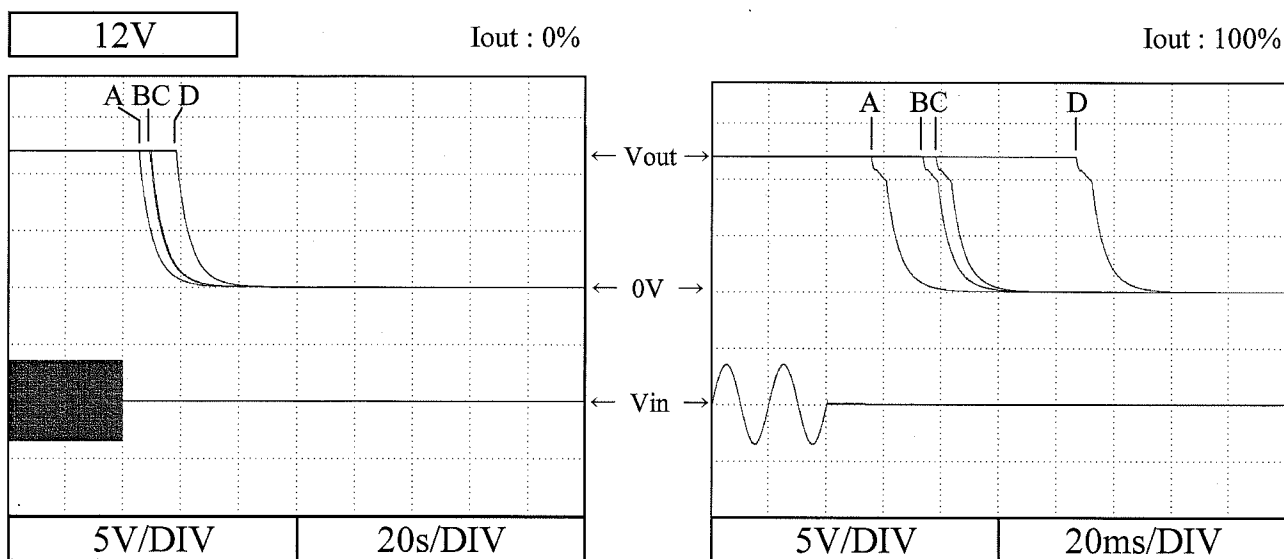
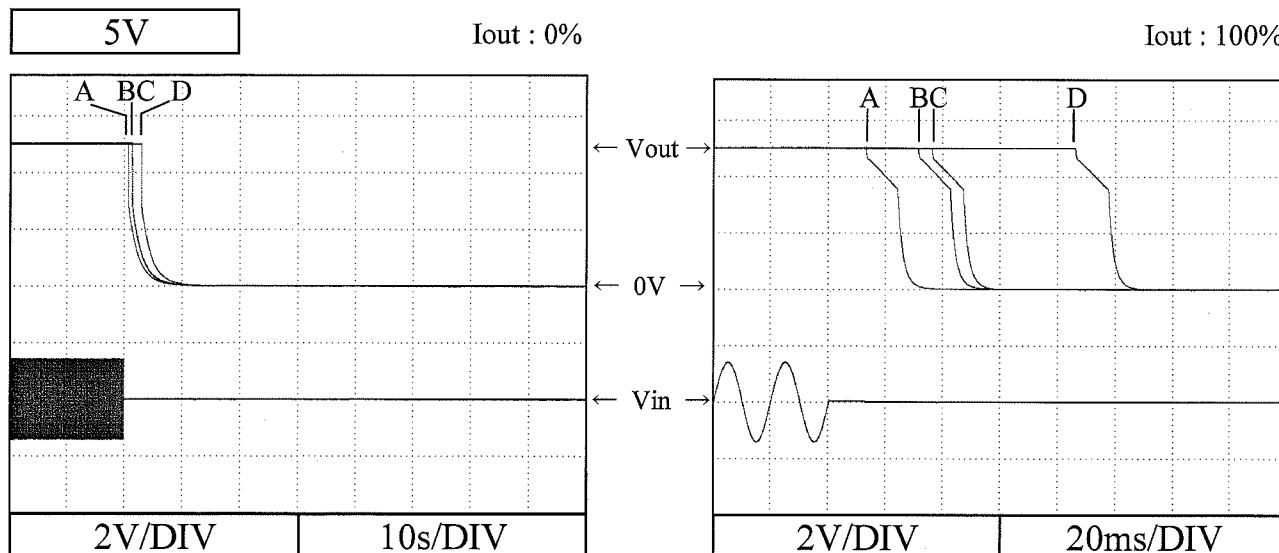
Conditions Vin : 85 VAC (A)
100 VAC (B)
200 VAC (C)
265 VAC (D)
Ta : 25 °C



2.5 出力立ち下がり特性

Output fall characteristics

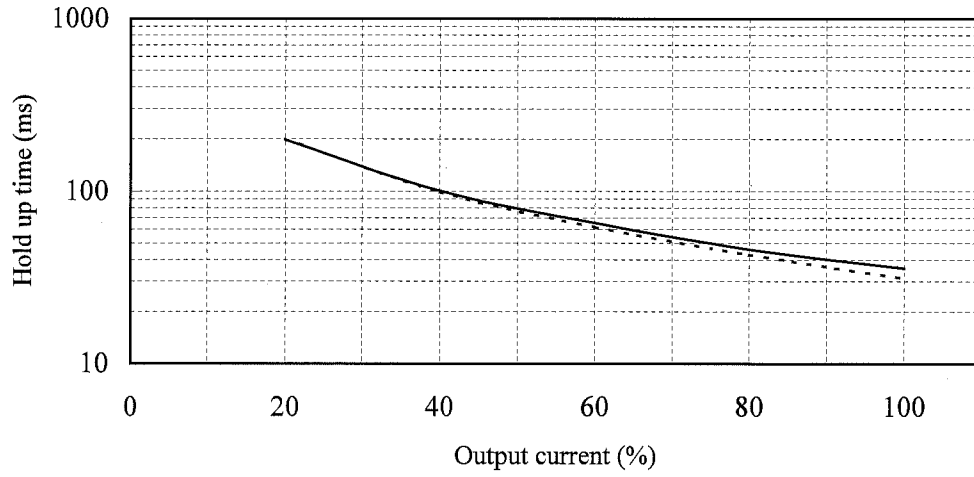
Conditions Vin : 85 VAC (A)
 100 VAC (B)
 200 VAC (C)
 265 VAC (D)
 Ta : 25 °C



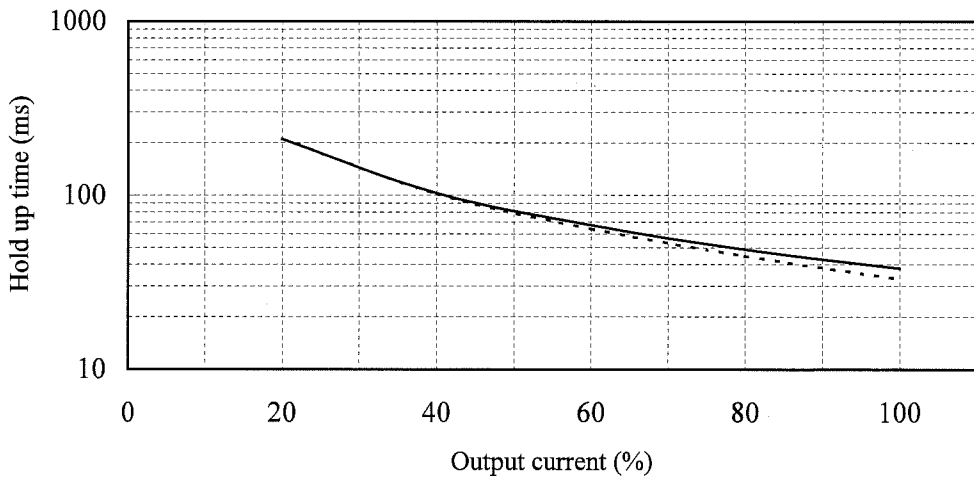
2.6 出力保持時間特性 Hold up time characteristics

Conditions V_{in} : 100 VAC -----
 200 VAC ————
 T_a : 25 °C

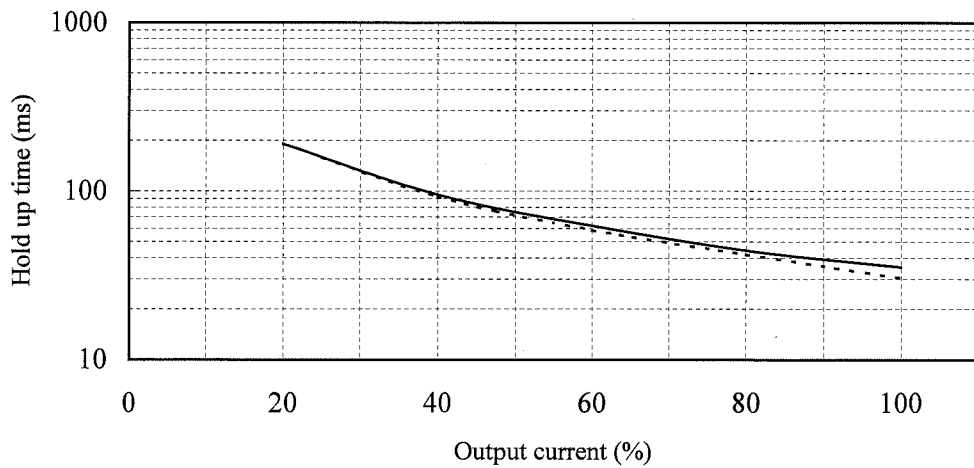
5V



12V



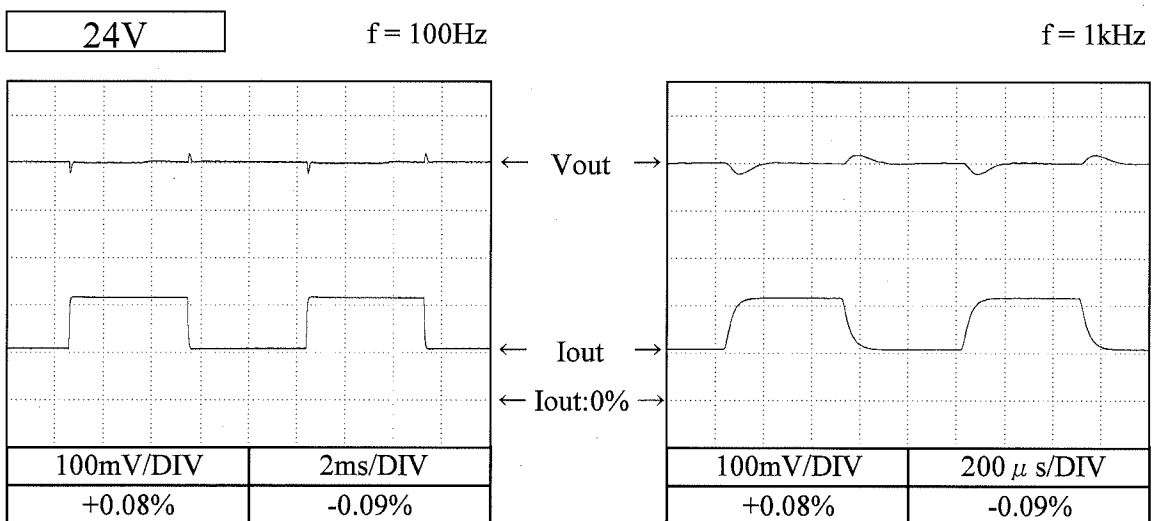
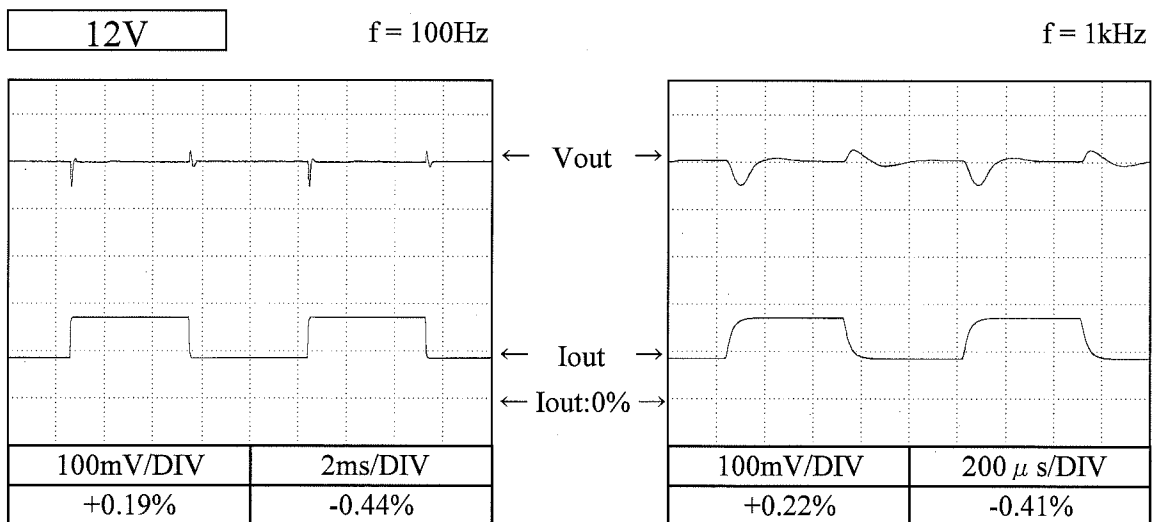
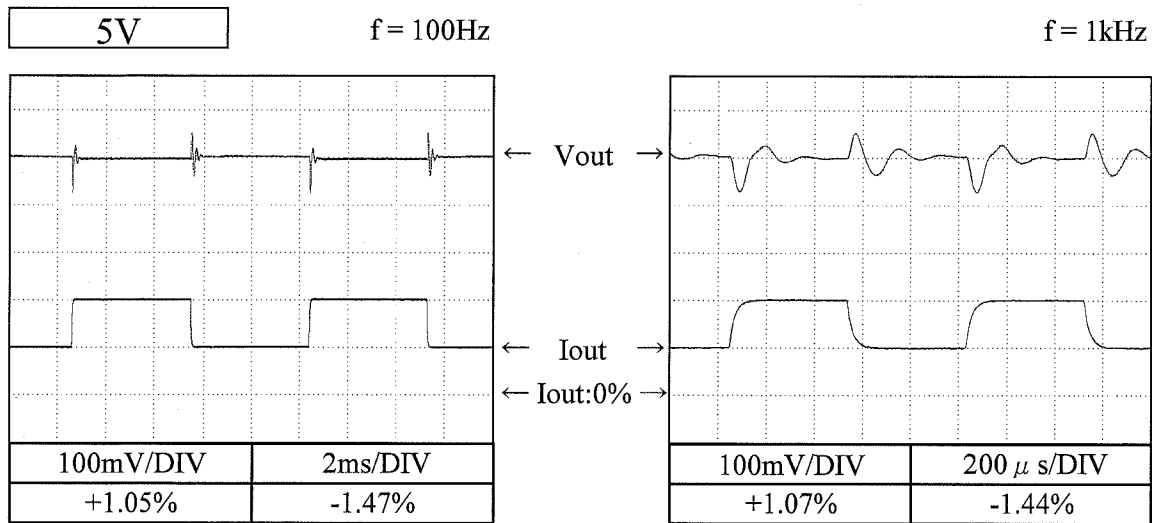
24V



2.7 過渡応答（負荷急変）特性

Dynamic load response characteristics

Conditions Vin : 100 VAC
 Iout : 50 % ↔ 100 %
 (tr = tf = 50us)
 Ta : 25 °C



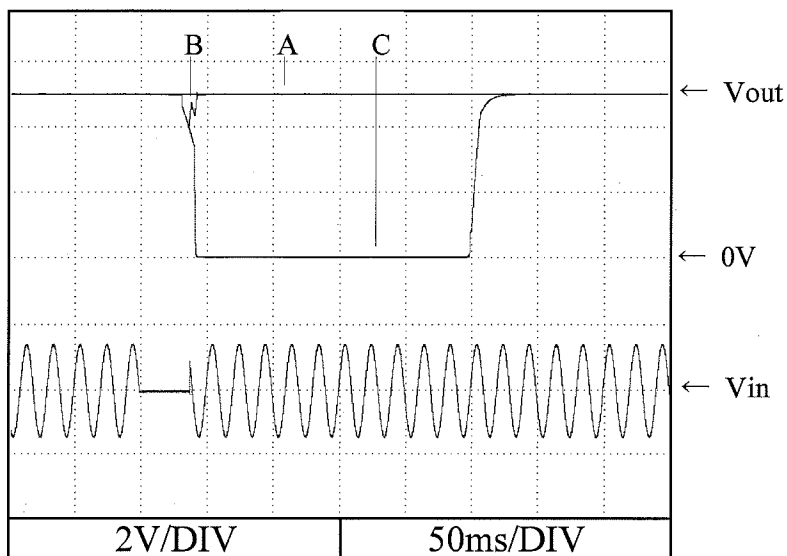
2.8 入力電圧瞬停特性

Response to brown out characteristics

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 °C

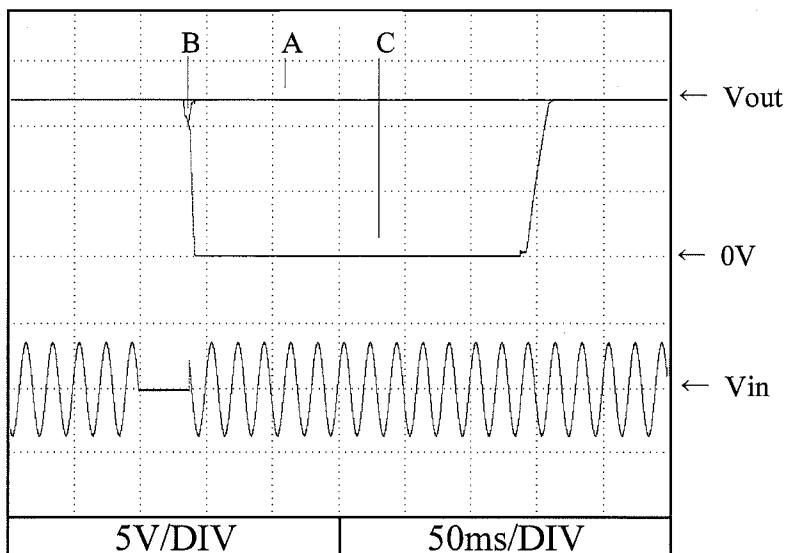
5V

A = 27ms
B = 37ms
C = 38ms



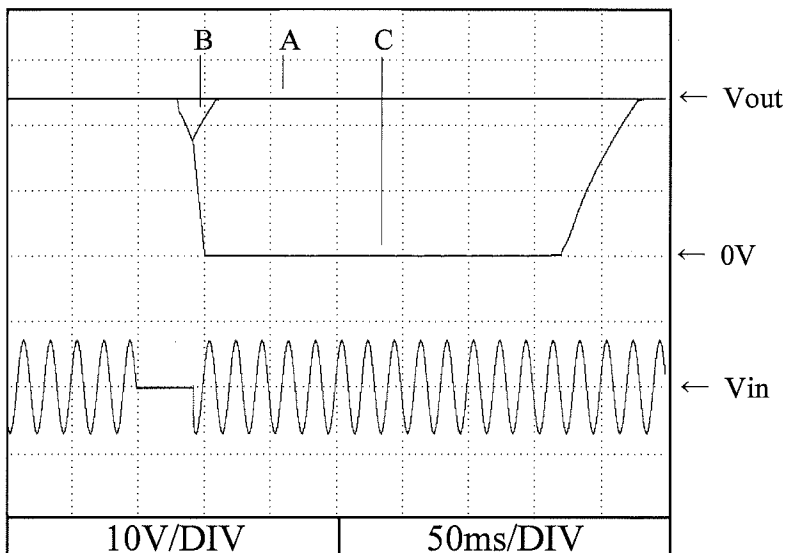
12V

A = 32ms
B = 37ms
C = 38ms



24V

A = 27ms
B = 38ms
C = 43ms



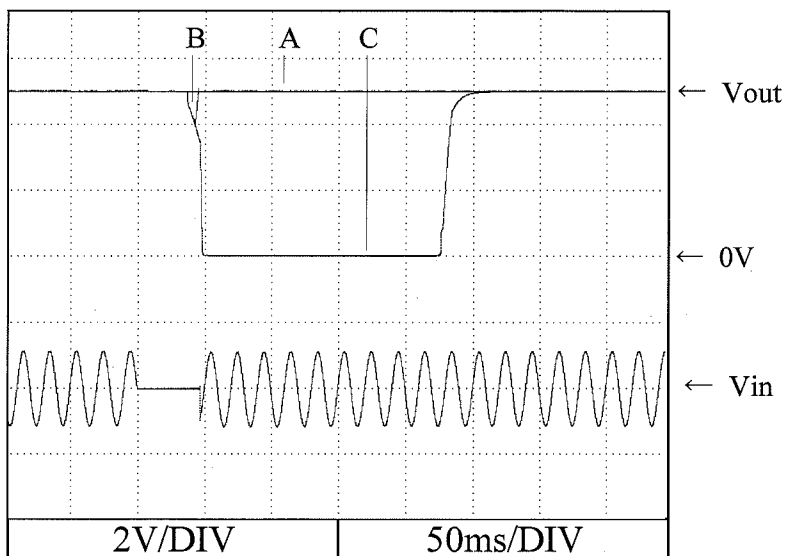
2.8 入力電圧瞬停特性

Response to brown out characteristics

Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 °C

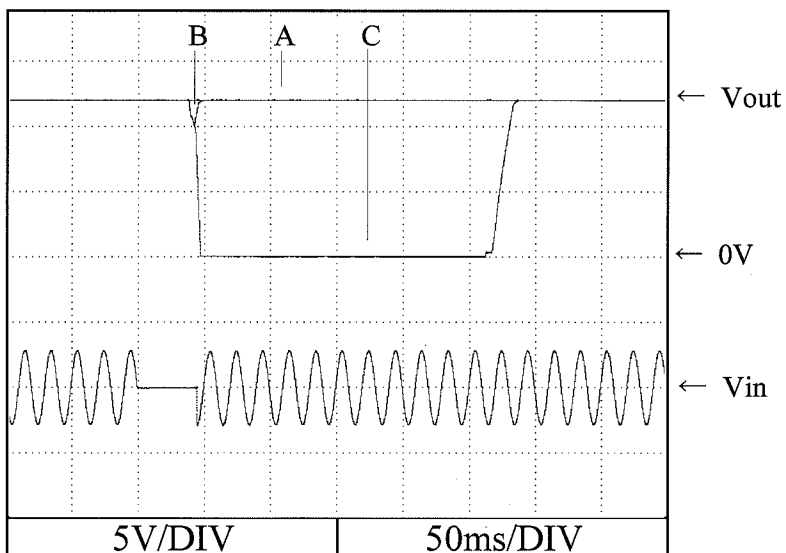
5V

A = 36ms
B = 43ms
C = 47ms



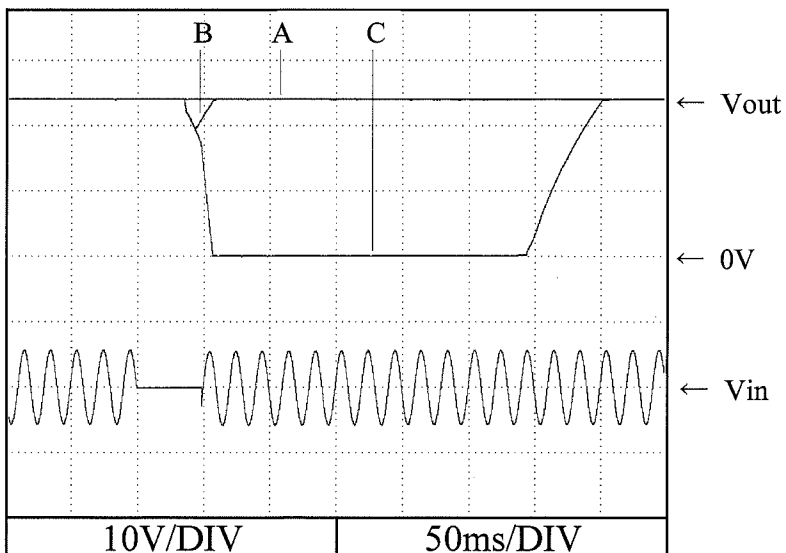
12V

A = 37ms
B = 43ms
C = 44ms



24V

A = 36ms
B = 44ms
C = 48ms

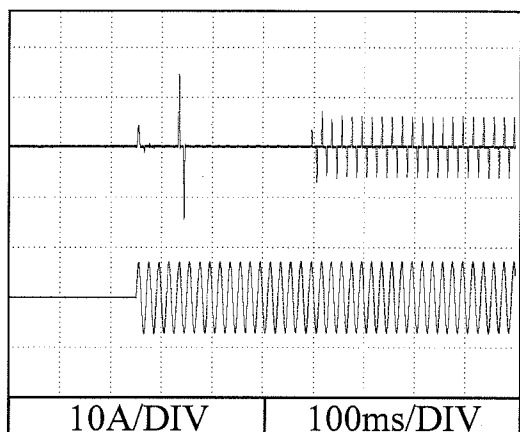


2.9 入力サージ電流 (突入電流) 波形
Inrush current waveform

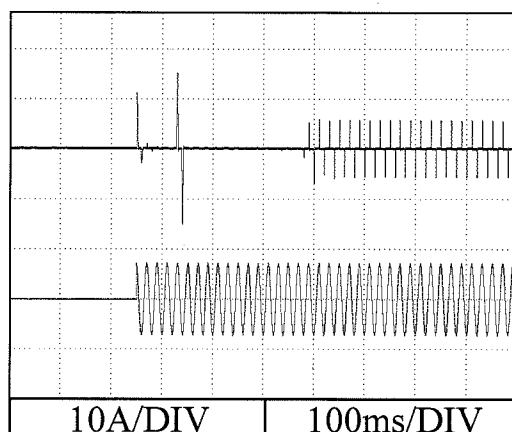
5V

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 °C

Switch on phase angle of input AC voltage
 $\phi = 0^\circ$

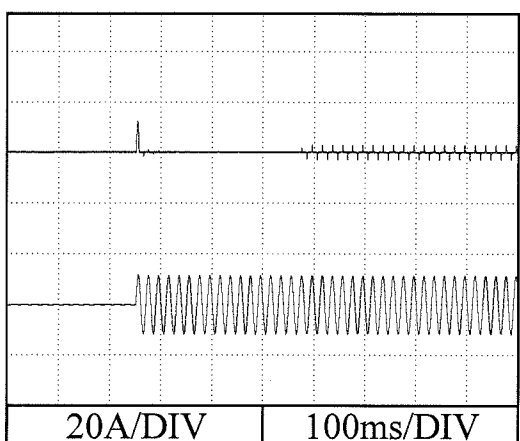


Switch on phase angle of input AC voltage
 $\phi = 90^\circ$

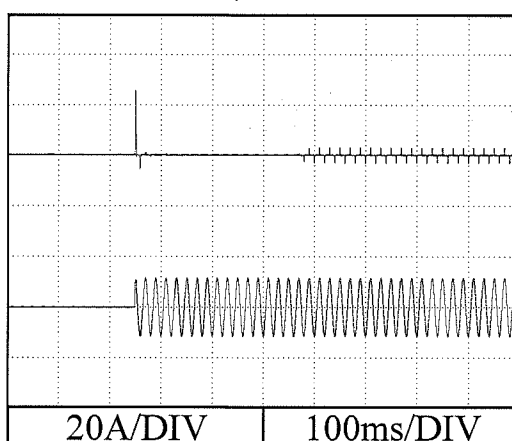


Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 °C

Switch on phase angle of input AC voltage
 $\phi = 0^\circ$



Switch on phase angle of input AC voltage
 $\phi = 90^\circ$

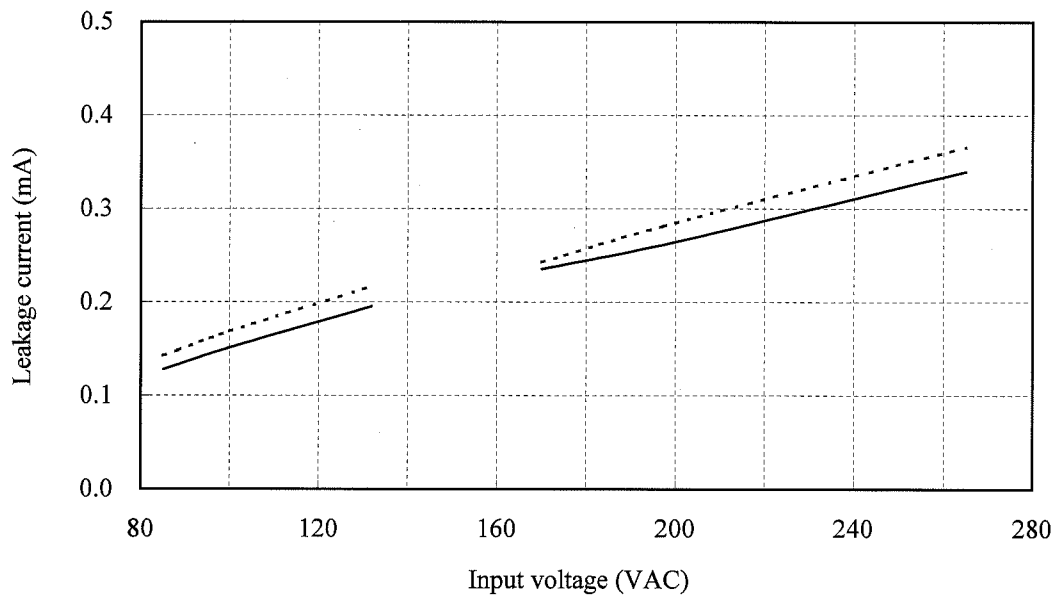


2.10 リーク電流特性 Leakage current characteristics

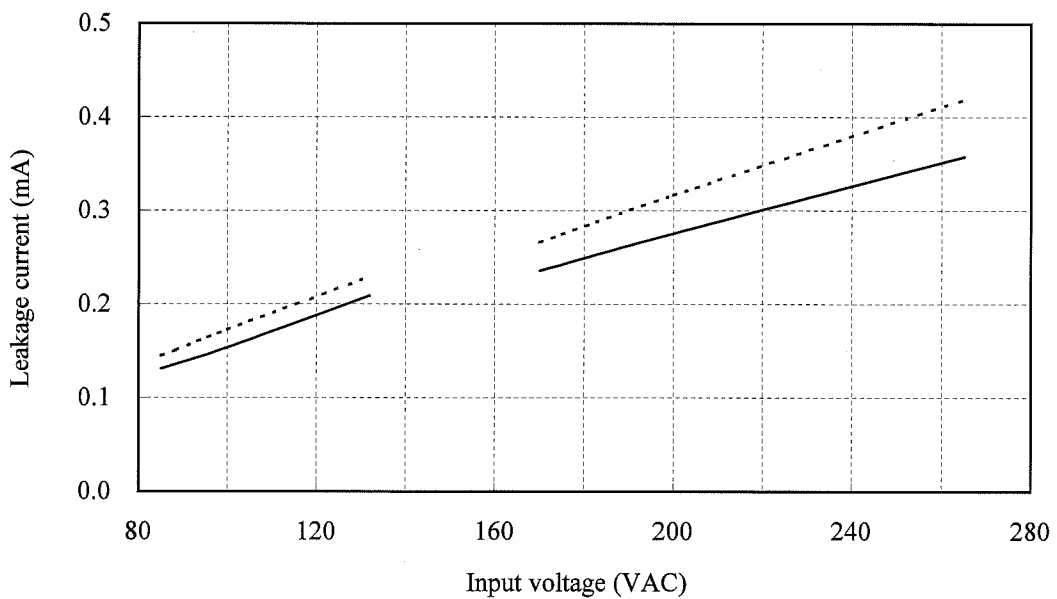
Conditions Iout : 0 % -----
 100 % ————
 Ta : 25 °C
Equipment used : 3156 (HIOKI)

5V

f: 50 Hz



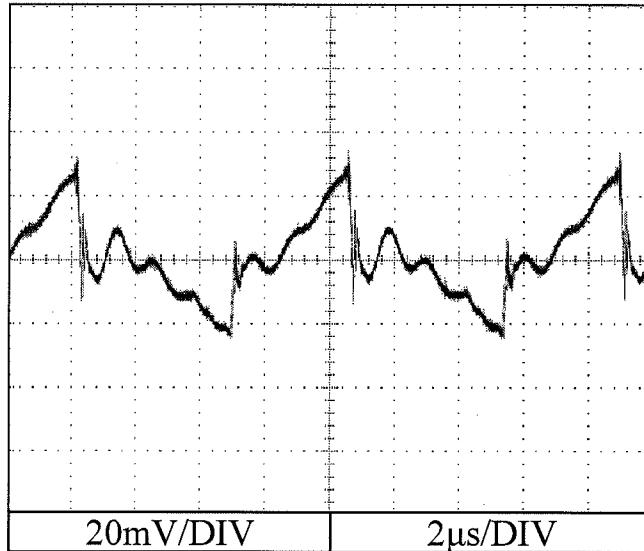
f: 60 Hz



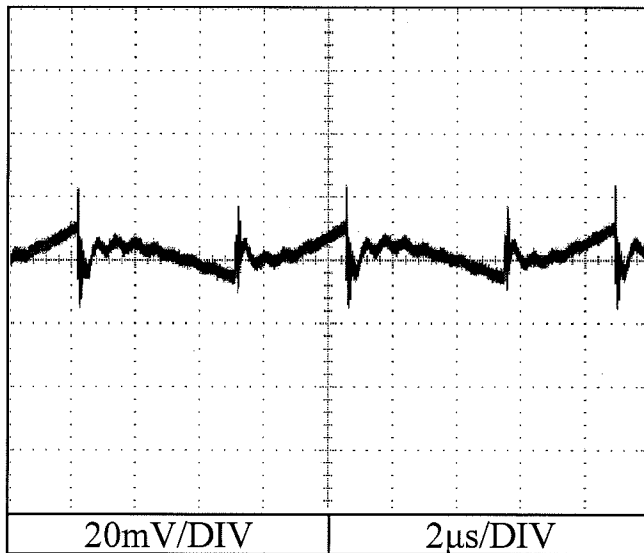
2.11 出力リップル、ノイズ波形
Output ripple and noise waveform

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 °C

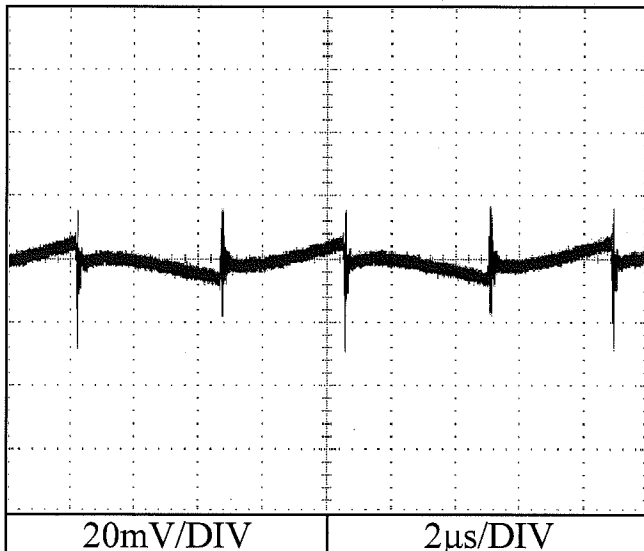
5V



12V



24V



2.12 EMI 特性

Electro-Magnetic Interference characteristics

ZWS100B

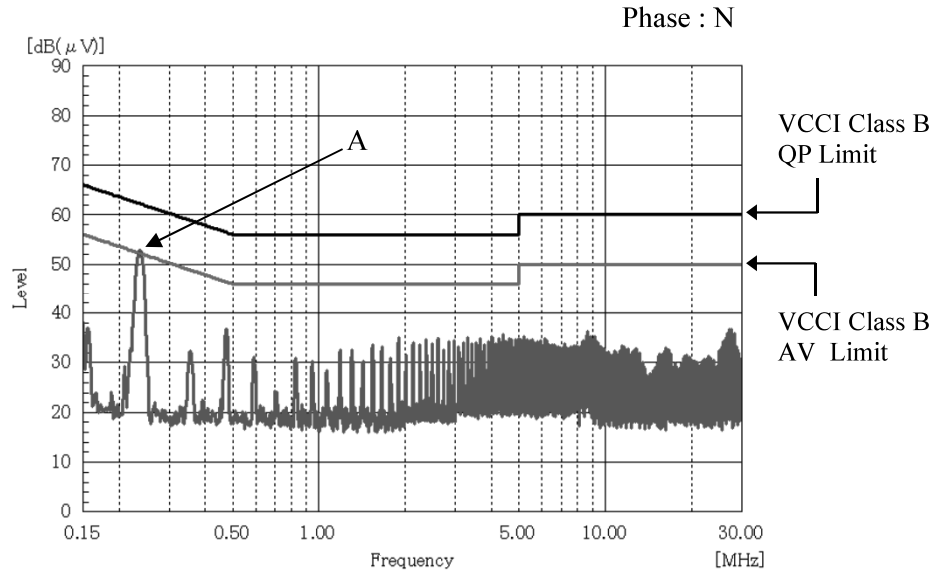
Conditions Vin : 230 VAC
Iout : 100 %
Ta : 25 °C

雑音端子電圧

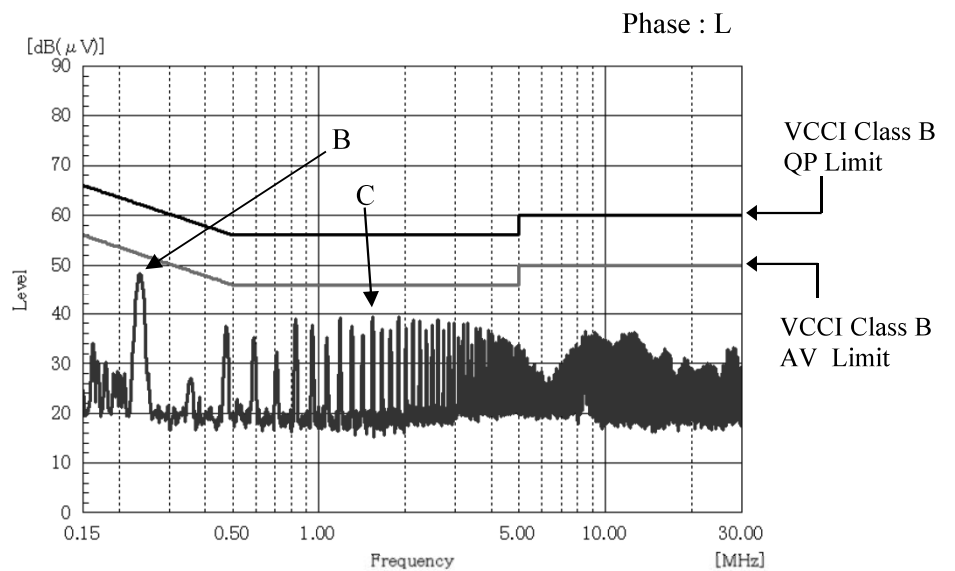
Conducted Emission

5V

Point A (237kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	62.2	51.7
AV	52.2	48.1



Point B (237kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	62.2	47.1
AV	52.2	39.6



Point C (1.54MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	38.6
AV	46.0	38.6

EN55011-B,EN55032-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55032-B,FCC-B are same as its VCCI class B.

2.12 EMI 特性

Electro-Magnetic Interference characteristics

ZWS100B

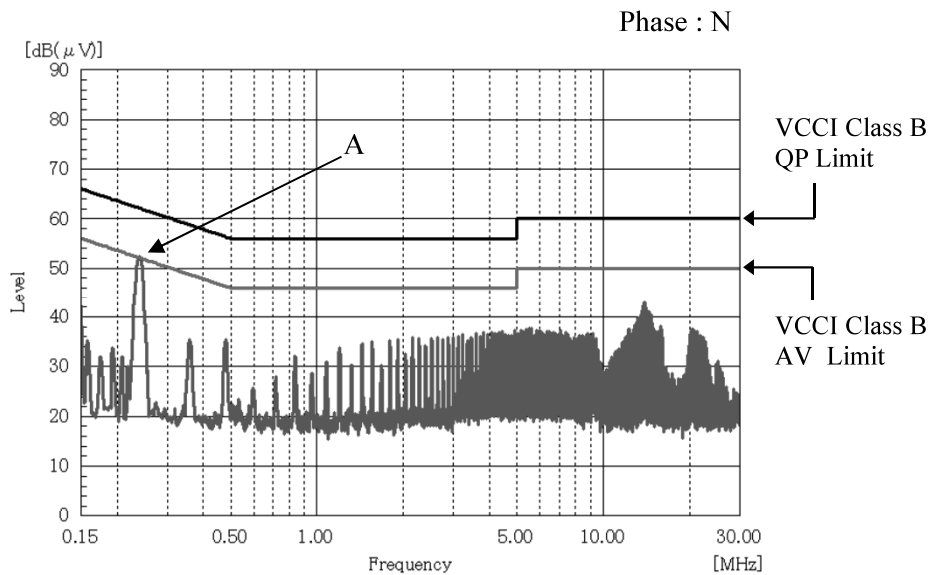
Conditions Vin : 230 VAC
Iout : 100 %
Ta : 25 °C

雑音端子電圧

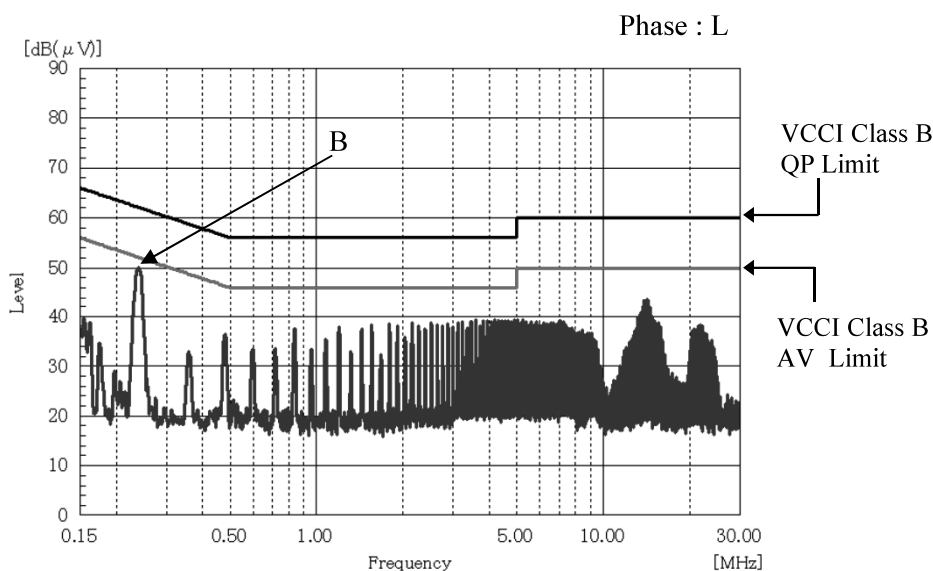
Conducted Emission

12V

Ref. Data	Point A (239kHz)	
	Limit (dBuV)	Measure (dBuV)
QP	62.1	52.1
AV	52.1	48.1



Ref. Data	Point B (241kHz)	
	Limit (dBuV)	Measure (dBuV)
QP	62.0	48.5
AV	52.0	41.1



EN55011-B,EN55032-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55032-B,FCC-B are same as its VCCI class B.

2.12 EMI 特性

Electro-Magnetic Interference characteristics

ZWS100B

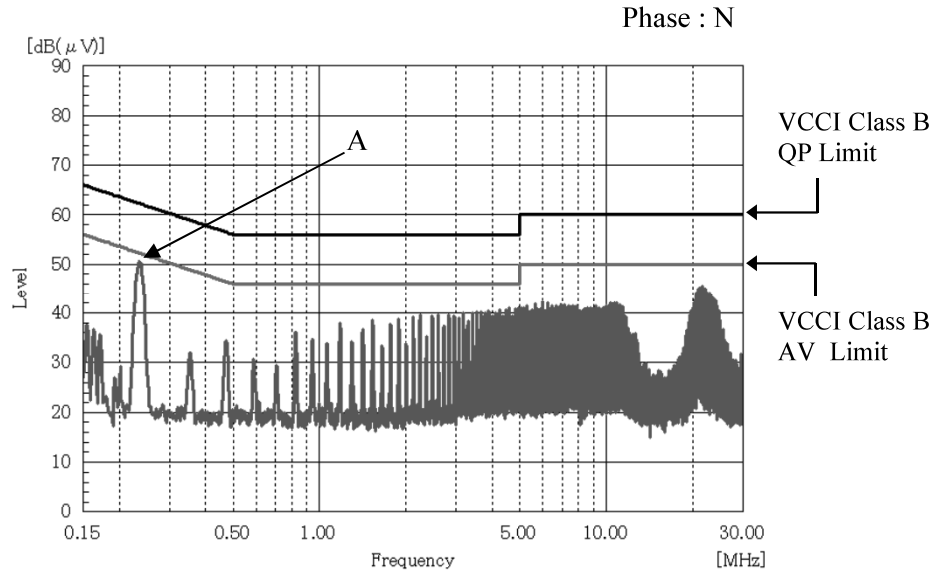
Conditions Vin : 230 VAC
Iout : 100 %
Ta : 25 °C

雑音端子電圧

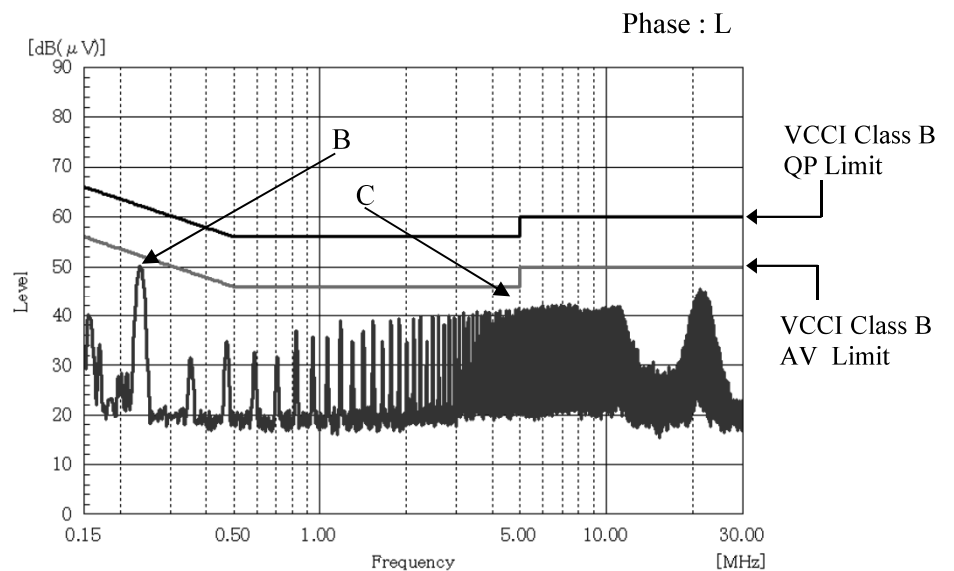
Conducted Emission

24V

Point A (237kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	62.2	49.4
AV	52.2	45.8



Point B (235kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	62.3	49.1
AV	52.3	43.5



Point C (4.83MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	39.4
AV	46.0	37.4

EN55011-B,EN55032-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55032-B,FCC-B are same as its VCCI class B.

2.12 EMI 特性

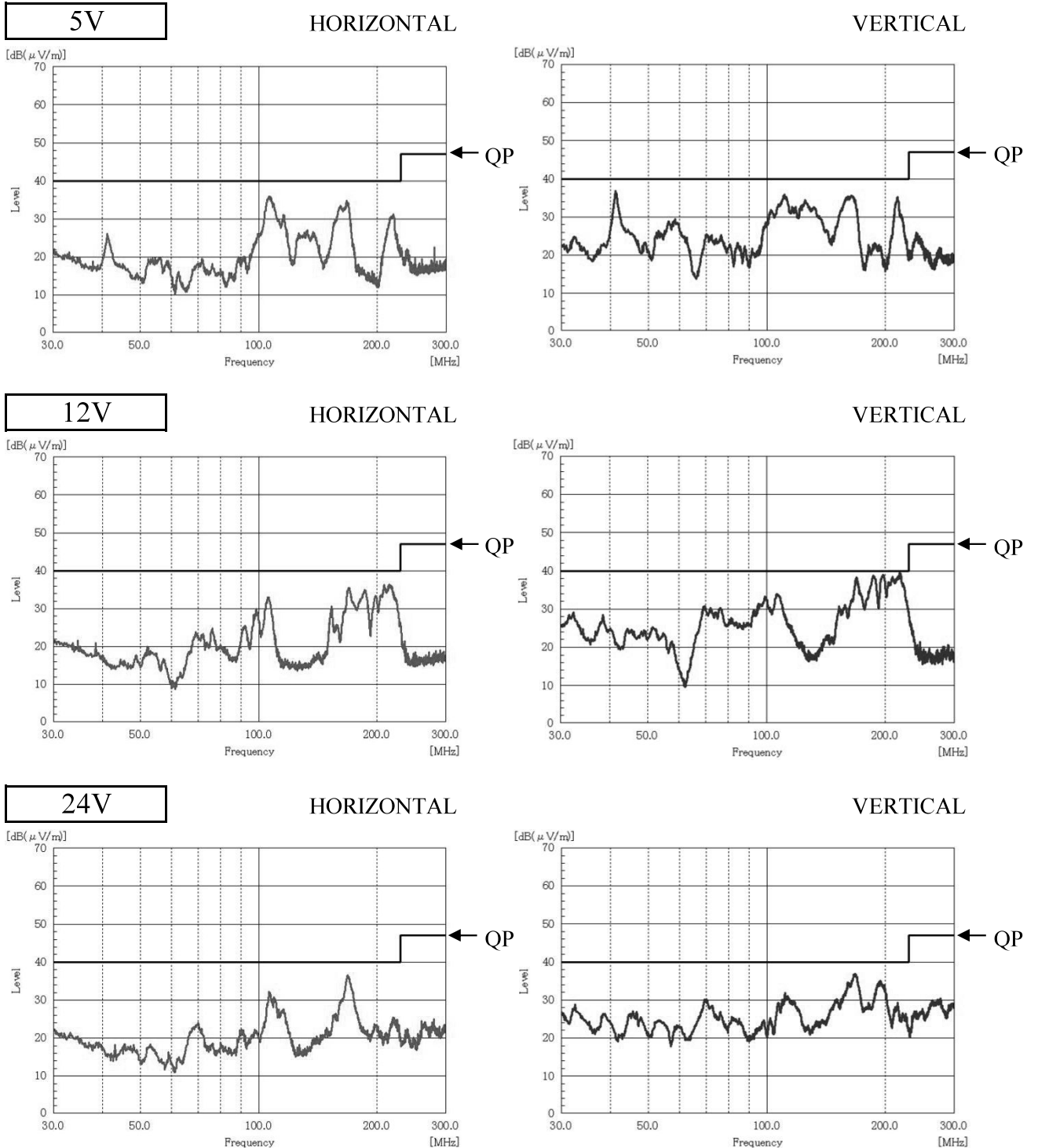
Electro-Magnetic Interference characteristics

ZWS100B

Conditions Vin : 230 VAC
Io : 100 %
Ta : 25 °C

雑音電界強度

Radiated Emission



EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55032-B are same as its VCCI class B.

表示はピーク値
Indication is peak values.