RWS100B

EVALUATION DATA

型式データ

TDK-Lambda

CA807-53-01

INDEX

2. 特性データ　Characteristics

使用記号　Terminology used

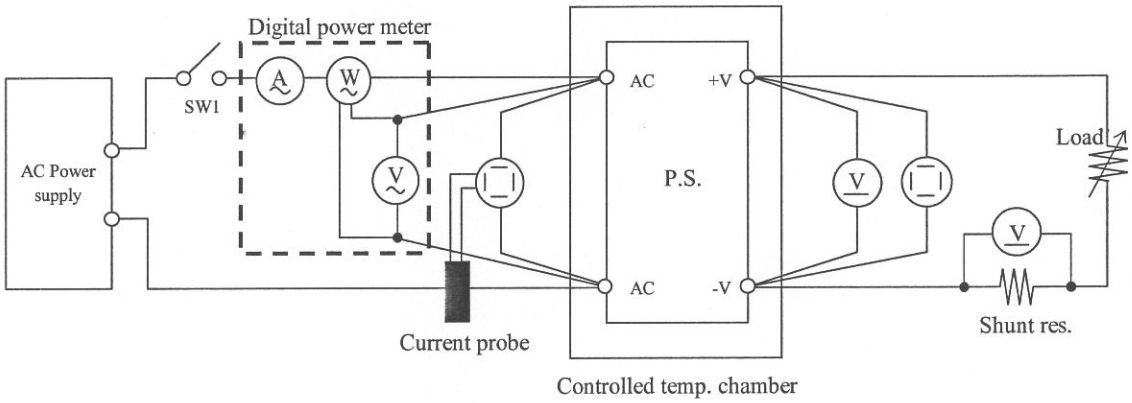
	定義　Definition
Vin	..... 入力電圧　Input voltage
Vout	..... 出力電圧　Output voltage
Iin	..... 入力電流　Input current
Iout	..... 出力電流　Output current
Ta	..... 周囲温度　Ambient temperature
f	..... 周波数　Frequency

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

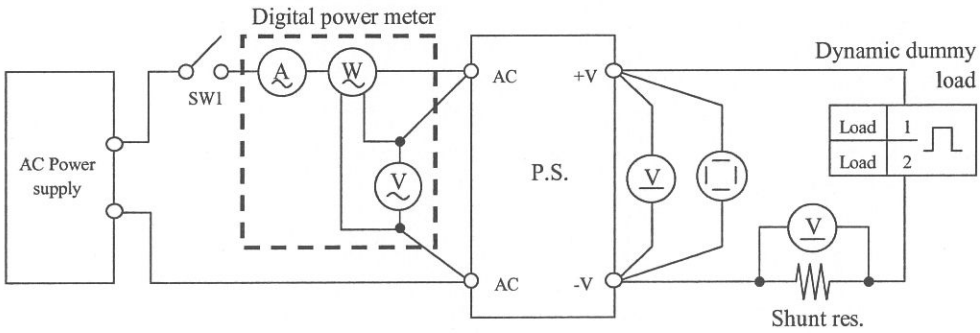
測定回路1 Circuit 1 used for determination

- ・静特性 Steady state data
- ・通電ドリフト特性 Warm up voltage drift characteristics
- ・出力保持時間特性 Hold up time 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
- ・過電流保護特性 Over current protection (OCP) characteristics
- ・過電圧保護特性 Over voltage protection (OVP) characteristics
- ・入力電圧瞬停特性 Response to brown out characteristics
- ・入力電流波形 Input current waveform

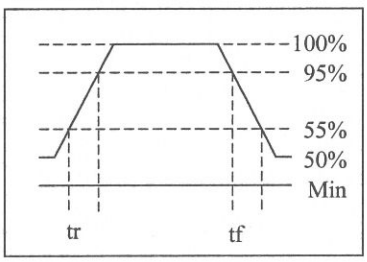


測定回路2 Circuit 2 used for determination

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

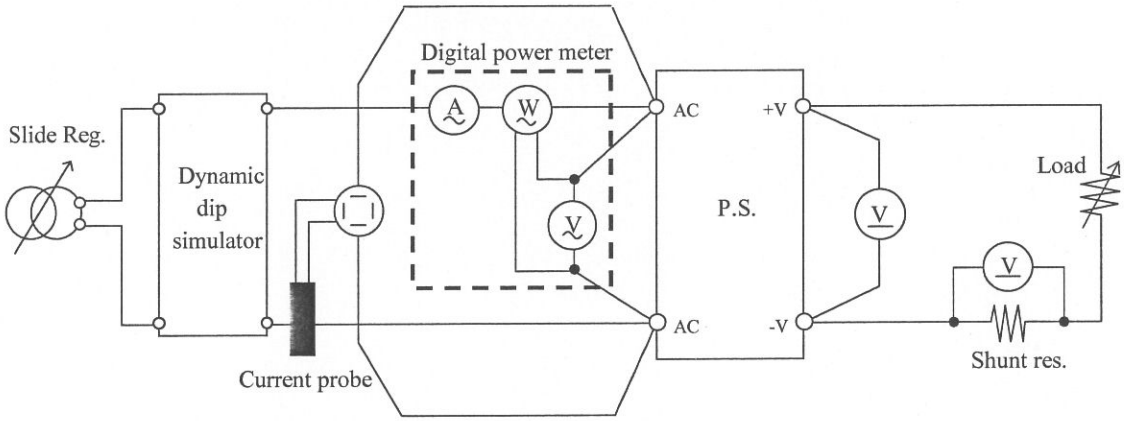


Output current waveform
Iout 50% <==> 100%



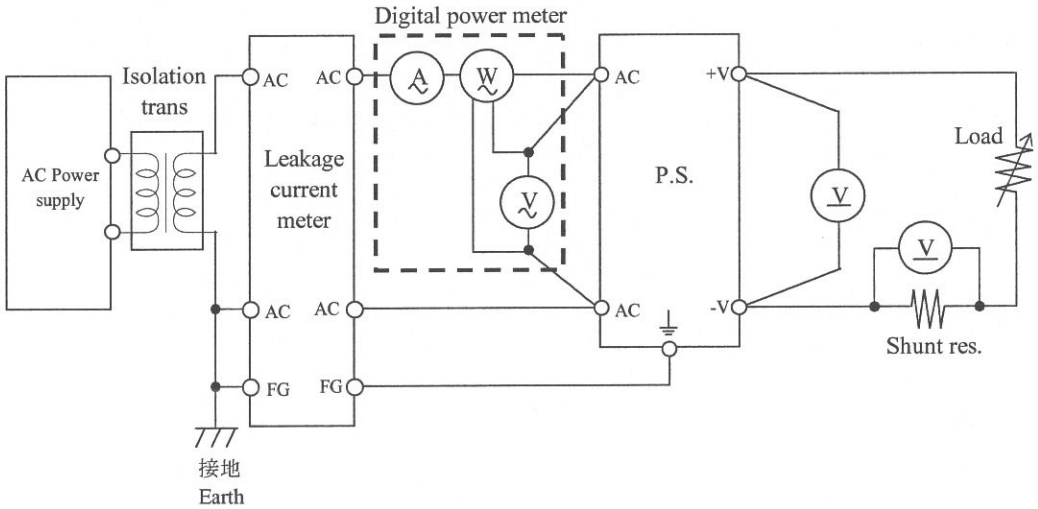
測定回路3 Circuit 3 used for determination

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



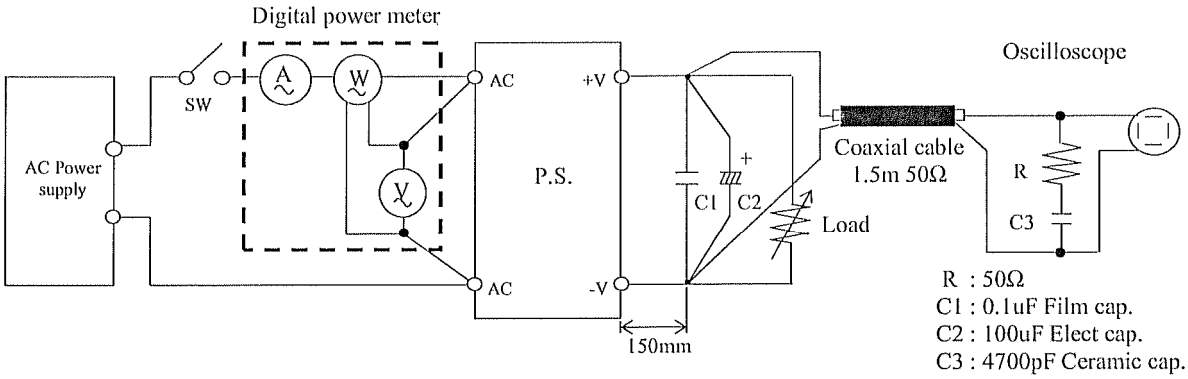
測定回路4 Circuit 4 used for determination

・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

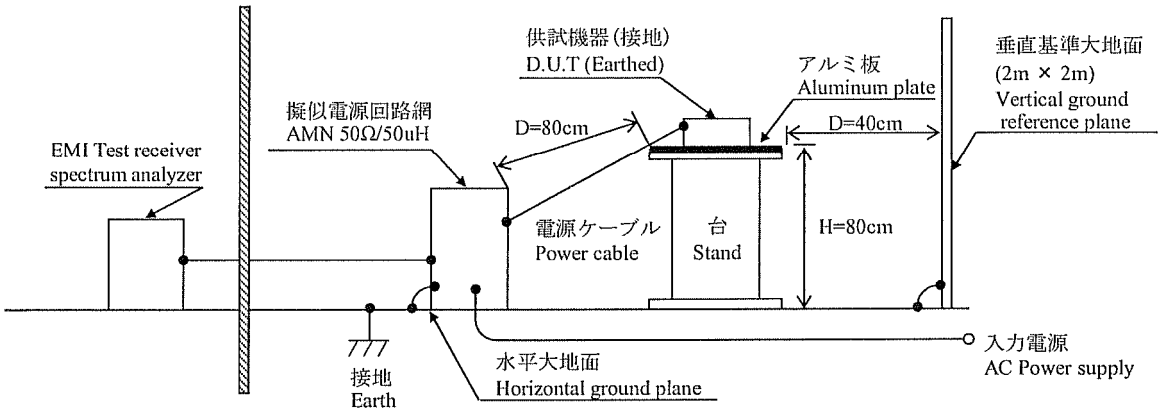


測定構成 Configuration used for determination

・EMI特性　Electro-Magnetic Interference characteristics

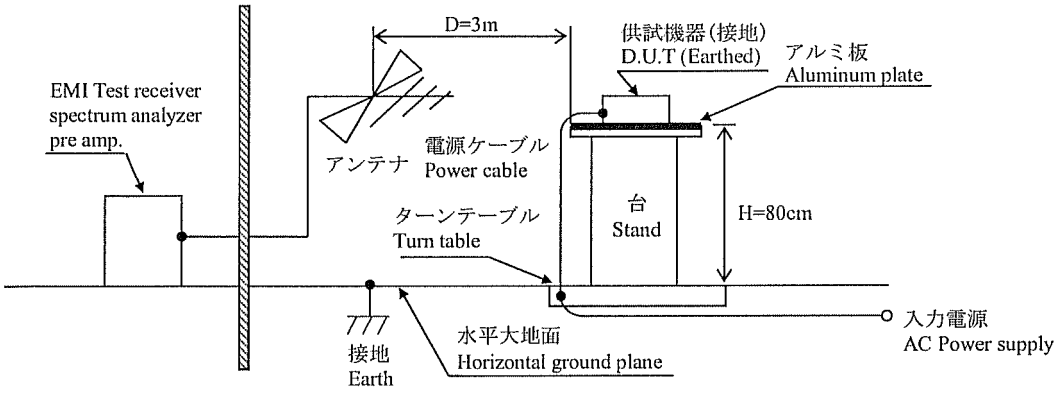
(a) 雑音端子電圧 (帰還ノイズ)

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	YOKOGAWA ELECT.	DLM2054
2	DIGITAL MULTIMETER	AGILENT	34405A/34410A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110 / WT210
4	CURRENT PROBE	YOKOGAWA ELECT.	701930 / 701933
5	DYNAMIC DUMMY LOAD	CHROMA	63640
6	DUMMY LOAD	CHROMA	63640
7	ISOLATION TRANS	TOUZHONG	BJZ-3KVA
8	CVCF	KIKUSUI	PCR2000LE
9	CVCF	KIKUSUI	PCR3000LE
10	CVCF	CHROMA	61605
11	LEAKAGE CURRENT METER	SIMPSON	228
12	CONTROLLED TEMP. CHAMBER	ESPEC	SU-661 / SH-661
13	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI-03
14	PRE AMP.	AGILENT	8447D
15	AMN	SCHWARZBECK	NNLK8121
16	ANTENNA	SCHWARZBECK	VULB9168
17	HARMONIC / FLICKER ANALYZER	SCHAFFNER	CCN100-1

1.3 評価負荷条件　　Load conditions

*入力電圧が110VAC以下の場合、下記のとおり出力ディレーティングが必要です。
Output derating is needed when input voltage is less than 110VAC.

Output voltage : 5V

Vin	Iout: Full load	5V
85VAC	90%	12.6A
90 - 265VAC	100%	14A

Output voltage : 12V, 24V

Vin	Iout: Full load	12V	24V
85VAC	80%	6.8A	3.6A
100VAC	92%	7.82A	4.14A
110 - 265VAC	100%	8.5A	4.5A

2. 特性データ　Characteristics

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 ℃

Iout \ Vin	90VAC	100VAC	200VAC	265VAC	line regulation	
0%	5.048V	5.048V	5.048V	5.048V	0mV	0.000%
50%	5.043V	5.043V	5.043V	5.043V	0mV	0.000%
Full load	5.032V	5.032V	5.032V	5.032V	0mV	0.000%
Load regulation	16mV	16mV	16mV	16mV		
	0.320%	0.320%	0.320%	0.320%		

2. Temperature drift　Conditions　Vin : 100 VAC, Iout : Full load

Ta	-10℃	+25℃	+40℃	temperature stability	
Vout	5.039V	5.032V	5.025V	14mV	0.280%

3. Start up voltage and Drop out voltage　Conditions　Ta :　25 ℃, Iout :　100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	74VAC

12V

1. Regulation - line and load　Condition　Ta :　25 ℃

Iout \ Vin	100VAC	110VAC	200VAC	265VAC	line regulation	
0%	12.019V	12.019V	12.019V	12.019V	0mV	0.000%
50%	12.015V	12.016V	12.015V	12.016V	1mV	0.008%
Full load	12.010V	12.009V	12.009V	12.009V	0mV※1	0.000%
Load regulation	9mV	10mV	10mV	10mV		
	0.075%	0.083%	0.083%	0.083%		

2. Temperature drift　Conditions　Vin : 110 VAC, Iout : Full load

Ta	-10℃	+25℃	+40℃	temperature stability	
Vout	12.024V	12.009V	12.000V	24mV	0.200%

3. Start up voltage and Drop out voltage　Conditions　Ta :　25 ℃, Iout :　100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	74VAC

24V

1. Regulation - line and load　Condition　Ta :　25 ℃

Iout \ Vin	100VAC	110VAC	200VAC	265VAC	line regulation	
0%	24.052V	24.052V	24.052V	24.052V	0mV	0.000%
50%	24.049V	24.049V	24.048V	24.048V	1mV	0.004%
Full load	24.047V	24.046V	24.046V	24.046V	0mV※1	0.000%
Load regulation	5mV	6mV	6mV	6mV		
	0.021%	0.025%	0.025%	0.025%		

2. Temperature drift　Conditions　Vin : 110 VAC, Iout : Full load

Ta	-10℃	+25℃	+40℃	temperature stability	
Vout	24.064V	24.046V	24.030V	34mV	0.142%

3. Start up voltage and Drop out voltage　Conditions　Ta :　25 ℃, Iout :　100%

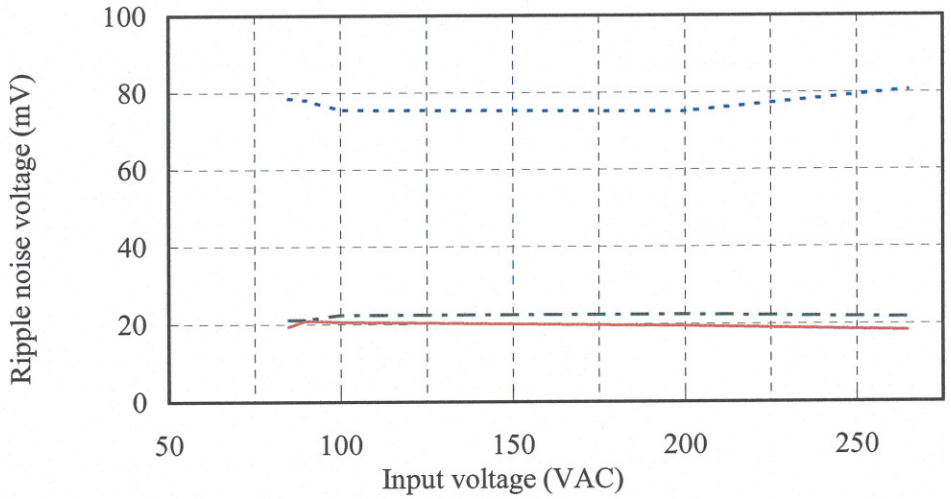
Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	74VAC

※1　Line regulation (12V,24V) : 110VAC - 265VAC

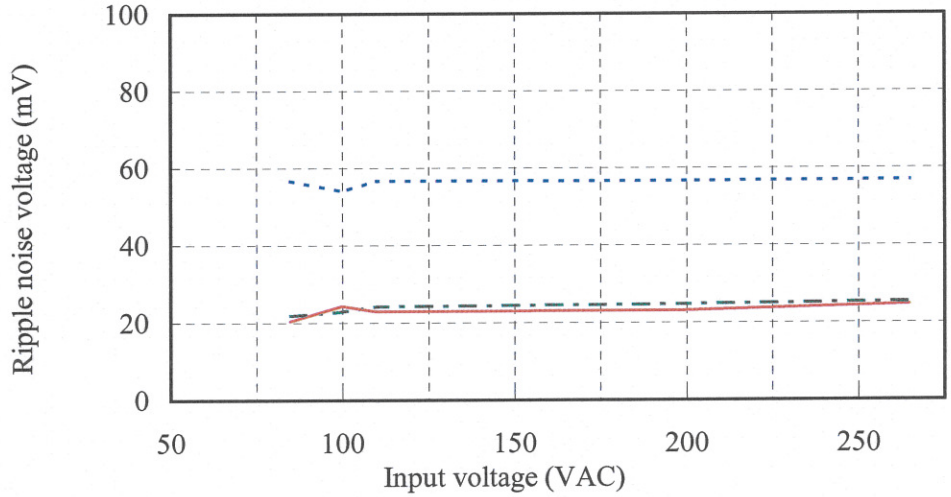
(2) リップルノイズ電圧対入力電圧
Ripple noise voltage vs. Input voltage

Conditions Iout : Full load
Ta : -10 ℃
25 ℃
40 ℃

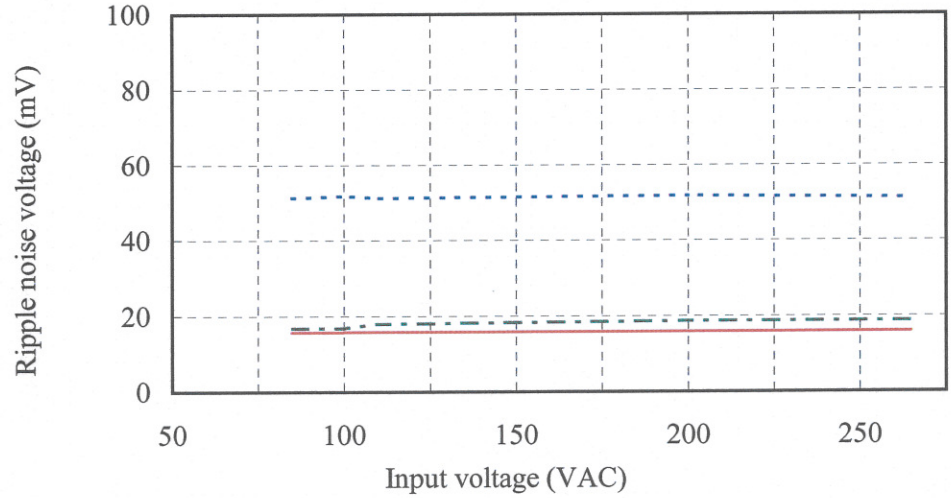
5V



12V



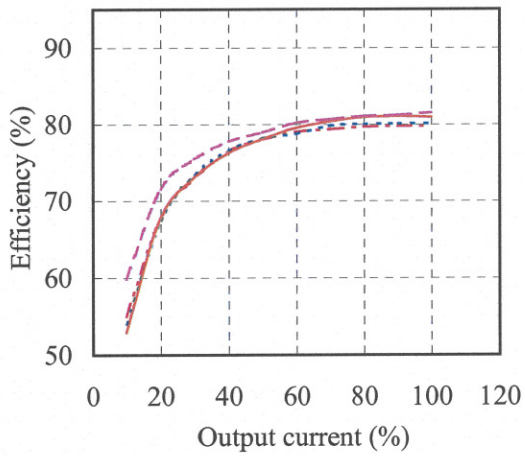
24V

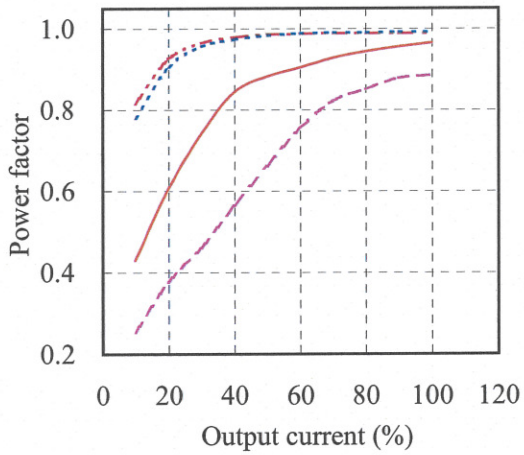


(3) 効率・力率対出力電流
Efficiency and Power factor vs. Output current

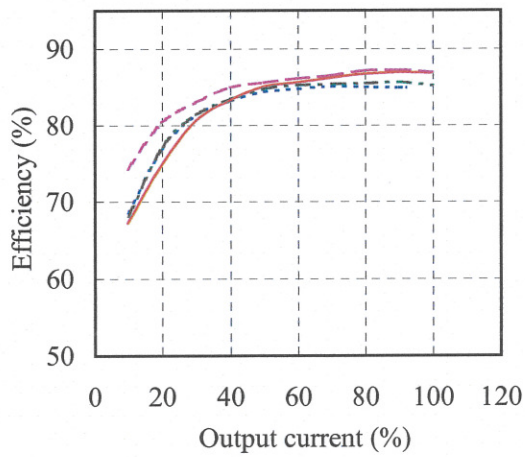
Conditions Vin : 90 VAC
100 VAC
110 VAC
200 VAC
265 VAC
Ta : 25 ℃

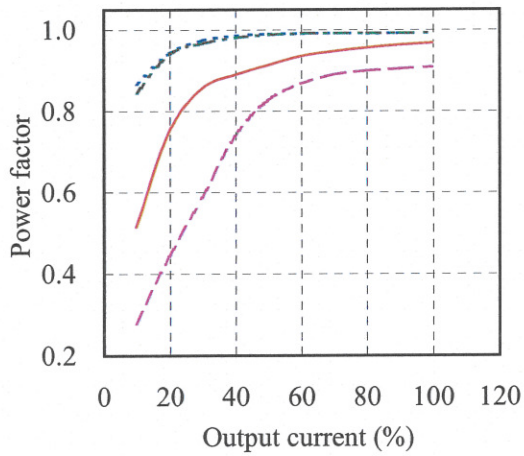
5V



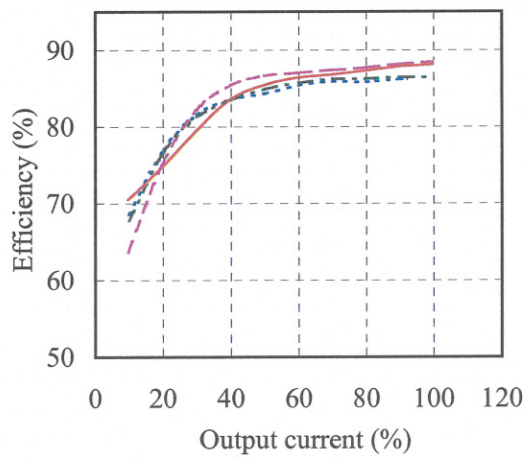


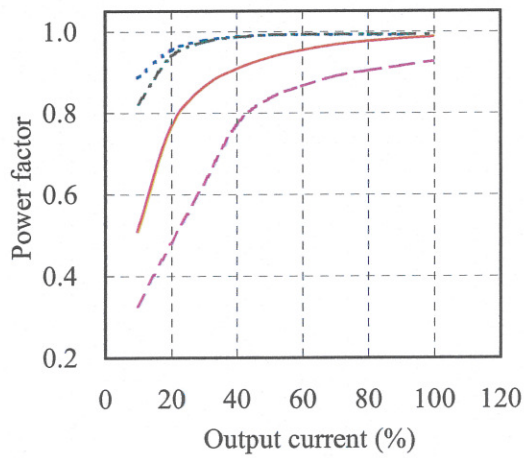
12V





24V



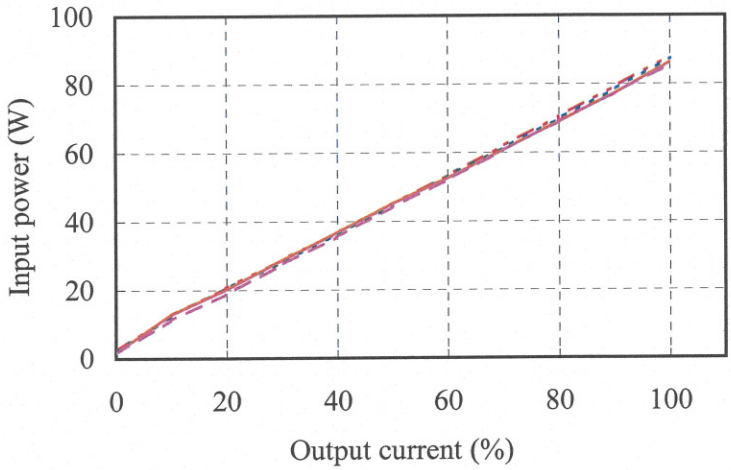


(4) 入力電力対出力電流
Input power vs. Output current

Conditions Vin : 90 VAC
100 VAC
110 VAC
200 VAC
265 VAC
Ta : 25 ℃

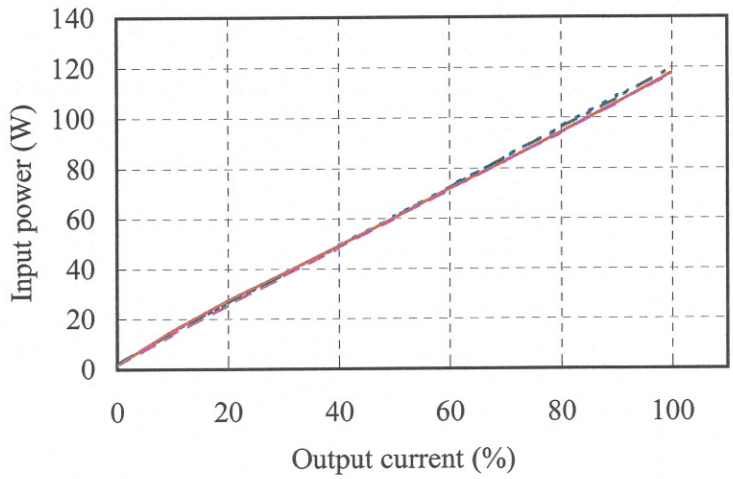
5V

Vin	Input power
	Iout : 0%
90VAC	2.2W
100VAC	1.9W
200VAC	1.7W
265VAC	1.5W



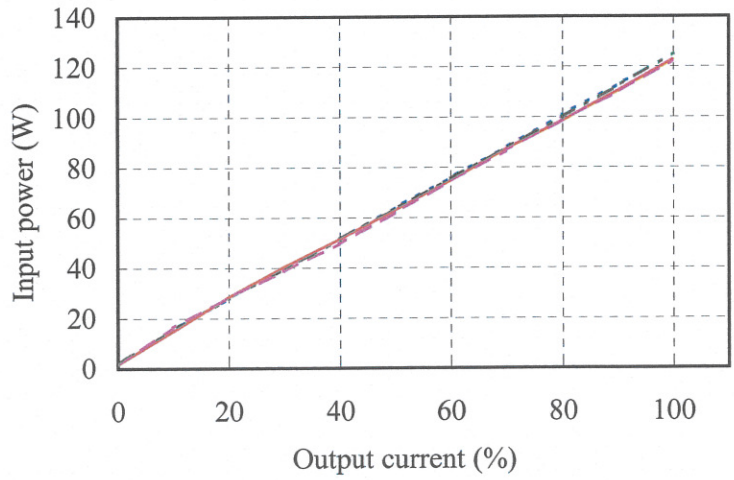
12V

Vin	Input power
	Iout : 0%
100VAC	1.8W
110VAC	1.8W
200VAC	1.5W
265VAC	1.3W



24V

Vin	Input power
	Iout : 0%
100VAC	1.9W
110VAC	1.9W
200VAC	1.7W
265VAC	1.4W

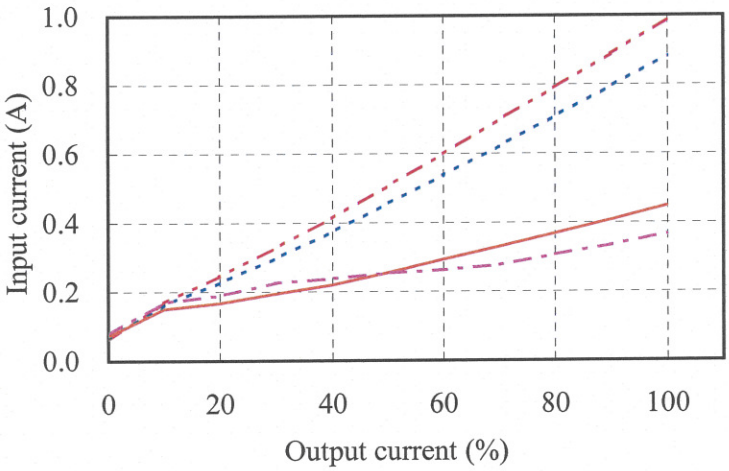


(5) 入力電流対出力電流
Input current vs. Output current

Conditions Vin : 90 VAC
100 VAC
110 VAC
200 VAC
265 VAC
Ta : 25 ℃

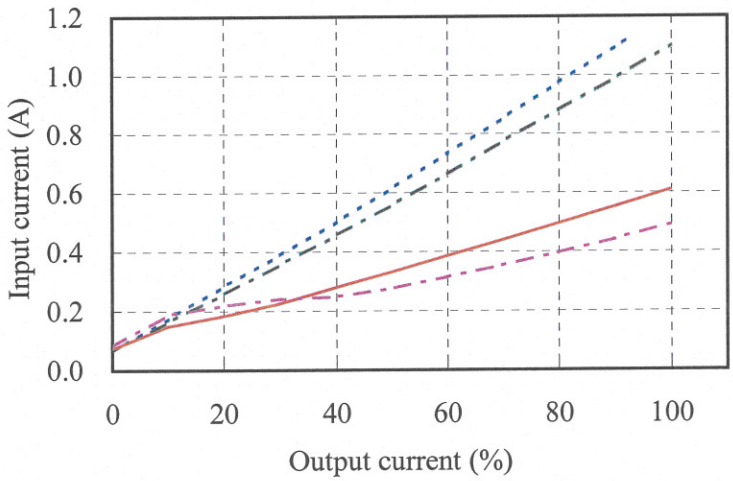
5V

Vin	Input current Iout : 0%
90VAC	0.06A
100VAC	0.07A
200VAC	0.07A
265VAC	0.08A



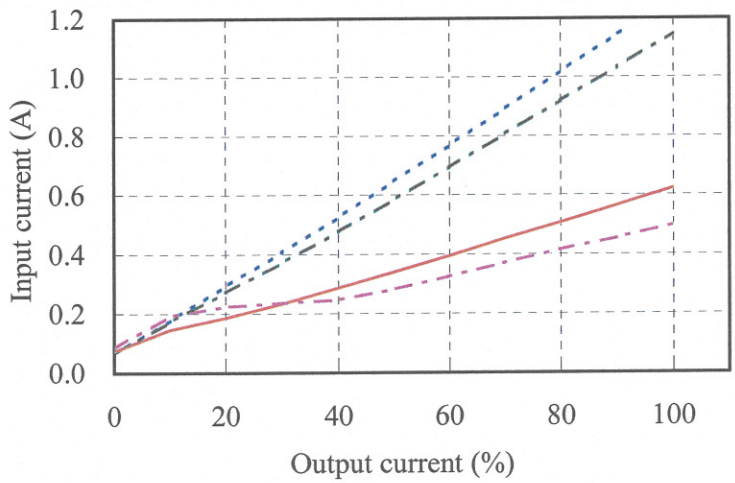
12V

Vin	Input current Iout : 0%
100VAC	0.06A
110VAC	0.07A
200VAC	0.07A
265VAC	0.08A



24V

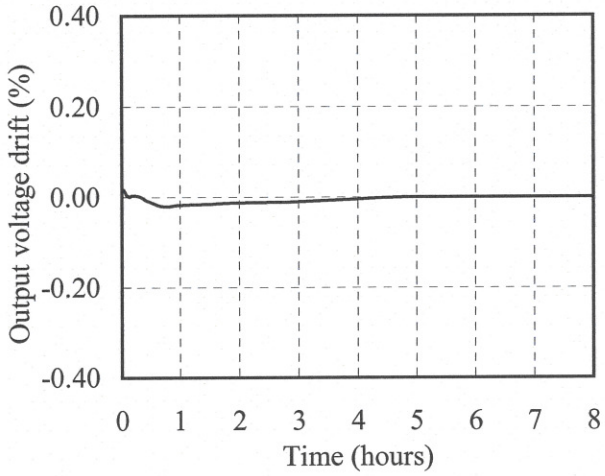
Vin	Input current Iout : 0%
100VAC	0.07A
110VAC	0.07A
200VAC	0.07A
265VAC	0.08A



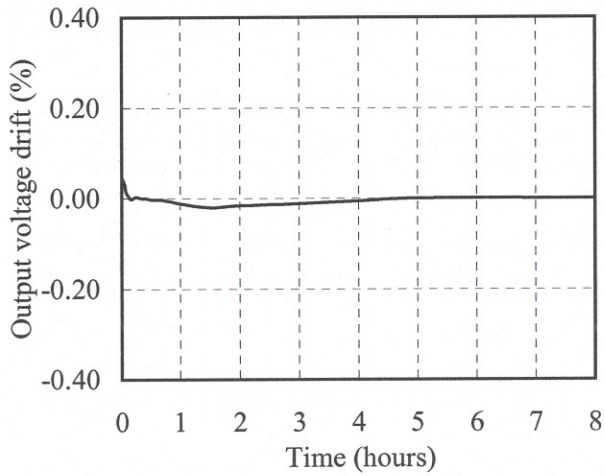
2.2 通電ドリフト特性
Warm up voltage drift characteristics

Conditions Vin : 110 VAC
Iout : Full load
Ta : 25 ℃

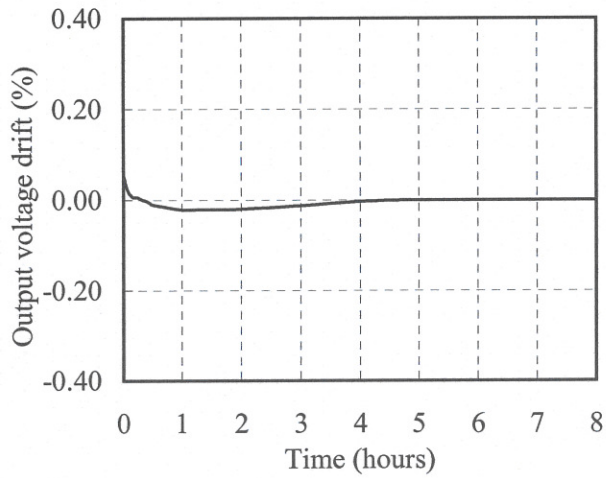
5V



12V

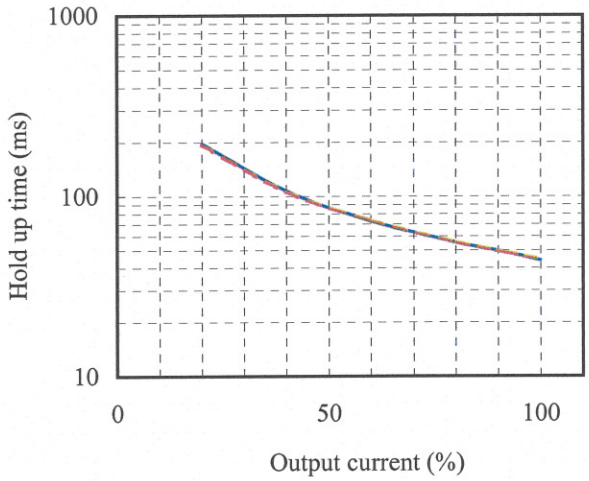


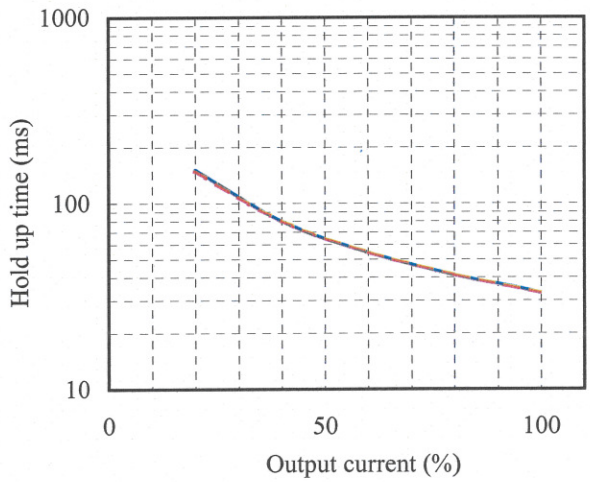
24V

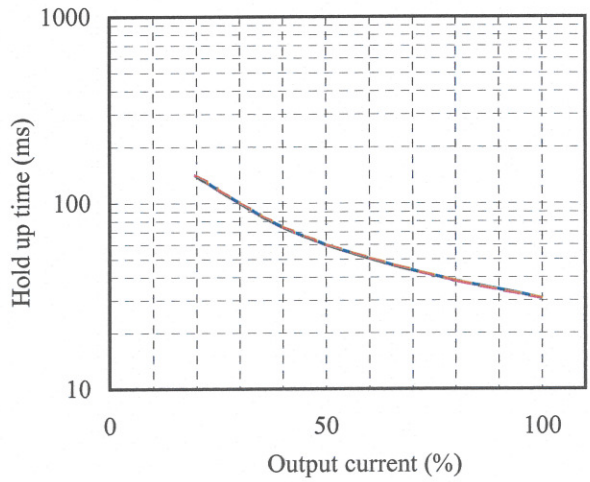


2.3 出力保持時間特性
Hold up time characteristics

Conditions Vin : 110 VAC
200 VAC
Ta : 25 ℃





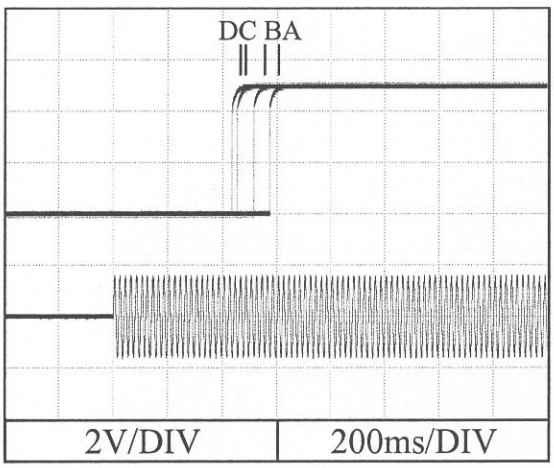


2.4 出力立ち上がり特性
Output rise characteristics

Conditions Vin : 100 VAC (A)
110 VAC (B)
200 VAC (C)
265 VAC (D)
Ta : 25 ℃

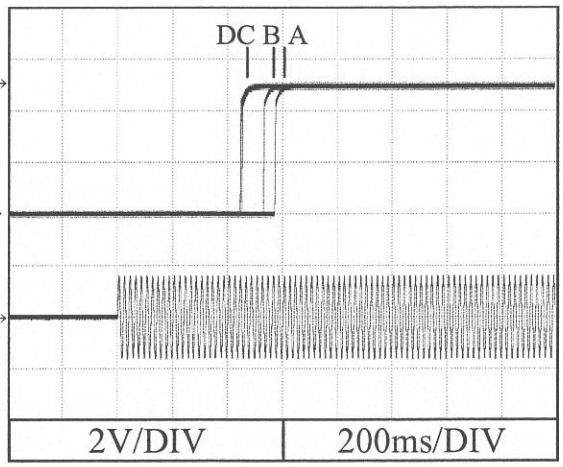
5V

Iout : 0%



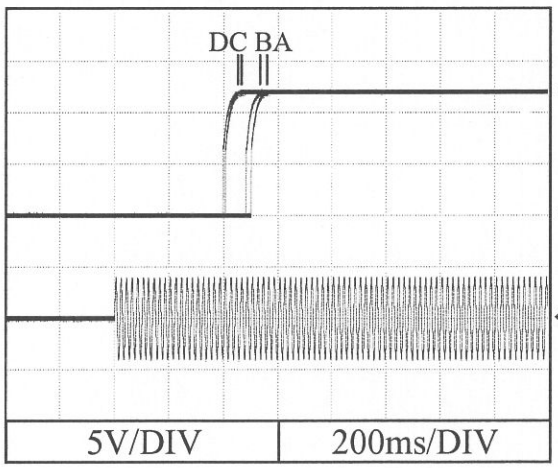
← Vout →
← 0V →
← Vin →

Iout:Full load



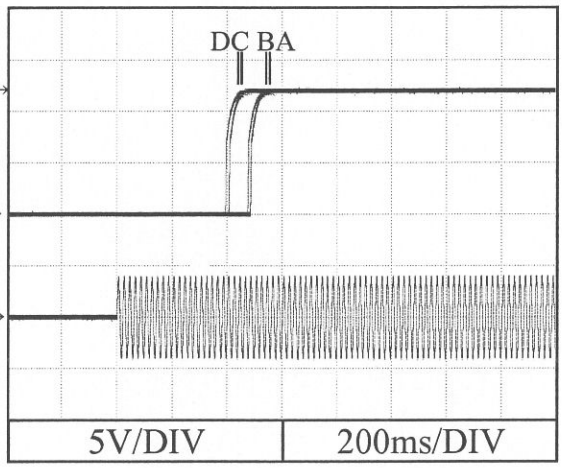
12V

Iout : 0%



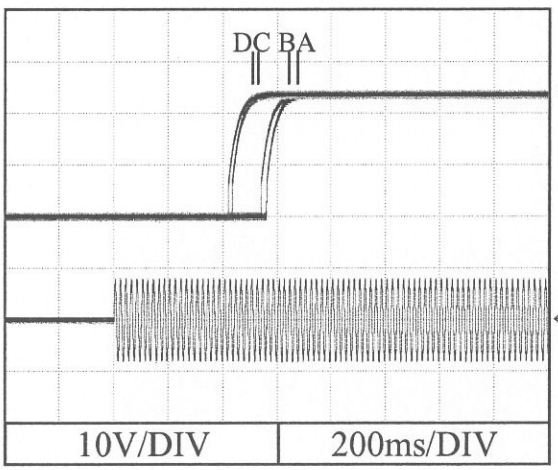
← Vout →
← 0V →
← Vin →

Iout:Full load



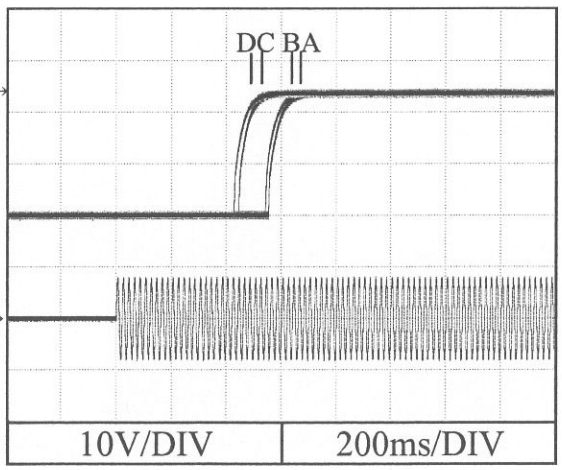
24V

Iout : 0%



← Vout →
← 0V
← Vin →

Iout:Full load

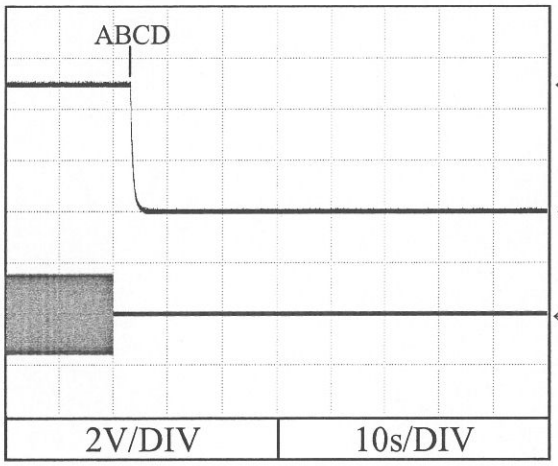


2.5 出力立ち下がり特性
Output fall characteristics

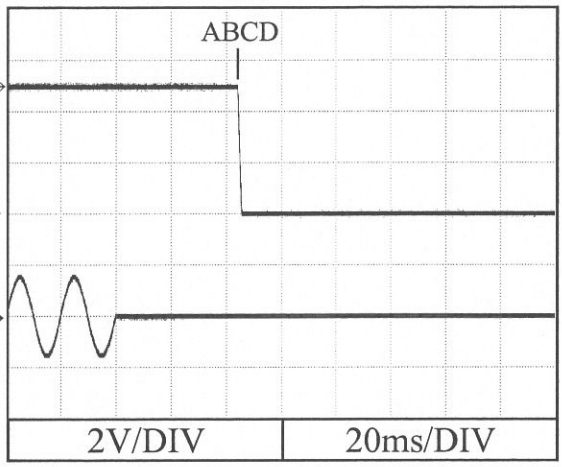
Conditions Vin : 100 VAC (A)
110 VAC (B)
200 VAC (C)
265 VAC (D)
Ta : 25 ℃

5V

Iout : 0%

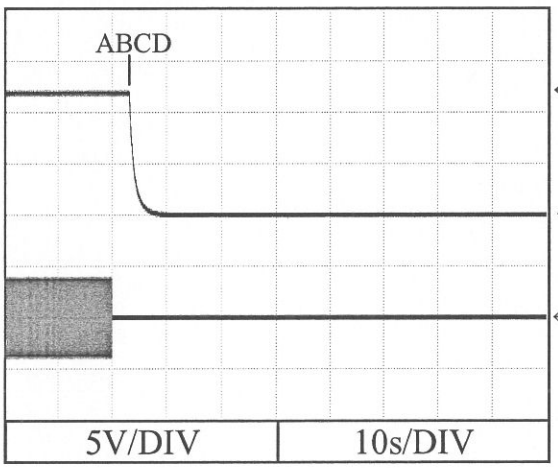


Iout:Full load

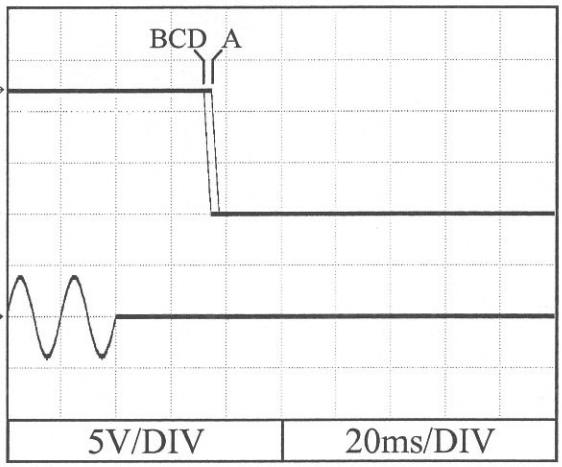


12V

Iout : 0%

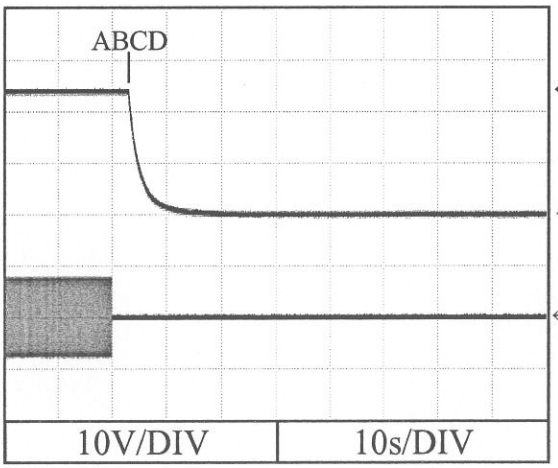


Iout : 92%(A) , 100%(B-D)

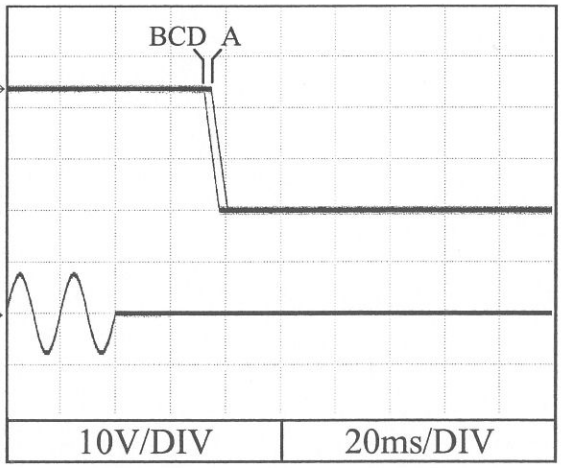


24V

Iout : 0%



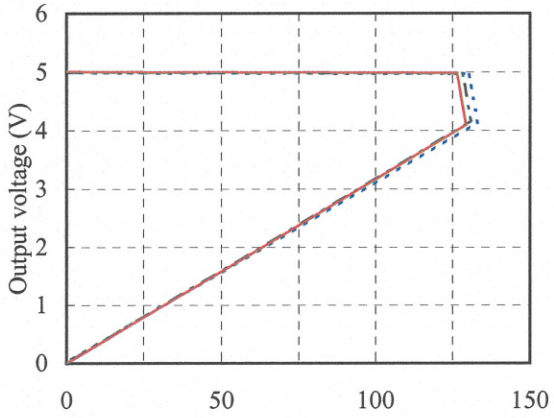
Iout : 92%(A) , 100%(B-D)



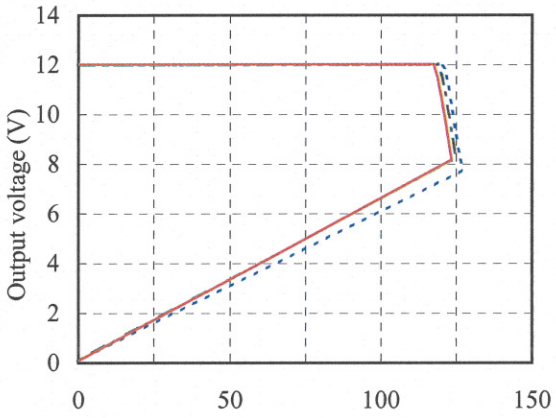
2. 6 過電流保護特性
Over current protection (OCP) characteristics

Conditions Vin : 110 VAC
Ta : -10 ℃
25 ℃
40 ℃

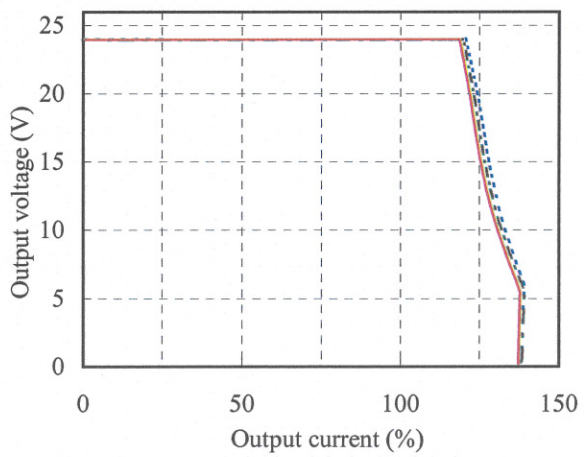
5V



12V

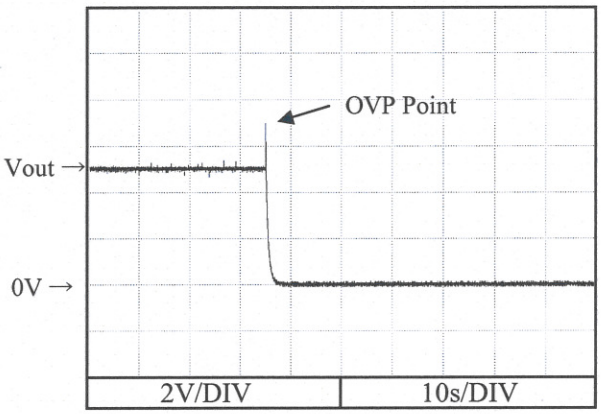


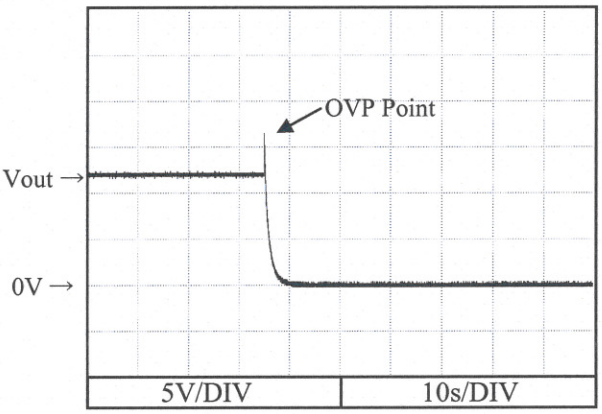
24V

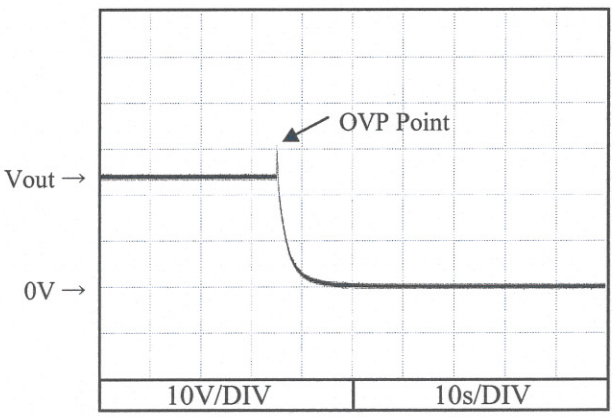


2. 7 過電圧保護特性
Over voltage protection (OVP) characteristics

Conditions Vin : 100 VAC
Iout : 0 %
Ta : 25 ℃



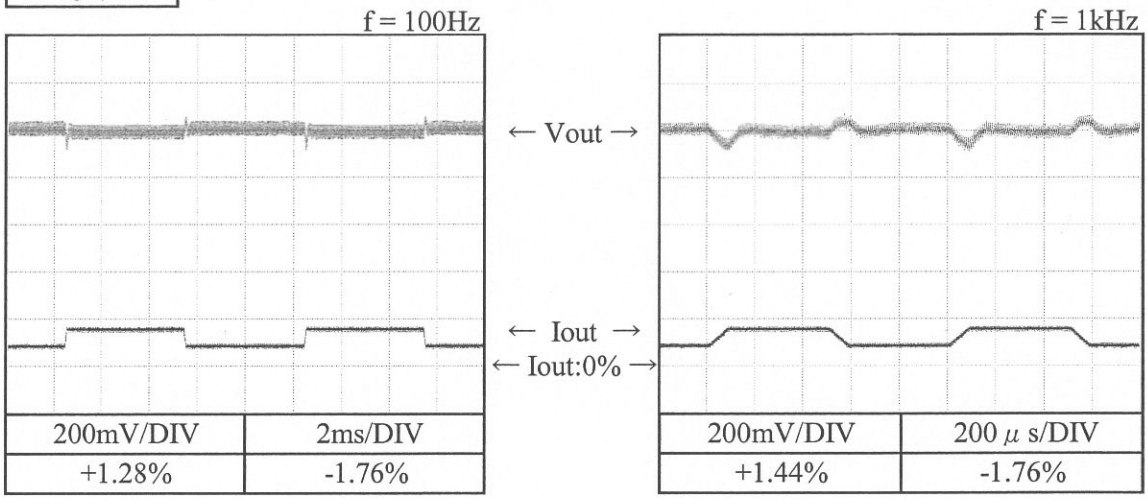




2.8 過渡応答（負荷急変）特性
Dynamic load response characteristics

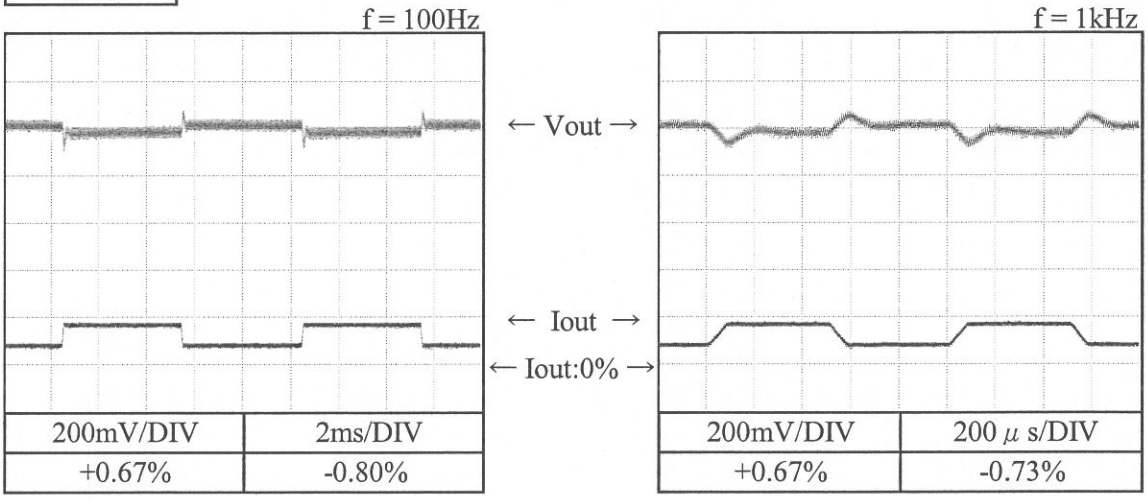
Conditions Vin : 110 VAC
Iout : 50 % ↔ 100 %
(tr = tf = 50us)
Ta : 25 ℃

5V



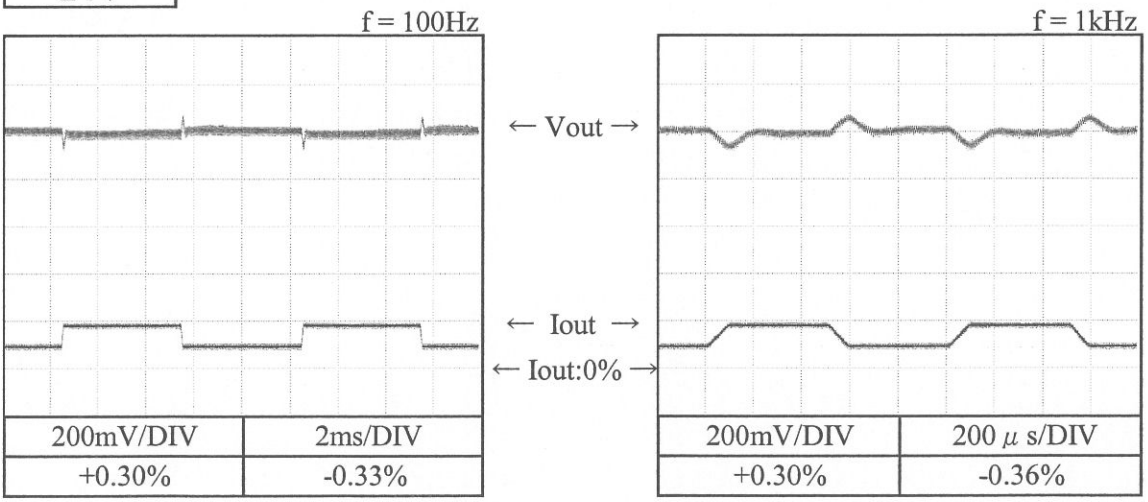
200mV/DIV	2ms/DIV	200mV/DIV	200 μ s/DIV
+1.28%	-1.76%	+1.44%	-1.76%

12V



200mV/DIV	2ms/DIV	200mV/DIV	200 μ s/DIV
+0.67%	-0.80%	+0.67%	-0.73%

24V



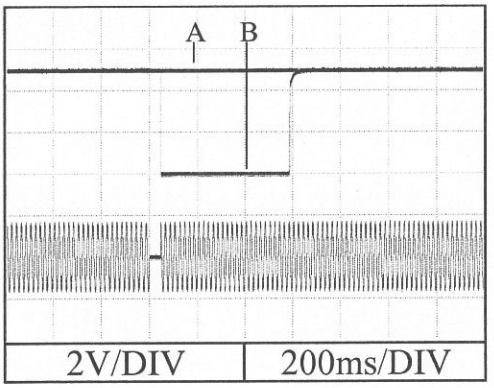
200mV/DIV	2ms/DIV	200mV/DIV	200 μ s/DIV
+0.30%	-0.33%	+0.30%	-0.36%

2.9 入力電圧瞬停特性
Response to brown out characteristics

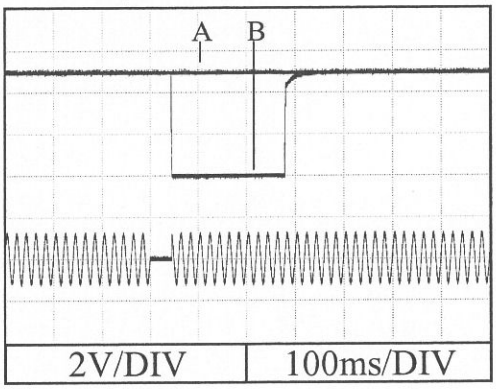
Conditions Ta : 25 ℃
Iout : Full load

5V

Vin : 110VAC
A = 44ms, B = 45ms

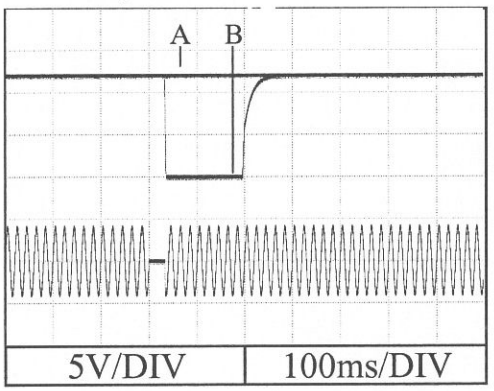


Vin : 200VAC
A = 45ms, B = 46ms

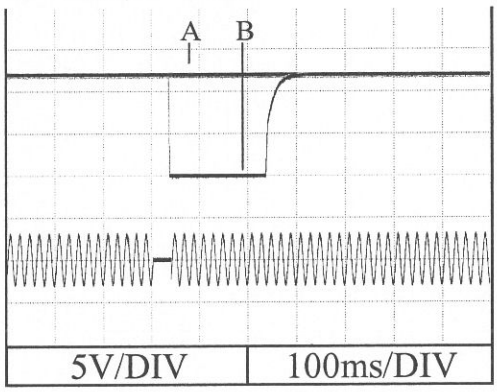


12V

Vin : 110VAC
A = 33ms, B = 34ms

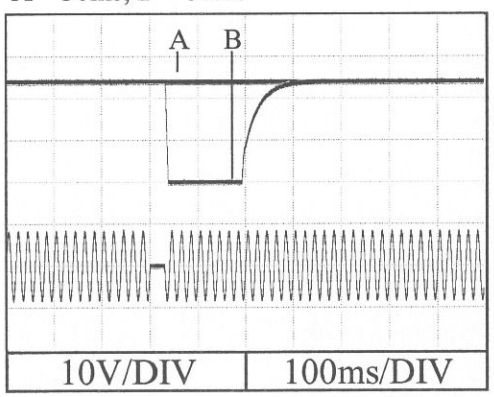


Vin : 200VAC
A = 33ms, B = 34ms

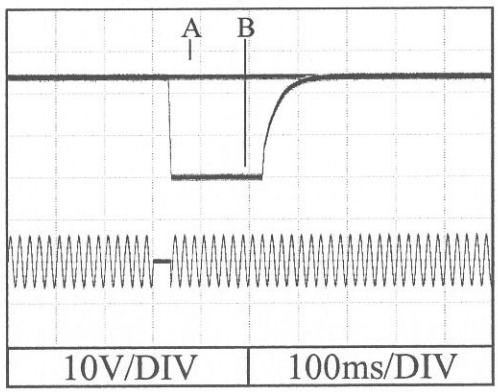


24V

Vin : 110VAC
A = 30ms, B = 31ms



Vin : 200VAC
A = 31ms, B = 32ms

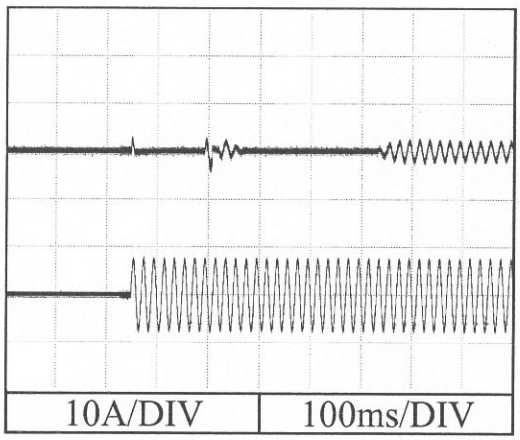


2.10 入力サージ電流（突入電流）波形
Inrush current waveform

24V

Conditions Vin : 100 VAC
Iout : Full load
Ta : 25 ℃

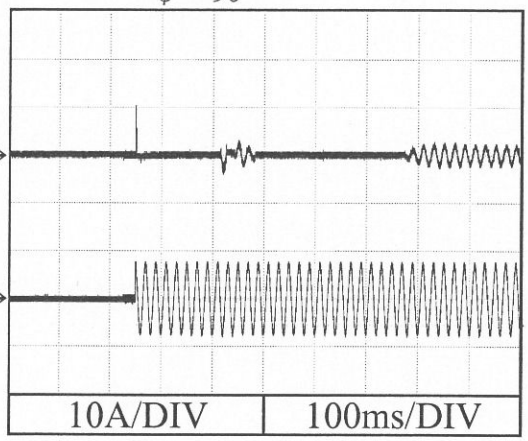
Switch on phase angle of input AC voltage
ϕ = 0°



← Iin →

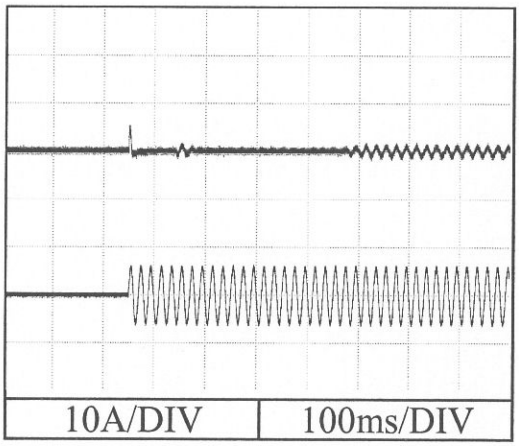
← Vin →

Switch on phase angle of input AC voltage
ϕ = 90°



Conditions Vin : 200 VAC
Iout : Full load
Ta : 25 ℃

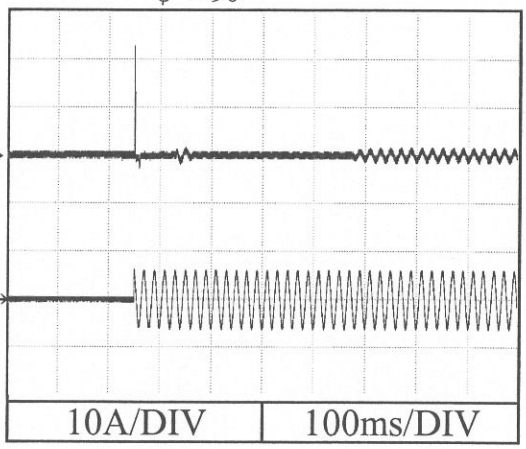
Switch on phase angle of input AC voltage
ϕ = 0°



← Iin →

← Vin →

Switch on phase angle of input AC voltage
ϕ = 90°

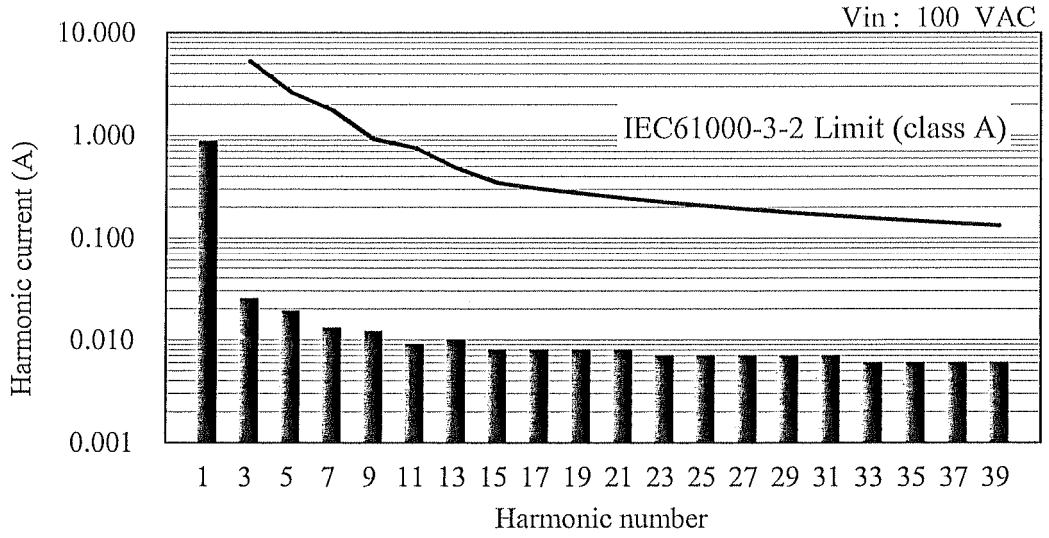


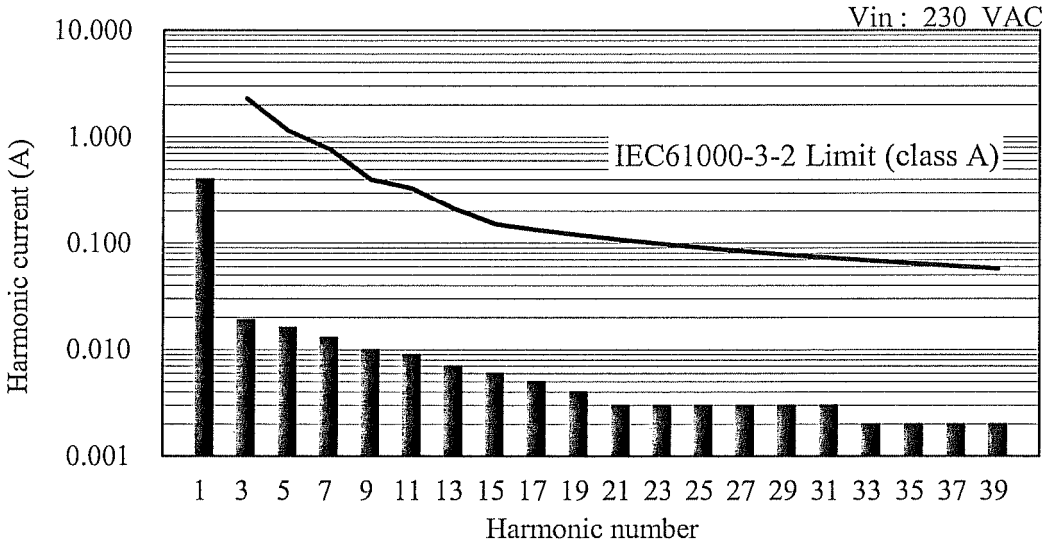
2.11 高調波成分

Input current harmonics

Conditions Iout : Full load
Ta : 25 ℃

5V



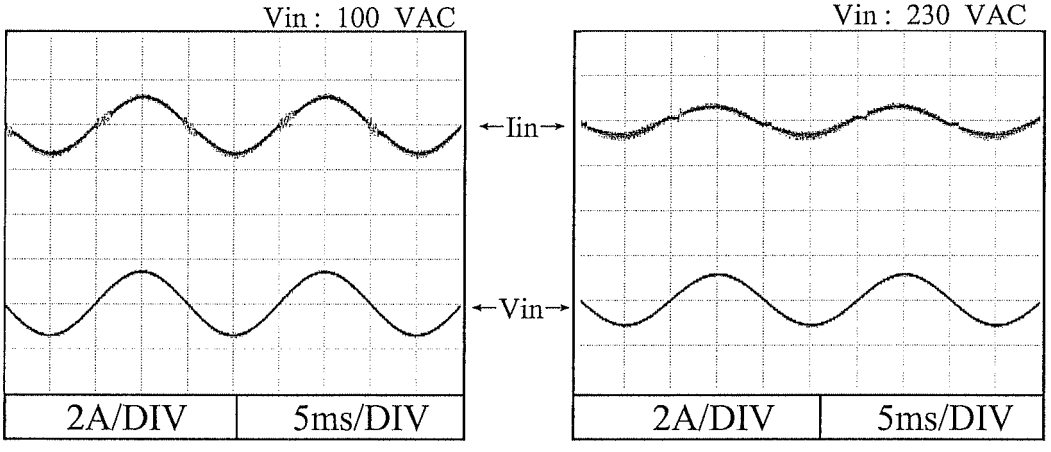


2.12 入力電流波形

Input current waveform

Conditions Iout : Full load
Ta : 25 ℃

5V

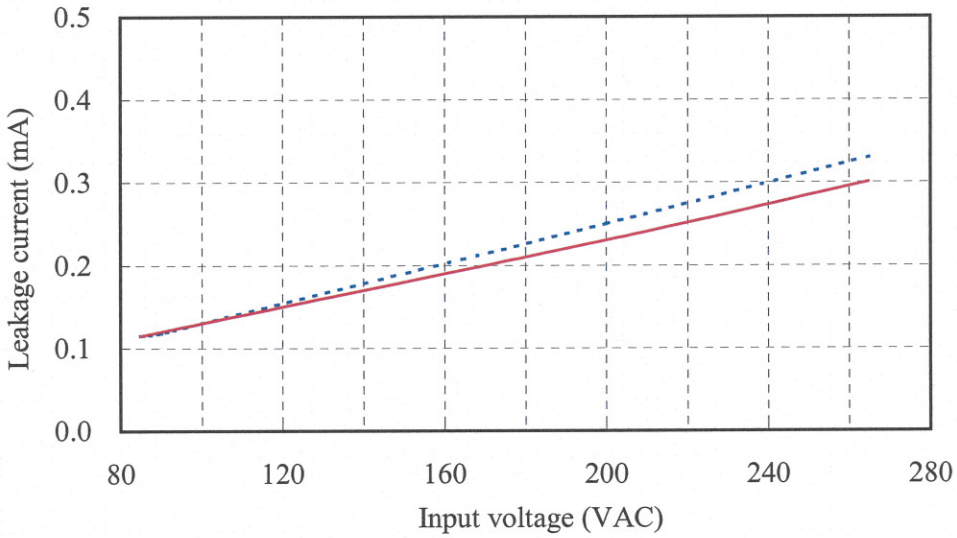


2.13 リーク電流特性
Leakage current characteristics

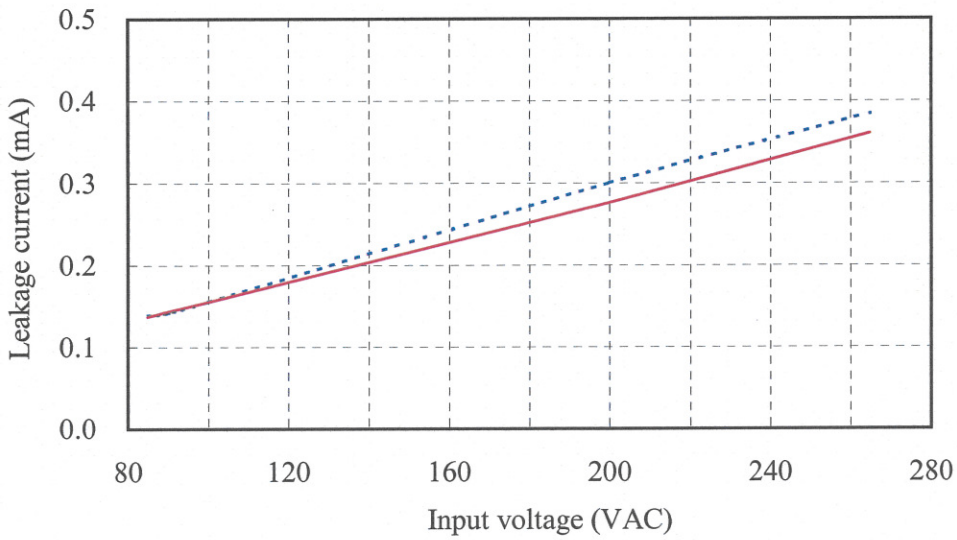
Conditions Iout : 0 %
Full Load
Ta : 25 ℃
Equipment used : MODEL 228
(Simpson)

5V

f : 50 Hz



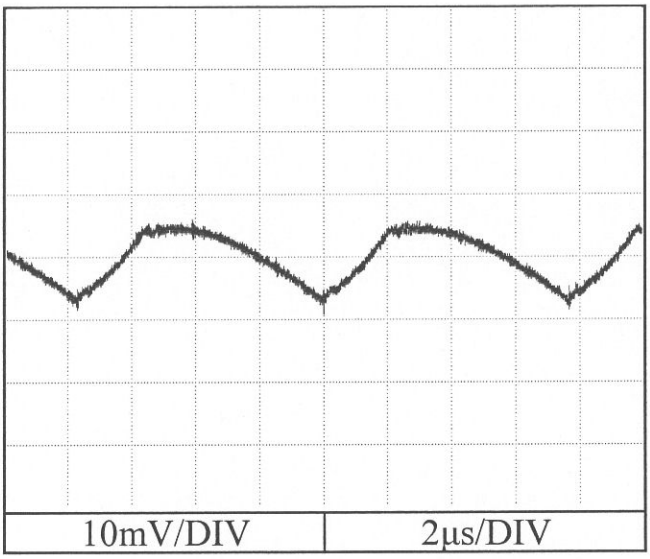
f : 60 Hz



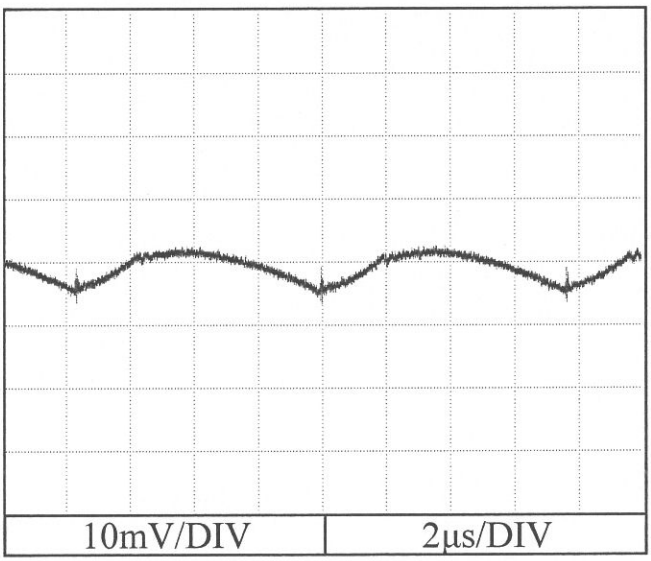
2. 14 出力リップル、ノイズ波形
Output ripple and noise waveform

Conditions Vin : 110 VAC
Iout : Full load
Ta : 25 ℃

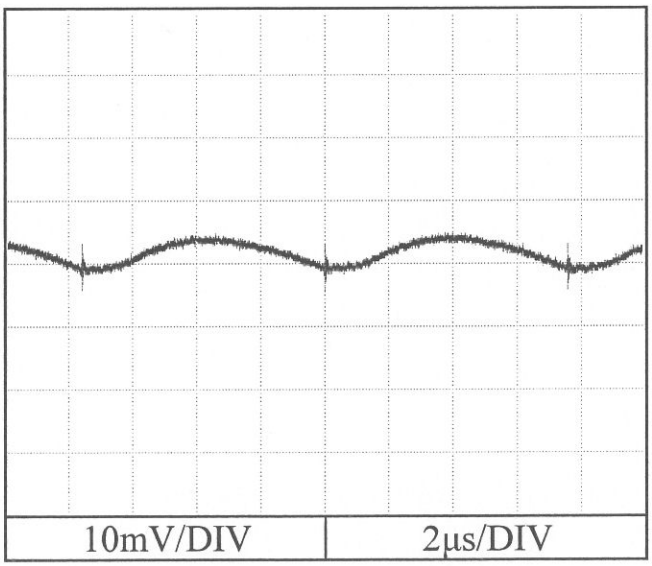
5V



12V



24V



2. 15 ＥＭＩ特性

Electro-Magnetic Interference characteristics

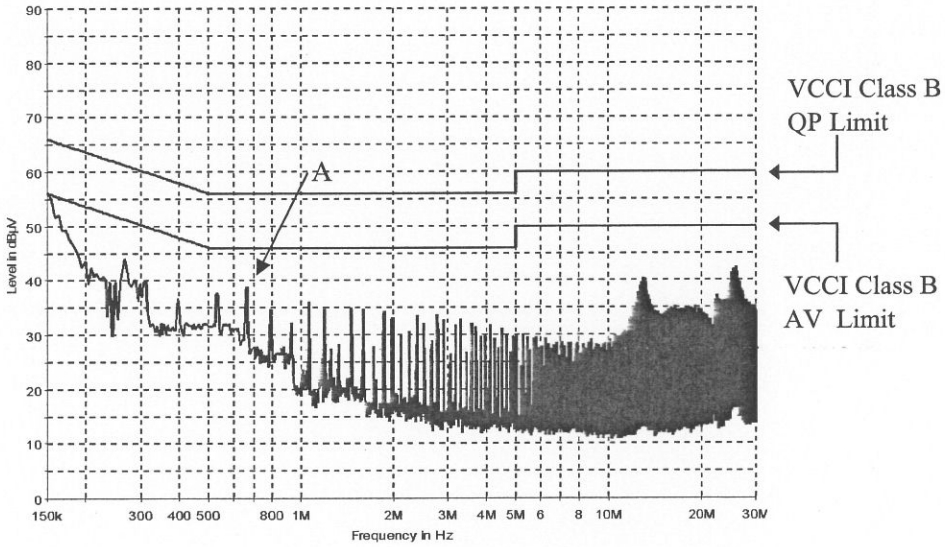
Conditions Vin : 230 VAC
Iout : Full load
Ta : 25 ℃

雑音端子電圧

Conducted Emission

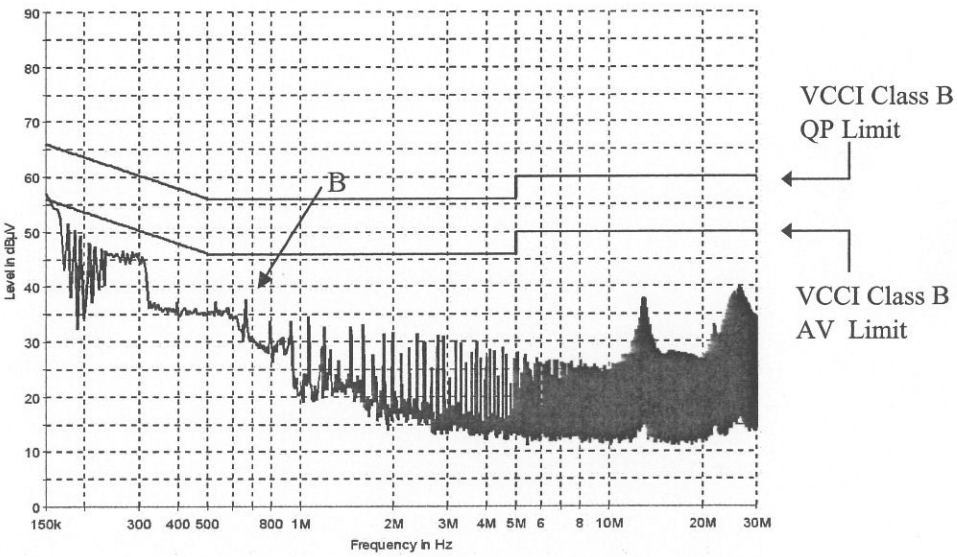
5V

Phase : N



Ref. Data	Point A (664kHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	39.5
AV	46.0	39.5

Phase : L



Ref. Data	Point B (664kHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	40.1
AV	46.0	40.0

EN55011-B,EN55022-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55022-B,FCC-B are same as its VCCI class B.

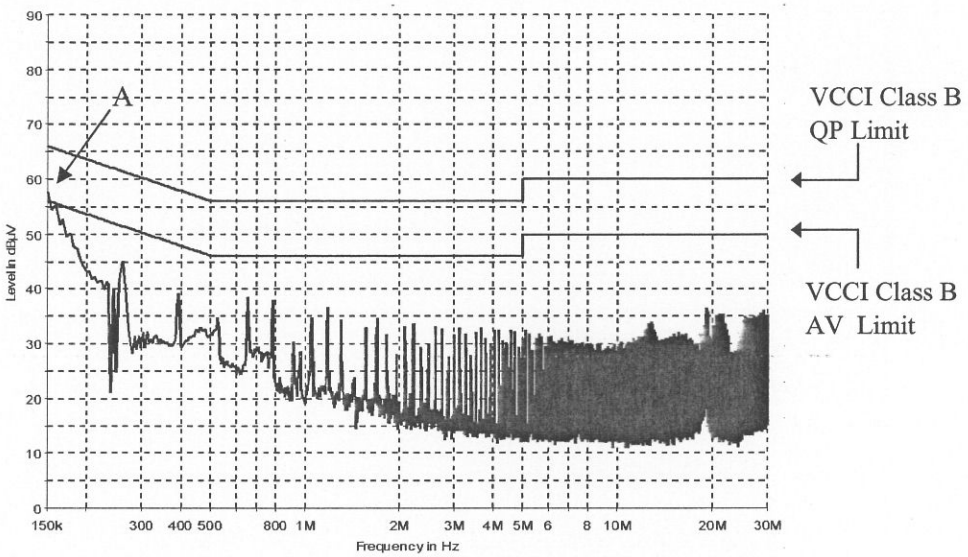
2. 15 ＥＭＩ特性
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
Iout : Full load
Ta : 25 ℃

雑音端子電圧
Conducted Emission

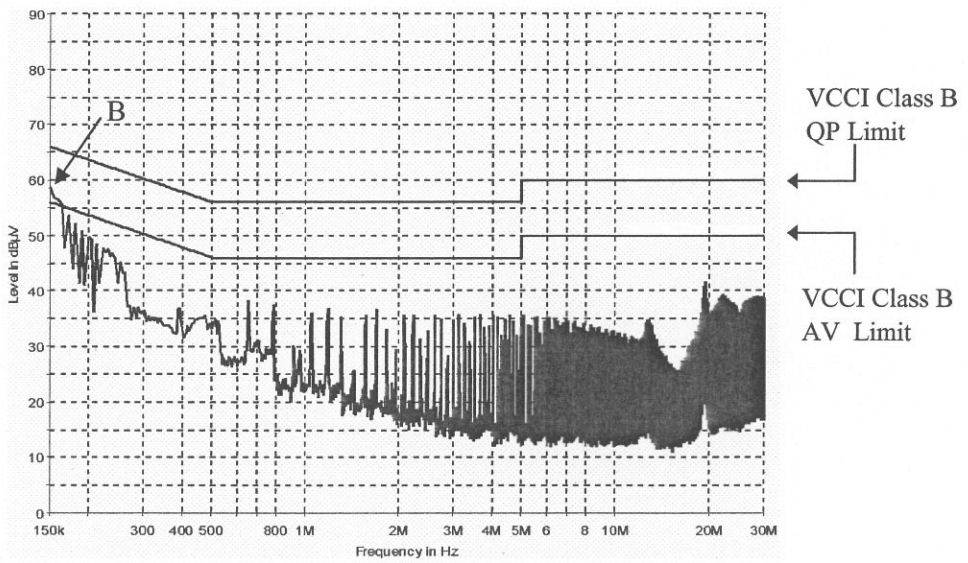
12V

Phase : N



Ref. Data	Point A (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	54.5
AV	56.0	32.1

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	54.8
AV	56.0	32.1

EN55011-B,EN55022-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55022-B,FCC-B are same as its VCCI class B.

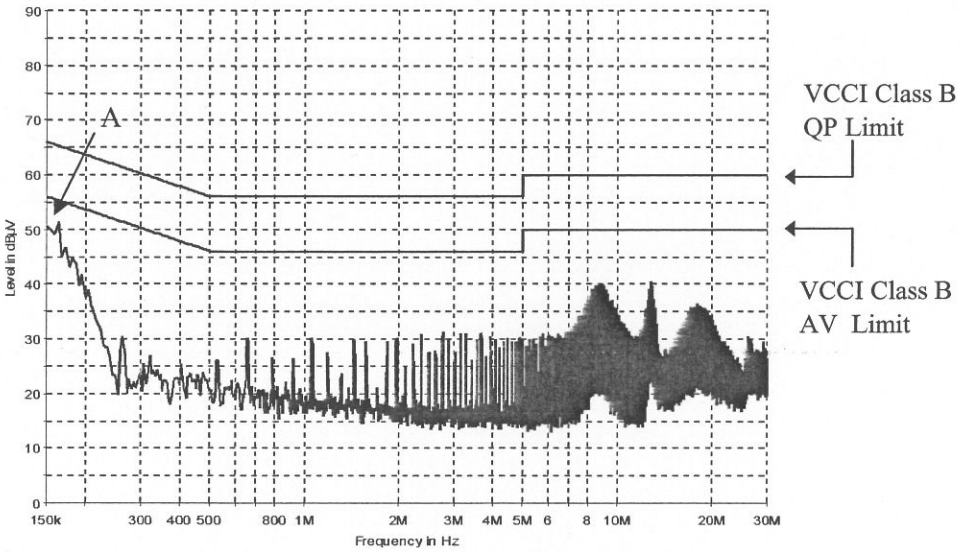
2. 15 ＥＭＩ特性
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
Iout : Full load
Ta : 25 ℃

雑音端子電圧
Conducted Emission

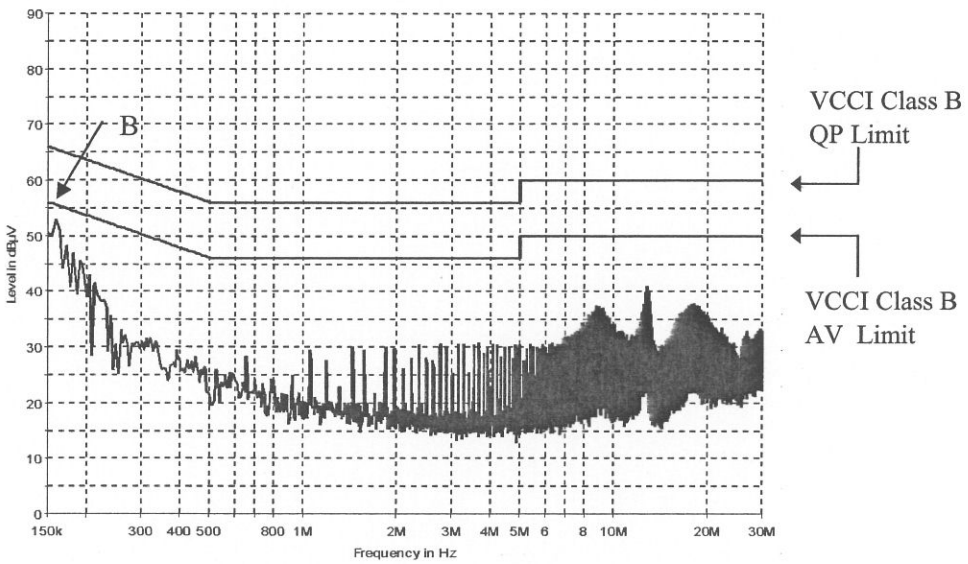
24V

Phase : N



Ref. Data	Point A (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	54.1
AV	56.0	31.6

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	54.7
AV	56.0	30.2

EN55011-B,EN55022-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55022-B,FCC-B are same as its VCCI class B.

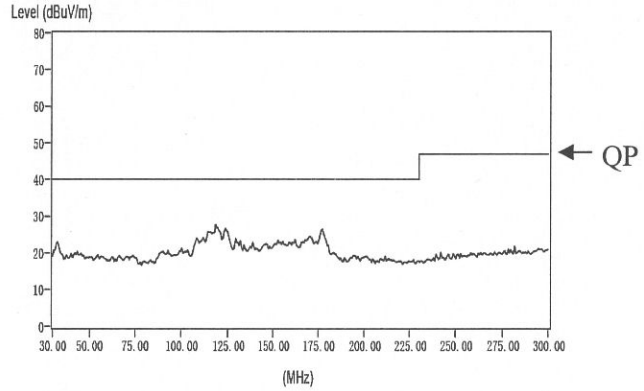
2.15 ＥＭＩ特性
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
Io : Full load
Ta : 25 ℃

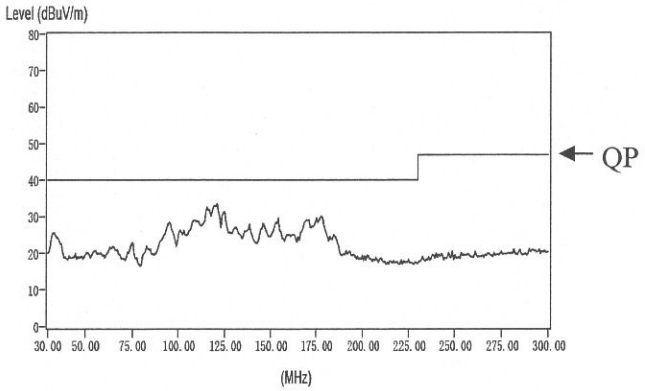
雑音電界強度
Radiated Emission

5V

HORIZONTAL

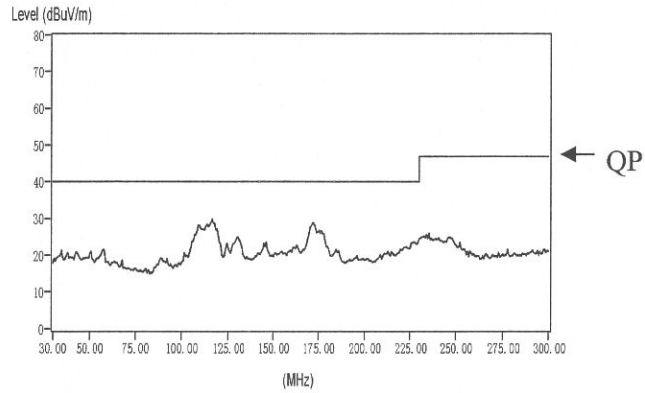


VERTICAL

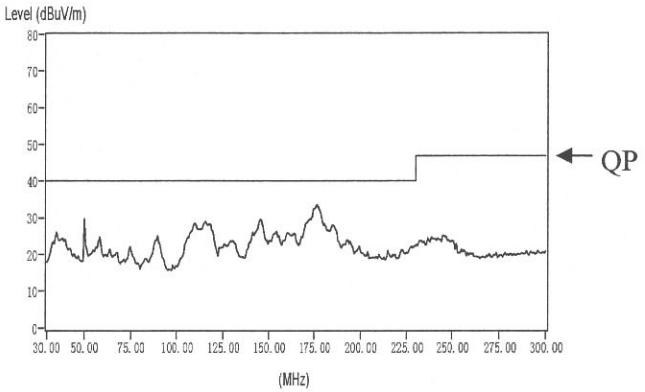


12V

HORIZONTAL

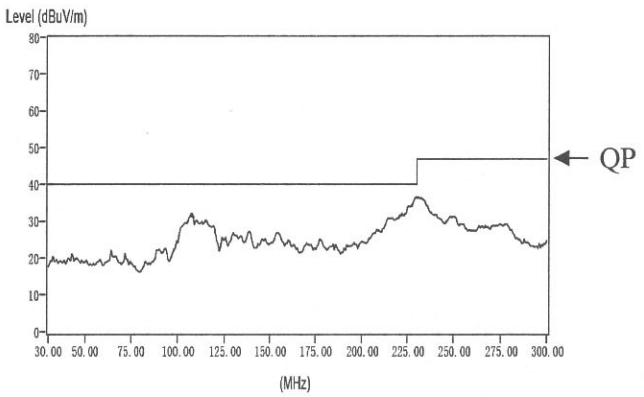


VERTICAL

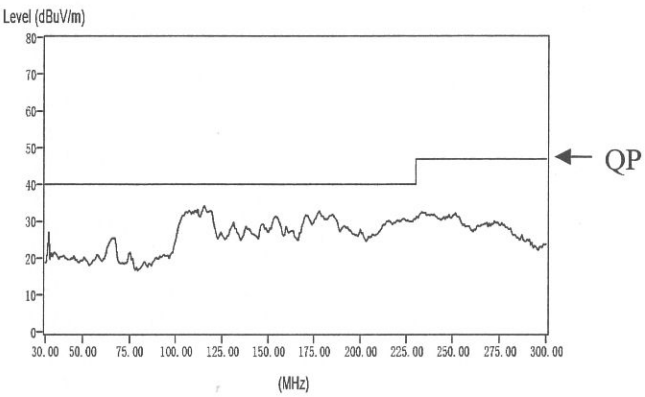


24V

HORIZONTAL



VERTICAL



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

表示はピーク値
Indication is peak values.