CME350A

EVALUATION DATA

型式データ

INDEX

2. 特性データ　Characteristics

使用記号　Terminology used

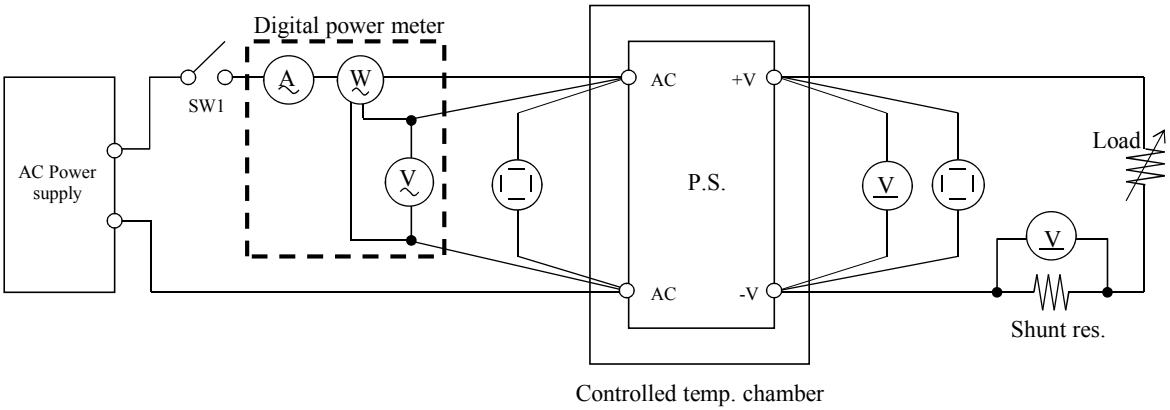
	定義　Definition
Vin	..... 入力電圧　Input voltage
Vout	..... 出力電圧　Output voltage
Iin	..... 入力電流　Input current
Iout	..... 出力電流　Output current
Ta	..... 周囲温度　Ambient temperature
f	..... 周波数　Frequency

1. 測定方法　Evaluation Method

1.1　測定回路　Circuit used for determination

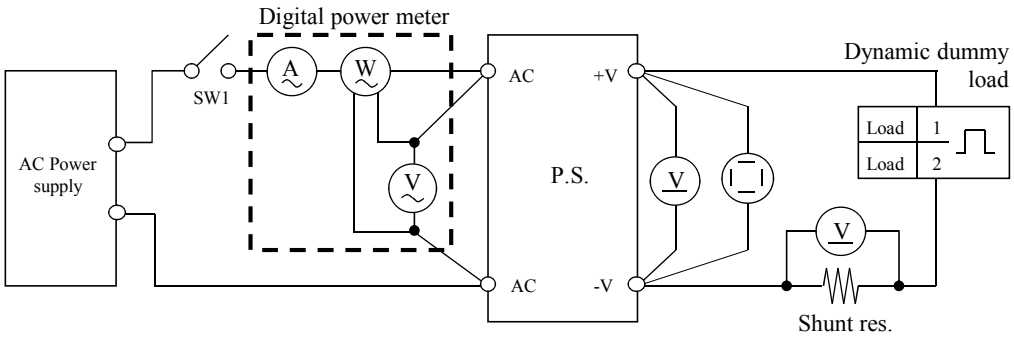
測定回路1 Circuit 1 used for determination

- ・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

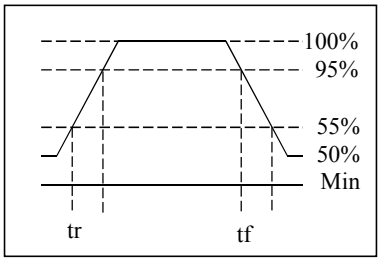


測定回路2 Circuit 2 used for determination

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

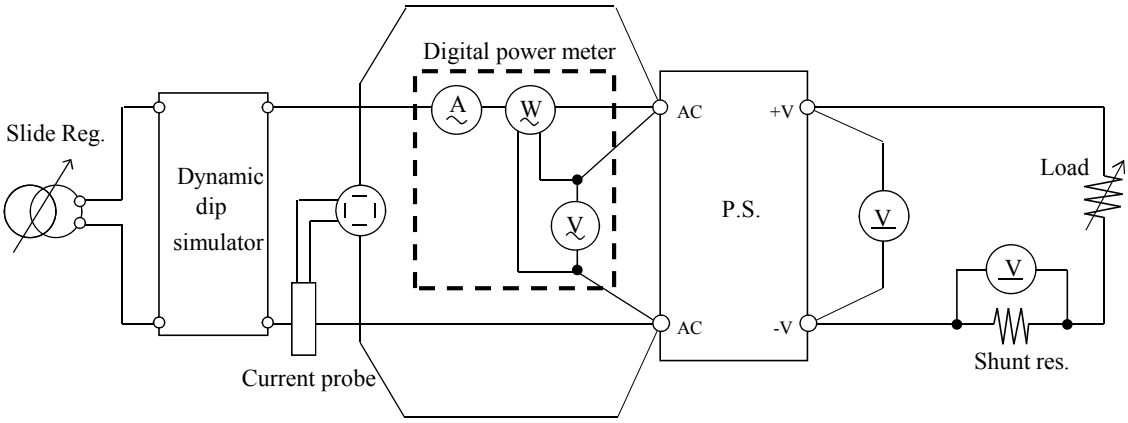


Output current waveform
Iout 50% <==> 100%



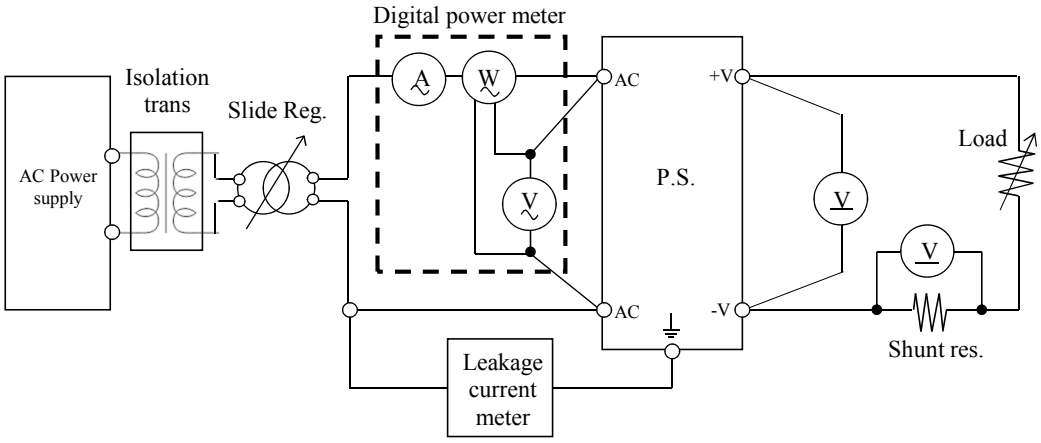
測定回路3 Circuit 3 used for determination

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



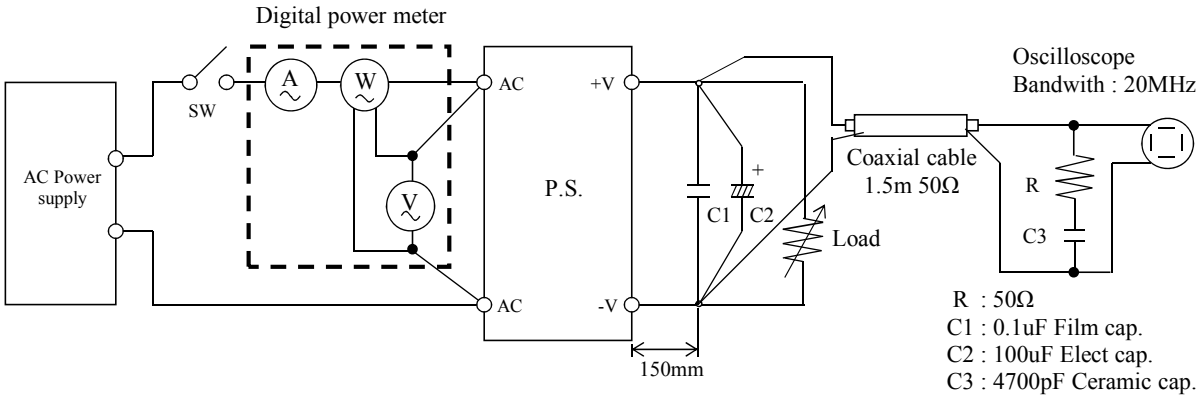
測定回路4 Circuit 4 used for determination

・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

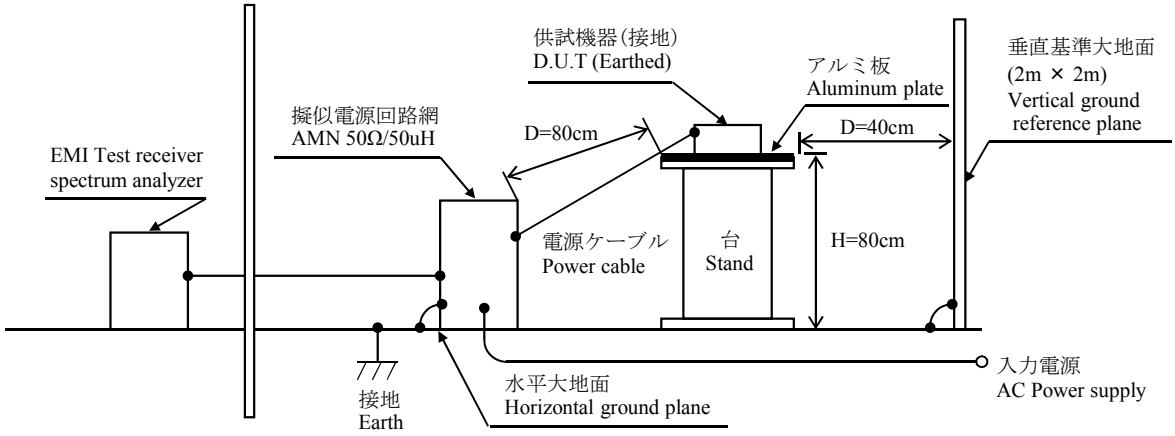


測定構成 Configuration used for determination

・EMI特性　Electro-Magnetic Interference characteristics

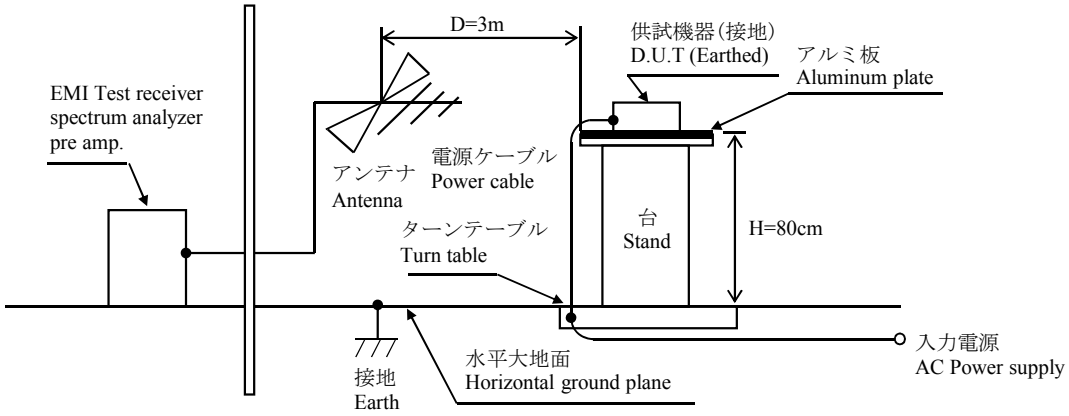
(a) 雑音端子電圧 (帰還ノイズ)

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	FLUKE	111
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110 / WT210
4	CURRENT PROBE	YOKOGAWA ELECT.	701932
5	DYNAMIC DUMMY LOAD	CHROMA	63201
6	ISOLATION TRANS	TOUZHONG	BJZ-3KVA
7	CVCF	KIKUSUI	PCR2000LE
8	CVCF	CHROMA	61605
9	LEAKAGE CURRENT METER	SIMPSON	228
10	CONTROLLED TEMP. CHAMBER	ESPEC	SH-661
11	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI-03
12	PRE AMP.	AGILENT	8447D
13	AMN	SCHWARZBECK	NNLK8121
14	ANTENNA	SCHWARZBECK	VULB9168
15	HARMONIC / FLICKER ANALYZER	SCHAFFNER	CCN100-1

1.3 評価負荷条件　　Load conditions

*入力電圧が115VAC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 115VAC.

Vin	Iout: Full load	12V	18V	24V	48V
85VAC	80%	23.20A	15.52A	11.76A	5.84A
115 - 265VAC	100%	29.0A	19.4A	14.7A	7.3A

* Vstby=5V, Istby=0A

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

12V

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

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	12.033V	12.033V	12.033V	12.033V	0mV	0.000%
50%	11.999V	11.998V	11.999V	11.999V	1mV	0.008%
100%	-	11.993V	11.993V	11.993V	0mV※1	0.000%
Load regulation	34mV	40mV	40mV	40mV		
	0.283%	0.333%	0.333%	0.333%		

2. Temperature drift　　Conditions　Vin : 115 VAC　Iout : Full load

Ta	-20℃	+25℃	+40℃	temperature stability	
Vout	11.957V	11.993V	11.995V	38mV	0.317%

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

Start up voltage (Vin)	82VAC
Drop out voltage (Vin)	70VAC

24V

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

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	24.012V	24.012V	24.012V	24.012V	0mV	0.000%
50%	24.009V	24.009V	24.009V	24.009V	0mV	0.000%
100%	-	24.007V	24.007V	24.007V	0mV※1	0.000%
Load regulation	3mV	5mV	5mV	5mV		
	0.013%	0.021%	0.021%	0.021%		

2. Temperature drift　　Conditions　Vin : 115 VAC　Iout : Full load

Ta	-20℃	+25℃	+40℃	temperature stability	
Vout	23.935V	24.007V	24.004V	72mV	0.300%

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

Start up voltage (Vin)	82VAC
Drop out voltage (Vin)	70VAC

48V

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

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	48.041V	48.042V	48.042V	48.041V	1mV	0.002%
50%	47.996V	47.997V	47.997V	47.998V	2mV	0.004%
100%	-	48.002V	48.002V	48.002V	0mV※1	0.000%
Load regulation	45mV	45mV	45mV	43mV		
	0.094%	0.094%	0.094%	0.090%		

2. Temperature drift　　Conditions　Vin : 115 VAC　Iout : Full load

Ta	-20℃	+25℃	+40℃	temperature stability	
Vout	47.847V	48.002V	48.003V	156mV	0.325%

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

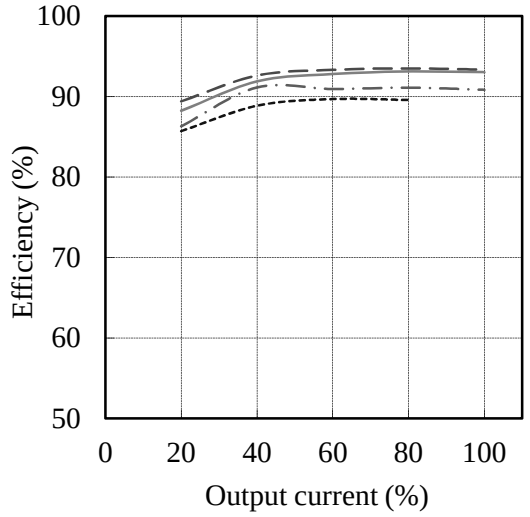
Start up voltage (Vin)	82VAC
Drop out voltage (Vin)	70VAC

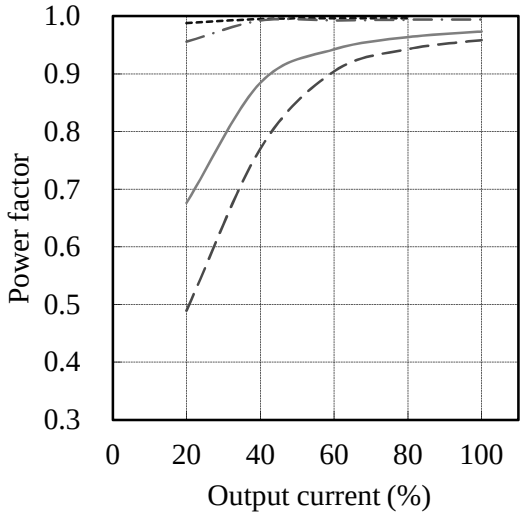
※1　Line regulation : 115VAC - 265VAC

Efficiency and Power factor vs. Output current

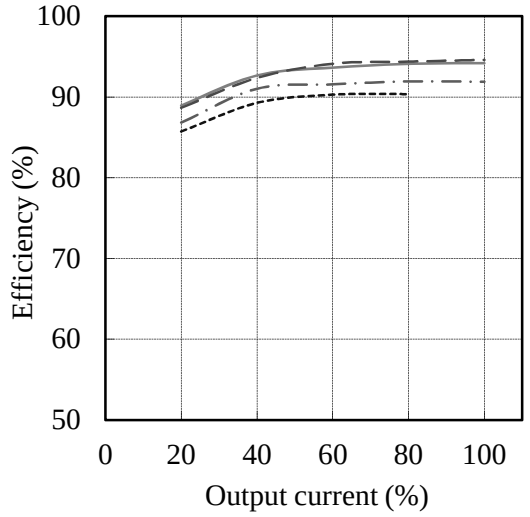
Conditions Vin : 85 VAC
115 VAC
230 VAC
265 VAC
Ta : 25 ℃

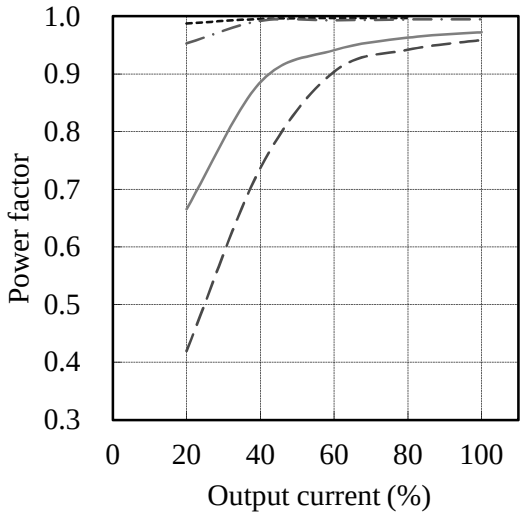
12V



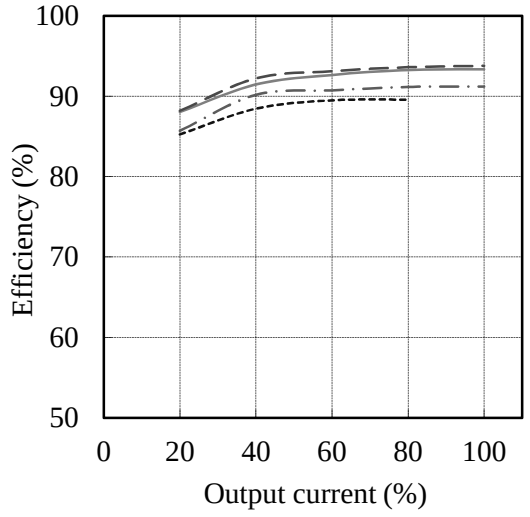


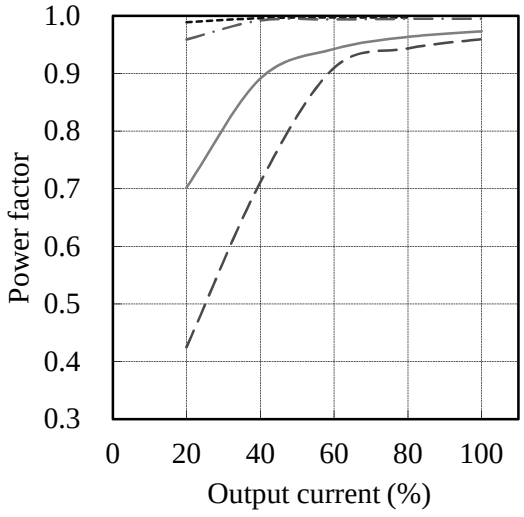
24V





48V



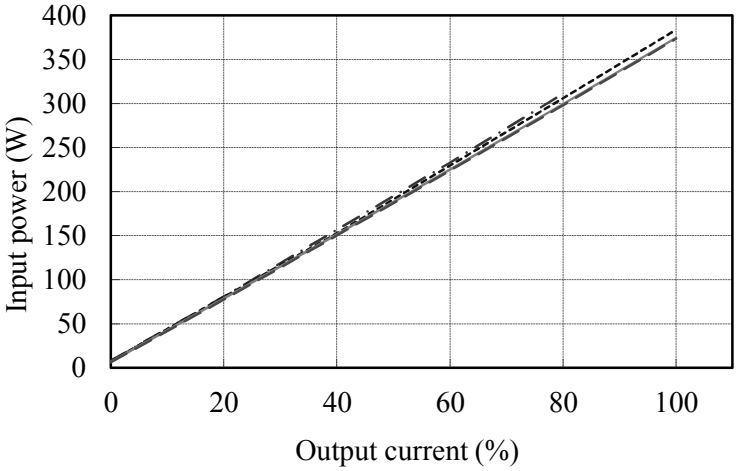


(3) 入力電力対出力電流
Input power vs. Output current

Conditions Vin : 85 VAC
115 VAC
230 VAC
265 VAC
Ta : 25 ℃

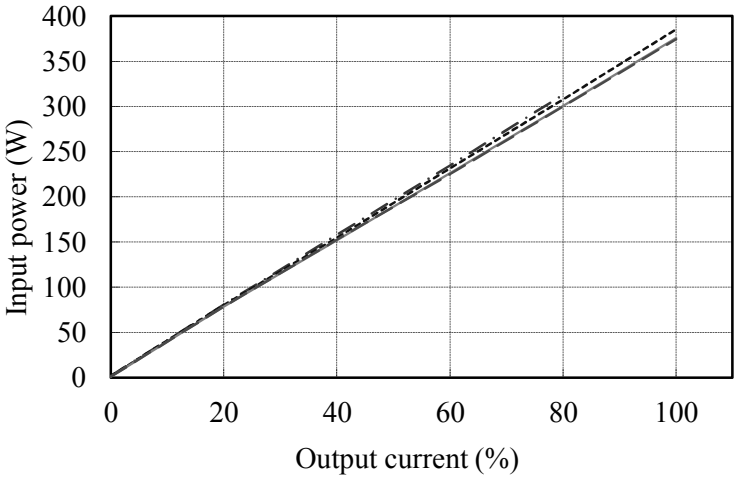
12V

Vin	Input power
	Iout : 0%
85VAC	8.00W
115VAC	7.59W
230VAC	6.57W
265VAC	6.13W



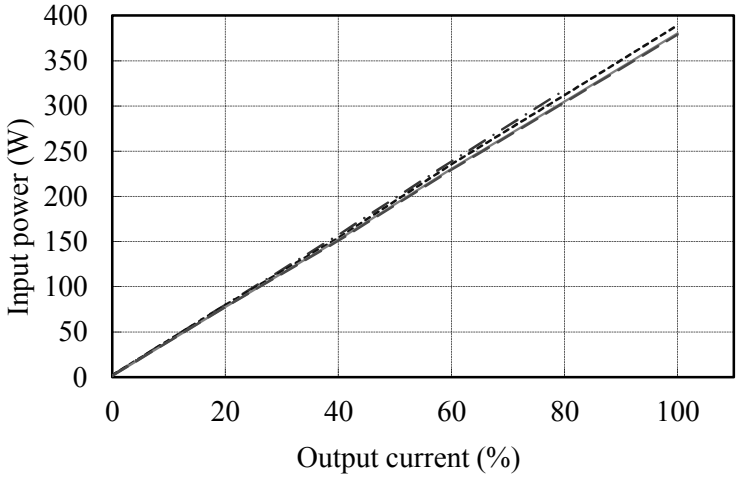
24V

Vin	Input power
	Iout : 0%
85VAC	2.21W
115VAC	1.63W
230VAC	1.18W
265VAC	1.00W



48V

Vin	Input power
	Iout : 0%
85VAC	2.23W
115VAC	2.17W
230VAC	1.38W
265VAC	1.30W

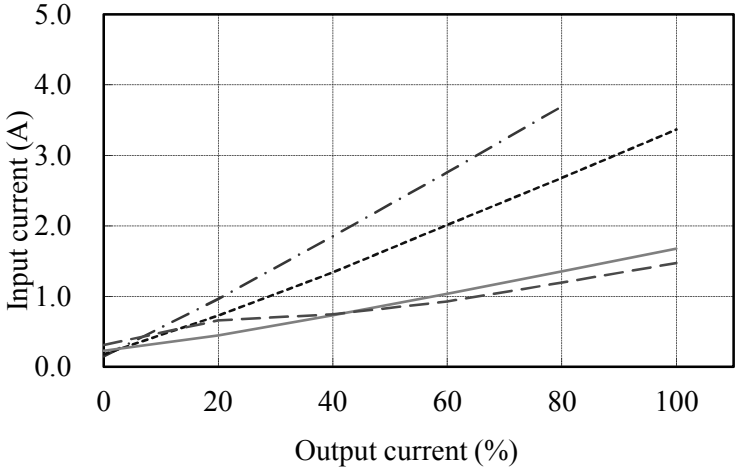


(4) 入力電流対出力電流
Input current vs. Output current

Conditions Vin : 85 VAC
115 VAC
230 VAC
265 VAC
Ta : 25 ℃

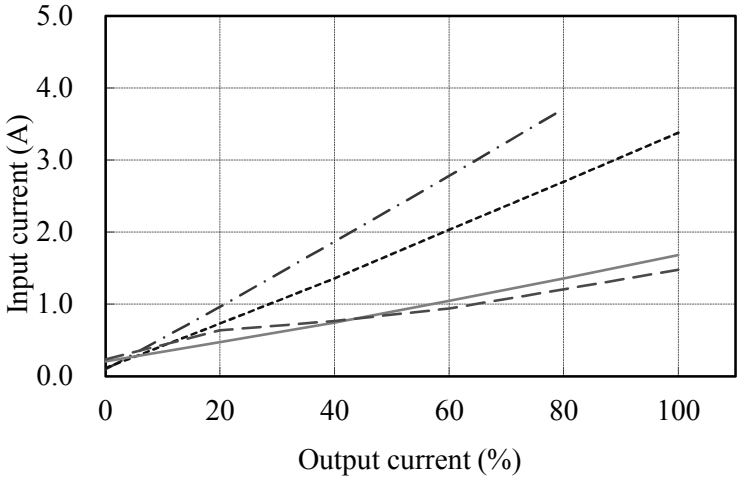
12V

Vin	Input current
	Iout : 0%
85VAC	0.152A
115VAC	0.181A
230VAC	0.228A
265VAC	0.311A



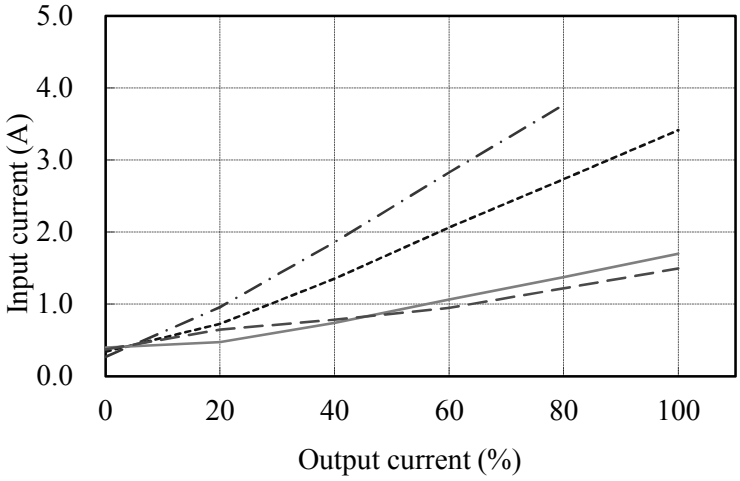
24V

Vin	Input current
	Iout : 0%
85VAC	0.097A
115VAC	0.112A
230VAC	0.205A
265VAC	0.234A



48V

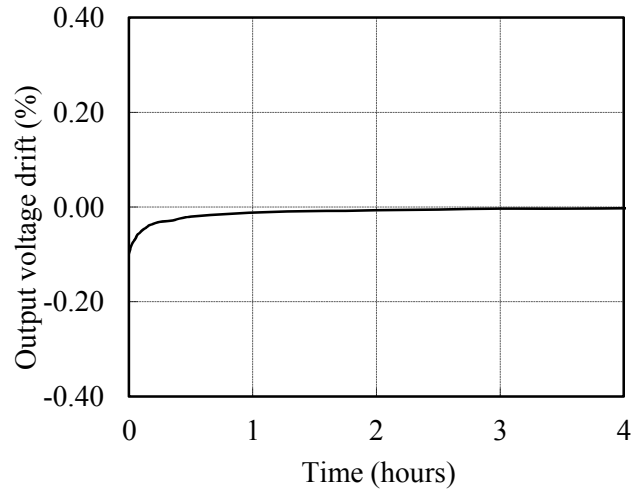
Vin	Input current
	Iout : 0%
85VAC	0.269A
115VAC	0.339A
230VAC	0.400A
265VAC	0.372A



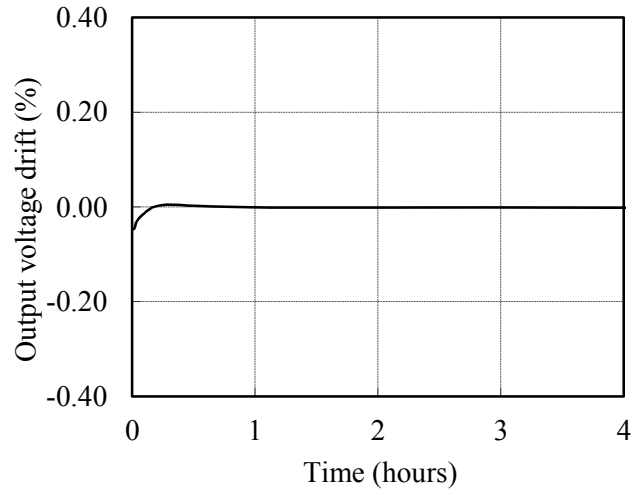
2.2 通電ドリフト特性
Warm up voltage drift characteristics

Conditions Vin : 115 VAC
Iout : Full load
Ta : 25 ℃

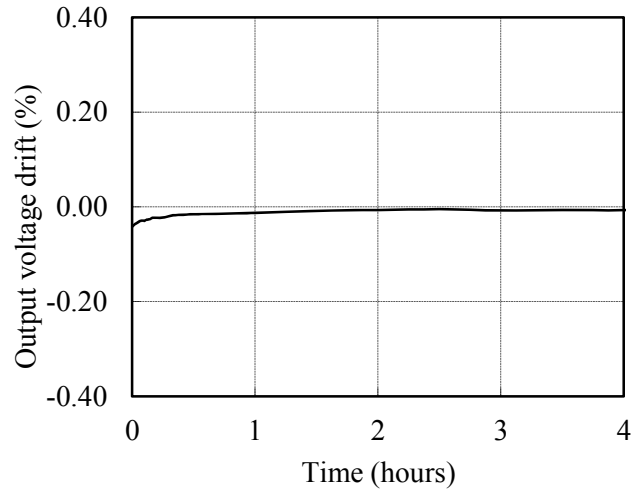
12V



24V

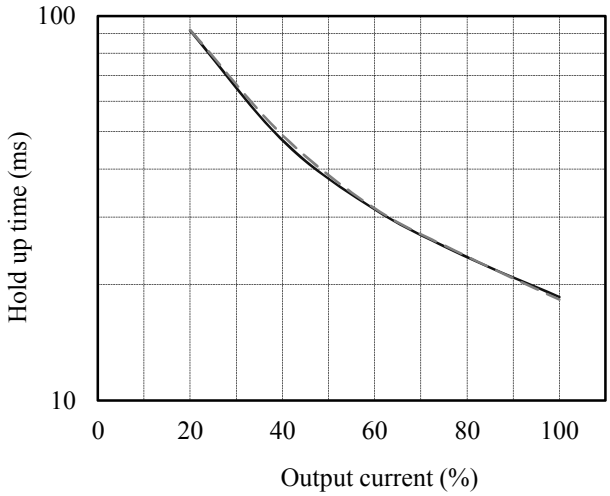


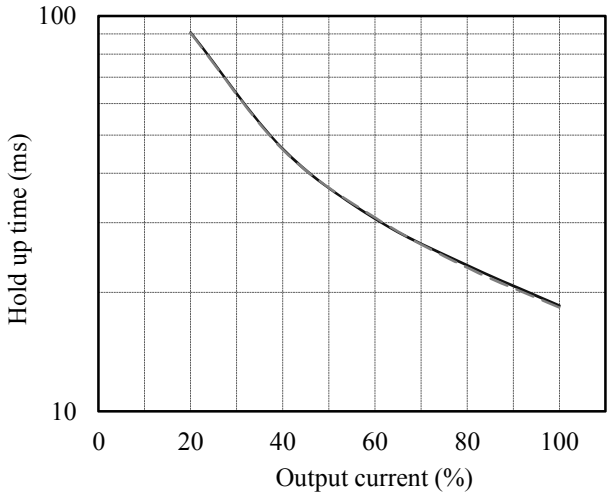
48V

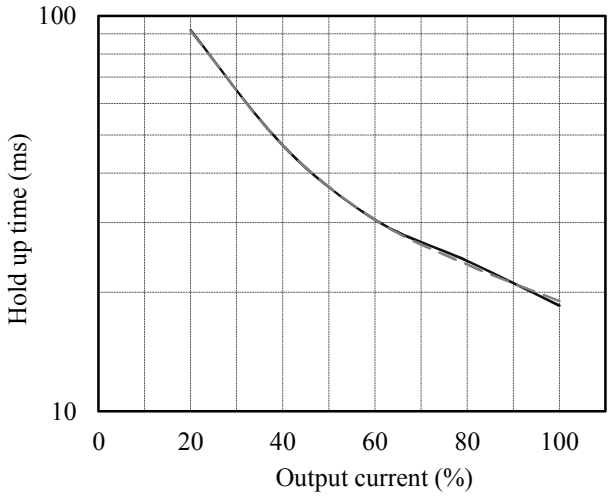


2.3 出力保持時間特性
Hold up time characteristics

Conditions Vin : 115 VAC ——
230 VAC - - - - -
Ta : 25 ℃





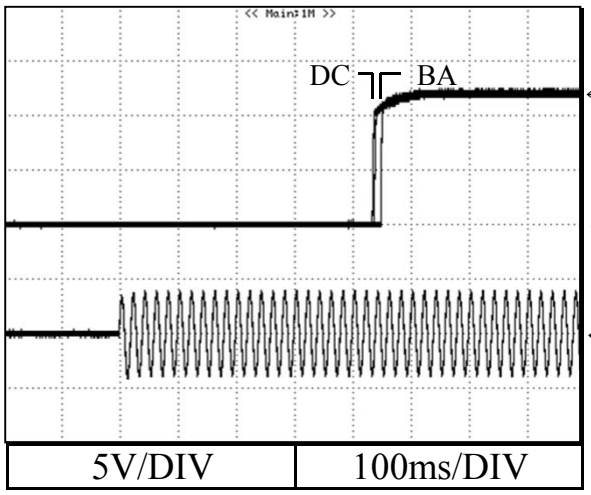


2.4 出力立ち上がり特性
Output rise characteristics

Conditions Vin : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
Ta : 25 ℃

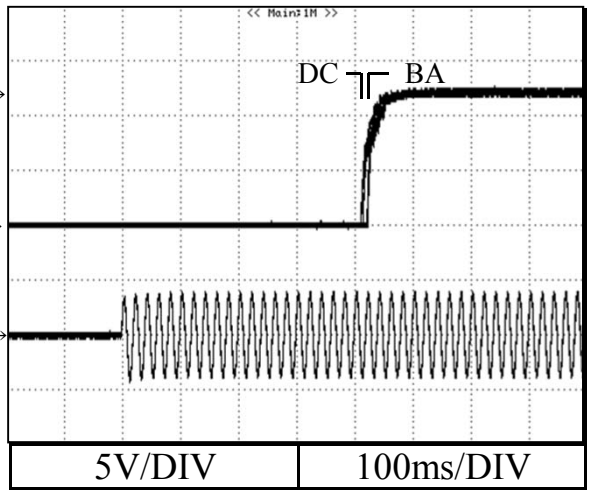
12V

Iout : 0%



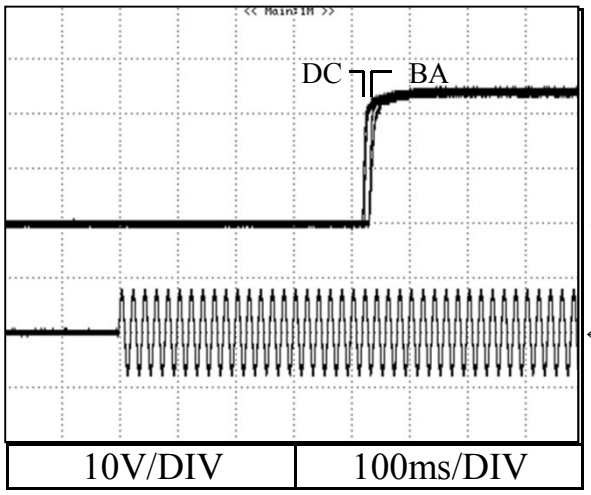
← Vout →
← 0V →
← Vin →

Iout:Full load



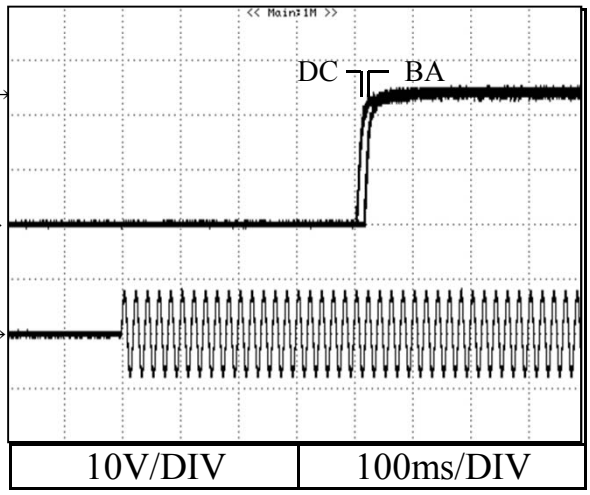
24V

Iout : 0%



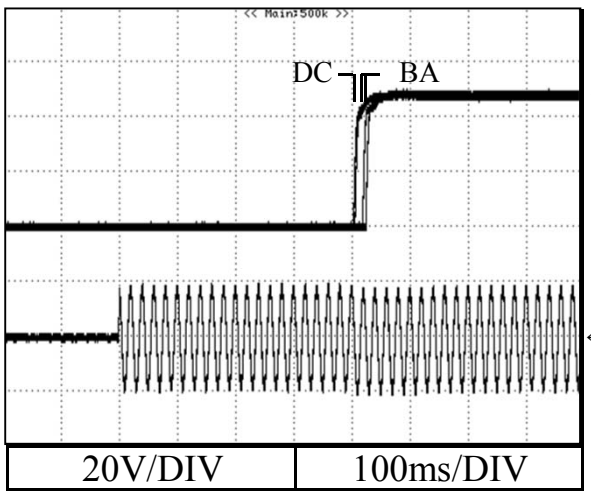
← Vout →
← 0V →
← Vin →

Iout:Full load



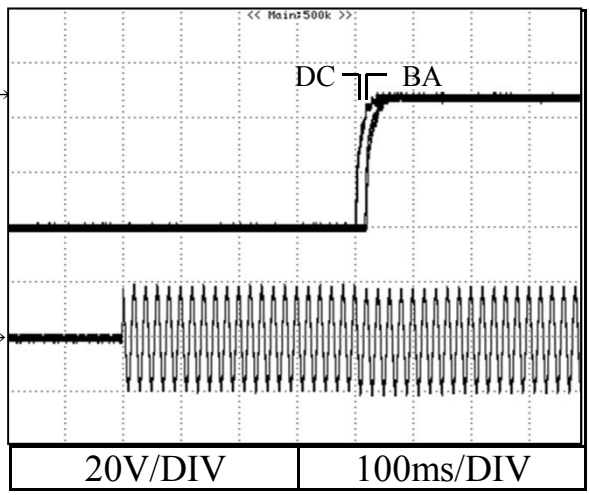
48V

Iout : 0%



← Vout →
← 0V →
← Vin →

Iout:Full load

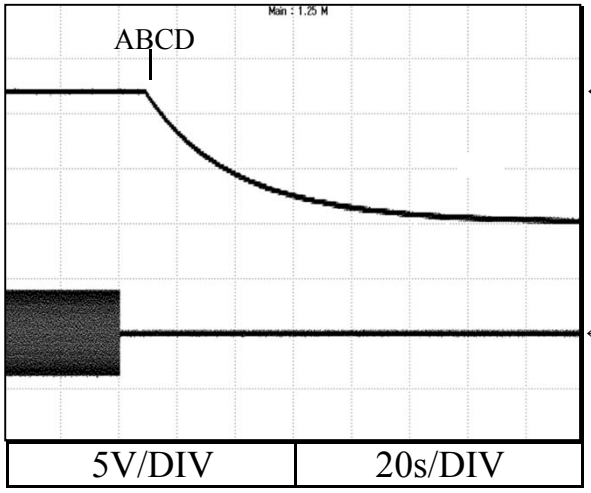


2.5 出力立ち下がり特性
Output fall characteristics

Conditions Vin : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
Ta : 25 ℃

12V

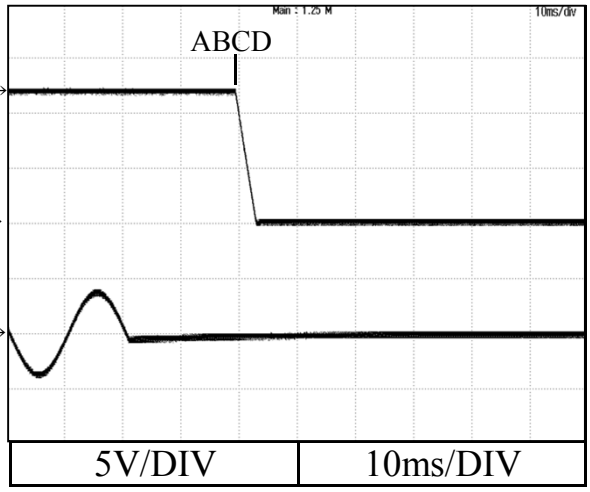
Iout : 0%



5V/DIV | 20s/DIV

← Vout →
← 0V →
← Vin →

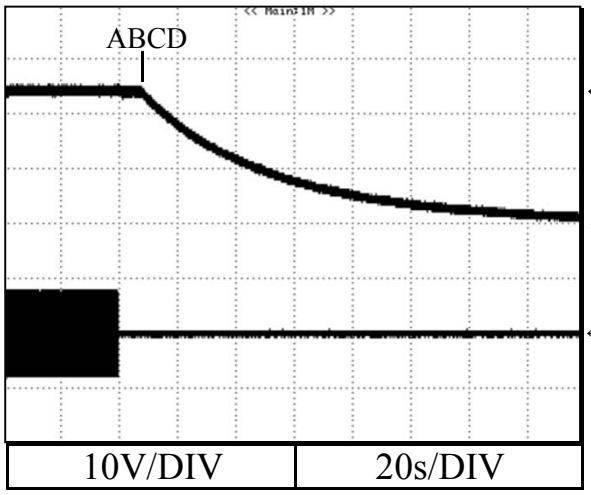
Iout:Full load



5V/DIV | 10ms/DIV

24V

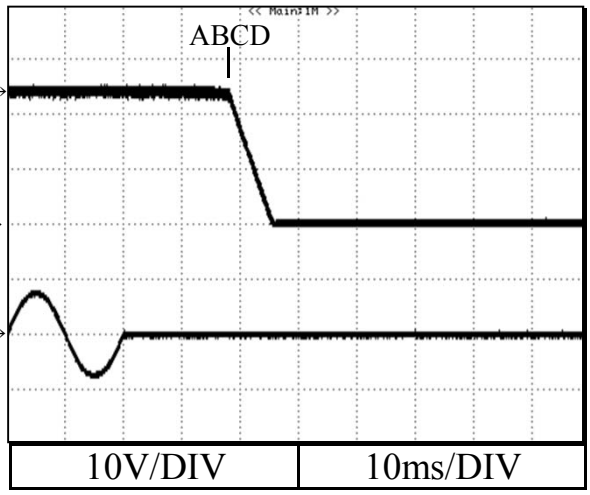
Iout : 0%



10V/DIV | 20s/DIV

← Vout →
← 0V →
← Vin →

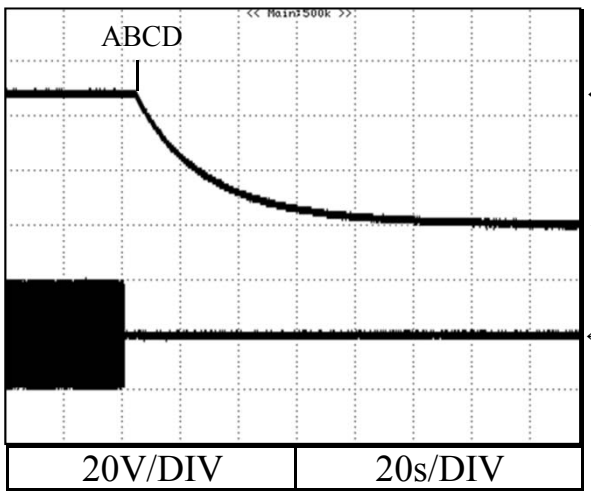
Iout:Full load



10V/DIV | 10ms/DIV

48V

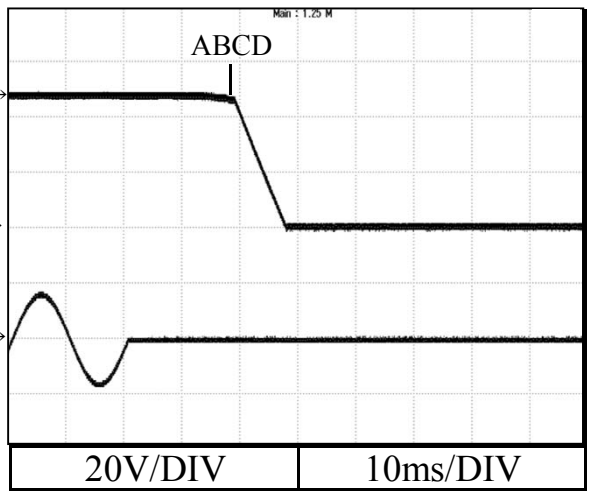
Iout : 0%



20V/DIV | 20s/DIV

← Vout →
← 0V →
← Vin →

Iout:Full load

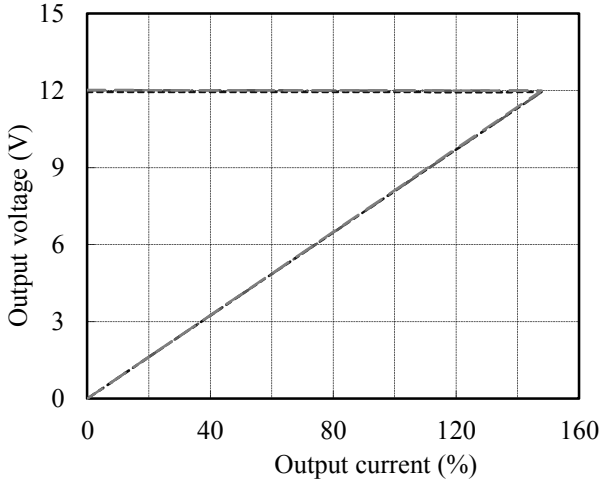


20V/DIV | 10ms/DIV

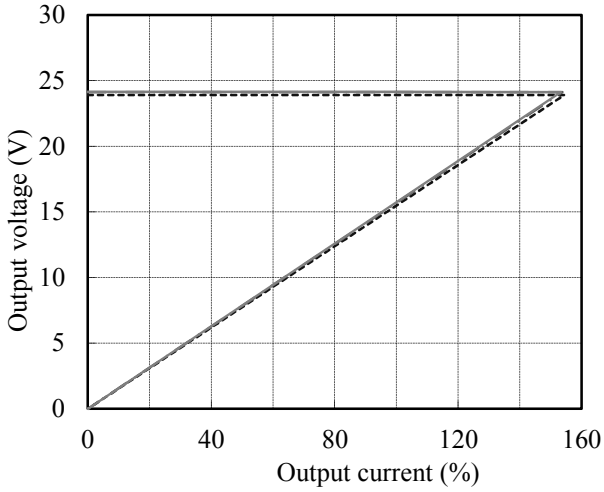
2.6 過電流保護特性
Over current protection (OCP) characteristics

Conditions Vin : 115 VAC
Ta : -20 ℃
25 ℃
40 ℃

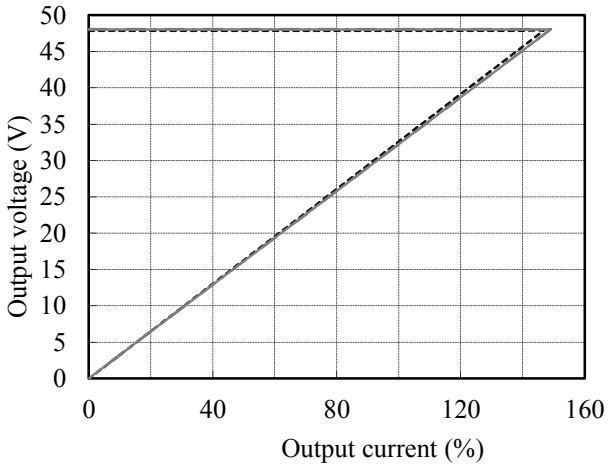
12V



24V

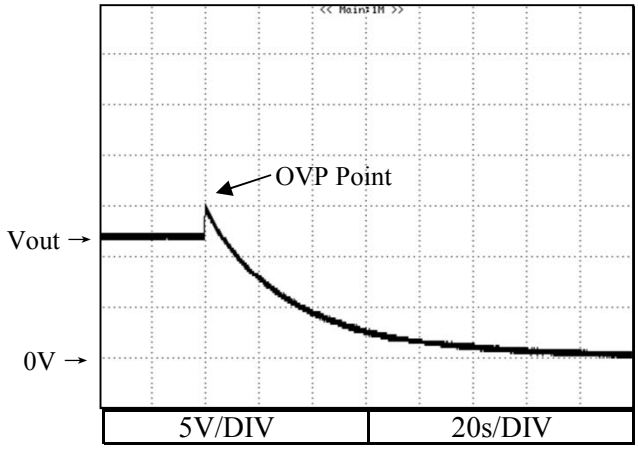


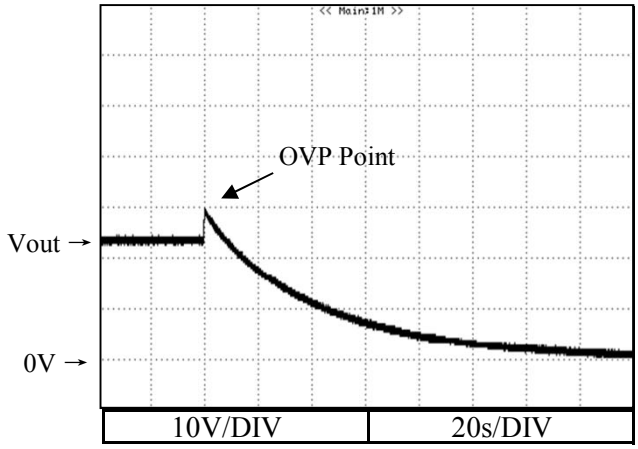
48V

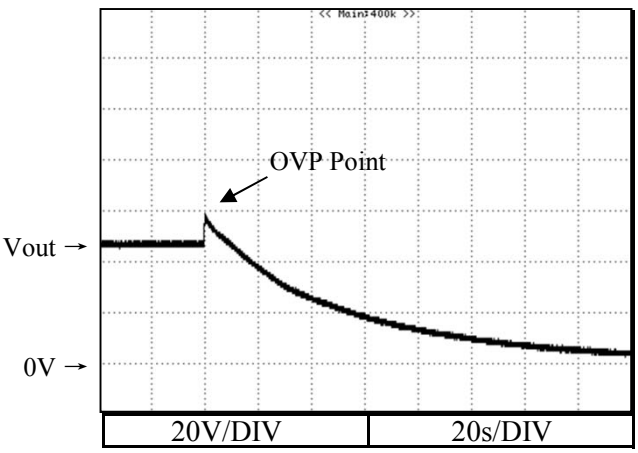


2.7 過電圧保護特性
Over voltage protection (OVP) characteristics

Conditions Vin : 115 VAC
Iout : 0 %
Ta : 25 ℃







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

Conditions Vin : 115 VAC
Iout : 50 %⟷ 100 %
(tr = tf = 75us)
Ta : 25 ℃

12V

f = 100Hz

100mV/DIV	2ms/DIV
+1.02%	-0.96%

← Vout →
← Iout →
← Iout:0% →

f = 1kHz

100mV/DIV	200 μ s/DIV
+1.05%	-0.85%

24V

f = 100Hz

200mV/DIV	2ms/DIV
+0.63%	-0.66%

← Vout →
← Iout →
← Iout:0% →

f = 1kHz

200mV/DIV	200 μ s/DIV
+0.55%	-0.90%

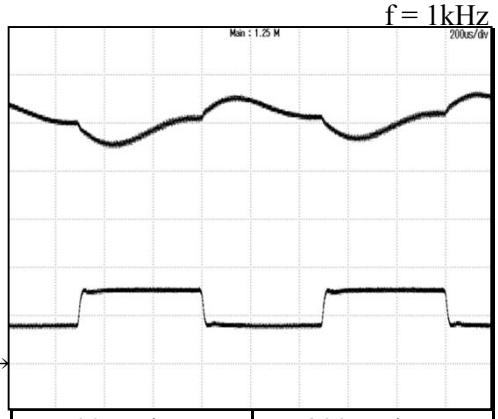
48V

f = 100Hz

500mV/DIV	2ms/DIV
+0.73%	-0.71%

← Vout →
← Iout →
← Iout:0% →

f = 1kHz



500mV/DIV	200 μ s/DIV
+0.71%	-0.54%

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

Conditions Ta : 25 ℃
Iout : Full load

瞬停時間 Interruption time

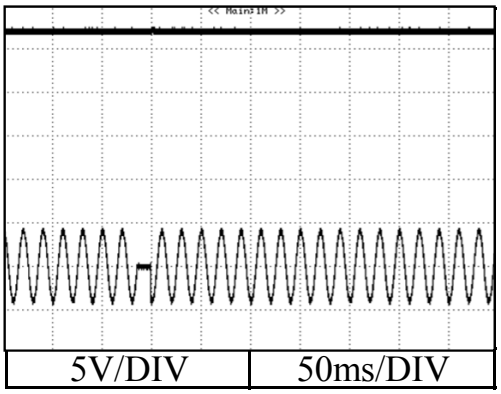
A : 出力電圧が低下なし Output voltage does not drop.

B : 出力電圧が0Vまで低下 Output voltage drops until 0V.

12V

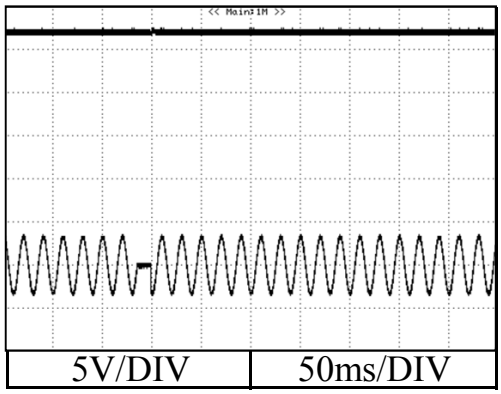
Vin : 115VAC

A = 14ms

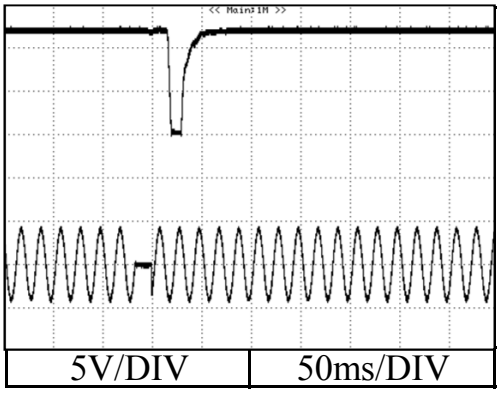


Vin : 230VAC

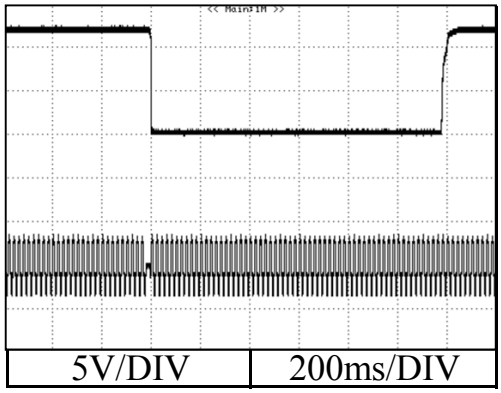
A = 14ms



B = 17ms



B = 19ms

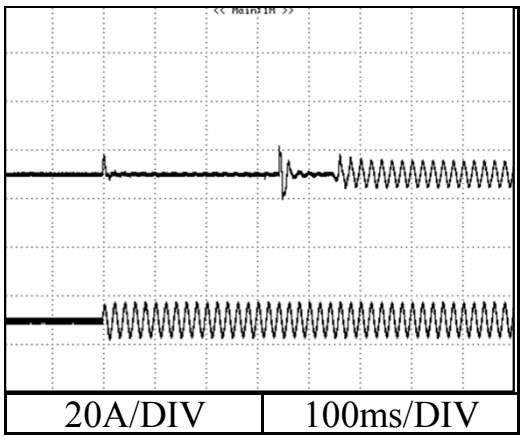


2.10 入力サージ電流（突入電流）波形
Inrush current waveform

12V

Conditions Vin : 115 VAC
Iout : Full load
Ta : 25 ℃

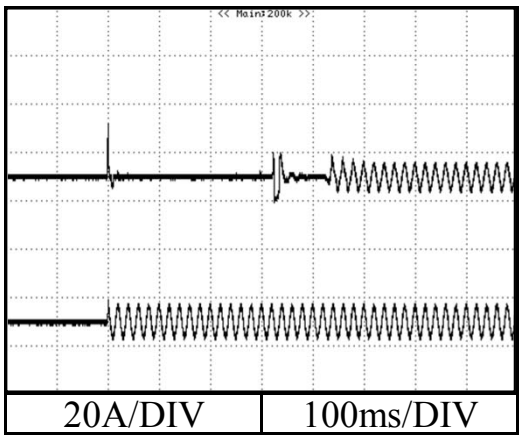
Switch on phase angle of input AC voltage
ϕ = 0°



← Iin →

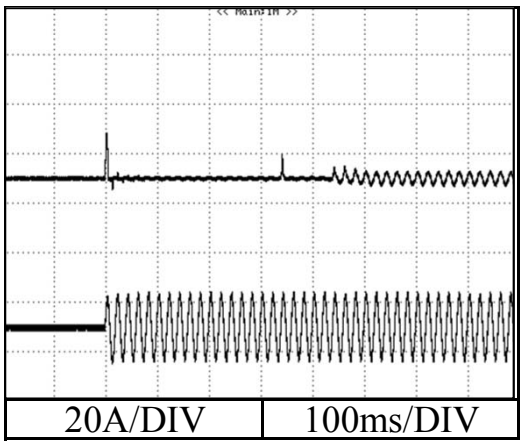
← Vin →

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



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

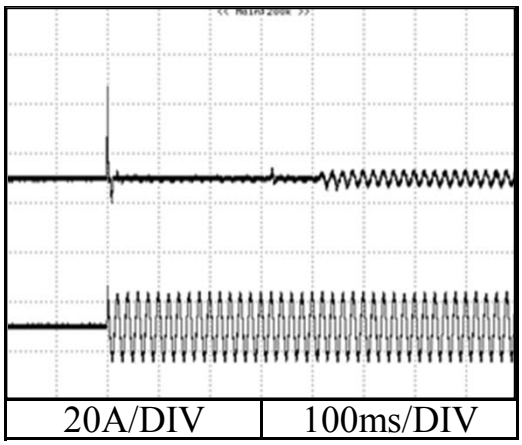
Switch on phase angle of input AC voltage
ϕ = 0°



← Iin →

← Vin →

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

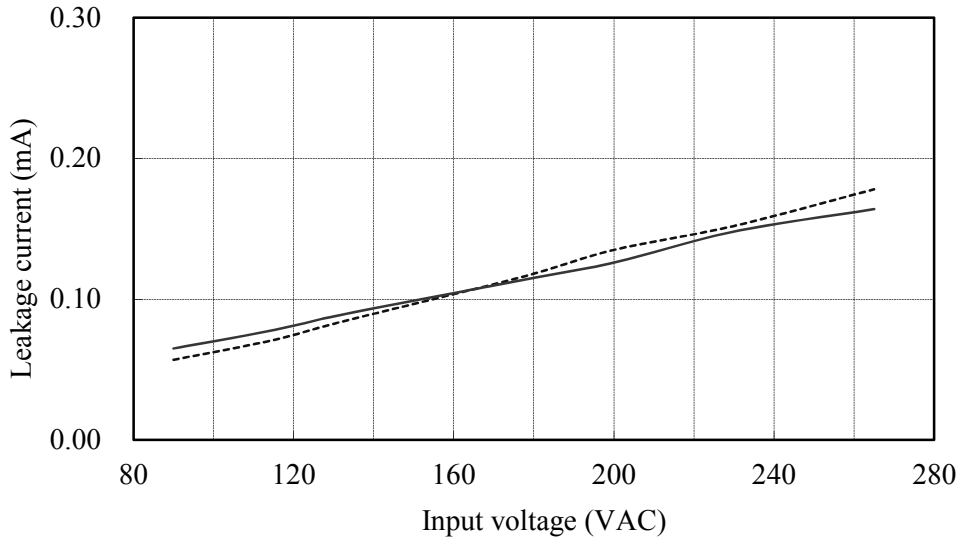


2.11 リーク電流特性
Leakage current characteristics

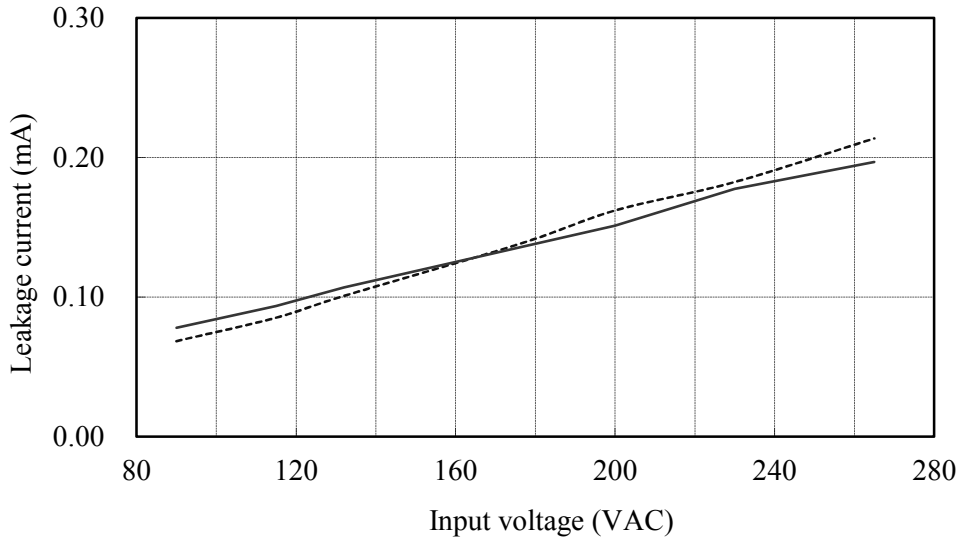
Conditions Iout : 0 % - - - - -
Full Load ——
Ta : 25 ℃
Equipment used : MODEL 228
(Simpson)

12V

f : 50 Hz



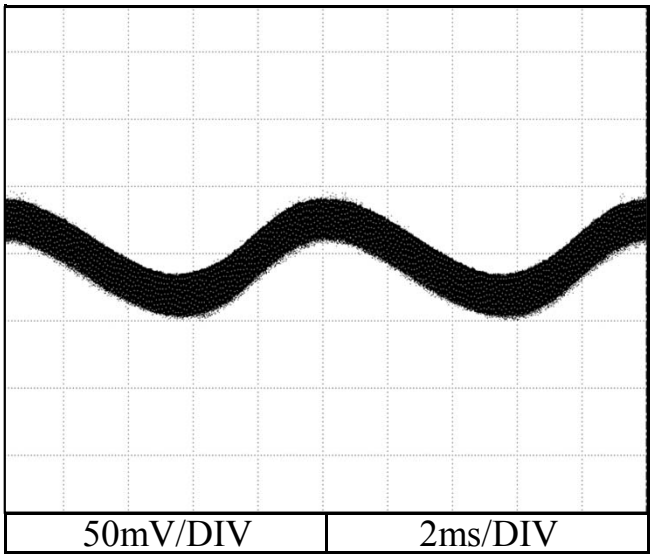
f : 60 Hz



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

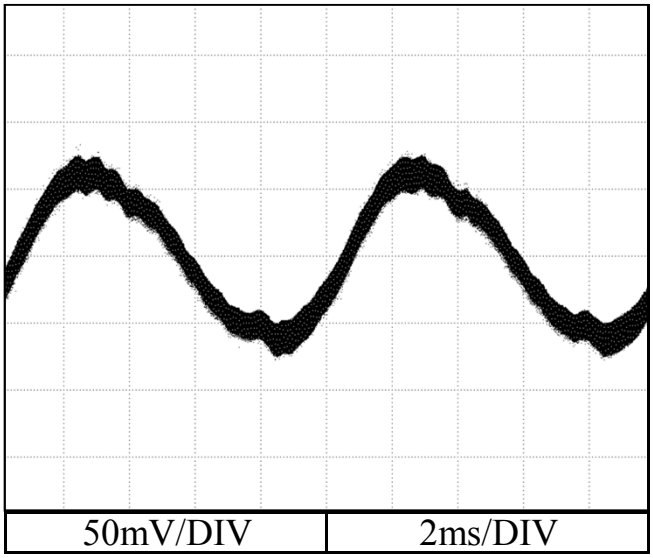
Conditions Vin : 115 VAC
Iout : Full load
Ta : 25 ℃

12V



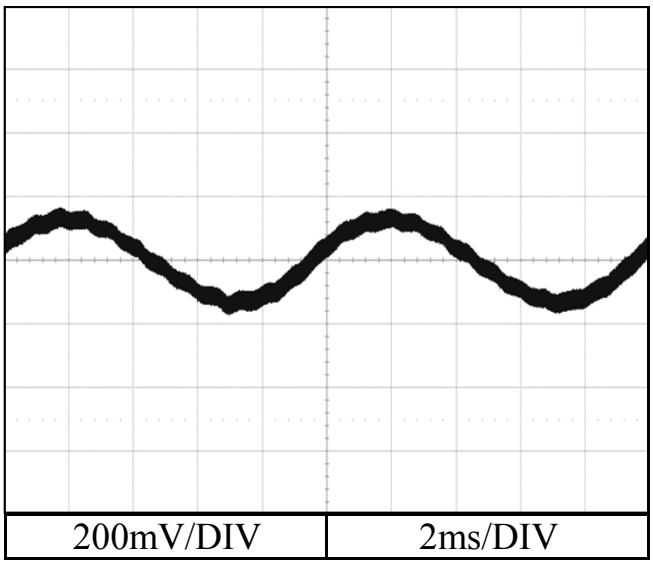
50mV/DIV	2ms/DIV

24V



50mV/DIV	2ms/DIV

48V



200mV/DIV	2ms/DIV

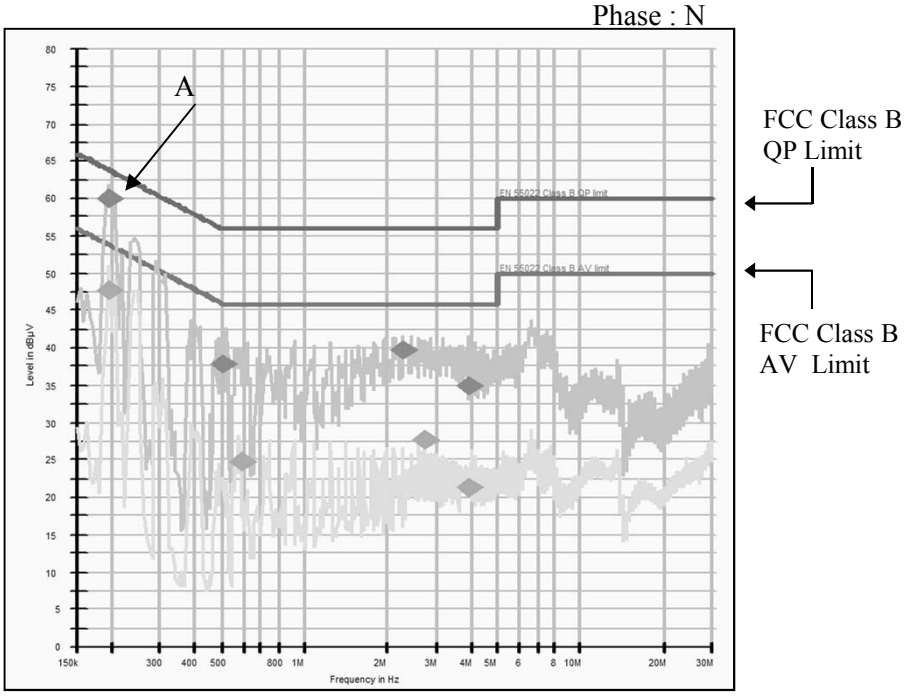
2.14 ＥＭＩ特性
Electro-Magnetic Interference characteristics

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

雑音端子電圧
Conducted Emission

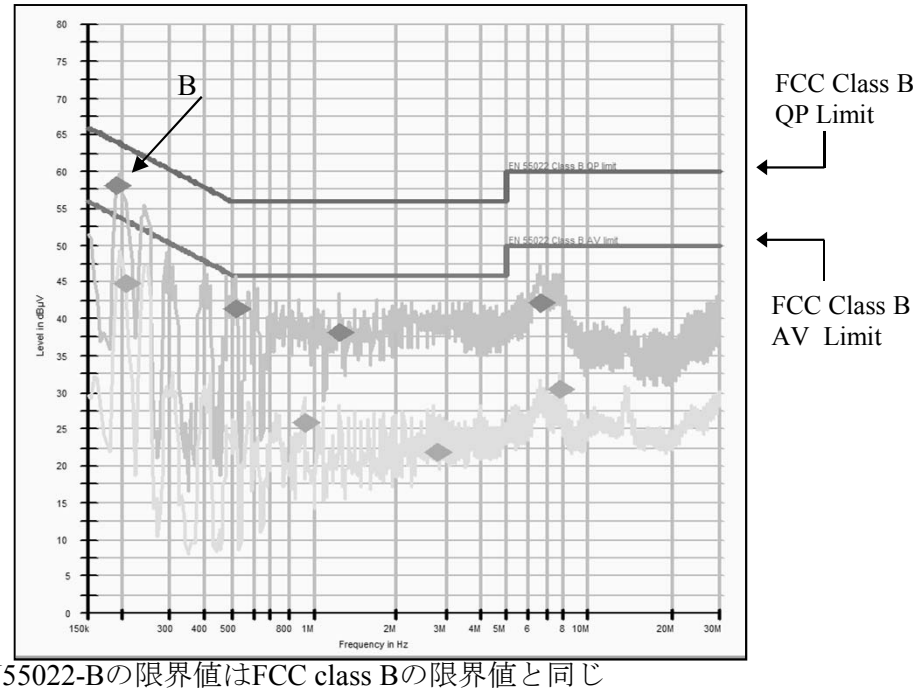
12V

Phase : N



Ref. Data	Point A (195.0kHz) Limit (dBuV)	Measure (dBuV)
QP	63.8	59.9
AV	53.8	47.8

Phase : L



Ref. Data	Point B (190.5kHz) Limit (dBuV)	Measure (dBuV)
QP	64.0	58.0
AV	53.3	44.9

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

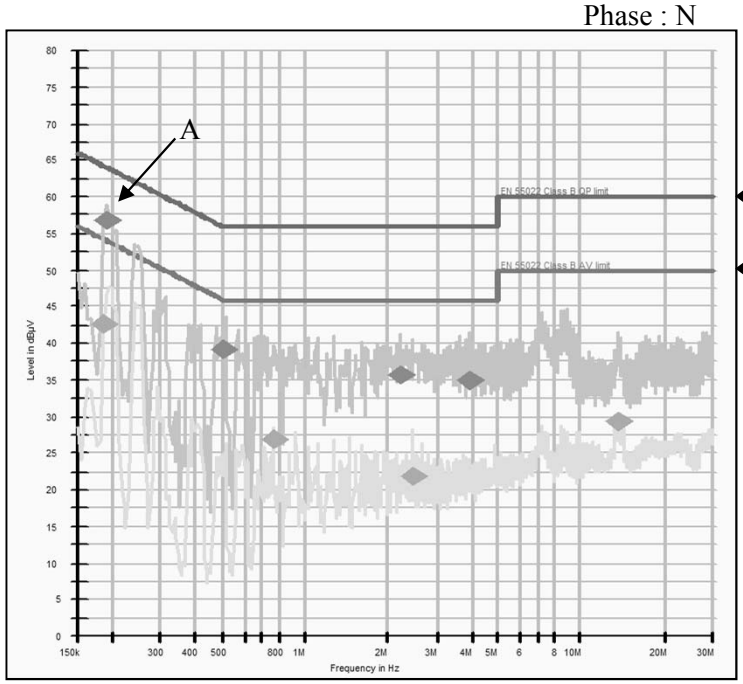
2.14 ＥＭＩ特性
Electro-Magnetic Interference characteristics

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

雑音端子電圧
Conducted Emission

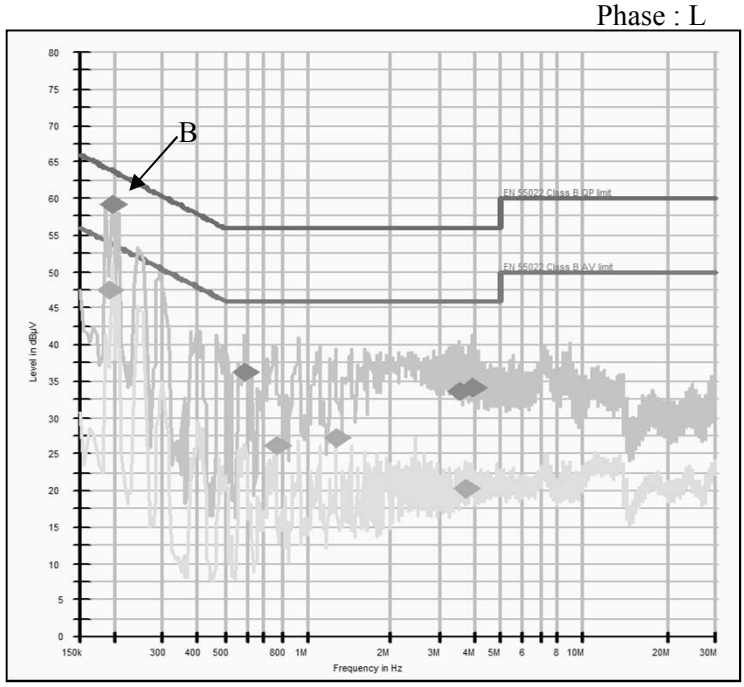
24V

Phase : N



Ref. Data	Point A (190.5kHz) Limit (dBuV)	Measure (dBuV)
QP	64.0	56.7
AV	54.2	42.6

Phase : L



Ref. Data	Point B (194.0kHz) Limit (dBuV)	Measure (dBuV)
QP	63.9	59.2
AV	54.0	47.5

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

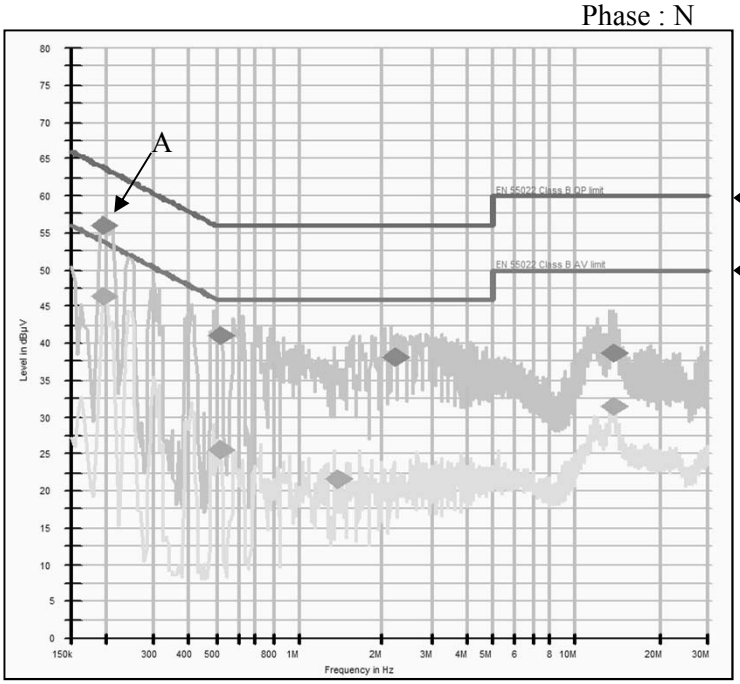
2.14 ＥＭＩ特性
Electro-Magnetic Interference characteristics

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

雑音端子電圧
Conducted Emission

48V

Phase : N

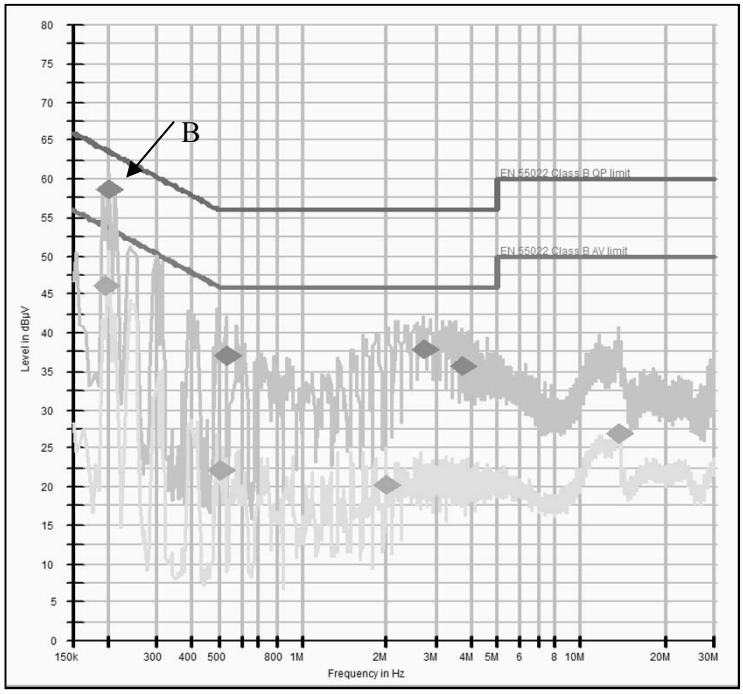


FCC Class B
QP Limit

FCC Class B
AV Limit

Ref. Data	Point A (195.0kHz) Limit (dBuV)	Measure (dBuV)
QP	63.8	56.0
AV	53.9	46.4

Phase : L



FCC Class B
QP Limit

FCC Class B
AV Limit

Ref. Data	Point B (198.5kHz) Limit (dBuV)	Measure (dBuV)
QP	63.7	58.7
AV	53.9	46.2

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

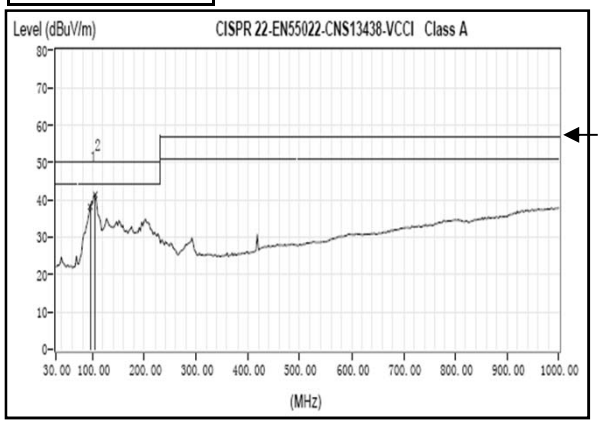
2.14 ＥＭＩ特性
Electro-Magnetic Interference characteristics

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

雑音電界強度
Radiated Emission

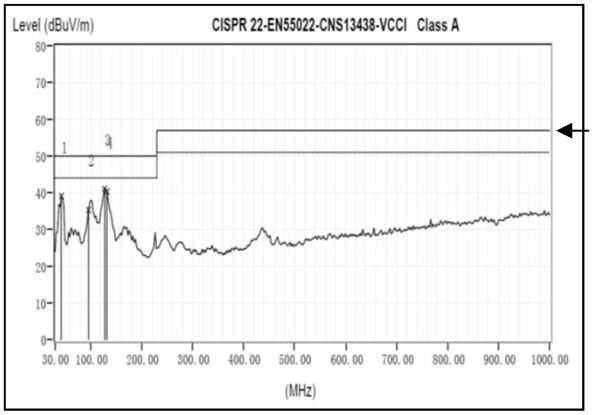
12V

HORIZONTAL



QP

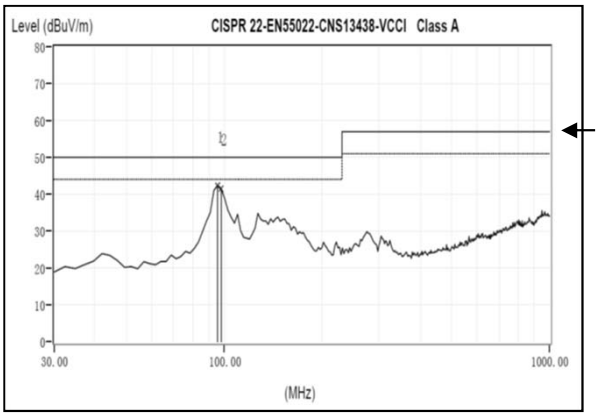
VERTICAL



QP

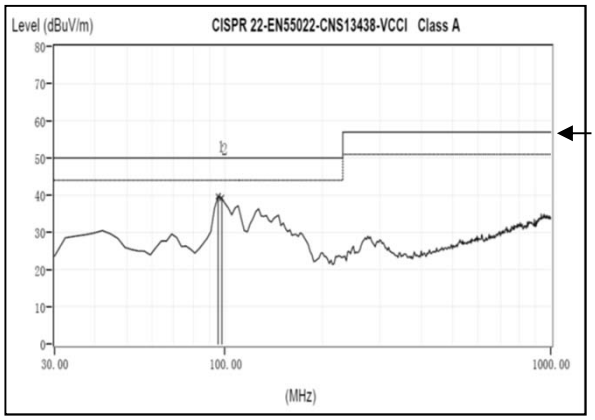
24V

HORIZONTAL



QP

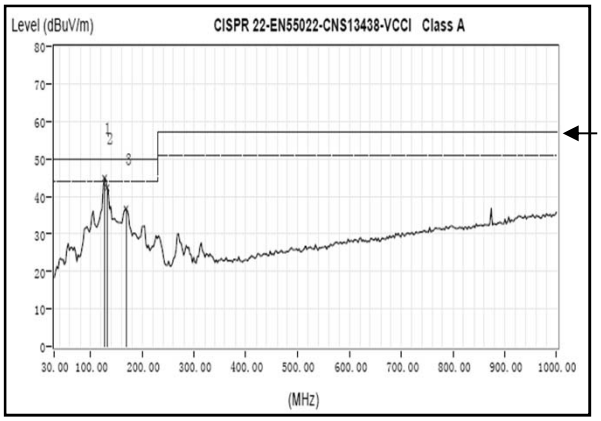
VERTICAL



QP

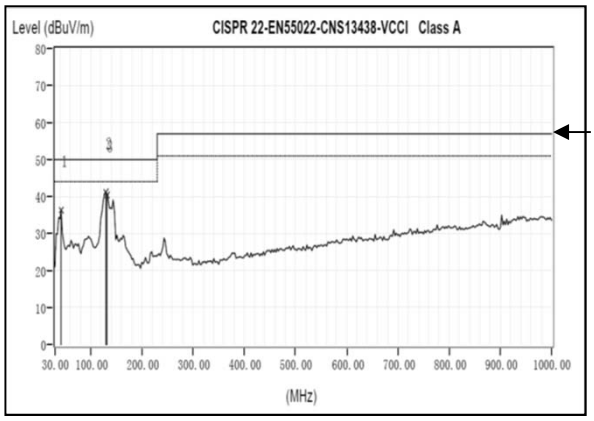
48V

HORIZONTAL



QP

VERTICAL



QP

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

表示はピーク値
Indication is peak values.