JWS480P

EVALUATION DATA

型式データ

DWG No. A183-53-01			
QA APPD	APPD	CHK	DWG

INDEX

使用記号 Terminology used

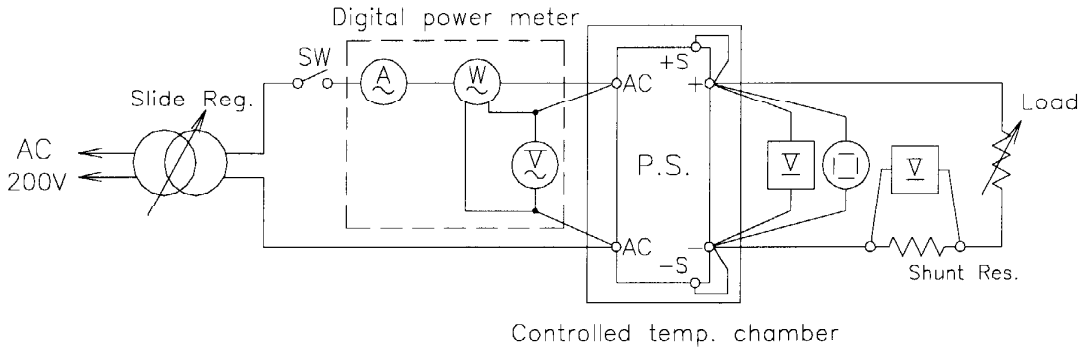
	Definition	
Vin	..... 入力電圧	Input voltage
Vout	..... 出力電圧	Output voltage
Iin	..... 入力電流	Input current
Iout	..... 出力電流	Output current
f	..... 周波数	Frequency
Ta	..... 周囲温度	Ambient temperature

1. 測定回路 Evaluation Method

1．1 測定回路 Circuit used for determination

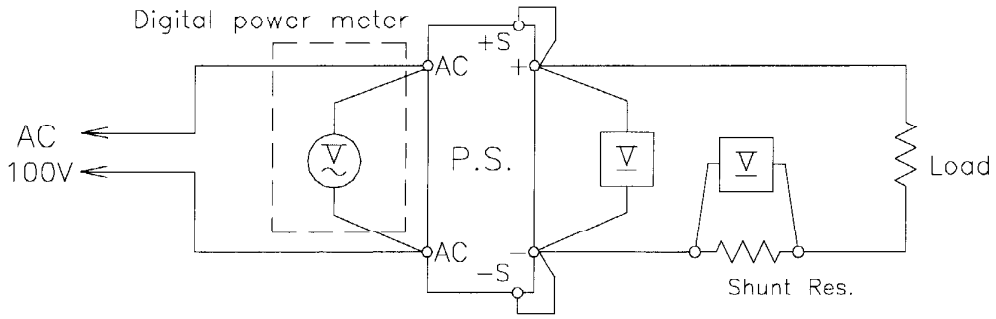
(1) 静特性

Steady state data



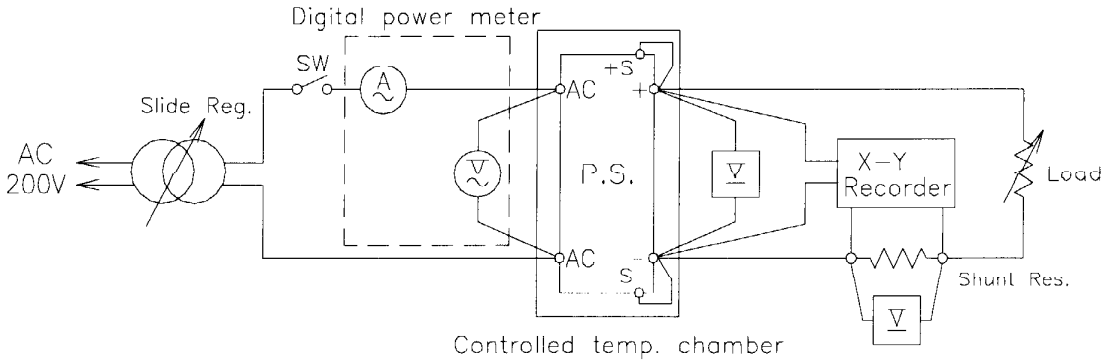
(2) 通電ドリフト特性

Warm up voltage drift characteristics



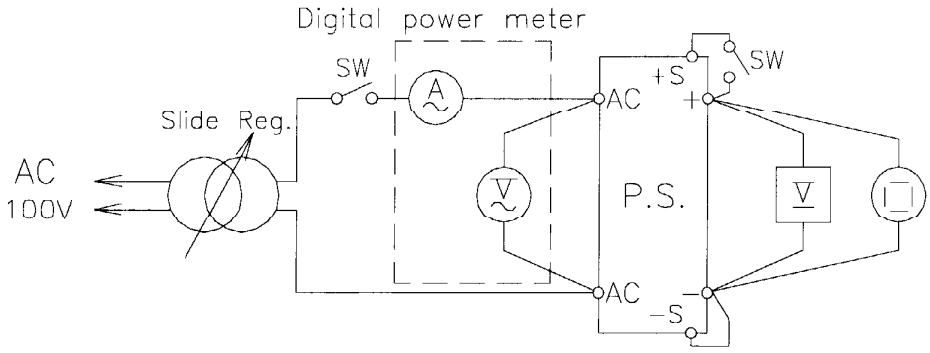
(3) 過電流保護特性

Over current protection (O.C.P.) characteristics



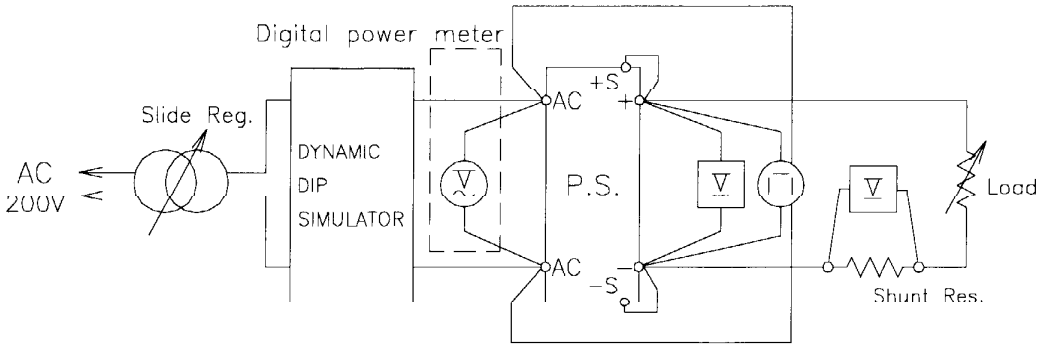
(4) 過電圧保護特性

Over voltage protection (O.V.P.) characteristics



(5) 出力立ち上がり特性

Output rise characteristics



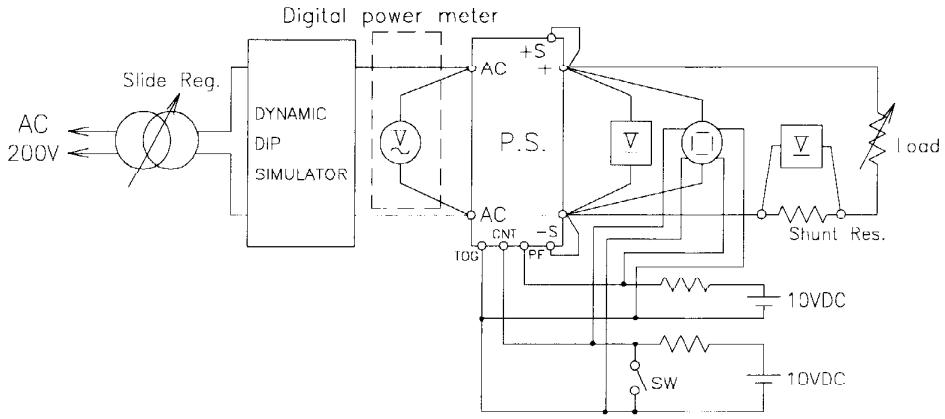
(6) 出力立ち下がり特性

Output fall characteristics

Same as output rise characteristics

(7) 出力立ち上がり特性 (ON/OFF コントロール特性)

Output rise characteristics with ON/OFF CONTROL



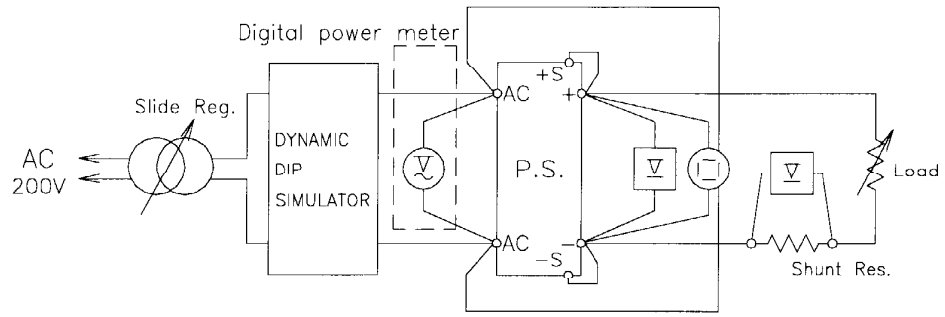
(8) 出力立ち下がり特性 (ON/OFF コントロール特性)

Output fall characteristics with ON/OFF CONTROL

Same as output rise characteristics with ON/OFF CONTROL

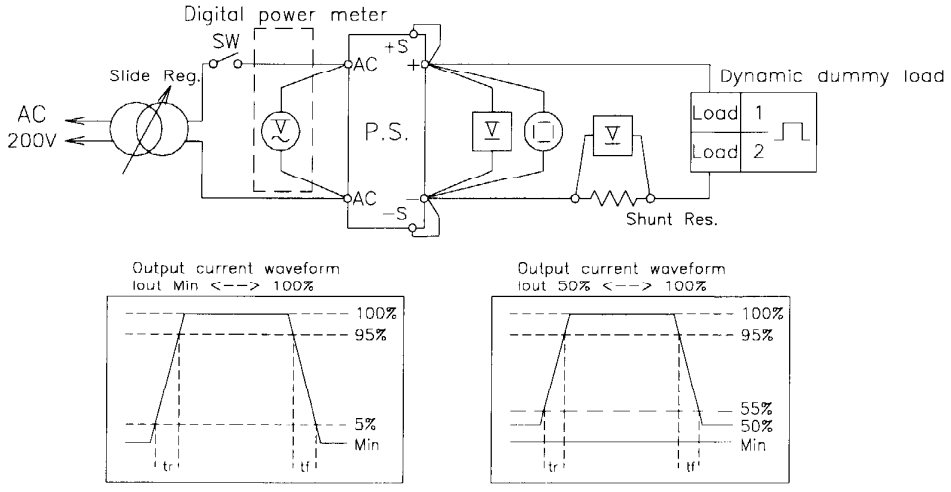
(9) 過渡応答（入力急変）

Dynamic line response characteristics



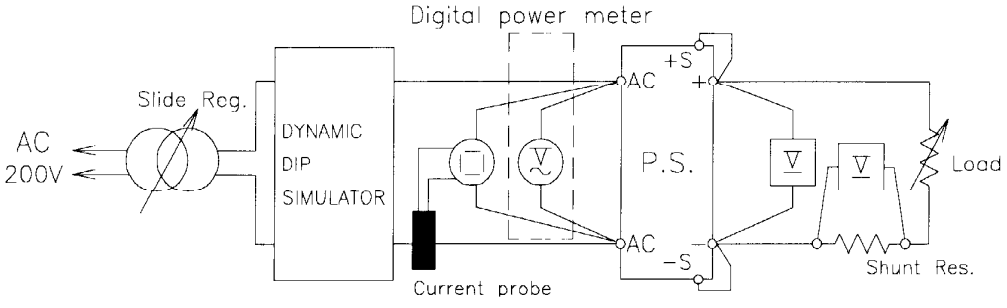
(10) 過渡応答（負荷急変）特性

Dynamic load response characteristics



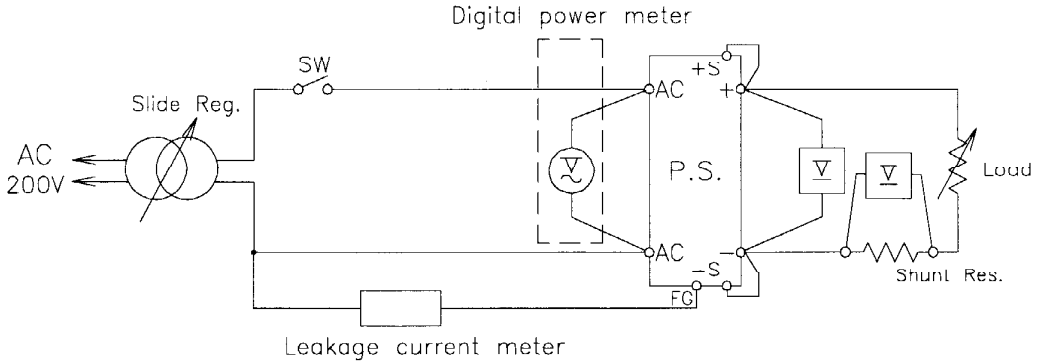
(11) 入力サージ電流（突入電流）特性

Inrush current characteristics



(12) リーク電流

Leakage current characteristics

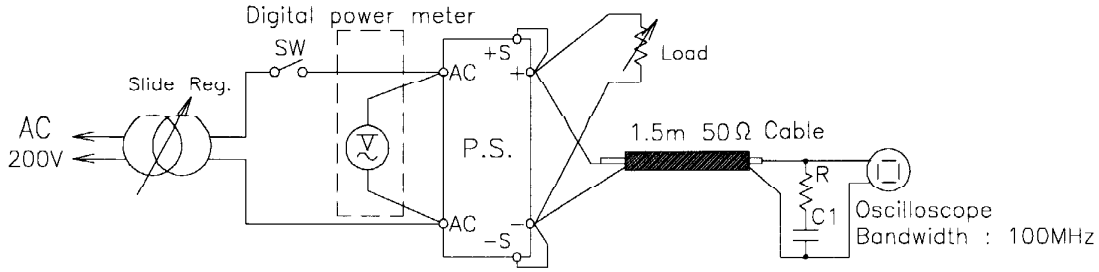


NOTE : Leakage current measured through a 1kohm resistor.
Range used---AC+DC (For YOKOGAWA TYPE 3226)
---AC (For SIMPSON MODEL 229-2)

(13) 出力リップルノイズ

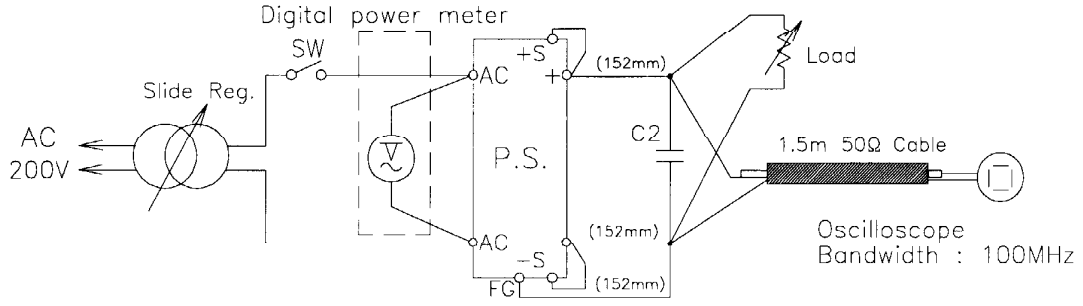
Output ripple noise

(a) Normal Mode



R : 50 Ω
C1: 4700pF Film Capacitor

(b) Normal + Common Mode



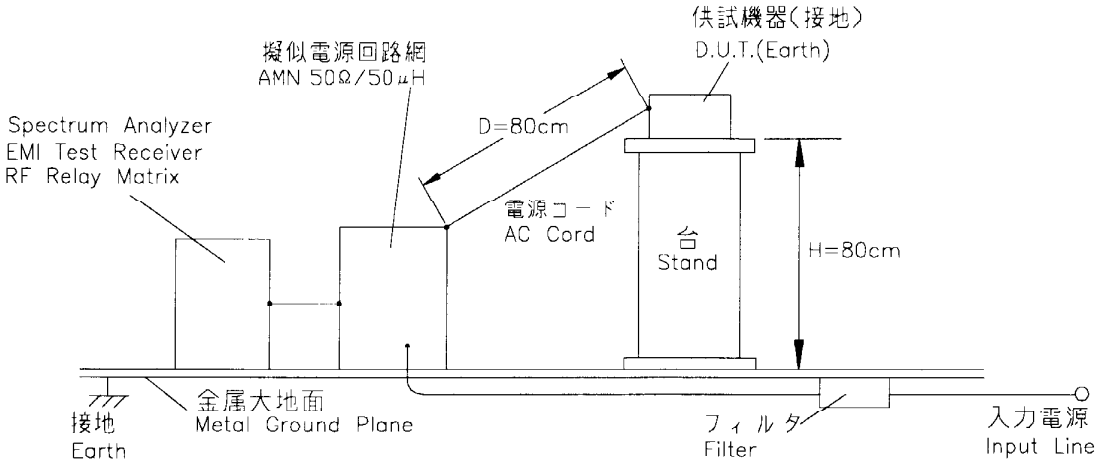
C2: 0.1uF Ceramic Capacitor

(14) EMI 特性

Electro-Magnetic Interference characteristics

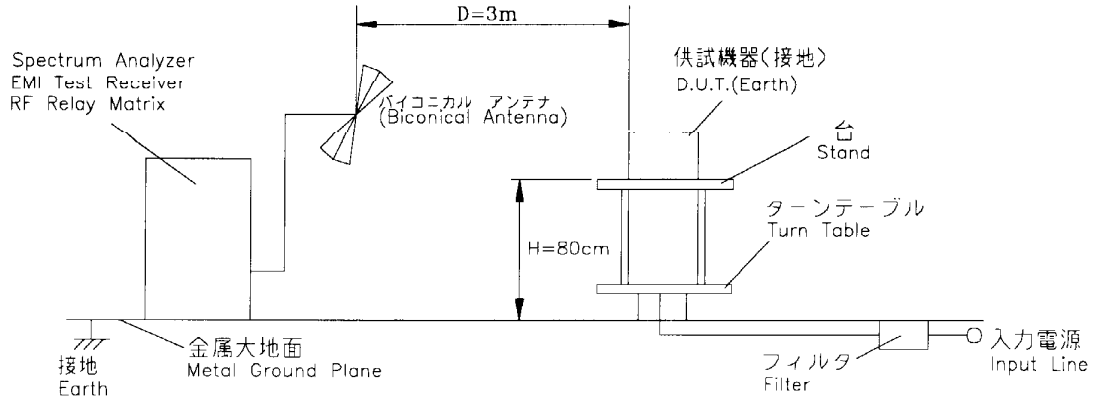
(a) 雑音端子電圧（帰還ノイズ）

Conducted Emission Noise



(b) 雑音電界強度（輻射ノイズ）

Radiated Emission Noise



1.2 使用測定機器　　LIST OF EQUIPMENT USED

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	OSCILLOSCOPE	HITACHI DENSHI	V-1100A
2	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS540B
3	DIGITAL MULTIMETER	ADVANTEST	R6341A
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110
5	SHUNT RESISTOR	YOKOGAWA ELECT.	2215
6	CURRENT PROBE/AMPLIFIER	TEKTRONIX	A6303/AM503
7	DYNAMIC DUMMY LOAD	TAKASAGO	FK-1000L
8	SLIDE REGULATOR	MATSUNAGA	SD-2625
9	CVCF	KIKUSUI	PCR4000L
10	LEAKAGE CURRENT METER	SIMPSON	229-2
11	LEAKAGE CURRENT METER	YOKOGAWA	TYPE3226
12	X-Y RECORDER	GRAPHTEC	WX3000-1
13	DYNAMIC DIP SIMULATOR	TAKAMISAWA CYBERNETICS	PSA-300
14	CONTROLLED TEMP. CHAMBER	TABAI ESPEC	PU-4KPH-A
15	SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSA
16	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESHS10
17	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESVS10
18	RF RELAY MATRIX	ROHDE & SCHWARZ	PSU
19	AMN	KYORITU DENSHI	KNW-242
20	ANTENNA(BICONICAL ANTENNA)	SCHWARZBECK	BBA9106

2. 特性データ　Characteristics

2.1 静特性　Steady state data

(1) 入力、負荷、温度変動　Regulation - line and load, temperature drift

24V

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	24.018V	24.018V	24.018V	24.018V	0mV	0.000%
50%	24.020V	24.020V	24.020V	24.020V	0mV	0.000%
100%	24.020V	24.020V	24.020V	24.020V	0mV	0.000%
load	2mV	2mV	2mV	2mV		
regulation	0.008%	0.008%	0.008%	0.008%		

2. Temperature drift　conditions Vin=100VAC Iout=100%

Ta	-10℃	+25℃	+50℃	temperature stability	
Vout	23.913V	24.020V	24.056V	143mV	0.60%

48V

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	48.09V	48.09V	48.09V	48.09V	0mV	0.000%
50%	48.09V	48.09V	48.09V	48.09V	0mV	0.000%
100%	48.09V	48.09V	48.09V	48.09V	0mV	0.000%
load	0mV	0mV	0mV	0mV		
regulation	0.000%	0.000%	0.000%	0.000%		

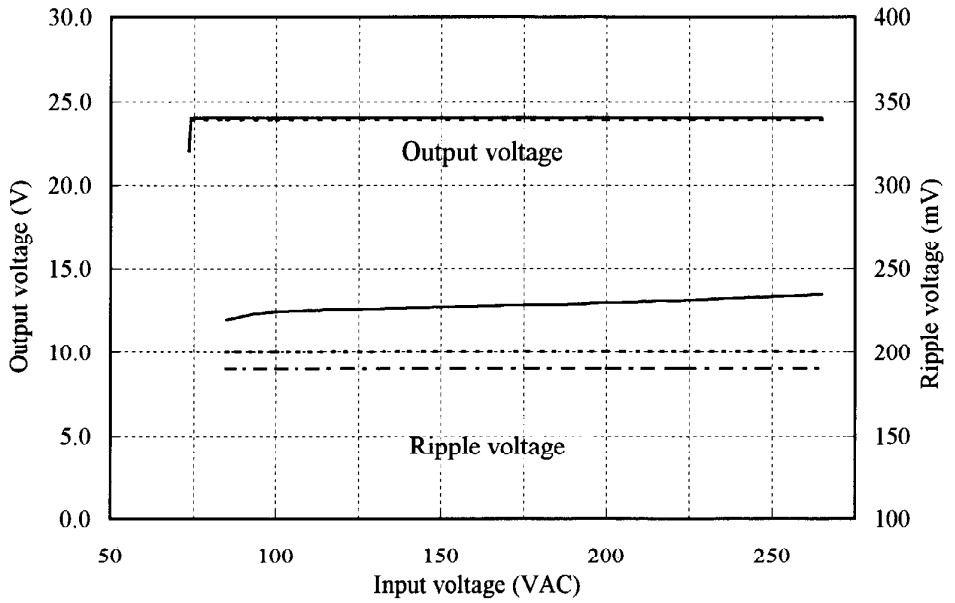
2. Temperature drift　conditions Vin=100VAC Iout=100%

Ta	-10℃	+25℃	+50℃	temperature stability	
Vout	48.06V	48.09V	48.14V	80mV	0.17%

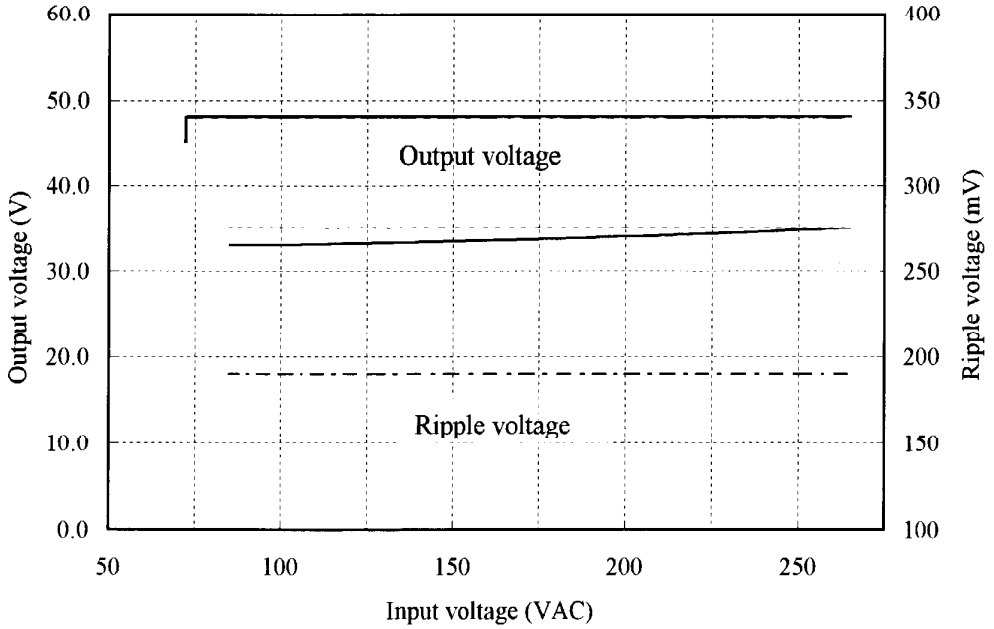
2.1 (2) 出力電圧、リップル電圧対入力電圧
Output voltage and Ripple voltage v.s. Input voltage

Conditions Iout : 100%
Ta : 10℃
: 25℃
: 50℃

24V



48V

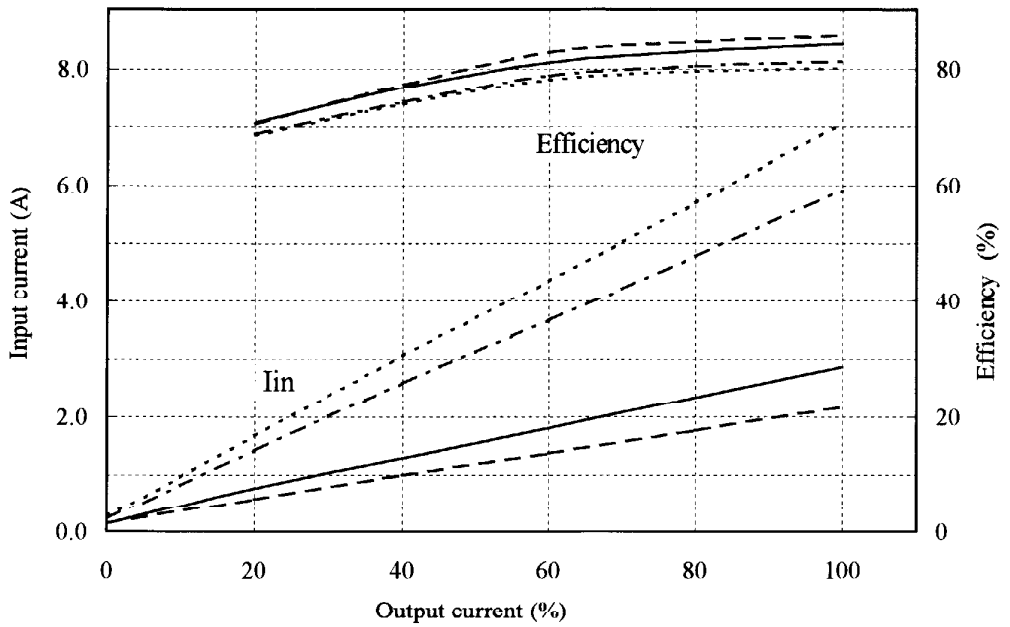


2.1 (3) 効率、入力電流対出力電流

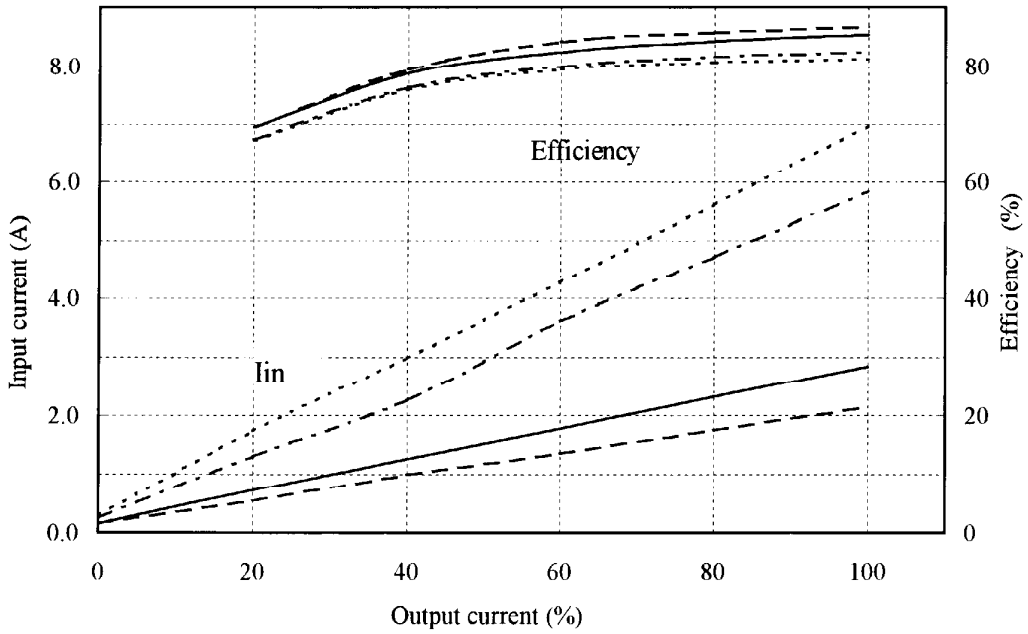
Efficiency and Input current v.s. Output current

Conditions Vin : 85VAC
: 100VAC
: 200VAC
: 265VAC
Ta : 25℃

24V



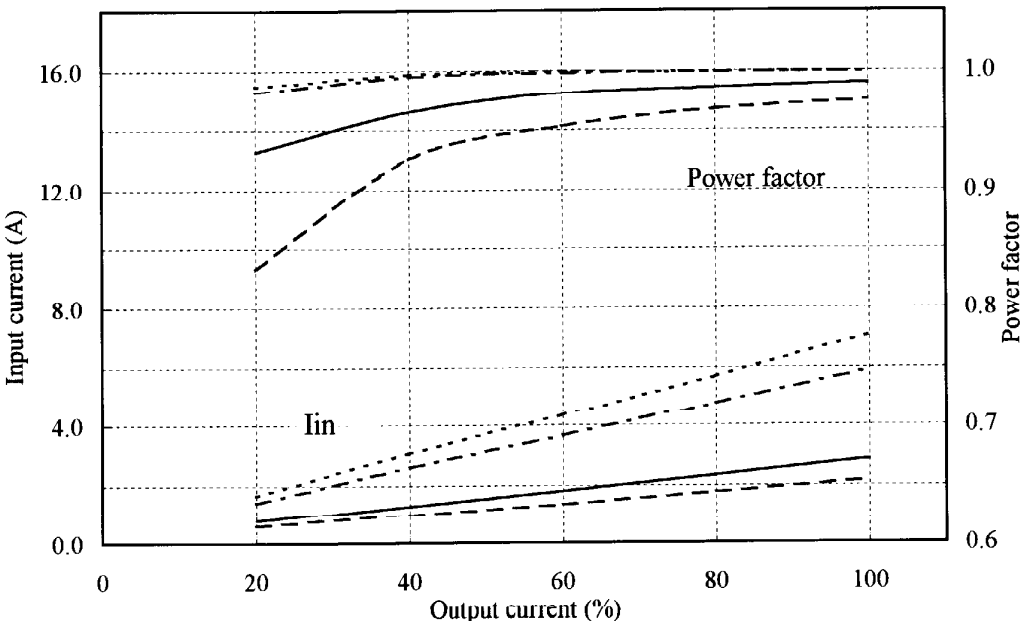
48V



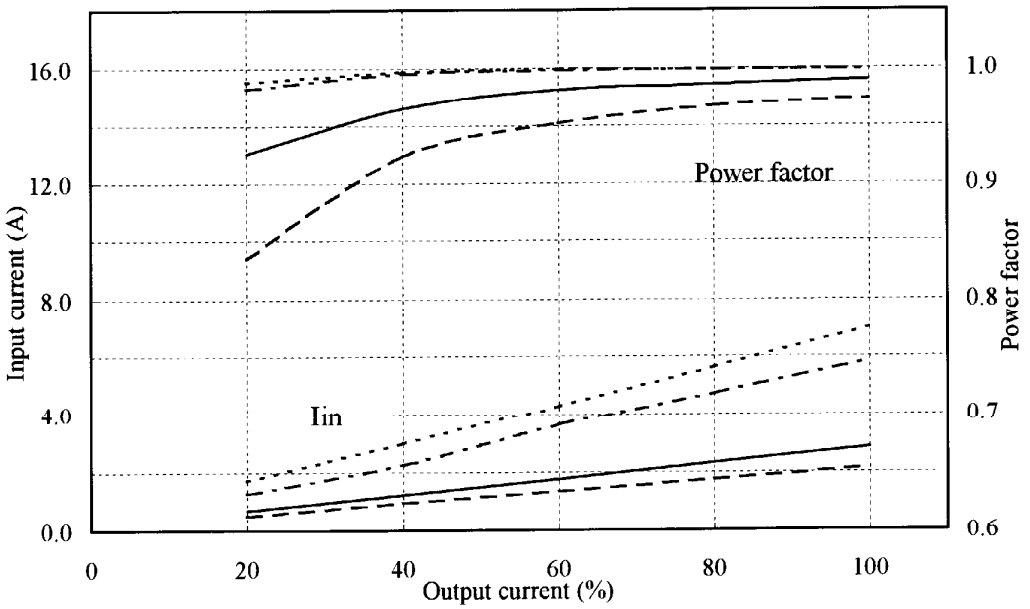
2.1 (4) 力率、入力電流対出力電流
Power factor and Input current v.s. Output current

Conditions Vin : 85VAC ------
: 100VAC -·-·-
: 200VAC ——
: 265VAC - - - -
Ta : 25℃

24V



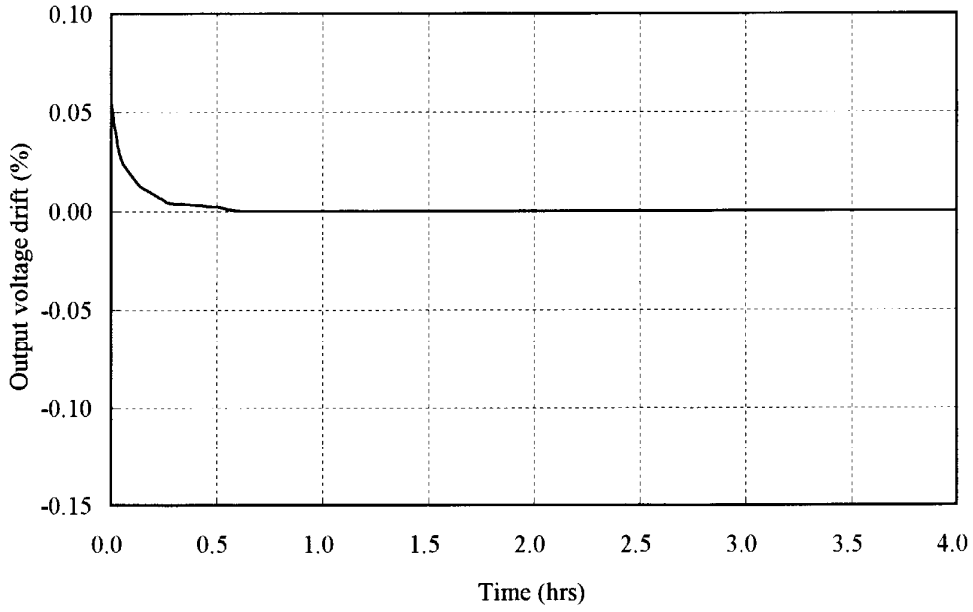
48V



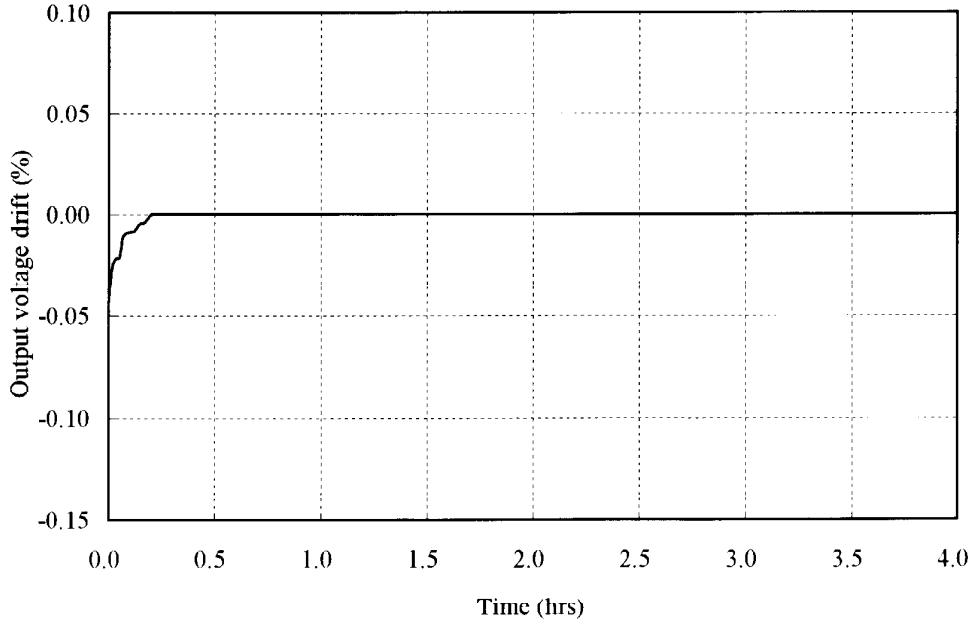
2.2 通電ドリフト特性
Warm up voltage drift characteristics

Conditions Vin : 100VAC
Io : 100%
Ta : 25℃

24V



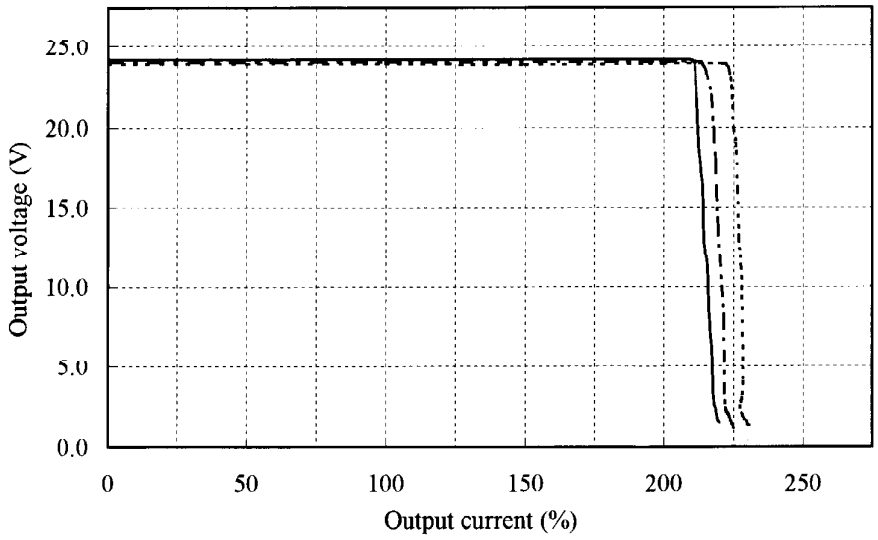
48V



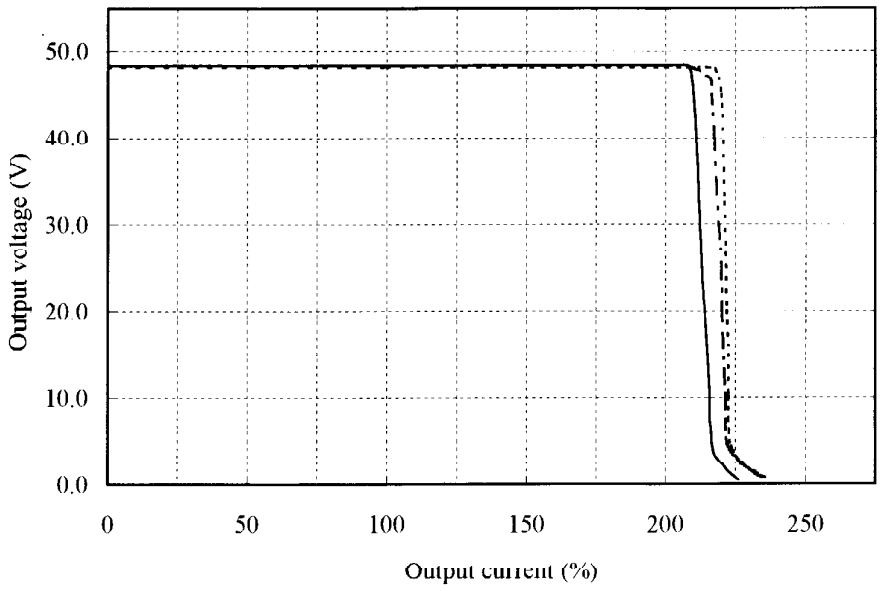
2. 3 過電流保護特性
Over current protection (OCP) characteristics

Conditions Ta : -10℃ -------
: 25℃ -·-·-·-
: 50℃ ———
Vin : 85-265VAC

24V



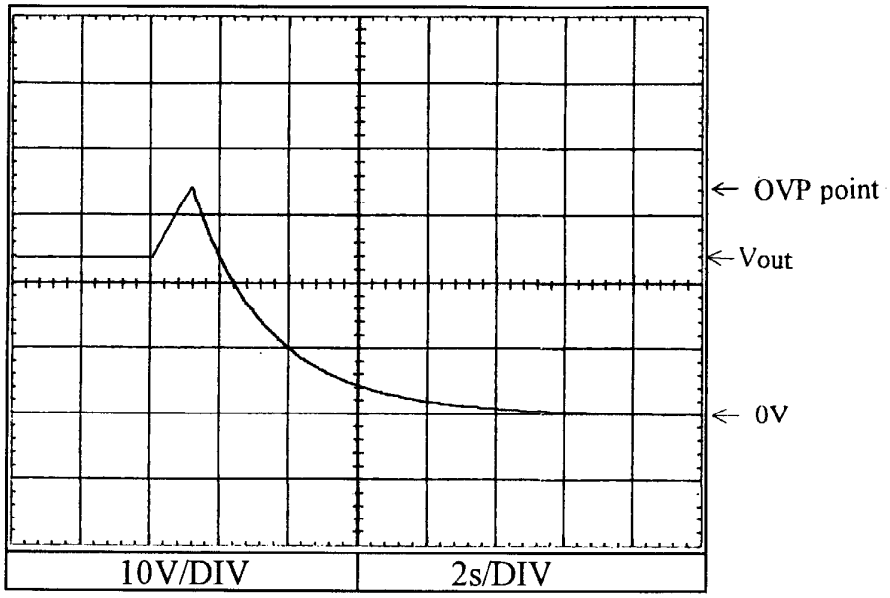
48V



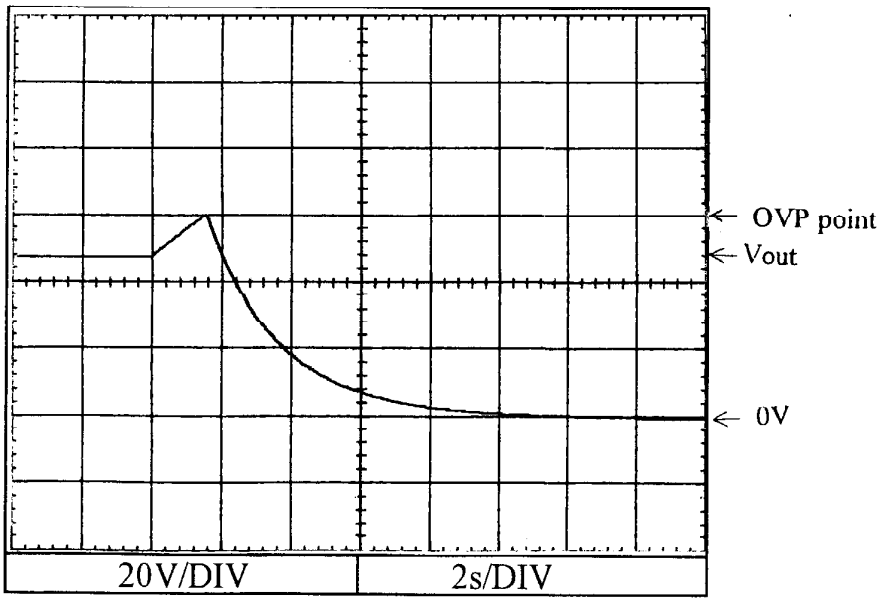
2.4 過電圧保護特性
Over voltage protection (OVP) characteristics

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

24V



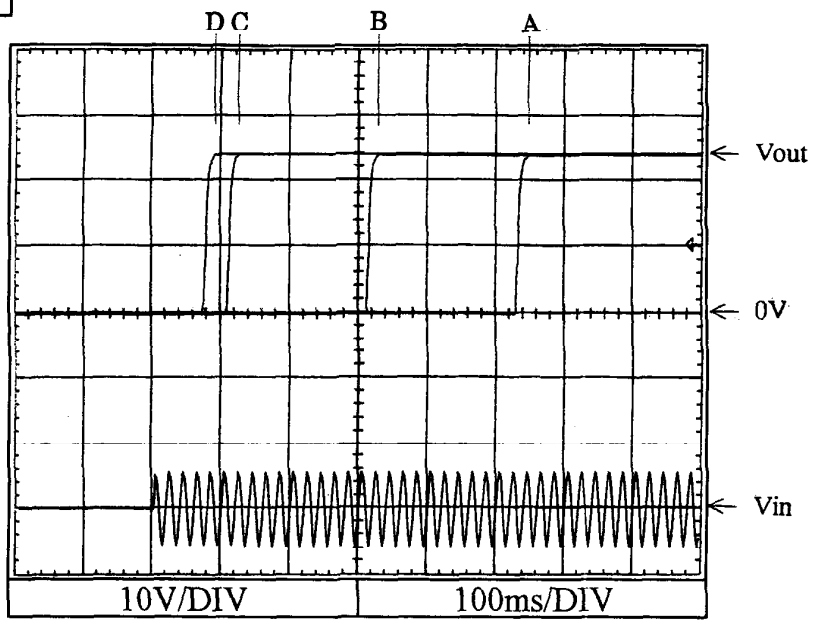
48V



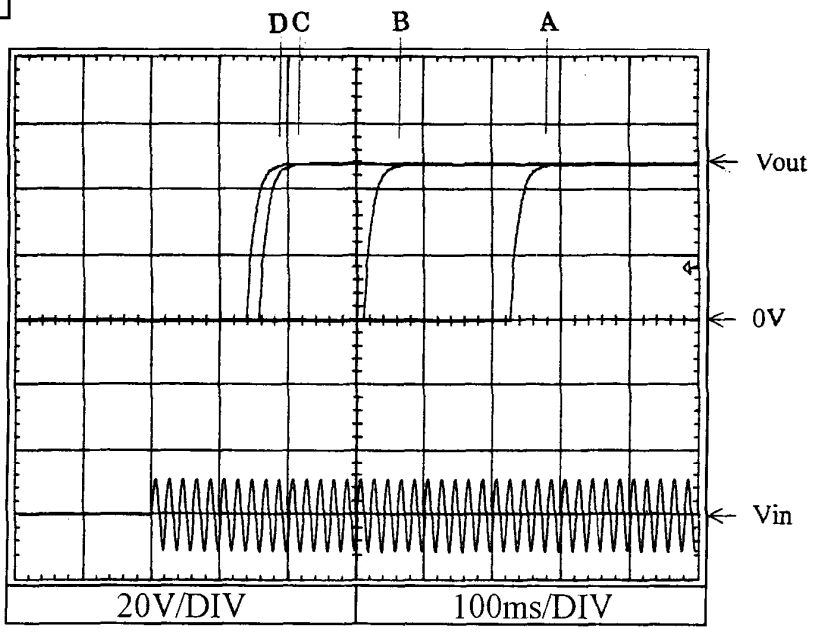
2.5 出力立ち上がり特性
Output rise characteristics

Conditions Vin : 85VAC (A)
: 100VAC (B)
: 200VAC (C)
: 265VAC (D)
Iout : 0%
Ta : 25℃

24V



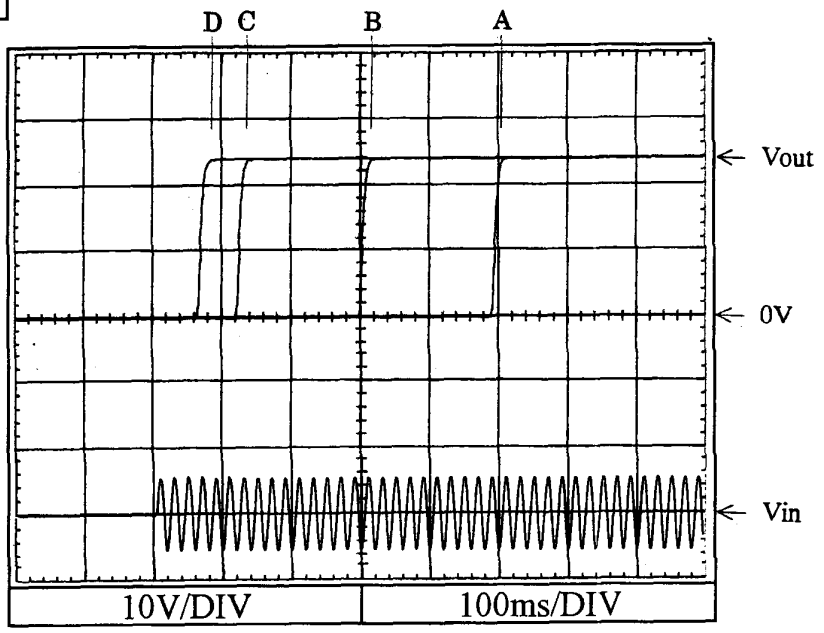
48V



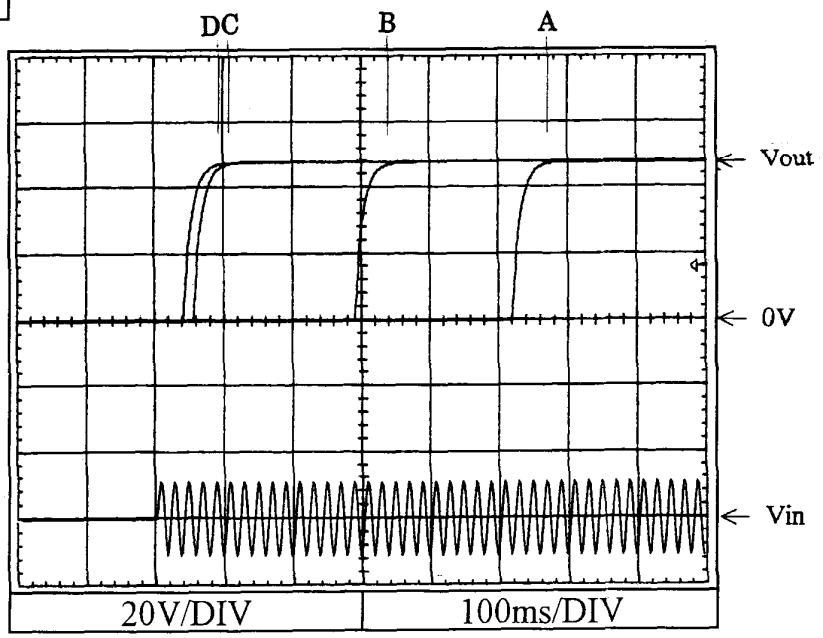
2.5 出力立ち上がり特性
Output rise characteristics

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

24V



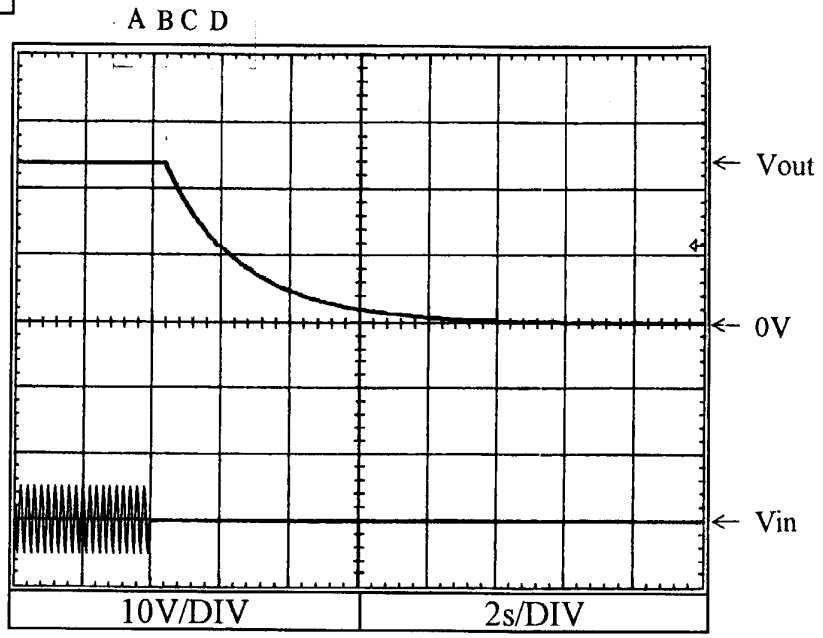
48V



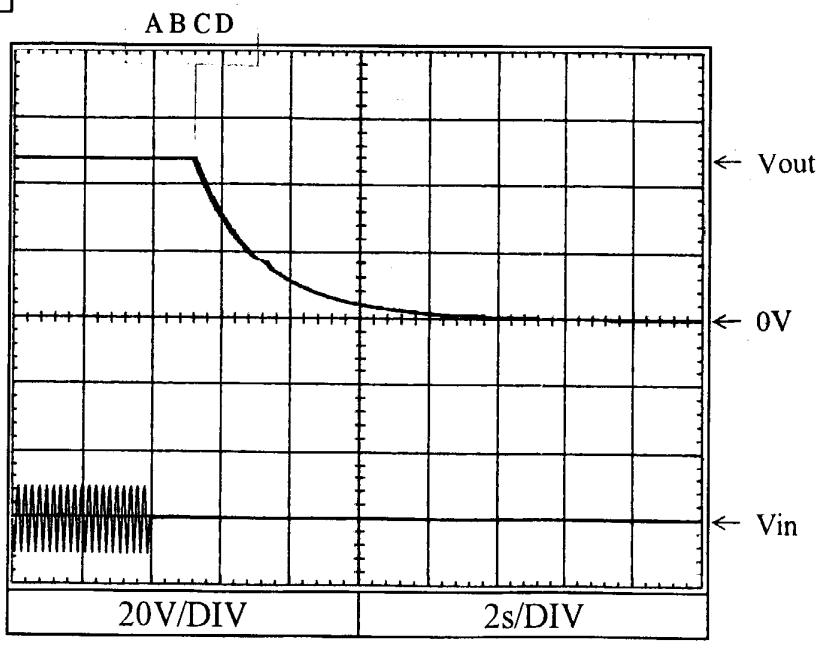
2.6 出力立ち下がり特性
Output fall characteristics

Conditions Vin : 85VAC (A)
: 100VAC (B)
: 200VAC (C)
: 265VAC (D)
Iout : 0%
Ta : 25℃

24V



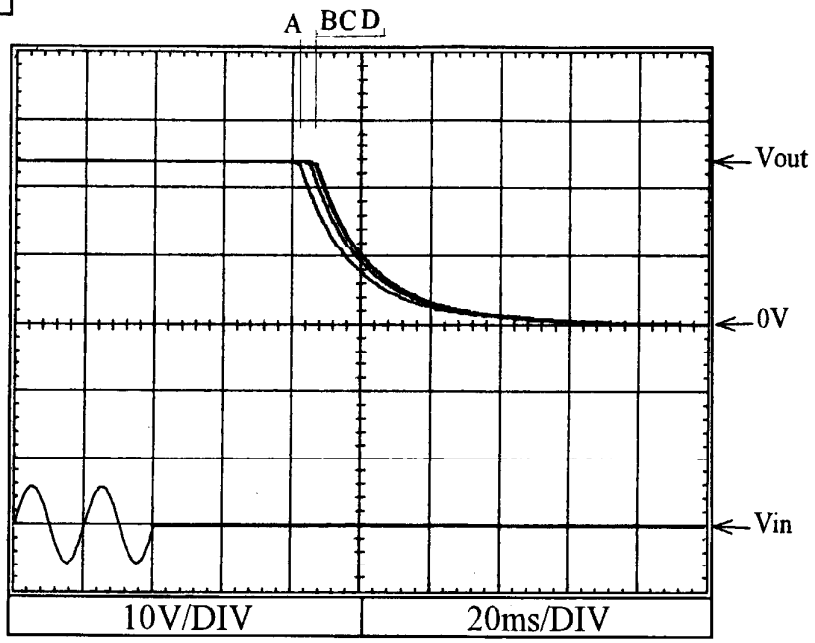
48V



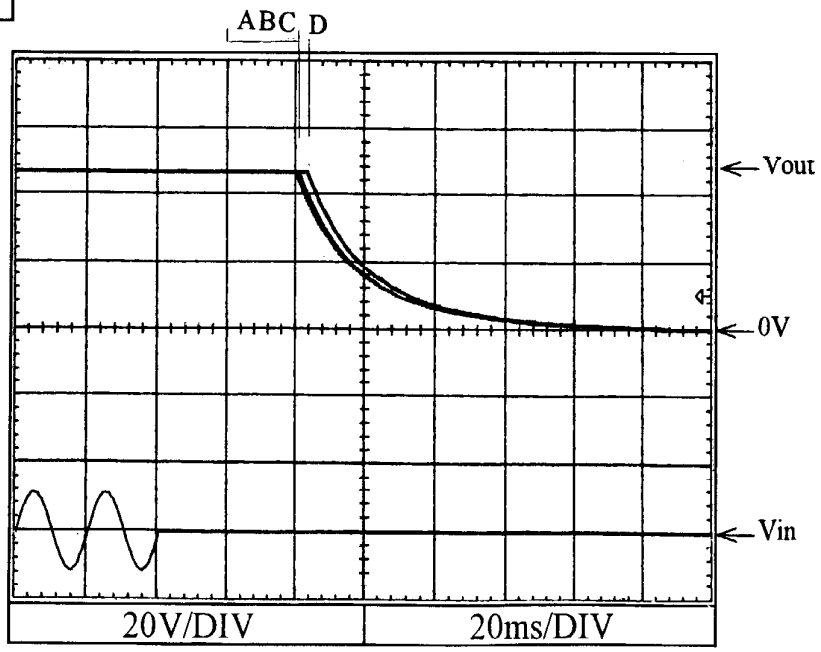
2.6 出力立ち下がり特性
Output fall characteristics

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

24V



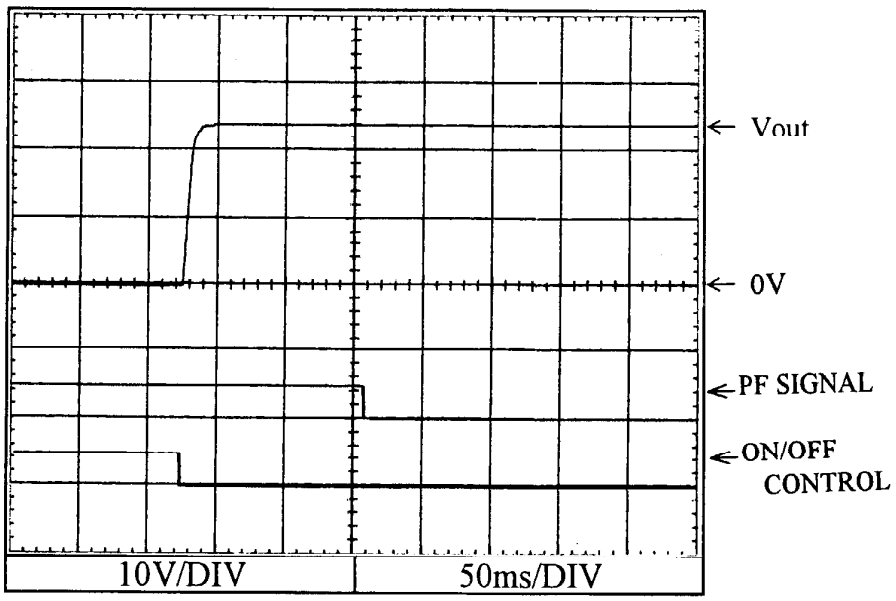
48V



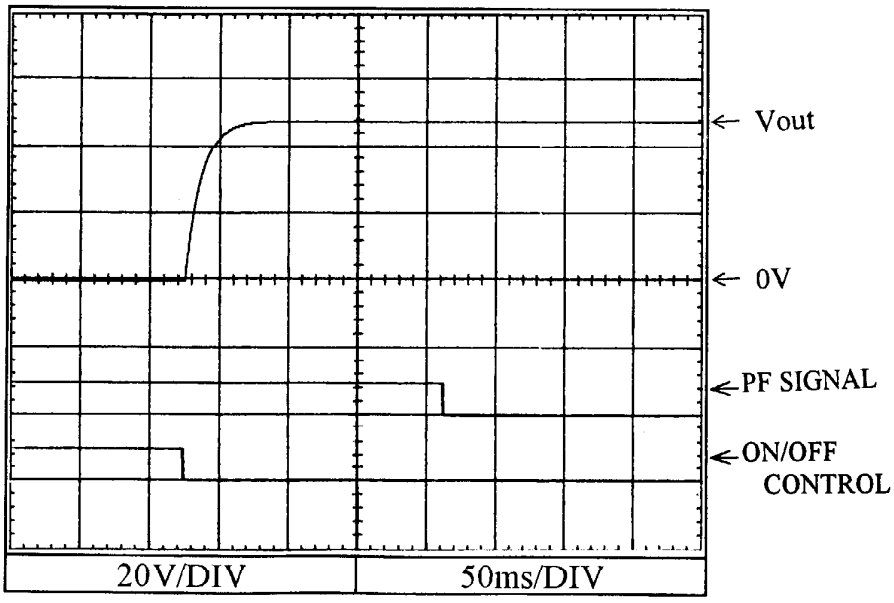
2.7 ON/OFFコントロール時出力立ち上がり特性
Output rise characteristics with ON/OFF CONTROL

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

24V



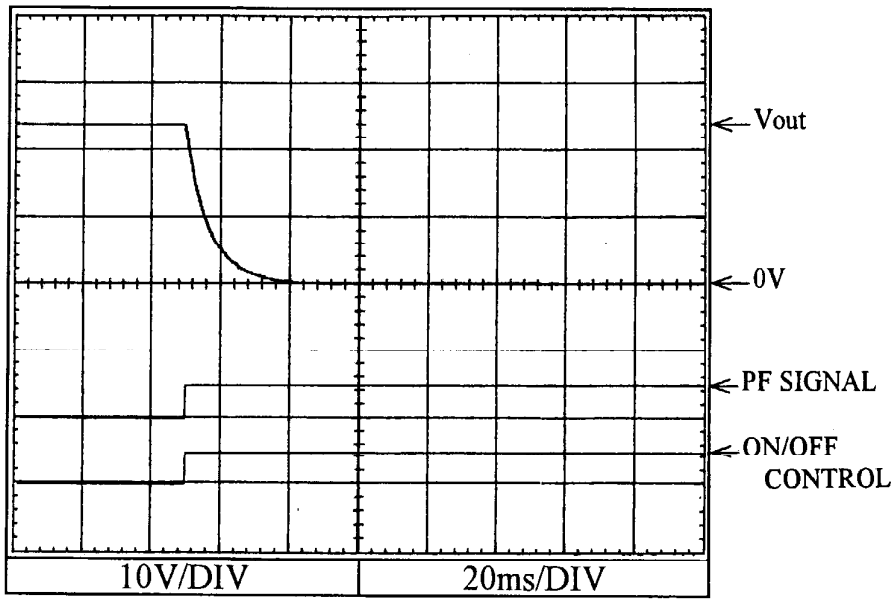
48V



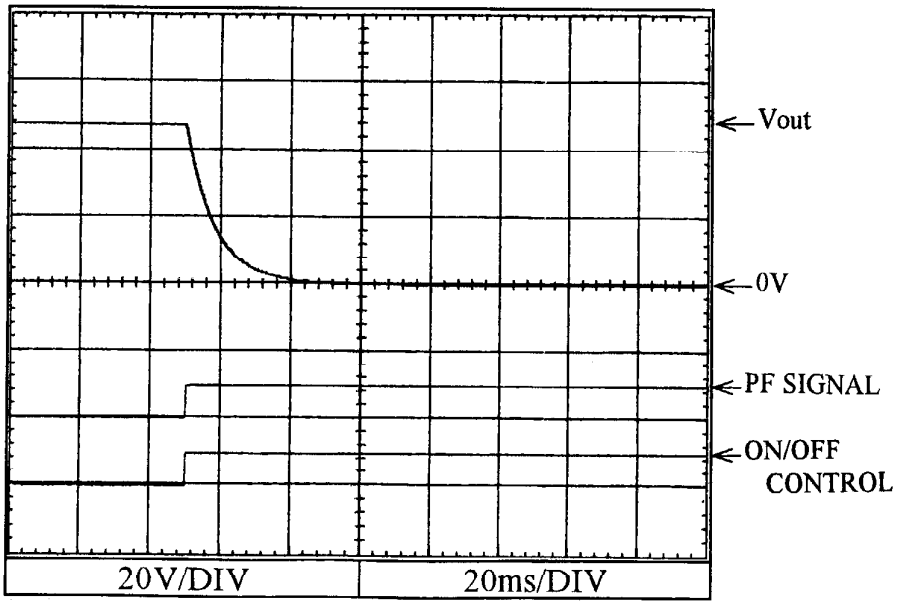
2.8 ON/OFFコントロール時出力立ち下がり特性
Output fall characteristics with ON/OFF CONTROL

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

24V



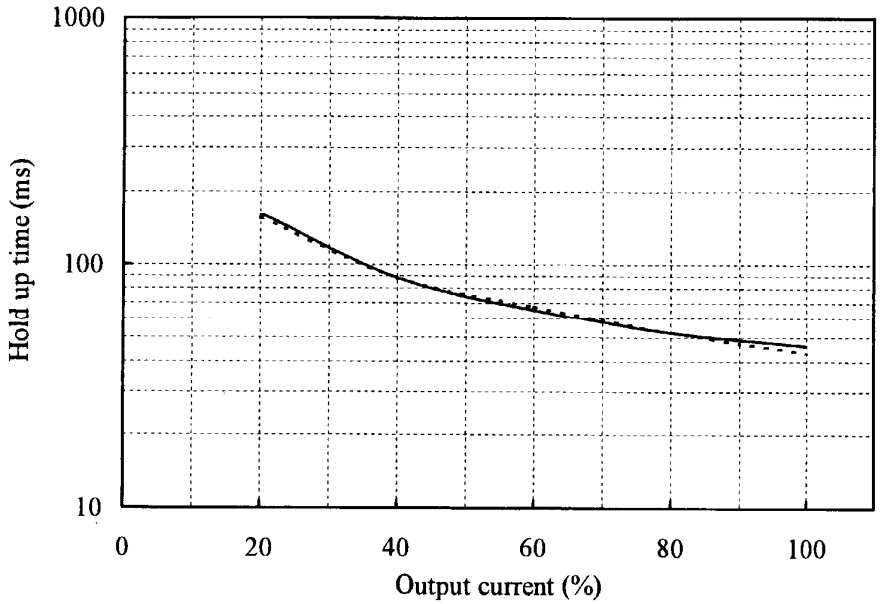
48V



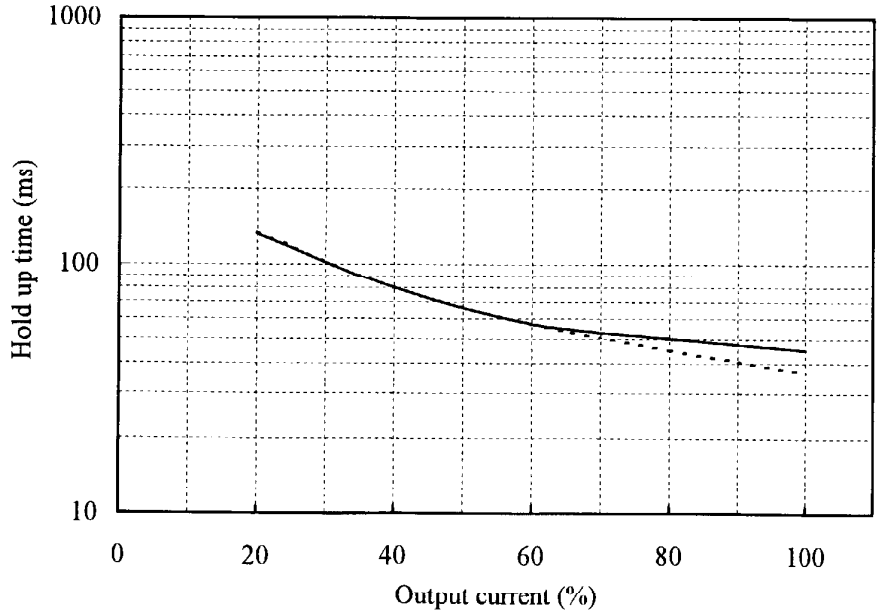
2. 9 出力保持時間特性
Hold up time characteristics

Conditions Vin : 100VAC --------
: 200VAC ————
Ta : 25℃

24V



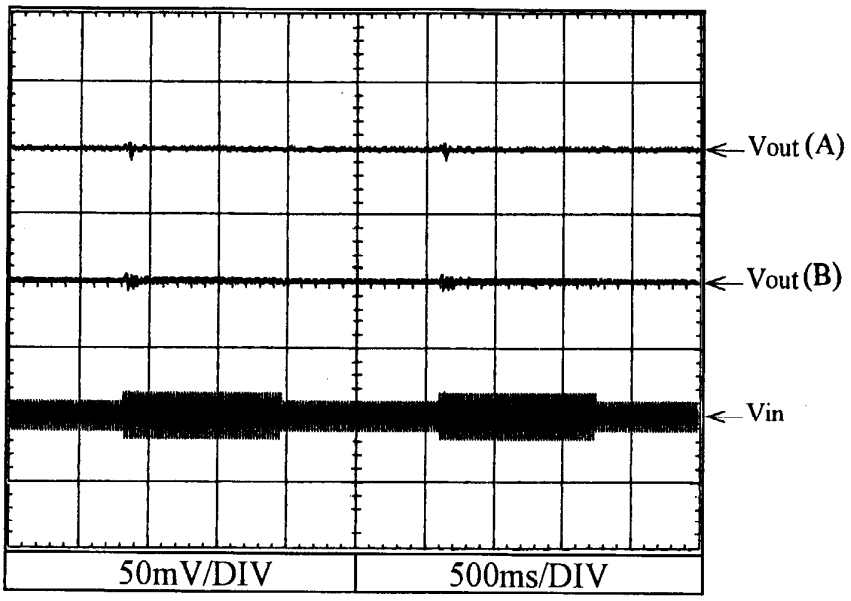
48V



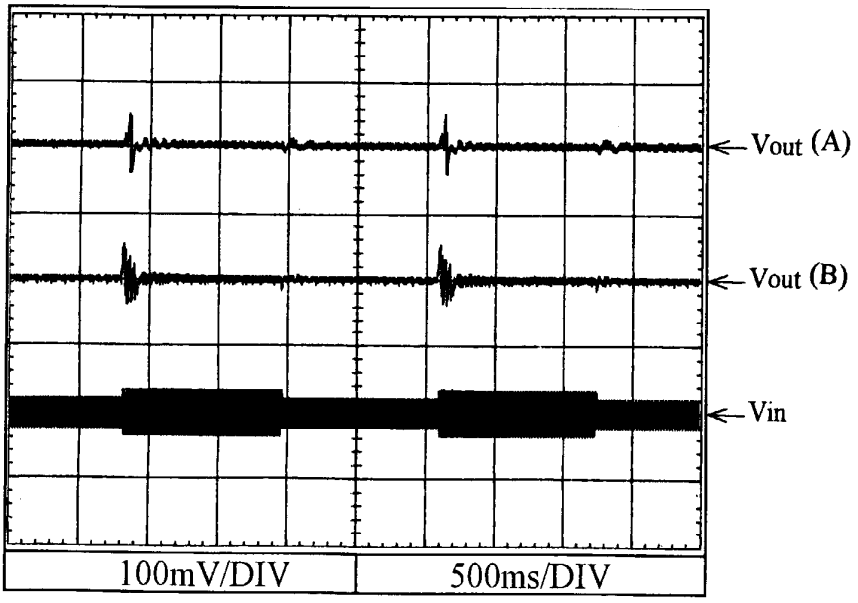
2.10 過渡応答（入力急変）特性
Dynamic line response characteristics

Conditions Vin : 85VAC←→132VAC(A)
170VAC←→265VAC(B)
Iout : 100%
Ta : 25℃

24V



48V



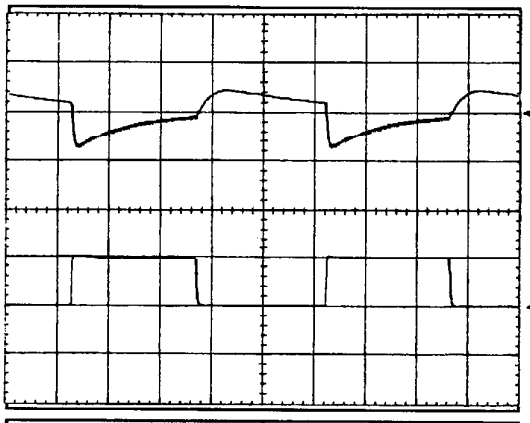
2.11 過渡応答（負荷急変）特性
Dynamic load response characteristics

Conditions Vin : 100VAC
Ta : 25℃

24V

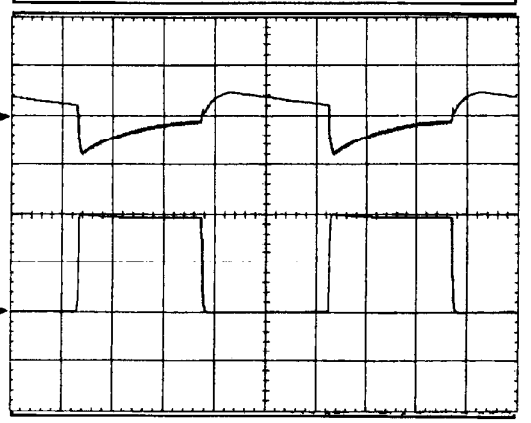
f=100Hz

Load current tr = tf = 50us
Iout 0%⟷100%



200mV/DIV	2ms/DIV
+0.38%	-0.62%

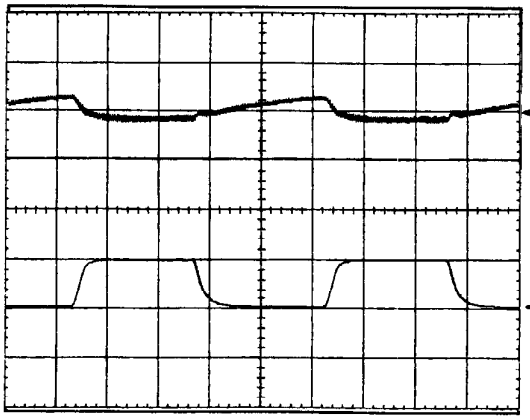
Load current tr = tf = 50us
Iout 0%⟷200%



200mV/DIV	2ms/DIV
+0.40%	-0.67%

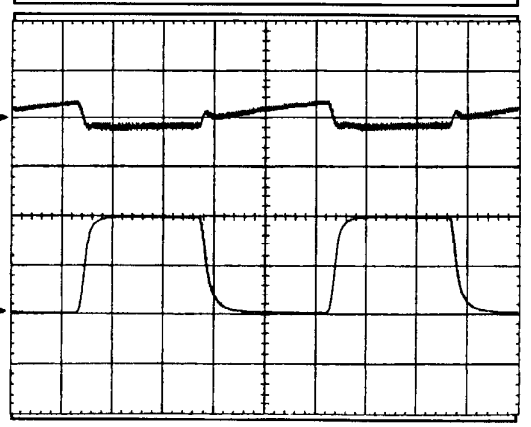
f=1kHz

Load current tr = tf = 50us
Iout 0%⟷100%



200mV/DIV	200μs/DIV
+0.27%	-0.20%

Load current tr = tf = 50us
Iout 0%⟷200%



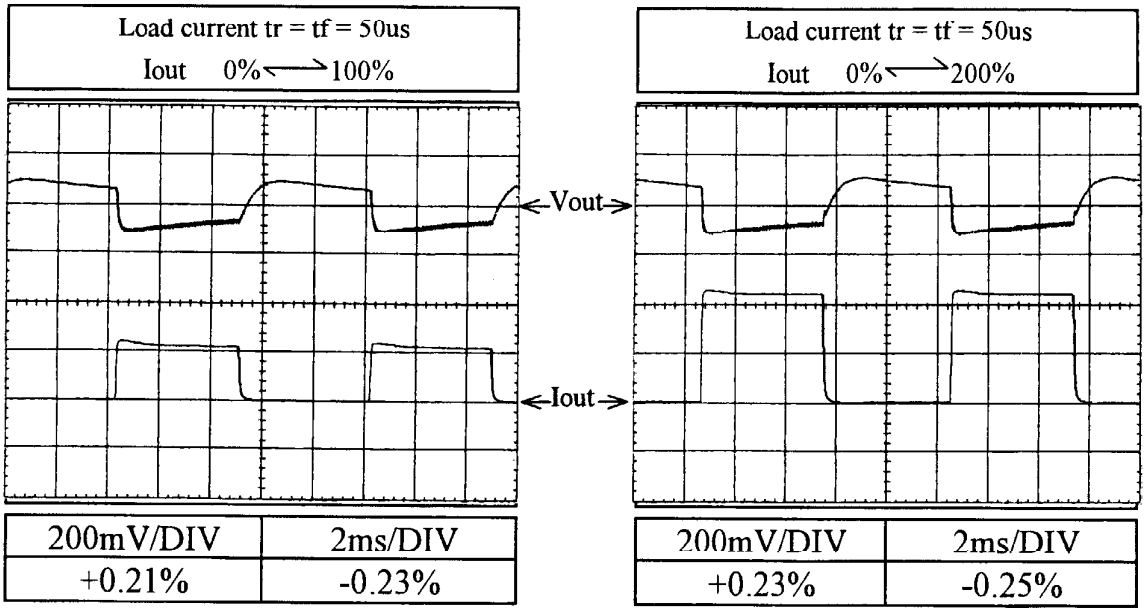
200mV/DIV	200μs/DIV
+0.28%	-0.23%

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

Conditions Vin : 100VAC
Ta : 25℃

48V

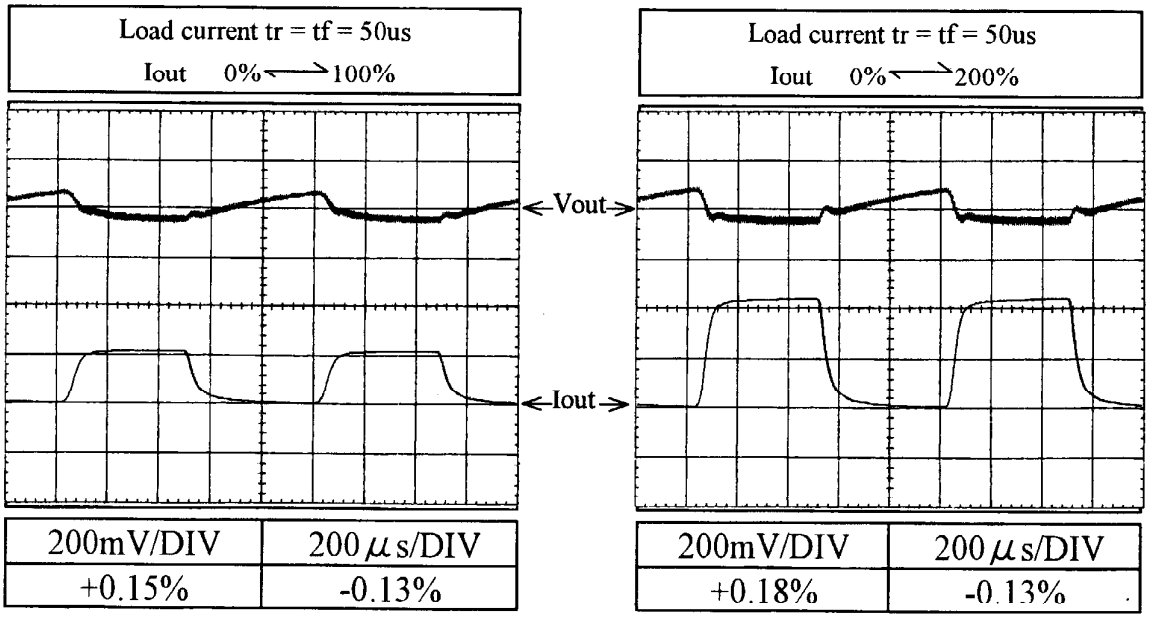
f=100Hz



200mV/DIV	2ms/DIV
+0.21%	-0.23%

200mV/DIV	2ms/DIV
+0.23%	-0.25%

f=1kHz



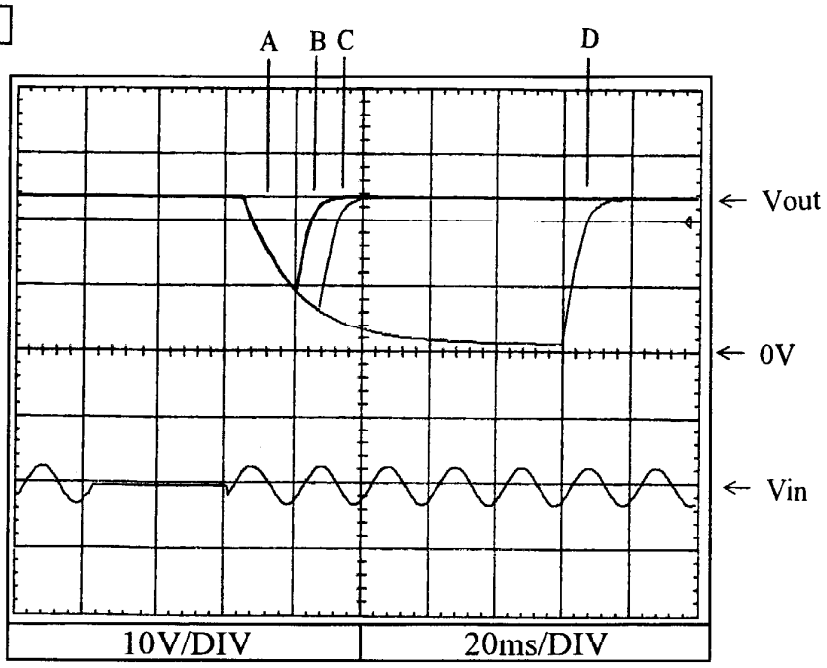
200mV/DIV	200μs/DIV
+0.15%	-0.13%

200mV/DIV	200μs/DIV
+0.18%	-0.13%

2. 12 入力電圧瞬停特性
Response to brown out characteristics

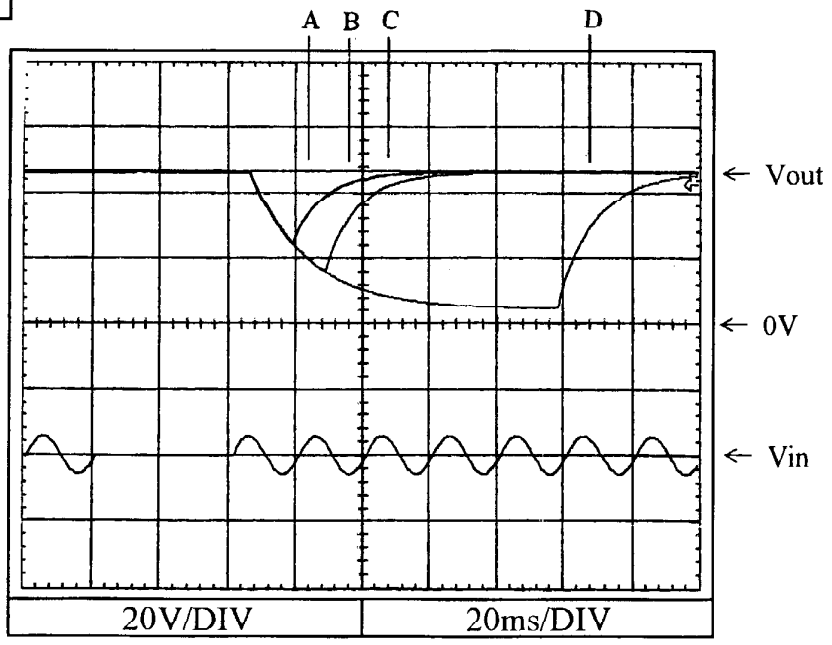
Conditions Vin : 100VAC
Iout : 100%
Ta : 25℃

24V



A=37ms
B=38ms
C=45ms
D=46ms

48V

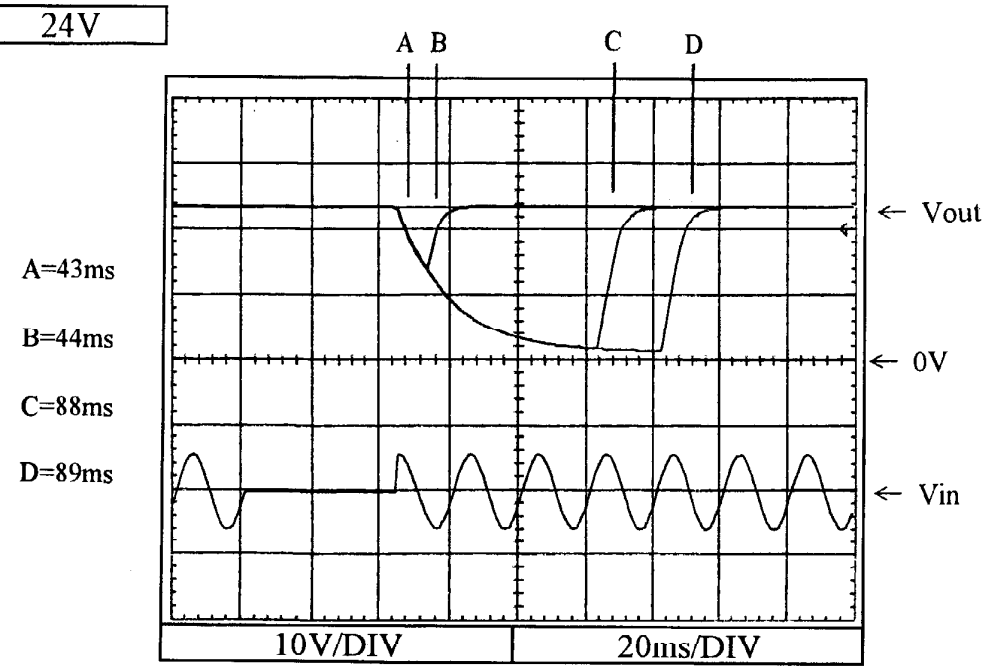


A=40ms
B=41ms
C=46ms
D=47ms

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

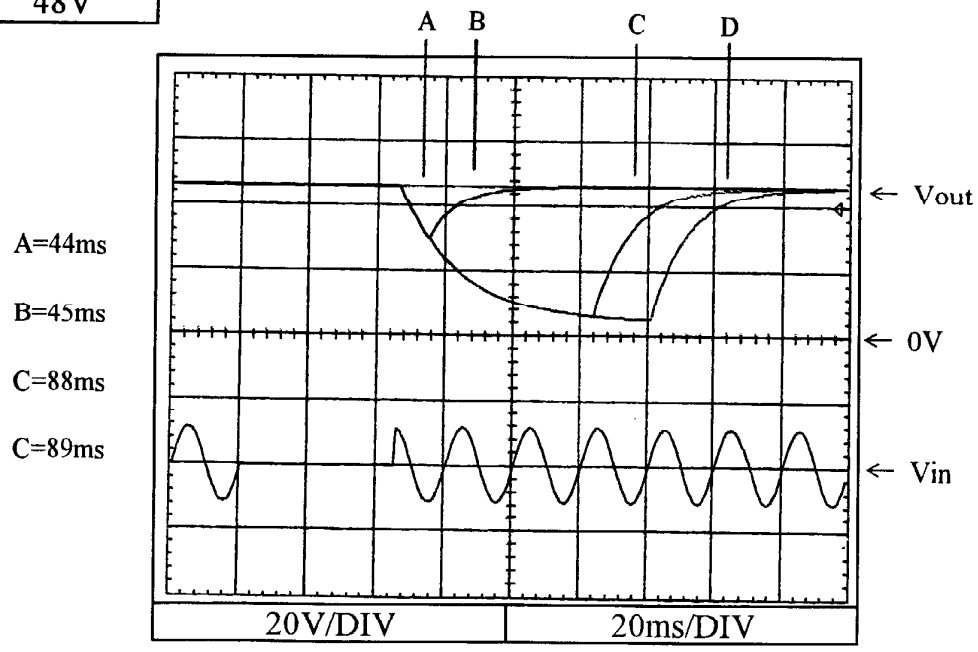
Conditions Vin : 200VAC
Iout : 100%
Ta : 25℃

24V



A=43ms
B=44ms
C=88ms
D=89ms

48V



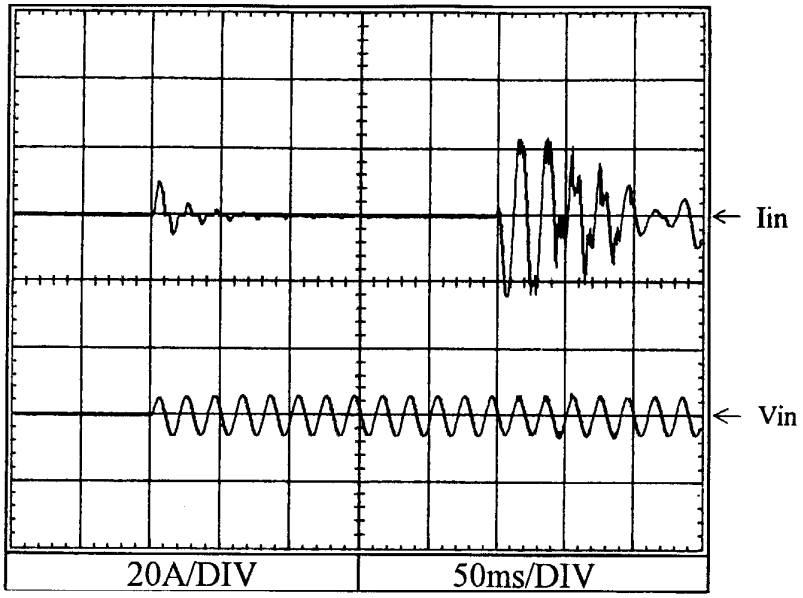
A=44ms
B=45ms
C=88ms
C=89ms

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

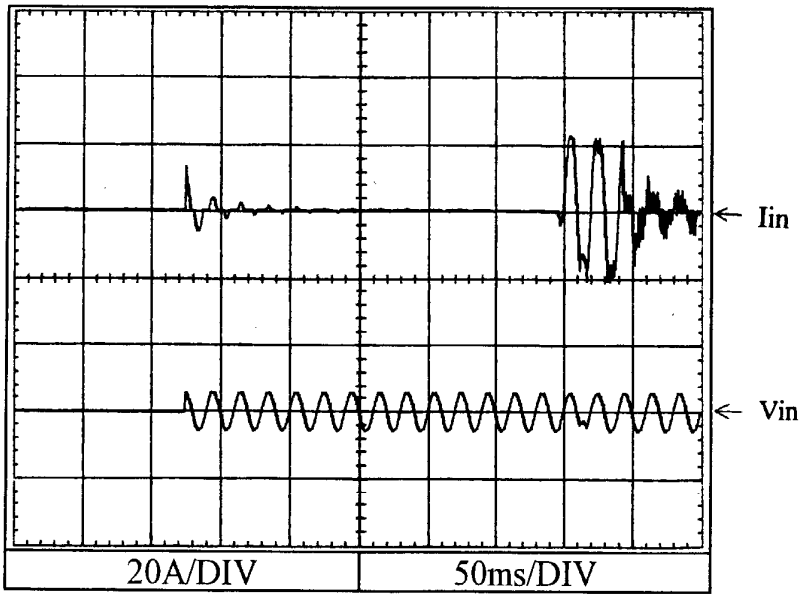
Conditions Vin : 100VAC
Iout : 100%
Ta : 25℃

24V

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



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

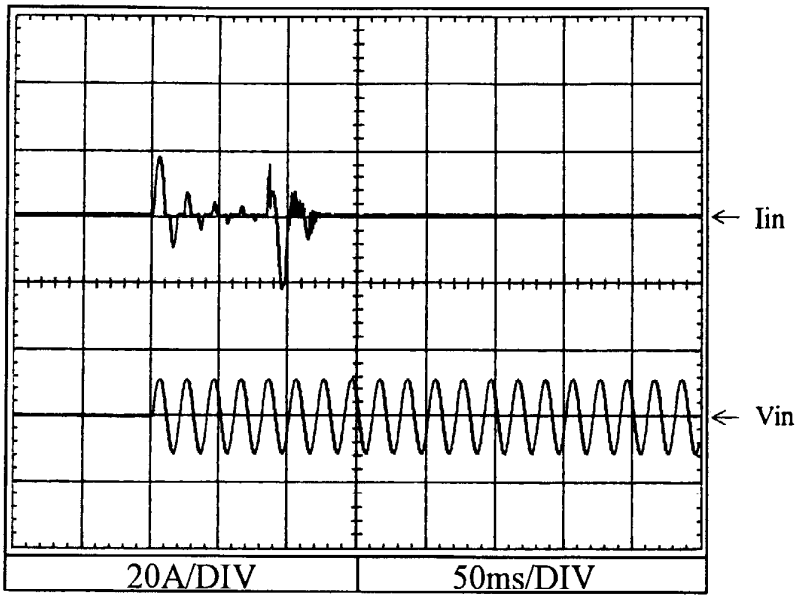


2. 13 入力サージ電流（突入電流）特性
Inrush current waveform

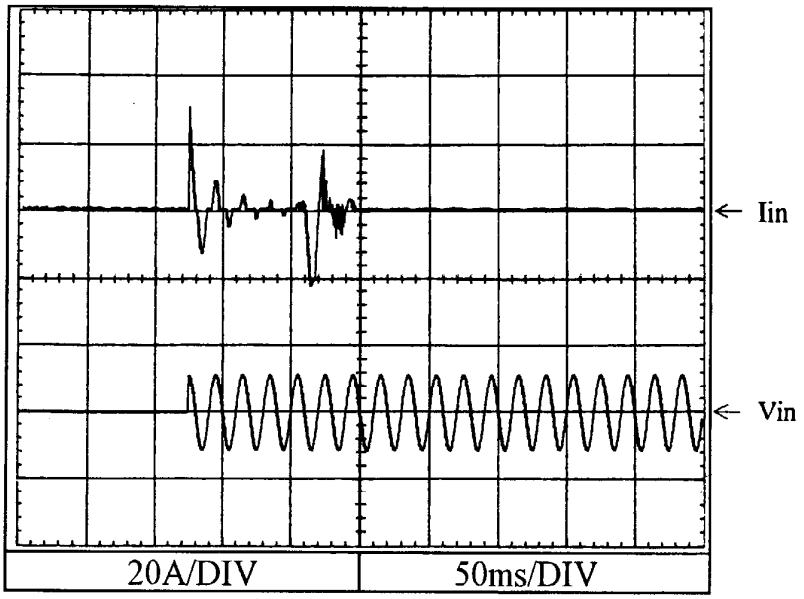
Conditions Vin : 200VAC
Iout : 100%
Ta : 25℃

24V

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



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

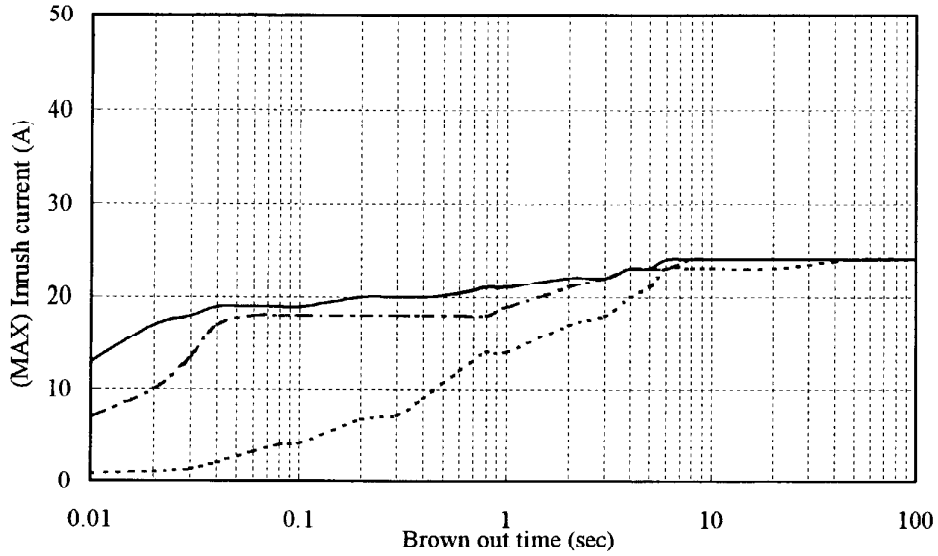


2.14 瞬停時突入電流特性
Inrush current characteristics

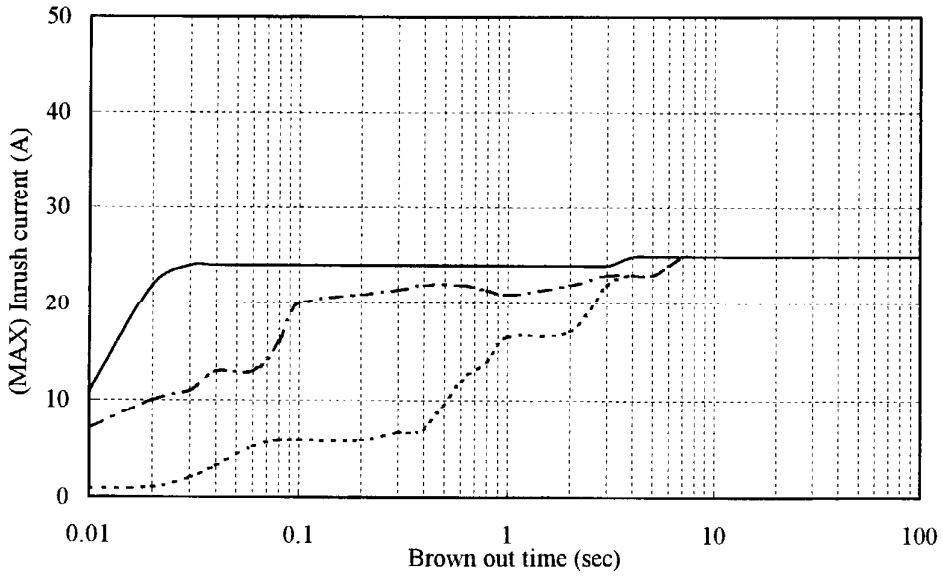
Conditions Iout : 0% -----
: 50% -·-·-
: 100% ——
Ta : 25℃

24V

Vin : 100VAC



Vin : 200VAC

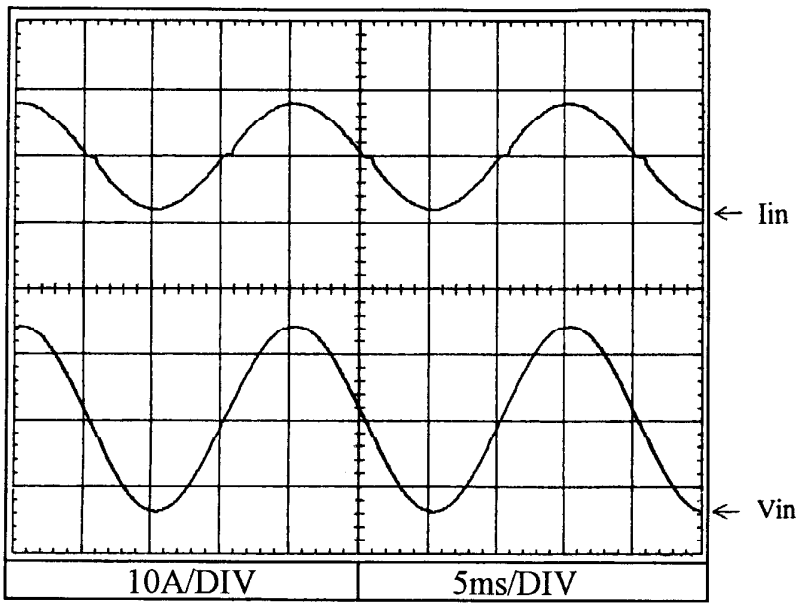


※ 上記値は、2次突入電流を含んだ値である。
Above data includes secondary inrush current.

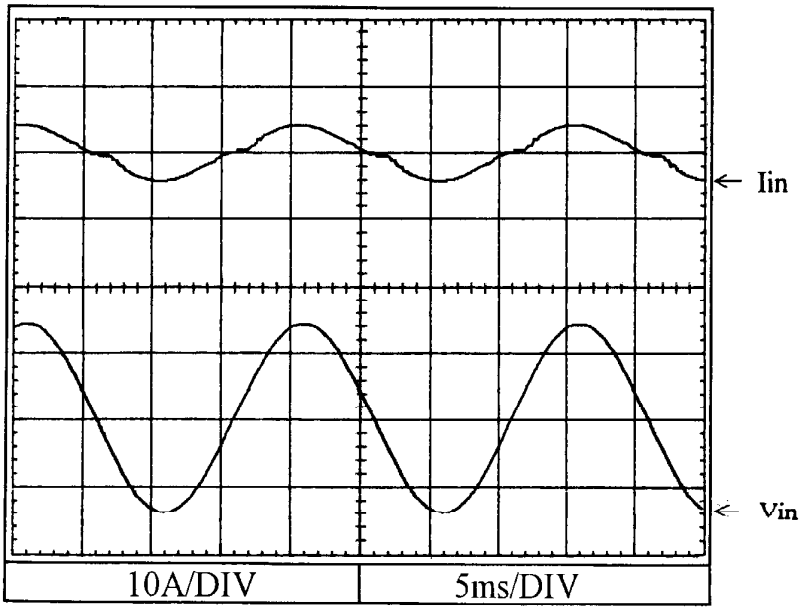
2.15 入力電流波形
Input current waveform

24V

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



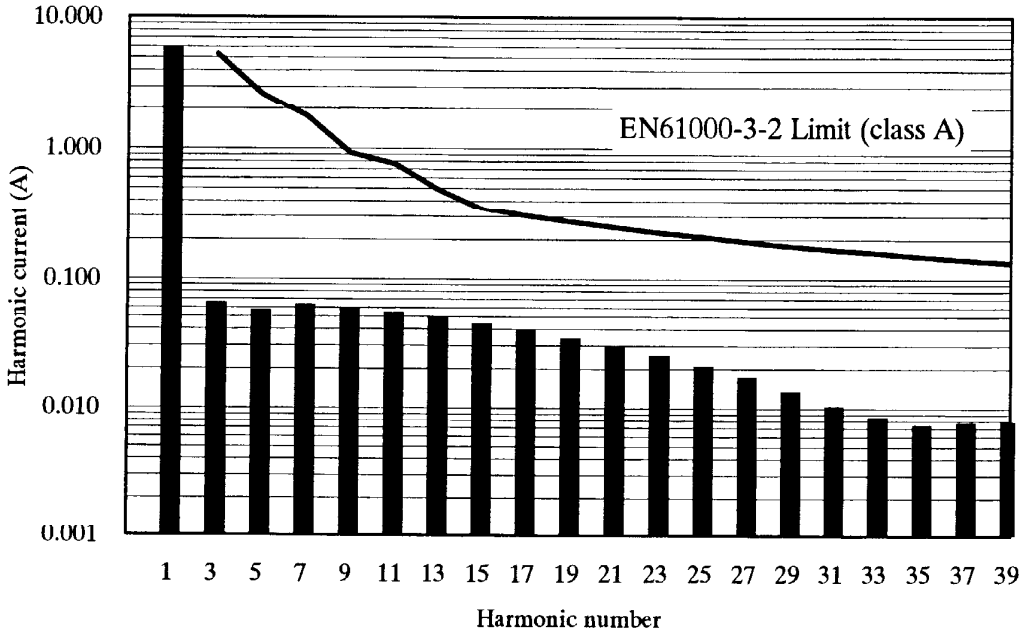
Conditions Vin : 200VAC
Iout : 100%
Ta : 25℃



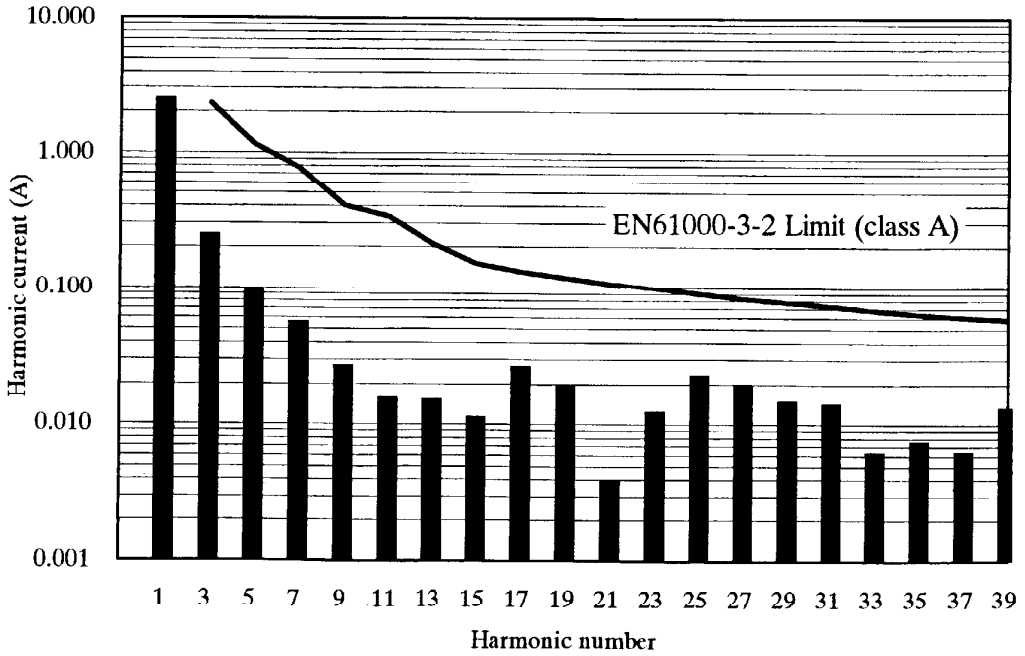
2.16 高調波成分
Input current harmonics

24V

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



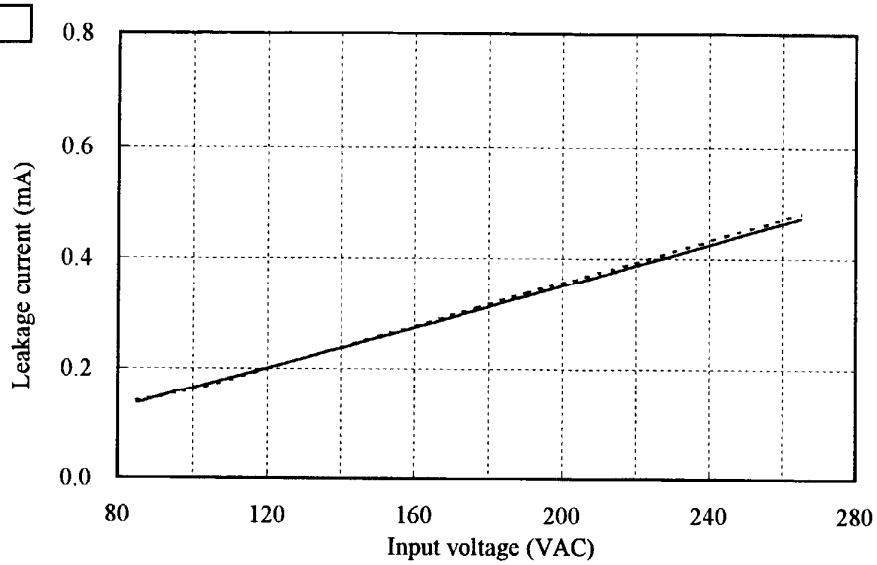
Conditions Vin : 230VAC
Iout : 100%
Ta : 25℃



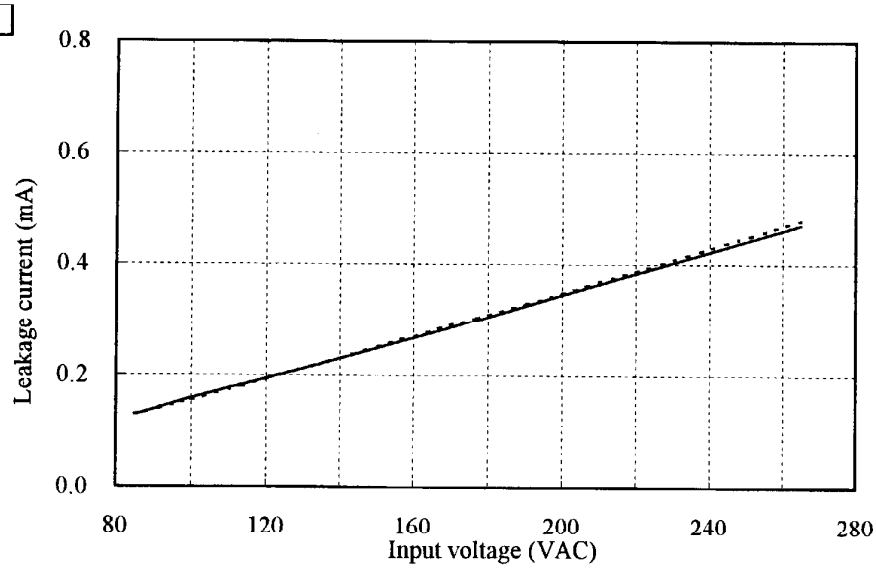
2.17 リーク電流特性
Leakage current characteristics

Conditions Iout : 0% --------
: 100% ———
Ta : 25°C
f : 50Hz
Equipment used : MODEL 229-2 (Simpson)

24V



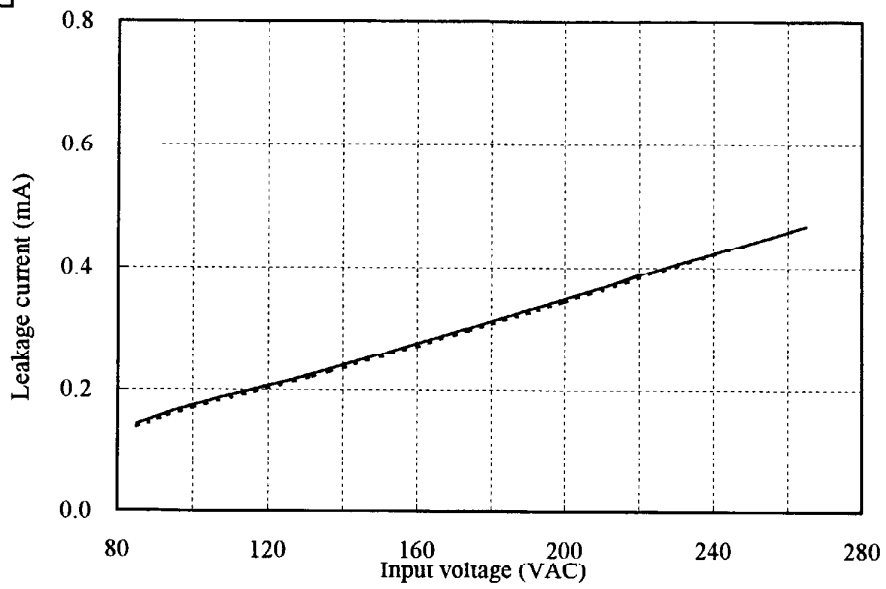
48V



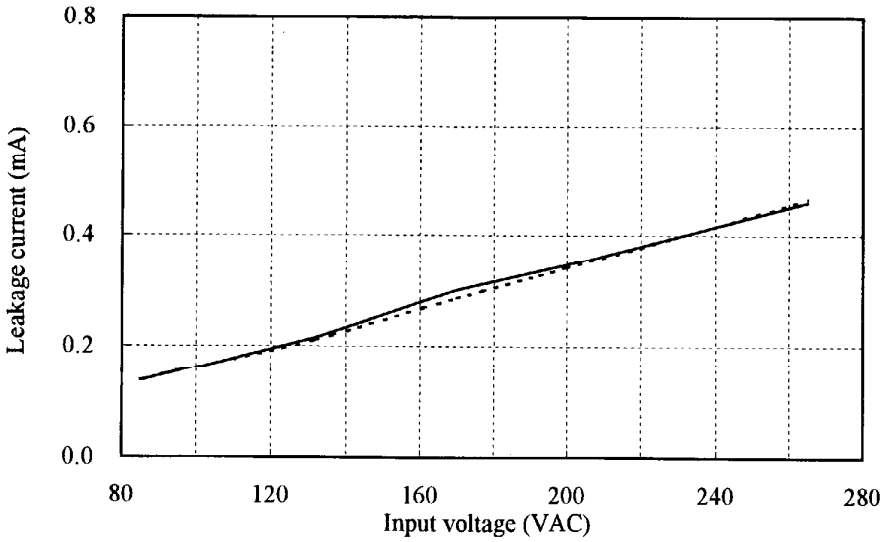
2. 17 リーク電流特性
Leakage current characteristics

Conditions Iout : 0% --------
: 100% ————
Ta : 25°C
f : 50Hz
Equipment used : TYPE3226 (YOKOGAWA)

24V



48V

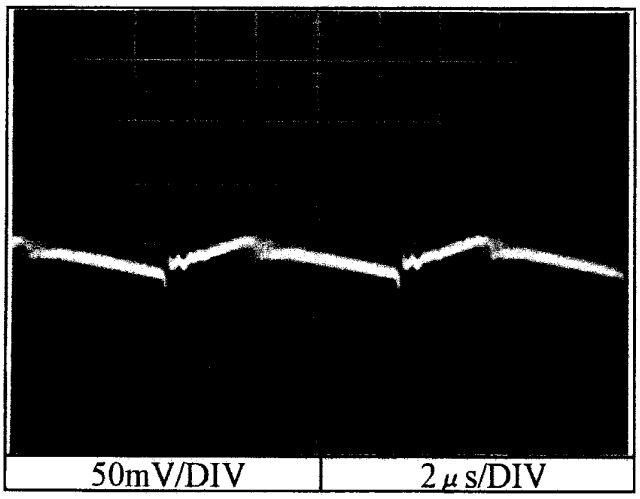


2. 18 出力リップル、ノイズ波形
Output ripple and noise waveform

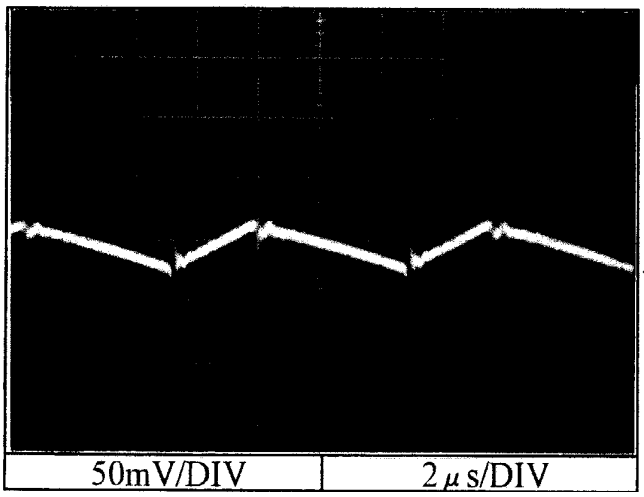
Conditions Vin : 100VAC
Iout : 100%
Ta : 25℃

NORMAL MODE

24V



48V

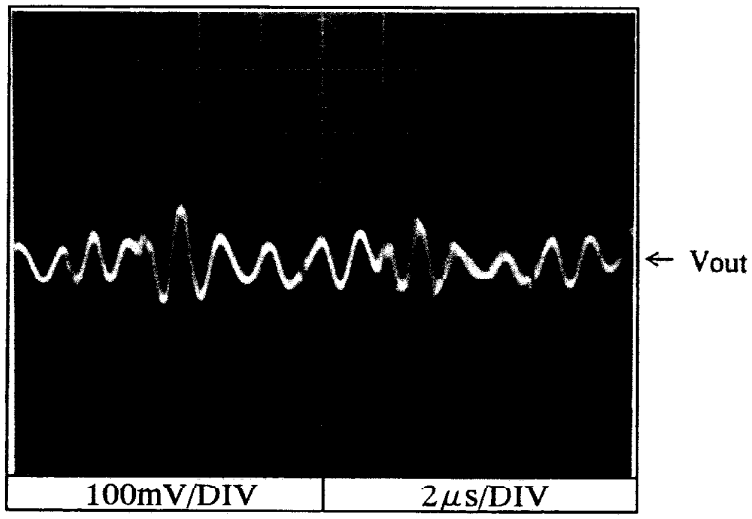


2.18 出力リップル、ノイズ波形
Output ripple and noise waveform

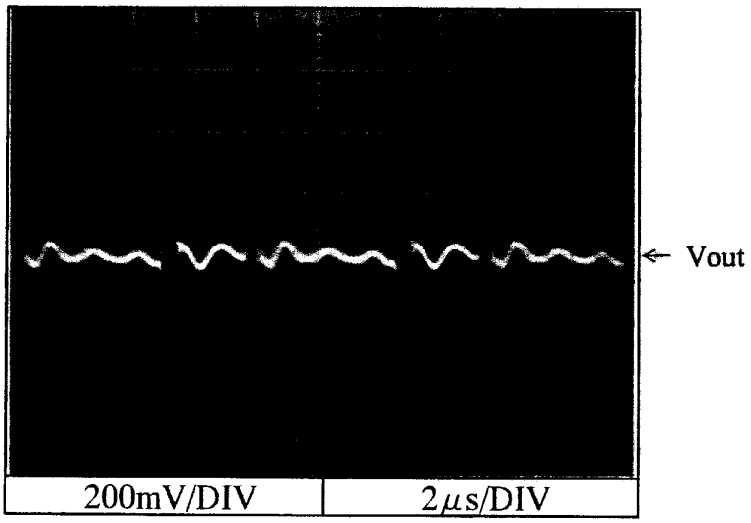
Conditions Vin : 100VAC
Iout : 100%
Ta : 25℃

NORMAL + COMMON MODE

24V



48V



2.19 ＥＭＩ特性

Electro-Magnetic Interference characteristics

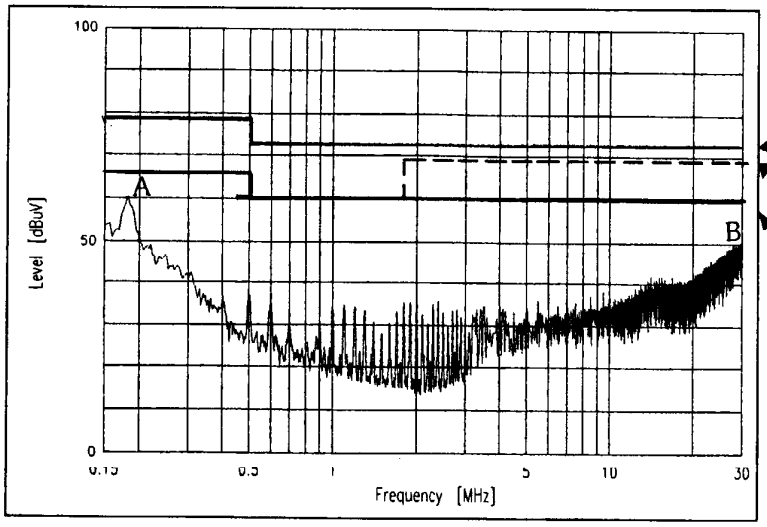
雑音端子電圧
Conducted Emission

24V

Conditions Vin : 230VAC
Iout : 100%

Ref.	Point A (181kHz)	
Data	VCCI-Limit (dBuV)	Measure (dBuV)
QP	79.0	57.1
AV	66.0	48.4

Ref.	Point B (28.85MHz)	
Data	VCCI-Limit (dBuV)	Measure (dBuV)
QP	73.0	48.1
AV	60.0	45.9

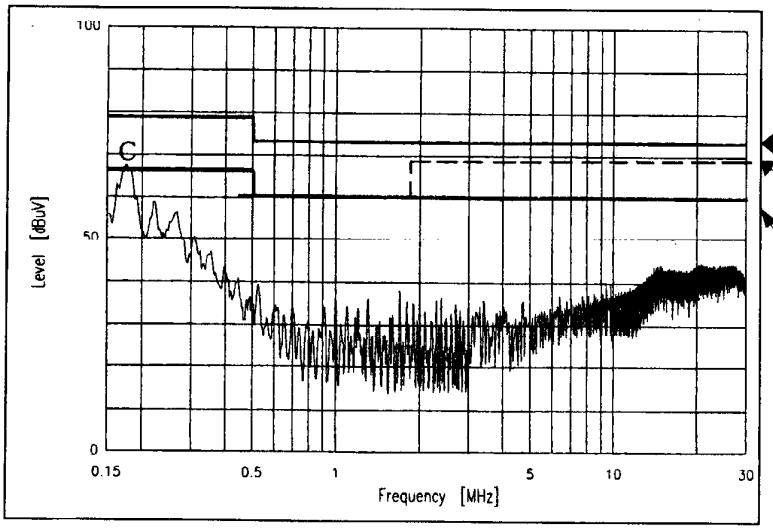


Phase : N

48V

Conditions Vin : 230VAC
Iout : 100%

Ref.	Point C (175kHz)	
Data	VCCI-Limit (dBuV)	Measure (dBuV)
QP	79.0	65.7
AV	66.0	58.7



Phase : N

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

2.19 EMI特性

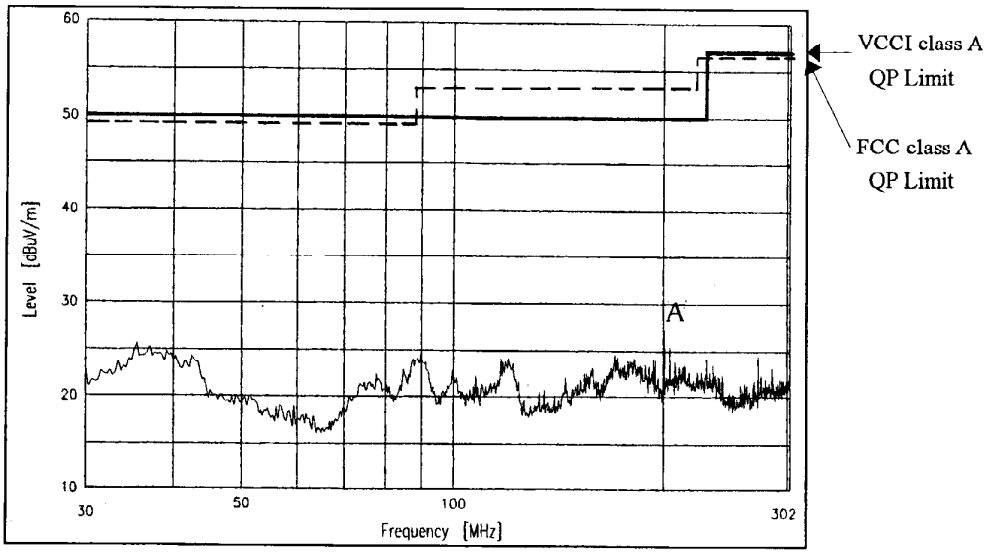
Electro-Magnetic Interference characteristics

雑音電界強度
Radiated Emission

Conditions Vin : 100VAC
Iout : 100%

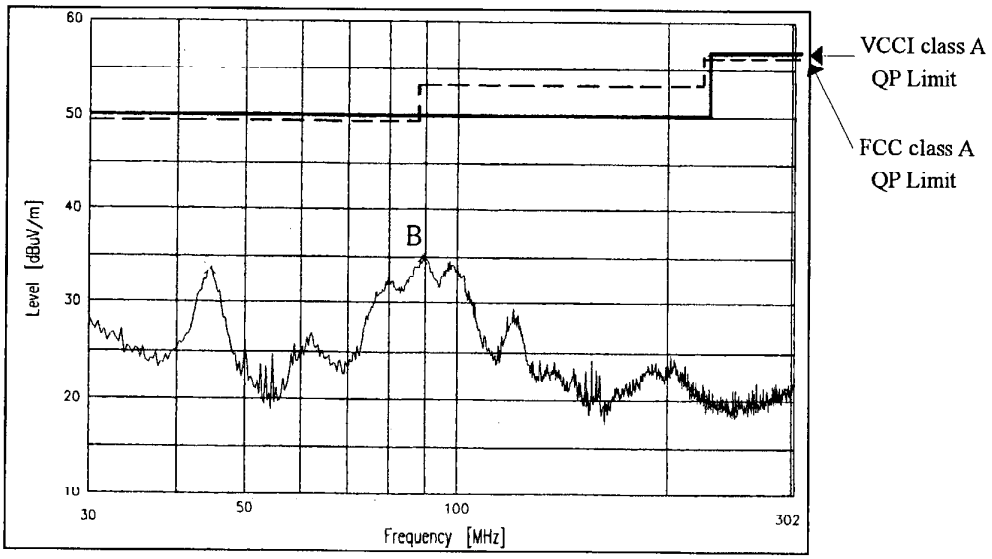
24V

HORIZONTAL:



Ref.	Point A (200.0MHz)	
Data	VCCI-Limit (dBuV/m)	Measure (dBuV/m)
QP	50.0	25.0

VERTICAL:



Ref.	Point B (89.0MHz)	
Data	VCCI-Limit (dBuV/m)	Measure (dBuV/m)
QP	50	32.5

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

2.19 ＥＭＩ特性

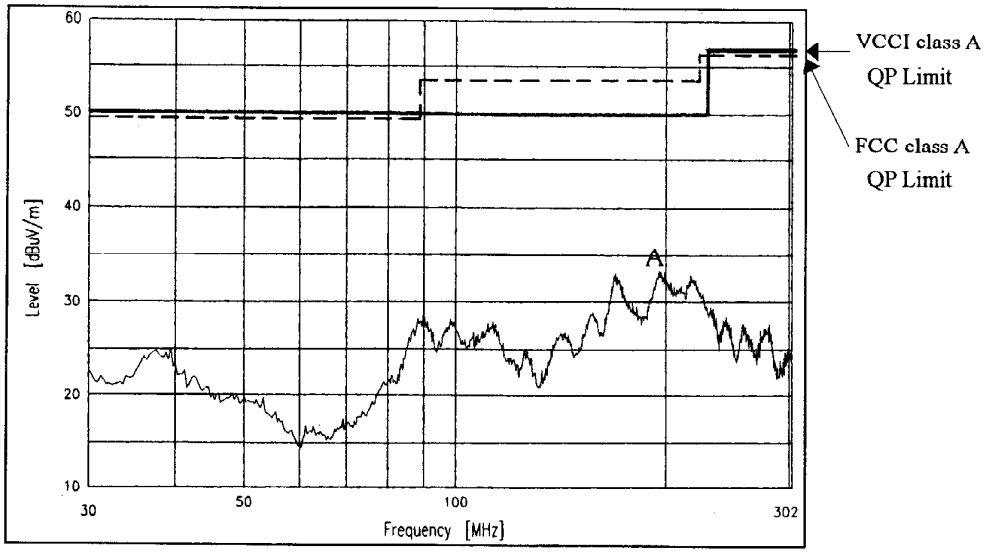
Electro-Magnetic Interference characteristics

雑音電界強度
Radiated Emission

Conditions Vin : 100VAC
Iout : 100%

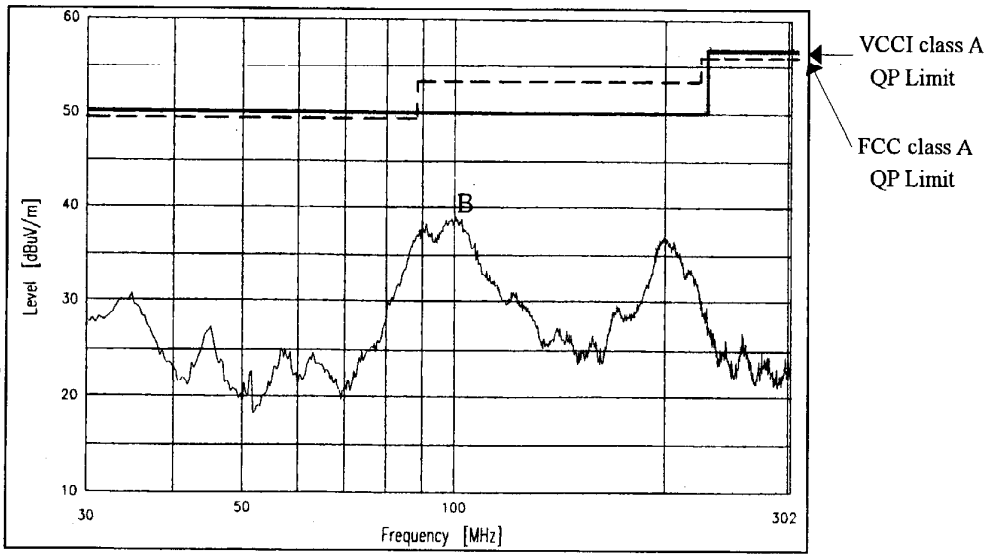
48V

HORIZONTAL:



Ref.	Point A (196.16MHz)	
Data	VCCI-Limit (dBuV/m)	Measure (dBuV/m)
QP	50.0	31.4

VERTICAL:



Ref.	Point B (100.94MHz)	
Data	VCCI-Limit (dBuV/m)	Measure (dBuV/m)
QP	50.0	37.0

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