MS300

EVALUATION DATA

型式データ

DWG. No. A134-53-01			
承認	承認	査閲	担当
'94.7.18	94.7.14	'94.6.21	'94.6.17

TDK·LAMBDA

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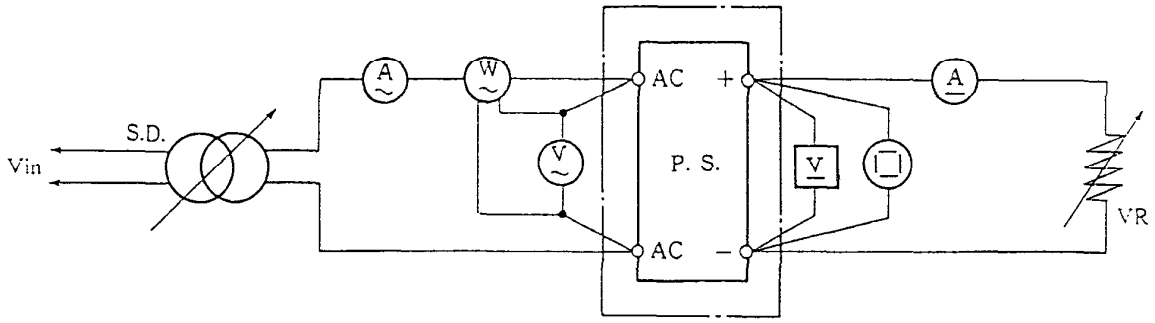
使用記号　Terminology used

	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
Ta	周囲温度	Ambient Temperature

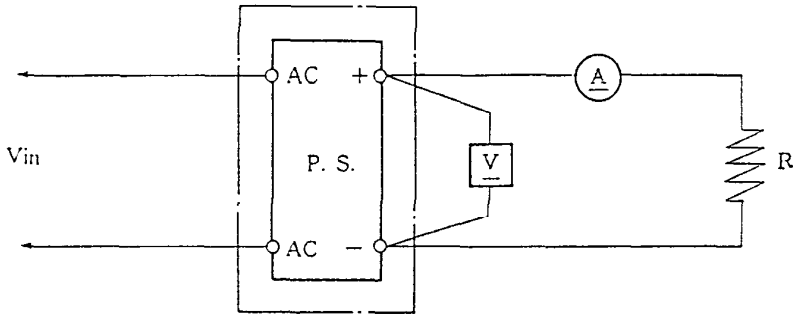
1．評価測定方法　EVALUATION METHOD

1－1　測定回路　Circuits used for determination

(1)　静特性　Steady state data



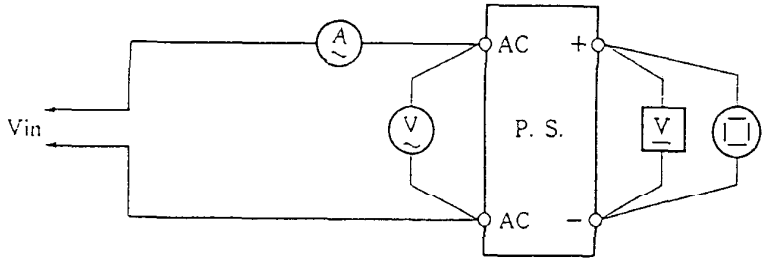
(2)　通電ドリフト特性　Warm up voltage drift characteristics



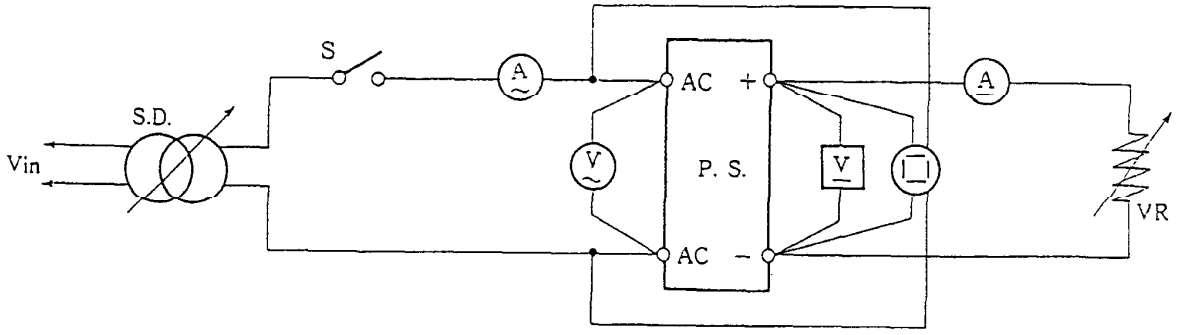
(3)　過電流保護特性　Over current protection (OCP) characteristics

Same as steady state data.

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



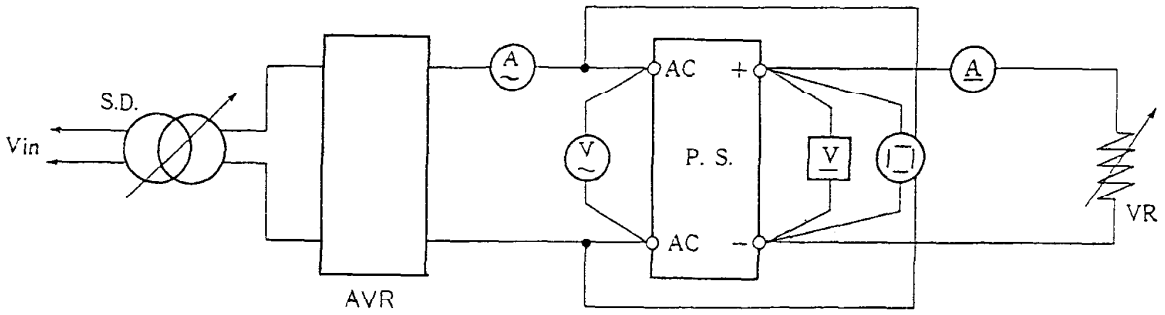
(5) 出力立上り特性 Output rise characteristics



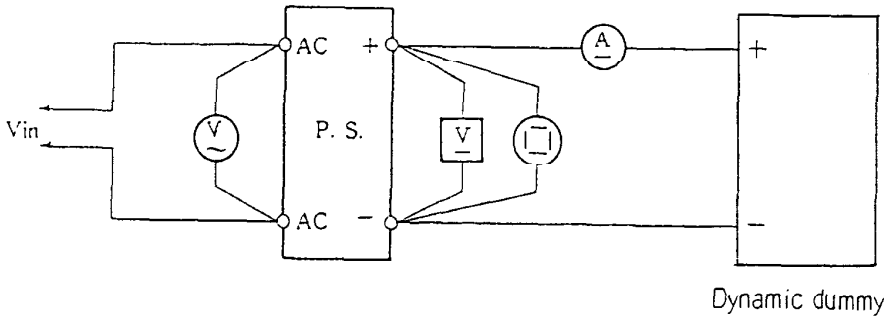
(6) 出力立下り特性 Output fall characteristics

Same as output rise characteristics.

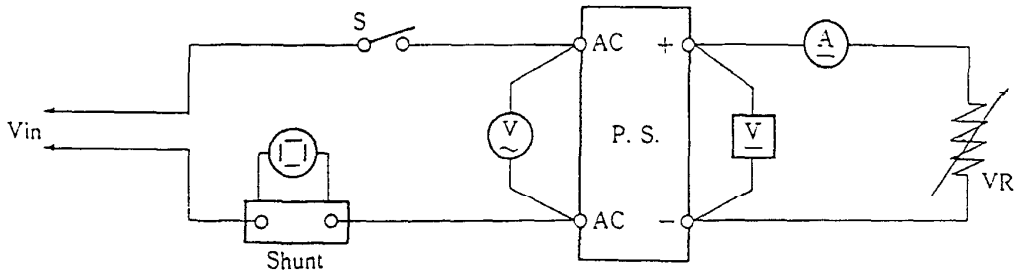
(7) 過渡応答（入力急変）特性 Dynamic line response characteristics



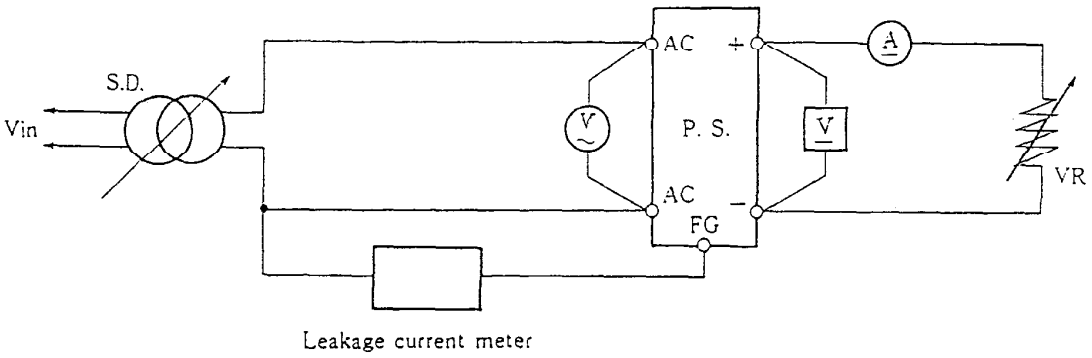
(8) 過渡応答（負荷急変）特性 Dynamic load response characteristics



(9) 入力サージ電流（突入電流）特性 Inrush current characteristics



(10) リーク電流（漏洩電流）特性 Leakage current caracteristics



Note : Leakage current measured through a 1kΩ resistor.

Range wed : AC + DC

1 - 2　使用測定機器　List of equipment used

No.	EQUIPMENT USED	MANUFACTURER	MODEL No.
1	Oscilloscope	IWATSU	SS-6613
2		TEKTRONIX	2465B
3	Storage oscilloscope	HITACHI	VC-6041
4		KENWOOD	CS-8010
5	Digital volt meter	SANWA	9100EA
6		ADVANTEST	TR6846
7	A.C. Ampere meter	NF ELECTRONIC INSTRUMENTS	4420A-102-3
8	A.C. Volt meter	NF ELECTRONIC INSTRUMENTS	4420A-102-3
9	A.C. Watt meter	NF ELECTRONIC INSTRUMENTS	4420A-102-3
10	D.C. Ampere meter	YOKOGAWA ELEC.,	2012
11	Variable resistive load	YAMABISHI ELEC.,	3.08 / 0.77Ω 53.2 / 13.3Ω
12	Dynamic dummy load	TAKAMIZAWA CYBERNETICS	PSA-150D
13	Controlled temp. chamber	TABAI	MC-710
14	Leakage current meter	SIMPSON	229-2

5V

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

Iout \ Vin	85 VAC	100 VAC	132 VAC	line regulation	
0 %	4.997 V	4.997 V	4.997 V	0 mV	0 %
50 %	4.994 V	4.994 V	4.994 V	0 mV	0 %
100 %	4.991 V	4.991 V	4.991 V	0 mV	0 %
load regulation	6 mV	6 mV	6 mV		
	0.12 %	0.12 %	0.12 %		

2. Temperature drift Conditions Vin :100VAC
Iout :100%

Ta	0 ℃	25 ℃	50 ℃	Temp. stability	
Vout	4.990 V	4.991 V	4.979 V	12 mV	0.24 %

12V

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

Iout \ Vin	85 VAC	100 VAC	132 VAC	line regulation	
0 %	11.984 V	11.985 V	11.985 V	1 mV	0.008 %
50 %	11.988 V	11.987 V	11.986 V	2 mV	0.016 %
100 %	11.986 V	11.985 V	11.985 V	1 mV	0.008 %
load regulation	4 mV	2 mV	1 mV		
	0.033 %	0.016 %	0.008 %		

2. Temperature drift Conditions Vin :100VAC
Iout :100%

Ta	0 ℃	25 ℃	50 ℃	Temp. stability	
Vout	11.959 V	11.985 V	11.999 V	40 mV	0.33 %

24V

1. Regulation - line and load

Condition Ta :25℃

Iout \ Vin	85 VAC	100 VAC	132 VAC	line regulation	
0 %	23.882 V	23.881 V	23.881 V	1 mV	0.004 %
50 %	23.885 V	23.884 V	23.884 V	1 mV	0.004 %
100 %	23.883 V	23.883 V	23.883 V	0 mV	0 %
load regulation	3 mV	3 mV	3 mV		
	0.012 %	0.012 %	0.012 %		

2. Temperature drift

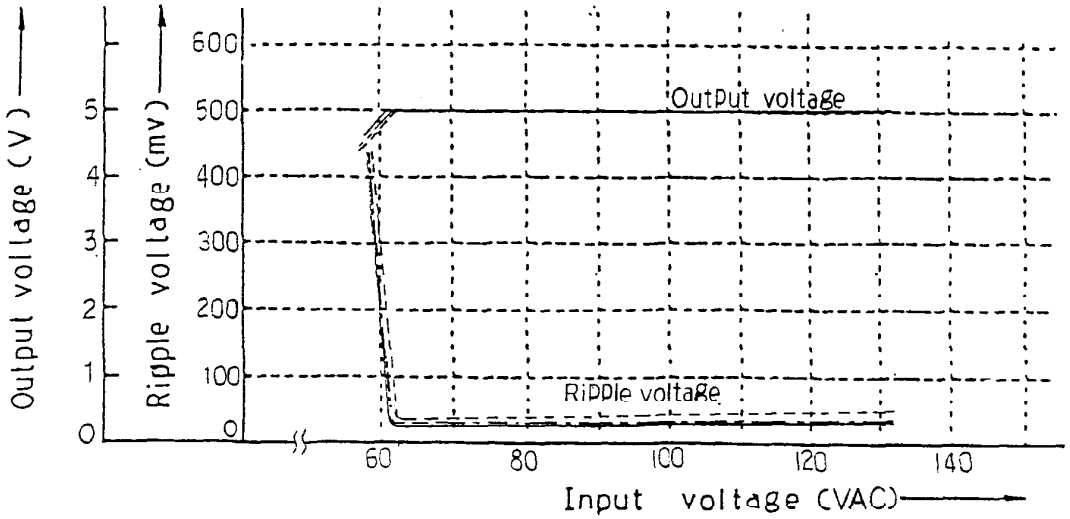
Conditions Vin :100VAC
Iout :100%

Ta	0 ℃	25 ℃	50 ℃	Temp. stability	
Vout	23.866 V	23.883 V	23.886 V	20 mV	0.08 %

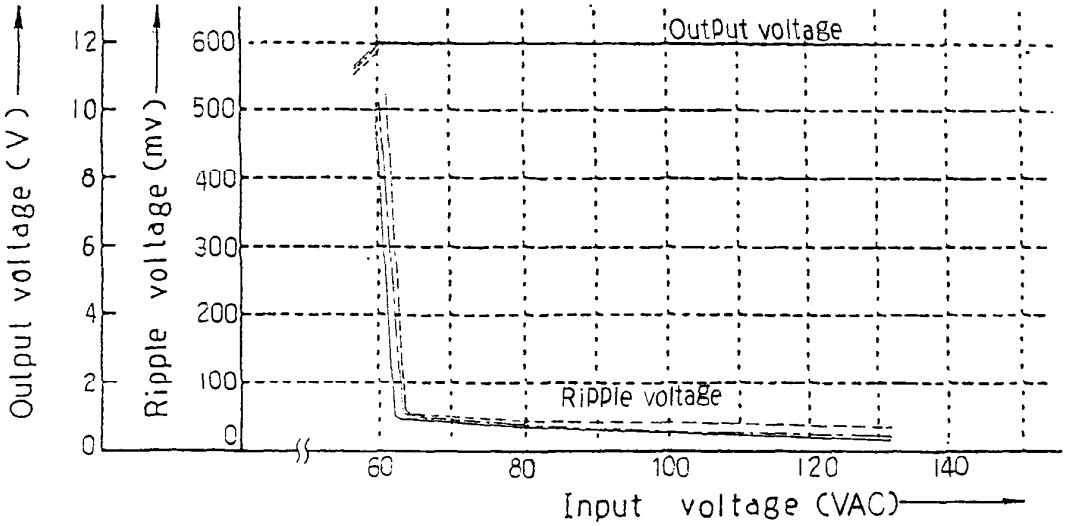
Output voltage and ripple v.s input voltage

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

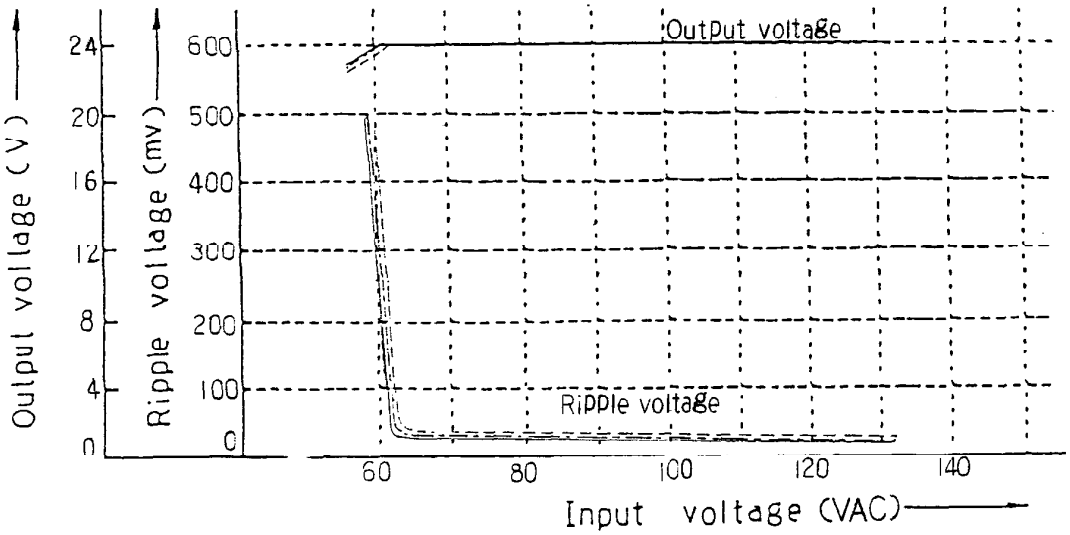
5V



12V



24V

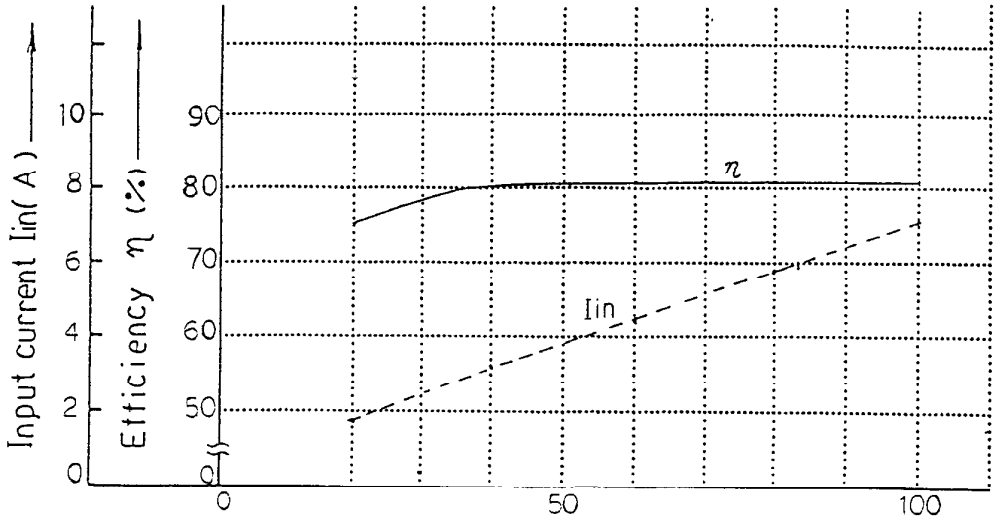


Efficiency and input current v.s. output current

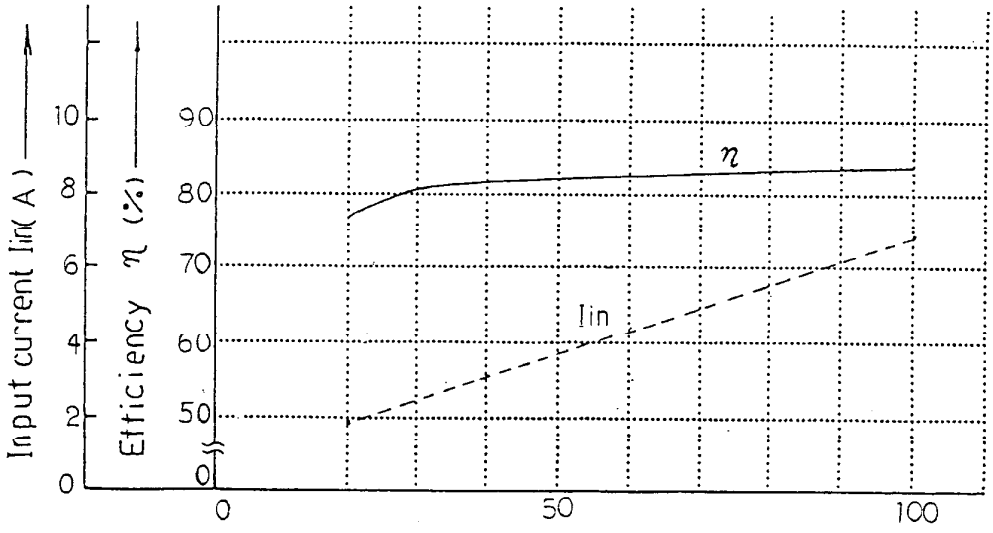
MS300

Conditions Vin : 100VAC
Ta : 25°C

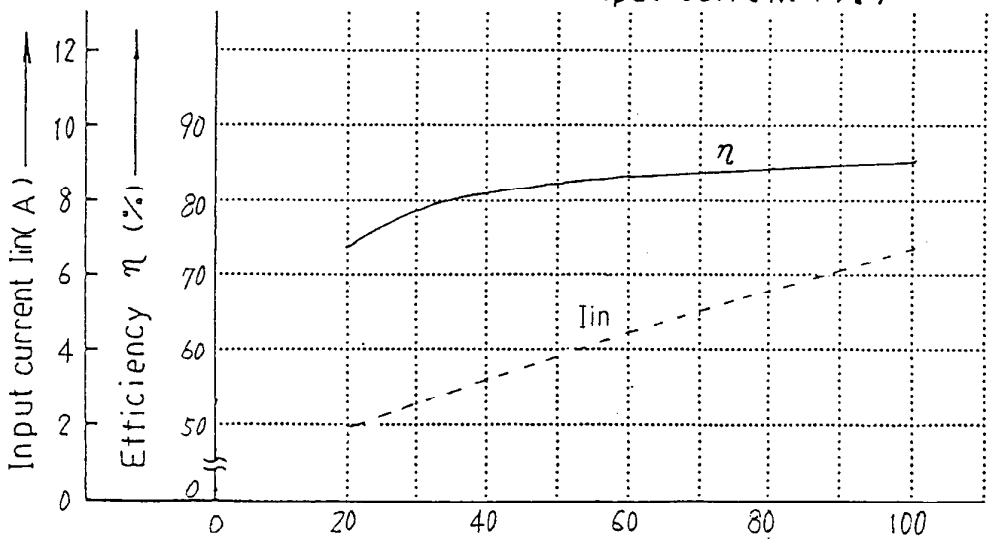
5V



12V



24 V

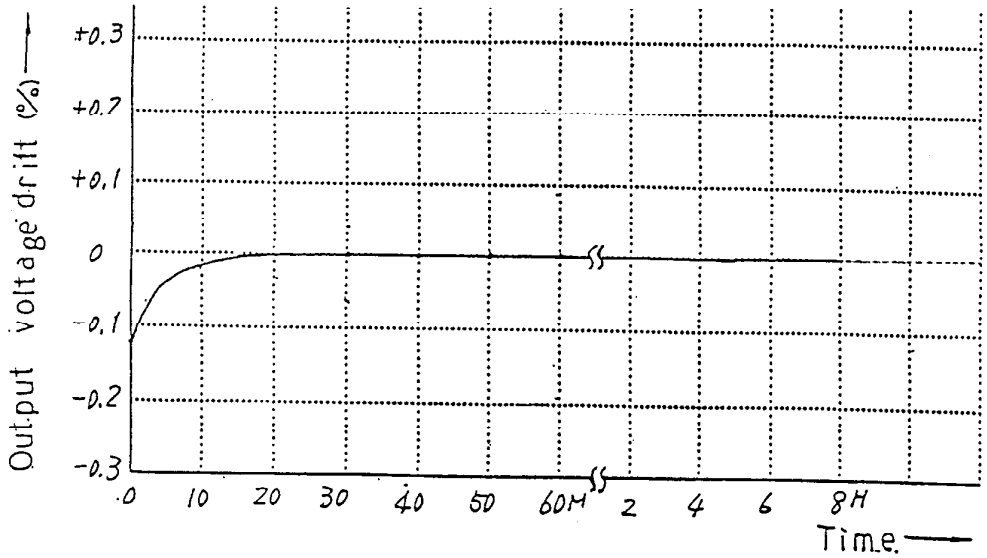


Warm up voltage drift

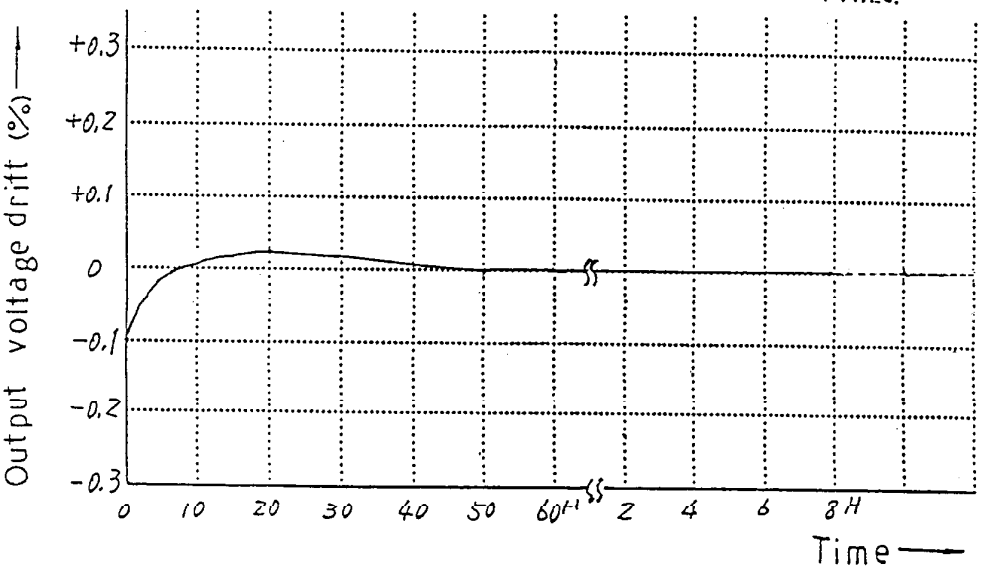
MS300

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

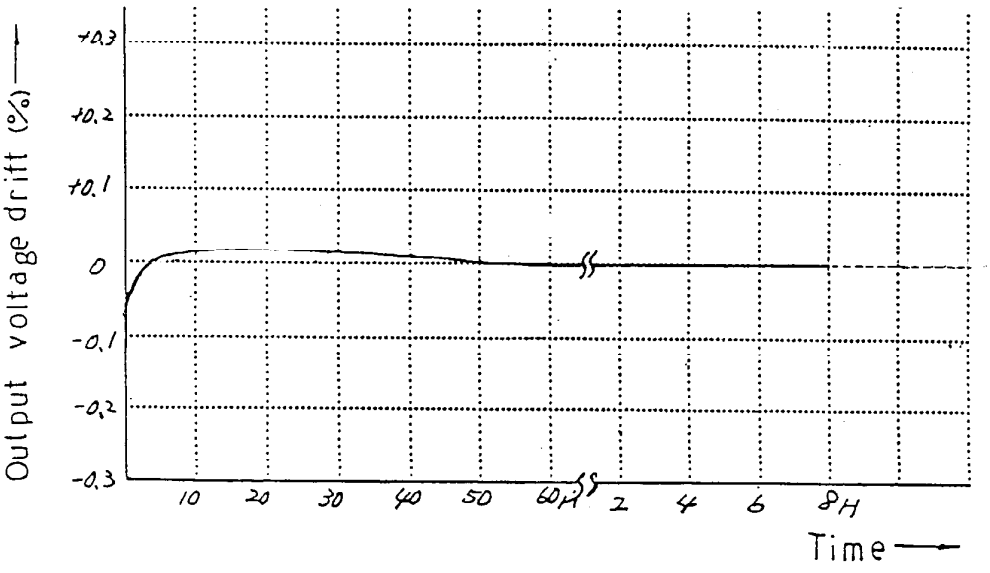
5V



12V



24V

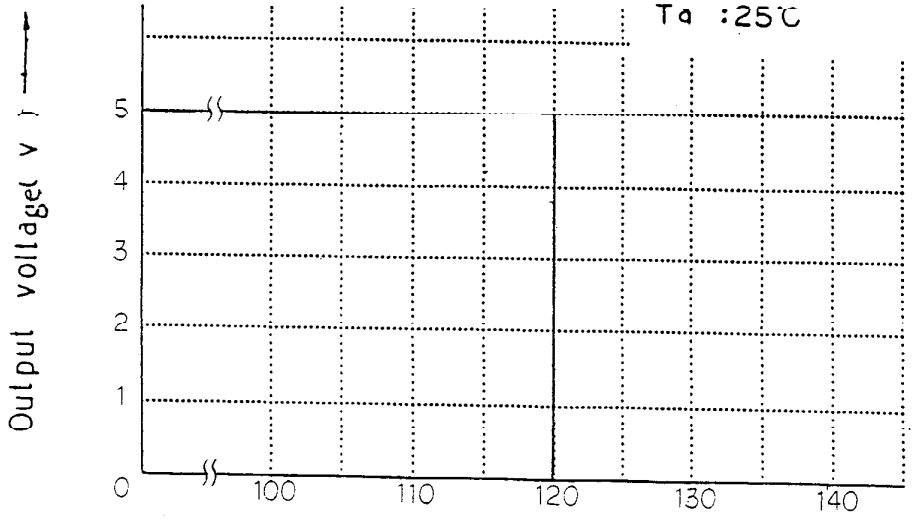


O.C.P characteristics

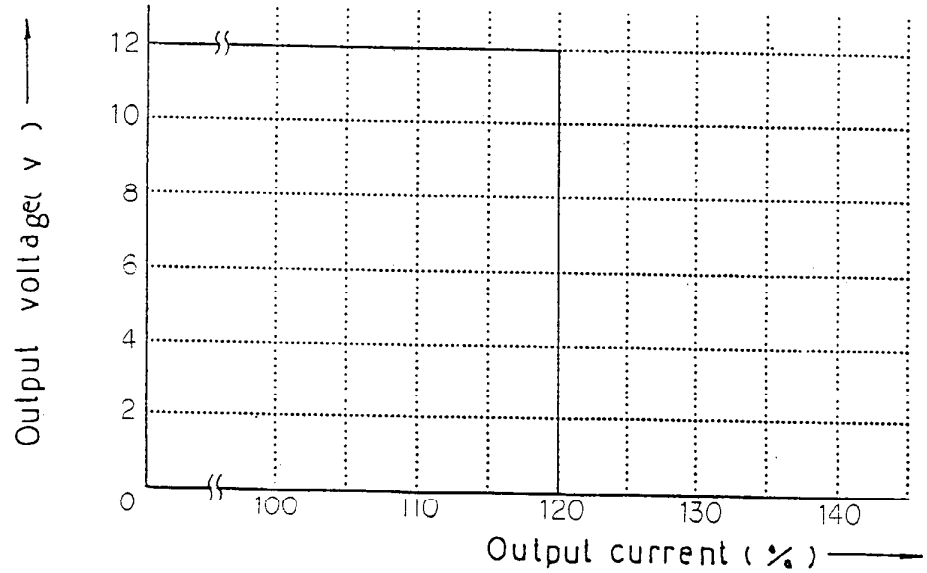
MS300

Conditions Vin : 85VAC ——
100VAC - - - -
132VAC — — —
Ta :25℃

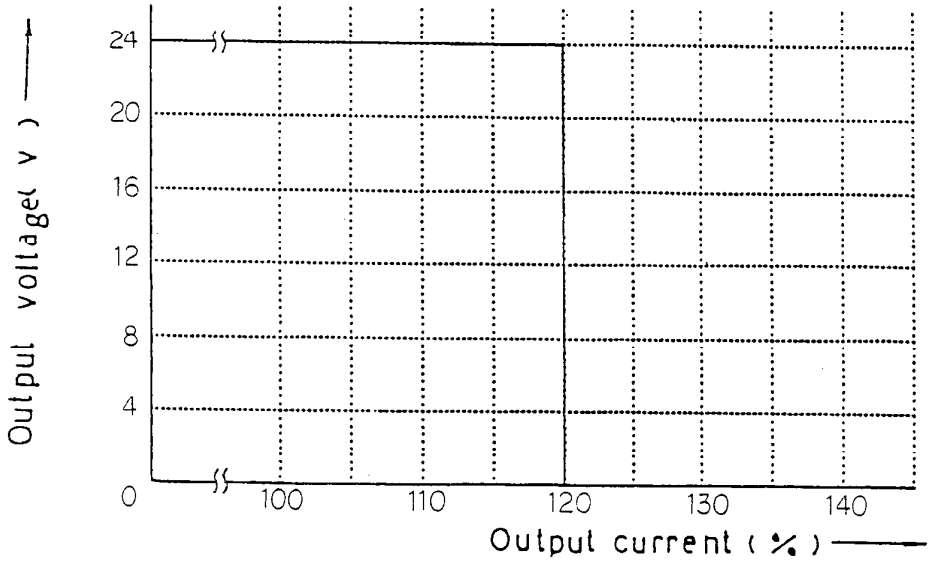
5V



12V



24V

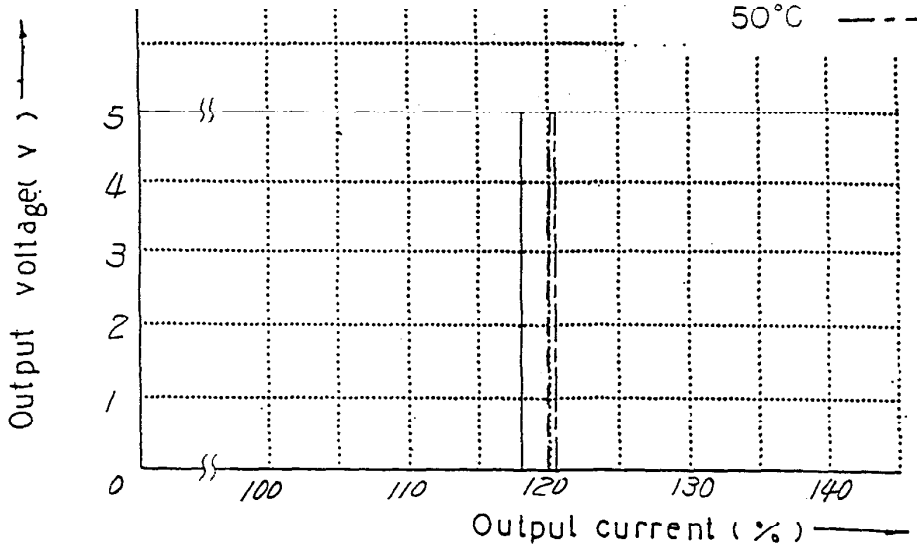


O.C.P characteristics

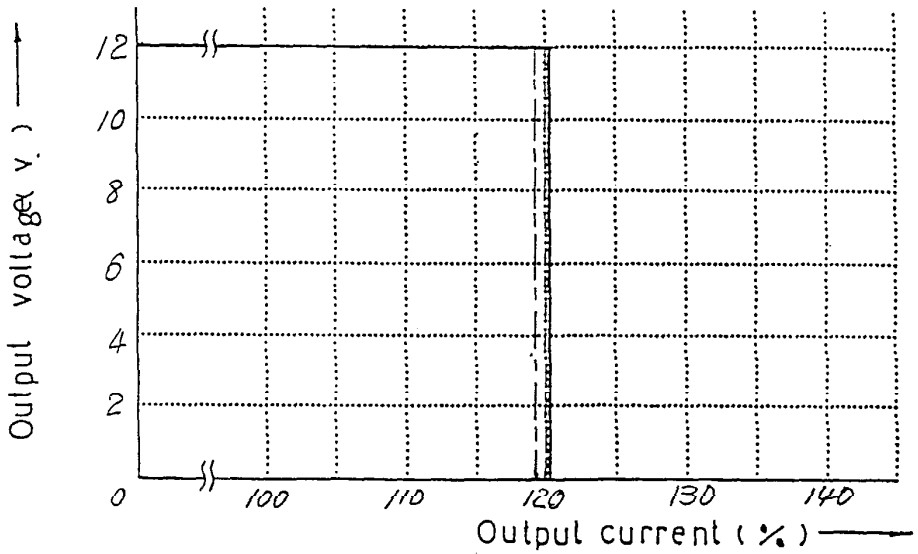
MS300

Conditions Vin : 100VAC
Ta : 0°C
25°C
50°C

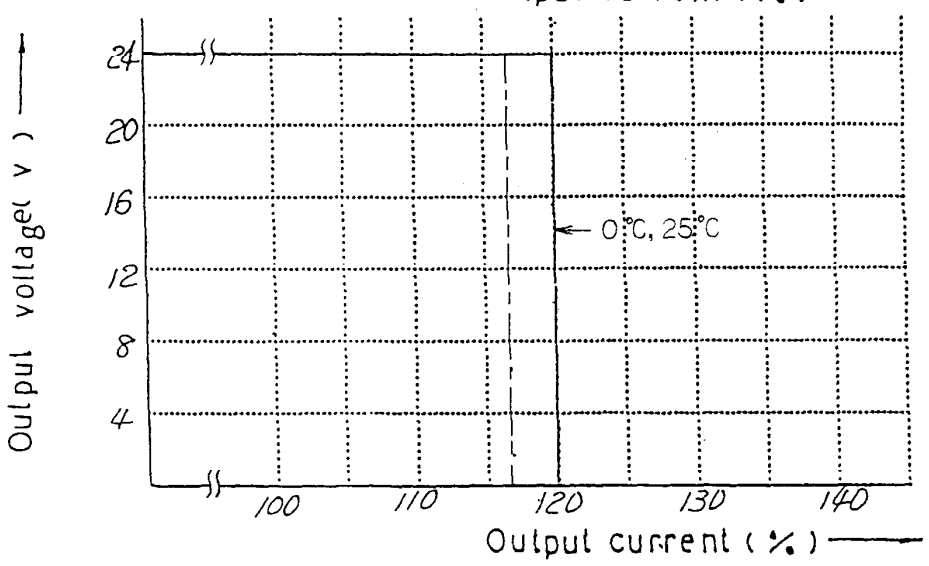
5V



12V



24V

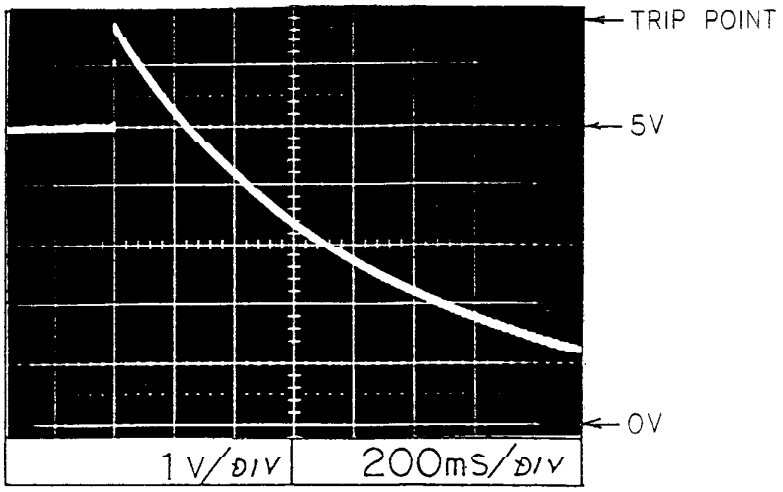


O.V.P. Characteristics

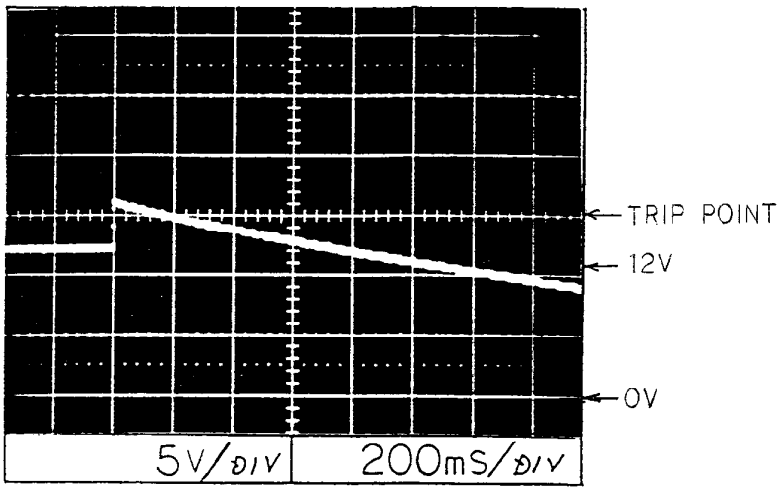
MS300

Conditions Vin : 100VAC
Iout: 0%
Ta : 25°C

5V



12V

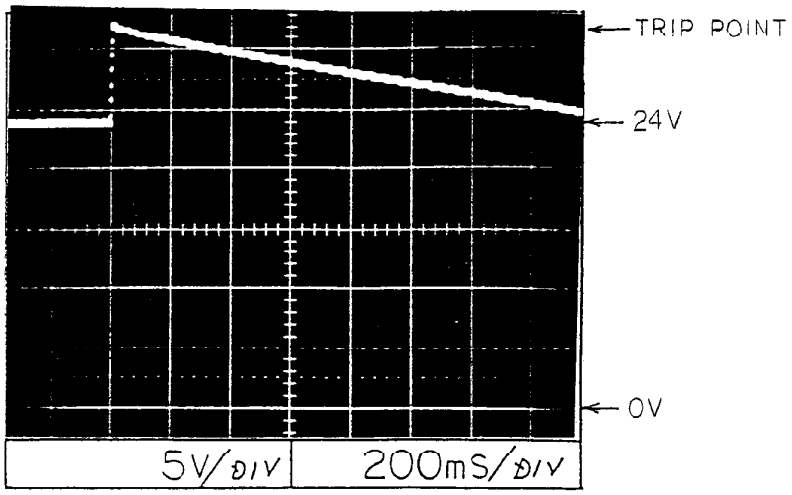


O.V.P. Characteristics

MS300

Conditions Vin : 100 VAC
Iout : 0 %
Ta : 25°C

24 V



Output rise Characteristics

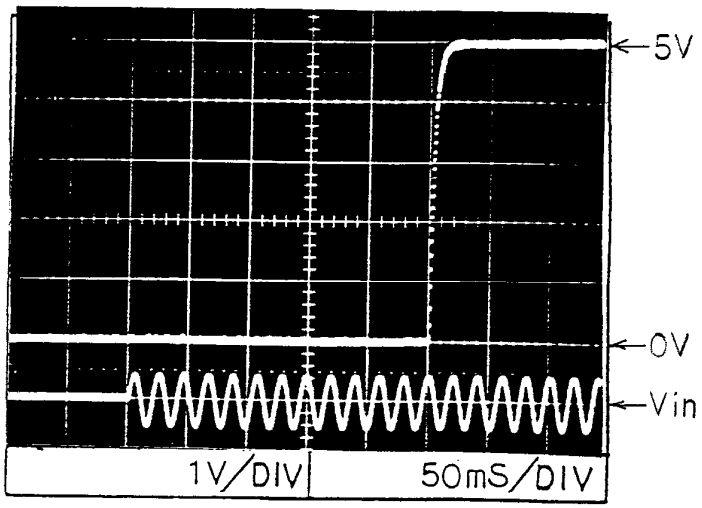
MS300

Conditions

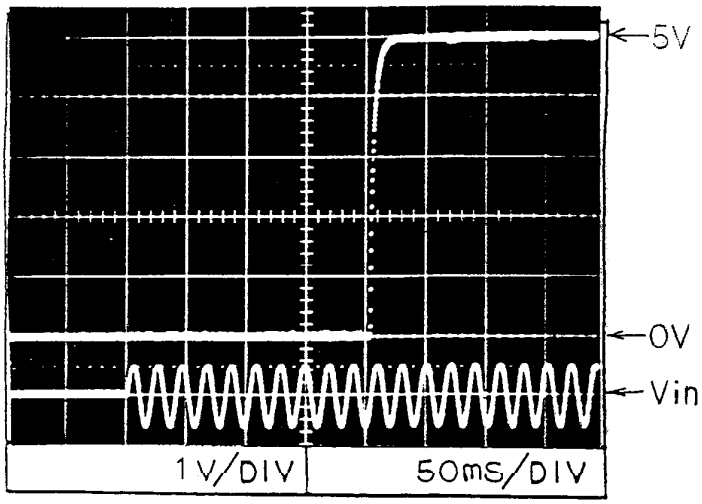
Vout:Rated
Iout: 0%
Ta :25°C

5V

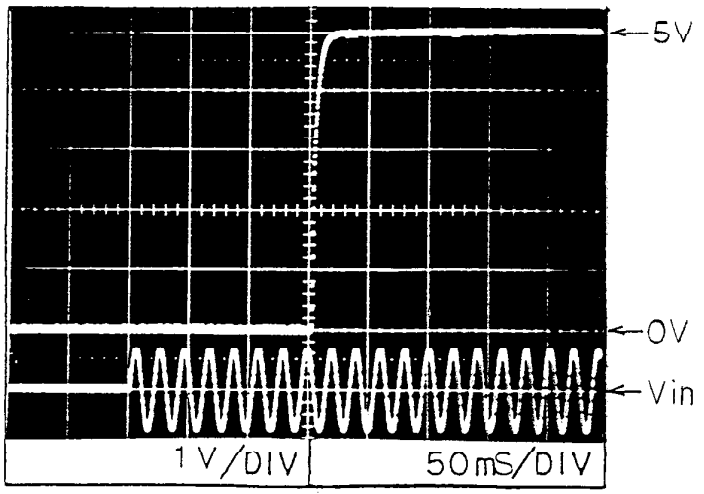
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise Characteristics

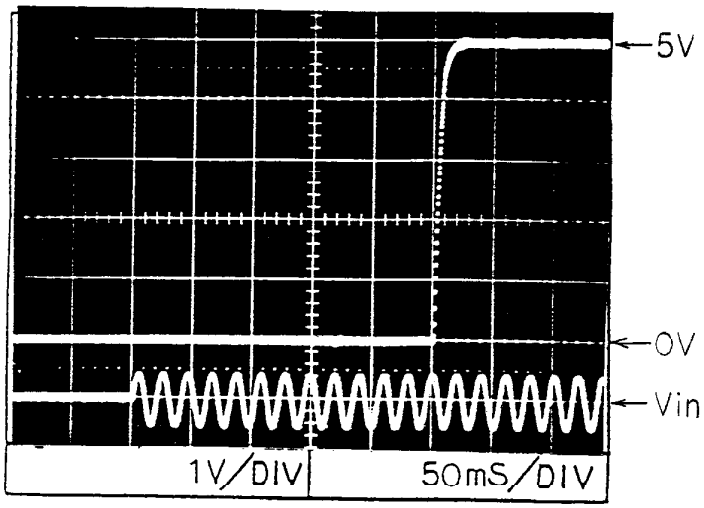
MS300

Conditions

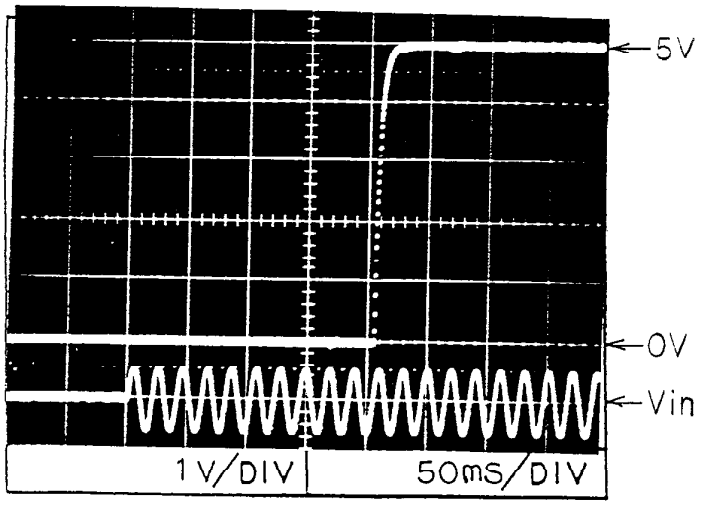
Vout:Rated
Iout:100%
Ta :25°C

5V

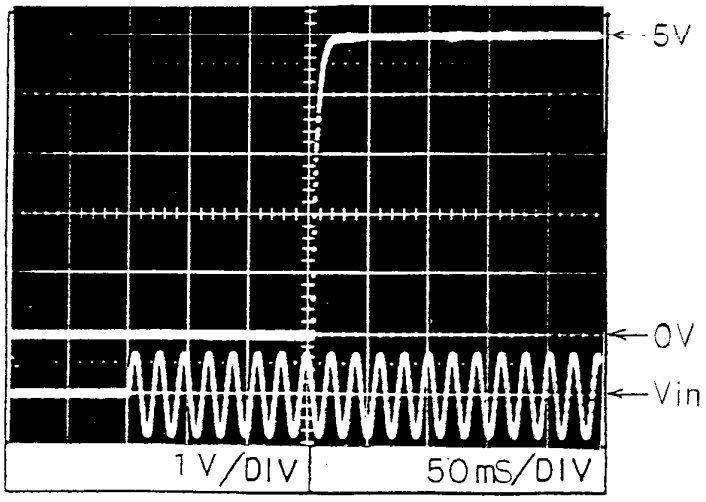
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise Characteristics

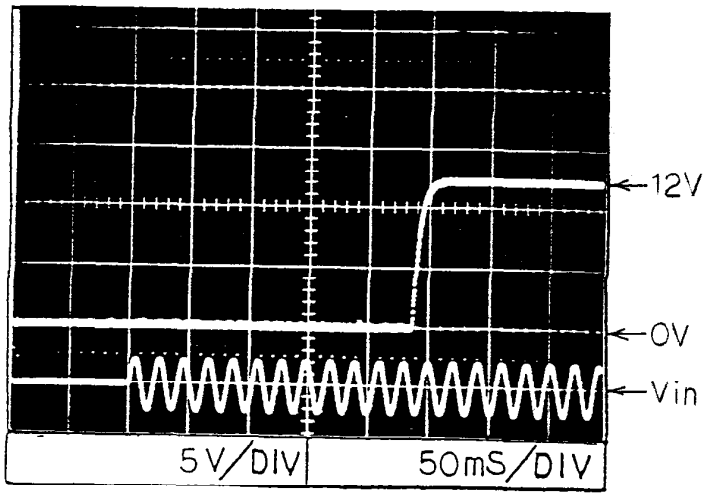
MS300

Conditions

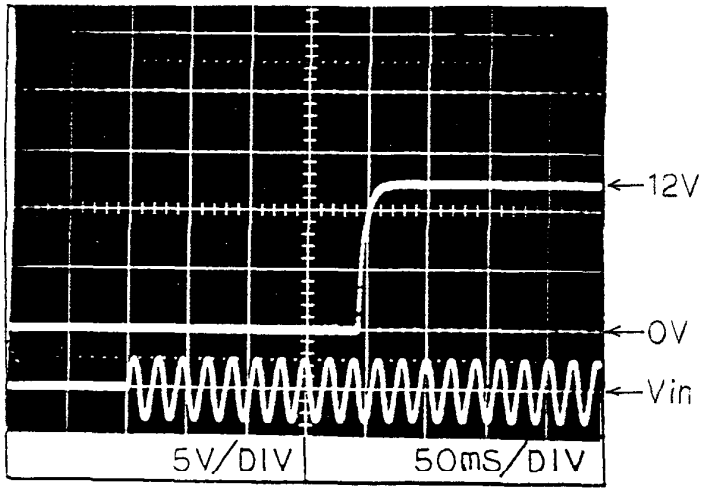
Vout:Rated
Iout: 0%
Ta :25°C

12V

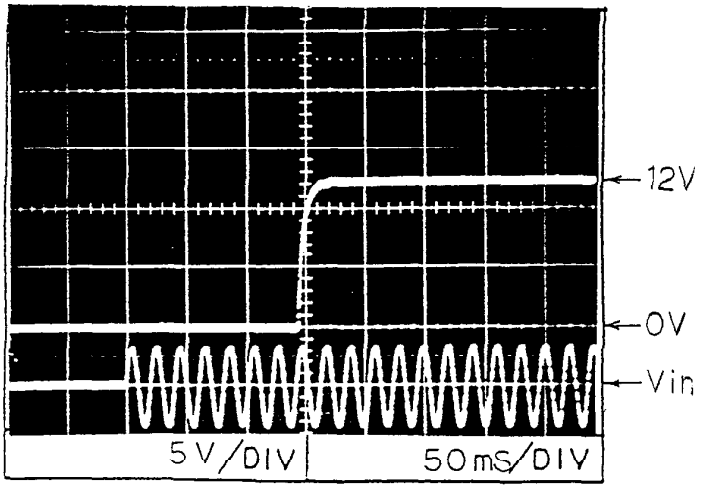
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise Characteristics

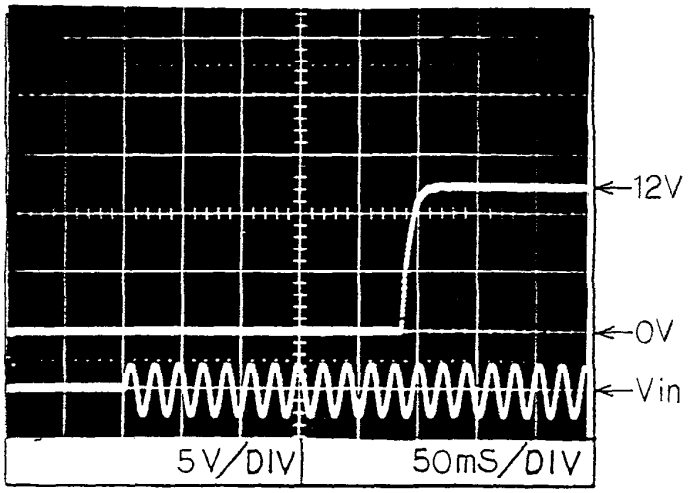
MS300

Conditions

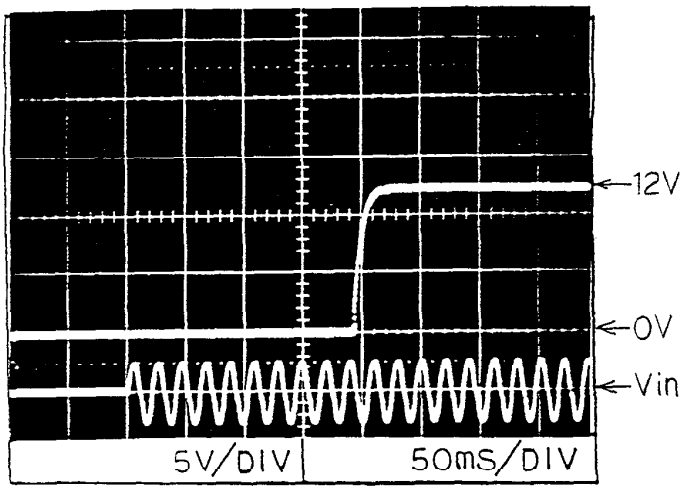
Vout:Rated
Iout:100%
Ta :25°C

12V

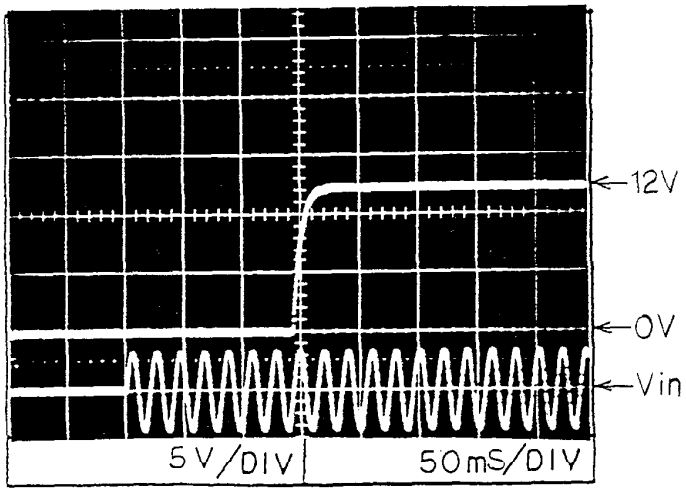
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise Characteristics

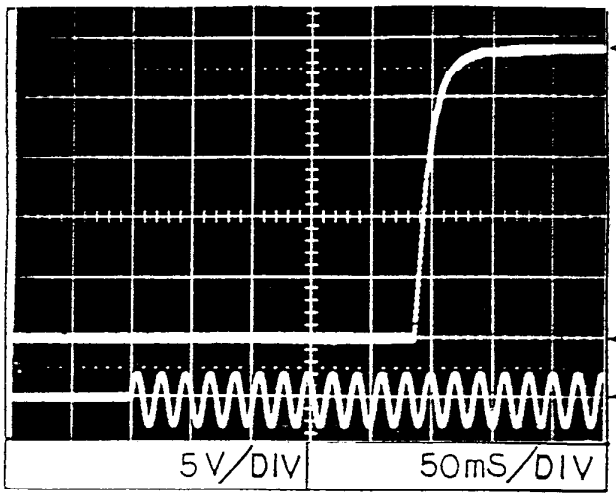
MS300

Conditions

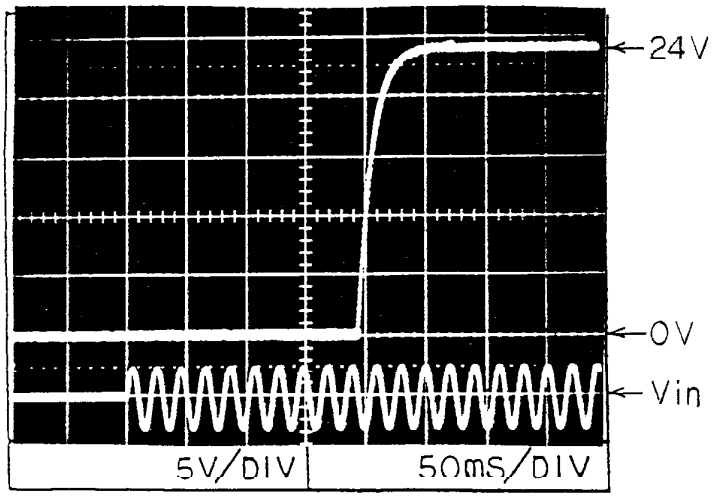
Vout:Rated
Iout: 0%
Ta :25°C

24V

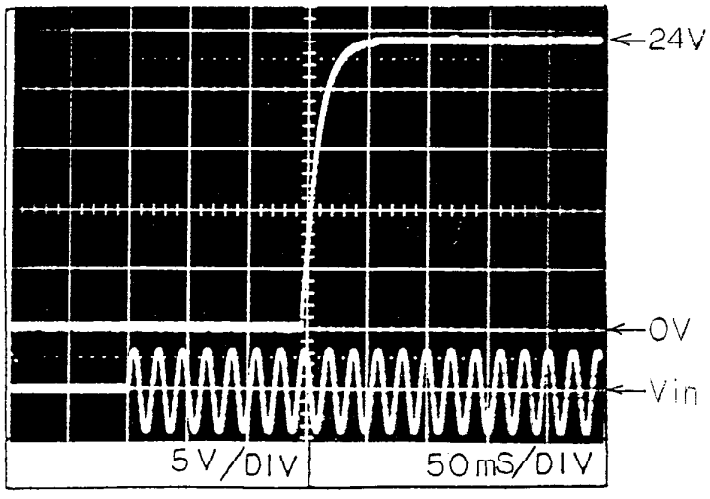
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise Characteristics

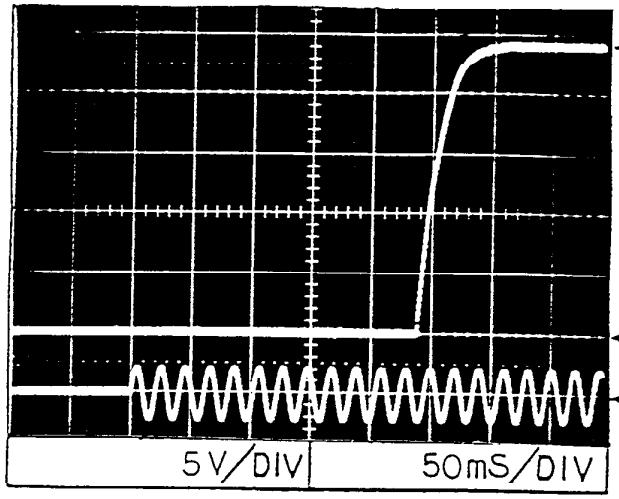
MS300

Conditions

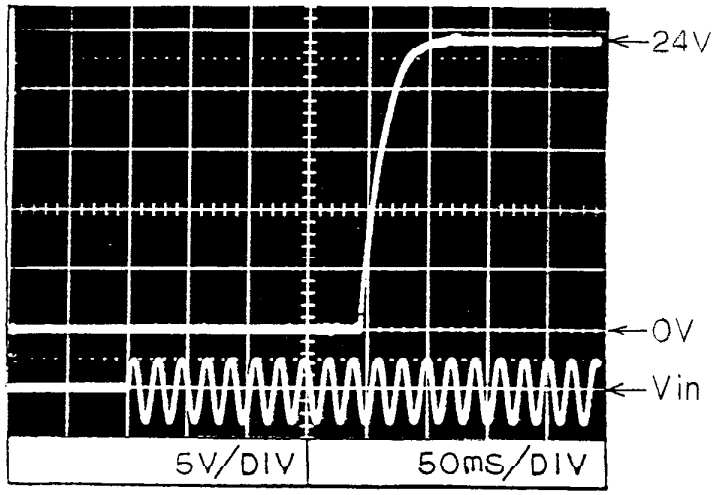
Vout:Rated
Iout:100%
Ta :25°C

24V

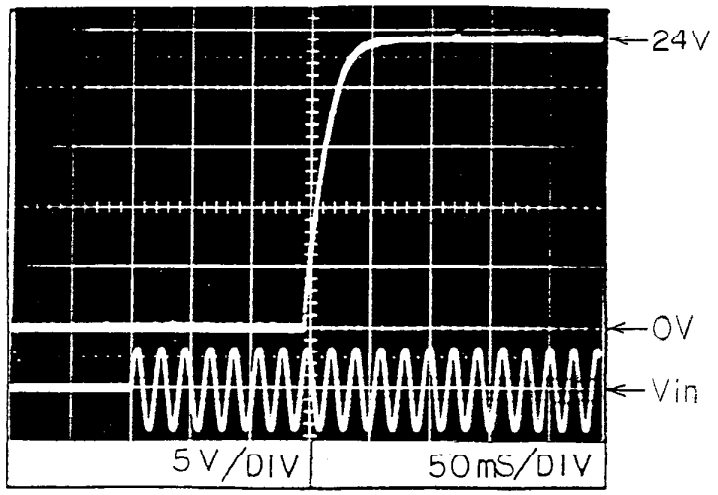
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output fall Characteristics

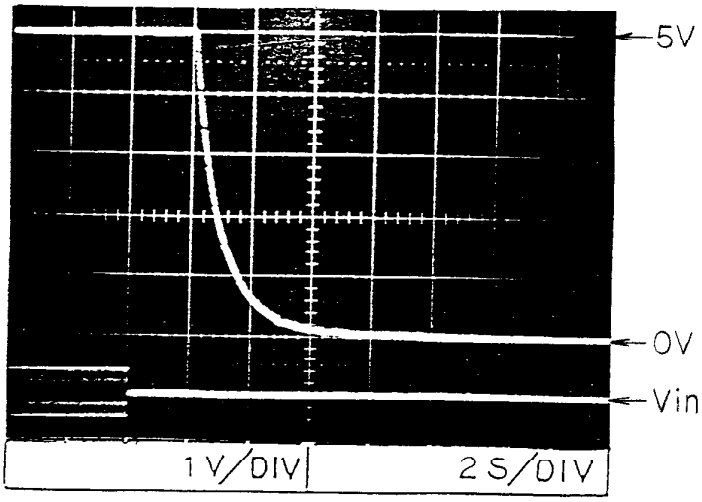
MS300

Conditions

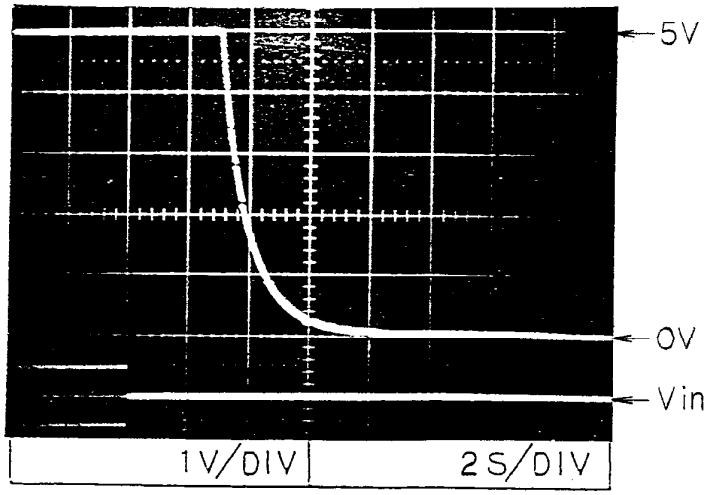
Vout:Rated
Iout: 0%
Ta :25°C

5V

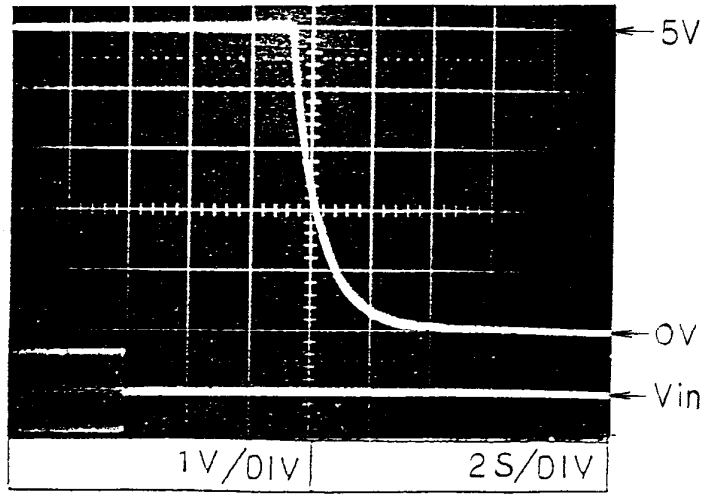
Vin:85VAC



Vin:100VAC



Vin:132VAC



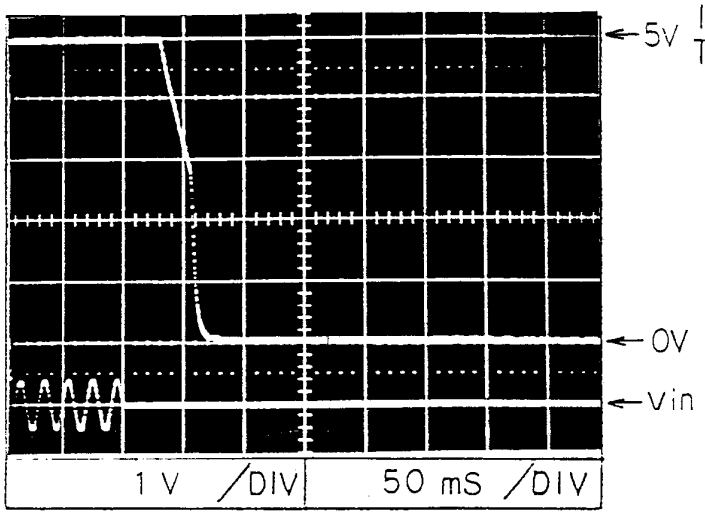
Output fall Characteristics

MS300

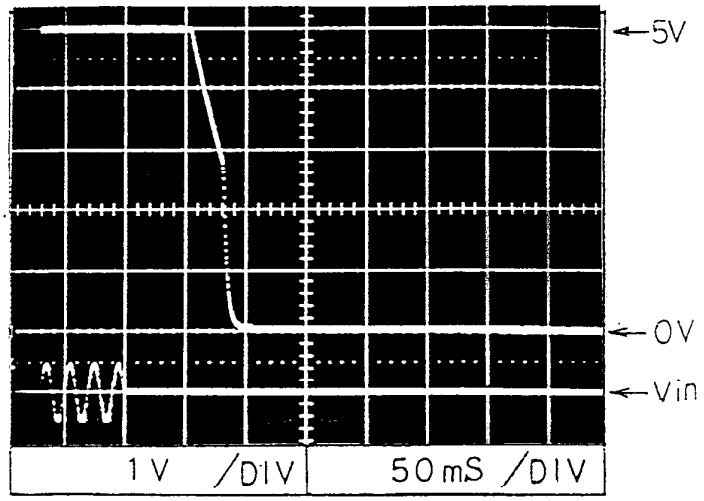
Conditions
Vout : Rated
Iout : 100%
Ta : 25°C

5 V

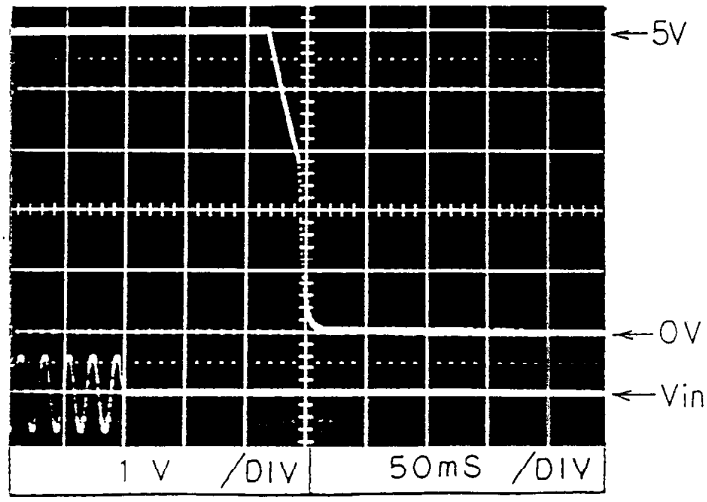
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output fall Characteristics

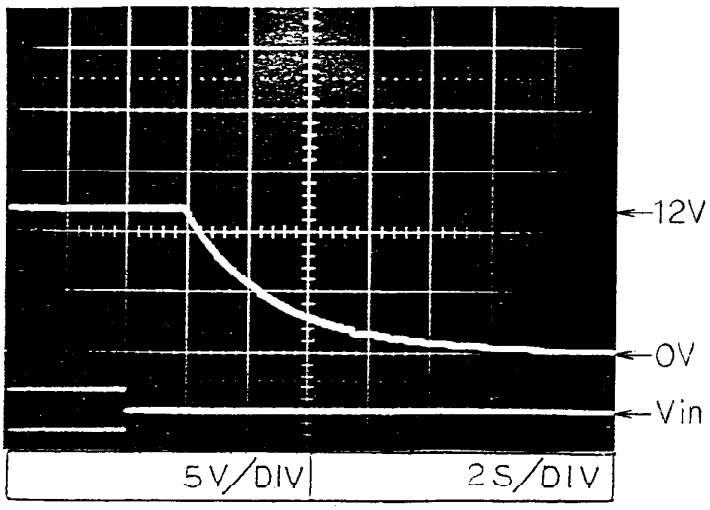
MS300

Conditions

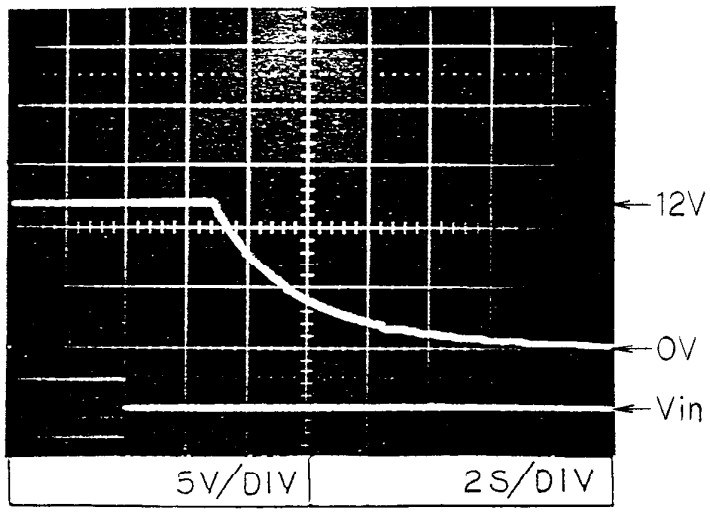
Vout:Rated
Iout: 0%
Ta :25°C

12V

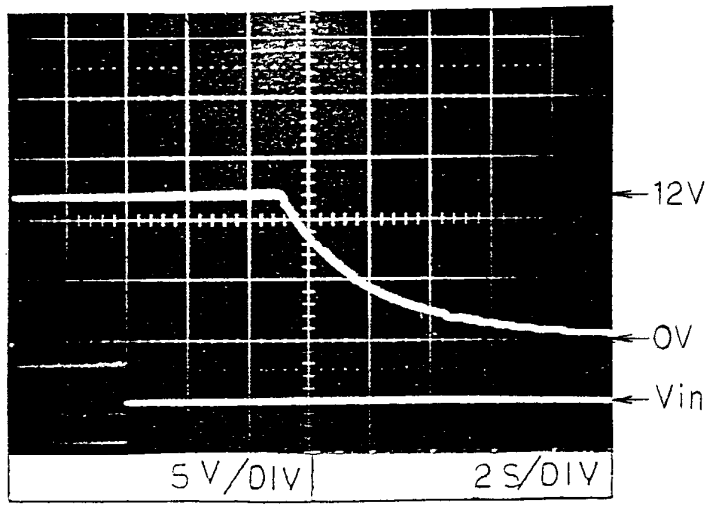
Vin:85VAC



Vin:100VAC



Vin:132VAC



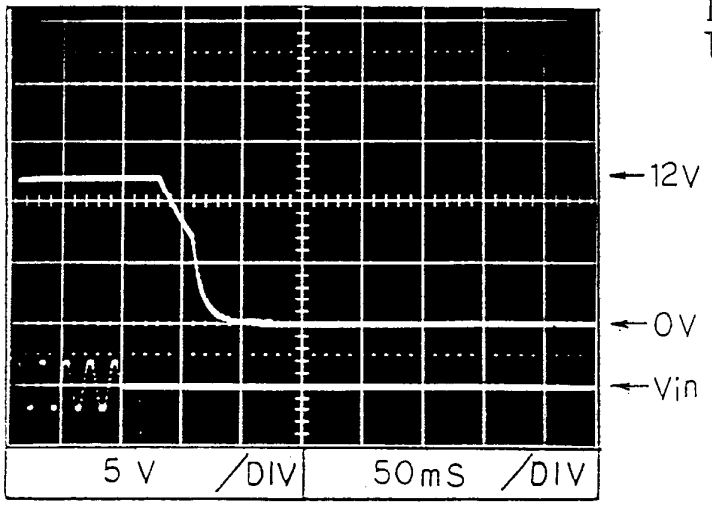
Output fall Characteristics

MS300

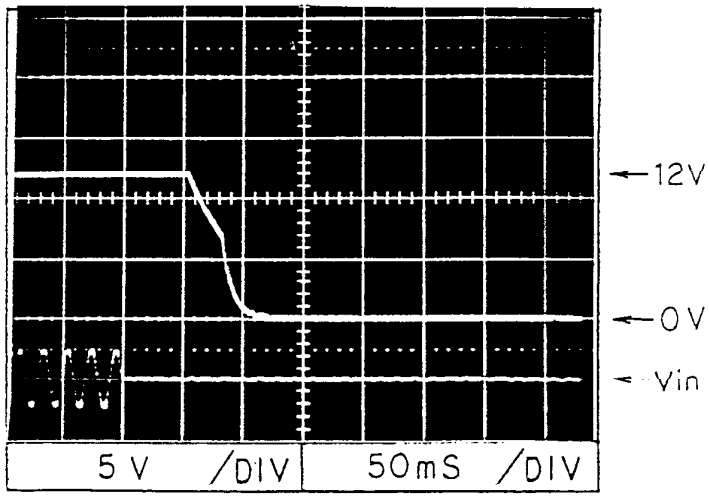
Conditions
Vout: Rated
Iout: 100%
Ta : 25°C

12V

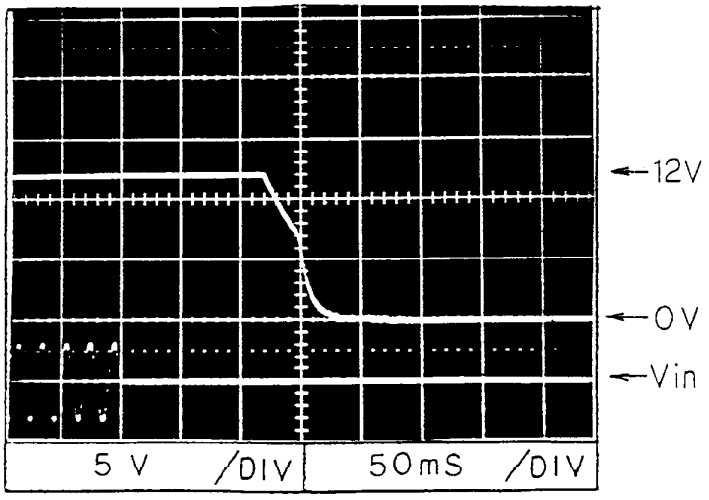
Vin: 85VAC



Vin: 100VAC



Vin: 132VAC



Output fall Characteristics

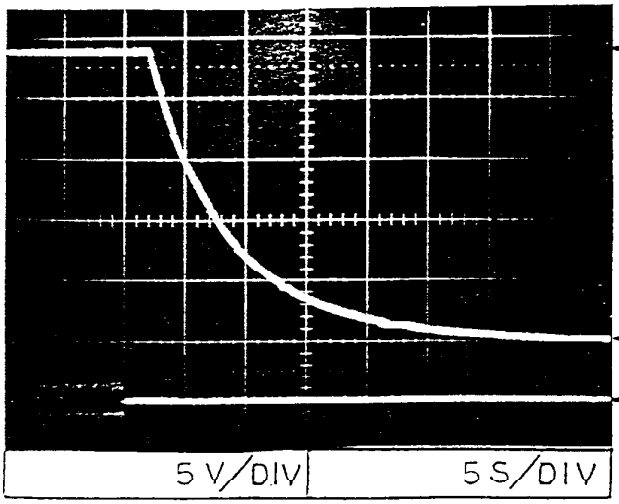
MS300

Conditions

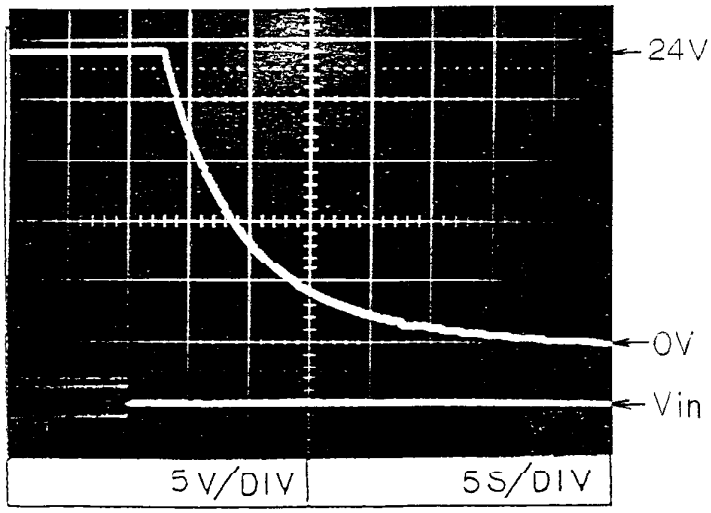
Vout:Rated
Iout: 0%
Ta :25°C

24V

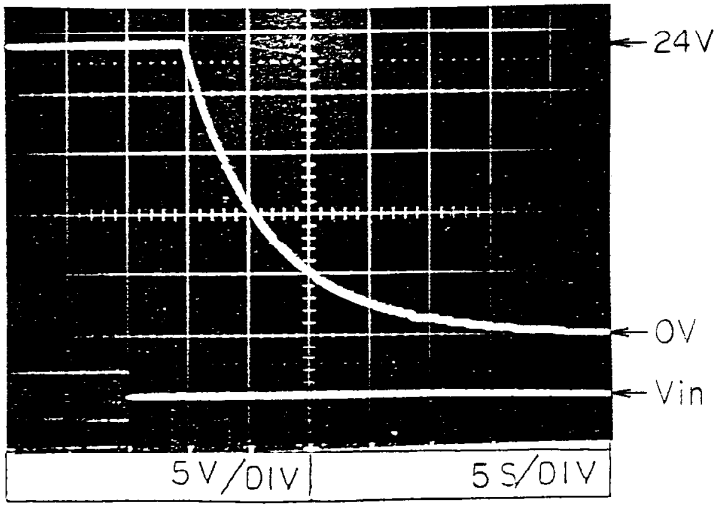
Vin:85VAC



Vin:100VAC



Vin:132VAC



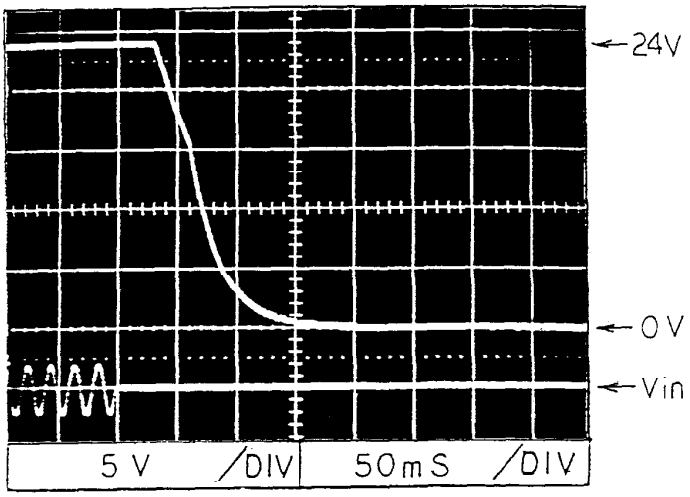
Output fall Characteristics

MS300

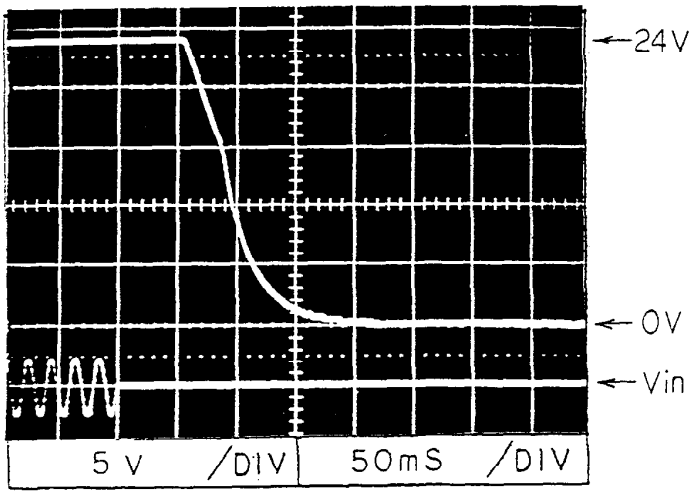
Conditions
Vout : Rated
Iout : 100 %
Ta : 25°C

24 V

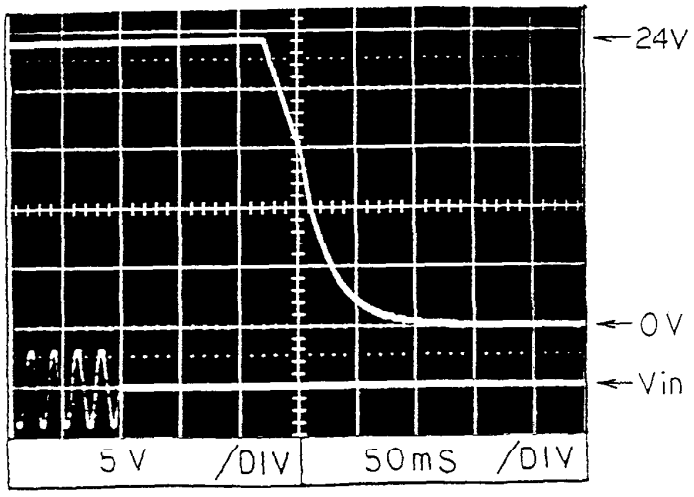
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise characteristics with ON/OFF control

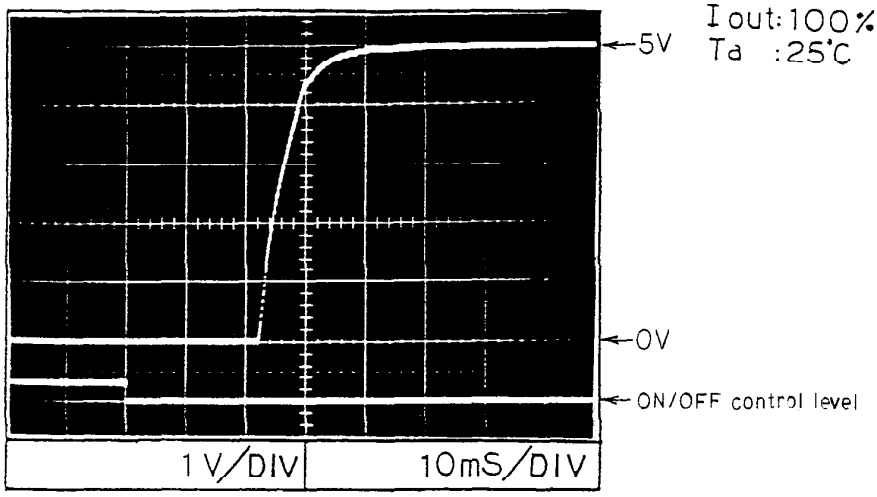
MS300

Conditions

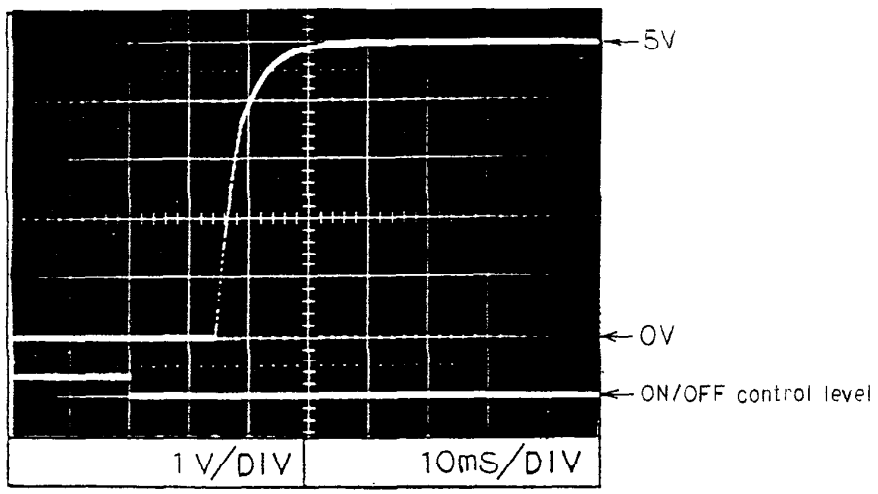
Vout:Rated
Iout:100%
Ta :25°C

5V

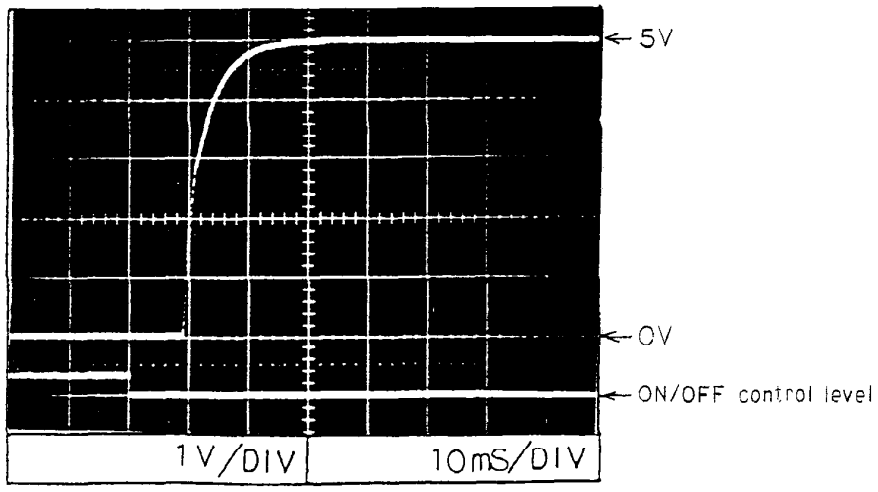
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise characteristics with ON/OFF control

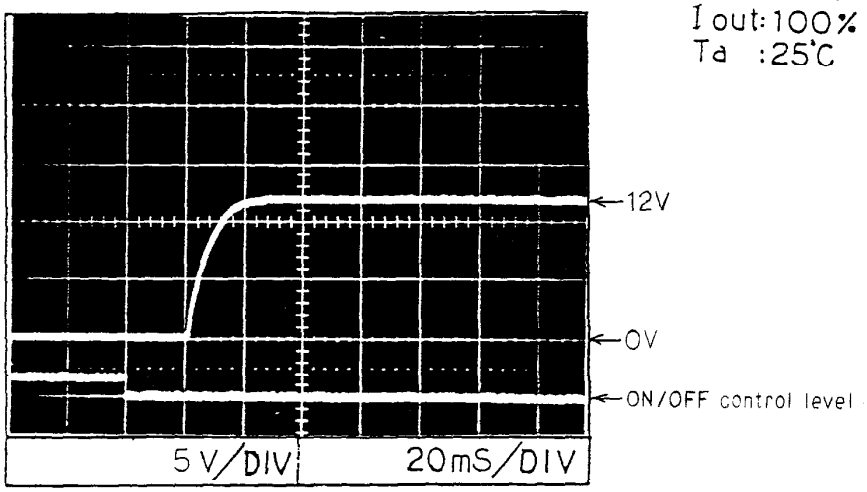
MS300

Conditions

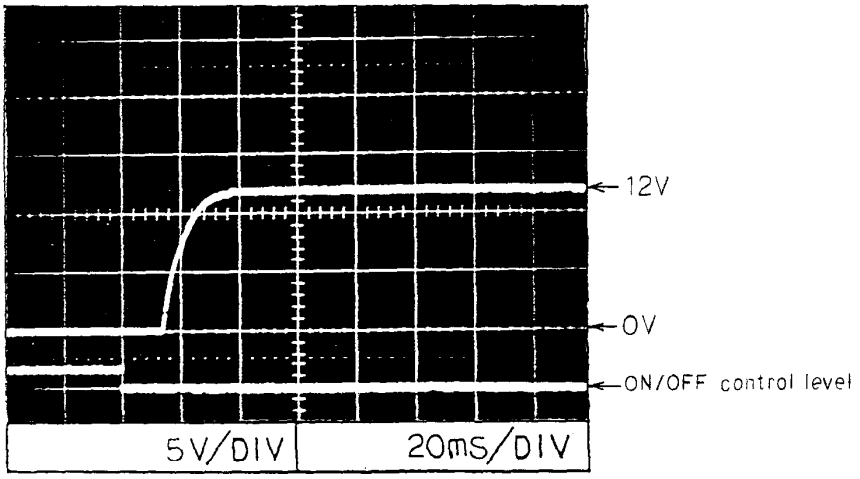
Vout:Rated
Iout:100%
Ta :25°C

12V

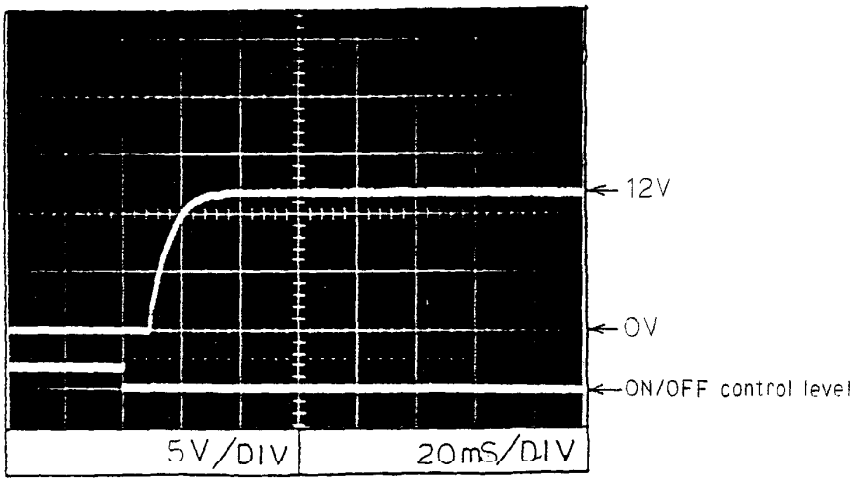
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output rise characteristics with ON/OFF control

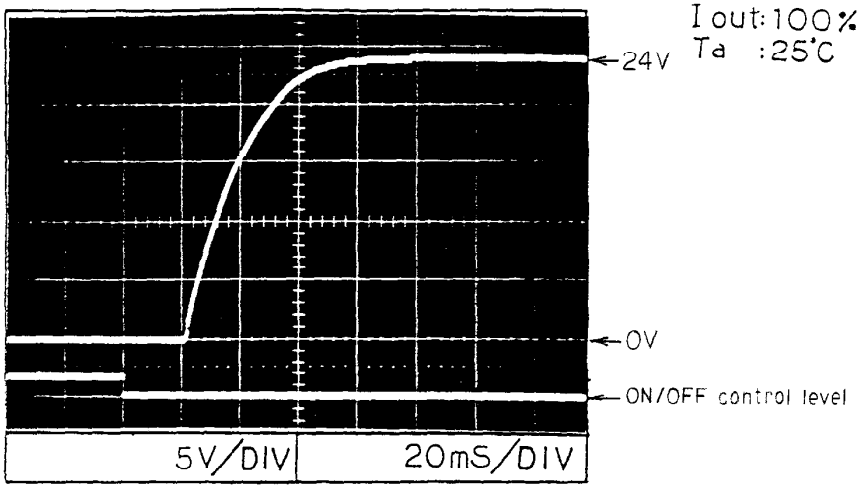
MS300

Conditions

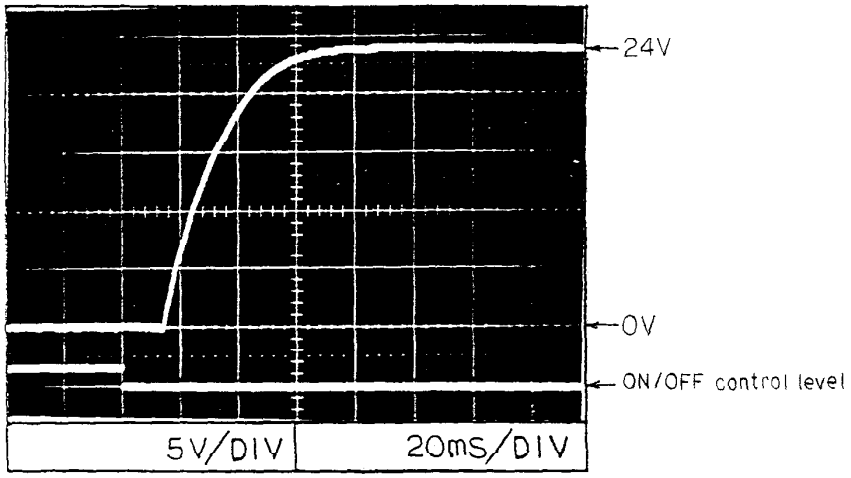
Vout:Rated
Iout:100%
Ta :25°C

24V

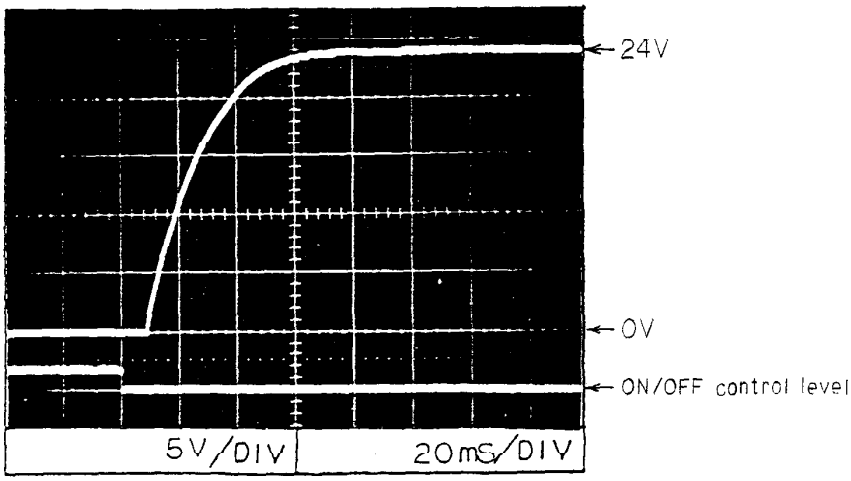
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output fall characteristics with ON/OFF control

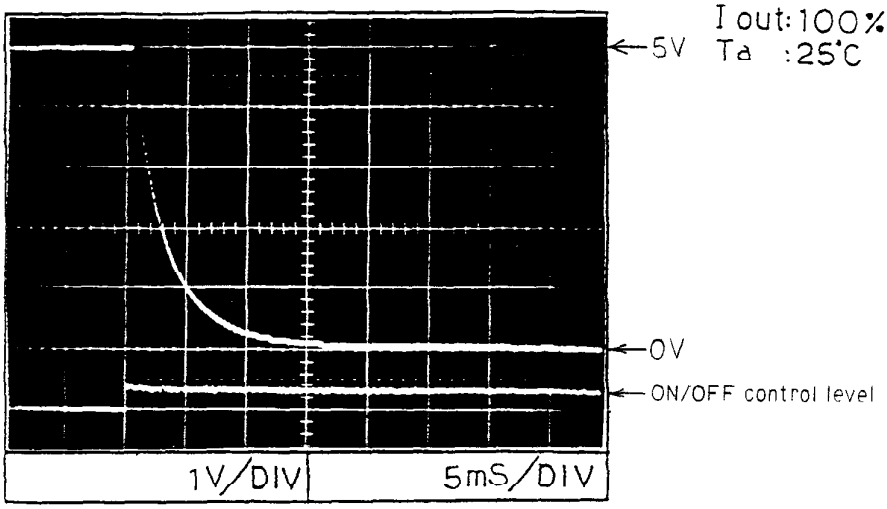
MS300

Conditions

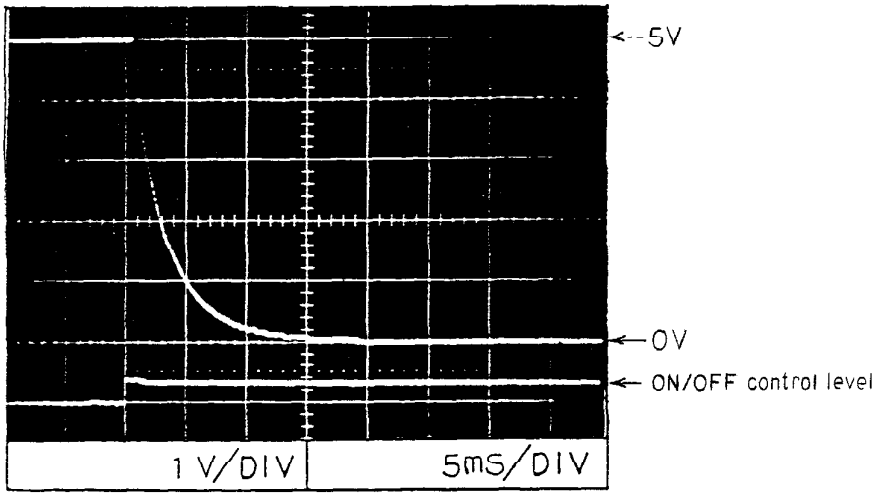
Vout:Rated
Iout:100%
Ta :25°C

5V

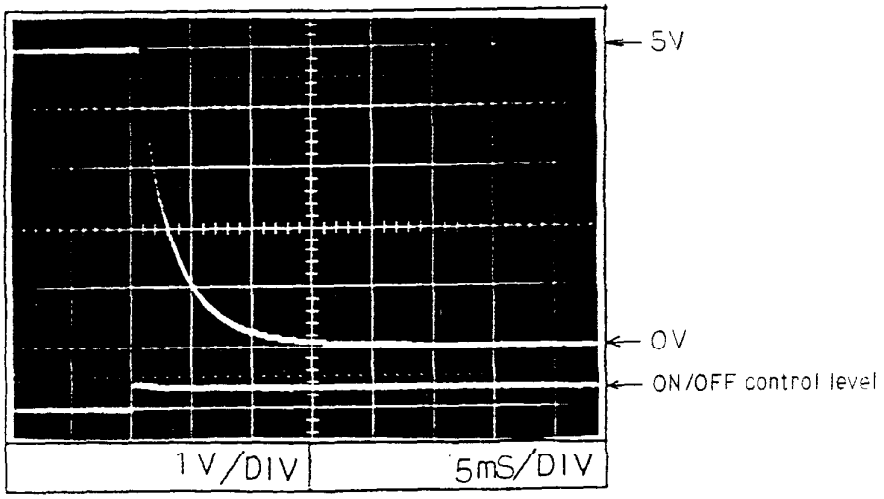
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output fall characteristics with ON/OFF control

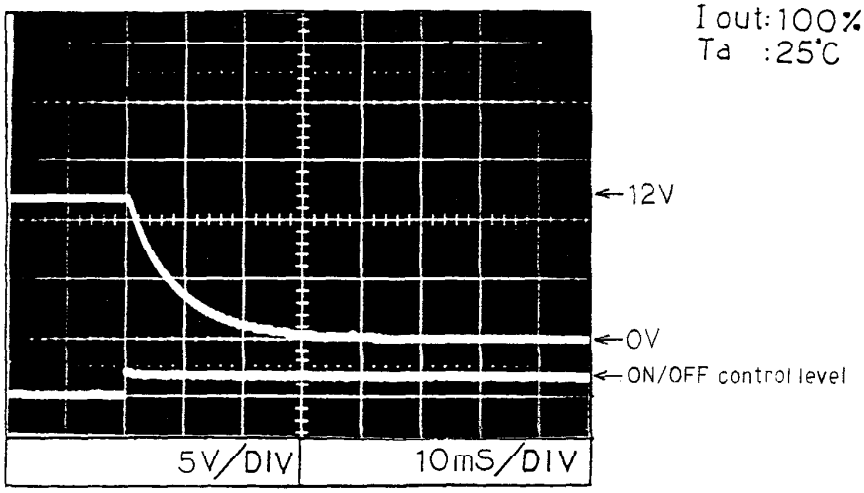
MS300

Conditions

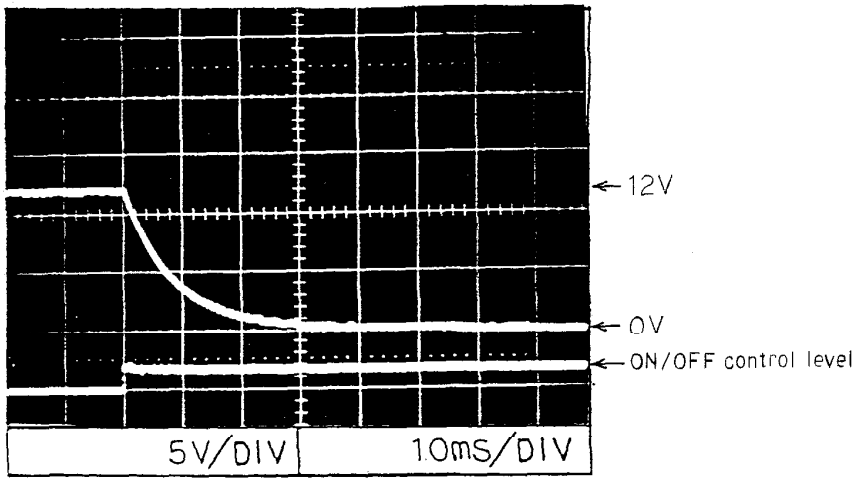
Vout:Rated
Iout:100%
Ta :25°C

12V

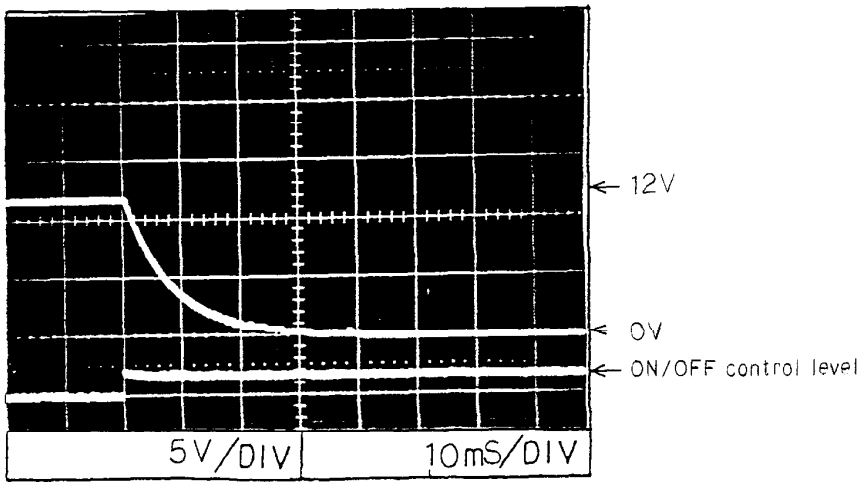
Vin:85VAC



Vin:100VAC



Vin:132VAC



Output fall characteristics with ON/OFF control

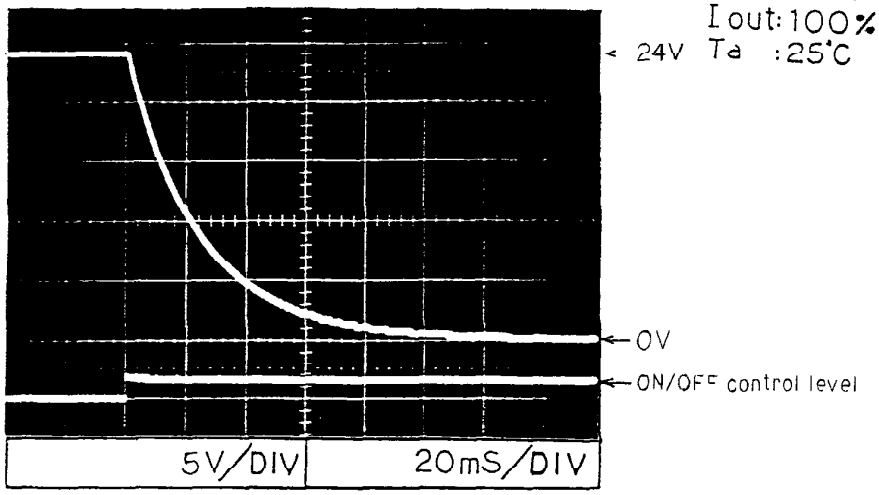
MS300

Conditions

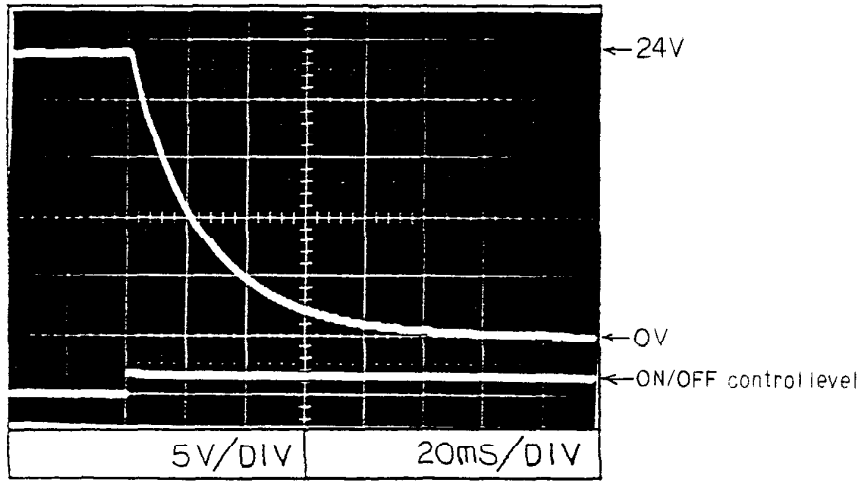
Vout:Rated
Iout:100%
Ta :25°C

24V

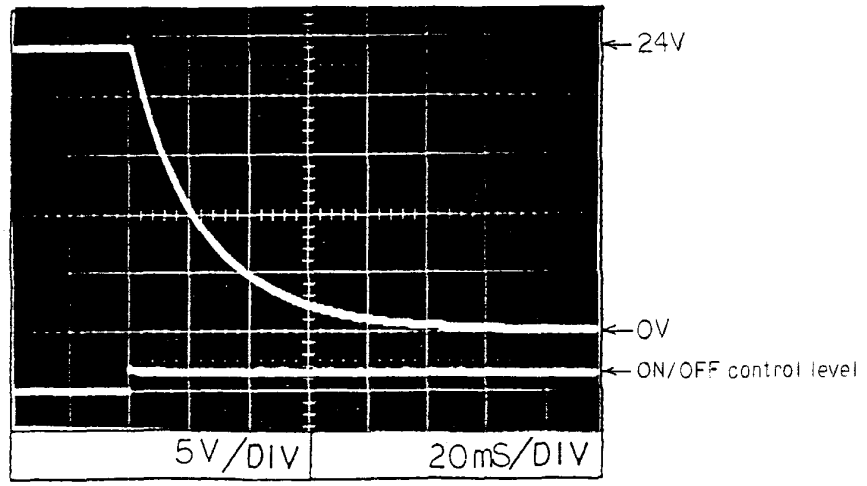
Vin:85VAC



Vin:100VAC



Vin:132VAC

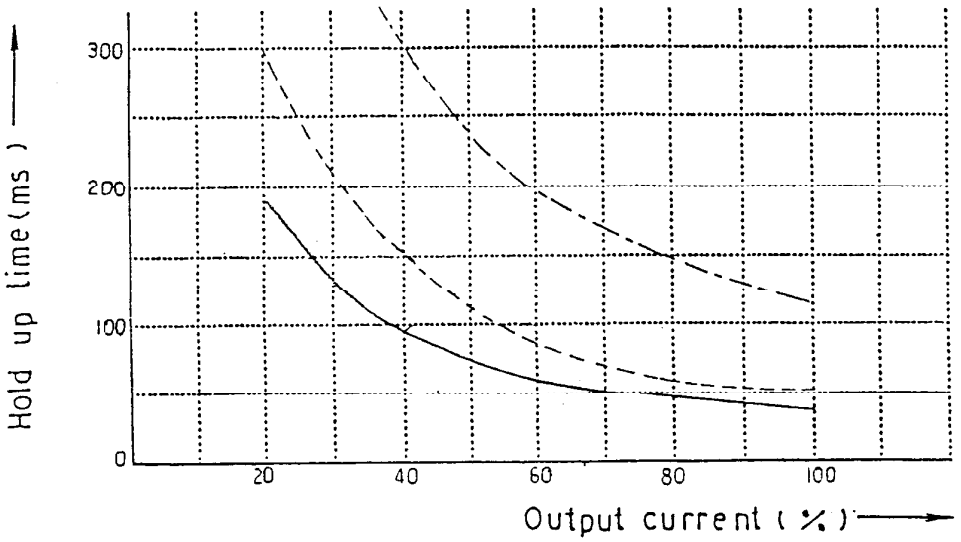


Hold up time

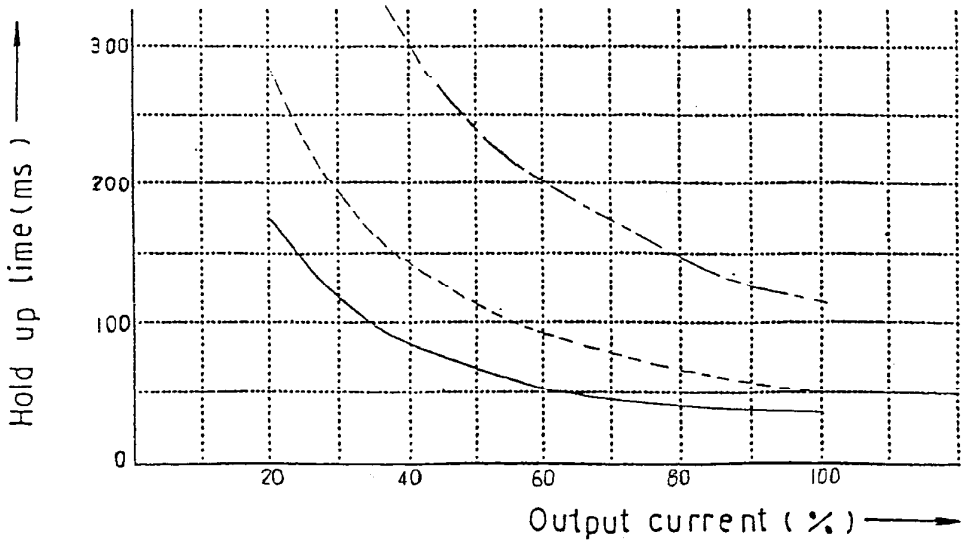
MS300

Conditions Vin : 85VAC ——
100VAC - - - - -
132VAC —·—
Ta : 25°C

5V



12V

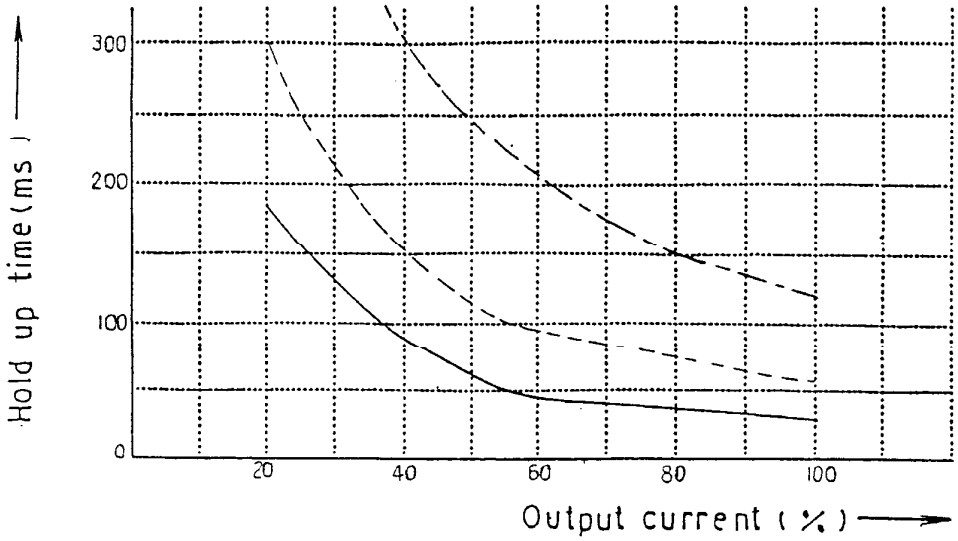


Hold up time

MS300

Conditions Vin : 85VAC ——
100VAC - - - -
132VAC —·—
Ta : 25°C

24V



Dynamic line - Response

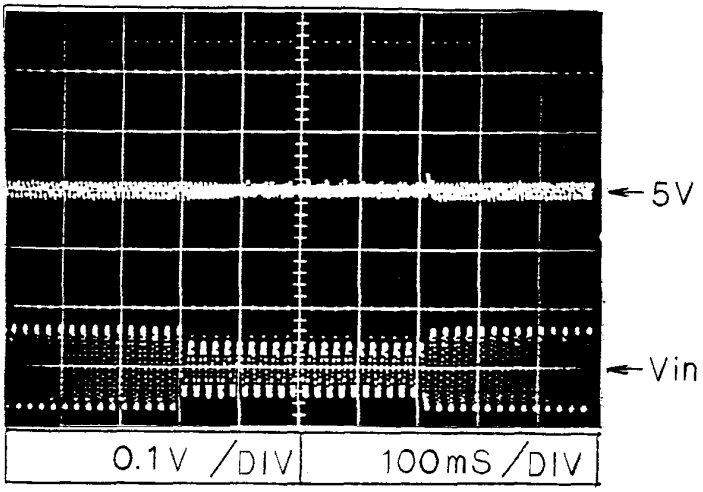
MS300

Conditions

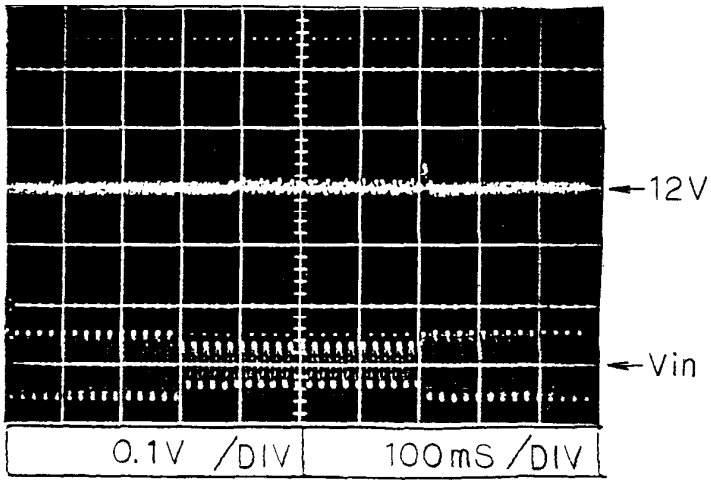
Ta : 25°C
Iout: 100%

Vin: 132VAC ⇌ 85 VAC

5V



12V



Dynamic line - Response

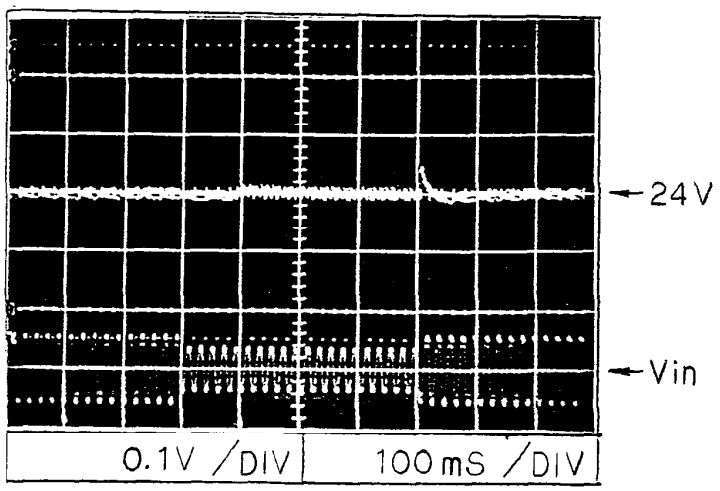
MS300

Conditions

Ta : 25°C
Iout: 100%

Vin: 132 VAC ⇌ 85 VAC

24 V

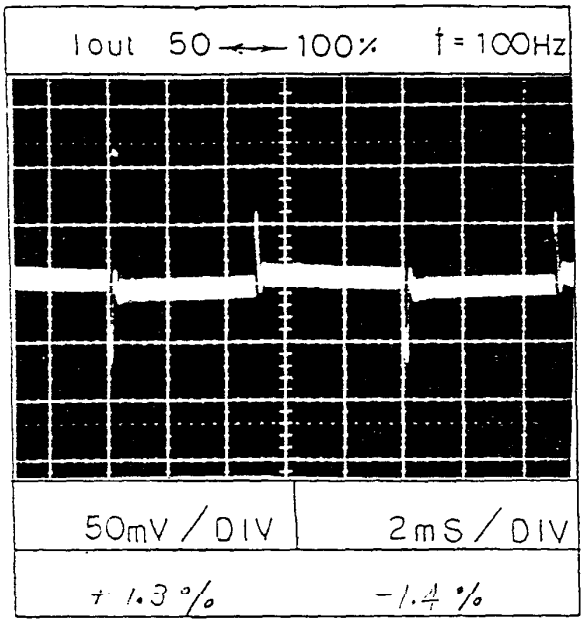


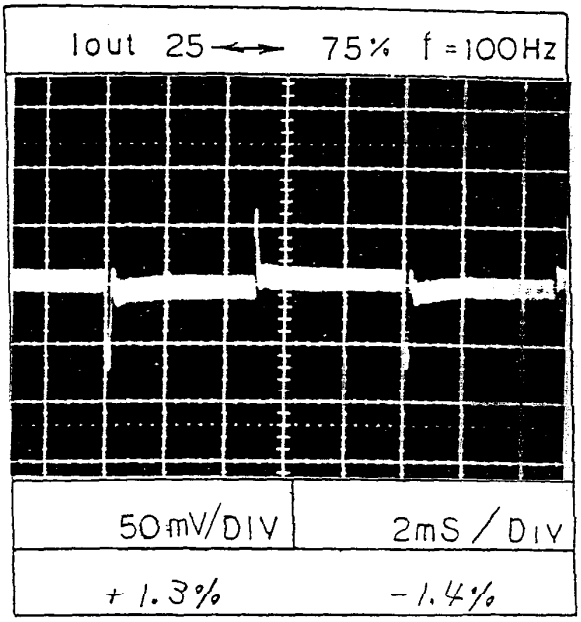
Dynamic load response

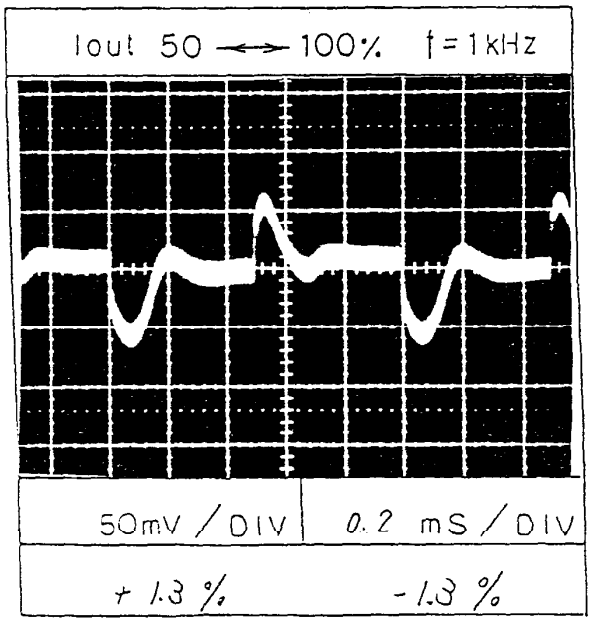
MS300

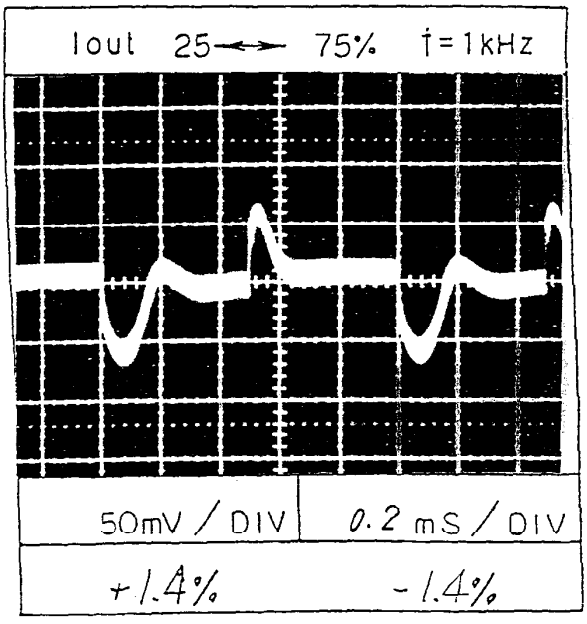
Conditions Vin : 100VAC
Ta : 25 °C

5V







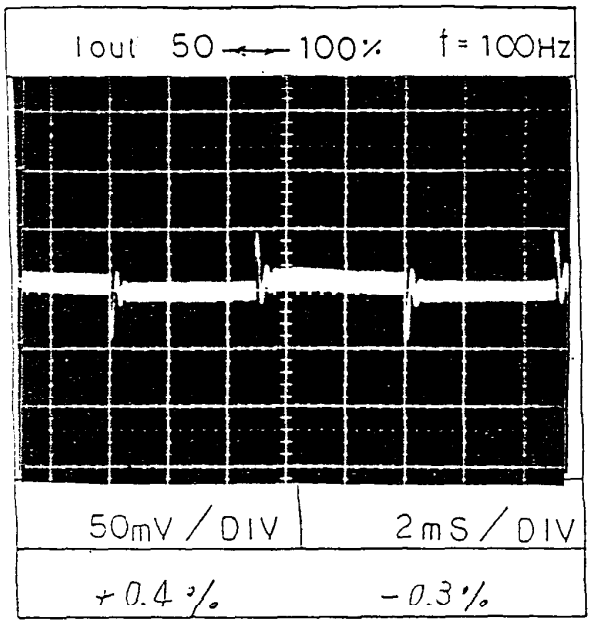


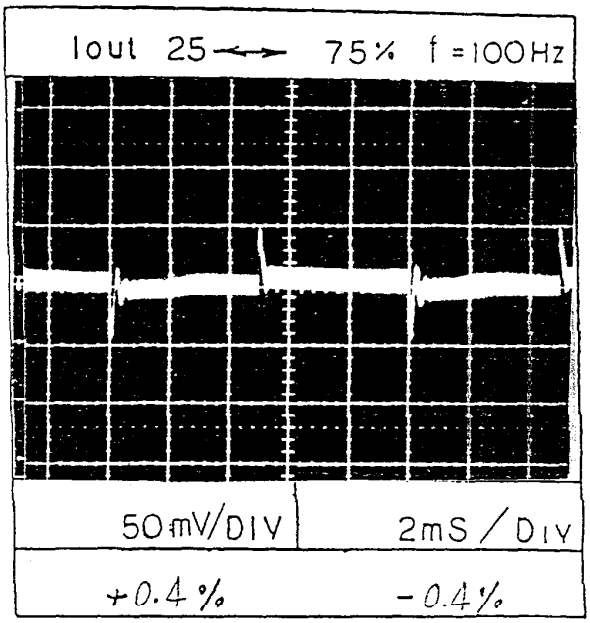
Dynamic load response

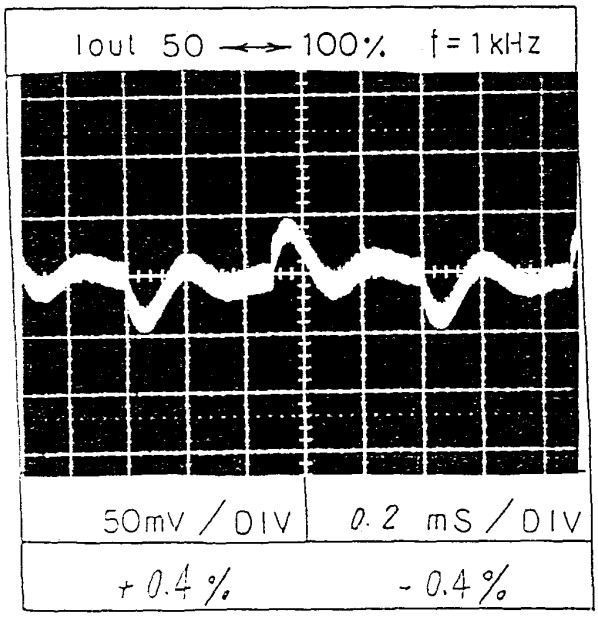
MS 300

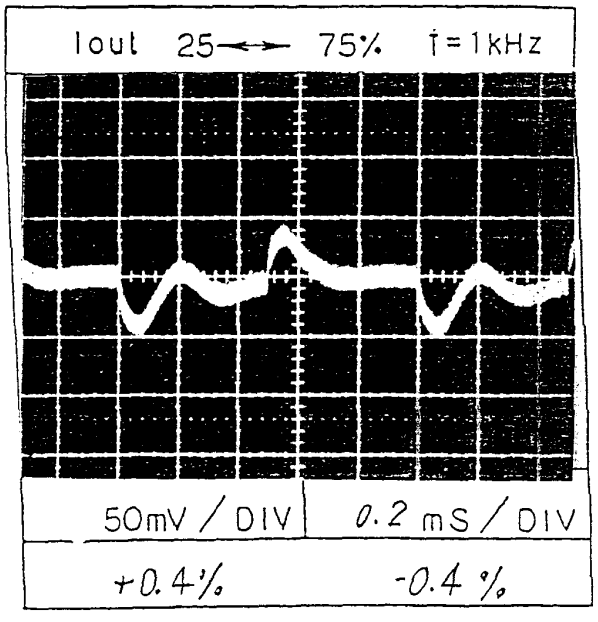
Conditions Vin : 100 VAC
Ta : 25 °C

12V







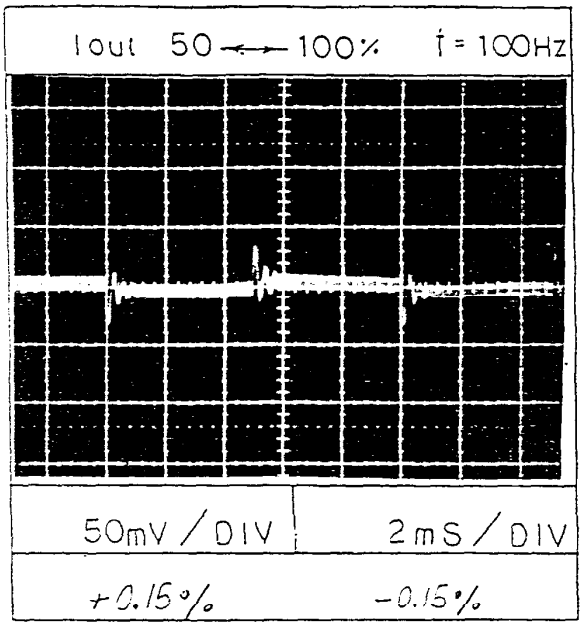


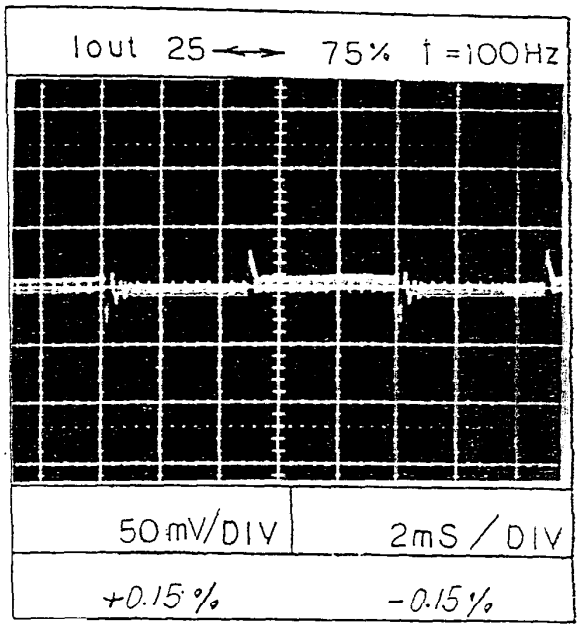
Dynamic load response

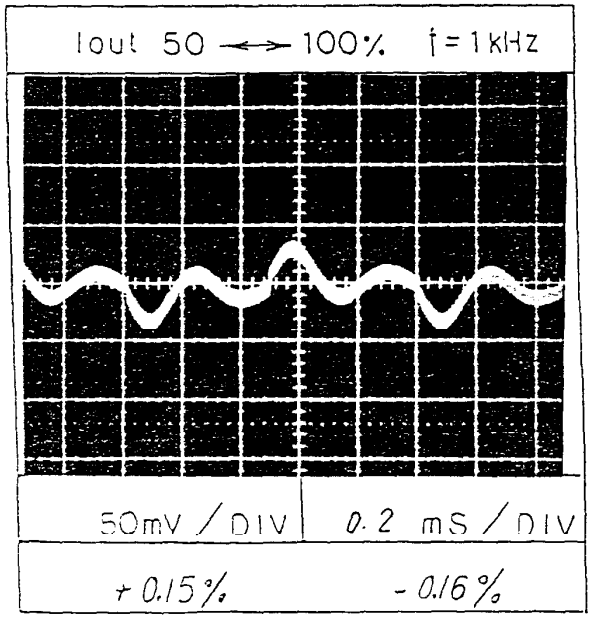
MS300

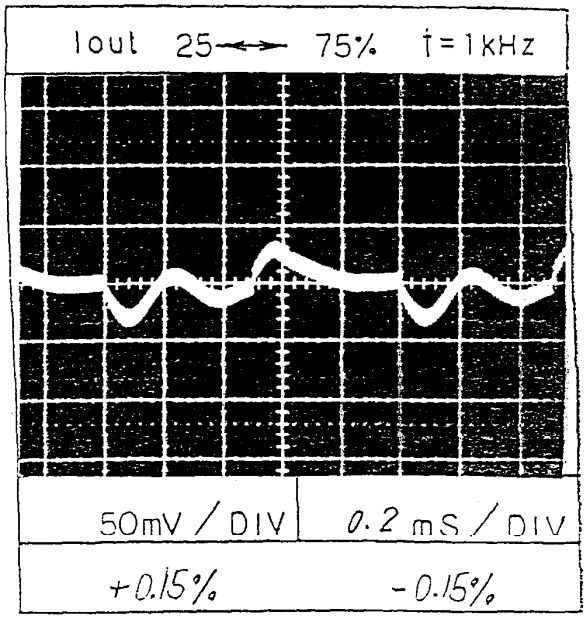
Conditions Vin : 100 VAC
Ta : 25 °C

24V









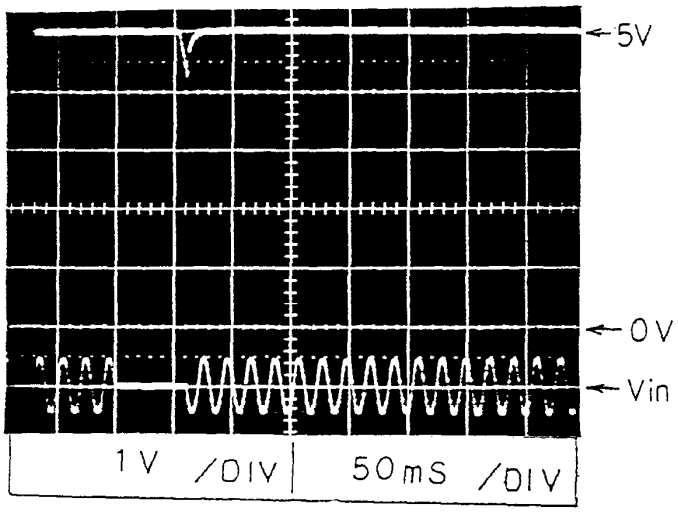
Response to brown out

MS300

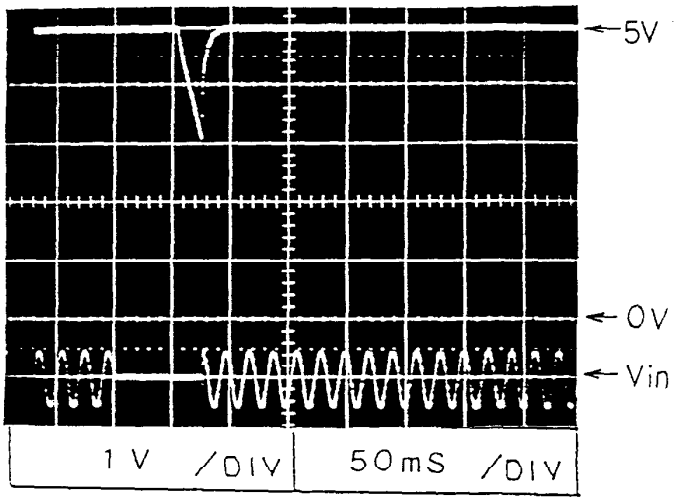
Conditions Vin :100VAC
Iout:100%
Ta :25°C

5 V

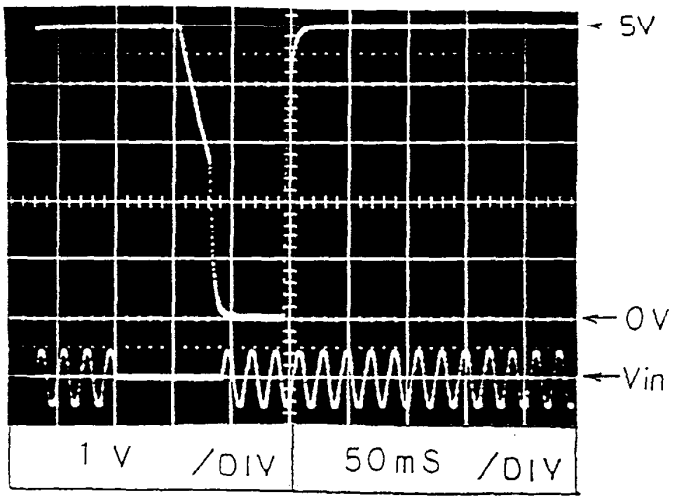
60mS



75mS



90mS



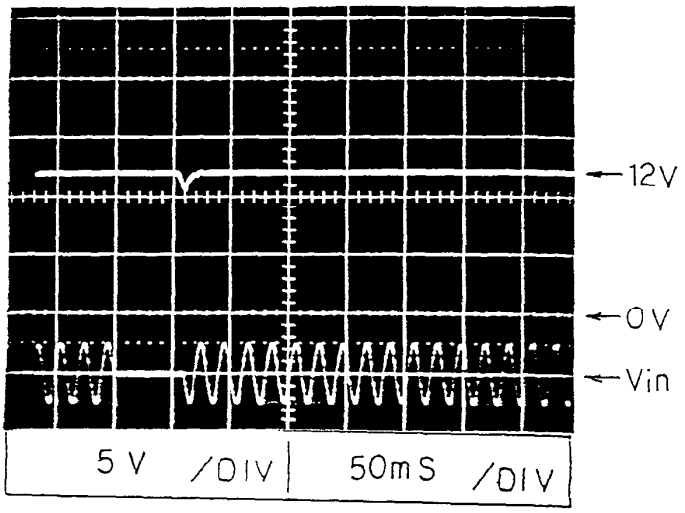
Response to brown out

MS300

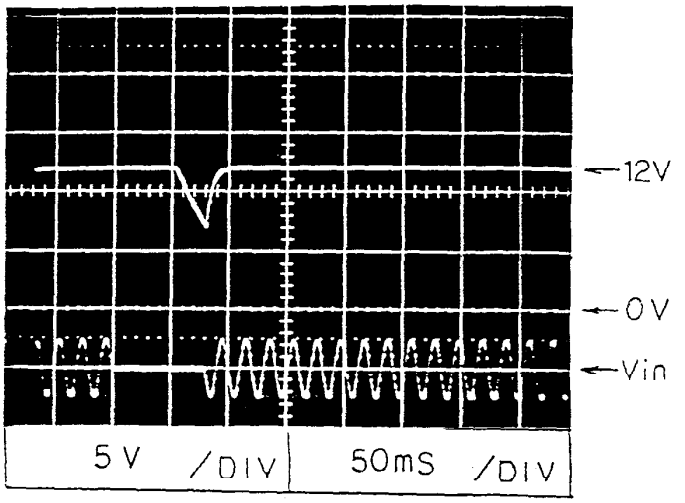
Conditions Vin :100VAC
Iout:100%
Ta :25°C

12V

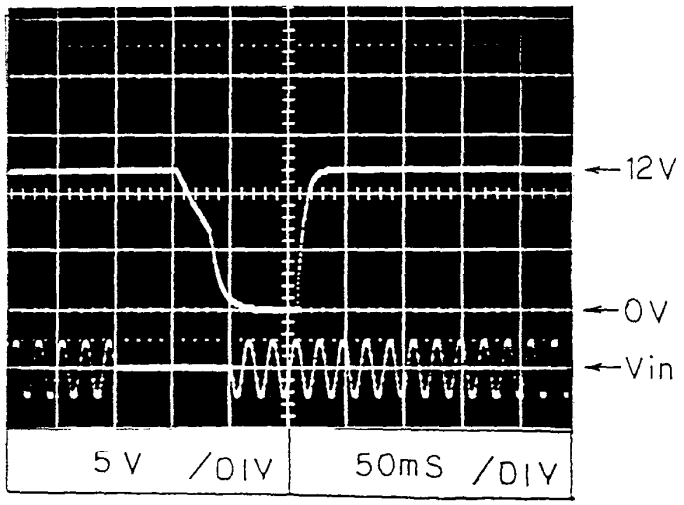
60mS



80mS



100mS



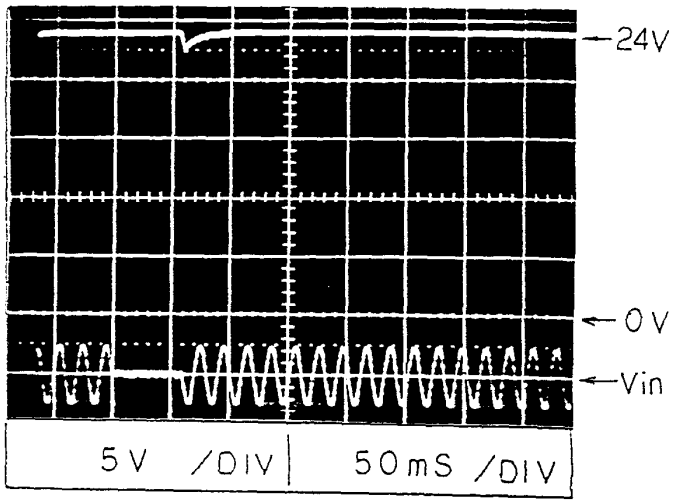
Response to brown out

MS300

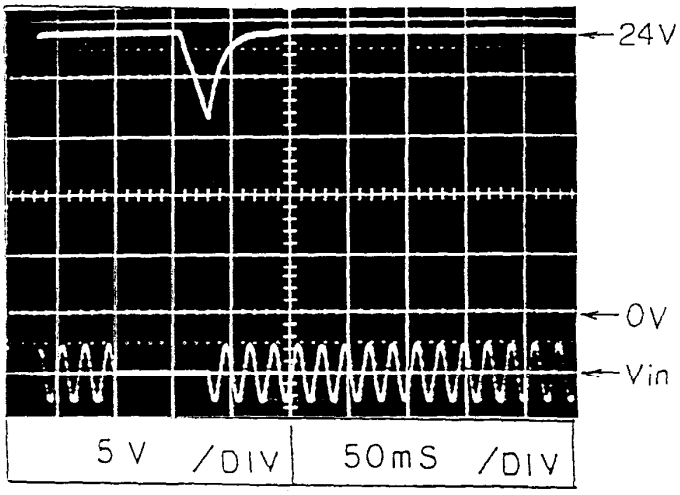
Conditions Vin :100VAC
Iout:100%
Ta :25°C

24 V

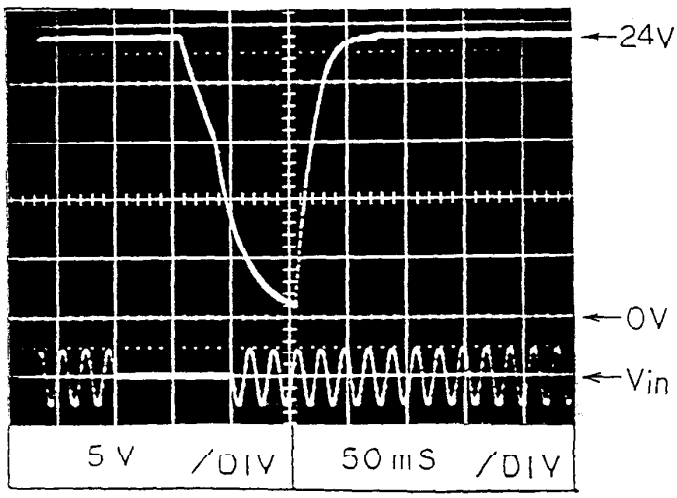
60mS



80mS



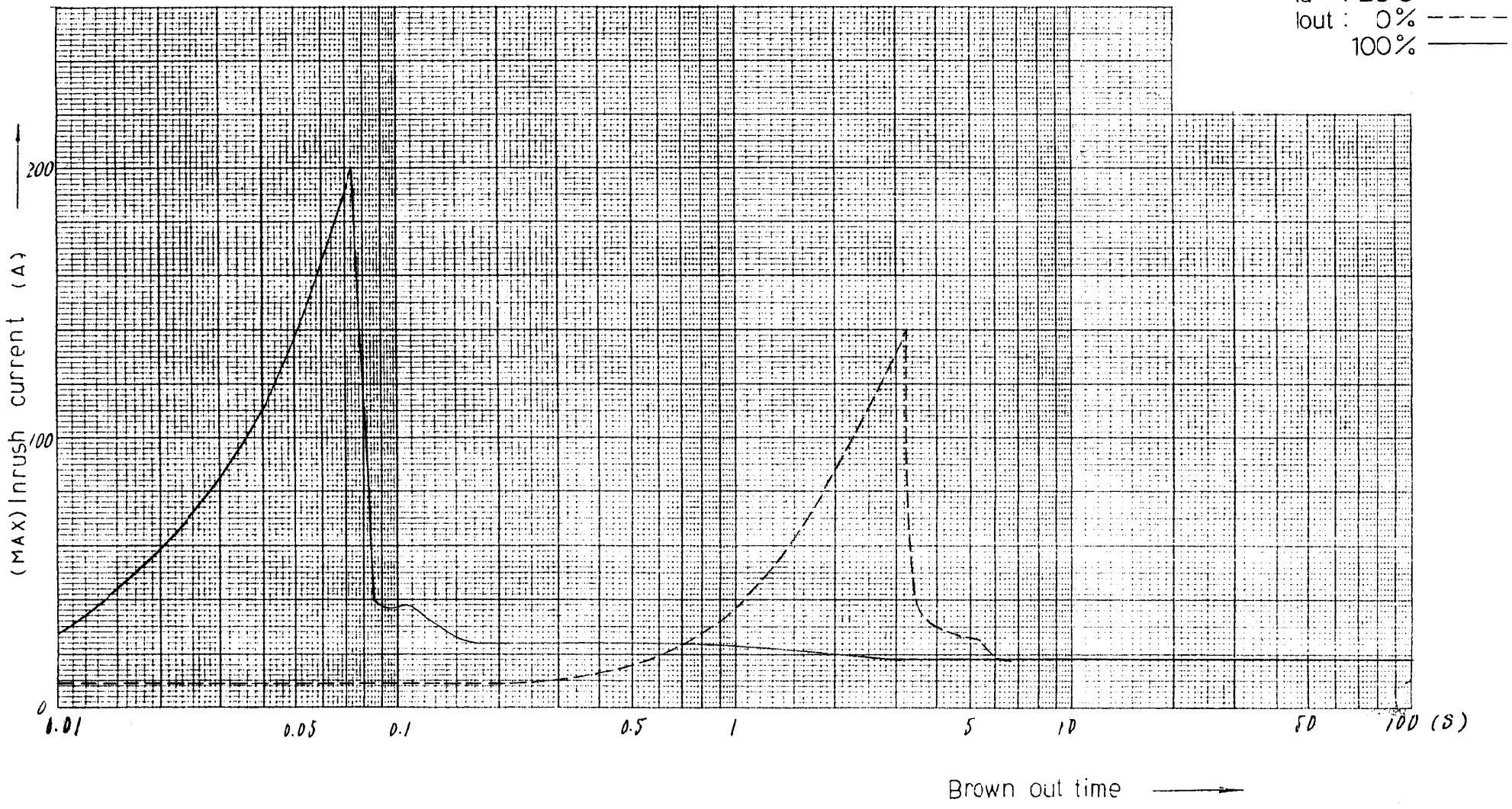
100mS



MS300

Inrush current characteristics

Conditions
Vin : 100 VAC
Ta : 25°C
Iout : 0% ----
100% ——



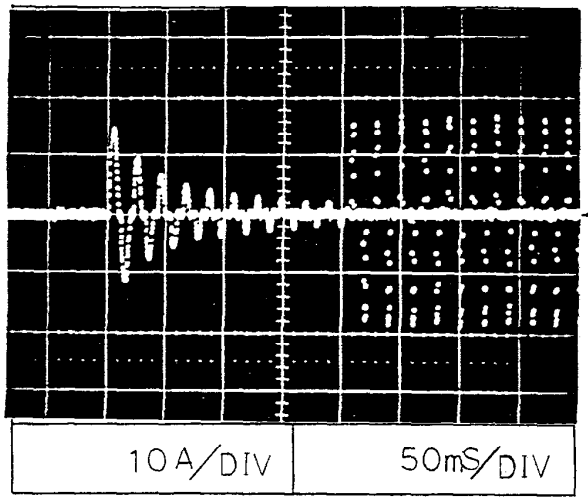
Inrush current waveform

MS300

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

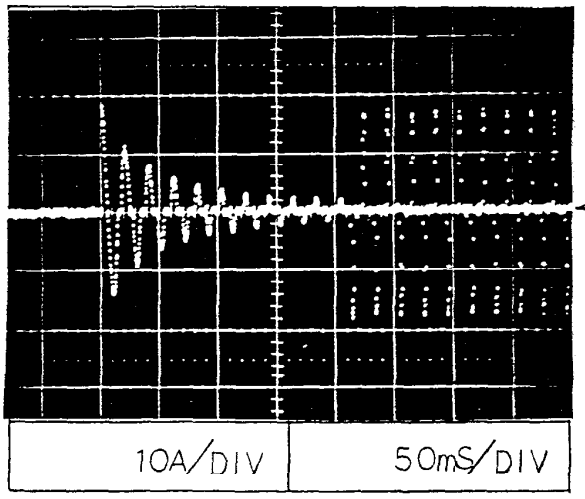
Switch in phase angle
of input AC voltage

$\phi = 0°$



Switch in phase angle
of input AC voltage

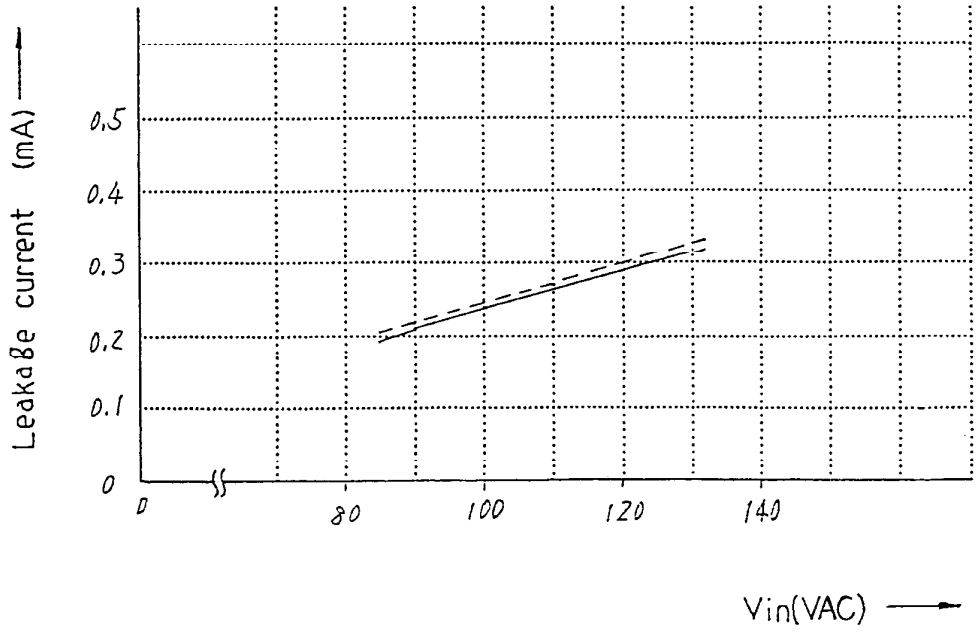
$\phi = 90°$



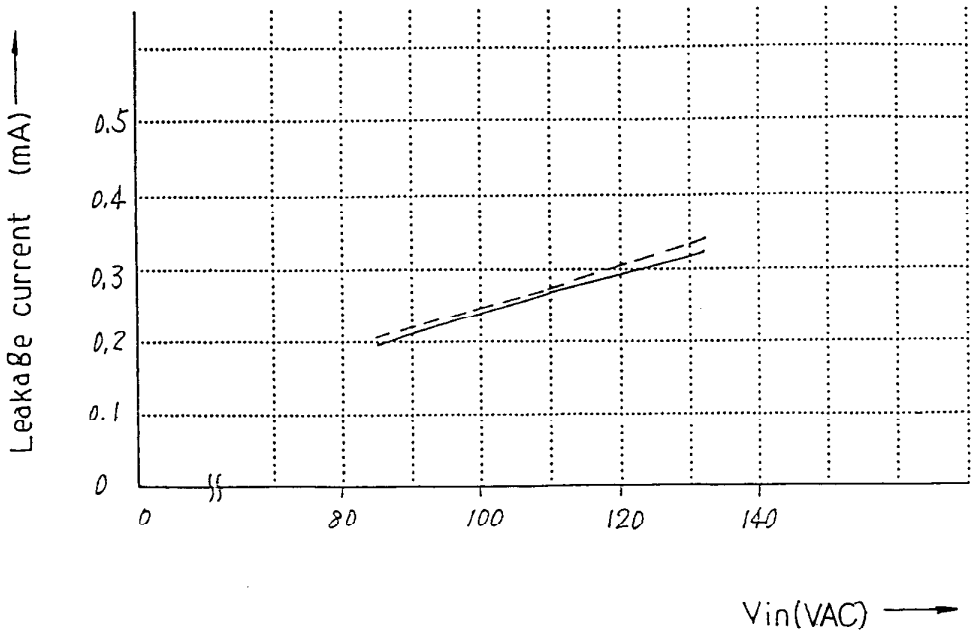
Leakage current

Conditions ACG-FG SHORT
Iout:100 % ——
0 % - - - - - -
Ta :25°C
f :50Hz

5V



12V

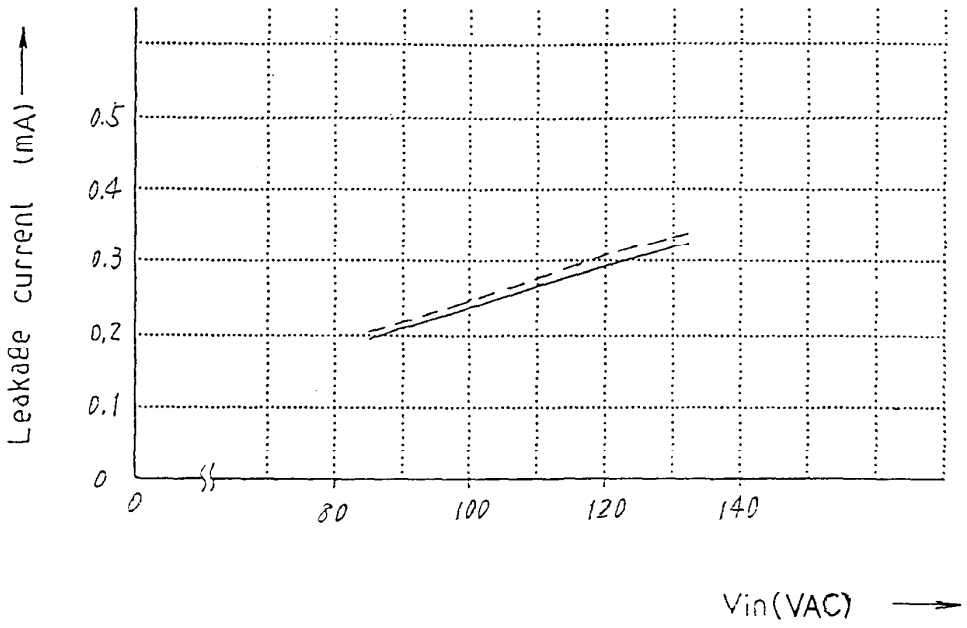


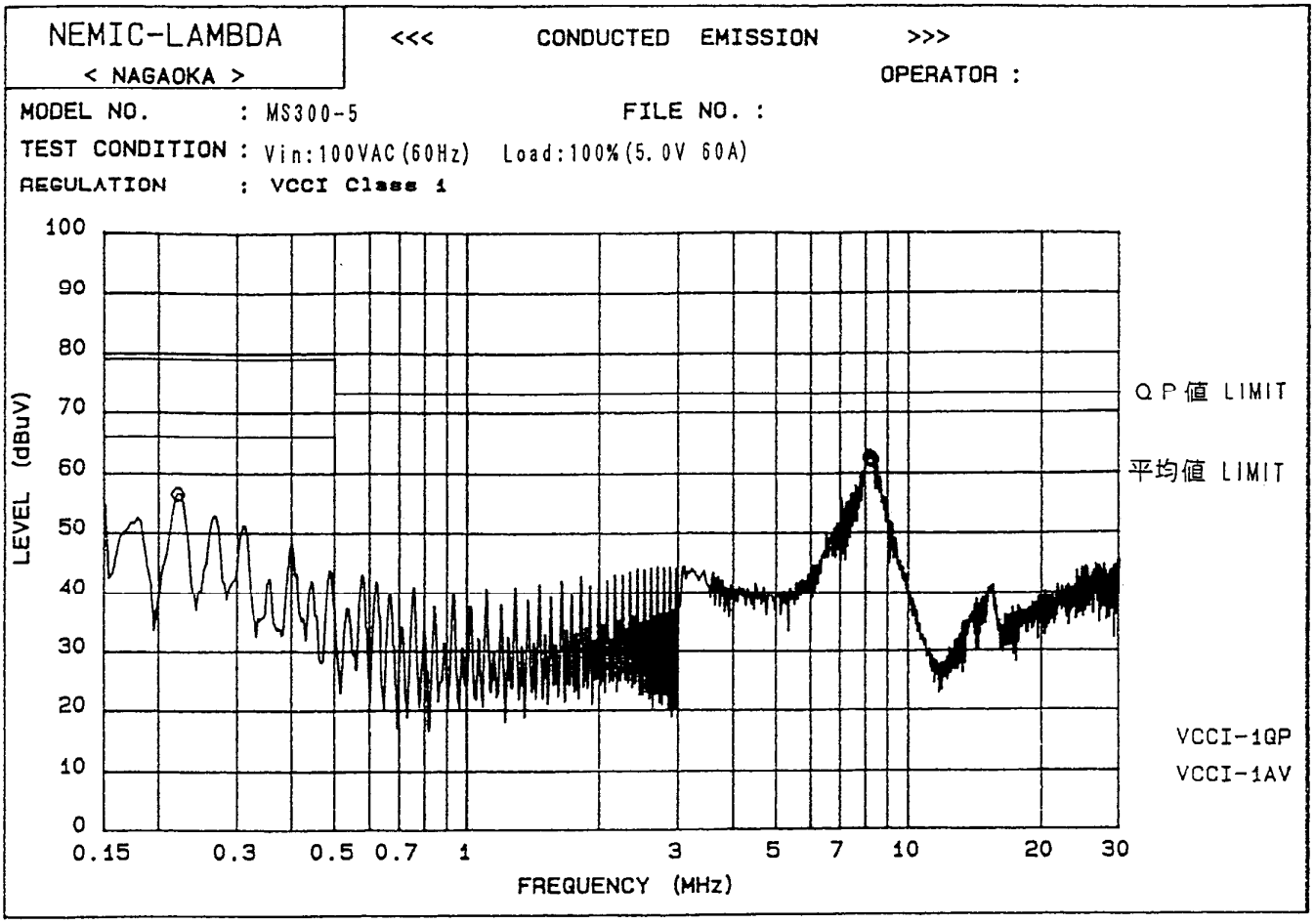
Leakage current

MS300

Conditions ACG-F.G SHORT
Iout:100 % ——
0 % - - - - - -
Ta :25°C
f :50Hz

24V





REMARK 1 : EMI Test Receiver : ESHS10 (R&S)
REMARK 2 : Spectrum Analyzer : FSA (R&S)
REMARK 3 : LISN : KNW-242 (Kyoritsu)
TEMPERATURE :
HUMIDITY :
OPERATOR :

RESULTS (QP:QP/AV)

NO	FREQ	MEAS		FACTOR	RESULT		LIMIT		MARGIN	
		QP	AV		QP	AV	QP	AV	QP	AV
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]
Phase L1										
1	0.2210	55.5	49.5	0.2	55.7	49.7	79.0	66.0	23.3	16.3
2	8.0707	61.9	53.4	0.8	62.6	54.2	73.0	60.0	10.4	5.8
3	8.2481	61.1	52.8	0.8	61.9	53.5	73.0	60.0	11.1	6.5