NND30

TEST DATA

DWG. No. IA503-53-01			
Q.A. NLJ	Q.A. NLI	ENG.	APP.
A. Kakinuta AUG. 9. '93		Doron Peled JULY-13-92	S. Shimshon JUL/13/92

T. Kato
JUL/14/93

NEMIC-LAMBDA

INDEX

Terminology used:

Definition:

Vin .....Input Voltage

Vout .....Output Voltage

Iin .....Input Current

Iout .....Output Current

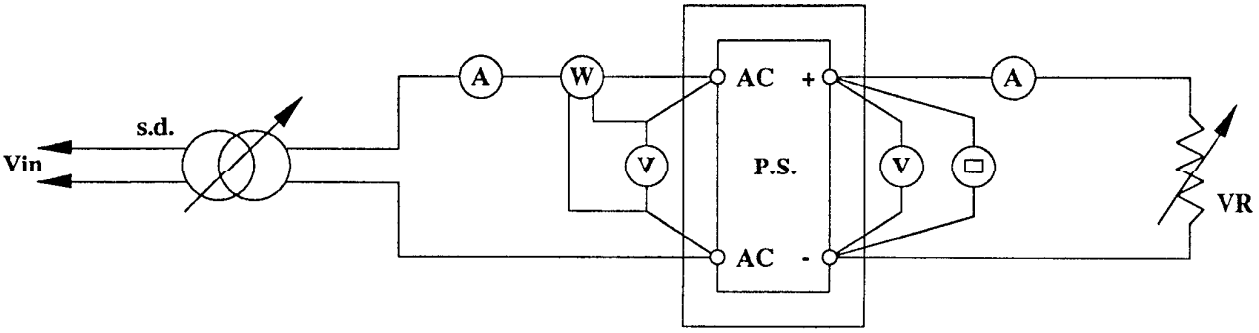
Ta .....Ambient Temperature

1.EVALUATION METHOD

NND30-1212

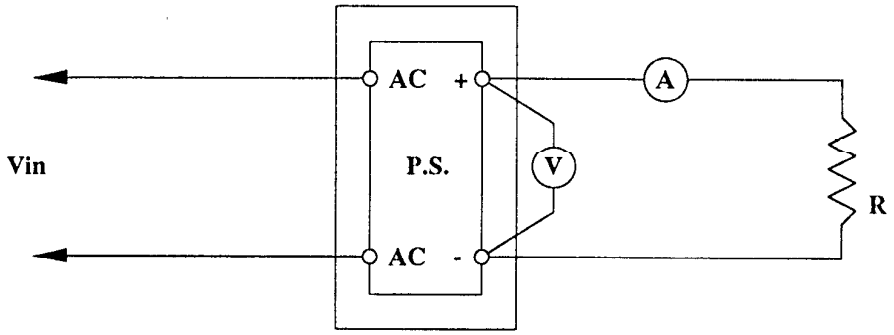
1-1 Circuits used for determination

(1) Steady state data



Controlled temp. chamber

(2) Warm up voltage drift characteristics

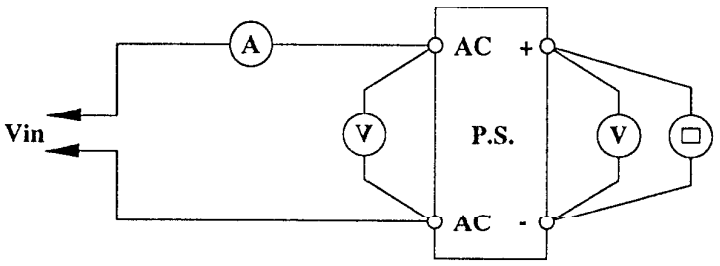


Controlled temp. chamber

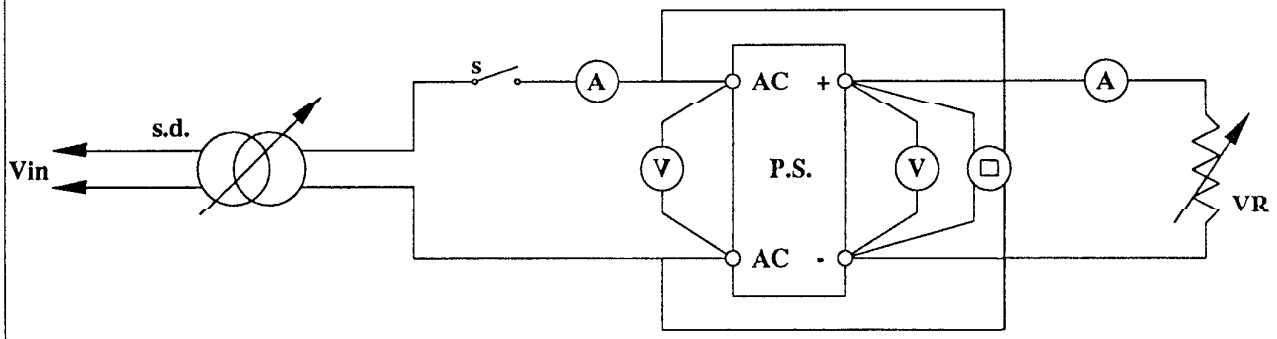
(3) Over current protection (OCP) characteristics

Same as steady state data.

(4) Over voltage protection (OVP) characteristics



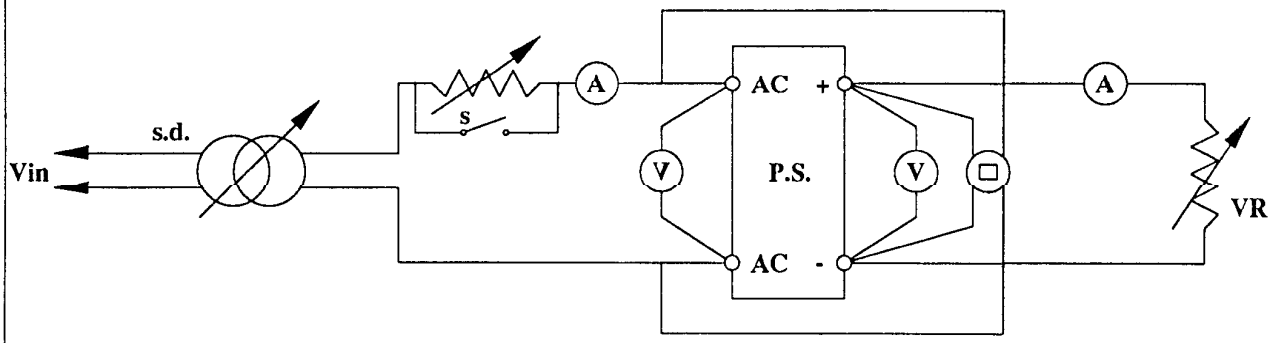
(5) Output rise characteristics



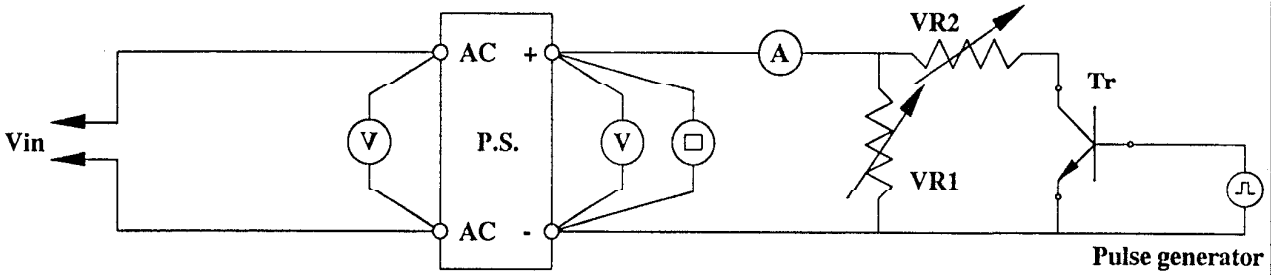
(6) Ouput fall characteristics

Same as Ouput rise characteristics

(7) Dynamic line response characteristics

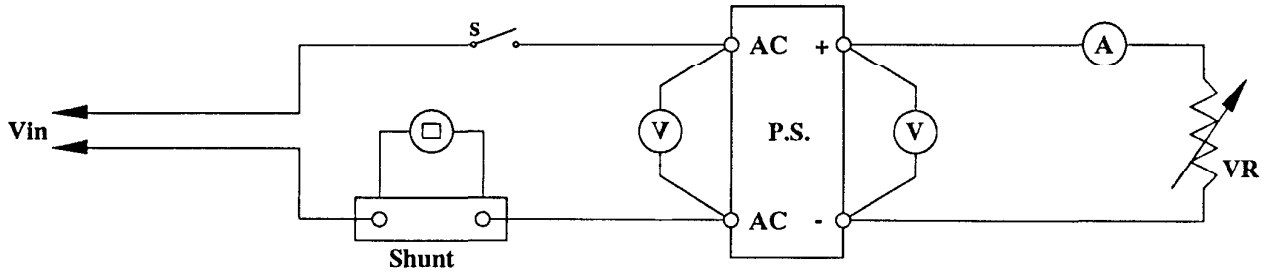


(8) Dynamic load response characteristics

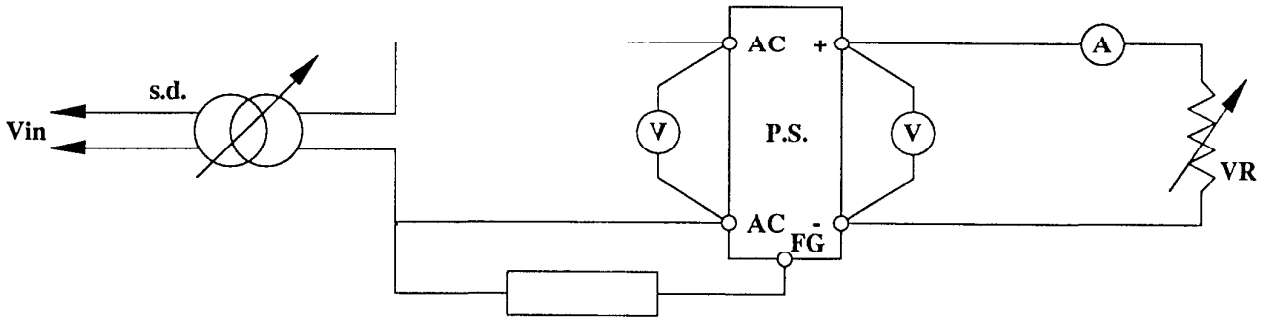


NND30-1212

(9) Inrush current characteristics



(10) Leakage current characteristics

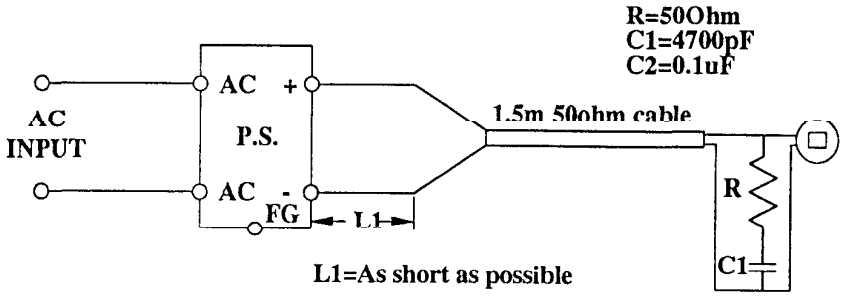


Leakage current meter

Note: Leakage current measured through a 1Kohm resistor. Range wed: AC+DC

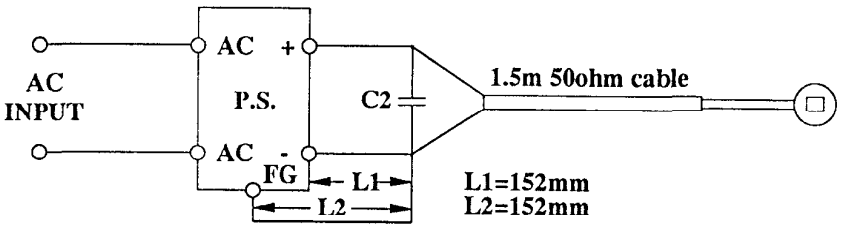
(11) Output-ripple, noise

a) Normal mode



L1=As short as possible

b) Normal + common mode



L1=152mm
L2=152mm

2. CHARACTERISTICS

2-1 STEADY STATE DATA

(1) REGULATION - Line and load, Temp. drift

V1: 12V

1. Regulation-line and load Condition Ta=25C

CH2: 100%

Iout \ Vin	AC 85V	AC 100V	AC 115V	Line Regulation	
0%	12.0349	12.0346	12.0344	0.5mV	0.0042%
50%	12.0332	12.0329	12.0328	0.4mV	0.0033%
100%	12.0323	12.0321	12.0319	0.4mV	0.0033%
Load	2.6mV	2.5mV	2.5mV		
Regulation	0.0217%	0.0208%	0.0208%		

2. Temperature Drift Conditions Vin=AC100V Iout=100%

Ta	0C	25C	50C	Temp. Stability	
Vout	12.0271	12.0524	12.0747	0.0476	0.4%

V1:-12V

1. Regulation-line and load Condition Ta=25C

CH1: 100%

Iout \ Vin	AC 85V	AC 100V	AC 115V	Line Regulation	
0%	12.0390	12.0389	12.0385	0.5mV	0.0042%
50%	12.0372	12.0370	12.0369	0.3mV	0.0025%
100%	12.0366	12.0365	12.0362	0.4mV	0.0033%
Load	2.4mV	2.4mV	2.3mV		
Regulation	0.0200%	0.0200%	0.0192%		

2. Temperature Drift Conditions Vin=AC100V Iout=100%

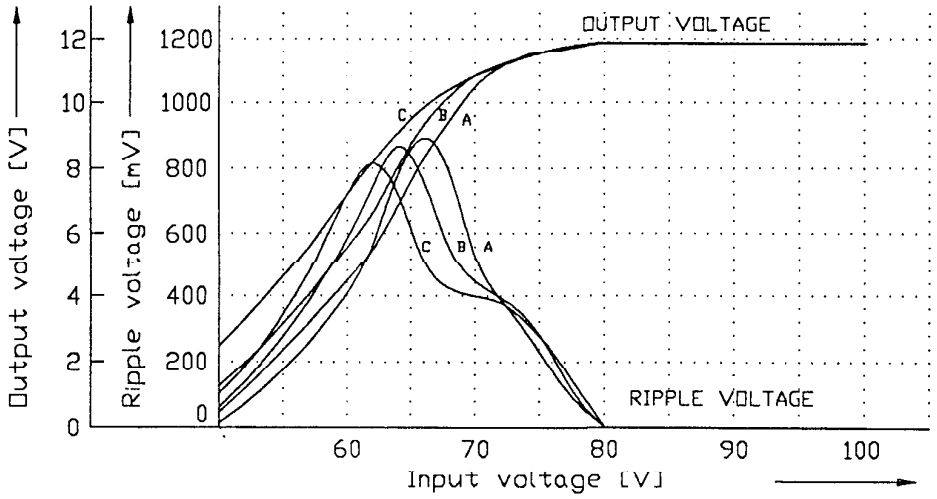
Ta	0C	25C	50C	Temp. Stability	
Vout	12.0069	12.0071	12.0098	.0029	0.024%

NND30-1212

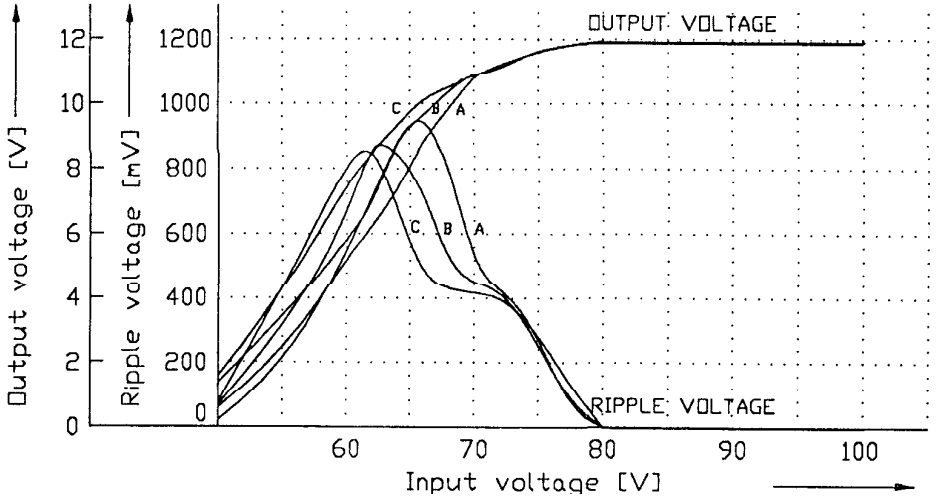
(2) Output voltage and ripple voltage
V.S. input voltage

Iout=100%
Conditions Ta: 0C = A 100VAC
25C = B
50C = C

V1: 12V



V2:-12V

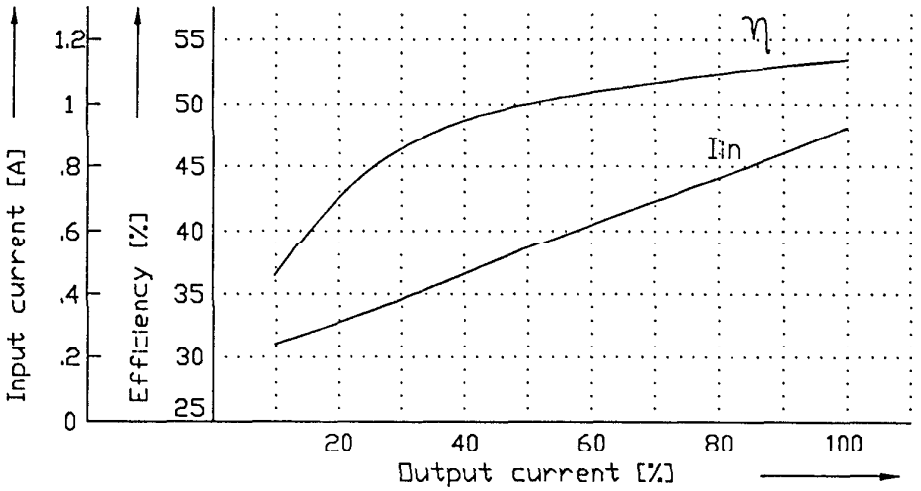


NND30-1212

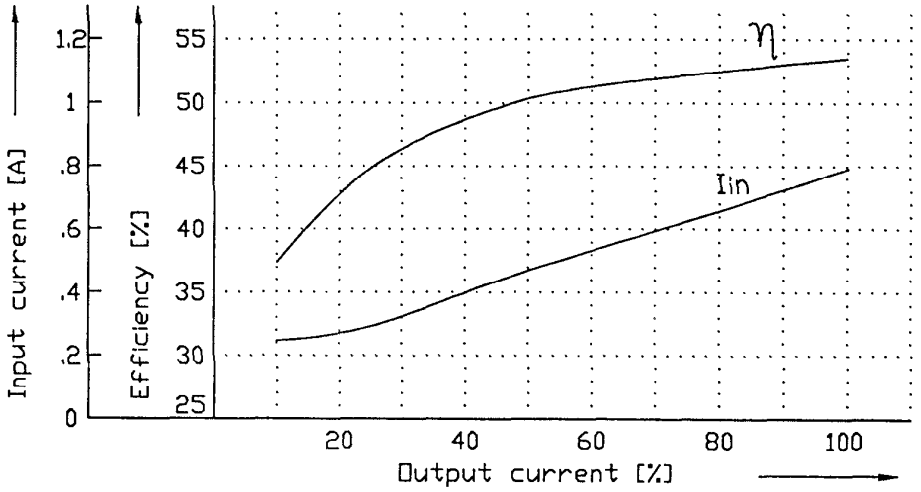
(3) Efficiency and Input current V.S. output current

Conditions Ta=25C

VIN:100VAC



VIN:115VAC

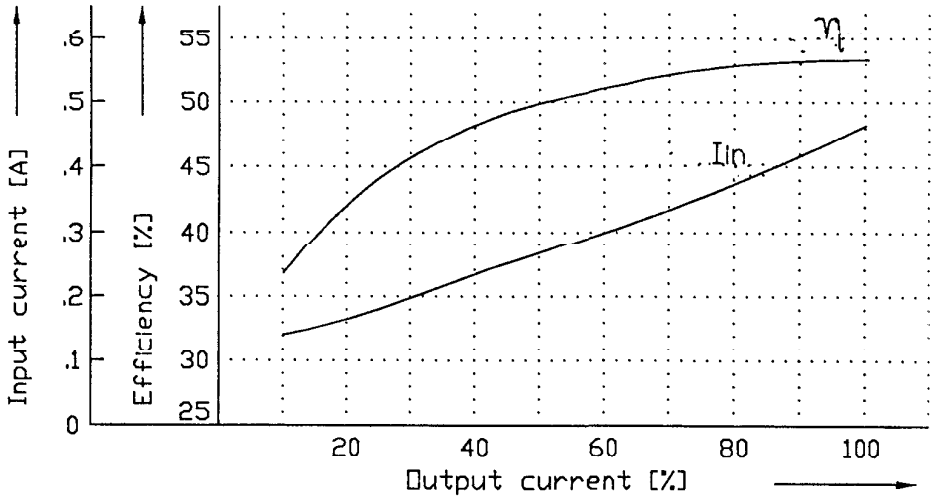


NND30-1212

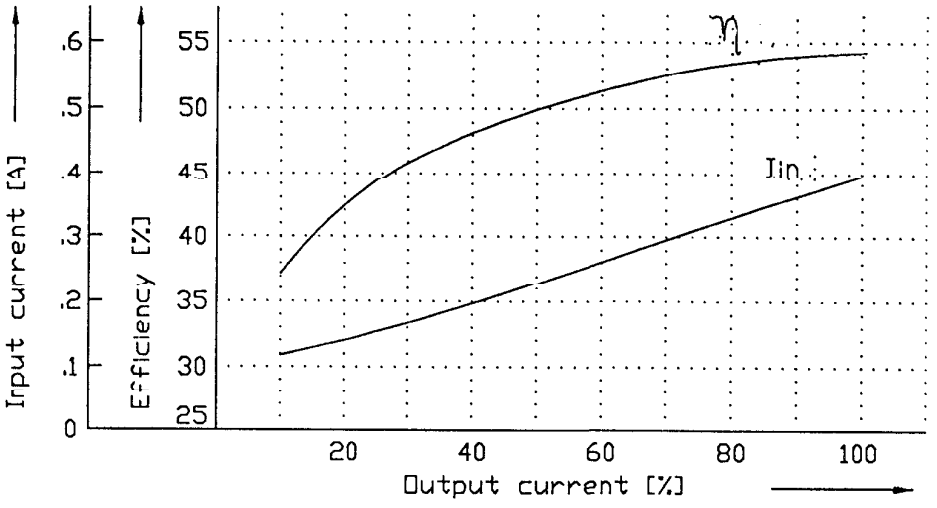
Efficiency and Input current
V.S. output current

Conditions Ta=25C

VIN:200VAC



VIN:230VAC

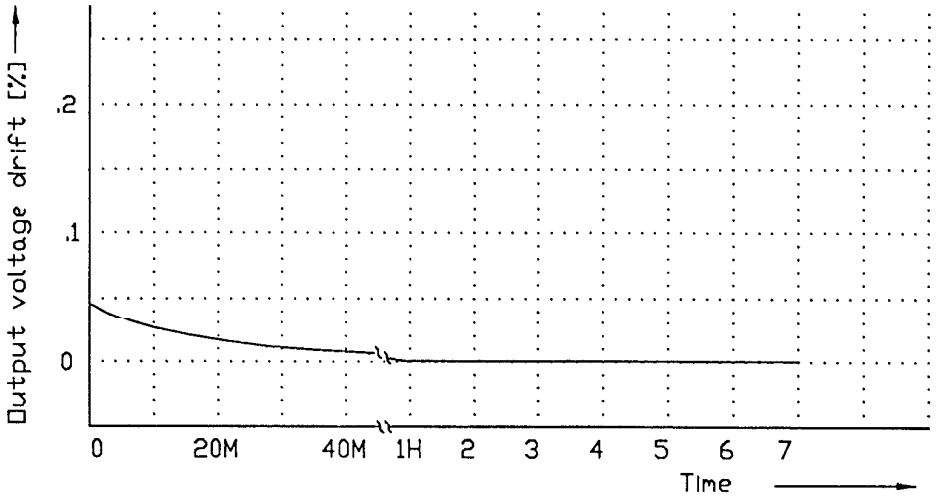


2-2 Warm up voltage drift

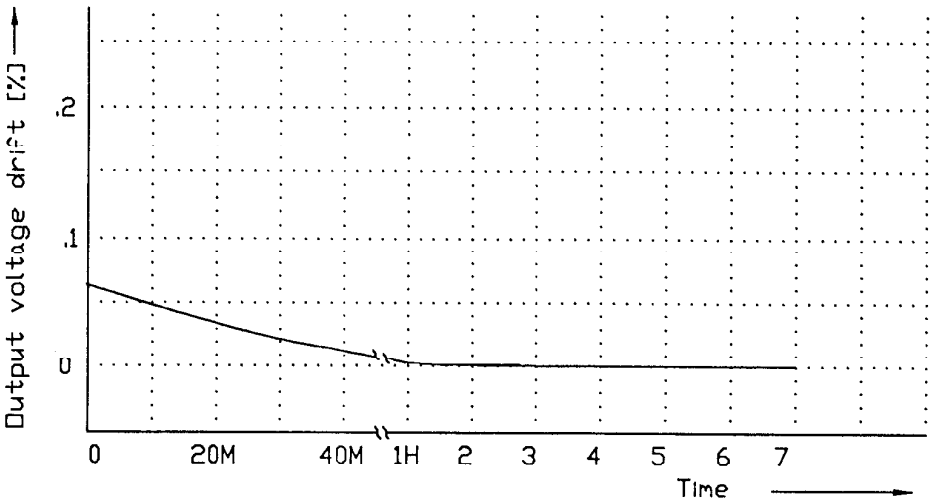
NND30-1212

Conditions Vin=AC100V
Vout,Iout=100%
Ta=25C

V1: 12V



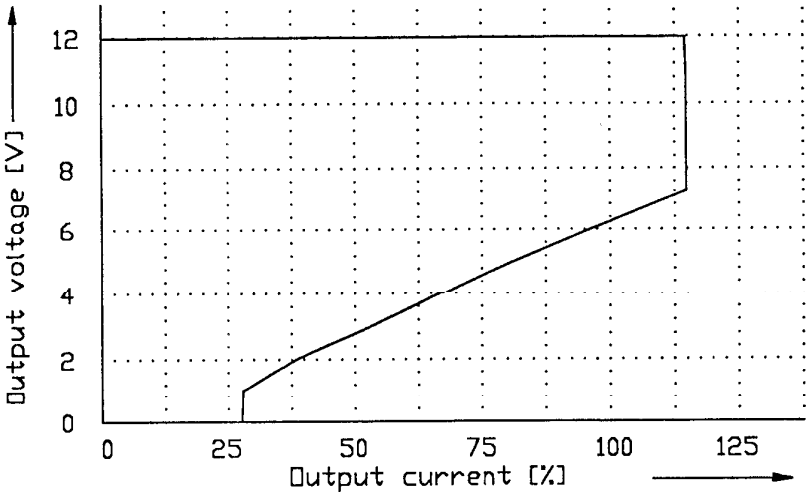
V2:-12V



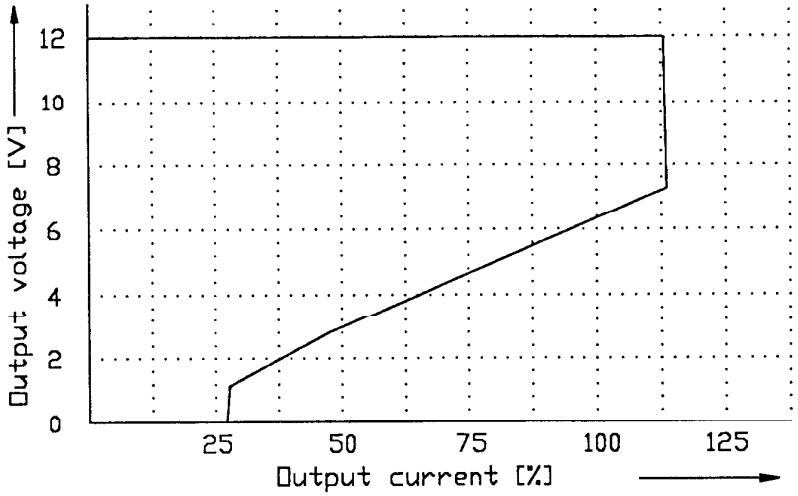
2-3 OCP Characteristics

Conditions Ta=25C
Vin: AC 85V ----
AC 100V ——
AC 115V ----

V1: 12V



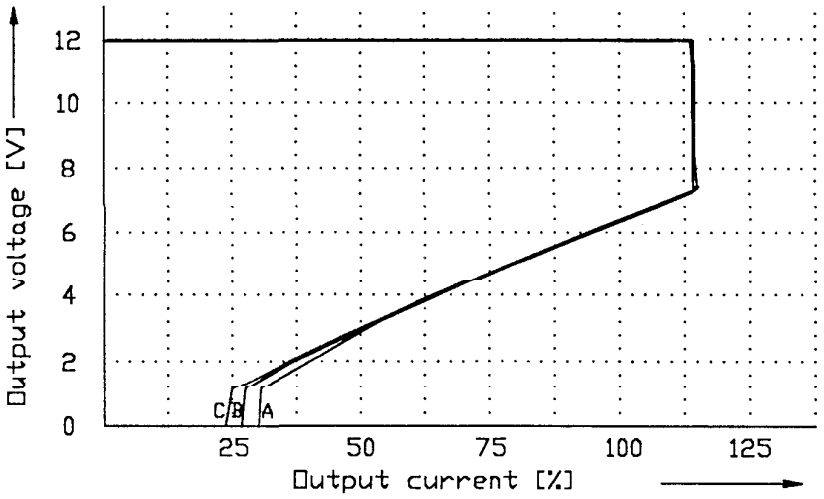
V2:-12V



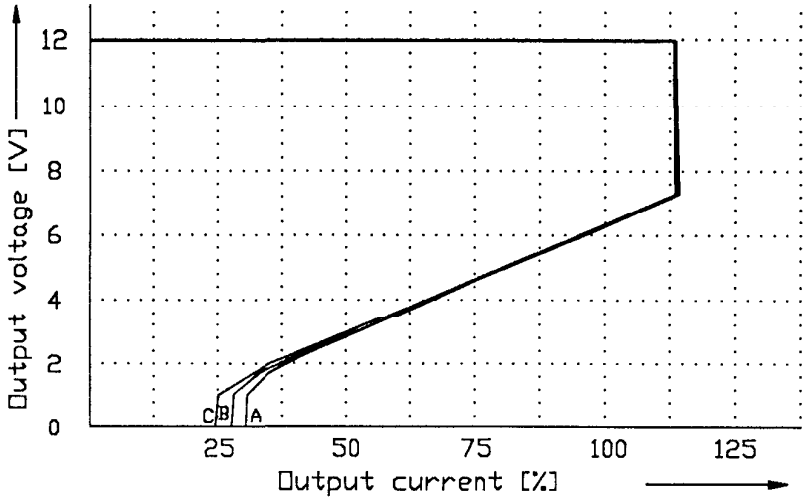
OCP Characteristics

Conditions Vin= AC 100V
Ta= 0C = A
25C = B
50C = C

V1: 12V



V2:-12V

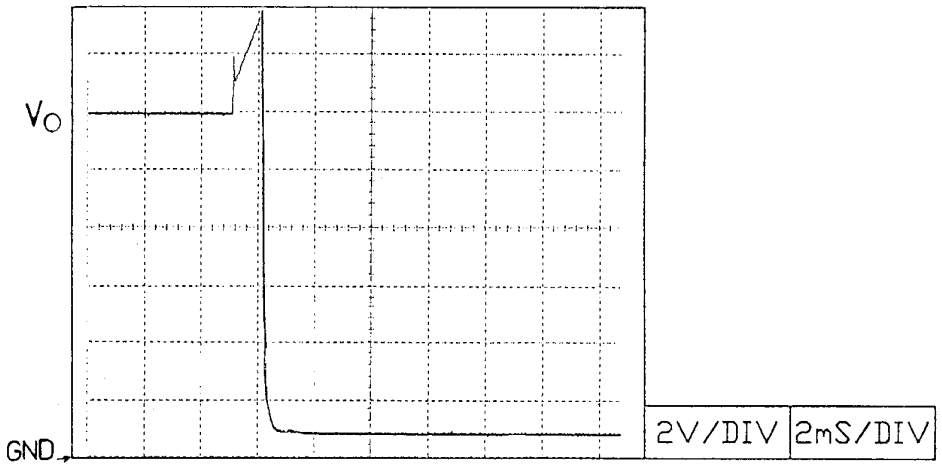


2-4 OVP Characteristics

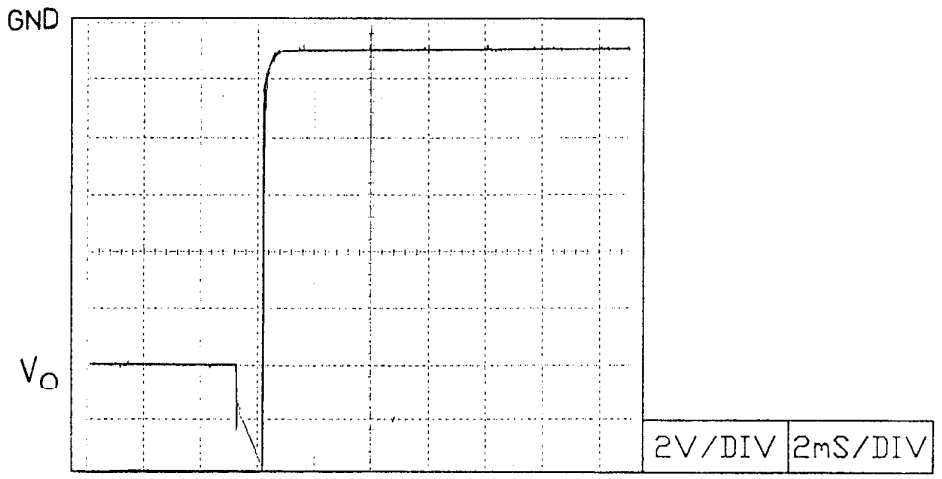
NND30-1212

Conditions Vin= AC 100V
Iout= 0%
Ta= 25C

V1: 12V



V2:-12V



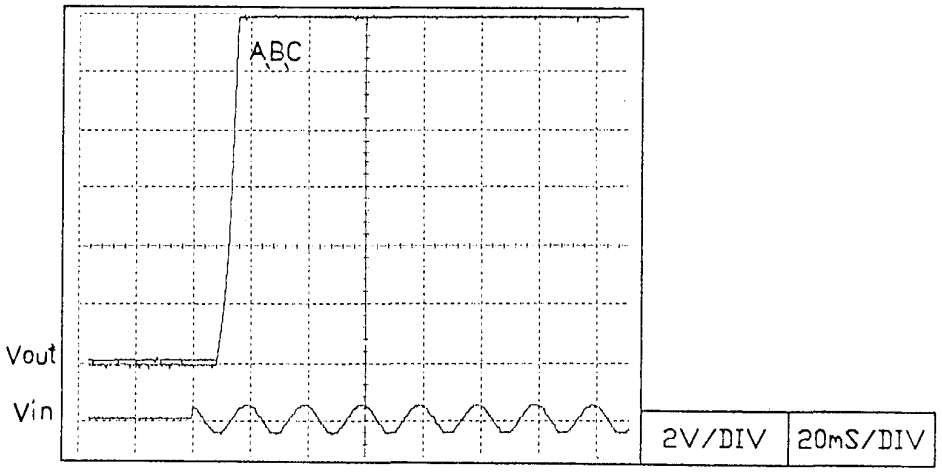
2-5 Output rise time

NND30-1212

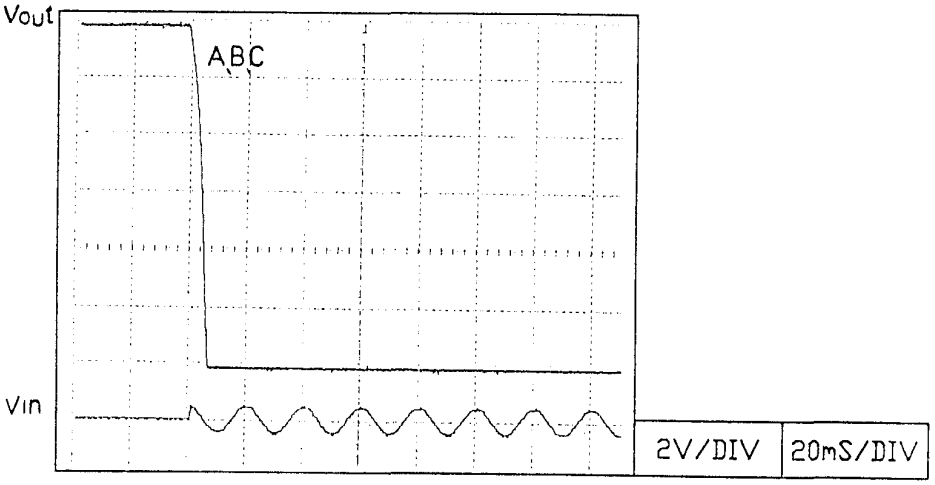
Conditions Vin= 85Vac (A)
100Vac (B)
115Vac (C)

Iout= 0%
Ta= 25C

V1: 12V



V2: -12V



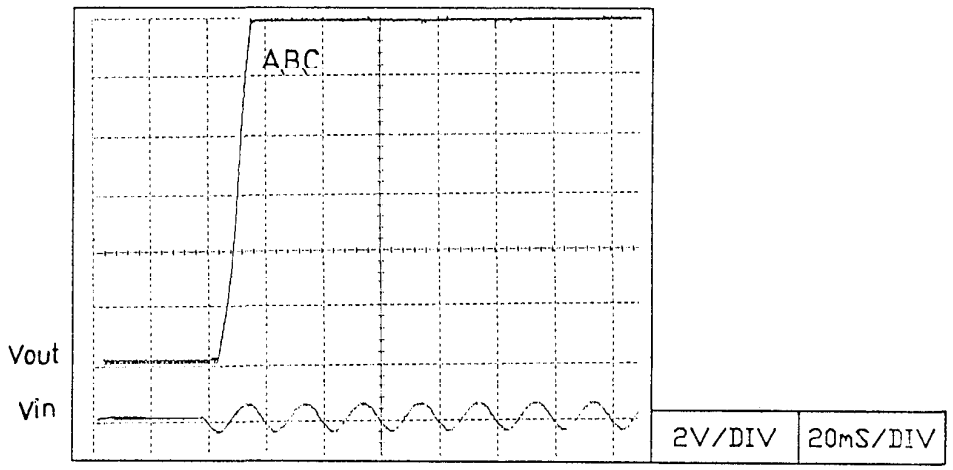
NND30-1212

Output rise time

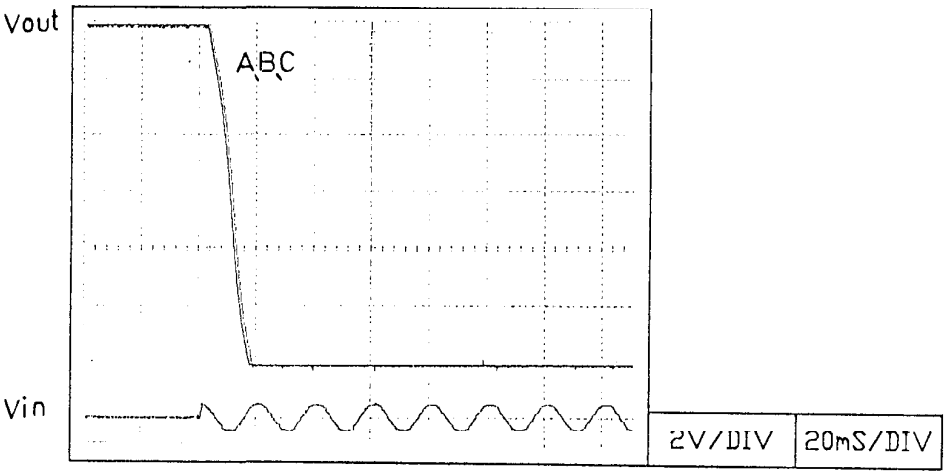
Conditions Vin= 85Vac (A)
100Vac (B)
115Vac (C)

Iout= 100%
Ta= 25C

V1: 12V



V2: -12V



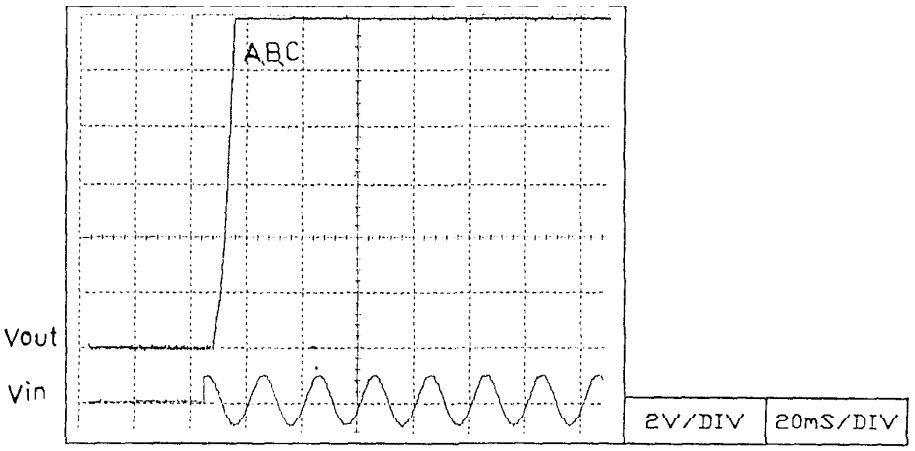
NND30-1212

Output rise time

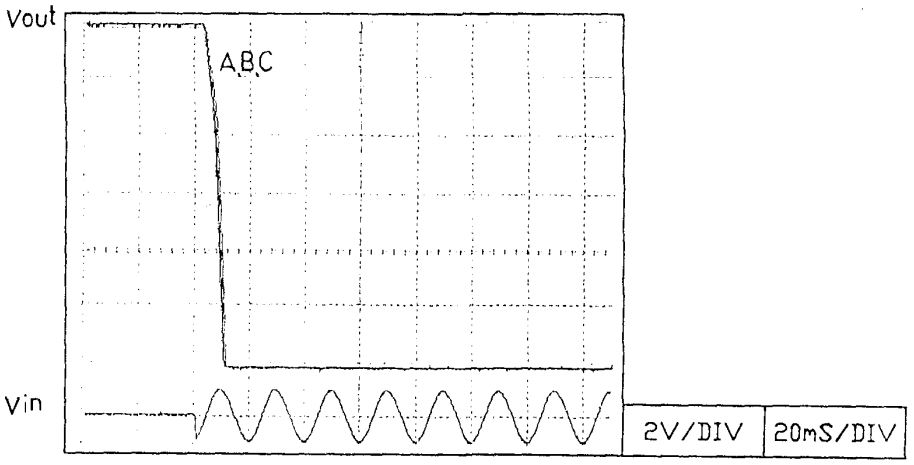
Conditions Vin= 170Vac (A)
200Vac (B)
230Vac (C)

Iout= 0%
Ta= 25C

V1: 12V



V2:-12V



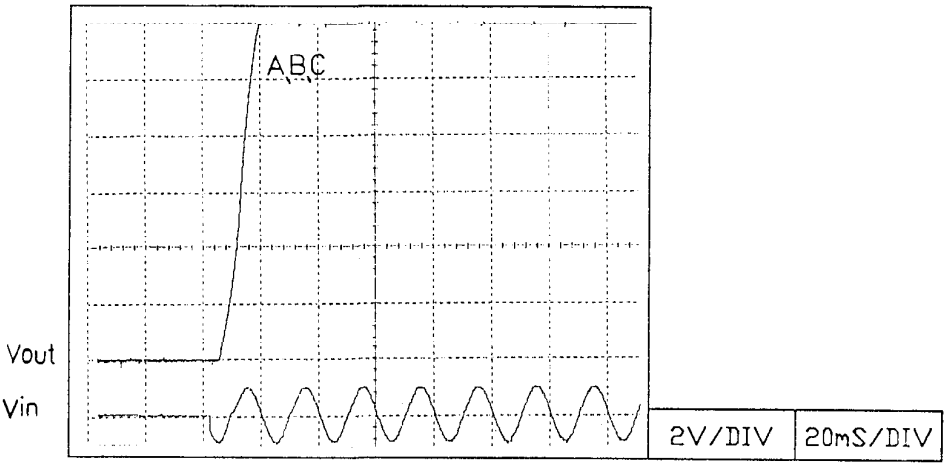
Output rise time

NND30-1212

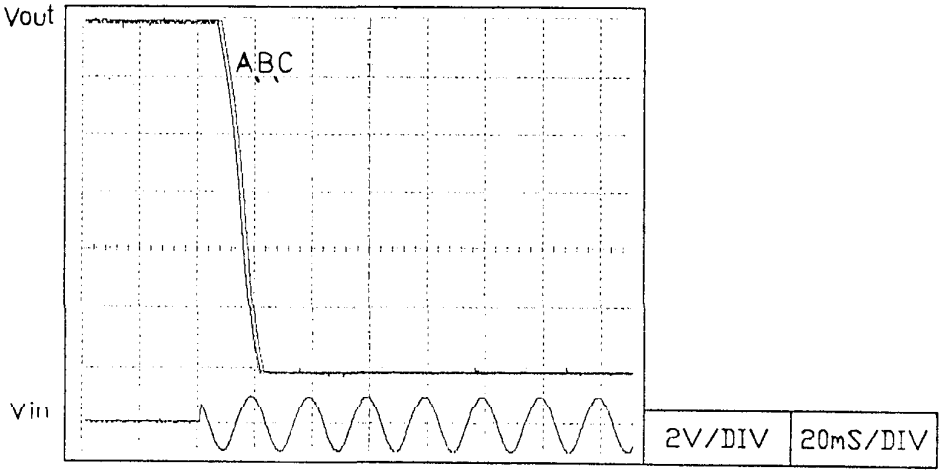
Conditions Vin= 170Vac (A)
200Vac (B)
230Vac (C)

Iout= 100%
Ta= 25C

V1: 12V



V2:-12V



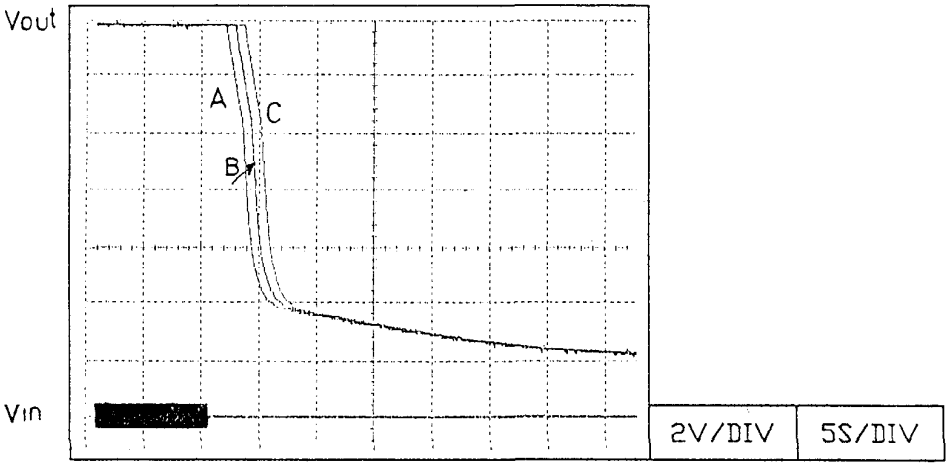
2-6 Output fall time

NND30-1212

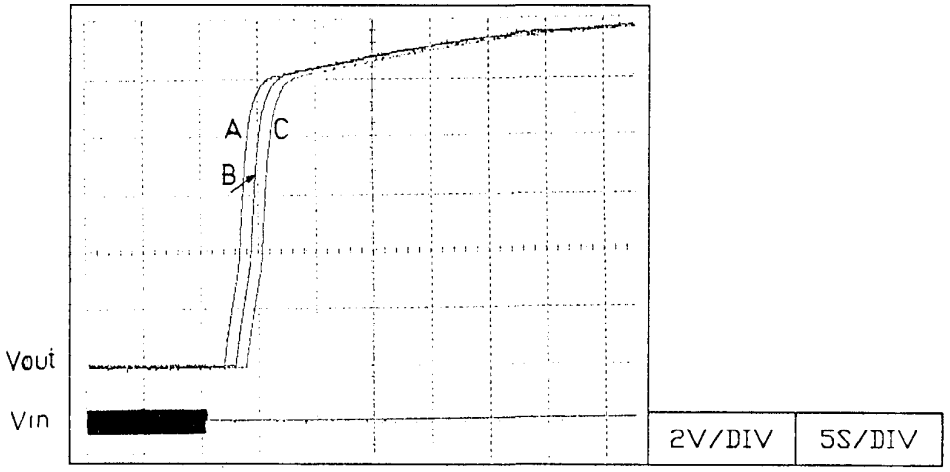
Conditions Vin= 85Vac (A)
100Vac (B)
115Vac (C)

Iout= 0%
Ta= 25C

V1: 12V



V2: 12V



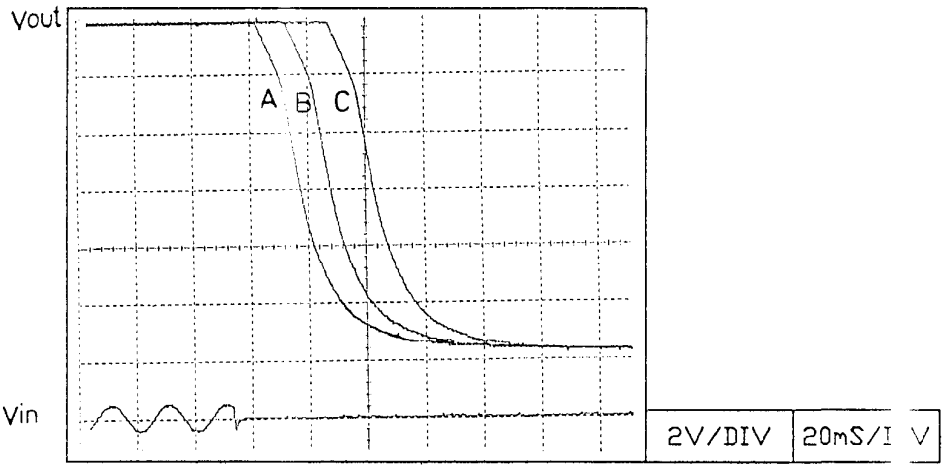
NND30-1212

Output fall time

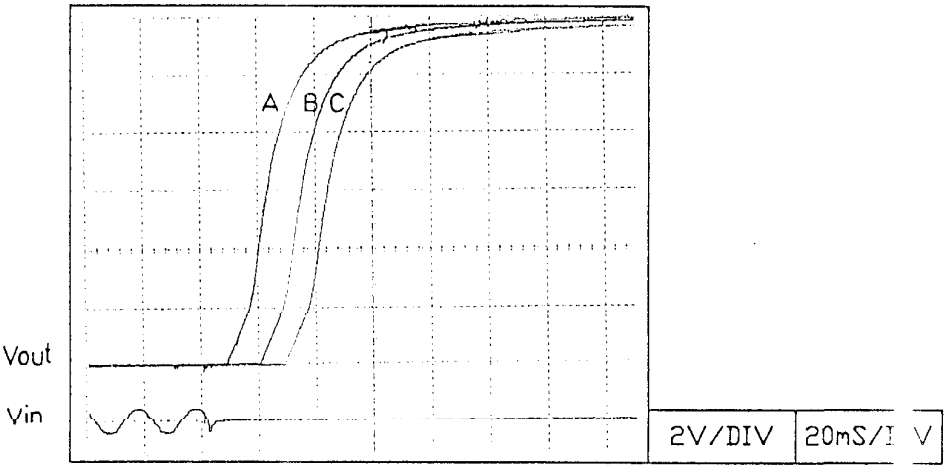
Conditions Vin= 85Vac (A)
100Vac (B)
115Vac (C)

Iout= 100%
Ta= 25C

V1: 12V



V2:-12V



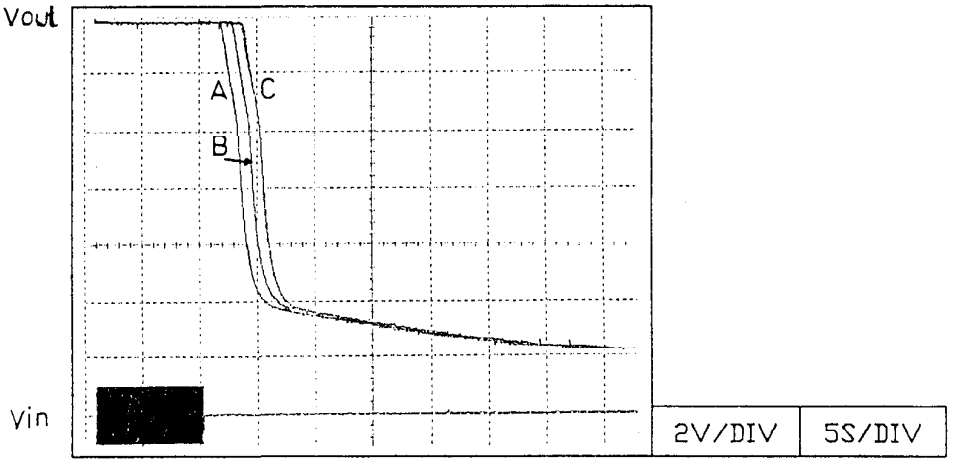
NND30-1212

Output fall time

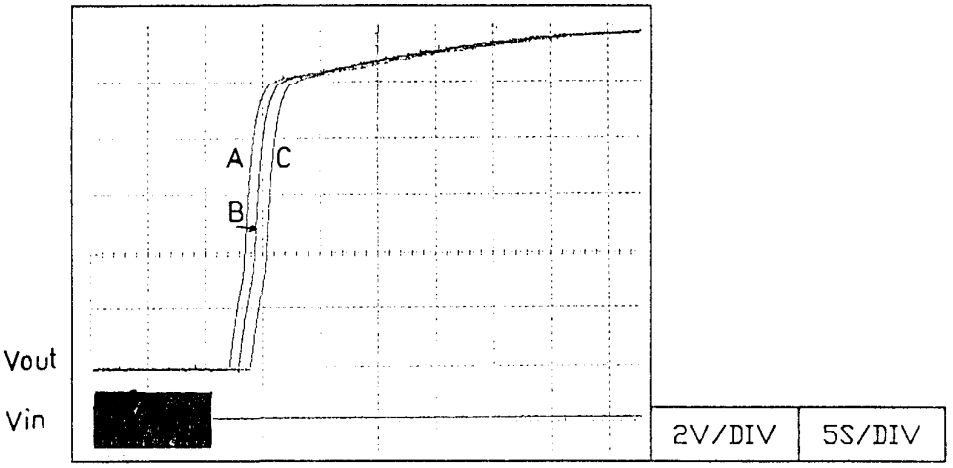
Conditions Vin= 170Vac (A)
200Vac (B)
230Vac (C)

Iout= 0%
Ta= 25C

V1: 12V



V2: -12V



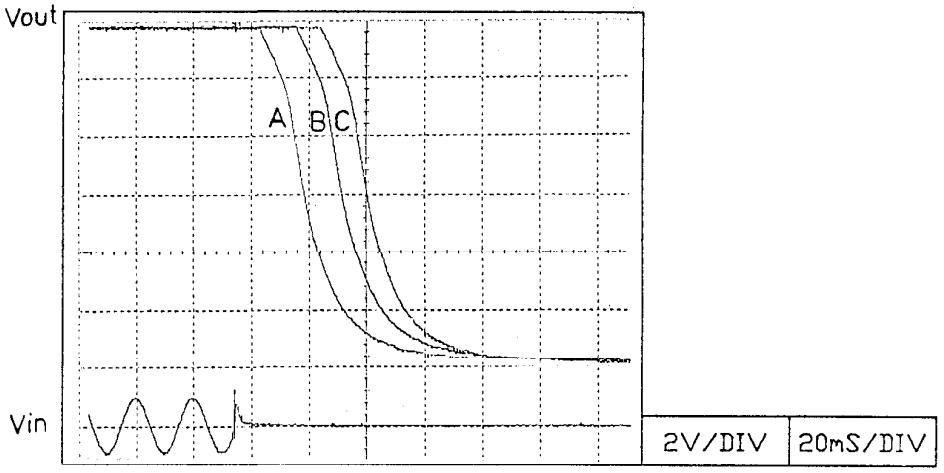
Output fall time

NND30-1212

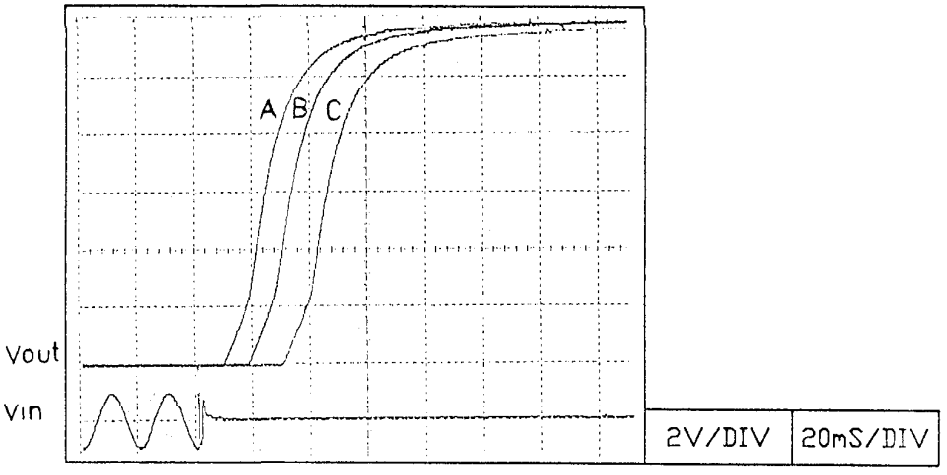
Conditions Vin= 170Vac (A)
200Vac (B)
230Vac (C)

Iout= 100%
Ta= 25C

V1: 12V



V2: -12V

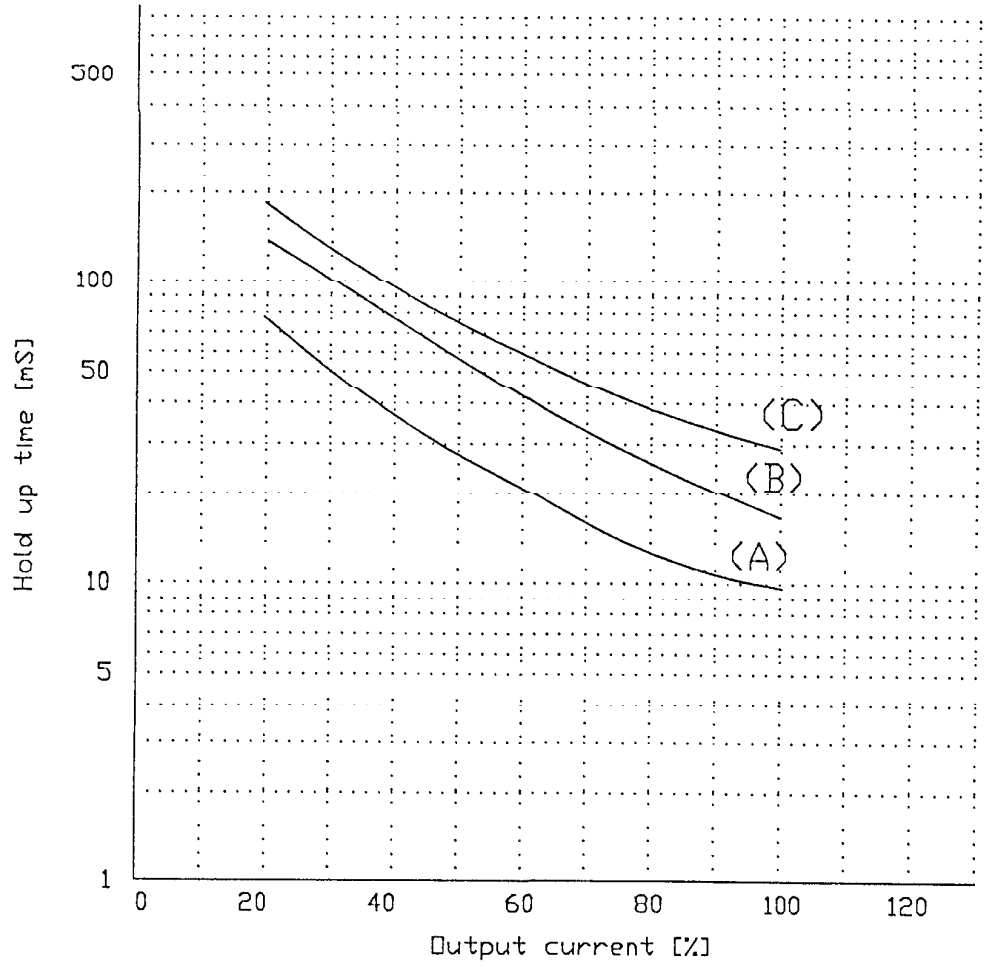


2-7 HOLD UP TIME

NND30-1212

CURVE OF 12V

Conditions
Ta= 25C
Vin= 85Vac —— (A)
100Vac —— (B)
115Vac —— (C)

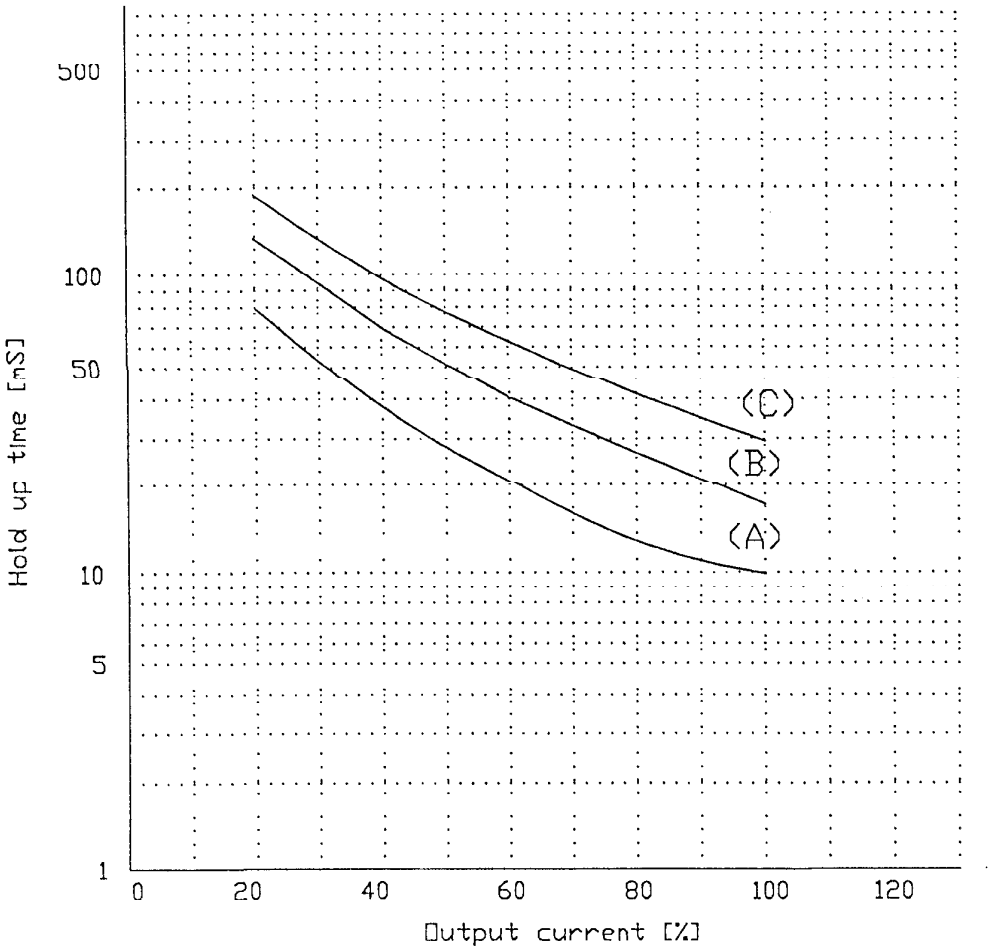


NND30-1212

HOLD UP TIME

CURVE OF 12V

Conditions
Ta= 25C
Vin= 170Vac—— (A)
200Vac—— (B)
230Vac—— (C)



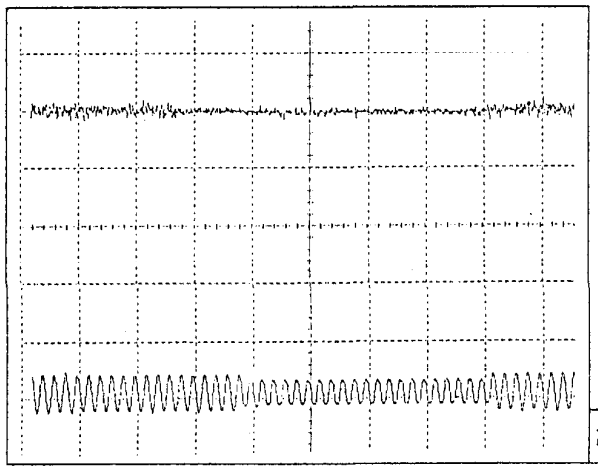
NND30-1212

2-8 Dynamic line response

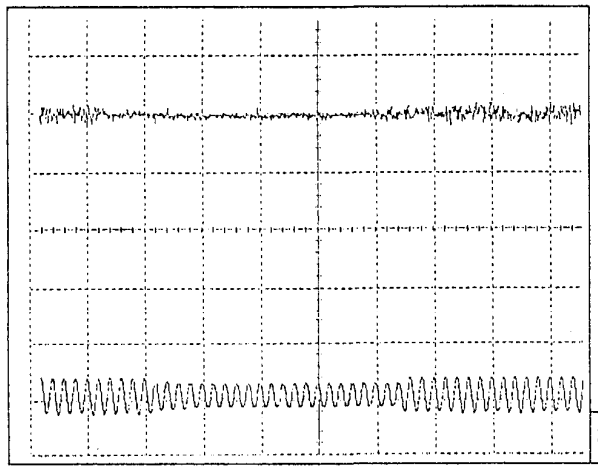
Conditions
Vout=Rated
Iout= 100%
Ta= 25C

Vin: 85Vac ═══ 115Vac

V1: 12V



V2:-12V



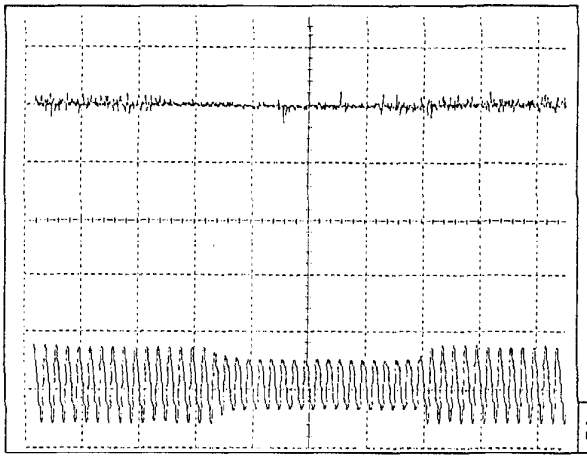
NND30-1212

Dynamic line response

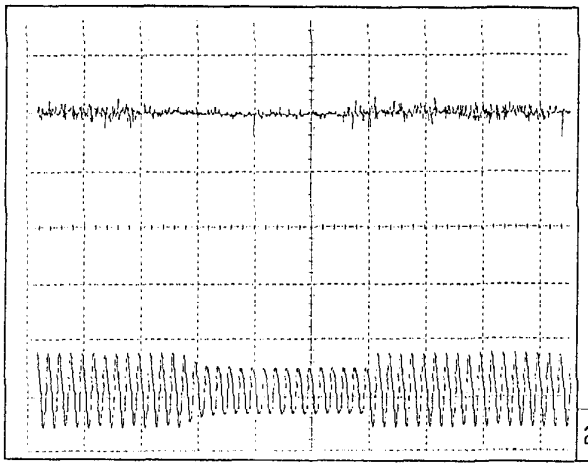
Conditions
Vout=Rated
Iout= 100%
Ta= 25C

Vin: 170Vac ⟷ 230Vac

V1: 12V



V2:-12V



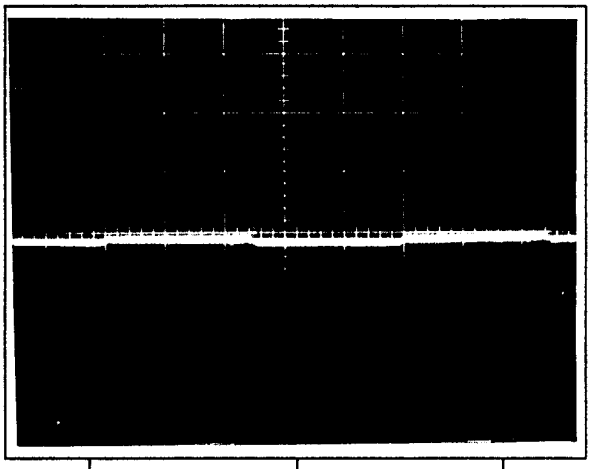
2-9 Dynamic load response

NND30-1212

Conditions
Vout=Rated
Vin=100Vac / 200Vac
Ta= 25C

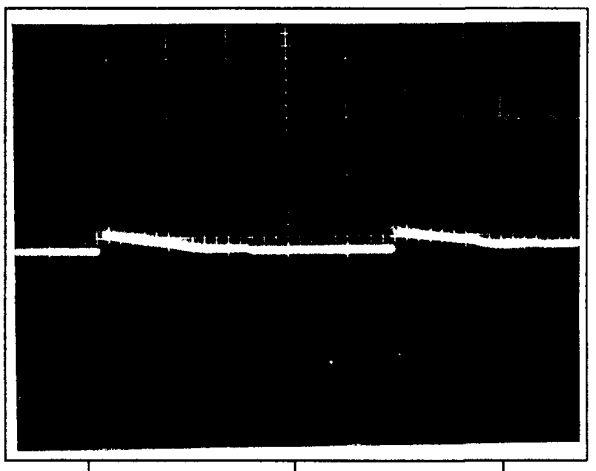
V1: 12V

Iout: 50 ⟷ 100% f=100Hz



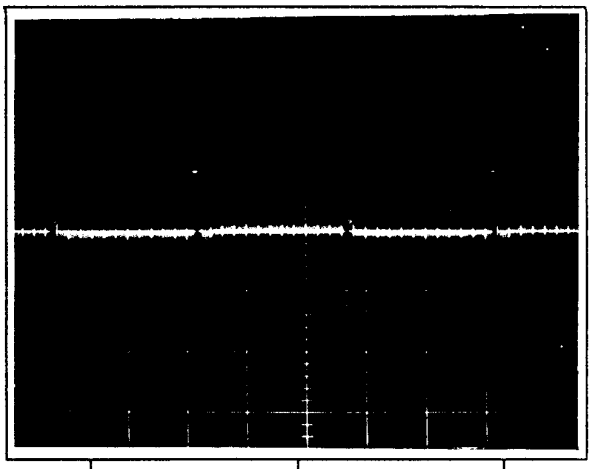
50mV/DIV	2mS/DIV
+0.3%	-0.3%

Iout: 0 ⟷ 100% f=100Hz



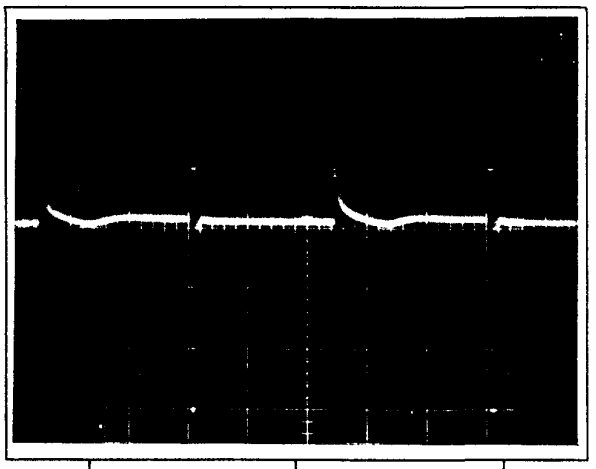
100mV/DIV	2mS/DIV
+0.4%	-1.6%

Iout: 50 ⟷ 100% f=1KHz



50mV/DIV	0.2mS/DIV
+0.5%	-0.5%

Iout: 0 ⟷ 100% f=1KHz



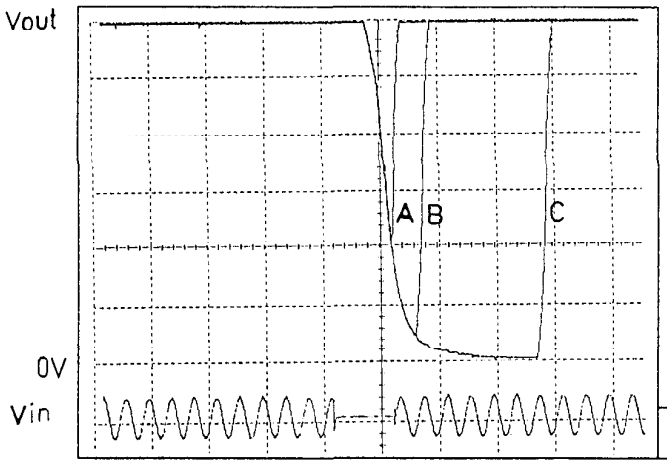
100mV/DIV	0.2mS/DIV
+0.8%	-2.5%

2-10 Response to brown out

NND30-1212

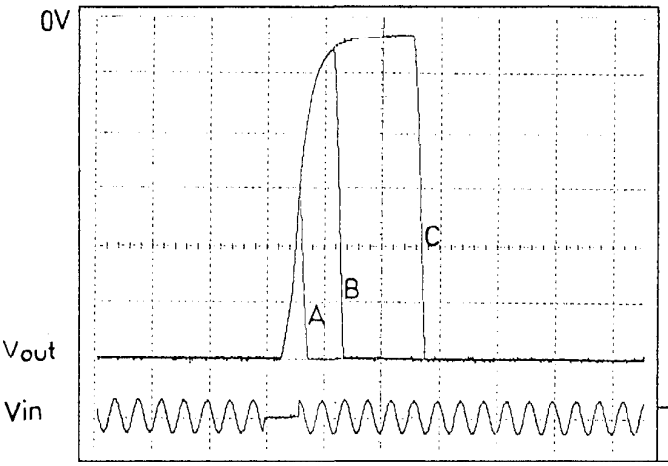
Conditions
Vin= 100Vac
Iout= 100%
Ta= 25C

V1: 12V



Brown out time
A: 55mS
B: 70mS
C: 175mS

V2:-12V



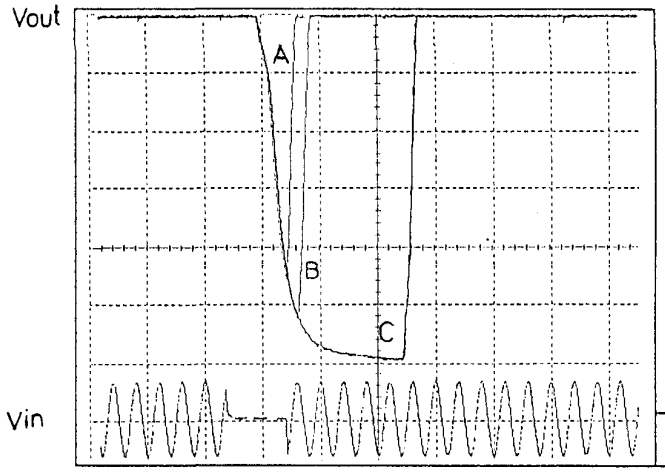
Brown out time
A: 30mS
B: 60mS
C: 125mS

NND30-1212

Response to brown out

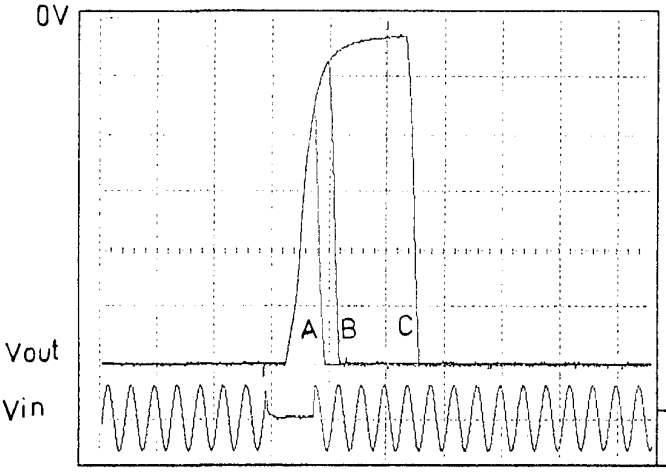
Conditions
Vin= 200Vac
Iout= 100%
Ta= 25C

V1: 12V



Brown out time
A: 50mS
B: 100mS
C: 150mS

V2:-12V

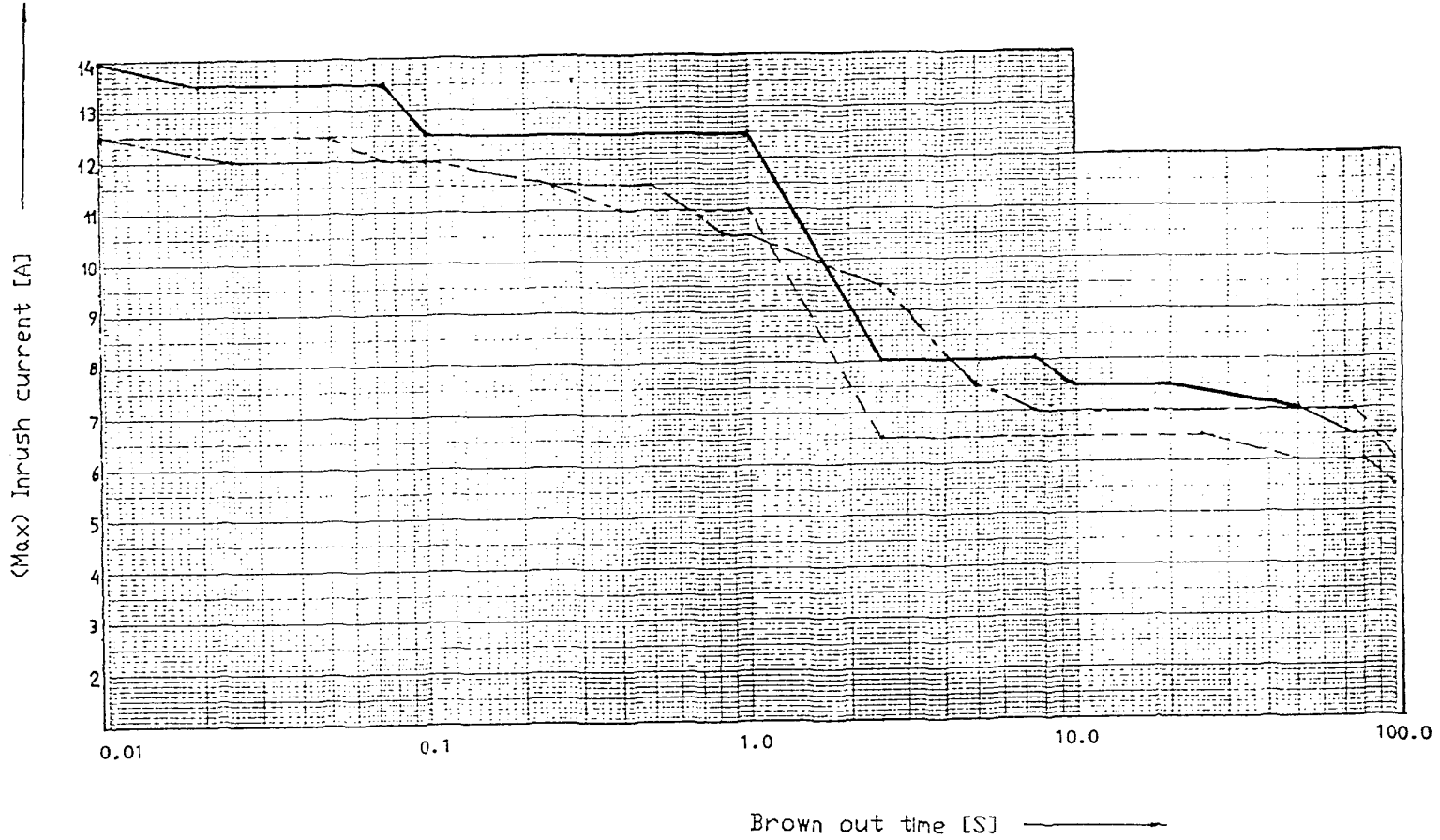


Brown out time
A: 45mS
B: 55mS
C: 120mS

2-11 Inrush current characteristics

NND30-1212

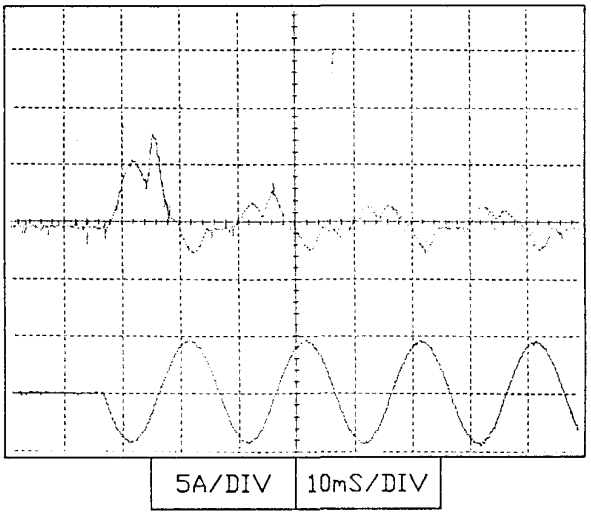
Vin= 100Vac
Iout= 0%-----
50%——
100%——
Ta= 25C



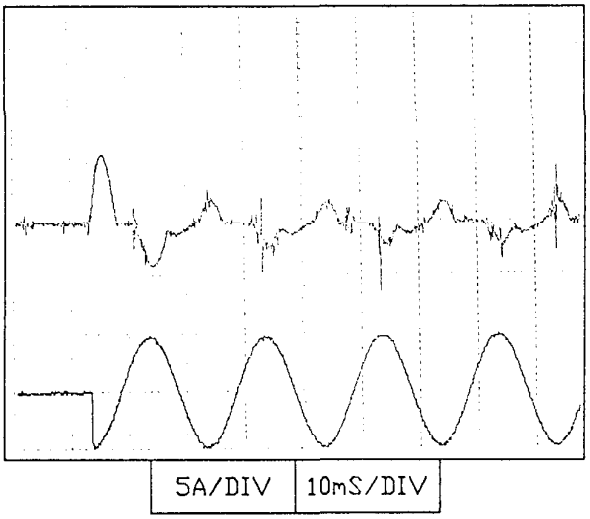
NND30-1212

Inrush current waveform

Conditions
Vin= 100Vac
Iout= 100%
Ta= 25C



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

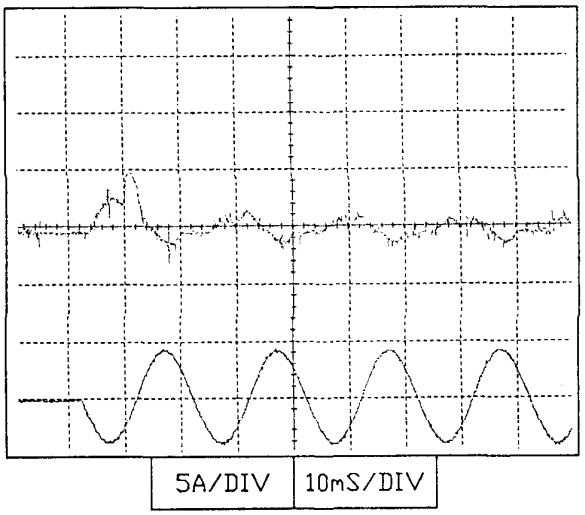


Switch on phase angle
of input AC voltage
ø=90°

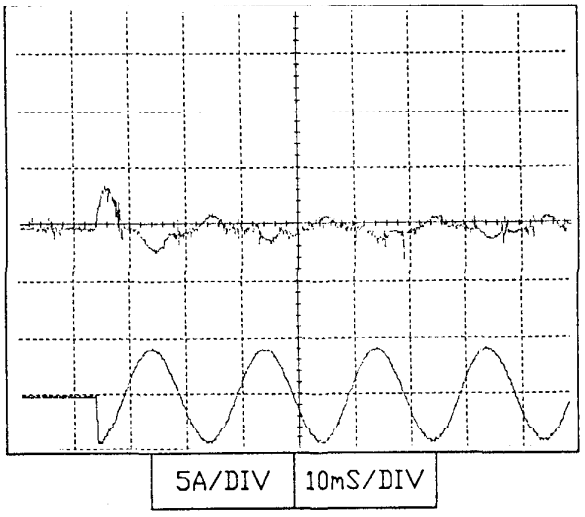
NND30-1212

Inrush current waveform

Conditions
Vin= 200Vac
Iout= 100%
Ta= 25C



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



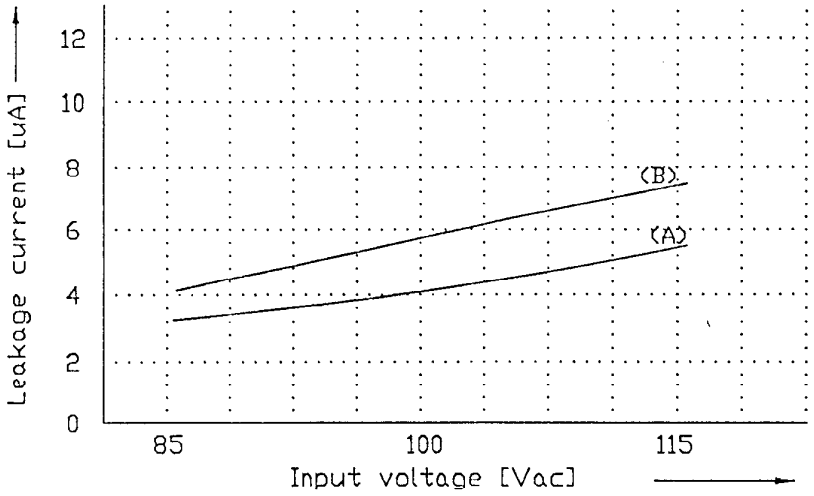
Switch on phase angle
of input AC voltage
ϕ=90°

2-12 Leakage current

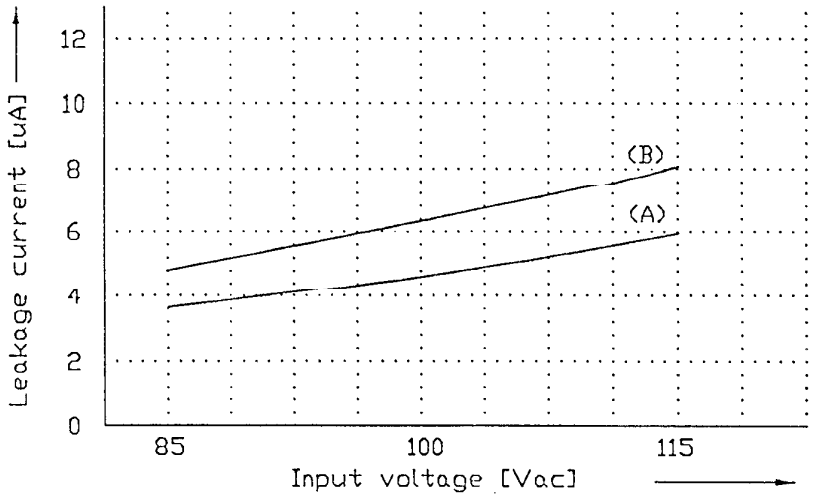
NND30-1212

Conditions Vin= 85-115Vac ——— (A)
Vin= 170-230Vac ——— (B)
Ta= 25C

Iout=0%



Iout=100%



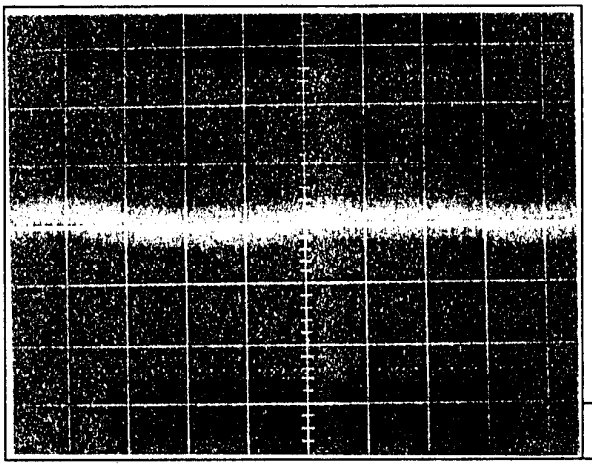
2-13 OUTPUT-RIPPLE, NOISE

NND30-1212

Conditions
Vin= 100Vac
Iout= 100%
Ta= 25C

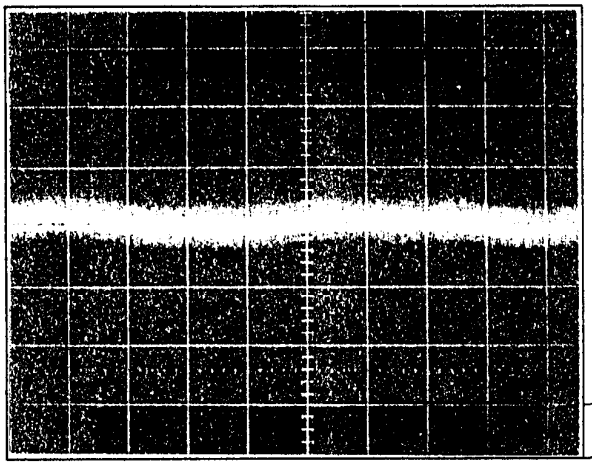
COMMON+NORMAL MODE

V1: 12V



1mV/DIV | 2mS/DIV

V2:-12V



1mV/DIV | 2mS/DIV

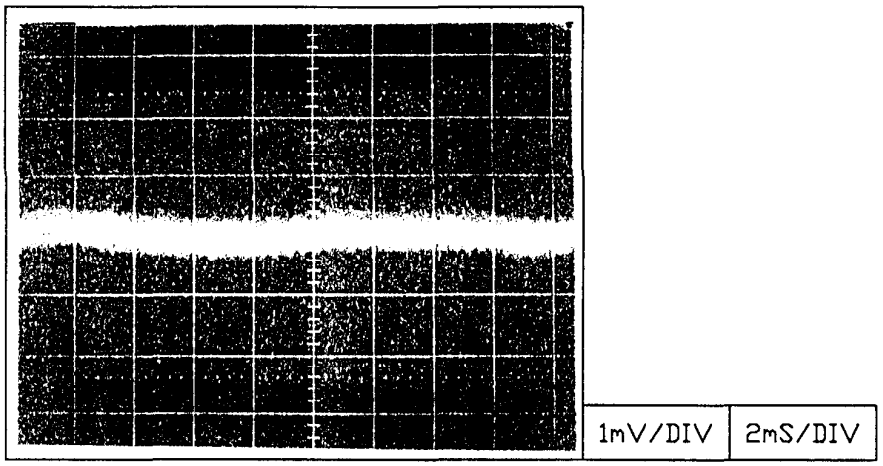
OUTPUT-RIPPLE, NOISE

NND30-1212

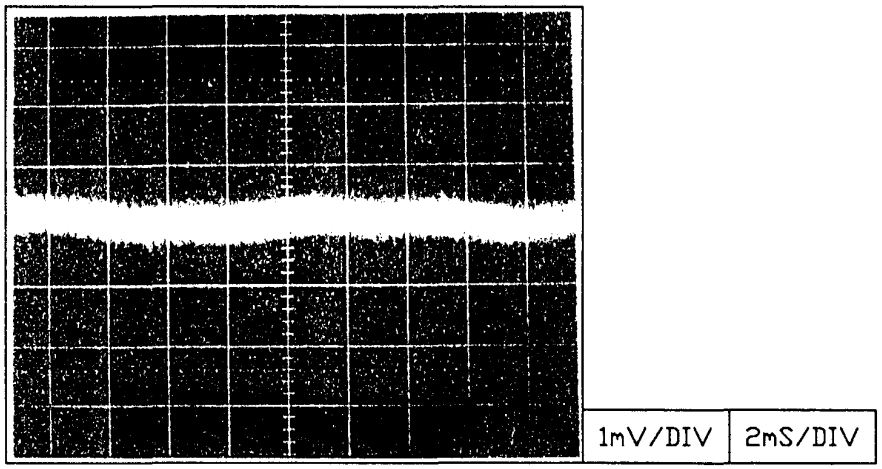
Conditions
Vin= 100Vac
Iout= 100%
Ta= 25C

NORMAL MODE

V1: 12V

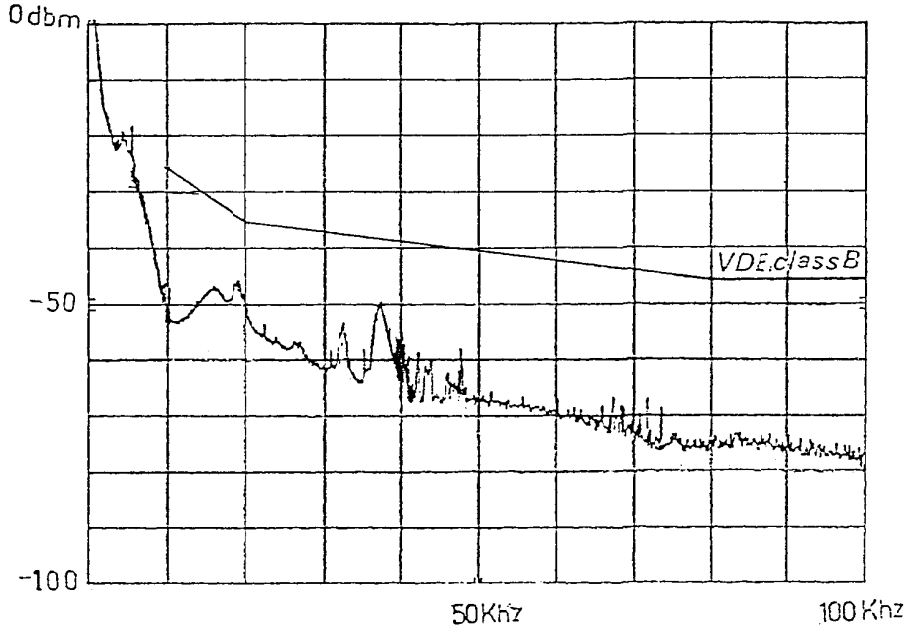


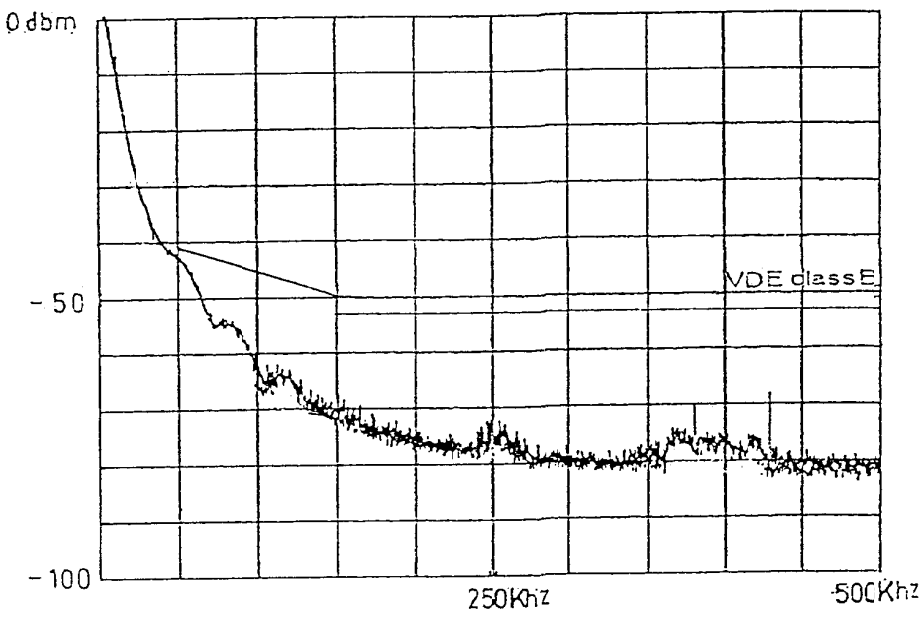
V2: -12V

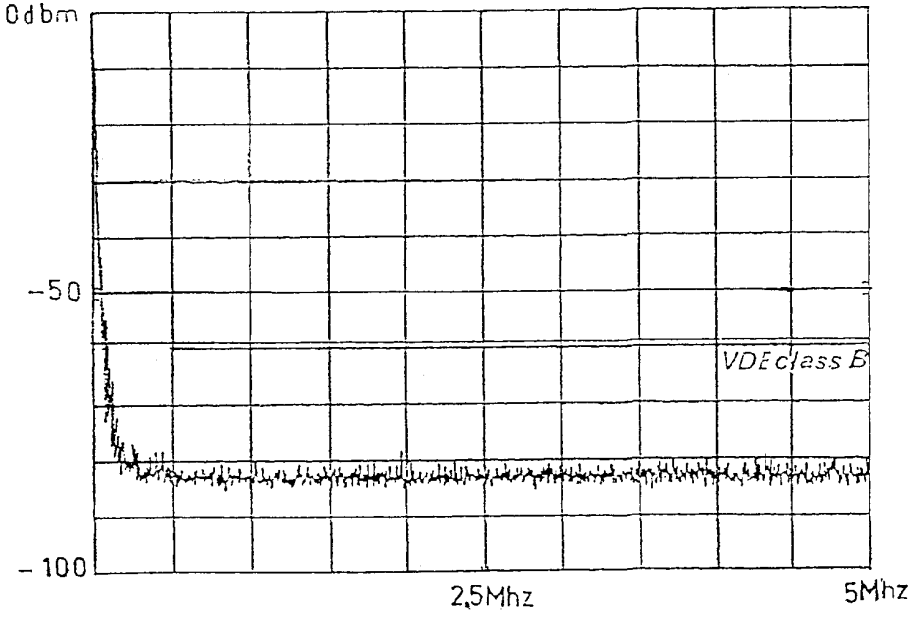


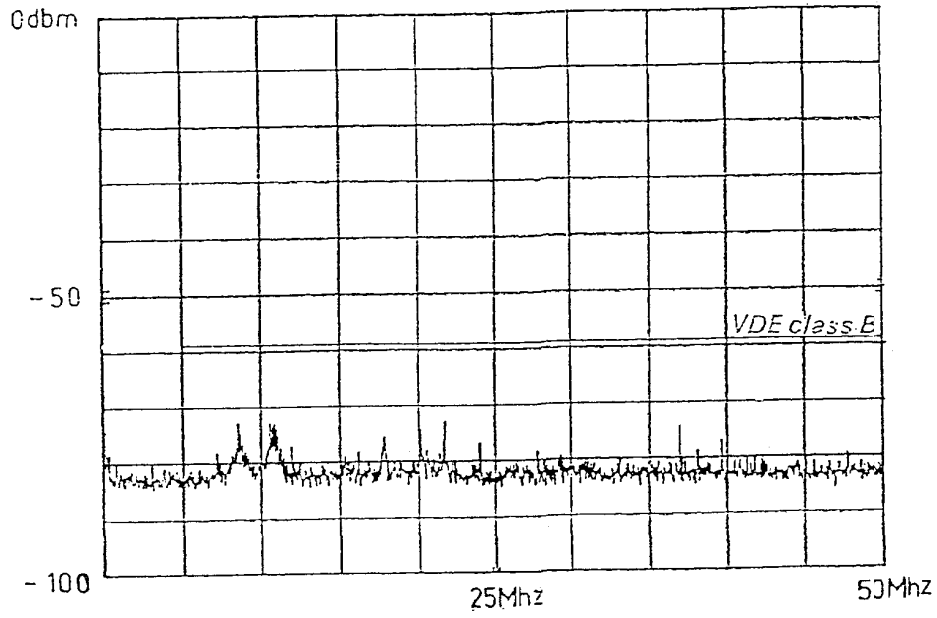
CONDUCTED EMISSION MODEL: NND30-1212

NND30-1212









NEMIC-LAMBDA

T-33

3. LIST OF EQUIPMENT USED

	EQUIPMENT USED	MANUFACTURER	MODEL No.
1	Oscilloscope	KENWOOD	CS-2110
2	Digital storage Oscilloscope	GOULD	OS4040
3	Digital Voltmeter	FLUKE	8840A
4	Digital Watt / Current Volt meter	YOKOGAWA	Y2509
5	DC Ampere meter	FLUKE	25
6	Autotransformer	SUPERIOR ELECTRIC	
7	Variable resistive Load	BUILT IN - HOUSE	
8	Dynamic dummy Load	HP	6050A
9	Digirush Currenter	BUILT IN - HOUSE	
10	Current probe / Amplifier	TEKTRONIX	011-0105
11	Controlled Temp. Chamber	TABAI	PL-2GM
12	Leakage Current meter	FLUKE	8840A
13	Equipment for dynamic line response	BUILT IN - HOUSE	