CUS150M1

EVALUATION DATA

TDK-Lambda

CA848-53-01

INDEX

Terminology used

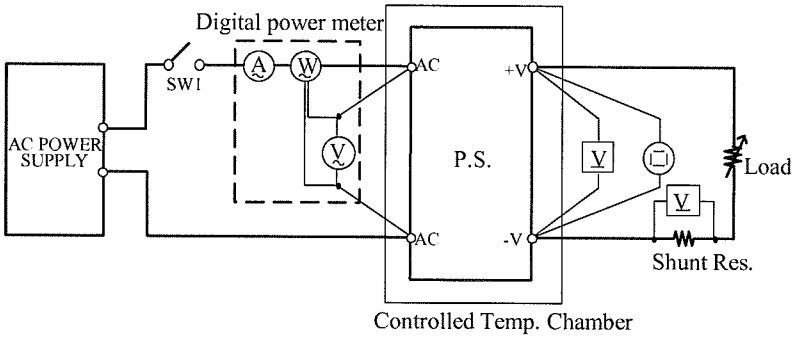
	Definition
Vin	..... Input voltage
Vout	..... Output voltage
Iin	..... Input current
Iout	..... Output current
Ta	..... Ambient temperature
f	..... Frequency

1. Evaluation Method

1.1 Circuit used for determination

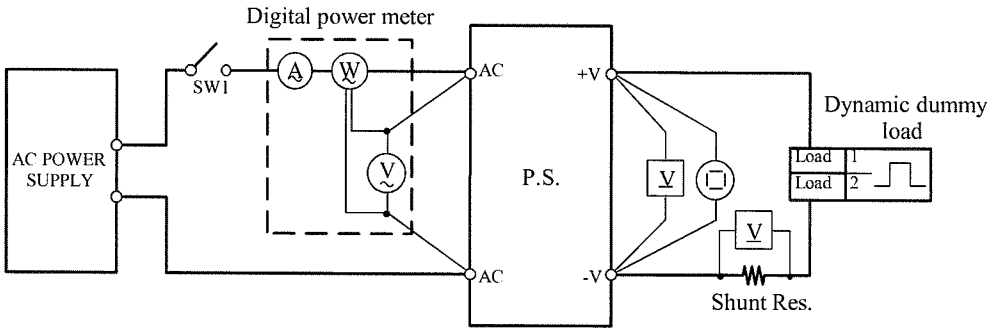
Circuit 1 used for determination

- Steady state data
- Over current protection (OCP) characteristics
- Over voltage protection (OVP) characteristics
- Output rise characteristics
- Output fall characteristics
- Hold up time characteristics

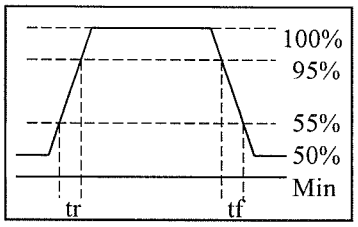


Circuit 2 used for determination

- Dynamic load response characteristics

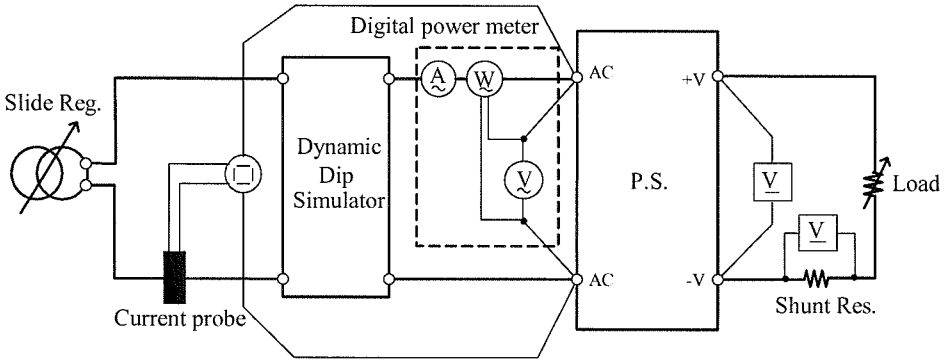


Output current waveform



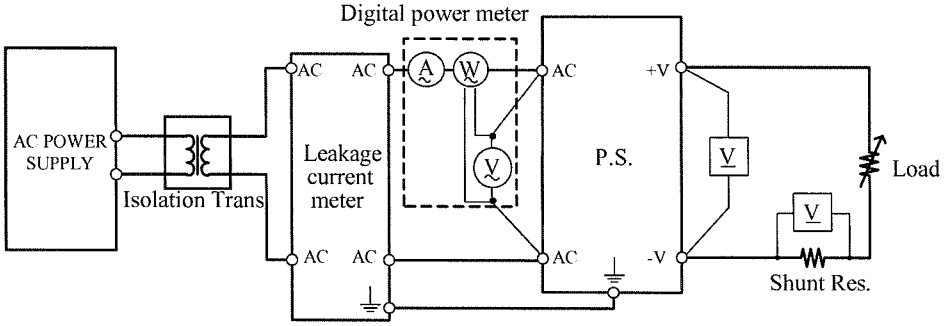
Circuit 3 used for determination

- Inrush current waveform



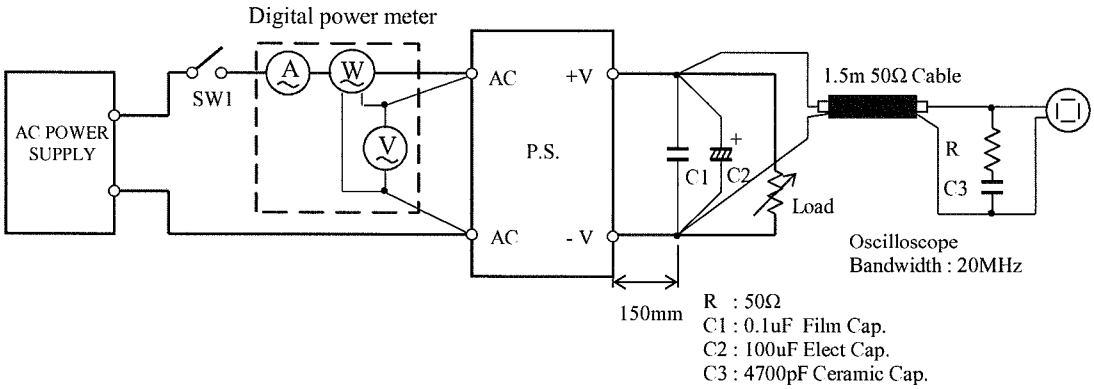
Circuit 4 used for determination

・Leakage current characteristics



Circuit 5 used for determination

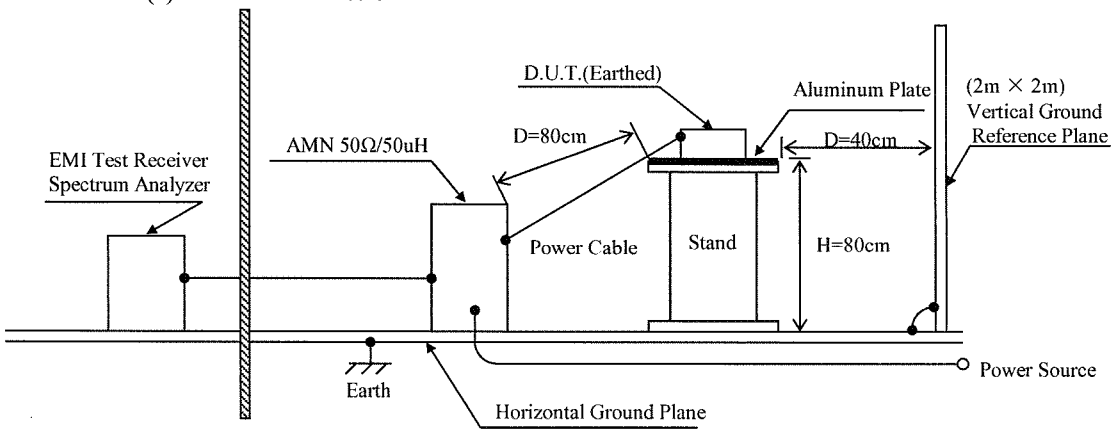
・Output ripple and noise waveform



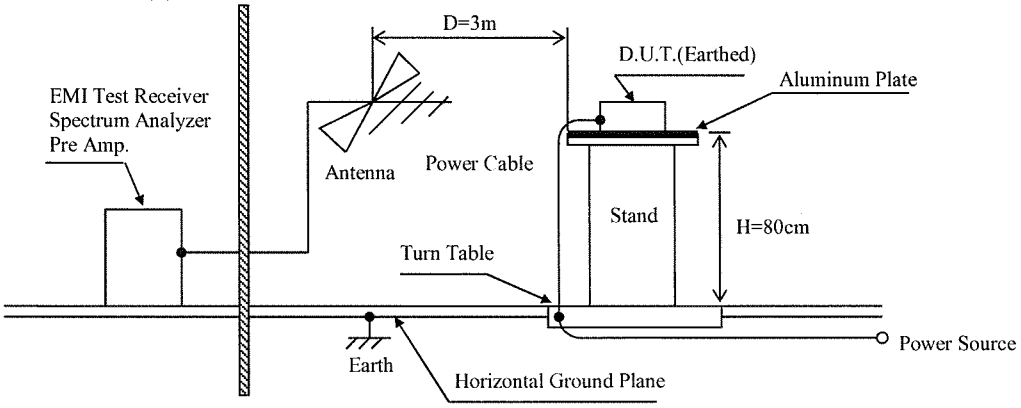
Configuration used for determination

・Electro-Magnetic Interference characteristics

(a) Conducted Emission



(b) Radiated Emission



1.2 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DLM2054
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
4	CURRENT PROBE	YOKOGAWA ELECT.	701932
5	DYNAMIC DUMMY LOAD	CHROMA	63201
6	CVCF	KIKUSUI	PCR2000LE
7	LEAKAGE CURRENT METER	SIMPSON	228
8	CONTROLLED TEMP. CHAMBER	TABAI-ESPEC	SU-661
9	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI-03
10	LISN	ROHDE & SCHWARZ	ENV216
11	BICONICAL ANTENNA	EMCO	63208

2 Characteristics

2.1 Steady state data

(1) 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	
0A (0%)	12.015V	12.015V	12.015V	12.016V	1mV	0.008%
6.25A (50%)	12.013V	12.013V	12.013V	12.013V	0mV	0.000%
12.5A (100%)	-	12.013V	12.012V	12.012V	1mV	0.008%
Load regulation	2mV	2mV	3mV	4mV		
	0.017%	0.017%	0.025%	0.033%		

2. Temperature drift

Conditions Iout : 12.5A (100%)

	Vin \ Ta	-20℃	+25℃	+50℃	Temperature stability	
Vout	115VAC	11.978V	12.013V	12.001V	35mV	0.292%
	230VAC	11.978V	12.012V	12.000V	34mV	0.283%

3. Start up voltage and Drop out voltage

Conditions Ta : 25℃
Iout : 12.5A (100%)

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

18V

1. Regulation - line and load

Condition Ta : 25℃

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0A (0%)	18.002V	18.004V	18.004V	18.004V	2mV	0.011%
4.2A (50%)	17.995V	17.997V	17.998V	17.999V	4mV	0.022%
8.4A (100%)	-	17.994V	17.995V	17.994V	1mV	0.006%
Load regulation	7mV	10mV	9mV	10mV		
	0.039%	0.056%	0.050%	0.056%		

2. Temperature drift

Conditions Iout : 8.4A (100%)

	Vin \ Ta	-20℃	+25℃	+50℃	Temperature stability	
Vout	115VAC	17.991V	17.994V	17.997V	6mV	0.033%
	230VAC	17.991V	17.995V	17.998V	7mV	0.039%

3. Start up voltage and Drop out voltage

Conditions Ta : 25℃
Iout : 8.4A (100%)

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

(1) Regulation - line and load, Temperature drift / Start up voltage and Drop out voltage

24V

1. Regulation - line and load

Condition Ta : 25℃

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0A (0%)	24.003V	24.003V	24.003V	24.002V	1mV	0.004%
3.15A (50%)	23.998V	23.998V	23.998V	23.998V	0mV	0.000%
6.3A (100%)	-	23.996V	23.997V	23.997V	1mV	0.004%
Load regulation	5mV	7mV	6mV	5mV		
	0.021%	0.029%	0.025%	0.021%		

2. Temperature drift

Conditions Iout : 6.3A (100%)

	Vin \ Ta	-20℃	+25℃	+50℃	Temperature stability	
Vout	115VAC	23.920V	23.996V	23.983V	76mV	0.317%
	230VAC	23.920V	23.997V	23.983V	77mV	0.321%

3. Start up voltage and Drop out voltage

Conditions Ta : 25℃
Iout : 6.3A (100%)

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

36V

1. Regulation - line and load

Condition Ta : 25℃

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0A (0%)	36.042V	36.042V	36.040V	36.040V	2mV	0.006%
2.1A (50%)	36.026V	36.026V	36.026V	36.026V	0mV	0.000%
4.2A (100%)	-	36.025V	36.026V	36.026V	1mV	0.003%
Load regulation	16mV	17mV	14mV	14mV		
	0.044%	0.047%	0.039%	0.039%		

2. Temperature drift

Conditions Iout : 4.2A (100%)

	Vin \ Ta	-20℃	+25℃	+50℃	Temperature stability	
Vout	115VAC	35.930V	36.025V	36.001V	95mV	0.264%
	230VAC	35.931V	36.026V	36.001V	95mV	0.264%

3. Start up voltage and Drop out voltage

Conditions Ta : 25℃
Iout : 4.2A (100%)

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

(1) Regulation - line and load, Temperature drift / Start up voltage and Drop out voltage

48V

1. Regulation - line and load

Condition Ta : 25℃

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0A (0%)	48.040V	48.035V	48.039V	48.034V	6mV	0.013%
1.6A (50%)	48.013V	48.013V	48.014V	48.014V	1mV	0.002%
3.2A (100%)	-	48.011V	48.011V	48.012V	1mV	0.002%
Load regulation	27mV	24mV	28mV	22mV		
	0.056%	0.050%	0.058%	0.046%		

2. Temperature drift

Conditions Iout : 3.2A (100%)

	Vin \ Ta	-20℃	+25℃	+50℃	Temperature stability	
Vout	115VAC	47.934V	48.011V	47.919V	92mV	0.192%
	230VAC	47.936V	48.011V	47.919V	92mV	0.192%

3. Start up voltage and Drop out voltage

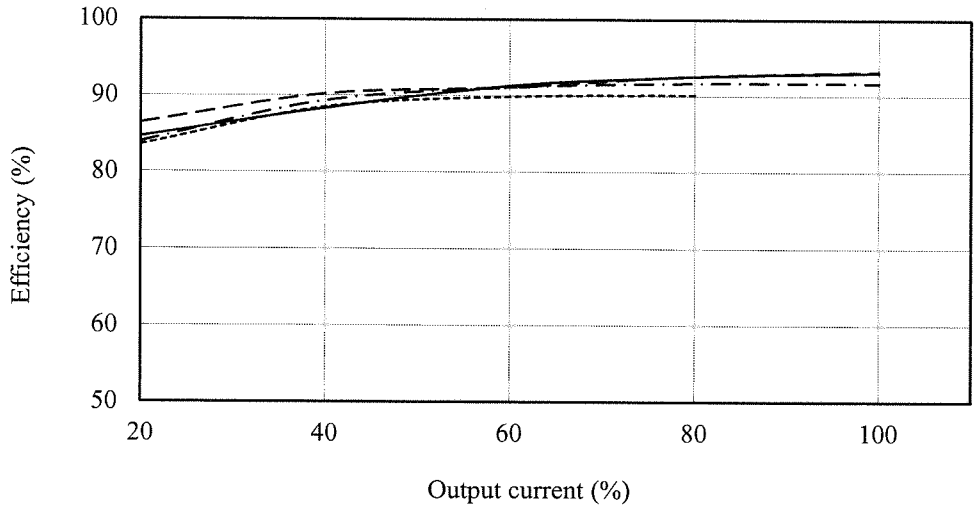
Conditions Ta : 25℃
Iout : 3.2A (100%)

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

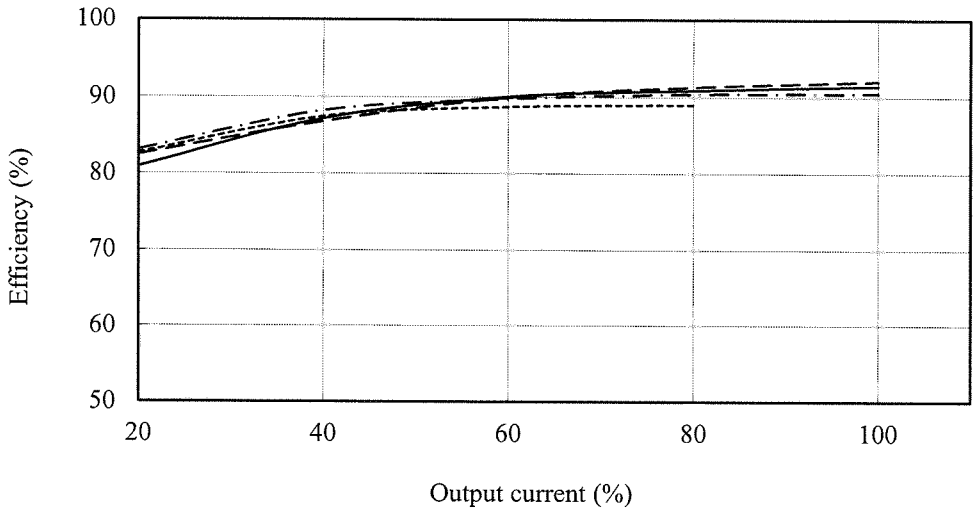
(2) Efficiency vs. Output current

Conditions Vin : 85 VAC ------
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC - - - -
Ta : 25 ℃

12V



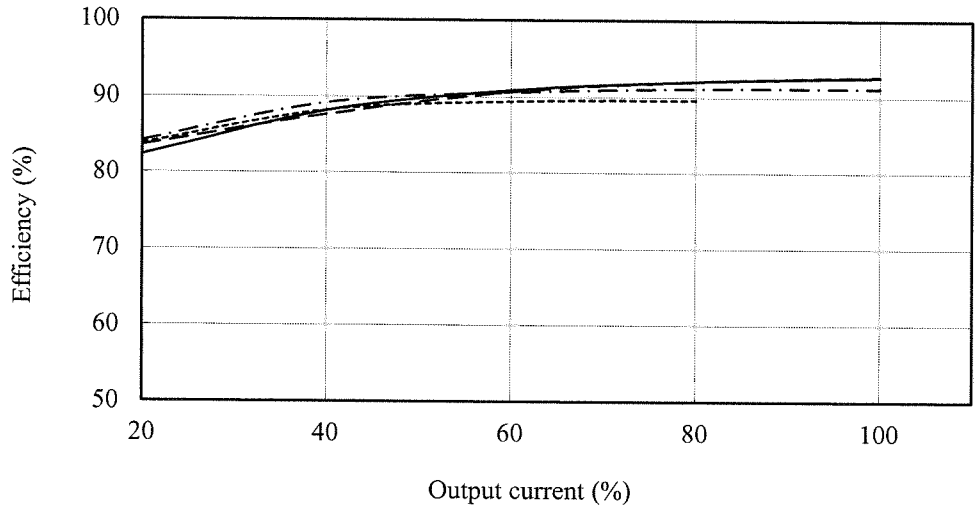
18V



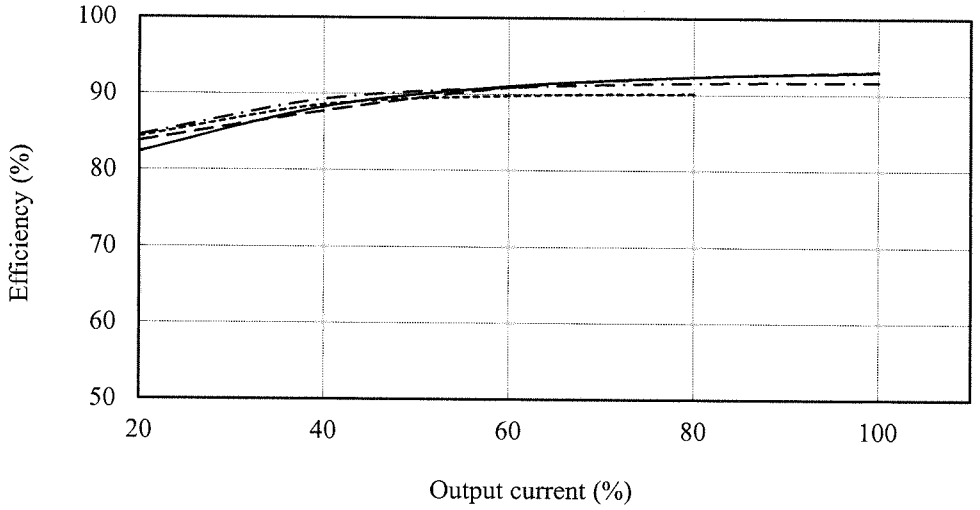
(2) Efficiency vs. Output current

Conditions Vin : 85 VAC ------
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC - - - -
Ta : 25 ℃

24V



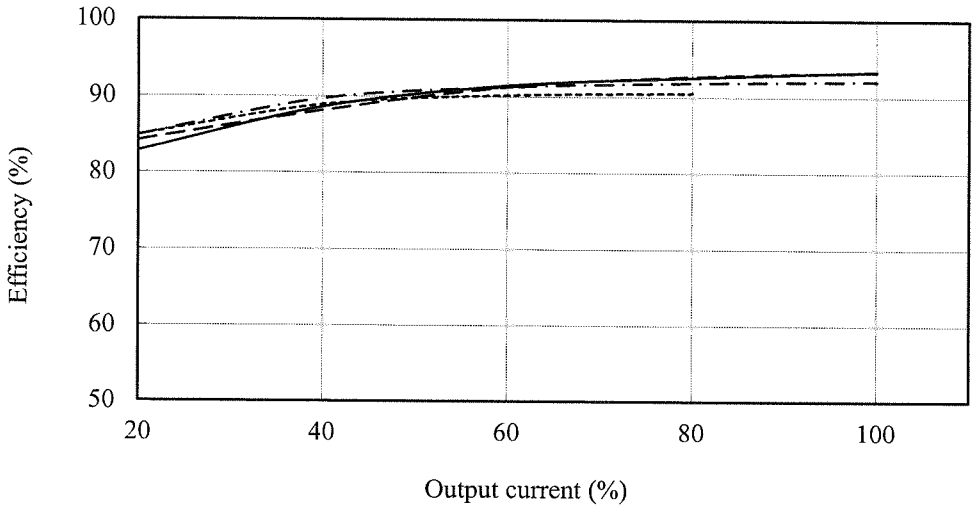
36V



(2) Efficiency vs. Output current

Conditions Vin : 85 VAC ------
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC - - - -
Ta : 25 ℃

48V



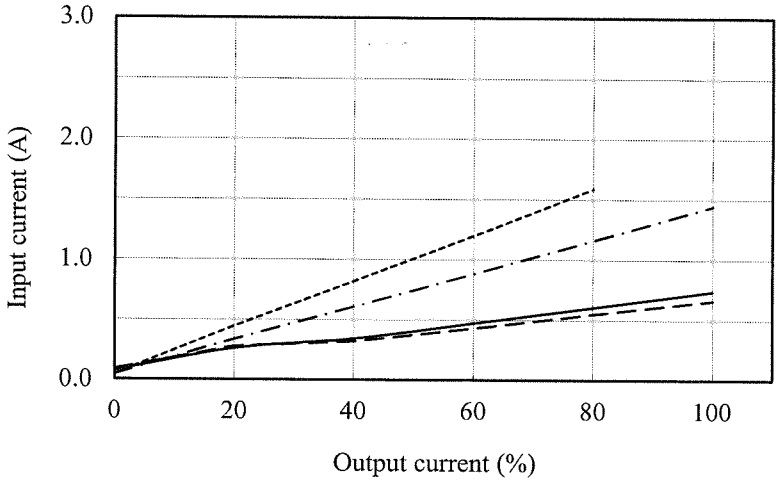
(3) Input current vs. Output current

Conditions Vin : 85 VAC ------
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC - - - -
Ta : 25 ℃

12V

Io: 0 A

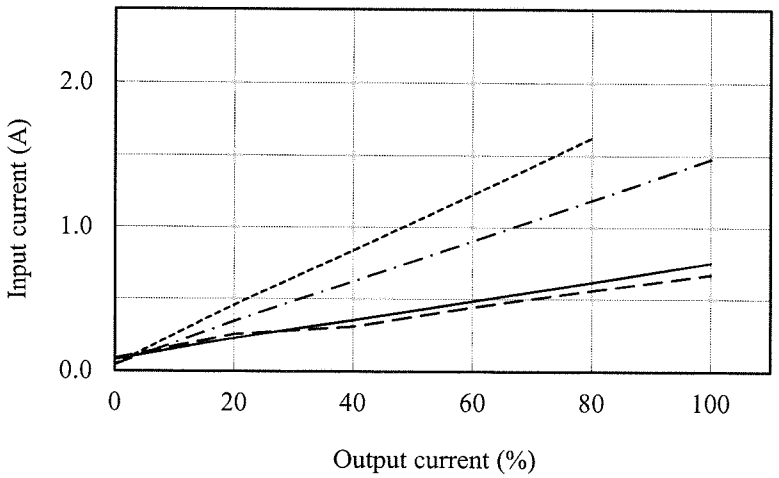
Vin	Input current
85VAC	0.043A
115VAC	0.043A
230VAC	0.075A
265VAC	0.089A



18V

Io: 0 A

Vin	Input current
85VAC	0.043A
115VAC	0.043A
230VAC	0.079A
265VAC	0.086A



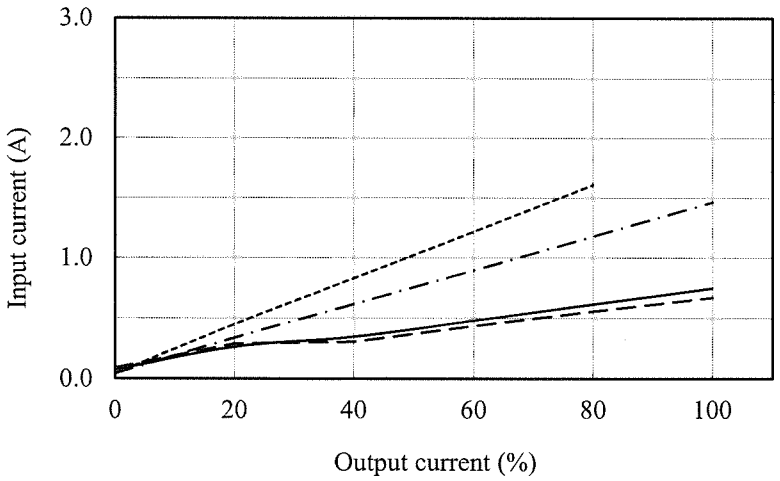
(3) Input current vs. Output current

Conditions Vin : 85 VAC ------
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC - - - -
Ta : 25 ℃

24V

Io: 0 A

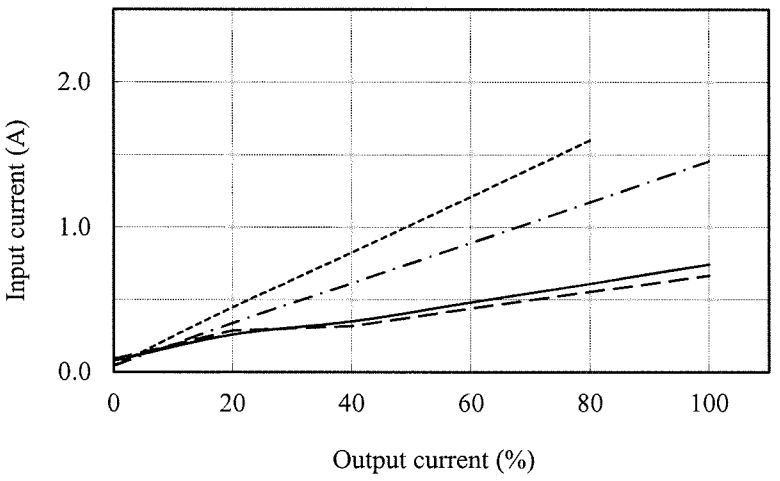
Vin	Input current
85VAC	0.044A
115VAC	0.043A
230VAC	0.074A
265VAC	0.092A



36V

Io: 0 A

Vin	Input current
85VAC	0.043A
115VAC	0.043A
230VAC	0.078A
265VAC	0.089A



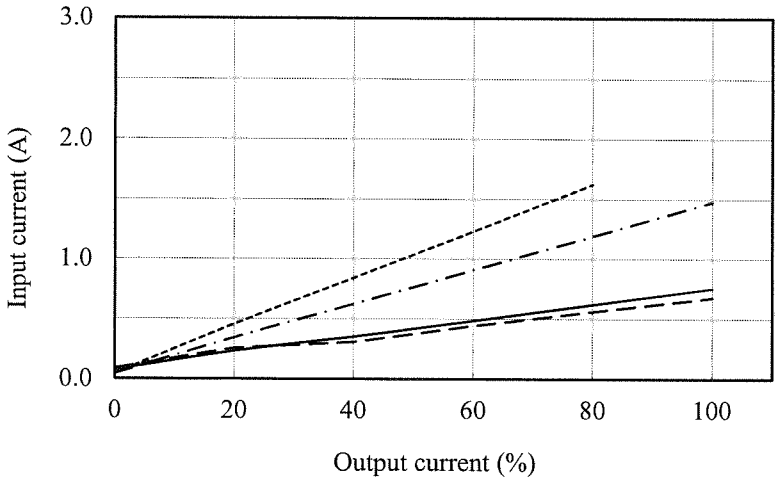
(3) Input current vs. Output current

Conditions Vin : 85 VAC ------
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC – – – –
Ta : 25 ℃

48V

Io: 0 A

Vin	Input current
85VAC	0.043A
115VAC	0.043A
230VAC	0.075A
265VAC	0.088A



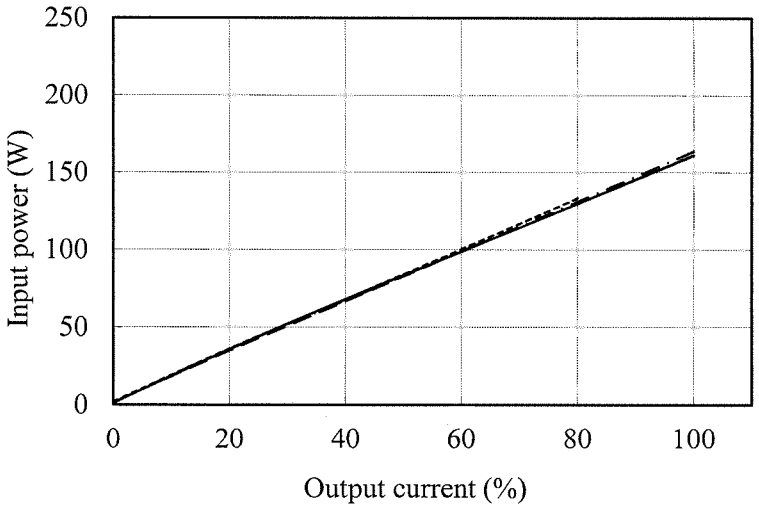
(4) Input power vs. Output current

Conditions Vin : 85 VAC ----
: 115 VAC -·-·-
: 230 VAC ——
: 265 VAC – – –
Ta : 25 ℃

12V

Io: 0 A

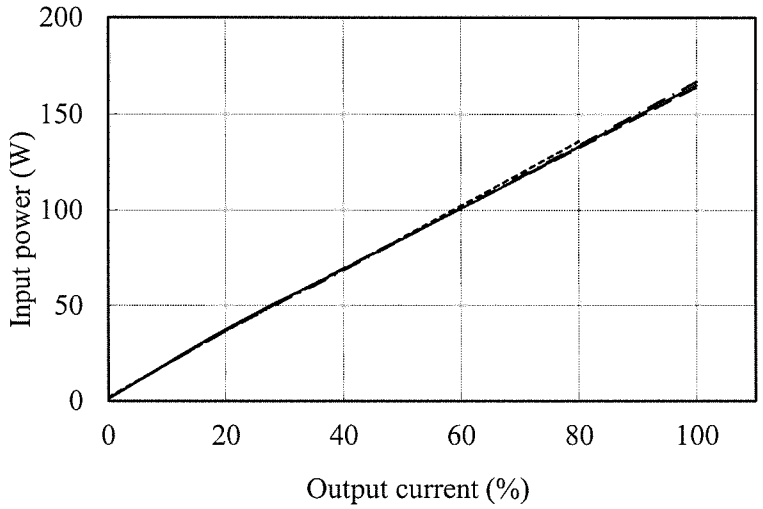
Vin	Input power
85VAC	1.92W
115VAC	1.29W
230VAC	1.30W
265VAC	1.50W



18V

Io: 0 A

Vin	Input power
85VAC	1.90W
115VAC	1.26W
230VAC	1.20W
265VAC	1.50W



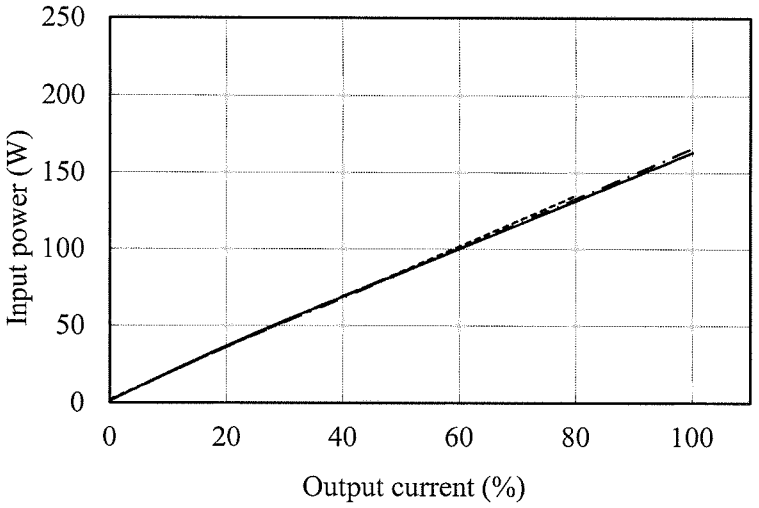
(4) Input power vs. Output current

Conditions Vin : 85 VAC - - - - -
: 115 VAC —·—·
: 230 VAC ——
: 265 VAC — — —
Ta : 25 ℃

24V

Io: 0 A

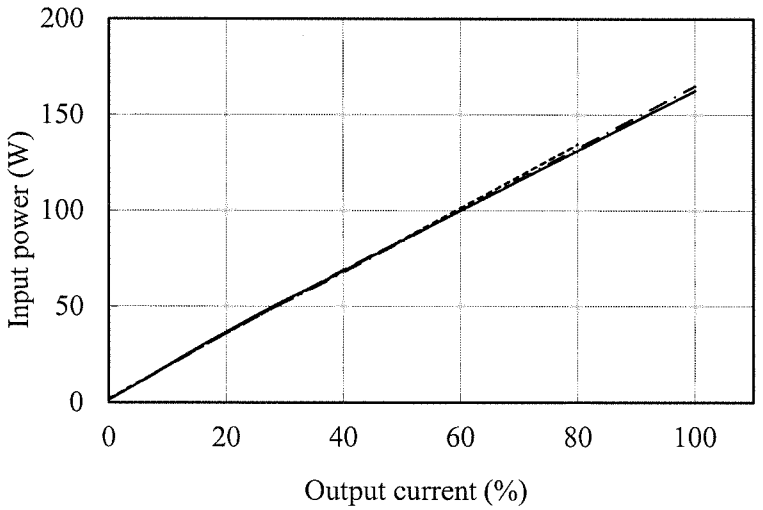
Vin	Input power
85VAC	1.97W
115VAC	1.40W
230VAC	1.30W
265VAC	1.50W



36V

Io: 0 A

Vin	Input power
85VAC	1.97W
115VAC	1.38W
230VAC	1.30W
265VAC	1.50W



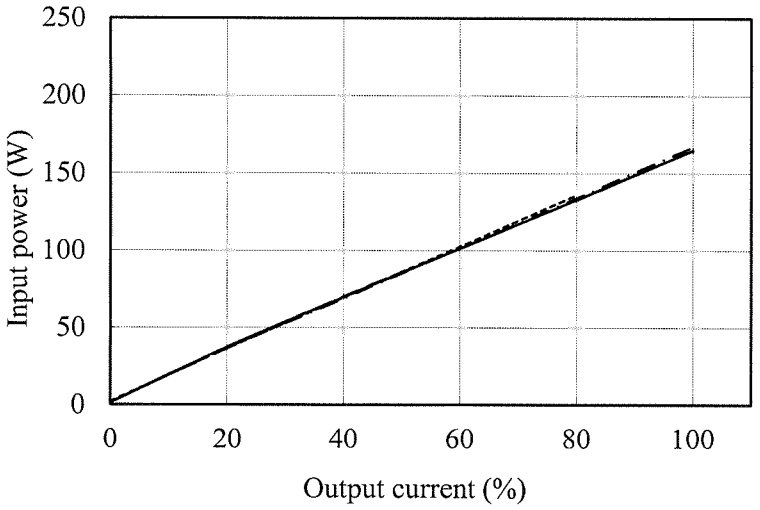
(4) Input power vs. Output current

Conditions Vin : 85 VAC - - - -
: 115 VAC — · — ·
: 230 VAC ——
: 265 VAC – – –
Ta : 25 ℃

48V

Io: 0 A

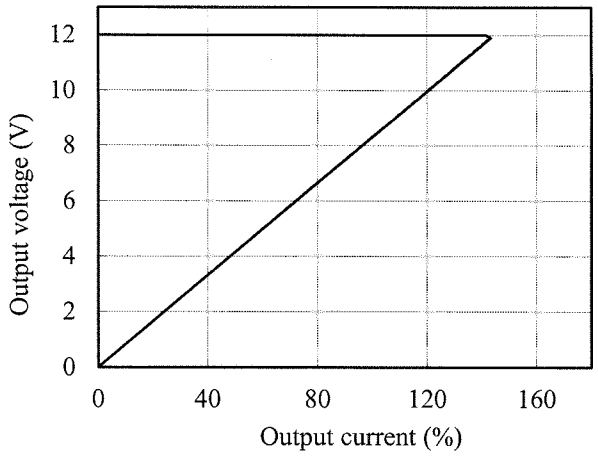
Vin	Input power
85VAC	2.03W
115VAC	1.38W
230VAC	1.30W
265VAC	1.50W



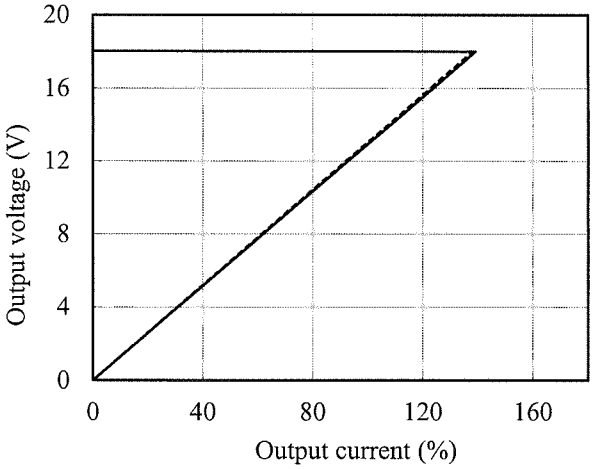
2.2 Over current protection (OCP) characteristics

Conditions Vin : 85 VAC ------
115 VAC -·-·-·-
230 VAC ——
265 VAC – – – –
Ta : 25 ℃

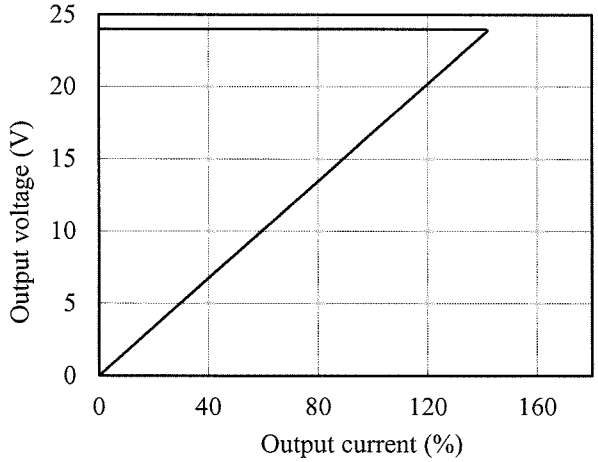
12V



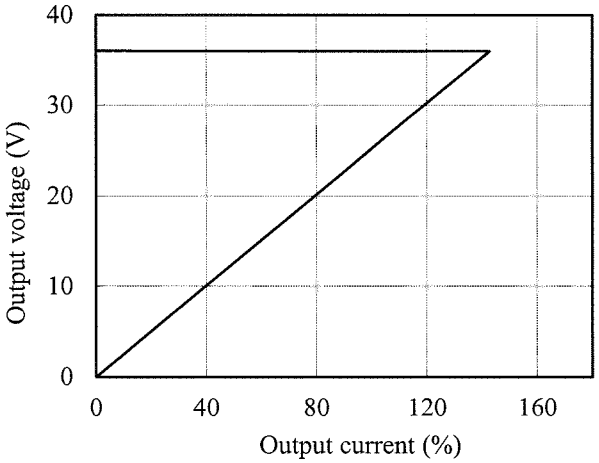
18V



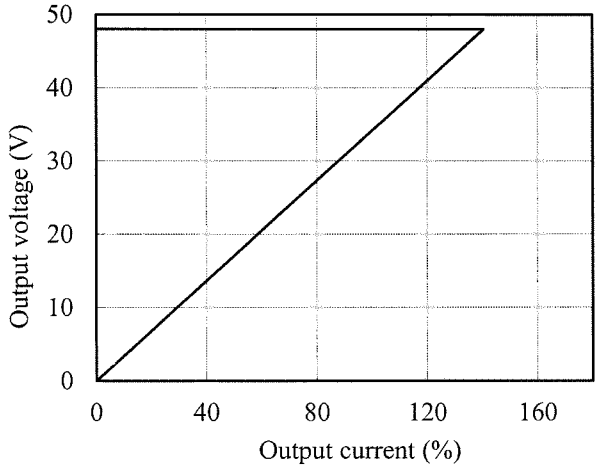
24V



36V



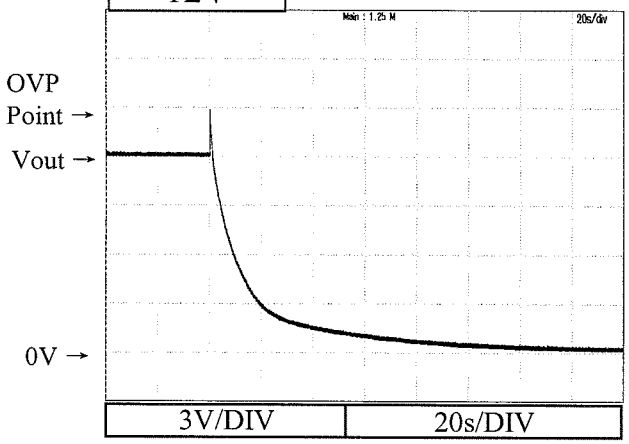
48V



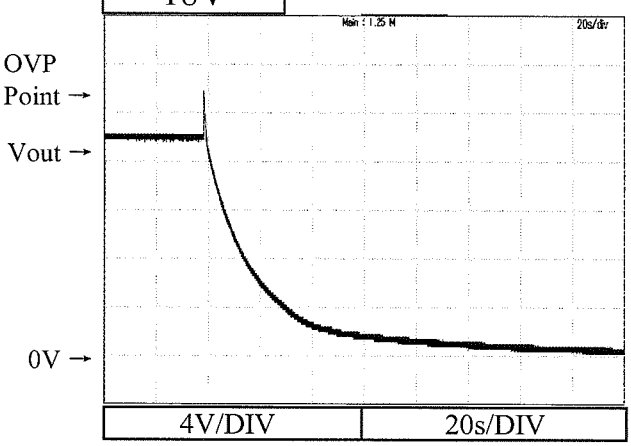
2.3 Over voltage protection (OVP) characteristics

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

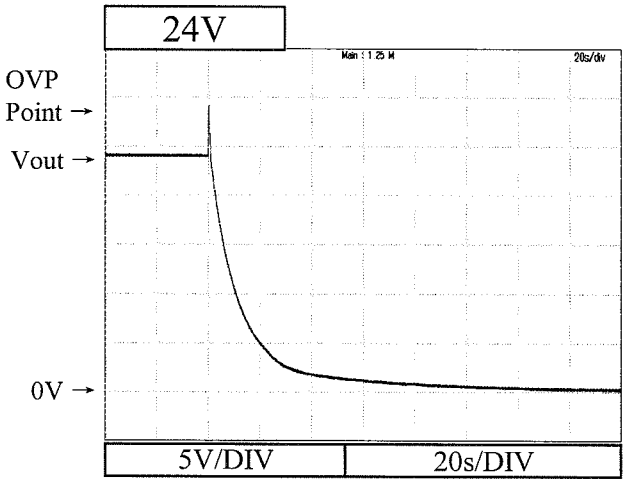
12V



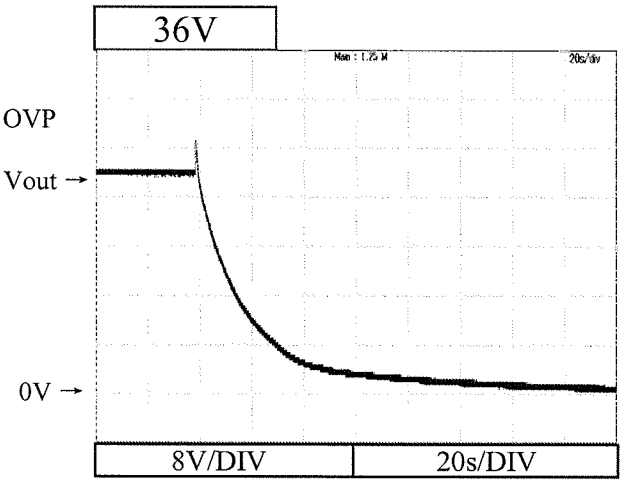
18V



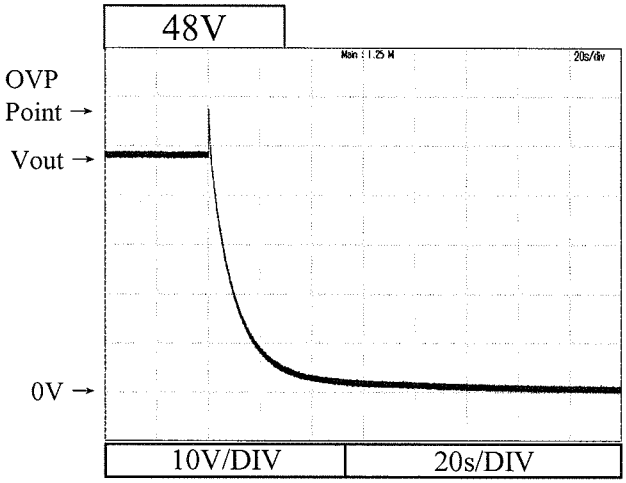
24V



36V



48V

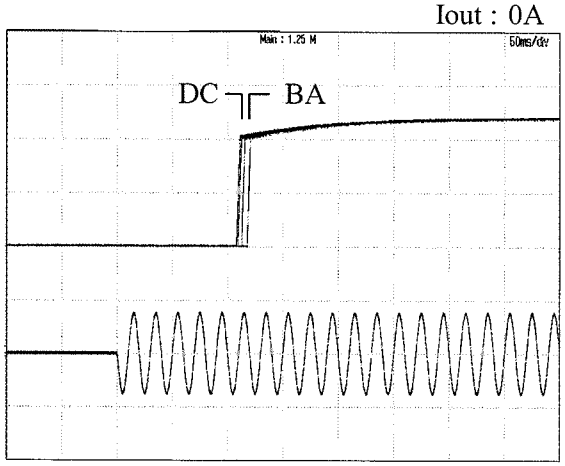


2.4 Output rise characteristics

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

12V

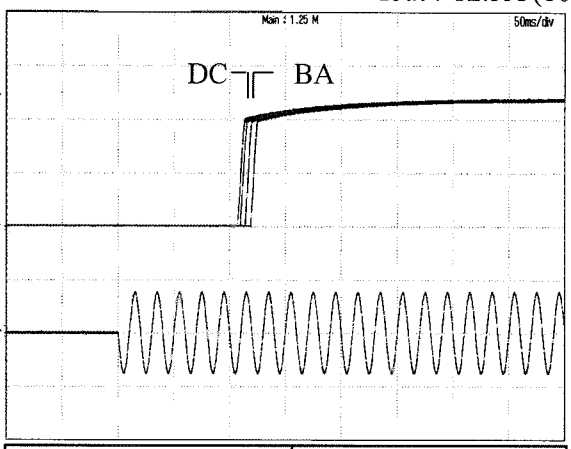
Iout : 0A



5V/DIV | 50ms/DIV

← Vout →
← 0V →
← Vin →

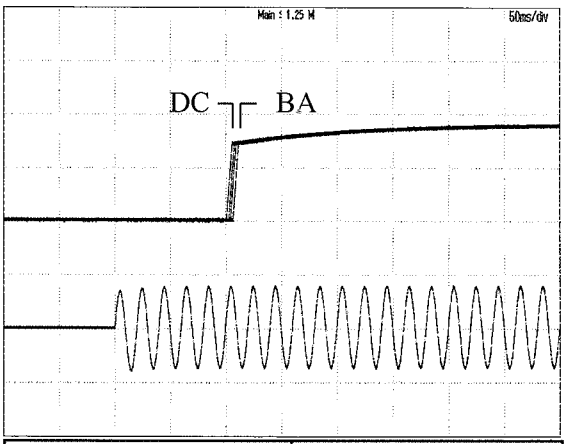
Iout : 12.5A (100%)



5V/DIV | 50ms/DIV

18V

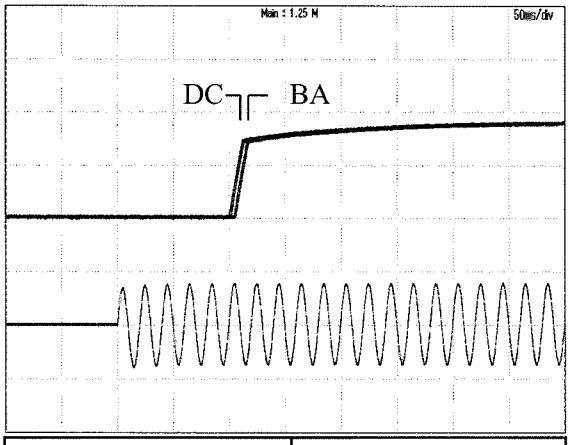
Iout : 0A



10V/DIV | 50ms/DIV

← Vout →
← 0V →
← Vin →

Iout : 8.4A (100%)



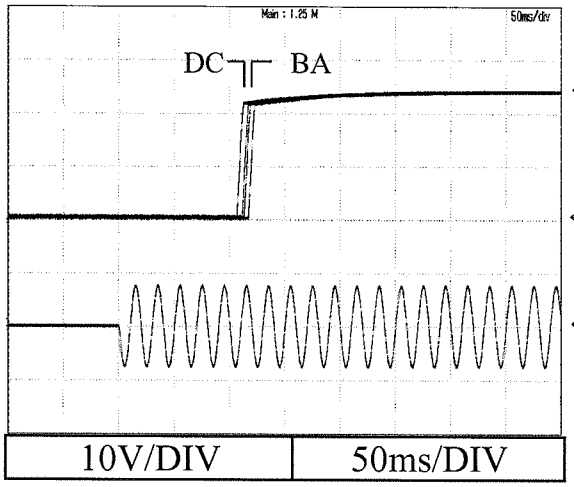
10V/DIV | 50ms/DIV

2.4 Output rise characteristics

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

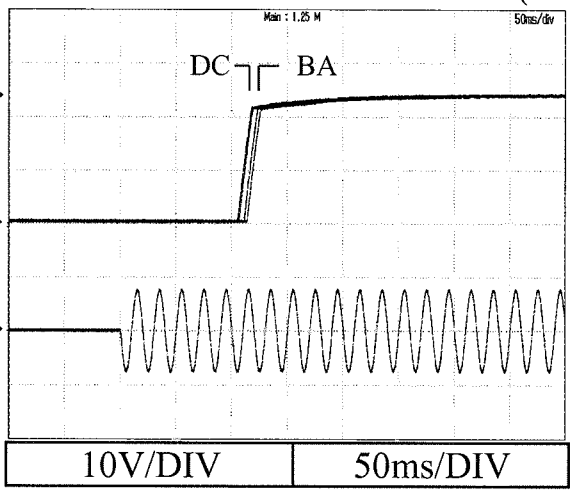
24V

Iout : 0A



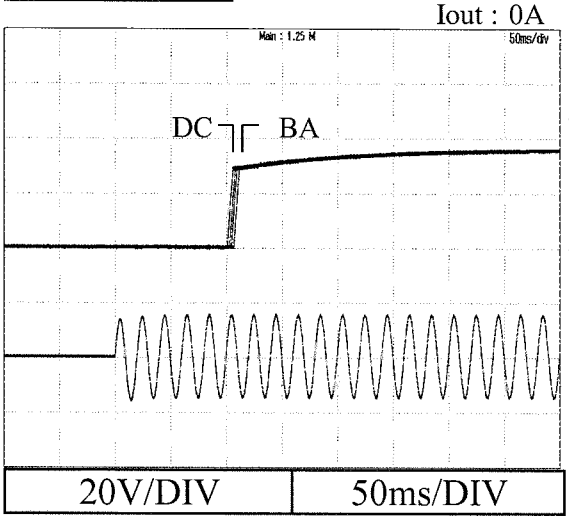
← Vout →
← 0V →
← Vin →

Iout : 6.3A (100%)



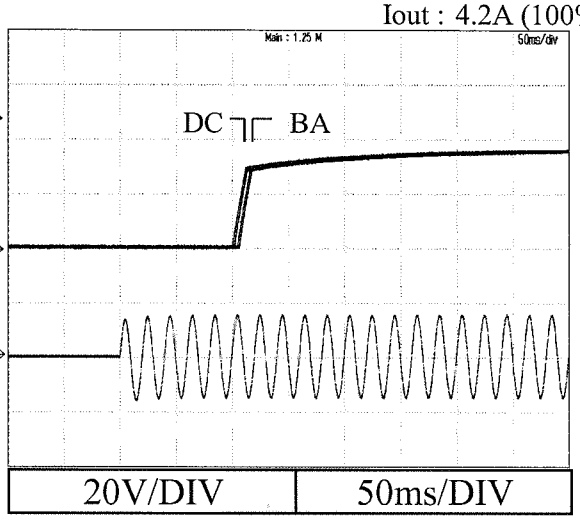
36V

Iout : 0A



← Vout →
← 0V →
← Vin →

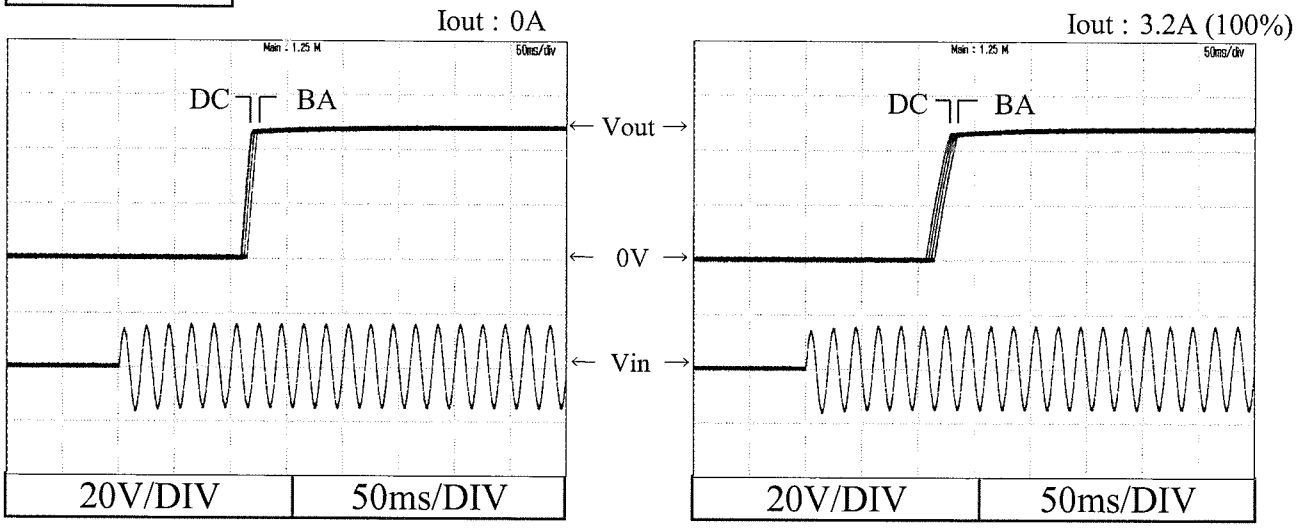
Iout : 4.2A (100%)



2.4 Output rise characteristics

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

48V

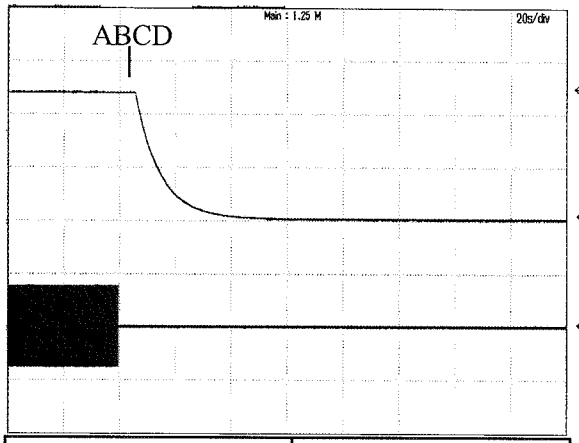


2.5 Output fall characteristics

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

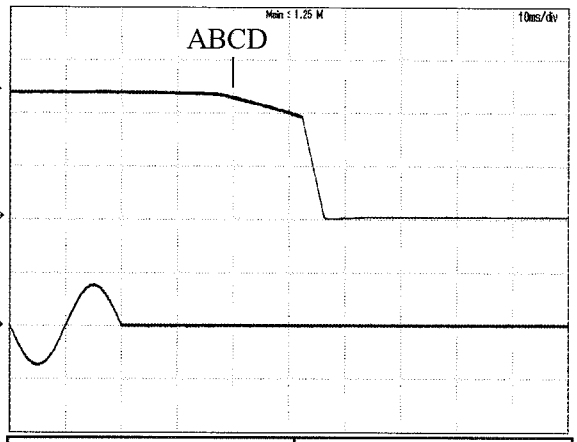
12V

Iout : 0A



5V/DIV | 20s/DIV

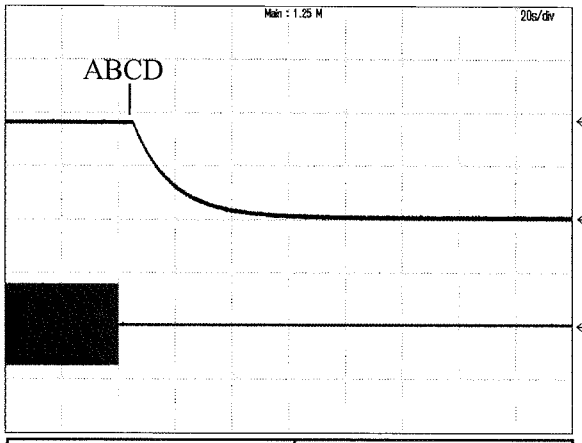
Iout : 12.5A (100%)



5V/DIV | 10ms/DIV

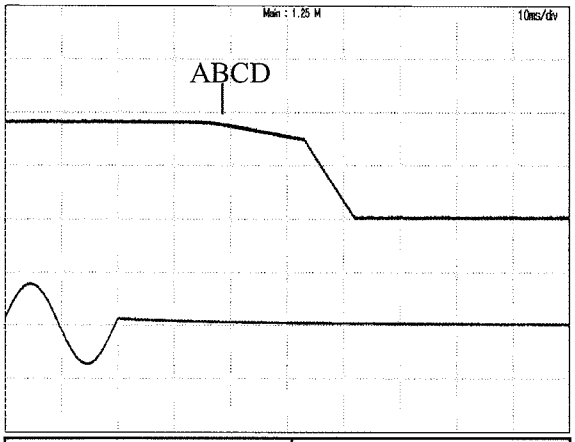
18V

Iout : 0A



10V/DIV | 20s/DIV

Iout : 8.4A (100%)

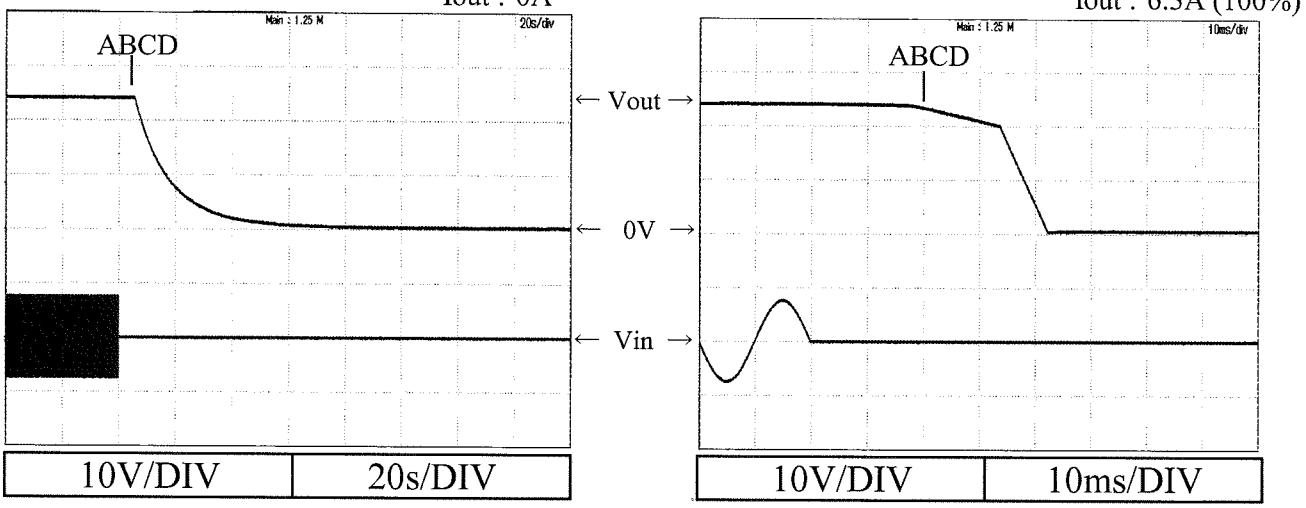


10V/DIV | 10ms/DIV

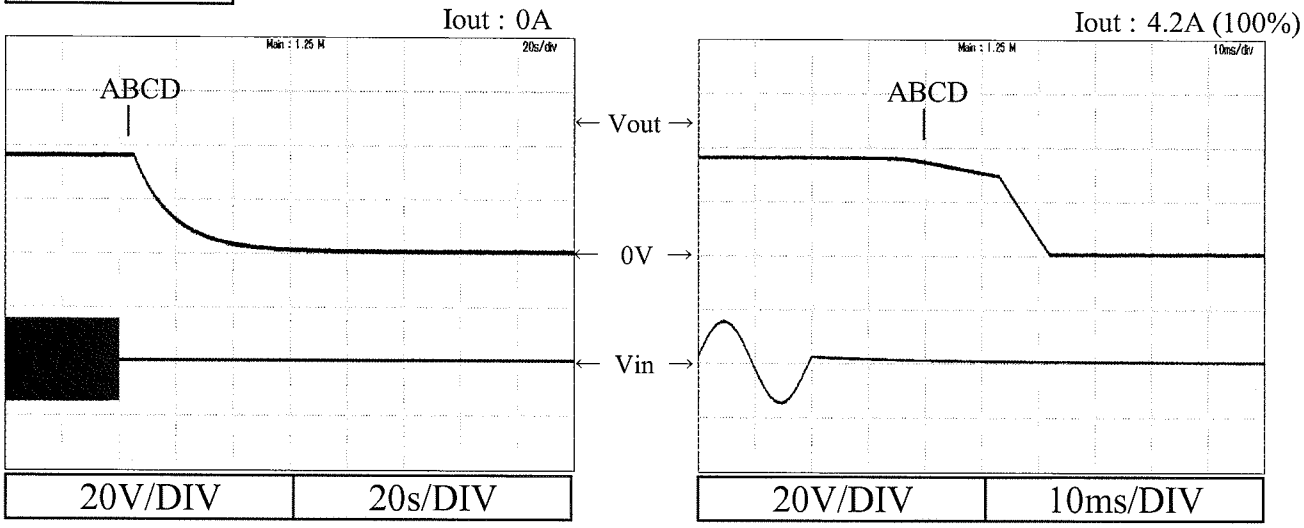
2.5 Output fall characteristics

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

24V

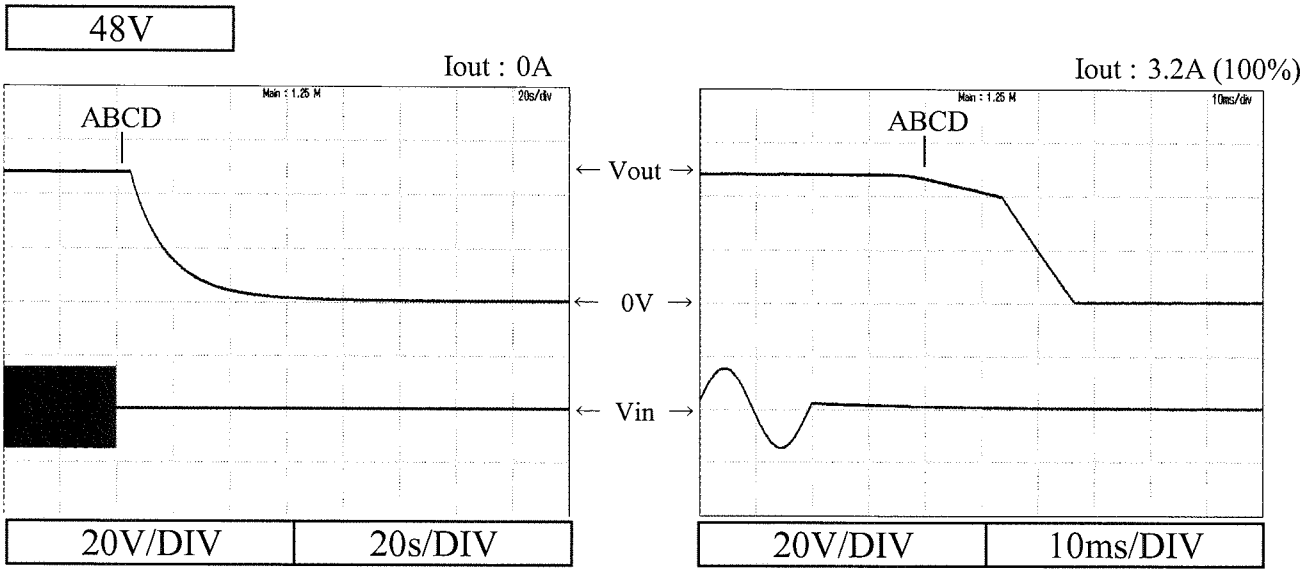


36V



2.5 Output fall characteristics

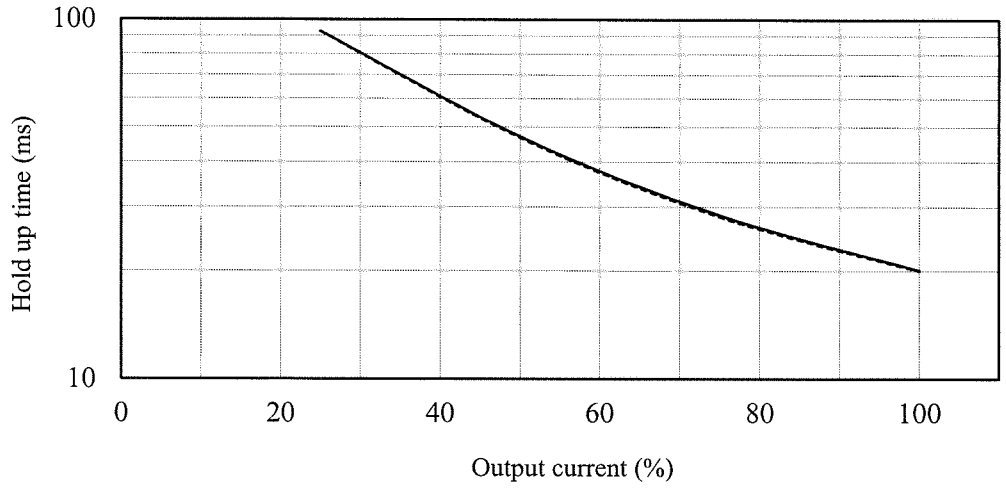
Conditions Vin : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
Ta : 25 ℃



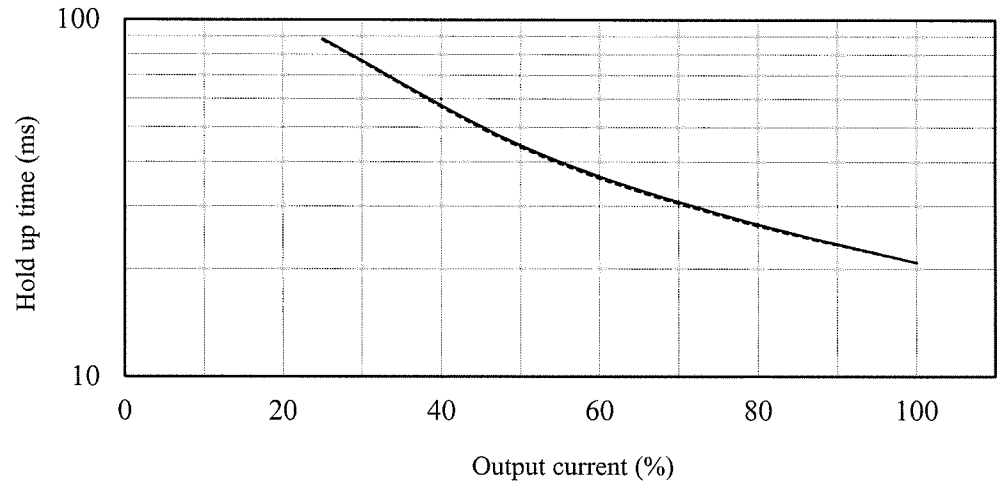
2.6 Hold up time characteristics

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

12V



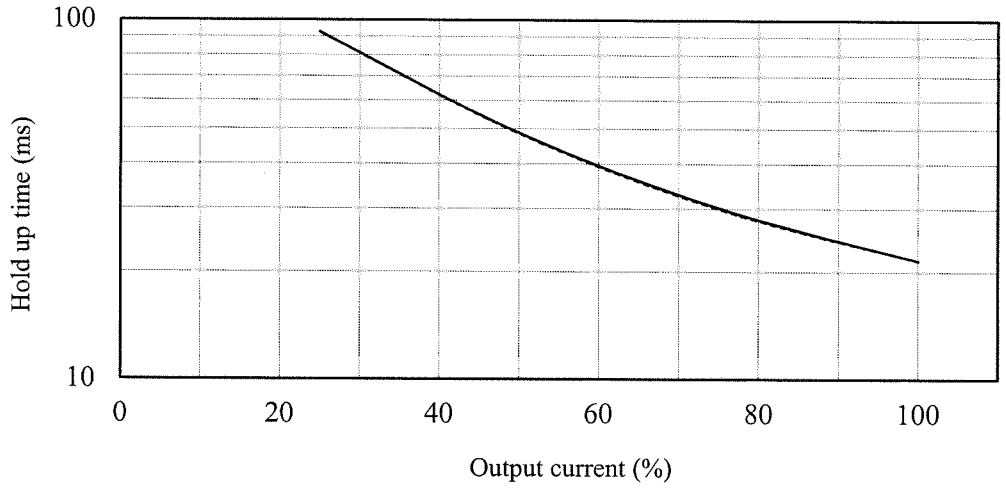
18V



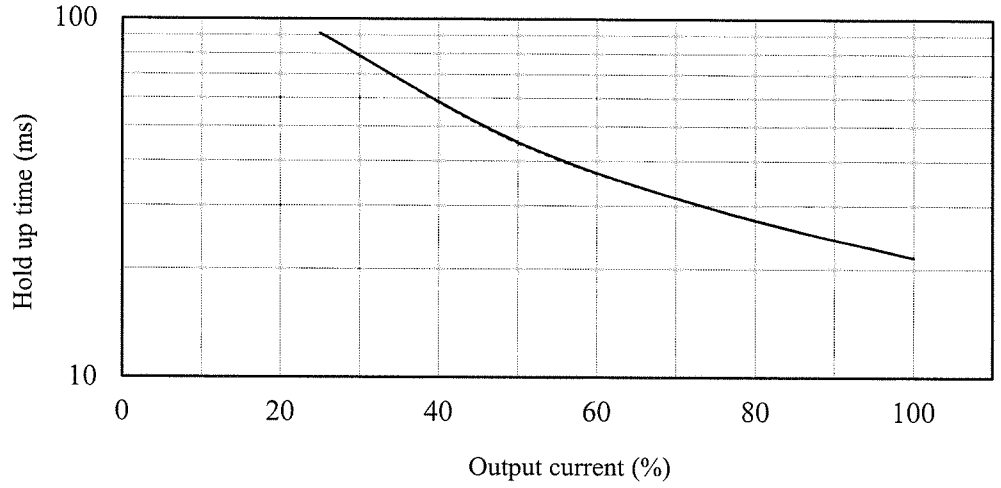
2.6 Hold up time characteristics

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

24V



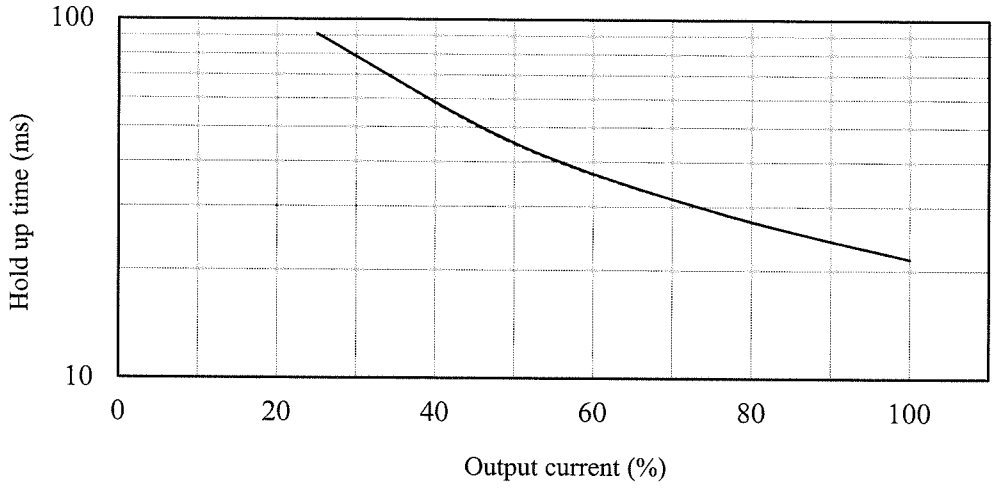
36V



2.6 Hold up time characteristics

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

48V

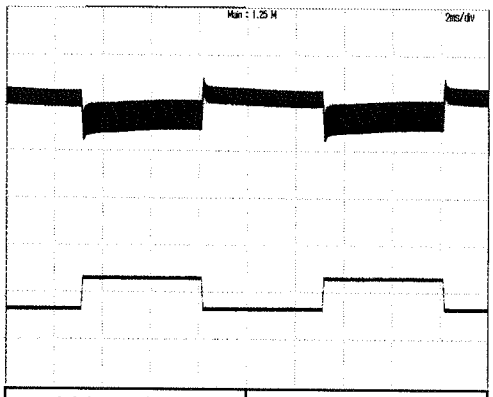


2.7 Dynamic load response characteristics

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

12V

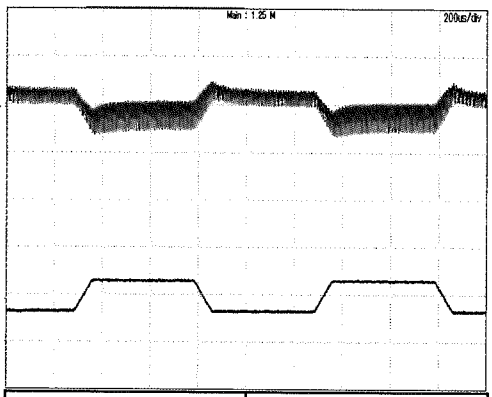
f = 100Hz



200mV/DIV	2ms/DIV
+0.89%	-1.31%

← Vout →
← 12.5A →
← 6.25A →
← 0A →

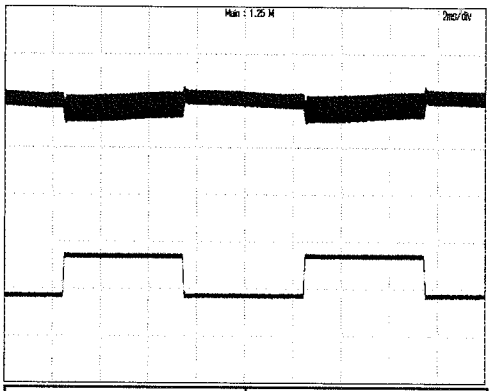
f = 1kHz



200mV/DIV	200 μ s/DIV
+0.81%	-1.07%

18V

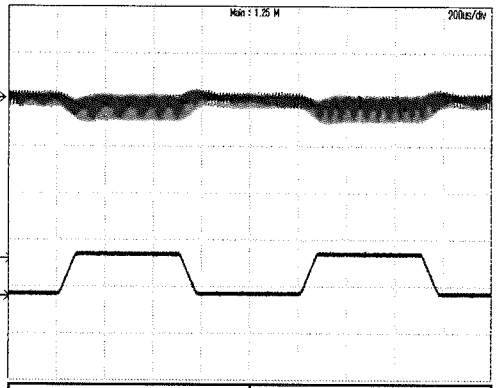
f = 100Hz



200mV/DIV	2ms/DIV
+0.34%	-0.56%

← Vout →
← 8.4A →
← 4.2A →
← 0A →

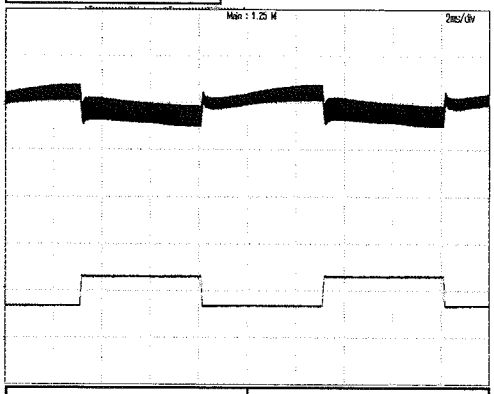
f = 1kHz



200mV/DIV	200 μ s/DIV
+0.25%	-0.56%

24V

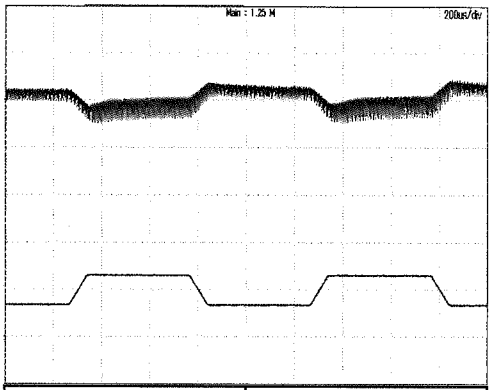
f = 100Hz



200mV/DIV	2ms/DIV
+0.44%	-0.48%

← Vout →
← 6.3A →
← 3.15A →
← 0A →

f = 1kHz



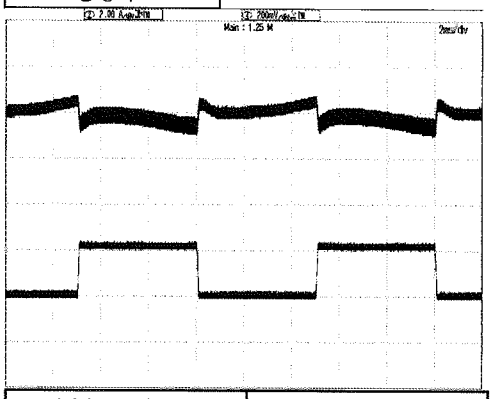
200mV/DIV	200 μ s/DIV
+0.39%	-0.38%

2.7 Dynamic load response characteristics

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

36V

f = 100Hz

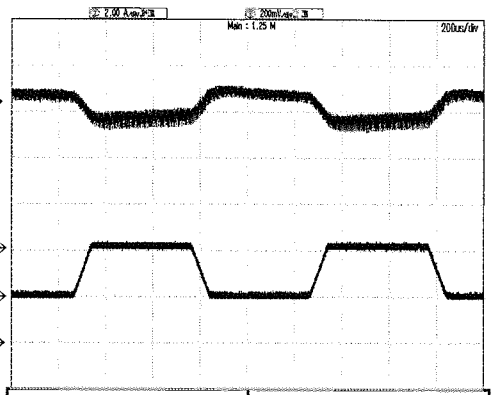


200mV/DIV	2ms/DIV
+0.21%	-0.29%

← Vout →

← 4.2A →
← 2.1A →
← 0A →

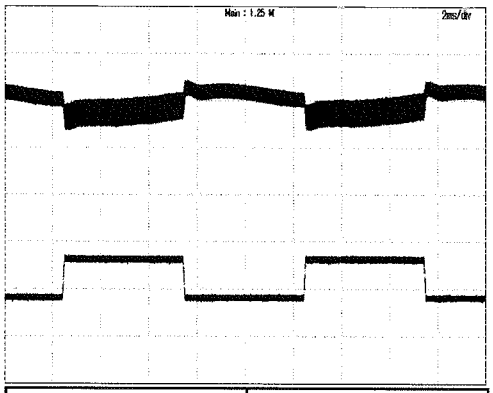
f = 1kHz



200mV/DIV	200 μ s/DIV
+0.31%	-0.24%

48V

f = 100Hz

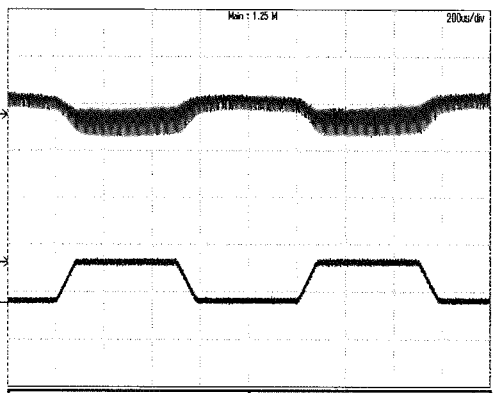


200mV/DIV	2ms/DIV
+0.18%	-0.27%

← Vout →

← 3.2A →
← 1.6A →
← 0A →

f = 1kHz



200mV/DIV	200 μ s/DIV
+0.11%	-0.30%

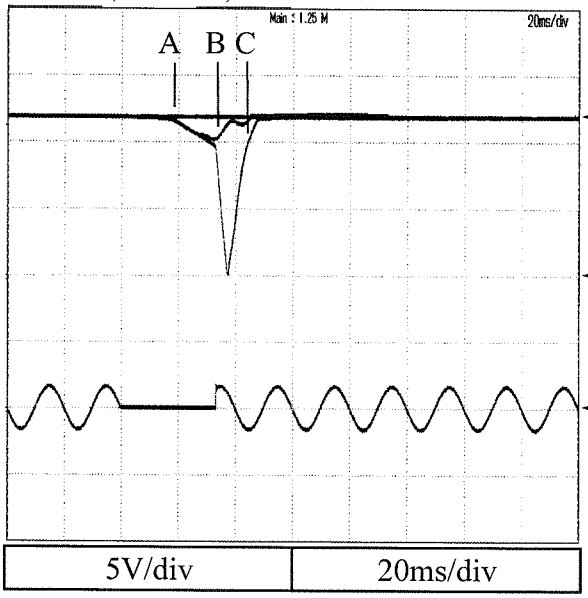
2.8 Response to brown out characteristics

Conditions: Iout : 100%
Ta : 25℃

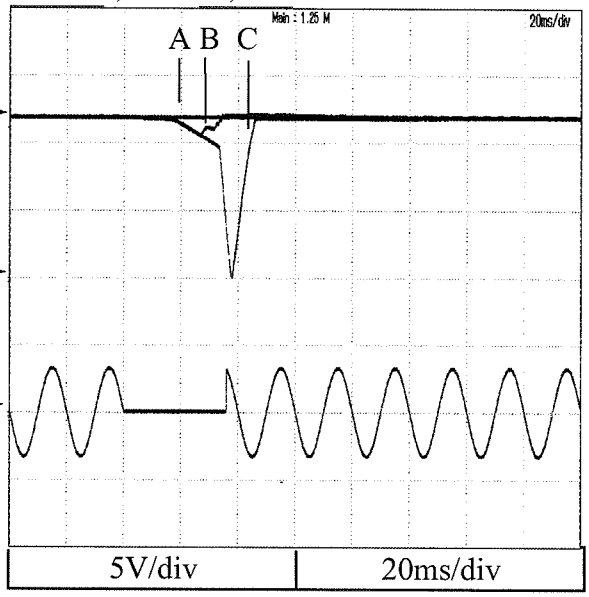
Interruption time
A : Output voltage does not drop
B : Output voltage drops down not reaching 0V
C : Output voltage drops until 0V

12V

Vin :115VAC
A: 17ms, B: 27ms, C: 33.5ms

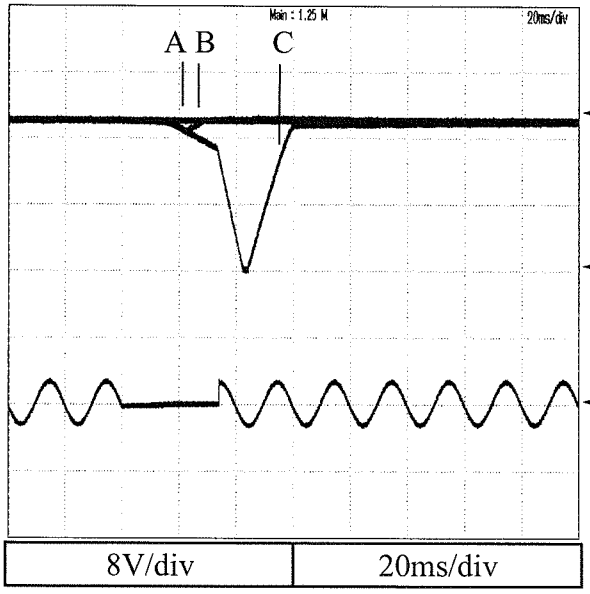


Vin :230VAC
A: 17ms, B: 27ms, C: 35.5ms

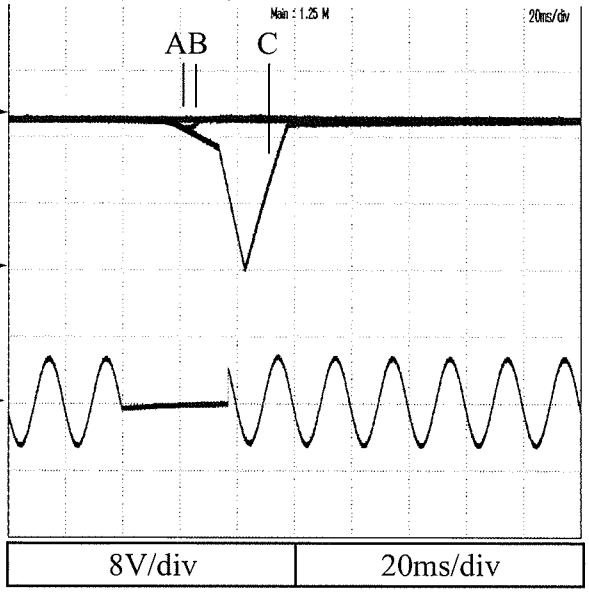


18V

Vin :115VAC
A: 18ms, B: 22ms, C: 34ms



Vin :230VAC
A: 18ms ,B: 22ms,C: 37ms



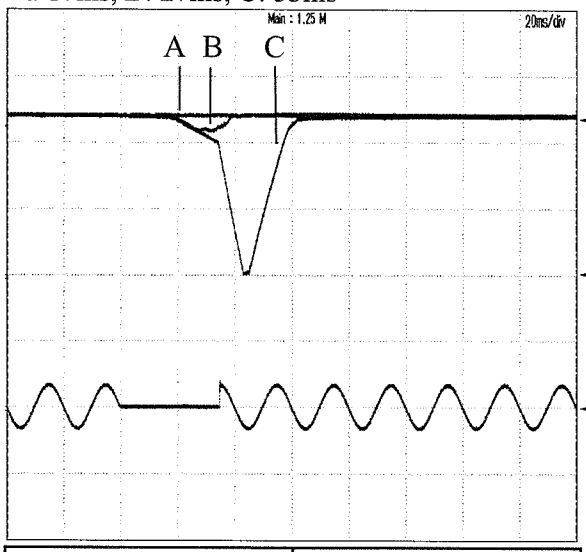
2.8 Response to brown out characteristics

Conditions: Iout : 100%
Ta : 25℃

Interruption time
A : Output voltage does not drop
B : Output voltage drops down not reaching 0V
C : Output voltage drops until 0V

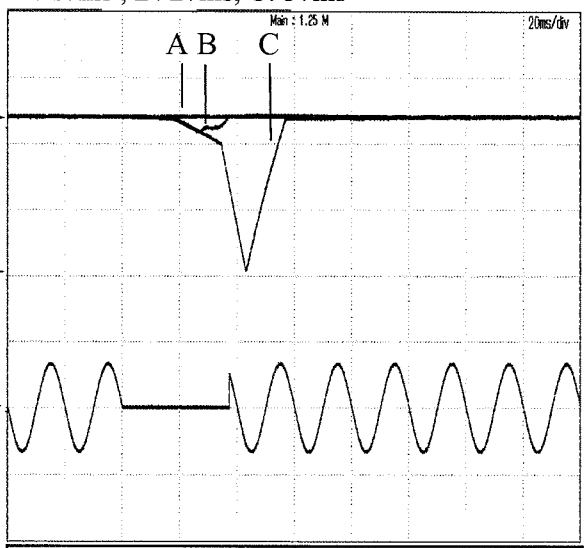
24V

Vin :115VAC
A: 17ms, B: 27ms, C: 33ms



10V/div | 20ms/div

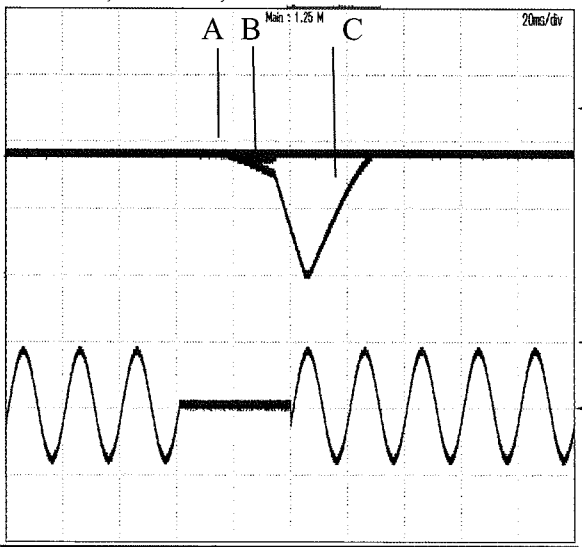
Vin :230VAC
A: 17ms , B: 27ms, C: 37ms



10V/div | 20ms/div

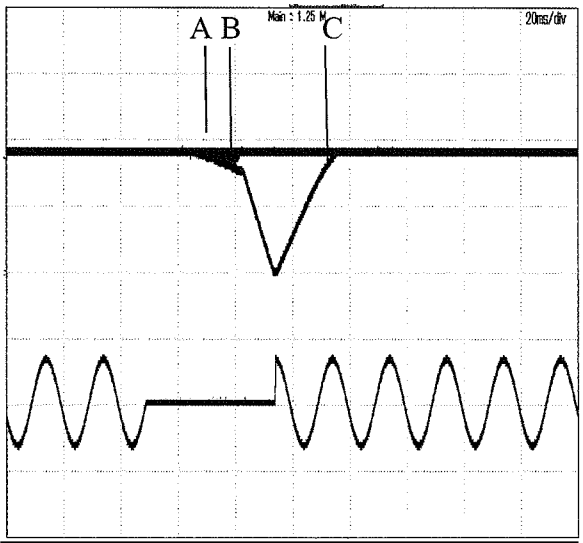
36V

Vin :115VAC
A: 18ms, B: 22ms,C :39ms



20V/div | 20ms/div

Vin :230VAC
A: 18ms ,B: 22ms,C: 43ms



20V/div | 20ms/div

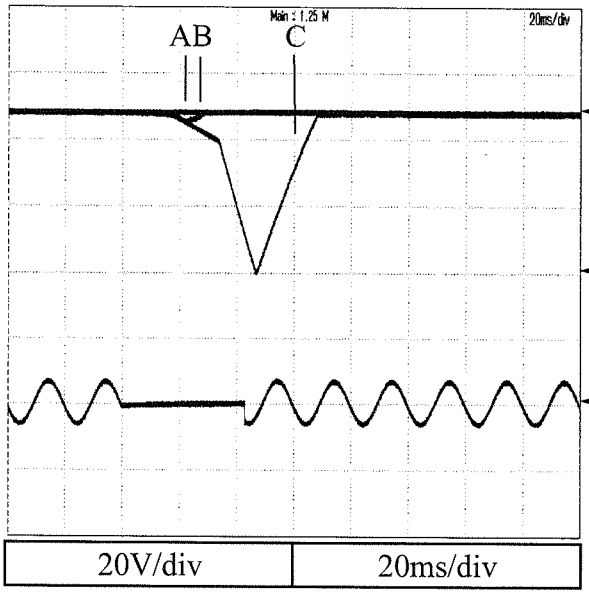
2.8 Response to brown out characteristics

Conditions: Iout : 100%
Ta : 25℃

Interruption time
A : Output voltage does not drop
B : Output voltage drops down not reaching 0V
C : Output voltage drops until 0V

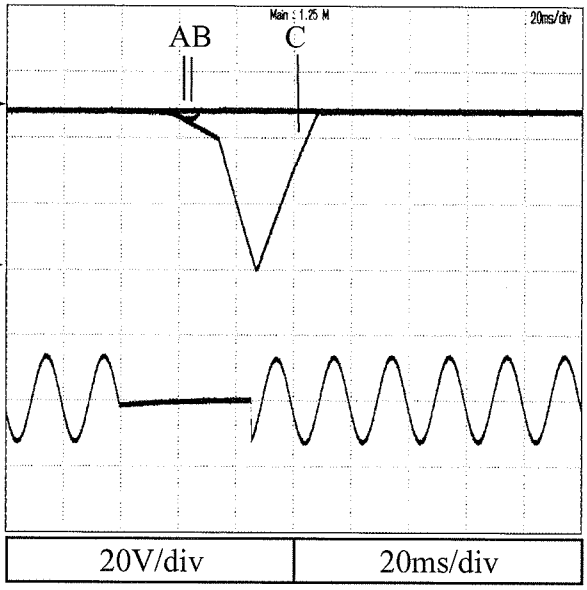
48V

Vin :115VAC
A: 18ms, B: 22ms,C :42ms



20V/div | 20ms/div

Vin :230VAC
A: 18ms ,B: 22ms,C: 46ms



20V/div | 20ms/div

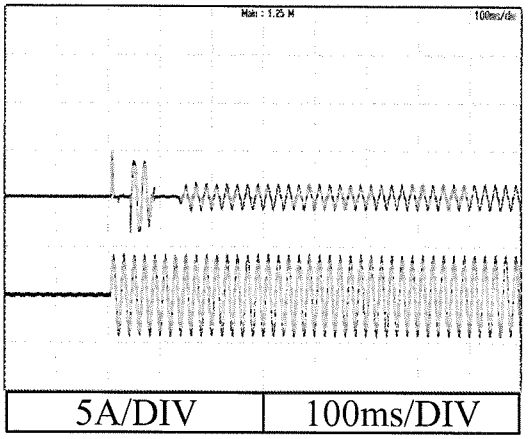
Vout
0V
Vin

2.9 Inrush current waveform

12V

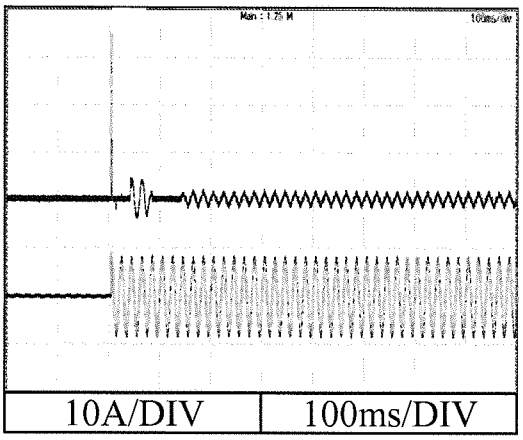
Conditions Vin : 115 VAC
Iout : 12.5A (100%)
Ta : 25 ℃

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



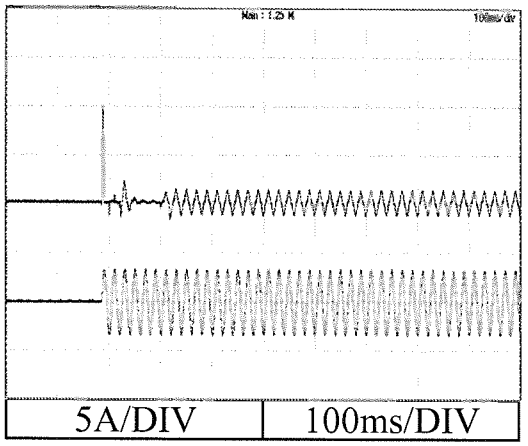
← Iin →
← Vin →

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



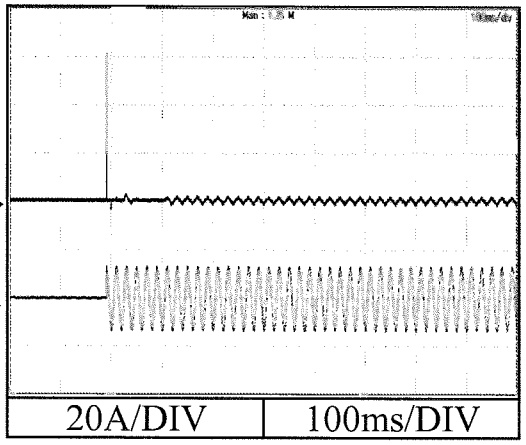
Conditions Vin : 230 VAC
Iout : 12.5A (100%)
Ta : 25 ℃

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



← Iin →
← Vin →

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

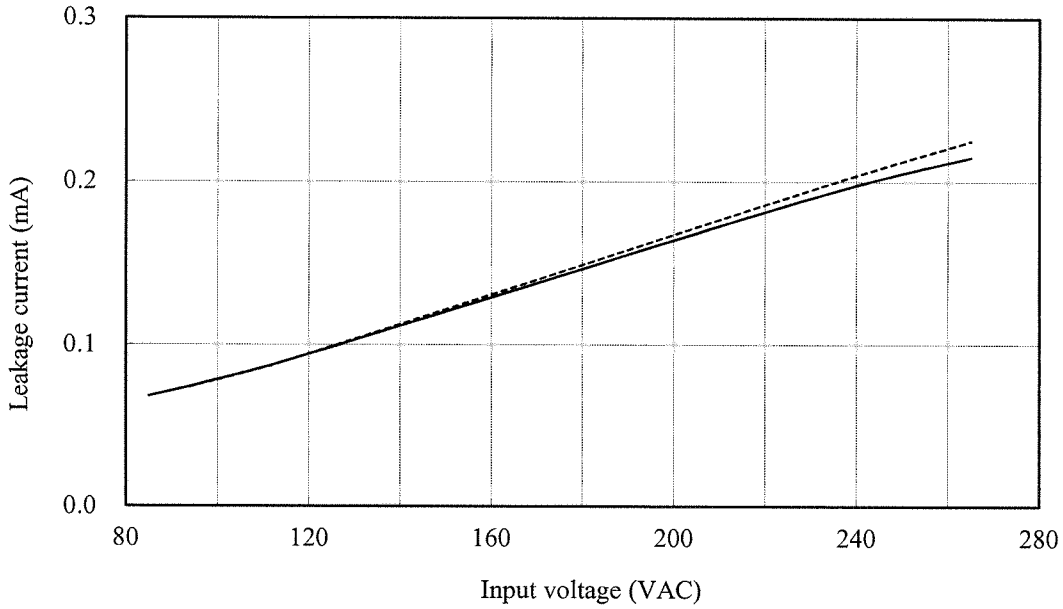


2.10 Leakage current characteristics

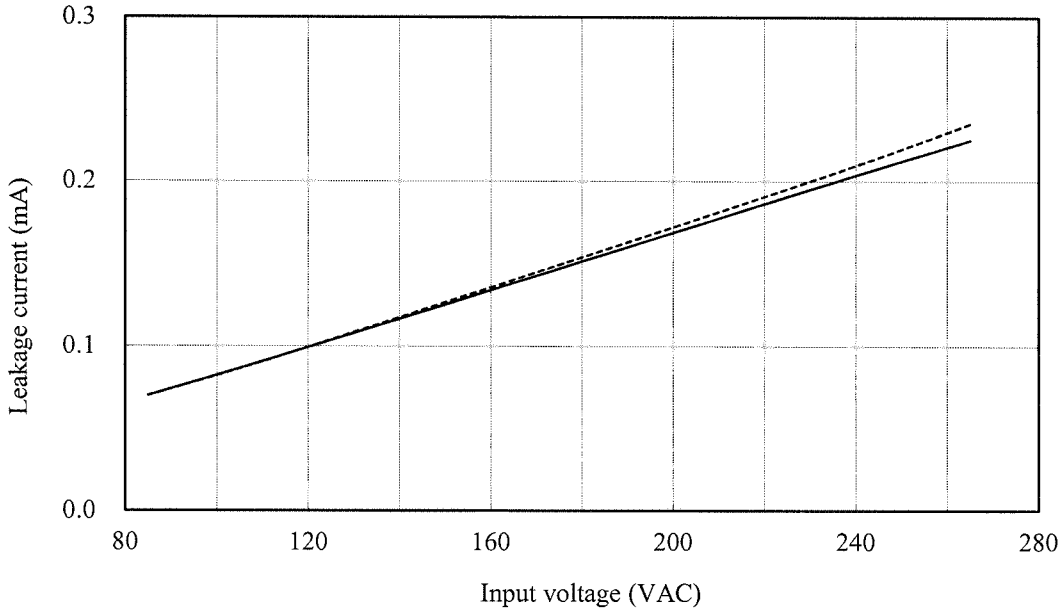
Conditions Iout : 0A -------
12.6A (100%) ———
Ta : 25℃
Equipment used : 228 (Simpson)

12V

L



N

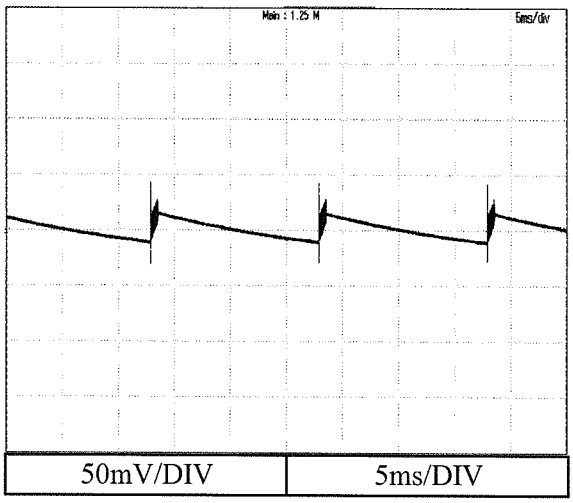


2.11 Output ripple and noise waveform

Conditions Vin : 115 VAC
Ta : 25 ℃

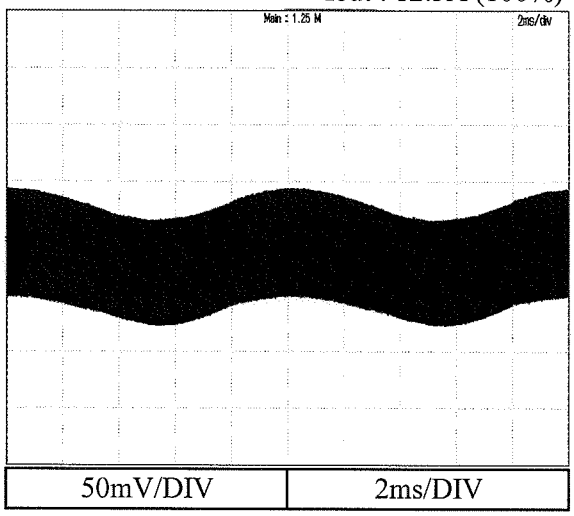
12V

Iout : 0%



50mV/DIV | 5ms/DIV

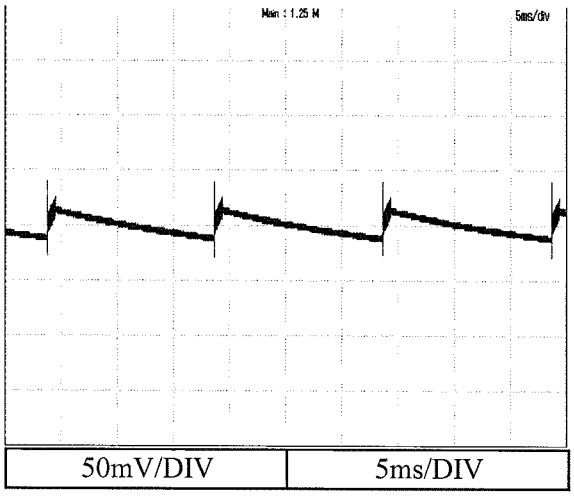
Iout : 12.5A (100%)



50mV/DIV | 2ms/DIV

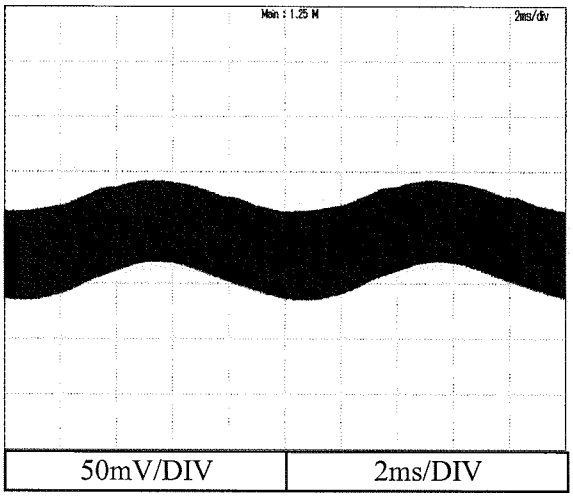
18V

Iout : 0%



50mV/DIV | 5ms/DIV

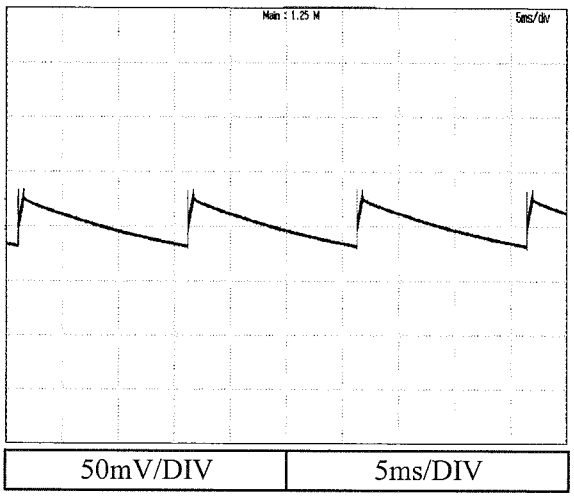
Iout : 8.4A (100%)



50mV/DIV | 2ms/DIV

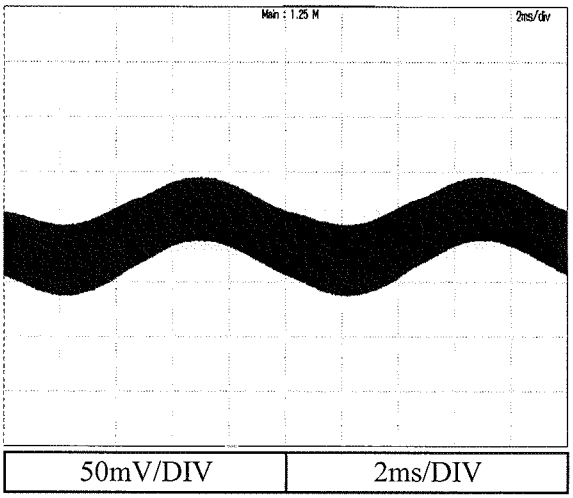
24V

Iout : 0%



50mV/DIV | 5ms/DIV

Iout : 6.3A (100%)



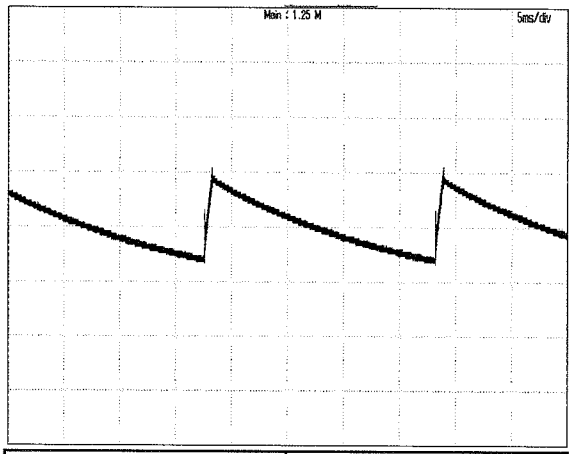
50mV/DIV | 2ms/DIV

2.11 Output ripple and noise waveform

Conditions Vin : 115 VAC
Ta : 25 ℃

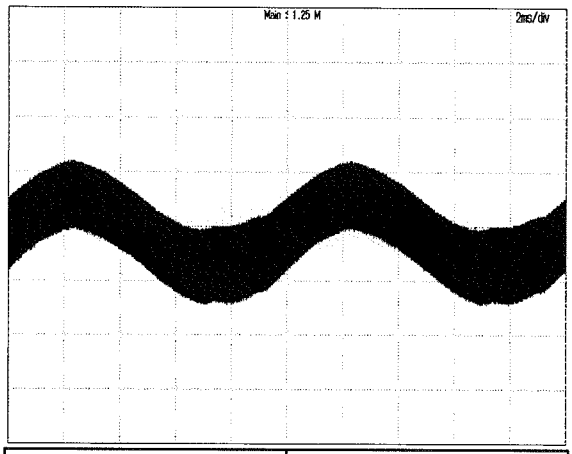
36V

Iout : 0%



50mV/DIV | 5ms/DIV

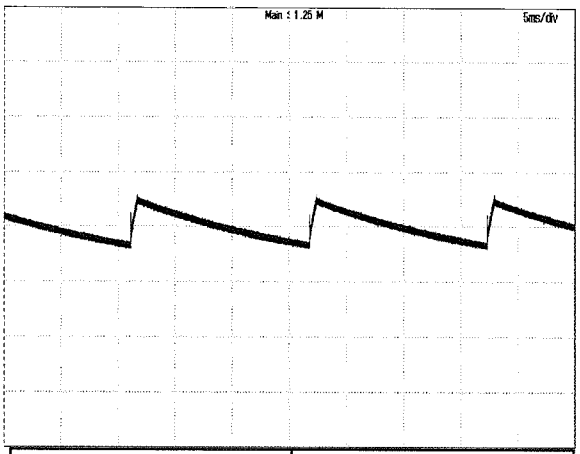
Iout : 4.2A (100%)



50mV/DIV | 2ms/DIV

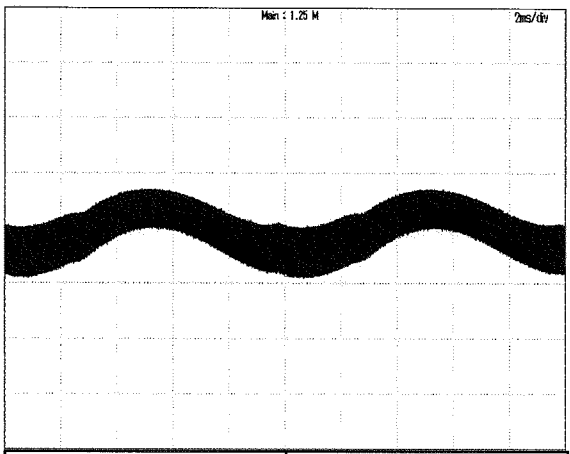
48V

Iout : 0%



100mV/DIV | 5ms/DIV

Iout : 3.2A (100%)



100mV/DIV | 2ms/DIV

2.12 Electro-Magnetic Interference characteristics

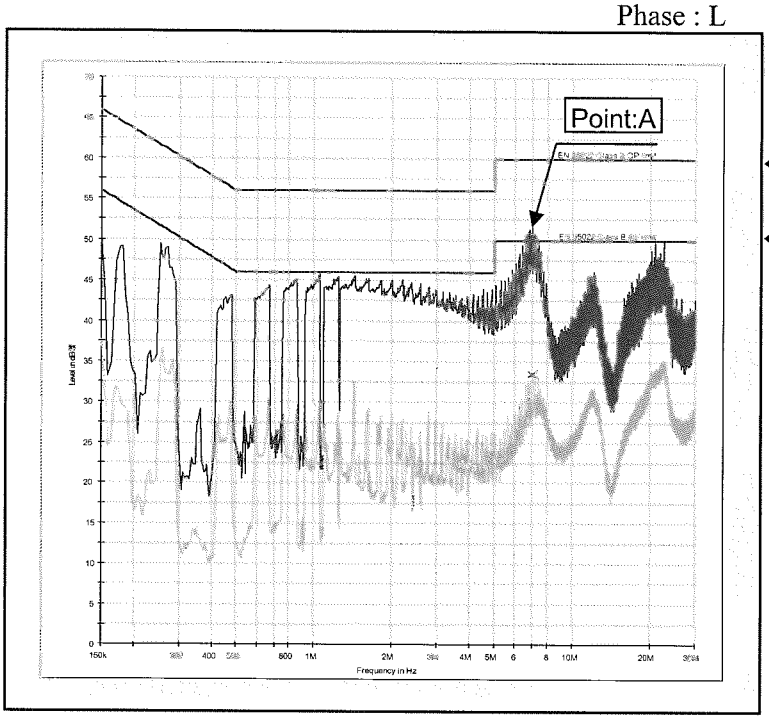
Conditions Vin : 115VAC
Iout : 12.5A (100%)
Ta : 25℃

Conducted Emission

12V

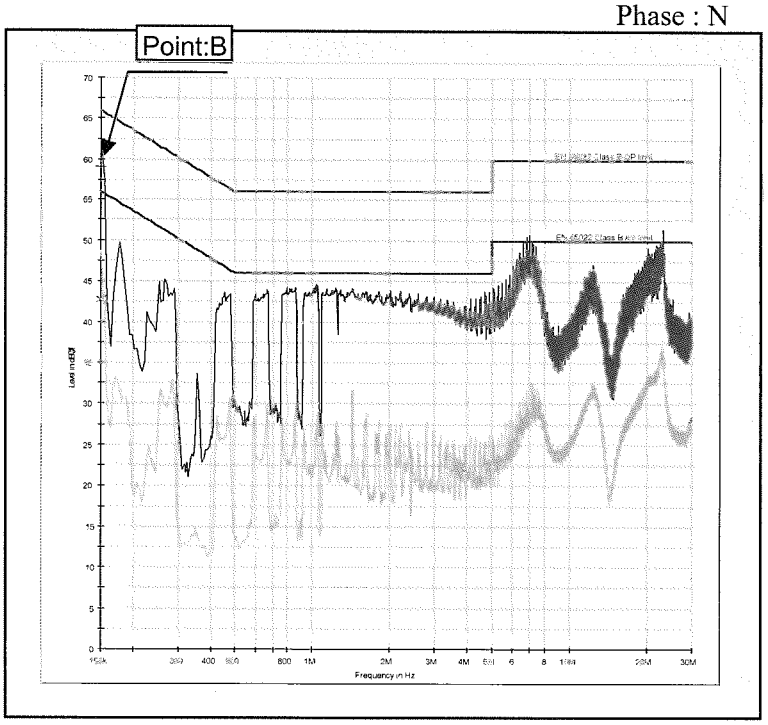
Ref. Data	Point A (6.989MHz) Limit (dBuV)	Measure (dBuV)
QP	60.0	50.4
AV	50.0	33.6

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	59.1
AV	56.0	42.8

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

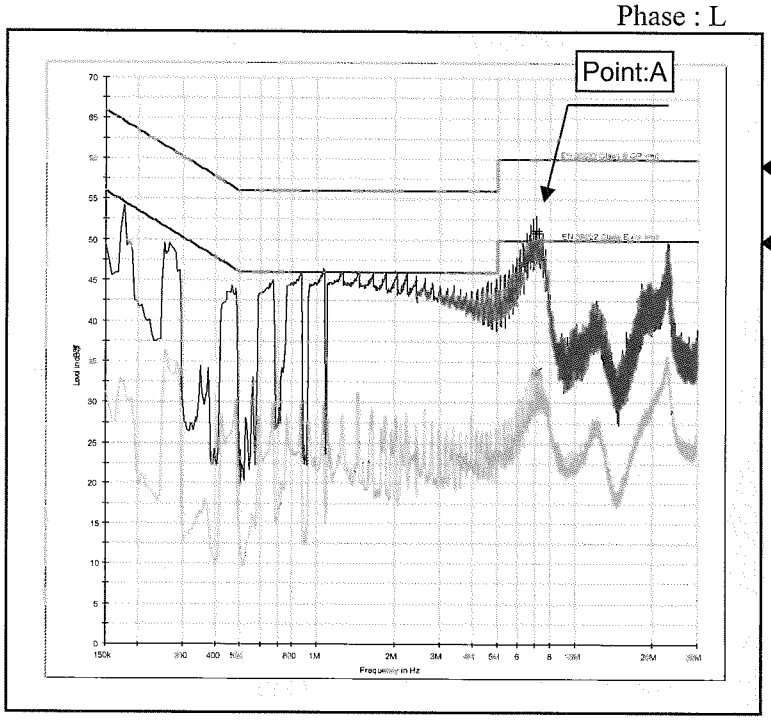
Conditions Vin : 230VAC
Iout : 12.5A (100%)
Ta : 25℃

Conducted Emission

12V

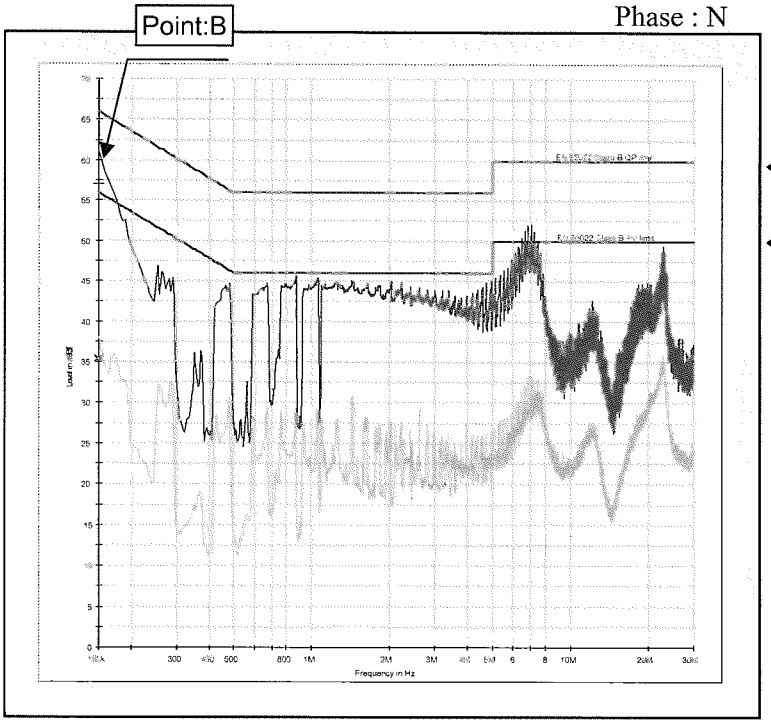
Ref. Data	Point A (7.063MHz) Limit (dBuV)	Measure (dBuV)
QP	60.0	51.2
AV	50.0	33.9

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	57.1
AV	56.0	35.4

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

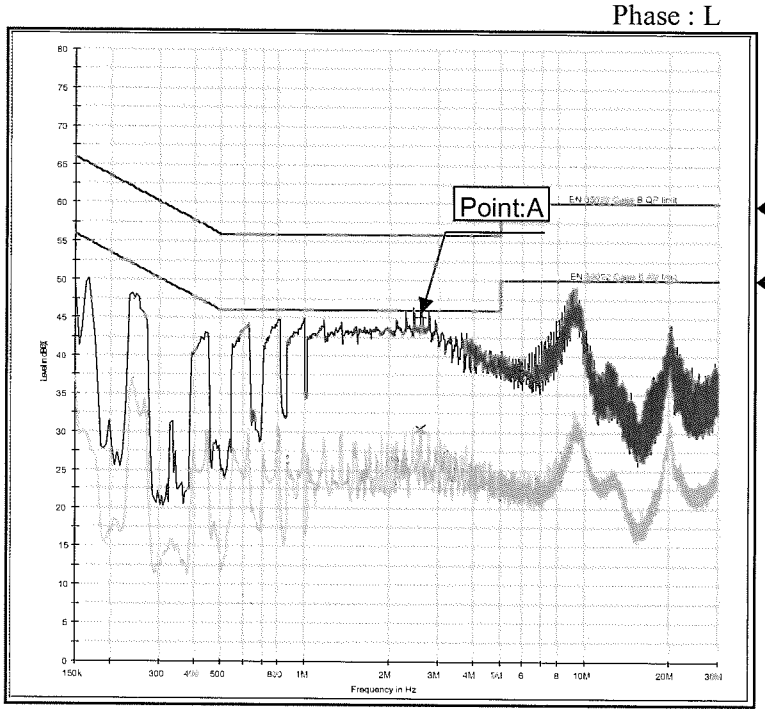
Conditions Vin : 115VAC
Iout : 8.4A (100%)
Ta : 25℃

Conducted Emission

18V

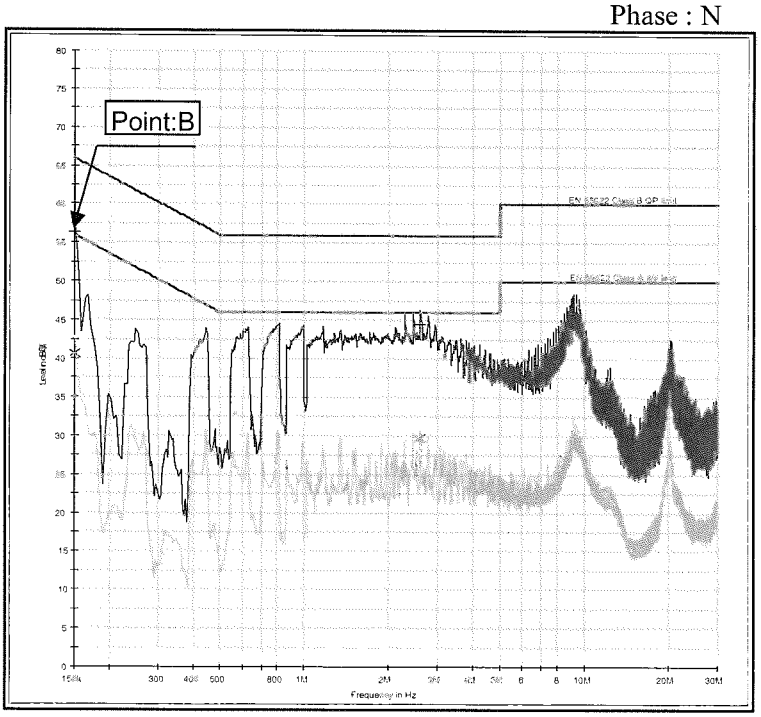
Ref. Data	Point A (2.592MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	45.2
AV	46.0	30.5

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	56.4
AV	56.0	40.7

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

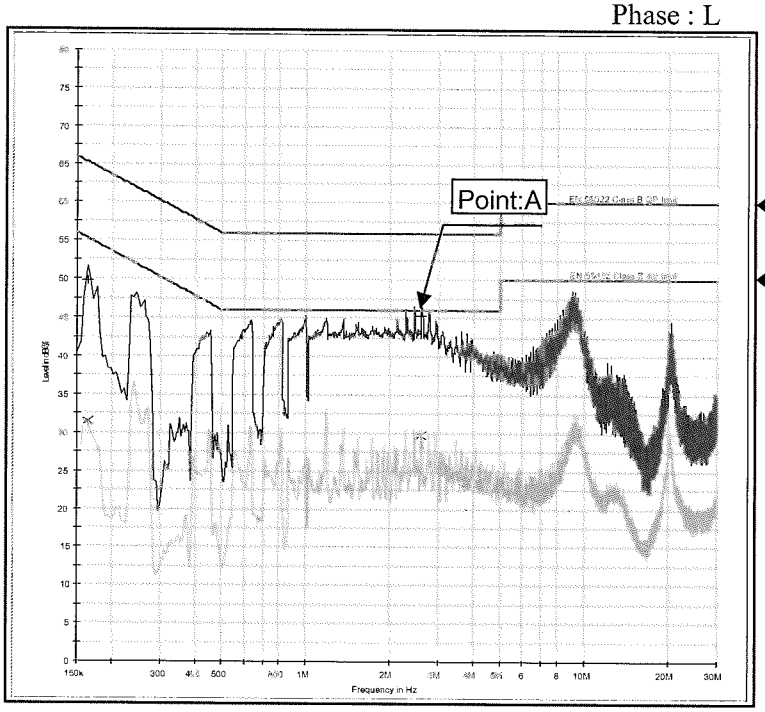
Conditions Vin : 230VAC
Iout : 8.4A (100%)
Ta : 25℃

Conducted Emission

18V

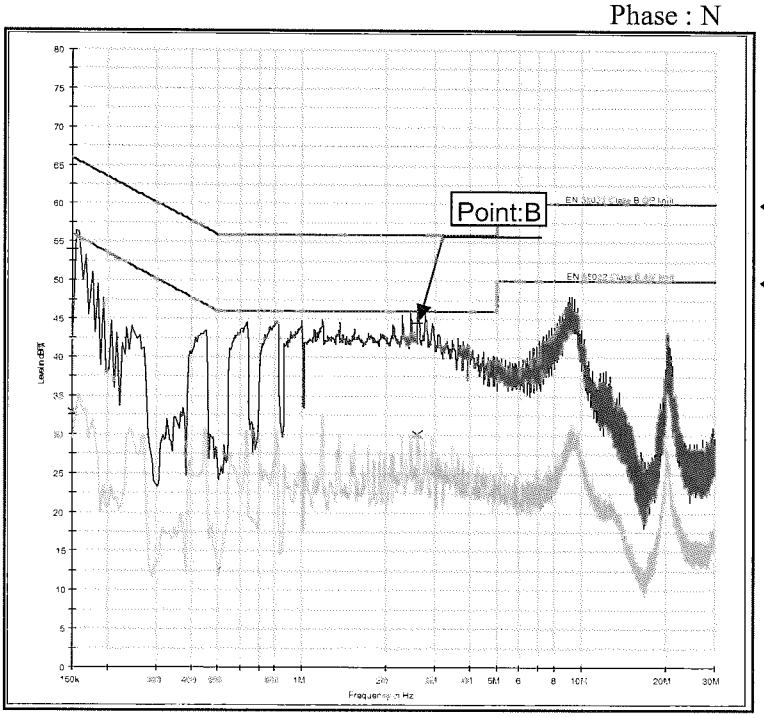
Ref. Data	Point A (2.592MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	45.3
AV	46.0	29.7

Phase : L



Ref. Data	Point B (2.595MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	44.5
AV	46.0	30.1

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

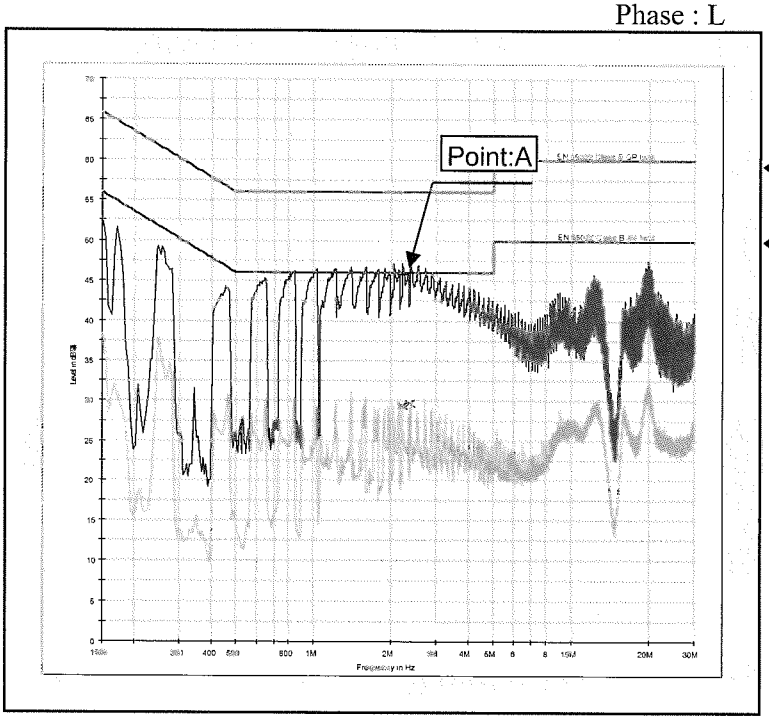
Conditions Vin : 115VAC
Iout : 6.3A (100%)
Ta : 25℃

Conducted Emission

24V

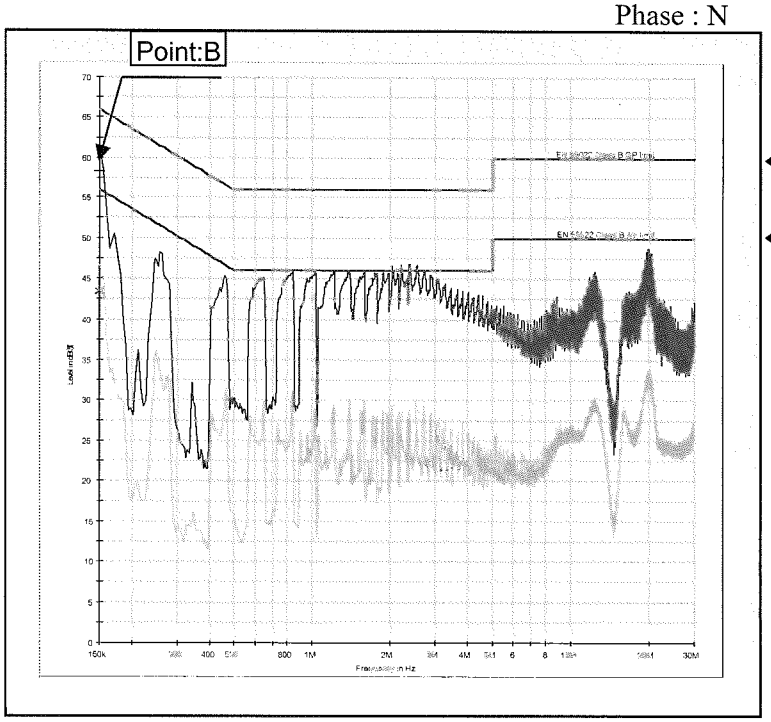
Ref. Data	Point A (2.368MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	46.0
AV	46.0	29.7

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	58.3
AV	56.0	43.4

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

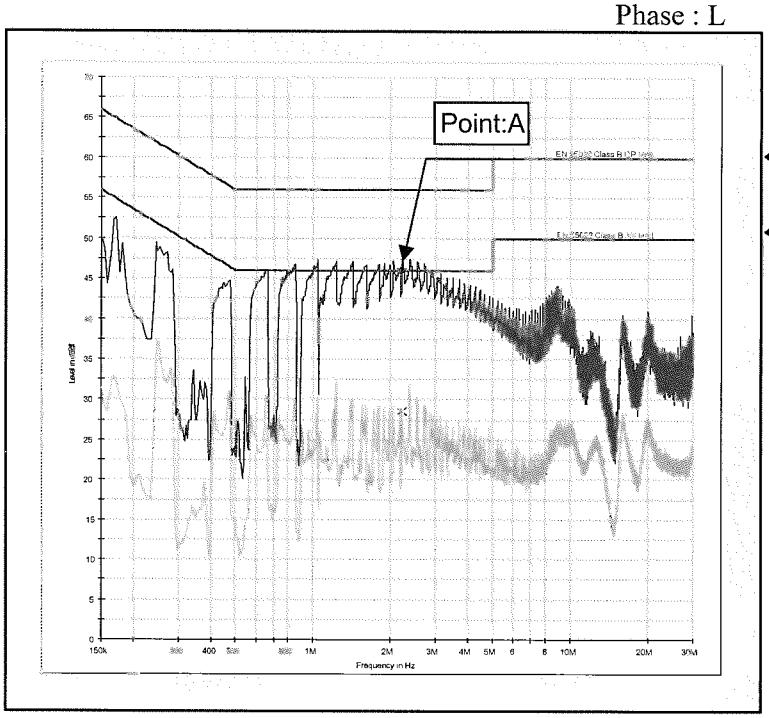
Conditions Vin : 230VAC
Iout : 6.3A (100%)
Ta : 25℃

Conducted Emission

24V

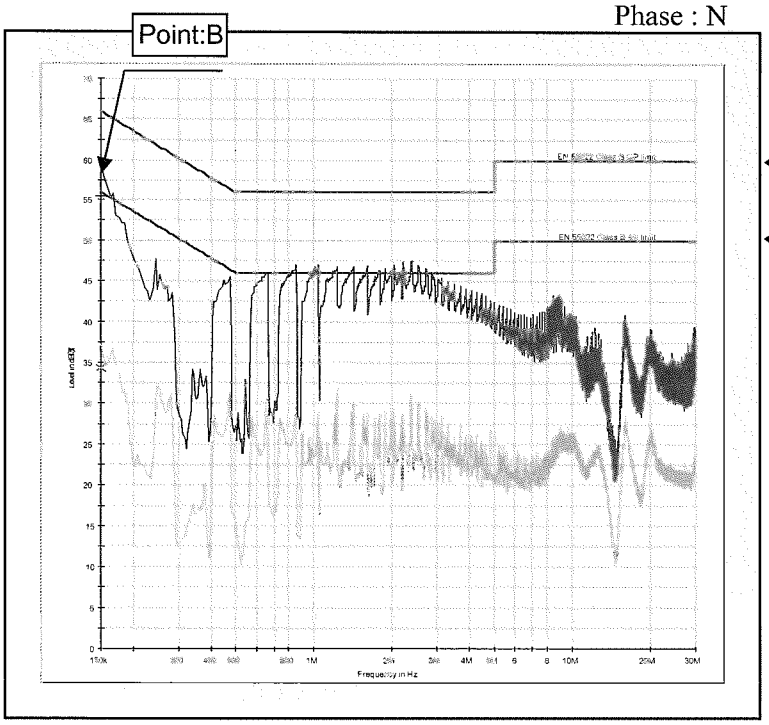
Ref. Data	Point A (2.205MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	46.3
AV	46.0	28.6

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	55.5
AV	56.0	34.3

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

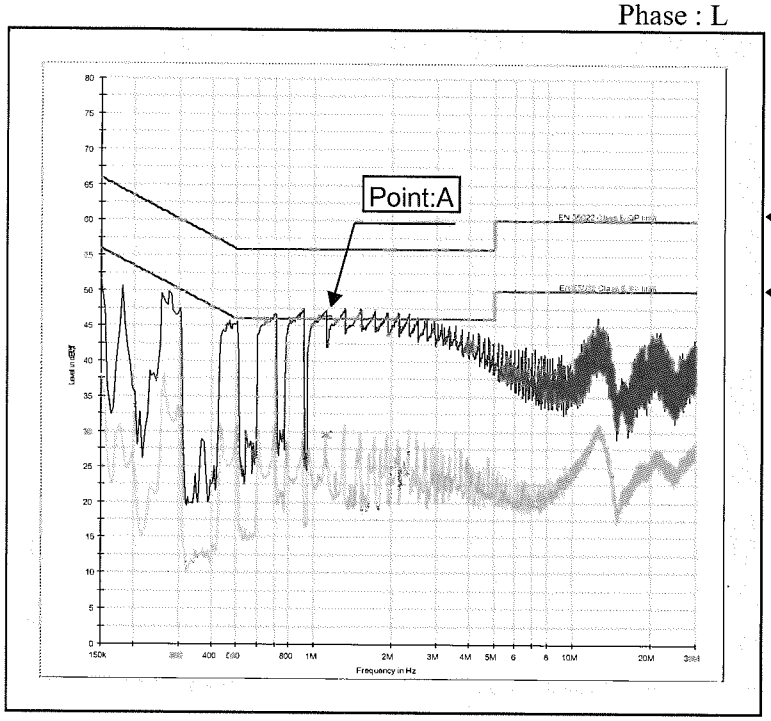
Conditions Vin : 115VAC
Iout : 4.2A (100%)
Istandby : 0A
Ta : 25℃

Conducted Emission

36V

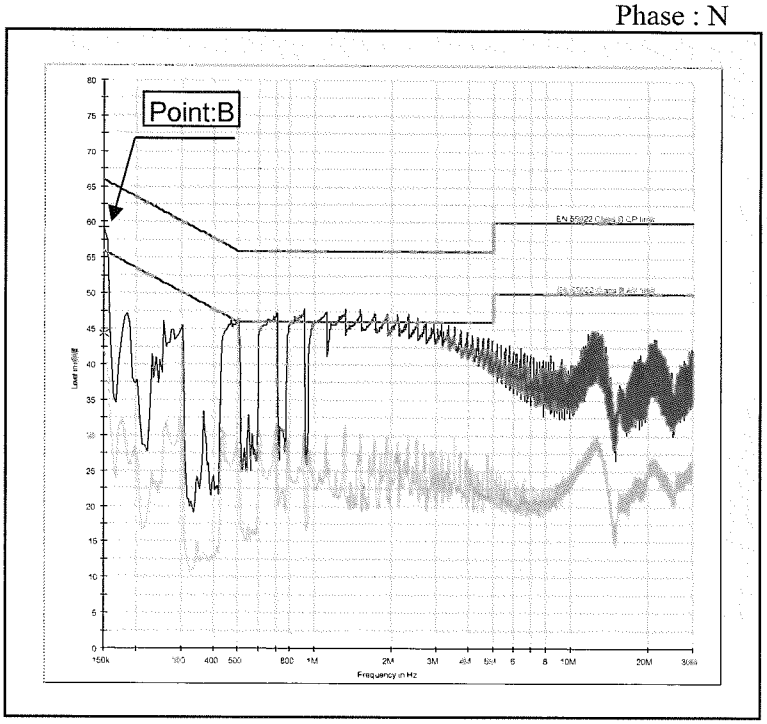
Ref. Data	Point A (1.112MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	46.4
AV	46.0	29.5

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	59.3
AV	56.0	44.6

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

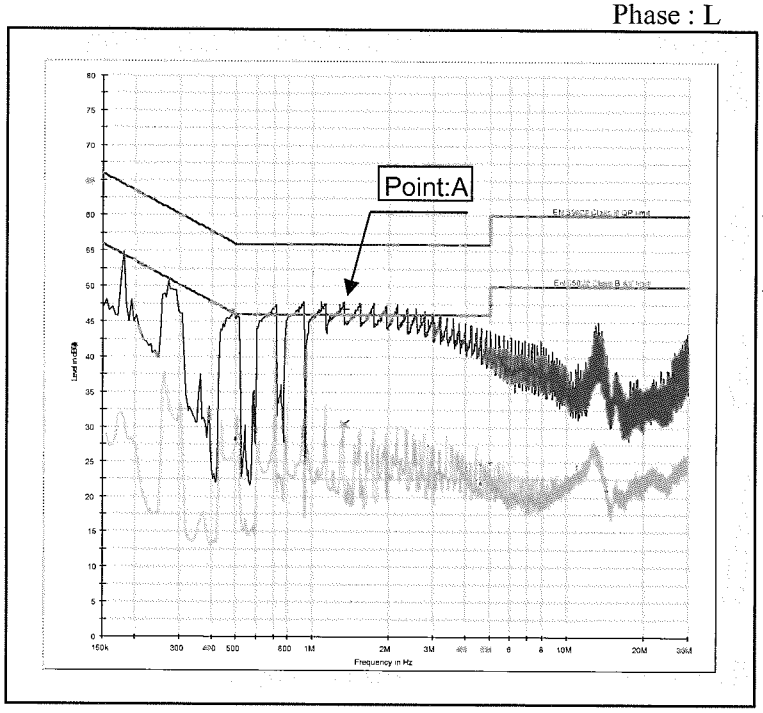
Conditions Vin : 230VAC
Iout : 4.2A (100%)
Istandby : 0A
Ta : 25℃

Conducted Emission

36V

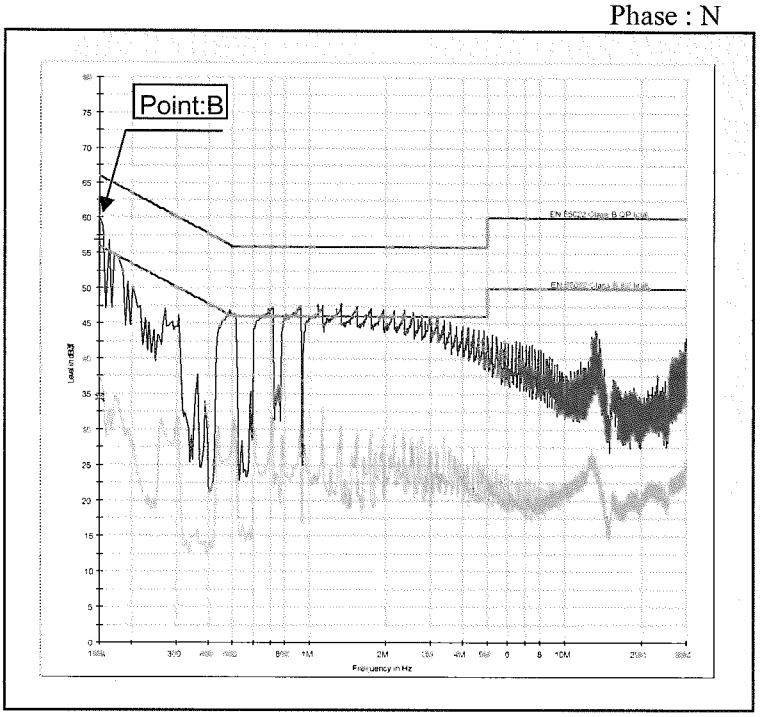
Ref. Data	Point A (1.332MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	46.8
AV	46.0	30.4

Phase : L



Ref. Data	Point B (150kHz) Limit (dBuV)	Measure (dBuV)
QP	66.0	56.8
AV	56.0	34.5

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

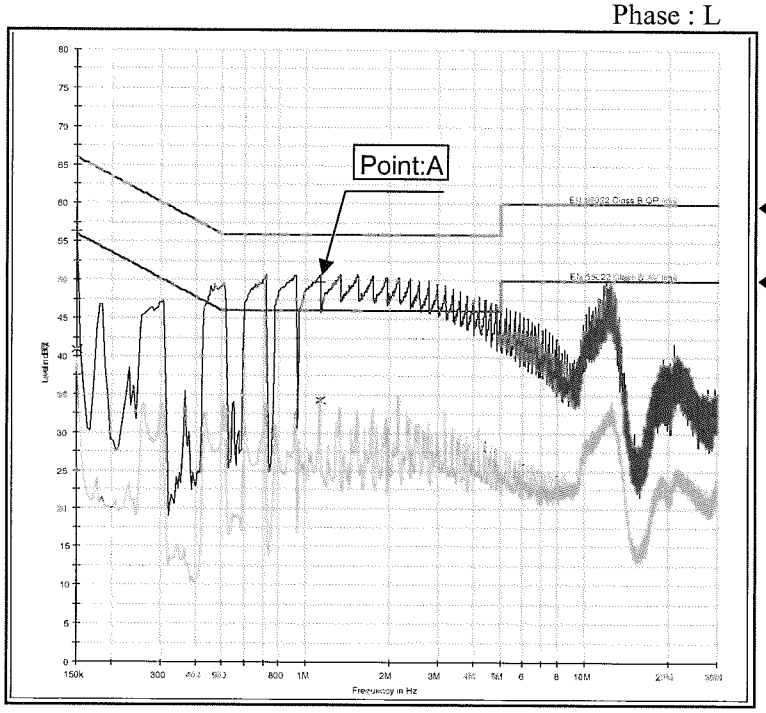
Conditions Vin : 115VAC
Iout : 3.2A (100%)
Ta : 25℃

Conducted Emission

48V

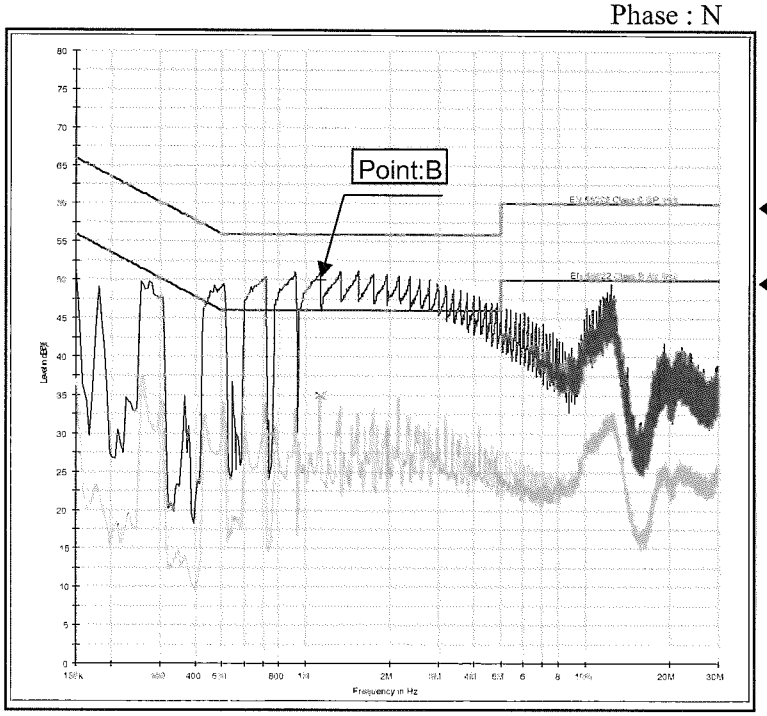
Ref. Data	Point A (1.125MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	49.8
AV	46.0	34.4

Phase : L



Ref. Data	Point B (1.125MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	50.1
AV	46.0	35.0

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2.12 Electro-Magnetic Interference characteristics

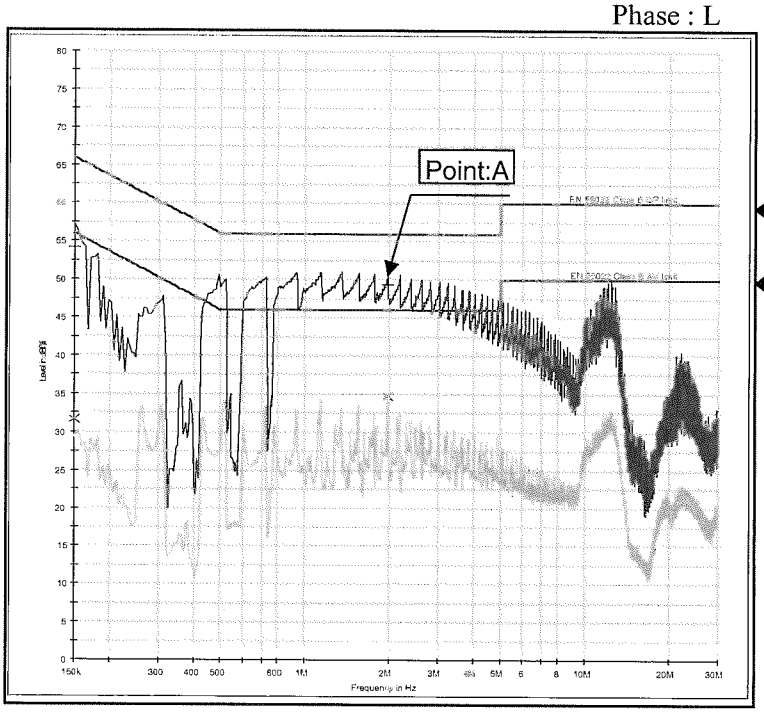
Conditions Vin : 230VAC
Iout : 3.2A (100%)
Ta : 25℃

Conducted Emission

48V

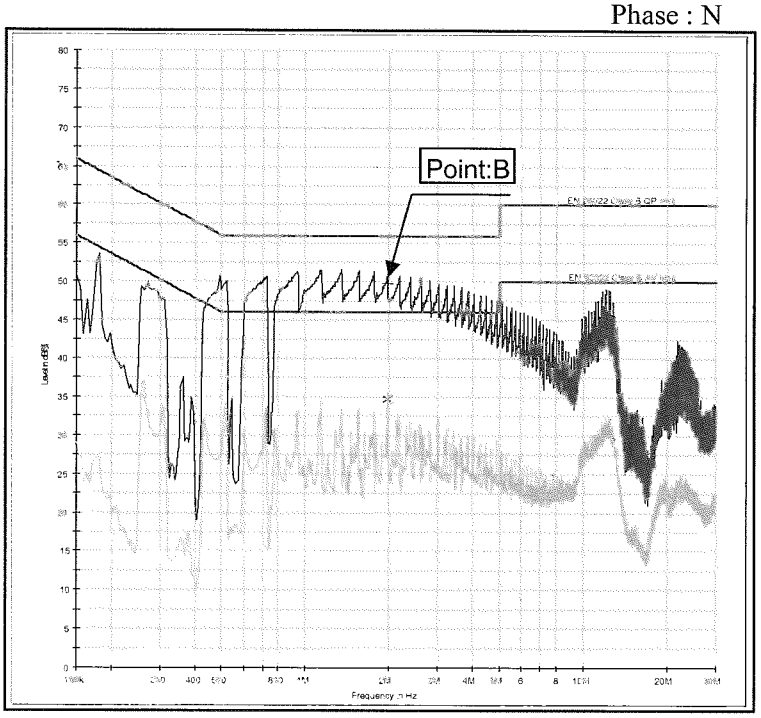
Ref. Data	Point A (1.974MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	49.4
AV	46.0	34.7

Phase : L



Ref. Data	Point B (1.975MHz) Limit (dBuV)	Measure (dBuV)
QP	56.0	49.8
AV	46.0	34.7

Phase : N



Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

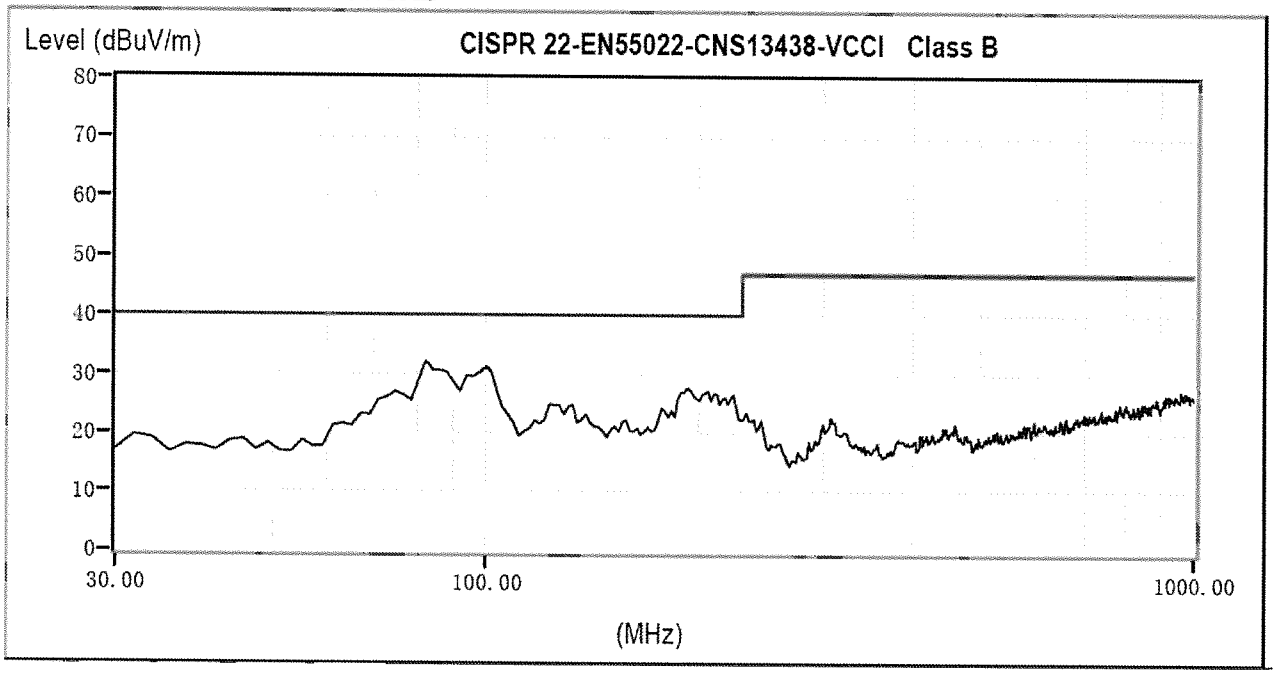
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 115VAC
Iout : 12.5A (100%)
Ta : 25℃

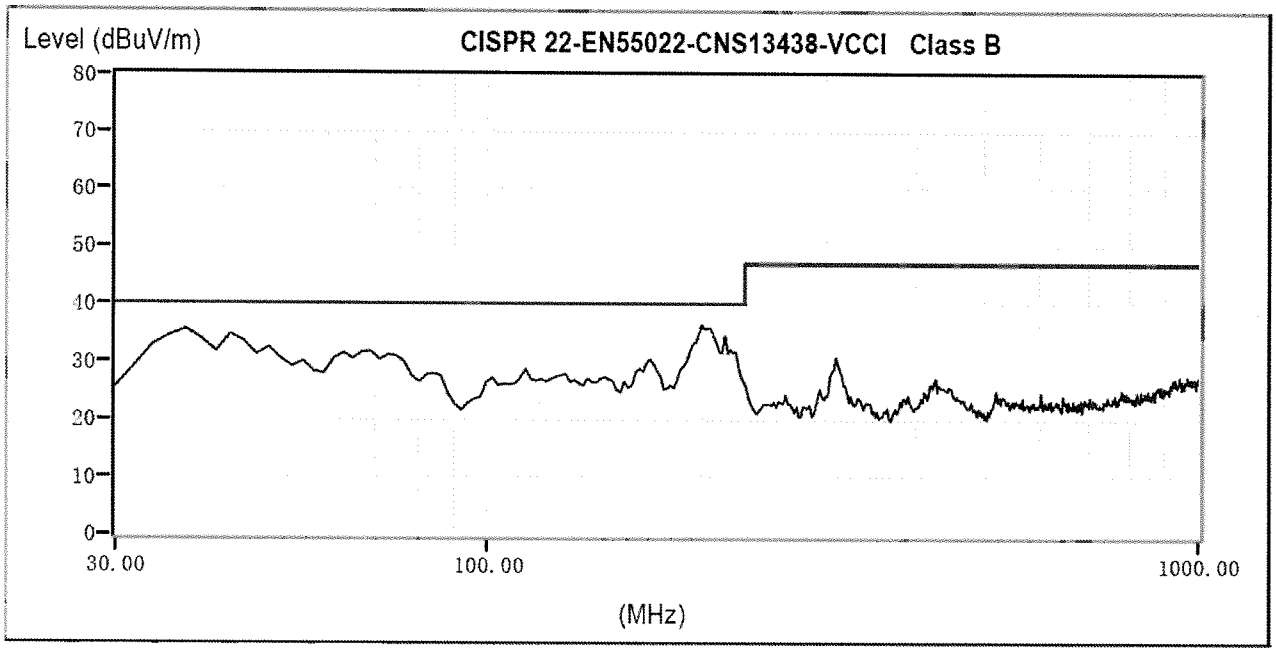
Radiated Emission

12V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

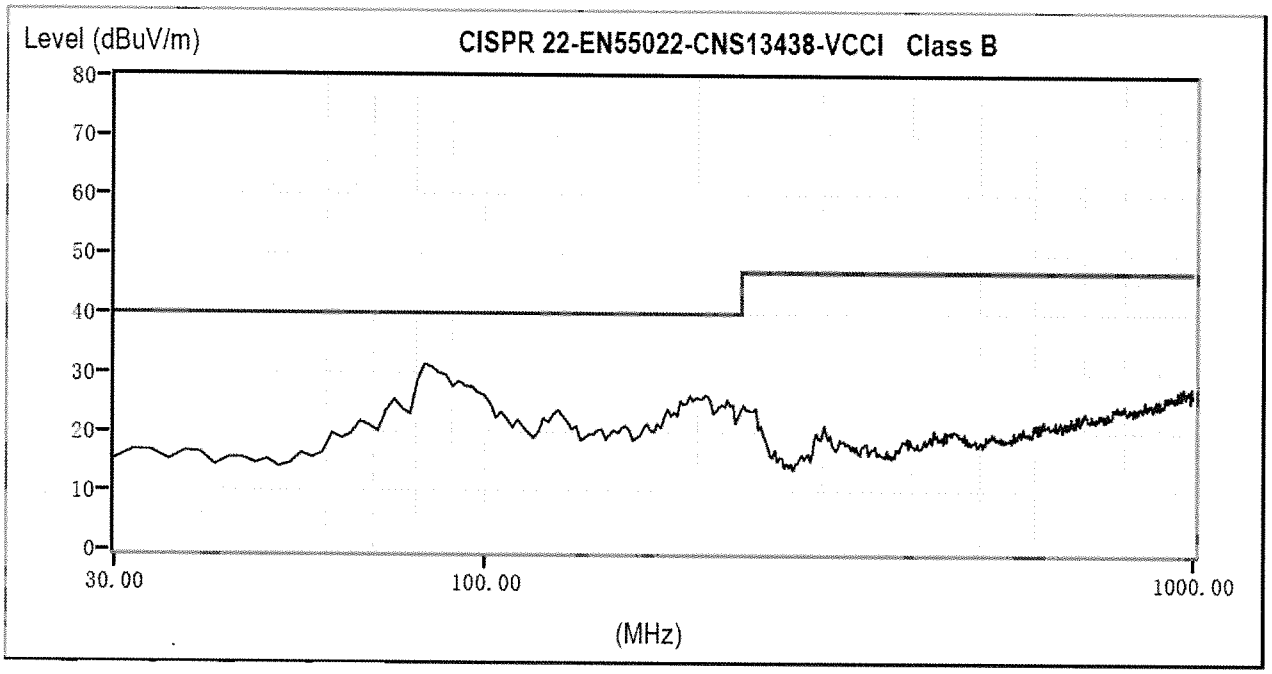
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC
Iout : 12.5A (100%)
Ta : 25℃

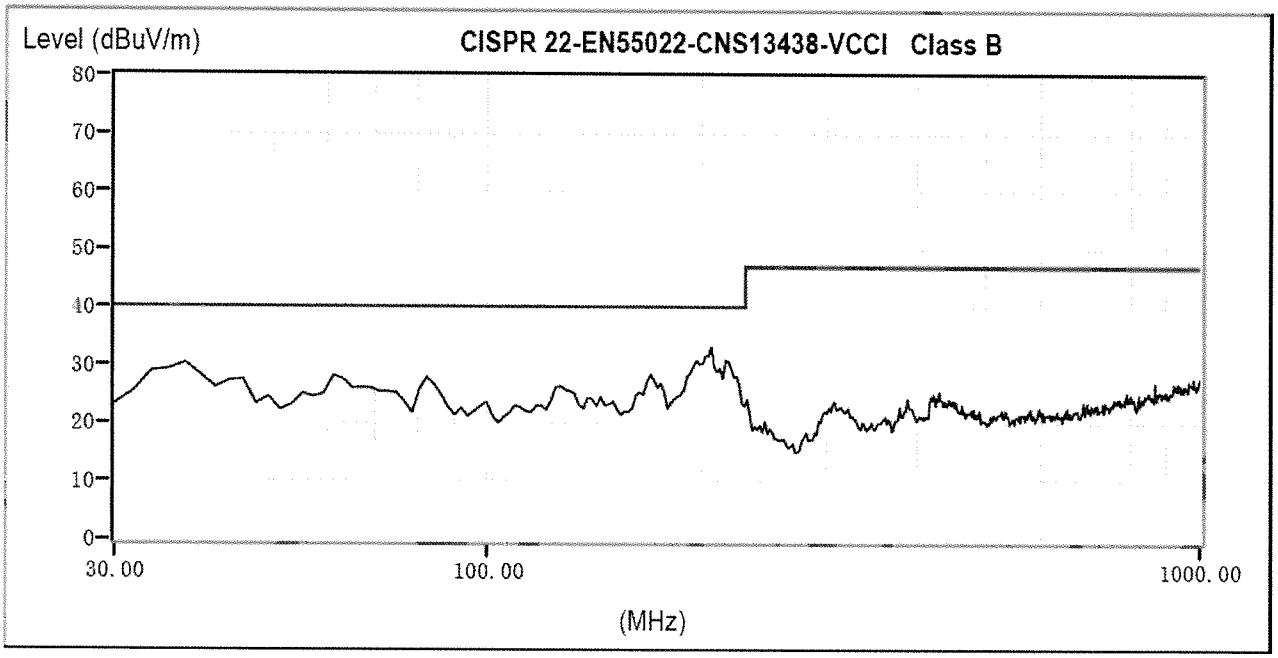
Radiated Emission

12V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

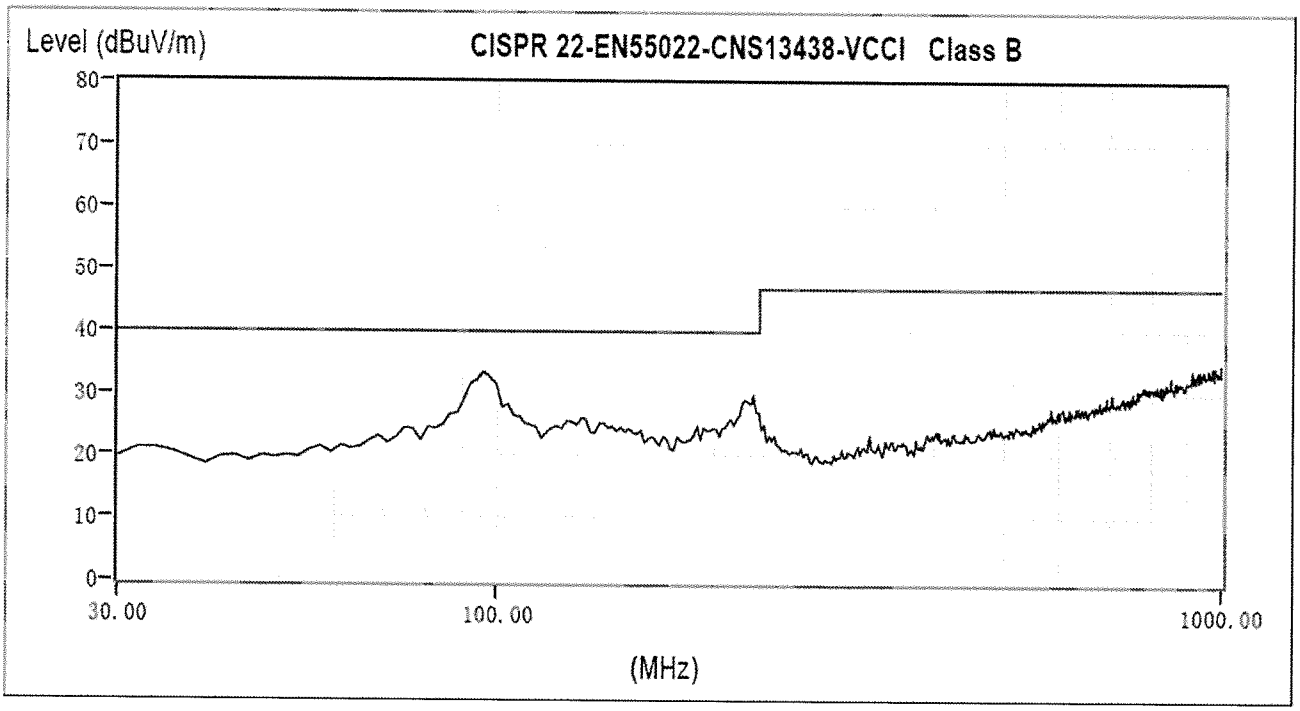
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 115VAC
Iout : 8.4A (100%)
Ta : 25℃

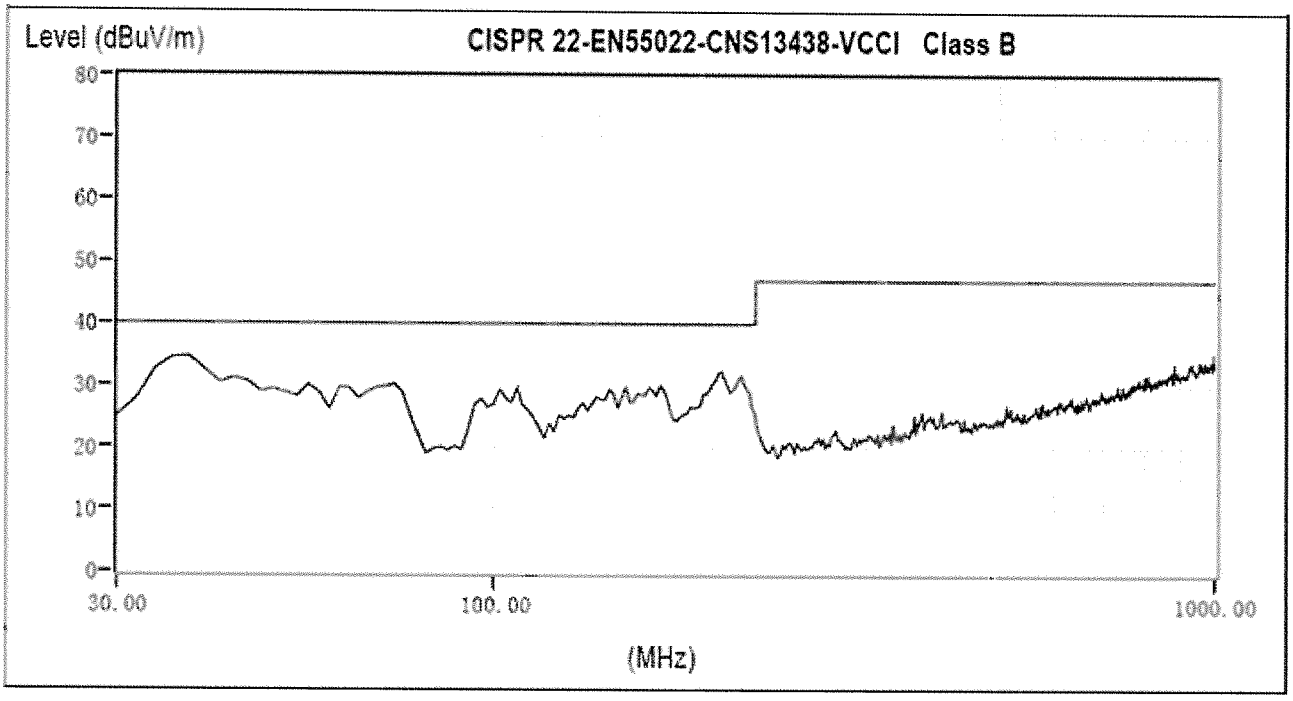
Radiated Emission

18V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

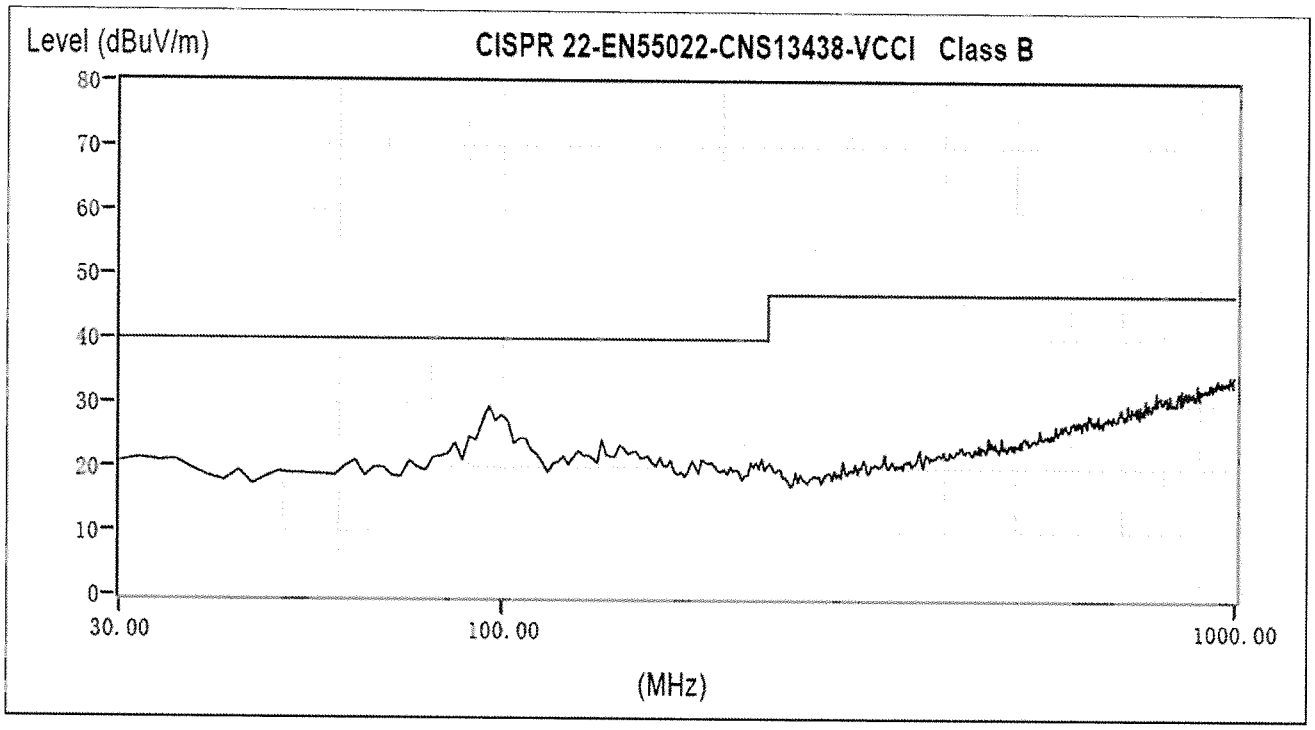
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC
Iout : 8.4A (100%)
Ta : 25℃

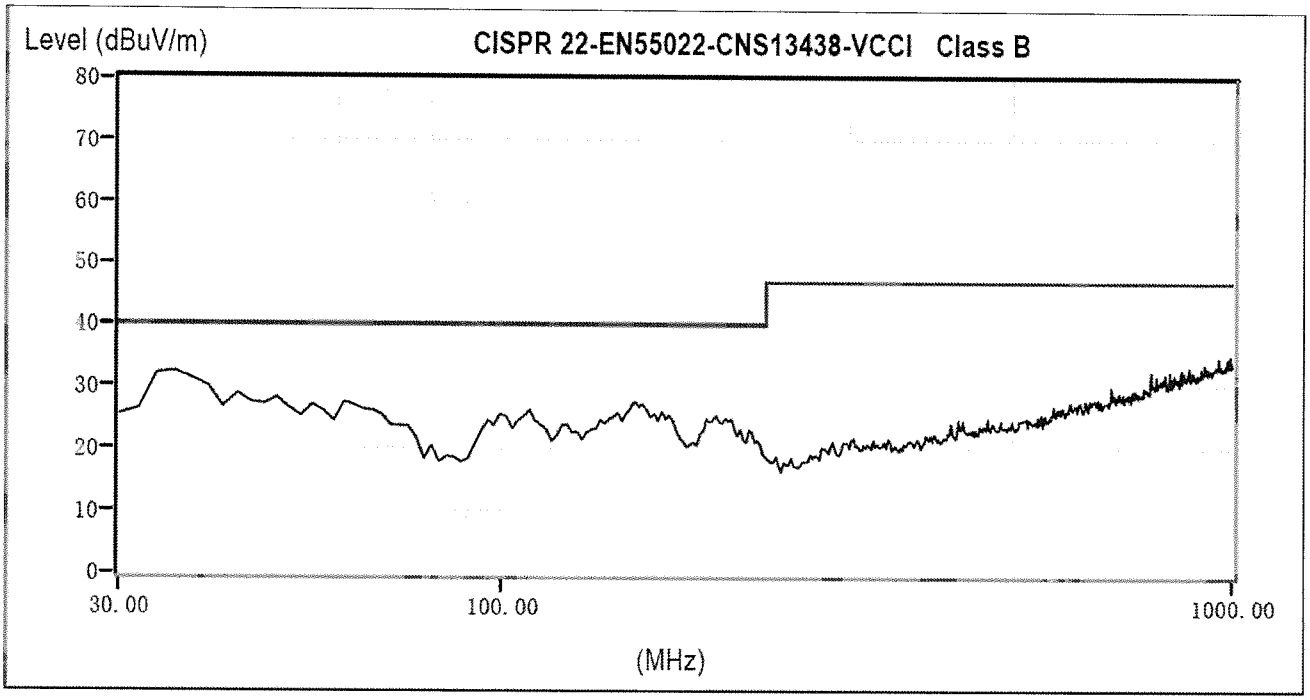
Radiated Emission

18V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

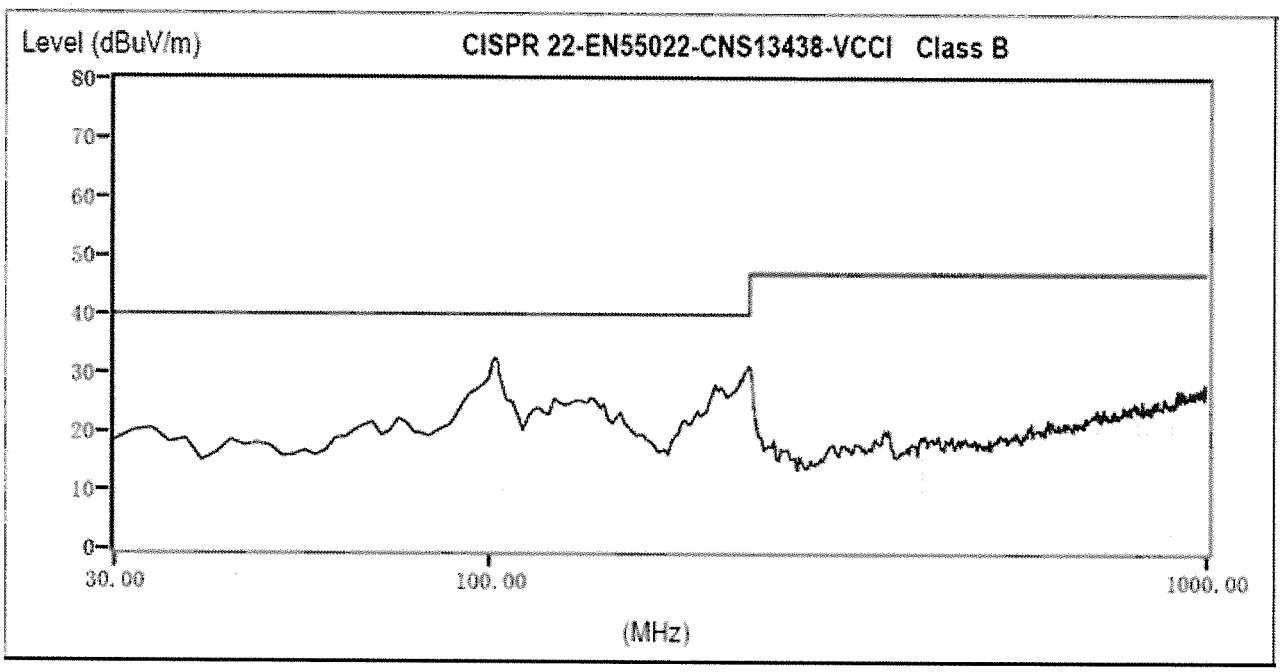
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 115VAC
Iout : 6.3A (100%)
Ta : 25℃

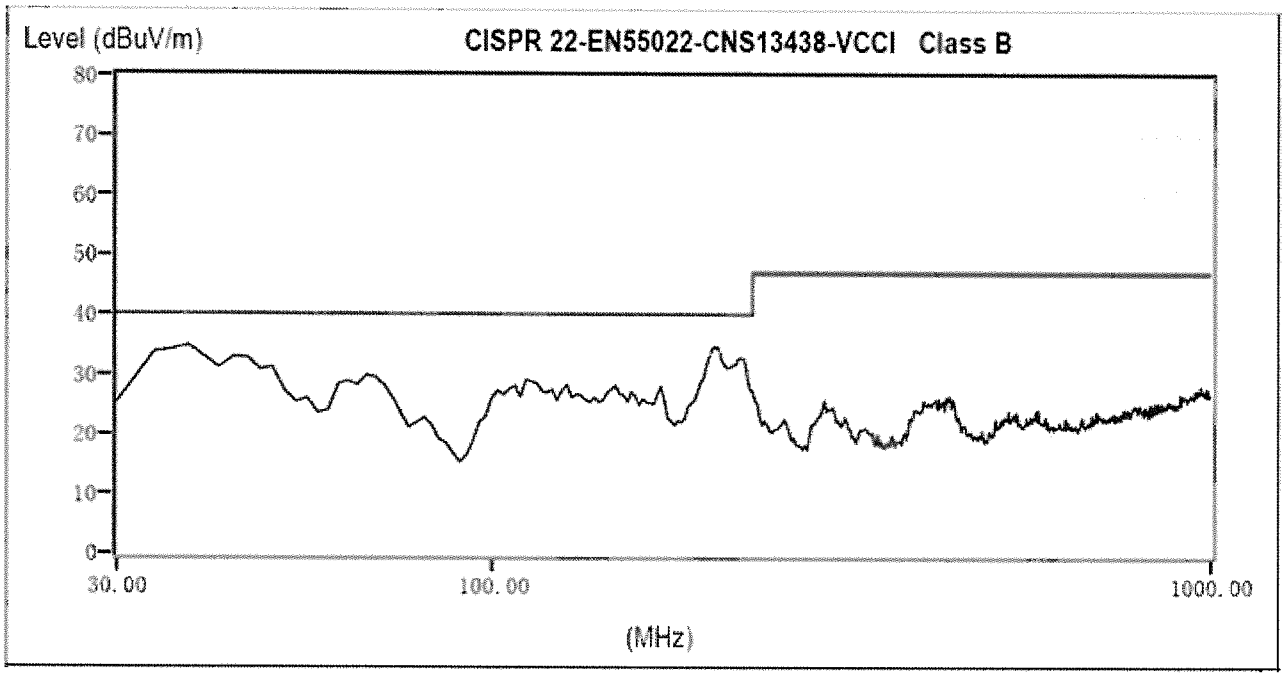
Radiated Emission

24V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

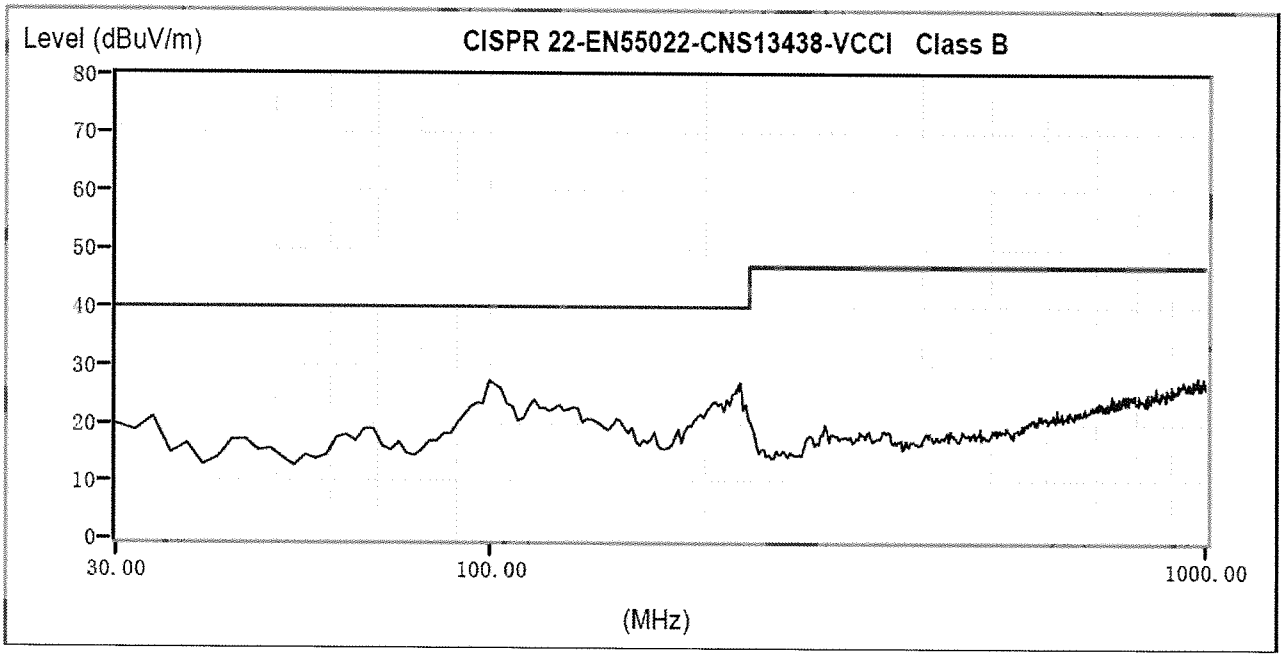
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC
Iout : 6.3A (100%)
Ta : 25℃

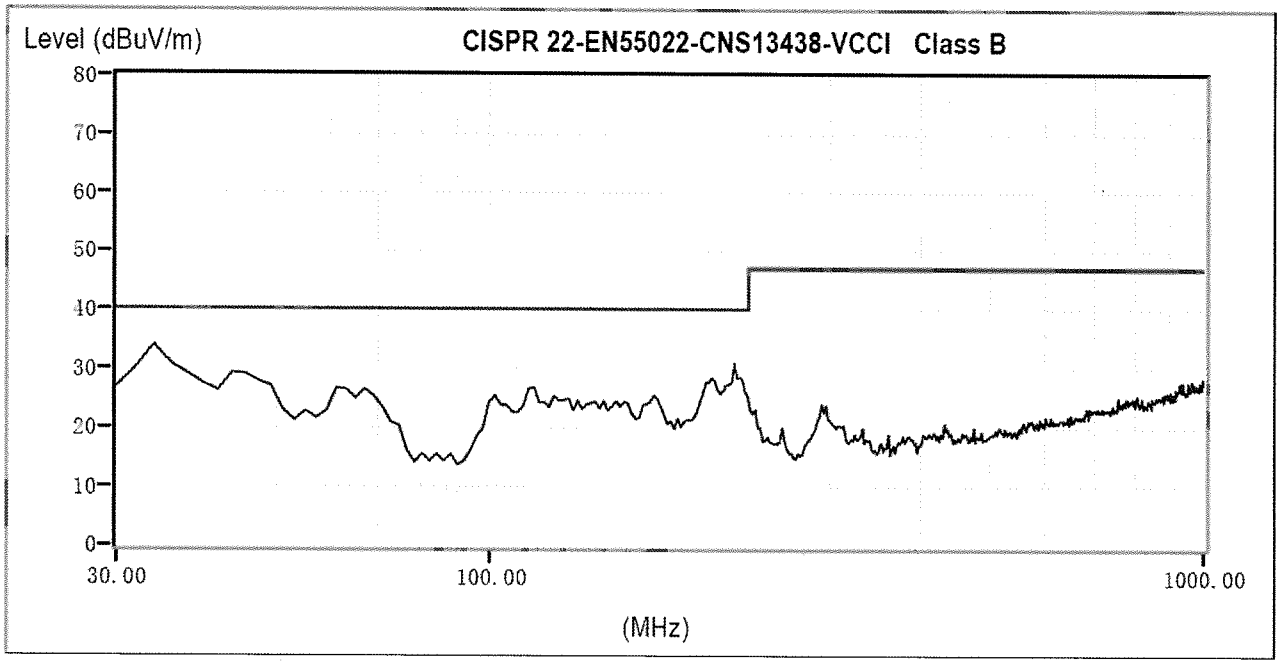
Radiated Emission

24V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

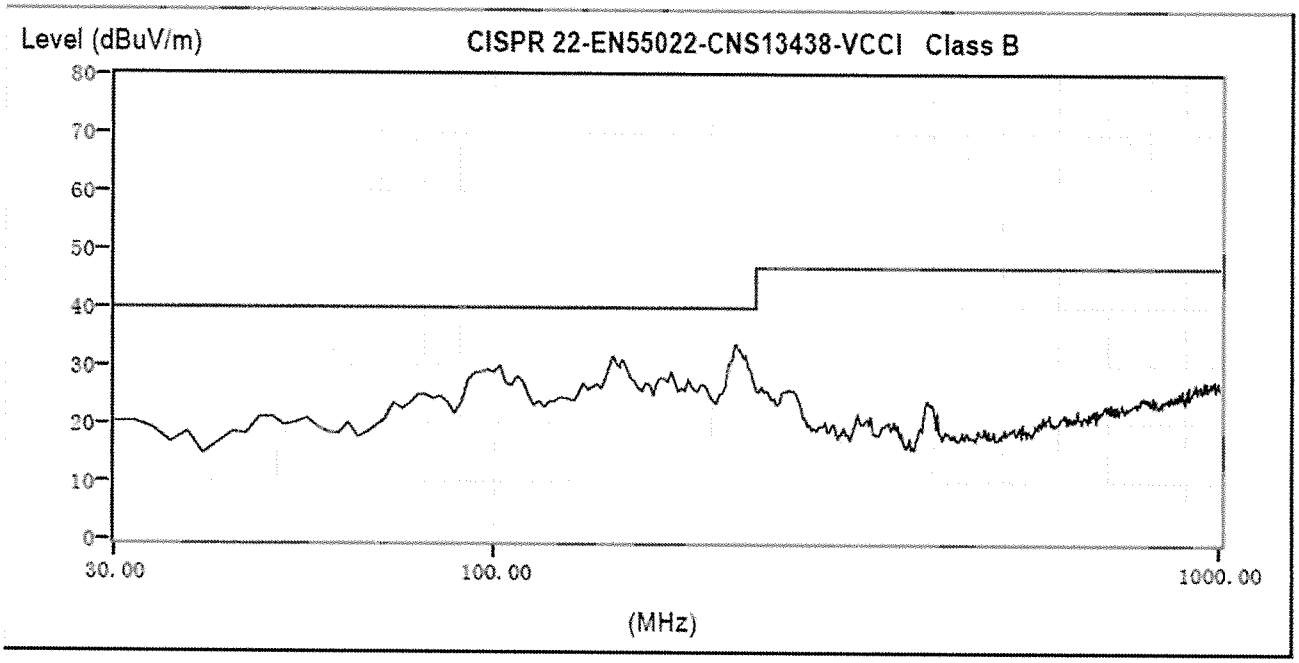
2.12 Electro-Magnetic Interference characteristics

Conditions
Vin : 115VAC
Iout : 4.2A (100%)
Istandby : 0A
Ta : 25℃

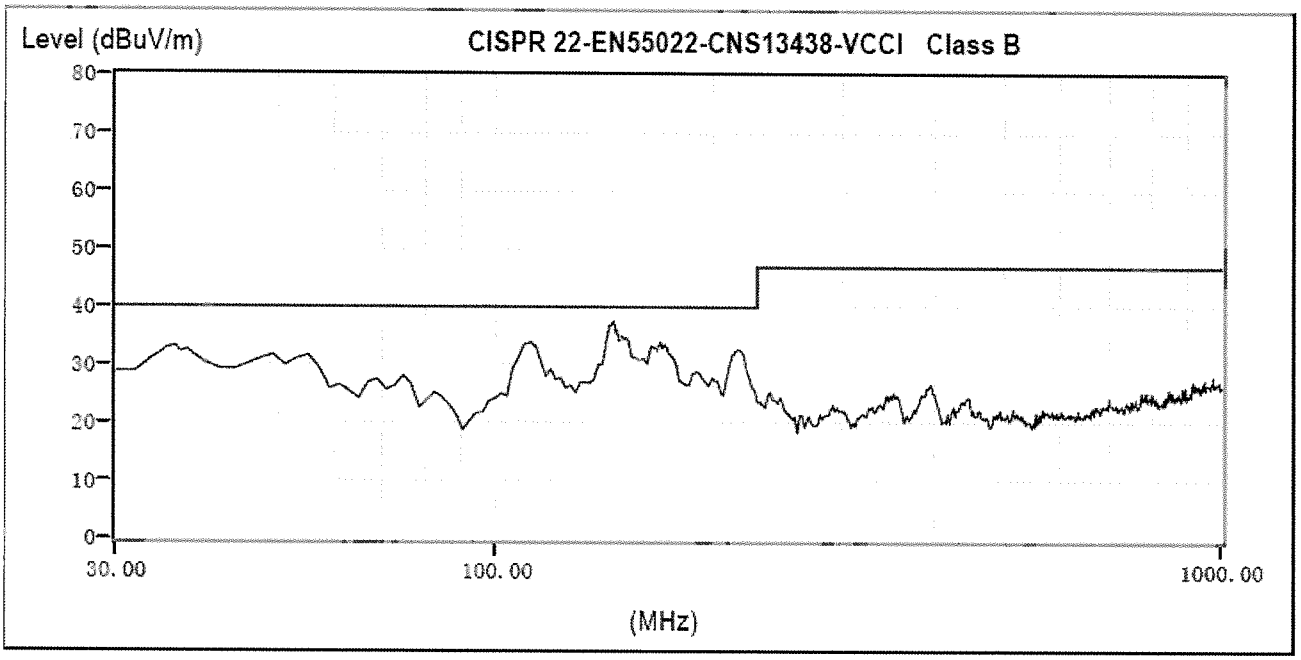
Radiated Emission

36V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

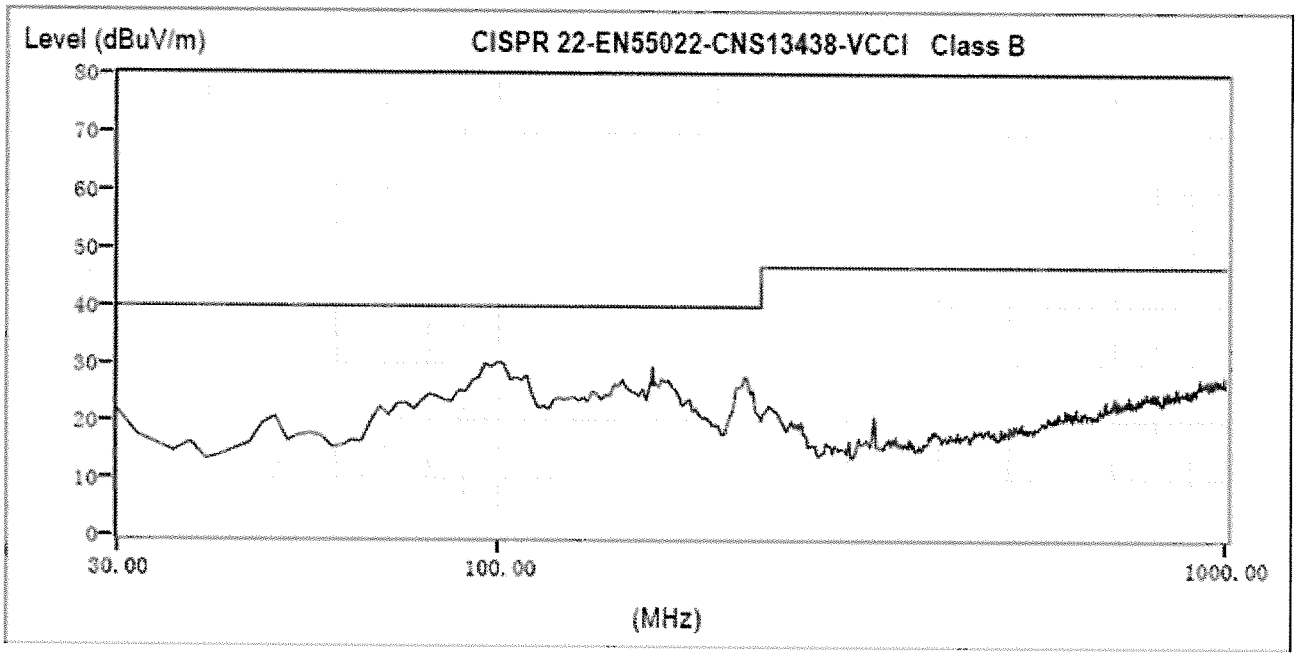
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC
Iout : 4.2A (100%)
Istandby : 0A
Ta : 25℃

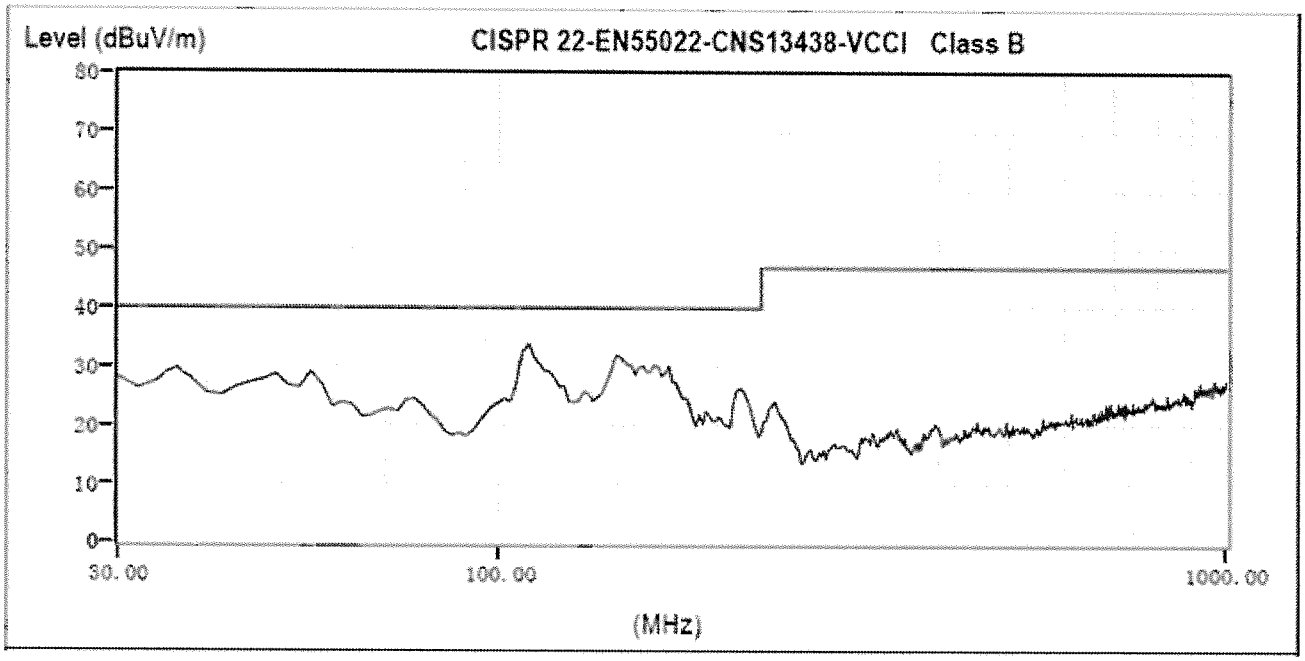
Radiated Emission

36V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

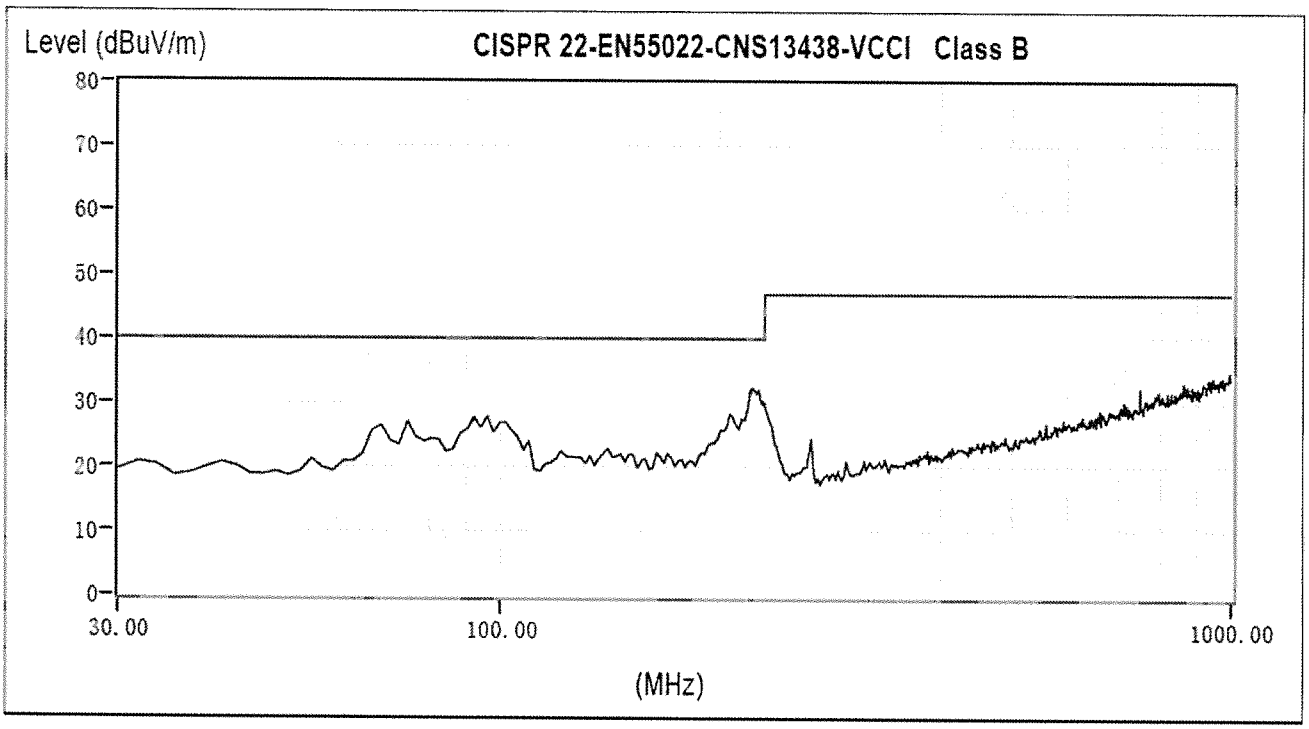
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 115VAC
Iout : 3.2A (100%)
Ta : 25℃

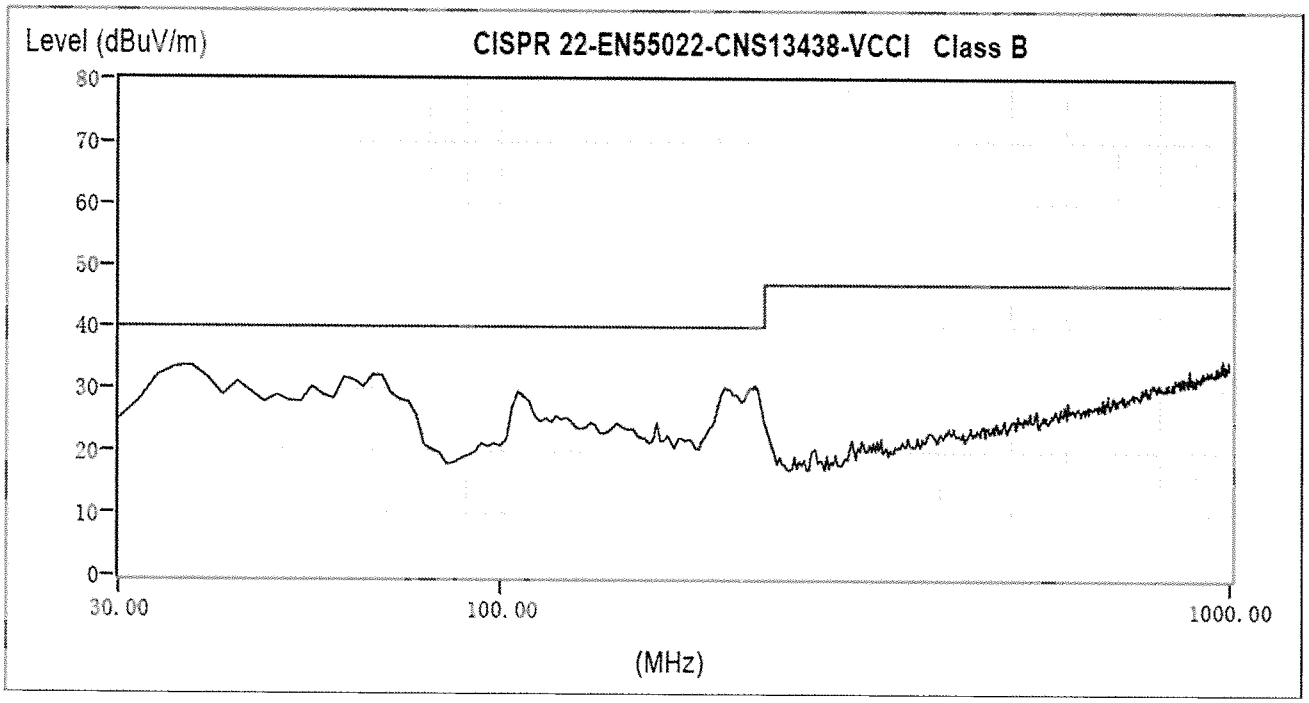
Radiated Emission

48V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.

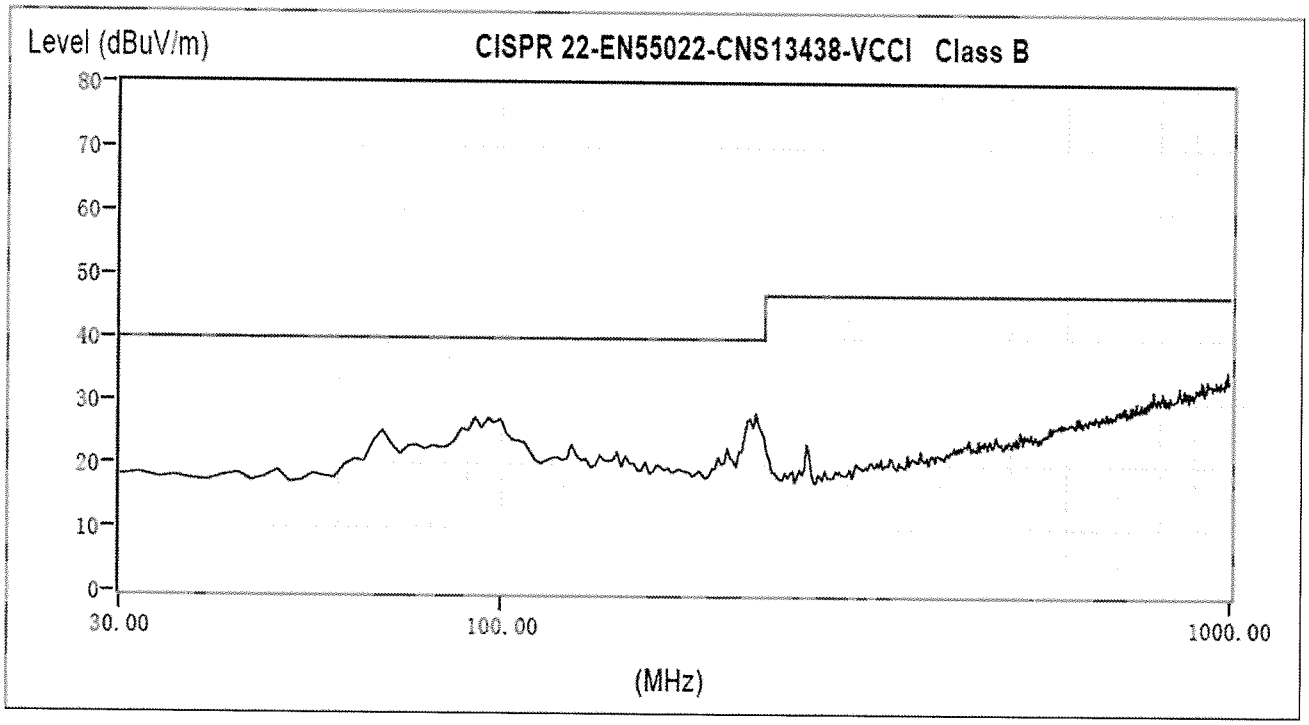
2.12 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC
Iout : 3.2A (100%)
Ta : 25℃

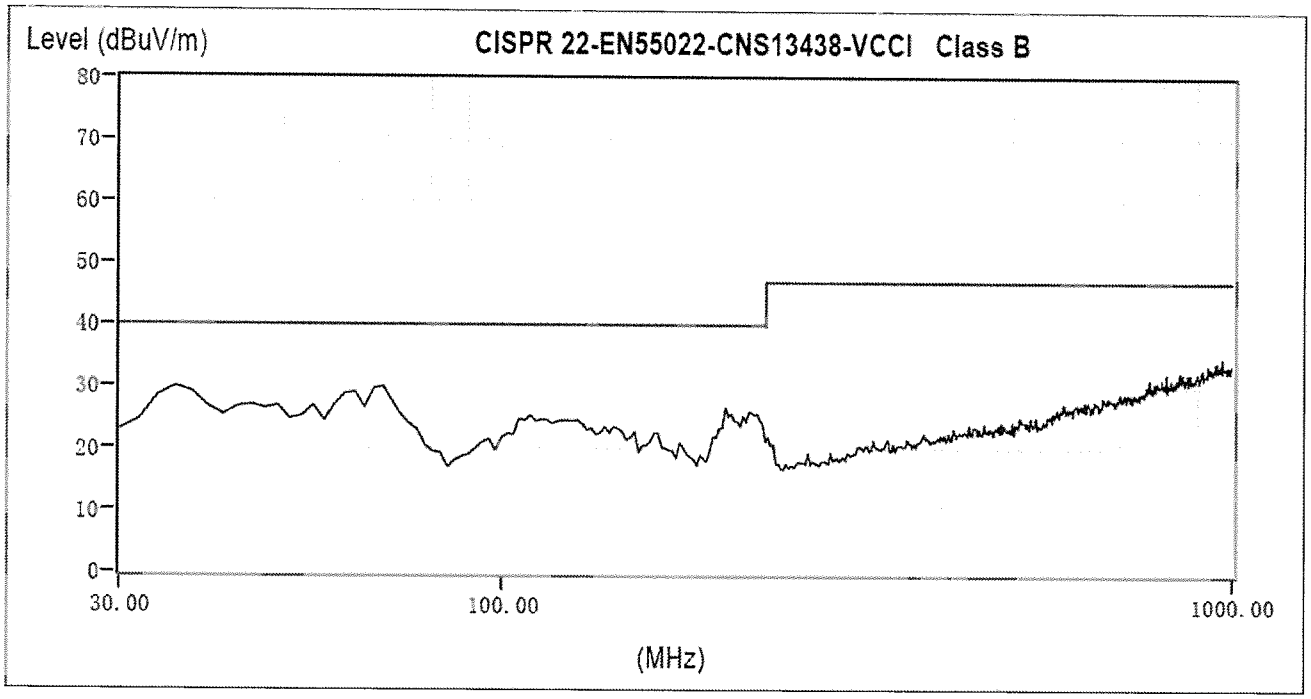
Radiated Emission

48V

HORIZONTAL



VERTICAL



Limit of EN55011-B,EN55022-B are same as its VCCI class B.
Indication is peak values.