

# VS150P

## EVALUATION DATA

### 型式データ

DWG No. A222-53-01		
APPD	CHK	DWG
M. I. sa 27. May. '04	<i>Hatsunoto</i> 26/May/04	k. Shimamura 26/May/04

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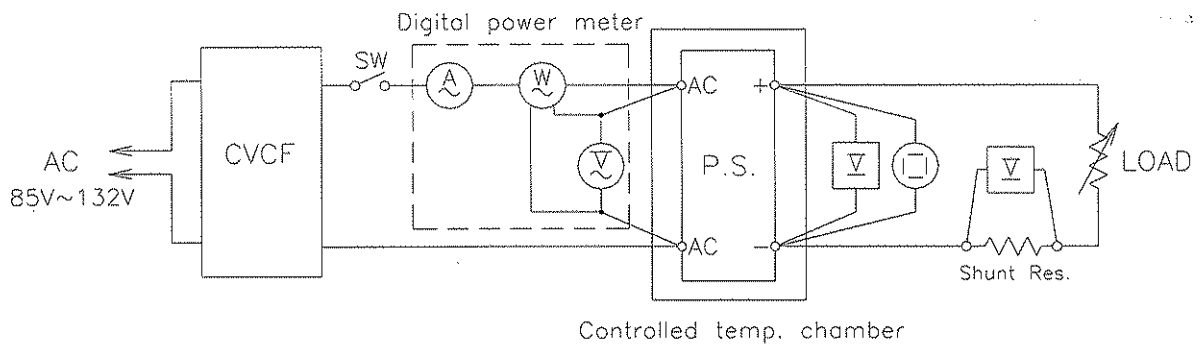
#### 使用記号 Terminology used

	Definition	
$V_{in}$	..... 入力電圧	Input voltage
$V_{out}$	..... 出力電圧	Output voltage
$I_{in}$	..... 入力電流	Input current
$I_{out}$	..... 平均出力電流	Average Output current
$T_a$	..... 周囲温度	Ambient temperature

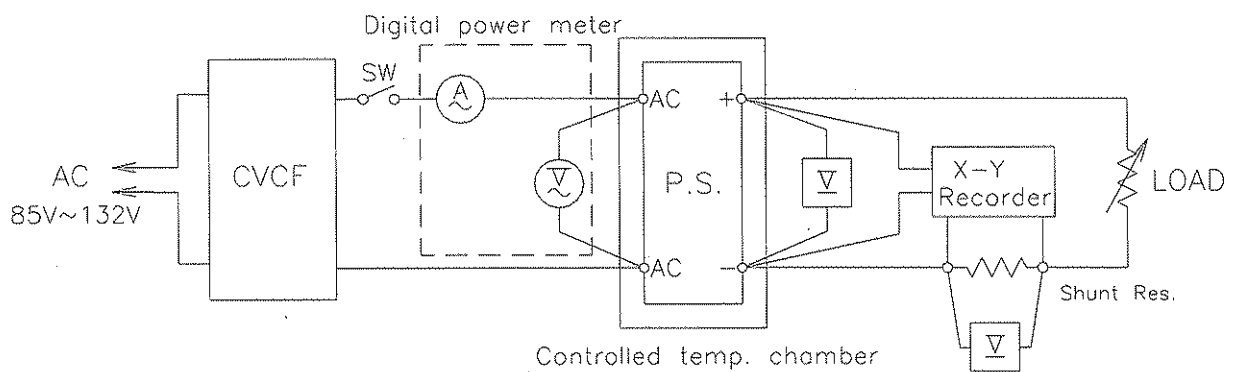
## 1. 測定方法 Evaluation Method

### 1.1 測定回路 Circuit used for determination

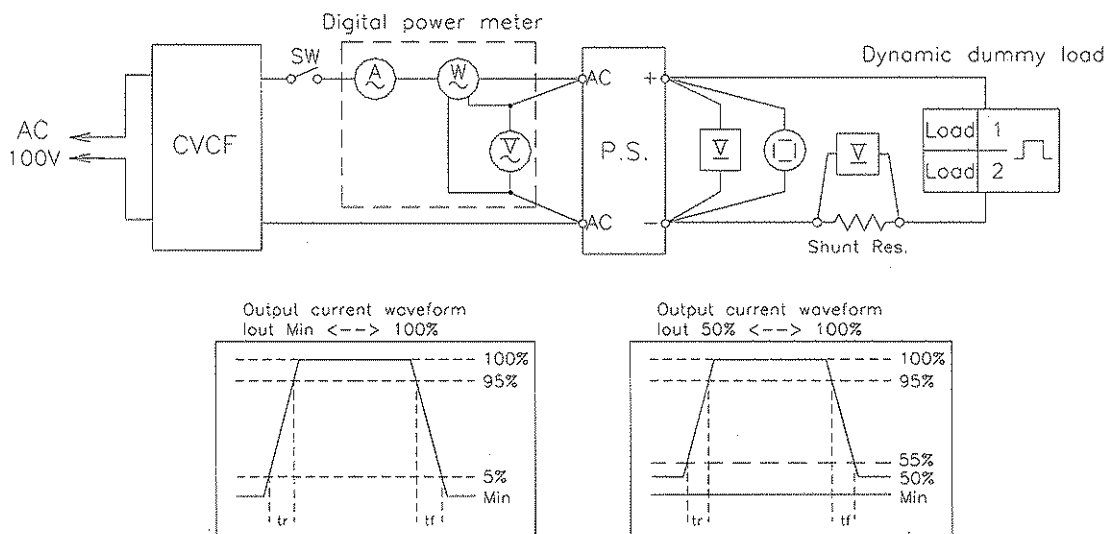
- (1) 静特性 Steady state data
- (2) 通電ドリフト特性 Warm up voltage drift characteristics
- (3) 過電圧保護特性 Over voltage protection (OVP) characteristics
- (4) 出力立ち上がり特性 Output rise characteristics
- (5) 出力立ち下がり特性 Output fall characteristics
- (6) 過渡応答 (入力急変) 特性 Dynamic line response characteristics
- (7) 出力保持時間特性 Hold up time characteristics
- (8) 入力電圧瞬停特性 Response to brown out characteristics



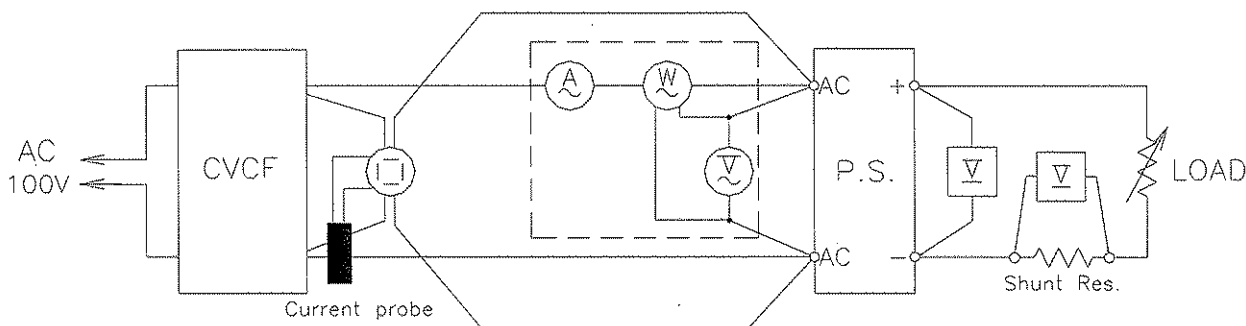
- (9) 過電流保護特性 Over current protection (OCP) characteristics



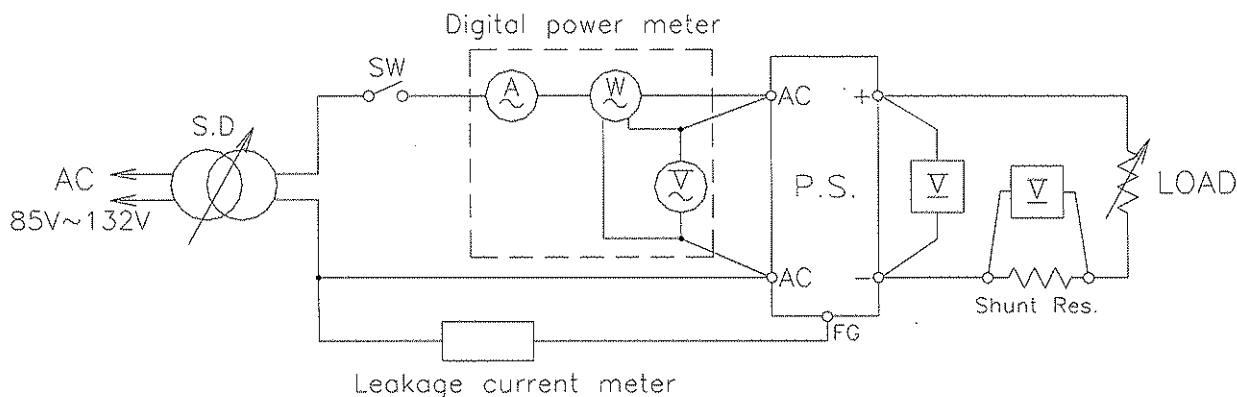
(10) 過渡応答 (負荷急変) 特性 Dynamic load response characteristics



(11) 入力電サージ電流 (突入電流) 特性 Inrush current characteristics



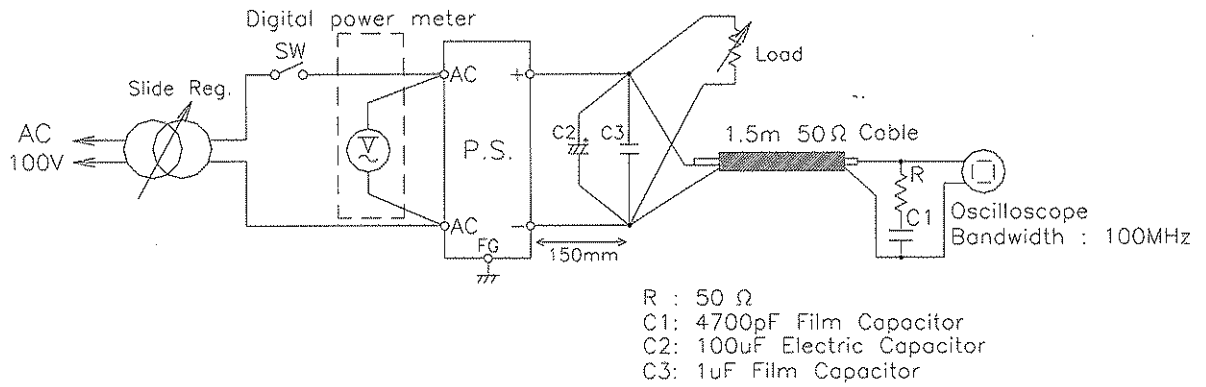
(12) リーク電流特性 Leakage current characteristics



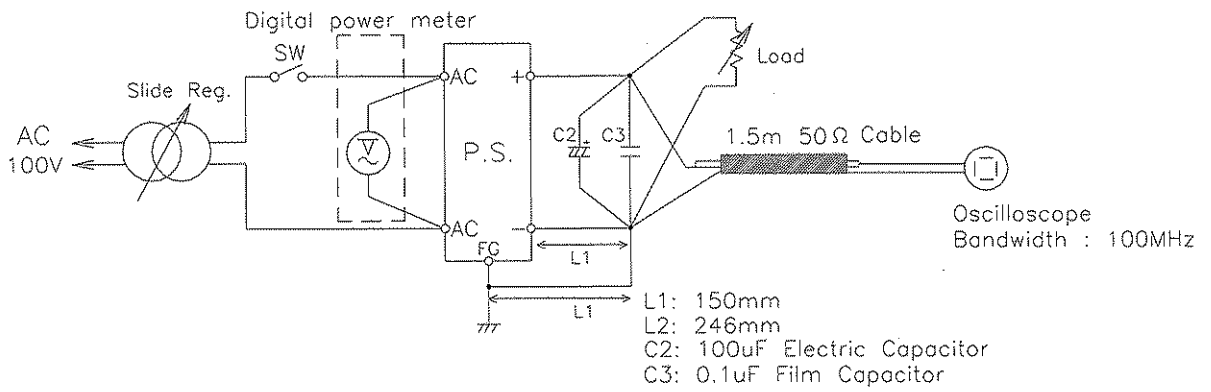
NOTE : Leakage current measured through a 1k ohm resistor.  
 Range used ---AC+DC (For YOKOGAWA TYPE 3226)  
 ---AC (For SIMPSON MODEL 229-2)

(13) 出力リップル、ノイズ特性 Output ripple and noise characteristics

(a) Normal Mode (JEITA Standard RC-9131)

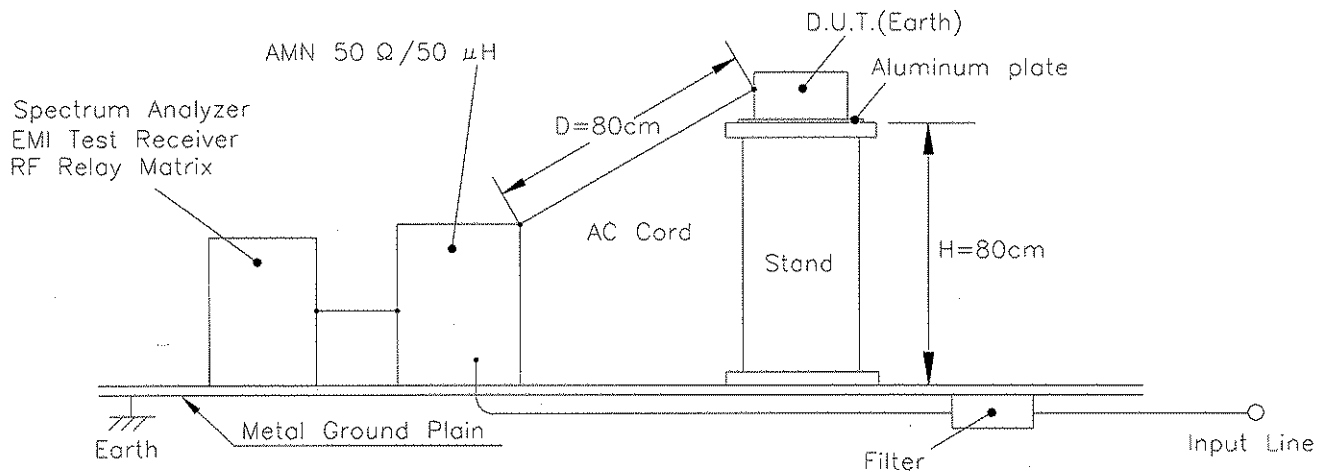


(b) Normal + Common Mode

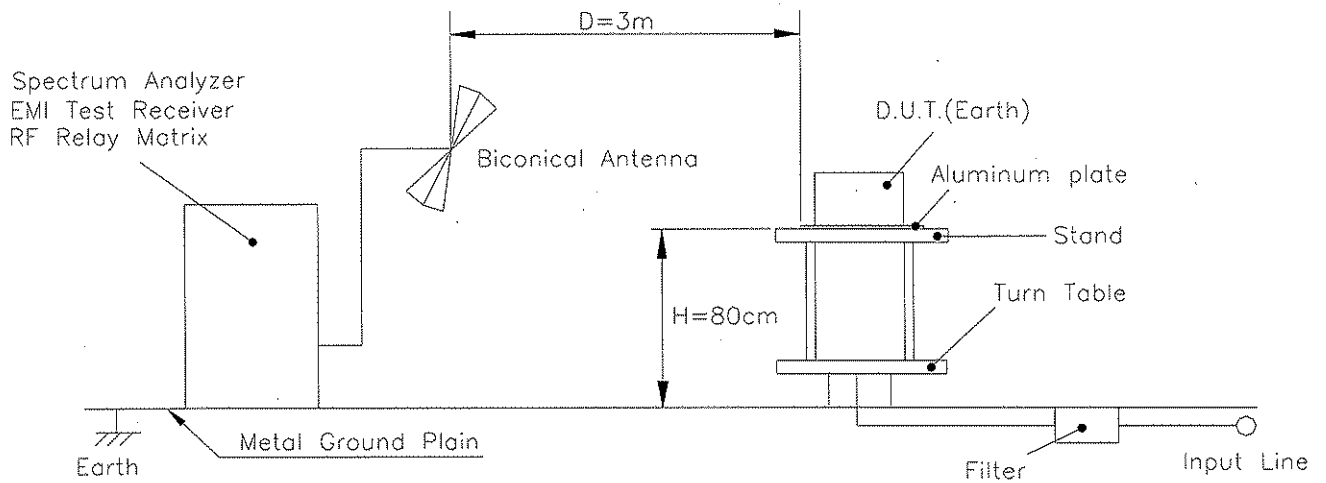


(14) EMI 特性 Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 Conducted Emission Noise



(b) 雑音電界強度 Radiated Emission Noise



## 1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	OSCILLOSCOPE	HITACHI DENSHI	V-1565/V-1100A
2	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS540D
3	DIGITAL MULTIMETER	YOKOGAWA ELECT.	7544/1/1
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110
5	SHUNT RESISTOR	YOKOGAWA ELECT.	2215
6	CURRENT PROBE/AMPLIFIER	TEKTRONIX	TM502A/AM503
7	DYNAMIC DUMMY LOAD	TAKASAGO	FK-600L
8	SLIDE REGURATOR	MATSUNAGA	SD-2652
9	CVCF	TAKASAGO	AA2000XG
10	LEAKAGE CURRENT METER	SIMPSON	229-2
11	LEAKAGE CURRENT METER	YOKOGAWA	TYPE3226
12	CONTROLLED TEMP. CHANBER	TABAI ESPEC	SH-240
13	SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSA
14	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESHS10
15	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESVS10
16	RF RELAY MATRIX	ROHDE & SCHWARZ	PSU
17	AMN	KYORITU DENSHI	KNW-242
18	ANTENA(BICONICAL ANTENA)	SCHWARZBECK NF ELECTRONIC	BBA9106
19	MULTIFUNCTION SYNTHESIZER	INSTRUMENTS	DF1940



2. 特性データ Characteristics

2.1 静特性 Steady state data

(1) 入力、負荷、温度変動

Regulation - Line and Load, Temperature drift

1. Regulation - Line and Load Condition Ta : 25°C

Iout \ Vin	85VAC	100VAC	132VAC	Line regulation	
	0%	23.985V	23.985V	23.986V	1mV
50%	23.980V	23.979V	23.978V	2mV	0.008%
100%	23.976V	23.975V	23.967V	9mV	0.038%
Load regulation	9mV	10mV	19mV		
	0.038%	0.042%	0.079%		

2. Temperature drift Conditions Vin : 100VAC

Iout : 100%

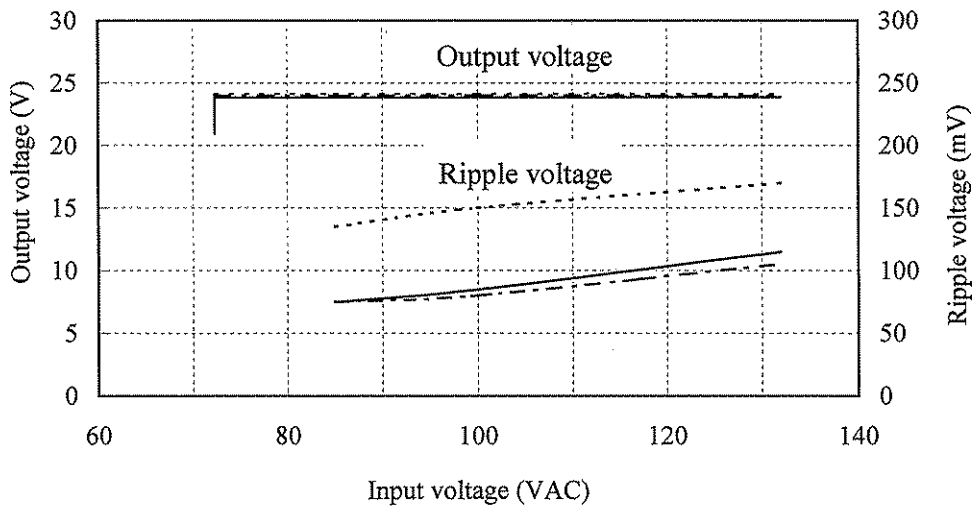
Ta	-10°C	+25°C	+50°C	Temperature stability	
Vout	24.097V	23.975V	23.850V	247mV	1.029%

(2) 出力電圧、リップル電圧 対 入力電圧

Output voltage and Ripple voltage v.s. Input voltage

Conditions Iout : 100%

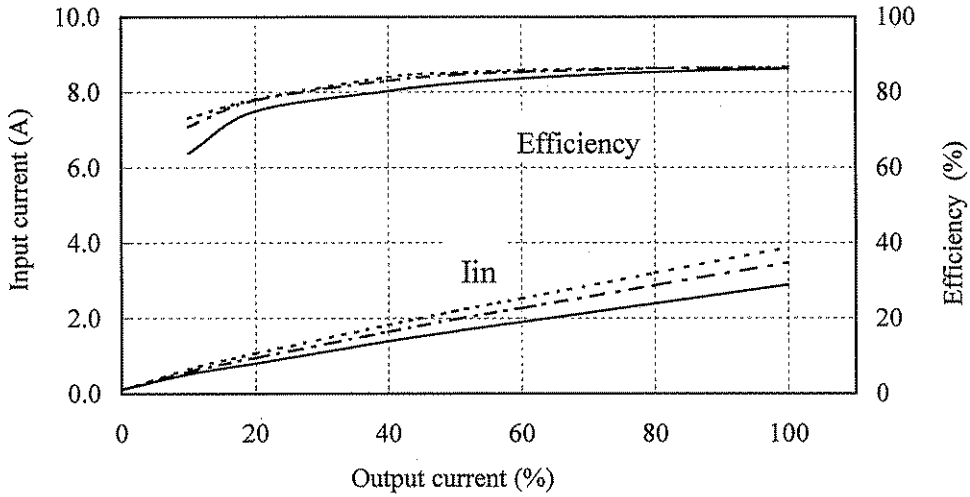
Ta : -10°C -----  
 : 25°C - - - - -  
 : 50°C ———



(3) 効率、入力電流 対 出力電流

Efficiency and Input current v.s. Output current

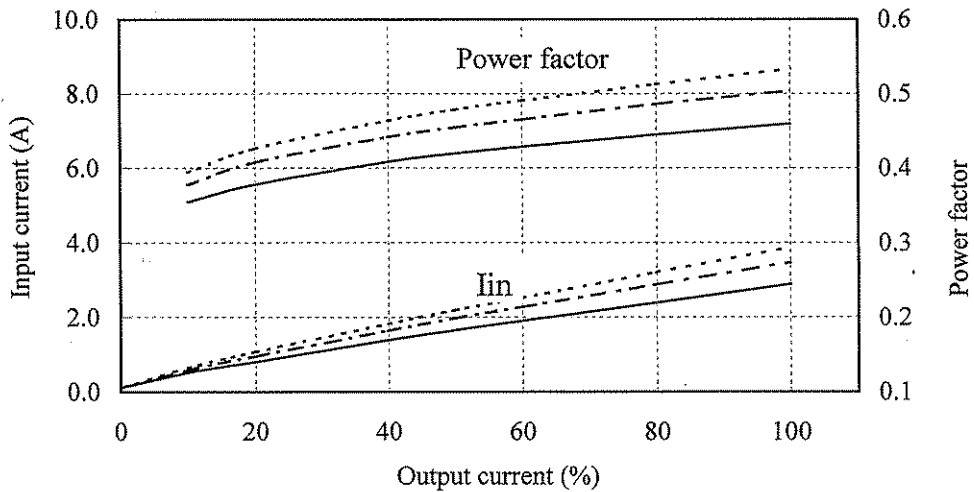
Conditions  $V_{in}$  : 85VAC -----  
 : 100VAC - - - - -  
 : 132VAC ————  
 $T_a$  : 25°C



(4) 力率、入力電流 対 出力電流

Power factor and Input current v.s. Output current

Conditions  $V_{in}$  : 85VAC -----  
 : 100VAC - - - - -  
 : 132VAC ————  
 $T_a$  : 25°C



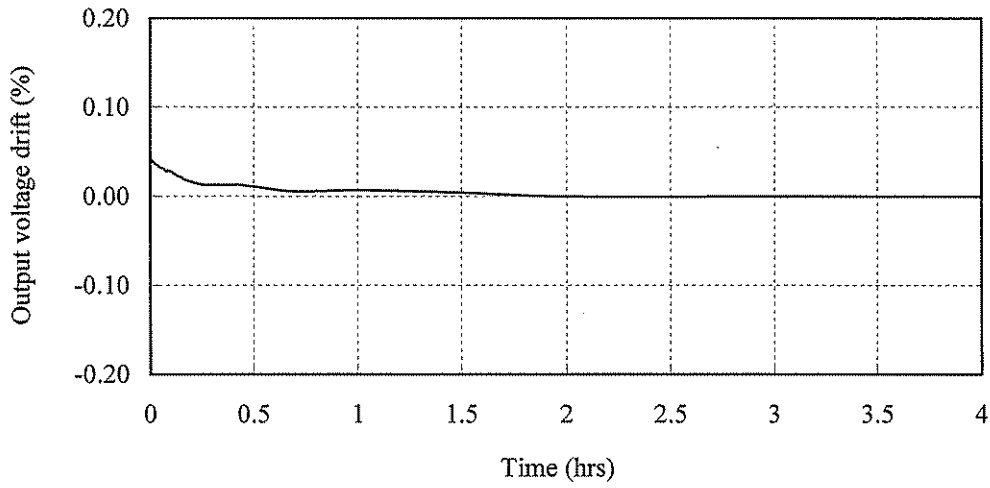
2.2 通電ドリフト特性

Warm up voltage drift characteristics

Conditions  $V_{in}$  : 100VAC

$I_o$  : 100%

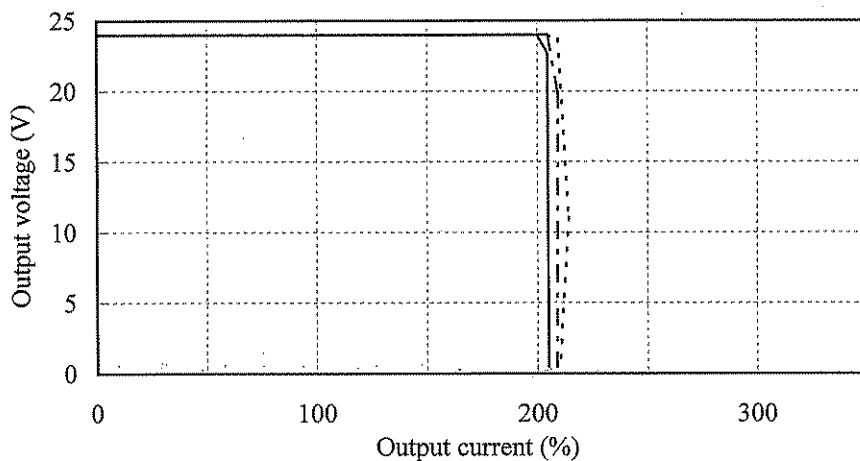
$T_a$  : 25°C



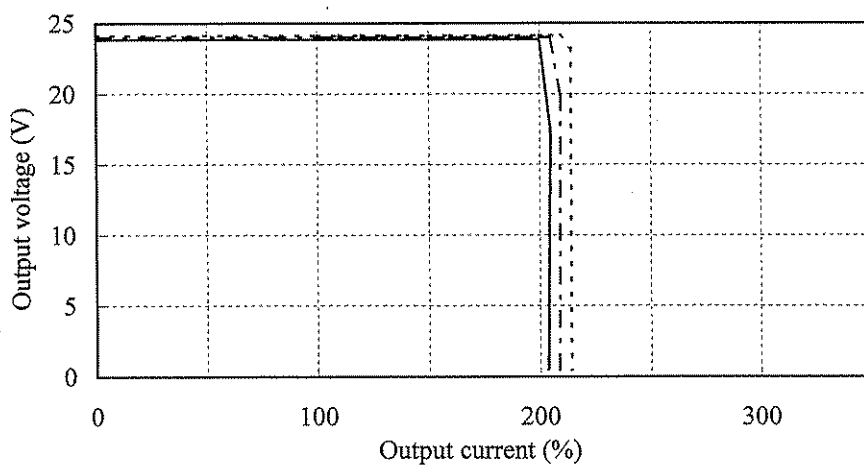
2.3 過電流保護特性

Over current protection (OCP) characteristics

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



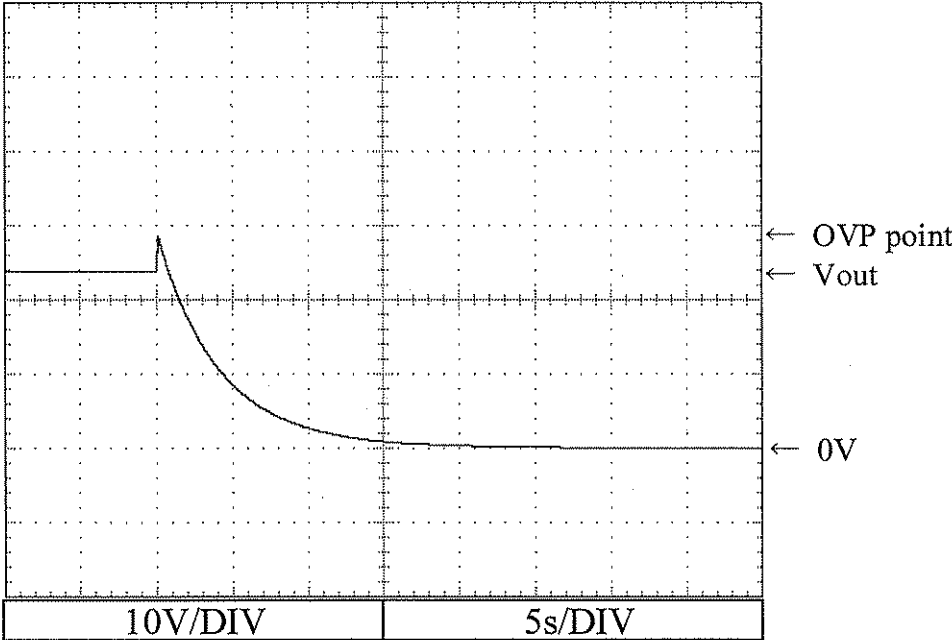
Conditions Vin : 100VAC  
 Ta : -10°C -----  
 : 25°C -----  
 : 50°C -----



2.4 過電圧保護特性

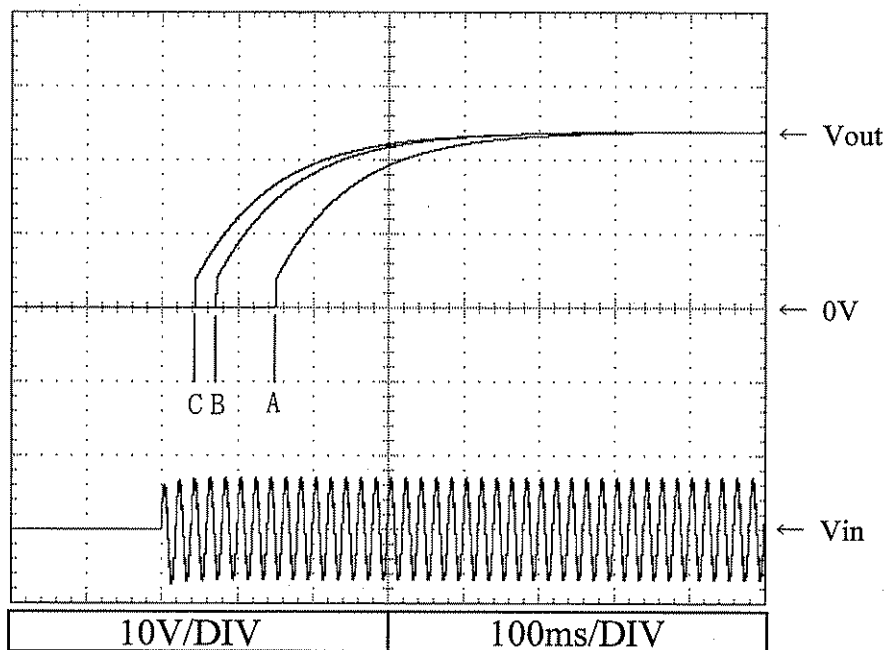
Over voltage protection (OVP) characteristics

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

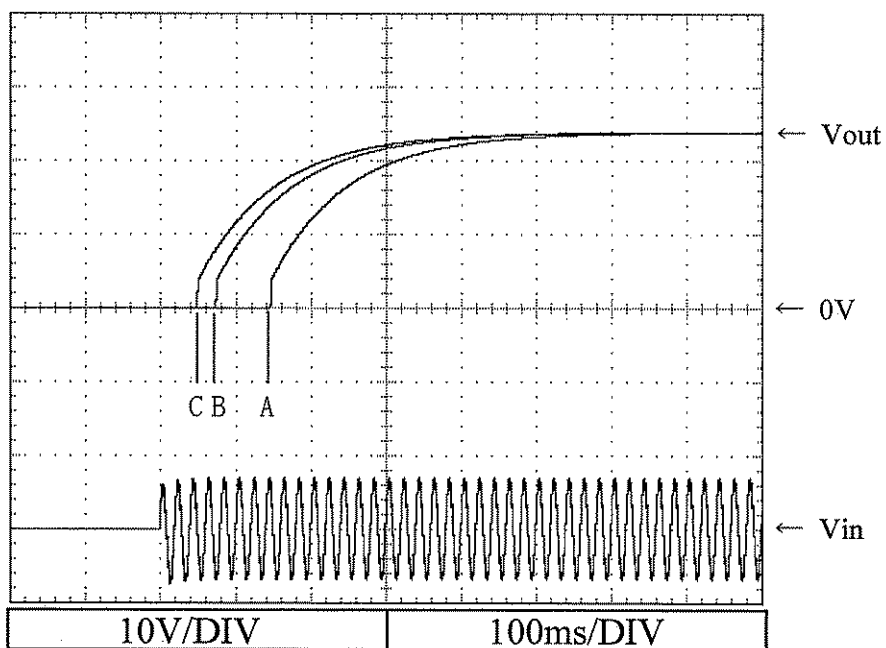


2.5 出力立ち上がり特性  
Output rise characteristics

Conditions Vin : 85VAC (A)  
: 100VAC (B)  
: 132VAC (C)  
Iout : 0%  
Ta : 25°C

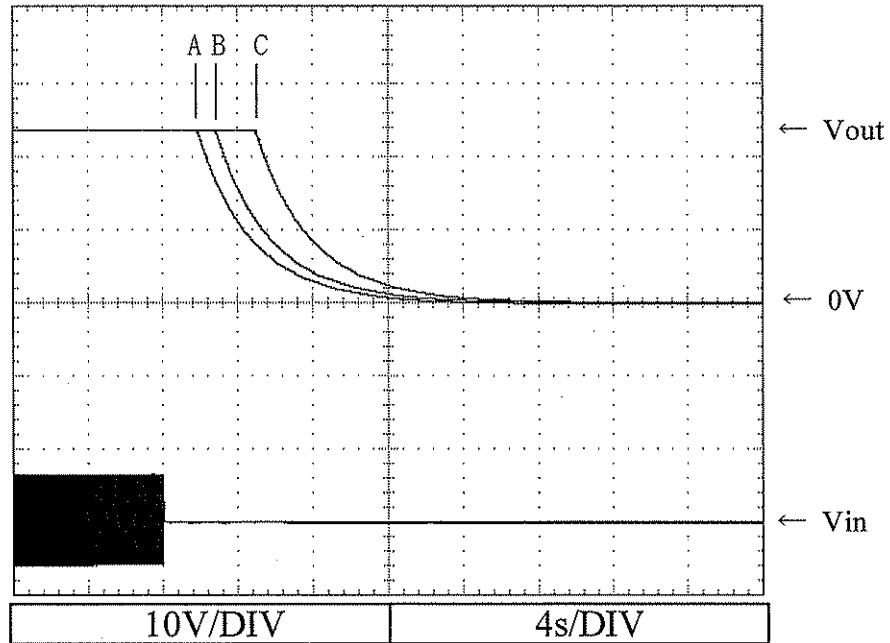


Conditions Vin : 85VAC (A)  
: 100VAC (B)  
: 132VAC (C)  
Iout : 100%  
Ta : 25°C

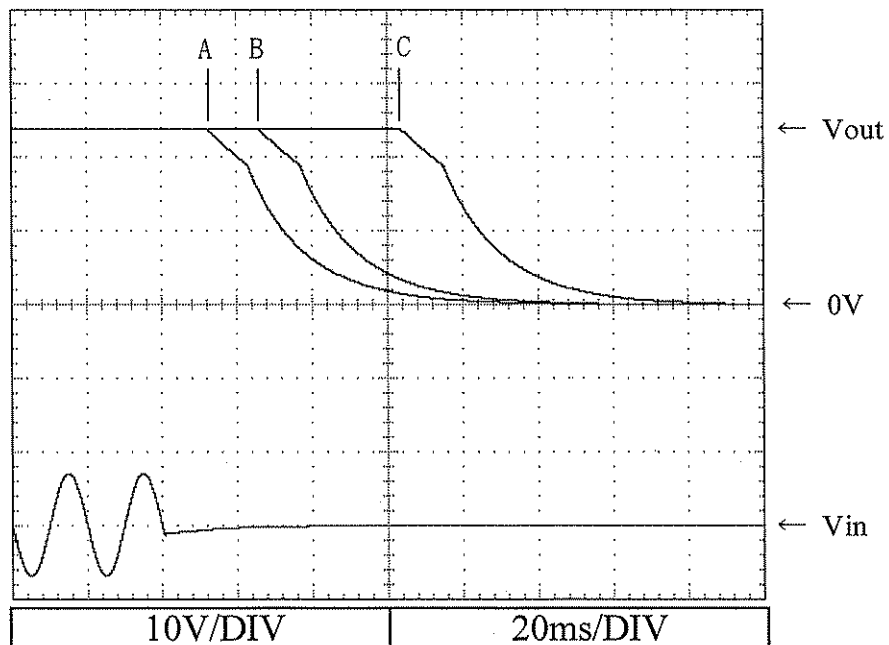


2.6 出力立ち下がり特性  
Output fall characteristics

Conditions  $V_{in}$  : 85VAC (A)  
 : 100VAC (B)  
 : 132VAC (C)  
 $I_{out}$  : 0%  
 $T_a$  : 25°C



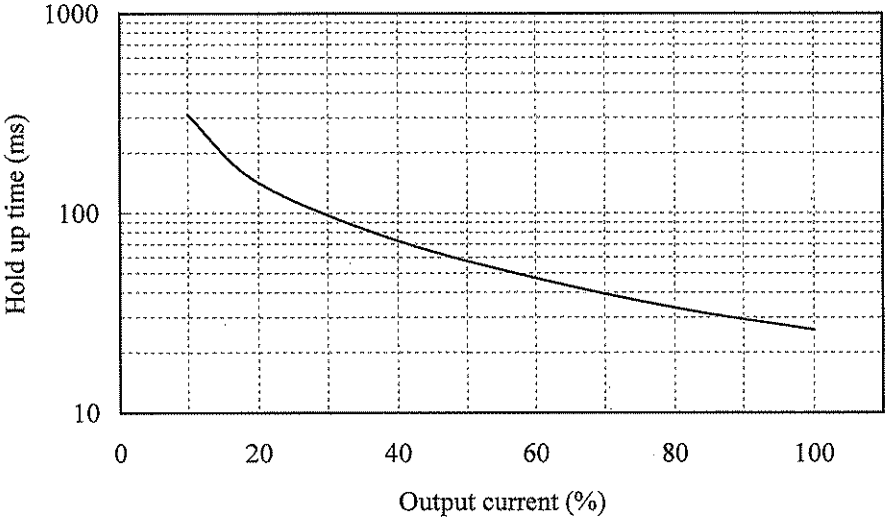
Conditions  $V_{in}$  : 85VAC (A)  
 : 100VAC (B)  
 : 132VAC (C)  
 $I_{out}$  : 100%  
 $T_a$  : 25°C



2.7 出力保持時間特性

Hold up time characteristics

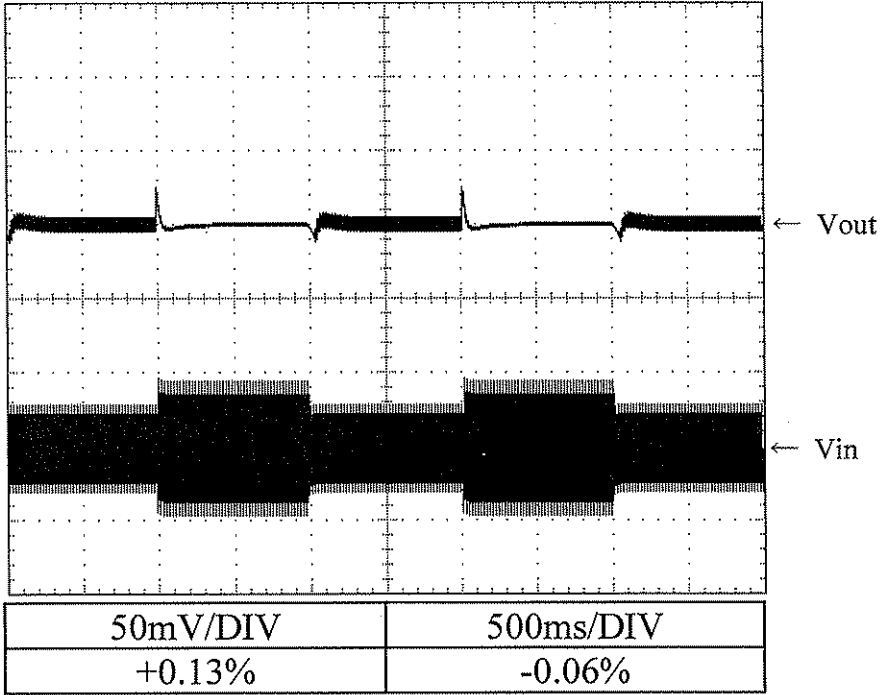
Conditions Vin : 100VAC  
Ta : 25°C



2.8 過渡応答 (入力急変) 特性

Dynamic line response characteristics

Conditions Vin : 85VAC ↔ 132VAC  
Iout : 100%  
Ta : 25°C

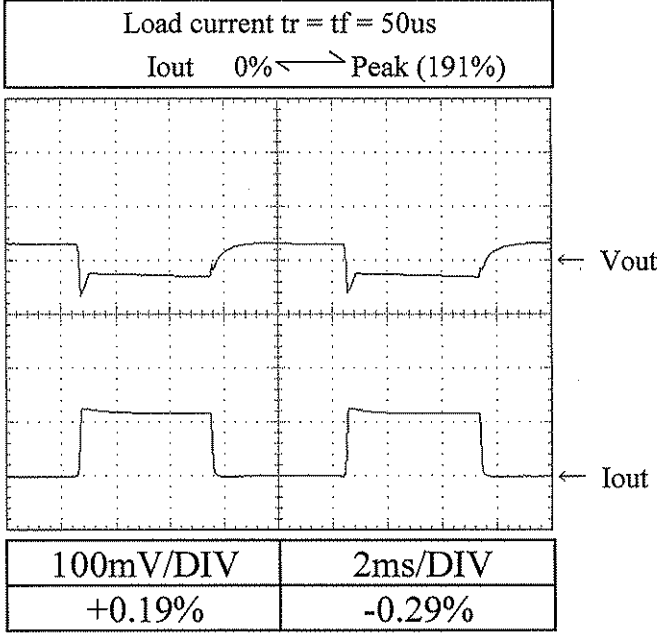
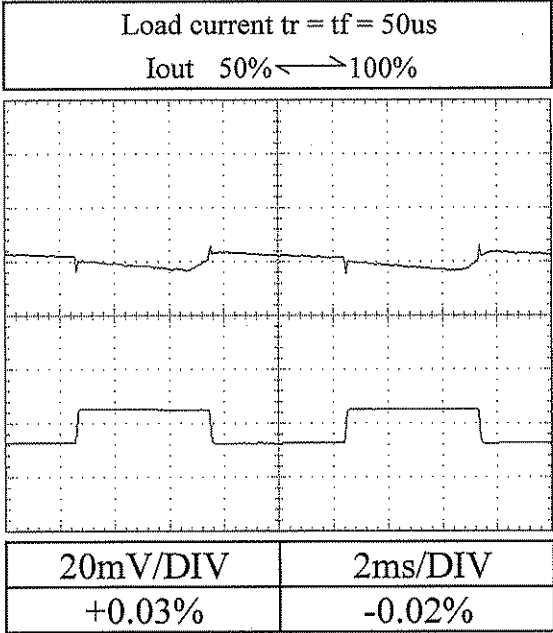




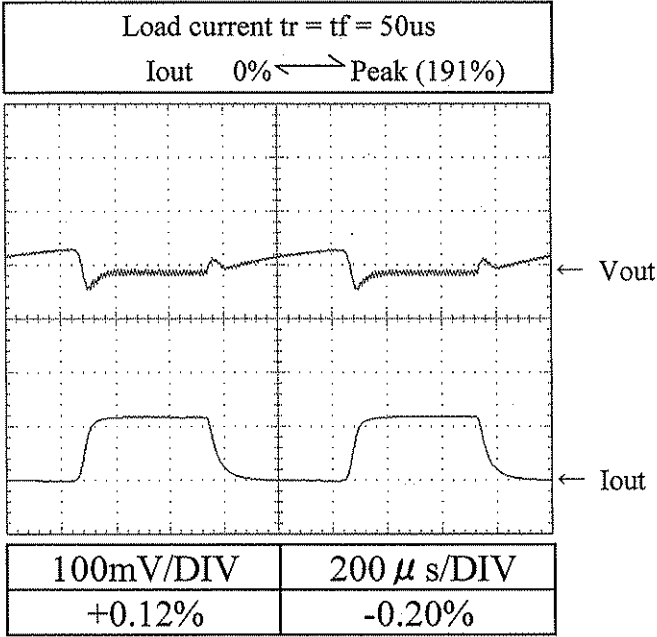
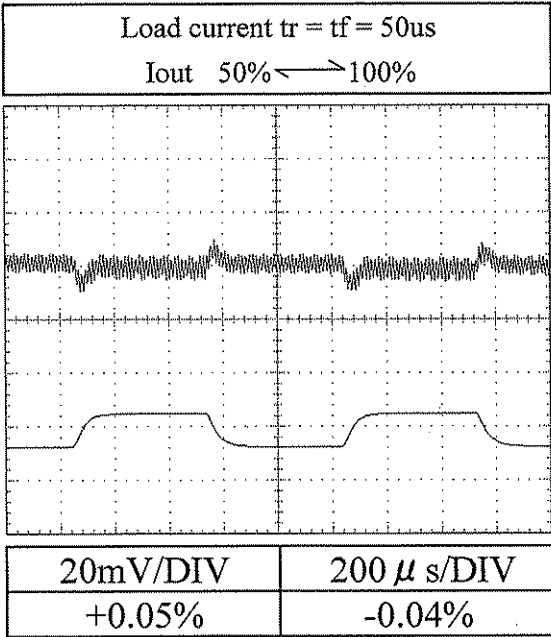
2.9 過渡応答 (負荷急変) 特性  
Dynamic load response characteristics

Conditions  $V_{in}$  : 100VAC  
 $T_a$  : 25°C

$f=100\text{Hz}$



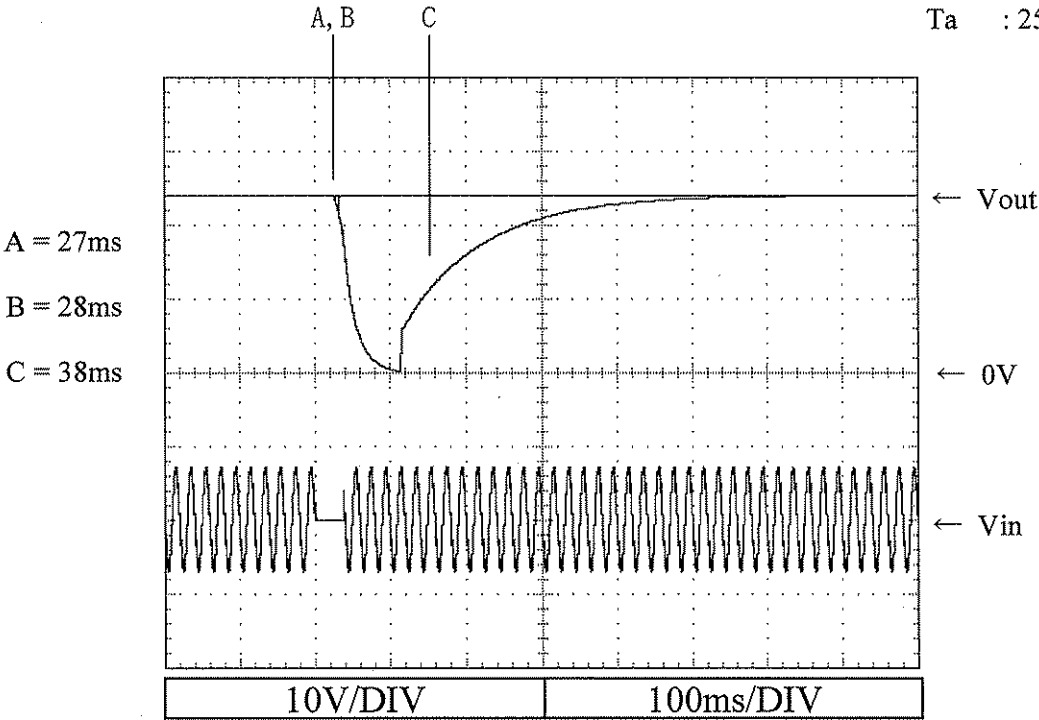
$f=1\text{kHz}$



2.10 入力電圧瞬停特性

Response to brown out characteristics

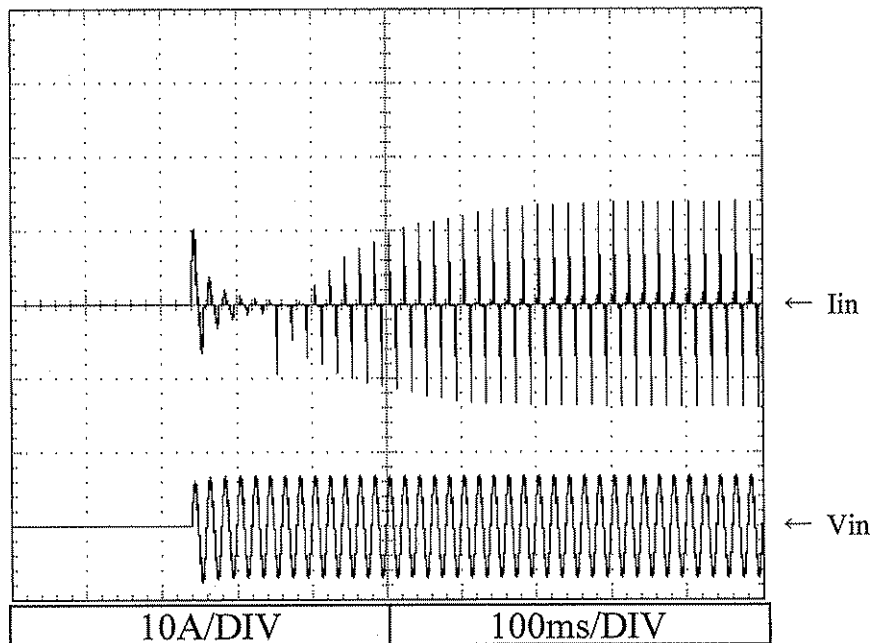
Conditions Vin : 100VAC  
Iout : 100%  
Ta : 25°C



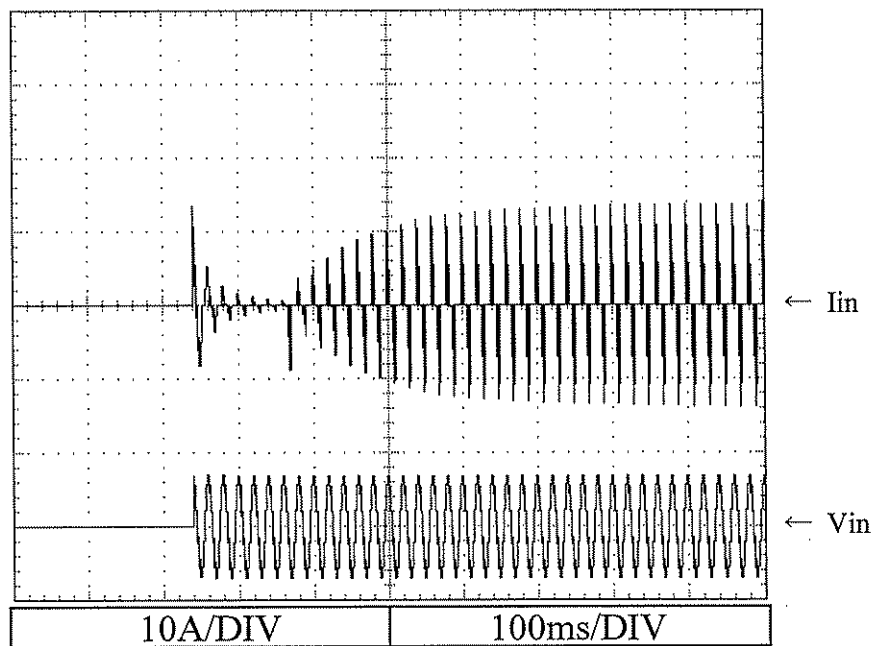
2.11 入力サージ電流（突入電流）特性  
Inrush current waveform

Conditions  $V_{in}$  : 100VAC  
 $I_{out}$  : 100%  
 $T_a$  : 25°C

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

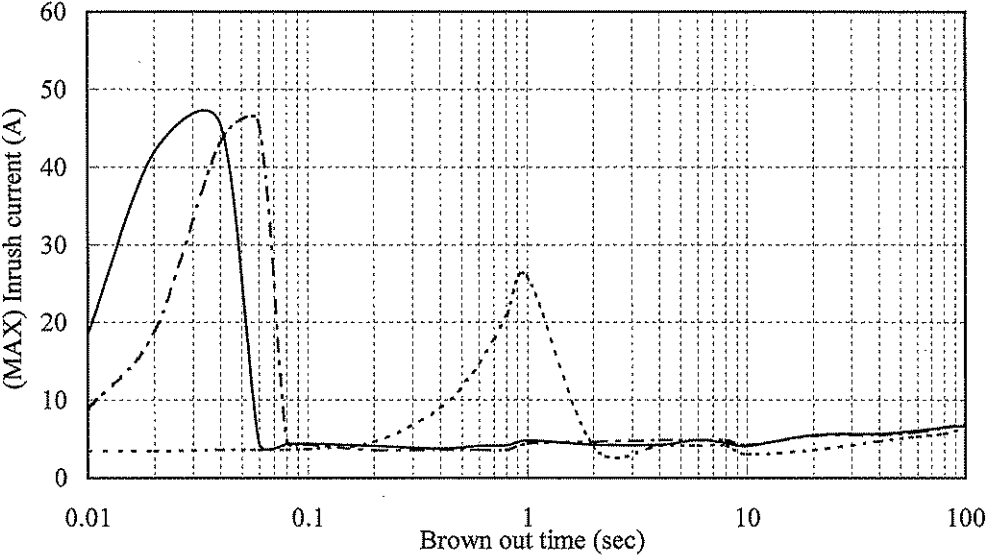


Switch on phase angle  
of input AC voltage  
 $\phi = 90^\circ$



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

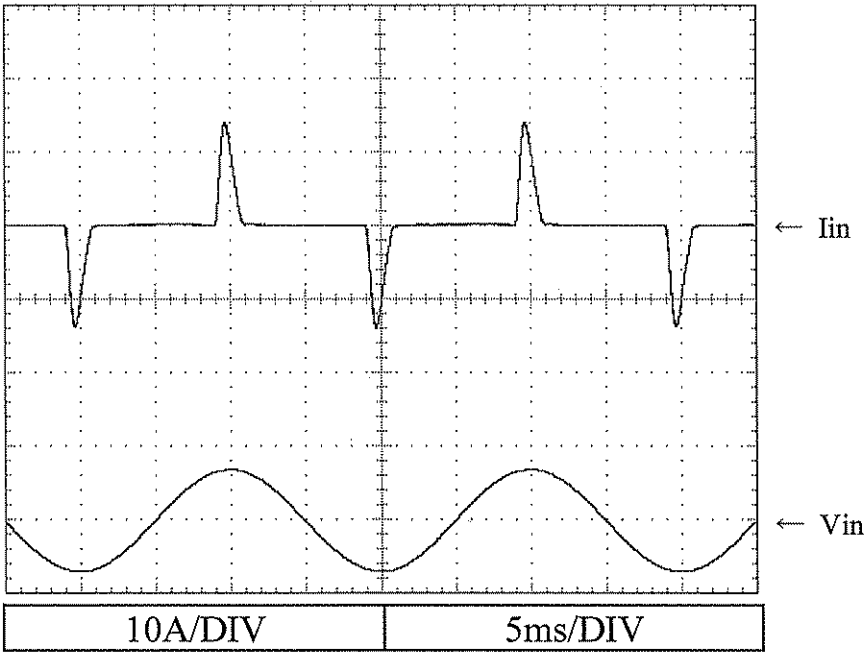
Conditions Vin : 100VAC  
Iout : 0% -----  
          : 50% -----  
          : 100% ————  
Ta : 25°C



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

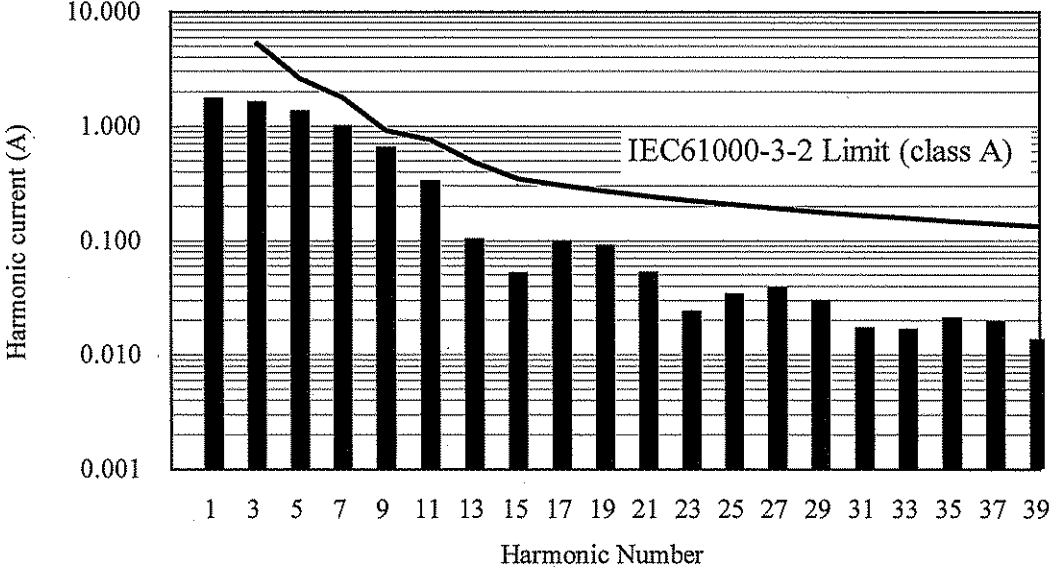
2.13 入力電流波形  
Input current waveform

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



2.14 高調波成分  
Input current harmonics

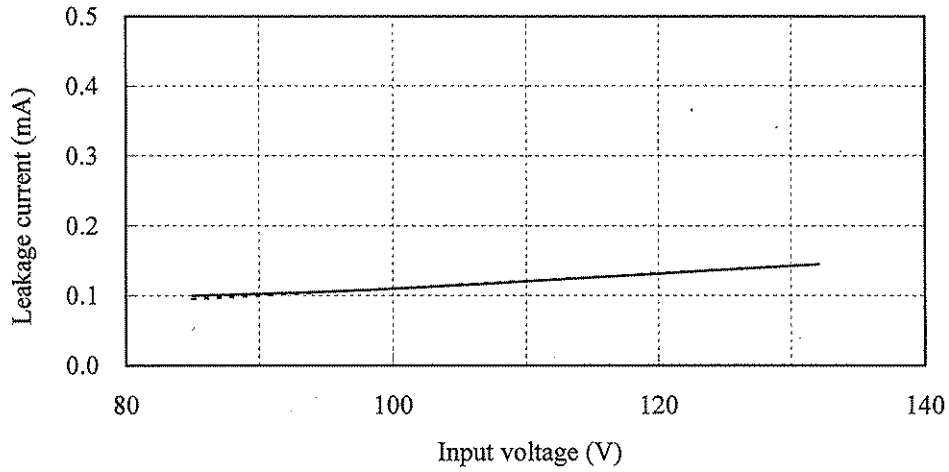
Conditions  $V_{in}$  : 100VAC  
 $I_{out}$  : 100%  
 $T_a$  : 25°C



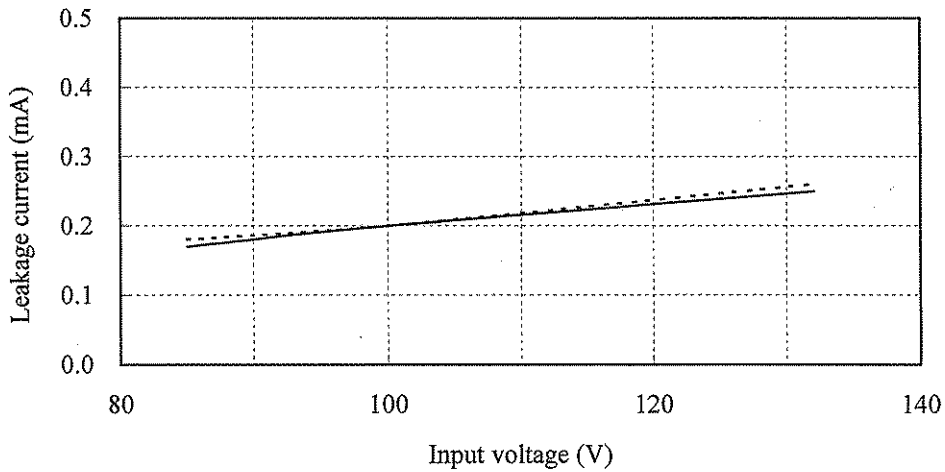
2.15 リーク電流特性  
Leakage current characteristics

Conditions Iout : 0% -----  
 : 100% -----  
 Ta : 25°C  
 f : 50Hz

Equipment used : MODEL 229-2 (SIMPSON)



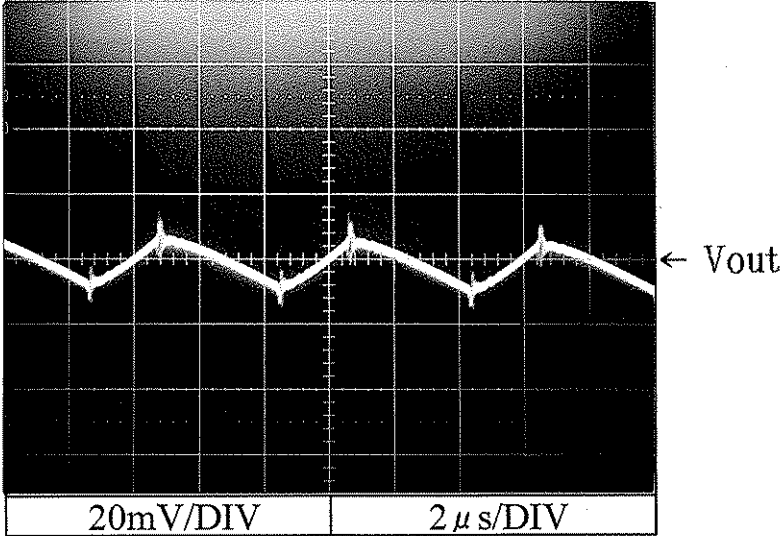
Equipment used : TYPE3226 (YOKOGAWA)



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

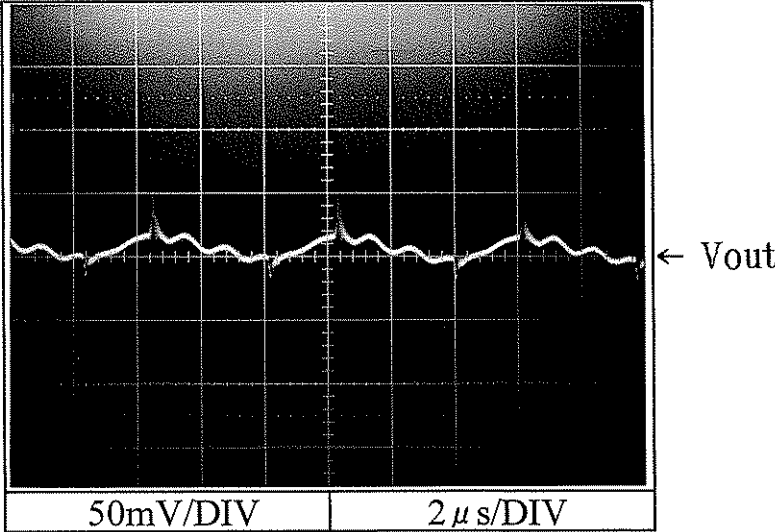
Conditions Vin : 100VAC  
Iout : 100%  
Ta : 25°C

NORMAL MODE



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

NORMAL + COMMON MODE



2.17 EMI特性

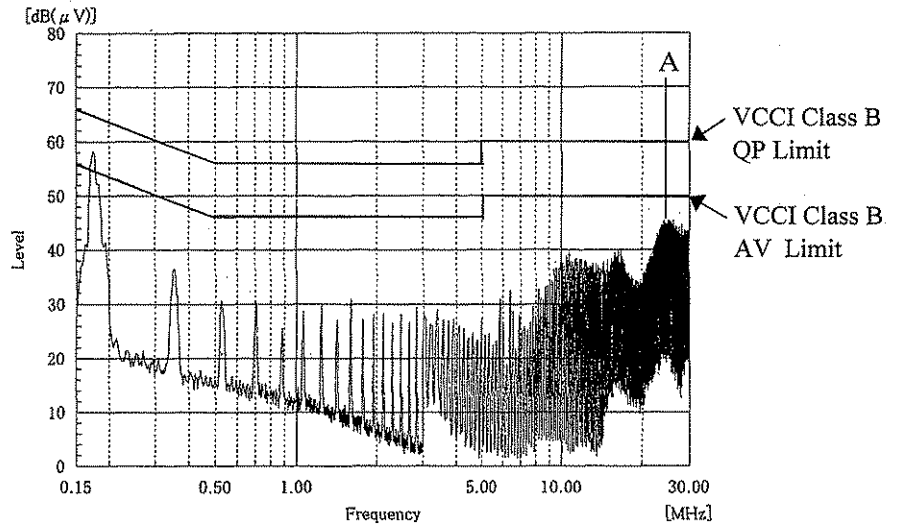
Electro-Magnetic Interference characteristics

Conditions Vin : 100VAC  
Iout : 100%

雑音端子電圧

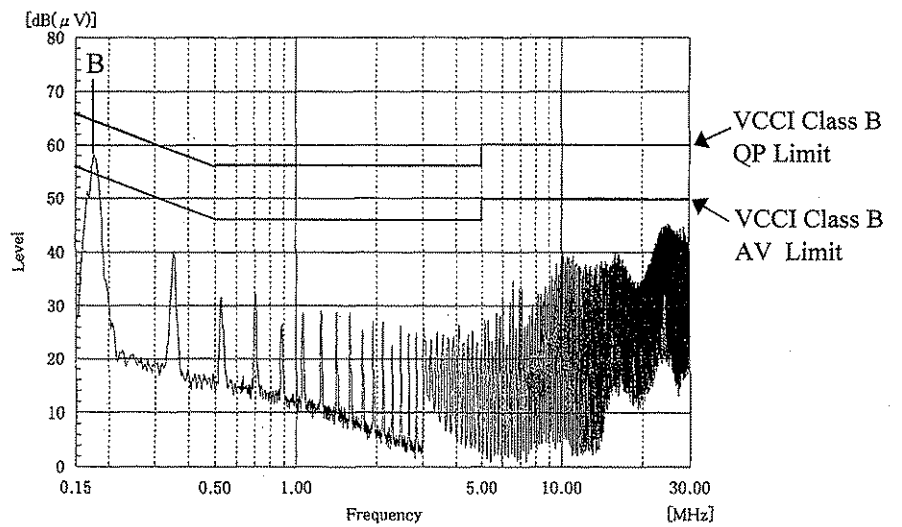
Conducted Emission

Point A (25.32MHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	60.0	45.8
AV	50.0	43.1



Phase : N

Point B (0.176MHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	64.7	58.6
AV	54.7	48.3



Phase : L

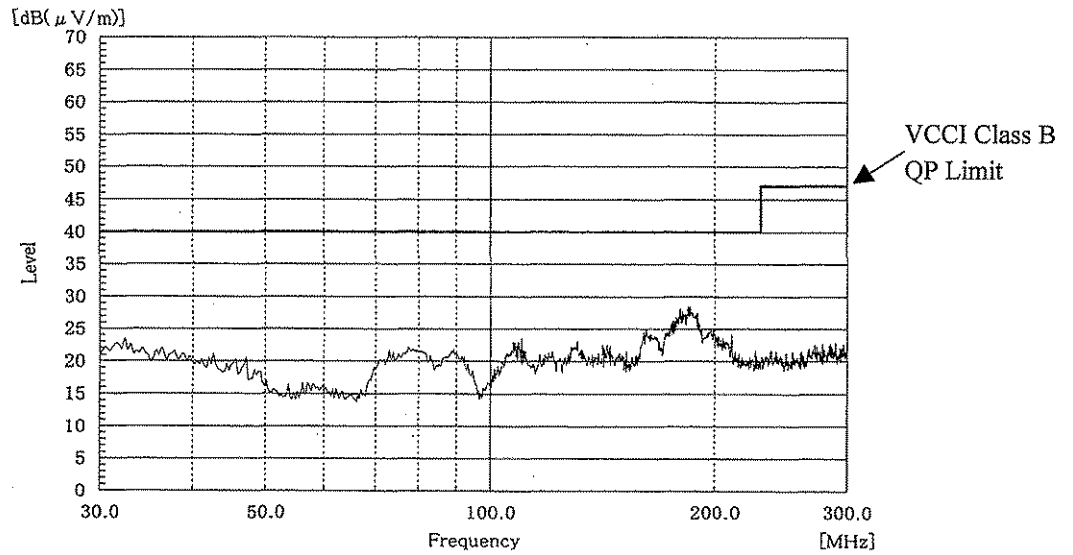
EN55011-B,EN55022-Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55022-B are same as its VCCI class B.



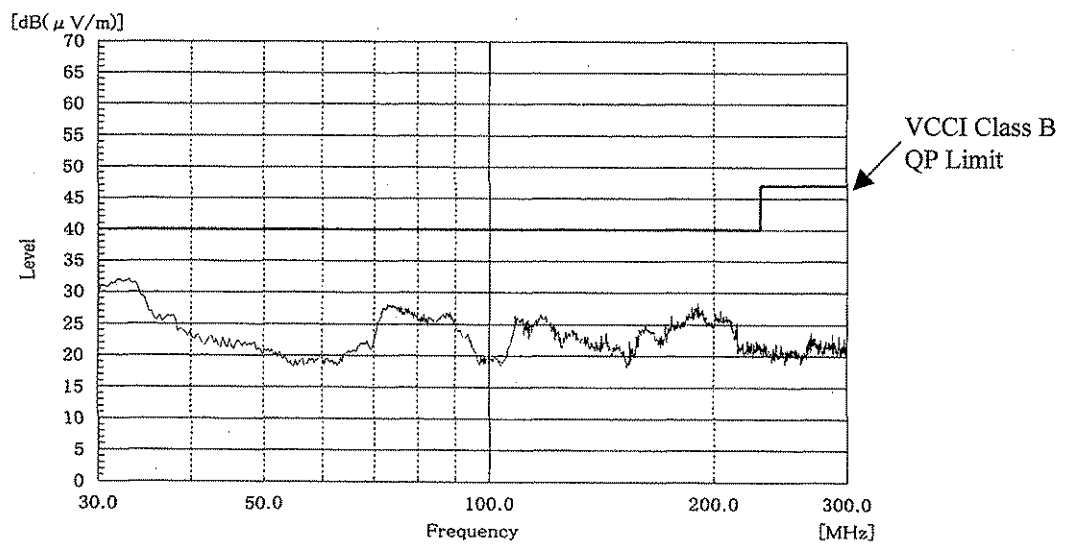
Conditions Vin : 100VAC  
Iout : 100%

雑音電界強度  
Radiated Emission

HORIZONTAL:



VERTICAL:



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