HWS1500/ME

EVALUATION DATA

型式データ

DWG No. DA006-53-01/ME		
APPD	CHK	DWG
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3. Apr. 2006	31. Mar. 2006	24. Mar. 2006

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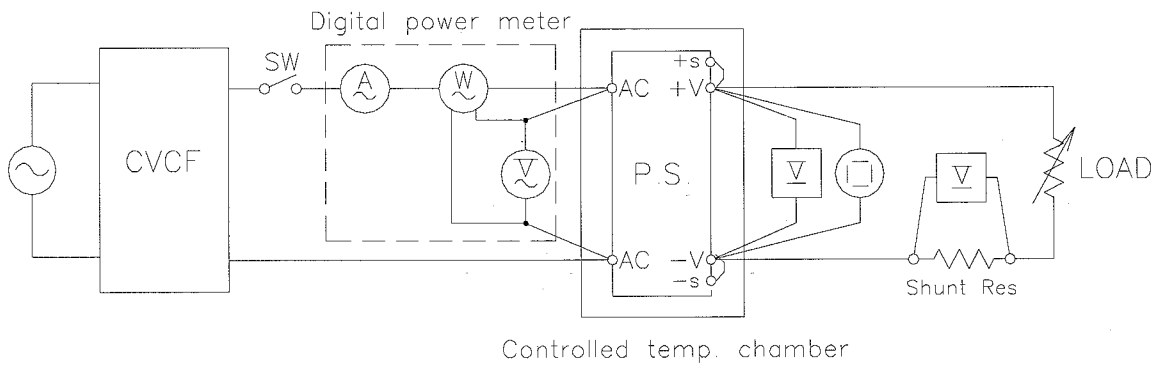
使用記号　Terminology used

	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
f	..... 周波数	Frequency

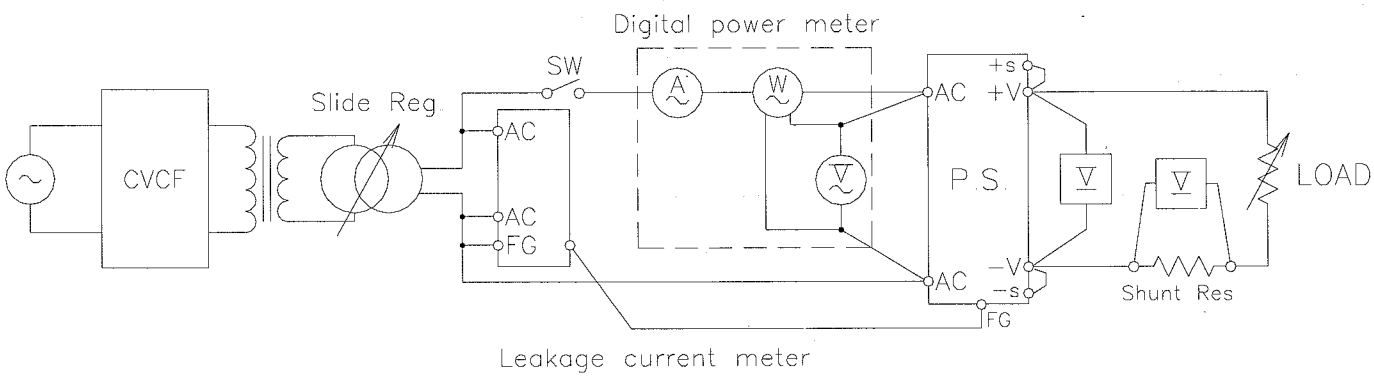
1. 測定方法　Evaluation Method

1.1 測定回路　Circuit used for determination

(1)　静特性　Steady state data



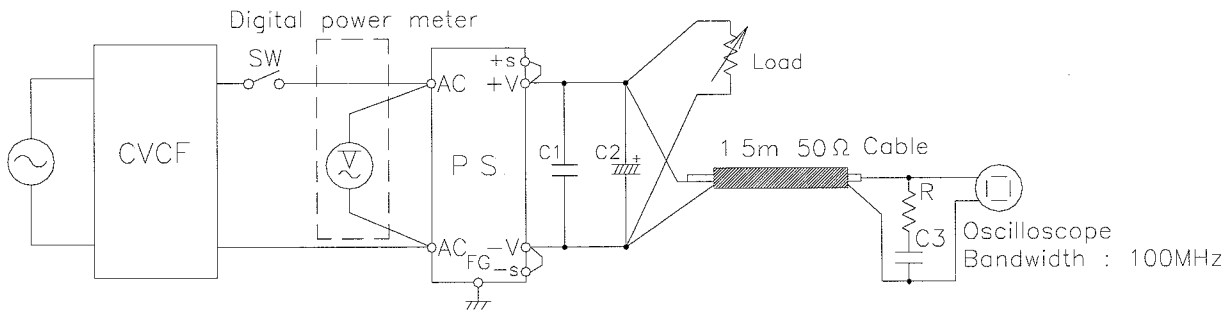
(2)　リーク電流特性　Leakage current characteristics



NOTE : Leakage current measured through 1kΩ // (10kΩ+0.015uF).
Range used - - - AC(For HIOKI MODEL 3155)

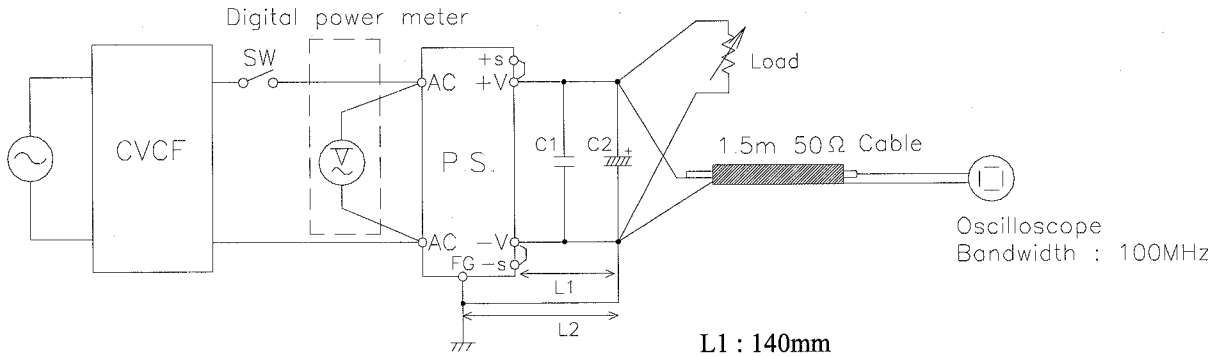
(3) 出力リップル、ノイズ特性　Output ripple and noise characteristics

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



R : 50Ω
C1 : 0.47uF Film capacitor
C2 : 22uF Electrolytic capacitor
C3 : 4700pF Film capacitor

(b) Normal + Common Mode



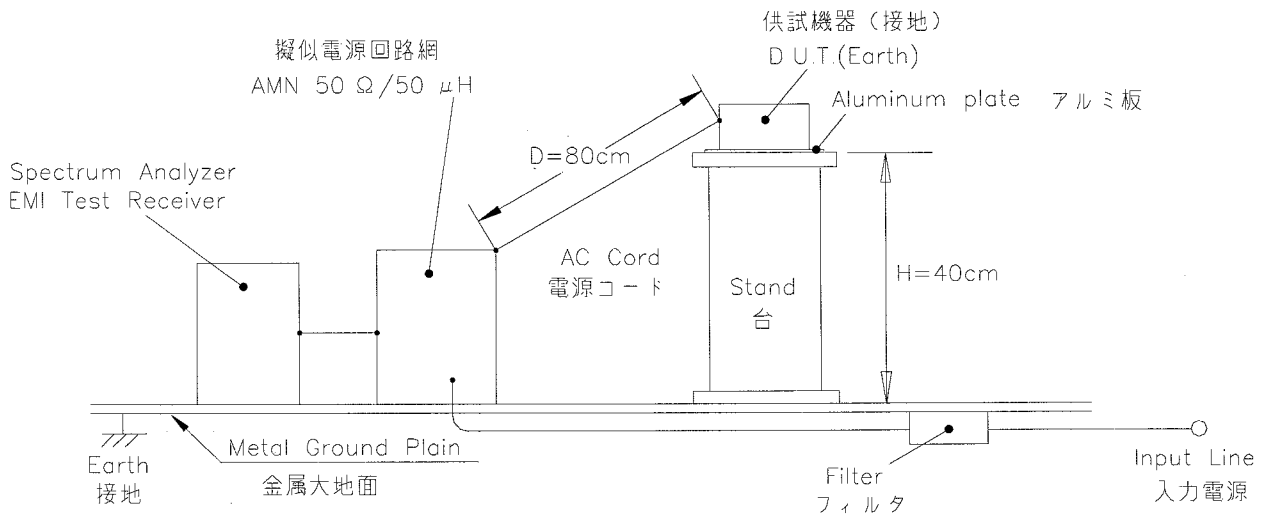
L1 : 140mm
L2 : 140mm
C1 : 0.47uF Film capacitor
C2 : 22uF Electrolytic capacitor

(4) ＥＭＩ特性

Electro-Magnetic Interference characteristics

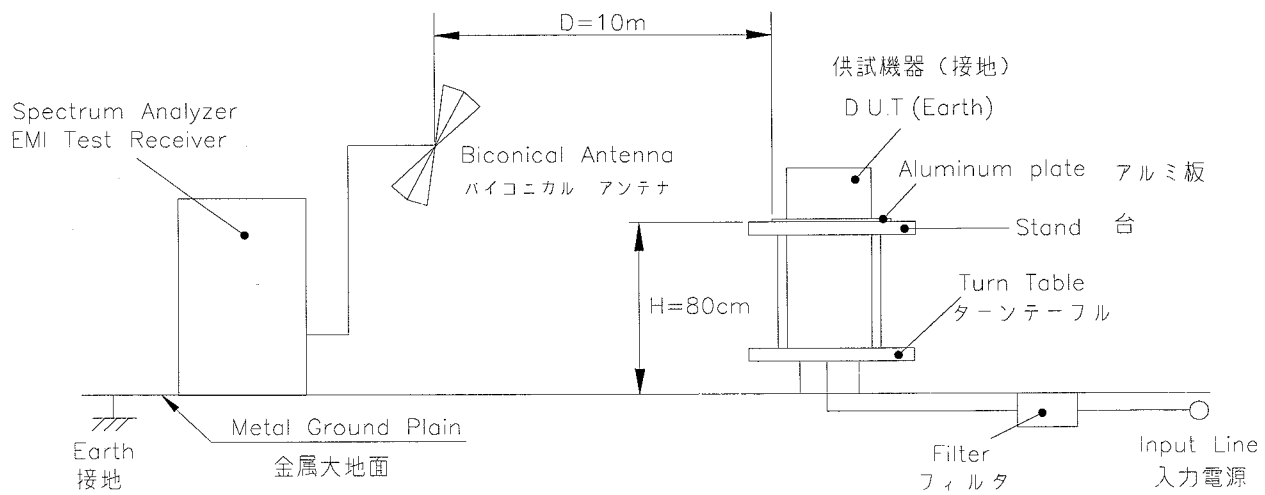
(a) 雑音端子電圧（帰還ノイズ）

Conducted Emission Noise



(b) 雑音電界強度（輻射ノイズ）

Radiated Emission Noise



1.2 使用測定機器　　List of equipment used

No.	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	OSCILLOSCOPE	HITACHI DENSHI	V-1565
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL7740
3	DIGITAL MULTIMETER	hp	34970A
4	DIGITAL POWER METER	HIOKI	3332
5	SHUNT RESISTOR	YOKOGAWA ELECT.	2215
6	DYNAMIC DUMMY LOAD	KIKUSUI	PLZ1004W+PLZ2004WB
7	CVCF	KIKUSUI	PCR2000L×2
8	LEAKAGE CURRENT METER	HIOKI	3155
9	CONTROLLED TEMP. CHAMBER	ESPEC	PL-1K
10	SPECTRUM ANALYZER	Hewlett Packard	8566B
11	EMI TEST RECEIVER	Schwarzbeck	FCKL1528
12	AMN	Schwarzbeck	NNLK8121
13	EMI TEST RECEIVER	Schwarzbeck	FCVU1534
14	ANTENNA(BICONICAL ANTENNA)	CHASE	CBL6111

2. 特性データ　Characteristics

2.1 静特性　Steady state data

(1) 入力・負荷・温度変動　Regulation - line and load, Temperature drift

24V

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

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	23.983V	23.984V	23.984V	23.985V	23.985V	2mV	0.008%
50%	23.981V	23.982V	23.982V	23.982V	23.982V	1mV	0.004%
80%	23.979V	23.980V	23.980V	23.980V	23.980V	1mV	0.004%
100%	—	23.978V	23.977V	23.978V	23.978V	1mV	0.004%
load	4mV	6mV	7mV	7mV	7mV		
regulation	0.017%	0.025%	0.029%	0.029%	0.029%		

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

Ta	-10℃	+25℃	+50℃	temperature stability	
Vout	23.937V	23.978V	24.006V	69mV	0.288%

36V

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

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	36.061V	36.068V	36.069V	36.070V	36.069V	9mV	0.025%
50%	36.066V	36.067V	36.067V	36.068V	36.068V	2mV	0.006%
80%	36.065V	36.066V	36.065V	36.066V	36.067V	2mV	0.006%
100%	—	36.064V	36.064V	36.064V	36.065V	1mV	0.003%
load	5mV	4mV	5mV	6mV	4mV		
regulation	0.014%	0.011%	0.014%	0.017%	0.011%		

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

Ta	-10℃	+25℃	+50℃	temperature stability	
Vout	35.991V	36.064V	36.081V	90mV	0.250%

2.1 静特性　　Steady state data
(1) 入力・負荷・温度変動　Regulation - line and load, Temperature drift

48V

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

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	47.992V	47.992V	47.992V	47.992V	47.992V	0mV	0.000%
50%	47.990V	47.990V	47.990V	47.989V	47.989V	1mV	0.002%
80%	47.988V	47.987V	47.987V	47.987V	47.987V	1mV	0.002%
100%	—	47.986V	47.986V	47.985V	47.986V	1mV	0.002%
load	4mV	6mV	6mV	7mV	6mV		
regulation	0.008%	0.013%	0.013%	0.015%	0.013%		

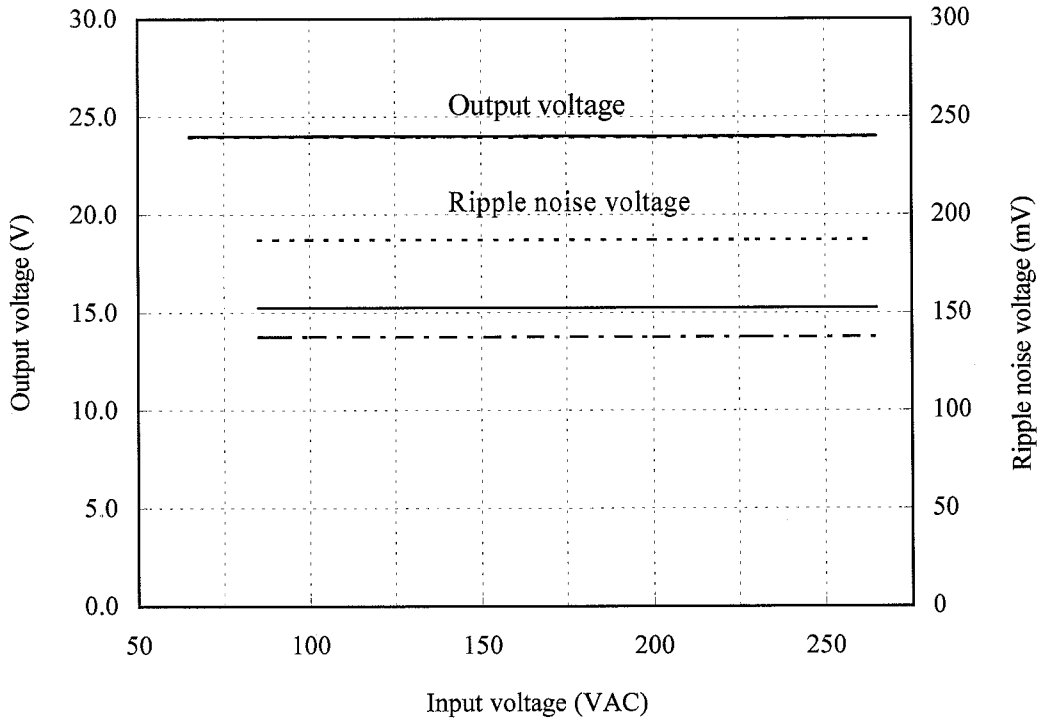
2. Temperature drift　　Conditions Vin=100VAC
Iout=100%

Ta	-10℃	+25℃	+50℃	temperature stability	
Vout	47.920V	47.986V	48.007V	87mV	0.181%

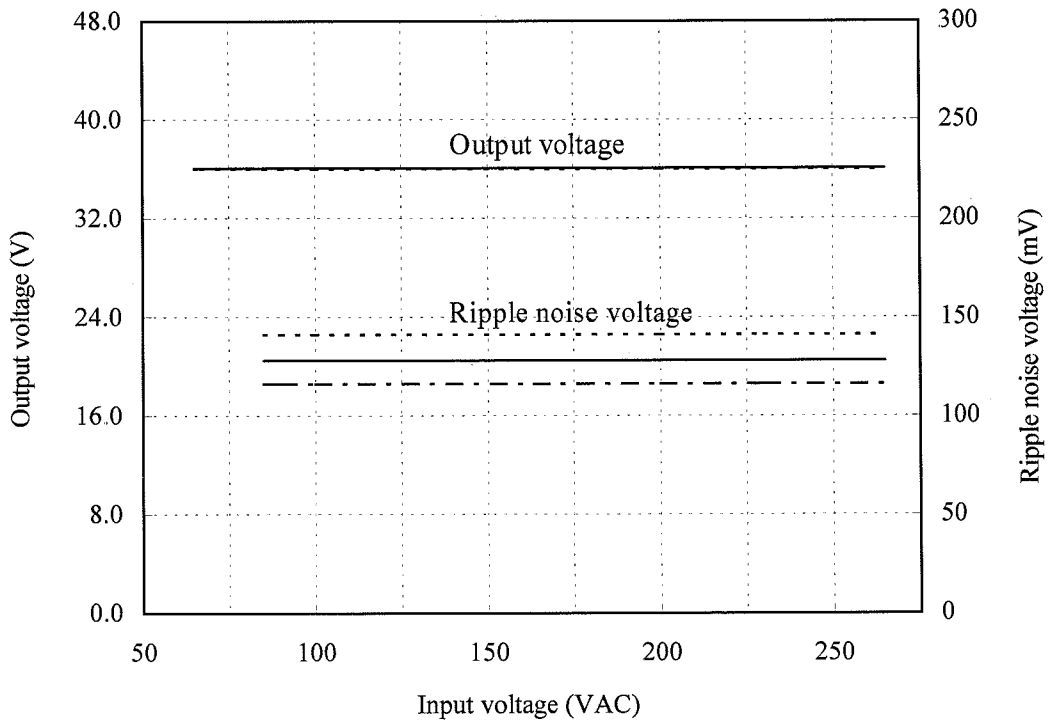
(2) 出力電圧・リップル電圧対入力電圧

Output voltage and Ripple noise voltage vs. Input voltage Conditions Iout : 100 %
Ta : -10 ℃
25 ℃
50 ℃

24V



36V



(2) 出力電圧・リップル電圧対入力電圧

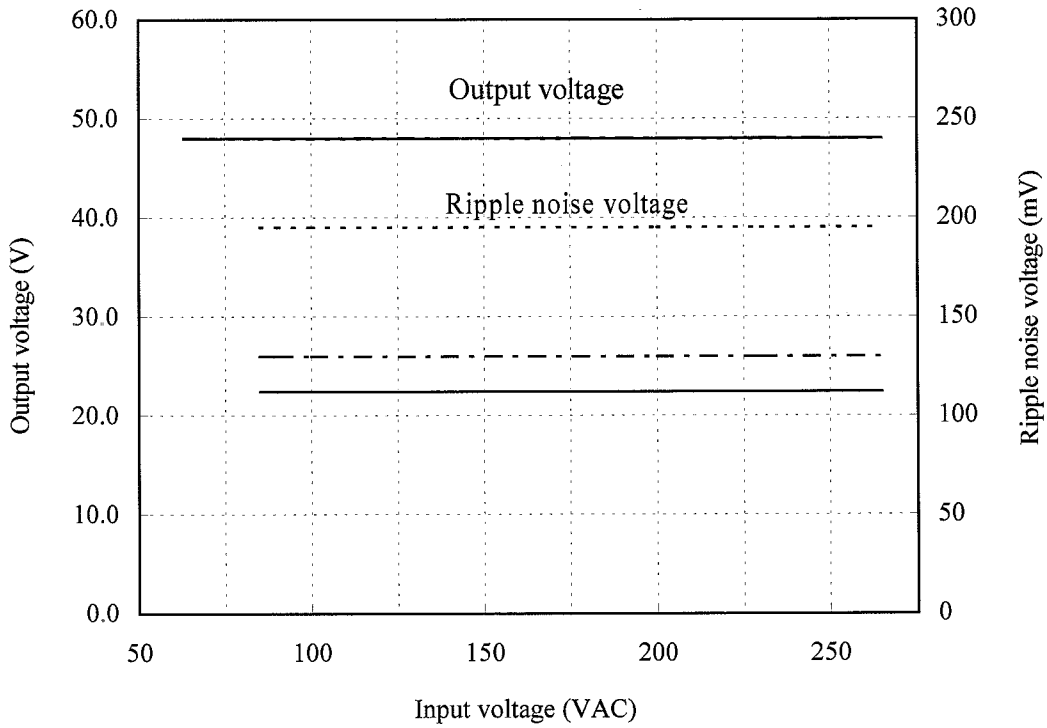
Output voltage and Ripple noise voltage vs. Input voltage Conditions Iout : 100 %

Ta : -10 ℃ - - - - -

25 ℃ —·—·—

50 ℃ ———

48V

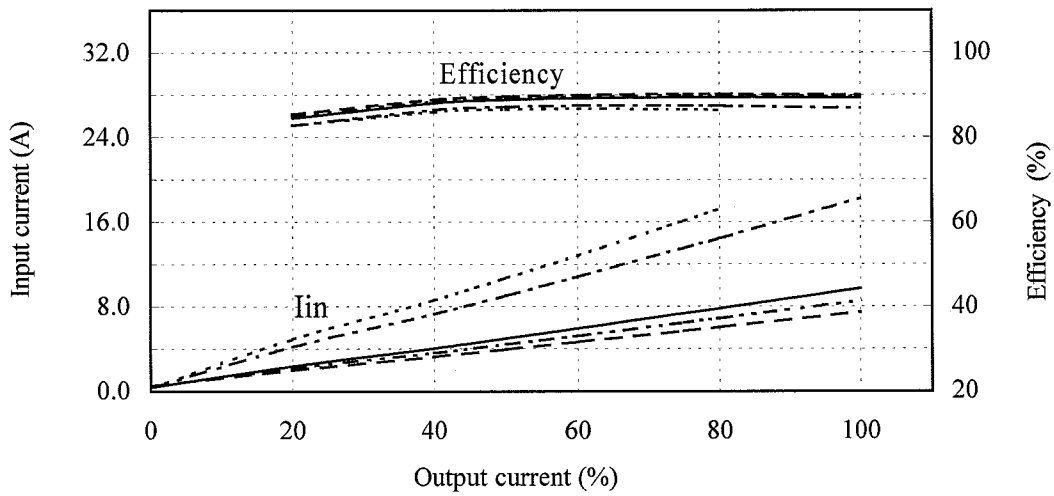


(3) 効率・入力電流対出力電流

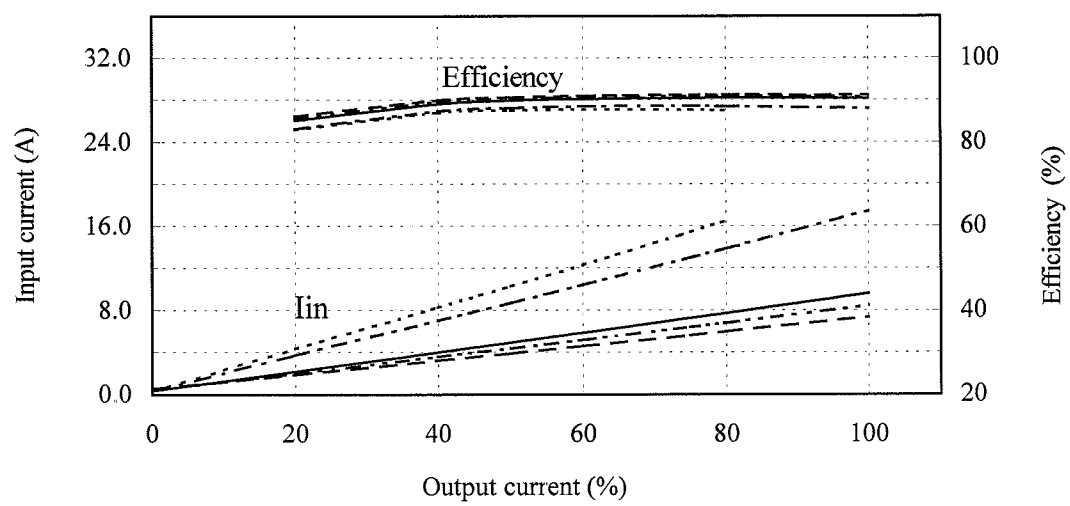
Efficiency and Input current vs. Output current

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

24V



36V

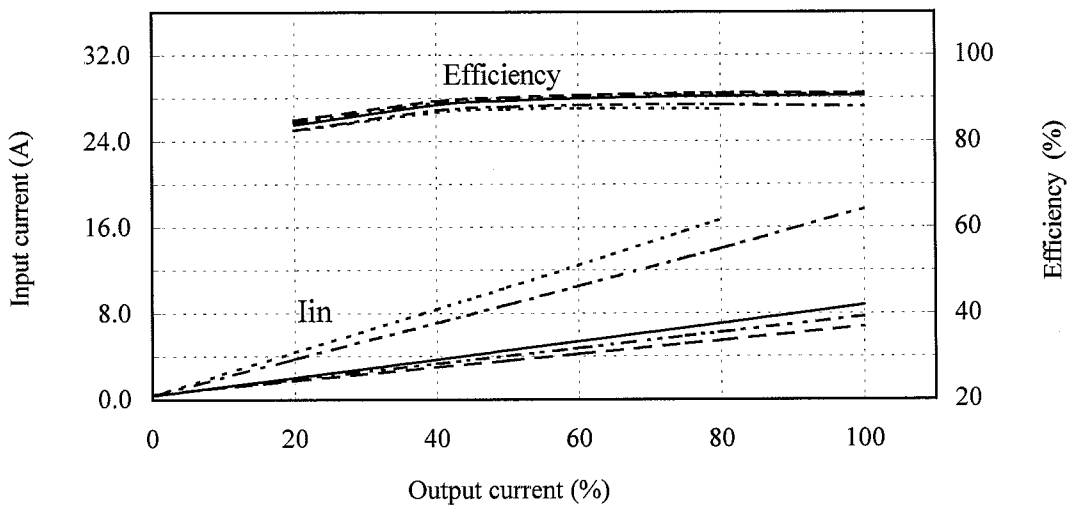


(3) 効率・入力電流対出力電流

Efficiency and Input current vs. Output current

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

48V

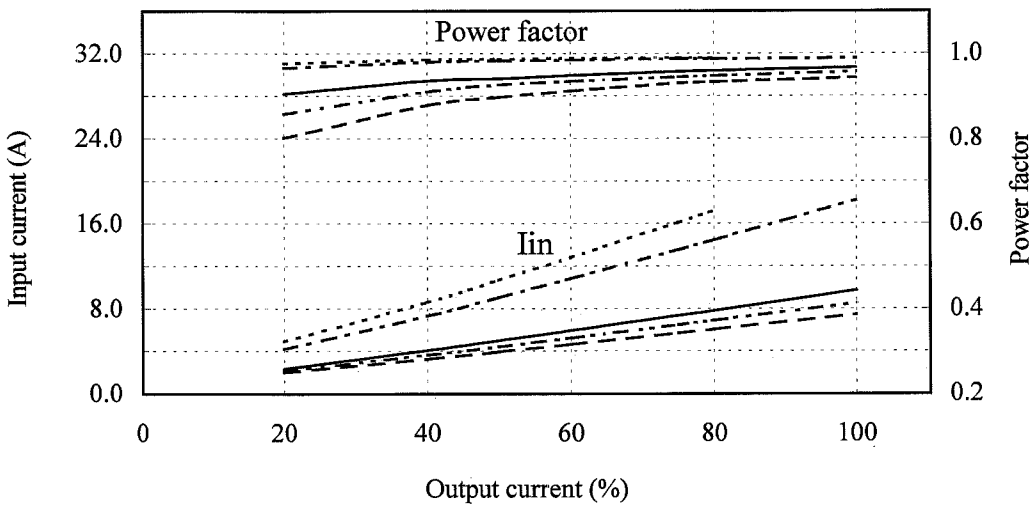


(4) 力率・入力電流対出力電流

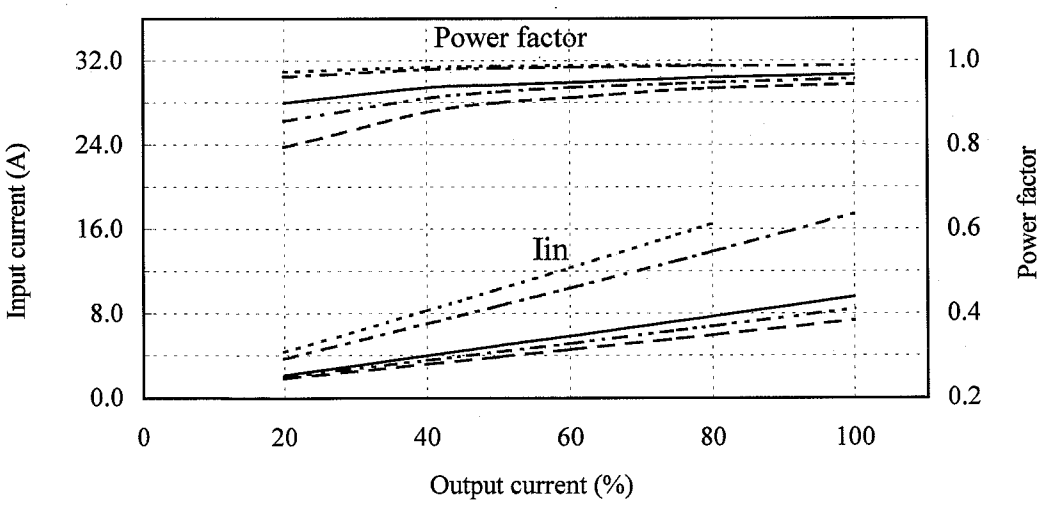
Power factor and Input current vs. Output current

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

24V



36V

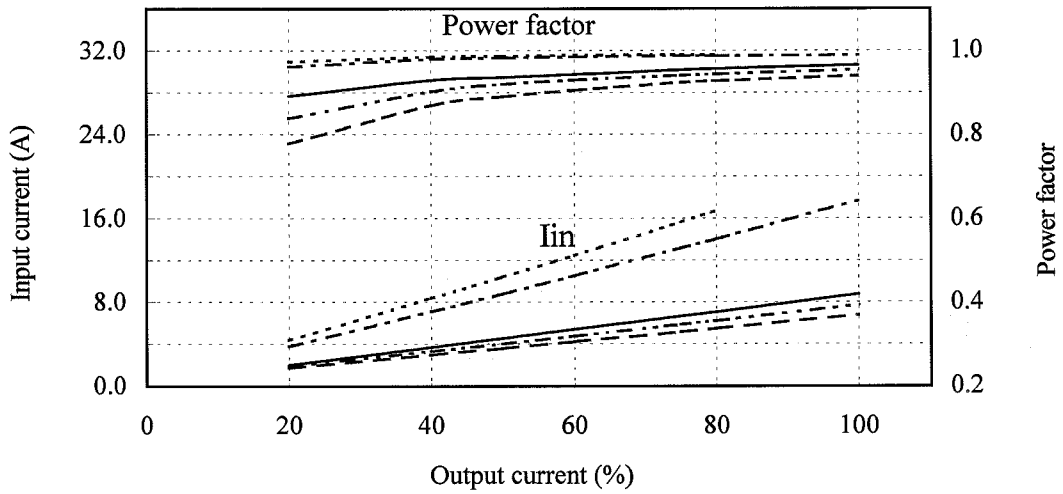


(4) 力率・入力電流対出力電流

Power factor and Input current vs. Output current

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

48V

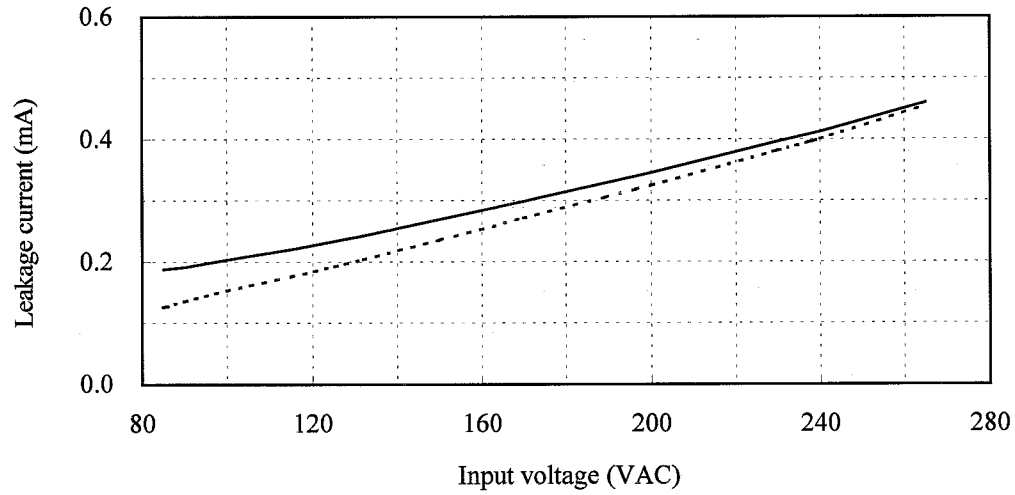


2.2 リーク電流特性

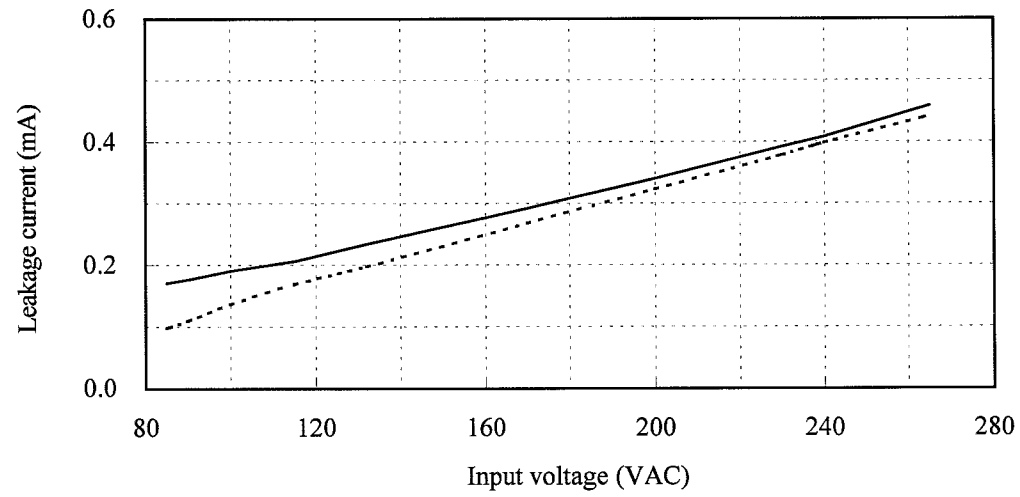
Leakage current characteristics

Conditions Iout : 0 % - - - - -
100 % ——
Ta : 25 ℃
f : 60 Hz
Equipment used : 3155(HIOKI)

24V



36V



2.2 リーク電流特性

Leakage current characteristics

Conditions Iout : 0 % - - - - -

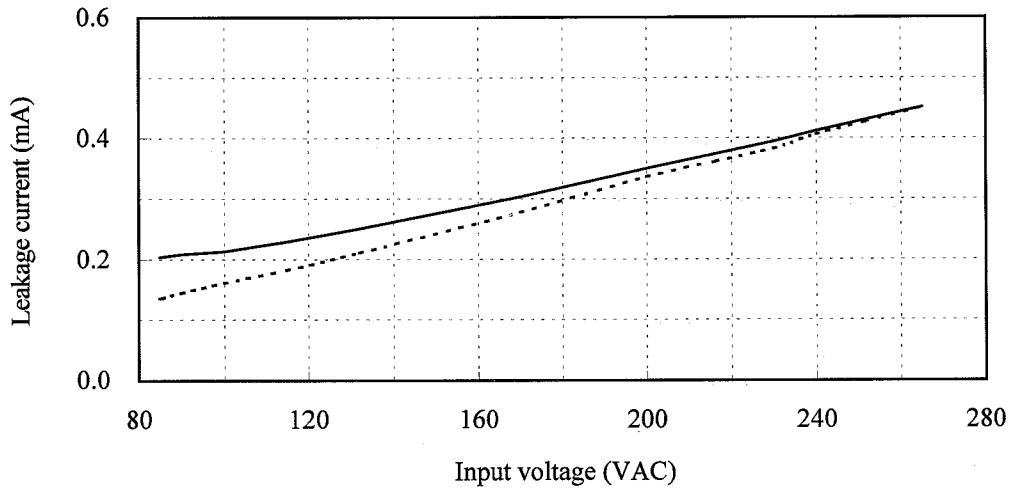
100 % ———

Ta : 25 ℃

f : 60 Hz

Equipment used : 3155(HIOKI)

48V

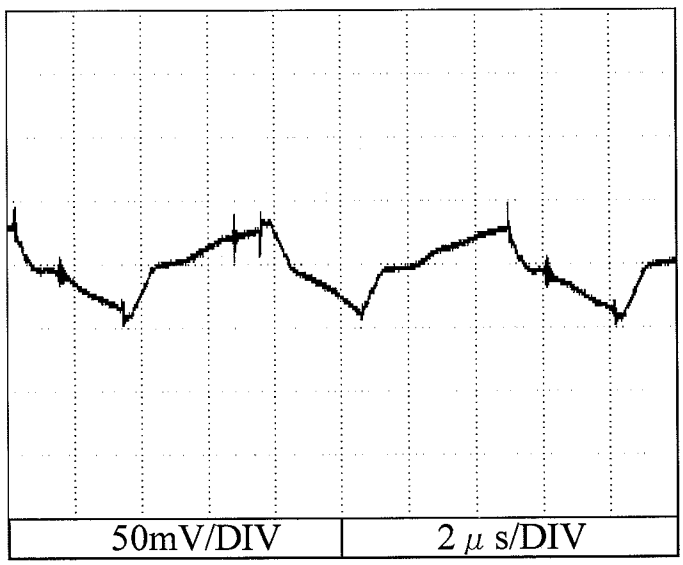


2.3 出力リップル、ノイズ波形
Output ripple and noise waveform

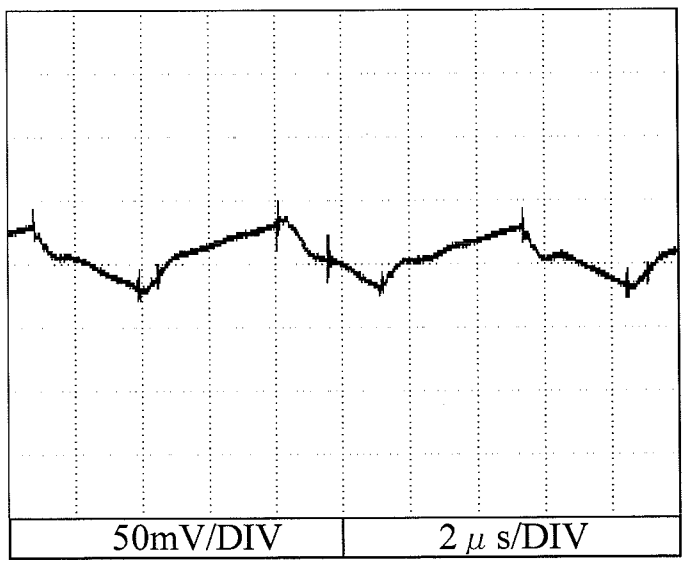
Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

NORMAL MODE

24V



36V

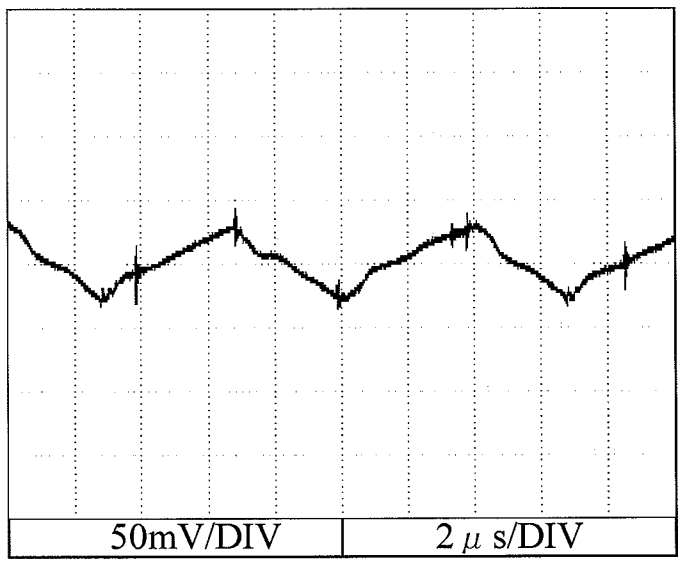


2.3 出力リップル、ノイズ波形
Output ripple and noise waveform

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

NORMAL MODE

48V

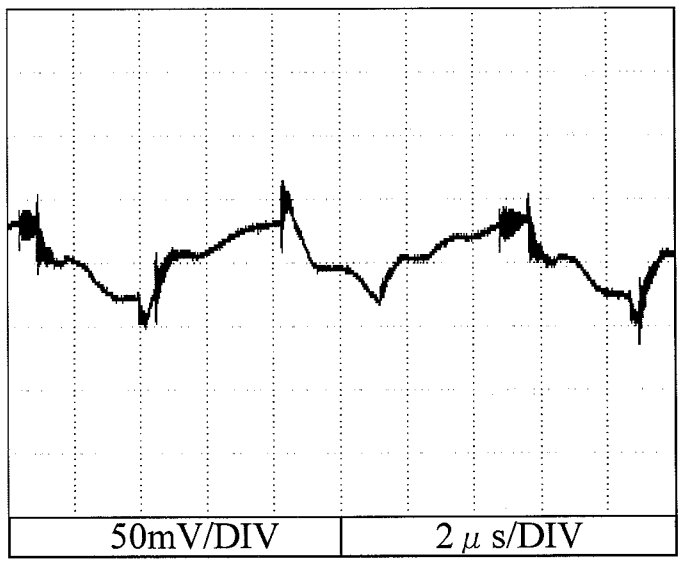


2.3 出力リップル、ノイズ波形
Output ripple and noise waveform

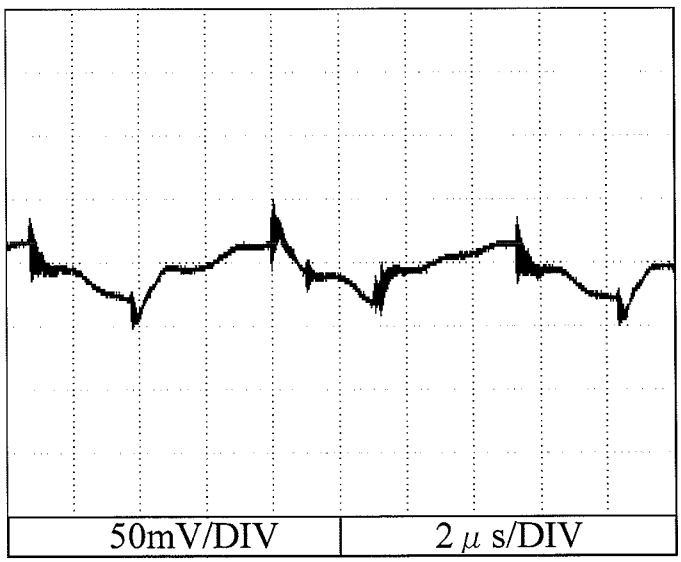
Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

NORMAL + COMMON MODE

24V



36V

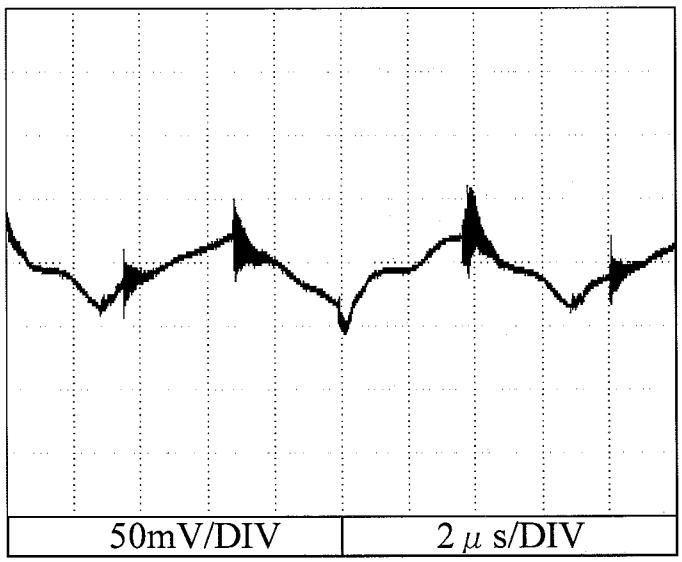


2.3 出力リップル、ノイズ波形
Output ripple and noise waveform

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

NORMAL + COMMON MODE

48V



2.4 ＥＭＩ特性
Electro-Magnetic Interference characteristics

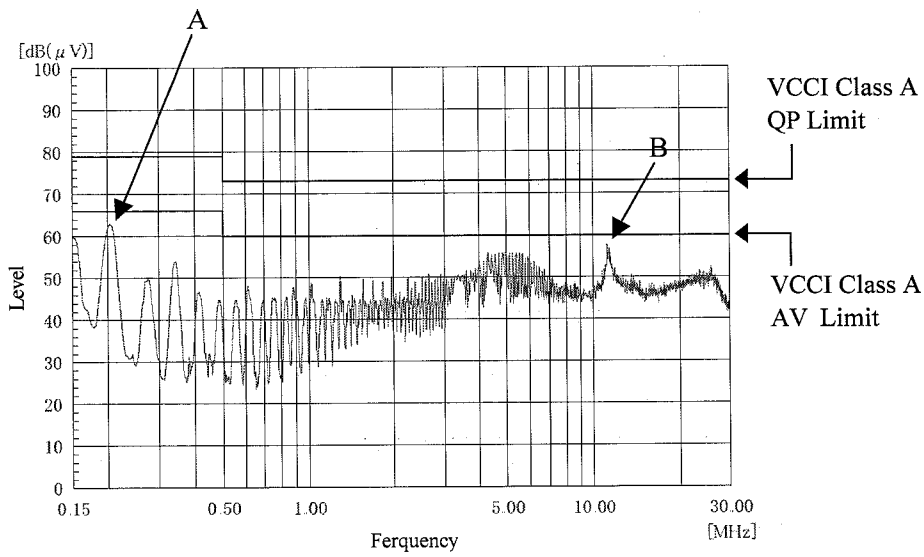
Conditions Vin : 230VAC
Iout : 100%

雑音端子電圧
Conducted Emission

24V

Ref. Data	Point A (201kHz) Limit (dBuV)	Measure (dBuV)
QP	79.0	59.9
AV	66.0	58.6

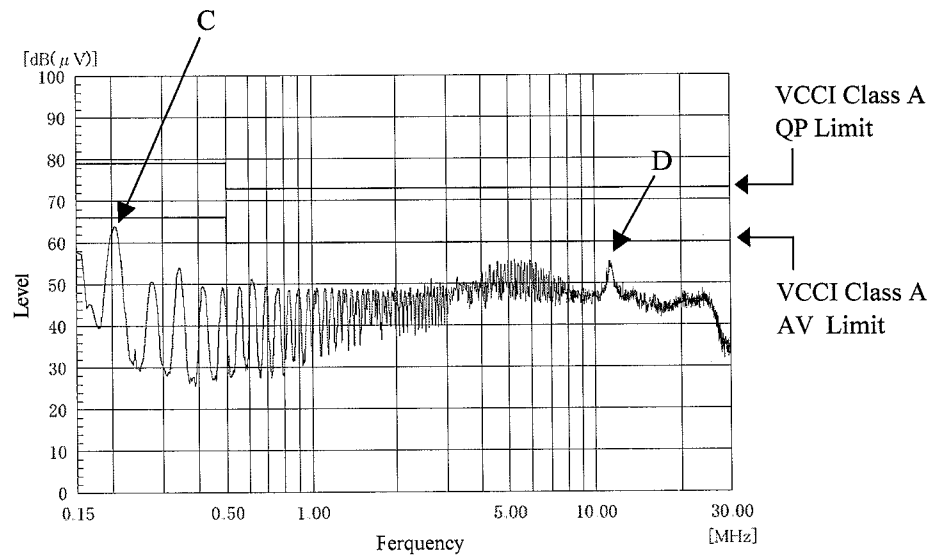
Ref. Data	Point B (11.319MHz) Limit (dBuV)	Measure (dBuV)
QP	73.0	51.1
AV	60.0	46.2



Phase : N

Ref. Data	Point C (202kHz) Limit (dBuV)	Measure (dBuV)
QP	79.0	57.4
AV	66.0	55.0

Ref. Data	Point D (11.182MHz) Limit (dBuV)	Measure (dBuV)
QP	73.0	49.4
AV	60.0	44.1



Phase : L

EN55011-A,EN55022-Aの限界値はVCCI class Aの限界値と同じ
Limit of EN55011-A,EN55022-A are same as its VCCI class A.
上記は、尖頭値検波(PK)方式にて測定した波形です。
The above is wave measured by the peak detection mode.

2.4 ＥＭＩ特性

Electro-Magnetic Interference characteristics

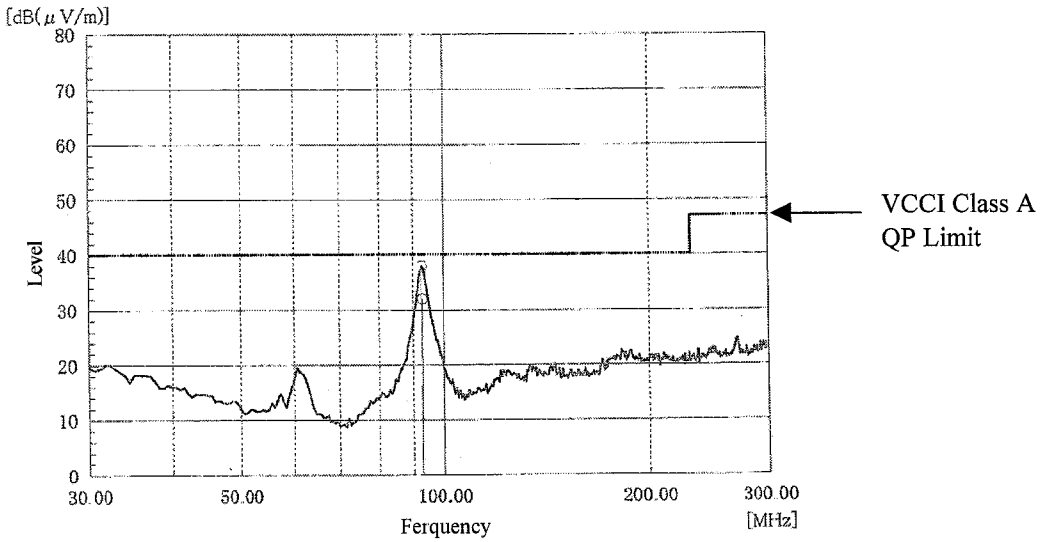
Conditions Vin : 230VAC
Iout : 100%

雑音電界強度

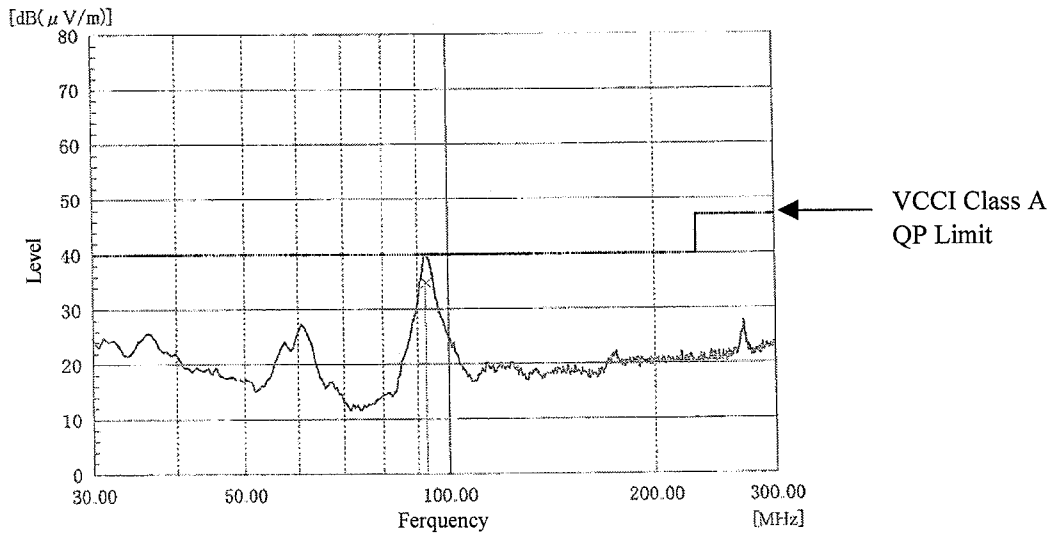
Radiated Emission

24V

HORIZONTAL



VERTICAL



EN55011-A,EN55022-Aの限界値はVCCI class Aの限界値と同じ
Limit of EN55011-A,EN55022-A are same as its VCCI class A.
上記は、尖頭値検波(PK)方式にて測定した波形です。
The above is wave measured by the peak detection mode.