参考資料

COSEL

TEST DATA OF VAA1005

(100V INPUT)

Regulated DC Power Supply

Date : June 2. 1998

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コーセル株式会社

COSEL CO.,LTD.

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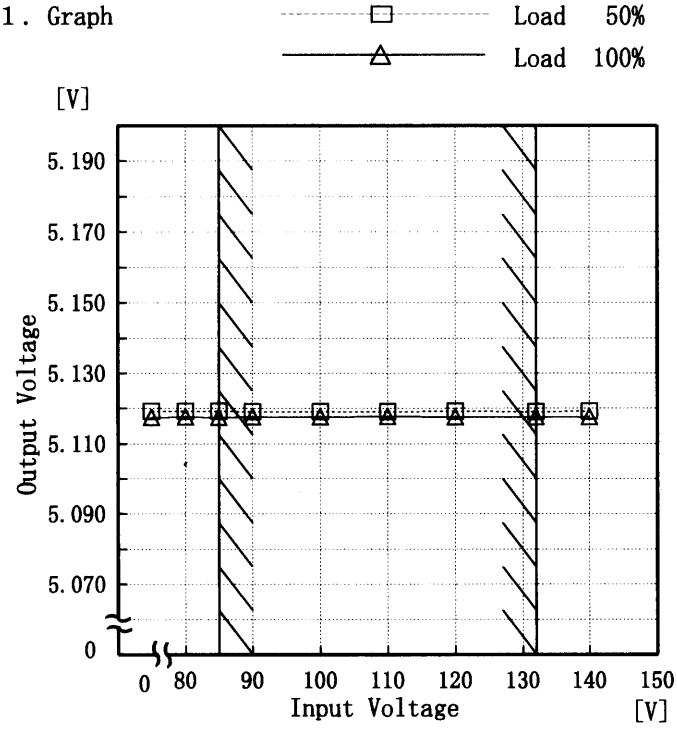
Model	VAA1005
Item	Line Regulation 静的入力変動
Object	+5.0V2.00A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated input voltage.

(注)斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]
75	5.119	5.117
80	5.119	5.118
85	5.119	5.118
90	5.119	5.118
100	5.119	5.118
110	5.119	5.118
120	5.119	5.118
132	5.119	5.118
140	5.119	5.118

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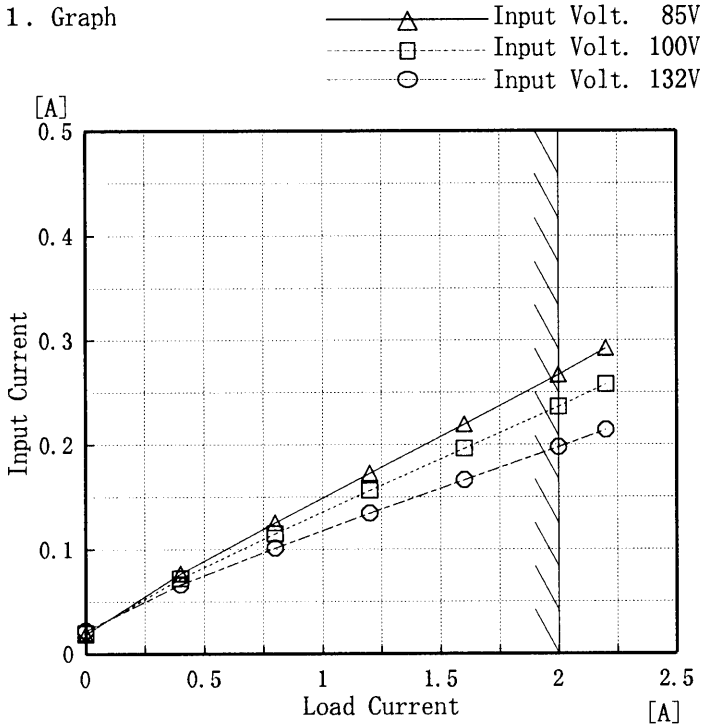
Model	VAA1005		
Item	Input Current (by Load Current) 入力電流 (負荷特性)	Temperature Testing Circuitry	25℃ Figure A
Output	————		

1. Graph



Note: Slanted line shows the range of the rated load current

(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	0.019	0.020	0.022
0.4	0.077	0.072	0.066
0.8	0.125	0.115	0.102
1.2	0.173	0.156	0.135
1.6	0.220	0.197	0.167
2.0	0.267	0.236	0.198
2.2	0.293	0.258	0.214
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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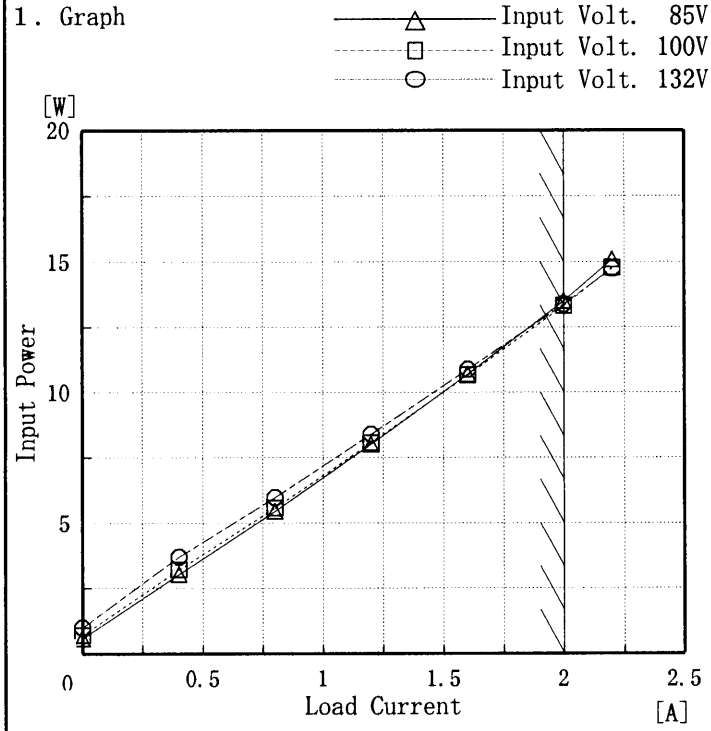
Model	VAA1005
Item	Input Power (by Load Current) 入力電力 (負荷特性)
Output	————

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current

(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Power [W] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	0.58	0.71	0.99
0.4	3.03	3.21	3.70
0.8	5.46	5.58	5.98
1.2	8.01	8.08	8.40
1.6	10.69	10.66	10.87
2.0	13.50	13.31	13.37
2.2	15.08	14.78	14.73
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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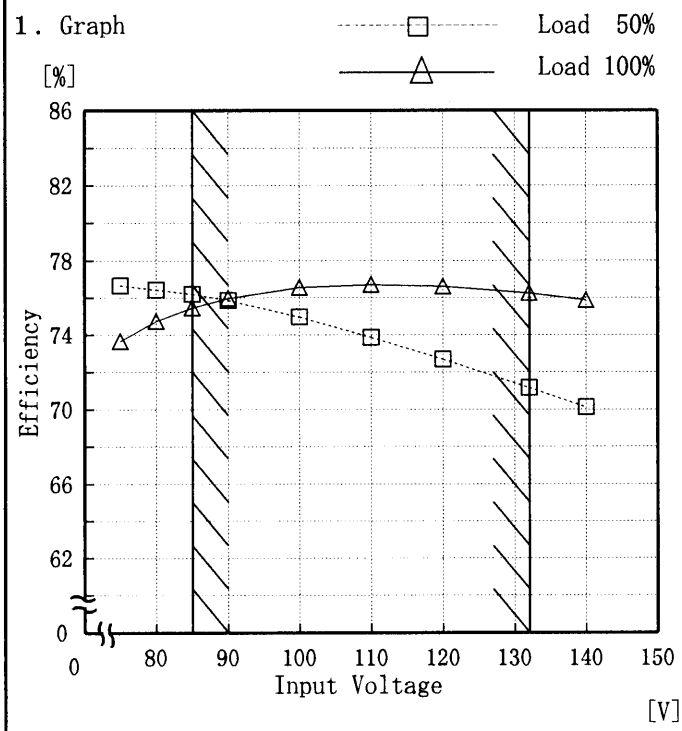
Model	VAA1005	
Item	Efficiency (by Input Voltage) 効率（入力電圧特性）	Temperature 25℃ Testing Circuitry Figure A
Object	———————	

1. Graph



Note: Slanted line shows the range of the rated input voltage.

(注)斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Load 50% Efficiency [%]	Load 100% Efficiency [%]
75	76.7	73.7
80	76.4	74.8
85	76.2	75.5
90	75.9	76.0
100	75.0	76.6
110	73.9	76.7
120	72.7	76.6
132	71.2	76.2
140	70.1	75.9

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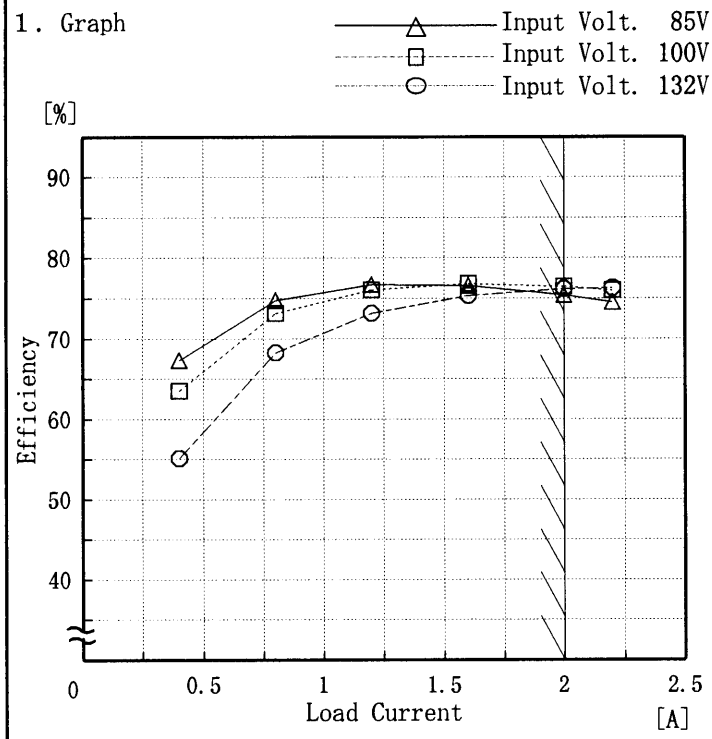
Model	VAA1005
Item	Efficiency (by Load Current) 効率 (負荷電流特性)
Output	————

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current

(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Efficiency [%] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.4	67.3	63.5	55.1
0.8	74.7	73.1	68.3
1.2	76.7	76.1	73.2
1.6	76.6	76.8	75.3
2.0	75.4	76.5	76.2
2.2	74.5	76.0	76.3
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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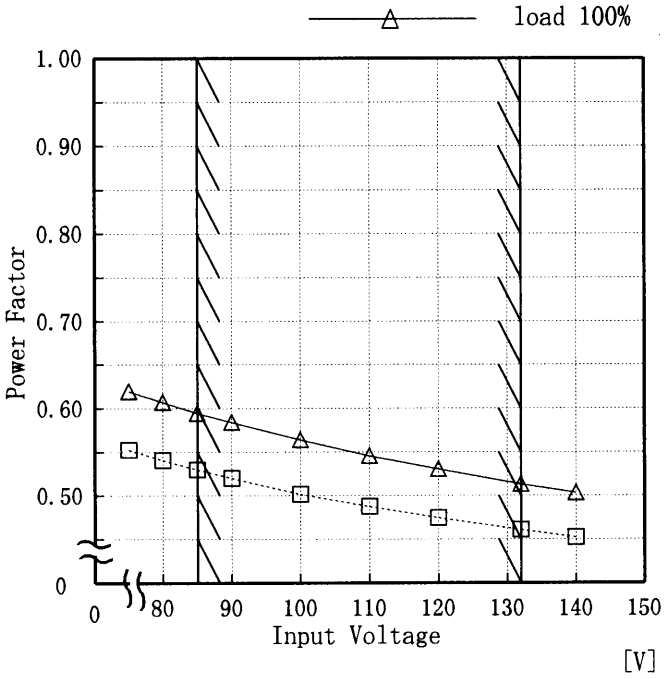
COSEL

Model	VAA1005	
Item	Power Factor (by Input Voltage) 力率（入力電圧特性）	Temperature 25℃ Testing Circuitry Figure A
Object	———————————	

1. Graph



Note: Slanted line shows the range of the rated input voltage.

(注)斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	load 50% Power Factor	load 100% Power Factor
75	0.55	0.62
80	0.54	0.61
85	0.53	0.59
90	0.52	0.58
100	0.50	0.56
110	0.49	0.55
120	0.47	0.53
132	0.46	0.51
140	0.45	0.50

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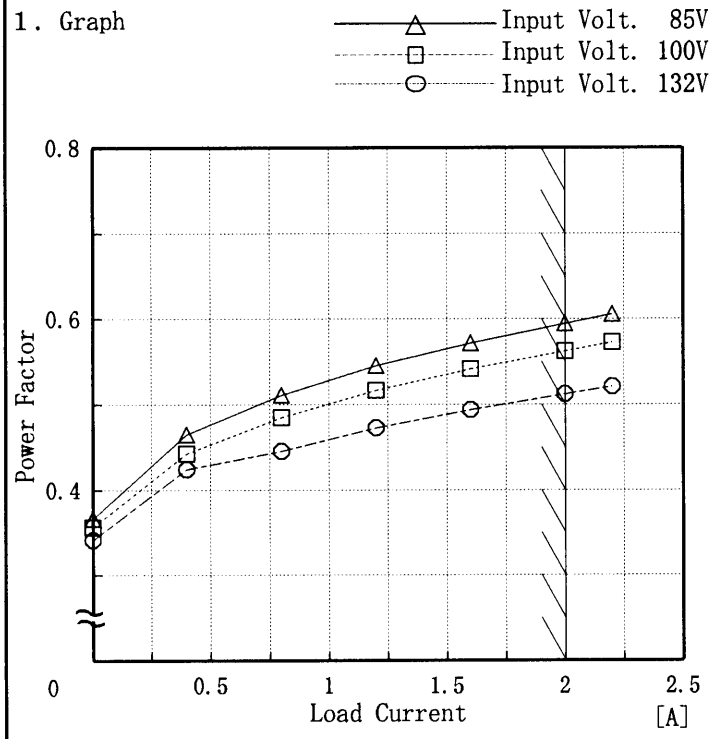
Model	VAA1005
Item	Power Factor (by Load Current) 力率（負荷電流特性）
Output	————

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current

(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
—	0.37	0.36	0.34
0.4	0.46	0.44	0.42
0.8	0.51	0.49	0.45
1.2	0.55	0.52	0.47
1.6	0.57	0.54	0.49
2.0	0.59	0.56	0.51
2.2	0.61	0.57	0.52
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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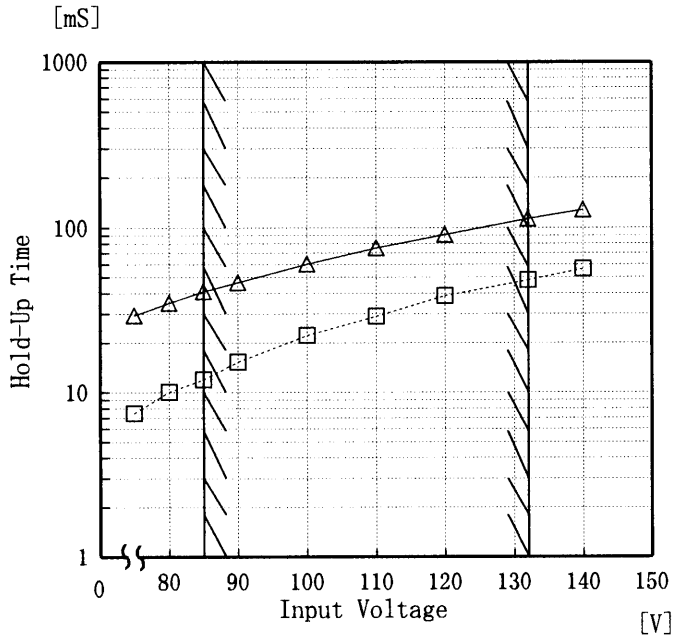
Model	VAA1005
Item	Hold-Up Time　出力保持時間
Object	+5.0V2.00A

Temperature　25℃
Testing Circuitry　Figure A

1. Graph

△ Load 50%
□ Load 100%



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

Note: Slanted line shows the range of the rated input voltage.

出力保持時間とは、入力電圧断から出力電圧が、定電圧精度の規格範囲を保持しているところまでの時間。

(注)斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Load 50% Hold-Up Time [mS]	Load 100% Hold-Up Time [mS]
75	30	8
80	35	10
85	41	12
90	47	15
100	60	22
110	76	29
120	91	39
132	113	48
140	128	56

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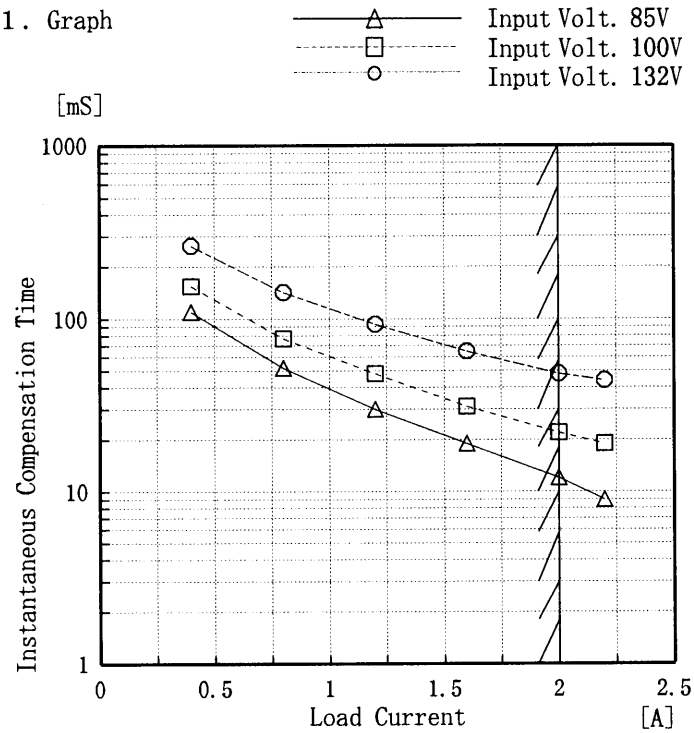
Model	VAA1005
Item	Instantaneous Interruption Compensation 瞬時停電保障
Object	+5.0V2.00A

Testing Circuitry Figure A

1. Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note:Slanted line shows the range of the rated load current.

瞬時停電保障時間とは、出力電圧が定電圧精度の規格範囲を保持している瞬時停電時間をいう。
(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Time [mS]		
0.0	—	—	—
0.4	110	154	264
0.8	52	77	142
1.2	30	48	93
1.6	19	31	65
2.0	12	22	48
2.2	9	19	44
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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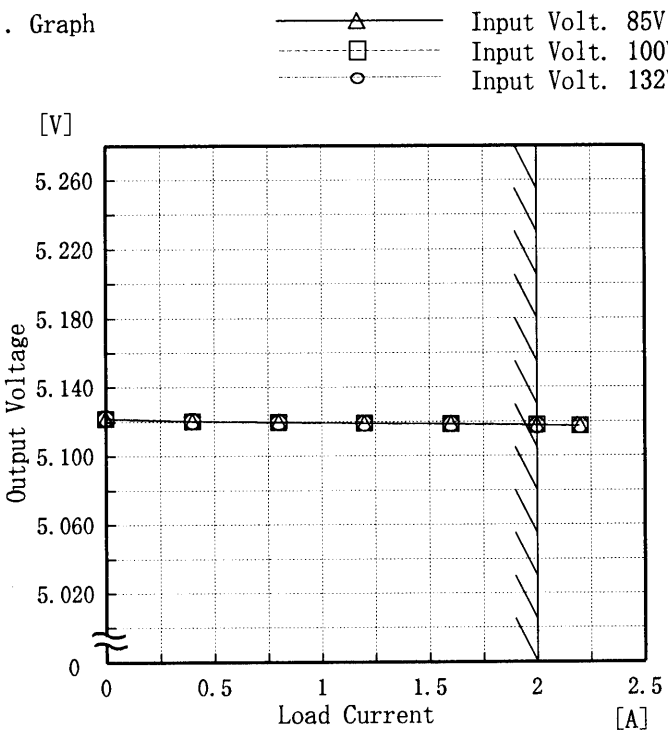
Model	VAA1005
Item	Load Regulation 静的負荷変動
Object	+5.0V2.00A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current.

(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Volt. 85[V] Output Volt. [V]	Input Volt. 100[V] Output Volt. [V]	Input Volt. 132[V] Output Volt. [V]
0.0	5.122	5.122	5.122
0.4	5.120	5.120	5.120
0.8	5.120	5.120	5.120
1.2	5.119	5.119	5.119
1.6	5.119	5.119	5.119
2.0	5.118	5.118	5.118
2.2	5.117	5.117	5.118
—	—	—	—
—	—	—	—
—	—	—	—

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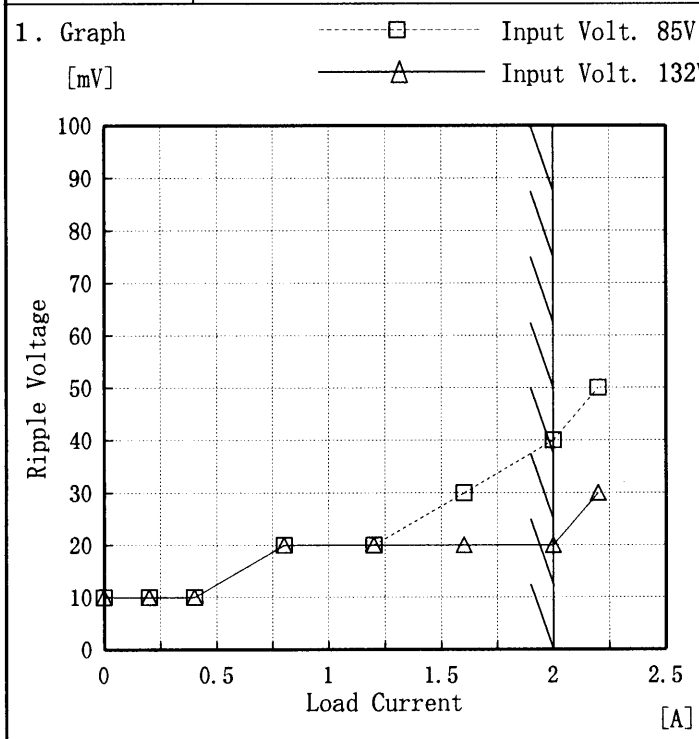
Model	VAA1005
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+5.0V2.00A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Ripple Voltage is shown as p-p in the figure below.

Note: Slanted line shows the range of the rated load current.

リップル電圧は、下図ｐ－ｐ値で示される。

(注)斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
入力商用周期
T2: Due to Switching
ｽｲｯﾁﾝｸﾞ周期

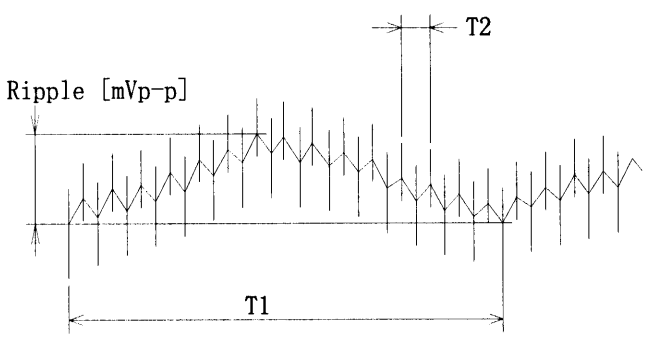


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

Load Current [A]	Input Volt. 85 [V] Ripple Output Volt. [mV]	Input Volt. 132 [V] Ripple Output Volt. [mV]
0.0	10	10
0.2	10	10
0.4	10	10
0.8	20	20
1.2	20	20
1.6	30	20
2.0	40	20
2.2	50	30
—	—	—
—	—	—
—	—	—

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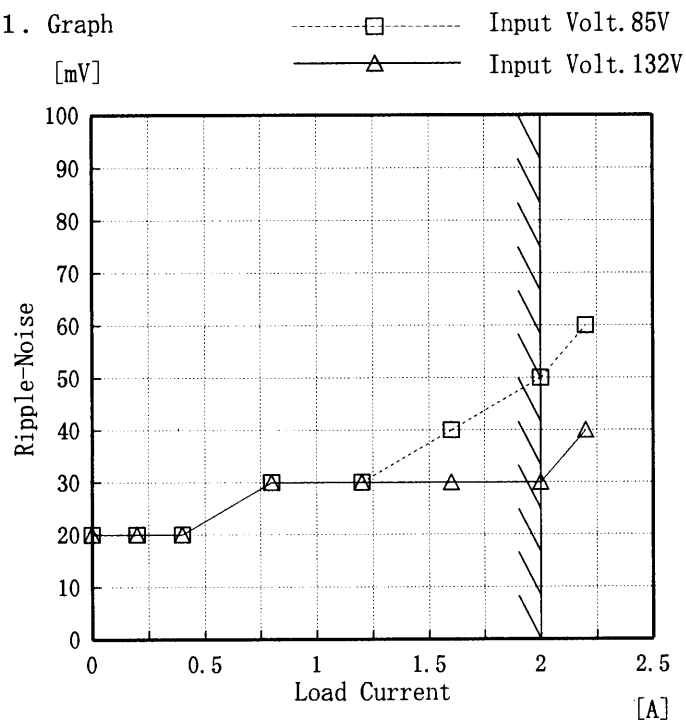
Model	VAA1005
Item	Ripple-Noise　リップルノイズ
Object	+5.0V2.00A

Temperature　25℃
Testing Circuitry　Figure A

1. Graph



Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

リップルノイズは、下図ｐ－ｐ値で示される。
(注)斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
入力商用周期
T2: Due to Switching
ｽｲｯﾁﾝｸﾞ周期

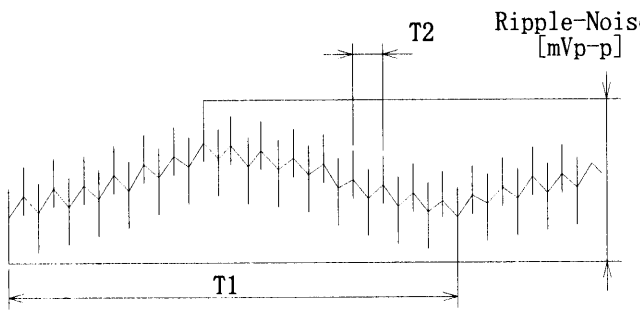


Fig. Complex Ripple Wave Form
図　リップル波形詳細図

2. Values

Load current [A]	Input Volt. 85 [V] Ripple-Noise [mV]	Input Volt. 132 [V] Ripple-Noise [mV]
0.0	20	20
0.2	20	20
0.4	20	20
0.8	30	30
1.2	30	30
1.6	40	30
2.0	50	30
2.2	60	40
—	—	—
—	—	—
—	—	—

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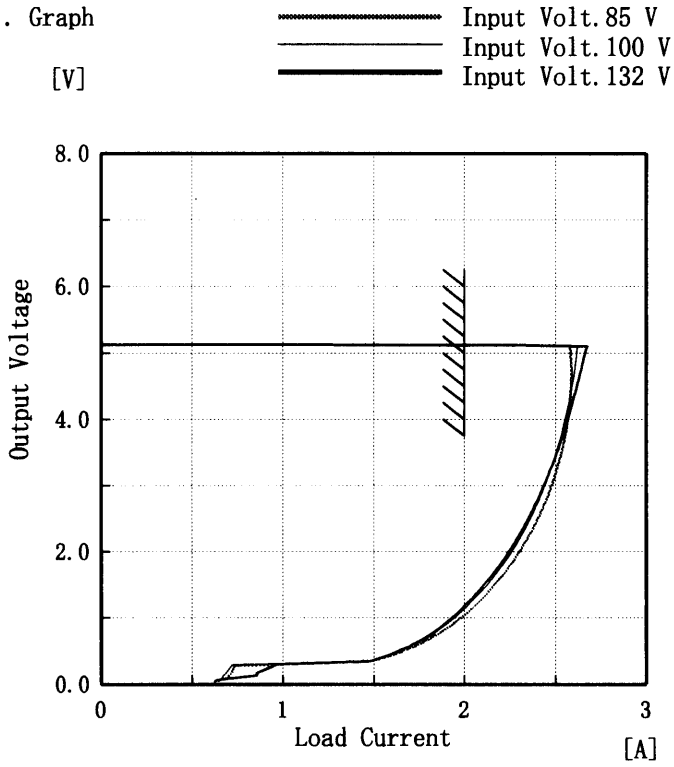
Model	VAA1005
Item	Overcurrent Protection 過電流保護
Object	+5.0V2.00A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current.

(注)斜線は定格負荷電流範囲を示す。

2. Values

Output Voltage [V]	Input Volt. 85[V] Load Current [A]	Input Volt. 100[V] Load Current [A]	Input Volt. 132[V] Load Current [A]
5.00	2.58	2.62	2.66
4.75	2.59	2.60	2.64
4.50	2.59	2.59	2.62
4.00	2.57	2.55	2.57
3.50	2.53	2.50	2.51
3.00	2.48	2.44	2.44
2.50	2.40	2.36	2.35
2.00	2.30	2.26	2.24
1.50	2.17	2.13	2.11
1.00	1.99	1.95	1.93
0.50	1.68	1.65	1.65
0.00	0.67	0.64	0.62

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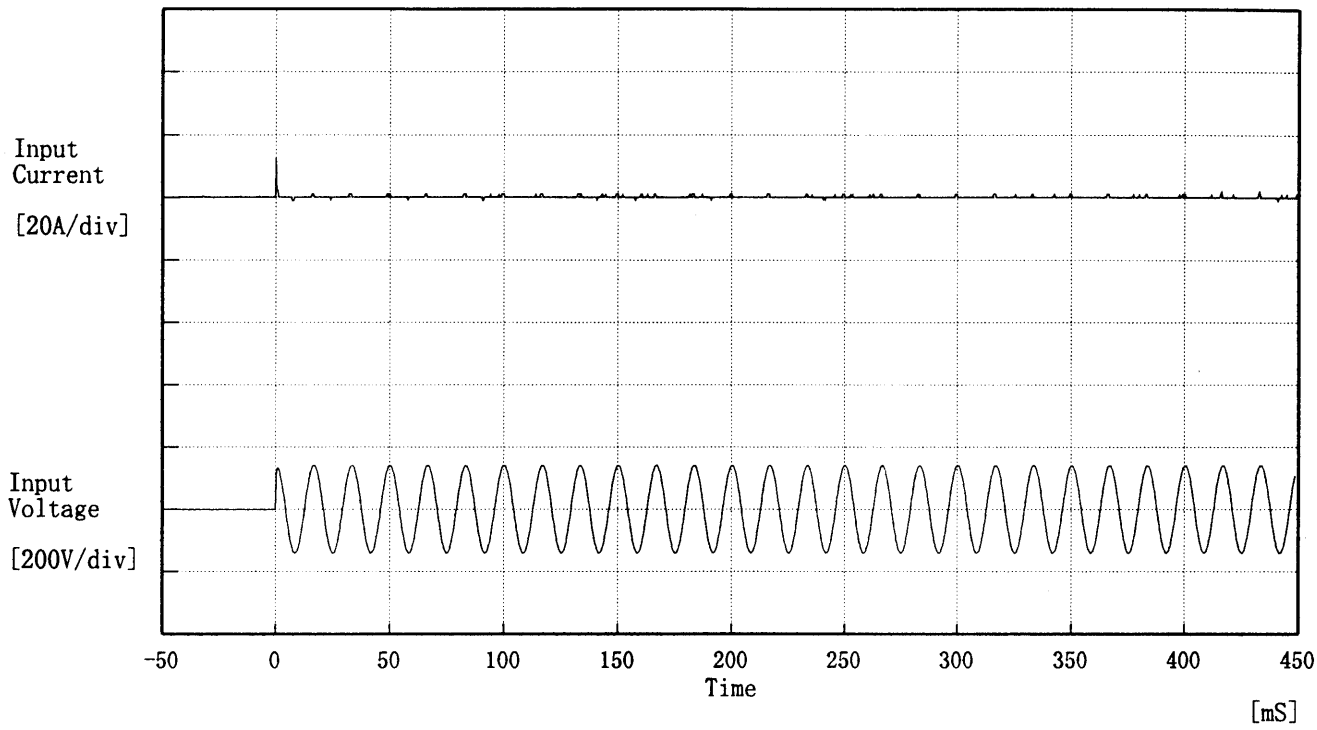
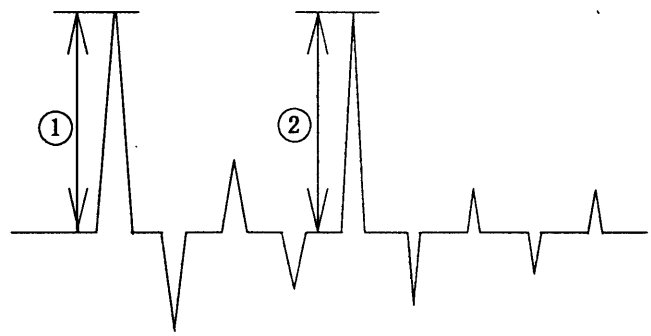
Model	VAA1005
Item	Inrush Current 突入電流
Object	――――――――

Temperature 25℃
Testing Circuitry Figure A



Input Voltage 100 V
Frequency 60 Hz
Load 100 %
Inrush Current
① 11.48 [A]
② 1.97 [A]



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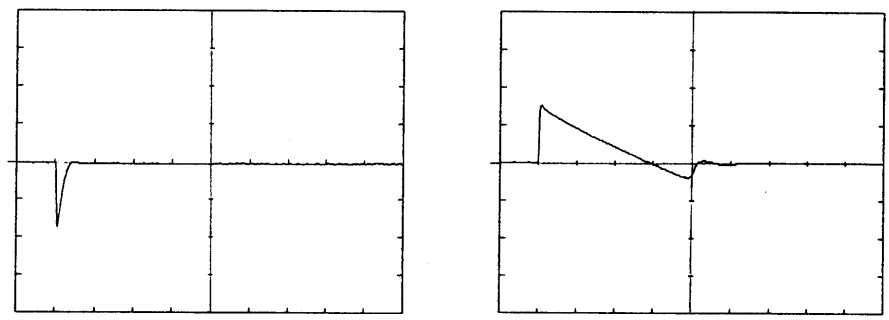
Model	VAA1005		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+5.0V2.00A		

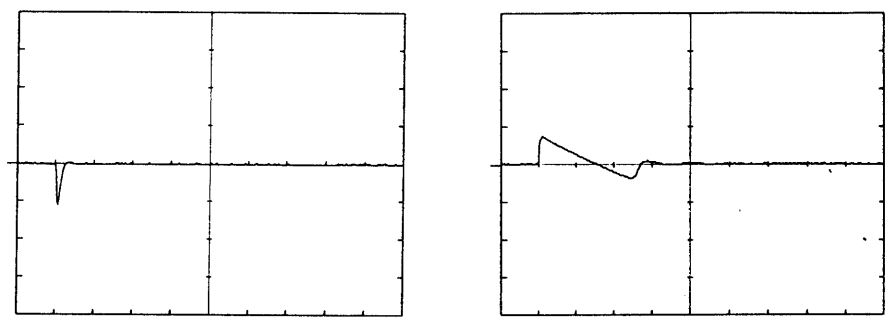
Input Volt. 100 V
Cycle 1000 mS

Load Current

Load 0% ←→
Load 100 %



Load 0% ←→
Load 50 %



200 mV/div

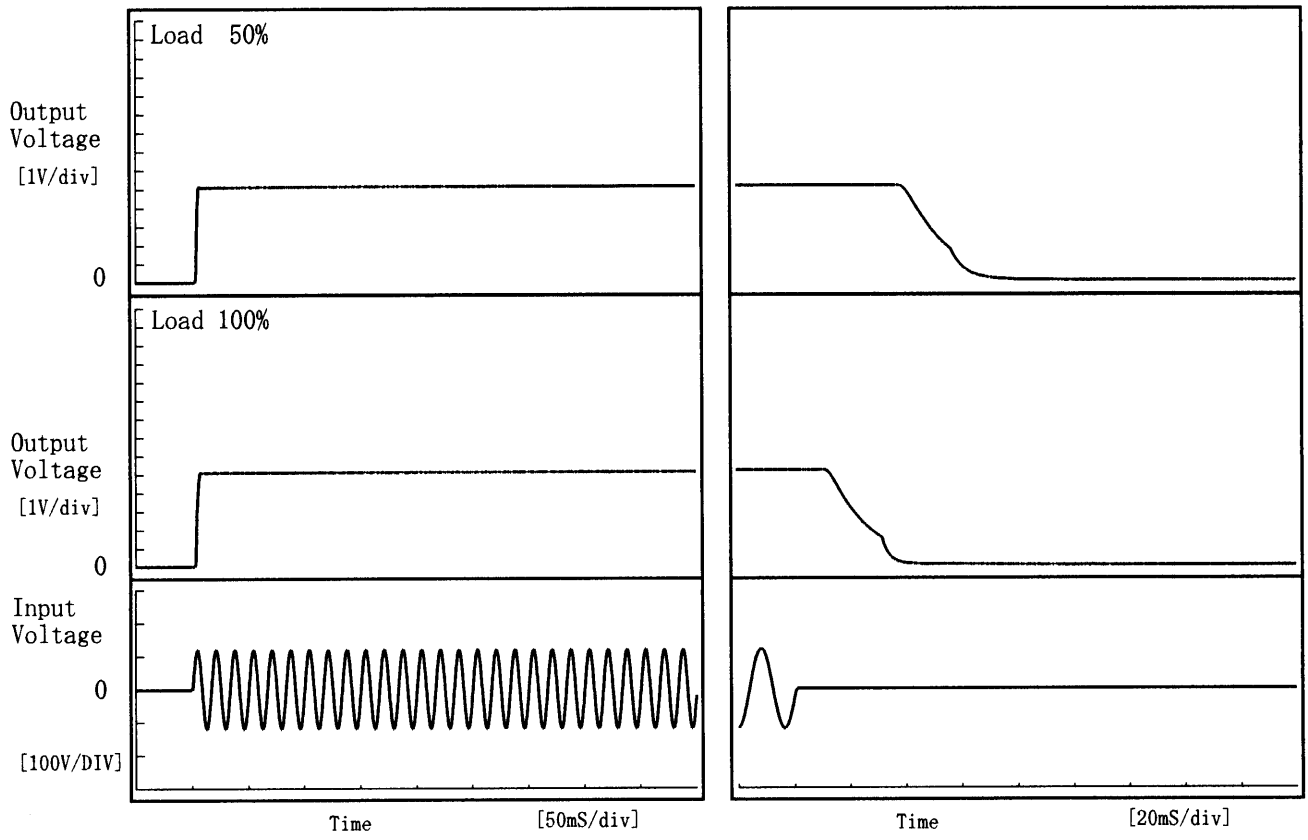
5 mS/div

COSEL

Model	VAA1005		
Item	Rise and Fall Time 立上り、立下り時間	Temperature	25℃
		Testing Circuitry	Figure A
Object	+5.0V2.00A		

1. Graph

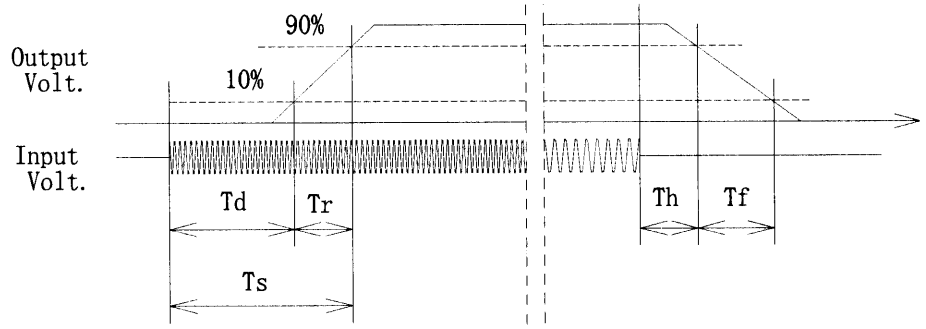
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	3.0	2.0	5.0	42.2	21.8
100 %	3.0	3.0	6.0	15.2	20.0



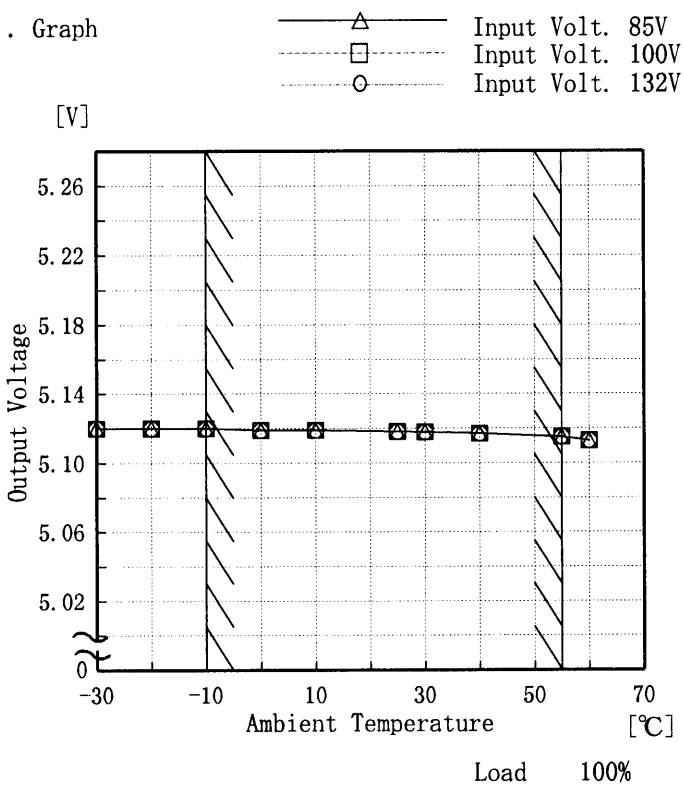
BC−3153

COSEL

Model	VAA1005
Item	Ambient Temperature Drift 周囲温度変動
Object	+5.0V2.00A

Testing Circuitry Figure A

1. Graph



Load 100%

Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

2. Values

Temperature [℃]	Input Volt. 85[V] Output Volt. [V]	Input Volt. 100[V] Output Volt. [V]	Input Volt. 132[V] Output Volt. [V]
-30	5.120	5.120	5.120
-20	5.120	5.120	5.120
-10	5.120	5.120	5.120
0	5.119	5.119	5.119
10	5.119	5.119	5.119
25	5.118	5.118	5.118
30	5.118	5.118	5.118
40	5.117	5.117	5.117
55	5.115	5.115	5.115
60	5.113	5.113	5.113
—	—	—	—

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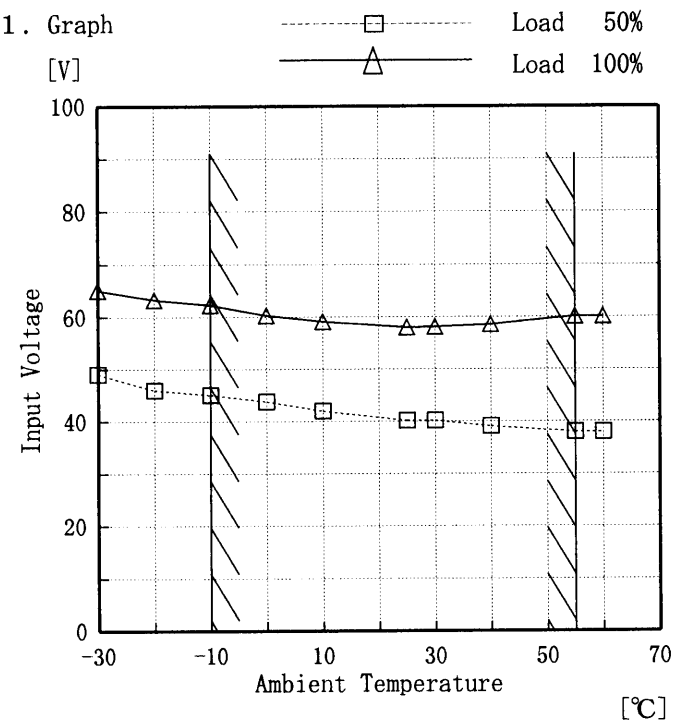
COSEL

Model	VAA1005
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+5.0V2.00A

Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

2. Values

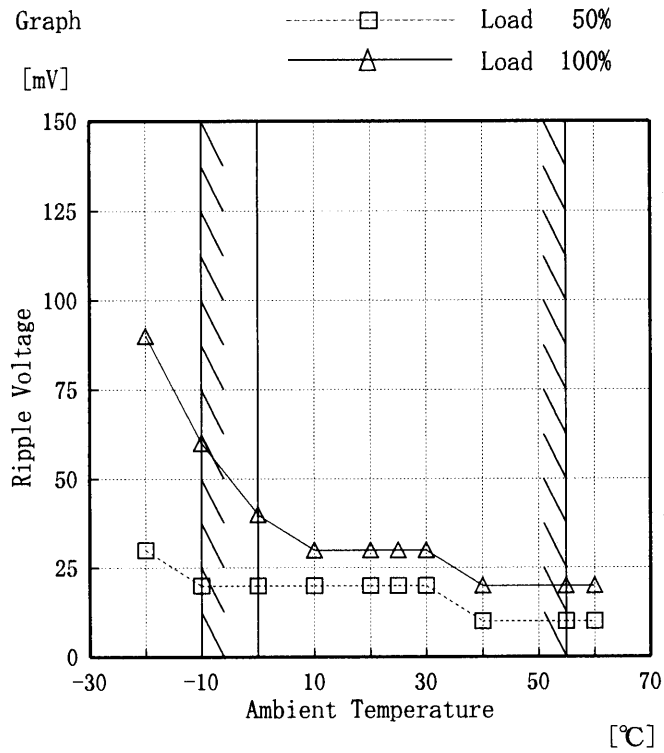
Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	49	65
-20	46	63
-10	45	62
0	44	60
10	42	59
25	40	58
30	40	58
40	39	59
55	38	60
60	38	60
—	—	—

COSEL

Model	VAA1005
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	+5.0V2.00A

Testing Circuitry Figure A

1. Graph



Input Volt. 100 V

Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

2. Values

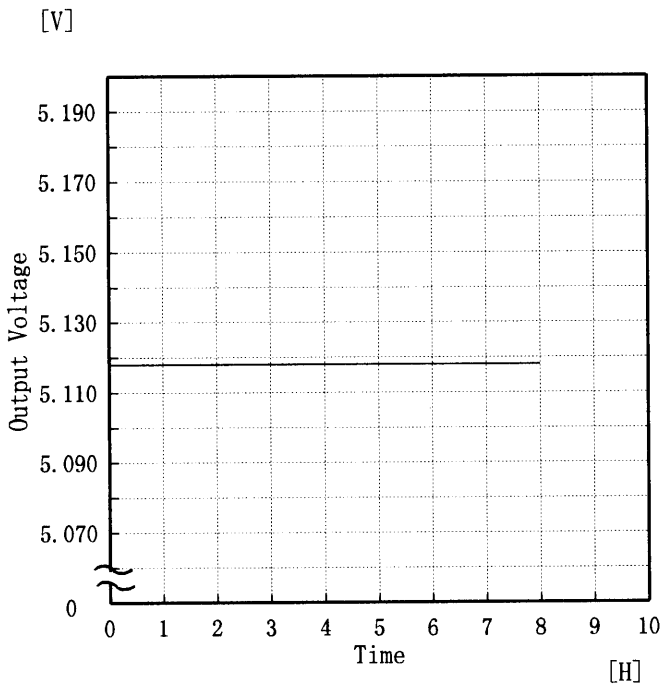
Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-20	30	90
-10	20	60
0	20	40
10	20	30
20	20	30
25	20	30
30	20	30
40	10	20
55	10	20
60	10	20
—	—	—

COSEL

Model	VAA1005
Item	Time Lapse Drift 経時ドリフト
Object	+5.0V2.00A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 100V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	5.119
0.5	5.118
1.0	5.118
2.0	5.118
3.0	5.118
4.0	5.118
5.0	5.118
6.0	5.118
7.0	5.118
8.0	5.118

COSEL

Model	VAA1005	
Item	Output Voltage Accuracy 定電圧精度	Testing Circuitry Figure A
Object	+5.0V2.00A	

Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature : -10～55 ℃
Input Voltage : 85～132 V
Load Current : 0.00～2.00 A

* Output Voltage Accuracy = ±(Maximum of Output Voltage − Minimum of Output Voltage)／2

$$\text{* Output Voltage Accuracy (Ration)} = \frac{\text{Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

定電圧精度

周囲温度、入力電圧、負荷を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

周囲温度 -10～55 ℃
入力電圧 85～132 V
負荷電流 0.00～2.00 A

* 定電圧精度(変動値) ＝ ±(出力電圧の最高値－出力電圧の最低値)／2

$$\text{* 定電圧精度(変動率)} = \frac{\text{変動値}}{\text{定格出力電圧}} \times 100$$

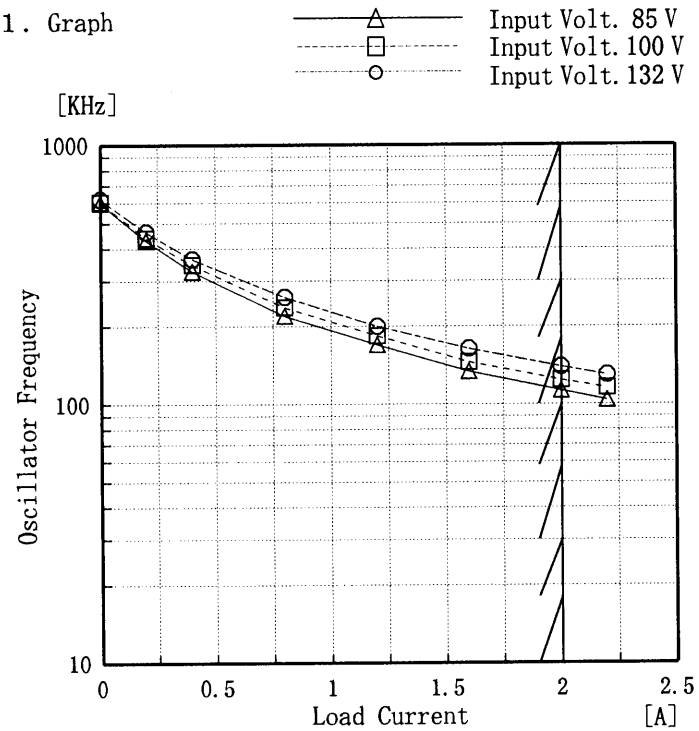
Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-10	132	0.00	5.125	±6	±0.2
Minimum Voltage	55	132	2.00	5.115		

COSEL

Model	VAA1005
Item	Oscillator Frequency 発振周波数
Object	+5.0V2.00A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note:Slanted line shows the range of the rated load current.

(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Oscillator Frequency [KHz]		
0.0	600	605	620
0.2	430	440	465
0.4	327	347	365
0.8	220	237	260
1.2	170	184	200
1.6	134	146	164
2.0	113	124	140
2.2	104	116	130
—	—	—	—
—	—	—	—
—	—	—	—

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COSEL

Model	VAA1005	
Item	Condensation 結露特性	Testing Circuitry Figure A
Object	+5.0V2.00A	

1. Condensation test

Testing procedure is as follows.

① Keeping and cooling the unit in a tank at -10℃ for an hour with the input off.

② Taking it out of the tank and dewing itself in a room where the temperature is 25℃ and the humidity is 40%RH.

③ Testing electrical characteristics of the unit to confirm there be no fault.

④ Repeating ①, ② and ③ three times.

1．結露特性試験

入力を切った状態で、恒温槽で－１０℃に冷却しておき、約１時間後に恒温槽から取り出し、室温２５℃、湿度４０%RHの状態におき結露させ、その電気的特性の測定を３度行い、異常のないことを確認する。

2．Values

	Times	Output Voltage [V]	Ripple Voltage [mV]	Ripple Noise [mV]
Load 50 %	1	5.119	20	30
	2	5.119	20	30
	3	5.119	20	30
Load 100 %	1	5.118	30	40
	2	5.118	30	40
	3	5.118	30	40

Input Volt. 100 V

COSEL

Model	VAA1005	
Item	Leakage Current 漏洩電流	Testing Circuitry Figure B
Object	———————	

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.09	0.10	0.13
(B) UL	0.09	0.10	0.13
(C) CSA	0.09	0.10	0.13

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 220 [V]	Input Volt. 264 [V]
(D) VDE	—	—	—

2. Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

交流入力の両相について測定し、その大きい方を漏洩電流測定値とする。

COSEL

Model	VAA1005
Item	Line Noise Tolerance 入力雑音耐量
Object	+5.0V2.00A

Testing Circuitry Figure C

1. Results

Pulse Width [nS]	MODE	Operating Point of Overvoltage Protection [V] 過電圧保護動作値	DC-like Regulation of Output Voltage 出力電圧の直流的変動
50	COMMON		no regulation
	NORMAL		no regulation
1000	COMMON		no regulation
	NORMAL		no regulation

Conditions

Input Voltage :100 V
Pulse Voltage :2000 V
Pulse Cycle :10 mS
Pulse Input Duration:1 min. or more
Load :100 %

COSEL

Model	VAA1005
Item	Conducted Emission 雑音端子電圧
Object	――――――

Testing Circuitry Figure D

1. Graph

Remarks

Input Volt. 100 V (VCCI class B)

120 V (FCC class B)

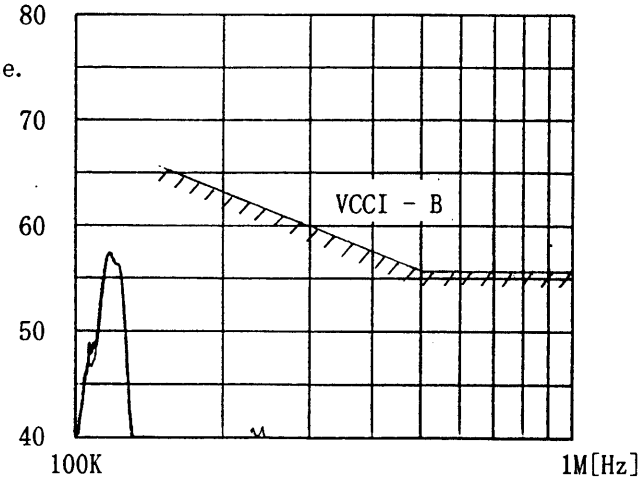
Load 100 %

Note: Slanted line shows the range of Tolerance.

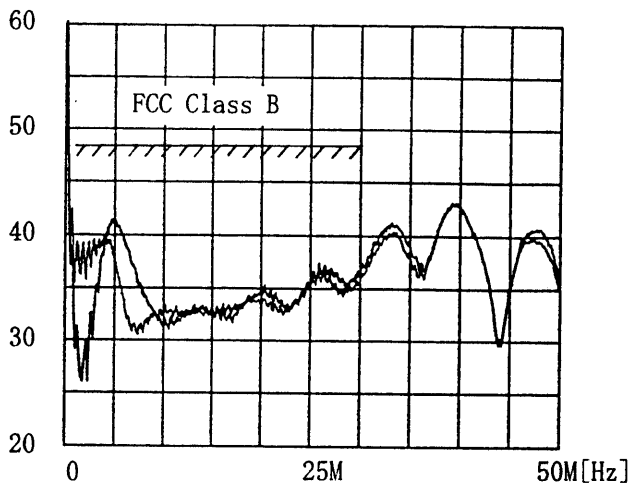
(注)斜線は許容値を示す。

NO	Standards	Standards Complied	Frequency [MHz]	Tolerance [dBμV]
1	FCC class A		0.45～1.6	60
			1.6～30	69.5
2	FCC class B	○	0.45～30	48
3	VCCI class A		0.15～0.5	79
			0.5～30	73
4	VCCI class B	○	0.15～0.5	66-56
			0.5～5	56
			5～30	60
5	CISPR Pub.22 class A (EN55022)		0.15～0.5	79
			0.5～30	73
6	CISPR Pub.22 class B (EN55022)		0.15～0.5	66-56
			0.5～5	56
			5～30	60

[dBμV]



[dBμV]



注：図1に示すように、外付けコンデンサーを取り付けて測定する。（C＝0．47μF）

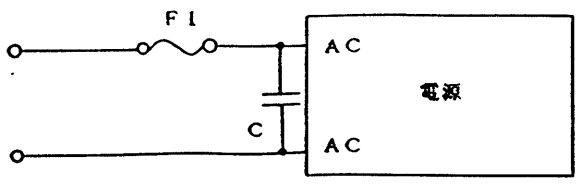


図1

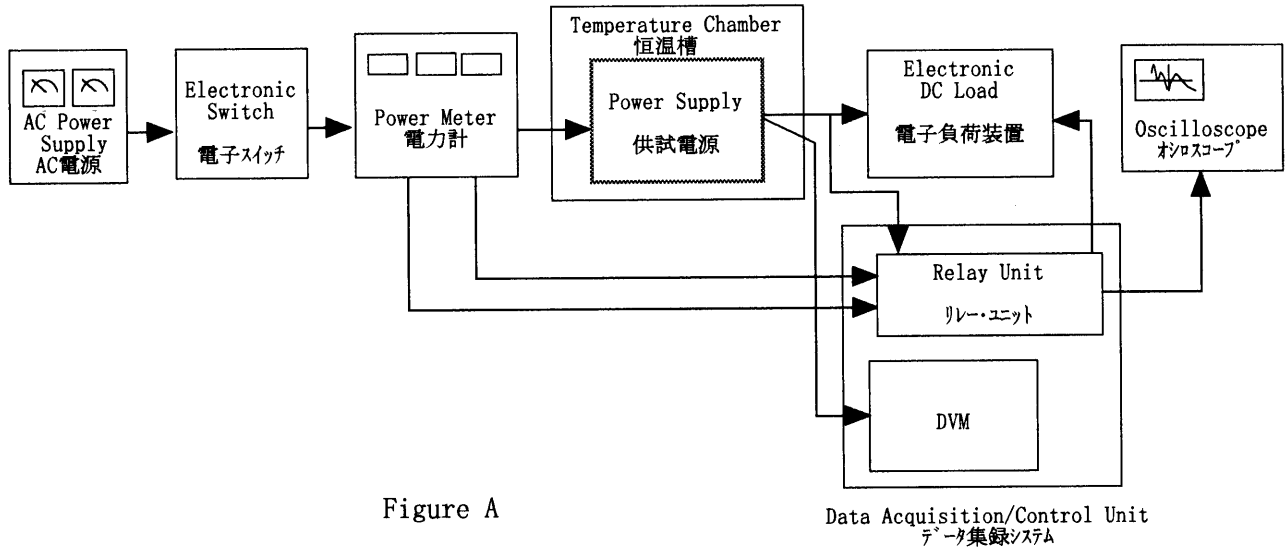


Figure A

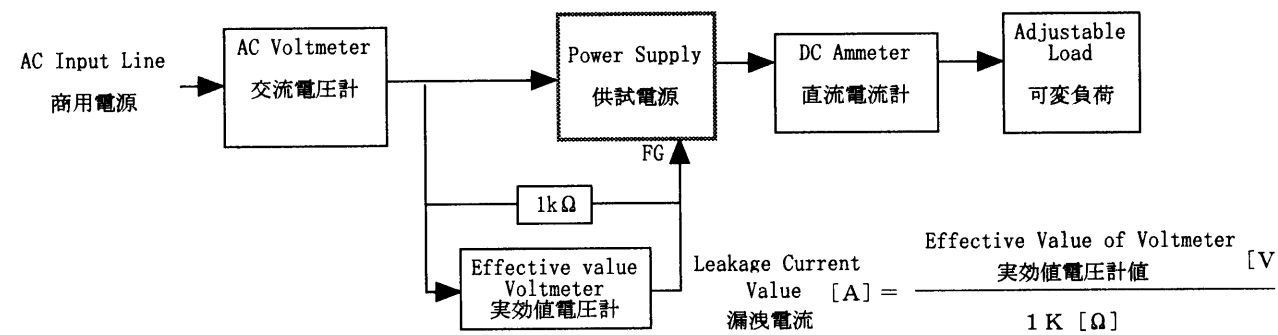


Figure B(DENTORI)

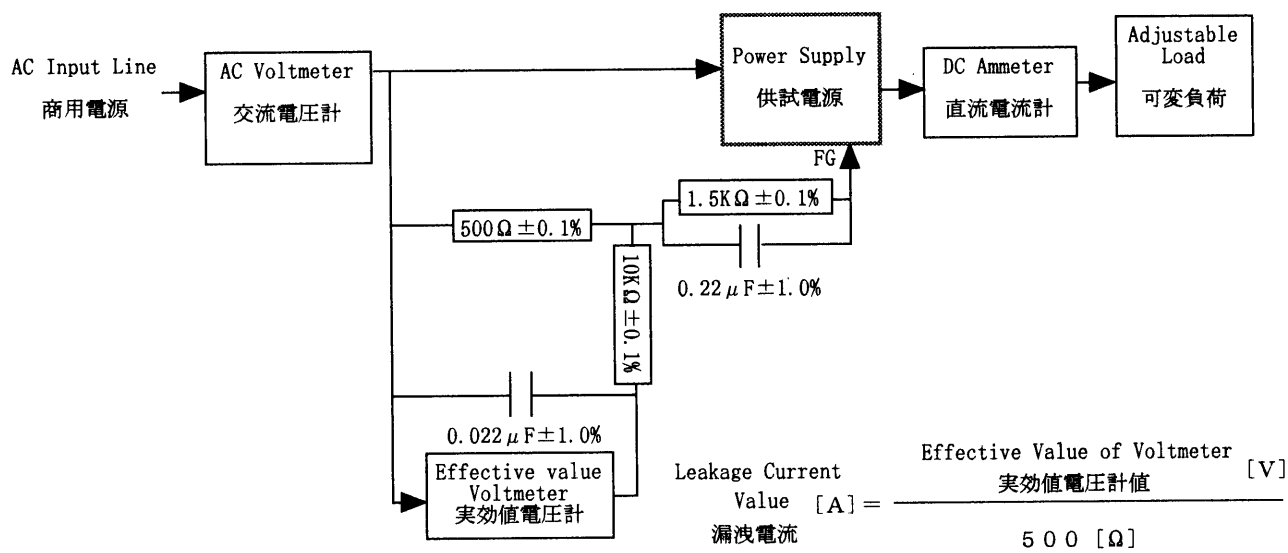


Figure B (UL, CSA, VDE)

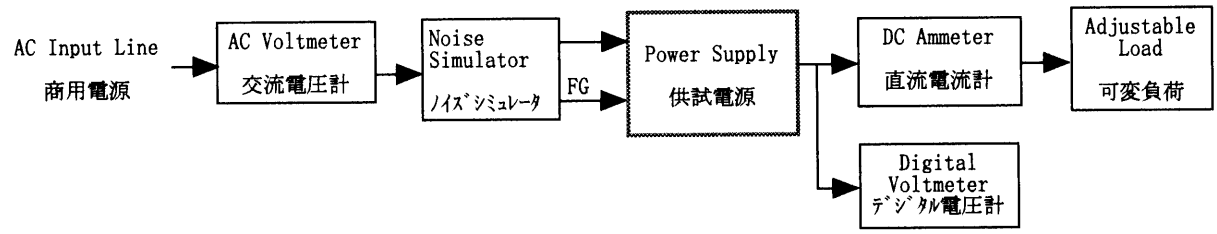


Figure C

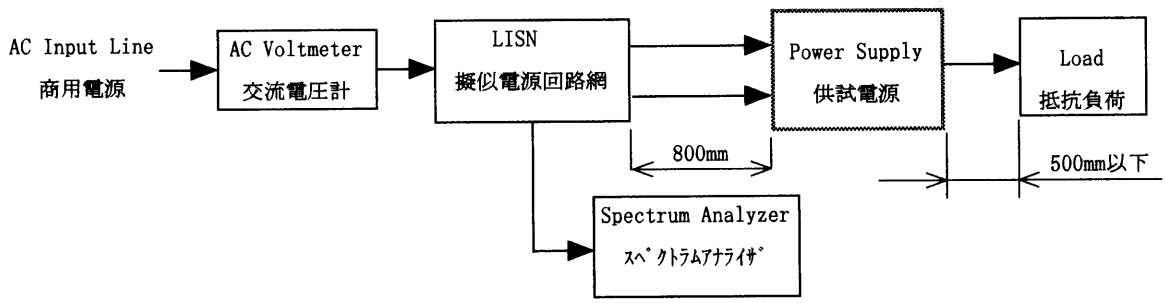


Figure D

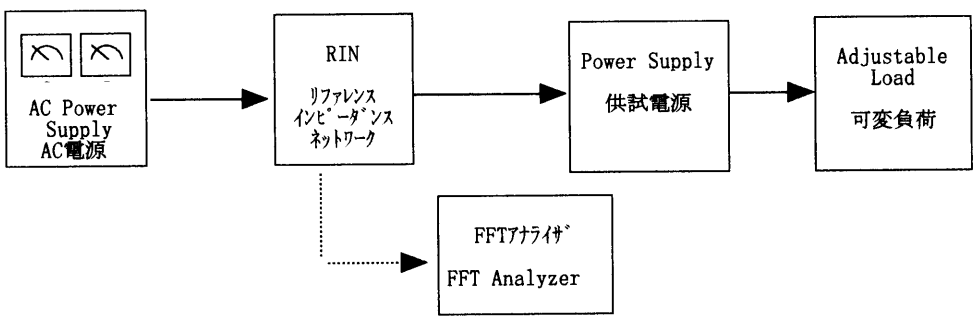


Figure E