参考資料

COSEL

TEST DATA OF VAF1005
(200V INPUT)

Regulated DC Power Supply

Date : May 28. 1999

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Design Engineer

コーセル株式会社

COSEL CO.,LTD.

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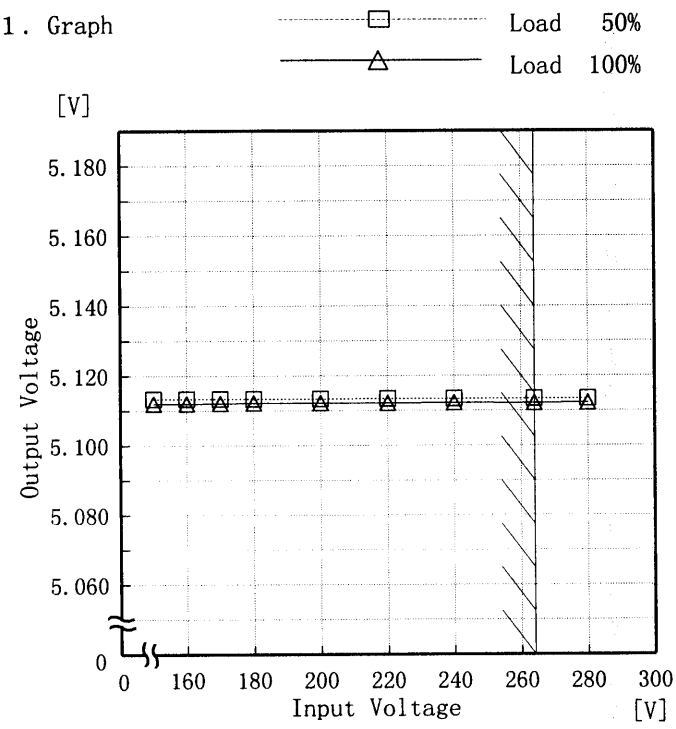
1. Graph



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]	Output Voltage [V]	
	Load 50%	Load 100%
150	5.113	5.112
160	5.113	5.112
170	5.113	5.112
180	5.113	5.112
200	5.113	5.112
220	5.113	5.112
240	5.113	5.112
264	5.114	5.112
280	5.113	5.112

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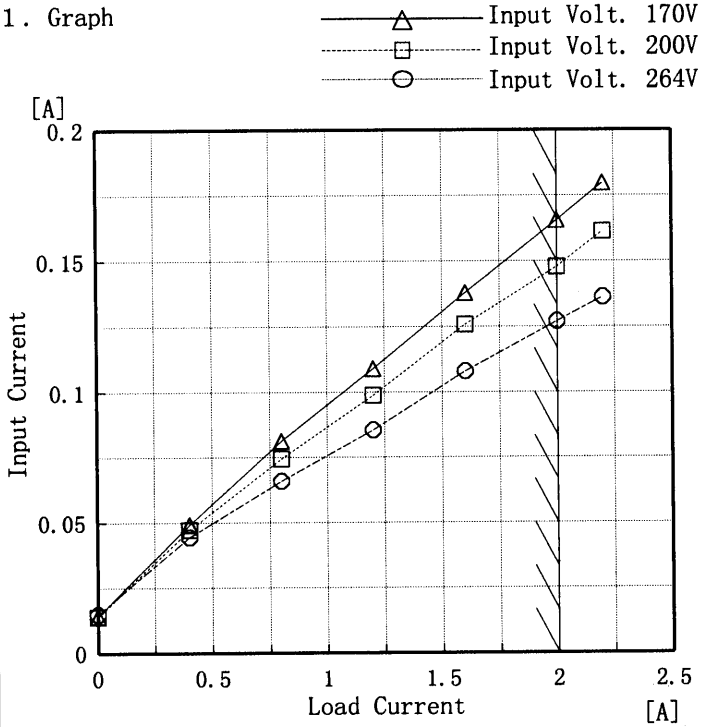
Model	VAF1005
Item	Input Current (by Load Current) 入力電流 (負荷特性)
Output	————

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

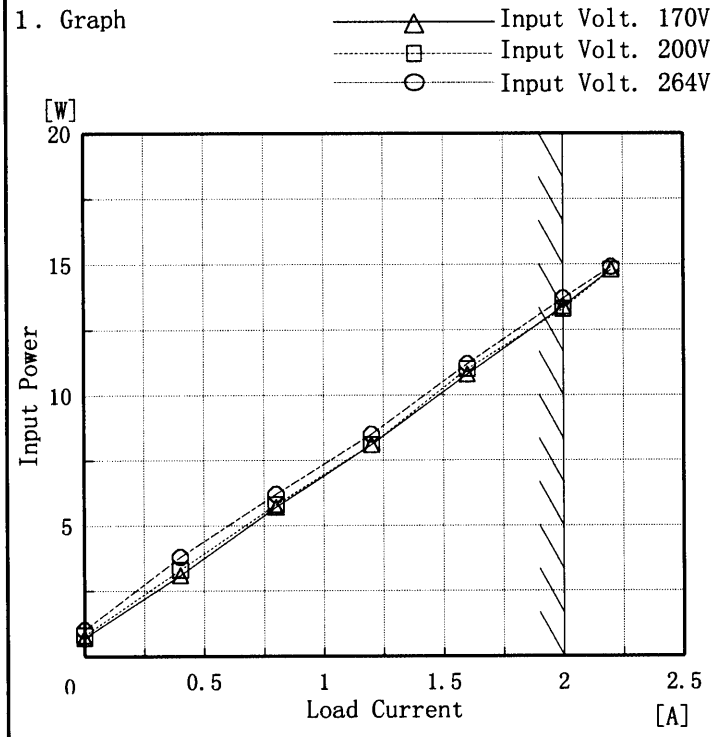
Load Current [A]	Input Current [A]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	0.014	0.014	0.015
0.4	0.049	0.047	0.045
0.8	0.081	0.074	0.066
1.2	0.109	0.099	0.086
1.6	0.138	0.126	0.108
2.0	0.166	0.148	0.127
2.2	0.180	0.161	0.136
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	VAF1005
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. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	0.70	0.80	1.00
0.4	3.10	3.30	3.80
0.8	5.70	5.80	6.20
1.2	8.10	8.10	8.50
1.6	10.80	11.00	11.20
2.0	13.40	13.30	13.70
2.2	14.80	14.80	14.90
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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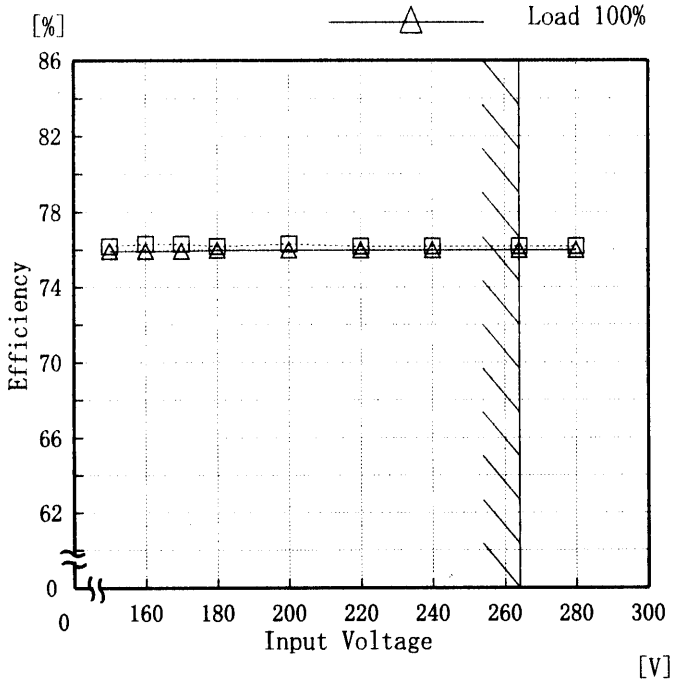
Model	VAF1005
Item	Efficiency 効率
Object	――――――――

Temperature 25℃
Testing Circuitry Figure A

1. Graph

□ Load 50%
△ Load 100%



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]	Efficiency [%]	
	Load 50%	Load 100%
150	76.2	75.9
160	76.3	75.9
170	76.3	75.9
180	76.2	76.0
200	76.3	76.0
220	76.2	76.0
240	76.2	76.0
264	76.2	76.0
280	76.2	76.0

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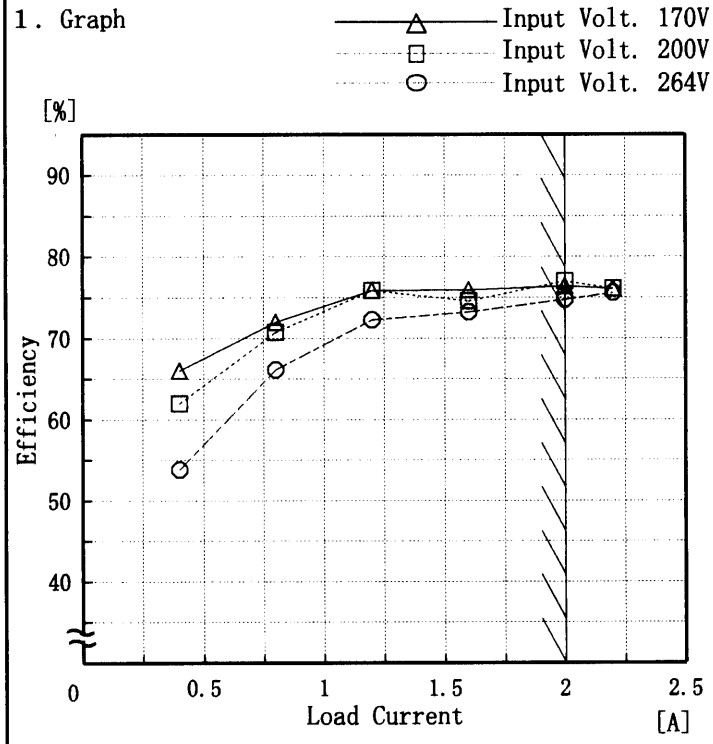
Model	VAF1005
Item	Efficiency (by Load Current) 効率 (負荷電流特性)
Output	————

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. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.4	66.0	62.0	53.8
0.8	72.0	70.7	66.1
1.2	75.9	75.9	72.3
1.6	75.9	74.6	73.2
2.0	76.4	77.0	74.8
2.2	76.1	76.1	75.6
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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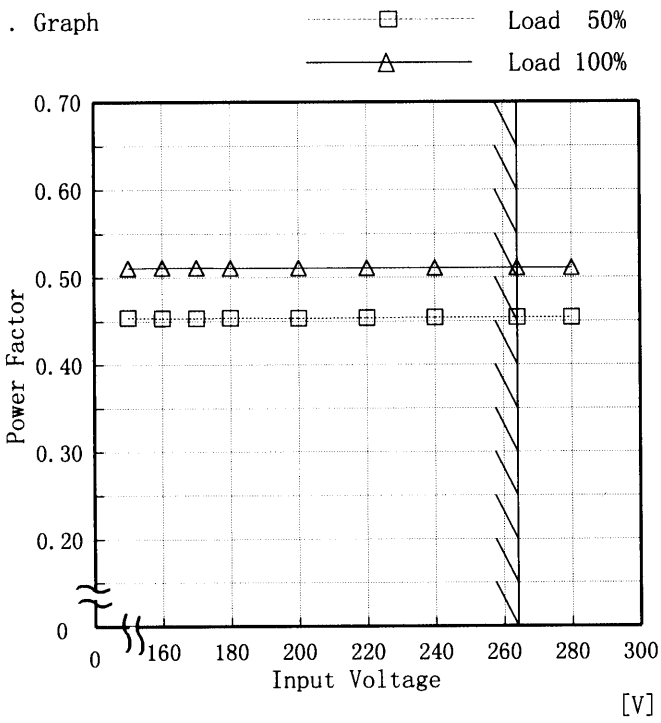
Model	VAF1005		
Item	Power Factor (by Input Voltage) 力率（入力電圧特性）	Temperature Testing Circuitry	25℃ Figure A
Object	———————		

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]	Power Factor	
	Load 50%	Load 100%
150	0.45	0.51
160	0.45	0.51
170	0.45	0.51
180	0.45	0.51
200	0.45	0.51
220	0.45	0.51
240	0.45	0.51
264	0.45	0.51
280	0.45	0.51

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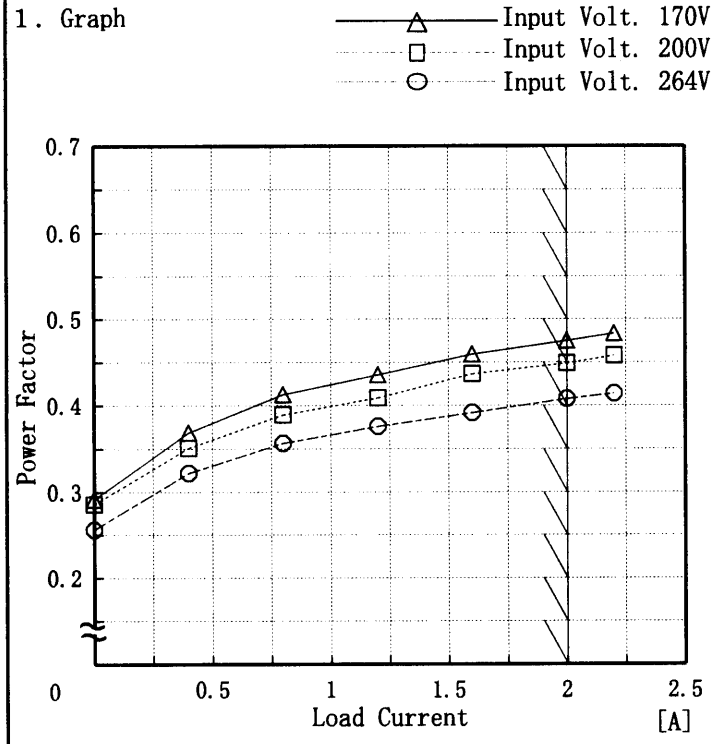
Model	VAF1005	
Item	Power Factor (by Load Current) 力率 (負荷電流特性)	Temperature 25℃ Testing Circuitry Figure A
Output	————	

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]	Power Factor		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	0.29	0.29	0.26
0.4	0.37	0.35	0.32
0.8	0.41	0.39	0.36
1.2	0.44	0.41	0.38
1.6	0.46	0.44	0.39
2.0	0.48	0.45	0.41
2.2	0.48	0.46	0.41
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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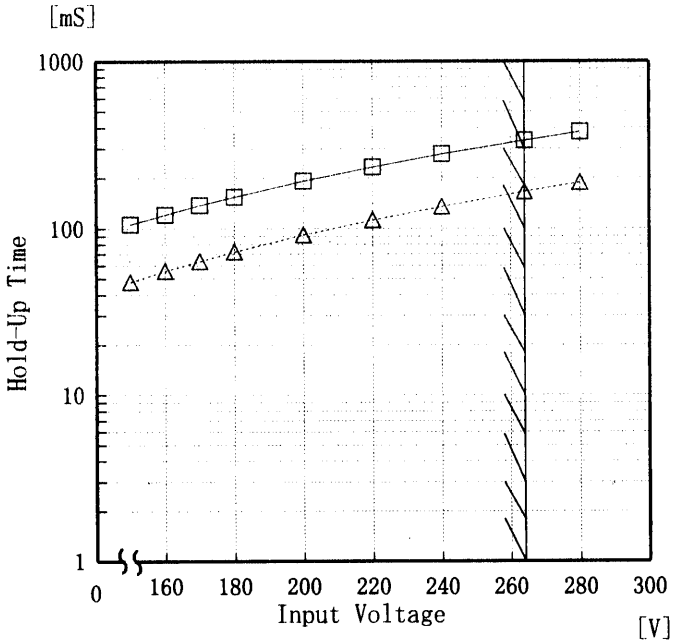
Model	VAF1005
Item	Hold-Up Time　出力保持時間
Object	+5.0V2A

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]	Hold-Up Time [mS]	
	Load 50%	Load 100%
150	105	48
160	121	55
170	138	64
180	155	72
200	193	91
220	234	112
240	279	136
264	337	166
280	379	188

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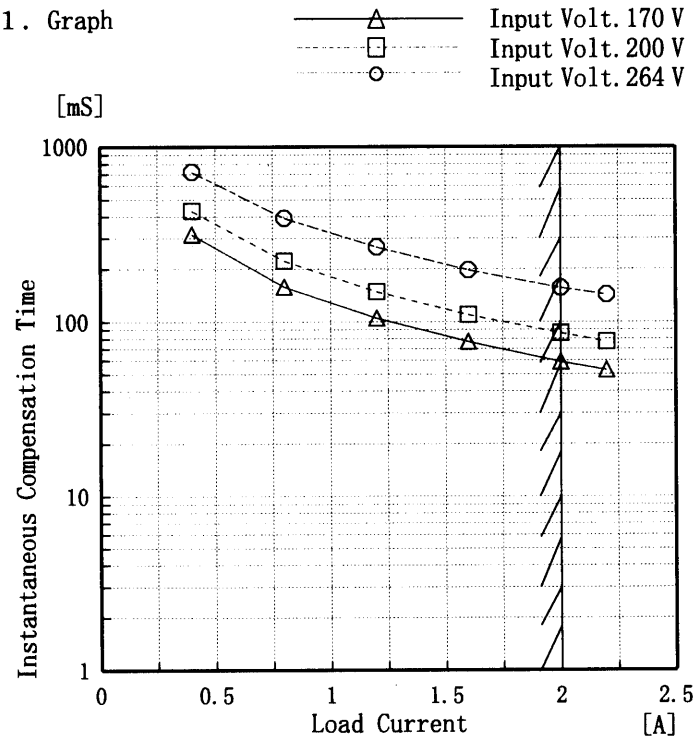
Model	VAF1005
Item	Instantaneous Interruption Compensation 瞬時停電保障
Object	+5.0V2A

Temperature 25℃
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]	Time [mS]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	—	—	—
0.4	316	432	720
0.8	159	223	391
1.2	105	149	268
1.6	77	110	198
2.0	59	86	157
2.2	53	77	143
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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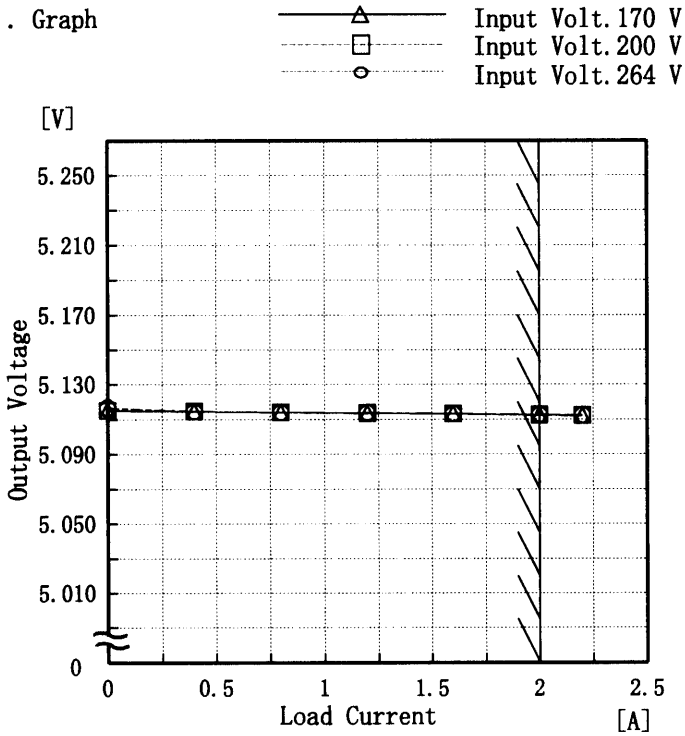
Model	VAF1005
Item	Load Regulation 静的負荷変動
Object	+5.0V2A

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]	Output Voltage [V]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	5.115	5.115	5.117
0.4	5.115	5.115	5.115
0.8	5.114	5.114	5.114
1.2	5.114	5.114	5.114
1.6	5.113	5.113	5.113
2.0	5.113	5.113	5.113
2.2	5.112	5.113	5.112
—	—	—	—
—	—	—	—
—	—	—	—

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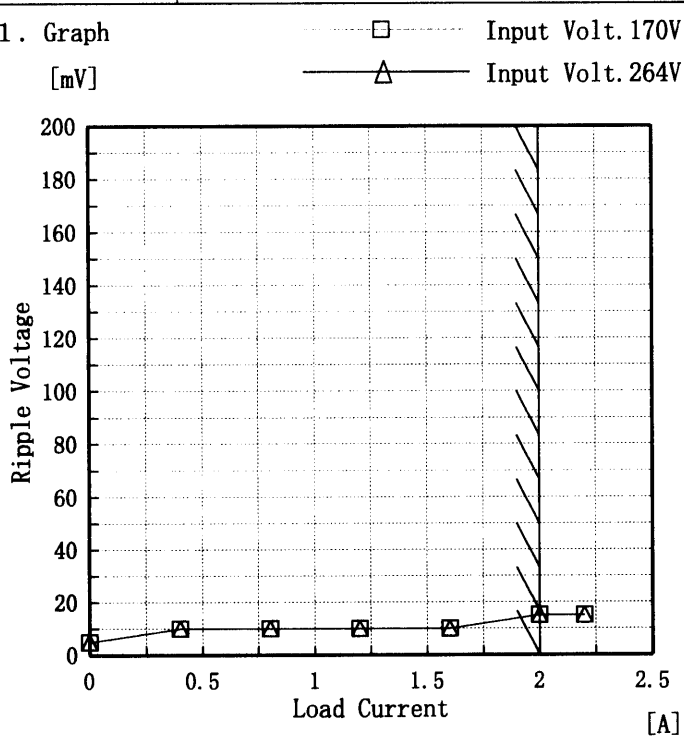
Model	VAF1005
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+5.0V2A

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

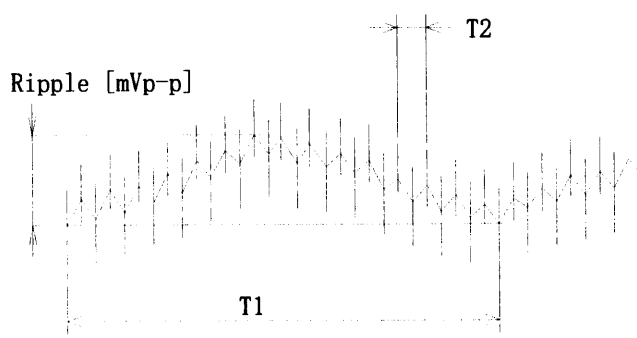


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 170 [V]	Input Volt. 264 [V]
0.0	5	5
0.4	10	10
0.8	10	10
1.2	10	10
1.6	10	10
2.0	15	15
2.2	15	15
—	—	—
—	—	—
—	—	—
—	—	—

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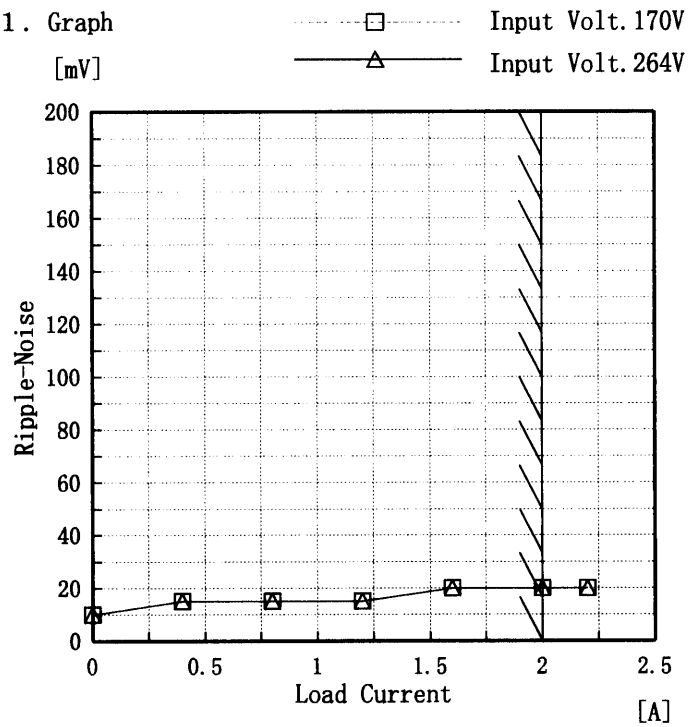
Model	VAF1005
Item	Ripple-Noise　リップルノイズ
Object	+5.0V2A

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

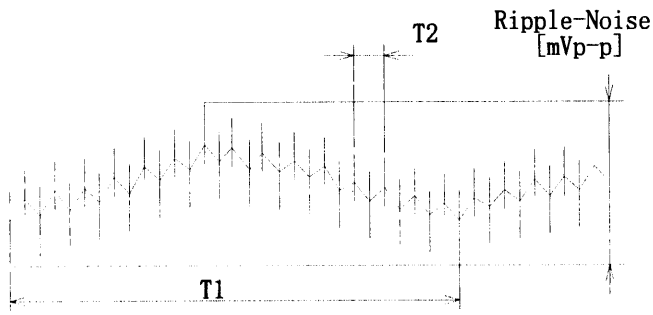


Fig. Complex Ripple Wave Form
図　リップル波形詳細図

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 170 [V]	Input Volt. 264 [V]
0.0	10	10
0.4	15	15
0.8	15	15
1.2	15	15
1.6	20	20
2.0	20	20
2.2	20	20
—	—	—
—	—	—
—	—	—
—	—	—

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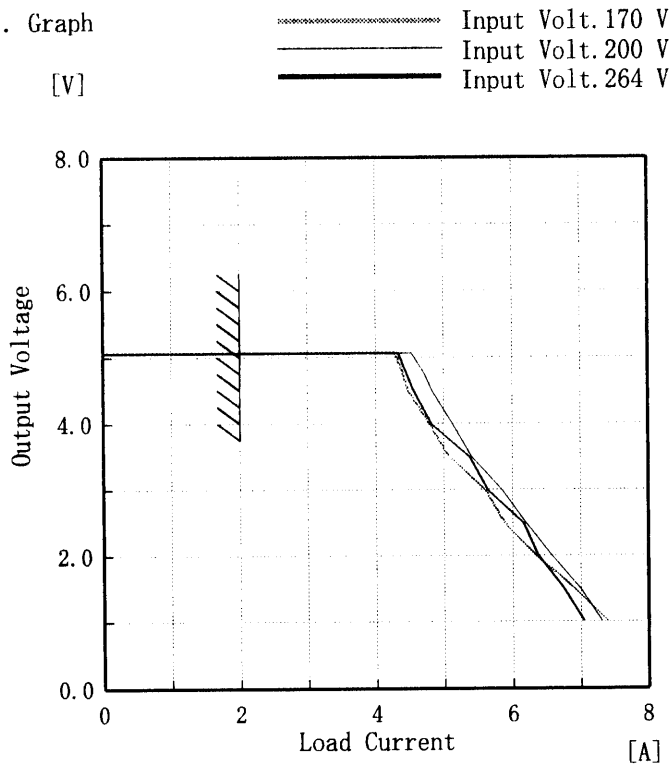
Model	VAF1005
Item	Overcurrent Protection 過電流保護
Object	+5.0V2A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note1: Slanted line shows the range of the rated load current.

Note2: The lines shows peak current of intermittent operation of power supply when output voltage drops less than rated voltage value at overcurrent.

(注１)斜線は定格負荷電流範囲を示す。

(注２)垂下部分は間欠モード時のピーク電流を示す。

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
5.00	4.28	4.52	4.33
4.75	4.40	4.71	4.45
4.50	4.70	4.82	4.55
4.00	4.78	5.12	4.81
3.50	5.07	5.40	5.37
3.00	5.60	5.84	5.63
2.50	5.88	6.19	6.15
2.00	6.34	6.57	6.37
1.50	6.91	6.99	6.74
1.00	7.41	7.31	7.04
0.50	—	—	—
0.00	—	—	—

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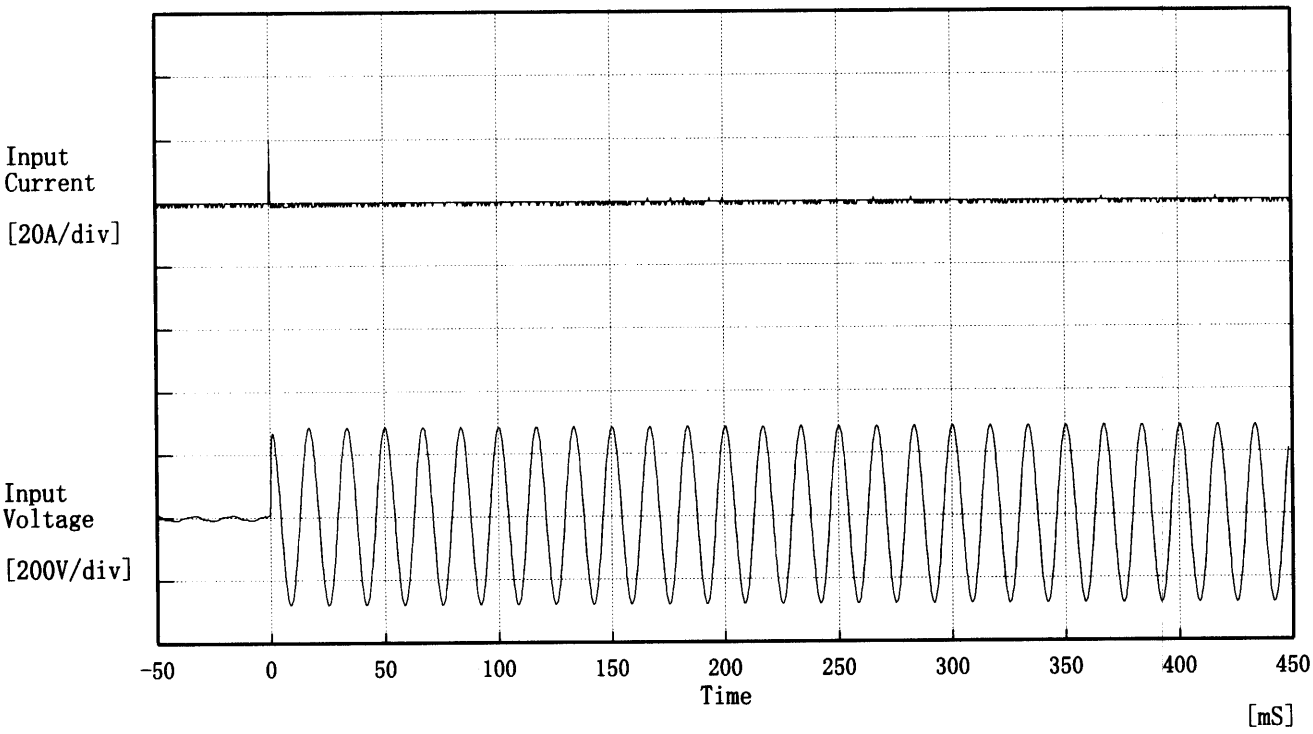
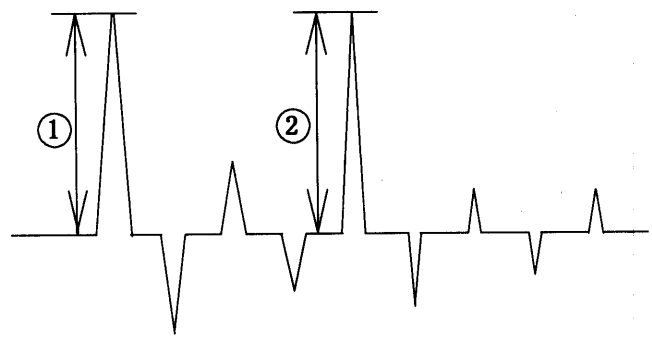
Model	VAF1005
Item	Inrush Current 突入電流
Object	――――――――

Temperature 25℃
Testing Circuitry Figure A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %
Inrush Current
① 20.19 [A]
② 1.12 [A]



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Model	VAF1005		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+5.0V2A		

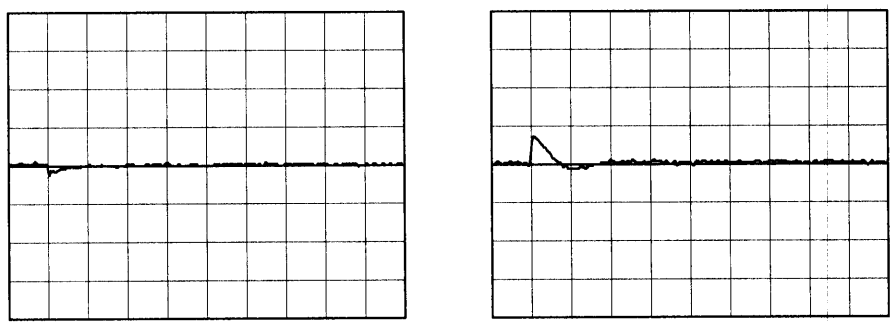
Input Volt. 200 V

Cycle 1000 mS

Load Current

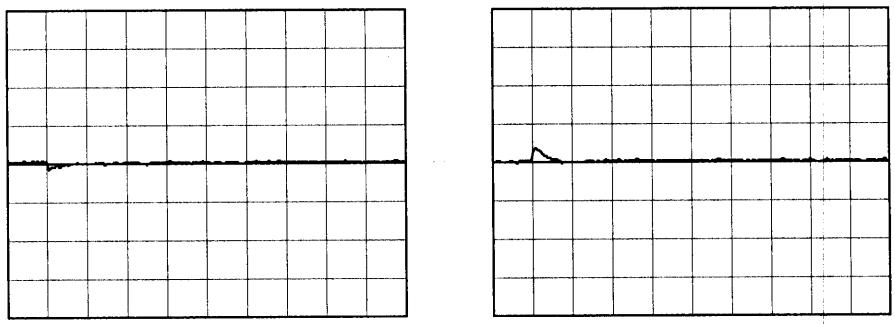
Min. Load ←→

Load 100 %



Min. Load ←→

Load 50 %



100 mV/div

20 mS/div

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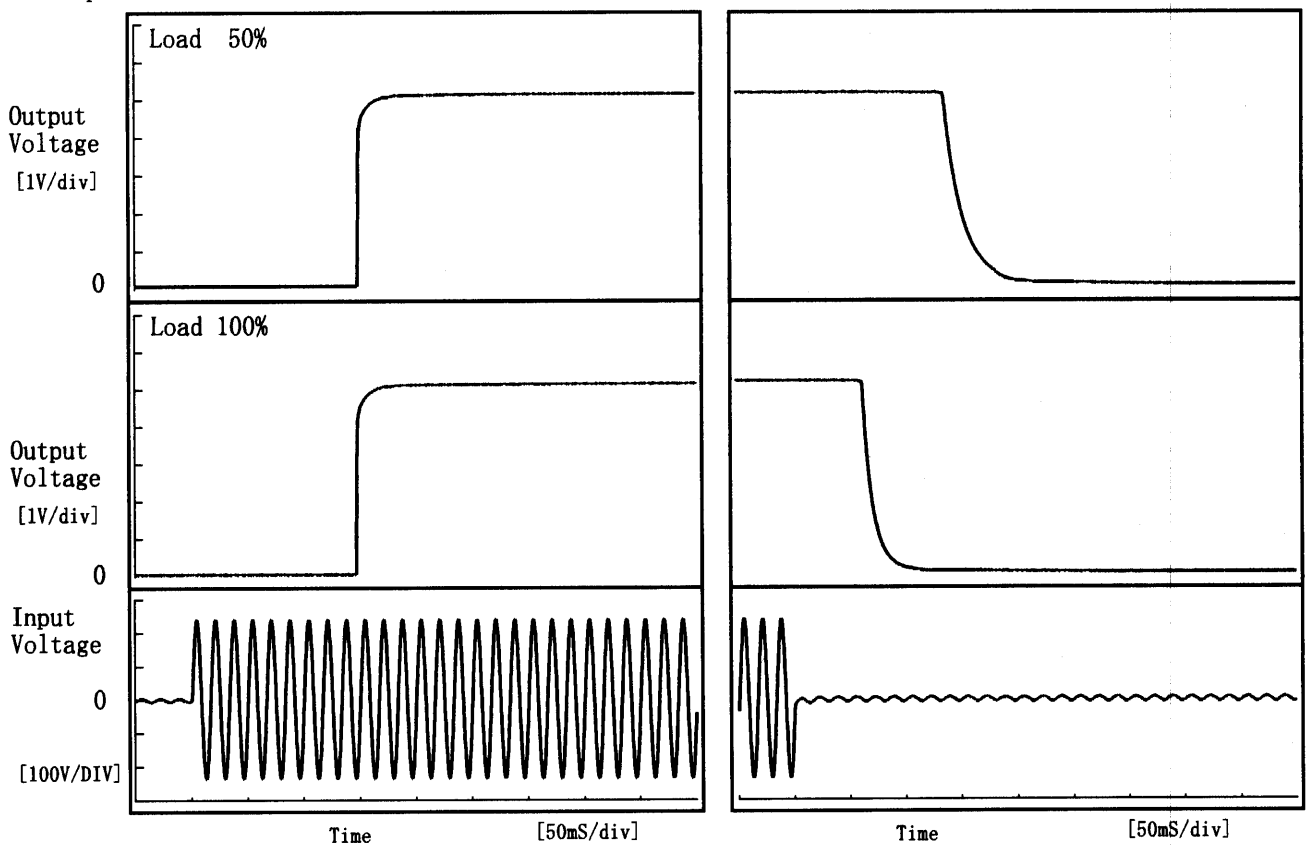
Model	VAF1005		
Item	Rise and Fall Time 立上り、立下り時間	Temperature	25℃
		Testing Circuitry	Figure A
Object	+5.0V2A		

1. Graph

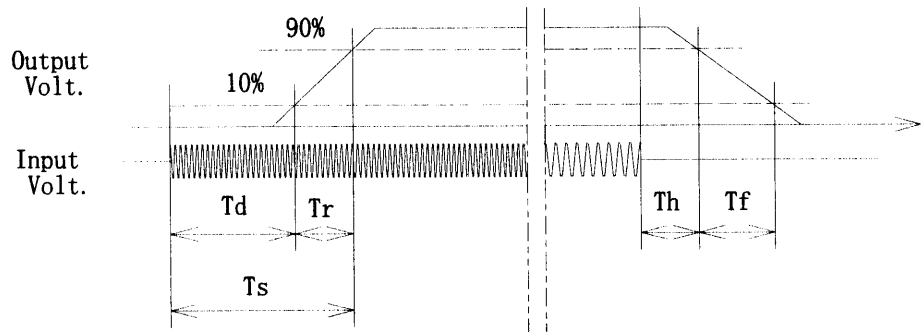
Input Volt. 170 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	148.3	3.5	151.8	137.5	41.0
100 %	147.0	3.8	150.8	63.8	22.0



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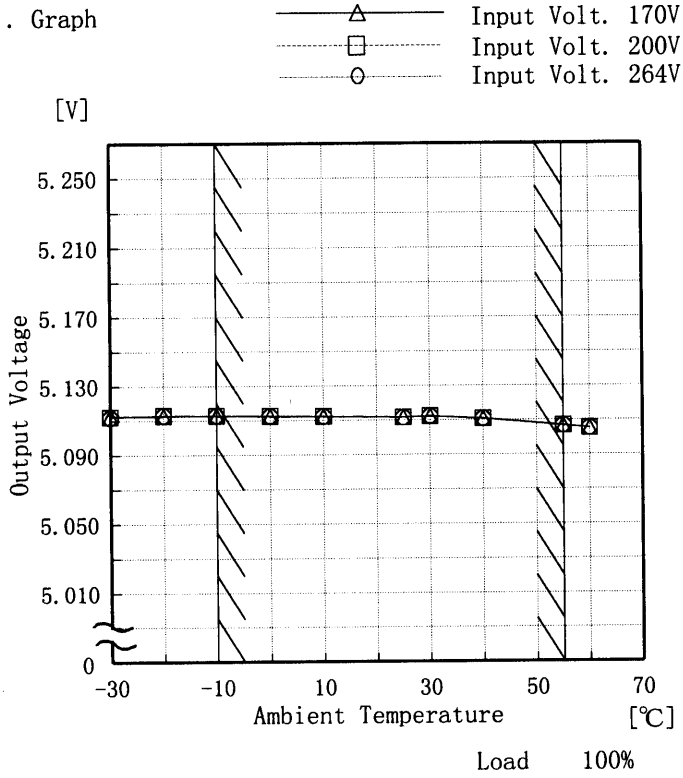
Model	VAF1005
Item	Ambient Temperature Drift 周囲温度変動
Object	+5.0V2A

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

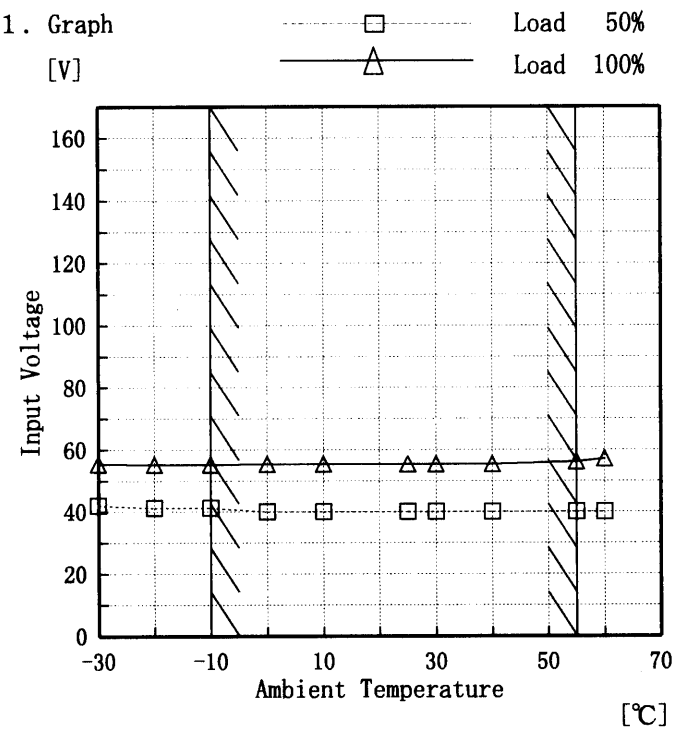
Temperature [℃]	Output Voltage [V] Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
-30	5.113	5.112	5.112
-20	5.113	5.113	5.113
-10	5.113	5.113	5.113
0	5.112	5.113	5.113
10	5.112	5.112	5.112
25	5.112	5.112	5.112
30	5.112	5.112	5.112
40	5.111	5.111	5.111
55	5.107	5.107	5.107
60	5.105	5.105	5.105
—	—	—	—

COSEL

Model	VAF1005
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+5.0V2A

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

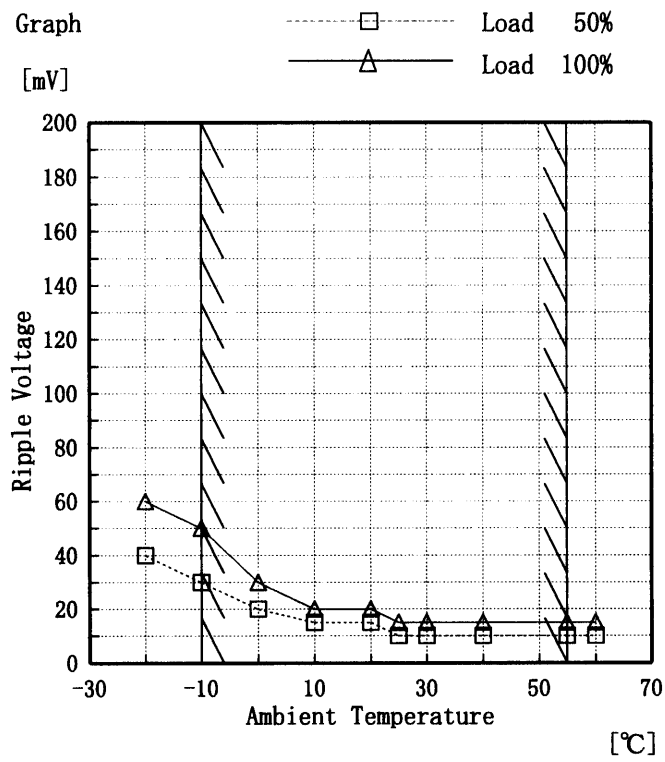
Ambient Temperature [℃]	Input Voltage [V]	
	Load 50%	Load 100%
-30	42	55
-20	41	55
-10	41	55
0	40	55
10	40	55
25	40	55
30	40	55
40	40	55
55	40	56
60	40	57
—	—	—

COSEL

Model	VAF1005
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	+5.0V2A

Testing Circuitry Figure A

1. Graph



Input Volt. 200 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

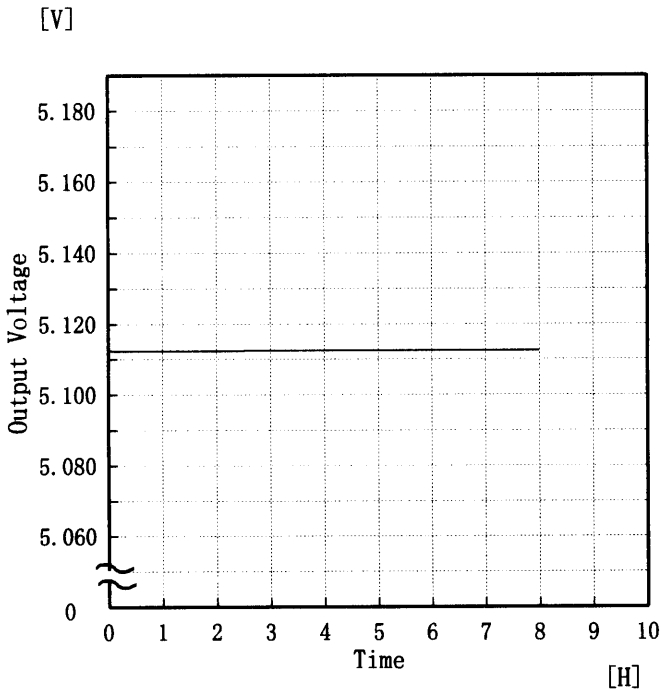
Ambient Temperature [℃]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	40	60
-10	30	50
0	20	30
10	15	20
20	15	20
25	10	15
30	10	15
40	10	15
55	10	15
60	10	15
—	—	—

COSEL

Model	VAF1005
Item	Time Lapse Drift 経時ドリフト
Object	+5.0V2A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 200V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	5.113
0.5	5.112
1.0	5.112
2.0	5.112
3.0	5.112
4.0	5.112
5.0	5.112
6.0	5.113
7.0	5.113
8.0	5.112

COSEL

Model	VAF1005	
Item	Output Voltage Accuracy　定電圧精度	Testing Circuitry　Figure A
Object	+5.0V2A	

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 : 170～264 V
Load Current　: 0～2A

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

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

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　170～264 V
負荷電流　0～2A

* 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

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

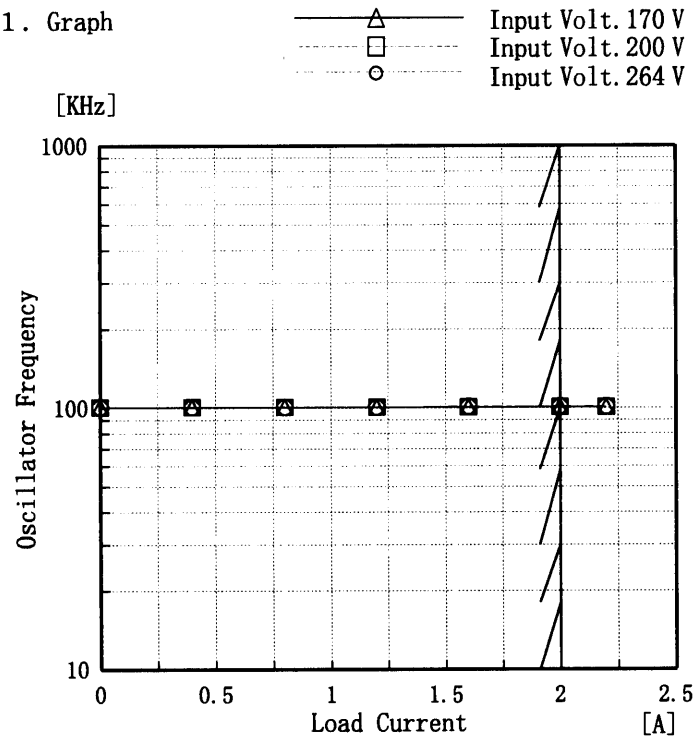
Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-10	264	0	5.117	±6	±0.2
Minimum Voltage	55	264	2	5.106		

COSEL

Model	VAF1005
Item	Oscillator Frequency 発振周波数
Object	+5.0V2A

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]	Oscillator Frequency [KHz]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	101	101	101
0.4	101	101	101
0.8	101	101	101
1.2	101	101	101
1.6	101	101	101
2.0	101	101	101
2.2	101	101	101
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	VAF1005	
Item	Condensation 結露特性	Testing Circuitry Figure A
Object	+5.0V2A	

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.

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行い、異常のないことを確認する。

2．Values

Item	Data	Testing Conditions
Output Voltage [V]	5.098	Input Volt.: 200V, Load Current:2A
Line Regulation [mV]	2	Input Volt.: 170～264V, Load Current:2A
Load Regulation [mV]	7	Input Volt.: 200V, Load Current:0～2A

COSEL

Model	VAF1005		
Item	Leakage Current 漏洩電流	Temperature Testing Circuitry	25℃ Figure B
Object	――――――		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DENTORI	―	―	―
(B)IEC60950	―	―	―

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B)IEC60950	0.15	0.20	0.23

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	VAF1005		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25℃ Figure C
Object	+5.0V2A		

1. Results

Pulse Width [nS]	MODE	No protection failure should occur 保護回路の誤動作がない	DC-like Regulation of Output Voltage 出力電圧の直流的変動
50	COMMON	OK	no fluctuation
	NORMAL	OK	no fluctuation
1000	COMMON	OK	no fluctuation
	NORMAL	OK	no fluctuation

2. Conditions

Input Voltage : 200 V
Pulse Voltage : 2000 V
Pulse Cycle : 10 mS
Pulse Input Duration : 1 min. or more
Load : 100 %

COSEL

Model	VAF1005		
Item	Conducted Emission 雑音端子電圧	Temperature Testing Circuitry	25℃ Figure D
Object	———————		

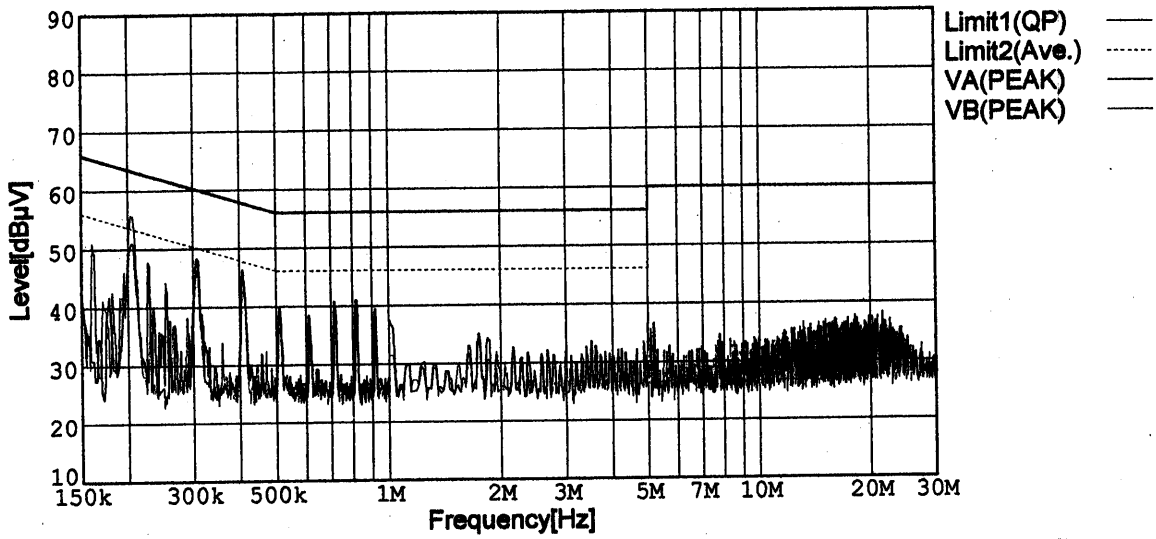
1. Graph

Remarks

Input Volt. 230 V (CISPR Pub22 Class B)

Load 100 %

Limit1: [CISPR Pub22] Class B(QP)
Limit2: [CISPR Pub22] Class B(Ave.)



COSEL

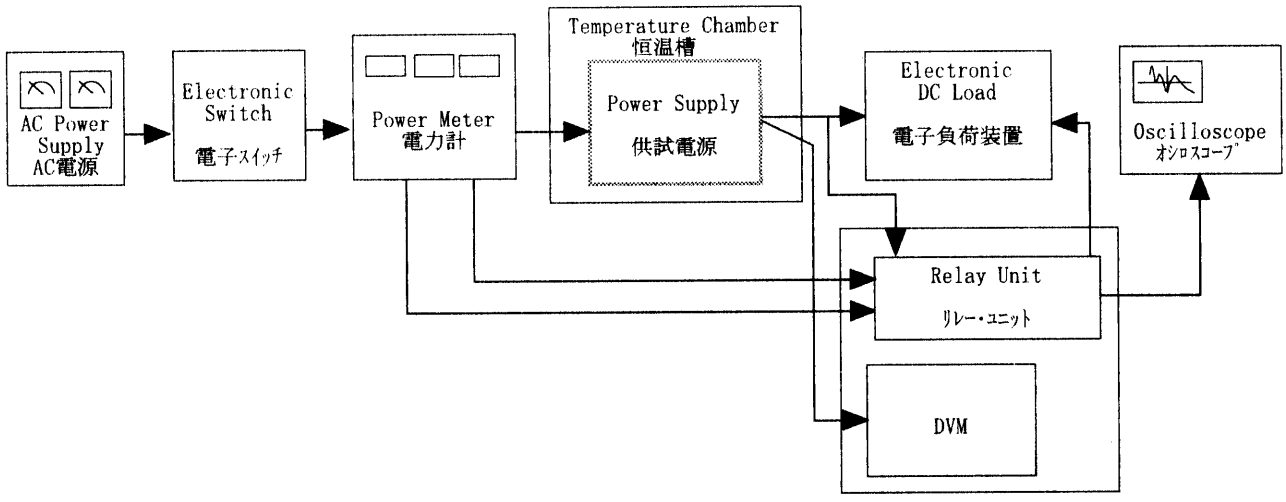


Figure A

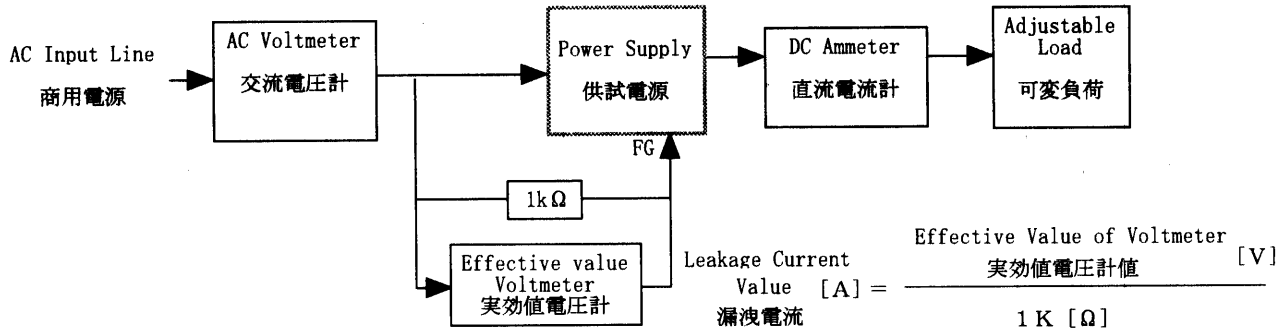


Figure B(DENTORI)

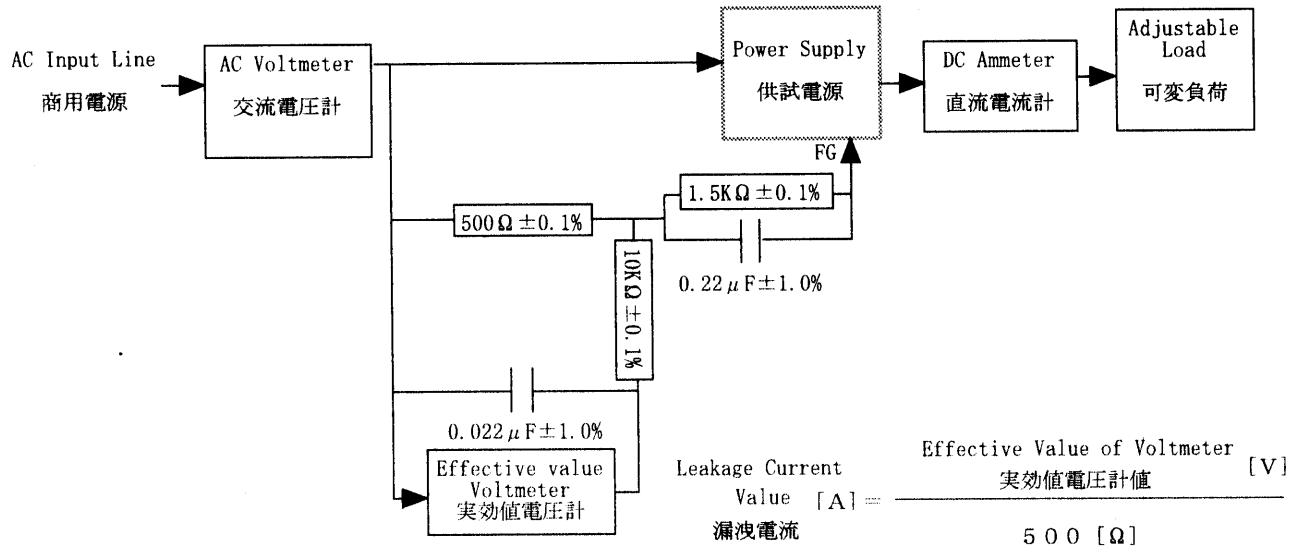


Figure B（IEC60950）

COSEL

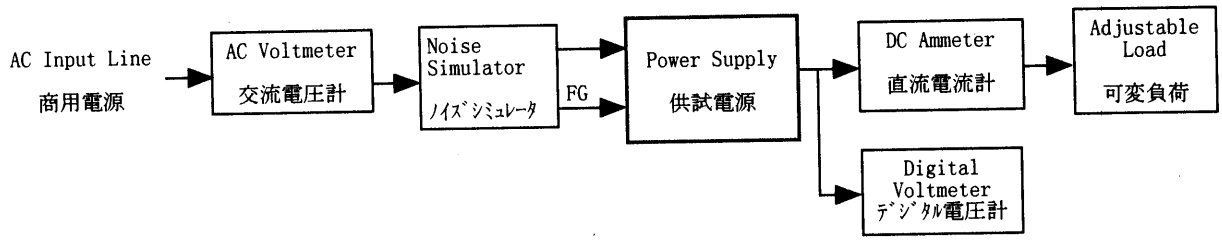


Figure C

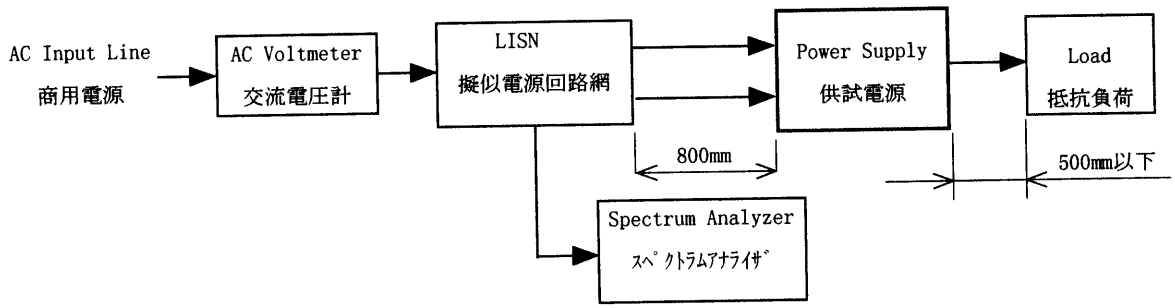


Figure D

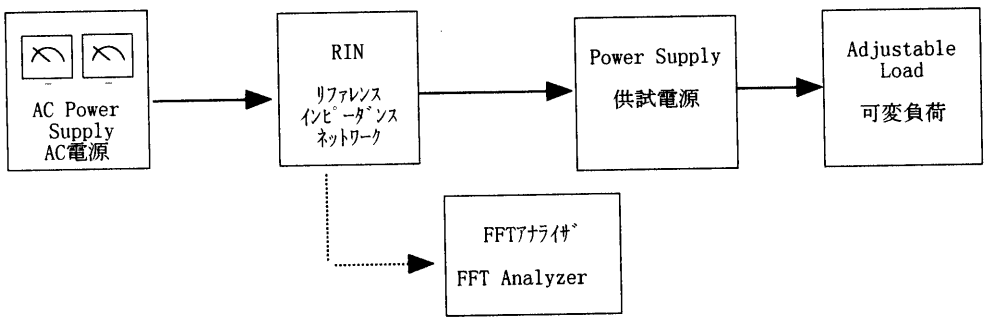


Figure E