



TEST DATA OF PAA75F-5 (200V INPUT)

Regulated DC Power Supply

Date : Feb. 17. 1997

Approved by : *M. Tanikawa*
Design Manager

Prepared by : *T. Amei*
Design Engineer

コーセル株式会社

COSEL CO., LTD.

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Model		PAA75F-5		Temperature		25°C																															
Item		Line Regulation 静的入力変動		Testing Circuitry		Figure A																															
Object		+5V15.0A																																			
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<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>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。</p> <p>(注)斜線は定格入力電圧範囲を示す。</p>																																							



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<p>1. Graph</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>—△— Input Volt. 170V</p> <p>- -□- - Input Volt. 200V</p> <p>- -○- - Input Volt. 264V</p> </div> </div>		<p>2. Values</p> <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th>Input Volt. 170[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 264[V]</th> </tr> <tr> <th colspan="3">Time [mS]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>1.0</td><td>635</td><td>786</td><td>843</td></tr> <tr><td>2.0</td><td>400</td><td>462</td><td>550</td></tr> <tr><td>4.0</td><td>238</td><td>227</td><td>309</td></tr> <tr><td>6.0</td><td>188</td><td>198</td><td>267</td></tr> <tr><td>8.0</td><td>157</td><td>176</td><td>213</td></tr> <tr><td>10.0</td><td>135</td><td>155</td><td>192</td></tr> <tr><td>12.0</td><td>102</td><td>142</td><td>187</td></tr> <tr><td>14.0</td><td>80</td><td>127</td><td>160</td></tr> <tr><td>15.0</td><td>74</td><td>113</td><td>155</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>	Load Current [A]	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	Time [mS]			0.0	—	—	—	1.0	635	786	843	2.0	400	462	550	4.0	238	227	309	6.0	188	198	267	8.0	157	176	213	10.0	135	155	192	12.0	102	142	187	14.0	80	127	160	15.0	74	113	155	—	—	—	—
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<p>This duration counts between Shut-off and on of input voltage automatically.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>瞬時停電保障時間とは、出力電圧が定格値の95%になる時の瞬時停電時間をいう。</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>																																																					



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<p>Fig. Complex Ripple Wave Form 図 リップル波形詳細図</p>																																								



<p>Model PAA75F-5</p> <p>Item Ripple-Noise リップルノイズ</p> <p>Object +5V15.0A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure A</p>																																						
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	Ripple-Noise [mV]	Ripple-Noise [mV]																																						
0.0	10	10																																						
1.0	30	30																																						
2.0	30	30																																						
4.0	40	40																																						
6.0	50	50																																						
8.0	60	60																																						
10.0	60	60																																						
12.0	60	60																																						
14.0	70	70																																						
15.0	70	70																																						
—	—	—																																						

COSEL

Model PAA75F-5		Temperature 25°C Testing Circuitry Figure A																																																							
Item	Overcurrent Protection 過電流保護																																																								
Object	+5V15.0A																																																								
1. Graph <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="margin-right: 20px;"> <p>----- Input Volt. 170 V</p> <p>_____ Input Volt. 200 V</p> <p>_____ Input Volt. 264 V</p> </div> </div> <p>[V]</p> <p style="text-align: center;">Load Current [A]</p>		2. Values <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th>Input Volt. 170[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 264[V]</th> </tr> <tr> <th>Load Current [A]</th> <th>Load Current [A]</th> <th>Load Current [A]</th> </tr> </thead> <tbody> <tr><td>5.00</td><td>18.08</td><td>17.53</td><td>17.38</td></tr> <tr><td>4.75</td><td>18.19</td><td>17.62</td><td>17.46</td></tr> <tr><td>4.50</td><td>18.29</td><td>17.75</td><td>17.38</td></tr> <tr><td>4.00</td><td>18.51</td><td>17.99</td><td>17.42</td></tr> <tr><td>3.50</td><td>18.75</td><td>18.22</td><td>17.59</td></tr> <tr><td>3.00</td><td>19.04</td><td>18.52</td><td>17.72</td></tr> <tr><td>2.50</td><td>19.28</td><td>18.80</td><td>17.97</td></tr> <tr><td>2.00</td><td>19.61</td><td>19.09</td><td>18.38</td></tr> <tr><td>1.50</td><td>19.86</td><td>19.49</td><td>18.73</td></tr> <tr><td>1.00</td><td>20.32</td><td>19.94</td><td>19.35</td></tr> <tr><td>0.50</td><td>20.54</td><td>20.19</td><td>19.77</td></tr> <tr><td>0.00</td><td>20.72</td><td>20.36</td><td>20.00</td></tr> </tbody> </table>	Output Voltage [V]	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	Load Current [A]	Load Current [A]	Load Current [A]	5.00	18.08	17.53	17.38	4.75	18.19	17.62	17.46	4.50	18.29	17.75	17.38	4.00	18.51	17.99	17.42	3.50	18.75	18.22	17.59	3.00	19.04	18.52	17.72	2.50	19.28	18.80	17.97	2.00	19.61	19.09	18.38	1.50	19.86	19.49	18.73	1.00	20.32	19.94	19.35	0.50	20.54	20.19	19.77	0.00	20.72	20.36	20.00
Output Voltage [V]	Input Volt. 170[V]	Input Volt. 200[V]		Input Volt. 264[V]																																																					
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0.00	20.72	20.36	20.00																																																						
<p>Note: Slanted line shows the range of the rated load current.</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>																																																									

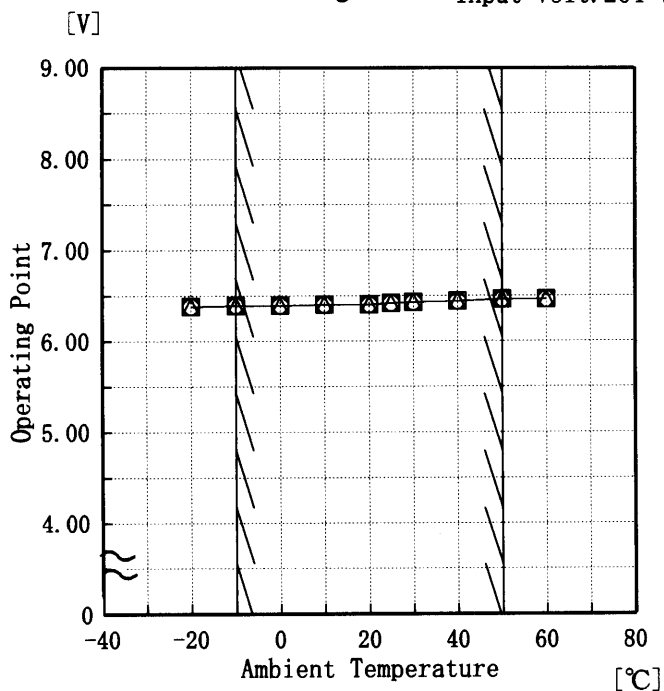


Model	PAA75F-5
Item	Overvoltage Protection 過電圧保護
Object	+5V15.0A

Testing Circuitry Figure A

1. Graph

- △— Input Volt. 170 V
- - -□- - - Input Volt. 200 V
- - -○- - - Input Volt. 264 V



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

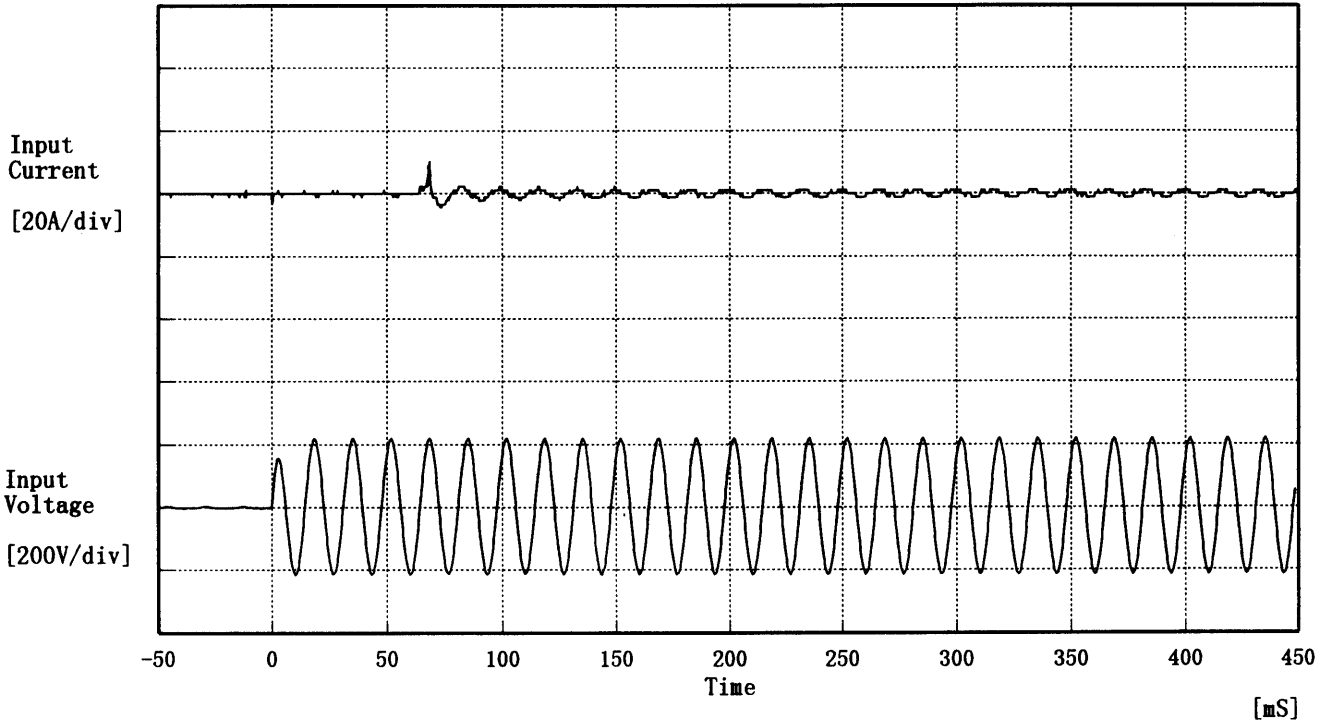
(注)斜線は定格周囲温度範囲を示す。

2. Values

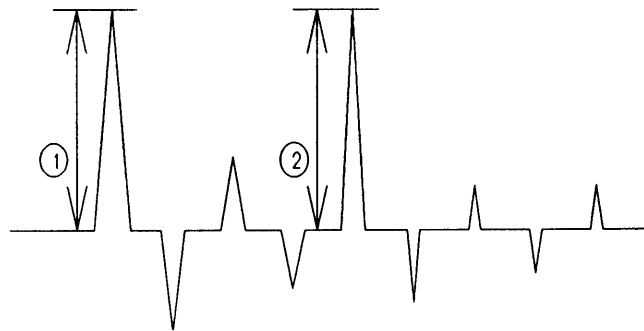
Ambient Temp. [°C]	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
	Operating Point [V]		
-20	6.38	6.38	6.38
-10	6.39	6.39	6.39
0	6.39	6.39	6.39
10	6.40	6.40	6.40
20	6.40	6.40	6.40
25	6.42	6.42	6.42
30	6.43	6.43	6.43
40	6.44	6.44	6.44
50	6.46	6.46	6.46
60	6.46	6.46	6.46
—	—	—	—



Model		PAA75F-5	
Item	Inrush Current 突入電流	Temperature	25°C
Object	+5V15.0A	Testing Circuitry	Figure A



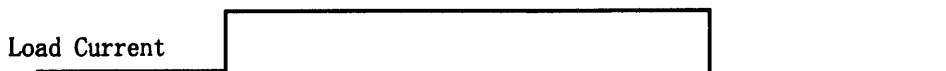
Input Voltage 200 V
 Frequency 60 Hz
 Load 100 %
 Inrush Current
 ① 3.36 [A]
 ② 10.10 [A]



COSEL

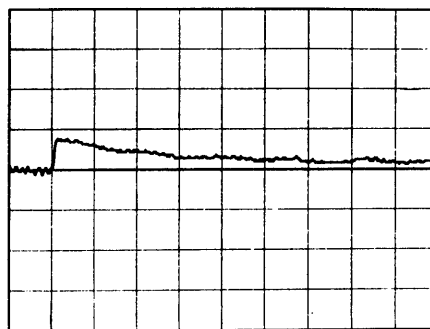
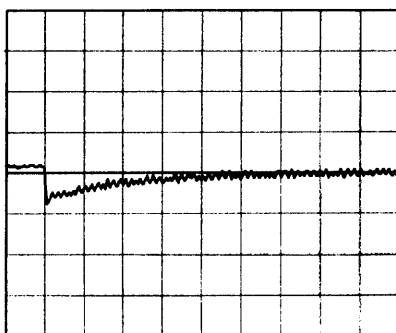
Model	PAA75F-5	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	+5V 15.0A		

Input Volt. 200 V
Cycle 200 mS

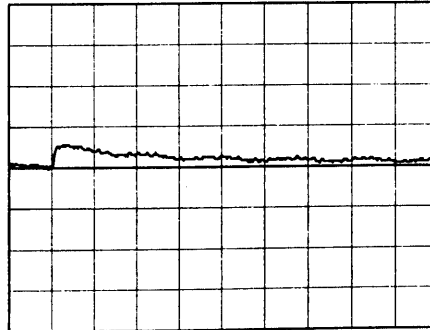
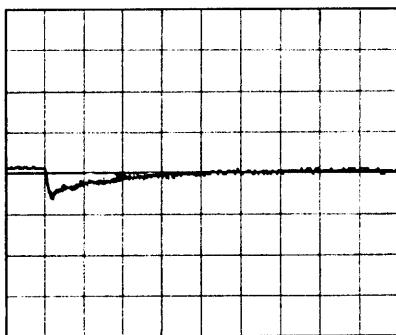


Min. Load ←→
Load 100 %

t 10 mS/div
Vo 100 mV/div



Min. Load ←→
Load 50 %

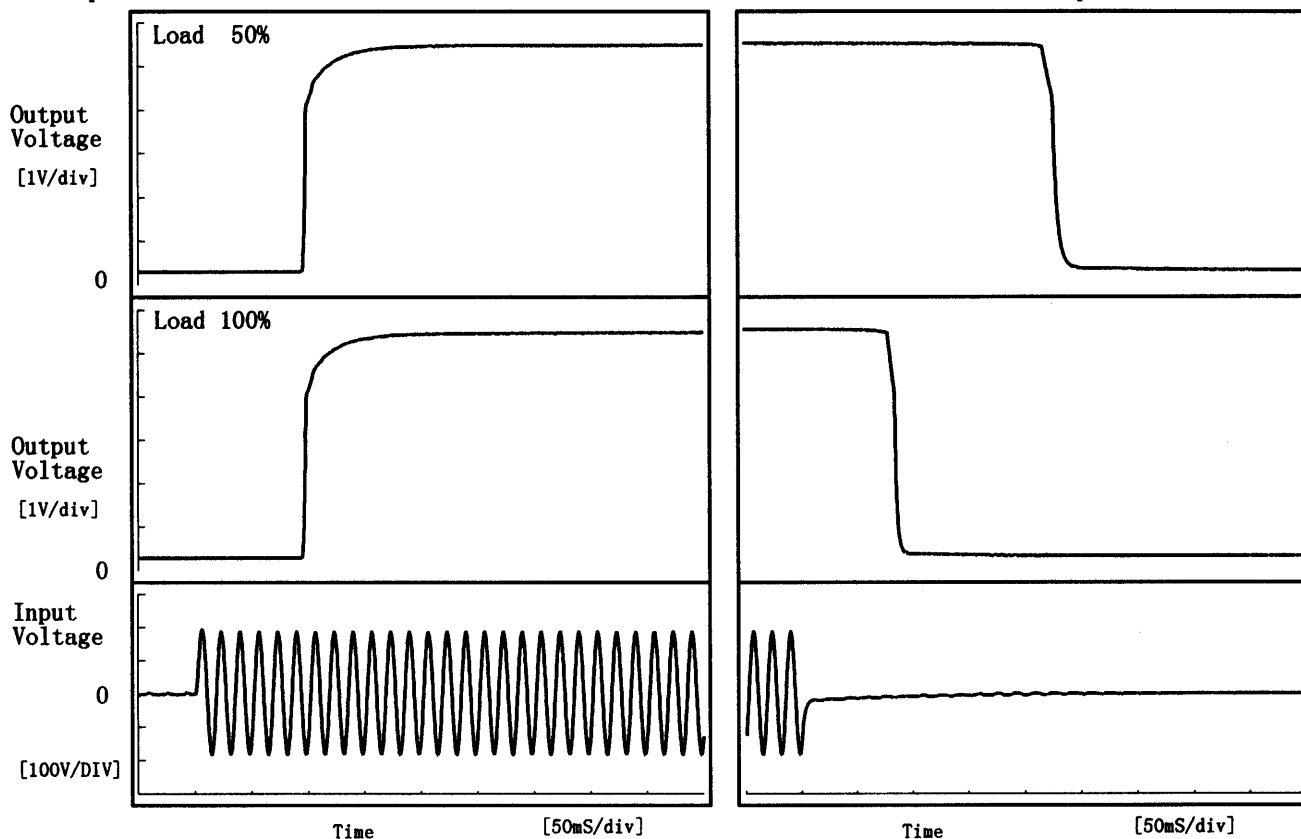




Model	PAA75F-5	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+5V 15.0A		

1. Graph

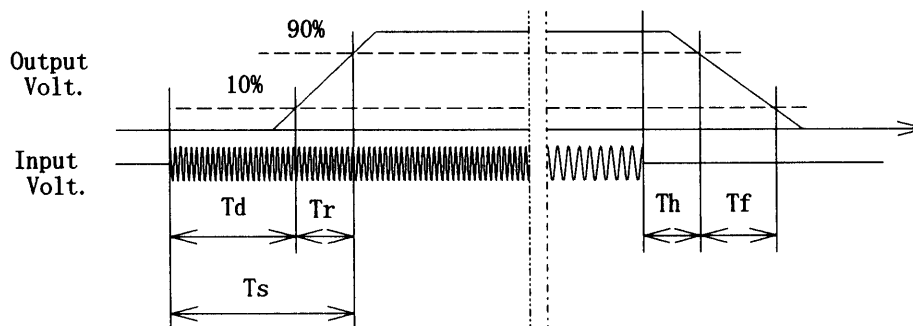
Input Volt. 170 V



2. Values

[μS]

Load \ Time	T d	T r	T s	T h	T f
50 %	95.8	14.3	110.0	221.5	13.0
100 %	95.8	15.3	111.0	81.5	8.3



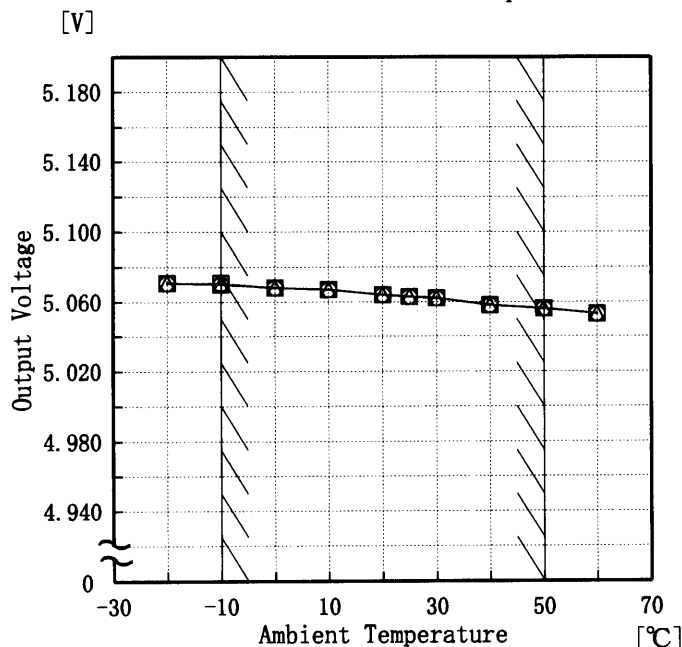


Model	PAA75F-5
Item	Ambient Temperature Drift 周囲温度変動
Object	+5V15.0A

Testing Circuitry Figure A

1. Graph

- △— Input Volt. 170V
- - -□- - - Input Volt. 200V
- - -○- - - Input Volt. 264V



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。

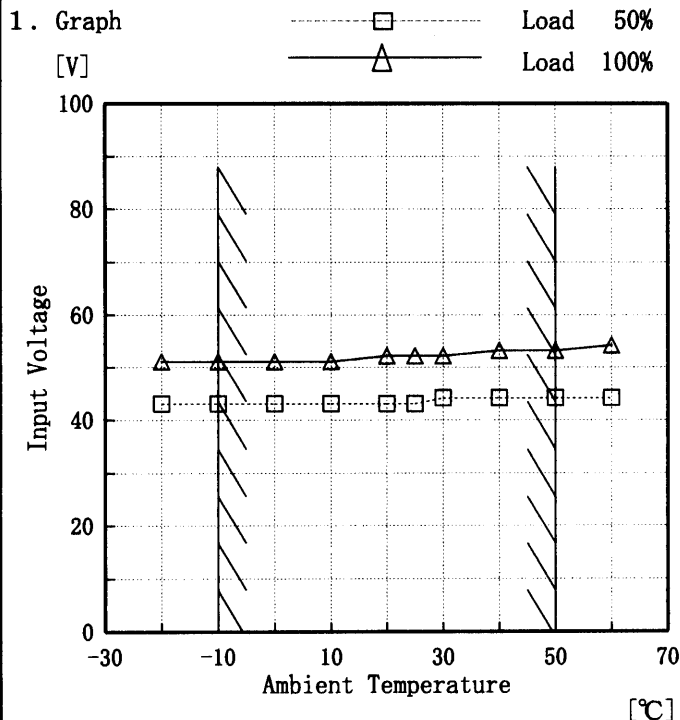
2. Values

Temperature [°C]	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-20	5.071	5.071	5.071
-10	5.070	5.071	5.070
0	5.068	5.068	5.068
10	5.067	5.067	5.067
20	5.064	5.064	5.064
25	5.063	5.063	5.063
30	5.062	5.062	5.062
40	5.058	5.058	5.058
50	5.056	5.056	5.056
60	5.053	5.053	5.053
—	—	—	—



Model	PAA75F-5
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+5V 15.0A

Testing Circuitry Figure A



2. Values

Ambient Temp. [°C]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-20	43	51
-10	43	51
0	43	51
10	43	51
20	43	52
25	43	52
30	44	52
40	44	53
50	44	53
60	44	54
—	—	—

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

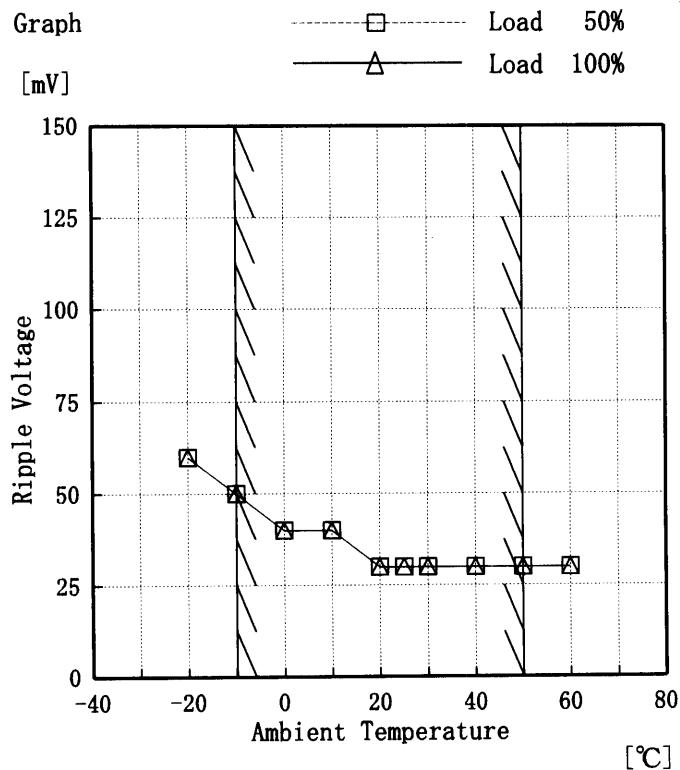
(注) 斜線は定格周囲温度範囲を示す。



Model	PAA75F-5
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	+5V15.0A

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 Temp. [°C]	Load 50%	Load 100%
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
-20	60	60
-10	50	50
0	40	40
10	40	40
20	30	30
25	30	30
30	30	30
40	30	30
50	30	30
60	30	30
—	—	—



COSEL																									
Model	PAA75F-5	Temperature	1 °C																						
Item	Time Lapse Drift 経時ドリフト	Testing Circuitry	Figure A																						
Object	+5V15.0A																								
<p>1. Graph</p> <p>[V]</p> <p style="text-align: center;">Time [H]</p> <p style="text-align: center;">Input Volt. 200V Load 100%</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.067</td></tr> <tr><td>0.5</td><td>5.063</td></tr> <tr><td>1.0</td><td>5.063</td></tr> <tr><td>2.0</td><td>5.063</td></tr> <tr><td>3.0</td><td>5.063</td></tr> <tr><td>4.0</td><td>5.063</td></tr> <tr><td>5.0</td><td>5.063</td></tr> <tr><td>6.0</td><td>5.063</td></tr> <tr><td>7.0</td><td>5.063</td></tr> <tr><td>8.0</td><td>5.063</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	5.067	0.5	5.063	1.0	5.063	2.0	5.063	3.0	5.063	4.0	5.063	5.0	5.063	6.0	5.063	7.0	5.063	8.0	5.063
Time since start [H]	Output Voltage [V]																								
0.0	5.067																								
0.5	5.063																								
1.0	5.063																								
2.0	5.063																								
3.0	5.063																								
4.0	5.063																								
5.0	5.063																								
6.0	5.063																								
7.0	5.063																								
8.0	5.063																								



Model		PAA75F-5	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+5V15.0A	

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 : -10~50 °C

Input Voltage : 170~264 V

Load Current : 0.0~15.0 A

* Output Voltage Accuracy = $\pm (\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

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 -10~50 °C

入力電圧 170~264 V

負荷電流 0.0~15.0 A

* 定電圧精度(変動値) = $\pm (\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

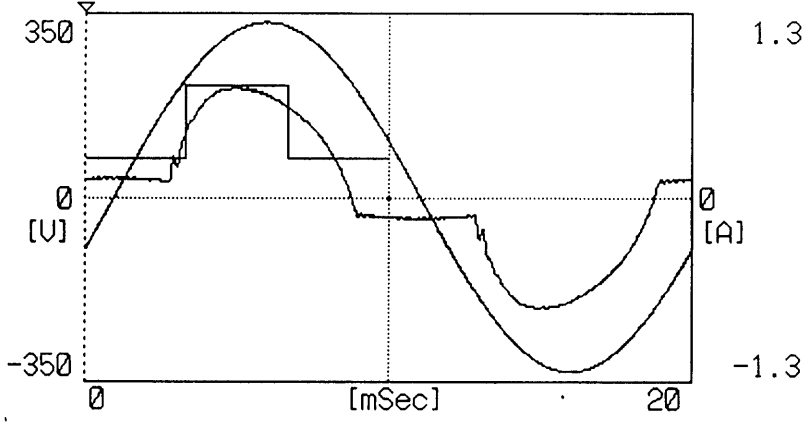
$$* \text{ 定電圧精度(変動率) } = \frac{\text{変動値}}{\text{定格出力電圧}} \times 100$$

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	-10	264	0.0	5.110	±23	±0.5
Minimum Voltage	50	170	15.0	5.064		

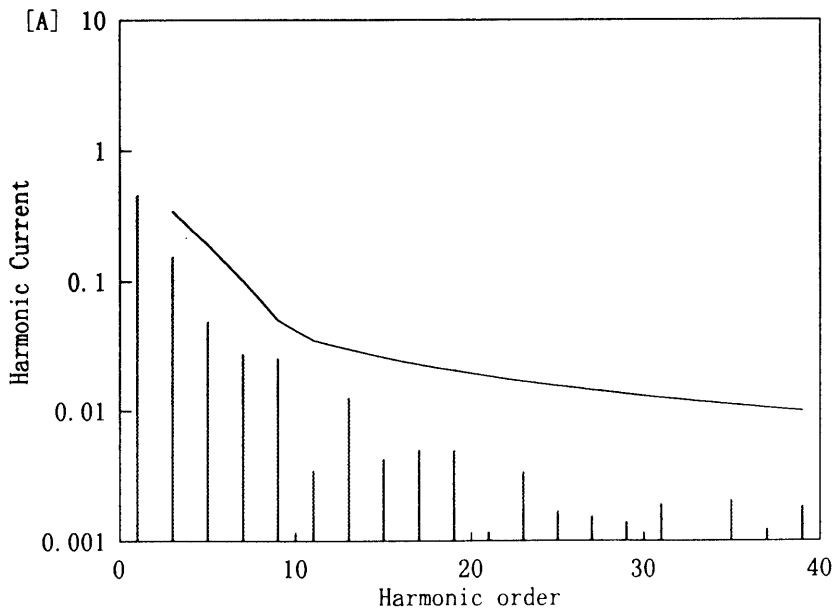
COSEL

Model	PAA75F-5	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object	+5V15.0A		

Conditions	Values
Input Voltage [V]	230
Input Current [A]	0.48
Active Power [W]	100.5
Apparent Power [VA]	111.5
Frequency [Hz]	50
Power Factor	0.901
Output Power [W]	75



2. Harmonic Current



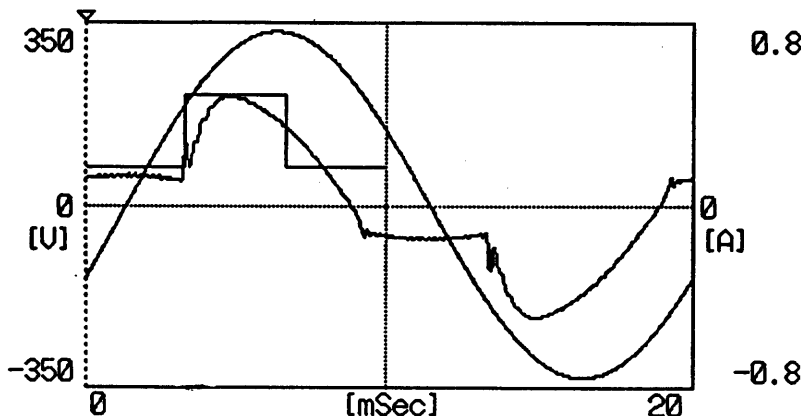
— Harmonic Current
 高調波電流
 - - - Limits for Class D equipment
 クラスDの機器に対する限度値

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	0.458
2	—	0.000
3	0.342	0.156
4	—	0.000
5	0.191	0.049
6	—	0.000
7	0.101	0.028
8	—	0.000
9	0.050	0.026
10	—	0.000
11	0.035	0.004
12	—	0.000
13	0.030	0.013
14	—	0.000
15	0.026	0.004
16	—	0.000
17	0.023	0.005
18	—	0.000
19	0.020	0.005
20	—	0.000
21	0.018	0.001
22	—	0.000
23	0.017	0.003
24	—	0.000
25	0.015	0.002
26	—	0.000
27	0.014	0.002
28	—	0.000
29	0.013	0.001
30	—	0.000
31	0.012	0.002
32	—	0.000
33	0.012	0.000
34	—	0.000
35	0.011	0.002
36	—	0.000
37	0.010	0.001
38	—	0.000
39	0.010	0.002
40	—	0.000

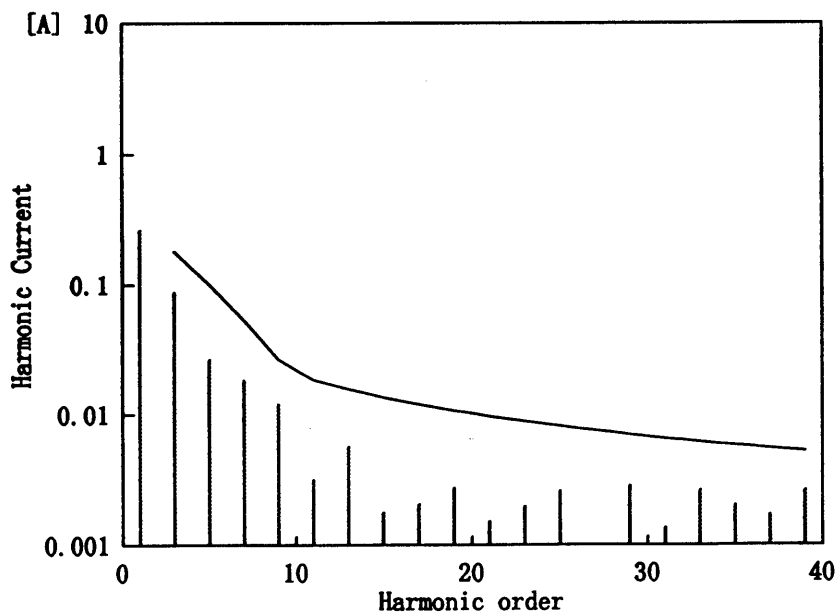
COSEL

Model	PAA75F-5	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object	+5V15.0A		

Conditions	Values
Input Voltage [V]	230
Input Current [A]	0.28
Active Power [W]	52.9
Apparent Power [VA]	64.9
Frequency [Hz]	50
Power Factor	0.815
Output Power [W]	37.5



2. Harmonic Current



— Harmonic Current
 高調波電流
 — Limits for Class D equipment
 クラスDの機器に対する限度値

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	0.265
2	—	0.000
3	0.180	0.089
4	—	0.000
5	0.101	0.027
6	—	0.000
7	0.053	0.019
8	—	0.000
9	0.026	0.012
10	—	0.000
11	0.019	0.003
12	—	0.000
13	0.016	0.006
14	—	0.000
15	0.014	0.002
16	—	0.000
17	0.012	0.002
18	—	0.000
19	0.011	0.003
20	—	0.000
21	0.010	0.002
22	—	0.000
23	0.009	0.002
24	—	0.000
25	0.008	0.003
26	—	0.000
27	0.008	0.001
28	—	0.000
29	0.007	0.003
30	—	0.000
31	0.007	0.001
32	—	0.000
33	0.006	0.003
34	—	0.000
35	0.006	0.002
36	—	0.000
37	0.006	0.002
38	—	0.000
39	0.005	0.003
40	—	0.000



Model		PAA75F-5	Testing Circuitry Figure A
Item		Condensation 結露特性	
Object		+5V15.0A	

1. Condensation test

Testing procedure is as follows.

- ① Keeping and cooling the unit in a tank at -10°C for an hour with the input off.
- ② Taking it out of the tank and dewing itself in a room where the temperature is 1°C and the humidity is 40%RH.
- ③ Testing electrical characteristics (Output Voltage, Ripple Voltage, Ripple noise) 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°Cに冷却しておき、約1時間後に恒温槽から取り出し、室温1°C、湿度40%RHの状態におき結露させ、その電気的特性（出力電圧、リップル、リップルノイズ）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	5.076	30	70
	2	5.076	30	70
	3	5.076	30	70
Load 100 %	1	5.063	30	70
	2	5.063	30	70
	3	5.063	30	70

Input Volt. 200 V



Model		PAA75F-5	Testing Circuitry Figure A
Item	Leakage Current 漏洩電流		
Object	+5V15.0A		

1. Results

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

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 220 [V]	Input Volt. 264 [V]
(D) VDE	0.25	0.35	0.40

2. Condition

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

交流入力 of 兩相について測定し、その大きい方を漏洩電流測定値とする。

Load 100 %

- (A) Input Resistance :1KΩ
- (B) Input Resistance :1.5KΩ
Input Capacitance :0.15 μF
- (C) Input Resistance :1.5KΩ
Input Capacitance :0.15 μF
- (D) Input Resistance :2KΩ
Input Capacitance :0.1 μF



Model		PAA75F-5	Testing Circuitry Figure C
Item		Line Noise Tolerance 入力雑音耐量	
Object		+5V15.0A	

1. Results

Pulse Width [n S]	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	6.60	no regulation
	NORMAL	6.60	no regulation
1000	COMMON	6.50	no regulation
	NORMAL	6.50	no regulation

Conditions

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

COSEL

Model	PAA75F-5
Item	Conducted Emission 雑音端子電圧
Object	+5V15.0A

Testing Circuitry Figure D

1. Graph

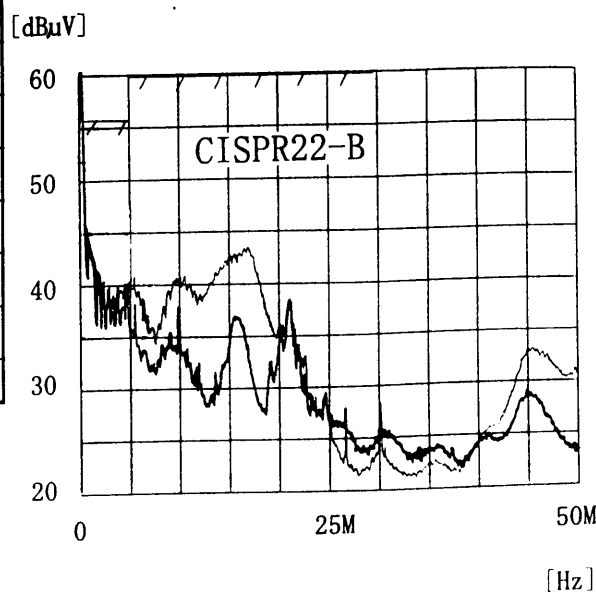
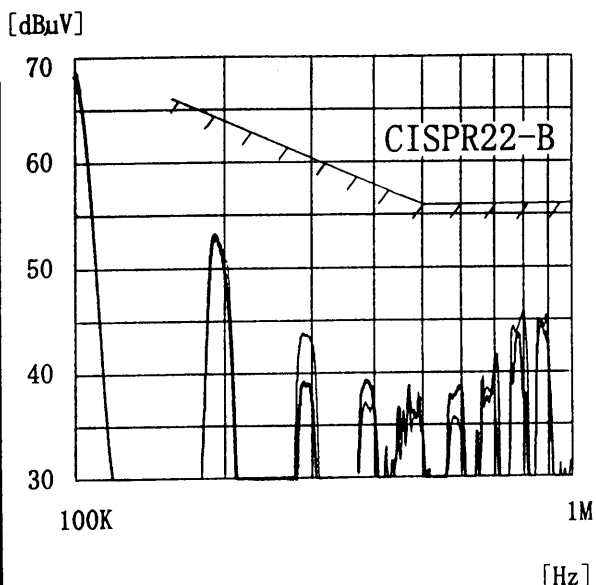
Remarks

Input Volt. 230 V
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 [dB/μV]
1	FCC class A		0.45~1.6	60
			1.6~30	69.5
2	FCC class B		0.45~30	48
3	VCCI -1		0.15~0.5	79
			0.5~30	73
4	VCCI -2		0.15~0.5	66-56
			0.5~5	56
			5~30	60
5	CISPR22-A		0.01~0.15	91-69.5
			0.15~0.5	66
			0.5~30	60
6	CISPR22-B	○	0.01~0.05	110
			0.05~0.15	90-80
			0.15~0.5	66-56
			0.5~5	56
			5~30	60



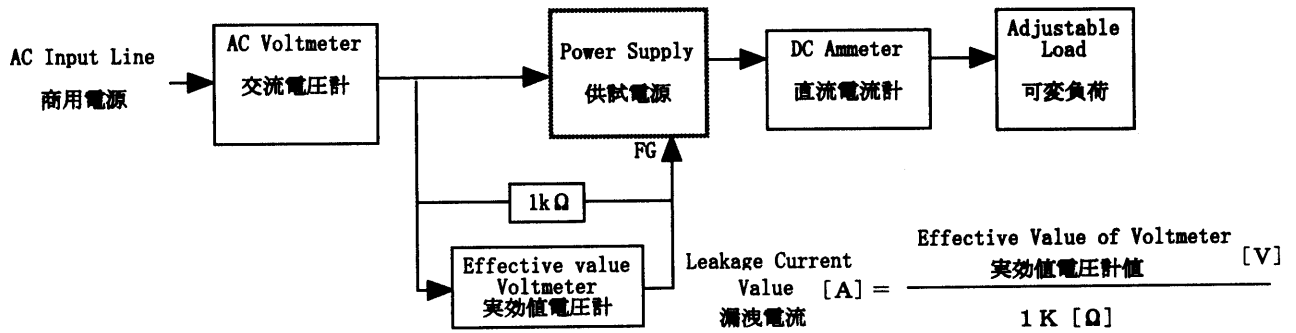
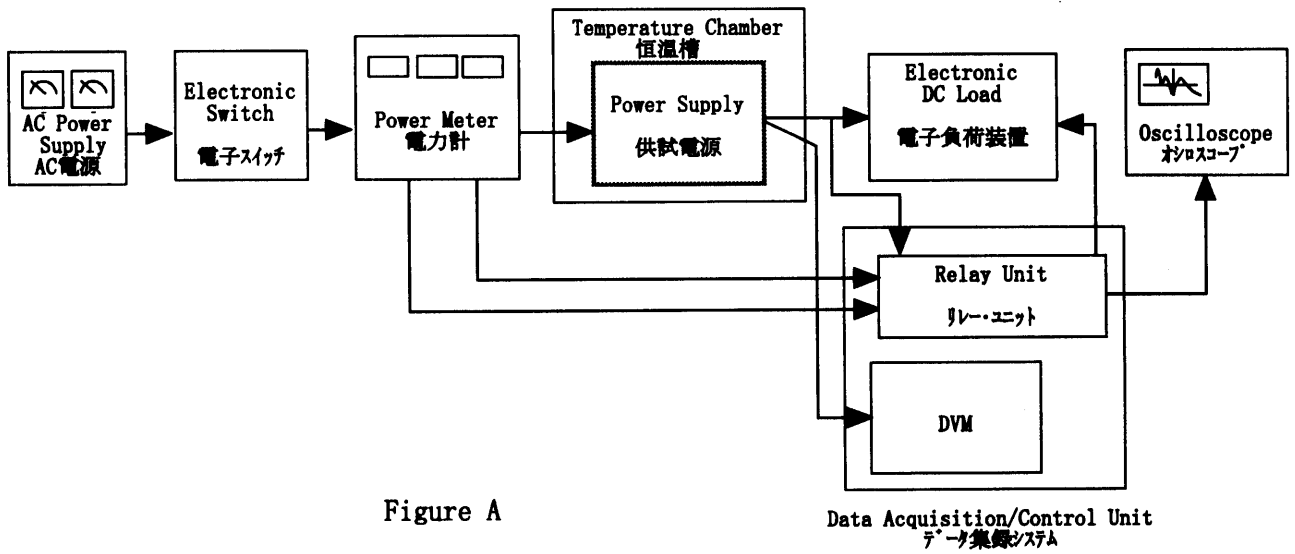


Figure B (DENTORI)

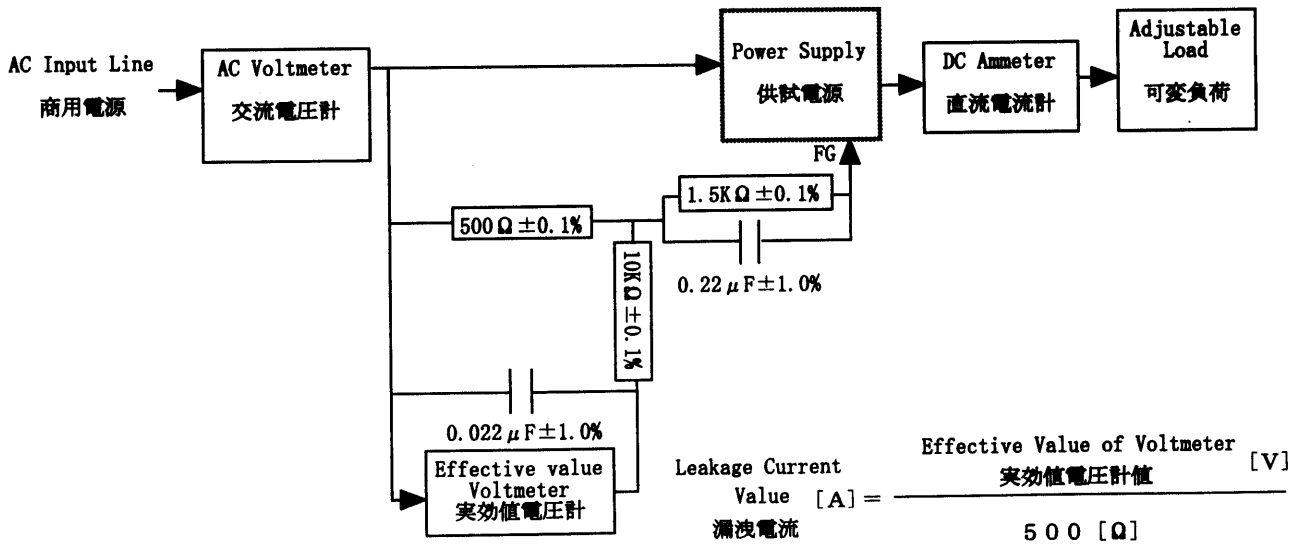


Figure B (UL, CSA, VDE)

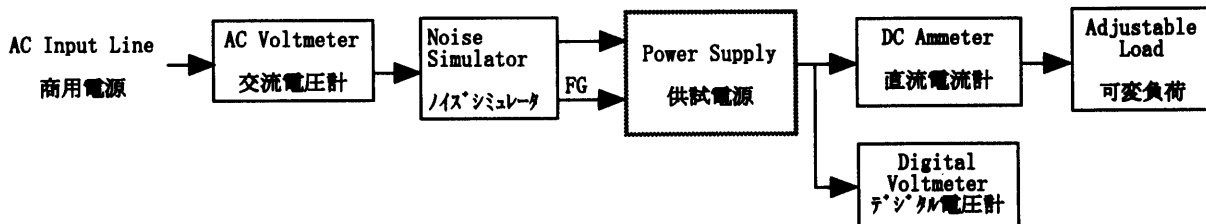


Figure C

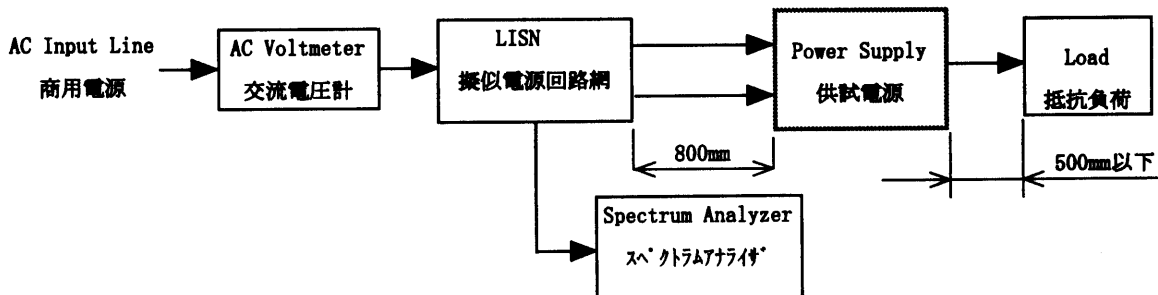


Figure D

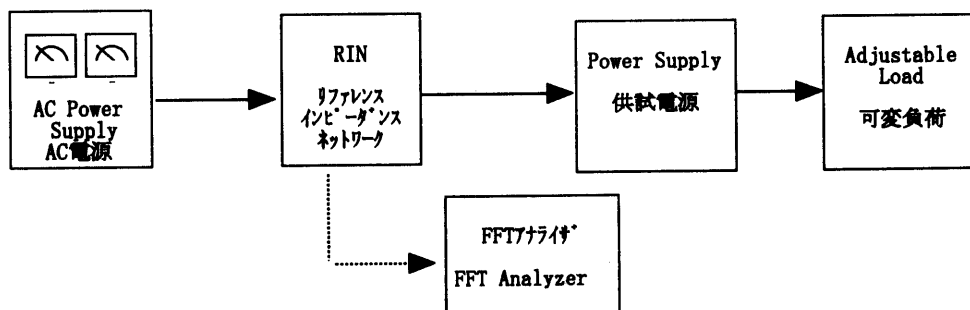


Figure E