



TEST DATA OF PAA300F-12

(100V INPUT)

Regulated DC Power Supply

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Approved by : J. Yoneda
Design Manager

Prepared by : J. Watanabe
Design Engineer

コーセル株式会社
COSEL CO., LTD.

CONTENTS

1. Line Regulation	1
静的入力変動	
2. Efficiency	2
効率	
3. Power Factor	3
力率	
4. Hold-Up Time	4
出力保持時間	
5. Instantaneous Interruption Compensation	5
瞬時停電保障	
6. Load Regulation	6
静的負荷変動	
7. Ripple Voltage (by Load Current)	7
リップル電圧(負荷電流特性)	
8. Ripple-Noise	8
リップルノイズ	
9. Overcurrent Protection	9
過電流保護	
10. Overvoltage Protection	10
過電圧保護	
11. Inrush Current	11
突入電流	
12. Dynamic Load Responce	12
動的負荷変動	
13. Rise and Fall Time	13
立上り、立下り時間	
14. Ambient Temperature Drift	14
周囲温度変動	
15. Minimum Input Voltage for Regulated Output Voltage	15
最低レギュレーション電圧	
16. Ripple Voltage (by Ambient Temperature)	16
リップル電圧(周囲温度特性)	
17. Time Lapse Drift	17
経時ドリフト	
18. Voltage Accuracy	18
定電圧精度	
19. Harmonic Current	19
高調波電流	
20. Condensation	21
結露特性	
21. Leakage Current	22
漏洩電流	
22. Line Noise Tolerance	23
入力雑音耐量	
23. Conducted Emission	24
雑音端子電圧	
24. Figure of Testing Circuitry	25
測定回路図	

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Model		PAA300F-12		Temperature 25℃ Testing Circuitry Figure A																																	
Item		Line Regulation 静的入力変動																																			
Object		+12V27A																																			
1. Graph				2. Values																																	
-----□----- Load 50% -----△----- Load 100% Output Voltage [V] Input Voltage [V] 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。				<table><tr><th rowspan="2">Input Voltage [V]</th><th>Load 50%</th><th>Load 100%</th></tr><tr><th>Output Volt. [V]</th><th>Output Volt. [V]</th></tr><tr><td>75</td><td>12.060</td><td>12.057</td></tr><tr><td>80</td><td>12.060</td><td>12.058</td></tr><tr><td>85</td><td>12.060</td><td>12.058</td></tr><tr><td>90</td><td>12.060</td><td>12.058</td></tr><tr><td>100</td><td>12.060</td><td>12.058</td></tr><tr><td>110</td><td>12.060</td><td>12.059</td></tr><tr><td>120</td><td>12.060</td><td>12.059</td></tr><tr><td>132</td><td>12.060</td><td>12.059</td></tr><tr><td>140</td><td>12.060</td><td>12.059</td></tr></table>		Input Voltage [V]	Load 50%	Load 100%	Output Volt. [V]	Output Volt. [V]	75	12.060	12.057	80	12.060	12.058	85	12.060	12.058	90	12.060	12.058	100	12.060	12.058	110	12.060	12.059	120	12.060	12.059	132	12.060	12.059	140	12.060	12.059
Input Voltage [V]	Load 50%	Load 100%																																			
	Output Volt. [V]	Output Volt. [V]																																			
75	12.060	12.057																																			
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132	12.060	12.059																																			
140	12.060	12.059																																			

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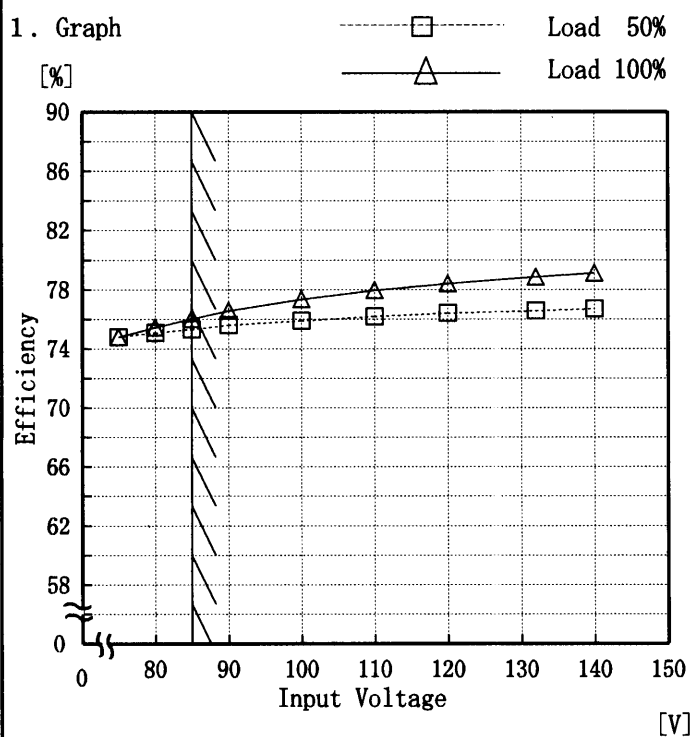
Model PAA300F-12

Item Efficiency 効率

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Load 50%	Load 100%
	Efficiency [%]	Efficiency [%]
75	74.80	74.79
80	75.08	75.46
85	75.33	76.03
90	75.61	76.57
100	75.89	77.35
110	76.18	77.95
120	76.40	78.42
132	76.58	78.86
140	76.69	79.11

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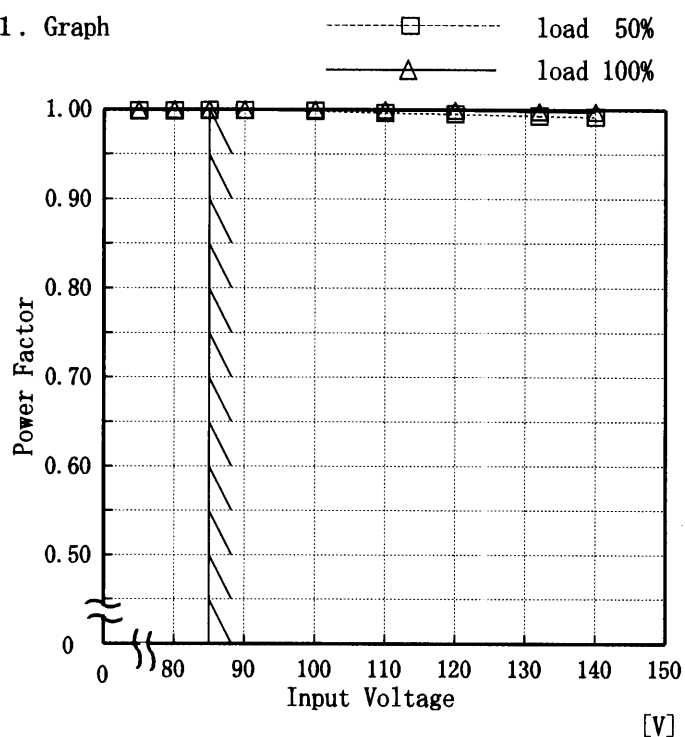
Model PAA300F-12

Item Power Factor 力率

Object

Temperature 25°C
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%	load 100%
	Power Factor	Power Factor
75	1.00	1.00
80	1.00	1.00
85	1.00	1.00
90	1.00	1.00
100	1.00	1.00
110	1.00	1.00
120	0.99	1.00
132	0.99	1.00
140	0.99	1.00

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Model PAA300F-12

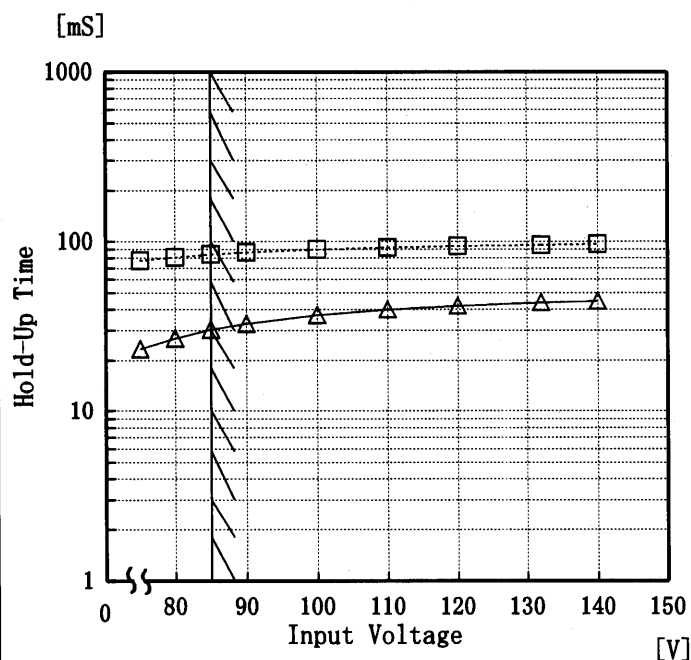
Item Hold-Up Time 出力保持時間

Object +12V27A

Temperature 25°C
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、AC入力断から出力電圧が、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%	Load 100%
	Hold-Up Time [mS]	Hold-Up Time [mS]
75	78	23
80	81	27
85	84	30
90	86	33
100	90	37
110	92	40
120	94	42
132	96	44
140	97	45

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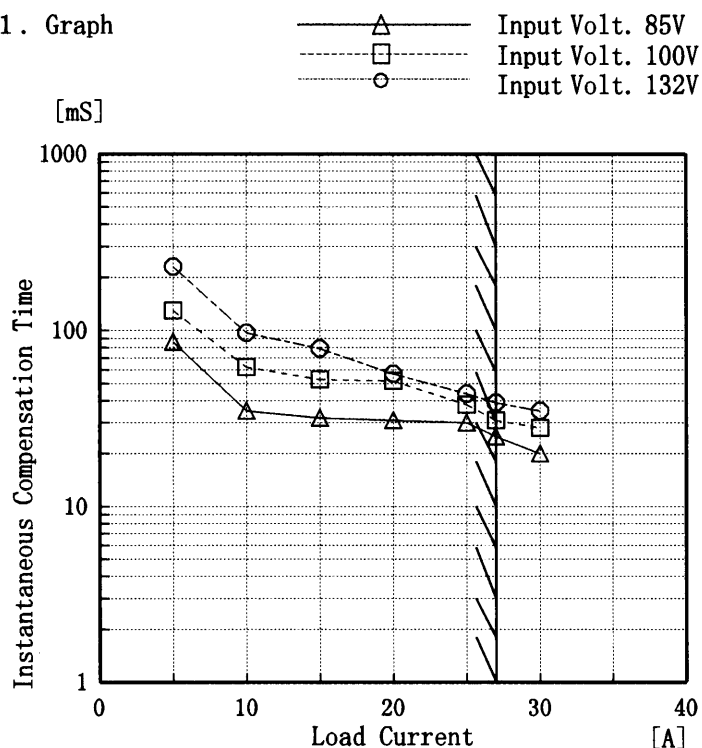
Model PAA300F-12

Item Instantaneous Interruption Compensation
瞬時停電保障

Object +12V27A

Testing Circuitry Figure A 25°C

1. Graph



This duration covers from Shut-off of AC-IN to the moment when output voltage descends to its 95% of the rated.

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

瞬時停電保障時間とは、出力電圧が定格値の95%になる時の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	—	—	—
5.0	86	130	230
10.0	35	62	97
15.0	32	53	79
20.0	31	52	57
25.0	30	38	44
27.0	25	31	39
30.0	20	28	35
—	—	—	—
—	—	—	—
—	—	—	—

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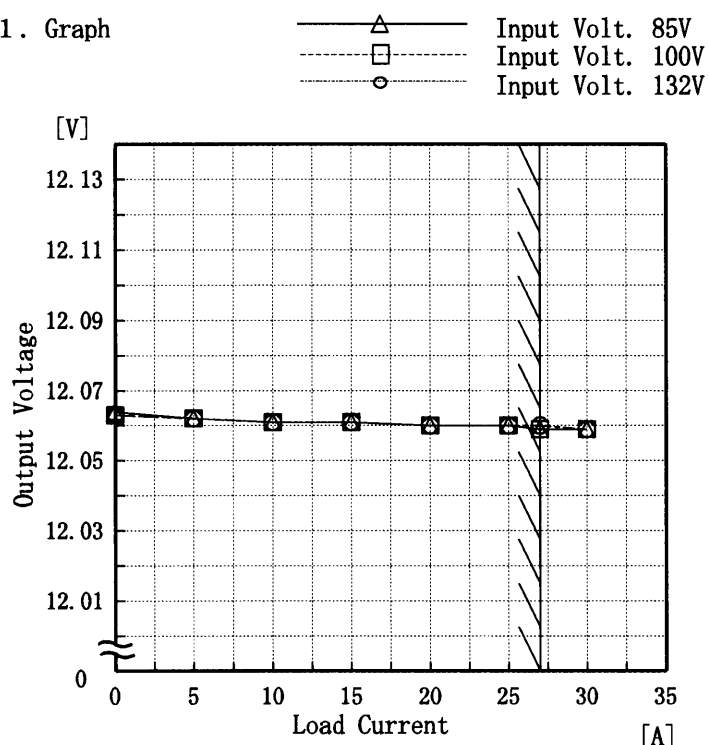
Model PAA300F-12

Item Load Regulation 静的負荷変動

Object +12V27A

Temperature 25°C
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]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
0.0	12.064	12.063	12.063
5.0	12.062	12.062	12.062
10.0	12.061	12.061	12.061
15.0	12.061	12.061	12.061
20.0	12.060	12.060	12.060
25.0	12.060	12.060	12.060
27.0	12.059	12.059	12.060
30.0	12.059	12.059	12.059
—	—	—	—
—	—	—	—

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Model		PAA300F-12	
Item		Ripple Voltage (by Load Current) リップル電圧 (負荷電流特性)	
Object		+12V27A	

1. Graph

-----□----- Input Volt. 85V

-----△----- Input Volt. 132V

[mV]

200

175

150

125

100

75

50

25

0

Ripple Voltage

0

10

20

30

40

Load Current

[A]

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
スイッチング周期

→← T2

←→ T1

Ripple [mVp-p]

↑

↓

↑

↓

Fig. Complex Ripple Wave Form

図 リップル波形詳細図

2.Values

Load Current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
0.0	30	30
5.0	30	30
10.0	30	30
15.0	35	35
20.0	35	35
25.0	40	40
27.0	40	40
30.0	40	40
—	—	—
—	—	—
—	—	—

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Model		PAA300F-12	
Item		Ripple-Noise リップルノイズ	
Object		+12V27A	

1. Graph

-----□----- Input Volt. 85V

—————△———— Input Volt. 132V

[mV]

Ripple-Noise

Load Current

[A]

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
スイッチング周期

T2

Ripple-Noise

[mVp-p]

T1

Fig. Complex Ripple Wave Form

図 リップル波形詳細図

Temperature 25℃

Testing Circuitry Figure A

2. Values

Load current	Input Volt.	Input Volt.
	85 [V]	132 [V]
[A]	Ripple-Noise	Ripple-Noise
	[mV]	[mV]
0.0	30	30
5.0	35	35
10.0	35	40
15.0	45	45
20.0	50	50
25.0	55	55
27.0	60	60
30.0	70	70
—	—	—
—	—	—
—	—	—

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Model PAA300F-12

Item Overcurrent Protection
過電流保護

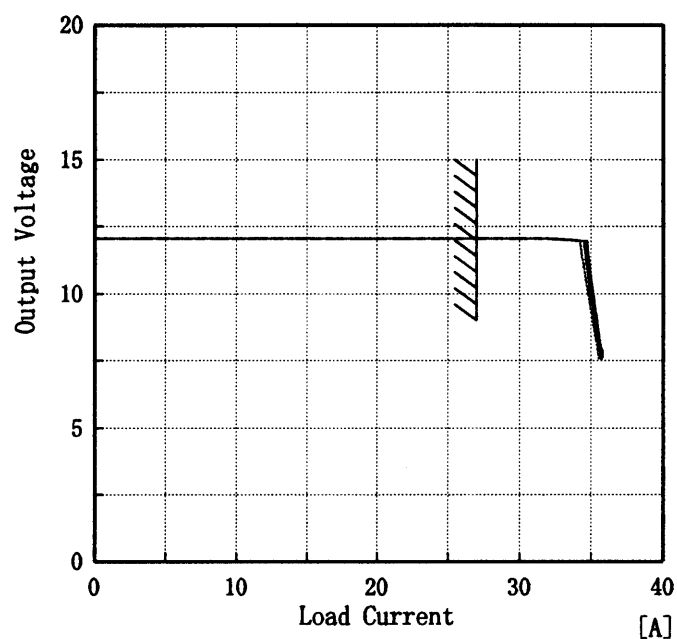
Object +12V27A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

[V]

Input Volt. 85 V
Input Volt. 100 V
Input Volt. 132 V



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。
8V以下は間欠モードにはいる。

2. Values

Output Voltage [V]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Load Current [A]	Load Current [A]	Load Current [A]
12.00	34.22	34.49	34.68
11.40	34.32	34.57	34.75
10.80	34.52	34.72	34.90
9.60	34.89	35.05	35.20
8.40	35.26	35.39	35.51
7.20	—	—	—
6.00	—	—	—
4.80	—	—	—
3.60	—	—	—
2.40	—	—	—
1.20	—	—	—
0.00	—	—	—

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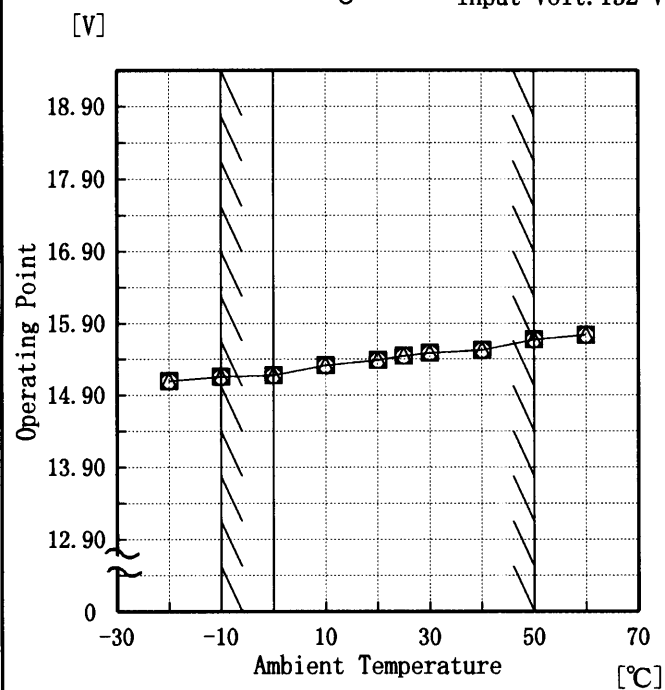
Model PAA300F-12
Item Overvoltage Protection
過電圧保護

Object +12V27A

Testing Circuitry Figure A

1. Graph

—△— Input Volt. 85 V
- - -□- - - Input Volt. 100 V
- - -○- - - Input Volt. 132 V

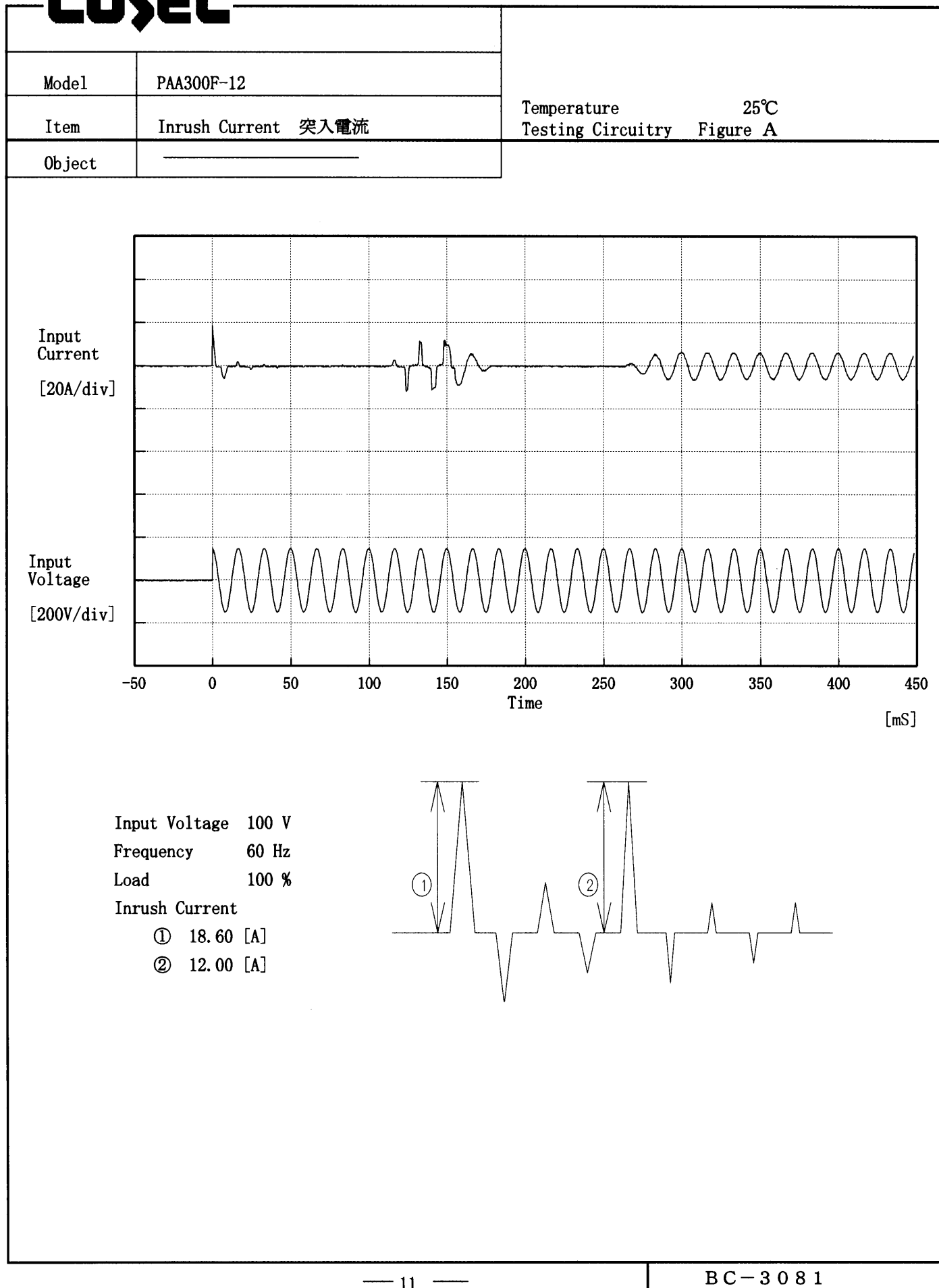


Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

2. Values

Ambient Temp.	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
[°C]	Operating Point [V]		
-20	15.10	15.10	15.10
-10	15.16	15.16	15.16
0	15.18	15.18	15.18
10	15.32	15.32	15.32
20	15.39	15.39	15.39
25	15.45	15.45	15.45
30	15.49	15.49	15.49
40	15.53	15.53	15.53
50	15.67	15.67	15.67
60	15.74	15.74	15.74
—	—	—	—

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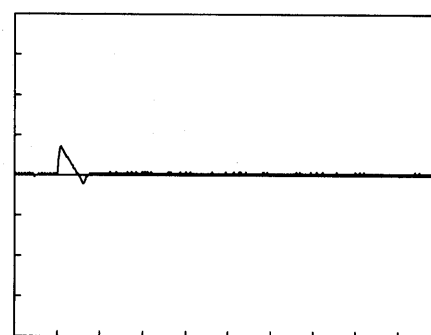
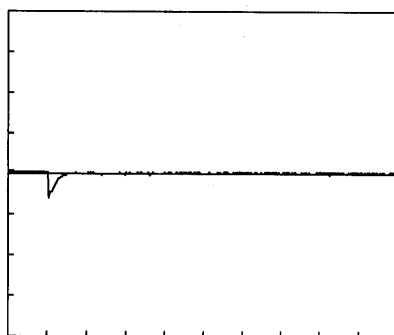
Model	PAA300F-12	Temperature	25℃
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	+12V27A		

Input Volt. 100 V
Cycle 200 mS

Load Current

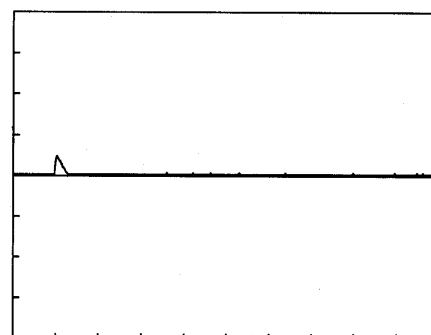
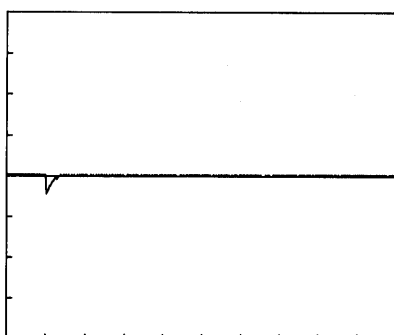
Min. Load ↔

Load 100 %



Min. Load ↔

Load 50 %



100 mV/div

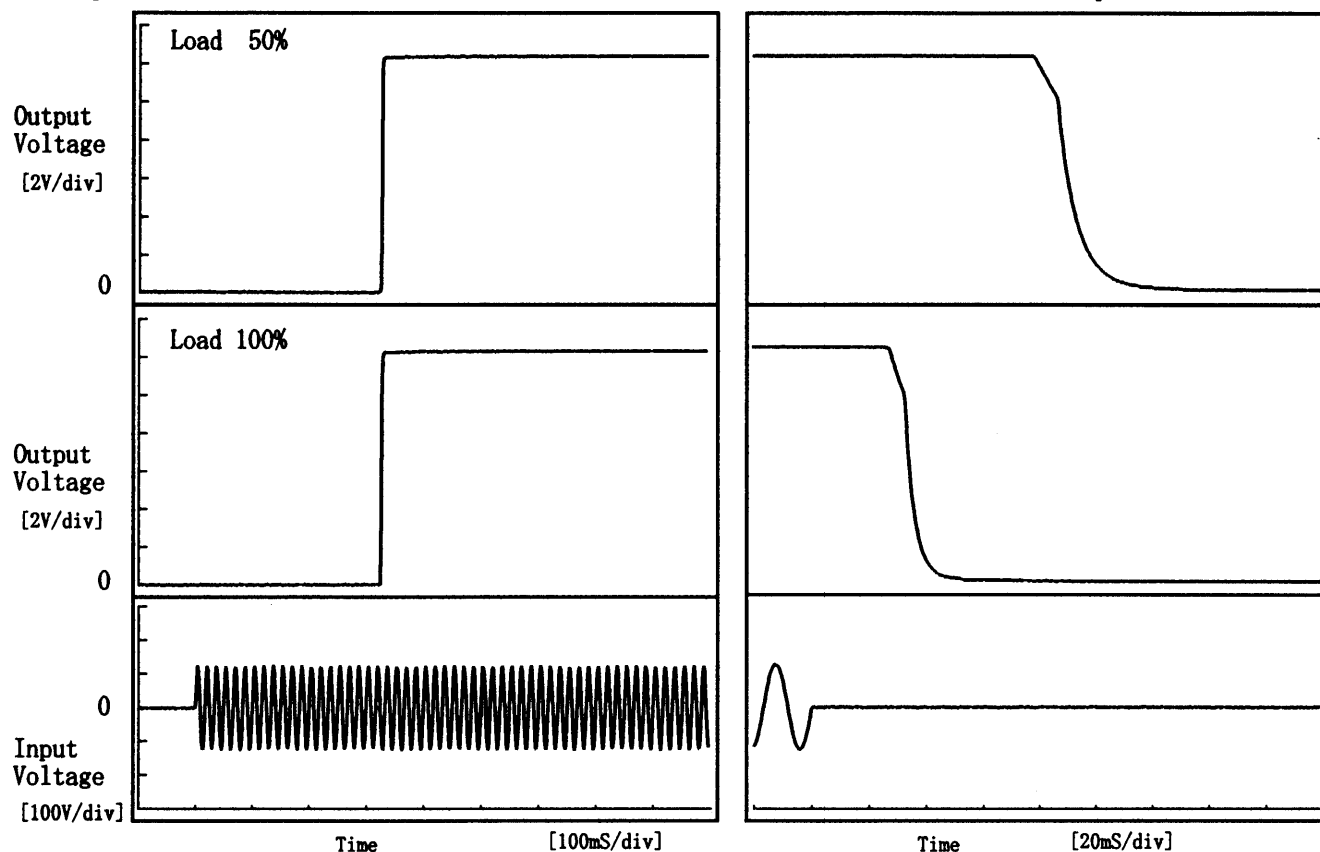
10 mS/div

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Model	PAA300F-12	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12V27A		

1. Graph

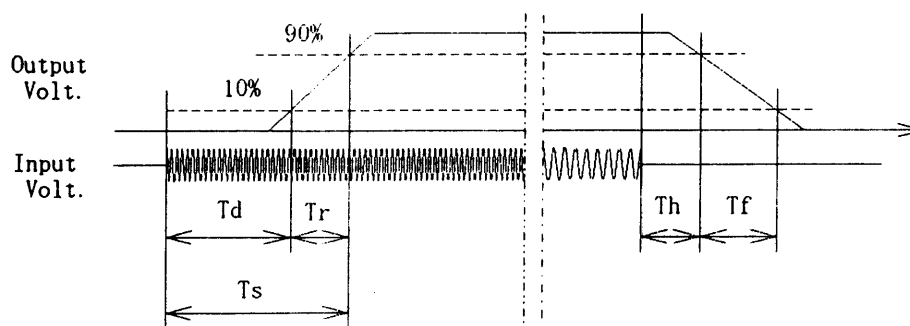
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	325.5	2.0	327.5	84.1	18.2
100 %	326.0	3.0	329.0	30.5	10.0



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Model

PAA300F-12

Item

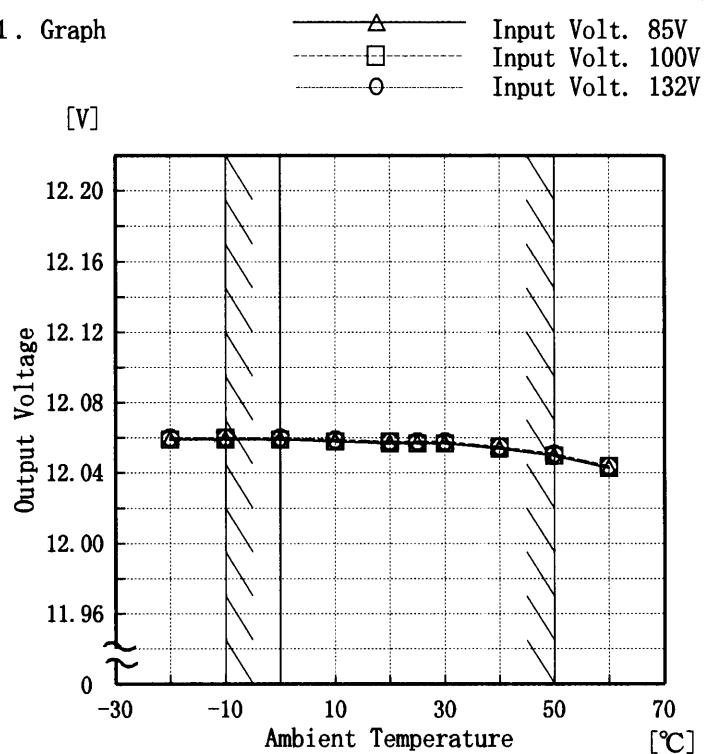
Ambient Temperature Drift
周囲温度変動

Object

+12V 27A

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 [°C]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-20	12.059	12.059	12.060
-10	12.059	12.060	12.060
0	12.059	12.059	12.060
10	12.058	12.058	12.059
20	12.057	12.058	12.058
25	12.057	12.057	12.058
30	12.057	12.057	12.058
40	12.054	12.055	12.055
50	12.050	12.050	12.051
60	12.043	12.044	12.044
—	—	—	—

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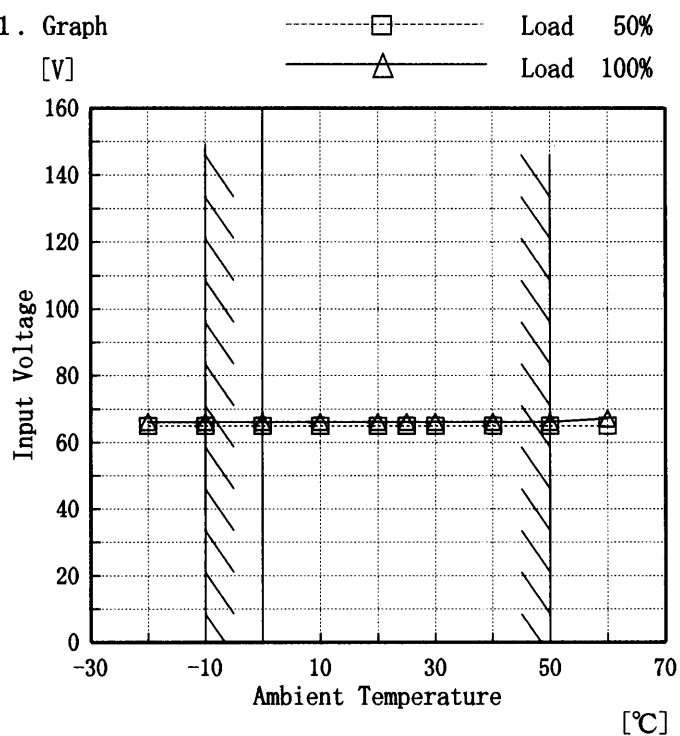
Model PAA300F-12

Item Minimum Input Voltage for Regulated Output Voltage
最低レギュレーション電圧

Object +12V27A

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%	Load 100%
[°C]	Input Volt. [V]	Input Volt. [V]
-20	65	66
-10	65	66
0	65	66
10	65	66
20	65	66
25	65	66
30	65	66
40	65	66
50	65	66
60	65	67
—	—	—

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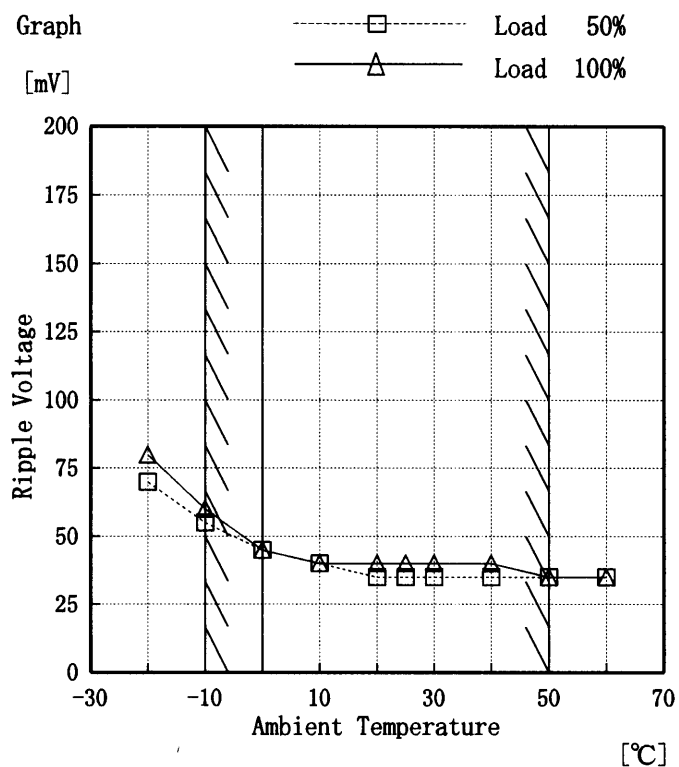
Model PAA300F-12

Item Ripple Voltage (by Ambient Temp.)
リップル電圧 (周囲温度特性)

Object +12V27A

Testing Circuitry Figure A

1. Graph



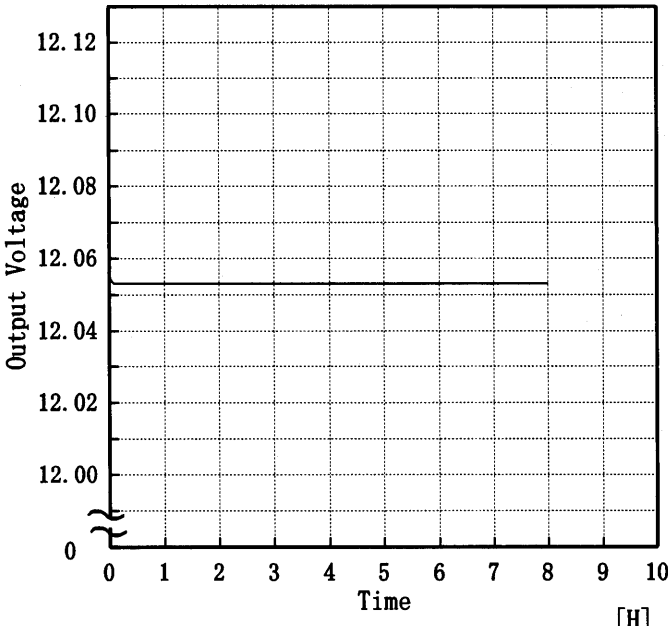
Note: Slanted line shows the range of the rated ambient temperature.

(注) 斜線は定格周囲温度範囲を示す。

2. Values

Ambient Temp. [°C]	Load 50%	Load 100%
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
-20	70	80
-10	55	60
0	45	45
10	40	40
20	35	40
25	35	40
30	35	40
40	35	40
50	35	35
60	35	35
—	—	—

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Model	PAA300F-12																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25 ℃																						
Object	+12V27A	Testing Circuitry	Figure A																						
1. Graph		2.Values																							
[V]  Output Voltage [V] Time [H] Input Volt. 100V Load 100%		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.055</td></tr><tr><td>0.5</td><td>12.053</td></tr><tr><td>1.0</td><td>12.053</td></tr><tr><td>2.0</td><td>12.053</td></tr><tr><td>3.0</td><td>12.053</td></tr><tr><td>4.0</td><td>12.053</td></tr><tr><td>5.0</td><td>12.053</td></tr><tr><td>6.0</td><td>12.053</td></tr><tr><td>7.0</td><td>12.053</td></tr><tr><td>8.0</td><td>12.053</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.055	0.5	12.053	1.0	12.053	2.0	12.053	3.0	12.053	4.0	12.053	5.0	12.053	6.0	12.053	7.0	12.053	8.0	12.053
Time since start [H]	Output Voltage [V]																								
0.0	12.055																								
0.5	12.053																								
1.0	12.053																								
2.0	12.053																								
3.0	12.053																								
4.0	12.053																								
5.0	12.053																								
6.0	12.053																								
7.0	12.053																								
8.0	12.053																								

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Model	PAA300F-12	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+12V27A	

Output Voltage Accuracy

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

Temperature : -10~50 °C

Input Voltage : 85~132 V

Load Current : 0~27 A

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

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

定電圧精度

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 : 85~132 V

負過電流 : 0~27 A

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

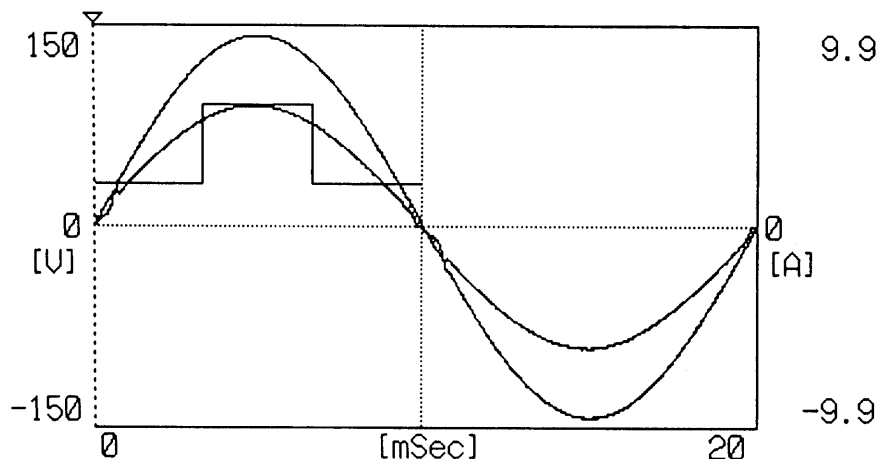
* 定電圧精度(変動率) = $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-10	132	0	12.064	±7	±0.058
Minimum Voltage	50	85	27	12.049		

COSEL

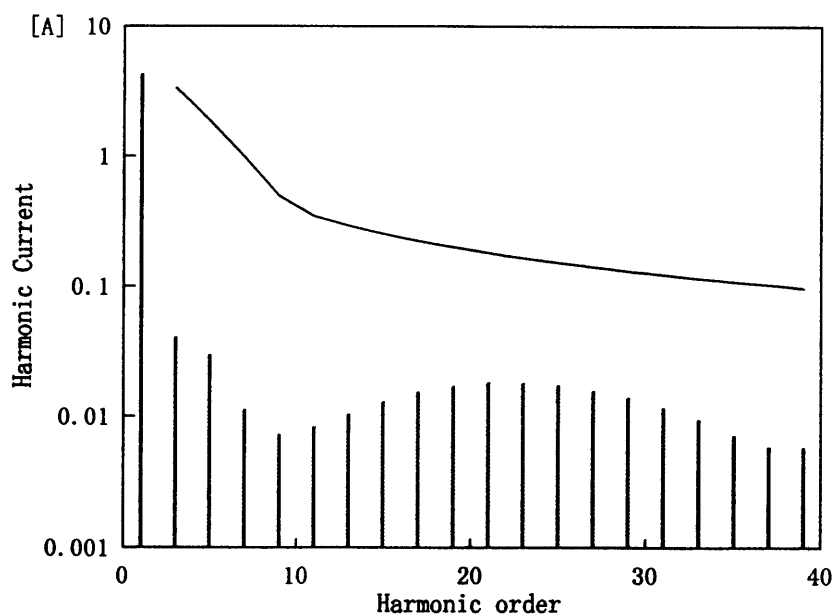
Model	PAA300F-12	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object			

1. Input Current Waveform



Conditions	Values
Input Voltage [V]	98.8
Input Current [A]	5.96
Active Power [W]	424.2
Apparent Power [VA]	425.4
Frequency [Hz]	60
Power Factor	0.997
Output Power [W]	324

2. Harmonic Current



— Harmonic Current
高調波電流

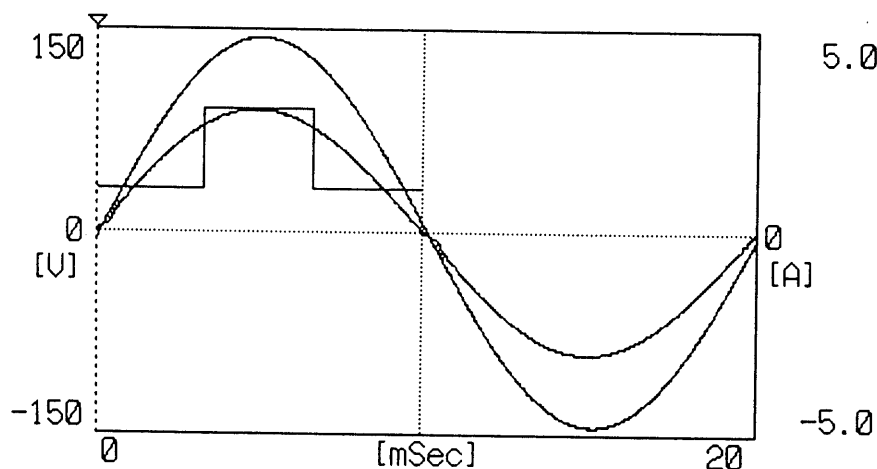
— Limits for Class D equipment
クラスDの機器に対する限度値

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	4.30600
2	—	0.00087
3	3.35753	0.04098
4	—	0.00036
5	1.87627	0.03000
6	—	0.00037
7	0.98751	0.01137
8	—	0.00031
9	0.49376	0.00739
10	—	0.00044
11	0.34563	0.00843
12	—	0.00043
13	0.29245	0.01050
14	—	0.00043
15	0.25346	0.01301
16	—	0.00037
17	0.22364	0.01558
18	—	0.00033
19	0.20010	0.01727
20	—	0.00044
21	0.18104	0.01838
22	—	0.00044
23	0.16530	0.01836
24	—	0.00039
25	0.15208	0.01756
26	—	0.00029
27	0.14081	0.01582
28	—	0.00026
29	0.13110	0.01405
30	—	0.00030
31	0.12264	0.01181
32	—	0.00044
33	0.11521	0.00957
34	—	0.00024
35	0.10863	0.00724
36	—	0.00036
37	0.10275	0.00591
38	—	0.00034
39	0.09748	0.00588
40	—	0.00035

COSEL

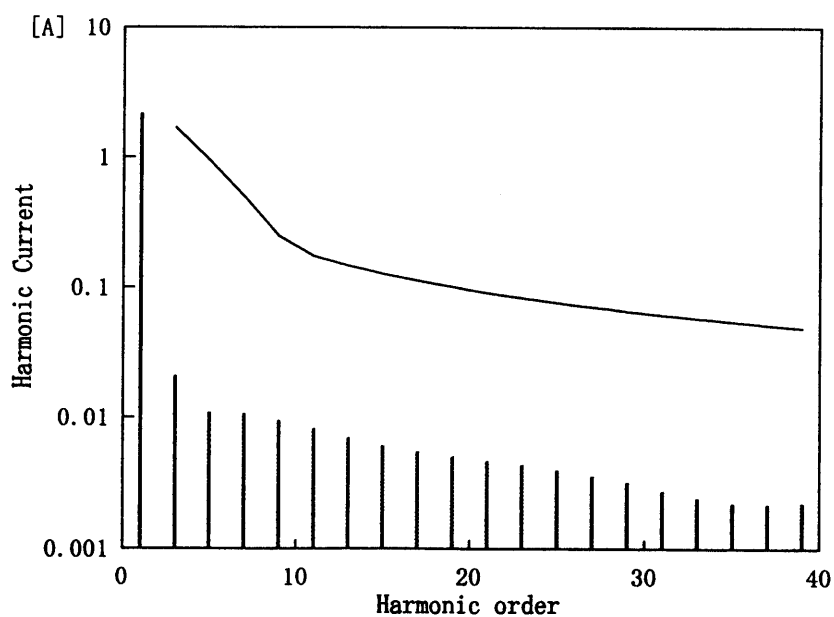
Model	PAA300F-12	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object			

1. Input Current Waveform



Conditions	Values
Input Voltage [V]	99.9
Input Current [A]	2.17
Active Power [W]	215.9
Apparent Power [VA]	216.6
Frequency [Hz]	60
Power Factor	0.997
Output Power [W]	162

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	—	2.16800
2	—	0.00038
3	1.69003	0.02104
4	—	0.00006
5	0.94443	0.01106
6	—	0.00007
7	0.49707	0.01070
8	—	0.00006
9	0.24853	0.00954
10	—	0.00006
11	0.17397	0.00827
12	—	0.00006
13	0.14721	0.00706
14	—	0.00007
15	0.12758	0.00612
16	—	0.00003
17	0.11257	0.00552
18	—	0.00004
19	0.10072	0.00506
20	—	0.00004
21	0.09113	0.00465
22	—	0.00004
23	0.08320	0.00438
24	—	0.00005
25	0.07655	0.00402
26	—	0.00006
27	0.07088	0.00359
28	—	0.00005
29	0.06599	0.00323
30	—	0.00005
31	0.06173	0.00276
32	—	0.00005
33	0.05799	0.00243
34	—	0.00006
35	0.05468	0.00222
36	—	0.00005
37	0.05172	0.00219
38	—	0.00007
39	0.04907	0.00224
40	—	0.00006

COSEL

LOVEL

Model	PAA300F-12		
Item	Condensation 結露特性	Testing Circuitry	Figure A
Object	+12V27A		

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	12.061	40	45
	2	12.060	40	45
	3	12.060	40	45
Load 100 %	1	12.059	40	60
	2	12.059	40	60
	3	12.059	40	60

Input Volt. 100 V

COSEL

		Testing Circuitry Figure B
Model	PAA300F-12	
Item	Leakage Current 漏洩電流	
Object	_____	

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.15	0.17	0.22
(B) UL	0.14	0.16	0.22
(C) CSA	0.14	0.16	0.22

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 of 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。

Load 100 %

COSEL

		Testing Circuitry Figure C
Model	PAA300F-12	
Item	Line Noise Tolerance 入力雑音耐量	
Object	+12V27A	

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	15.43	no regulation
	NORMAL	15.43	no regulation
1000	COMMON	15.43	no regulation
	NORMAL	15.44	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	PAA300F-12	Testing Circuitry Figure D
Item	Conducted Emission 雑音端子電圧	
Object		

1. Graph

Remarks

Input Volt. 120 V

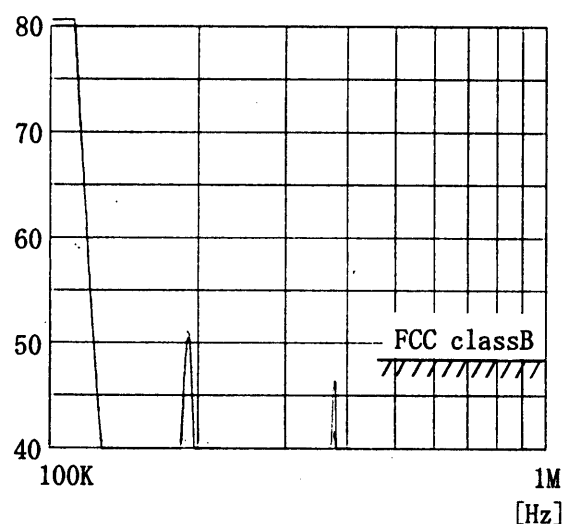
Load 100 %

Note: Slanted line shows the range of Tolerance

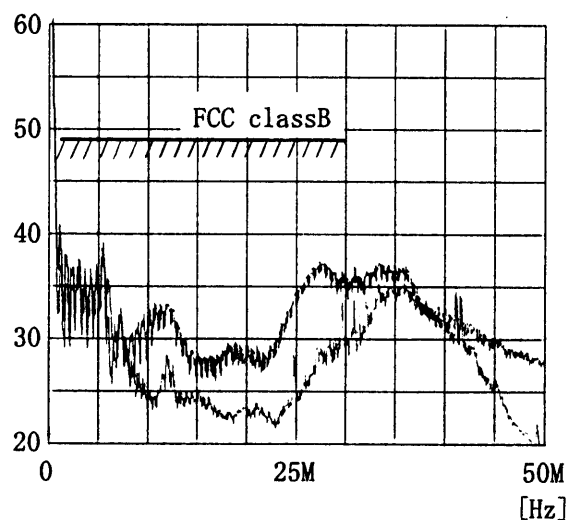
(注)斜線は許容値を示す。

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	VDE Class A		0.01~0.15	91-69.5
			0.15~0.5	66
			0.5~30	60
6	CISPR22 Class B		0.15~0.5	66-56
			0.5~5	56
			5~30	60

[dBμV]



[dBμV]



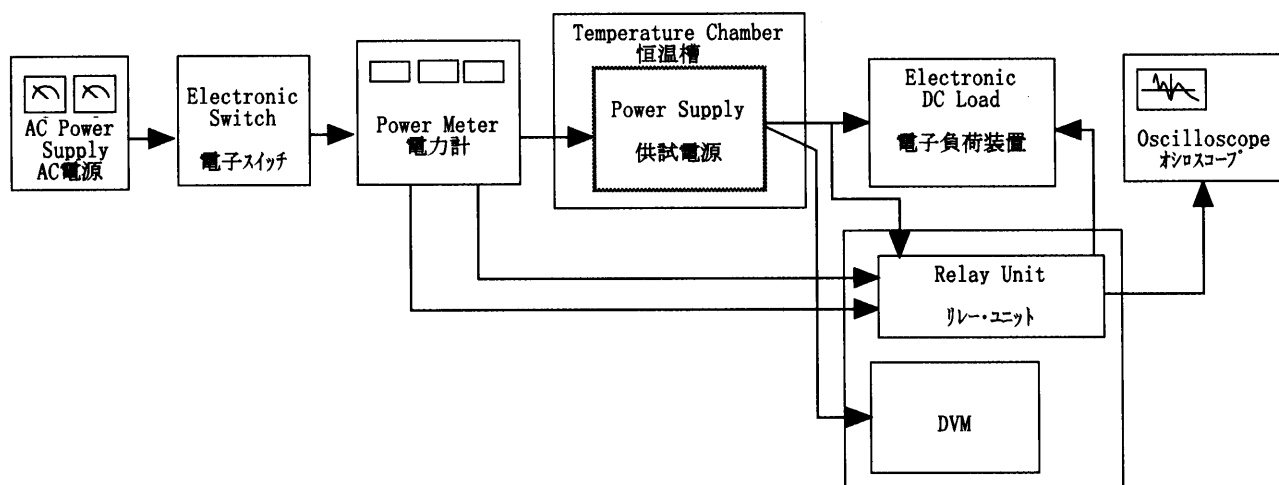


Figure A

Data Acquisition/Control Unit
データ集録システム

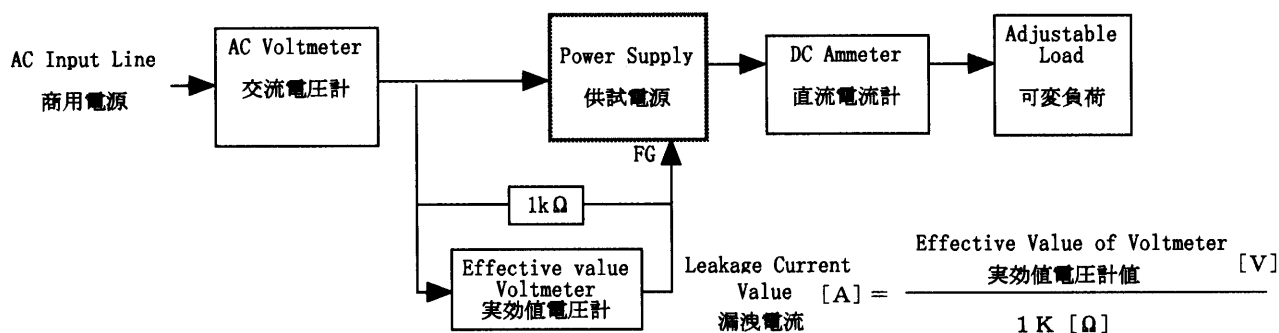


Figure B (DENTORI)

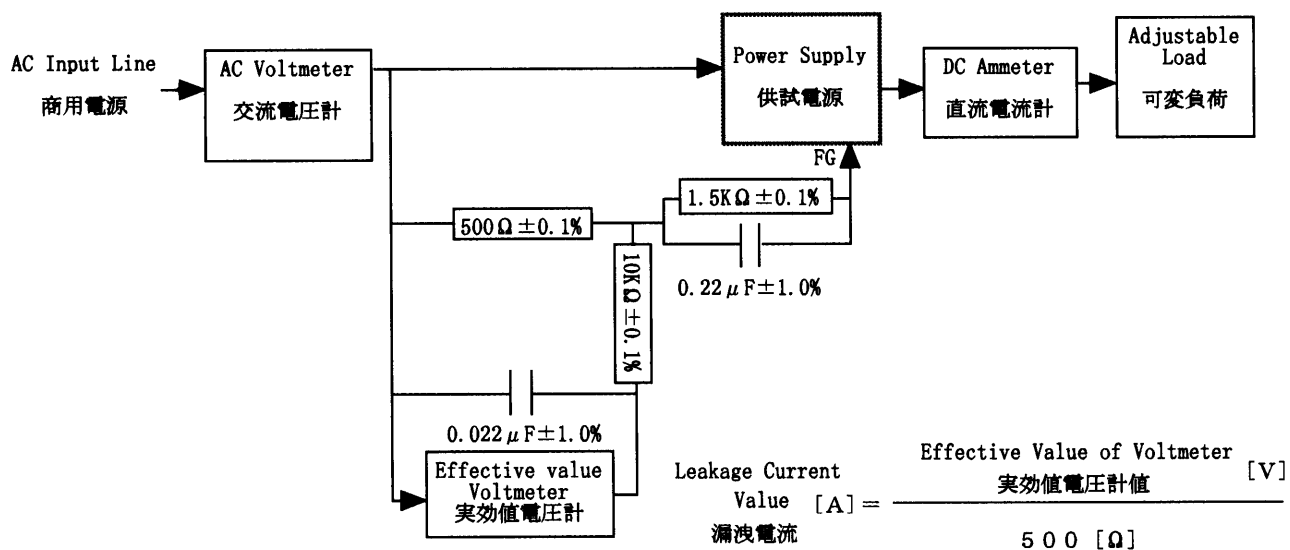


Figure B (UL, CSA, VDE)

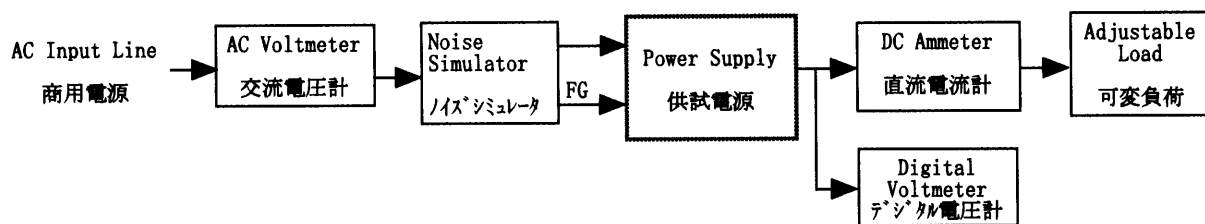


Figure C

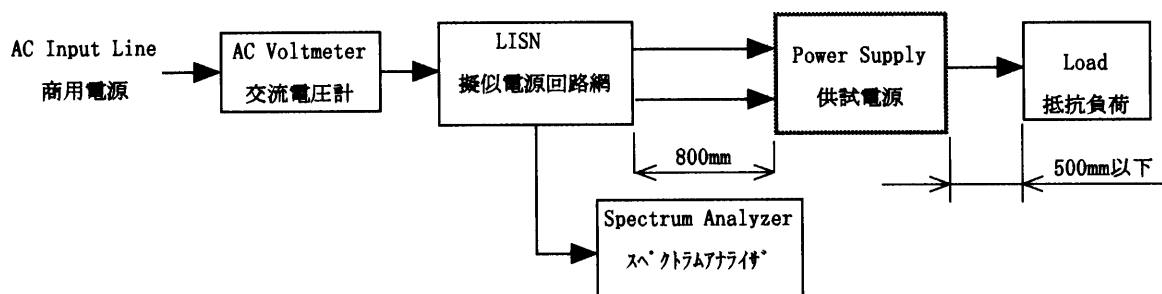


Figure D

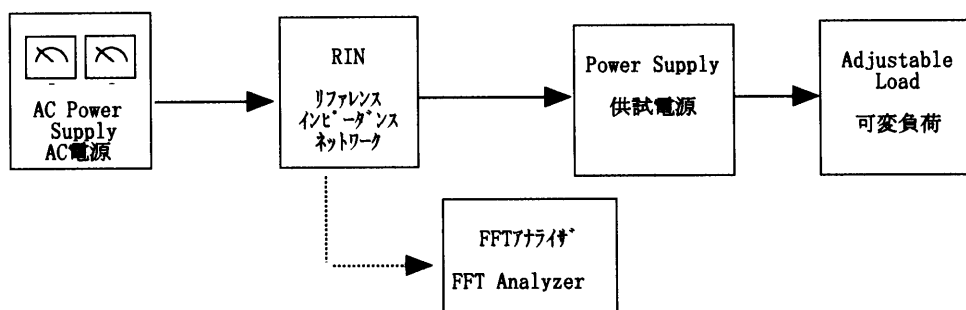


Figure E