

COSEL

TEST DATA OF LDA10F-24
(100V INPUT)

Regulated DC Power Supply

Date : June 18. 1999

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Design Manager

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コーセル株式会社
COSEL CO., LTD.



CONTENTS

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

(Final Page 25)

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Model	LDA10F-24		Temperature Testing Circuitry 25°C Figure A																																
Item	Line Regulation 静的输入变动																																		
Object	+24.0V 0.5A																																		
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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。

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Model	LDA10F-24																																																									
Item	Input Current (by Load Current) 入力電流 (負荷特性)	Temperature 25°C	Testing Circuitry Figure A																																																							
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<p>Graph showing Input Current [A] vs Load Current [A] for three input voltages: 85V, 100V, and 132V. The x-axis ranges from 0 to 0.6 A, and the y-axis ranges from 0 to 0.5 A. Data points are plotted at 0.05 A intervals, connected by dashed lines. A solid diagonal line indicates the rated load current range.</p>																																																										
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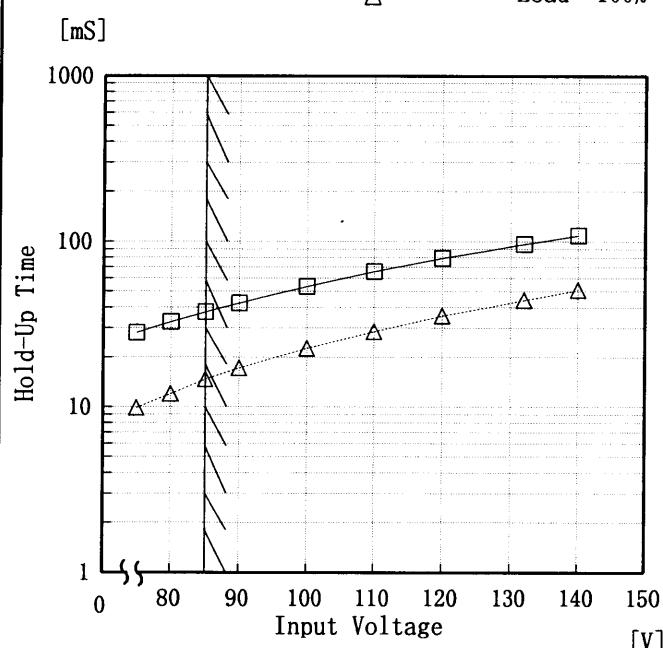
Model	LDA10F-24	
Item	Efficiency 効率	Temperature 25°C Testing Circuitry Figure A
Object	—	—
1. Graph	Load 50% [%]	Load 100%
<p>Note: Slanted line shows the range of the rated input voltage.</p> <p>(注) 斜線は定格入力電圧範囲を示す。</p>		
2. Values		
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	73.0	70.7
80	73.4	72.4
85	73.8	73.4
90	73.8	74.1
100	73.8	75.2
110	73.4	75.9
120	72.9	76.3
132	72.0	76.6
140	71.4	76.5

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Model	LDA10F-24	Temperature Testing Circuitry	25°C Figure A																								
Item	Hold-Up Time 出力保持時間																										
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1. Graph	<p style="text-align: center;">□ Load 50% △ Load 100%</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Input Voltage [V]</th> <th>Hold-Up Time [mS] (Load 50%)</th> <th>Hold-Up Time [mS] (Load 100%)</th> </tr> </thead> <tbody> <tr><td>80</td><td>~30</td><td>~15</td></tr> <tr><td>90</td><td>~50</td><td>~25</td></tr> <tr><td>100</td><td>~70</td><td>~35</td></tr> <tr><td>110</td><td>~85</td><td>~45</td></tr> <tr><td>120</td><td>~95</td><td>~55</td></tr> <tr><td>130</td><td>~105</td><td>~65</td></tr> <tr><td>140</td><td>~115</td><td>~75</td></tr> </tbody> </table>			Input Voltage [V]	Hold-Up Time [mS] (Load 50%)	Hold-Up Time [mS] (Load 100%)	80	~30	~15	90	~50	~25	100	~70	~35	110	~85	~45	120	~95	~55	130	~105	~65	140	~115	~75
Input Voltage [V]	Hold-Up Time [mS] (Load 50%)	Hold-Up Time [mS] (Load 100%)																									
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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。



Model	LDA10F-24	Temperature Testing Circuitry	25°C Figure A																																																			
Item	Instantaneous Interruption Compensation 瞬時停電保障																																																					
Object	+24.0V 0.5A																																																					
1. Graph	<p>—△— Input Volt. 85 V —□— Input Volt. 100 V —○— Input Volt. 132 V</p> <table border="1"> <caption>Data points estimated from Figure A graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 85[V] [ms]</th> <th>Input Volt. 100[V] [ms]</th> <th>Input Volt. 132[V] [ms]</th> </tr> </thead> <tbody> <tr><td>0.08</td><td>101</td><td>141</td><td>245</td></tr> <tr><td>0.16</td><td>53</td><td>76</td><td>138</td></tr> <tr><td>0.24</td><td>31</td><td>48</td><td>92</td></tr> <tr><td>0.32</td><td>22</td><td>34</td><td>68</td></tr> <tr><td>0.40</td><td>14</td><td>23</td><td>53</td></tr> <tr><td>0.48</td><td>10</td><td>18</td><td>40</td></tr> <tr><td>0.50</td><td>5</td><td>14</td><td>39</td></tr> <tr><td>0.55</td><td>5</td><td>14</td><td>35</td></tr> </tbody> </table>			Load Current [A]	Input Volt. 85[V] [ms]	Input Volt. 100[V] [ms]	Input Volt. 132[V] [ms]	0.08	101	141	245	0.16	53	76	138	0.24	31	48	92	0.32	22	34	68	0.40	14	23	53	0.48	10	18	40	0.50	5	14	39	0.55	5	14	35															
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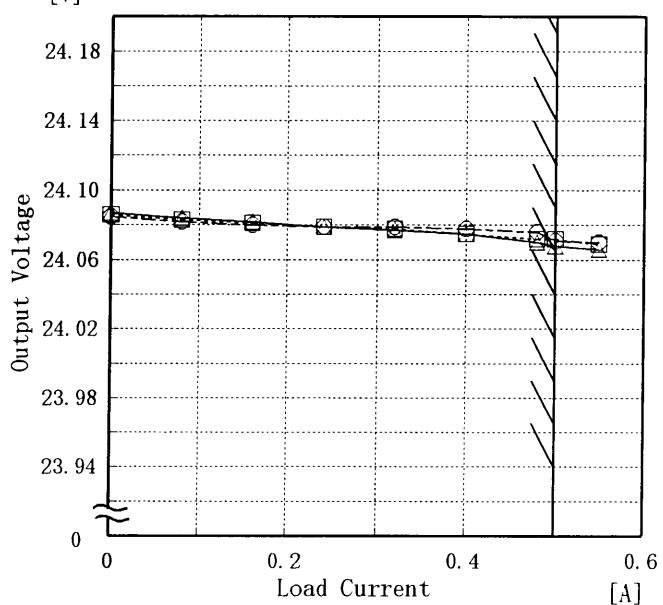
This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

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。

COSEL

Model	LDA10F-24																																																	
Item	Load Regulation 靜的負荷変動	Temperature Testing Circuitry	25°C Figure A																																															
Object	+24.0V 0.5A																																																	
1. Graph	<p>—△— Input Volt. 85 V —□— Input Volt. 100 V —○— Input Volt. 132 V</p> 																																																	
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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。

COSEL

Model	LDA10F-24	Temperature Testing Circuitry 25°C Figure A																																						
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)																																							
Object	+24.0V0.5A																																							
1. Graph	<p style="text-align: center;">□ Input Volt. 85V △ Input Volt. 132V</p>	2. Values																																						
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<p>Fig. Complex Ripple Wave Form 図 リップル波形詳細図</p>																																								

COSEL

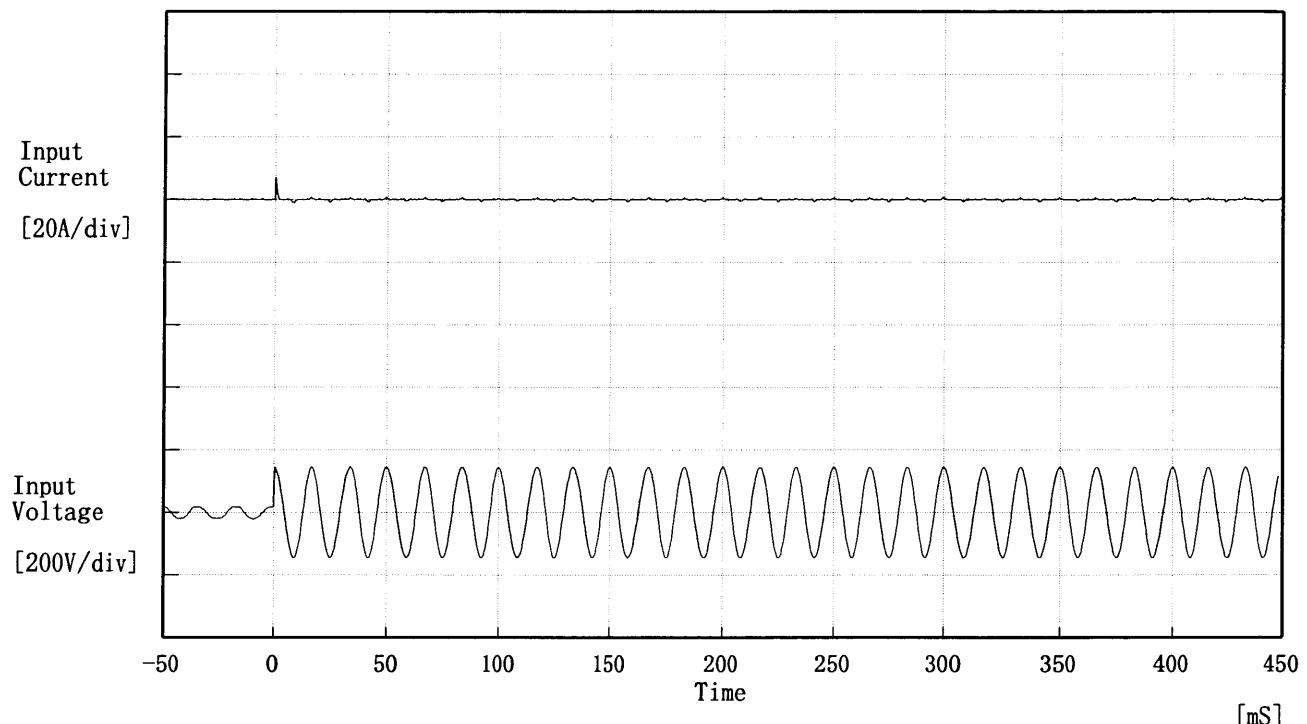
Model	LDA10F-24	Temperature Testing Circuitry 25°C Figure A																																						
Item	Ripple-Noise リップルノイズ																																							
Object	+24.0V 0.5A																																							
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Model	LDA10F-24	Temperature	25°C																																																							
Item	Overcurrent Protection 過電流保護	Testing Circuitry	Figure A																																																							
Object	+24.0V 0.5A																																																									
1. Graph	<p>Input Volt. 85 V Input Volt. 100 V Input Volt. 132 V</p>																																																									
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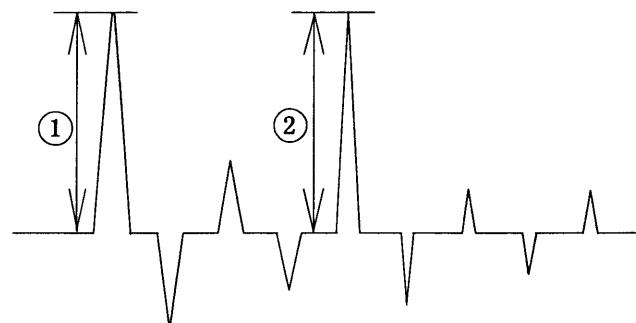
COSEL

Model	LDA10F-24	Temperature	25°C
Item	Inrush Current 突入電流	Testing Circuitry	Figure A
Object	_____		



Input Voltage 100 V
 Frequency 60 Hz
 Load 100 %
 Inrush Current

- ① 7.19 [A]
- ② 0.81 [A]

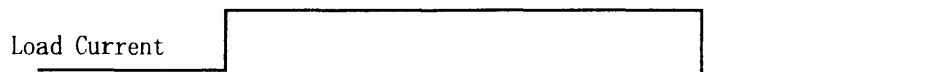


COSEL

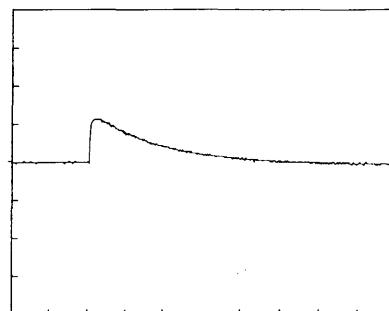
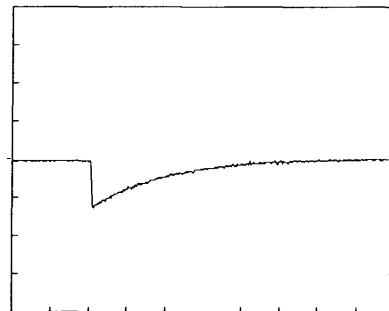
Model	LDA10F-24
Item	Dynamic Load Response 動的負荷變動
Object	+24.0V 0.5A

Temperature 25°C
Testing Circuitry Figure A

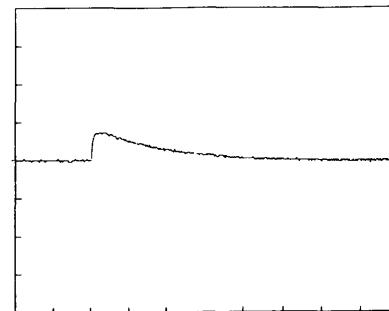
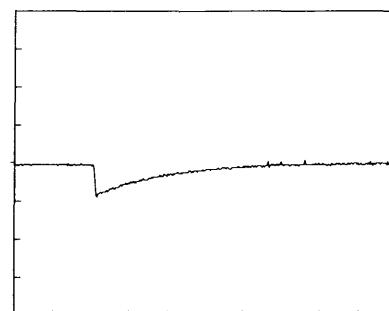
Input Volt. 100 V
Cycle 1000 mS



Load 0% ↔
Load 100 %



Load 0% ↔
Load 50 %



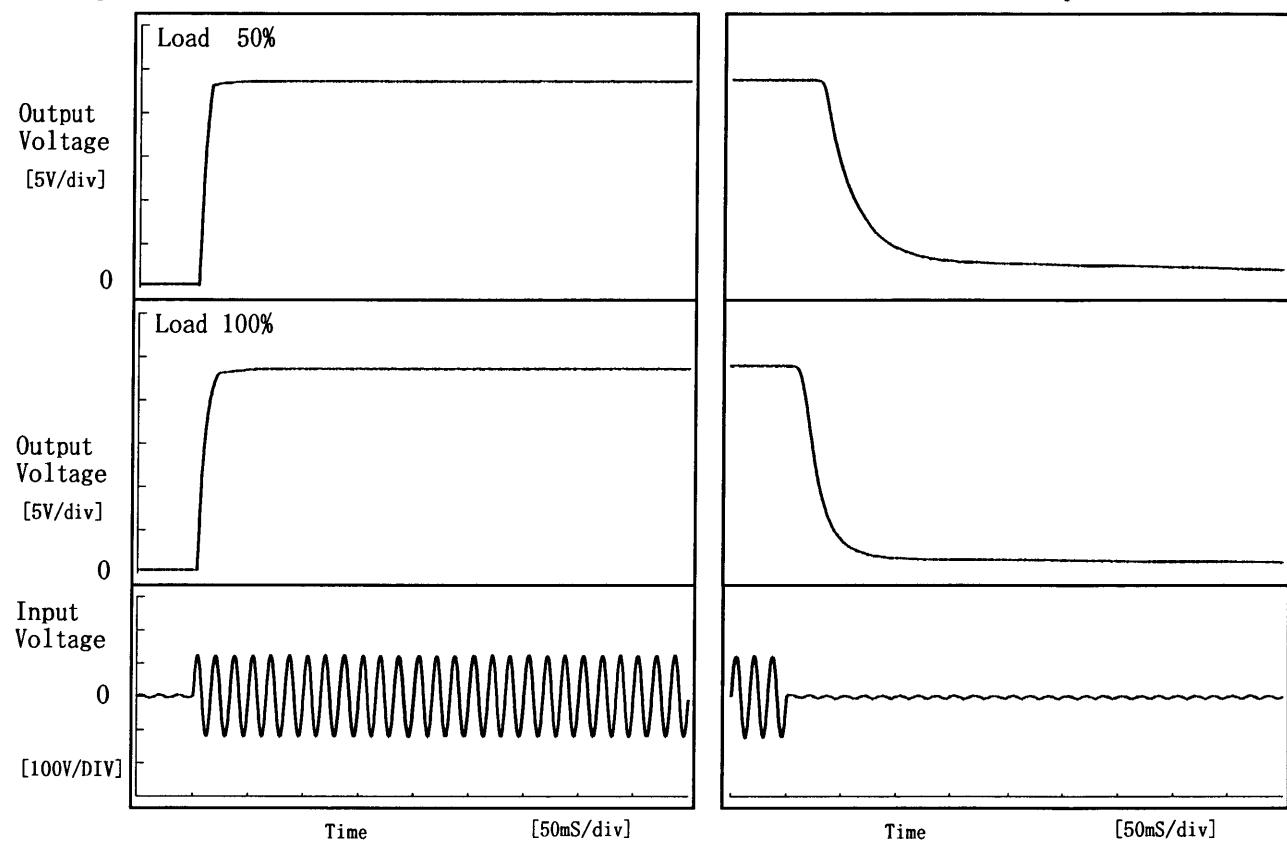
200 mV/div

10 mS/div

COSEL

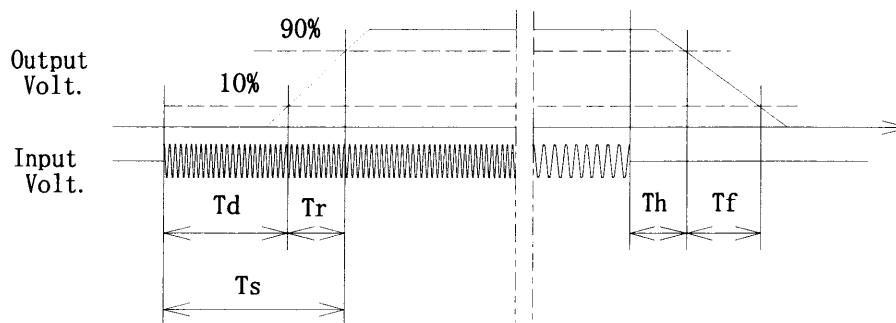
Model	LDA10F-24	Temperature Testing Circuitry Figure A	25°C
Item	Rise and Fall Time 立上り、立下り時間		
Object	+24.0V 0.5A		

1. Graph



2. Values

Load	Time	T d	T r	T s	T h	T f	[mS]
50 %		3.8	9.8	13.5	36.3	260.3	
100 %		3.8	14.3	18.0	15.0	52.5	

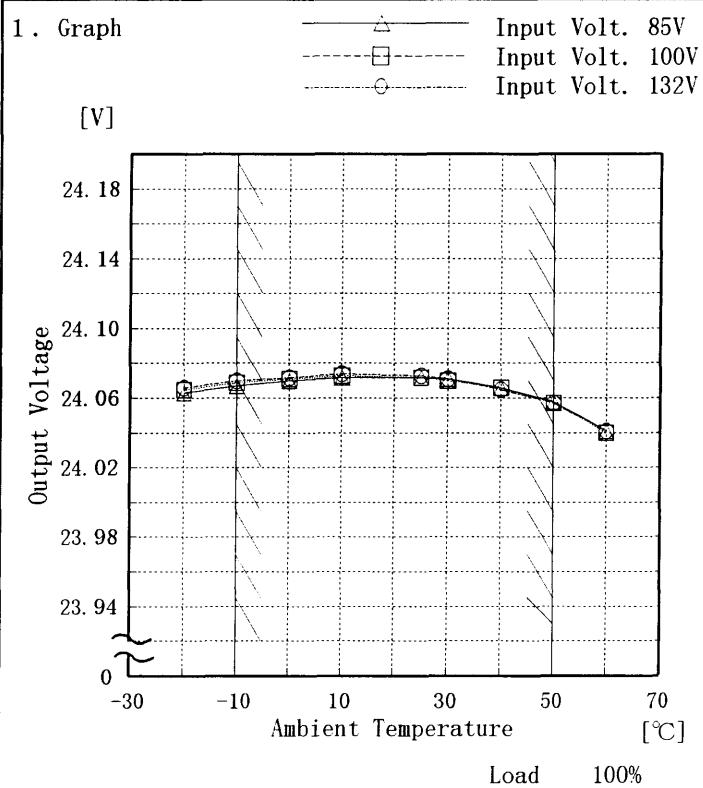


COSEL

Model LDA10F-24

Item Ambient Temperature Drift
周囲温度変動

Object +24.0V 0.5A



Testing Circuitry Figure A

2. Values

Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	24.063	24.065	24.066
-10	24.067	24.069	24.070
0	24.070	24.071	24.072
10	24.072	24.073	24.074
25	24.072	24.072	24.073
30	24.071	24.070	24.071
40	24.066	24.066	24.065
50	24.058	24.057	24.057
60	24.041	24.040	24.041
—	—	—	—
—	—	—	—

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。

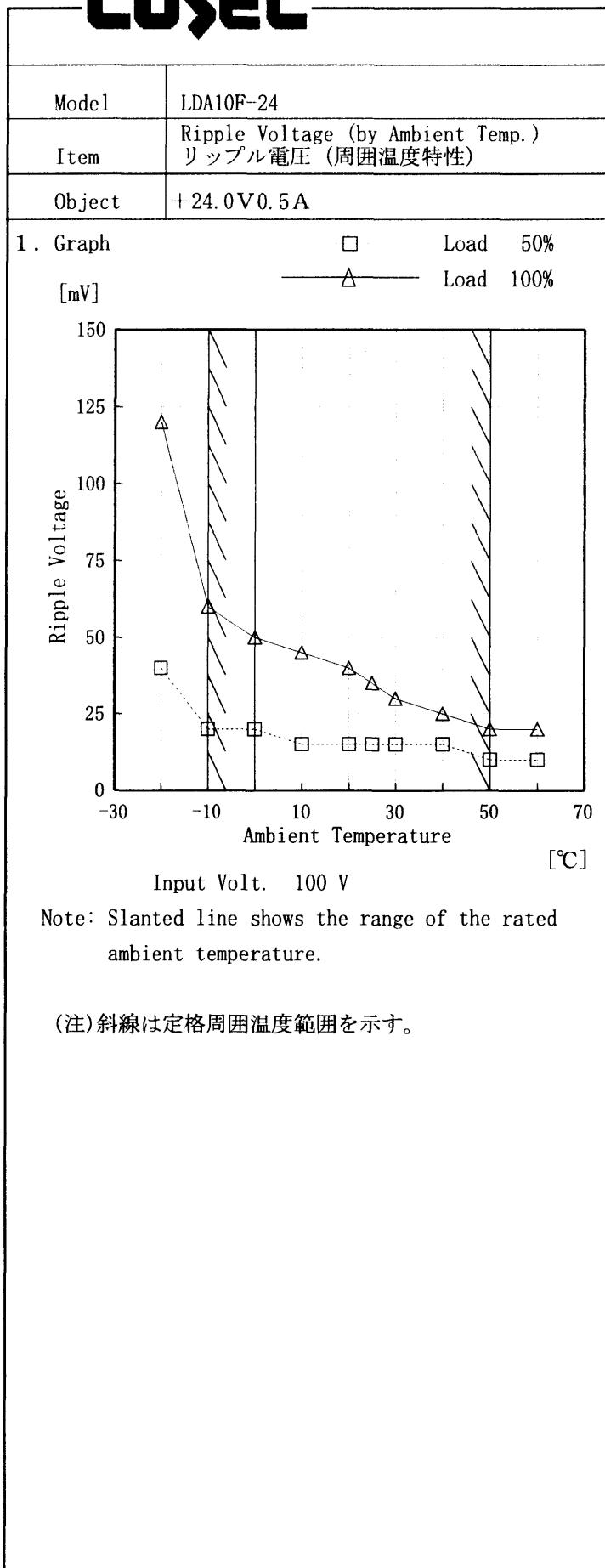


Model	LDA10F-24																																							
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧	Testing Circuitry Figure A																																						
Object	+24.0V 0.5A																																							
1. Graph	<p style="text-align: center;">----- □ ----- Load 50% [V] ----- △ ----- Load 100%</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Load 50% [V]</th> <th>Load 100% [V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>41</td><td>63</td></tr> <tr><td>-10</td><td>40</td><td>62</td></tr> <tr><td>0</td><td>40</td><td>63</td></tr> <tr><td>10</td><td>40</td><td>64</td></tr> <tr><td>20</td><td>40</td><td>65</td></tr> <tr><td>30</td><td>40</td><td>66</td></tr> <tr><td>40</td><td>40</td><td>67</td></tr> <tr><td>50</td><td>41</td><td>68</td></tr> <tr><td>60</td><td>42</td><td>70</td></tr> </tbody> </table>		Ambient Temperature [°C]	Load 50% [V]	Load 100% [V]	-20	41	63	-10	40	62	0	40	63	10	40	64	20	40	65	30	40	66	40	40	67	50	41	68	60	42	70								
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—	—	—																																						

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。

COSEL



Testing Circuitry Figure A

COSEL

Model	LDA10F-24	Temperature Testing Circuitry	25°C																						
Item	Time Lapse Drift 経時ドリフト		Figure A																						
Object	+24.0V 0.5A																								
1. Graph	<p>[V]</p> <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 100V Load 100%</p>																								
2. Values	<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>24.073</td></tr> <tr><td>0.5</td><td>24.066</td></tr> <tr><td>1.0</td><td>24.065</td></tr> <tr><td>2.0</td><td>24.067</td></tr> <tr><td>3.0</td><td>24.065</td></tr> <tr><td>4.0</td><td>24.066</td></tr> <tr><td>5.0</td><td>24.066</td></tr> <tr><td>6.0</td><td>24.066</td></tr> <tr><td>7.0</td><td>24.066</td></tr> <tr><td>8.0</td><td>24.066</td></tr> </tbody> </table>			Time since start [H]	Output Voltage [V]	0.0	24.073	0.5	24.066	1.0	24.065	2.0	24.067	3.0	24.065	4.0	24.066	5.0	24.066	6.0	24.066	7.0	24.066	8.0	24.066
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Model	LDA10F-24	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+24.0V 0.5A	

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 : 85~132 V

Load Current : 0~0.5 A

* 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、負荷電流を下記仕様内で、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

負荷電流 0~0.5 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 [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	25	132	0.0	24.085		
Minimum Voltage	50	85	0.5	24.042	±22	±0.6



Model	LDA10F-24		
Item	Condensation 結露特性	Testing Circuitry	Figure A
Object	+24.0V 0.5A		

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 25°C 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]	24.081	Input Volt.: 100V, Load Current: 0.5A
Line Regulation [mV]	7	Input Volt.: 85~132V, Load Current: 0.5A
Load Regulation [mV]	21	Input Volt.: 100V, Load Current: 0~0.5A



Model	LDA10F-24	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current 漏洩電流		
Object	<hr/>		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.11	0.14	0.17
(B) IEC60950	0.12	0.15	0.18

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。

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



Model	LDA10F-24	Temperature Testing Circuitry Figure C	25°C
Item	Line Noise Tolerance 入力雑音耐量		
Object	+24.0V 0.5A		

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

COSEL

Model

LDA10F-24

Item

Conducted Emission
雜音端子電圧Temperature
Testing Circuitry25°C
Figure D

Object

1. Graph

Remarks

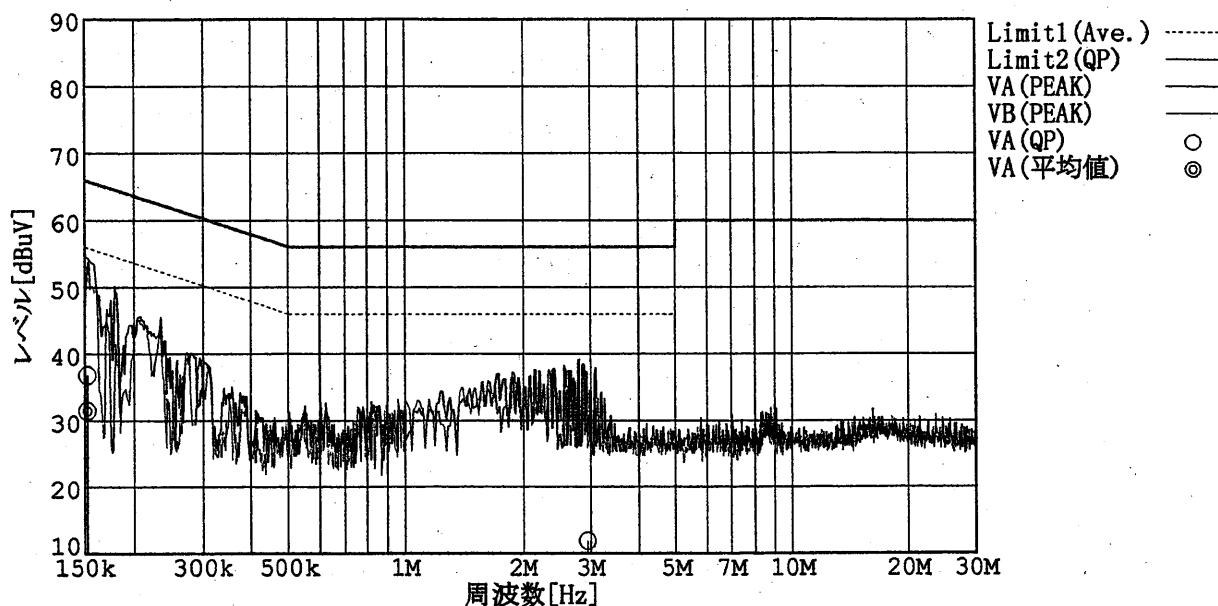
Input Volt. 100 V (VCCI Class B)

120 V (FCC Class B)

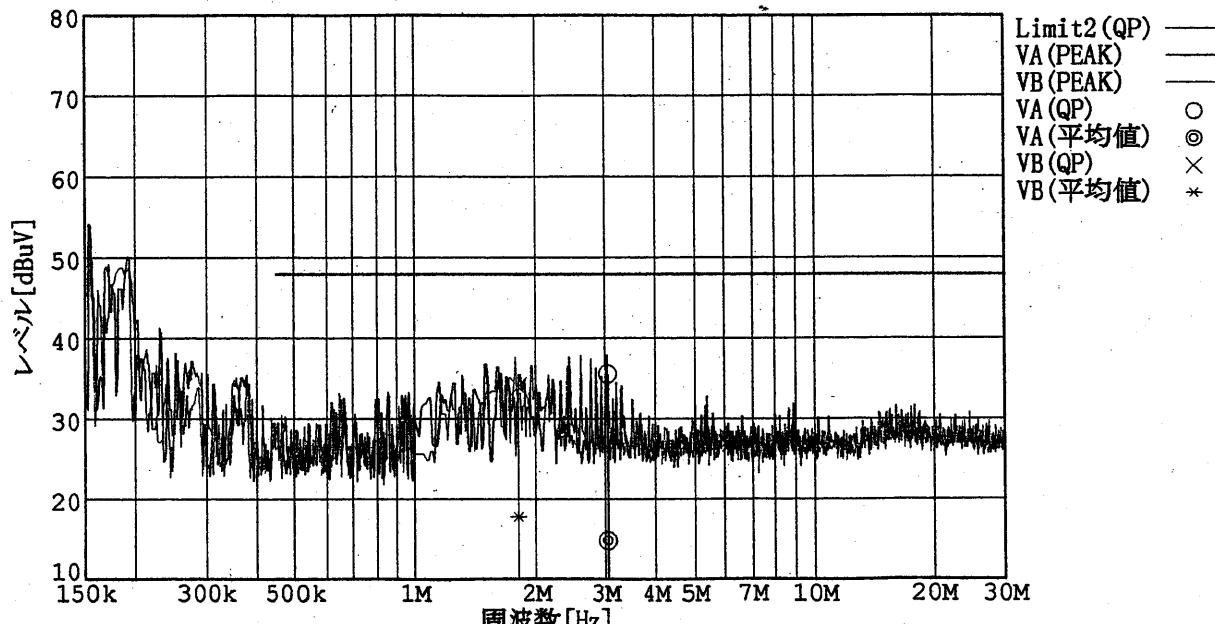
Load 100 %

規格1: [VCCI] Class B(平均値)

規格2: [VCCI] Class B(QP)



規格2: [FCC Part15] Class B



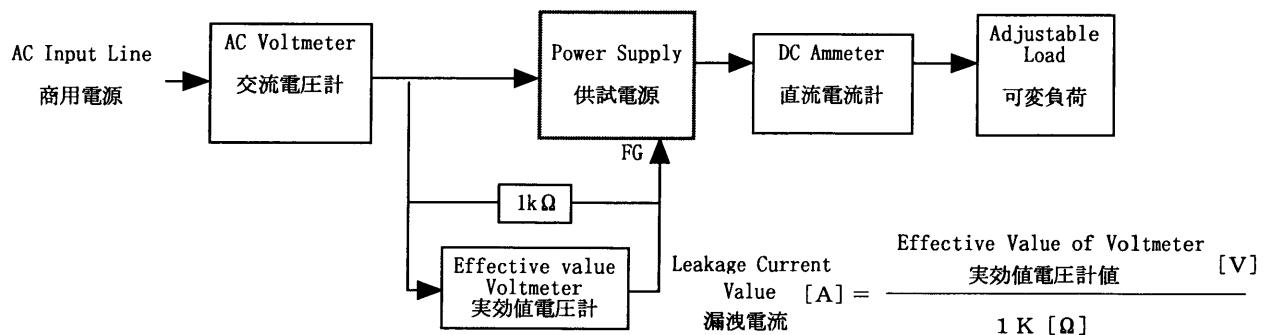
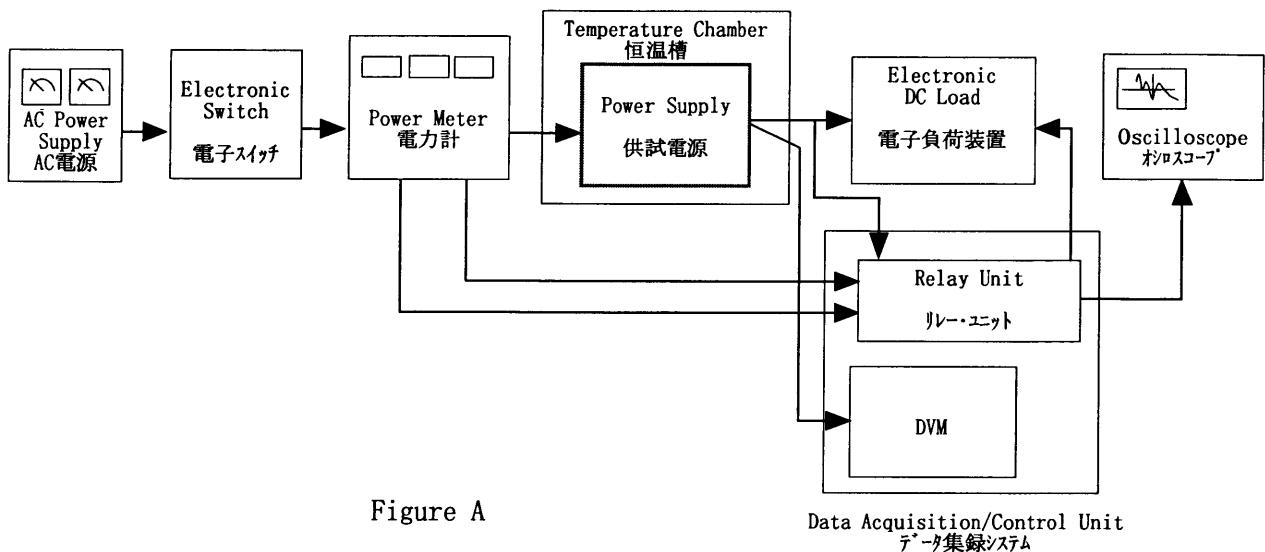


Figure B (DENTORI)

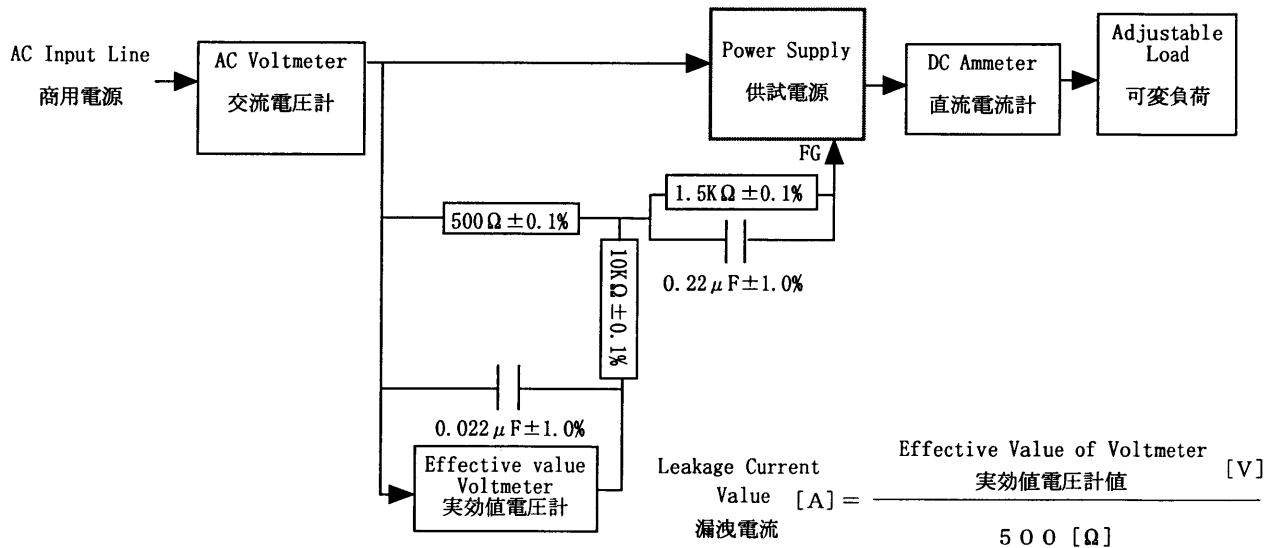


Figure B (IEC 60950)

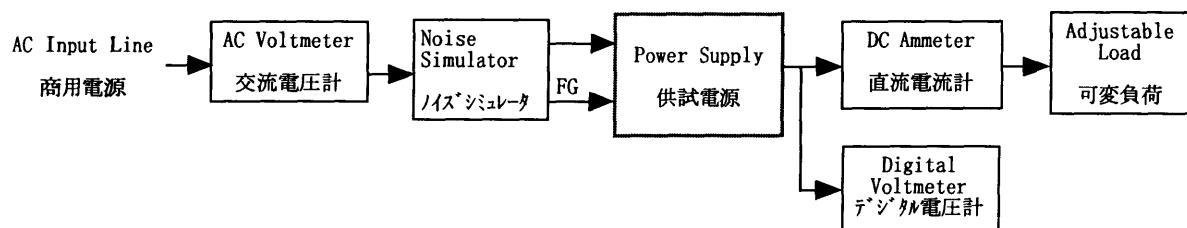


Figure C

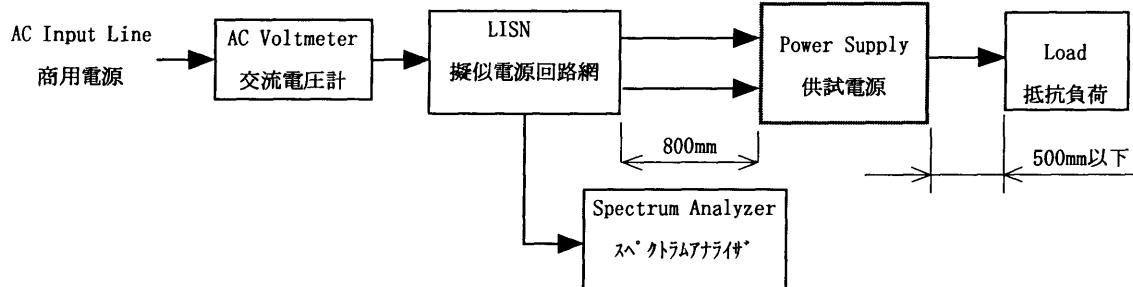


Figure D

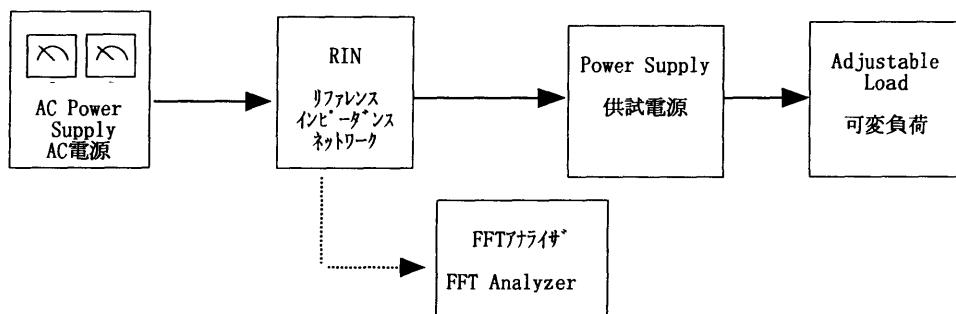


Figure E