



# TEST DATA OF LCA30S-15

(100V INPUT)

Regulated DC Power Supply

Date : Aug. 4. 1999

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Design Manager

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コーワセル株式会社  
**COSEL CO., LTD.**



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Model	LCA30S-15		Temperature Testing Circuitry	25°C Figure A																																
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Object	+15.0V 2A																																			
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Note: Slanted line shows the range of the rated input voltage.

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1. Graph	<p>Graph showing Input Current vs Load Current for three input voltages: 85V (triangles), 100V (squares), and 132V (circles). The x-axis is Load Current [A] from 0 to 2.5. The y-axis is Input Current [A] from 0 to 1. A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 85V [A]</th> <th>Input Volt. 100V [A]</th> <th>Input Volt. 132V [A]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.053</td><td>0.057</td><td>0.046</td></tr> <tr><td>0.4</td><td>0.195</td><td>0.180</td><td>0.165</td></tr> <tr><td>0.8</td><td>0.331</td><td>0.300</td><td>0.259</td></tr> <tr><td>1.2</td><td>0.467</td><td>0.416</td><td>0.352</td></tr> <tr><td>1.6</td><td>0.606</td><td>0.536</td><td>0.444</td></tr> <tr><td>2.0</td><td>0.746</td><td>0.657</td><td>0.539</td></tr> <tr><td>2.2</td><td>0.815</td><td>0.717</td><td>0.586</td></tr> </tbody> </table>			Load Current [A]	Input Volt. 85V [A]	Input Volt. 100V [A]	Input Volt. 132V [A]	0.0	0.053	0.057	0.046	0.4	0.195	0.180	0.165	0.8	0.331	0.300	0.259	1.2	0.467	0.416	0.352	1.6	0.606	0.536	0.444	2.0	0.746	0.657	0.539	2.2	0.815	0.717	0.586																							
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<p>The graph plots Input Power [W] on the Y-axis (0 to 50) against Load Current [A] on the X-axis (0 to 2.5). Three data series are shown for different input voltages: 85V (triangles), 100V (squares), and 132V (circles). All series show a linear increase in power with load current. A slanted line is drawn through the origin, representing the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 85V [W]</th> <th>Input Volt. 100V [W]</th> <th>Input Volt. 132V [W]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>1.80</td><td>2.16</td><td>1.91</td></tr> <tr><td>0.4</td><td>8.91</td><td>9.26</td><td>10.45</td></tr> <tr><td>0.8</td><td>16.17</td><td>16.50</td><td>17.43</td></tr> <tr><td>1.2</td><td>23.34</td><td>23.50</td><td>24.38</td></tr> <tr><td>1.6</td><td>30.81</td><td>30.78</td><td>31.31</td></tr> <tr><td>2.0</td><td>38.48</td><td>38.24</td><td>38.47</td></tr> <tr><td>2.2</td><td>42.31</td><td>41.95</td><td>42.03</td></tr> </tbody> </table>			Load Current [A]	Input Volt. 85V [W]	Input Volt. 100V [W]	Input Volt. 132V [W]	0.0	1.80	2.16	1.91	0.4	8.91	9.26	10.45	0.8	16.17	16.50	17.43	1.2	23.34	23.50	24.38	1.6	30.81	30.78	31.31	2.0	38.48	38.24	38.47	2.2	42.31	41.95	42.03																								
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Model	LCA30S-15	
Item	Efficiency 効率	Temperature Testing Circuitry 25°C Figure A
Object	—	—
1. Graph		
	□ Load 50%	△ Load 100%
[%]	<p>The graph plots Efficiency [%] on the y-axis (0 to 86) against Input Voltage [V] on the x-axis (0 to 150). The Load 50% series (squares) starts at ~78.5% at 80V, dips to ~75.5% at 100V, and then gradually declines to ~73.5% at 140V. The Load 100% series (triangles) starts at ~79.5% at 80V, peaks at ~80.5% at 100V, and then slightly declines to ~79.0% at 140V. Two slanted lines indicate the rated input voltage range, which is approximately between 85V and 135V.</p>	
2. Values		
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	78.8	79.3
80	78.6	79.9
85	78.4	80.3
90	78.1	80.5
100	77.3	81.0
110	76.3	81.0
120	75.1	80.7
132	73.6	80.3
140	72.7	80.0

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

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Model	LCA30S-15	Temperature	25°C																																																							
Item	Efficiency (by Load Current) 効率(負荷電流特性)	Testing Circuitry	Figure A																																																							
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<p>The graph plots Efficiency [%] on the y-axis (40 to 90) against Load Current [A] on the x-axis (0 to 2.5). Three data series are shown for different input voltages: 85V (triangles), 100V (squares), and 132V (circles). The 85V curve starts at ~70% efficiency at 0.4A and rises to ~80% at 2.0A. The 100V curve starts at ~68% at 0.4A and rises to ~80% at 2.0A. The 132V curve starts at ~60% at 0.4A and rises to ~78% at 1.6A. A slanted line connects the points (0.4, 70), (0.8, 75), (1.2, 79), (1.6, 80), and (2.0, 80), representing the rated load current range.</p>																																																										
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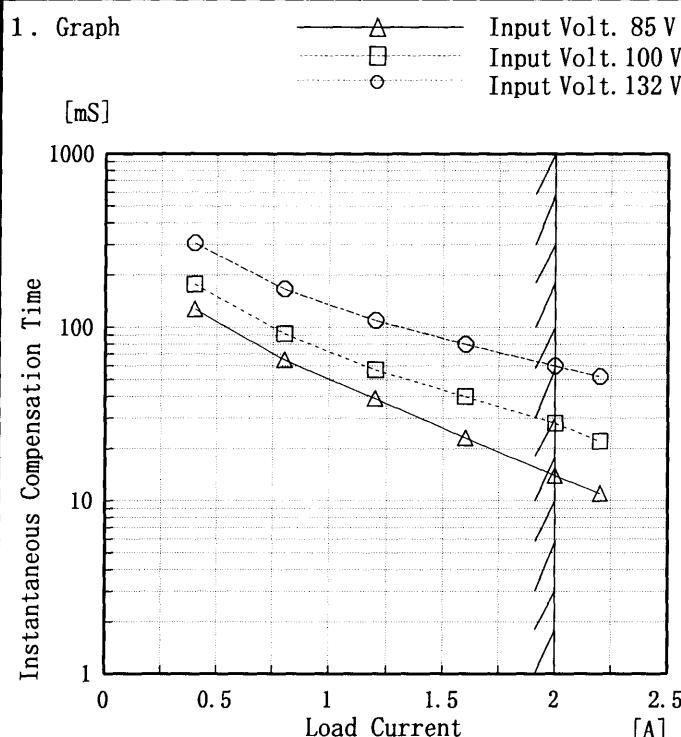
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132	135	67																																	
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<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: 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。      (注)斜線は定格入力電圧範囲を示す。</p>																																			

# COSEL

Model	LCA30S-15
Item	Instantaneous Interruption Compensation 瞬時停電保障
Object	+15.0V 2A

Temperature 25°C  
Testing Circuitry Figure A



## 2. Values

Load Current [A]	Time [mS]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	—	—	—
0.4	127	177	306
0.8	65	92	166
1.2	39	57	110
1.6	23	40	80
2.0	14	28	60
2.2	11	22	52
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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	LCA30S-15																																																	
Item	Load Regulation 静的負荷変動	Temperature 25°C	Testing Circuitry Figure A																																															
Object	+15.0V2A																																																	
1. Graph	<p>—△— Input Volt. 85 V        —□— Input Volt. 100 V        —○— Input Volt. 132 V</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage 85V [V]</th> <th>Output Voltage 100V [V]</th> <th>Output Voltage 132V [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15.292</td><td>15.292</td><td>15.289</td></tr> <tr><td>0.4</td><td>15.291</td><td>15.291</td><td>15.291</td></tr> <tr><td>0.8</td><td>15.292</td><td>15.292</td><td>15.292</td></tr> <tr><td>1.2</td><td>15.292</td><td>15.292</td><td>15.292</td></tr> <tr><td>1.6</td><td>15.293</td><td>15.293</td><td>15.293</td></tr> <tr><td>2.0</td><td>15.293</td><td>15.293</td><td>15.293</td></tr> <tr><td>2.2</td><td>15.293</td><td>15.293</td><td>15.294</td></tr> </tbody> </table>			Load Current [A]	Output Voltage 85V [V]	Output Voltage 100V [V]	Output Voltage 132V [V]	0.0	15.292	15.292	15.289	0.4	15.291	15.291	15.291	0.8	15.292	15.292	15.292	1.2	15.292	15.292	15.292	1.6	15.293	15.293	15.293	2.0	15.293	15.293	15.293	2.2	15.293	15.293	15.294															
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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	LCA30S-15																																							
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)	Temperature Testing Circuitry 25°C Figure A																																						
Object	+15.0V2A																																							
1. Graph																																								
[mV] 		2. Values																																						
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Load Current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]																																						
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Ripple [mVp-p] 																																								
Fig. Complex Ripple Wave Form 図 リップル波形詳細図																																								

COSEL

Model	LCA30S-15																																							
Item	Ripple-Noise リップルノイズ	Temperature Testing Circuitry 25°C Figure A																																						
Object	+ 15.0V 2A																																							
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**COSEL**

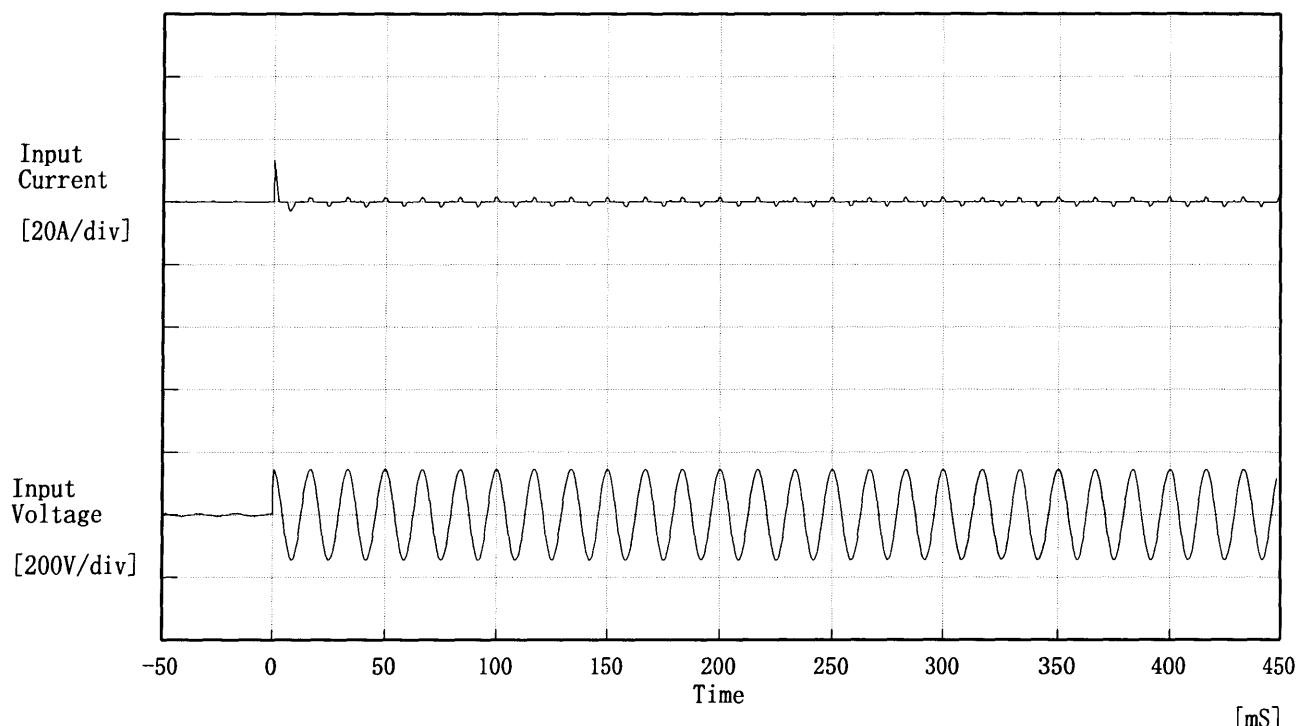
Model	LCA30S-15	Temperature	25°C																																																							
Item	Overcurrent Protection 過電流保護	Testing Circuitry	Figure A																																																							
Object	+15.0V2A	2. Values																																																								
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Note: 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。

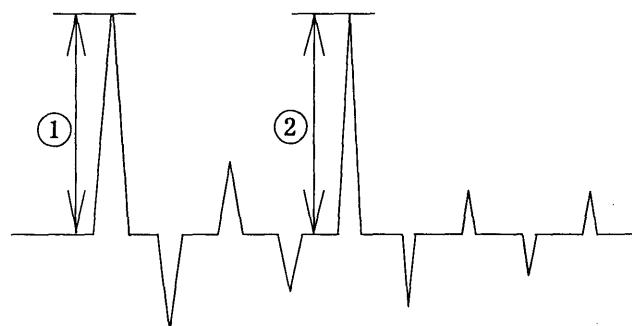
**COSSEL**

Model	LCA30S-15	Temperature Testing Circuitry	25°C Figure A
Item	Inrush Current 突入電流		
Object	—		



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

- ① 13.20 [A]
- ② 1.60 [A]



**COSEL**

Model	LCA30S-15	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response 動的負荷變動	
Object	+15V2A	

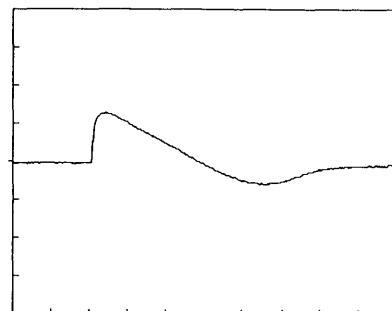
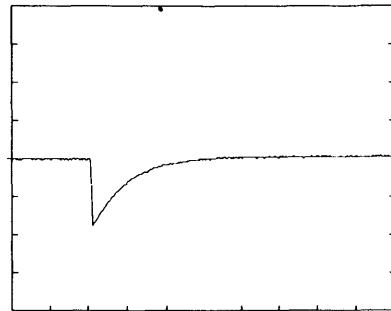
Input Volt. 100 V

Cycle 1000 mS



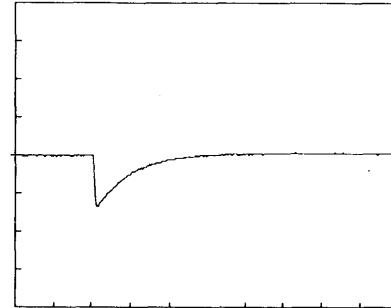
Load 0% ↔

Load 100 %

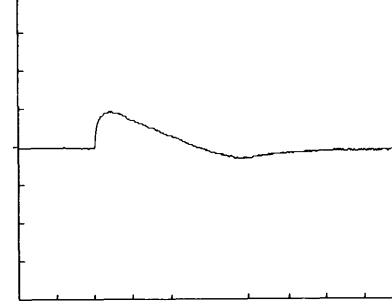


Load 0% ↔

Load 50 %



200 mV/div

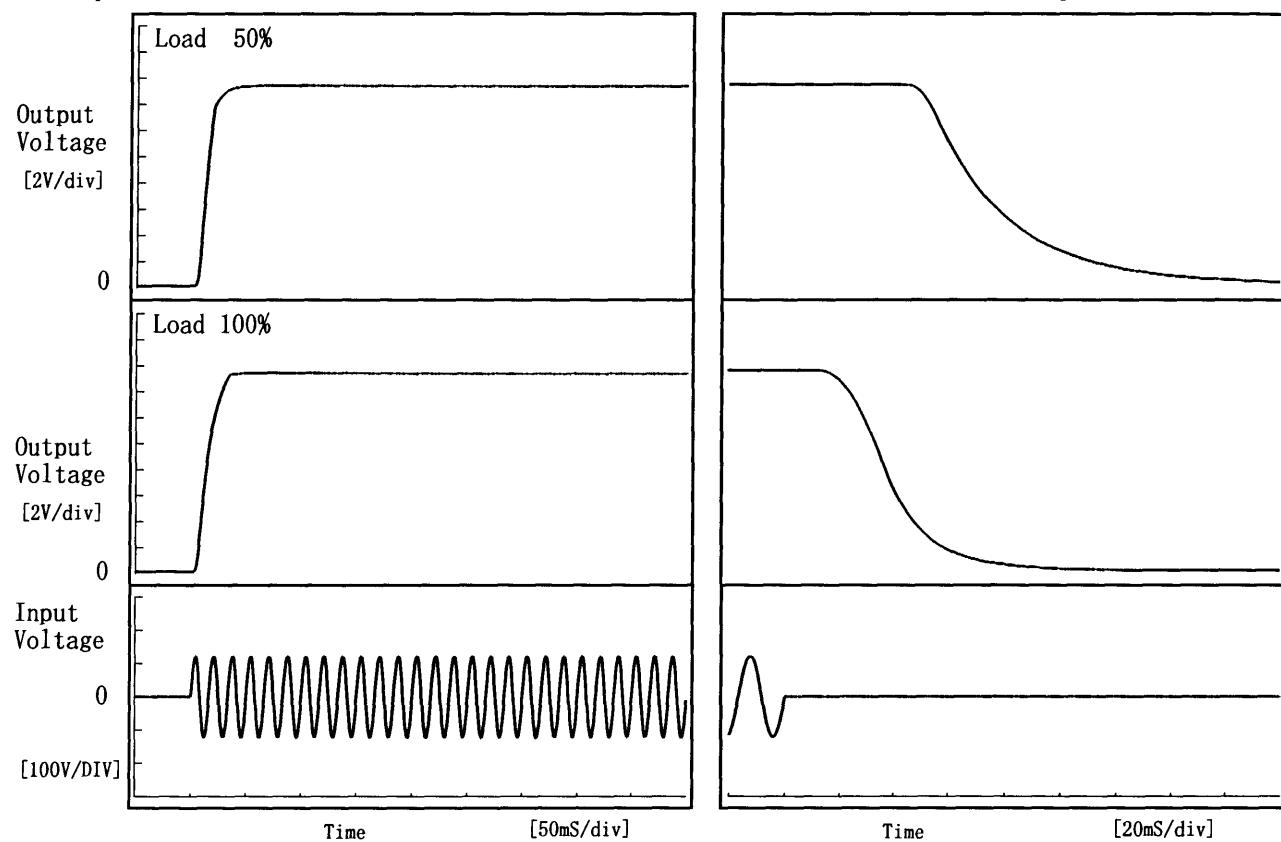


10 mS/div

**COSEL**

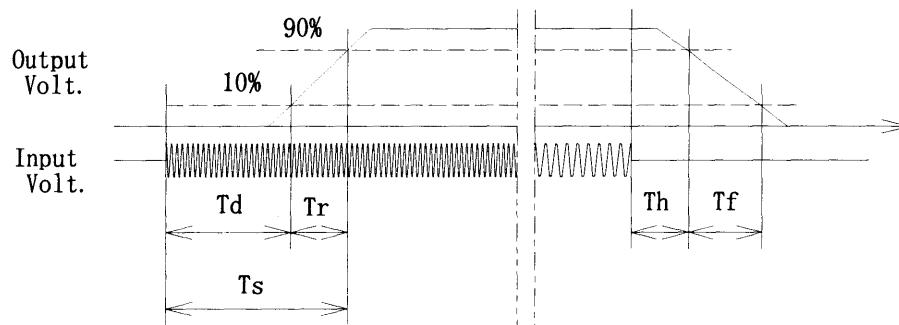
Model	LCA30S-15	Temperature Testing Circuitry Figure A
Item	Rise and Fall Time 立上り、立下り時間	
Object	+15.0V2A	

## 1. Graph



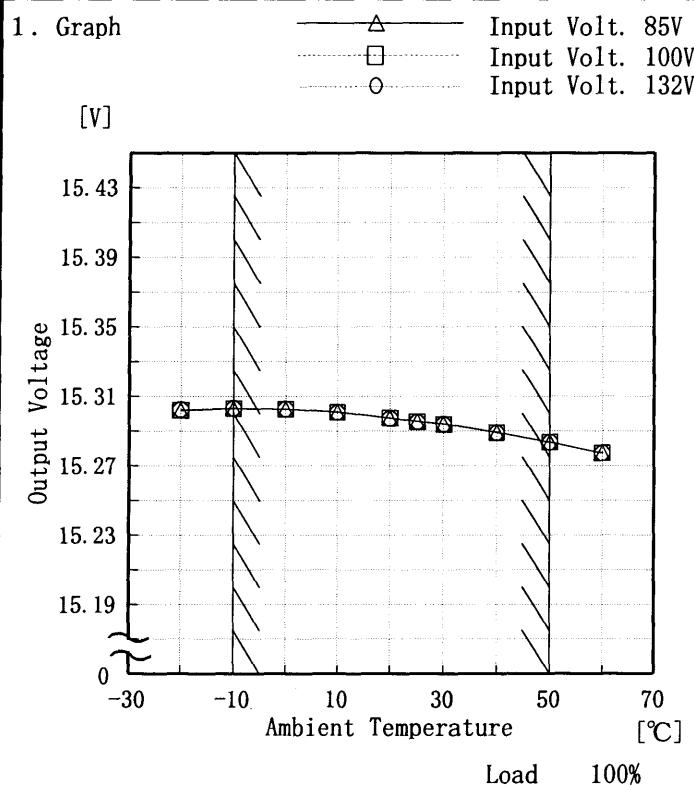
## 2. Values

Load	Time	T d	T r	T s	T h	T f	[mS]
50 %		6.0	12.8	18.8	54.7	65.5	
100 %		6.0	19.3	25.3	24.6	38.6	



**COSEL**

Model	LCA30S-15
Item	Ambient Temperature Drift 周囲温度変動
Object	+15.0V2A



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。

Testing Circuitry Figure A

2. Values

Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	15.302	15.302	15.302
-10	15.303	15.303	15.303
0	15.303	15.303	15.303
10	15.301	15.301	15.301
20	15.297	15.297	15.297
25	15.295	15.295	15.295
30	15.294	15.294	15.294
40	15.289	15.289	15.289
50	15.284	15.283	15.284
60	15.277	15.277	15.277
—	—	—	—

**COSEL**

Model	LCA30S-15			Testing Circuitry Figure A																																								
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧																																											
Object	+15.0V2A																																											
1. Graph	<p>[V]</p>			2. Values																																								
	<p>Load 50%      □</p> <p>Load 100%      △</p> <p>Ambient Temperature [°C]</p> <p>Input Voltage [V]</p>			<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-20</td><td>34</td><td>61</td></tr> <tr><td>-10</td><td>34</td><td>61</td></tr> <tr><td>0</td><td>34</td><td>61</td></tr> <tr><td>10</td><td>34</td><td>60</td></tr> <tr><td>20</td><td>34</td><td>60</td></tr> <tr><td>25</td><td>34</td><td>60</td></tr> <tr><td>30</td><td>34</td><td>60</td></tr> <tr><td>40</td><td>34</td><td>60</td></tr> <tr><td>50</td><td>34</td><td>60</td></tr> <tr><td>60</td><td>34</td><td>60</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>			Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-20	34	61	-10	34	61	0	34	61	10	34	60	20	34	60	25	34	60	30	34	60	40	34	60	50	34	60	60	34	60	—	—	—
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**COSEL**

Model	LCA30S-15																																					
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)	Testing Circuitry																																				
Object	+15.0V2A	Figure A																																				
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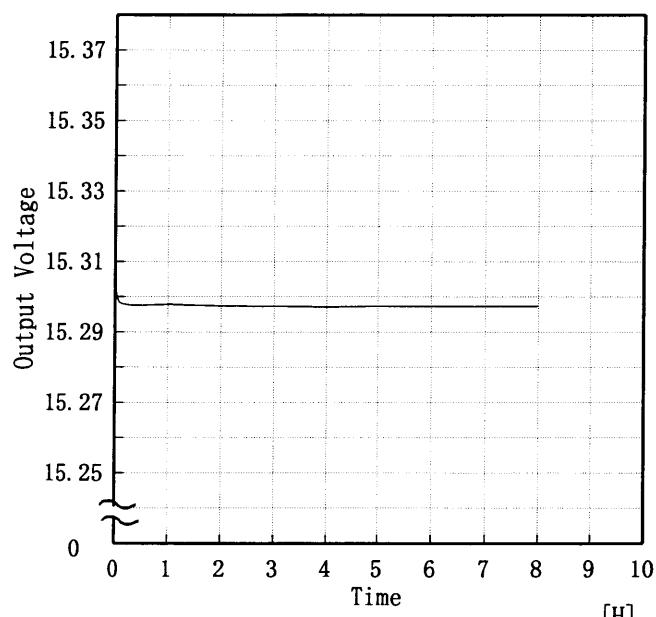
(注)斜線は定格周囲温度範囲を示す。

**COSEL**

Model	LCA30S-15
Item	Time Lapse Drift 経時ドリフト
Object	+15.0V2A

## 1. Graph

[V]



Input Volt. 100V

Load 100%

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Time since start [H]	Output Voltage [V]
0.0	15.305
0.5	15.298
1.0	15.298
2.0	15.297
3.0	15.297
4.0	15.297
5.0	15.297
6.0	15.297
7.0	15.297
8.0	15.297



Model	LCA30S-15	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+15.0V 2A	

#### 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 : 0~2 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 0~2 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	-10	85	2	15.304		
Minimum Voltage	50	132	0	15.282	±12	±0.1



Model	LCA30S-15	Testing Circuitry Figure A
Item	Condensation 結露特性	
Object	+ 15.0 V 2A	

### 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°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25°C、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]	15.292	Input Volt.:100V, Load Current:2A
Line Regulation [mV]	2	Input Volt.:85~132V, Load Current:2A
Load Regulation [mV]	5	Input Volt.:100V, Load Current:0~2A



Model	LCA30S-15	Temperature	25°C
Item	Leakage Current 漏洩電流	Testing Circuitry	Figure B
Object	<hr/>		

### 1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.09	0.10	0.14
(B) IEC60950	0.09	0.11	0.14

### 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	LCA30S-15	Temperature Testing Circuitry	25°C Figure C
Item	Line Noise Tolerance 入力雑音耐量		
Object	+15.0V2A		

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

COSEL

Model	LCA30S-15	Temperature Testing Circuitry	25°C Figure D
Item	Conducted Emission 雜音端子電圧		
Object	_____		

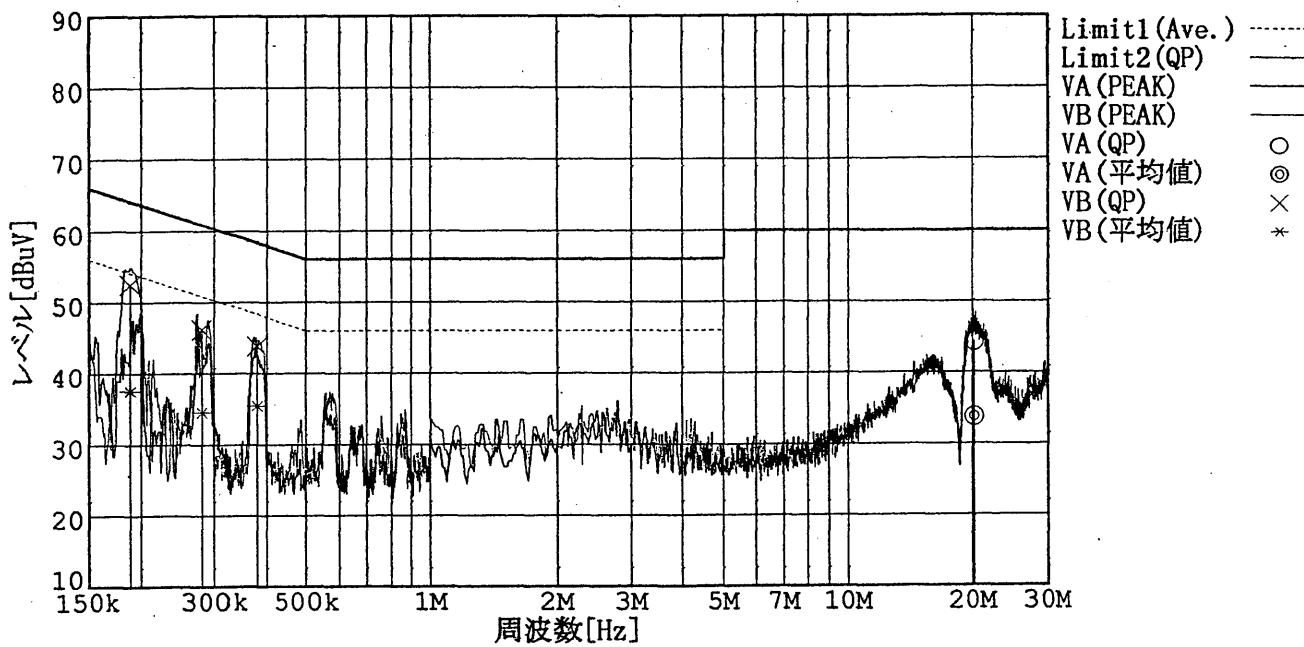
## 1. Graph

## Remarks

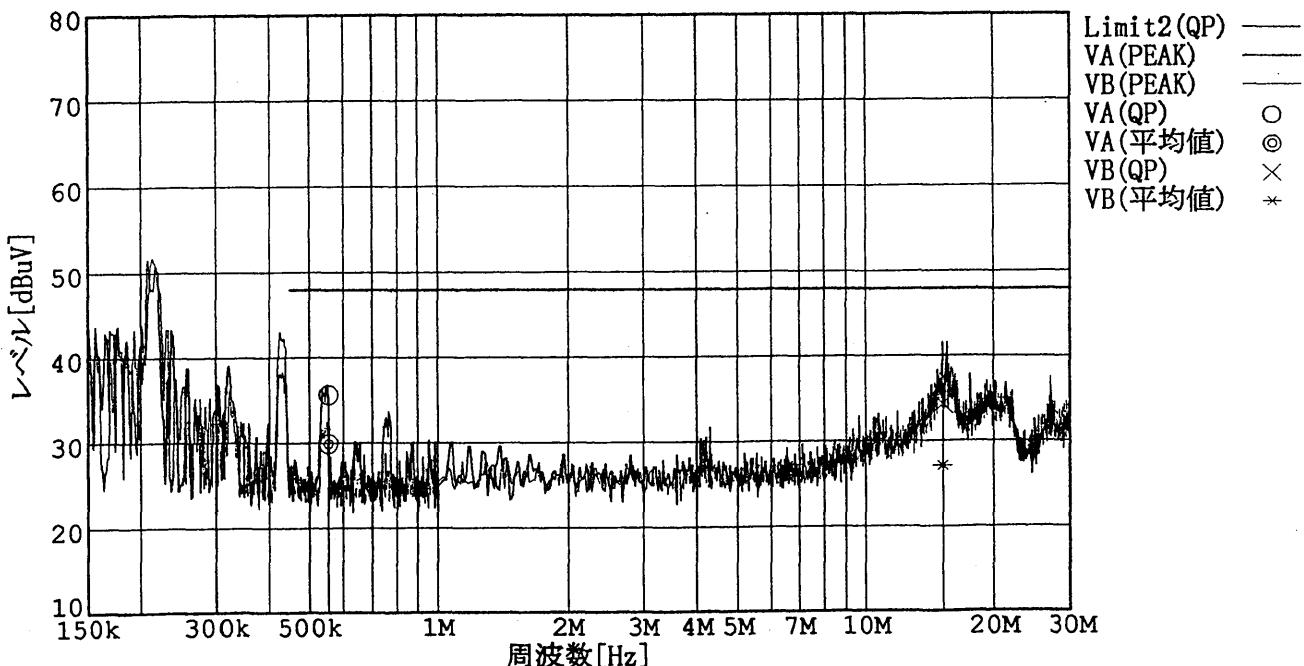
Input Volt. 100 V (VCCI Class B)  
120 V (FCC Class B)

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



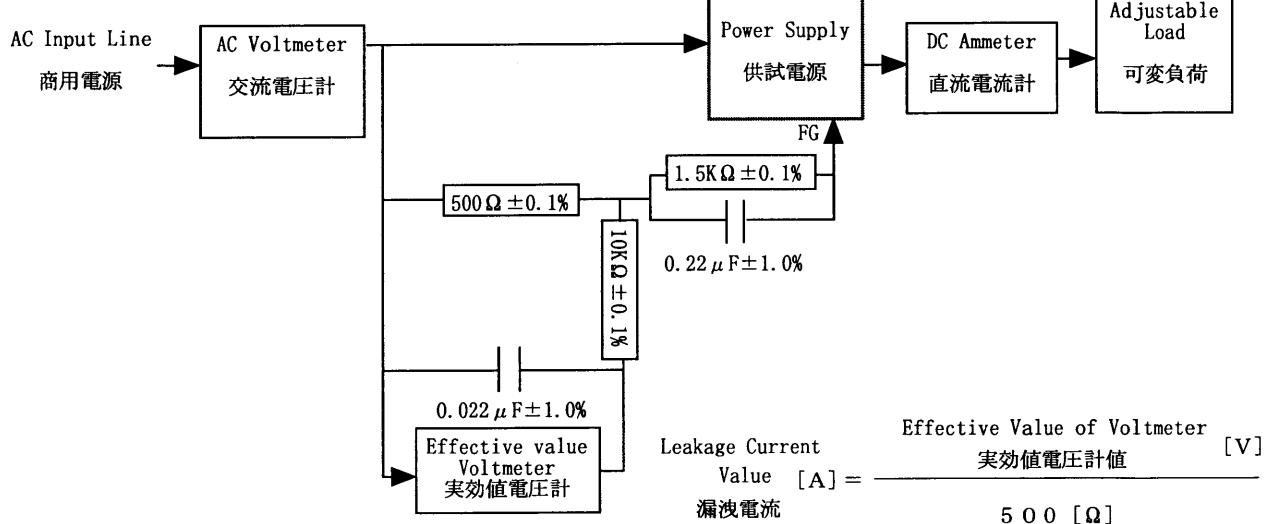
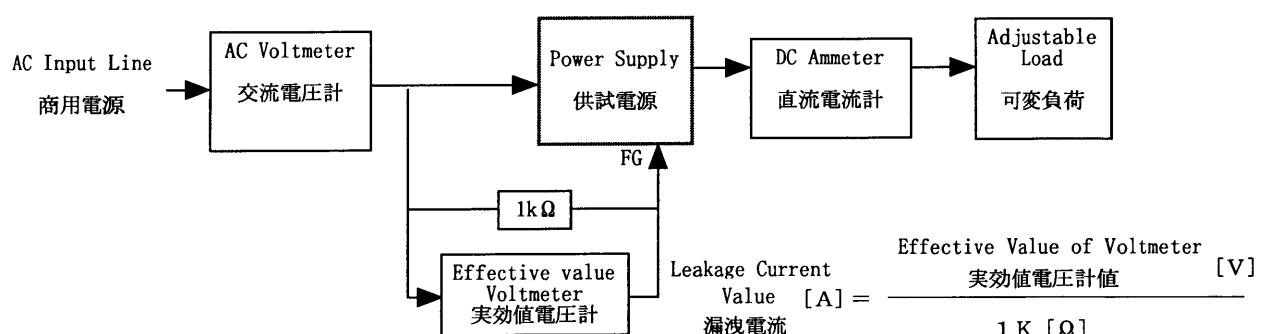
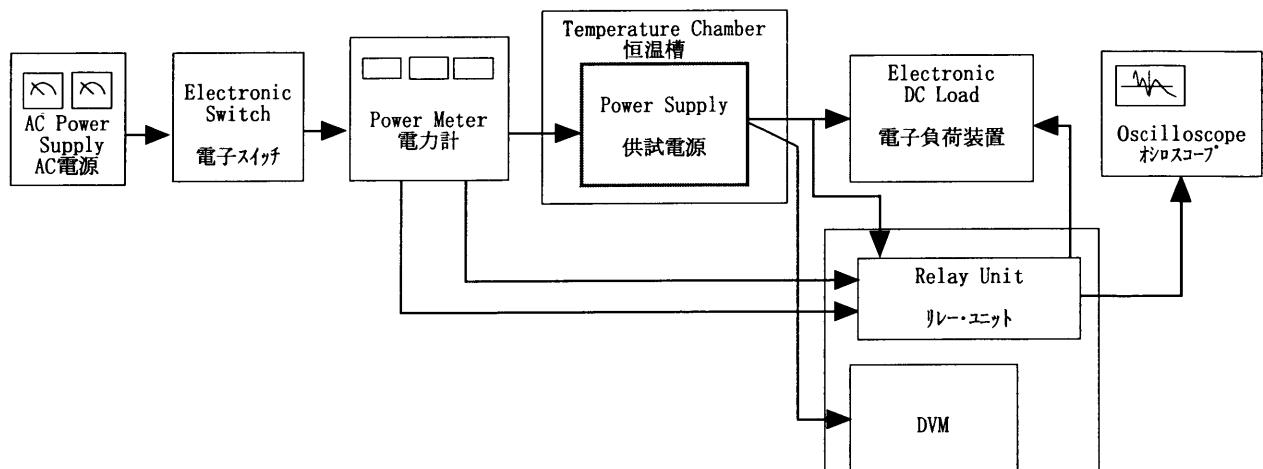


Figure B (IEC 60950)

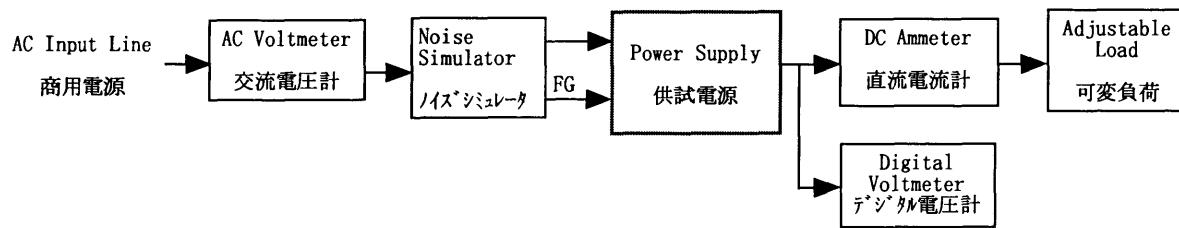


Figure C

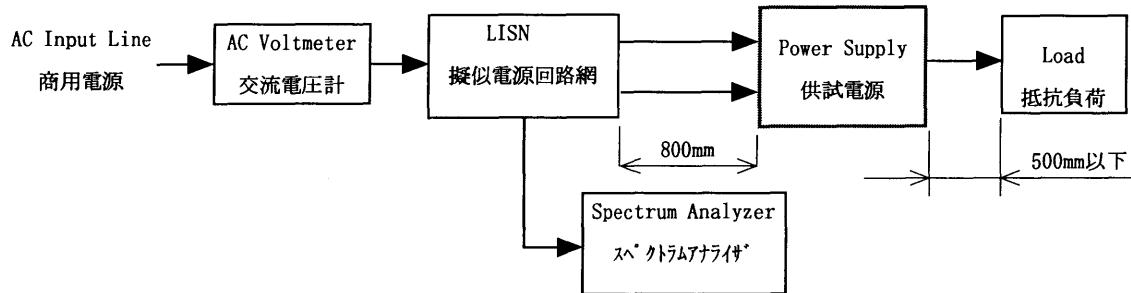


Figure D

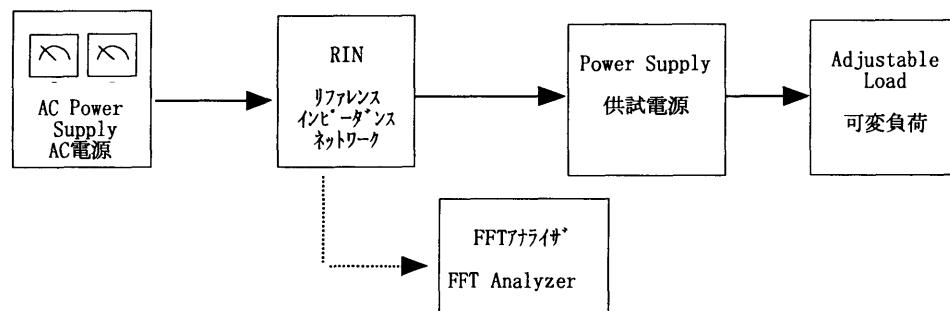


Figure E