



# TEST DATA OF LEP100F-24 (100V INPUT)

Regulated DC Power Supply  
Oct.17. 2002

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**コーセル株式会社**  
**COSEL CO.,LTD.**

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(Final Page 30)

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Model	LEP100F-24																																
Item	Line Regulation 静的入力変動	Temperature	25℃																														
Object	+24V4.2A	Testing Circuitry	Figure A																														
1. Graph		2. Values																															
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] (Load 50%)</th><th>Output Voltage [V] (Load 100%)</th></tr></thead><tbody><tr><td>75</td><td>24.078</td><td>24.078</td></tr><tr><td>80</td><td>24.078</td><td>24.078</td></tr><tr><td>85</td><td>24.078</td><td>24.078</td></tr><tr><td>90</td><td>24.078</td><td>24.078</td></tr><tr><td>100</td><td>24.078</td><td>24.078</td></tr><tr><td>110</td><td>24.078</td><td>24.078</td></tr><tr><td>120</td><td>24.078</td><td>24.078</td></tr><tr><td>132</td><td>24.079</td><td>24.078</td></tr><tr><td>140</td><td>24.079</td><td>24.078</td></tr></tbody></table> <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>		Input Voltage [V]	Output Voltage [V] (Load 50%)	Output Voltage [V] (Load 100%)	75	24.078	24.078	80	24.078	24.078	85	24.078	24.078	90	24.078	24.078	100	24.078	24.078	110	24.078	24.078	120	24.078	24.078	132	24.079	24.078	140	24.079	24.078		
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Model		LEP100F-24	
Item		Input Current (by Load Current) 入力電流 (負荷特性)	
Object			

1. Graph

—△—

Input Volt. 85V

---□---

Input Volt. 100V

-○-

Input Volt. 132V

Input Current [A]

2.00

1.50

1.00

0.50

0.00

0.0

1.0

2.0

3.0

4.0

5.0

Load Current [A]

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. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.079	0.072	0.063
0.80	0.384	0.329	0.256
1.60	0.643	0.547	0.420
2.40	0.902	0.765	0.582
3.20	1.161	0.982	0.745
4.00	1.428	1.204	0.910
4.20	1.496	1.259	0.951
4.62	1.638	1.379	1.039
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BC-3452

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Model		LEP100F-24	
Item		Power Factor (by Load Current) 力率 (負荷特性)	
Object			

1. Graph

—△— Input Volt. 85V

---□--- Input Volt. 100V

---○--- Input Volt. 132V

Power Factor

1.0

0.9

0.8

0.7

0.6

0.5

0.4

0.0

1.0

2.0

3.0

4.0

5.0

Load Current [A]

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。

Load Current [A]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.764	0.721	0.634
0.80	0.939	0.921	0.887
1.60	0.967	0.958	0.933
2.40	0.980	0.975	0.956
3.20	0.988	0.984	0.969
4.00	0.996	0.988	0.978
4.20	0.995	0.990	0.979
4.62	0.996	0.991	0.982
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# COSEL

Model		LEP100F-24	
Item		Hold-Up Time 出力保持時間	
Object		+24V4.2A	

1. Graph

-----□----- Load 50%

-----△----- Load 100%

Hold-Up Time [mS]

1000

100

10

1

70

90

110

130

150

Input Voltage [V]

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。

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	64	25
80	66	27
85	68	29
90	70	30
100	73	32
110	75	34
120	77	36
132	80	37
140	80	38

2. Values

# COSEL

Model	LEP100F-24		
Item	Instantaneous Interruption Compensation 瞬時停電保障	Temperature	25℃
Object	+24V4.2A	Testing Circuitry	Figure A
1. Graph		2. Values	
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Load Current [A]	Output Voltage [V]																																																	
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																															
0.00	24.076	24.076	24.075																																															
0.80	24.074	24.074	24.074																																															
1.60	24.074	24.074	24.074																																															
2.40	24.073	24.073	24.074																																															
3.20	24.074	24.073	24.074																																															
4.00	24.074	24.073	24.074																																															
4.20	24.073	24.074	24.074																																															
4.62	24.073	24.073	24.074																																															
--	--	--	--																																															
--	--	--	--																																															
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	LEP100F-24																																								
Item	Ripple Voltage (by Load Current) リップル電圧 (負荷特性)	Temperature	25℃																																						
Object	+24V4.2A	Testing Circuitry	Figure A																																						
1. Graph		2. Values																																							
<div><div>—△— Input Volt. 85V - -○- - Input Volt. 132V</div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div>																																									
<p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>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。</p> <div><div>T1: Due to AC Input Line 入力商用周期 T2: Due to Switching スイッチング周期</div><p>Ripple [mVp-p]</p><p>T1</p><p>T2</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><td>0.0</td><td>20</td><td>20</td></tr><tr><td>0.8</td><td>40</td><td>40</td></tr><tr><td>1.7</td><td>40</td><td>40</td></tr><tr><td>2.5</td><td>40</td><td>40</td></tr><tr><td>3.4</td><td>40</td><td>40</td></tr><tr><td>4.2</td><td>45</td><td>45</td></tr><tr><td>4.6</td><td>45</td><td>45</td></tr><tr><td>---</td><td>---</td><td>---</td></tr><tr><td>---</td><td>---</td><td>---</td></tr><tr><td>---</td><td>---</td><td>---</td></tr><tr><td>---</td><td>---</td><td>---</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 85 [V]	Input Volt. 132 [V]	0.0	20	20	0.8	40	40	1.7	40	40	2.5	40	40	3.4	40	40	4.2	45	45	4.6	45	45	---	---	---	---	---	---	---	---	---	---	---	---
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 85 [V]	Input Volt. 132 [V]																																							
0.0	20	20																																							
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2.5	40	40																																							
3.4	40	40																																							
4.2	45	45																																							
4.6	45	45																																							
---	---	---																																							
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<p>Fig. Complex Ripple Wave Form 図 リップル波形詳細図</p>																																									

- 11 -

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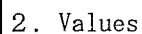
# COSEL

Model	LEP100F-24																																								
Item	Ripple-Noise リップルノイズ	Temperature	25℃																																						
Object	+24V4.2A	Testing Circuitry	Figure A																																						
1. Graph		2. Values																																							
<div><div>—△— Input Volt. 85V - -○- - Input Volt. 132V</div><div>Ripple-Noise [mV]</div><div>Load Current [A]</div></div> <div><p>Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p><p>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。</p><div><div>T1: Due to AC Input Line 入力商用周期 T2: Due to Switching スイッチング周期</div><div>Ripple-Noise [mVp-p]</div><div>T1</div><div>T2</div></div><div><p>Fig. Complex Ripple Wave Form 図 リップル波形詳細図</p></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><td>0.0</td><td>30</td><td>30</td></tr><tr><td>0.8</td><td>60</td><td>60</td></tr><tr><td>1.7</td><td>65</td><td>65</td></tr><tr><td>2.5</td><td>65</td><td>65</td></tr><tr><td>3.4</td><td>70</td><td>70</td></tr><tr><td>4.2</td><td>80</td><td>80</td></tr><tr><td>4.6</td><td>85</td><td>85</td></tr><tr><td>---</td><td>---</td><td>---</td></tr><tr><td>---</td><td>---</td><td>---</td></tr><tr><td>---</td><td>---</td><td>---</td></tr><tr><td>---</td><td>---</td><td>---</td></tr></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 85 [V]	Input Volt. 132 [V]	0.0	30	30	0.8	60	60	1.7	65	65	2.5	65	65	3.4	70	70	4.2	80	80	4.6	85	85	---	---	---	---	---	---	---	---	---	---	---	---
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 85 [V]	Input Volt. 132 [V]																																							
0.0	30	30																																							
0.8	60	60																																							
1.7	65	65																																							
2.5	65	65																																							
3.4	70	70																																							
4.2	80	80																																							
4.6	85	85																																							
---	---	---																																							
---	---	---																																							
---	---	---																																							
---	---	---																																							

BC - 3452

Testing Circuitry Figure A

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

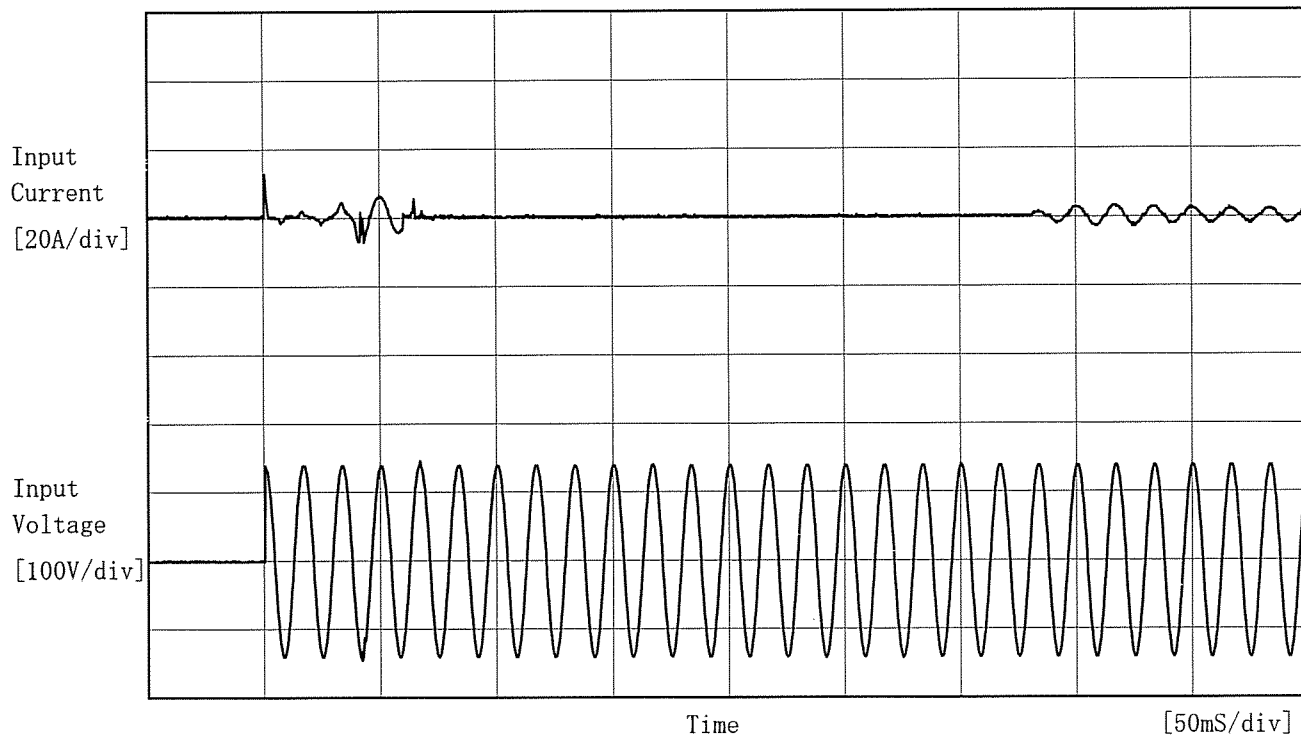


Ambient Temperature [°C]	Operating Point [V]		
	Input Volt.	Input Volt.	Input Volt.
	85[V]	100[V]	132[V]
-20	30.22	30.22	30.22
-10	30.46	30.46	30.45
0	30.63	30.63	30.63
10	30.86	30.86	30.86
25	31.15	31.15	31.14
40	31.55	31.44	31.44
45	31.61	31.61	31.61
50	31.73	31.61	31.61
60	31.85	31.85	31.85
70	32.15	32.03	32.03
—	—	—	—

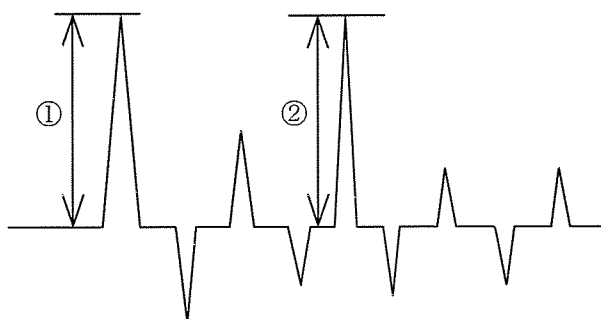
(注) 斜線は定格周囲温度範囲を示す。

**COSEL**

Model	LEP100F-24	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object	_____	



Input Voltage 100 V  
Frequency 60 Hz  
Load 100 %  
Inrush Current  
① 12.6 [A]  
② 6.4 [A]



# COSEL

Model	LEP100F-24	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response 動的負荷変動	
Object	+24V4.2A	

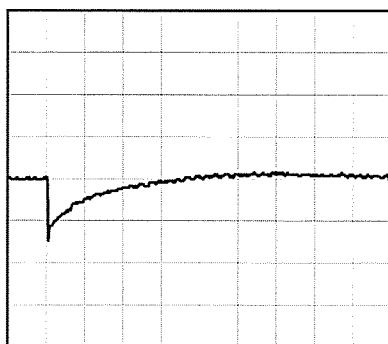
Input Volt. 100 V  
Cycle 1000 ms

Load Current

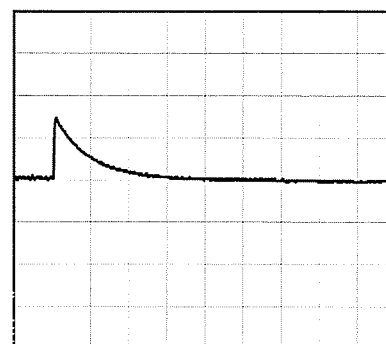


Min. Load (0A)  $\longleftrightarrow$   
Load 100% (4.2A)

100 mV/div



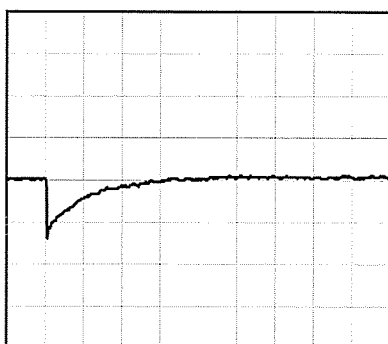
10 ms/div



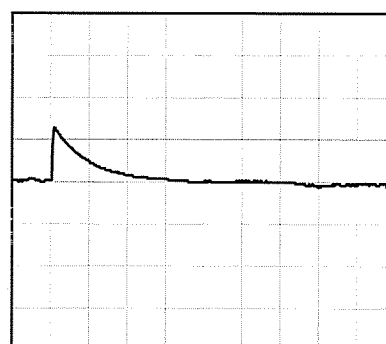
10 ms/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (2.1A)

100 mV/div



10 ms/div



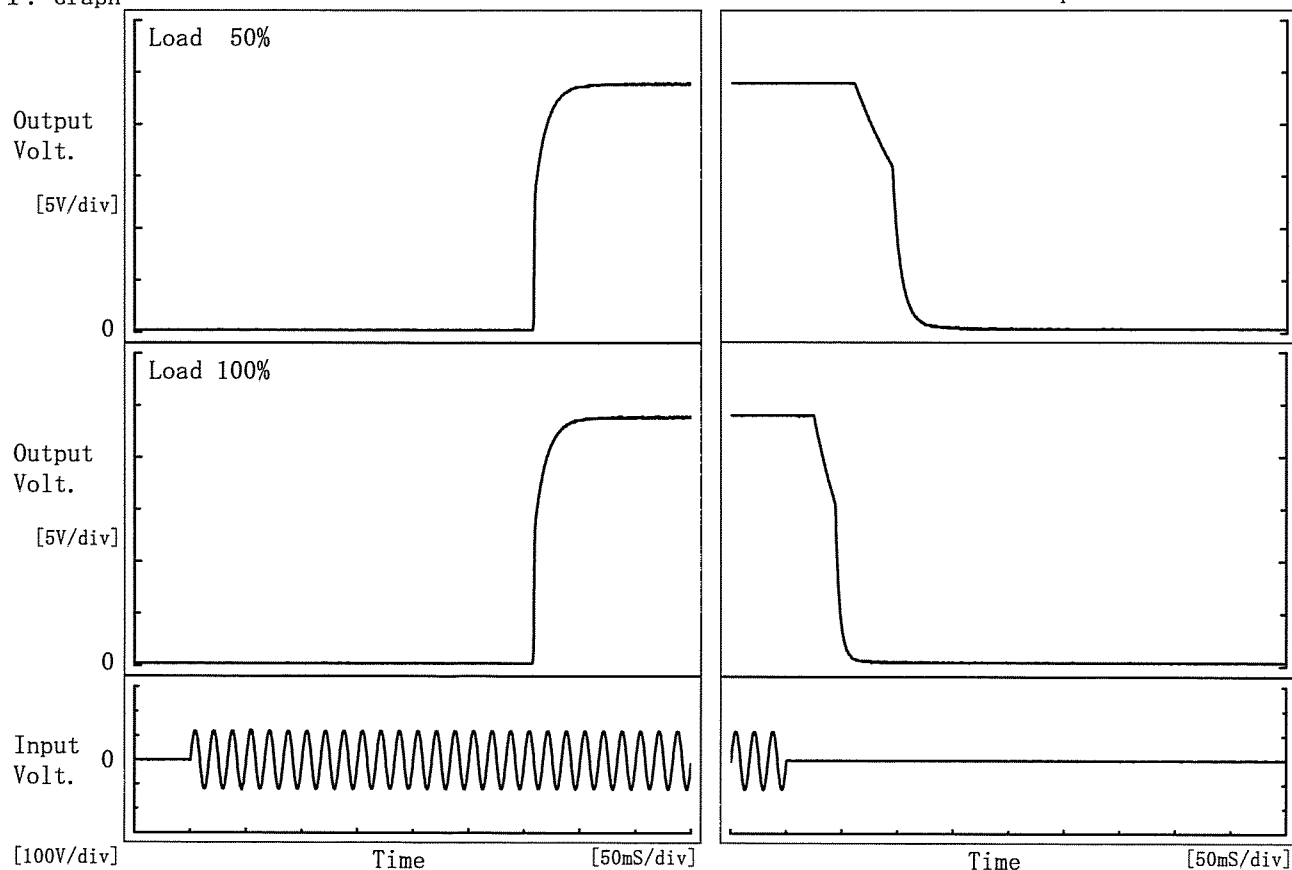
10 ms/div

# COSEL

Model	LEP100F-24	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+24V4.2A		

## 1. Graph

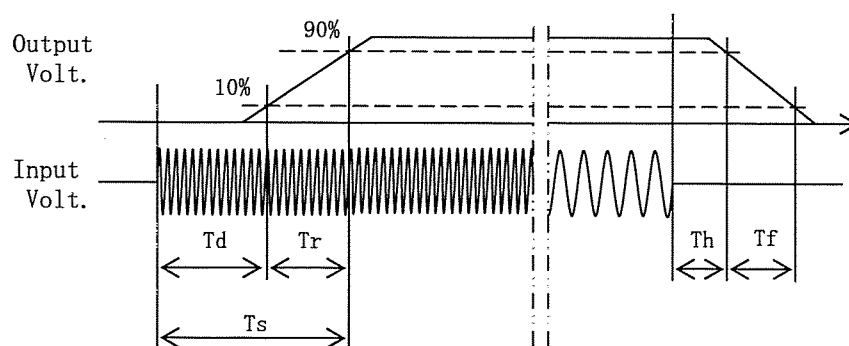
Input Volt. 85 V



## 2. Values

[mS]

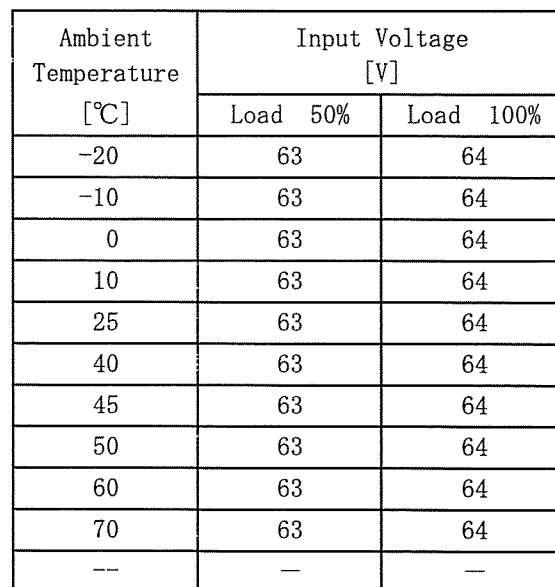
Load \ Time	T d	T r	T s	T h	T f
50 %	308.5	19.3	327.8	68.3	42.0
100 %	308.3	19.3	327.5	28.8	23.0



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Testing Circuitry	Figure A
-------------------	----------

## 2. Values



(注) 斜線は定格周囲温度範囲を示す。

# COSEL

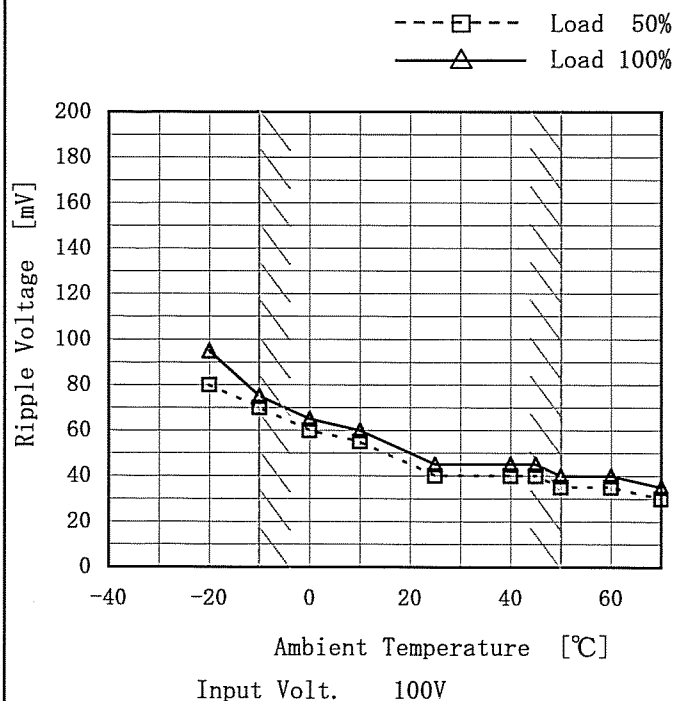
Model LEP100F-24

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

Object +24V4.2A

Testing Circuitry Figure A

## 1. Graph



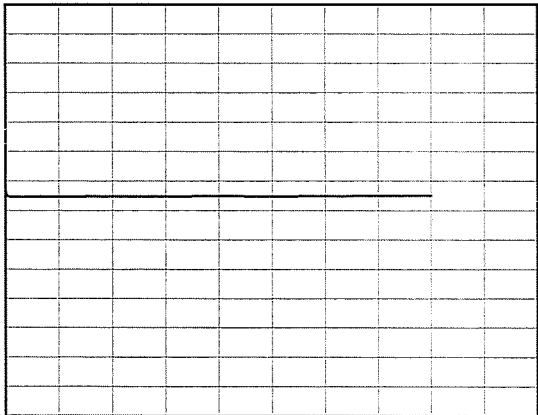
Note: Slanted line shows the range of the rated ambient temperature.

(注) 斜線は定格周囲温度範囲を示す。

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	80	95
-10	70	75
0	60	65
10	55	60
25	40	45
40	40	45
45	40	45
50	35	40
60	35	40
70	30	35
--	—	—

# COSEL

Model	LEP100F-24																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25℃																						
Object	+24V4.2A	Testing Circuitry	Figure A																						
1. Graph		2. Values																							
<div><div>Output Voltage [V]</div><div><div>Time [H]</div></div><div>Input Volt. 100V Load 100%</div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>24.085</td></tr><tr><td>0.5</td><td>24.074</td></tr><tr><td>1.0</td><td>24.074</td></tr><tr><td>2.0</td><td>24.074</td></tr><tr><td>3.0</td><td>24.074</td></tr><tr><td>4.0</td><td>24.075</td></tr><tr><td>5.0</td><td>24.074</td></tr><tr><td>6.0</td><td>24.075</td></tr><tr><td>7.0</td><td>24.075</td></tr><tr><td>8.0</td><td>24.076</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	24.085	0.5	24.074	1.0	24.074	2.0	24.074	3.0	24.074	4.0	24.075	5.0	24.074	6.0	24.075	7.0	24.075	8.0	24.076
Time since start [H]	Output Voltage [V]																								
0.0	24.085																								
0.5	24.074																								
1.0	24.074																								
2.0	24.074																								
3.0	24.074																								
4.0	24.075																								
5.0	24.074																								
6.0	24.075																								
7.0	24.075																								
8.0	24.076																								

Model		LEP100F-24	Testing Circuitry    Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+24V4.2A	

## 1. 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 ~ 132V

Load Current : 0 ~ 4.2A

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

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

## 1. 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 ~ 132V

負荷電流 : 0 ~ 4.2A

\* 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) =  $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

## 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	132	0	24.142	±29	±0.1
Minimum Voltage	50	132	4.2	24.084		

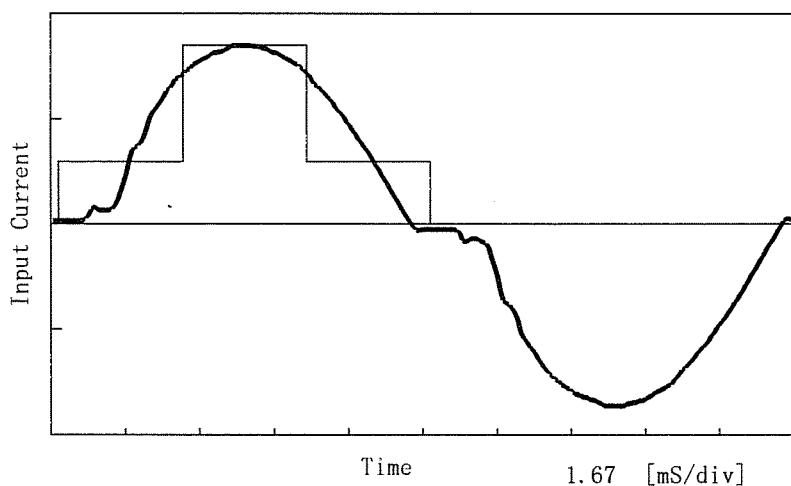
# COSEL

Model	LEP100F-24	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object			

## 1. Input Current Waveform

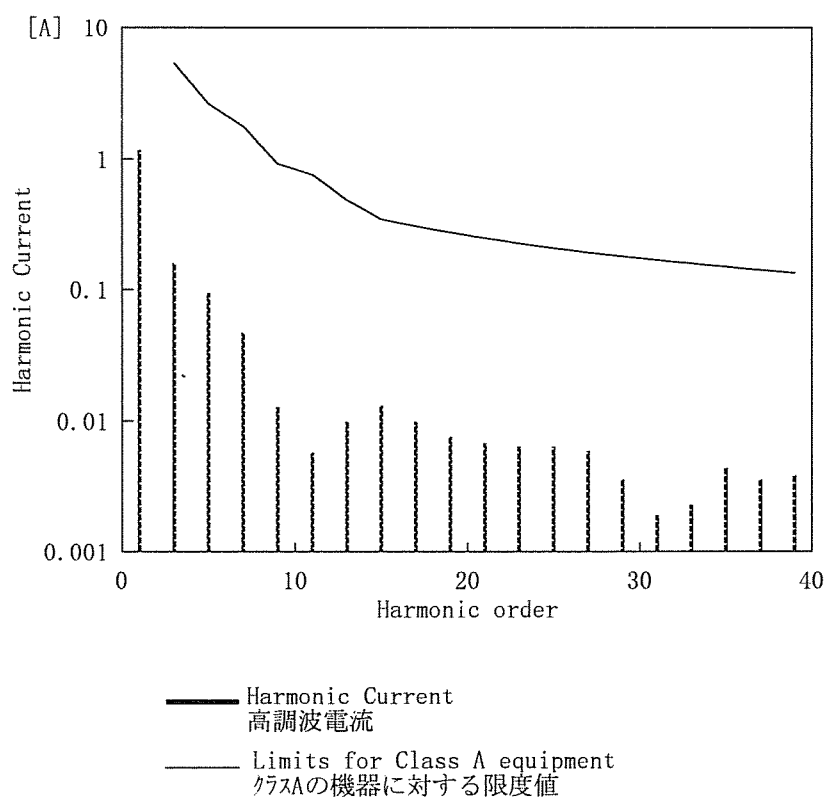
— Input Current  
 — Envelope of the input current to classify equipment as Class D  
 クラスDの機器を決定するための入力電流包絡線

1 A/div



Conditions	Values
Input Voltage [V]	100.1
Input Current [A]	1.19
Active Power [W]	117.6
Apparent Power [VA]	119.2
Frequency [Hz]	60
Power Factor	0.987
Output Power [W]	100.8

## 2. Harmonic Current



Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	1.17480
2	—	0.00060
3	5.28472	0.15860
4	—	0.00030
5	2.61938	0.09390
6	—	0.00010
7	1.76923	0.04700
8	—	0.00010
9	0.91908	0.01280
10	—	0.00000
11	0.75824	0.00580
12	—	0.00010
13	0.48252	0.00990
14	—	0.00010
15	0.34466	0.01310
16	—	0.00000
17	0.30411	0.00990
18	—	0.00000
19	0.27210	0.00760
20	—	0.00010
21	0.24618	0.00680
22	—	0.00000
23	0.22478	0.00640
24	—	0.00010
25	0.20679	0.00640
26	—	0.00000
27	0.19148	0.00590
28	—	0.00000
29	0.17827	0.00360
30	—	0.00000
31	0.16677	0.00190
32	—	0.00000
33	0.15666	0.00230
34	—	0.00000
35	0.14771	0.00440
36	—	0.00000
37	0.13973	0.00360
38	—	0.00010
39	0.13256	0.00390
40	—	0.00010

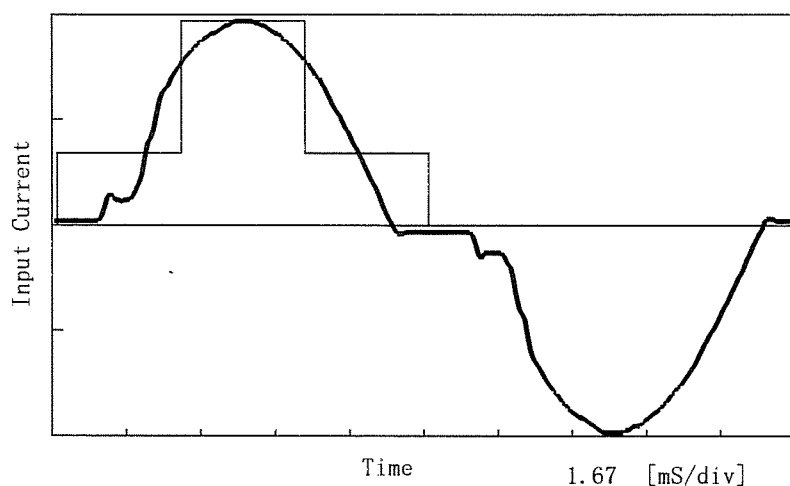
# COSEL

Model	LEP100F-24	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object			

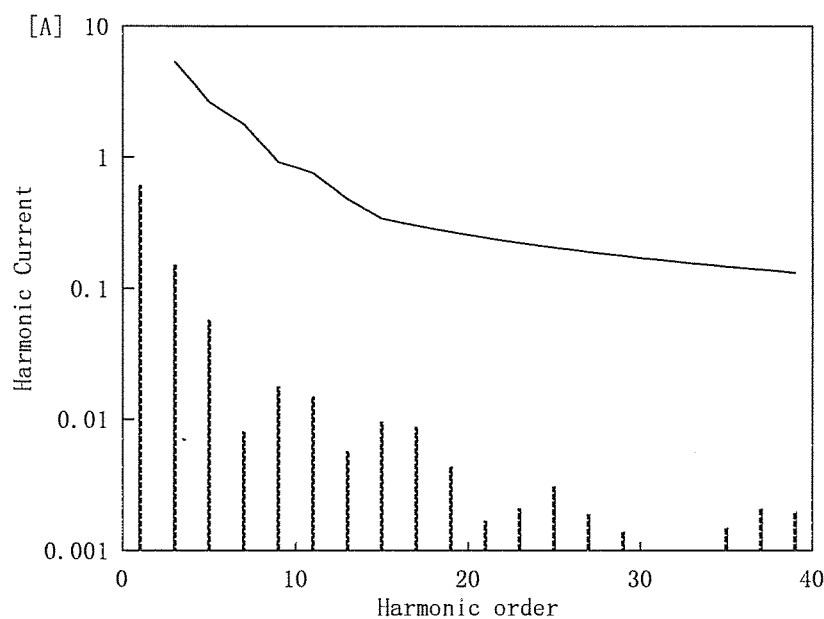
## 1. Input Current Waveform

— Input Current  
 — Envelope of the input current to classify equipment as Class D  
 クラスDの機器を決定するための入力電流包絡線

0.5 A/div



## 2. Harmonic Current



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

Conditions	Values
Input Voltage [V]	100.3
Input Current [A]	0.639
Active Power [W]	61.8
Apparent Power[VA]	64.1
Frequency [Hz]	60
Power Factor	0.964
Output Power [W]	50.4

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	0.61710
2	—	0.00030
3	5.27418	0.15200
4	—	0.00010
5	2.61416	0.05750
6	—	0.00010
7	1.76570	0.00810
8	—	0.00010
9	0.91725	0.01790
10	—	0.00010
11	0.75673	0.01500
12	—	0.00000
13	0.48156	0.00580
14	—	0.00010
15	0.34397	0.00960
16	—	0.00010
17	0.30350	0.00880
18	—	0.00010
19	0.27155	0.00440
20	—	0.00010
21	0.24569	0.00170
22	—	0.00000
23	0.22433	0.00210
24	—	0.00010
25	0.20638	0.00310
26	—	0.00010
27	0.19109	0.00190
28	—	0.00000
29	0.17791	0.00140
30	—	0.00010
31	0.16644	0.00100
32	—	0.00000
33	0.15635	0.00080
34	—	0.00000
35	0.14741	0.00150
36	—	0.00000
37	0.13945	0.00210
38	—	0.00000
39	0.13230	0.00200
40	—	0.00000

# COSEL

		Testing Circuitry      Figure A
Model	LEP100F-24	
Item	Condense 結露特性	
Object	+24V4.2A	

## 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]	24.107	Input Volt. :100V, Load Current. :4.2A
Line Regulation [mV]	1	Input Volt. :85~132V, Load Current. :4.2A
Load Regulation [mV]	4	Input Volt. :100V, Load Current. :0~4.2A

**COSEL**

Model	LEP100F-24		
Item	Leakage Current 漏洩電流	Temperature	25℃
Object		Testing Circuitry	Figure B

## 1. Results

Standards	Leakage Current [mA]		
	Input Volt.	Input Volt.	Input Volt.
	85 [V]	100 [V]	132 [V]
(A) DEN-AN	0.17	0.19	0.25
(B) IEC60950	0.17	0.20	0.25

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

## 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。

# COSEL

Model	LEP100F-24		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25°C Figure C
Object	+24V4.2A		

## 1. Conditions

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

## 2. Results

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

# COSEL

Model	LEP100F-24	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object			

## 1. Graph

### Remarks

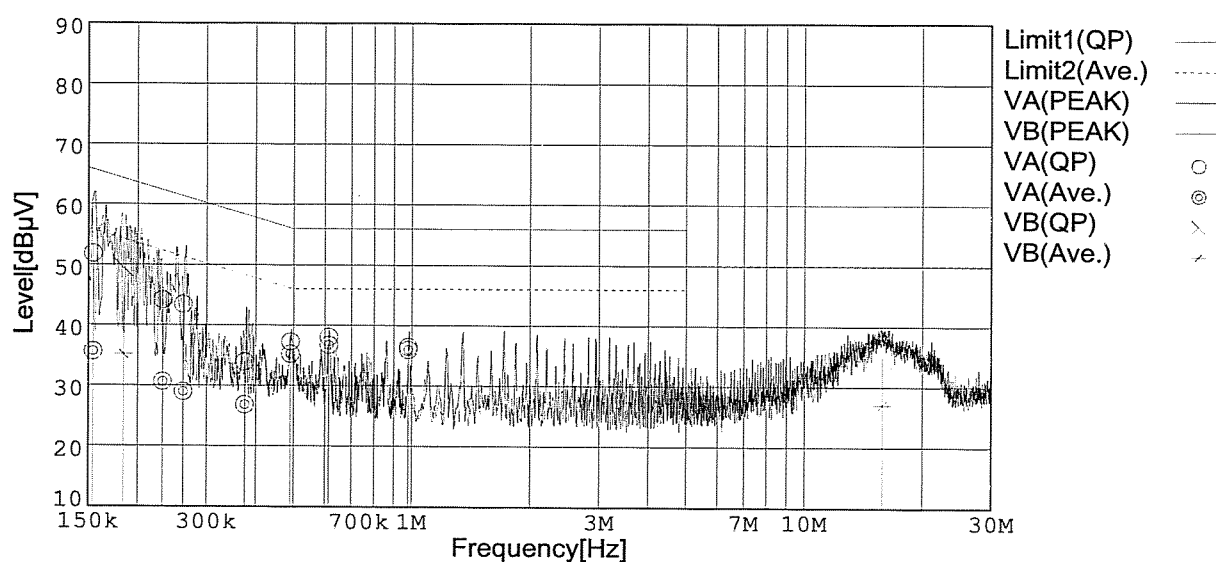
Input Volt. 100V( VCCI Class B )

120V(FCC Class B )

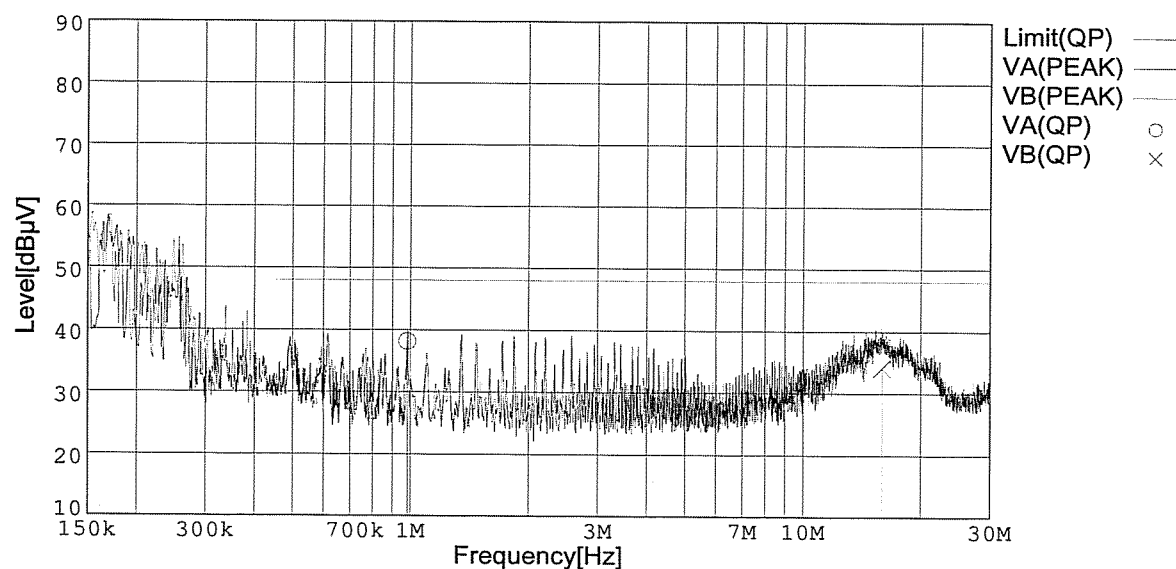
Load 100%

Limit1: [VCCI] Class B(QP)

Limit2: [VCCI] Class B(Ave.)



Limit: [FCC Part15] Class B



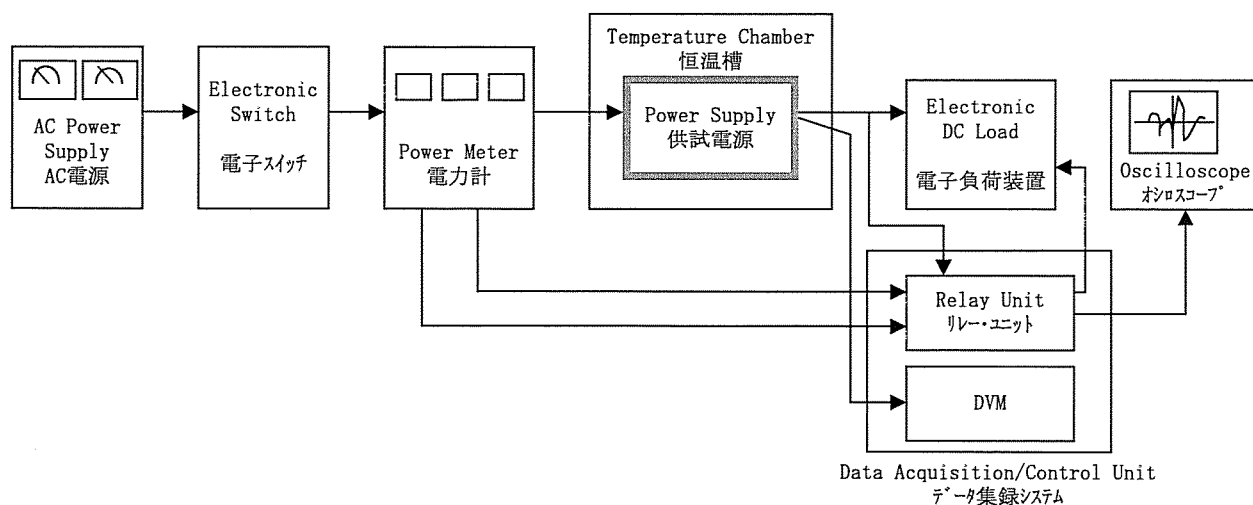


Figure A

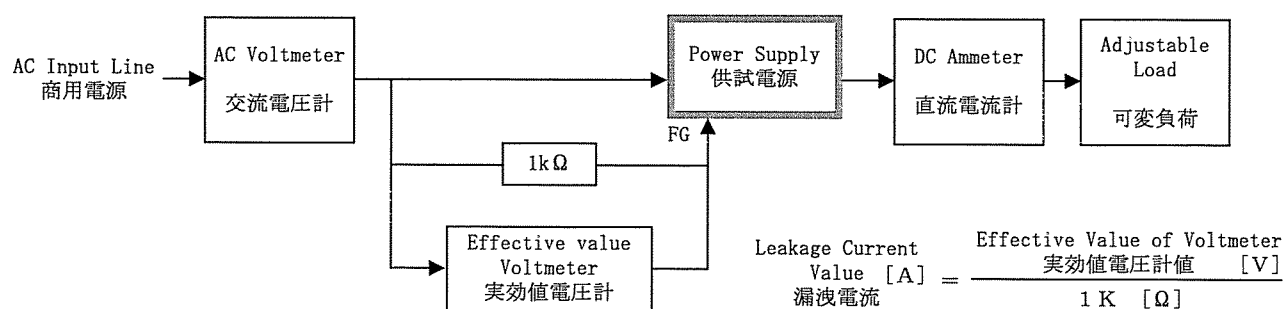


Figure B ( DEN-AN )

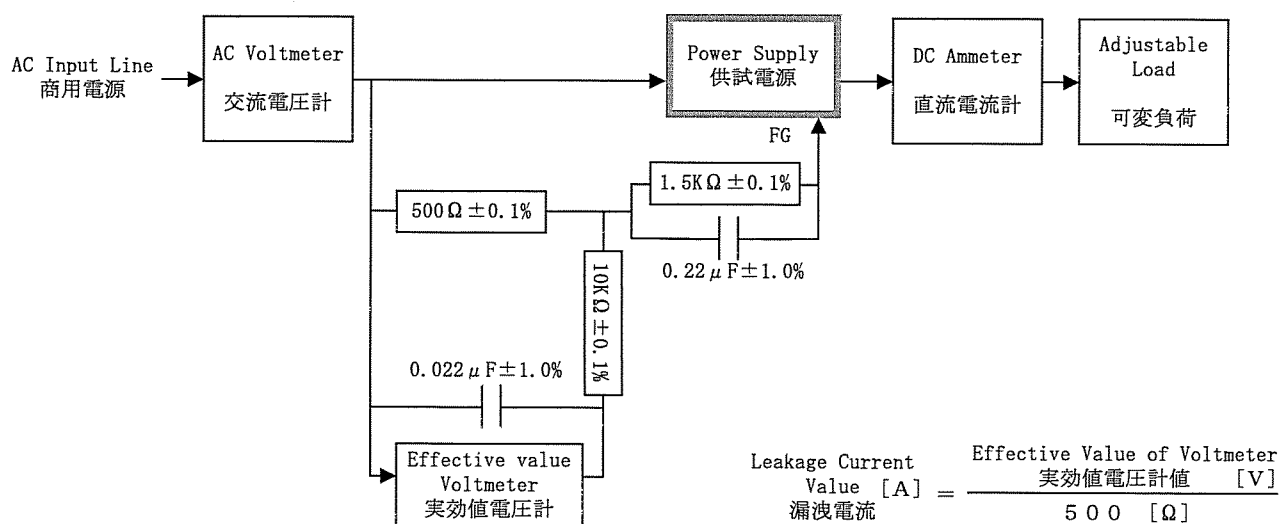


Figure B ( IEC60950 )

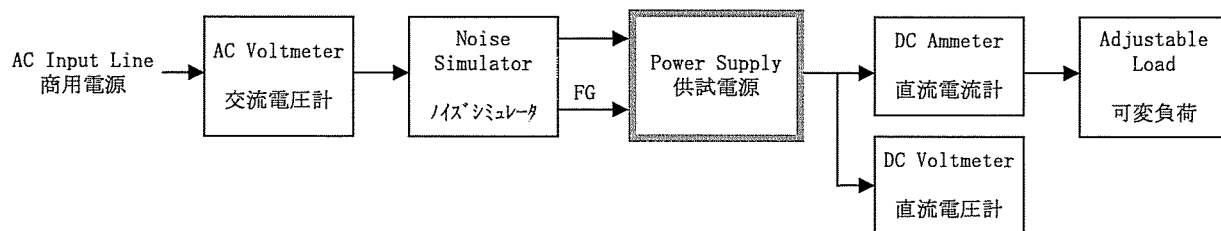


Figure C

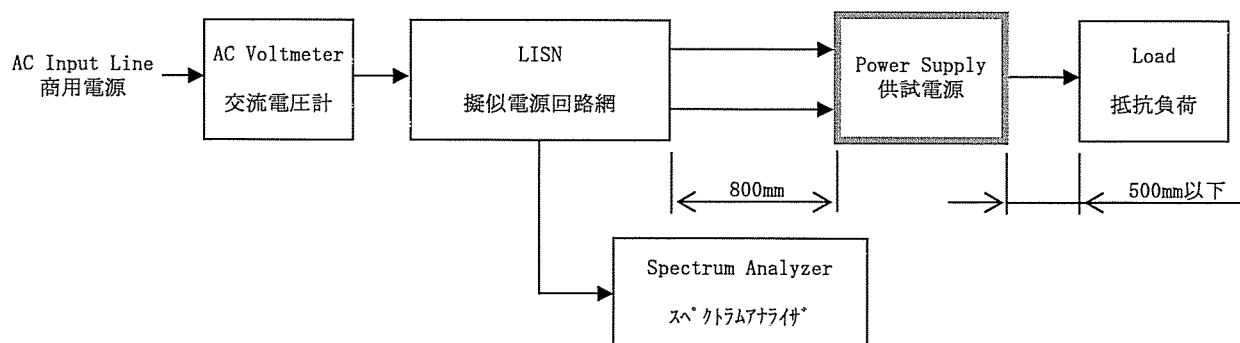


Figure D

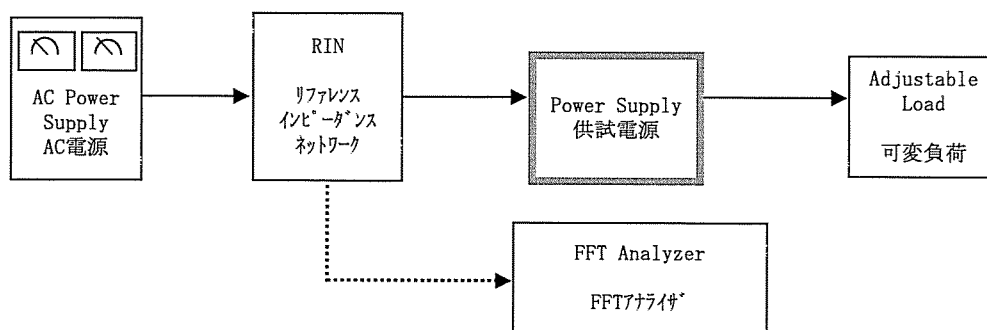


Figure E