



TEST DATA OF LEP150F-24 (100V INPUT)

Regulated DC Power Supply
Oct.17. 2002

Approved by : Kuniaki nagahara
Kuniaki nagahara Design Manager

Prepared by : Tadayuki Noda
Tadayuki Noda 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. 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. Power Factor (by Input Voltage)	6
力率 (入力電圧特性)	
7. Power Factor (by Load Current)	7
力率 (負荷特性)	
8. Hold-Up Time	8
出力保持時間	
9. Instantaneous Interruption Compensation	9
瞬時停電保障	
10. Load Regulation	10
静的負荷変動	
11. Ripple Voltage (by Load Current)	11
リップル電圧 (負荷特性)	
12. Ripple-Noise	12
リップルノイズ	
13. Overcurrent Protection	13
過電流保護	
14. Overvoltage Protection	14
過電圧保護	
15. Inrush Current	15
突入電流	
16. Dynamic Load Response	16
動的負荷変動	
17. Rise and Fall Time	17
立上り、立下り時間	
18. Ambient Temperature Drift	18
周囲温度変動	
19. Minimum Input Voltage for Regulated Output Voltage	19
最低レギュレーション電圧	
20. Ripple Voltage (by Ambient Temperature)	20
リップル電圧 (周囲温度特性)	
21. Time Lapse Drift	21
経時ドリフト	
22. Output Voltage Accuracy	22
定電圧精度	
23. Harmonic Current	23
高調波電流	
24. Condensation	25
結露特性	
25. Leakage Current	26
漏洩電流	
26. Line Noise Tolerance	27
入力雑音耐量	
27. Conducted Emission	28
雑音端子電圧	
28. Figure of Testing Circuitry	29
測定回路図	

(Final Page 30)

Model	LEP150F-24																																		
Item	Line Regulation 静的入力変動	Temperature	25℃																																
Object	+24V6.3A	Testing Circuitry	Figure A																																
1. Graph		2. Values																																	
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div> <div>Output Voltage [V]</div> <div>Input Voltage [V]</div>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>75</td><td>24.151</td><td>24.147</td></tr><tr><td>80</td><td>24.151</td><td>24.147</td></tr><tr><td>85</td><td>24.151</td><td>24.147</td></tr><tr><td>90</td><td>24.151</td><td>24.147</td></tr><tr><td>100</td><td>24.151</td><td>24.147</td></tr><tr><td>110</td><td>24.151</td><td>24.147</td></tr><tr><td>120</td><td>24.151</td><td>24.147</td></tr><tr><td>132</td><td>24.151</td><td>24.147</td></tr><tr><td>140</td><td>24.151</td><td>24.147</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	24.151	24.147	80	24.151	24.147	85	24.151	24.147	90	24.151	24.147	100	24.151	24.147	110	24.151	24.147	120	24.151	24.147	132	24.151	24.147	140	24.151	24.147
Input Voltage [V]	Output Voltage [V]																																		
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<div>Note: Slanted line shows the range of the rated input voltage.</div> <div>(注) 斜線は定格入力電圧範囲を示す。</div>																																			

— 1 —

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Model		LEP150F-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]

COSEL

Model		LEP150F-24	
Item		Input Power (by Load Current) 入力電力 (負荷特性)	
Object			

1. Graph

—△—

Input Volt. 85V

---□---

Input Volt. 100V

---○---

Input Volt. 132V

Input Power [W]

500

400

300

200

100

0

0

2

4

6

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]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	8.6	8.6	8.7
1.00	38.8	38.4	38.1
2.00	66.0	65.3	64.5
3.00	93.5	92.8	91.4
4.00	122.1	120.2	118.6
5.00	150.3	148.8	146.0
6.00	179.1	177.0	173.6
6.30	187.8	185.7	182.2
6.93	206.1	203.8	200.7
--	—	—	—
--	—	—	—

2. Values

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Model		LEP150F-24																																	
Item		Efficiency (by Input Voltage) 効率（入力電圧特性）																																	
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Item		Power Factor (by Load Current) 力率 (負荷特性)	
Object			
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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. 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>																																			

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<div><div>—△— Input Volt. 85V</div><div>-·-○-·- Input Volt. 132V</div></div> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>		<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>15</td><td>15</td></tr><tr><td>1.3</td><td>20</td><td>20</td></tr><tr><td>2.5</td><td>25</td><td>25</td></tr><tr><td>3.8</td><td>30</td><td>30</td></tr><tr><td>5.0</td><td>30</td><td>30</td></tr><tr><td>6.3</td><td>35</td><td>35</td></tr><tr><td>6.9</td><td>35</td><td>35</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	15	15	1.3	20	20	2.5	25	25	3.8	30	30	5.0	30	30	6.3	35	35	6.9	35	35	---	---	---	---	---	---	---	---	---	---	---	---
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 85 [V]	Input Volt. 132 [V]																																							
0.0	15	15																																							
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<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。</p> <p>(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</div><div>T2: Due to Switching スイッチング周期</div></div> <p>Ripple [mVp-p]</p> <p>T1</p> <p>T2</p>																																									
Fig. Complex Ripple Wave Form 図 リップル波形詳細図																																									

COSEL

Model	LEP150F-24																																								
Item	Ripple-Noise リップルノイズ	Temperature	25℃																																						
Object	+24V6.3A	Testing Circuitry	Figure A																																						
1. Graph		2. Values																																							
<div><div>—△— Input Volt. 85V - -○- - Input Volt. 132V</div><p>Ripple-Noise [mV]</p><p>Load Current [A]</p></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><p>Fig. Complex Ripple Wave Form 図 リップル波形詳細図</p></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>1.3</td><td>60</td><td>60</td></tr><tr><td>2.5</td><td>65</td><td>65</td></tr><tr><td>3.8</td><td>70</td><td>70</td></tr><tr><td>5.0</td><td>75</td><td>75</td></tr><tr><td>6.3</td><td>80</td><td>80</td></tr><tr><td>6.9</td><td>80</td><td>80</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	1.3	60	60	2.5	65	65	3.8	70	70	5.0	75	75	6.3	80	80	6.9	80	80	---	---	---	---	---	---	---	---	---	---	---	---
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 85 [V]	Input Volt. 132 [V]																																							
0.0	30	30																																							
1.3	60	60																																							
2.5	65	65																																							
3.8	70	70																																							
5.0	75	75																																							
6.3	80	80																																							
6.9	80	80																																							
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- 12 -

BC-3454

COSEL

Model		LEP150F-24	
Item		Overcurrent Protection 過電流保護	
Object		+24V6.3A	

1. Graph

Input Volt. 85V

Input Volt. 100V

Input Volt. 132V

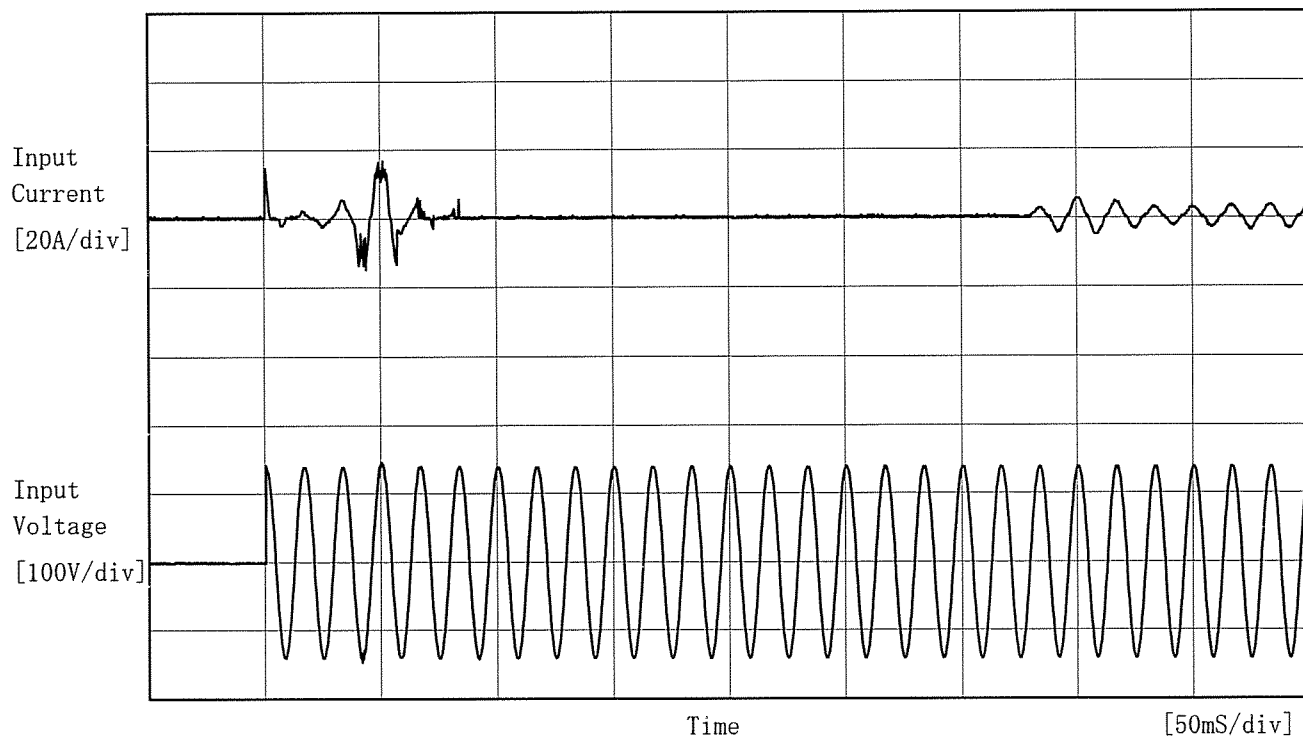
Output Voltage [V]

<

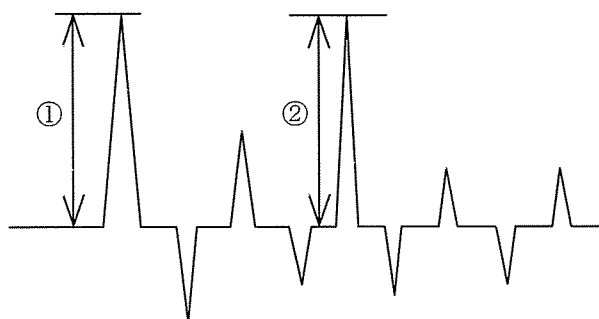
BC-3454

COSEL

Model	LEP150F-24		
Item	Inrush Current 突入電流	Temperature	25°C
		Testing Circuitry	Figure A
Object			



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





Model	LEP150F-24		
Item	Dynamic Load Response 動的負荷変動	Temperature	25℃
Object	+24V6.3A	Testing Circuitry	Figure A

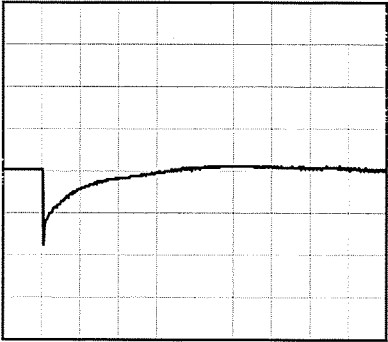
Input Volt. 100 V
Cycle 1000 ms

Load Current

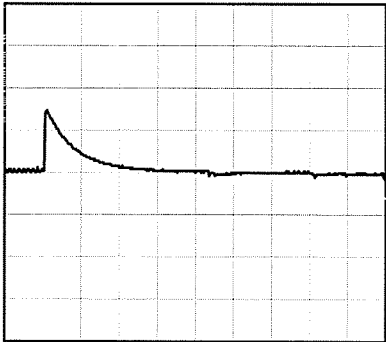


Min. Load (0A) ←→
Load 100% (6.3A)

100 mV/div



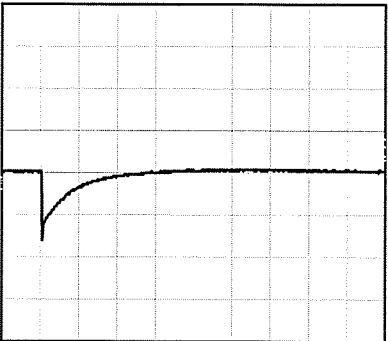
10 ms/div



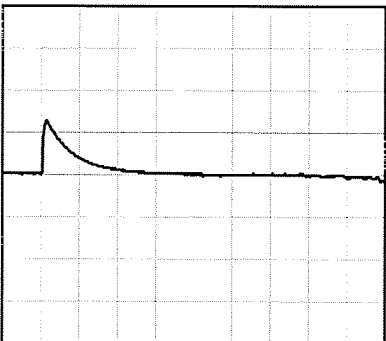
10 ms/div

Min. Load (0A) ←→
Load 50% (3.15A)

100 mV/div



10 ms/div



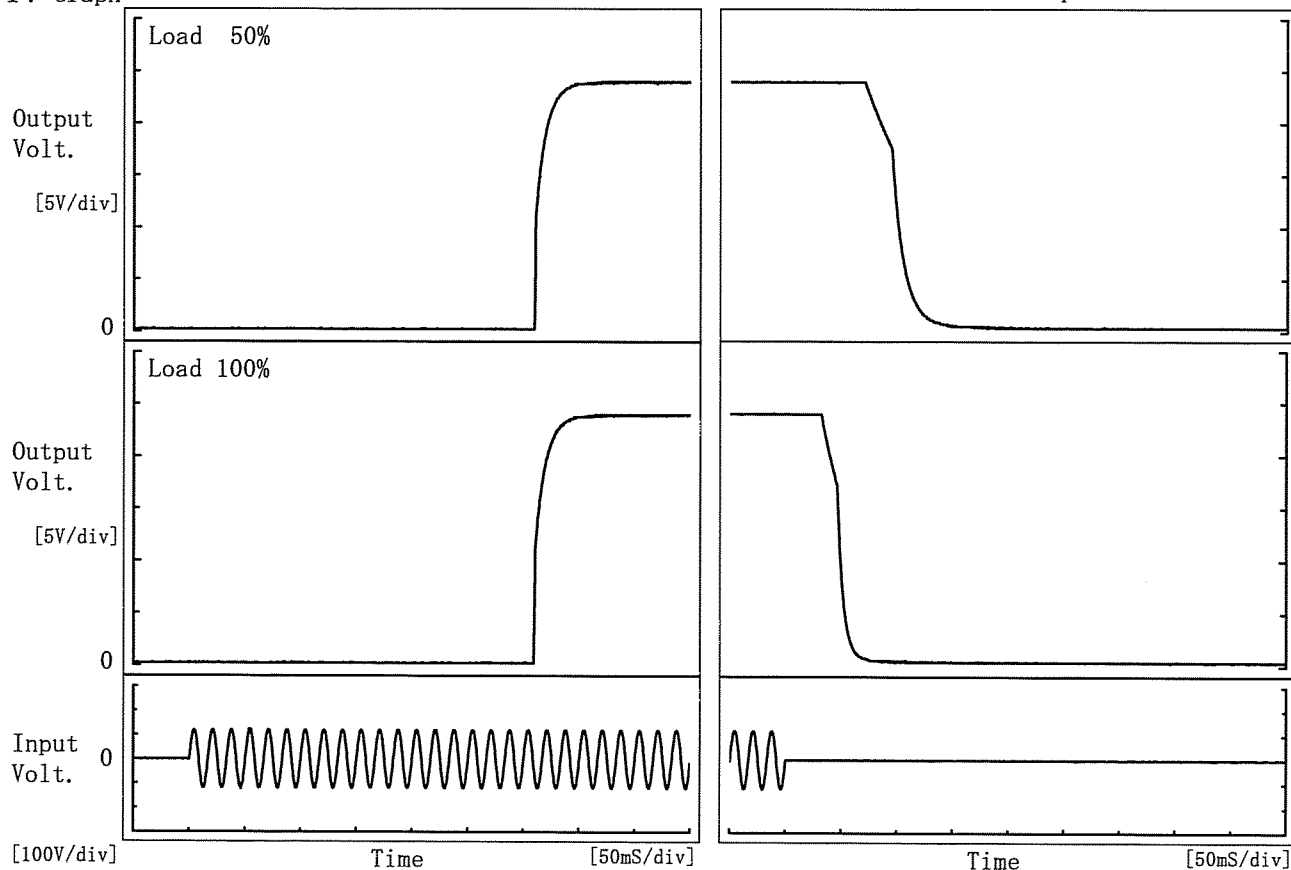
10 ms/div

COSEL

Model	LEP150F-24	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+24V6.3A		

1. Graph

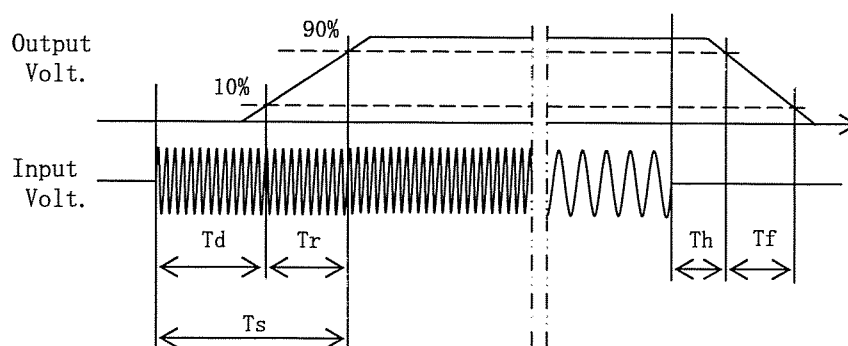
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	309.8	18.0	327.8	77.5	39.5
100 %	309.5	17.8	327.3	35.8	21.8



COSEL

Model

LEP150F-24

Item

Ambient Temperature Drift
周囲温度変動

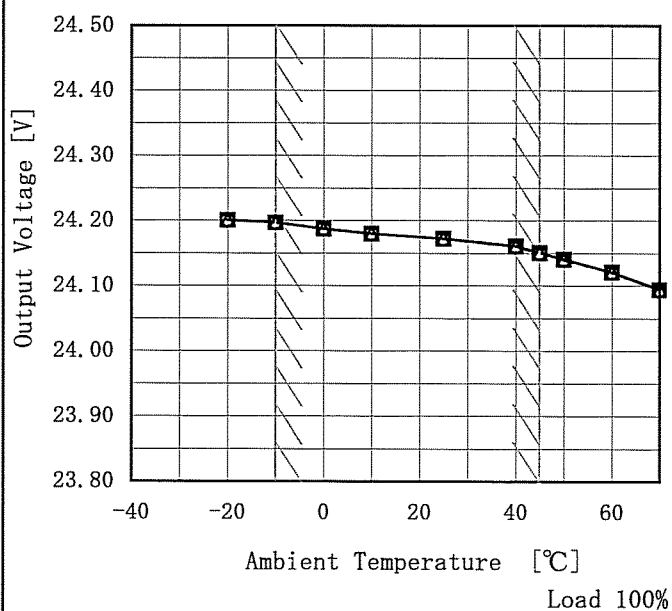
Object

+24V6.3A

Testing Circuitry Figure A

1. Graph

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



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

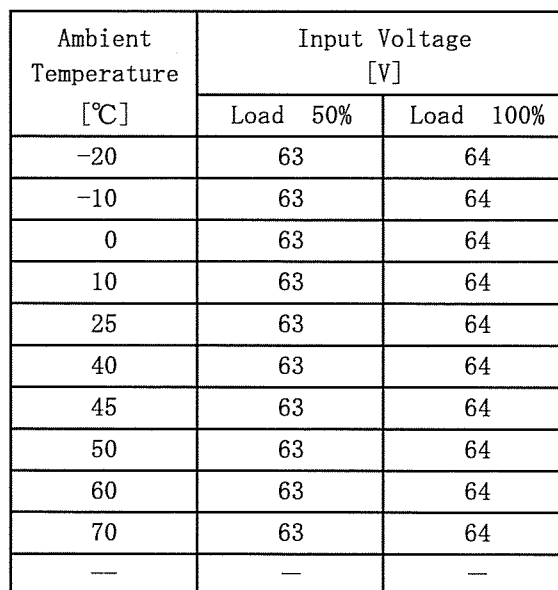
(注) 斜線は定格周囲温度範囲を示す。

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	24.200	24.201	24.201
-10	24.197	24.197	24.197
0	24.187	24.188	24.187
10	24.180	24.180	24.180
25	24.173	24.172	24.172
40	24.161	24.161	24.160
45	24.151	24.151	24.150
50	24.141	24.141	24.140
60	24.121	24.121	24.121
70	24.094	24.094	24.094
—	—	—	—

Testing Circuitry Figure A

2. Values



(注) 斜線は定格周囲温度範囲を示す。

BC-3454

COSEL

Model	LEP150F-24		
Item	Time Lapse Drift 経時ドリフト	Temperature	25℃
Object	+24V6.3A	Testing Circuitry	Figure A
1. Graph		2. Values	
<div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></di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		Testing Circuitry Figure A
Model	LEP150F-24	
Item	Output Voltage Accuracy 定電圧精度	
Object	+24V6.3A	

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 ~ 45°C

Input Voltage : 85 ~ 132V

Load Current : 0 ~ 6.3A

* 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 ~ 45°C

入力電圧 : 85 ~ 132V

負荷電流 : 0 ~ 6.3A

* 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	24.205	±33	±0.1
Minimum Voltage	45	132	6.3	24.140		

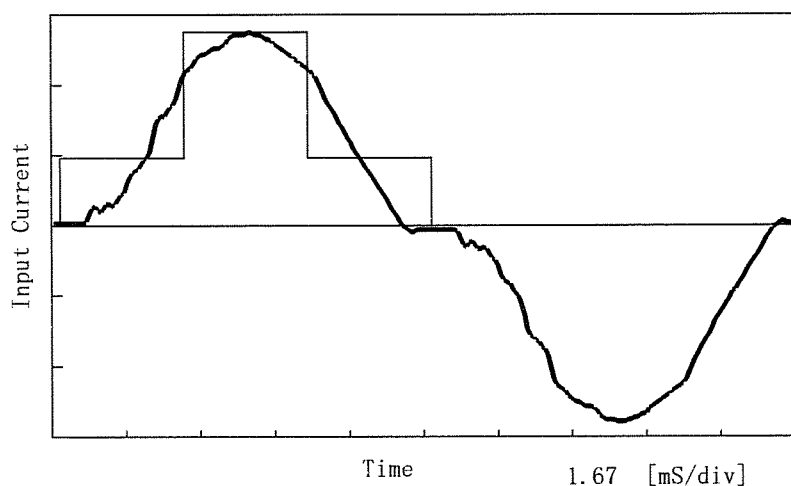
COSEL

Model	LEP150F-24	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object			

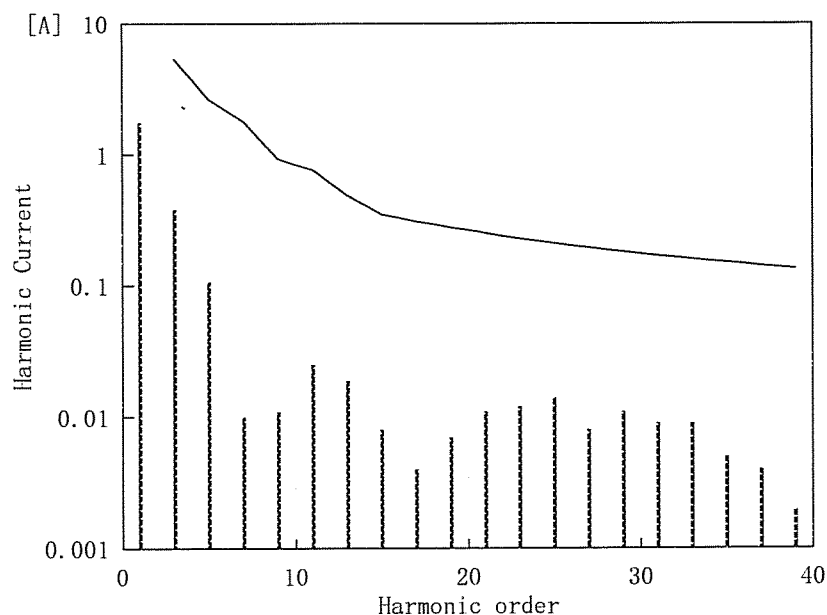
1. Input Current Waveform

— 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



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

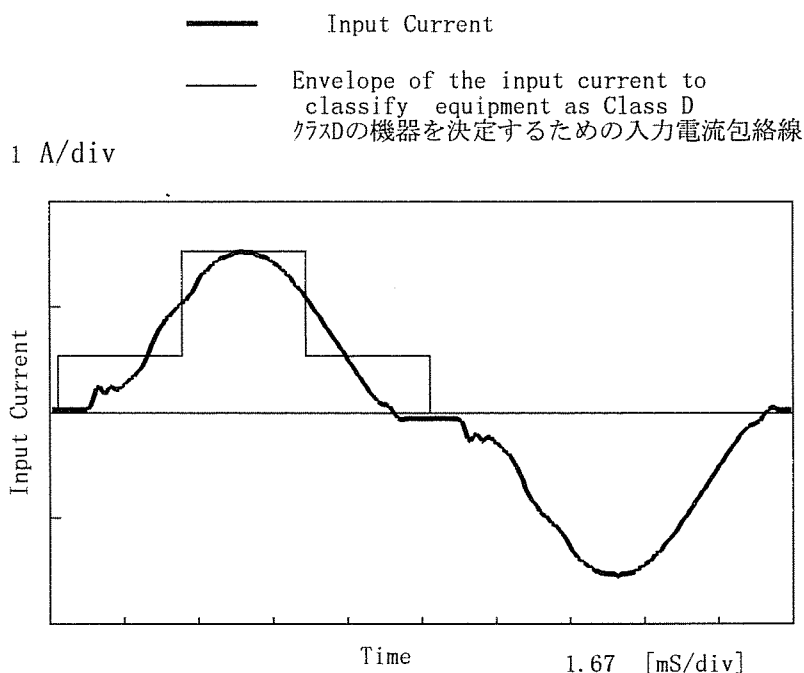
Conditions	Values
Input Voltage [V]	99.7
Input Current [A]	1.798
Active Power [W]	174.8
Apparent Power [VA]	179.3
Frequency [Hz]	60
Power Factor	0.975
Output Power [W]	151.2

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	1.75300
2	—	0.00100
3	5.30592	0.37900
4	—	0.00000
5	2.62989	0.10700
6	—	0.00000
7	1.77633	0.01000
8	—	0.00000
9	0.92277	0.01100
10	—	0.00000
11	0.76128	0.02500
12	—	0.00000
13	0.48445	0.01900
14	—	0.00000
15	0.34604	0.00800
16	—	0.00000
17	0.30533	0.00400
18	—	0.00000
19	0.27319	0.00700
20	—	0.00000
21	0.24717	0.01100
22	—	0.00000
23	0.22568	0.01200
24	—	0.00000
25	0.20762	0.01400
26	—	0.00000
27	0.19224	0.00800
28	—	0.00000
29	0.17899	0.01100
30	—	0.00000
31	0.16744	0.00900
32	—	0.00000
33	0.15729	0.00900
34	—	0.00000
35	0.14830	0.00500
36	—	0.00000
37	0.14029	0.00400
38	—	0.00000
39	0.13309	0.00200
40	—	0.00000

COSEL

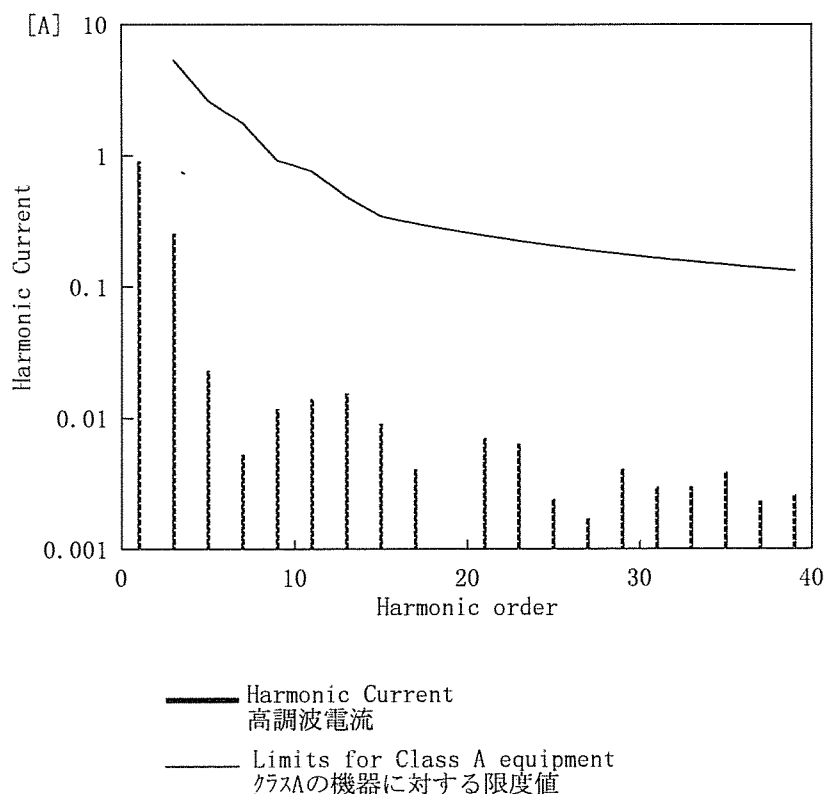
Model	LEP150F-24	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object			

1. Input Current Waveform



Conditions	Values
Input Voltage [V]	100.1
Input Current [A]	0.945
Active Power [W]	90.7
Apparent Power [VA]	94.6
Frequency [Hz]	60
Power Factor	0.959
Output Power [W]	75.6

2. Harmonic Current



Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	0.90860
2	—	0.00040
3	5.28472	0.25620
4	—	0.00030
5	2.61938	0.02300
6	—	0.00030
7	1.76923	0.00530
8	—	0.00000
9	0.91908	0.01170
10	—	0.00000
11	0.75824	0.01410
12	—	0.00010
13	0.48252	0.01550
14	—	0.00010
15	0.34466	0.00910
16	—	0.00000
17	0.30411	0.00410
18	—	0.00010
19	0.27210	0.00100
20	—	0.00010
21	0.24618	0.00710
22	—	0.00010
23	0.22478	0.00640
24	—	0.00000
25	0.20679	0.00240
26	—	0.00010
27	0.19148	0.00170
28	—	0.00010
29	0.17827	0.00410
30	—	0.00010
31	0.16677	0.00300
32	—	0.00000
33	0.15666	0.00300
34	—	0.00000
35	0.14771	0.00390
36	—	0.00000
37	0.13973	0.00230
38	—	0.00010
39	0.13256	0.00260
40	—	0.00000

		Testing Circuitry Figure A
Model	LEP150F-24	
Item	Condense 結露特性	
Object	+24V6.3A	

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]	24.186	Input Volt. :100V, Load Current. :6.3A
Line Regulation [mV]	1	Input Volt. :85~132V, Load Current. :6.3A
Load Regulation [mV]	9	Input Volt. :100V, Load Current. :0~6.3A

COSEL

Model	LEP150F-24		
Item	Leakage Current 漏洩電流	Temperature	25℃
Object		Testing Circuitry	Figure B

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DEN-AN	0.15	0.18	0.24
(B) IEC60950	0.15	0.18	0.24

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 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	LEP150F-24		
Item	Line Noise Tolerance 入力雑音耐量	Temperature	25°C
Object	+24V6.3A	Testing Circuitry	Figure C

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	LEP150F-24	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object	_____		

1. Graph

Remarks

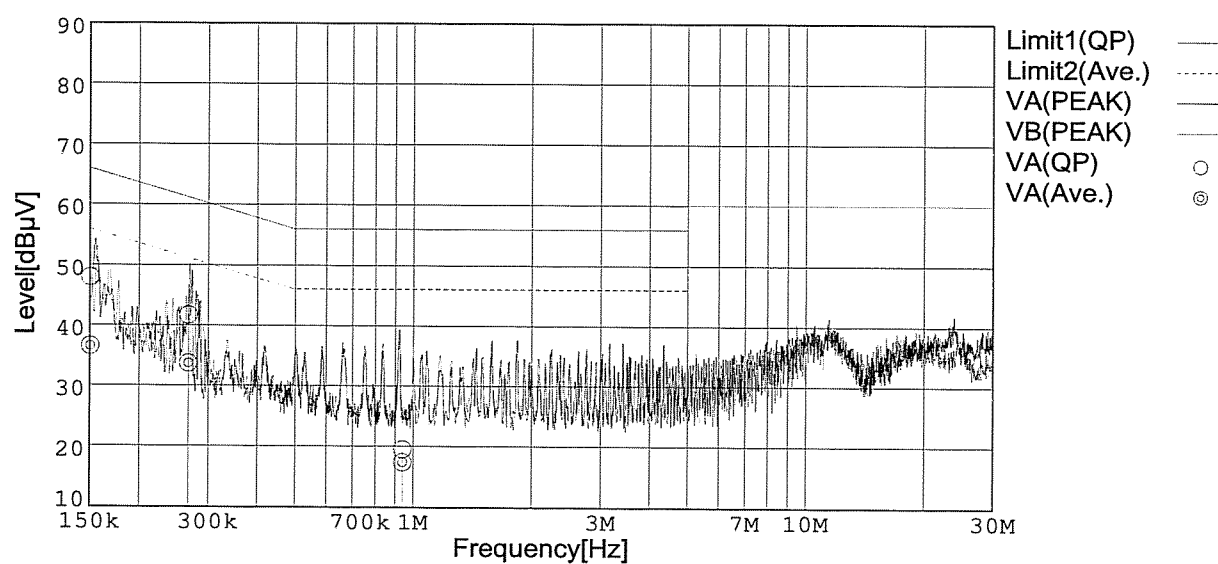
Input Volt. 100V(VCCI Class B)

120V(FCC Class B)

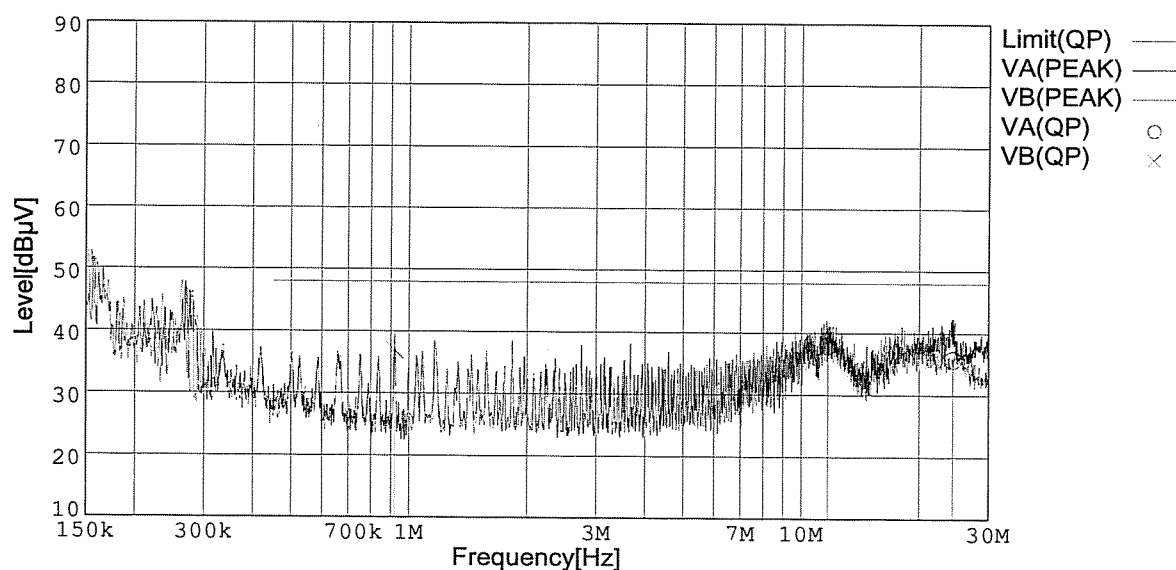
Load 100%

Limit1: [VCCI] Class B(QP)

Limit2: [VCCI] Class B(Ave.)



Limit: [FCC Part15] Class B



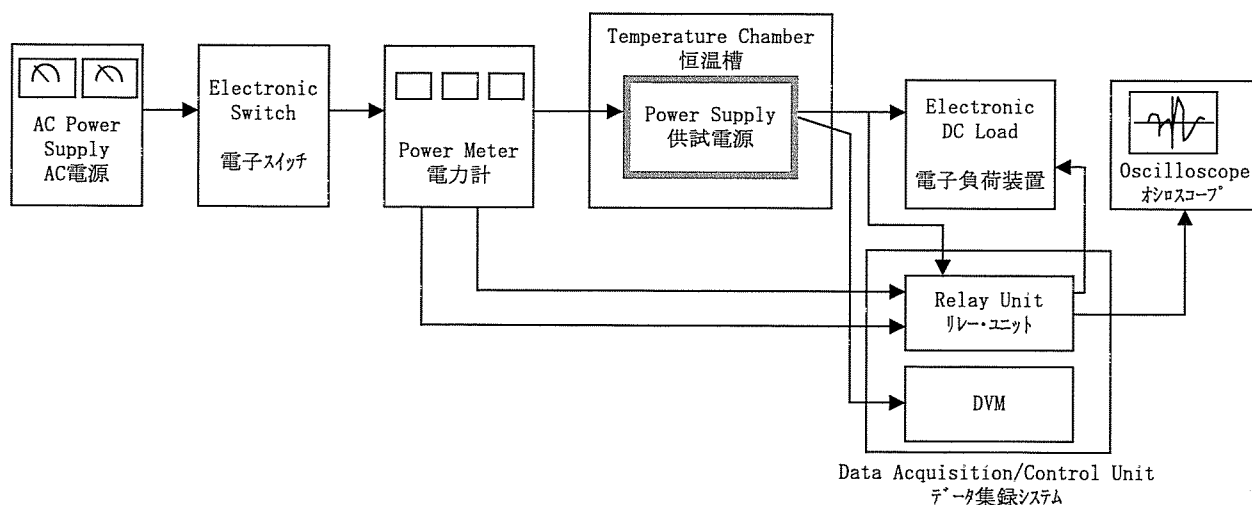


Figure A

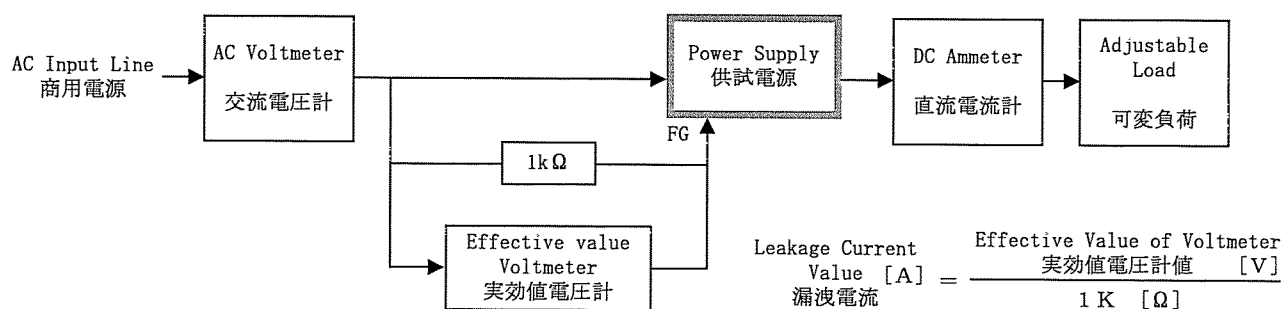


Figure B (DEN-AN)

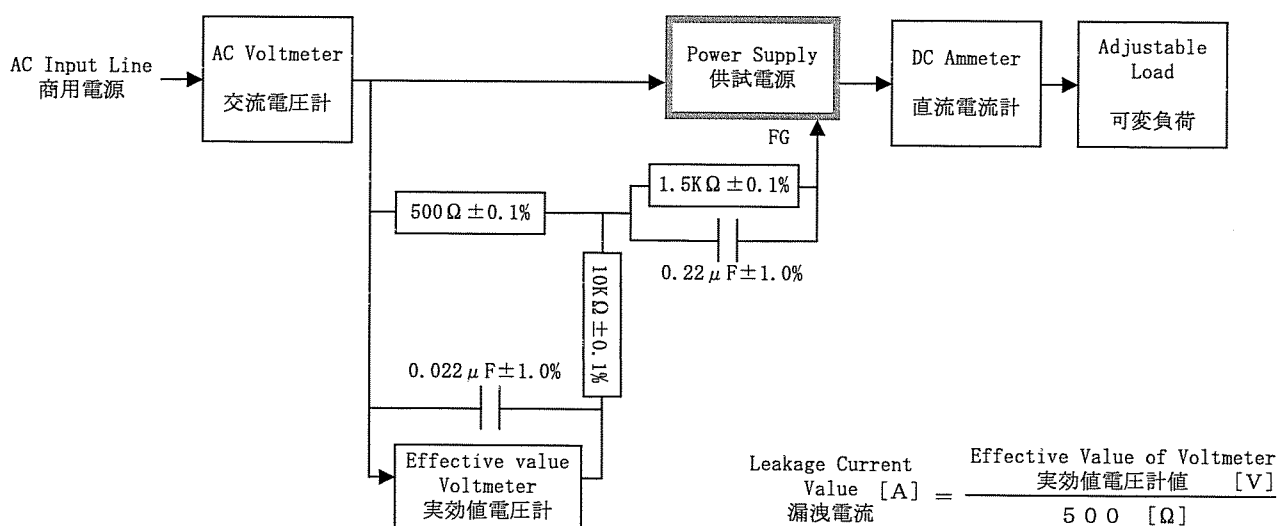


Figure B (IEC60950)

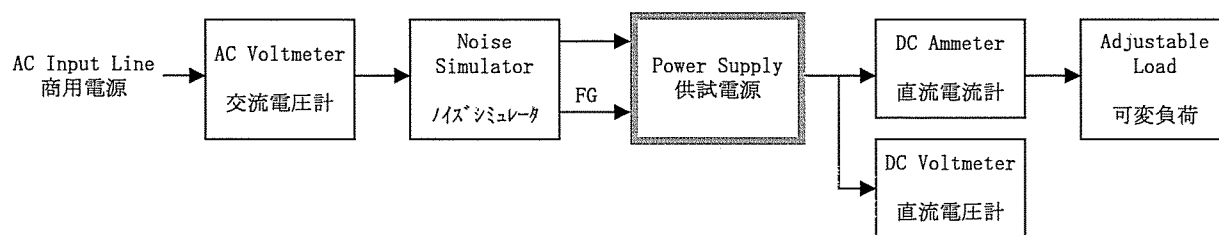


Figure C

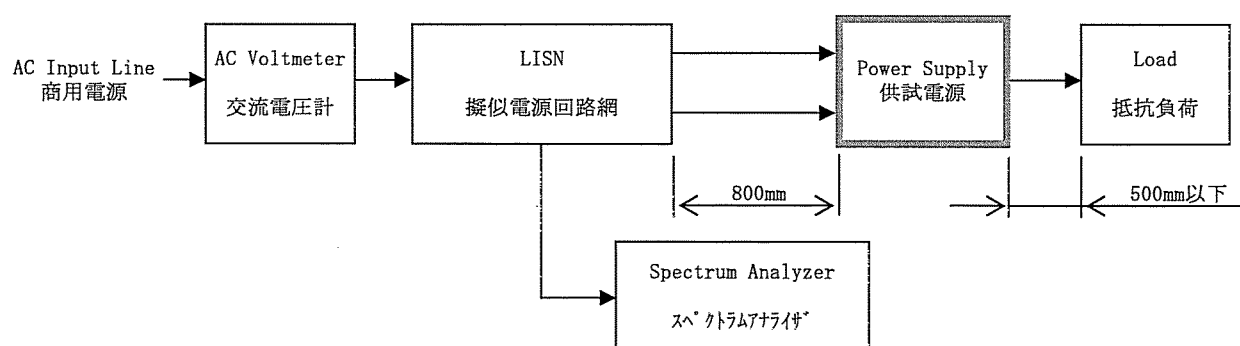


Figure D

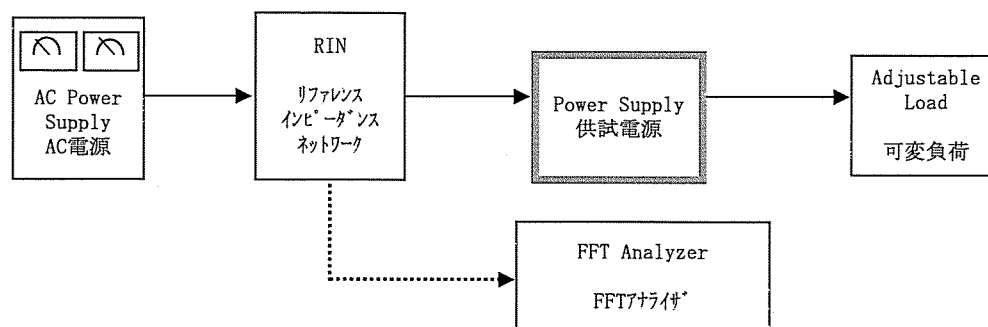


Figure E