

TEST DATA OF LEP100F-48

(100V INPUT)

Regulated DC Power Supply

Dec. 12. 2002

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コーワセル株式会社
COSEL CO.,LTD.



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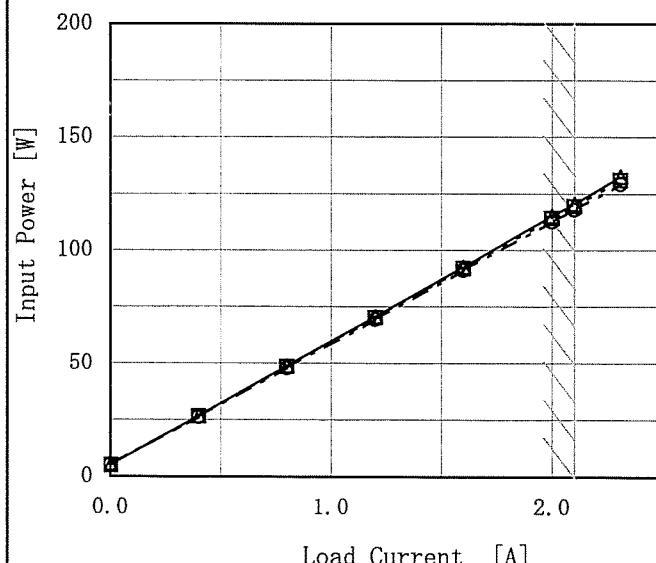
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Model	LEP100F-48	Temperature Testing Circuitry 25°C Figure A																																
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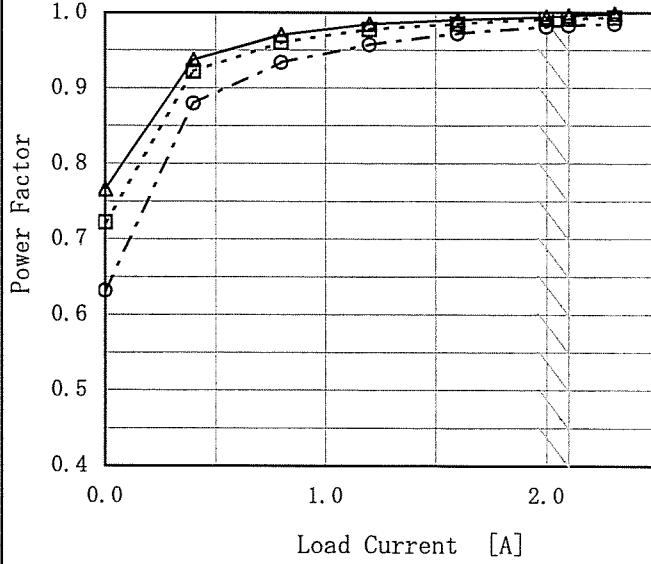
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<p>Note: Slanted line shows the range of the rated load current.</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>																																																					



Model	LEP100F-48	Temperature	25°C																																
Item	Hold-Up Time 出力保持時間	Testing Circuitry	Figure A																																
Object	+48V2.1A																																		
1. Graph			2. Values																																
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Input Voltage [V]	Hold-Up Time [ms]																																		
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110	68	31																																	
120	70	33																																	
132	71	34																																	
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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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Model	LEP100F-48	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation 瞬時停電保障	Testing Circuitry	Figure A																																																			
Object	+48V2.1A																																																					
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Load Current [A]	Time [mS]																																																					
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Model	LEP100F-48	Temperature Testing Circuitry	25°C Figure A																																															
Item	Load Regulation 静的負荷変動																																																	
Object	+48V2.1A																																																	
1. Graph	<p>—△— Input Volt. 85V - - -□- - Input Volt. 100V - - ○- - Input Volt. 132V</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (85V)</th> <th>Output Voltage [V] (100V)</th> <th>Output Voltage [V] (132V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>48.040</td><td>48.040</td><td>48.040</td></tr> <tr><td>0.40</td><td>48.035</td><td>48.034</td><td>48.034</td></tr> <tr><td>0.80</td><td>48.034</td><td>48.034</td><td>48.033</td></tr> <tr><td>1.20</td><td>48.033</td><td>48.033</td><td>48.032</td></tr> <tr><td>1.60</td><td>48.032</td><td>48.032</td><td>48.032</td></tr> <tr><td>2.00</td><td>48.032</td><td>48.031</td><td>48.032</td></tr> <tr><td>2.10</td><td>48.032</td><td>48.031</td><td>48.031</td></tr> <tr><td>2.31</td><td>48.031</td><td>48.031</td><td>48.031</td></tr> </tbody> </table>			Load Current [A]	Output Voltage [V] (85V)	Output Voltage [V] (100V)	Output Voltage [V] (132V)	0.00	48.040	48.040	48.040	0.40	48.035	48.034	48.034	0.80	48.034	48.034	48.033	1.20	48.033	48.033	48.032	1.60	48.032	48.032	48.032	2.00	48.032	48.031	48.032	2.10	48.032	48.031	48.031	2.31	48.031	48.031	48.031											
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Note: Slanted line shows the range of the rated load current.

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Model	LEP100F-48																																						
Item	Ripple Voltage (by Load Current) リップル電圧 (負荷特性)	Temperature 25°C Testing Circuitry Figure A																																					
Object	+48V2.1A																																						
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Model	LEP100F-48	Temperature	25°C																																						
Item	Ripple-Noise リップルノイズ	Testing Circuitry	Figure A																																						
Object	+48V2.1A																																								
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Model	LEP100F-48	Temperature	25°C																																																												
Item	Overcurrent Protection 過電流保護	Testing Circuitry	Figure A																																																												
Object	+48V 2.1A																																																														
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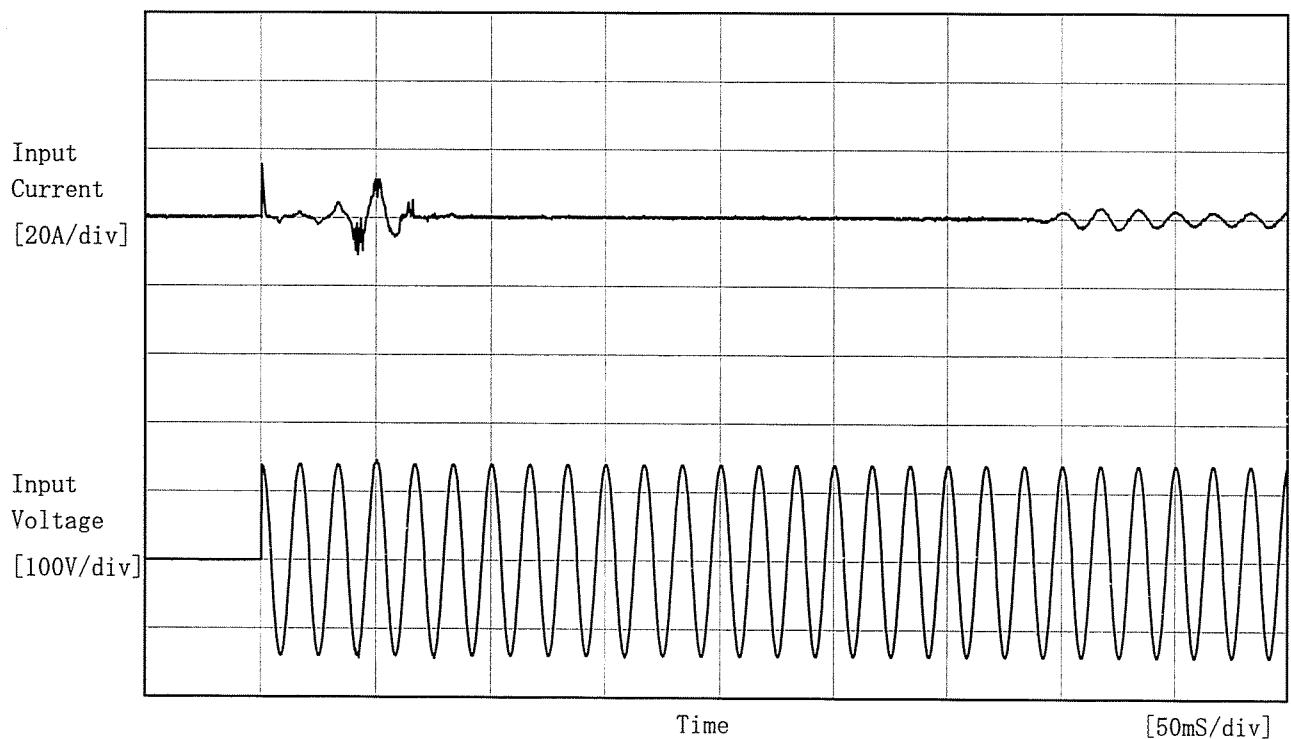
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Item	Overvoltage Protection 過電圧保護																																															
Object	+48V2.1A																																															
1. Graph	<p>—▲— Input Volt. 85V - - - □ - - Input Volt. 100V - - ○ - - Input Volt. 132V</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Operating Point [V] (85V)</th> <th>Operating Point [V] (100V)</th> <th>Operating Point [V] (132V)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>59.56</td><td>59.32</td><td>59.32</td></tr> <tr><td>-10</td><td>60.39</td><td>60.16</td><td>60.04</td></tr> <tr><td>0</td><td>60.45</td><td>60.51</td><td>60.51</td></tr> <tr><td>10</td><td>60.98</td><td>61.04</td><td>61.10</td></tr> <tr><td>25</td><td>62.21</td><td>62.04</td><td>61.98</td></tr> <tr><td>40</td><td>62.62</td><td>62.62</td><td>62.68</td></tr> <tr><td>45</td><td>62.86</td><td>62.86</td><td>62.92</td></tr> <tr><td>50</td><td>63.56</td><td>63.33</td><td>63.27</td></tr> <tr><td>60</td><td>63.61</td><td>63.67</td><td>63.67</td></tr> <tr><td>70</td><td>64.20</td><td>64.20</td><td>64.20</td></tr> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V] (85V)	Operating Point [V] (100V)	Operating Point [V] (132V)	-20	59.56	59.32	59.32	-10	60.39	60.16	60.04	0	60.45	60.51	60.51	10	60.98	61.04	61.10	25	62.21	62.04	61.98	40	62.62	62.62	62.68	45	62.86	62.86	62.92	50	63.56	63.33	63.27	60	63.61	63.67	63.67	70	64.20	64.20	64.20			
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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

Model	LEP100F-48	Temperature	25°C
Item	Inrush Current 突入電流	Testing Circuitry	Figure A
Object	—		



Input Voltage 100 V

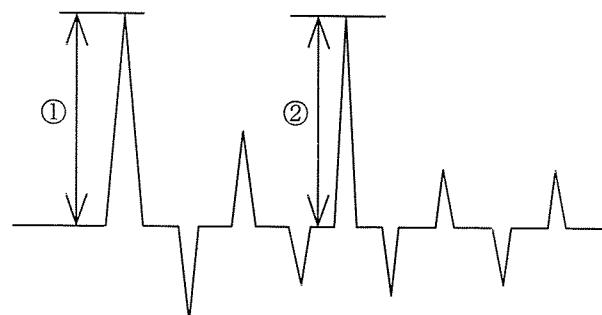
Frequency 60 Hz

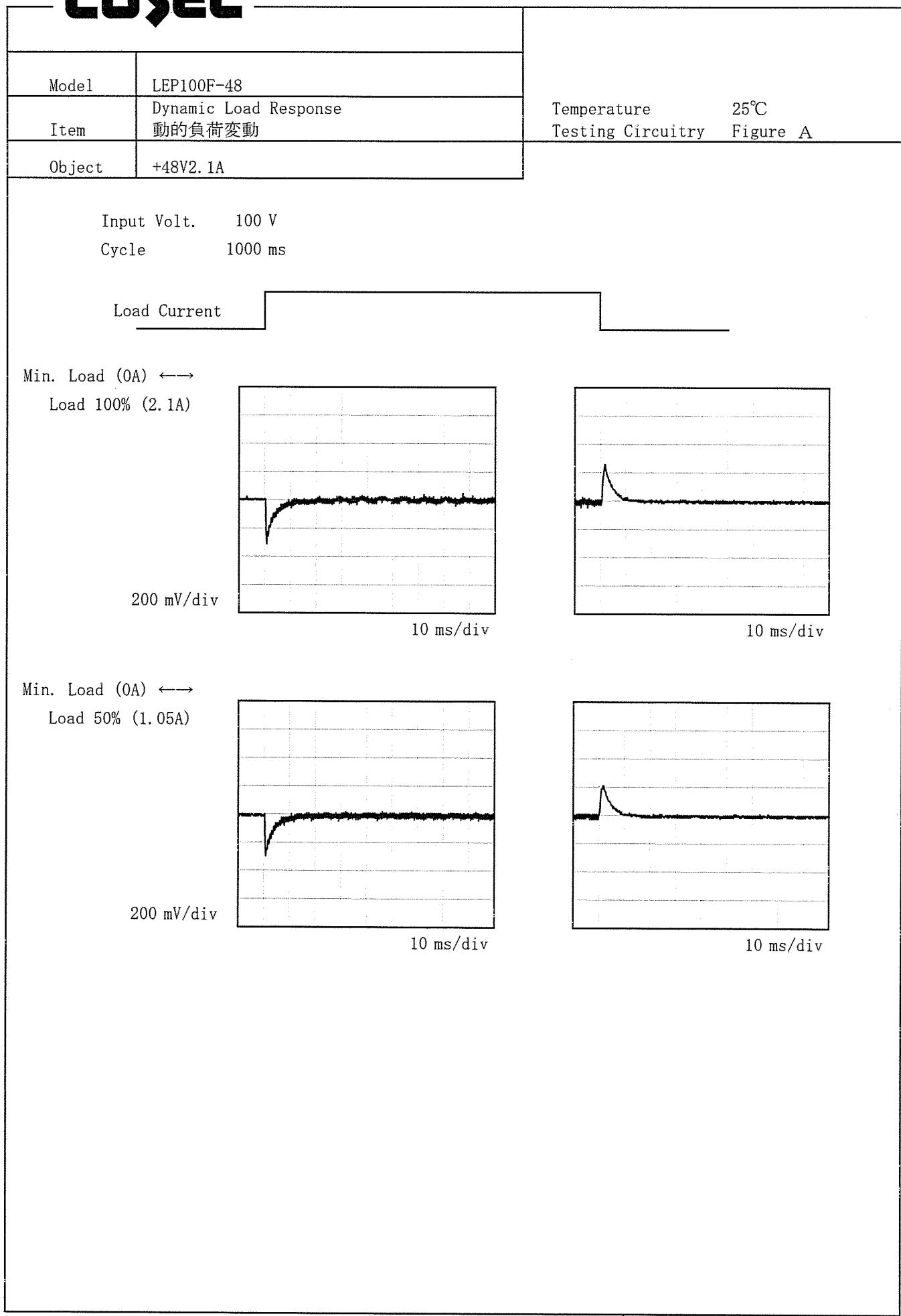
Load 100 %

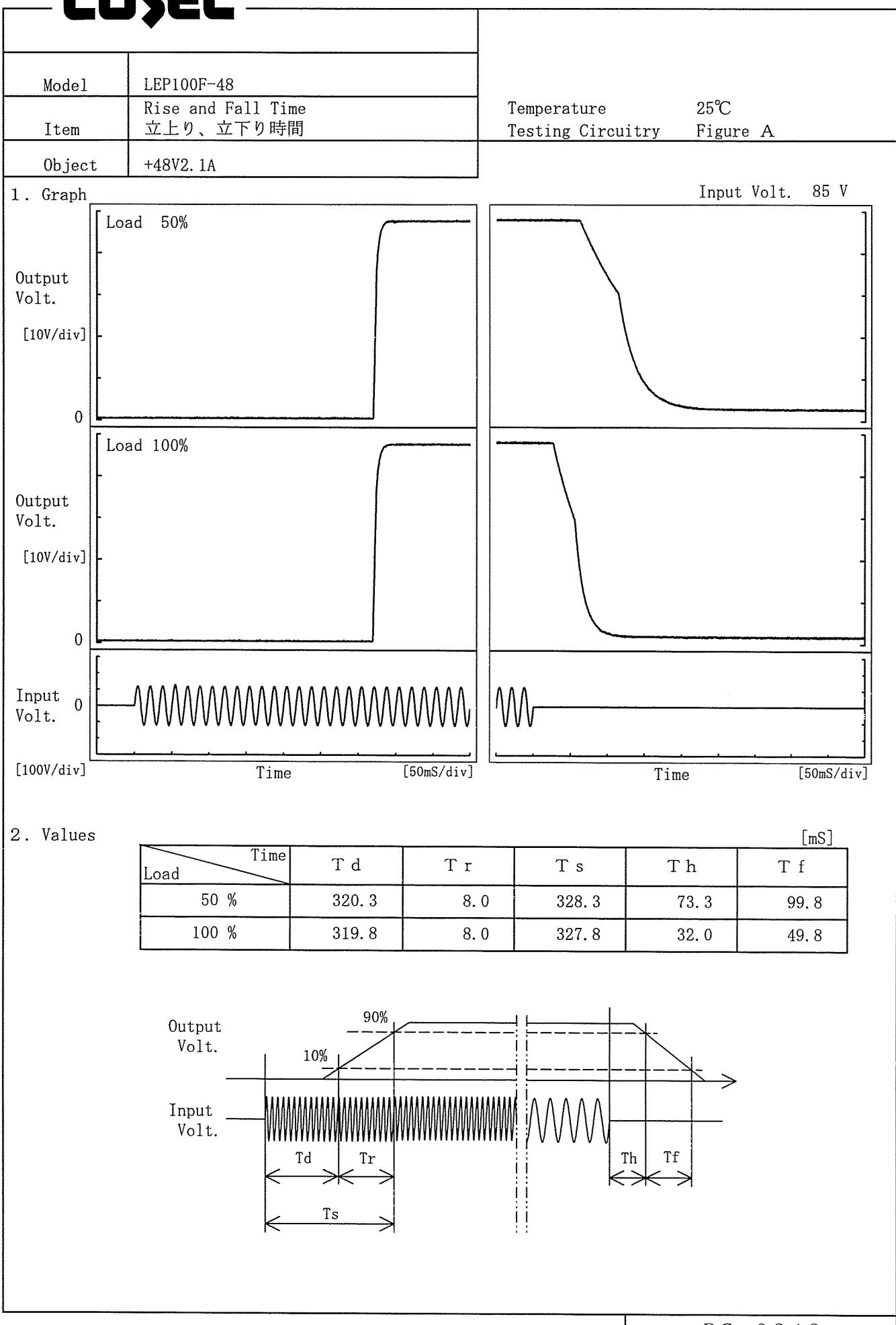
Inrush Current

① 15.4 [A]

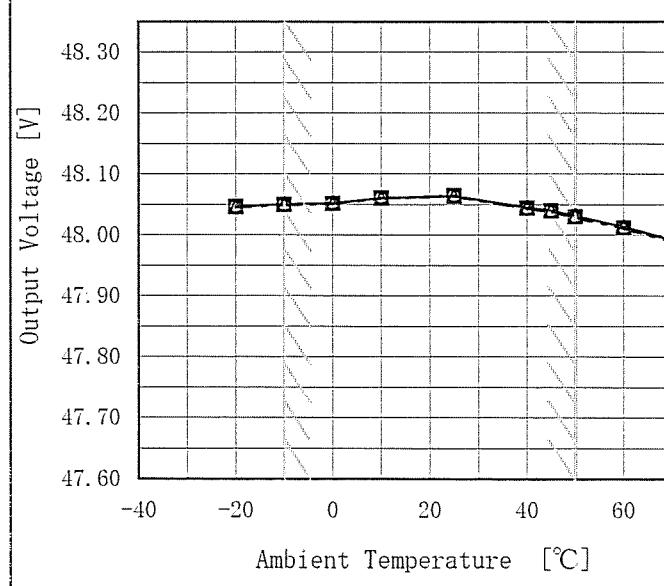
② 11.0 [A]



COSEL

COSEL

COSEL

Model	LEP100F-48
Item	Ambient Temperature Drift 周囲温度変動
Object	+48V2.1A
1. Graph	
<p style="text-align: center;"> —△— Input Volt. 85V ---□--- Input Volt. 100V ---○--- Input Volt. 132V </p>  <p style="text-align: center;">Output Voltage [V]</p> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Load 100%</p>	
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

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	48.046	48.046	48.046
-10	48.051	48.050	48.049
0	48.052	48.052	48.052
10	48.061	48.061	48.061
25	48.064	48.065	48.064
40	48.045	48.044	48.043
45	48.041	48.040	48.039
50	48.032	48.030	48.029
60	48.014	48.012	48.011
70	47.992	47.991	47.989
--	—	—	—

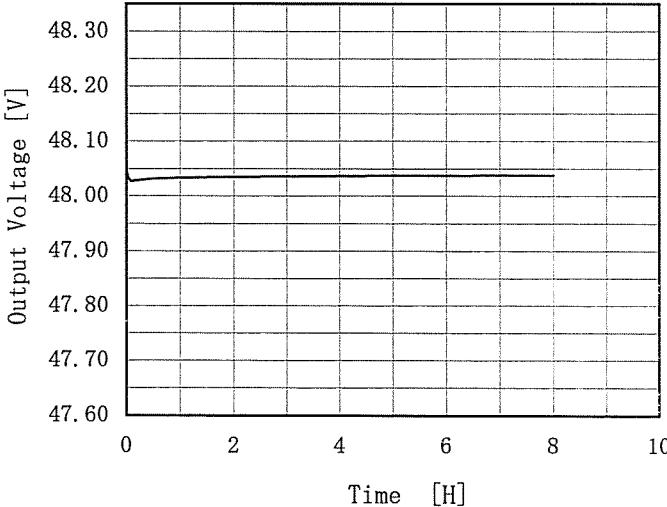
COSEL

Model	LEP100F-48	Testing Circuitry Figure A	
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧	2. Values	
Object	+48V2.1A	Ambient Temperature [°C]	Input Voltage [V]
1. Graph	<p>Input Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Legend:</p> <ul style="list-style-type: none"> Load 50% (Dashed line with squares) Load 100% (Solid line with triangles) 	Ambient Temperature [°C]	Input Voltage [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。			

COSEL

Model	LEP100F-48																																							
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)	Testing Circuitry Figure A																																						
Object	+48V2.1A																																							
1. Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C] for LEP100F-48 at Input Volt. 100V. The graph shows two sets of data points: Load 50% (represented by squares) and Load 100% (represented by triangles). Both series show a decreasing trend as ambient temperature increases from -20°C to 70°C. A dashed diagonal line indicates the rated ambient temperature range.</p>																																								
<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>-20</td> <td>170</td> <td>190</td> </tr> <tr> <td>-10</td> <td>125</td> <td>140</td> </tr> <tr> <td>0</td> <td>90</td> <td>100</td> </tr> <tr> <td>10</td> <td>75</td> <td>85</td> </tr> <tr> <td>25</td> <td>45</td> <td>55</td> </tr> <tr> <td>40</td> <td>40</td> <td>50</td> </tr> <tr> <td>45</td> <td>40</td> <td>45</td> </tr> <tr> <td>50</td> <td>40</td> <td>45</td> </tr> <tr> <td>60</td> <td>35</td> <td>40</td> </tr> <tr> <td>70</td> <td>35</td> <td>40</td> </tr> <tr> <td>--</td> <td>—</td> <td>—</td> </tr> </tbody> </table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-20	170	190	-10	125	140	0	90	100	10	75	85	25	45	55	40	40	50	45	40	45	50	40	45	60	35	40	70	35	40	--	—	—	
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COSEL

Model	LEP100F-48	Temperature Testing Circuitry 25°C Figure A																						
Item	Time Lapse Drift 経時ドリフト																							
Object	+48V2.1A																							
1. Graph		2. Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 100V Load 100%</p>		<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>48.048</td></tr> <tr><td>0.5</td><td>48.032</td></tr> <tr><td>1.0</td><td>48.034</td></tr> <tr><td>2.0</td><td>48.036</td></tr> <tr><td>3.0</td><td>48.037</td></tr> <tr><td>4.0</td><td>48.038</td></tr> <tr><td>5.0</td><td>48.038</td></tr> <tr><td>6.0</td><td>48.038</td></tr> <tr><td>7.0</td><td>48.038</td></tr> <tr><td>8.0</td><td>48.039</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	48.048	0.5	48.032	1.0	48.034	2.0	48.036	3.0	48.037	4.0	48.038	5.0	48.038	6.0	48.038	7.0	48.038	8.0	48.039
Time since start [H]	Output Voltage [V]																							
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6.0	48.038																							
7.0	48.038																							
8.0	48.039																							



Model	LEP100F-48	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+48V2.1A	

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 ~ 2.1A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

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 ~ 2.1A

* 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

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

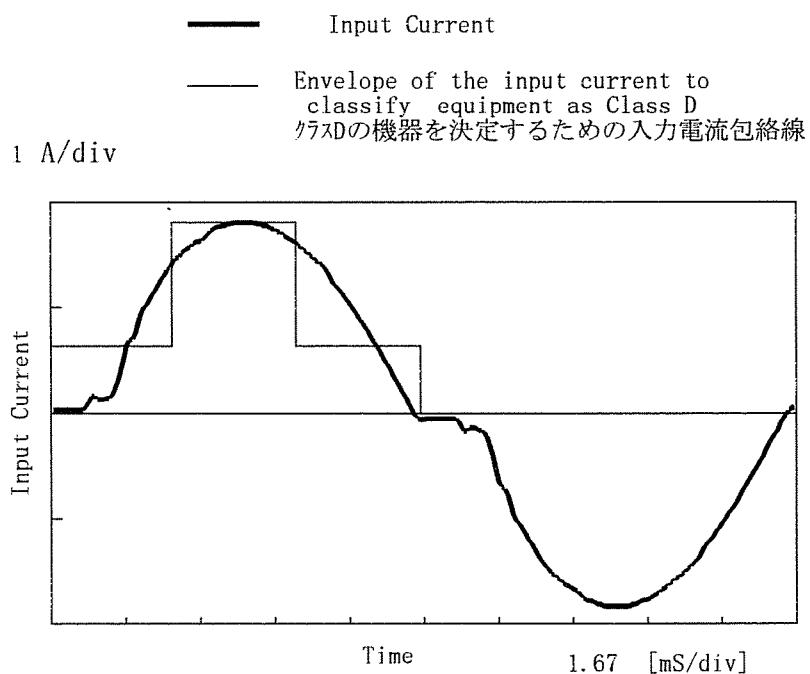
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	85	0	48.086	±19	±0.1
Minimum Voltage	50	132	2.1	48.048		

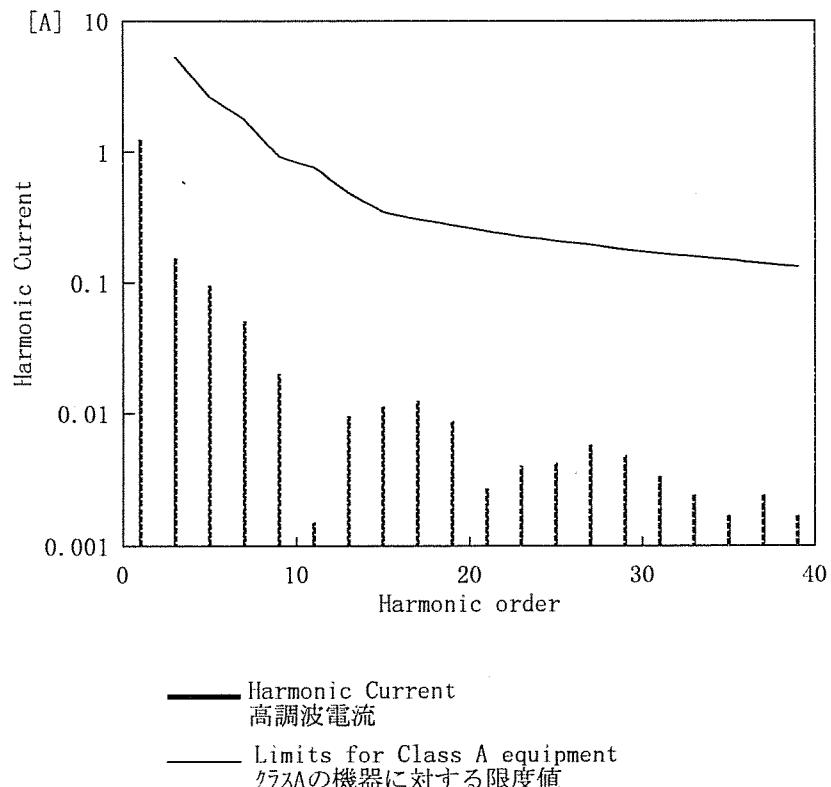
COSEL

Model	LEP100F-48	Temperature	25°C
Item	Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object	—		

1. Input Current Waveform



2. Harmonic Current



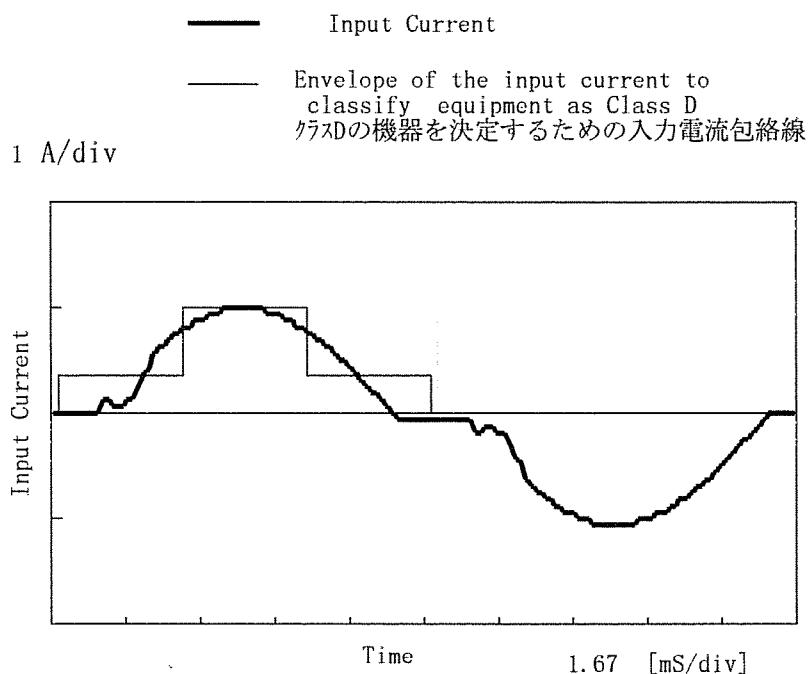
Conditions	Values
Input Voltage [V]	99.9
Input Current [A]	1.277
Active Power [W]	126.2
Apparent Power [VA]	127.6
Frequency [Hz]	60
Power Factor	0.989
Output Power [W]	100.8

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	1.26300
2	—	0.00060
3	0.15340	5.29530
4	—	0.00030
5	0.09550	2.62462
6	—	0.00030
7	0.05110	1.77277
8	—	0.00010
9	0.02020	0.92092
10	—	0.00010
11	0.00150	0.75976
12	—	0.00010
13	0.00960	0.48348
14	—	0.00010
15	0.01130	0.34535
16	—	0.00000
17	0.01250	0.30472
18	—	0.00000
19	0.00870	0.27264
20	—	0.00010
21	0.00270	0.24668
22	—	0.00010
23	0.00400	0.22523
24	—	0.00000
25	0.00420	0.20721
26	—	0.00010
27	0.00570	0.19186
28	—	0.00000
29	0.00480	0.17863
30	—	0.00010
31	0.00330	0.16710
32	—	0.00000
33	0.00240	0.15698
34	—	0.00000
35	0.00170	0.14801
36	—	0.00000
37	0.00240	0.14000
38	—	0.00000
39	0.00170	0.13283
40	—	0.00000

COSEL

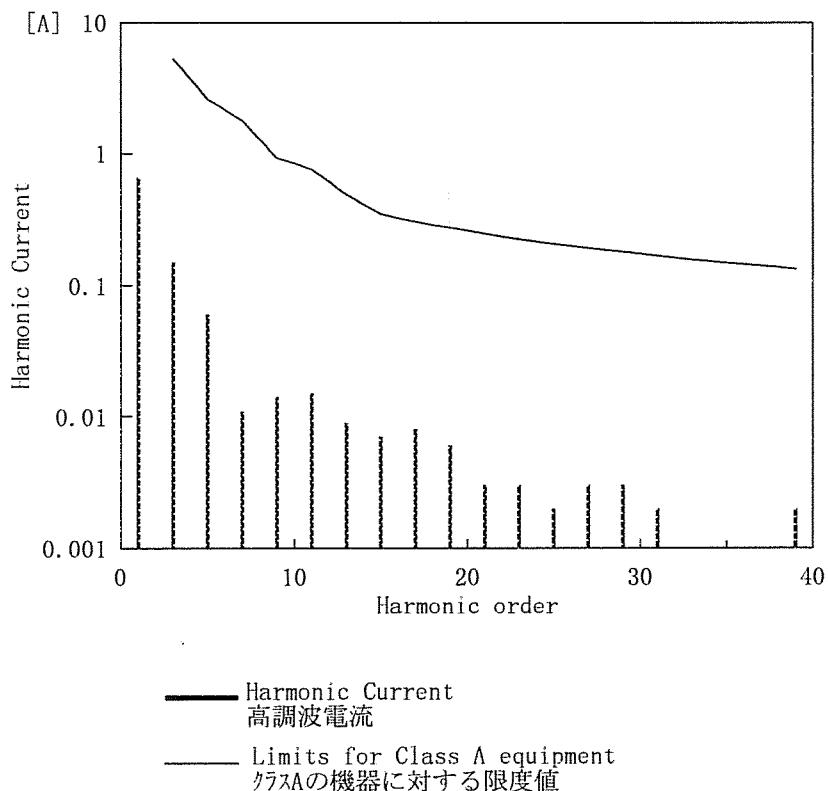
Model	LEP100F-48	Temperature Testing Circuitry	25°C Figure E
Item	Harmonic Current 高調波電流		
Object	_____		

1. Input Current Waveform



Conditions	Values
Input Voltage [V]	100.2
Input Current [A]	0.677
Active Power [W]	65.6
Apparent Power [VA]	67.9
Frequency [Hz]	60
Power Factor	0.966
Output Power [W]	50.4

2. Harmonic Current



Harmonics order	Limits 限度値 [A]	Values 測定値 [A]
1	—	0.65600
2	—	0.00100
3	5.27944	0.15100
4	—	0.00000
5	2.61677	0.06000
6	—	0.00000
7	1.76747	0.01100
8	—	0.00000
9	0.91816	0.01400
10	—	0.00000
11	0.75749	0.01500
12	—	0.00000
13	0.48204	0.00900
14	—	0.00000
15	0.34431	0.00700
16	—	0.00000
17	0.30380	0.00800
18	—	0.00100
19	0.27182	0.00600
20	—	0.00100
21	0.24594	0.00300
22	—	0.00100
23	0.22455	0.00300
24	—	0.00000
25	0.20659	0.00200
26	—	0.00100
27	0.19128	0.00300
28	—	0.00000
29	0.17809	0.00300
30	—	0.00100
31	0.16660	0.00200
32	—	0.00000
33	0.15651	0.00100
34	—	0.00000
35	0.14756	0.00100
36	—	0.00000
37	0.13959	0.00100
38	—	0.00000
39	0.13243	0.00200
40	—	0.00100



Model	LEP100F-48	
Item	Condense 結露特性	Testing Circuitry Figure A
Object	+48V2.1A	

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]	48.031	Input Volt.:100V, Load Current.:2.1A
Line Regulation [mV]	3	Input Volt.:85~132V, Load Current.:2.1A
Load Regulation [mV]	9	Input Volt.:100V, Load Current.:0~2.1A



Model	LEP100F-48	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) DEN-AN	0.17	0.19	0.25
(B) IEC60950	0.17	0.20	0.25

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。



Model	LEP100F-48	Temperature	25°C
Item	Line Noise Tolerance 入力雑音耐量	Testing Circuitry	Figure C
Object	+48V2.1A		

1. Conditions

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

2. 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
		POLARITY		
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-48	Temperature	25°C
Item	Conducted Emission 雜音端子電圧	Testing Circuitry	Figure D
Object	_____		

1. Graph

Remarks

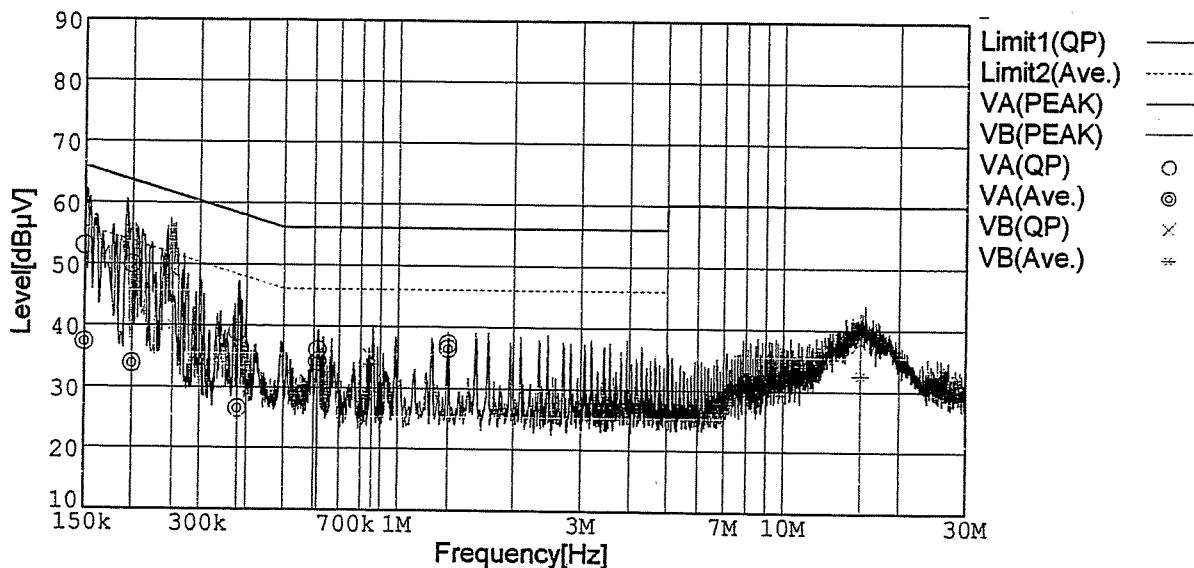
Input Volt. 100V (VCCI Class B)

120V (FCC Class B)

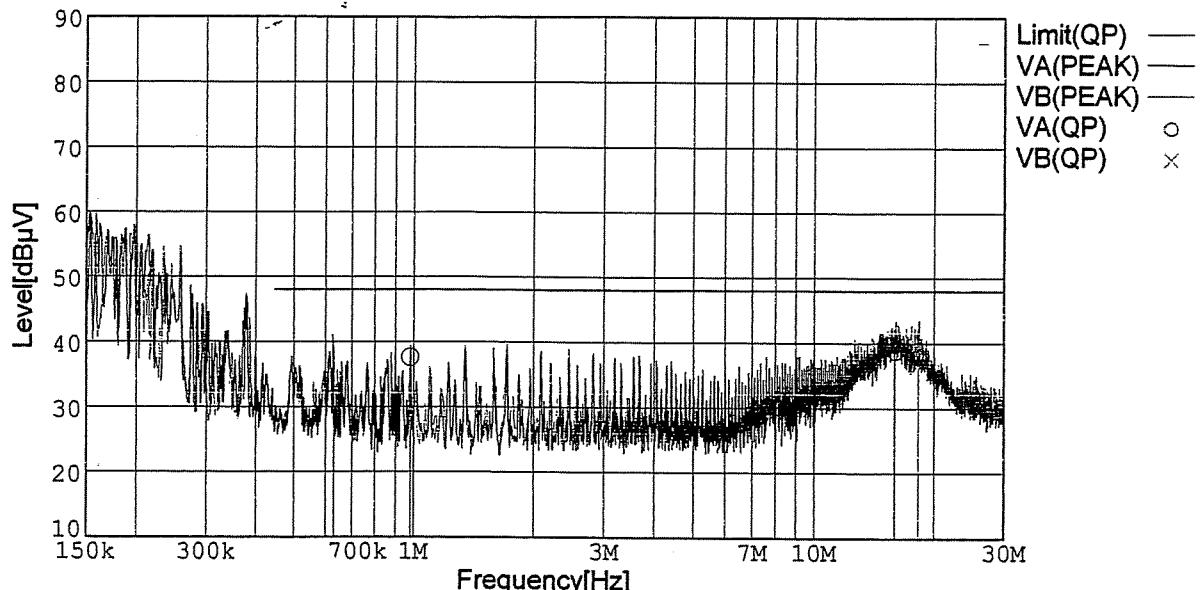
Load 100%

Limit1: [VCCI] Class B(QP)

Limit2: [VCCI] Class B(Ave.)



Limit: [FCC Part15] Class B



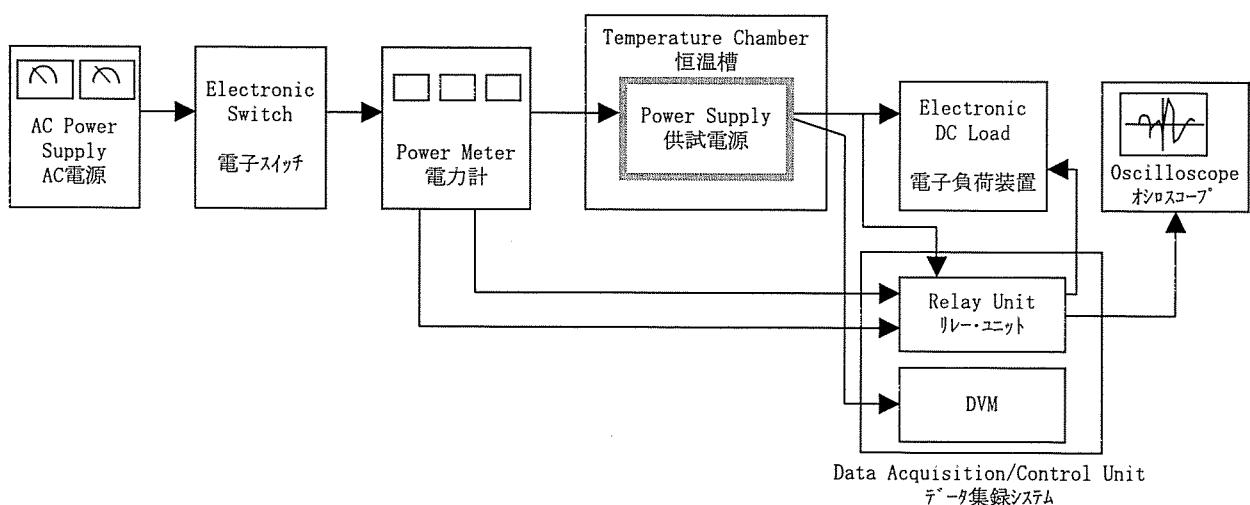


Figure A

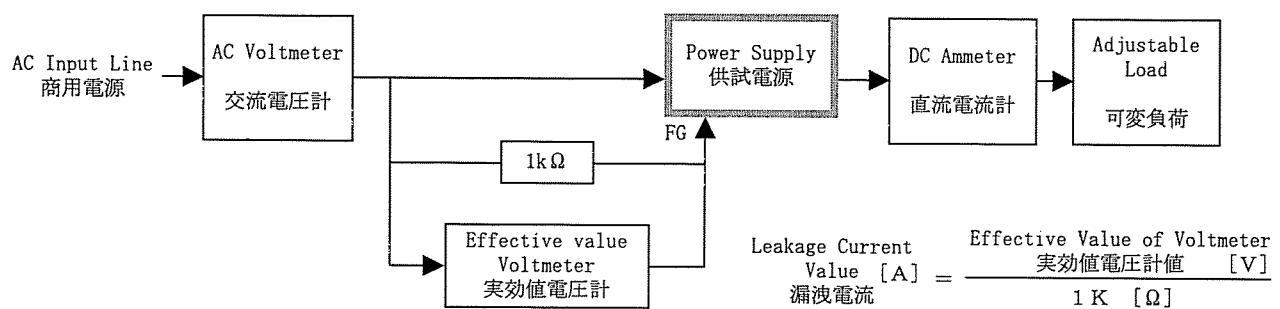


Figure B (DEN-AN)

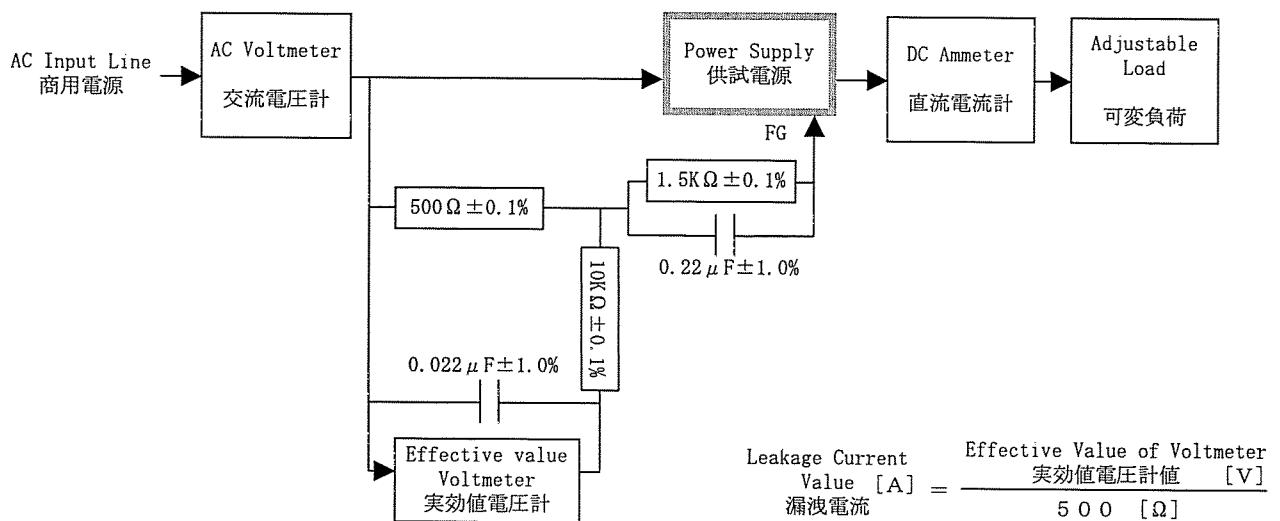


Figure B (IEC60950)

COSEL

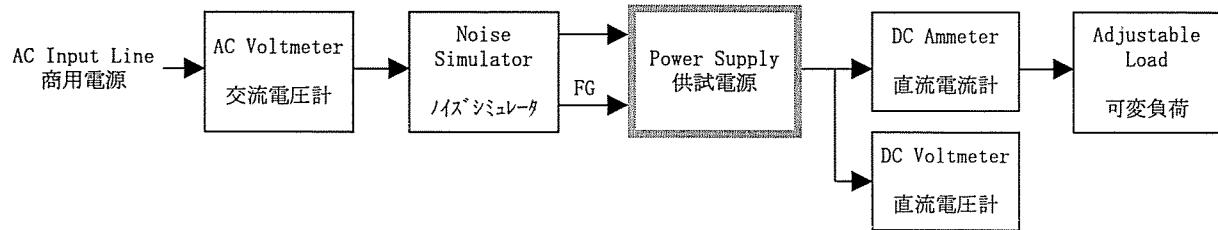


Figure C

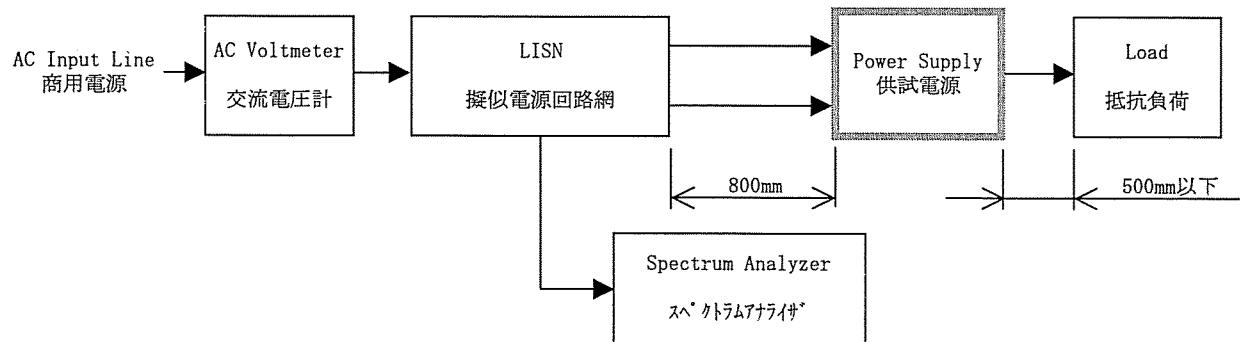


Figure D

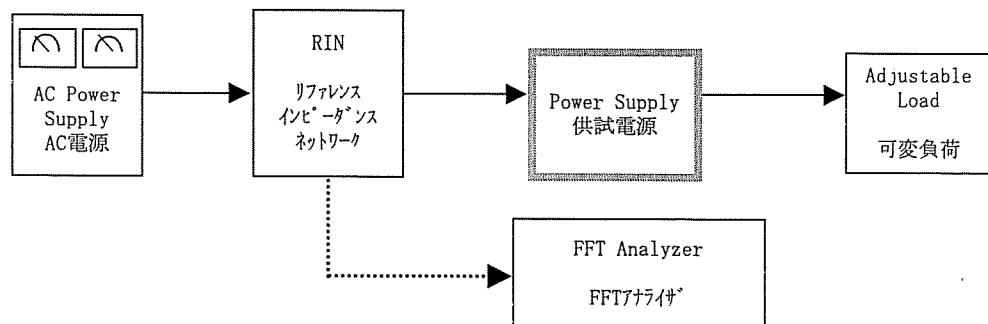


Figure E

*