



TEST DATA OF LCA100S-12

(100V INPUT)

Regulated DC Power Supply

Date : Aug. 25. 1999

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Design Manager

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Design Engineer

コーセル株式会社
COSEL CO., LTD.

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Model		LCA100S-12		Temperature Testing Circuitry	25℃ Figure A																																
Item		Line Regulation 静的入力変動																																			
Object		+12.0V8.5A																																			
1. Graph				2. Values																																	
<div><div><div>□</div><div>Load 50%</div></div><div><div>△</div><div>Load 100%</div></div></div> <div><div><div>Output Voltage [V]</div><div><div><div>12.10</div><div>12.08</div><div>12.06</div><div>12.04</div><div>12.02</div><div>12.00</div><div>11.98</div><div>0</div></div><div><div>0</div><div>80</div><div>90</div><div>100</div><div>110</div><div>120</div><div>130</div><div>140</div><div>150</div></div></div><div><div>Input Voltage [V]</div></div></div></div> <div><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></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>12.029</td><td>12.030</td></tr><tr><td>80</td><td>12.029</td><td>12.030</td></tr><tr><td>85</td><td>12.029</td><td>12.030</td></tr><tr><td>90</td><td>12.029</td><td>12.030</td></tr><tr><td>100</td><td>12.029</td><td>12.030</td></tr><tr><td>110</td><td>12.028</td><td>12.030</td></tr><tr><td>120</td><td>12.028</td><td>12.030</td></tr><tr><td>132</td><td>12.028</td><td>12.030</td></tr><tr><td>140</td><td>12.028</td><td>12.030</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	12.029	12.030	80	12.029	12.030	85	12.029	12.030	90	12.029	12.030	100	12.029	12.030	110	12.028	12.030	120	12.028	12.030	132	12.028	12.030	140	12.028	12.030
Input Voltage [V]	Output Voltage [V]																																				
	Load 50%	Load 100%																																			
75	12.029	12.030																																			
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Model		LCA100S-12	
Item		Input Current (by Load Current) 入力電流 (負荷特性)	
Output		_____	

1. Graph

△

 Input Volt. 85V

□

 Input Volt. 100V

○

 Input Volt. 132V

Input Current [A]

5

4

3

2

1

0

0

2

4

6

8

10

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	0.068	0.072	0.077
1.50	0.641	0.584	0.509
3.00	1.107	0.997	0.844
4.50	1.546	1.388	1.162
6.00	1.968	1.762	1.469
7.50	2.383	2.130	1.767
8.50	2.654	2.370	1.962
9.35	2.886	2.574	2.128
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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Model		LCA100S-12		Temperature		25℃																																																								
Item		Input Power (by Load Current) 入力電力 (負荷特性)		Testing Circuitry		Figure A																																																								
Output		—————																																																												
1. Graph				2. Values																																																										
<div><div>—△—</div><div>- - -□- - -</div><div>○</div></div> <div><div>Input Volt. 85V</div><div>Input Volt. 100V</div><div>Input Volt. 132V</div></div> <p>Input Power [W]</p> <p>Load Current [A]</p> <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>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.00</td><td>1.96</td><td>2.35</td><td>3.10</td></tr><tr><td>1.50</td><td>23.52</td><td>24.16</td><td>25.94</td></tr><tr><td>3.00</td><td>44.23</td><td>44.69</td><td>46.30</td></tr><tr><td>4.50</td><td>65.40</td><td>65.66</td><td>66.90</td></tr><tr><td>6.00</td><td>87.00</td><td>86.90</td><td>87.90</td></tr><tr><td>7.50</td><td>109.20</td><td>108.70</td><td>109.10</td></tr><tr><td>8.50</td><td>124.20</td><td>123.40</td><td>123.40</td></tr><tr><td>9.35</td><td>137.20</td><td>136.20</td><td>135.80</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current [A]	Input Power [W]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.00	1.96	2.35	3.10	1.50	23.52	24.16	25.94	3.00	44.23	44.69	46.30	4.50	65.40	65.66	66.90	6.00	87.00	86.90	87.90	7.50	109.20	108.70	109.10	8.50	124.20	123.40	123.40	9.35	137.20	136.20	135.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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Model		LCA100S-12		Temperature 25℃																																	
Item		Efficiency 効率		Testing Circuitry Figure A																																	
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Input Voltage [V]	Efficiency [%]																																				
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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>																																					

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Model

LCA100S-12

Item

Efficiency (by Load Current)
効率 (負荷電流特性)

Output

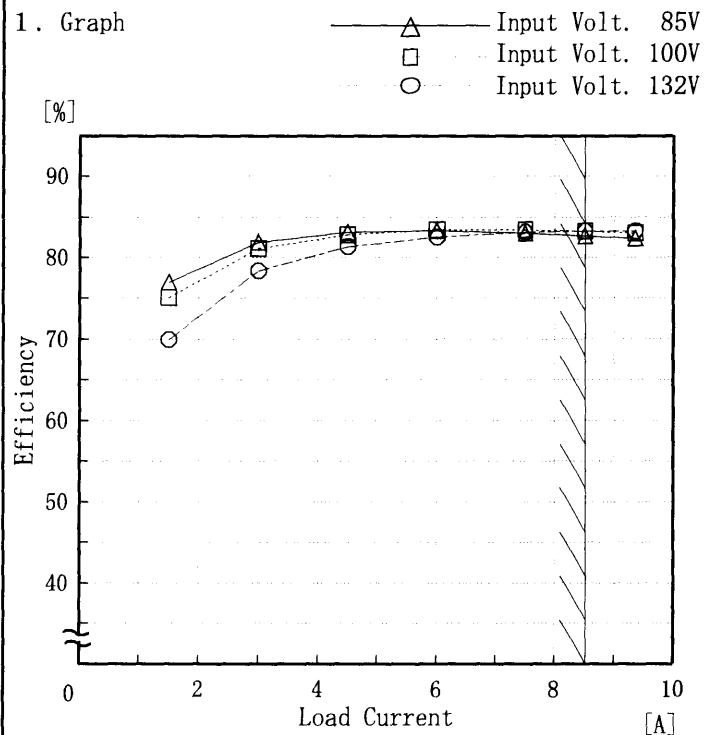
Temperature

25°C

Testing Circuitry

Figure A

1. Graph



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]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
1.50	77.0	75.1	69.9
3.00	81.9	81.1	78.3
4.50	83.2	82.9	81.4
6.00	83.3	83.4	82.5
7.50	83.0	83.4	83.1
8.50	82.7	83.3	83.3
9.35	82.4	83.0	83.3
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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Model LCA100S-12

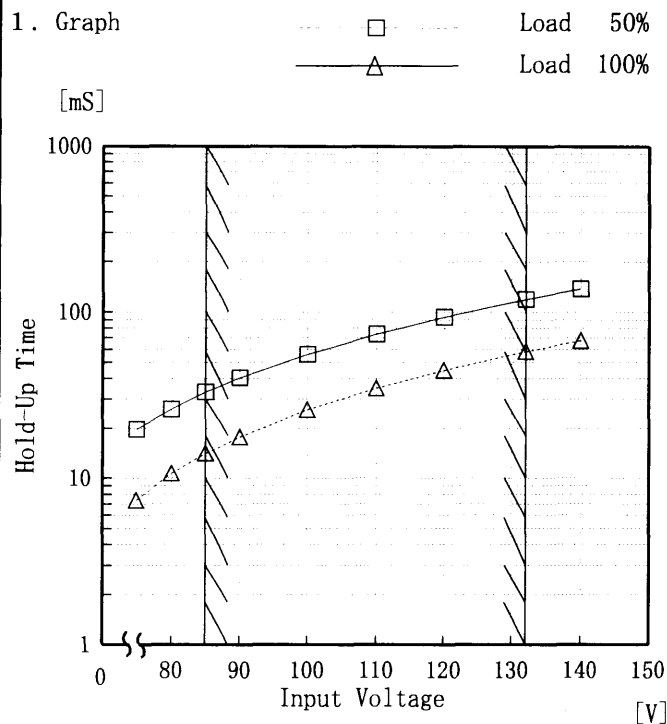
Item Hold-Up Time 出力保持時間

Object +12.0V8.5A

Temperature 25°C

Testing Circuitry Figure A

1. Graph



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。

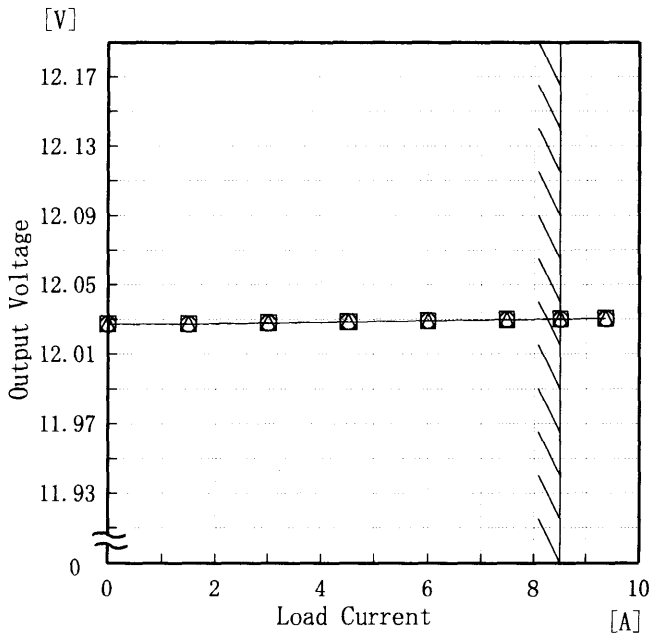
2. Values

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	20	7
80	26	11
85	33	14
90	40	18
100	56	26
110	74	35
120	94	45
132	119	58
140	138	68

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Model		LCA100S-12		Temperature Testing Circuitry	25℃ Figure A																																																			
Item		Instantaneous Interruption Compensation 瞬時停電保障																																																						
Object		+12.0V8.5A																																																						
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<div><div><div>△</div><div>—</div><div>Input Volt. 85 V</div></div><div><div>□</div><div>- - -</div><div>Input Volt. 100 V</div></div><div><div>○</div><div>· · ·</div><div>Input Volt. 132 V</div></div></div> <div><div><div>[mS]</div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>Instantaneous Compensation Time</div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>[A]</div></div></div> <div><div>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</div><div>Note:Slanted line shows the range of the rated load current.</div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [mS]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.00</td><td>—</td><td>—</td><td>—</td></tr><tr><td>1.50</td><td>87</td><td>148</td><td>313</td></tr><tr><td>3.00</td><td>39</td><td>73</td><td>164</td></tr><tr><td>4.50</td><td>25</td><td>48</td><td>110</td></tr><tr><td>6.00</td><td>19</td><td>36</td><td>81</td></tr><tr><td>7.50</td><td>13</td><td>27</td><td>64</td></tr><tr><td>8.50</td><td>11</td><td>22</td><td>48</td></tr><tr><td>9.35</td><td>5</td><td>20</td><td>48</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>		Load Current [A]	Time [mS]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.00	—	—	—	1.50	87	148	313	3.00	39	73	164	4.50	25	48	110	6.00	19	36	81	7.50	13	27	64	8.50	11	22	48	9.35	5	20	48	—	—	—	—	—	—	—	—	—	—	—	—
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Model		LCA100S-12		Temperature 25℃																																																
Item		Load Regulation 静的負荷変動		Testing Circuitry Figure A																																																
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Model		LCA100S-12		Temperature		25℃																																							
Item		Ripple Voltage (by Load Current) リップル電圧 (負荷電流特性)		Testing Circuitry		Figure A																																							
Object		+12.0V 8.5A																																											
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<div><div>□-----</div>Input Volt. 85V</div> <div><div>△-----</div>Input Volt. 132V</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。</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>				<table><tr><th rowspan="2">Load Current [A]</th><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><th>Ripple Output Volt. [mV]</th><th>Ripple Output Volt. [mV]</th></tr><tr><td>0.00</td><td>10</td><td>10</td></tr><tr><td>1.00</td><td>15</td><td>15</td></tr><tr><td>2.00</td><td>20</td><td>20</td></tr><tr><td>3.00</td><td>20</td><td>20</td></tr><tr><td>4.00</td><td>20</td><td>20</td></tr><tr><td>5.00</td><td>25</td><td>20</td></tr><tr><td>6.00</td><td>25</td><td>25</td></tr><tr><td>7.00</td><td>25</td><td>25</td></tr><tr><td>8.00</td><td>25</td><td>25</td></tr><tr><td>8.50</td><td>25</td><td>25</td></tr><tr><td>9.35</td><td>25</td><td>25</td></tr></table>				Load Current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]	0.00	10	10	1.00	15	15	2.00	20	20	3.00	20	20	4.00	20	20	5.00	25	20	6.00	25	25	7.00	25	25	8.00	25	25	8.50	25	25	9.35	25	25
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4.00	20	20																																											
5.00	25	20																																											
6.00	25	25																																											
7.00	25	25																																											
8.00	25	25																																											
8.50	25	25																																											
9.35	25	25																																											
<p>T1: Due to AC Input Line 入力商用周期</p> <p>T2: Due to Switching スイッチング周期</p> <p>Fig. Complex Ripple Wave Form</p> <p>図 リップル波形詳細図</p>																																													

COSEL

Model		LCA100S-12	
Item		Ripple-Noise リップルノイズ	
Object		+12.0V8.5A	
1. Graph		2. Values	

Input Volt. 85V

Input Volt. 132V

200

180

160

140

120

100

80

60

40

20

0

Ripple-Noise

[mV]

0

2

4

6

8

10

Load Current

[A]

Ripple-Noise is shown as p-p in the figure below.

Note: Slanted line shows the range of the rated load current.

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。

T1: Due to AC Input Line
入力商用周期

T2: Due to Switching
スイッチング周期

Ripple-Noise

[mVp-p]

Fig. Complex Ripple Wave Form

図 リップル波形詳細図

Load current	Input Volt.	Input Volt.
	85 [V]	132 [V]
[A]	Ripple-Noise	Ripple-Noise
	[mV]	[mV]
0.00	20	45
1.00	30	65
2.00	35	65
3.00	40	65
4.00	45	70
5.00	45	70
6.00	50	70
7.00	50	70
8.00	50	70
8.50	55	70
9.35	60	70

COSEL

Model	LCA100S-12	Temperature	25°C
Item	Overcurrent Protection 過電流保護	Testing Circuitry	Figure A
Object	+12.0V8.5A		

1. Graph

Input Volt.85 V

Input Volt.100 V

Input Volt.132 V

[V]

20.0

15.0

10.0

5.0

0.0

Output Voltage

0

2

4

6

8

10

12

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

COSEL

Model LCA100S-12

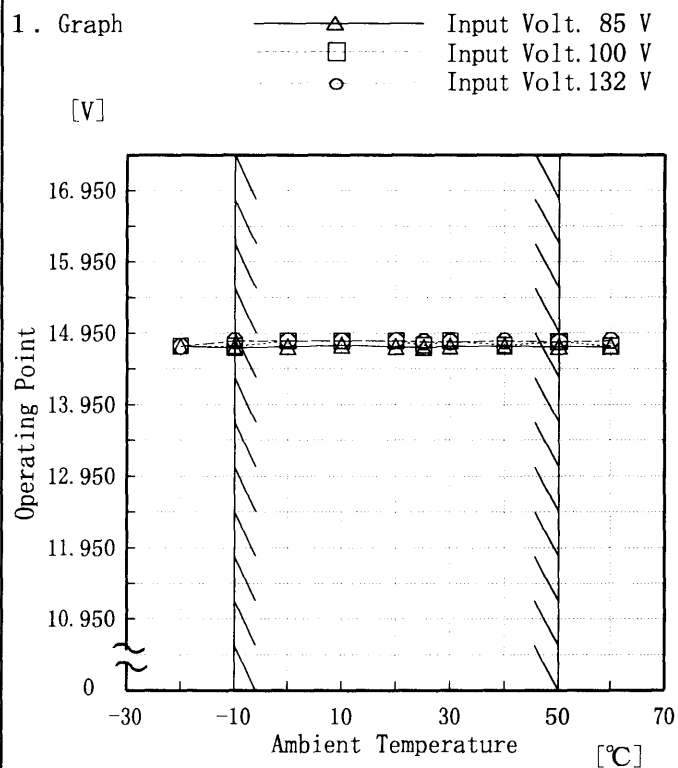
Item Overvoltage Protection

過電圧保護

Object +12.0V8.5A

Testing Circuitry Figure A

1. Graph



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

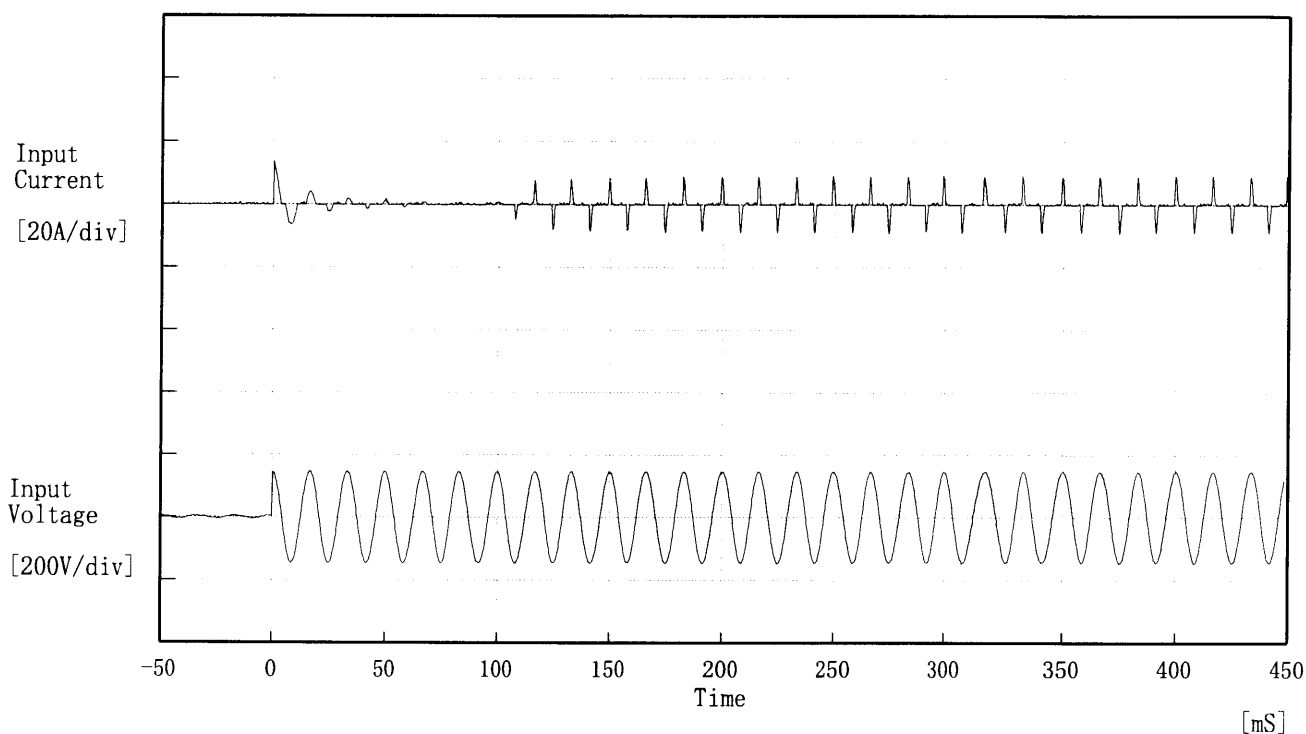
(注)斜線は定格周囲温度範囲を示す。

2. Values

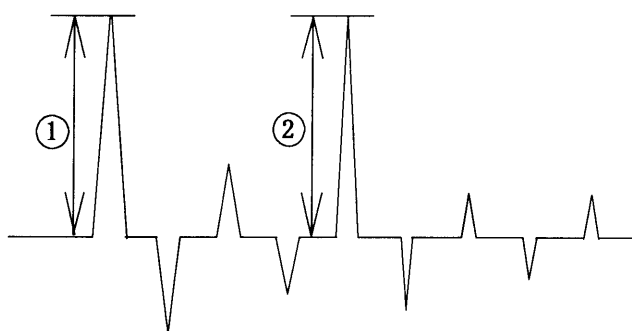
Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
-20	14.77	14.77	14.77
-10	14.75	14.77	14.84
0	14.76	14.84	14.84
10	14.78	14.84	14.84
20	14.76	14.84	14.84
25	14.75	14.78	14.83
30	14.77	14.84	14.83
40	14.77	14.78	14.84
50	14.76	14.83	14.83
60	14.76	14.77	14.84
—	—	—	—

COSEL

Model	LCA100S-12	Temperature 25℃ Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object	_____	



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



COSEL

Model	LCA100S-12	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Responce 動的負荷変動	
Object	+12.0V8.5A	

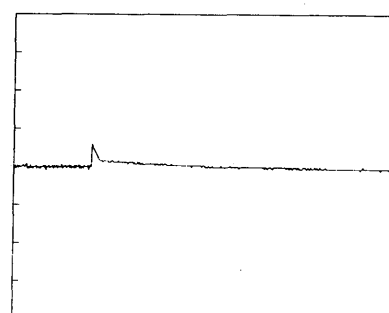
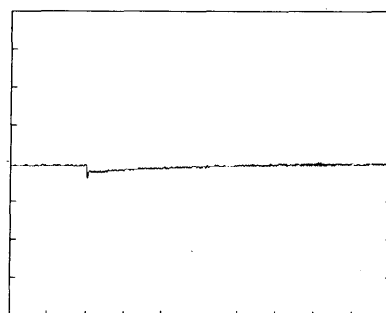
Input Volt. 100 V

Cycle 1000 mS

Load Current

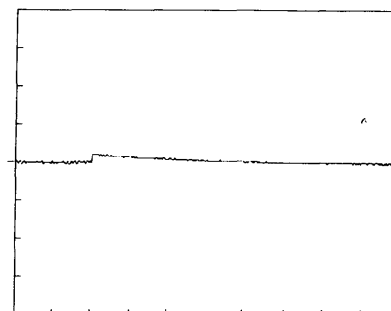
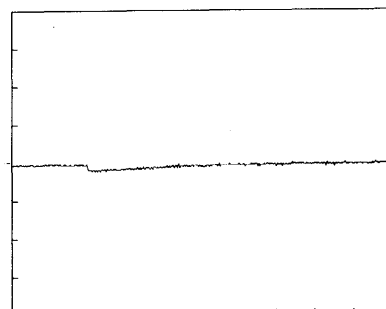
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



100 mV/div

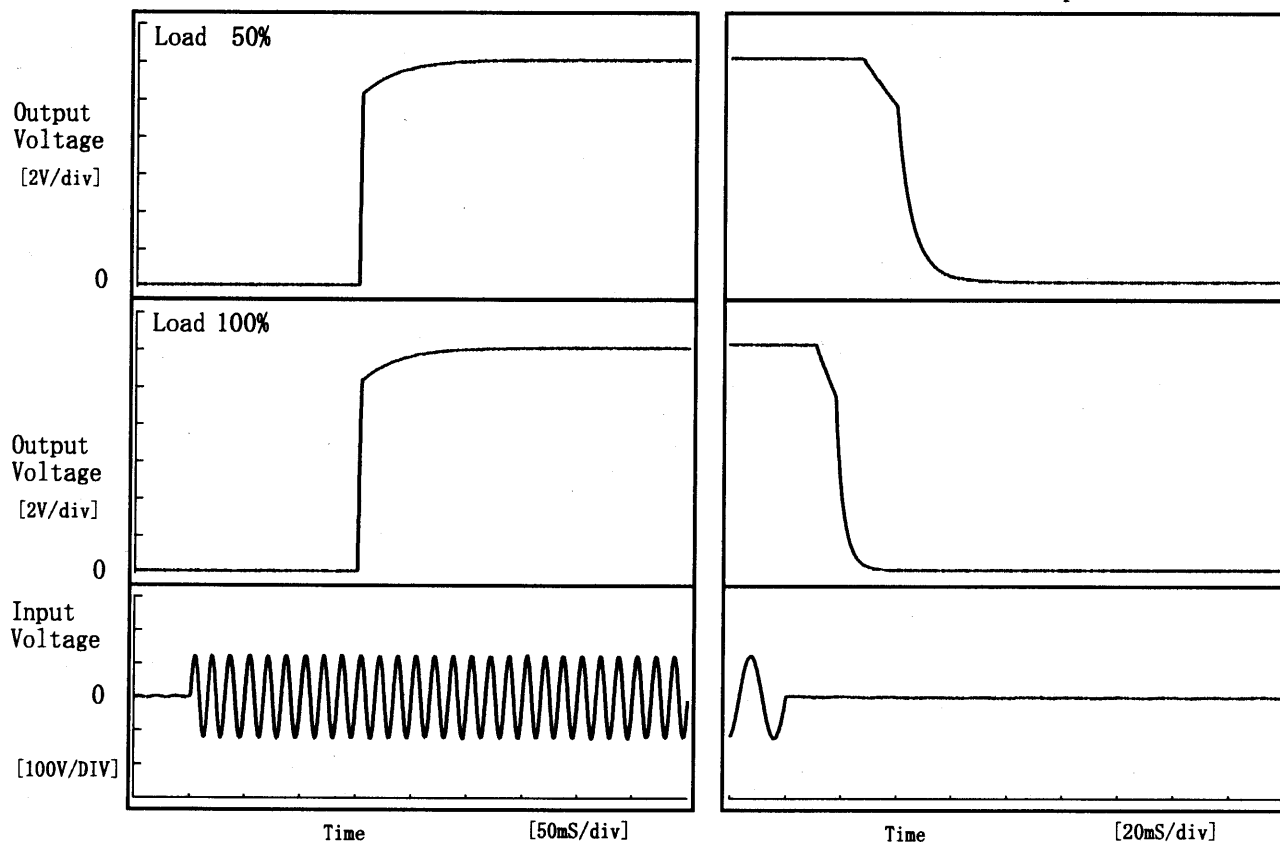
10 mS/div

COSEL

Model	LCA100S-12	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12.0V8.5A		

1. Graph

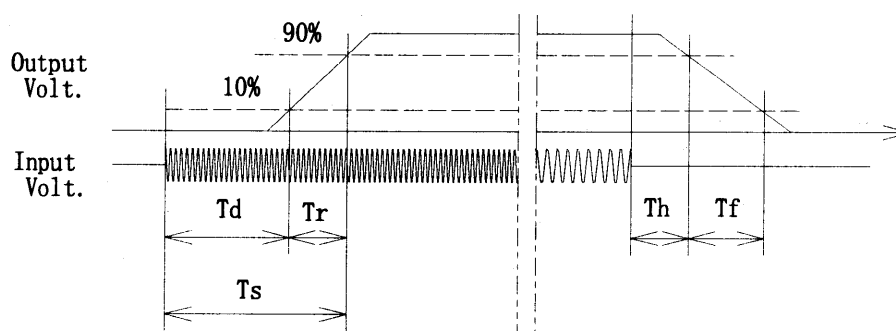
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	150.8	14.0	164.8	33.5	19.4
100 %	150.8	14.8	165.5	14.4	10.3



COSEL

Model		LCA100S-12	
Item		Ambient Temperature Drift 周囲温度変動	
Object		+12.0V8.5A	

1. Graph

△

Input Volt. 85V

□

Input Volt. 100V

○

Input Volt. 132V

[V]

12.17

12.13

12.09

12.05

12.01

11.97

11.93

0

Output Voltage

-30

-10

10

30

50

70

Ambient Temperature

[°C]

Load 100%

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

Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	12.028	12.028	12.028
-10	12.030	12.030	12.030
0	12.031	12.031	12.031
10	12.031	12.031	12.031
20	12.031	12.031	12.030
25	12.030	12.030	12.030
30	12.029	12.029	12.029
40	12.028	12.027	12.027
50	12.025	12.026	12.025
60	12.023	12.023	12.023
—	—	—	—

COSEL

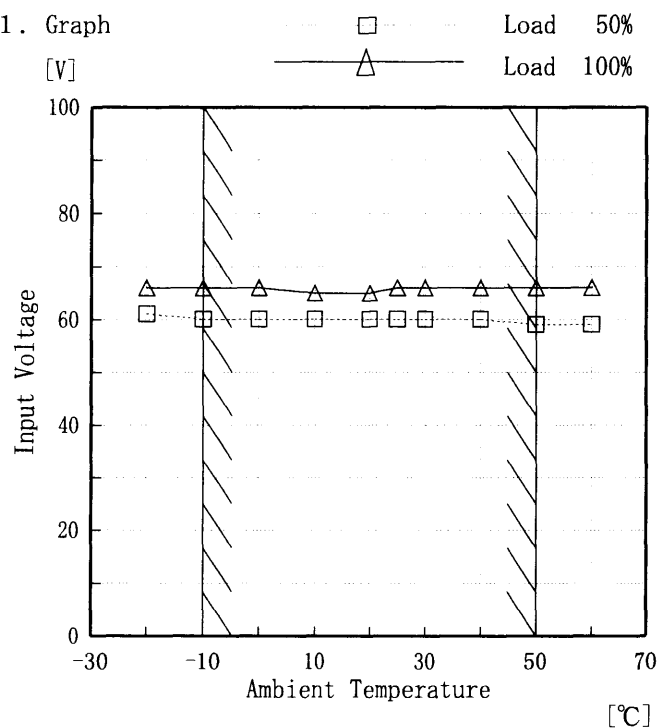
Model LCA100S-12

Item Minimum Input Voltage for Regulated Output Voltage
最低レギュレーション電圧

Object +12.0V8.5A

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]	Input Voltage [V]	
	Load 50%	Load 100%
-20	61	66
-10	60	66
0	60	66
10	60	65
20	60	65
25	60	66
30	60	66
40	60	66
50	59	66
60	59	66
—	—	—

COSEL

Model		LCA100S-12	Testing Circuitry Figure A	
Item		Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)		
Object		+12.0V8.5A		

1. Graph

□ Load 50%

—△— Load 100%

[mV]

150

125

100

75

50

25

0

Ripple Voltage

</

COSEL

Model

LCA100S-12

Item

Time Lapse Drift 経時ドリフト

Temperature

25°C

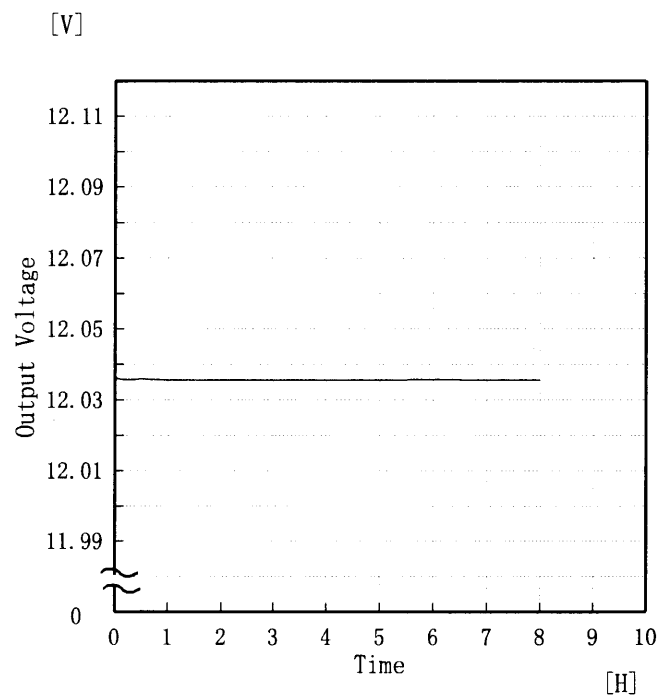
Testing Circuitry

Figure A

Object

+12.0V8.5A

1. Graph



2. Values

Time since start [H]	Output Voltage [V]
0.0	12.037
0.5	12.036
1.0	12.036
2.0	12.036
3.0	12.036
4.0	12.036
5.0	12.036
6.0	12.036
7.0	12.036
8.0	12.036

Model		LCA100S-12	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+12.0V8.5A	

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 : 0~8.5 A

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

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

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 0~8.5 A

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

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ratio) [%]
Maximum Voltage	-10	100	8.5	12.031	±5	±0.1
Minimum Voltage	50	132	0.0	12.023		

COSEL

LOREL

		Testing Circuitry Figure A
Model	LCA100S-12	
Item	Condensation 結露特性	
Object	+12.0V8.5A	

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]	12.03	Input Volt. : 100V, Load Current:8.5A
Line Regulation [mV]	2	Input Volt. : 85～132V, Load Current:8.5A
Load Regulation [mV]	6	Input Volt. : 100V, Load Current:0.0～8.5A

COSEL

Model	LCA100S-12	Temperature	25℃
Item	Leakage Current 漏洩電流	Testing Circuitry	Figure B
Object	_____		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.18	0.22	0.31
(B) IEC60950	0.20	0.23	0.32

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.

交流入力の高相について測定し、その大きい方を漏洩電流測定値とする。

COSEL

Model	LCA100S-12	Temperature 25°C Testing Circuitry Figure C
Item	Line Noise Tolerance 入力雑音耐量	
Object	+12.0V 8.5A	

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	LCA100S-12	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object	_____		

1. Graph

Remarks

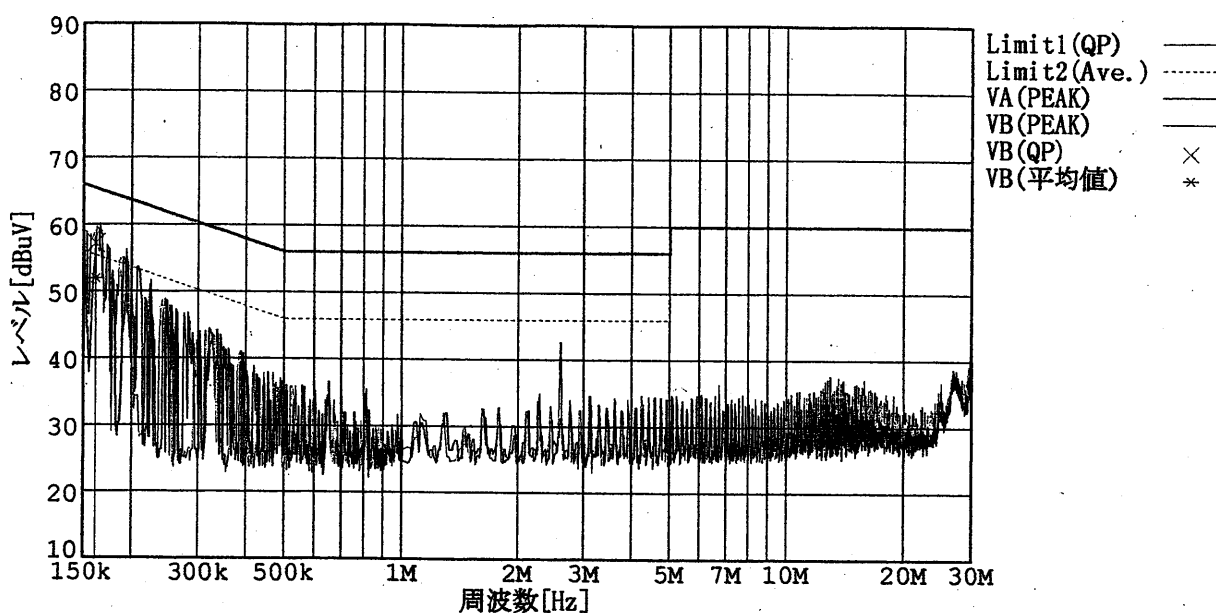
Input Volt. 100 V (VCCI Class B)

120 V (FCC Class B)

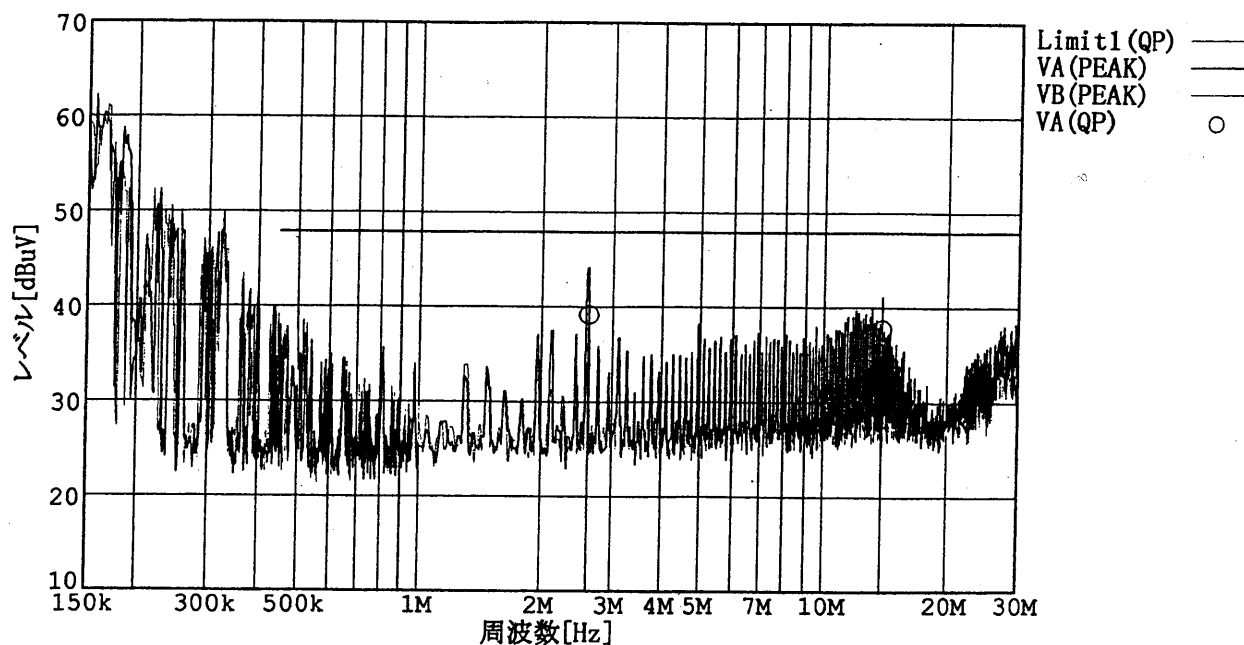
Load 100 %

規格 1: [VCCI] Class B (QP)

規格 2: [VCCI] Class B (平均値)



規格 1: [FCC Part15] Class B



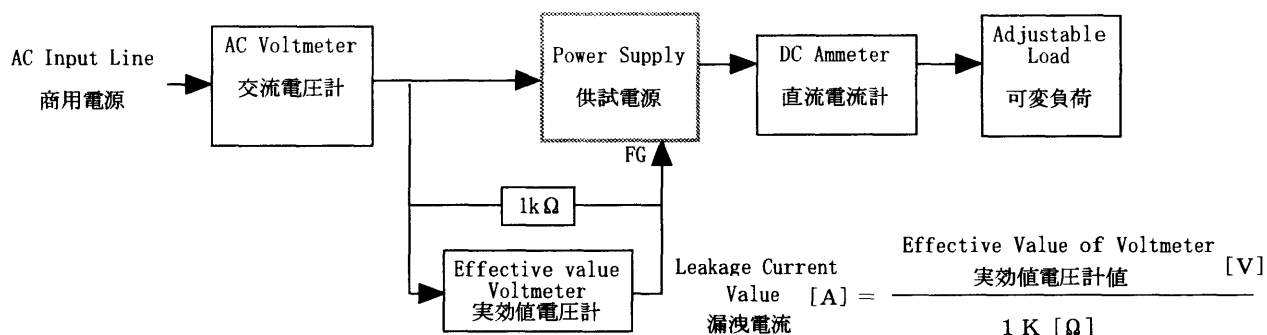
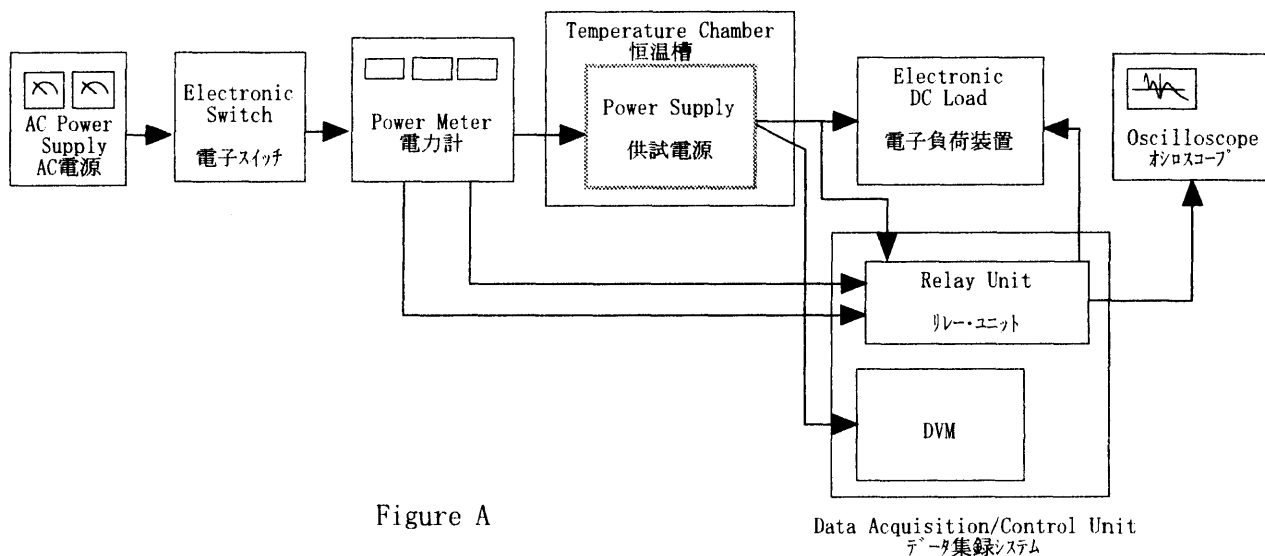


Figure B (DENTORI)

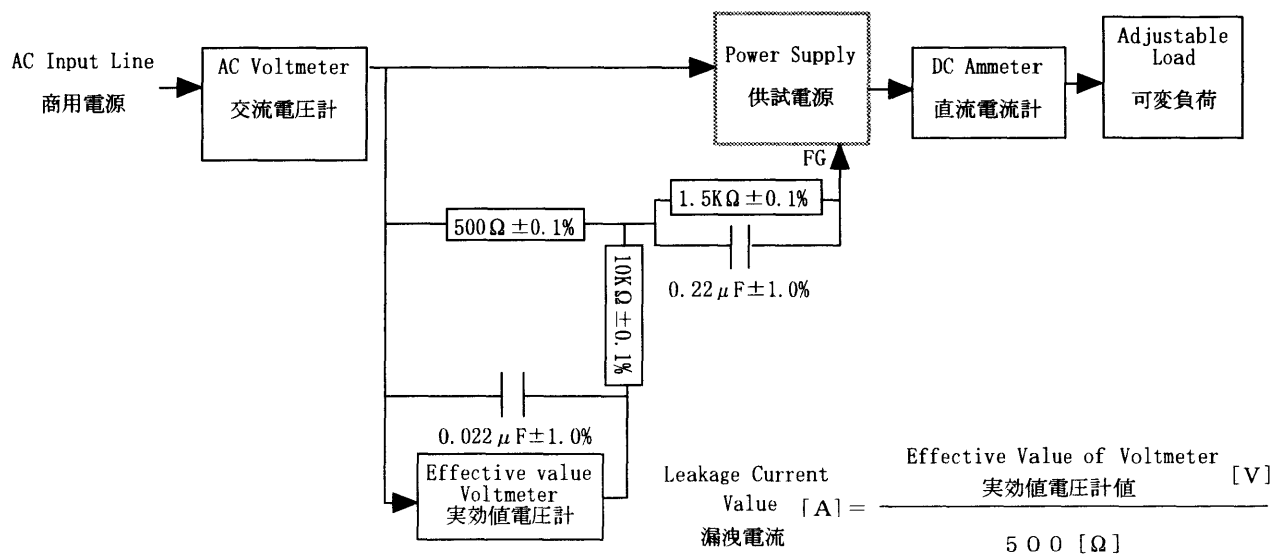


Figure B (IEC 60950)

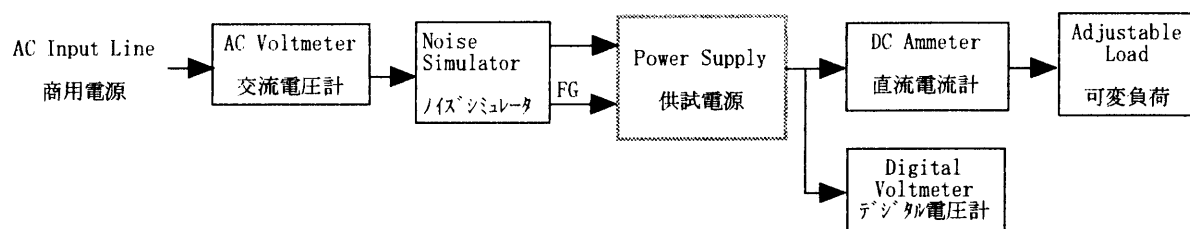


Figure C

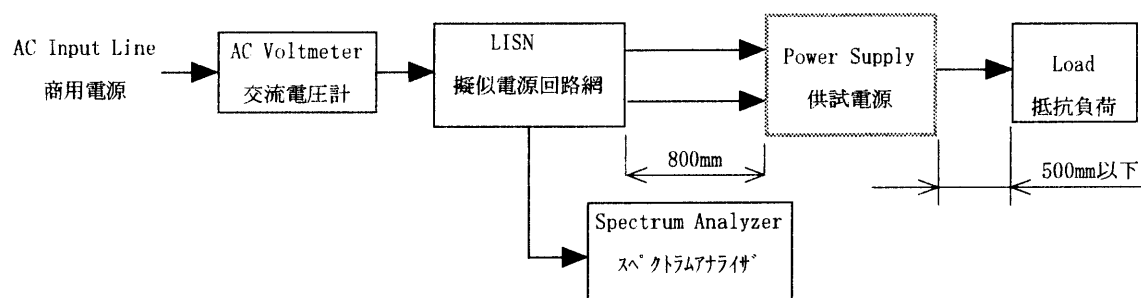


Figure D

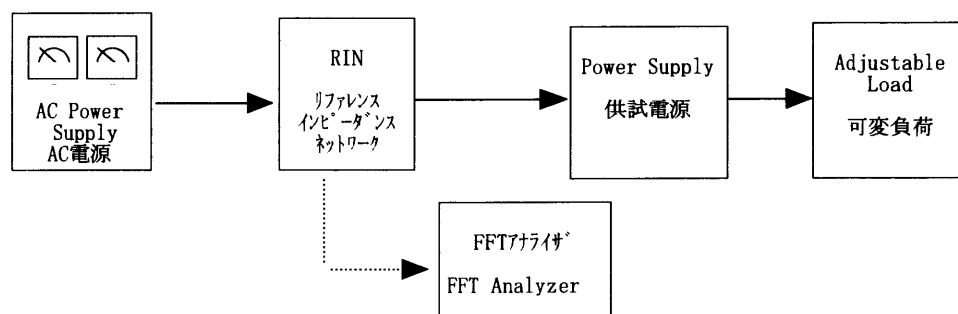


Figure E