



TEST DATA OF LCA30S-12

(100V INPUT)

Regulated DC Power Supply

Date : Aug. 4. 1999

Approved by : H. Yamaguchi
Design Manager

Prepared by : S. Taniguchi
Design Engineer

コーセル株式会社

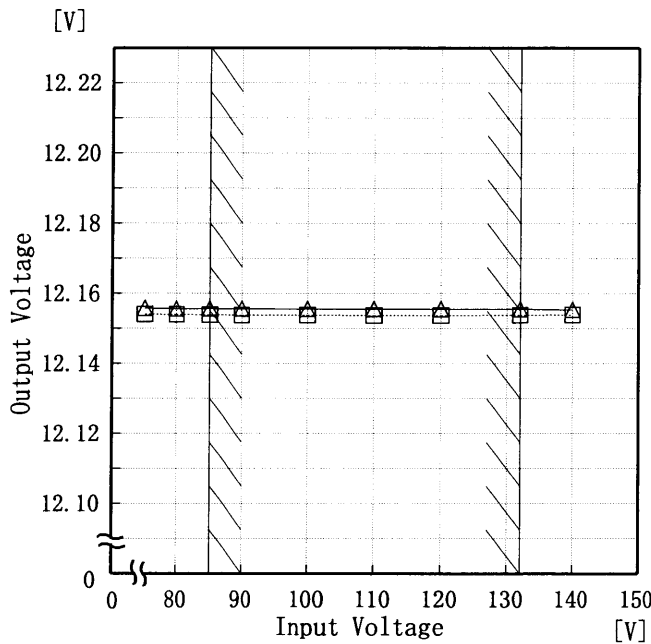
COSEL CO., LTD.

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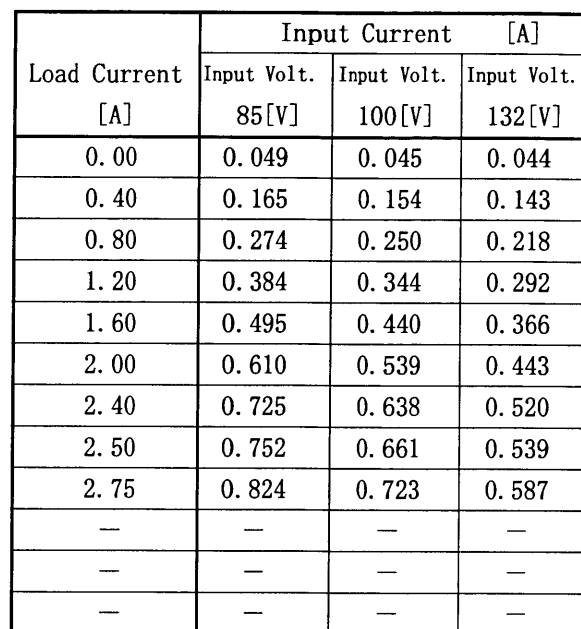
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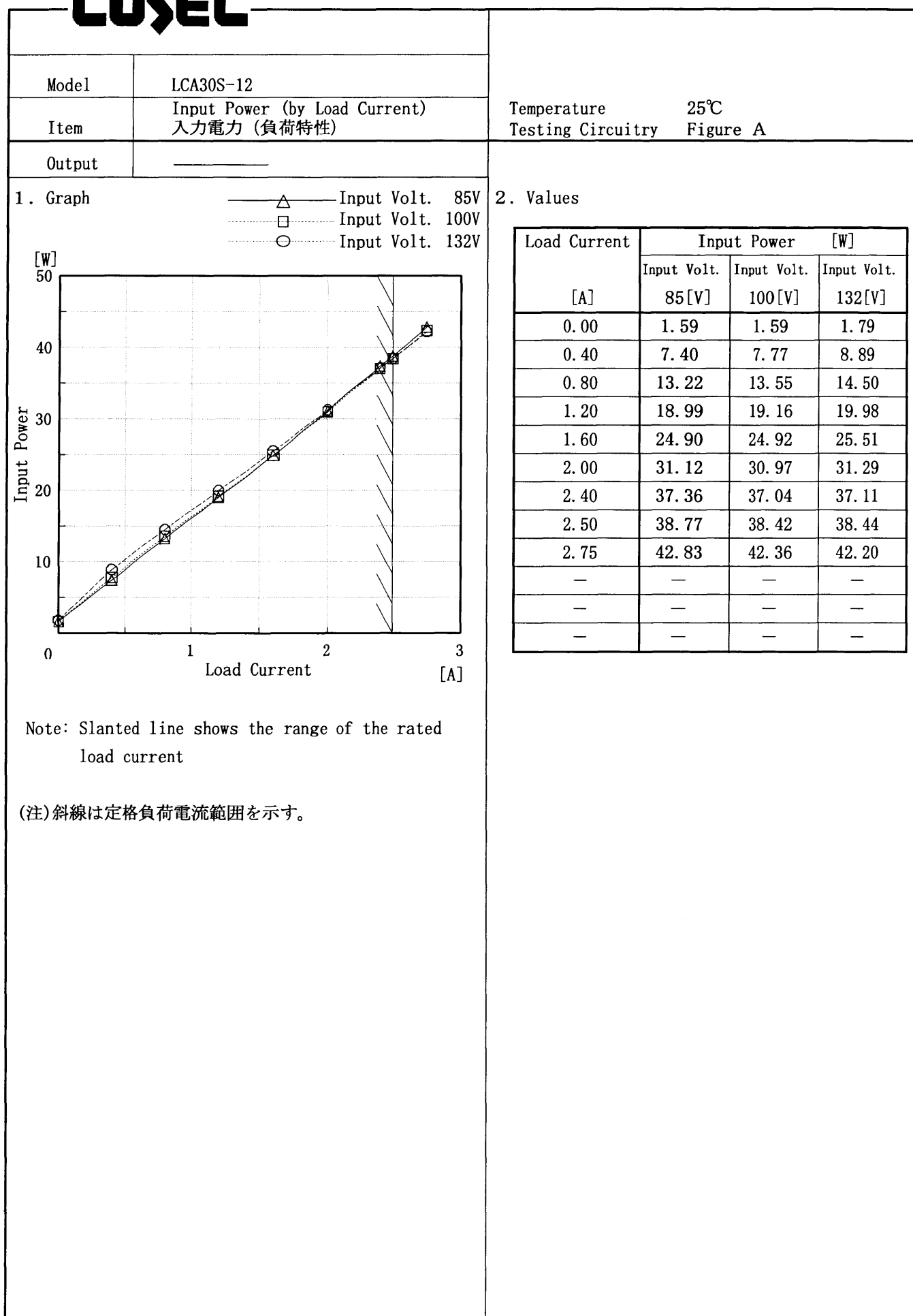
Model		LCA30S-12		Temperature		25℃																																	
Item		Line Regulation 静的入力変動		Testing Circuitry		Figure A																																	
Object		+12.0V2.5A																																					
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Temperature	25°C
Testing Circuitry	Figure A

2. Values



(注)斜線は定格負荷電流範囲を示す。

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Model		LCA30S-12	
Item		Efficiency 効率	
Object			

1. Graph

□ Load 50%

△ Load 100%

Efficiency [%]

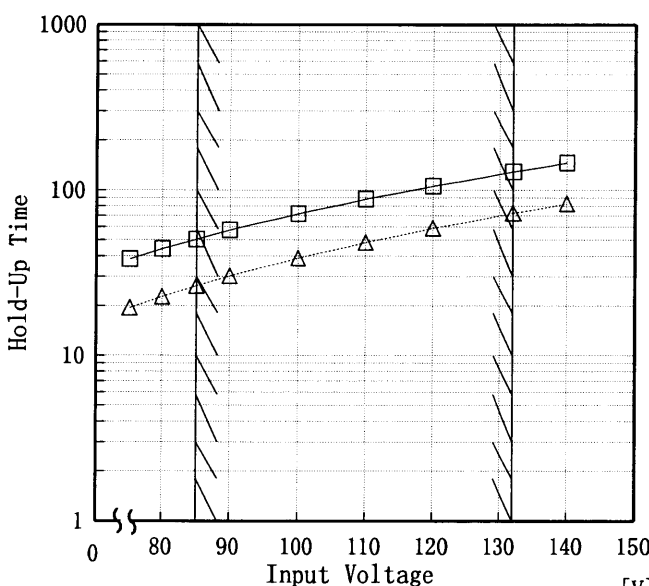
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Model		LCA30S-12		Temperature		25°C																																																								
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<div><div>—△—</div><div>Input Volt. 85V</div></div> <div><div>—□—</div><div>Input Volt. 100V</div></div> <div><div>—○—</div><div>Input Volt. 132V</div></div> <div><div>Efficiency [%]</div><div><div>90</div><div>80</div><div>70</div><div>60</div><div>50</div><div>40</div></div><div><div>0</div><div>0.5</div><div>1</div><div>1.5</div><div>2</div><div>2.5</div><div>3</div></div><div>Load Current [A]</div></div> <div>Note: Slanted line shows the range of the rated load current</div> <div>(注)斜線は定格負荷電流範囲を示す。</div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.40</td><td>67.8</td><td>64.7</td><td>56.5</td></tr><tr><td>0.80</td><td>75.1</td><td>73.4</td><td>68.5</td></tr><tr><td>1.20</td><td>77.8</td><td>77.2</td><td>74.1</td></tr><tr><td>1.60</td><td>78.8</td><td>78.7</td><td>76.9</td></tr><tr><td>2.00</td><td>79.0</td><td>79.4</td><td>78.6</td></tr><tr><td>2.40</td><td>78.9</td><td>79.6</td><td>79.5</td></tr><tr><td>2.50</td><td>78.9</td><td>79.6</td><td>79.6</td></tr><tr><td>2.75</td><td>78.7</td><td>79.6</td><td>79.9</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]	Efficiency [%]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.40	67.8	64.7	56.5	0.80	75.1	73.4	68.5	1.20	77.8	77.2	74.1	1.60	78.8	78.7	76.9	2.00	79.0	79.4	78.6	2.40	78.9	79.6	79.5	2.50	78.9	79.6	79.6	2.75	78.7	79.6	79.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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Note: Slanted line shows the range of the rated load current

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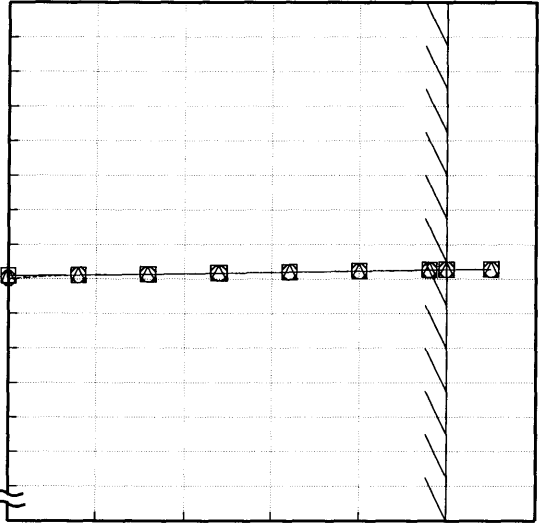
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Model		LCA30S-12	
Item		Ripple Voltage (by Load Current) リップル電圧 (負荷電流特性)	
Object		+12.0V2.5A	

1. Graph

-----□----- Input Volt. 85V

-----△----- Input Volt. 132V

80

70

60

50

40

30

20

10

0

Ripple Voltage

[mV]

0

0.5

1

1.5

2

2.5

3

Load Current

[A]

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

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

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。

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 [mVp-p]

T1

T2

Fig. Complex Ripple Wave Form

図 リップル波形詳細図

2. Values

Load Current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
0.00	5	5
0.40	10	10
0.80	10	10
1.20	10	10
1.60	10	10
2.00	10	10
2.40	20	10
2.50	20	10
2.75	20	10
—	—	—
—	—	—

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Model		LCA30S-12	
Item		Ripple-Noise リップルノイズ	
Object		+12.0V2.5A	

1. Graph

-----□----- Input Volt. 85V
-----△----- Input Volt. 132V

[mV]

Ripple-Noise

Load Current

[A]

2. Values

Load current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	10	10
0.40	15	15
0.80	15	15
1.20	15	15
1.60	15	15
2.00	15	15
2.40	20	15
2.50	20	15
2.75	20	15
—	—	—
—	—	—

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]

T1

T2

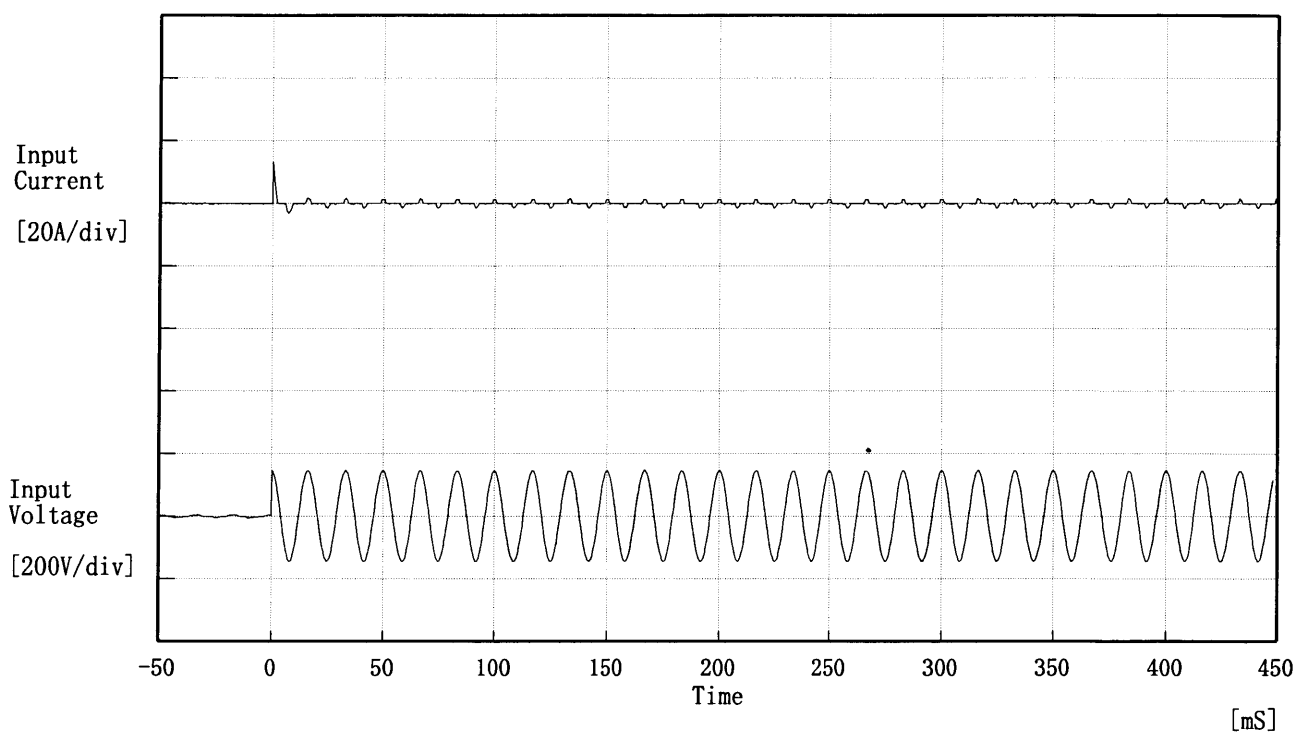
Fig. Complex Ripple Wave Form
図 リップル波形詳細図

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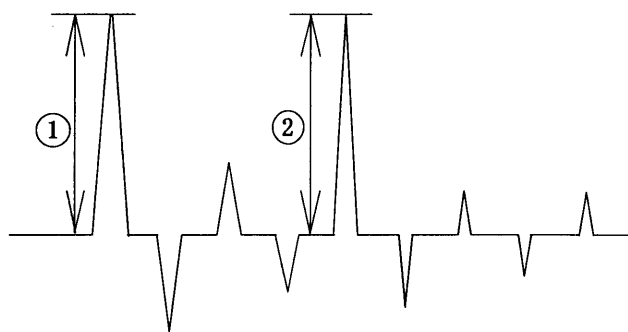
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<div><div><div></div><div>Input Volt. 85 V</div></div><div><div></div><div>Input Volt. 100 V</div></div><div><div></div><div>Input Volt. 132 V</div></div></div> <div><div><div><div>Output Voltage</div><div>[V]</div></div><div><div>20.0</div><div>15.0</div><div>10.0</div><div>5.0</div><div>0.0</div></div><div><div>0</div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>Load Current</div><div>[A]</div></div></div></div>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>12.00</td><td>3.17</td><td>3.12</td><td>3.10</td></tr><tr><td>11.40</td><td>3.16</td><td>3.11</td><td>3.09</td></tr><tr><td>10.80</td><td>3.16</td><td>3.11</td><td>3.08</td></tr><tr><td>9.60</td><td>3.14</td><td>3.08</td><td>3.04</td></tr><tr><td>8.40</td><td>3.11</td><td>3.04</td><td>3.00</td></tr><tr><td>7.20</td><td>3.05</td><td>2.98</td><td>2.93</td></tr><tr><td>6.00</td><td>2.96</td><td>2.89</td><td>2.85</td></tr><tr><td>4.80</td><td>2.85</td><td>2.77</td><td>2.74</td></tr><tr><td>3.60</td><td>2.67</td><td>2.61</td><td>2.58</td></tr><tr><td>2.40</td><td>2.42</td><td>2.38</td><td>2.36</td></tr><tr><td>1.20</td><td>2.09</td><td>2.06</td><td>2.08</td></tr><tr><td>0.00</td><td>1.75</td><td>1.73</td><td>1.77</td></tr></table>			Output Voltage [V]	Load Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	12.00	3.17	3.12	3.10	11.40	3.16	3.11	3.09	10.80	3.16	3.11	3.08	9.60	3.14	3.08	3.04	8.40	3.11	3.04	3.00	7.20	3.05	2.98	2.93	6.00	2.96	2.89	2.85	4.80	2.85	2.77	2.74	3.60	2.67	2.61	2.58	2.40	2.42	2.38	2.36	1.20	2.09	2.06	2.08	0.00	1.75	1.73	1.77
Output Voltage [V]	Load Current [A]																																																										
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<div>Note: Slanted line shows the range of the rated load current.</div> <div>(注)斜線は定格負荷電流範囲を示す。</div>																																																											

COSEL

Model	LCA30S-12	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 13.27 [A]
② 1.67 [A]



COSEL

Model	LCA30S-12	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Responce 動的負荷変動	
Object	+12.0V2.5A	

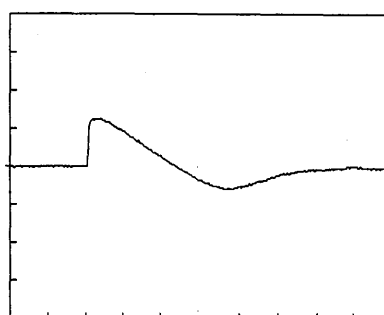
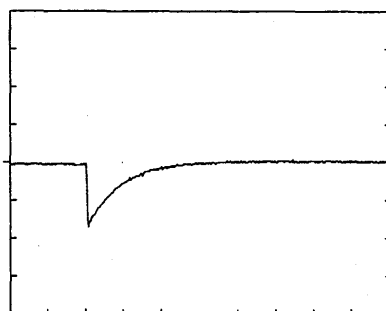
Input Volt. 100 V

Cycle 1000 mS

Load Current

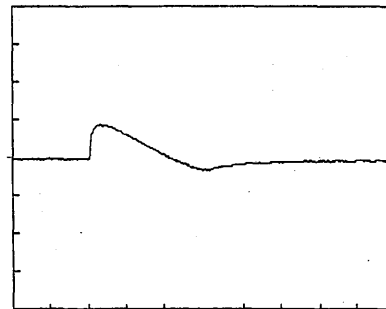
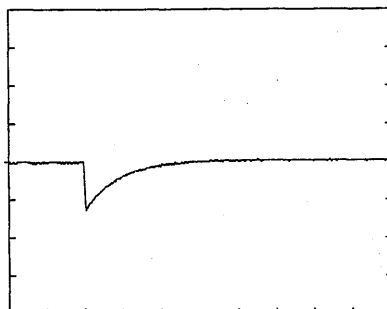
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



200 mV/div

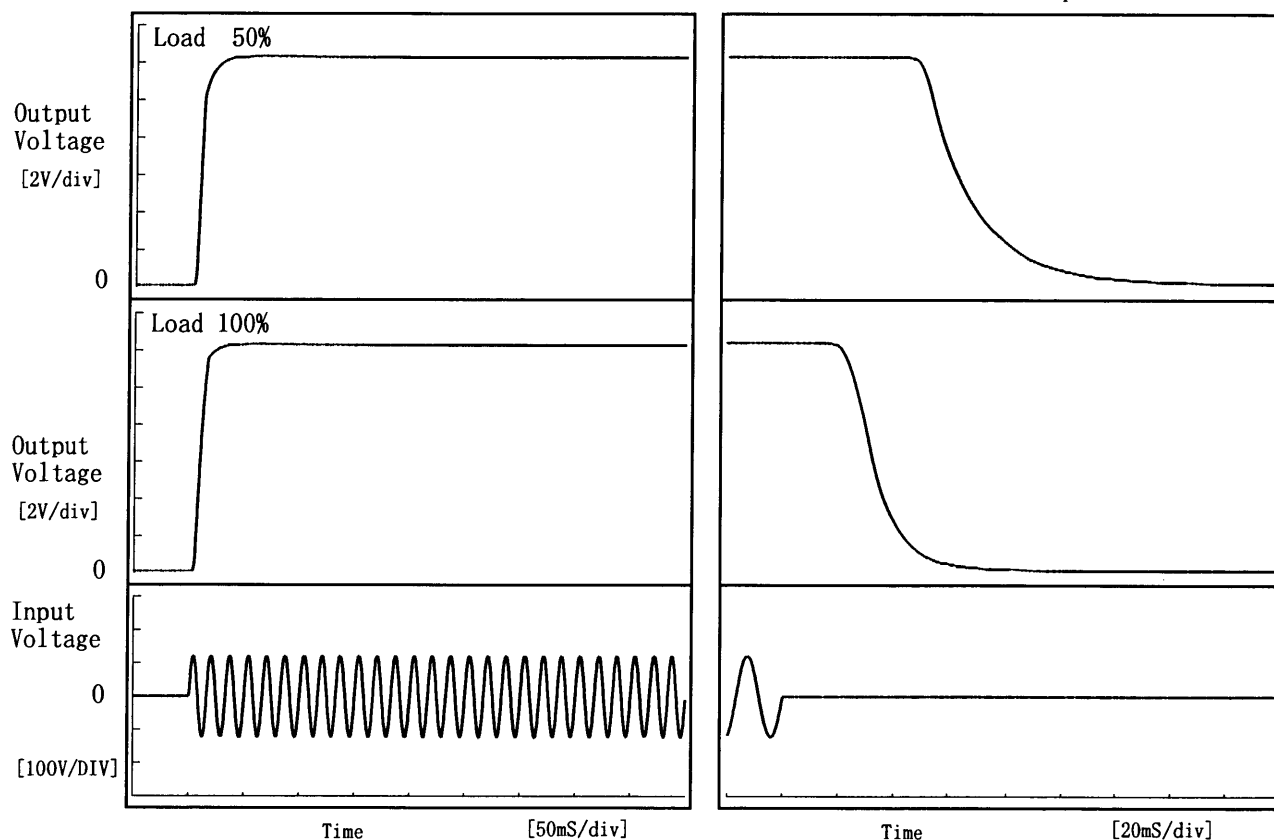
10 mS/div

COSEL

Model	LCA30S-12	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12.0V2.5A		

1. Graph

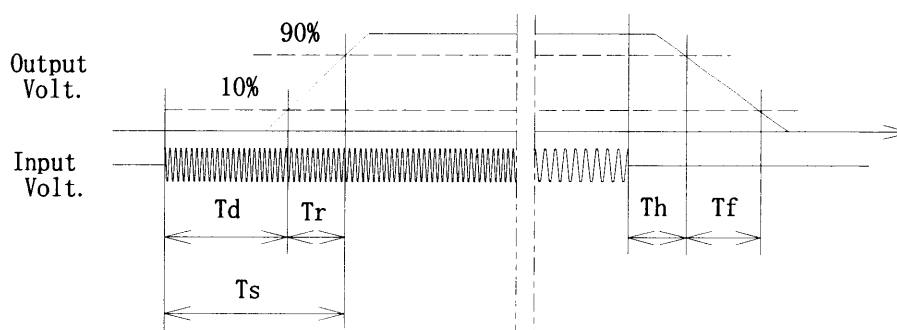
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	5.0	10.8	15.8	52.8	39.6
100 %	5.0	11.0	16.0	24.9	24.1



BC-4023

COSEL

Model		LCA30S-12	
Item		Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧	
Object		+12.0V2.5A	
1. Graph		2. Values	

□

Load 50%

△

Load 100%

Input Voltage

[V]

100

80

60

40

20

0

-30

-10

10

30

50

70

Ambient Temperature

[°C]

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。

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	30	52
-10	30	51
0	30	51
10	30	51
20	30	51
25	30	51
30	30	51
40	30	51
50	30	51
60	30	51
—	—	—

COSEL

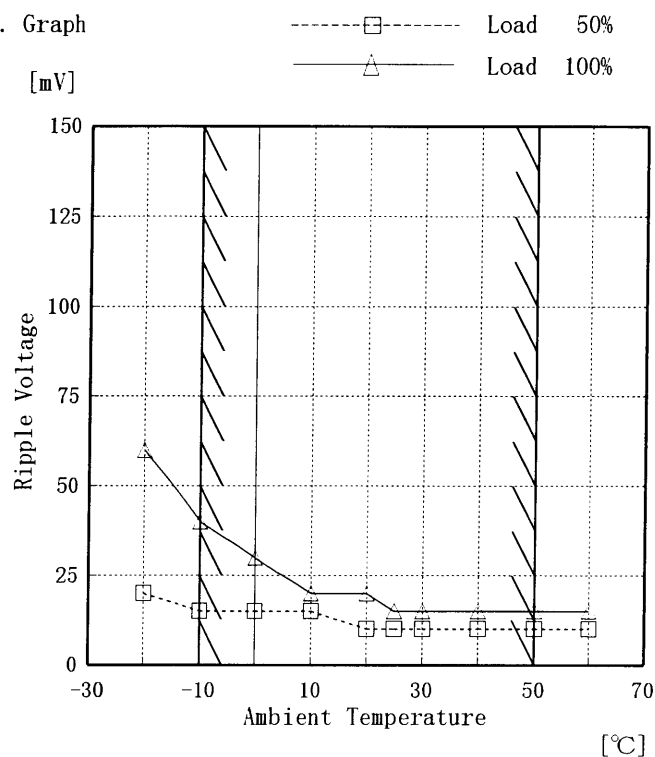
Model LCA30S-12

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

Object +12.0V2.5A

Testing Circuitry Figure A

1. Graph



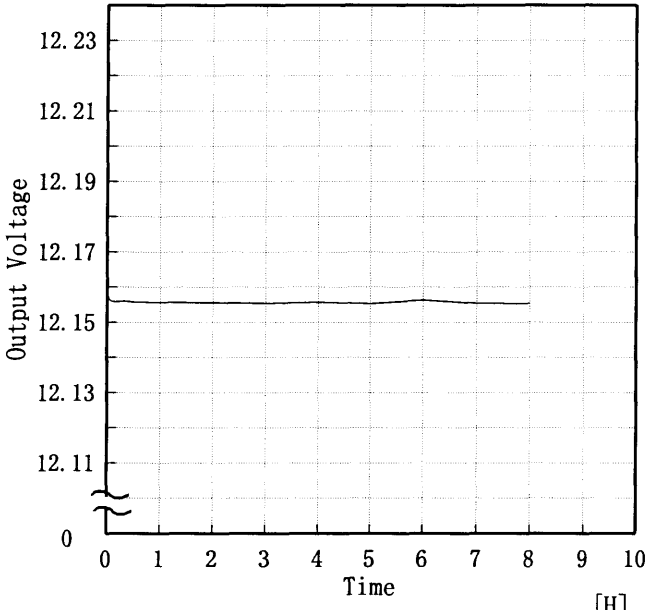
Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

2. Values

Ambient Temp. [°C]	Load 50%	Load 100%
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
-20	20	60
-10	15	40
0	15	30
10	15	20
20	10	20
25	10	15
30	10	15
40	10	15
50	10	15
60	10	15
—	—	—

COSEL

COSEL																									
Model	LCA30S-12																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25℃																						
Object	+12.0V2.5A	Testing Circuitry	Figure A																						
1. Graph		2.Values																							
<div>[V]</div> <div></div> <div>Output Voltage [V]</div> <div>Time [H]</div> <div>Input Volt. 100V</div> <div>Load 100%</div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.159</td></tr><tr><td>0.5</td><td>12.156</td></tr><tr><td>1.0</td><td>12.156</td></tr><tr><td>2.0</td><td>12.156</td></tr><tr><td>3.0</td><td>12.155</td></tr><tr><td>4.0</td><td>12.156</td></tr><tr><td>5.0</td><td>12.155</td></tr><tr><td>6.0</td><td>12.156</td></tr><tr><td>7.0</td><td>12.155</td></tr><tr><td>8.0</td><td>12.155</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.159	0.5	12.156	1.0	12.156	2.0	12.156	3.0	12.155	4.0	12.156	5.0	12.155	6.0	12.156	7.0	12.155	8.0	12.155
Time since start [H]	Output Voltage [V]																								
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0.5	12.156																								
1.0	12.156																								
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7.0	12.155																								
8.0	12.155																								

COSEL

Model	LCA30S-12	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+12.0V 2.5A	

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 : 0~2.5 A

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

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

定電圧精度

周囲温度、入力電圧、負荷電流を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

周囲温度 -10~50 °C

入力電圧 85~132 V

負荷電流 0~2.5 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 (Ration) [%]
Maximum Voltage	-10	85	2.5	12.171	±18	±0.2
Minimum Voltage	50	132	0.0	12.136		

COSEL

Model		LCA30S-12	Testing Circuitry Figure A
Item		Condensation 結露特性	
Object		+12.0V2.5A	

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]	12.154	Input Volt.:100V, Load Current:2.5A
Line Regulation [mV]	3	Input Volt.:85~132V, Load Current:2.5A
Load Regulation [mV]	7	Input Volt.:100V, Load Current:0~2.5A

COSEL

Model	LCA30S-12	Temperature	25°C
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	0.07	0.08	0.12
(B) IEC60950	0.07	0.09	0.13

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.

交流入力の一相について測定し、その大きい方を漏洩電流測定値とする。

COSEL

Model	LCA30S-12		
Item	Line Noise Tolerance 入力雑音耐量	Temperature	25℃
		Testing Circuitry	Figure C
Object	+12.0V2.5A		

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	LCA30S-12	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object			

1. Graph

Remarks

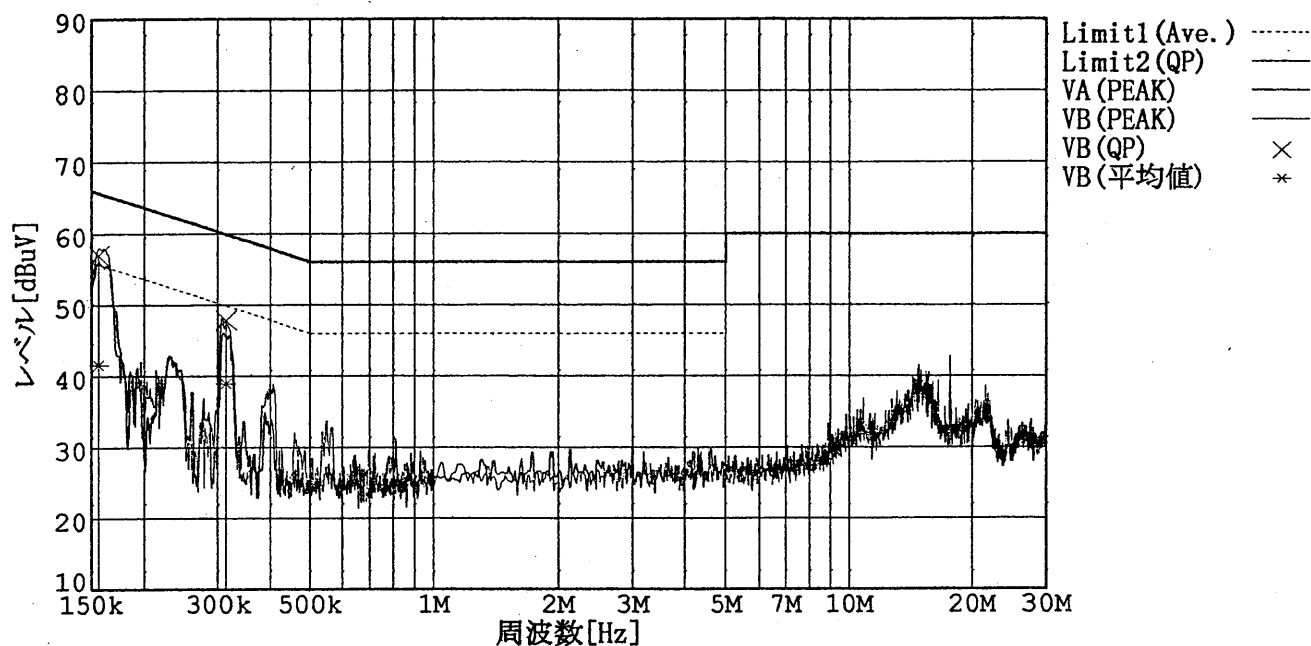
Input Volt. 100 V (VCCI Class B)

120 V (FCC Class B)

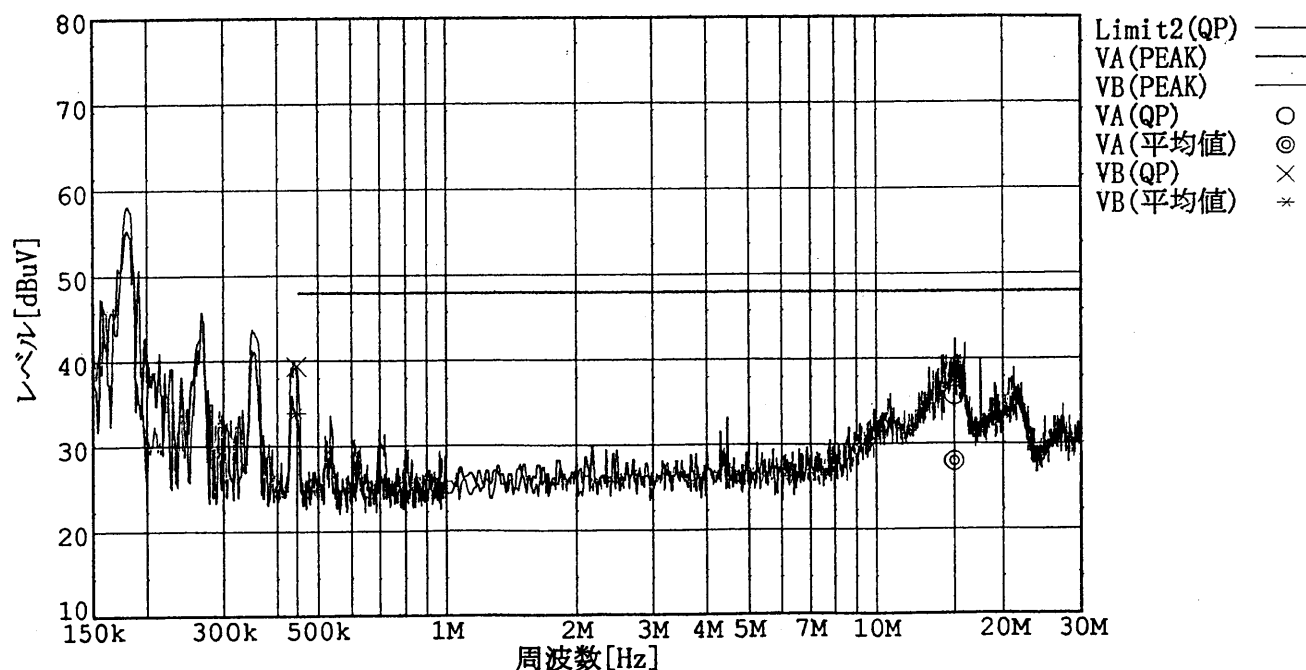
Load 100 %

規格 1: [VCCI] Class B(平均値)

規格 2: [VCCI] Class B(QP)



規格 2: [FCC Part15] Class B



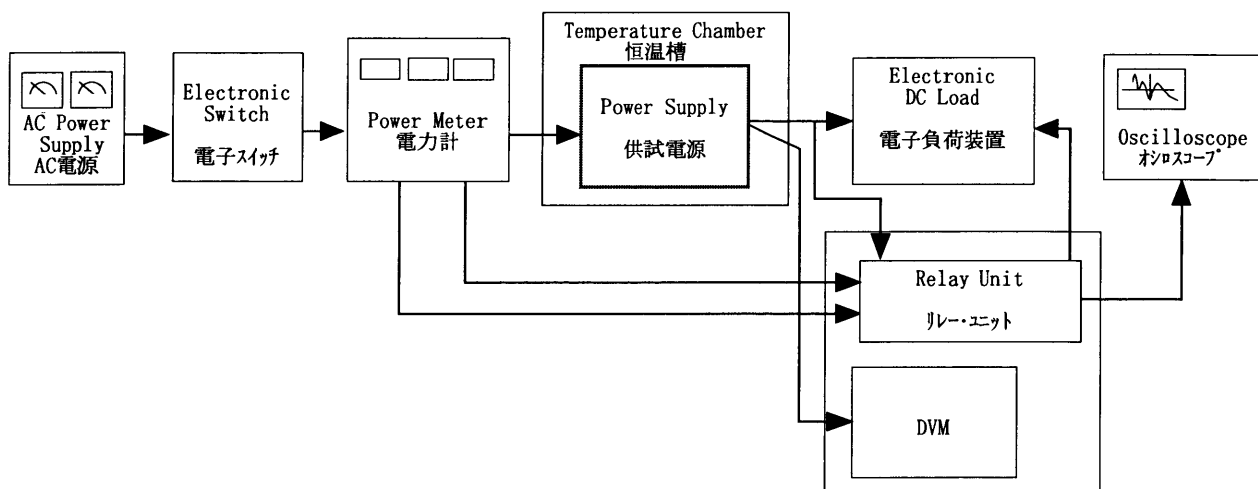


Figure A

Data Acquisition/Control Unit
データ集録システム

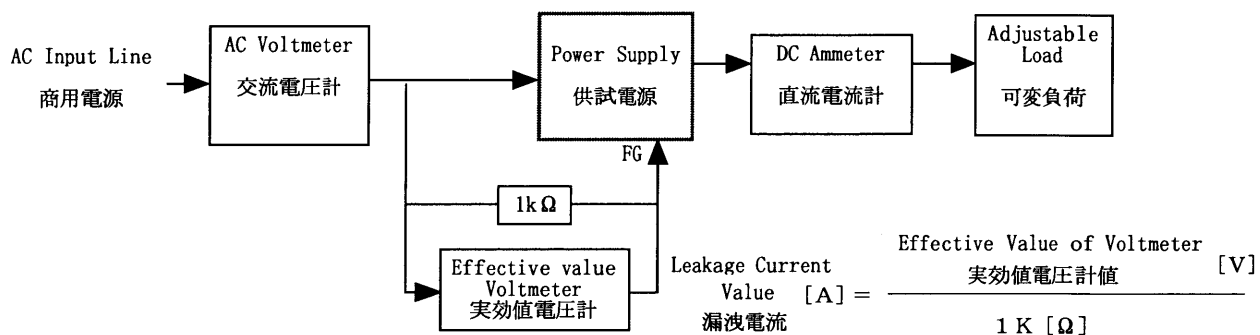


Figure B (DENTORI)

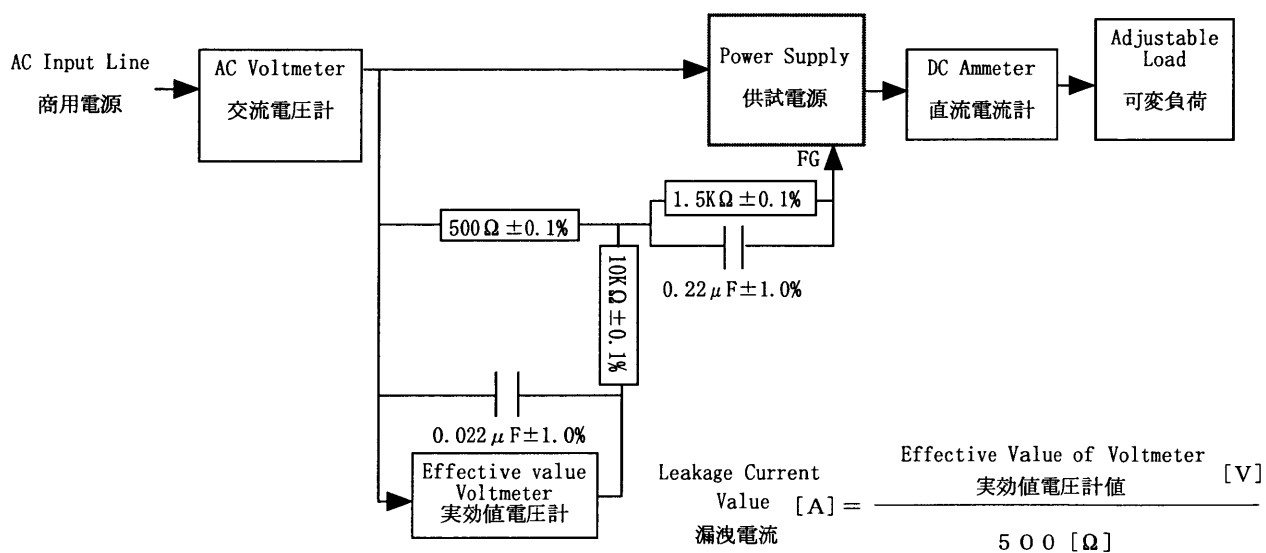


Figure B (IEC 60950)

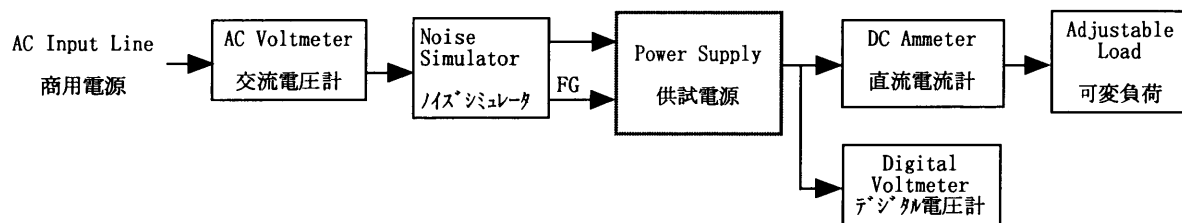


Figure C

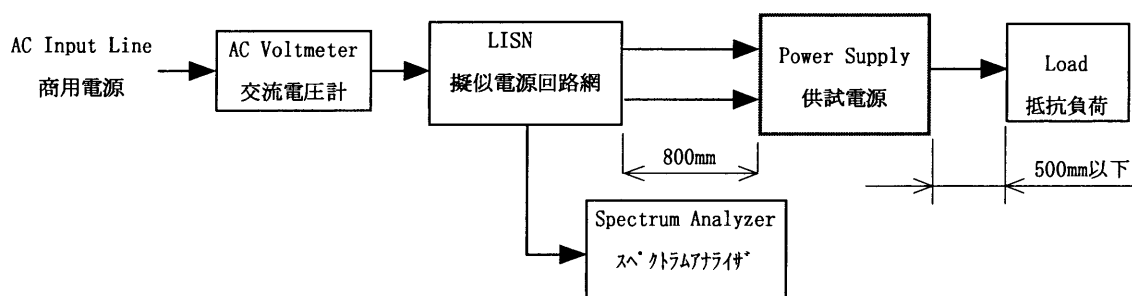


Figure D

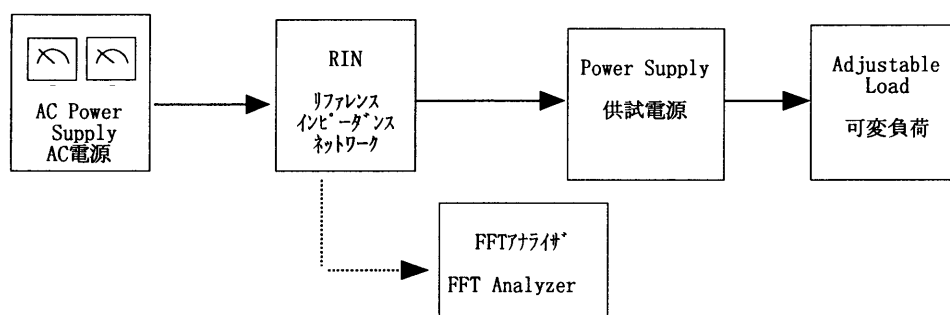


Figure E