



# TEST DATA OF LCA75S-24 (100V INPUT)

Regulated DC Power Supply

Date : Aug. 11. 1999

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**コーセル株式会社**

**COSEL CO., LTD.**

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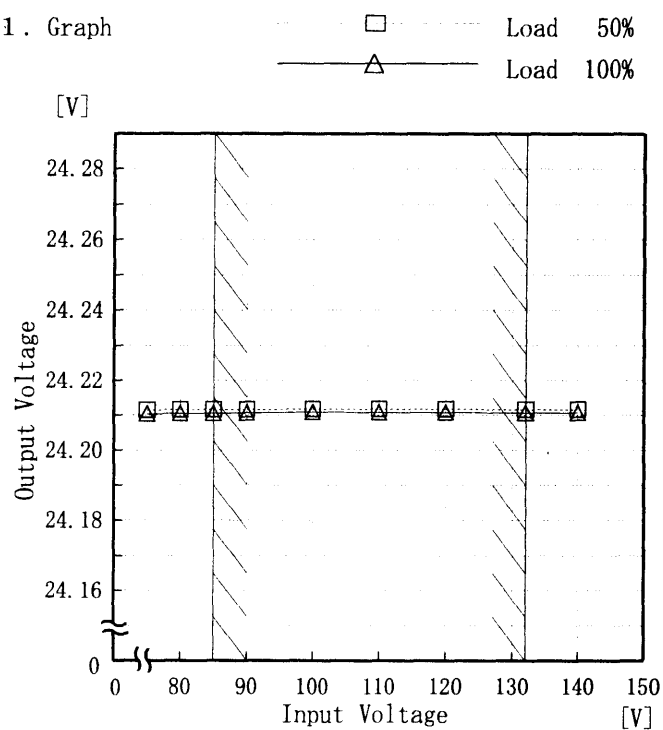
Model LCA75S-24

Item Line Regulation 静的入力変動

Object +24.0V3.2A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



Note: Slanted line shows the range of the rated input voltage.

(注) 斜線は定格入力電圧範囲を示す。

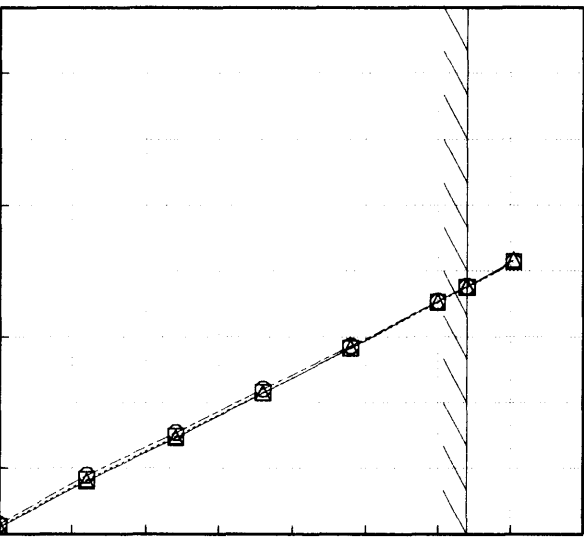
## 2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	24.211	24.210
80	24.212	24.211
85	24.212	24.211
90	24.212	24.211
100	24.212	24.211
110	24.212	24.211
120	24.212	24.211
132	24.212	24.211
140	24.212	24.211

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LCA75S-24		Temperature 25℃																																																								
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<div><div>—△— Input Volt. 85V</div><div>—□— Input Volt. 100V</div><div>—○— Input Volt. 132V</div></div> <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 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>0.00</td><td>0.077</td><td>0.078</td><td>0.081</td></tr><tr><td>0.60</td><td>0.437</td><td>0.400</td><td>0.349</td></tr><tr><td>1.20</td><td>0.762</td><td>0.682</td><td>0.573</td></tr><tr><td>1.80</td><td>1.095</td><td>0.972</td><td>0.803</td></tr><tr><td>2.40</td><td>1.424</td><td>1.259</td><td>1.031</td></tr><tr><td>3.00</td><td>1.755</td><td>1.549</td><td>1.261</td></tr><tr><td>3.20</td><td>1.864</td><td>1.643</td><td>1.337</td></tr><tr><td>3.52</td><td>2.044</td><td>1.800</td><td>1.461</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 Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.00	0.077	0.078	0.081	0.60	0.437	0.400	0.349	1.20	0.762	0.682	0.573	1.80	1.095	0.972	0.803	2.40	1.424	1.259	1.031	3.00	1.755	1.549	1.261	3.20	1.864	1.643	1.337	3.52	2.044	1.800	1.461	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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<div><div><div>[W]</div><div>200</div><div>150</div><div>100</div><div>50</div><div>0</div></div><div><div>Input Power</div><div></div></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>		<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>2.48</td><td>2.87</td><td>3.76</td></tr><tr><td>0.60</td><td>20.13</td><td>20.70</td><td>22.29</td></tr><tr><td>1.20</td><td>36.61</td><td>37.06</td><td>38.51</td></tr><tr><td>1.80</td><td>53.62</td><td>53.81</td><td>55.00</td></tr><tr><td>2.40</td><td>70.83</td><td>70.74</td><td>71.60</td></tr><tr><td>3.00</td><td>88.60</td><td>88.20</td><td>88.60</td></tr><tr><td>3.20</td><td>94.30</td><td>93.80</td><td>94.20</td></tr><tr><td>3.52</td><td>104.30</td><td>103.50</td><td>103.50</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	2.48	2.87	3.76	0.60	20.13	20.70	22.29	1.20	36.61	37.06	38.51	1.80	53.62	53.81	55.00	2.40	70.83	70.74	71.60	3.00	88.60	88.20	88.60	3.20	94.30	93.80	94.20	3.52	104.30	103.50	103.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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Model		LCA75S-24		Temperature Testing Circuitry	25℃ Figure A
Item		Efficiency 効率			
Object					

1. Graph

□ Load 50%

△ Load 100%

Efficiency [%]

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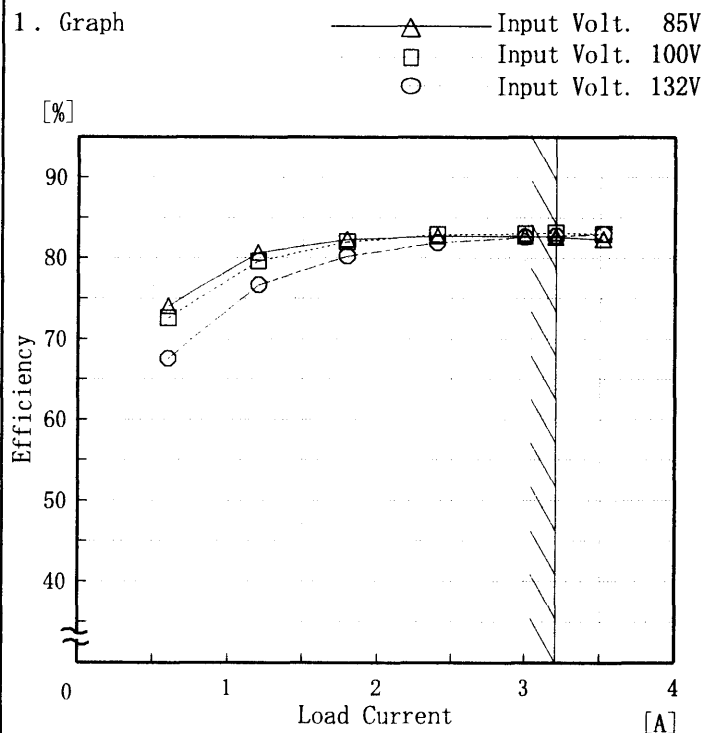
Model LCA75S-24

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]
0.60	74.0	72.6	67.6
1.20	80.7	79.6	76.6
1.80	82.3	82.0	80.2
2.40	82.7	82.9	81.9
3.00	82.7	83.1	82.6
3.20	82.6	83.2	82.8
3.52	82.3	83.0	83.0
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

**COSEL**

Model		LCA75S-24		Temperature		25℃																																	
Item		Hold-Up Time 出力保持時間		Testing Circuitry		Figure A																																	
Object		+24.0V3.2A																																					
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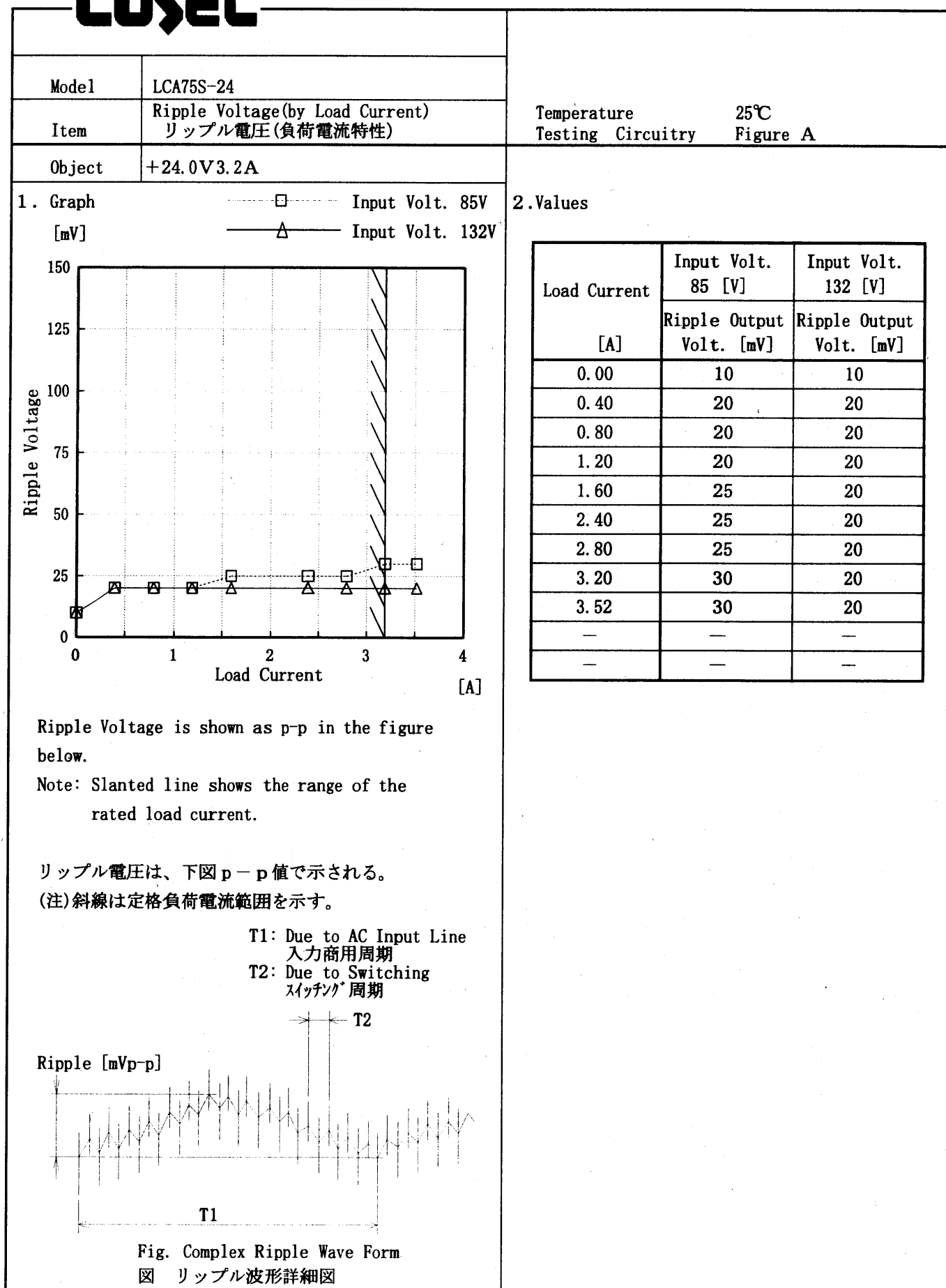
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Model		LCA75S-24	
Item		Ripple-Noise   リップルノイズ	
Object		+24.0V3.2A	

1. Graph

-----□-----    Input Volt. 85V

-----△-----    Input Volt. 132V

Ripple-Noise

[mV]

200

180

160

140

120

100

80

60

40

20

0

0

1

2

3

4

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

T2

Ripple-Noise

[mVp-p]

T1

Fig. Complex Ripple Wave Form

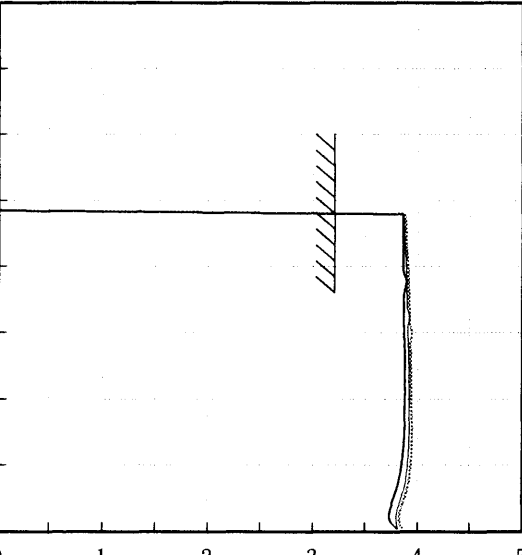
図   リップル波形詳細図

Temperature	25℃
Testing Circuitry	Figure A

2. Values

Load current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	20	20
0.40	30	30
0.80	30	35
1.20	30	35
1.60	35	35
2.00	35	35
2.40	35	35
2.80	35	35
3.20	40	35
3.52	40	35
—	—	—

**COSEL**

Model		LCA75S-24		Temperature 25℃ Testing Circuitry Figure A																																																						
Item		Overcurrent Protection 過電流保護																																																								
Object		+24.0V 3.2A																																																								
1. Graph		<div><div>-----</div>Input Volt. 85 V</div> <div><div>-----</div>Input Volt. 100 V</div> <div><div>-----</div>Input Volt. 132 V</div>		2. Values																																																						
<div>[V]</div> <div><div>40.0</div><div>30.0</div><div>20.0</div><div>10.0</div><div>0.0</div><div>Output Voltage</div></div> <div><div>0</div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>Load Current</div><div>[A]</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>24.00</td><td>3.88</td><td>3.86</td><td>3.85</td></tr><tr><td>22.80</td><td>3.88</td><td>3.86</td><td>3.85</td></tr><tr><td>21.60</td><td>3.89</td><td>3.87</td><td>3.85</td></tr><tr><td>19.20</td><td>3.91</td><td>3.89</td><td>3.88</td></tr><tr><td>16.80</td><td>3.92</td><td>3.90</td><td>3.86</td></tr><tr><td>14.40</td><td>3.94</td><td>3.91</td><td>3.87</td></tr><tr><td>12.00</td><td>3.94</td><td>3.92</td><td>3.87</td></tr><tr><td>9.60</td><td>3.94</td><td>3.92</td><td>3.88</td></tr><tr><td>7.20</td><td>3.95</td><td>3.92</td><td>3.87</td></tr><tr><td>4.80</td><td>3.93</td><td>3.90</td><td>3.84</td></tr><tr><td>2.40</td><td>3.88</td><td>3.84</td><td>3.76</td></tr><tr><td>0.00</td><td>3.85</td><td>3.81</td><td>3.81</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	24.00	3.88	3.86	3.85	22.80	3.88	3.86	3.85	21.60	3.89	3.87	3.85	19.20	3.91	3.89	3.88	16.80	3.92	3.90	3.86	14.40	3.94	3.91	3.87	12.00	3.94	3.92	3.87	9.60	3.94	3.92	3.88	7.20	3.95	3.92	3.87	4.80	3.93	3.90	3.84	2.40	3.88	3.84	3.76	0.00	3.85	3.81	3.81
Output Voltage [V]	Load Current [A]																																																									
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																							
24.00	3.88	3.86	3.85																																																							
22.80	3.88	3.86	3.85																																																							
21.60	3.89	3.87	3.85																																																							
19.20	3.91	3.89	3.88																																																							
16.80	3.92	3.90	3.86																																																							
14.40	3.94	3.91	3.87																																																							
12.00	3.94	3.92	3.87																																																							
9.60	3.94	3.92	3.88																																																							
7.20	3.95	3.92	3.87																																																							
4.80	3.93	3.90	3.84																																																							
2.40	3.88	3.84	3.76																																																							
0.00	3.85	3.81	3.81																																																							
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

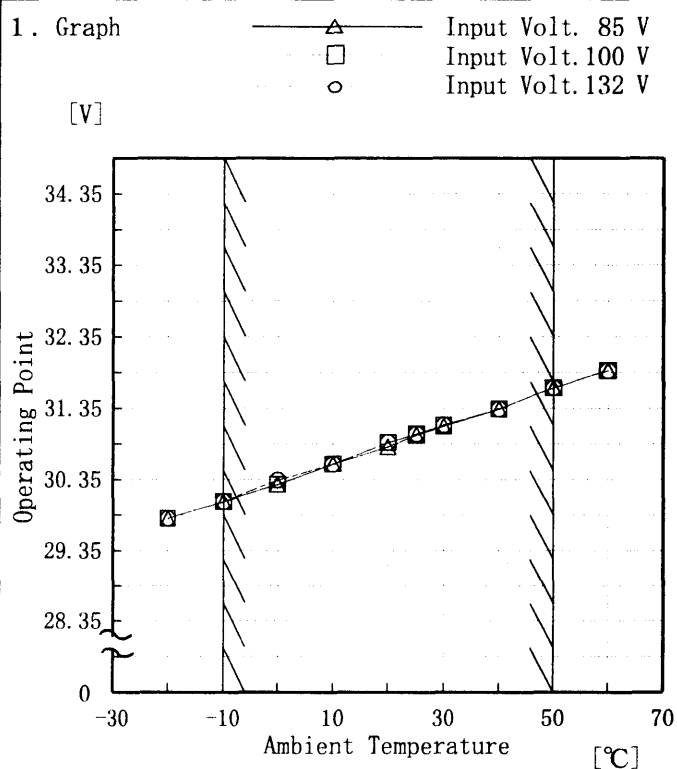
Model LCA75S-24

Item Overvoltage Protection  
過電圧保護

Object +24.0V3.2A

Testing Circuitry Figure A

## 1. Graph



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

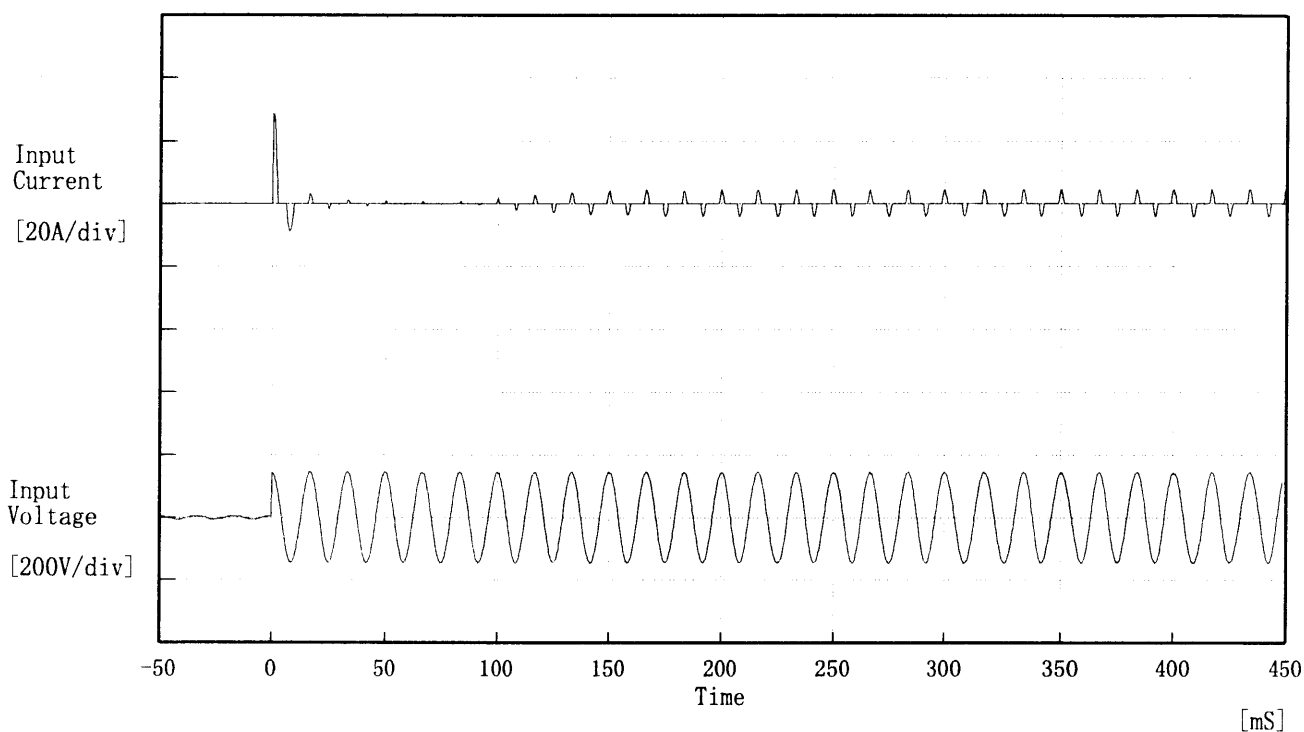
(注) 斜線は定格周囲温度範囲を示す。

## 2. Values

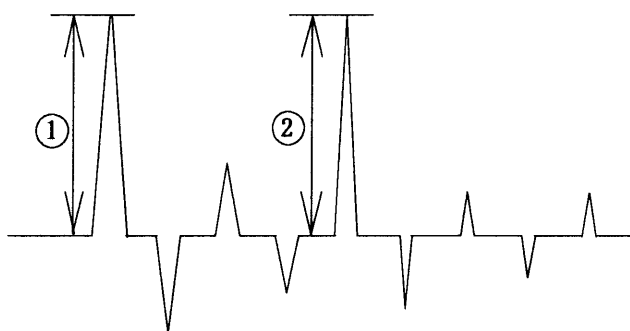
Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	29.80	29.80	29.80
-10	30.04	30.04	30.04
0	30.28	30.28	30.34
10	30.57	30.57	30.57
20	30.81	30.87	30.87
25	30.98	30.99	30.99
30	31.10	31.11	31.11
40	31.34	31.34	31.34
50	31.64	31.64	31.64
60	31.88	31.88	31.88
—	—	—	—

**COSEL**

Model	LCA75S-24	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 28.40 [A]  
② 4.40 [A]



**COSEL**

Model	LCA75S-24	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Responce 動的負荷変動	
Object	+24.0V 3.5A	

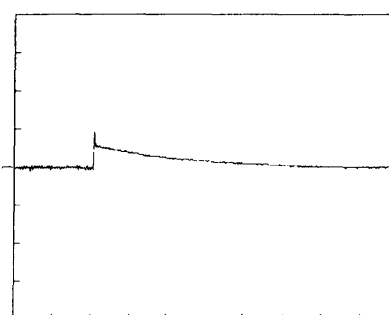
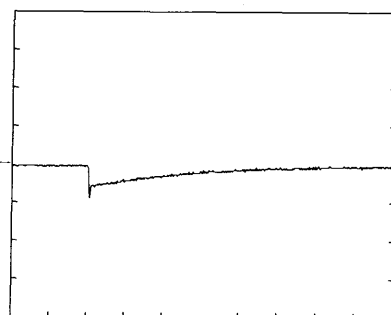
Input Volt. 100 V

Cycle 1000 mS

Load Current

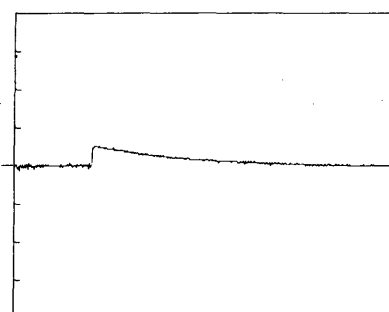
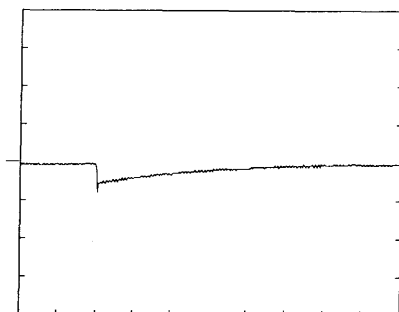
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



100 mV/div

10 mS/div

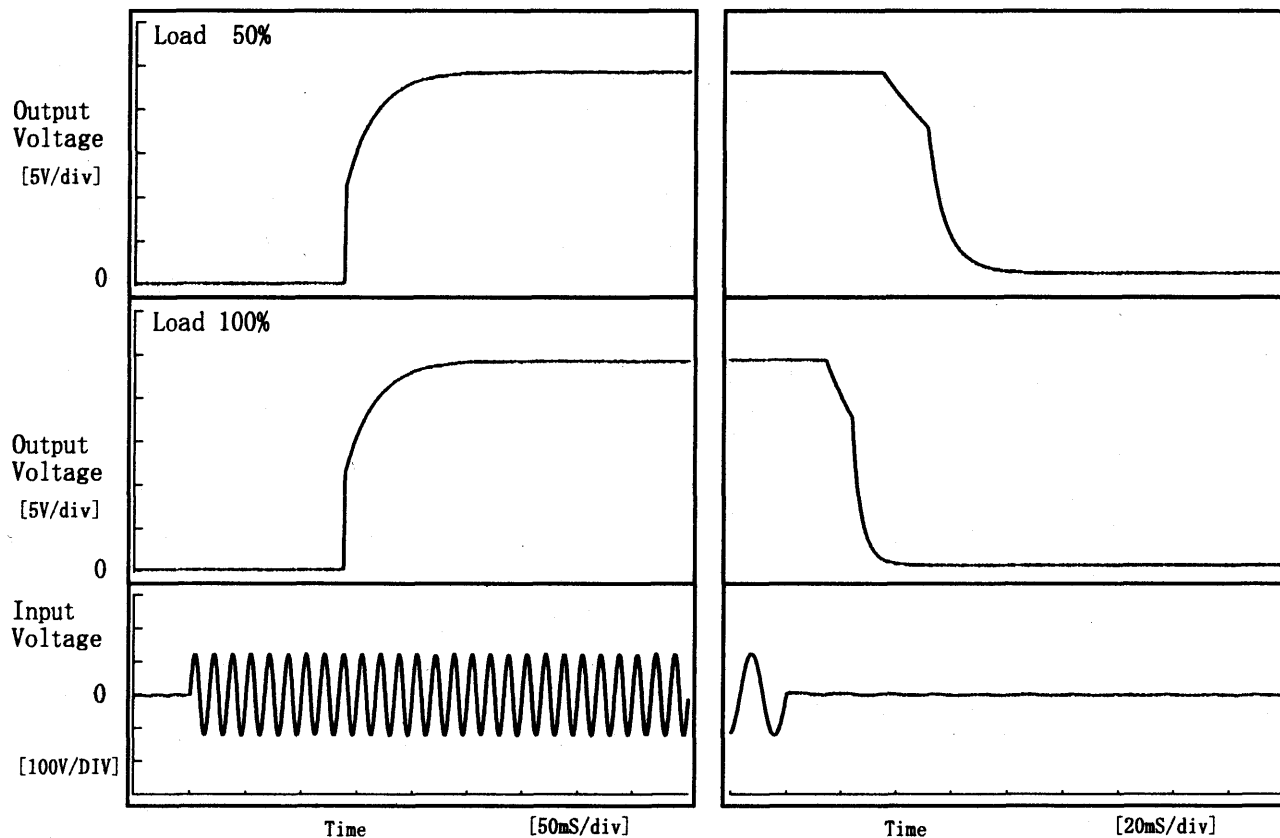


**COSEL**

Model	LCA75S-24	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+24.0V3.2A		

## 1. Graph

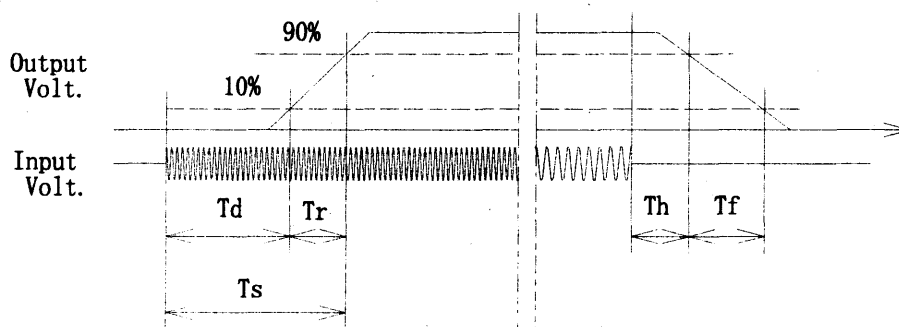
Input Volt. 85 V



## 2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	137.0	44.5	181.5	40.6	28.1
100 %	137.0	45.0	182.0	17.9	14.0



# COSEL

Model		LCA75S-24	
Item		Ambient Temperature Drift 周囲温度変動	
Object		+24.0V 3.2A	

1. Graph

△

—

Input Volt. 85V

□

- - -

Input Volt. 100V

○

· · ·

Input Volt. 132V

Output Voltage

[V]

24.340

24.300

24.260

24.220

24.180

24.140

24.100

0

-30

-10

10

20

30

40

50

60

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

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	24.283	24.283	24.283
-10	24.271	24.270	24.271
0	24.254	24.254	24.253
10	24.238	24.238	24.238
20	24.220	24.220	24.220
25	24.211	24.212	24.211
30	24.207	24.206	24.207
40	24.189	24.189	24.188
50	24.170	24.171	24.171
60	24.156	24.156	24.155
—	—	—	—

# COSEL

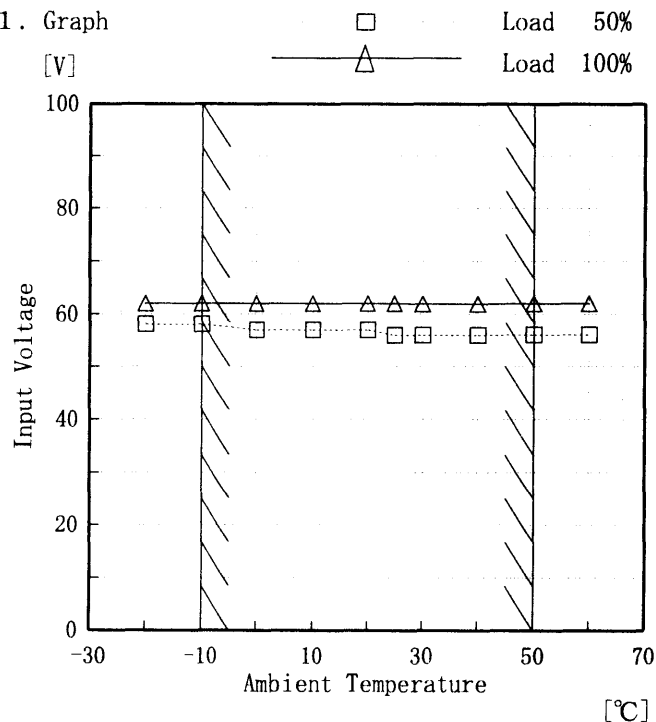
Model LCA75S-24

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

Object +24.0V3.2A

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]	Input Voltage [V]	
	Load 50%	Load 100%
-20	58	62
-10	58	62
0	57	62
10	57	62
20	57	62
25	56	62
30	56	62
40	56	62
50	56	62
60	56	62
—	—	—

# COSEL

Model

LCA75S-24

Item

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

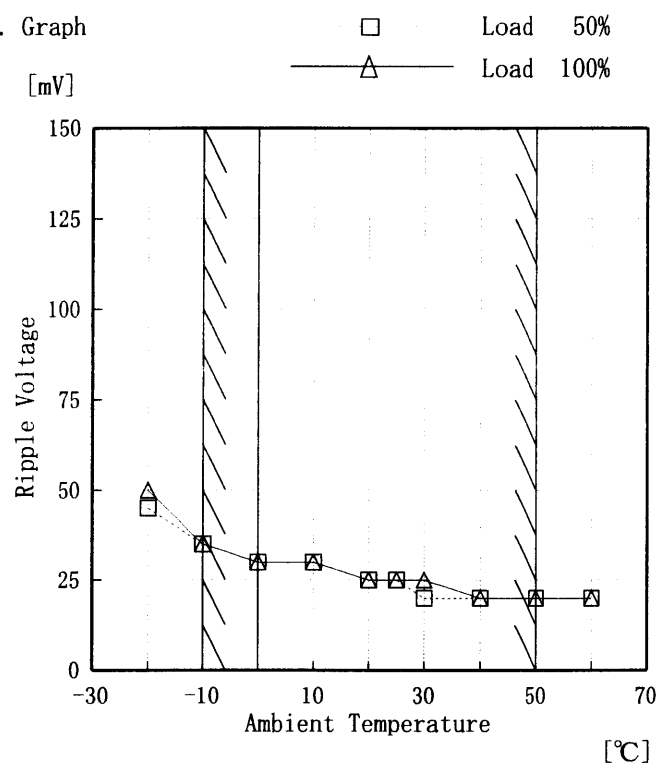
Object

+24.0V3.2A

Testing Circuitry

Figure A

## 1. Graph



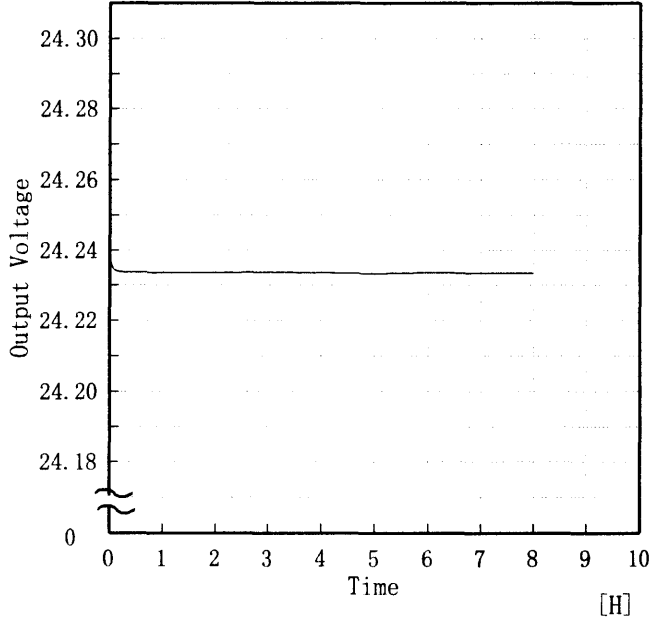
Note: Slanted line shows the range of the rated ambient temperature.

(注) 斜線は定格周囲温度範囲を示す。

## 2. Values

Ambient Temp. [°C]	Load 50%	Load 100%
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
-20	45	50
-10	35	35
0	30	30
10	30	30
20	25	25
25	25	25
30	20	25
40	20	20
50	20	20
60	20	20
—	—	—

**COSEL**

COSEL																									
Model	LCA75S-24	Temperature 25℃ Testing Circuitry Figure A																							
Item	Time Lapse Drift 経時ドリフト																								
Object	+24.0V3.2A																								
1. Graph		2.Values																							
<div>[V]</div> <div></div> <div>Input Volt. 100V Load 100%</div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>24.240</td></tr><tr><td>0.5</td><td>24.234</td></tr><tr><td>1.0</td><td>24.234</td></tr><tr><td>2.0</td><td>24.234</td></tr><tr><td>3.0</td><td>24.234</td></tr><tr><td>4.0</td><td>24.234</td></tr><tr><td>5.0</td><td>24.233</td></tr><tr><td>6.0</td><td>24.234</td></tr><tr><td>7.0</td><td>24.233</td></tr><tr><td>8.0</td><td>24.233</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	24.240	0.5	24.234	1.0	24.234	2.0	24.234	3.0	24.234	4.0	24.234	5.0	24.233	6.0	24.234	7.0	24.233	8.0	24.233
Time since start [H]	Output Voltage [V]																								
0.0	24.240																								
0.5	24.234																								
1.0	24.234																								
2.0	24.234																								
3.0	24.234																								
4.0	24.234																								
5.0	24.233																								
6.0	24.234																								
7.0	24.233																								
8.0	24.233																								

Model		LCA75F-24	Testing Circuitry    Figure A
Item		Output Voltage Accuracy    定電圧精度	
Object		+24.0V 3.2A	

### 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 :    85~132 V

Load Current :    0~3.2 A

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

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

### 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            85~132 V

負荷電流            0~3.2 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) =  $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

### 2. Values

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-10	132	0.0	24.271	±51	±0.3
Minimum Voltage	50	132	3.2	24.171		

# COSEL

Model		LCA75S-24	Testing Circuitry	Figure A												
Item		Condensation 結露特性														
Object		+24.0V3.2A														
<div>1. Condensation test</div> <div>Testing procedure is as follows.</div> <div>① Keeping and cooling the unit in a tank at -10℃ for an hour with the input off.</div> <div>② Taking it out of the tank and dewing itself in a room where the temperature is 25℃ and the humidity is 40%RH.</div> <div>③ Testing electrical characteristics of the unit to confirm there be no fault.</div>																
<div>1. 結露特性試験</div> <div>入力を切った状態で、恒温槽で- 1 0℃に冷却しておき、約1時間後に恒温槽から取り出し、室温2 5℃、湿度4 0 %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。</div>																
<div>2. Values</div> <table><tr><td>Item</td><td>Data</td><td>Testing Conditions</td></tr><tr><td>Output Voltage [V]</td><td>24.213</td><td>Input Volt. : 100V, Load Current:3.2A</td></tr><tr><td>Line Regulation [mV]</td><td>3</td><td>Input Volt. : 85~132V, Load Current:3.2A</td></tr><tr><td>Load Regulation [mV]</td><td>6</td><td>Input Volt. : 100V, Load Current:0~3.2A</td></tr></table>					Item	Data	Testing Conditions	Output Voltage [V]	24.213	Input Volt. : 100V, Load Current:3.2A	Line Regulation [mV]	3	Input Volt. : 85~132V, Load Current:3.2A	Load Regulation [mV]	6	Input Volt. : 100V, Load Current:0~3.2A
Item	Data	Testing Conditions														
Output Voltage [V]	24.213	Input Volt. : 100V, Load Current:3.2A														
Line Regulation [mV]	3	Input Volt. : 85~132V, Load Current:3.2A														
Load Regulation [mV]	6	Input Volt. : 100V, Load Current:0~3.2A														

-21-

BC-4057

# COSEL

Model	LCA75S-24	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	0.16	0.20	0.25
(B) IEC60950	0.17	0.21	0.26

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	LCA75S-24	Temperature Testing Circuitry	25°C Figure C
Item	Line Noise Tolerance 入力雑音耐量		
Object	+24.0V3.2A		

## 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	LCA75S-24	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object			

## 1. Graph

## Remarks

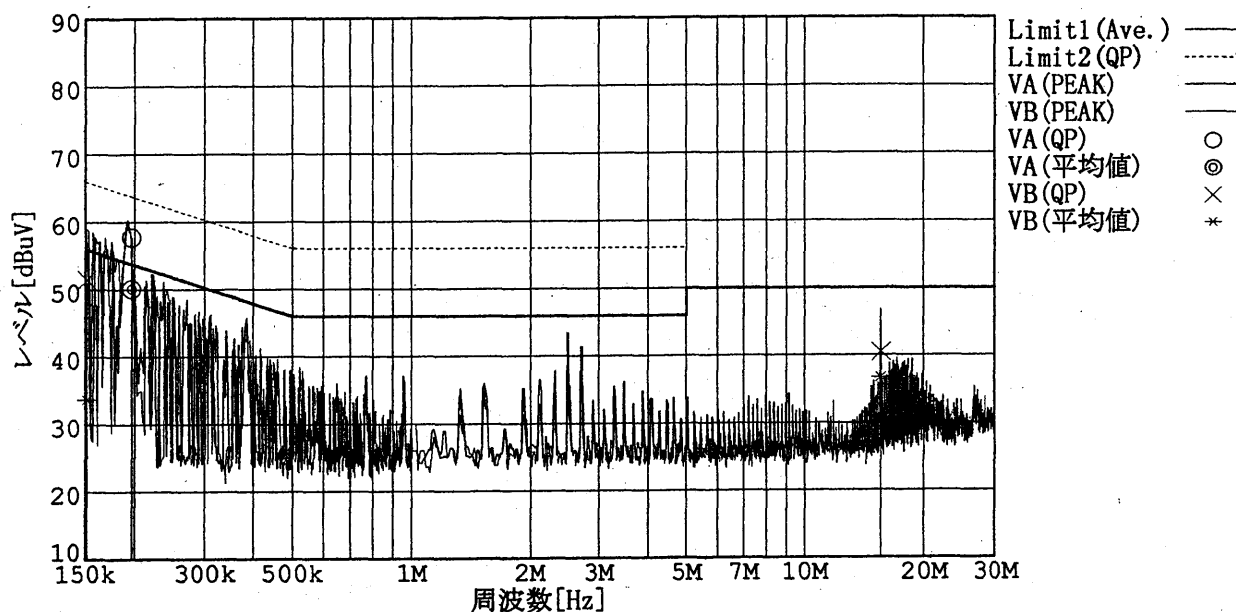
Input Volt. 100 V (VCCI Class B)

120 V (FCC Class B)

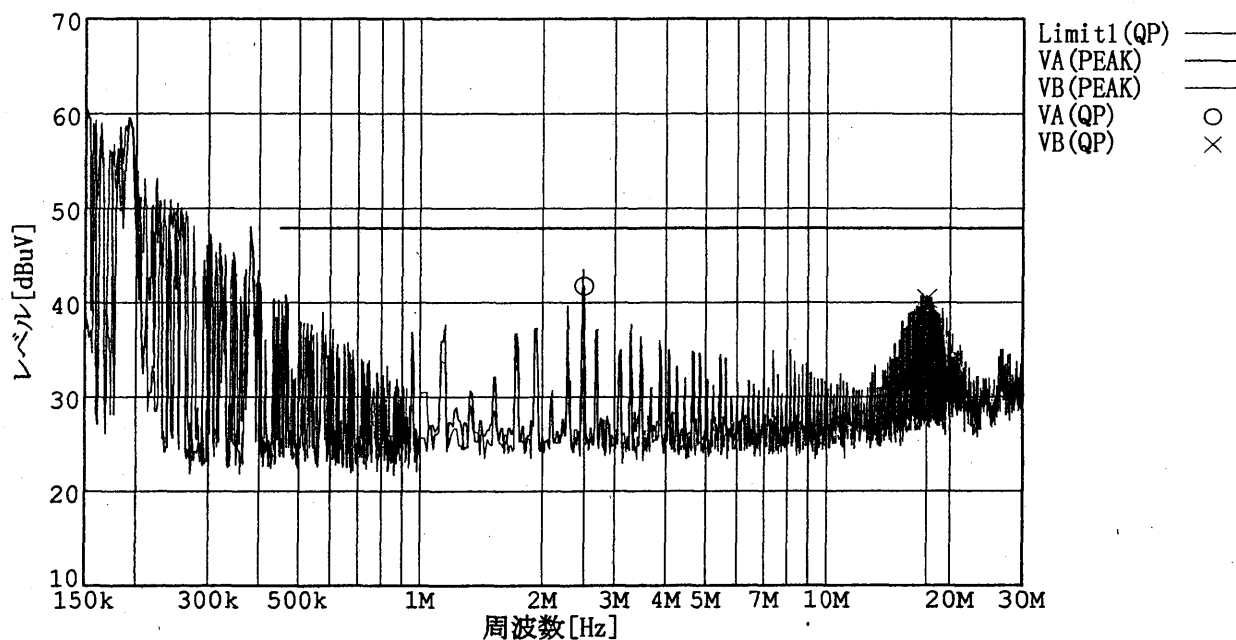
Load 100 %

規格 1: [VCCI] Class B(平均値)

規格 2: [VCCI] Class B(QP)



規格 1: [FCC Part15] Class B



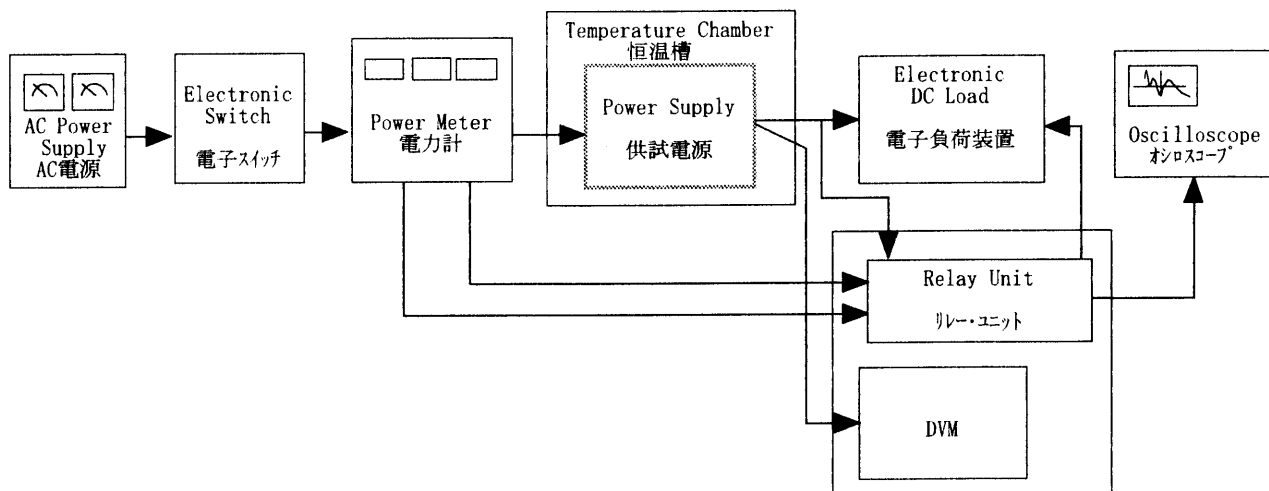


Figure A

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

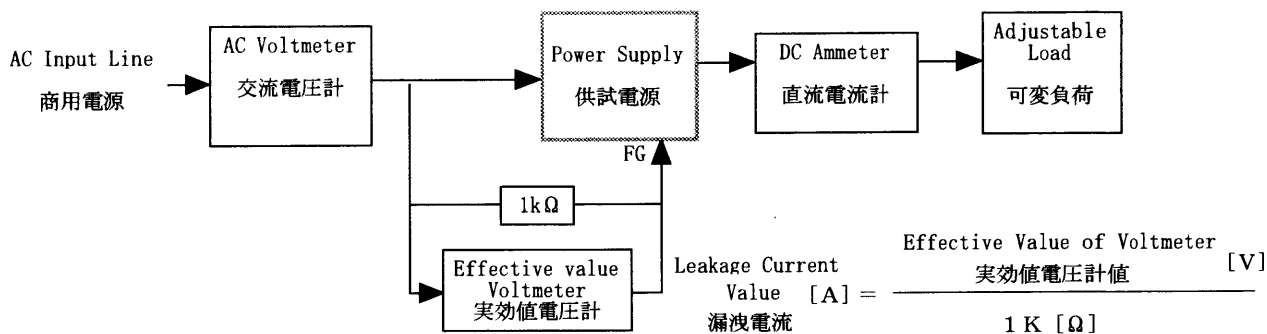


Figure B (DENTORI)

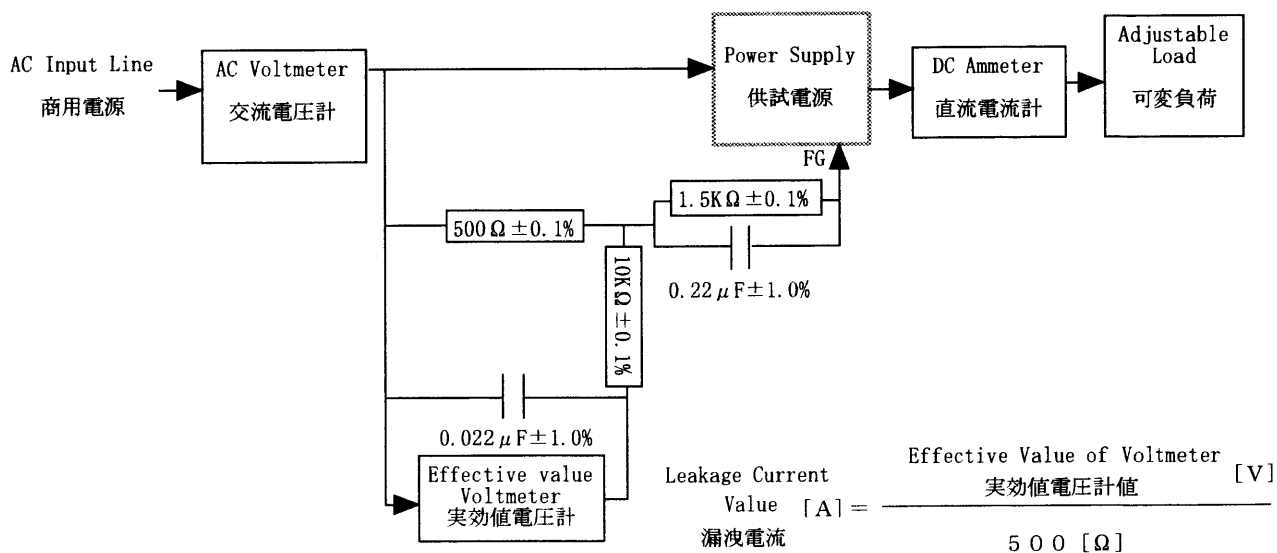


Figure B (IEC 60950)

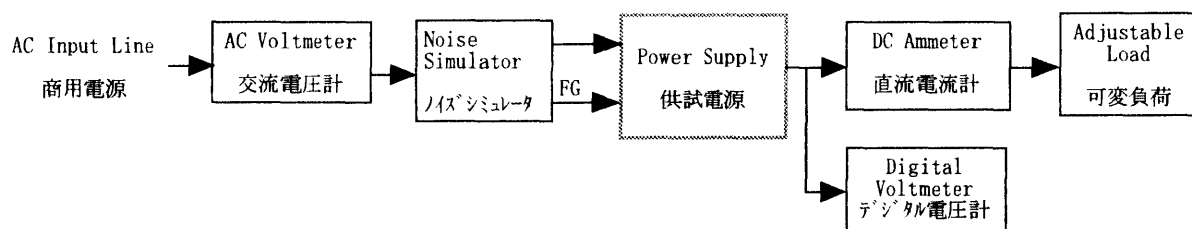


Figure C

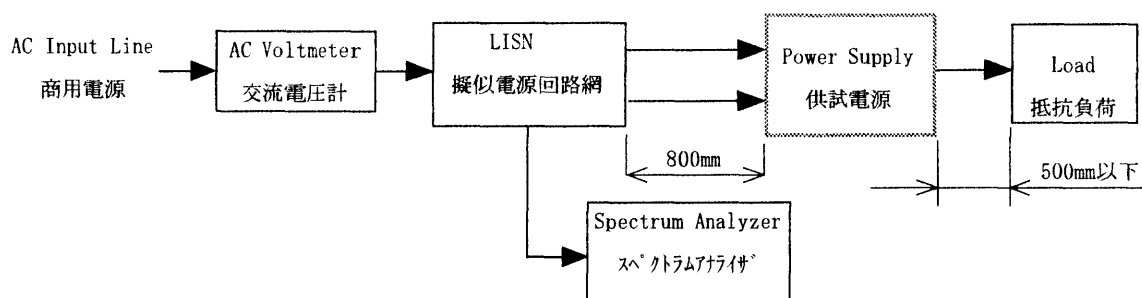


Figure D

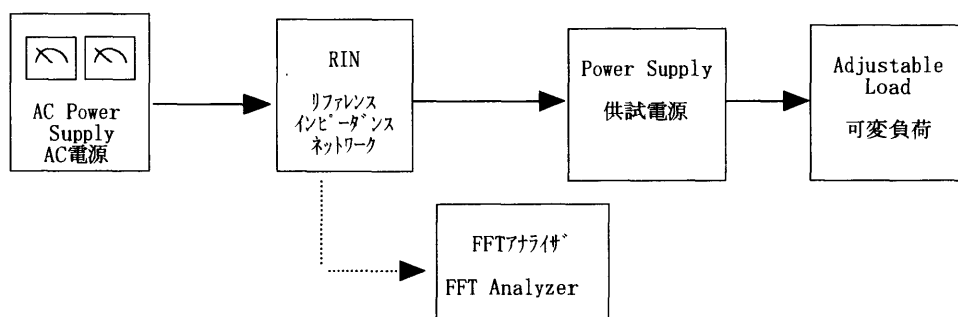


Figure E