



TEST DATA OF LCA50S-24-H (100V INPUT)

Regulated DC Power Supply

Nov. 5, 1999

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コーセル株式会社
COSEL CO., LTD.

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Object	+24.0V2.5A																																	
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<div><div><div>□-----</div><div>Load 50%</div></div><div><div>△-----</div><div>Load 100%</div></div></div> <div><div><div>[V]</div><div>24.240</div><div>24.220</div><div>24.200</div><div>24.180</div><div>24.160</div><div>24.140</div><div>24.120</div><div>0</div></div><div><div>Output Voltage</div><div></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>Input Voltage</div><div>[V]</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>																																		
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Model		LCA50S-24-H		Temperature		25℃	
Item		Efficiency (by Input Voltage) 効率 (入力電圧特性)		Testing Circuitry		Figure A	
Object							

1. Graph

-----□----- Load 50%

-----△----- Load 100%

Efficiency [%]

86

82

78

74

70

66

62

0

0

80

90

100

110

120

130

140

150

Input Voltage [V]

0

80

90

100

110

120

130

140

150

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]	Efficiency [%]	
	Load 50%	Load 100%
75	81.0	79.9
80	81.1	80.5
85	81.1	80.7
90	80.9	81.1
100	80.5	81.5
110	79.9	81.6
120	79.4	81.5
132	78.5	81.5
140	77.8	81.3

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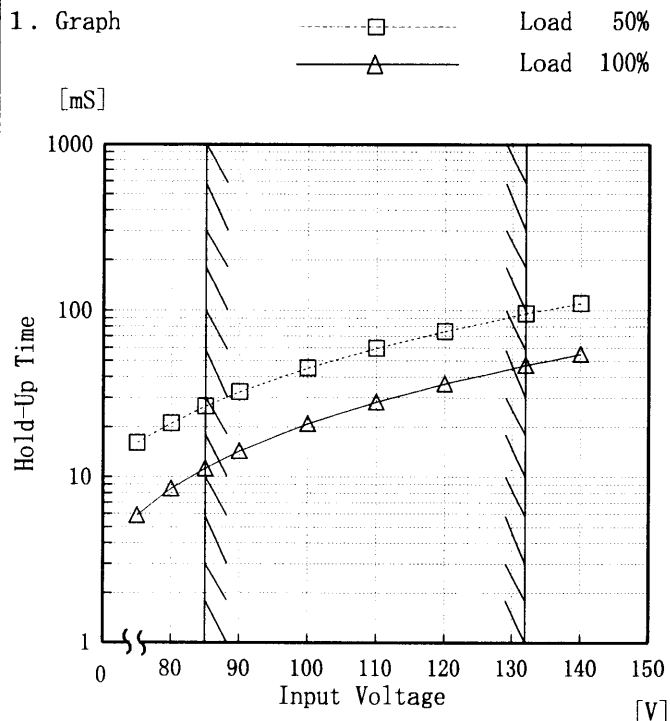
Model LCA50S-24-H

Item Hold-Up Time 出力保持時間

Object +24.0V2.5A

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	16	6
80	21	9
85	27	11
90	32	14
100	45	21
110	59	28
120	75	36
132	96	47
140	110	55

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Model

LCA50S-24-H

Item

Instantaneous Interruption Compensation
瞬時停電保障

Object

+24.0V2.5A

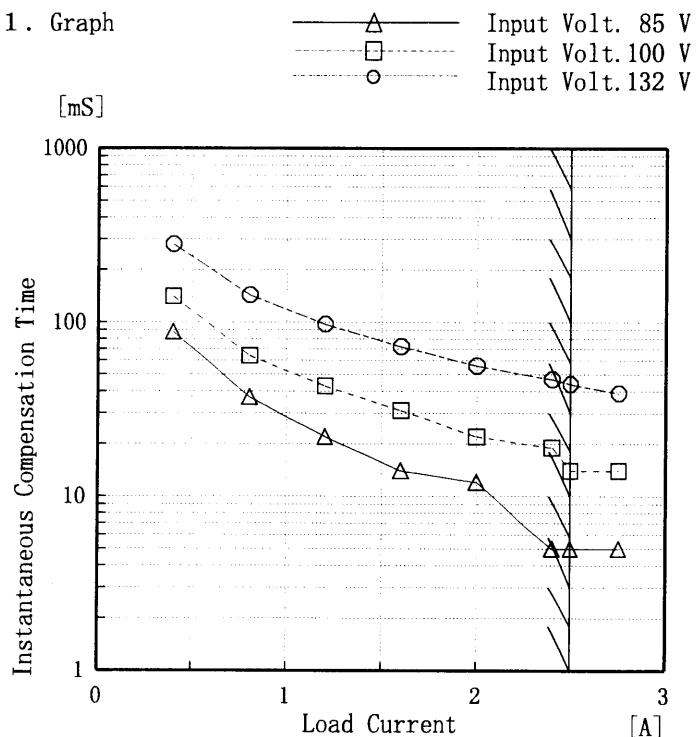
Temperature

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 load current.

瞬時停電保障時間とは、出力電圧が定電圧精度の規格範囲を保持している瞬時停電時間をいう。

(注) 斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Time [mS]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	—	—	—
0.40	88	140	281
0.80	37	64	143
1.20	22	43	97
1.60	14	31	72
2.00	12	22	56
2.40	5	19	47
2.50	5	14	44
2.75	5	14	39
—	—	—	—
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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>[V]</div><div><div><div>24.320</div><div>24.280</div><div>24.240</div><div>24.200</div><div>24.160</div><div>24.120</div><div>24.080</div><div>0</div></div><div><div>0</div><div>1</div><div>2</div><div>3</div></div><div><div>Output Voltage</div><div>Load Current [A]</div></div></div></div></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></div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Output Voltage [V]</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>24.177</td><td>24.177</td><td>24.176</td></tr><tr><td>0.40</td><td>24.176</td><td>24.176</td><td>24.175</td></tr><tr><td>0.80</td><td>24.175</td><td>24.175</td><td>24.175</td></tr><tr><td>1.20</td><td>24.175</td><td>24.175</td><td>24.175</td></tr><tr><td>1.60</td><td>24.175</td><td>24.175</td><td>24.174</td></tr><tr><td>2.00</td><td>24.175</td><td>24.175</td><td>24.174</td></tr><tr><td>2.40</td><td>24.175</td><td>24.175</td><td>24.174</td></tr><tr><td>2.50</td><td>24.175</td><td>24.175</td><td>24.174</td></tr><tr><td>2.75</td><td>24.175</td><td>24.174</td><td>24.174</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>	Load Current [A]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.00	24.177	24.177	24.176	0.40	24.176	24.176	24.175	0.80	24.175	24.175	24.175	1.20	24.175	24.175	24.175	1.60	24.175	24.175	24.174	2.00	24.175	24.175	24.174	2.40	24.175	24.175	24.174	2.50	24.175	24.175	24.174	2.75	24.175	24.174	24.174	—	—	—	—
Load Current [A]	Output Voltage [V]																																																		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																
0.00	24.177	24.177	24.176																																																
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2.40	24.175	24.175	24.174																																																
2.50	24.175	24.175	24.174																																																
2.75	24.175	24.174	24.174																																																
—	—	—	—																																																

COSEL

Model		LCA50S-24-H	
Item	Ripple Voltage (by Load Current) リップル電圧 (負荷特性)		Temperature 25℃ Testing Circuitry Figure A
Object	+24.0V2.5A		

1. Graph

—△— Input Volt. 85V

---○--- Input Volt. 132V

Ripple Voltage [mV]

100
90
80
70
60
50
40
30
20
10
0

01234

Load Current [A]

Load Current [A]	Input Volt. 85 [V] [mV]	Input Volt. 132 [V] [mV]
0.0	10	10
0.4	20	20
0.8	25	25
1.2	25	25
1.6	25	25
2.0	30	30
2.5	40	30
3.0	40	30
—	—	—
—	—	—
—	—	—

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]

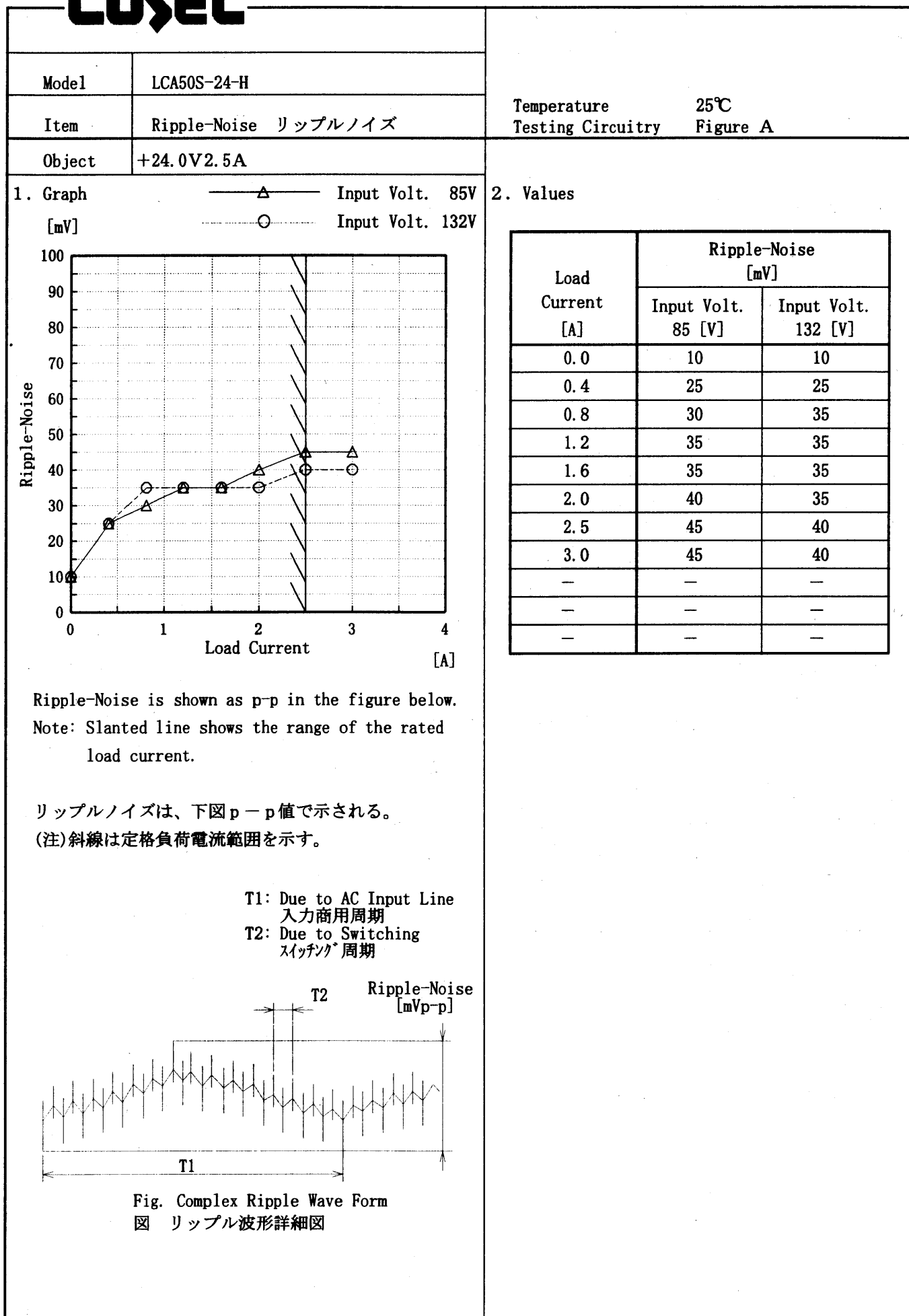
T1

T2

Fig. Complex Ripple Wave Form

図 リップル波形詳細図

Load Current [A]	Ripple Output Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.0	10	10
0.4	20	20
0.8	25	25
1.2	25	25
1.6	25	25
2.0	30	30
2.5	40	30
3.0	40	30
—	—	—
—	—	—
—	—	—

COSEL

COSEL

Model		LCA50S-24-H	
Item		Overcurrent Protection 過電流保護	
Object		+24.0V2.5A	

1. Graph

Input Volt. 85 V

Input Volt. 100 V

Input Volt. 132 V

[V]

40.0

30.0

20.0

10.0

0.0

0

1

2

3

4

5

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。

Output Voltage [V]	Load Current [A]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
24.00	3.511	3.514	3.554
22.80	3.530	3.527	3.566
21.60	3.540	3.535	3.574
19.20	3.553	3.550	3.595
16.80	3.571	3.562	3.614
14.40	3.572	3.580	3.633
12.00	3.582	3.595	3.649
9.60	3.589	3.606	3.657
7.20	3.587	3.605	3.650
4.80	3.561	3.575	3.611
2.40	3.478	3.487	3.535
0.00	3.976	4.121	4.503

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		LCA50S-24-H	
Item		Overvoltage Protection 過電圧保護	
Object		+24.0V2.5A	

1. Graph

—△—

---□---

---○---

Input Volt. 85 V

Input Volt.100 V

Input Volt.132 V

[V]

Operating Point

Ambient Temperature [°C]

Load 0%

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

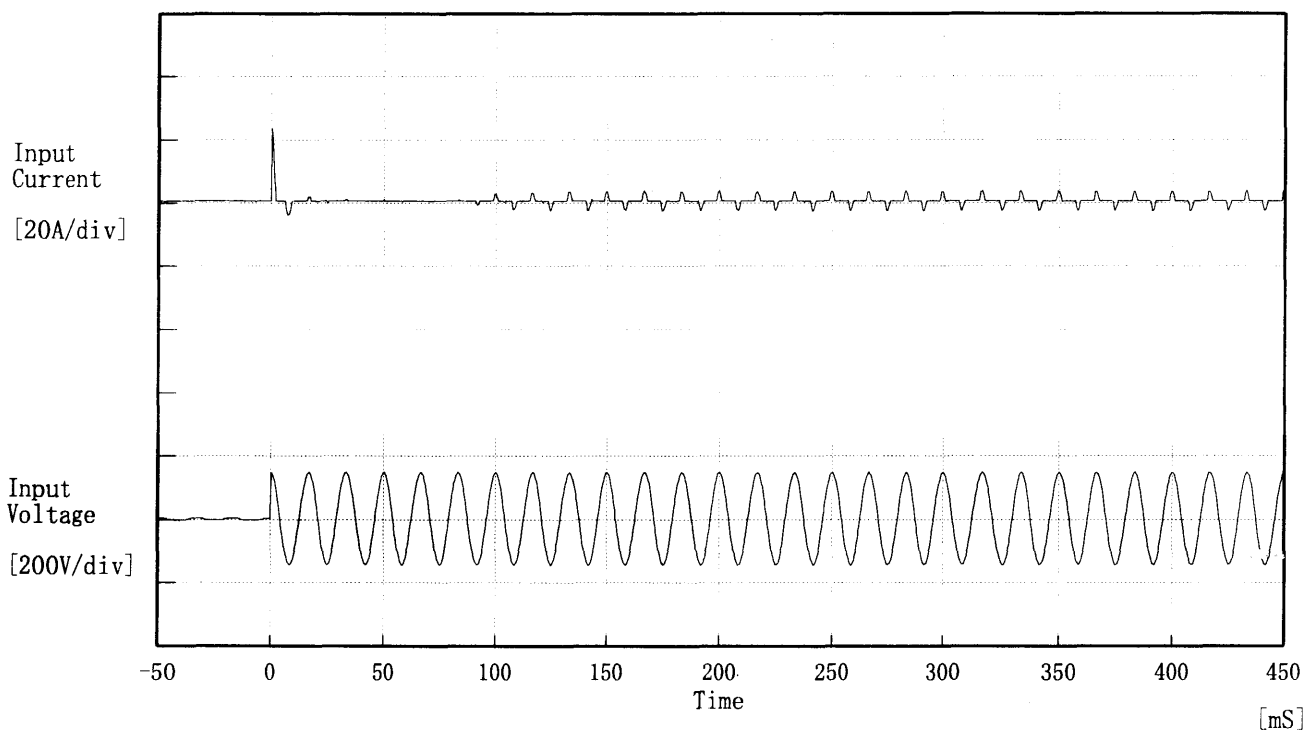
(注)斜線は定格周囲温度範囲を示す。

2. Values

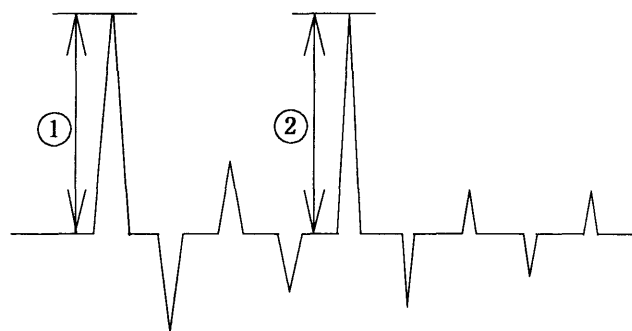
Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	30.10	30.10	30.10
-10	30.34	30.34	30.34
0	30.63	30.63	30.63
10	30.87	30.87	30.87
20	31.17	31.17	31.17
25	31.29	31.29	31.29
30	31.41	31.41	31.41
40	31.65	31.65	31.71
50	31.95	31.95	31.95
60	32.18	32.18	32.18
—	—	—	—

COSEL

Model	LCA50S-24-H	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 23.58 [A]
 ② 3.98 [A]



COSEL

Model	LCA50S-24-H	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Responce 動的負荷変動		
Object	+24.0V2.5A		

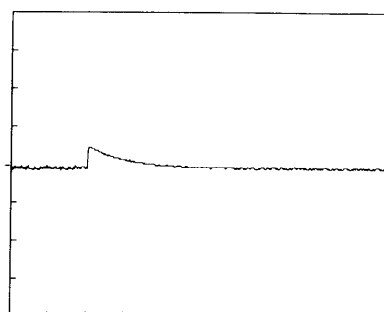
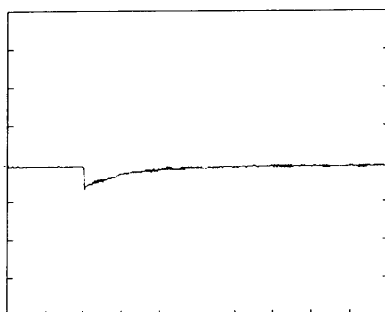
Input Volt. 100 V

Cycle 1000 mS

Load Current

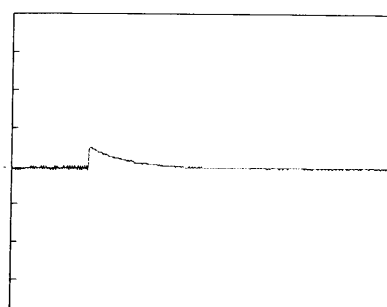
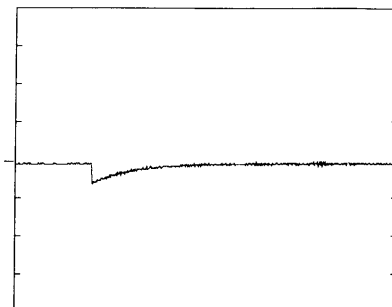
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



100 mV/div

100 mS/div

COSEL

Model		LCA50S-24-H	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Responce 動的負荷変動	
Object		+24.0V2.5A	

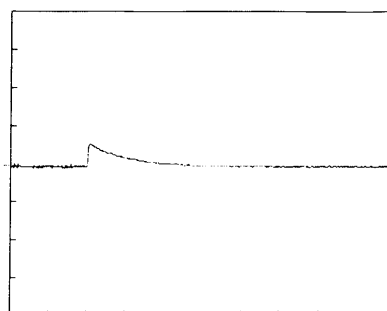
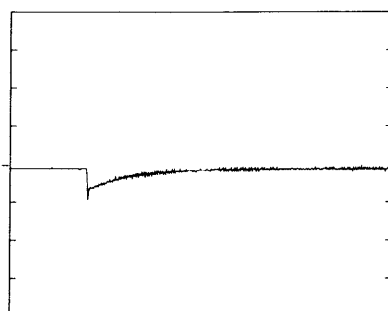
Input Volt. 100 V

Cycle 1000 mS

Load Current

Load 0% ←→

Peak



100 mv/div

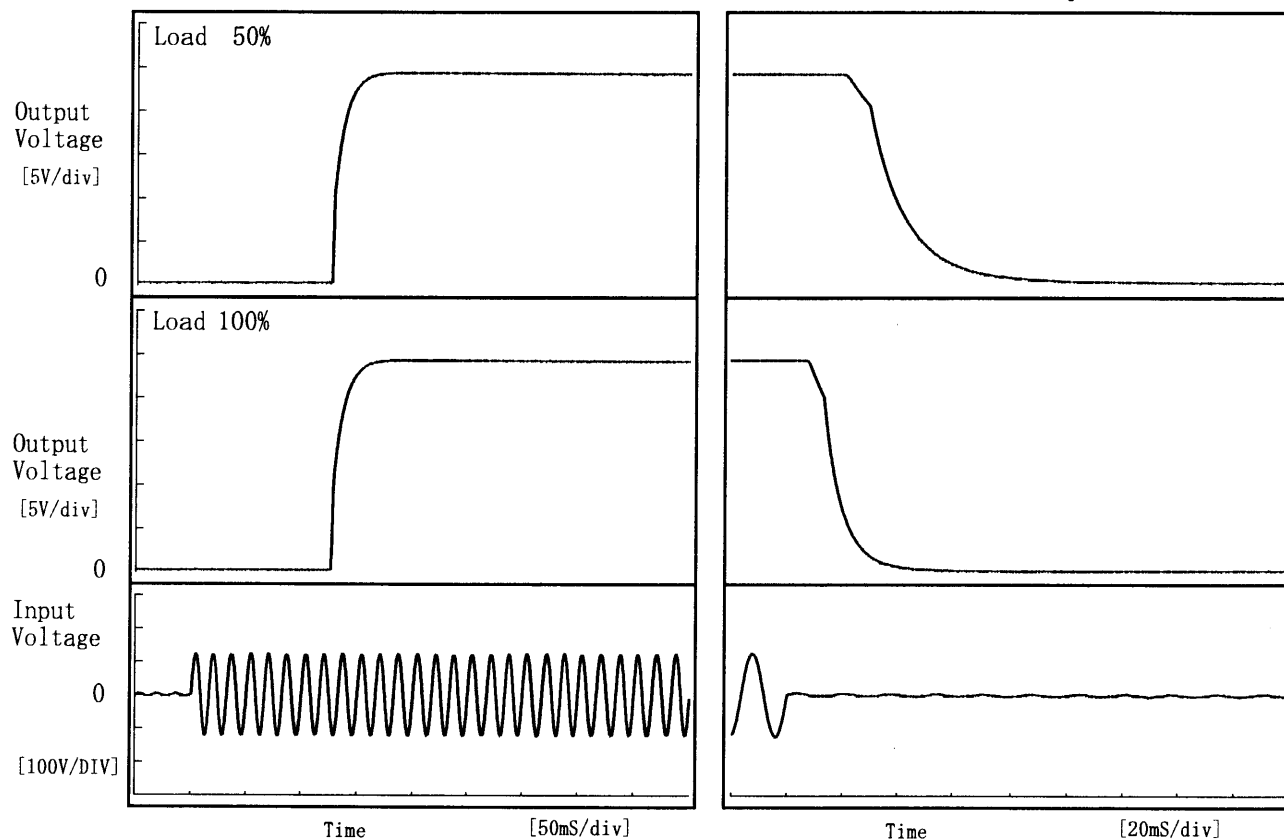
100 ms/div

COSEL

Model	LCA50S-24-H	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+24.0V2.5A		

1. Graph

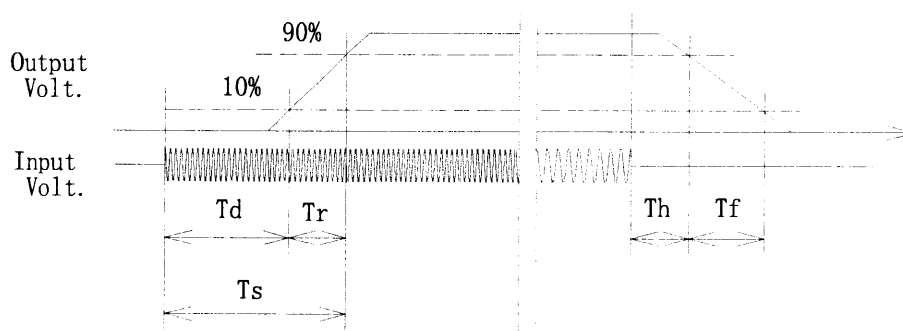
Input Volt. 85 V



2. Values

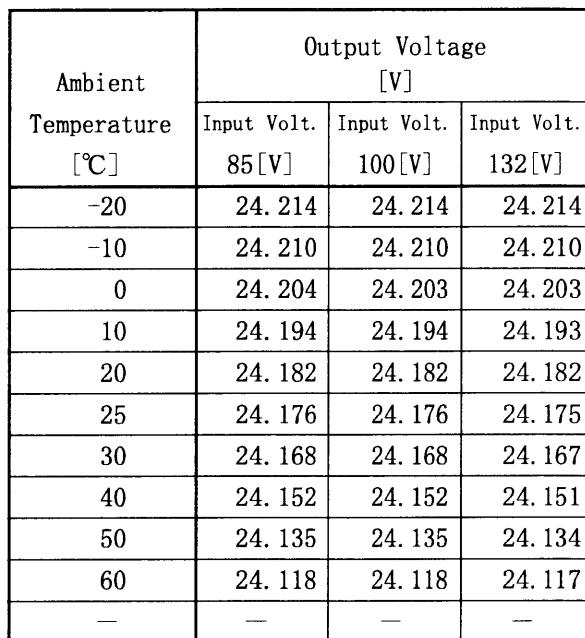
[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	126.5	18.5	145.0	26.7	32.7
100 %	126.8	18.5	145.3	11.4	16.8



Testing Circuitry Figure A

2. Values



(注)斜線は定格周囲温度範囲を示す。

COSEL

Model

LCA50S-24-H

Item

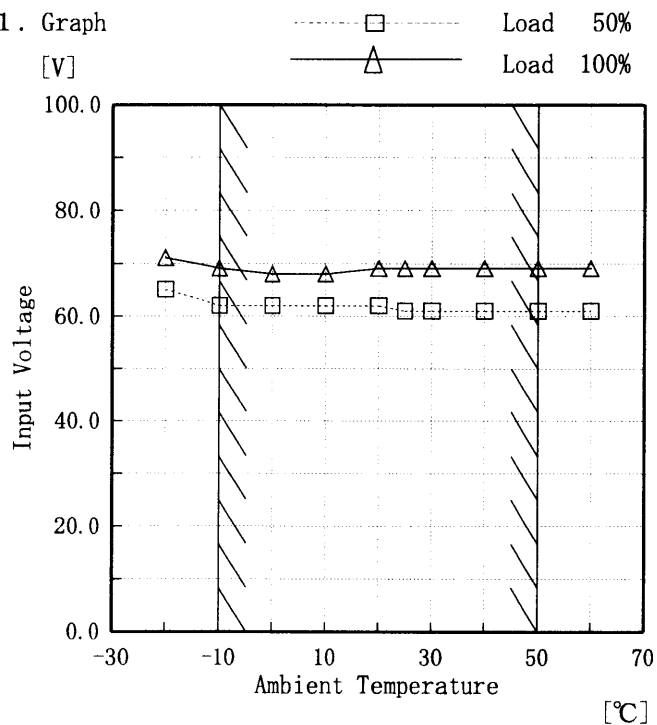
Minimum Input Voltage for Regulated Output Voltage
最低レギュレーション電圧

Object

+24.0V2.5A

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。

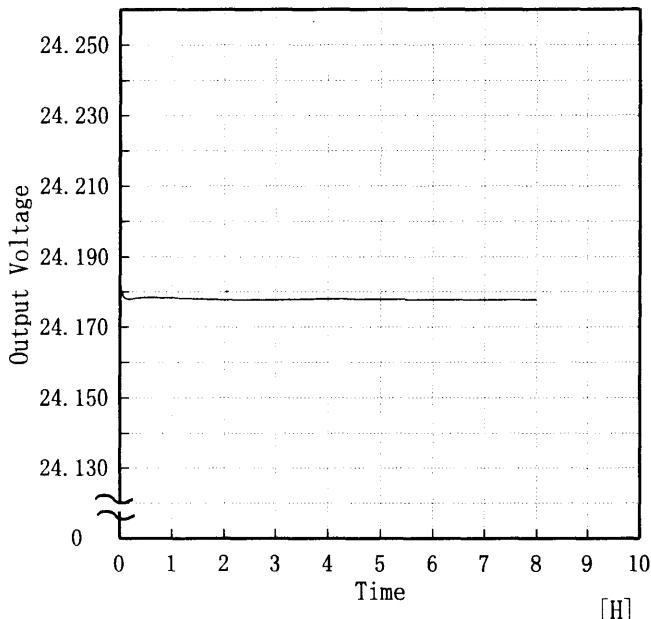
2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	65	71
-10	62	69
0	62	68
10	62	68
20	62	69
25	61	69
30	61	69
40	61	69
50	61	69
60	61	69
—	—	—

COSEL

Model		LCA50S-24-H																																						
Item		Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)																																						
Object		+24.0V2.5A																																						
1. Graph		<div> <div>□ Load 50%</div> <div>△ Load 100%</div> </div> <p>Input Volt. 100 V</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p> <p>(注) 斜線は定格周囲温度範囲を示す。</p>																																						
2. Values		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Ripple Output Voltage [mV]</th></tr> <tr> <th>Load 50%</th><th>Load 100%</th></tr> </thead> <tbody> <tr><td>-20</td><td>85</td><td>90</td></tr> <tr><td>-10</td><td>70</td><td>80</td></tr> <tr><td>0</td><td>55</td><td>55</td></tr> <tr><td>10</td><td>50</td><td>50</td></tr> <tr><td>20</td><td>40</td><td>40</td></tr> <tr><td>25</td><td>30</td><td>35</td></tr> <tr><td>30</td><td>25</td><td>30</td></tr> <tr><td>40</td><td>25</td><td>25</td></tr> <tr><td>50</td><td>25</td><td>25</td></tr> <tr><td>60</td><td>25</td><td>25</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>	Ambient Temperature [°C]	Ripple Output Voltage [mV]		Load 50%	Load 100%	-20	85	90	-10	70	80	0	55	55	10	50	50	20	40	40	25	30	35	30	25	30	40	25	25	50	25	25	60	25	25	—	—	—
Ambient Temperature [°C]	Ripple Output Voltage [mV]																																							
	Load 50%	Load 100%																																						
-20	85	90																																						
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20	40	40																																						
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50	25	25																																						
60	25	25																																						
—	—	—																																						

COSEL

COSEL																									
Model	LCA50S-24-H	Temperature 25℃ Testing Circuitry Figure A																							
Item	Time Lapse Drift 経時ドリフト																								
Object	+24.0V2.5A																								
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>24.188</td></tr><tr><td>0.5</td><td>24.178</td></tr><tr><td>1.0</td><td>24.178</td></tr><tr><td>2.0</td><td>24.178</td></tr><tr><td>3.0</td><td>24.178</td></tr><tr><td>4.0</td><td>24.178</td></tr><tr><td>5.0</td><td>24.178</td></tr><tr><td>6.0</td><td>24.178</td></tr><tr><td>7.0</td><td>24.178</td></tr><tr><td>8.0</td><td>24.178</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	24.188	0.5	24.178	1.0	24.178	2.0	24.178	3.0	24.178	4.0	24.178	5.0	24.178	6.0	24.178	7.0	24.178	8.0	24.178
Time since start [H]	Output Voltage [V]																								
0.0	24.188																								
0.5	24.178																								
1.0	24.178																								
2.0	24.178																								
3.0	24.178																								
4.0	24.178																								
5.0	24.178																								
6.0	24.178																								
7.0	24.178																								
8.0	24.178																								

COSEL

Model

LCA50S-24-H

Item

Output Voltage Accuracy 定電圧精度

Testing Circuitry Figure A

Object

+24.0V2.5A

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 : 0~2.5 A

* Output Voltage Accuracy = ± (Maximum of Output Voltage - 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 0~2.5 A

* 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

* 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	24.213	±41	±0.2
Minimum Voltage	50	132	2.5	24.132		

COSEL

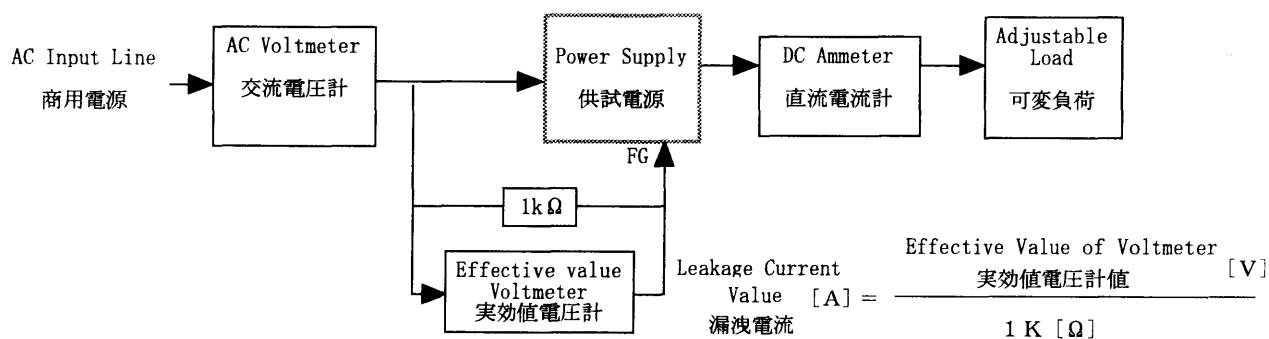
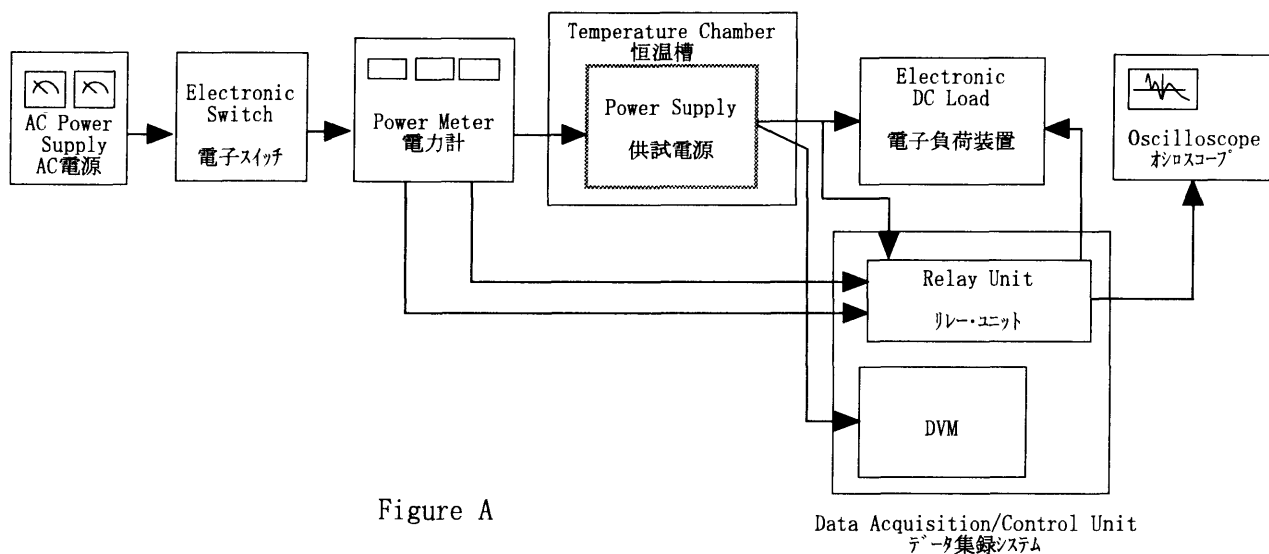


Figure B (DENTORI)

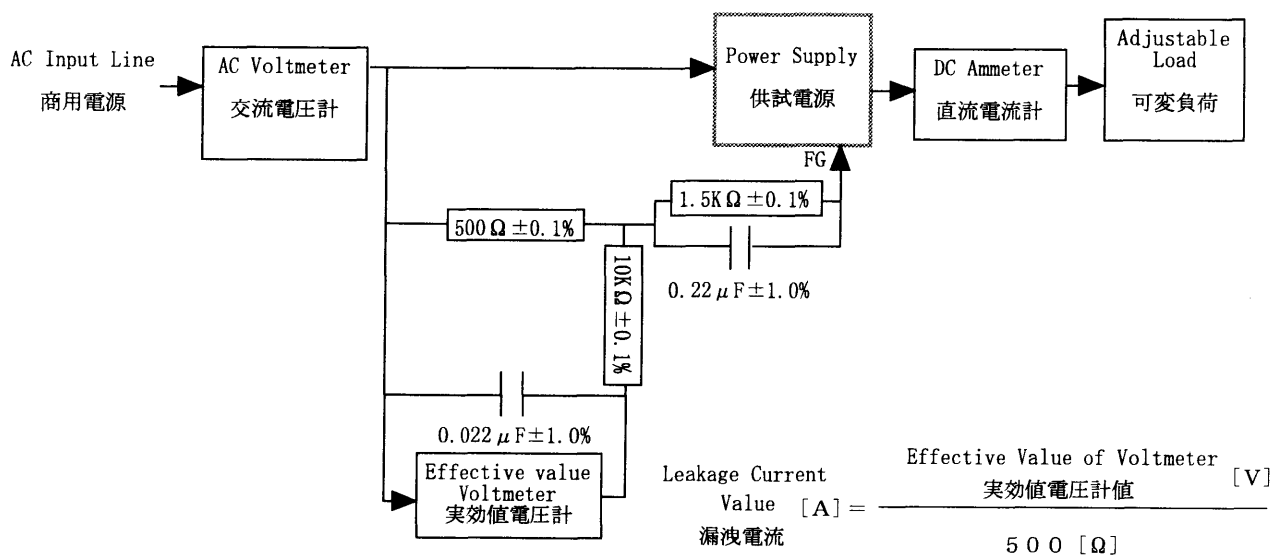


Figure B (IEC 60950)

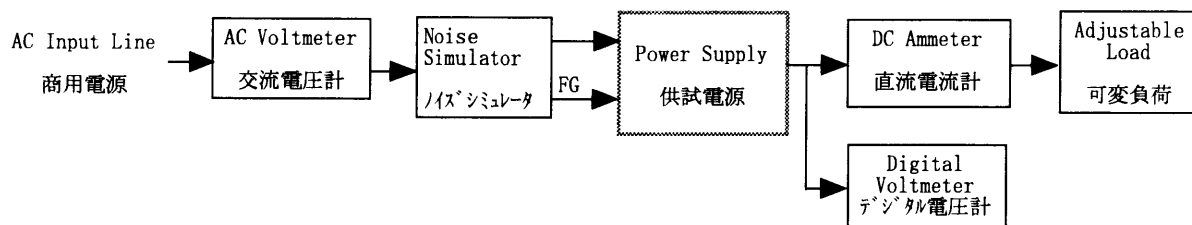


Figure C

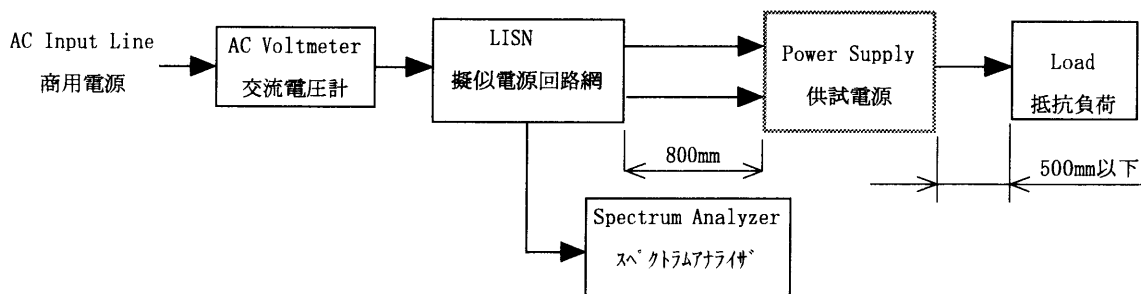


Figure D

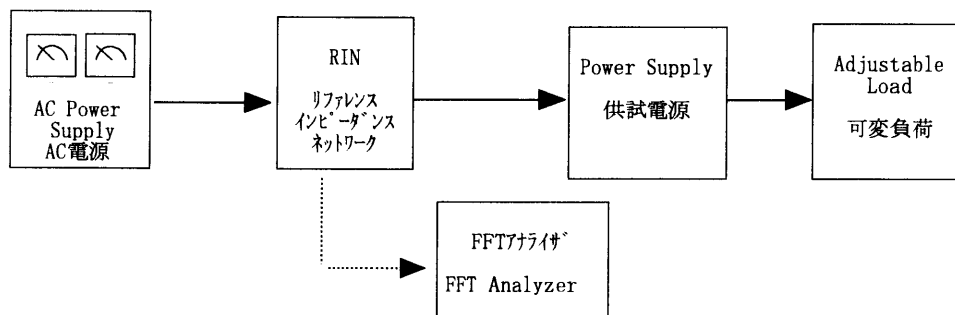


Figure E