

**COSEL**

TEST DATA OF R25A-24  
(100V INPUT)

Regulated DC Power Supply

Date : Nov. 4. 1998

Approved by : R. Soto  
Design Manager

Prepared by : H. Ishikawa  
Design Engineer

コーセル株式会社

**COSEL CO., LTD.**



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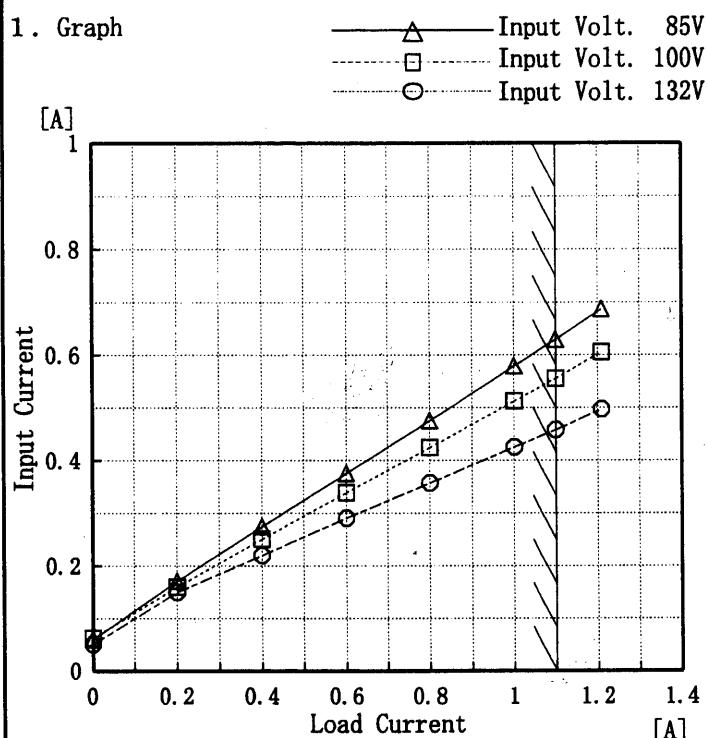
Model	R25A-24	Temperature Testing Circuitry 25°C Figure A																																
Item	Line Regulation 静的入力変動																																	
Object	+24.0V 1.10A																																	
1. Graph	<p>Load 50%      □</p> <p>Load 100%     △</p>																																	
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Note: 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。

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Model	R25A-24
Item	Input Current (by Load Current) 入力電流 (負荷特性)
Output	—



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。

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.060	0.062	0.051
0.20	0.170	0.160	0.150
0.40	0.275	0.251	0.220
0.60	0.376	0.339	0.291
0.80	0.476	0.424	0.357
1.00	0.579	0.513	0.426
1.10	0.629	0.555	0.459
1.21	0.687	0.606	0.498
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

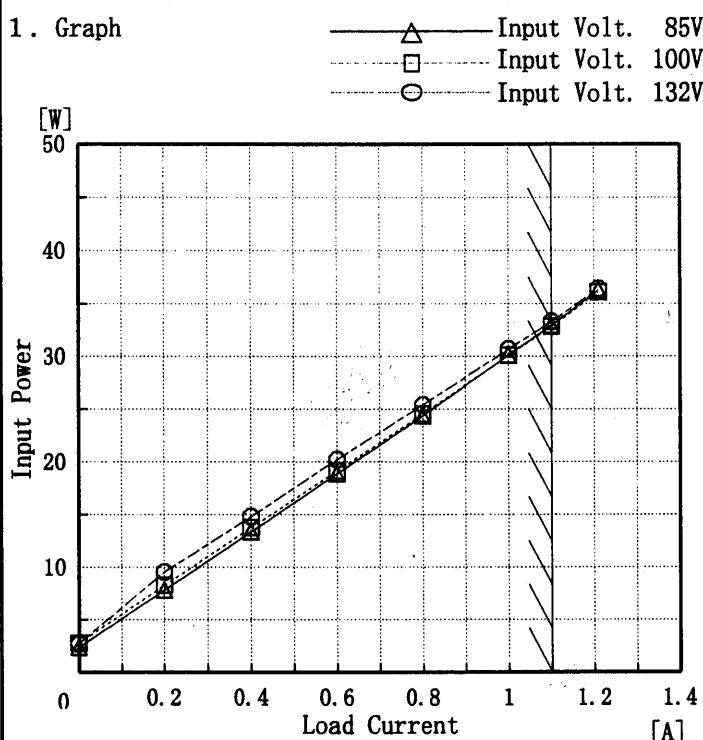
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Model R25A-24

Item Input Power (by Load Current)  
入力電力 (負荷特性)

Output \_\_\_\_\_

## 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。

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	2.33	2.77	2.71
0.20	7.82	8.25	9.54
0.40	13.37	13.76	14.80
0.60	18.87	19.16	20.22
0.80	24.39	24.53	25.40
1.00	30.15	30.12	30.70
1.10	32.93	32.83	33.30
1.21	36.25	36.06	36.40
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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Model	R25A-24	Temperature Testing Circuitry	25°C Figure A																														
Item	Efficiency (by Input Voltage) 効率(入力電圧特性)																																
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1. Graph	<p>Efficiency [%]</p> <p>Input Voltage [V]</p> <p>Legend: □ Load 50%    ▲ Load 100%</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Load 50% Efficiency [%]</th> <th>Load 100% Efficiency [%]</th> </tr> </thead> <tbody> <tr><td>75</td><td>76.4</td><td>79.3</td></tr> <tr><td>80</td><td>76.4</td><td>79.8</td></tr> <tr><td>85</td><td>75.9</td><td>80.0</td></tr> <tr><td>90</td><td>75.5</td><td>80.3</td></tr> <tr><td>100</td><td>74.4</td><td>80.3</td></tr> <tr><td>110</td><td>73.2</td><td>80.0</td></tr> <tr><td>120</td><td>71.9</td><td>79.8</td></tr> <tr><td>132</td><td>70.2</td><td>79.1</td></tr> <tr><td>140</td><td>69.0</td><td>78.6</td></tr> </tbody> </table>			Input Voltage [V]	Load 50% Efficiency [%]	Load 100% Efficiency [%]	75	76.4	79.3	80	76.4	79.8	85	75.9	80.0	90	75.5	80.3	100	74.4	80.3	110	73.2	80.0	120	71.9	79.8	132	70.2	79.1	140	69.0	78.6
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120	71.9	79.8																															
132	70.2	79.1																															
140	69.0	78.6																															

## 2. Values

Input Voltage [V]	Load 50%	Load 100%
	Efficiency [%]	Efficiency [%]
75	76.4	79.3
80	76.4	79.8
85	75.9	80.0
90	75.5	80.3
100	74.4	80.3
110	73.2	80.0
120	71.9	79.8
132	70.2	79.1
140	69.0	78.6

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。

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Model	R25A-24	Temperature Testing Circuitry 25°C Figure A																																																							
Item	Efficiency (by Load Current) 効率(負荷電流特性)																																																								
Output	—																																																								
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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。

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Model

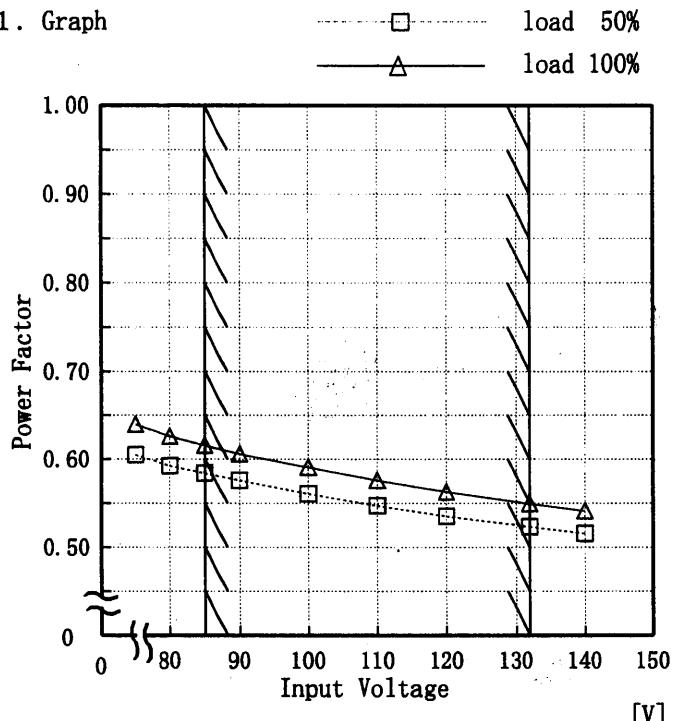
R25A-24

Item

Power Factor (by Input Voltage)  
力率(入力電圧特性)

Object

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。

Temperature 25°C  
Testing Circuitry Figure A

2. Values

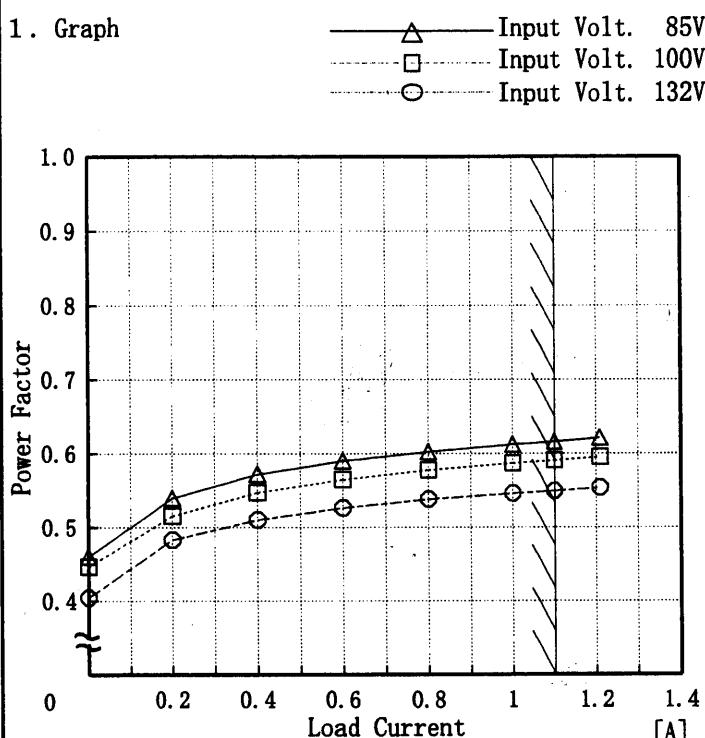
Input Voltage [V]	load 50%	load 100%
	Power Factor	Power Factor
75	0.60	0.64
80	0.59	0.63
85	0.58	0.62
90	0.58	0.61
100	0.56	0.59
110	0.55	0.58
120	0.54	0.56
132	0.52	0.55
140	0.52	0.54

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Model	R25A-24
Item	Power Factor (by Load Current) 力率(負荷電流特性)
Output	—

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Load Current [A]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.46	0.45	0.40
0.20	0.54	0.52	0.48
0.40	0.57	0.55	0.51
0.60	0.59	0.57	0.53
0.80	0.60	0.58	0.54
1.00	0.61	0.59	0.55
1.10	0.62	0.59	0.55
1.21	0.62	0.60	0.55
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

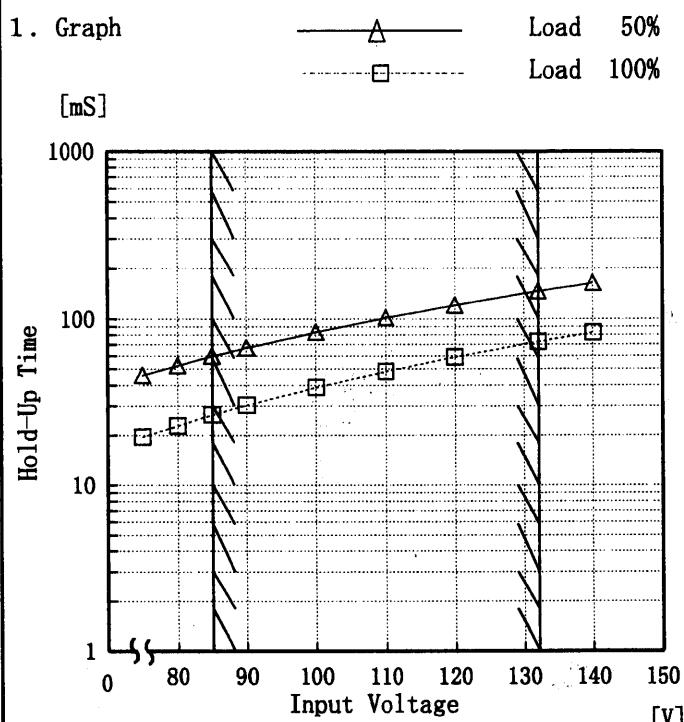
Note: Slanted line shows the range of the rated load current

(注)斜線は定格負荷電流範囲を示す。

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Model	R25A-24
Item	Hold-Up Time 出力保持時間
Object	+24.0V 1.10A

Temperature 25°C  
Testing Circuitry Figure A



## 2. Values

Input Voltage [V]	Load 50%	Load 100%
	Hold-Up Time [mS]	Hold-Up Time [mS]
75	46	20
80	53	23
85	60	27
90	67	30
100	83	39
110	101	48
120	121	59
132	146	73
140	165	83

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。

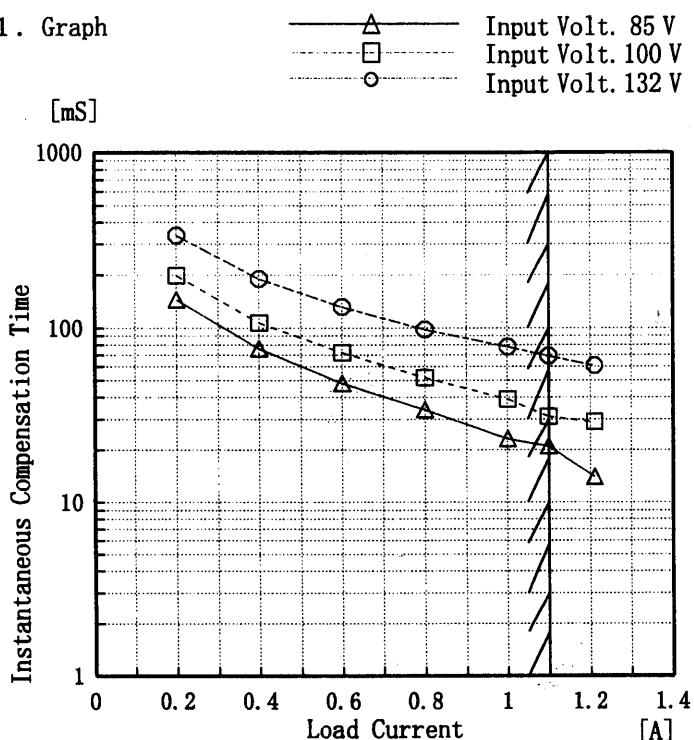
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Model R25A-24

Item Instantaneous Interruption Compensation  
瞬時停電保障

Object +24.0V 1.10A

## 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。

Testing Circuitry Figure A

## 2. Values

Load Current [A]	Input Volt.	Input Volt.	Input Volt.
	85[V]	100[V]	132[V]
Time [mS]			
0.00	—	—	—
0.20	145	199	337
0.40	76	107	191
0.60	48	72	132
0.80	34	52	98
1.00	23	39	78
1.10	21	31	69
1.21	14	29	61
—	—	—	—
—	—	—	—
—	—	—	—

**COSSEL**

Model	R25A-24	Temperature Testing Circuitry      25°C Figure A																																														
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Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																													
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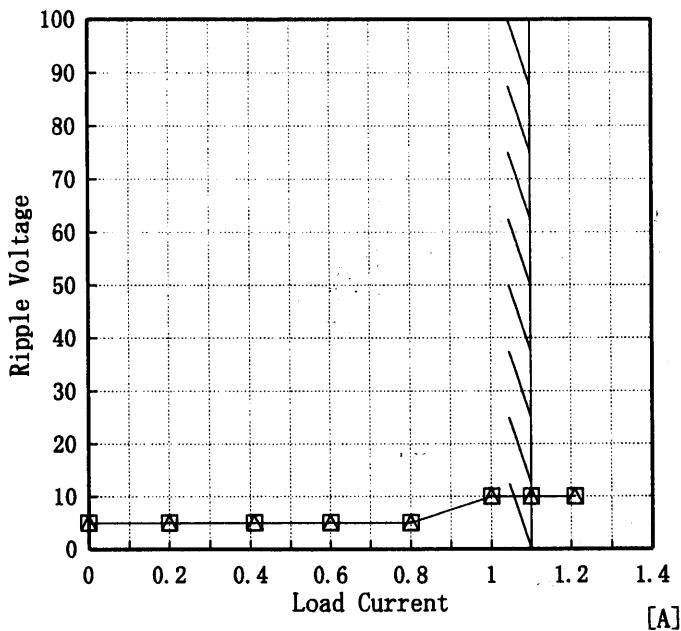
Model R25A-24

Item Ripple Voltage (by Load Current)  
リップル電圧(負荷電流特性)

Object +24.0V 1.10A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph



2. Values

Load Current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
0.0	5	5
0.2	5	5
0.4	5	5
0.6	5	5
0.8	5	5
1.0	10	10
1.1	10	10
1.2	10	10
—	—	—
—	—	—
—	—	—

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

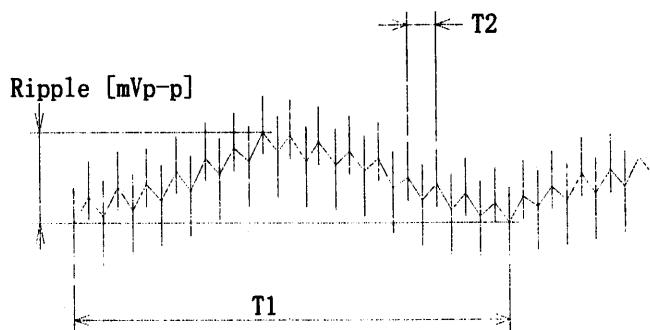
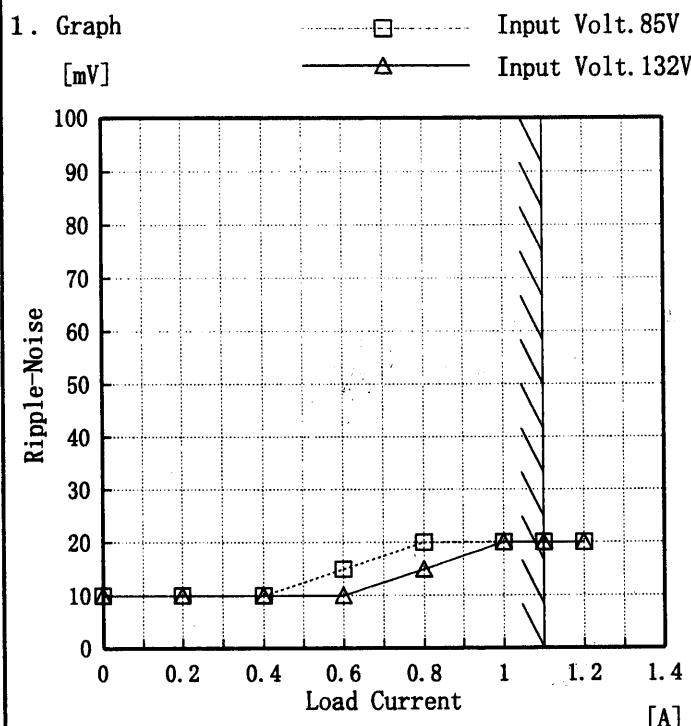


Fig. Complex Ripple Wave Form

図 リップル波形詳細図

**COSSEL**

Model	R25A-24	Temperature Testing Circuitry	25°C Figure A
Item	Ripple-Noise リップルノイズ		
Object	+24.0V 1.10A		



## 2. Values

Load current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.0	10	10
0.2	10	10
0.4	10	10
0.6	15	10
0.8	20	15
1.0	20	20
1.1	20	20
1.2	20	20
—	—	—
—	—	—
—	—	—

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

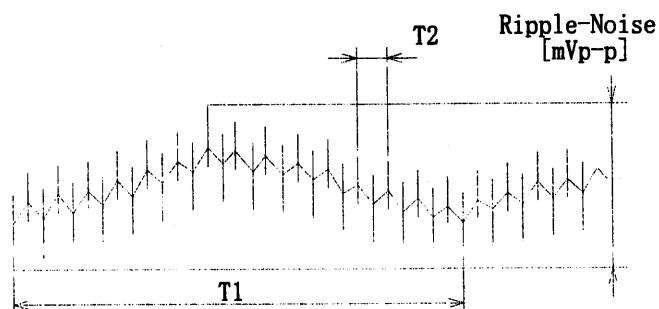


Fig. Complex Ripple Wave Form

図 リップル波形詳細図

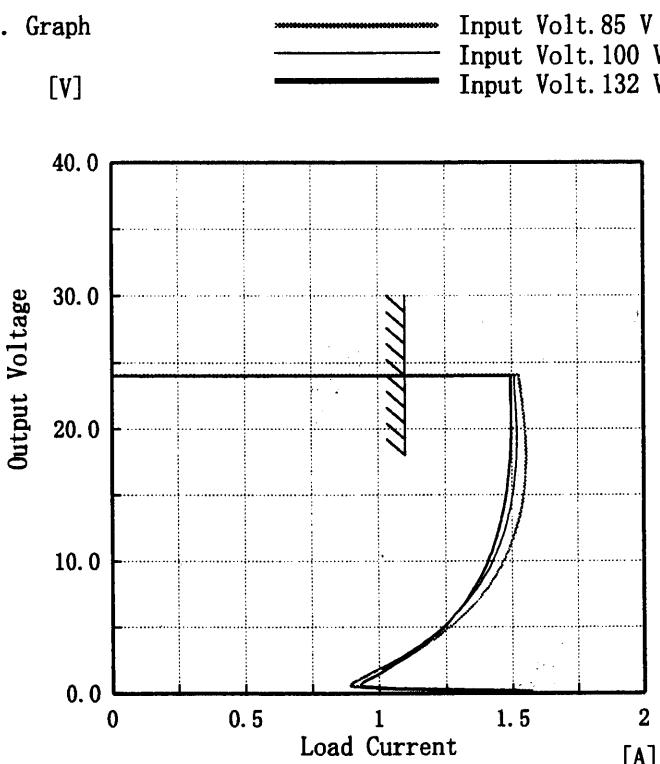
**COSEL**

Model R25A-24

Item Overcurrent Protection  
過電流保護

Object +24.0V 1.10A

## 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。

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

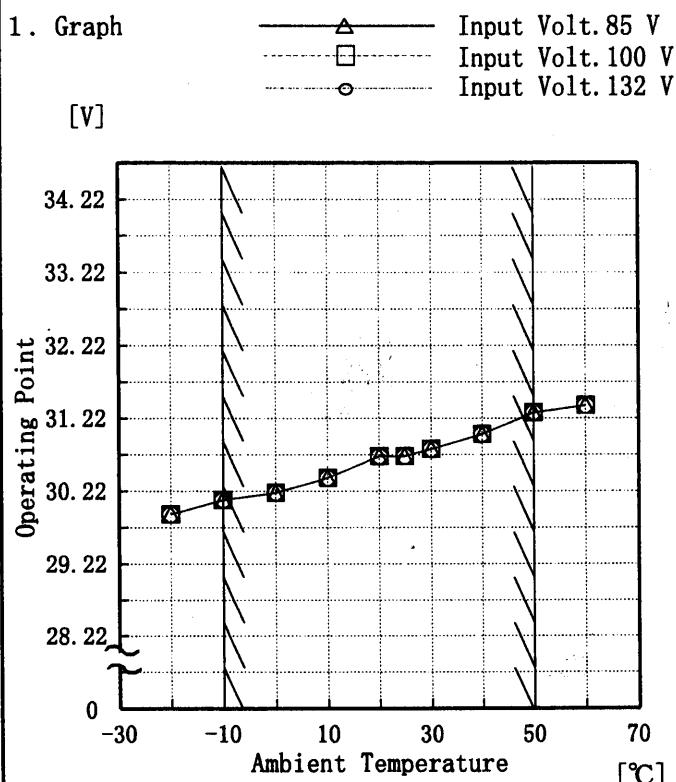
Output Voltage [V]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Load Current [A]	Load Current [A]	Load Current [A]
24.00	1.53	1.51	1.50
22.80	1.53	1.51	1.49
21.60	1.54	1.51	1.50
19.20	1.55	1.52	1.50
16.80	1.55	1.51	1.49
14.40	1.54	1.50	1.47
12.00	1.51	1.47	1.44
9.60	1.46	1.42	1.40
7.20	1.38	1.34	1.34
4.80	1.26	1.23	1.24
2.40	1.08	1.07	1.09
0.00	1.52	1.45	1.58

**COSSEL**

Model R25A-24

Item Overvoltage Protection  
過電圧保護

Object +24.0V 1.10A



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

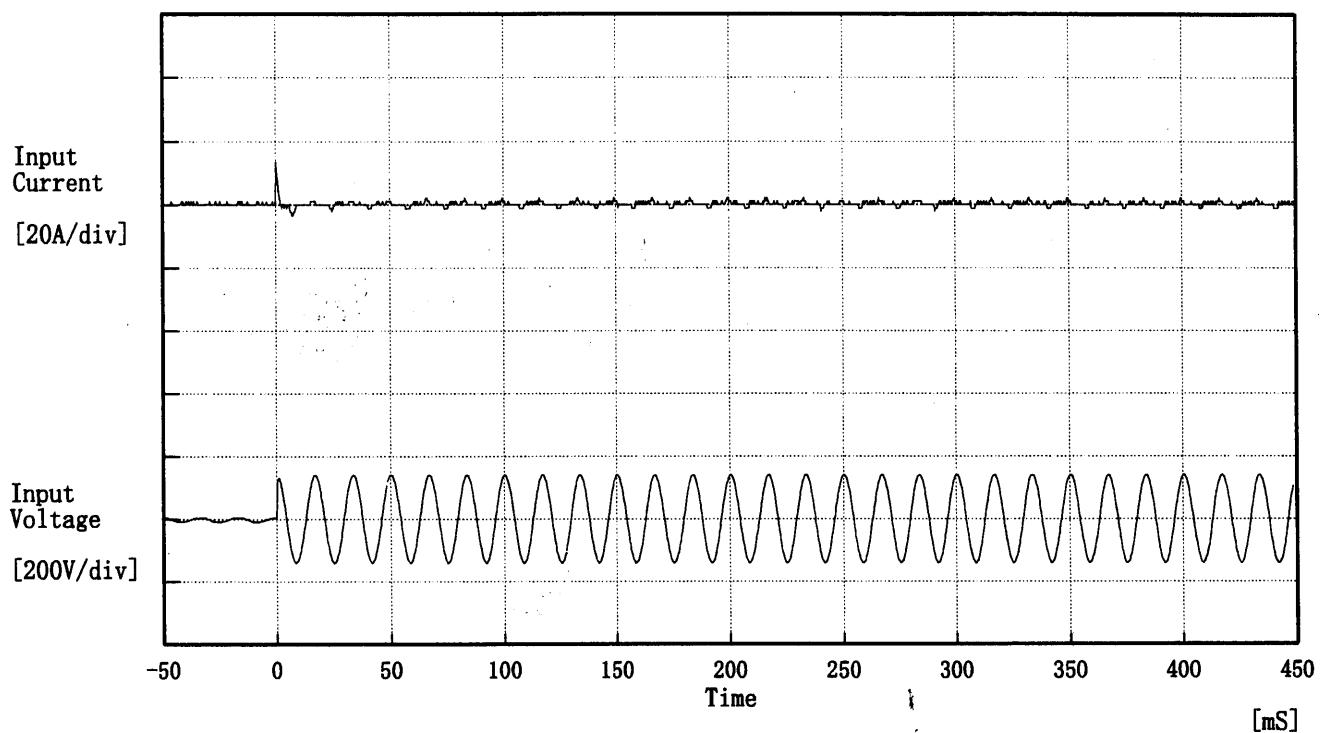
Ambient Temp. [°C]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Operating Point [V]		
-20	29.9	29.9	29.9
-10	30.1	30.1	30.1
0	30.2	30.2	30.2
10	30.4	30.4	30.4
20	30.7	30.7	30.7
25	30.7	30.7	30.7
30	30.8	30.8	30.8
40	31.0	31.0	31.0
50	31.3	31.3	31.3
60	31.4	31.4	31.4
—	—	—	—

COSEL

Model R25A-24

Item Inrush Current 突入電流

Object

Temperature 25°C  
Testing Circuitry Figure A

Input Voltage 100 V

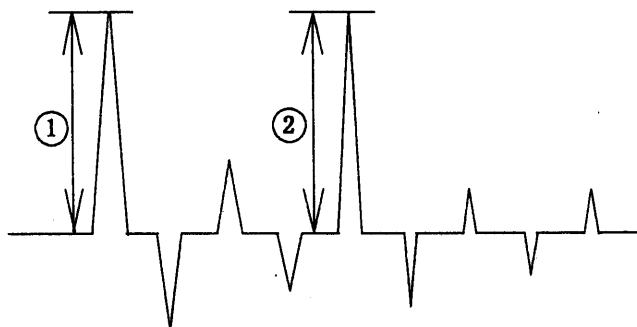
Frequency 60 Hz

Load 100 %

Inrush Current

① 13.45 [A]

② 2.25 [A]



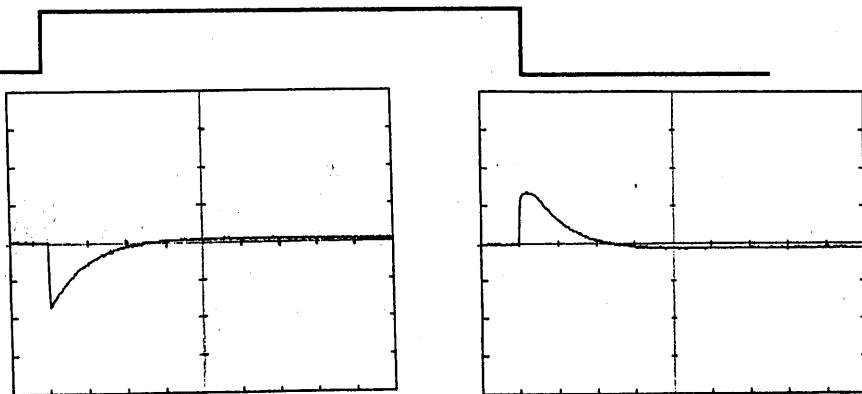
COSEL

Model	R25A-24	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response 動的負荷變動		
Object	+24.0V 1.10A		

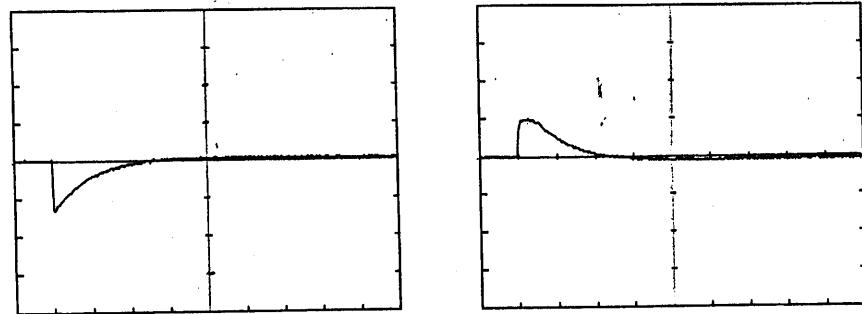
Input Volt. 100 V  
 Cycle 1000 mS

Load Current

Load 0% ↔  
 Load 100 %



Load 0% ↔  
 Load 50 %



200 mV/div

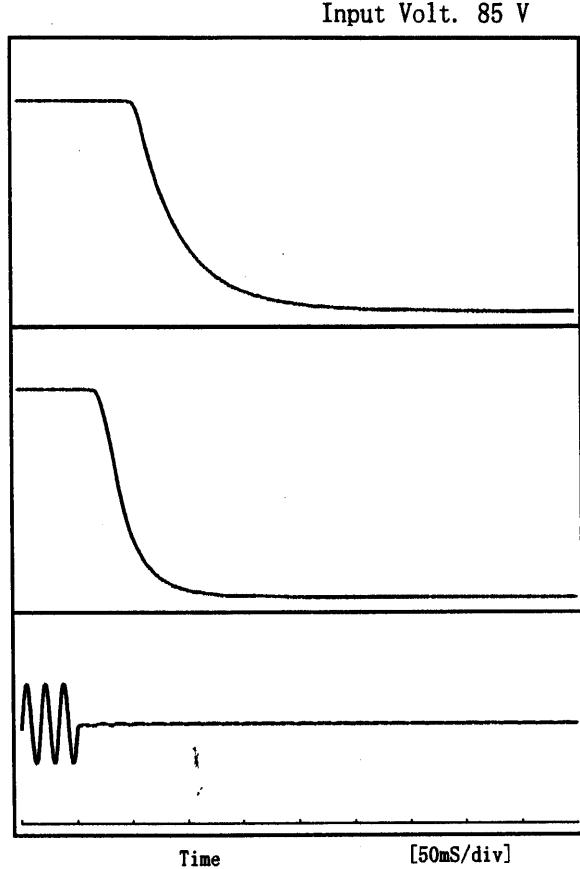
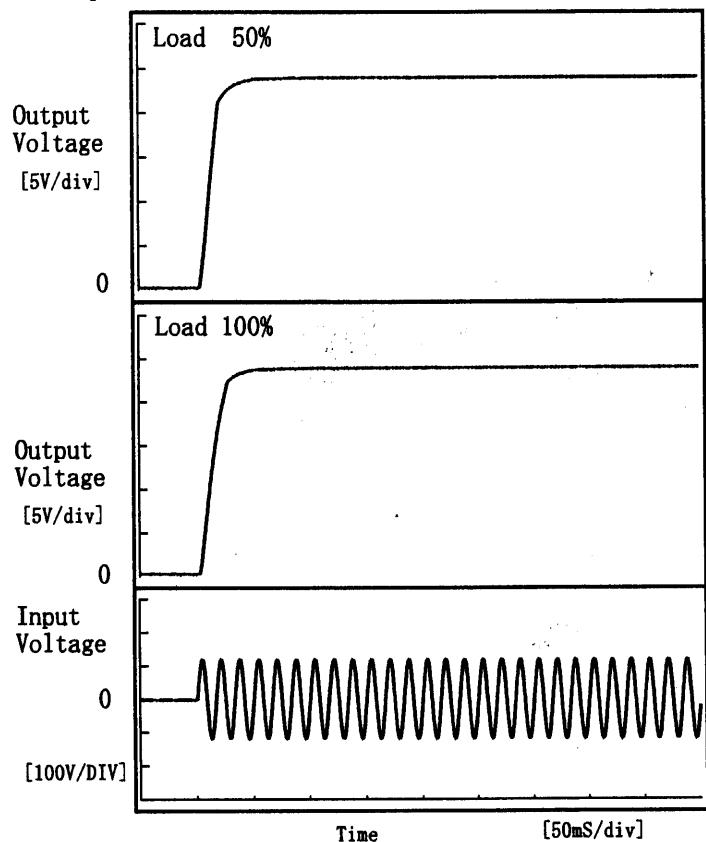
20 mS/div

COSEL

Model	R25A-24
Item	Rise and Fall Time 立上り、立下り時間
Object	+24.0V 1.10A

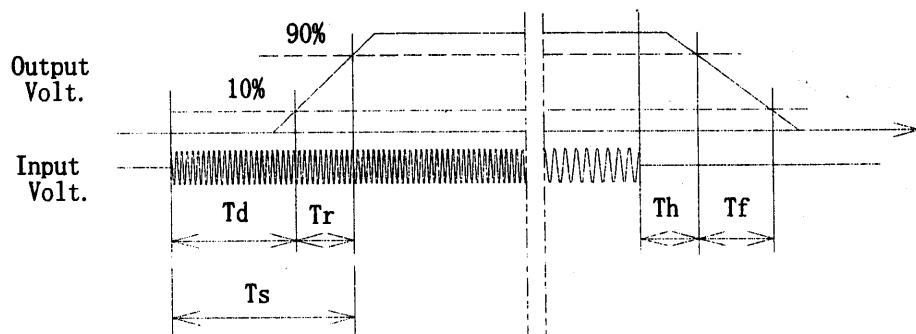
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Load	Time	T <sub>d</sub>	T <sub>r</sub>	T <sub>s</sub>	T <sub>h</sub>	T <sub>f</sub>	[mS]
50 %		5.5	18.0	23.5	60.5	96.0	
100 %		5.5	21.8	27.3	26.3	51.5	



**COSSEL**

Model

R25A-24

Item

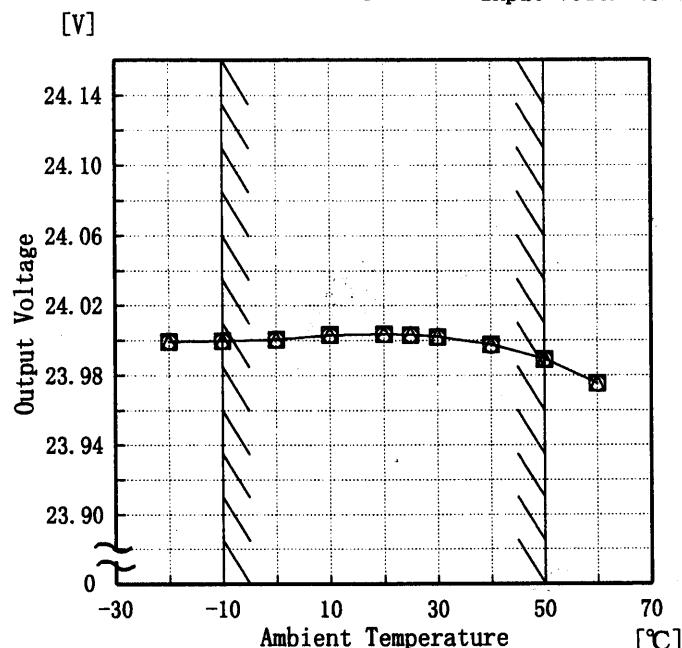
Ambient Temperature Drift  
周囲温度変動

Object

+24.0V 1.10A

1. Graph

—△— Input Volt. 85V  
 -□- Input Volt. 100V  
 -○- Input Volt. 132V



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。

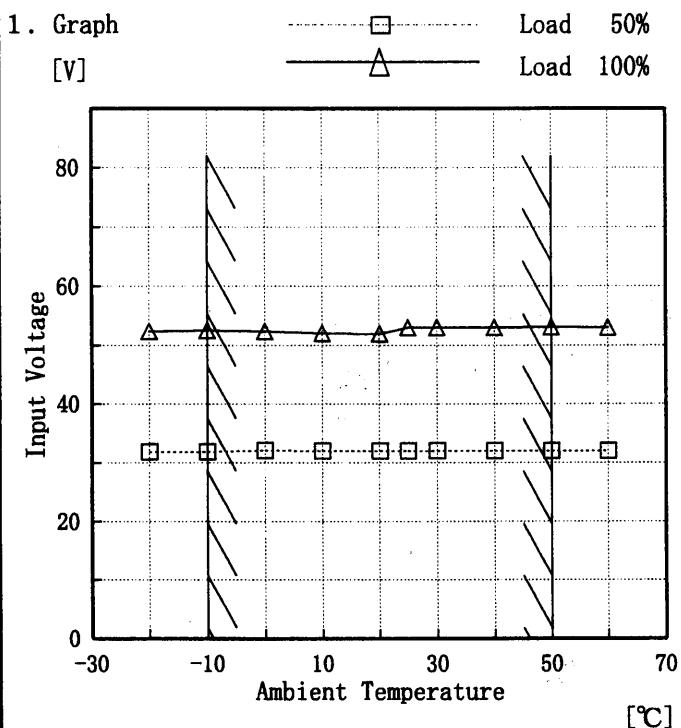
## Testing Circuitry Figure A

## 2. Values

Temperature [°C]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-20	23.999	23.999	23.999
-10	24.000	24.000	24.000
0	24.000	24.000	24.000
10	24.003	24.003	24.003
20	24.003	24.003	24.003
25	24.003	24.003	24.003
30	24.002	24.002	24.002
40	23.998	23.997	23.997
50	23.989	23.989	23.989
60	23.975	23.975	23.975
—	—	—	—

**COSEL**

Model	R25A-24
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+24.0V 1.10A



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 Temp. [°C]	Load 50%	Load 100%
	Input Volt. [V]	Input Volt. [V]
-20	32	52
-10	32	52
0	32	52
10	32	52
20	32	52
25	32	53
30	32	53
40	32	53
50	32	53
60	32	53
—	—	—

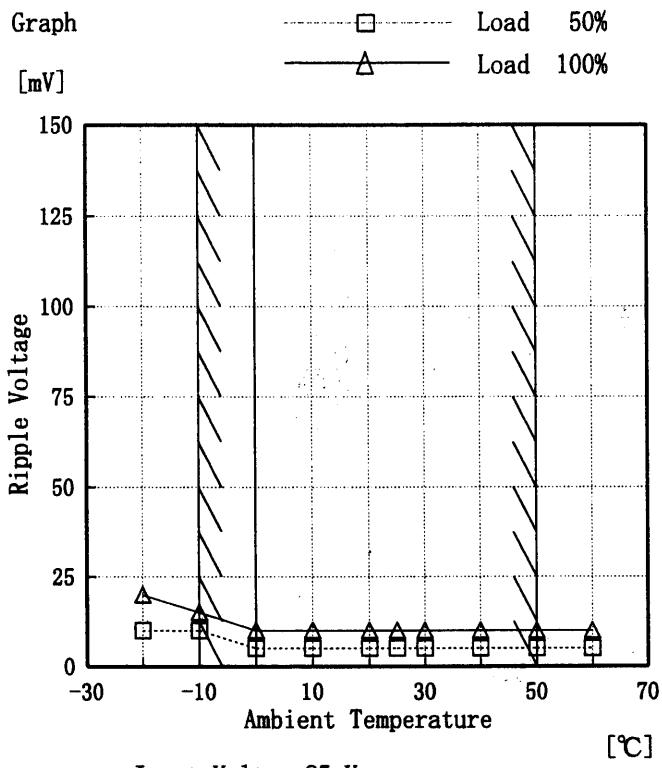
COSEL

Model R25A-24

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

Object +24.0V 1.10A

## 1. Graph



Input Volt. 85 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。

Testing Circuitry    Figure A

## 2. Values

Ambient Temp. [°C]	Load 50%	Load 100%
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
-20	10	20
-10	10	15
0	5	10
10	5	10
20	5	10
25	5	10
30	5	10
40	5	10
50	5	10
60	5	10
—	—	—

# COSEL

Model	R25A-24	Temperature Testing Circuitry	25 °C Figure A																						
Item	Time Lapse Drift 経時ドリフト																								
Object	+24.0V 1.10A																								
1. Graph			2. Values																						
<p>[V]</p> <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>23.996</td></tr> <tr><td>0.5</td><td>23.984</td></tr> <tr><td>1.0</td><td>23.984</td></tr> <tr><td>2.0</td><td>23.985</td></tr> <tr><td>3.0</td><td>23.985</td></tr> <tr><td>4.0</td><td>23.985</td></tr> <tr><td>5.0</td><td>23.985</td></tr> <tr><td>6.0</td><td>23.985</td></tr> <tr><td>7.0</td><td>23.985</td></tr> <tr><td>8.0</td><td>23.985</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	23.996	0.5	23.984	1.0	23.984	2.0	23.985	3.0	23.985	4.0	23.985	5.0	23.985	6.0	23.985	7.0	23.985	8.0	23.985
Time since start [H]	Output Voltage [V]																								
0.0	23.996																								
0.5	23.984																								
1.0	23.984																								
2.0	23.985																								
3.0	23.985																								
4.0	23.985																								
5.0	23.985																								
6.0	23.985																								
7.0	23.985																								
8.0	23.985																								



Model R25A-24

Item Output Voltage Accuracy 定電圧精度

Object +24.0V 1.10A

Testing Circuitry Figure A

**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 : 0.00~1.10 A

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

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

**定電圧精度**

周囲温度、入力電圧、負荷を下記仕様内で、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 0.00~1.10 A

$$* \text{定電圧精度(変動値)} = \pm (\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$$

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

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	25	100	0.00	24.012	±14	±0.1
Minimum Voltage	50	132	1.10	23.985		

**COSSEL**

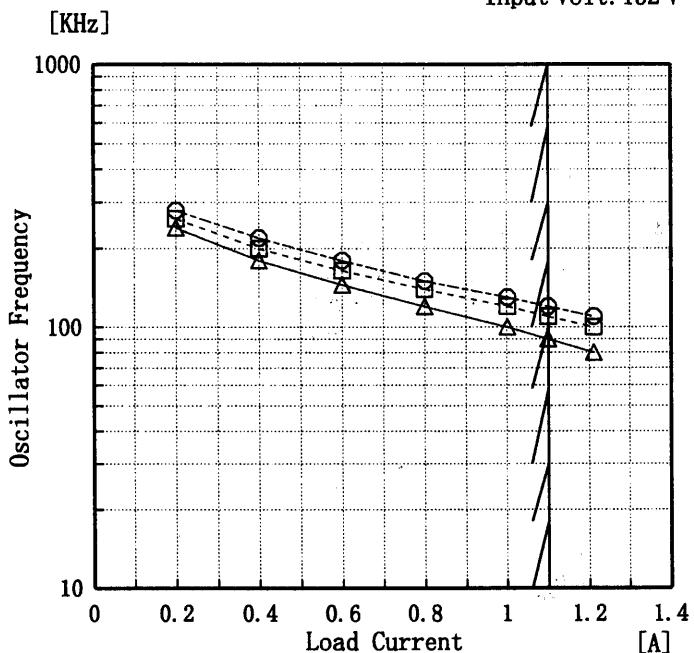
Model R25A-24

Item Oscillator Frequency 発振周波数

Object +24.0V 1.10A

## 1. Graph

—△— Input Volt. 85 V  
 -□--- Input Volt. 100 V  
 -○--- Input Volt. 132 V



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。

Temperature 25°C  
 Testing Circuitry Figure A

## 2. Values

Load Current [A]	Input Volt.	Input Volt.	Input Volt.
	85[V]	100[V]	132[V]
Oscillator Frequency [KHz]			
0.20	240	260	280
0.40	180	200	220
0.60	145	165	180
0.80	120	140	150
1.00	100	120	130
1.10	90	110	120
1.21	80	100	110
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—



Model	R25A-24	Testing Circuitry Figure A
Item	Condensation 結露特性	
Object	+24.0V 1.1A	

### 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]	24.135	Input Volt.: 100V, Load Current: 1.1A
Line Regulation [mV]	2	Input Volt.: 85~132V, Load Current: 1.1A
Load Regulation [mV]	7	Input Volt.: 100V, Load Current: 0.0~1.1A

**COSSEL**

Model	R25A-24
Item	Leakage Current 漏洩電流
Object	_____

Testing Circuitry Figure A

## 1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.32	0.40	0.44
(B) UL	0.26	0.32	0.36
(C) CSA	0.26	0.32	0.36

## 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。

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 220 [V]	Input Volt. 264 [V]
(D) VDE	—	—	—



Model	R25A-24	Testing Circuitry Figure C
Item	Line Noise Tolerance 入力雑音耐量	
Object	+24.0V 1.10A	

### 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 regulation
	NORMAL	OK	no regulation
1000	COMMON	OK	no regulation
	NORMAL	OK	no regulation

#### Conditions

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

**COSEL**

Model	R25A-24
Item	Conducted Emission 雜音端子電圧
Object	_____

Testing Circuitry      Figure D

## 1. Graph

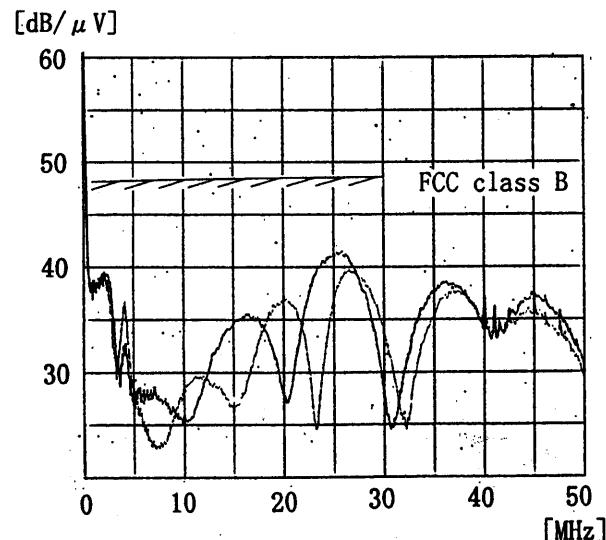
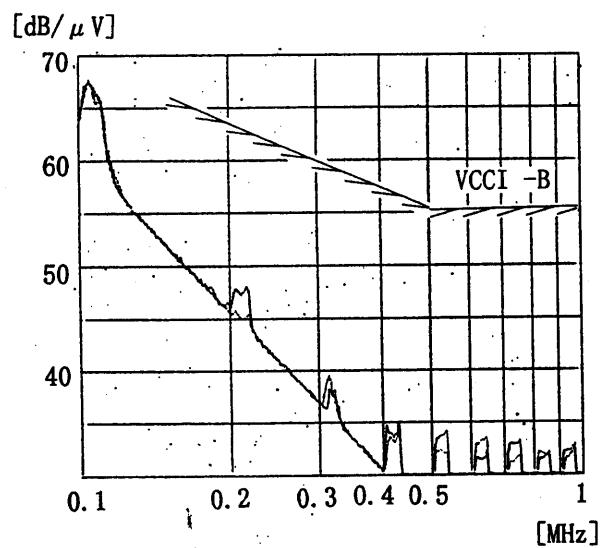
## Remarks

Input Volt.      100 V (VCCI -B)  
                   120 V (FCC class B)  
      Load      100 %

Note: Slanted line shows the range of Tolerance.

(注)斜線は許容値を示す。

NO	Standards	Standards Complied	Frequency [MHz]	Tolerance [dB/ $\mu$ V]
1	FCC class A		0.45~1.6	60
			1.6~30	69.5
2	FCC class B	○	0.45~30	48
3	VCCI -A		0.15~0.5	79
			0.5~30	73
4	VCCI -B	○	0.15~0.5	66-56
			0.5~5	56
			5~30	60
5	CISPR Pub. 22 class A (EN55022)		0.15~0.5	79
			0.5~30	73
6	CISPR Pub. 22 class B (EN55022)		0.15~0.5	66-56
			0.5~5	56
			5~30	60



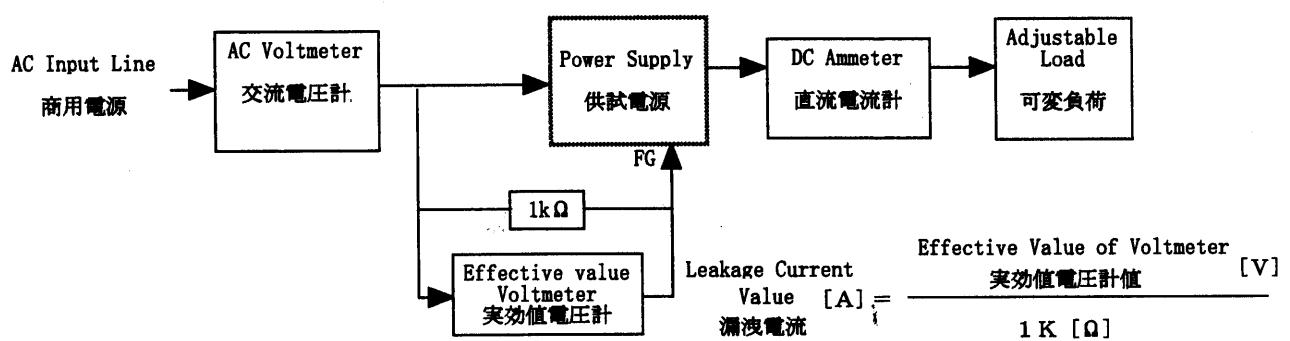
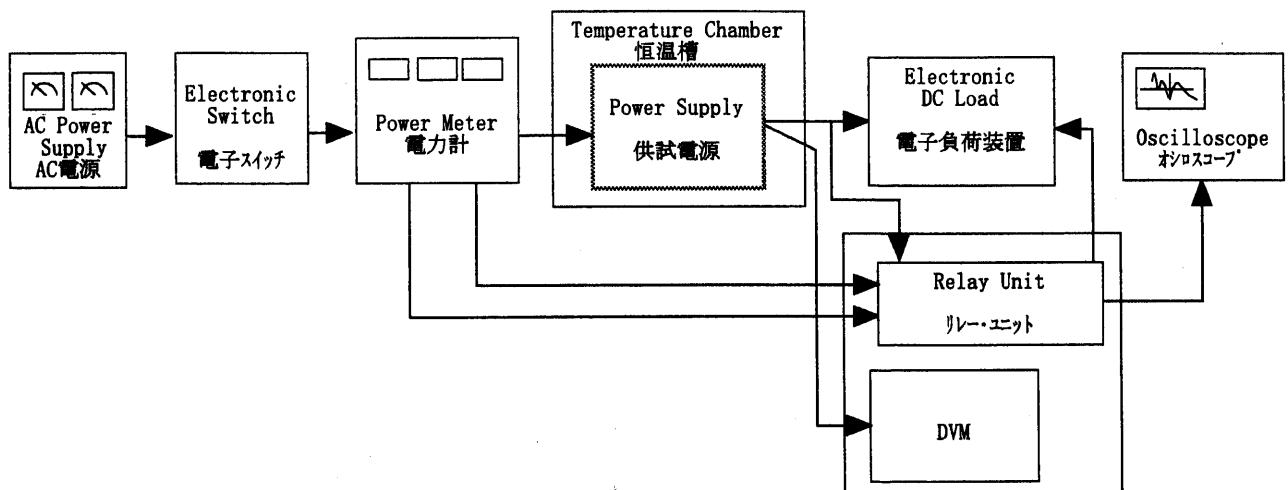


Figure B (DENTORI)

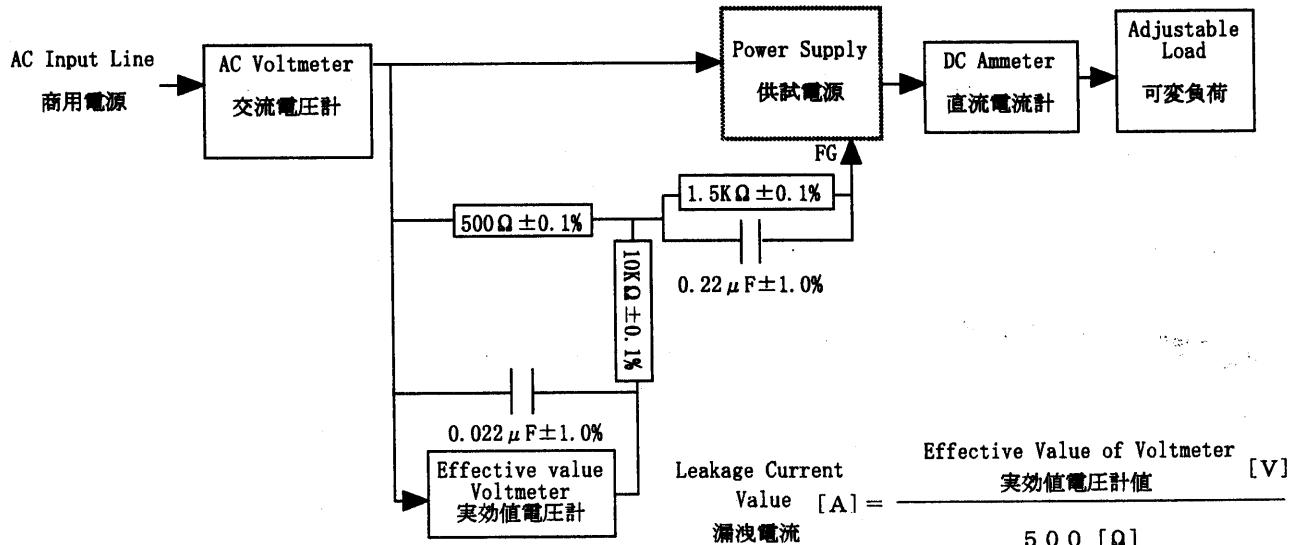


Figure B (UL, CSA, VDE)

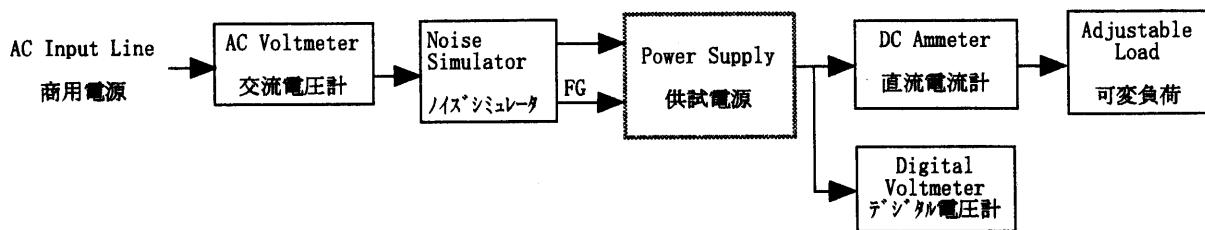


Figure C

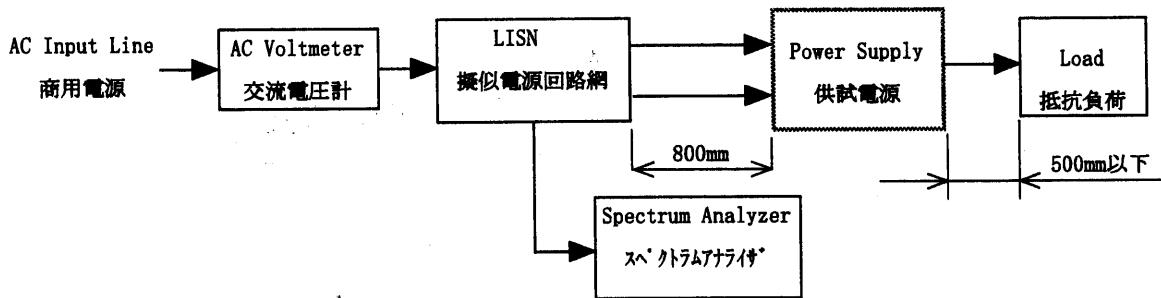


Figure D

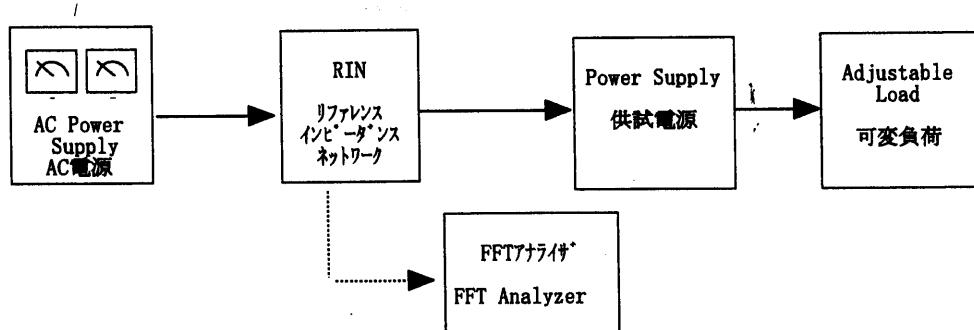


Figure E