



TEST DATA OF LDA15F-24 (100V INPUT)

Regulated DC Power Supply

Date : June 23. 1999

Approved by : H. Yamaguchi
Design Manager

Prepared by : T. Ashihara
Design Engineer

コーセル株式会社
COSEL CO., LTD.

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Model		LDA15F-24		Temperature		25℃																																	
Item		Line Regulation 静的入力変動		Testing Circuitry		Figure A																																	
Object		+24V0.7A																																					
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</div><div>[V]</div><div>24.070</div><div>24.050</div><div>24.030</div><div>24.010</div><div>23.990</div><div>23.970</div><div>23.950</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>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>				<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>24.005</td><td>23.987</td></tr><tr><td>80</td><td>24.005</td><td>23.999</td></tr><tr><td>85</td><td>24.005</td><td>24.003</td></tr><tr><td>90</td><td>24.005</td><td>24.003</td></tr><tr><td>100</td><td>24.004</td><td>24.001</td></tr><tr><td>110</td><td>24.003</td><td>24.001</td></tr><tr><td>120</td><td>24.003</td><td>24.000</td></tr><tr><td>132</td><td>24.003</td><td>24.000</td></tr><tr><td>140</td><td>24.003</td><td>24.000</td></tr></table>				Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	24.005	23.987	80	24.005	23.999	85	24.005	24.003	90	24.005	24.003	100	24.004	24.001	110	24.003	24.001	120	24.003	24.000	132	24.003	24.000	140	24.003	24.000
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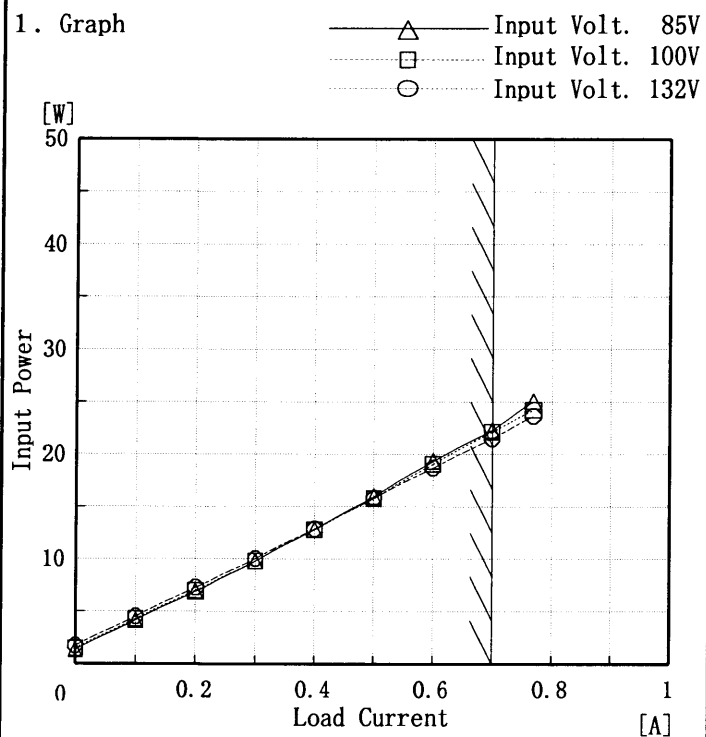
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<div><div>—△— Input Volt. 85V - - -□- - - Input Volt. 100V - - -○- - - Input Volt. 132V</div><p>Note: Slanted line shows the range of the rated load current</p><p>(注) 斜線は定格負荷電流範囲を示す。</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input 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>0.037</td><td>0.036</td><td>0.034</td></tr><tr><td>0.10</td><td>0.095</td><td>0.087</td><td>0.075</td></tr><tr><td>0.20</td><td>0.145</td><td>0.131</td><td>0.111</td></tr><tr><td>0.30</td><td>0.198</td><td>0.176</td><td>0.148</td></tr><tr><td>0.40</td><td>0.252</td><td>0.224</td><td>0.184</td></tr><tr><td>0.50</td><td>0.308</td><td>0.270</td><td>0.222</td></tr><tr><td>0.60</td><td>0.367</td><td>0.322</td><td>0.257</td></tr><tr><td>0.70</td><td>0.418</td><td>0.368</td><td>0.293</td></tr><tr><td>0.77</td><td>0.465</td><td>0.400</td><td>0.319</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	0.037	0.036	0.034	0.10	0.095	0.087	0.075	0.20	0.145	0.131	0.111	0.30	0.198	0.176	0.148	0.40	0.252	0.224	0.184	0.50	0.308	0.270	0.222	0.60	0.367	0.322	0.257	0.70	0.418	0.368	0.293	0.77	0.465	0.400	0.319	—	—	—	—	—	—	—	—	—	—	—	—
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Model	LDA15F-24
Item	Input Power (by Load Current) 入力電力 (負荷特性)
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]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	1.32	1.46	1.72
0.10	4.17	4.28	4.53
0.20	6.89	6.98	7.28
0.30	9.80	9.80	10.05
0.40	12.82	12.80	12.88
0.50	15.96	15.77	15.83
0.60	19.34	19.07	18.69
0.70	22.28	22.14	21.49
0.77	25.06	24.23	23.65
—	—	—	—
—	—	—	—
—	—	—	—

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Model		LDA15F-24	
Item		Efficiency 効率	
Object			

1. Graph

□ Load 50%

△ Load 100%

Efficiency [%]

86

82

78

74

70

66

62

0

Input Voltage [V]

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	77.2	76.6
80	77.6	78.1
85	77.7	78.8
90	78.0	79.5
100	78.2	80.5
110	78.3	81.1
120	77.7	81.4
132	77.6	81.4
140	77.1	80.9

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Model		LDA15F-24		Temperature		25℃																																																								
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Model LDA15F-24		Temperature 25°C Testing Circuitry Figure A																																
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Object	+24.0V0.7A																																	
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<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>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。</p> <p>(注)斜線は定格入力電圧範囲を示す。</p>																																		

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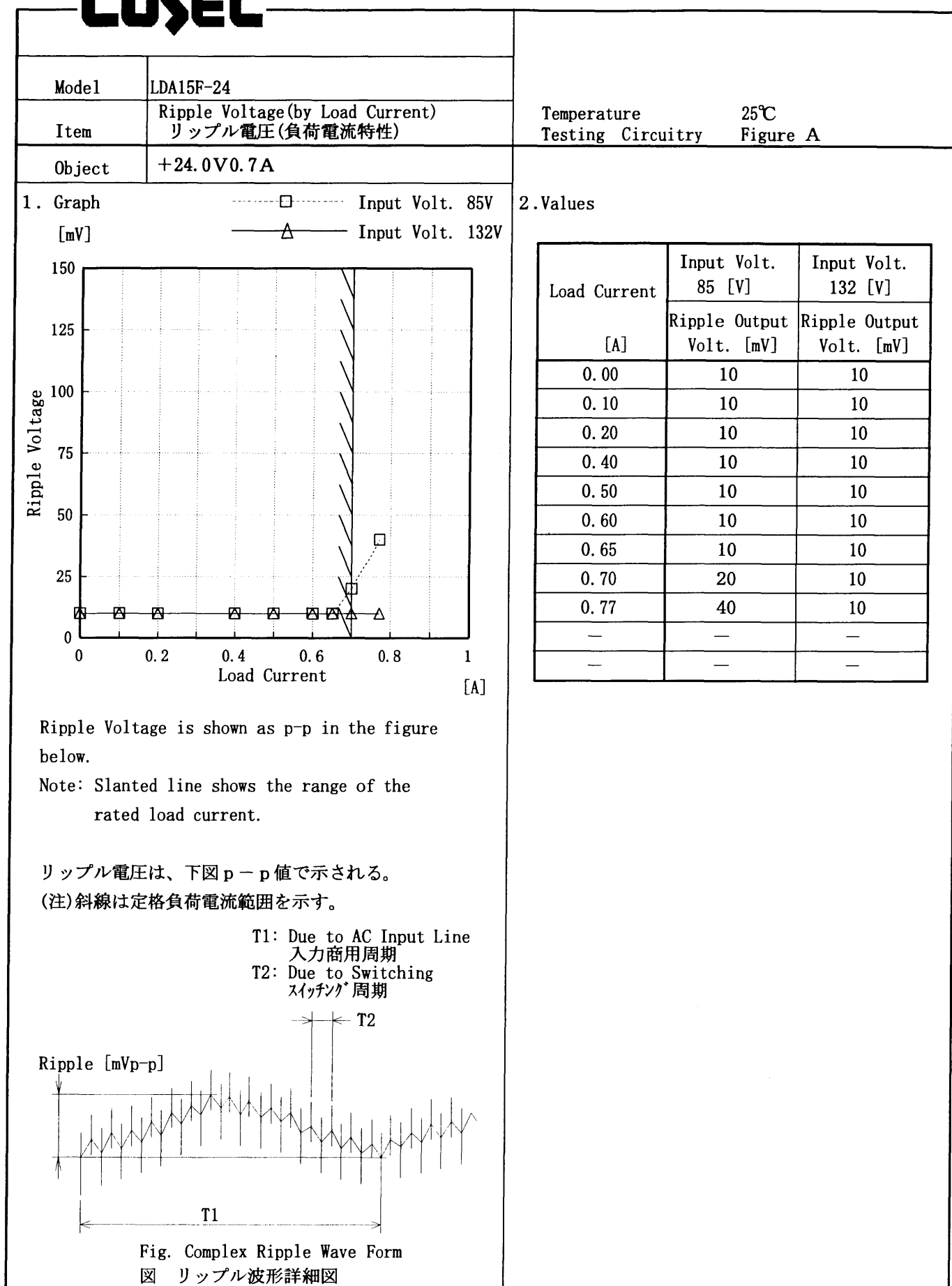
Model		LDA15F-24		Temperature		25℃	
Item		Instantaneous Interruption Compensation 瞬時停電保障		Testing Circuitry		Figure A	
Object		+24.0V0.7A					
1. Graph				2. Values			

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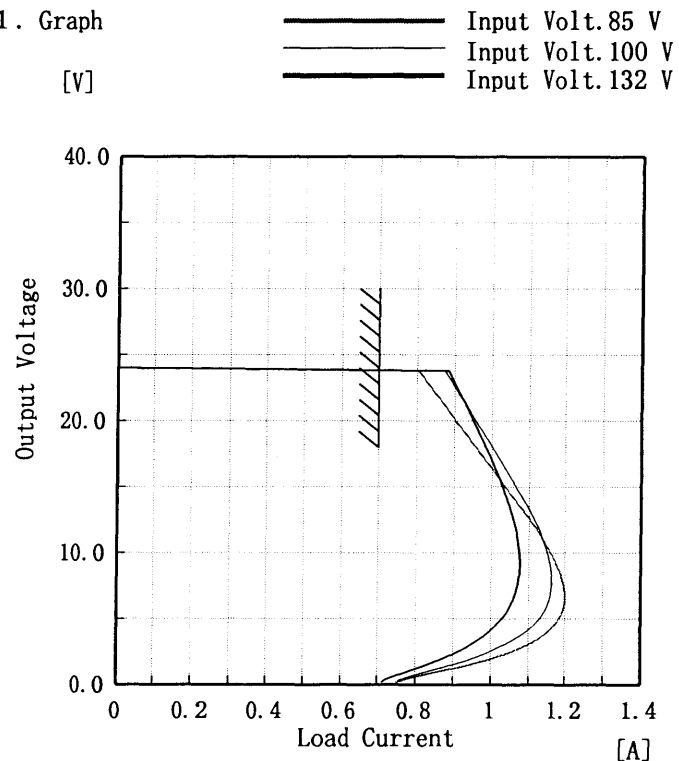
BC-4048

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Model	LDA15F-24
Item	Overcurrent Protection 過電流保護
Object	+24.0V0.7A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

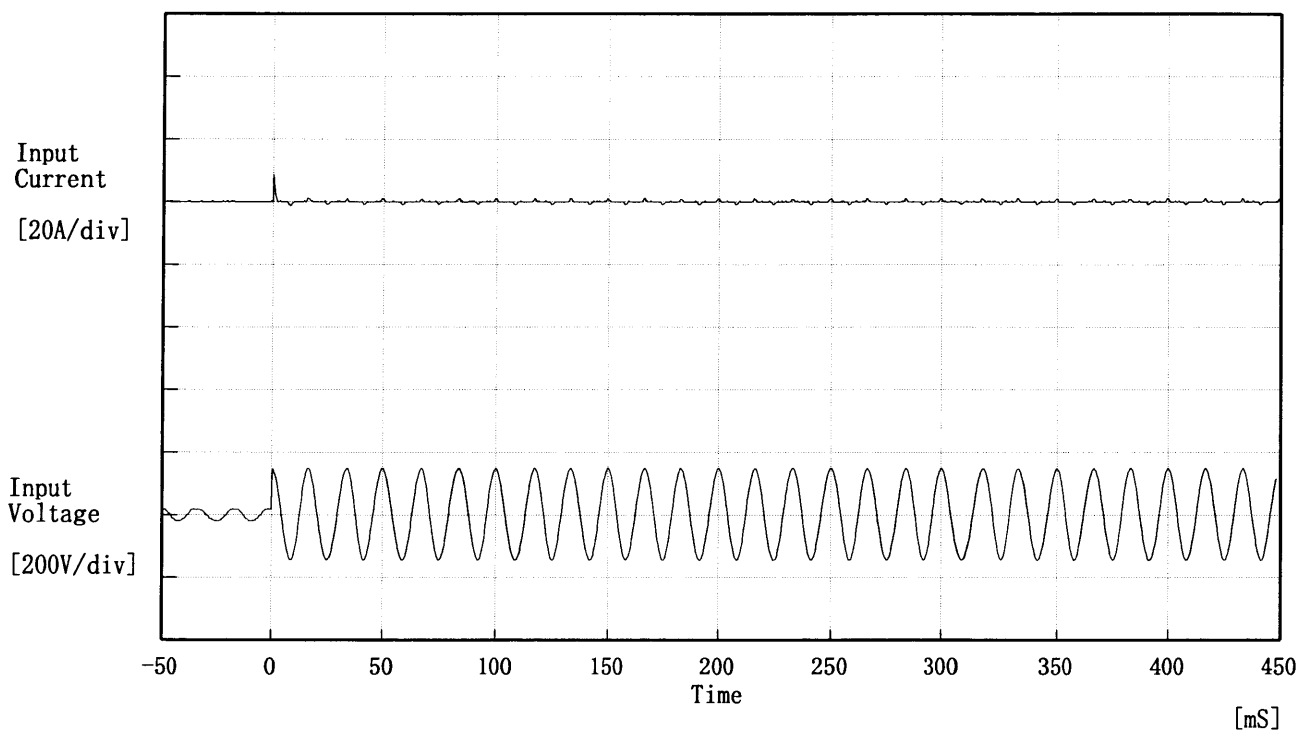
(注)斜線は定格負荷電流範囲を示す。

2. Values

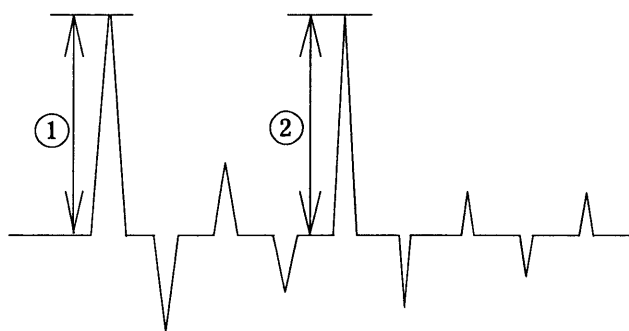
Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
24.00	0.81	0.88	0.89
22.80	0.83	0.89	0.90
21.60	0.86	0.92	0.92
19.20	0.92	0.97	0.96
16.80	0.99	1.02	1.00
14.40	1.05	1.08	1.04
12.00	1.11	1.12	1.06
9.60	1.17	1.15	1.08
7.20	1.20	1.16	1.07
4.80	1.18	1.12	1.02
2.40	1.05	0.99	0.91
0.00	0.75	0.75	0.71

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Model	LDA15F-24	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object	_____	



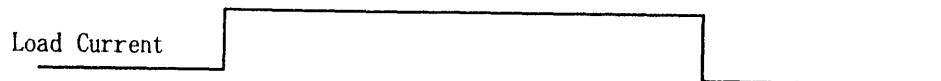
Input Voltage 100 V
Frequency 60 Hz
Load 100 %
Inrush Current
① 8.81 [A]
② 1.21 [A]



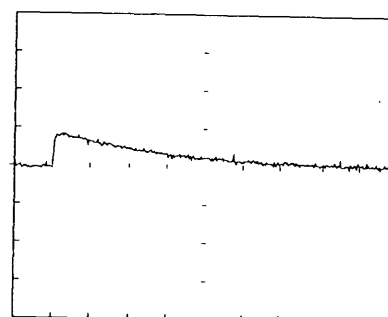
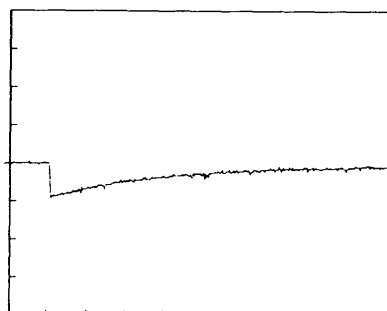
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Model	LDA15F-24	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Responce 動的負荷変動	
Object	+24.0V0.7A	

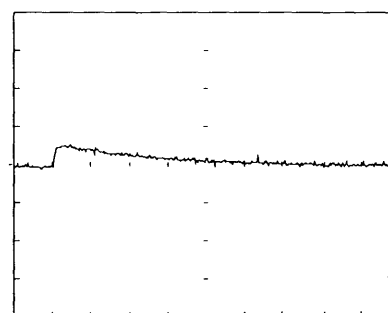
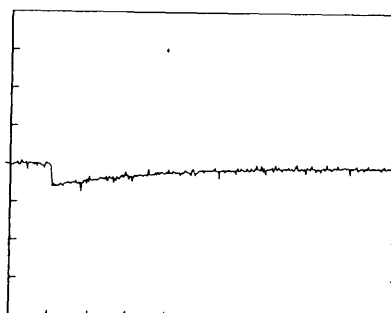
Input Volt. 100 V
Cycle 1000 mS



Load 0% ↔
Load 100 %

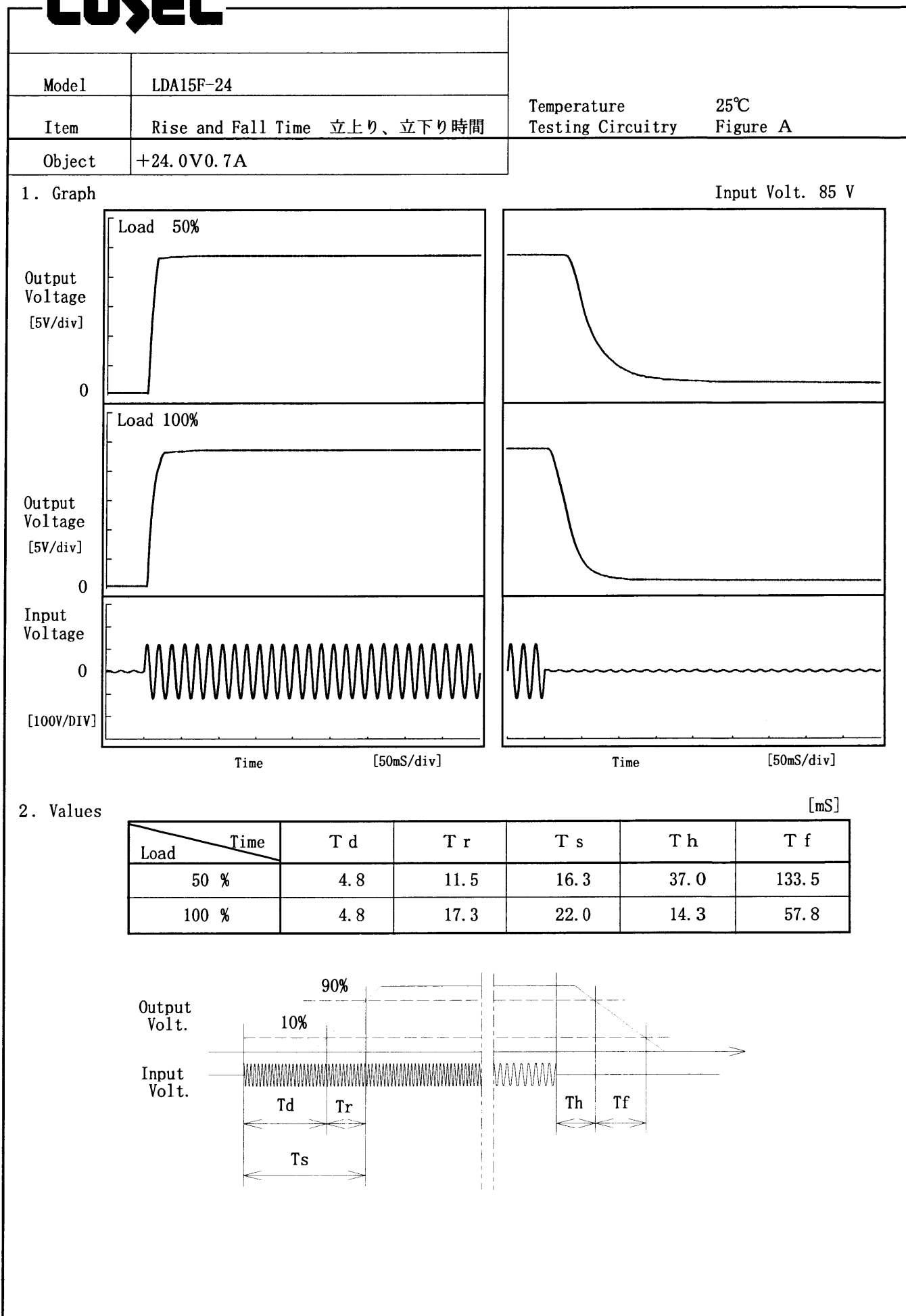


Load 0% ↔
Load 50 %



200 mV/div

10 mS/div

COSEL

COSEL

Model		LDA15F-24	
Item		Ambient Temperature Drift 周囲温度変動	
Object		+24.0V0.7A	
1. Graph		2. Values	

△

Input Volt. 85V

□

Input Volt. 100V

○

Input Volt. 132V

Output Voltage [V]

24.13

24.09

24.05

24.01

23.97

23.93

23.89

0

—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。

Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	24.009	24.010	24.008
-10	24.011	24.009	24.008
0	24.007	24.006	24.005
10	24.005	24.002	24.002
20	24.002	24.002	24.000
25	24.001	24.000	23.999
30	23.998	24.001	23.997
40	23.989	23.988	23.985
50	23.974	23.973	23.971
60	23.953	23.952	23.950
—	—	—	—

COSEL

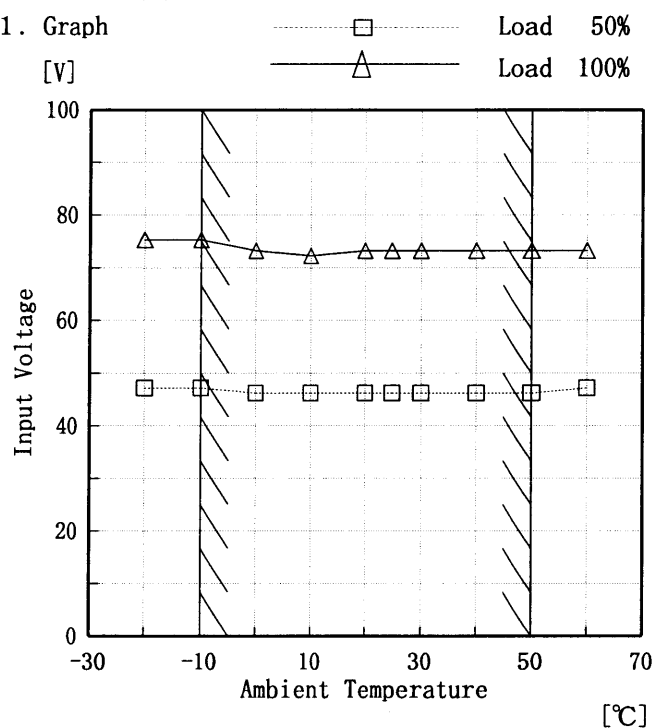
Model LDA15F-24

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

Object +24.0V0.7A

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	47	75
-10	47	75
0	46	73
10	46	72
20	46	73
25	46	73
30	46	73
40	46	73
50	46	73
60	47	73
—	—	—

COSEL

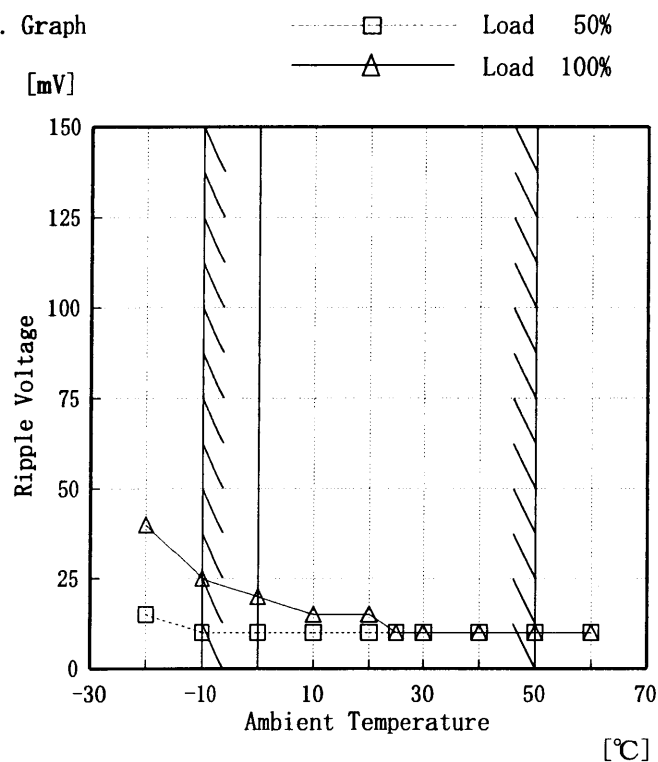
Model LDA15F-24

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

Object +24.0V0.7A

Testing Circuitry Figure A

1. Graph



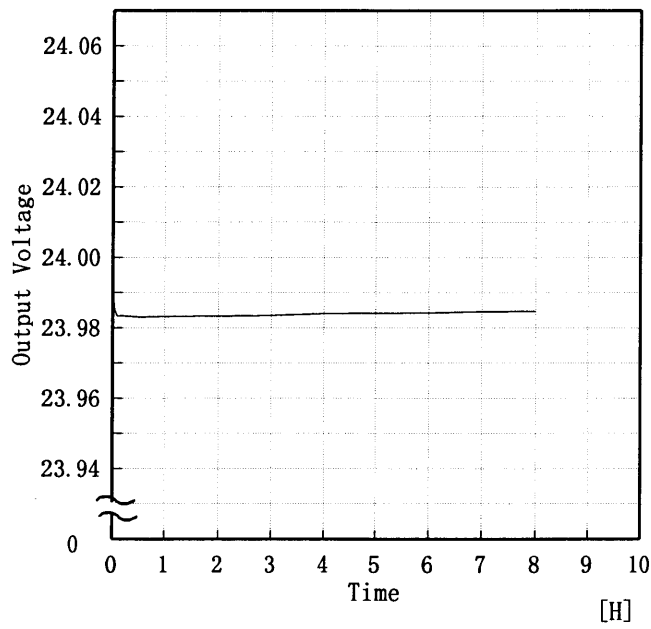
Note: Slanted line shows the range of the rated ambient temperature.

(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	15	40
-10	10	25
0	10	20
10	10	15
20	10	15
25	10	10
30	10	10
40	10	10
50	10	10
60	10	10
—	—	—

COSEL

Model		LDA15F-24	Temperature Testing Circuitry	25℃ Figure A																						
Item		Time Lapse Drift 経時ドリフト																								
Object		+24.0V0.7A																								
1. Graph			2.Values																							
<div><div>[V]</div><div></div><div>Output Voltage [V]</div><div>Time [H]</div><div>Input Volt. 100V</div><div>Load 100%</div></div>			<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>23.999</td></tr><tr><td>0.5</td><td>23.983</td></tr><tr><td>1.0</td><td>23.983</td></tr><tr><td>2.0</td><td>23.983</td></tr><tr><td>3.0</td><td>23.984</td></tr><tr><td>4.0</td><td>23.984</td></tr><tr><td>5.0</td><td>23.984</td></tr><tr><td>6.0</td><td>23.984</td></tr><tr><td>7.0</td><td>23.985</td></tr><tr><td>8.0</td><td>23.985</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	23.999	0.5	23.983	1.0	23.983	2.0	23.983	3.0	23.984	4.0	23.984	5.0	23.984	6.0	23.984	7.0	23.985	8.0	23.985
Time since start [H]	Output Voltage [V]																									
0.0	23.999																									
0.5	23.983																									
1.0	23.983																									
2.0	23.983																									
3.0	23.984																									
4.0	23.984																									
5.0	23.984																									
6.0	23.984																									
7.0	23.985																									
8.0	23.985																									

COSEL

Model		LDA15F-24	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+24.0V0.7A	

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 : 0~0.7 A

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

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

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 0~0.7 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	-10	85	0.0	24.020	±29	±0.2
Minimum Voltage	50	132	0.7	23.964		

COSEL

Model		LDA15F-24	Testing Circuitry	Figure A												
Item		Condensation 結露特性														
Object		+24.0V0.7A														
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																
<table><tr><td>Item</td><td>Data</td><td>Testing Conditions</td></tr><tr><td>Output Voltage [V]</td><td>24.002</td><td>Input Volt.: 100V, Load Current:0.7A</td></tr><tr><td>Line Regulation [mV]</td><td>8</td><td>Input Volt.: 85~132V, Load Current:0.7A</td></tr><tr><td>Load Regulation [mV]</td><td>15</td><td>Input Volt.: 100V, Load Current:0~0.7A</td></tr></table>					Item	Data	Testing Conditions	Output Voltage [V]	24.002	Input Volt.: 100V, Load Current:0.7A	Line Regulation [mV]	8	Input Volt.: 85~132V, Load Current:0.7A	Load Regulation [mV]	15	Input Volt.: 100V, Load Current:0~0.7A
Item	Data	Testing Conditions														
Output Voltage [V]	24.002	Input Volt.: 100V, Load Current:0.7A														
Line Regulation [mV]	8	Input Volt.: 85~132V, Load Current:0.7A														
Load Regulation [mV]	15	Input Volt.: 100V, Load Current:0~0.7A														

COSEL

Model	LDA15F-24		
Item	Leakage Current 漏洩電流		Temperature 25℃ 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	0.12	0.16	0.24
(B) IEC60950	0.12	0.16	0.25

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 of 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。

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BC-4048

COSEL

Model	LDA15F-24	Temperature 25℃ Testing Circuitry Figure C
Item	Line Noise Tolerance 入力雑音耐量	
Object	+24.0V0.7A	

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	LDA15F-24	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object			

1. Graph

Remarks

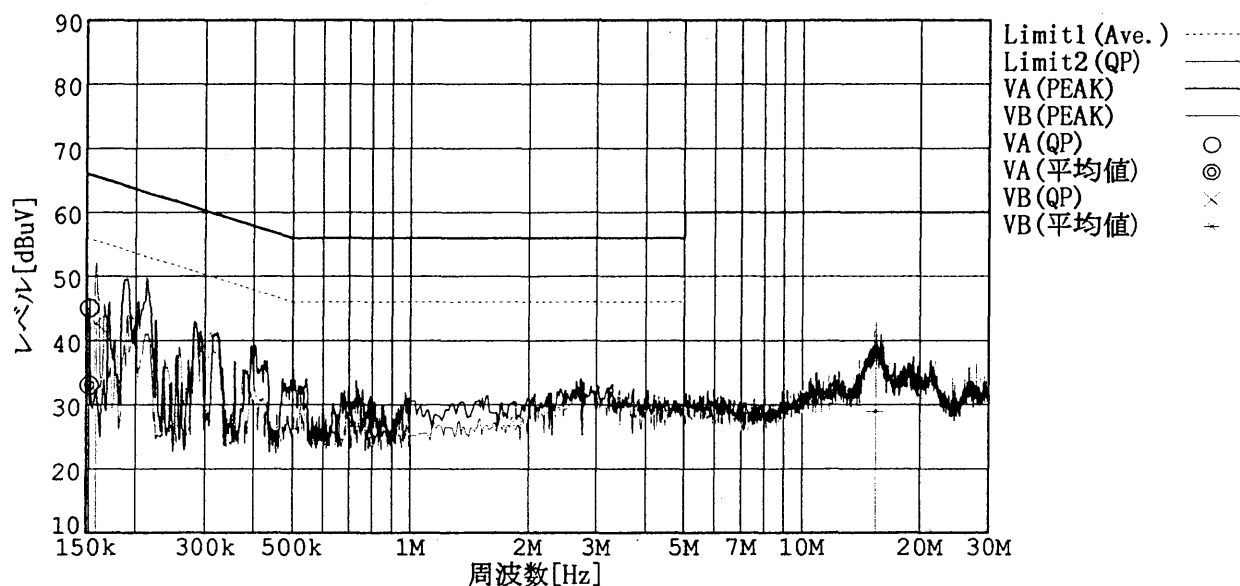
Input Volt. 100 V (VCCI Class B)

120 V (FCC Class B)

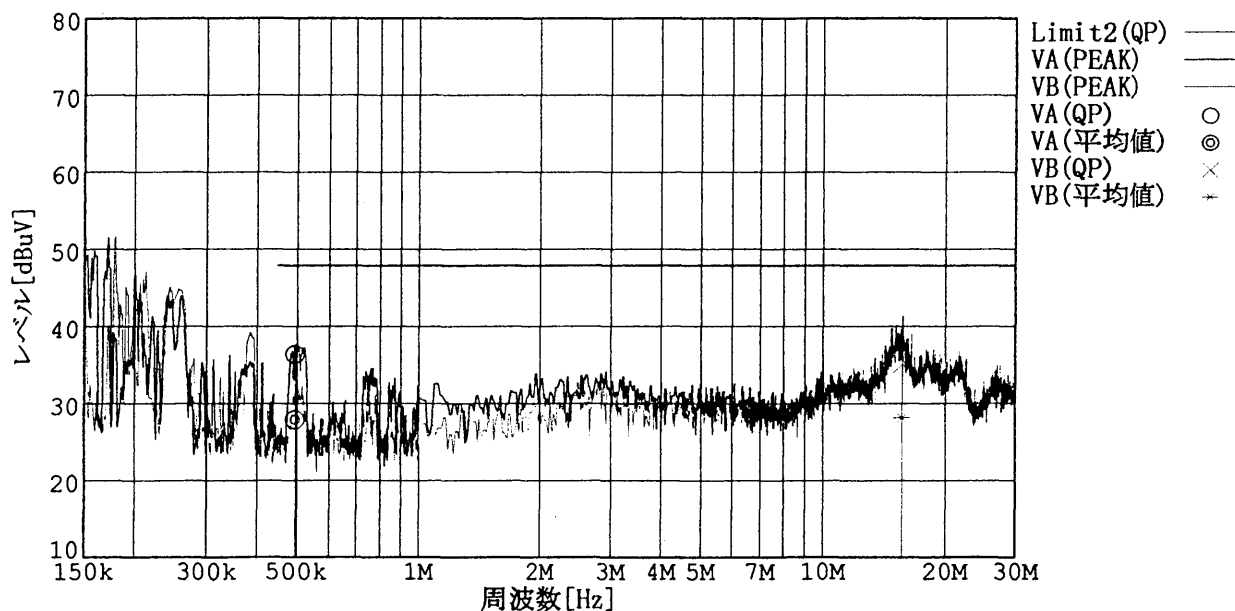
Load 100 %

規格 1: [VCCI] Class B(平均値)

規格 2: [VCCI] Class B(QP)



規格 2: [FCC Part15] Class B



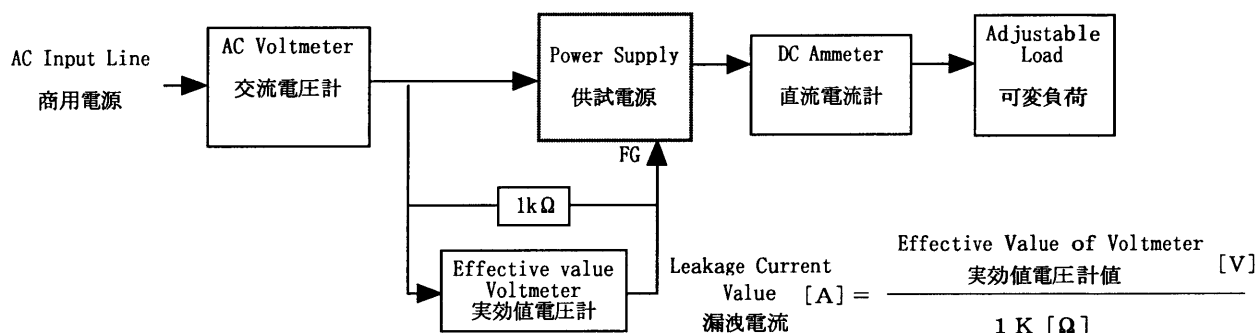
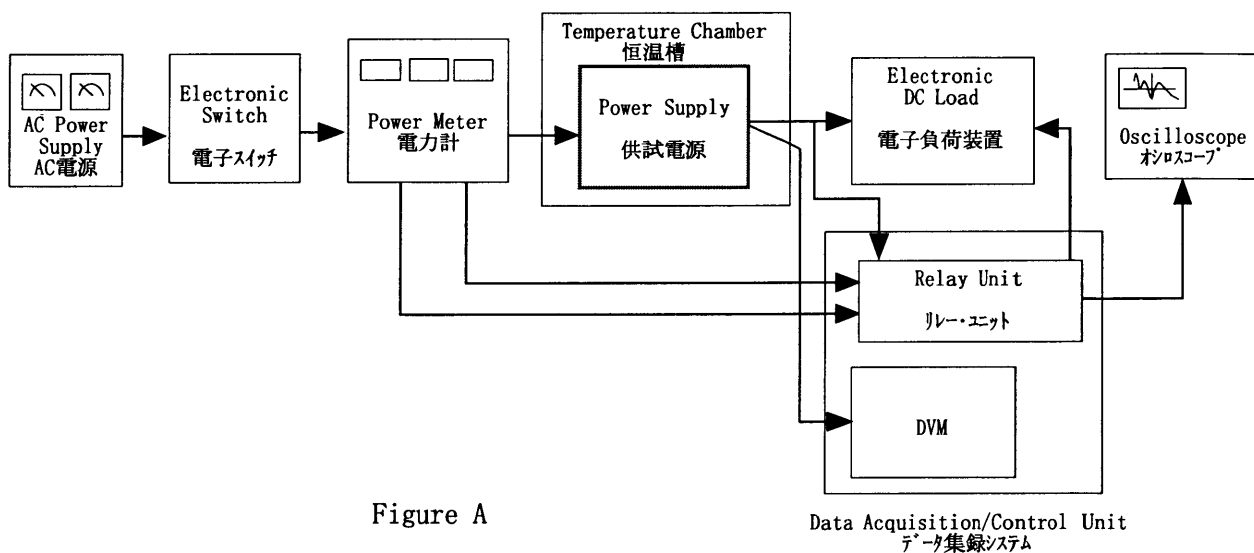


Figure B (DENTORI)

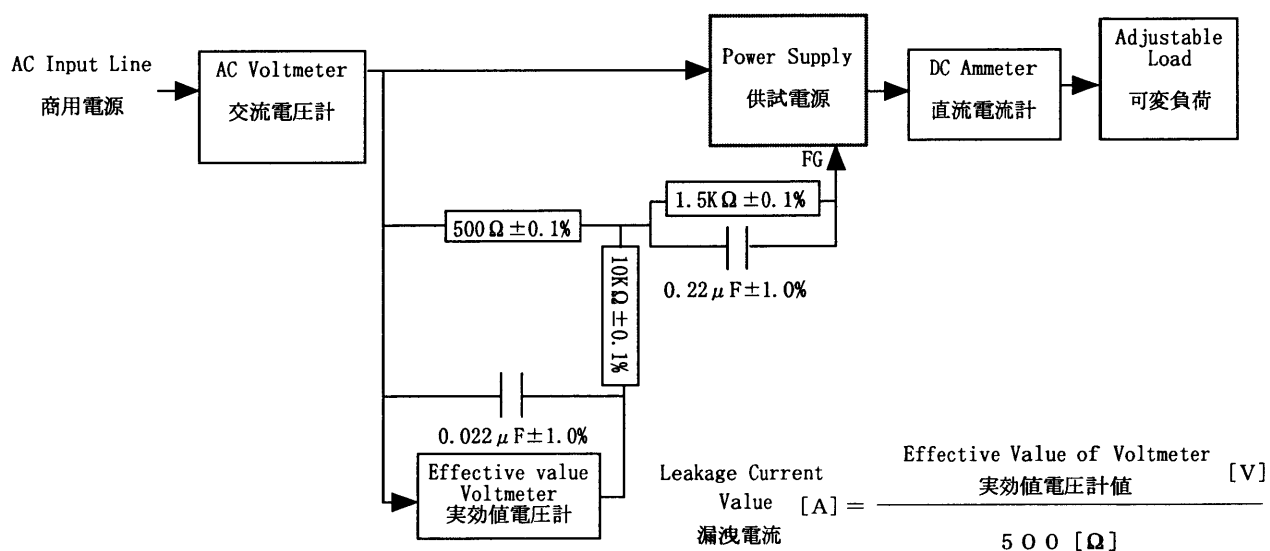


Figure B (IEC 60950)

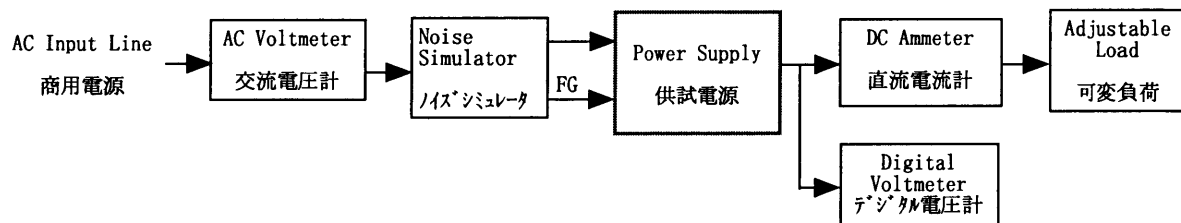


Figure C

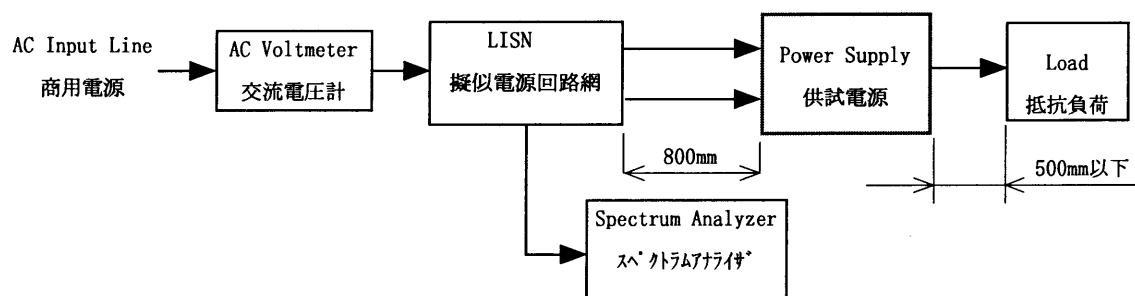


Figure D

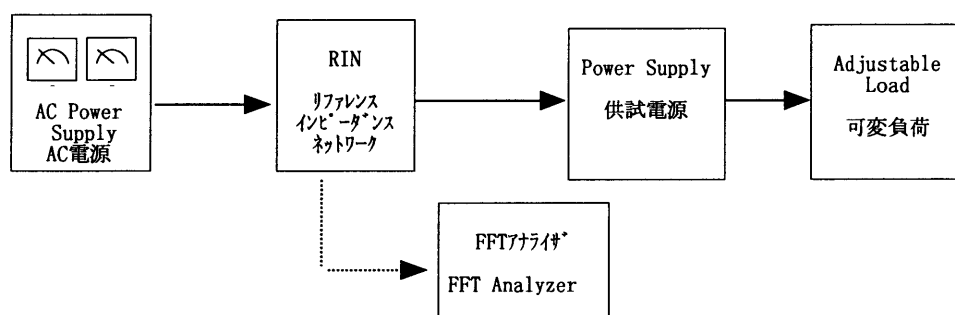


Figure E