



TEST DATA OF LDA50F-5 (200V INPUT)

Regulated DC Power Supply

Aug. 23, 1999

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COSEL CO., LTD.

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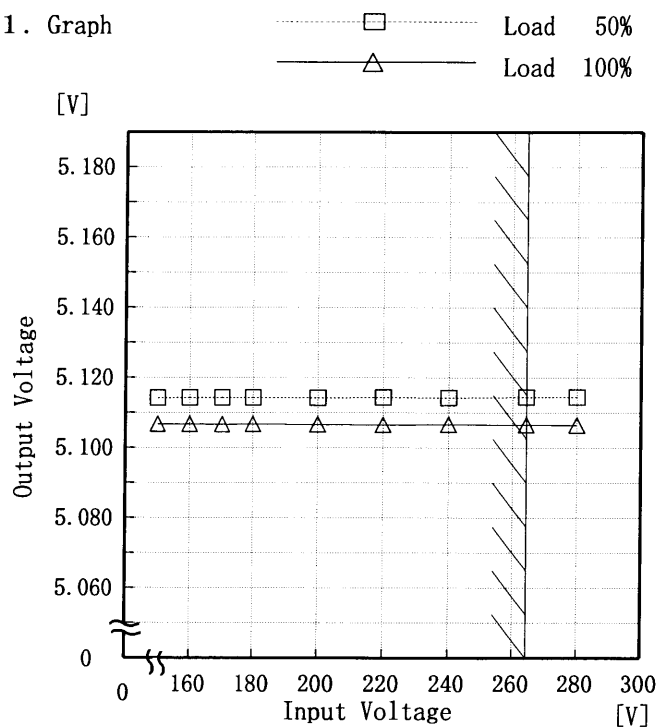
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Model	LDA50F-5
Item	Line Regulation 静的入力変動
Object	+5.0V10A

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

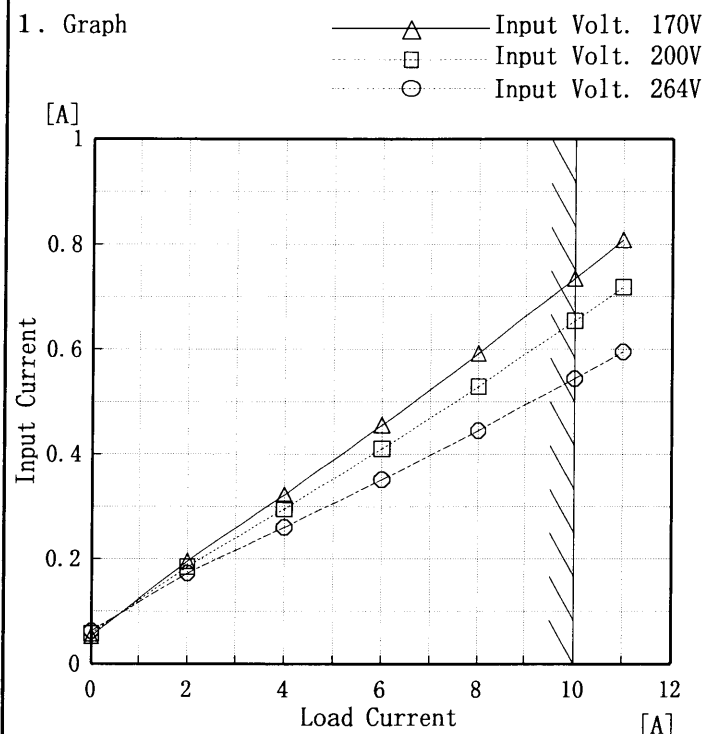
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
150	5.114	5.107
160	5.114	5.107
170	5.114	5.107
180	5.114	5.107
200	5.114	5.107
220	5.114	5.107
240	5.114	5.107
264	5.114	5.107
280	5.114	5.106

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Model	LDA50F-5
Item	Input Current (by Load Current) 入力電流 (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 Current [A]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0	0.053	0.057	0.063
2	0.196	0.185	0.173
4	0.323	0.296	0.261
6	0.456	0.411	0.352
8	0.592	0.529	0.446
10	0.735	0.654	0.545
11	0.809	0.719	0.595
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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Model

LDA50F-5

Item

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

Output

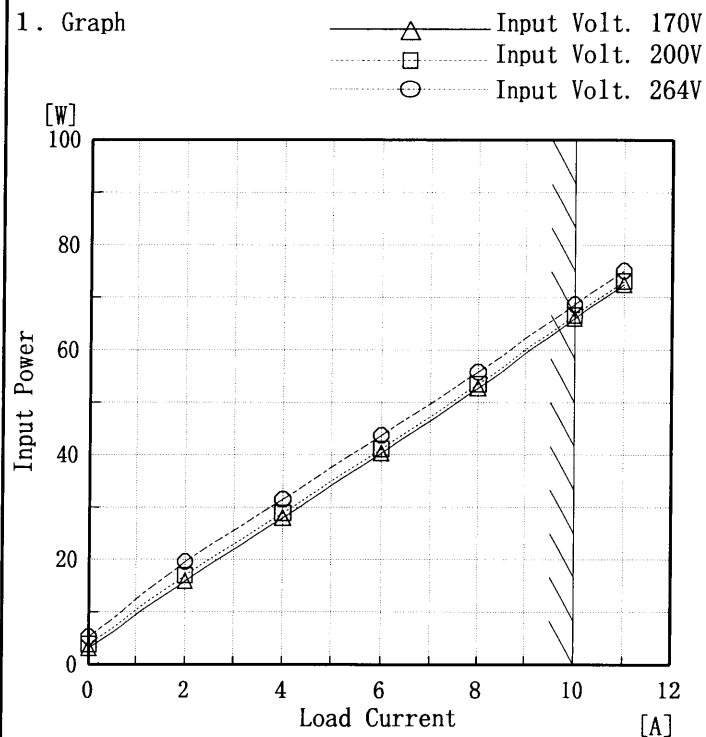
Temperature

25°C

Testing Circuitry

Figure A

1. Graph



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

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2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0	3.10	3.80	5.30
2	15.90	17.00	19.60
4	28.00	28.90	31.50
6	40.30	41.10	43.70
8	52.70	53.50	55.80
10	66.00	66.60	68.70
11	72.50	73.10	75.10
—	—	—	—
—	—	—	—
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Model	LDA50F-5	Temperature	25℃																																																														
Item	Efficiency (by Input Voltage) 効率 (入力電圧特性)	Testing Circuitry	Figure A																																																														
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<div><div>△</div> Input Volt. 170V</div> <div><div>□</div> Input Volt. 200V</div> <div><div>○</div> Input Volt. 264V</div> <p>Efficiency [%]</p> <p>Load Current [A]</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 170 [V]</th><th>Input Volt. 200 [V]</th><th>Input Volt. 264 [V]</th></tr><tr><td>2</td><td>64.5</td><td>60.3</td><td>52.4</td></tr><tr><td>4</td><td>73.5</td><td>71.3</td><td>65.4</td></tr><tr><td>6</td><td>76.5</td><td>75.0</td><td>70.6</td></tr><tr><td>8</td><td>77.7</td><td>76.6</td><td>73.4</td></tr><tr><td>10</td><td>77.9</td><td>77.2</td><td>74.8</td></tr><tr><td>11</td><td>78.0</td><td>77.4</td><td>75.3</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><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. 170 [V]	Input Volt. 200 [V]	Input Volt. 264 [V]	2	64.5	60.3	52.4	4	73.5	71.3	65.4	6	76.5	75.0	70.6	8	77.7	76.6	73.4	10	77.9	77.2	74.8	11	78.0	77.4	75.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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<p>1. Graph</p> <p> Load 50% Load 100% </p> <p>Hold-Up Time [mS]</p> <p>Input Voltage [V]</p> <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>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [mS]</th></tr> <tr> <th>Load 50%</th><th>Load 100%</th></tr> </thead> <tbody> <tr><td>150</td><td>146</td><td>69</td></tr> <tr><td>160</td><td>168</td><td>80</td></tr> <tr><td>170</td><td>192</td><td>92</td></tr> <tr><td>180</td><td>217</td><td>105</td></tr> <tr><td>200</td><td>272</td><td>133</td></tr> <tr><td>220</td><td>331</td><td>164</td></tr> <tr><td>240</td><td>396</td><td>198</td></tr> <tr><td>264</td><td>480</td><td>243</td></tr> <tr><td>280</td><td>540</td><td>275</td></tr> </tbody> </table>	Input Voltage [V]	Hold-Up Time [mS]		Load 50%	Load 100%	150	146	69	160	168	80	170	192	92	180	217	105	200	272	133	220	331	164	240	396	198	264	480	243	280	540	275
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<div><div>-----□----- Input Volt. 170V</div><div>-----△----- Input Volt. 264V</div><div>Ripple Voltage</div><div>Load Current [A]</div></div>			<table><tr><th rowspan="2">Load Current [A]</th><th>Input Volt. 170 [V]</th><th>Input Volt. 264 [V]</th></tr><tr><th>Ripple Output Volt. [mV]</th><th>Ripple Output Volt. [mV]</th></tr><tr><td>0.00</td><td>10</td><td>10</td></tr><tr><td>2.00</td><td>20</td><td>25</td></tr><tr><td>4.00</td><td>20</td><td>25</td></tr><tr><td>6.00</td><td>25</td><td>25</td></tr><tr><td>8.00</td><td>25</td><td>25</td></tr><tr><td>10.00</td><td>25</td><td>25</td></tr><tr><td>11.00</td><td>25</td><td>25</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr></table>			Load Current [A]	Input Volt. 170 [V]	Input Volt. 264 [V]	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]	0.00	10	10	2.00	20	25	4.00	20	25	6.00	25	25	8.00	25	25	10.00	25	25	11.00	25	25	—	—	—	—	—	—	—	—	—	—	—	—
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<p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>リップル電圧は、下図 p-p 値で示される。</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p> <div><div>T1: Due to AC Input Line 入力商用周期</div><div>T2: Due to Switching スイッチング周期</div><div>Ripple [mVp-p]</div><div>T1</div><div>T2</div></div> <p>Fig. Complex Ripple Wave Form</p> <p>図 リップル波形詳細図</p>																																											

COSEL

Model		LDA50F-5	
Item		Ripple-Noise リップルノイズ	
Object		+5.0V10A	

1. Graph

□

Input Volt. 170V

△

Input Volt. 264V

200

180

160

140

120

100

80

60

40

20

0

Ripple-Noise

[mV]

0

2

4

6

8

10

12

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. 170 [V]	Input Volt. 264 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	20	25
2.00	35	40
4.00	40	45
6.00	45	50
8.00	50	50
10.00	55	55
11.00	60	60
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model		LDA50F-5	Temperature		25℃																																																							
Item		Overcurrent Protection 過電流保護	Testing Circuitry		Figure A																																																							
Object		+5.0V10A																																																										
1. Graph			2. Values																																																									
<div><div><div></div><div></div><div></div></div><div>Input Volt. 170 V Input Volt. 200 V Input Volt. 264 V</div></div> <div><div>[V]</div><div>8.0</div><div>6.0</div><div>4.0</div><div>2.0</div><div>0.0</div></div> <div><div>Output Voltage</div><div>[V]</div></div> <div><div>0</div><div>5</div><div>10</div><div>15</div></div> <div><div>Load Current</div><div>[A]</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>			<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 170 [V]</th><th>Input Volt. 200 [V]</th><th>Input Volt. 264 [V]</th></tr><tr><td>5.00</td><td>12.30</td><td>12.30</td><td>12.36</td></tr><tr><td>4.75</td><td>12.34</td><td>12.34</td><td>12.39</td></tr><tr><td>4.50</td><td>12.37</td><td>12.37</td><td>12.51</td></tr><tr><td>4.00</td><td>12.47</td><td>12.46</td><td>12.53</td></tr><tr><td>3.50</td><td>12.55</td><td>12.57</td><td>12.65</td></tr><tr><td>3.00</td><td>12.65</td><td>12.62</td><td>12.78</td></tr><tr><td>2.50</td><td>12.72</td><td>12.73</td><td>12.91</td></tr><tr><td>2.00</td><td>12.83</td><td>12.83</td><td>13.04</td></tr><tr><td>1.50</td><td>12.91</td><td>12.94</td><td>13.15</td></tr><tr><td>1.00</td><td>13.00</td><td>13.01</td><td>13.14</td></tr><tr><td>0.50</td><td>12.92</td><td>12.82</td><td>12.62</td></tr><tr><td>0.00</td><td>12.17</td><td>11.72</td><td>11.08</td></tr></table>			Output Voltage [V]	Load Current [A]			Input Volt. 170 [V]	Input Volt. 200 [V]	Input Volt. 264 [V]	5.00	12.30	12.30	12.36	4.75	12.34	12.34	12.39	4.50	12.37	12.37	12.51	4.00	12.47	12.46	12.53	3.50	12.55	12.57	12.65	3.00	12.65	12.62	12.78	2.50	12.72	12.73	12.91	2.00	12.83	12.83	13.04	1.50	12.91	12.94	13.15	1.00	13.00	13.01	13.14	0.50	12.92	12.82	12.62	0.00	12.17	11.72	11.08
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Input Volt. 170 V

Input Volt. 200 V

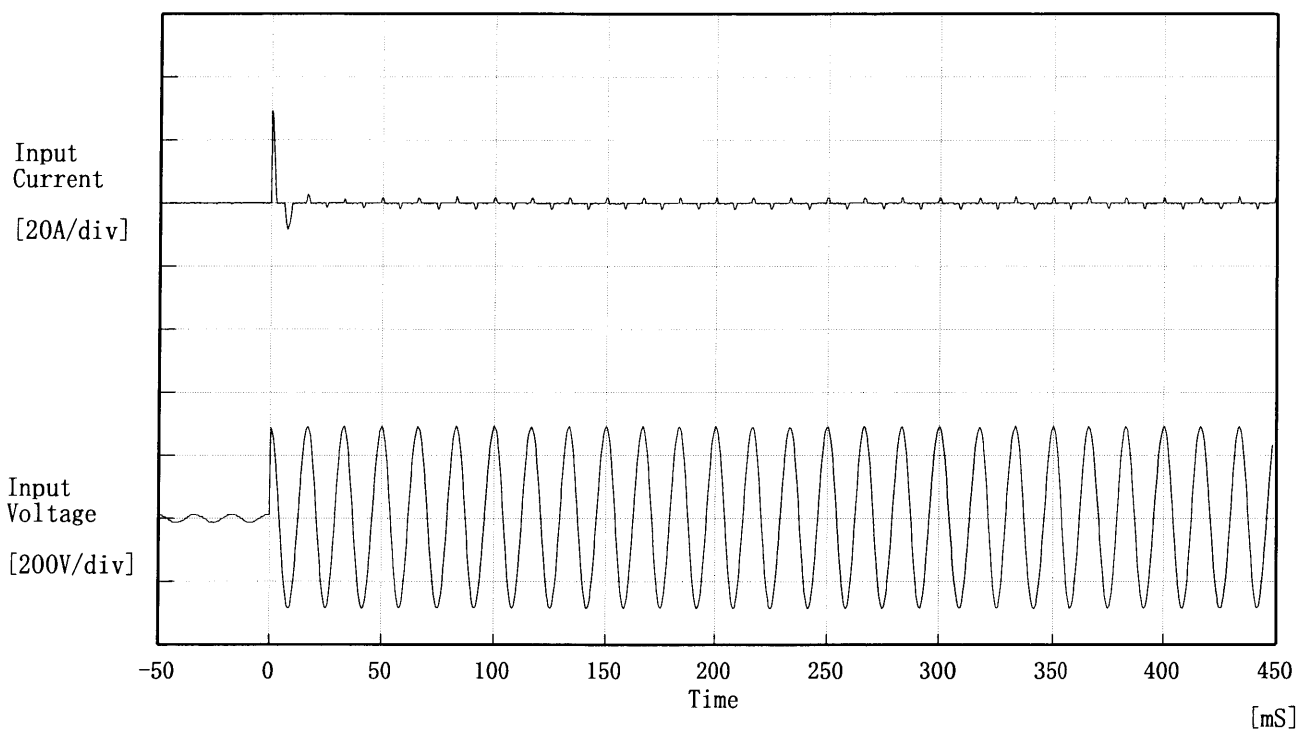
Input Volt. 264 V

COSEL

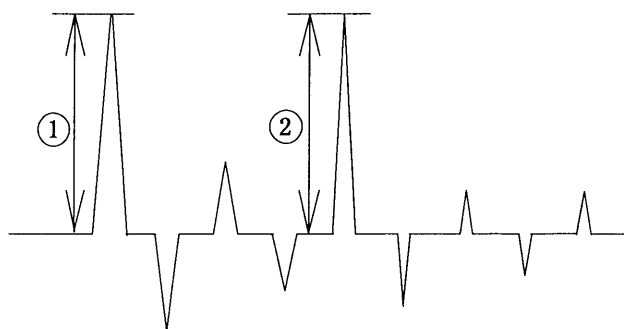
Model		LDA50F-5	Testing Circuitry Figure A																																																								
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Object		+5.0V10A	2. Values																																																								
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<div><div>Operating Point [V]</div><div>Ambient Temperature [°C]</div></div> <div>Load 0%</div> <div>Note: Slanted line shows the range of the rated ambient temperature.</div> <div>(注)斜線は定格周囲温度範囲を示す。</div>		<table><tr><th>Ambient Temp.</th><th>Input Volt.</th><th>Input Volt.</th><th>Input Volt.</th></tr><tr><th>[°C]</th><th>170[V]</th><th>200[V]</th><th>264[V]</th></tr><tr><th colspan="4">Operating Point [V]</th></tr><tr><td>-20</td><td>6.49</td><td>6.50</td><td>6.52</td></tr><tr><td>-10</td><td>6.49</td><td>6.49</td><td>6.49</td></tr><tr><td>0</td><td>6.49</td><td>6.49</td><td>6.49</td></tr><tr><td>10</td><td>6.49</td><td>6.49</td><td>6.49</td></tr><tr><td>20</td><td>6.49</td><td>6.49</td><td>6.47</td></tr><tr><td>25</td><td>6.48</td><td>6.48</td><td>6.48</td></tr><tr><td>30</td><td>6.48</td><td>6.48</td><td>6.48</td></tr><tr><td>40</td><td>6.48</td><td>6.48</td><td>6.48</td></tr><tr><td>50</td><td>6.47</td><td>6.47</td><td>6.45</td></tr><tr><td>60</td><td>6.47</td><td>6.42</td><td>6.42</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>		Ambient Temp.	Input Volt.	Input Volt.	Input Volt.	[°C]	170[V]	200[V]	264[V]	Operating Point [V]				-20	6.49	6.50	6.52	-10	6.49	6.49	6.49	0	6.49	6.49	6.49	10	6.49	6.49	6.49	20	6.49	6.49	6.47	25	6.48	6.48	6.48	30	6.48	6.48	6.48	40	6.48	6.48	6.48	50	6.47	6.47	6.45	60	6.47	6.42	6.42	—	—	—	—
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—	—	—	—																																																								

COSEL

Model	LDA50F-5	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object		



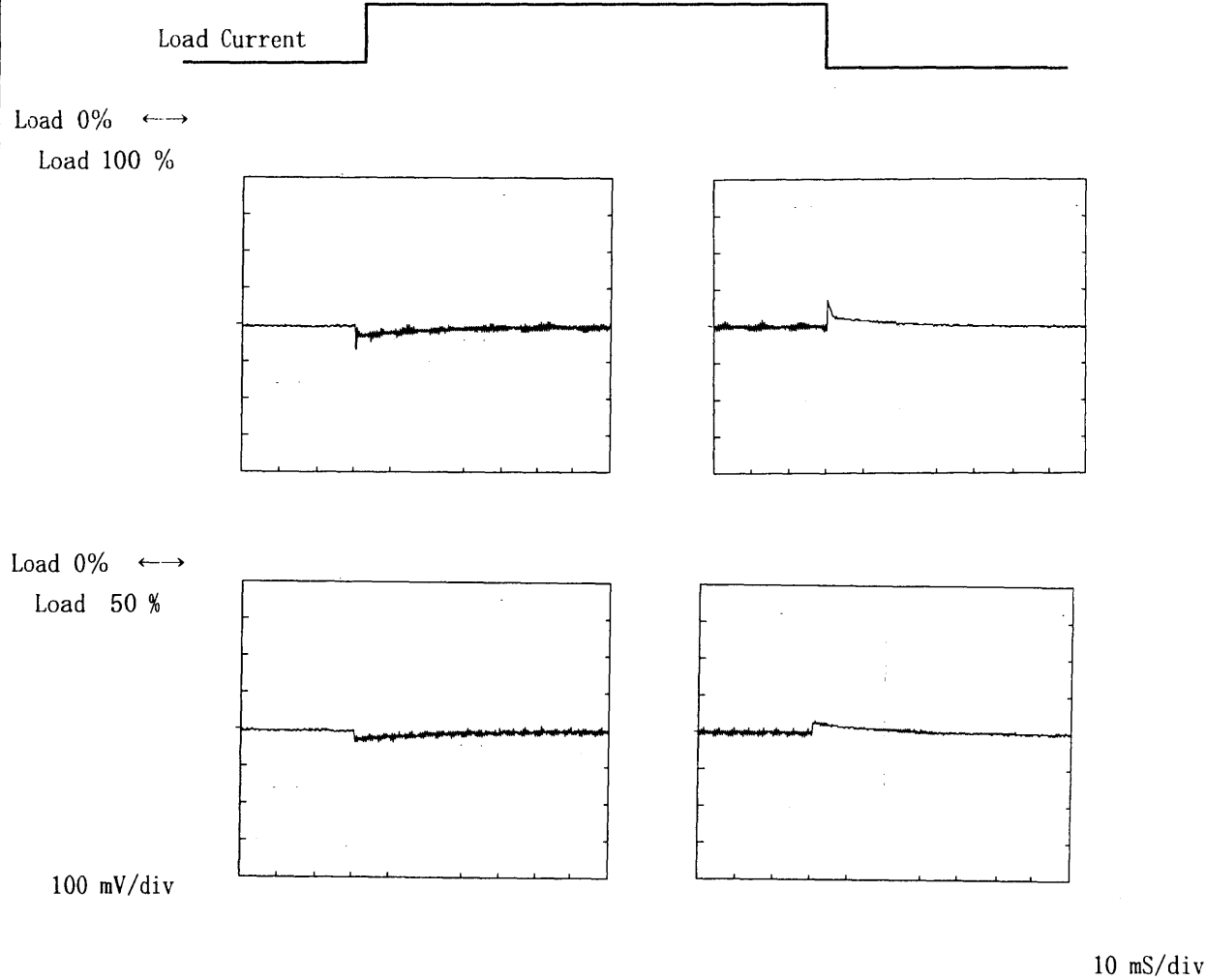
Input Voltage 200 V
 Frequency 60 Hz
 Load 100 %
 Inrush Current
 ① 29.31 [A]
 ② 2.11 [A]



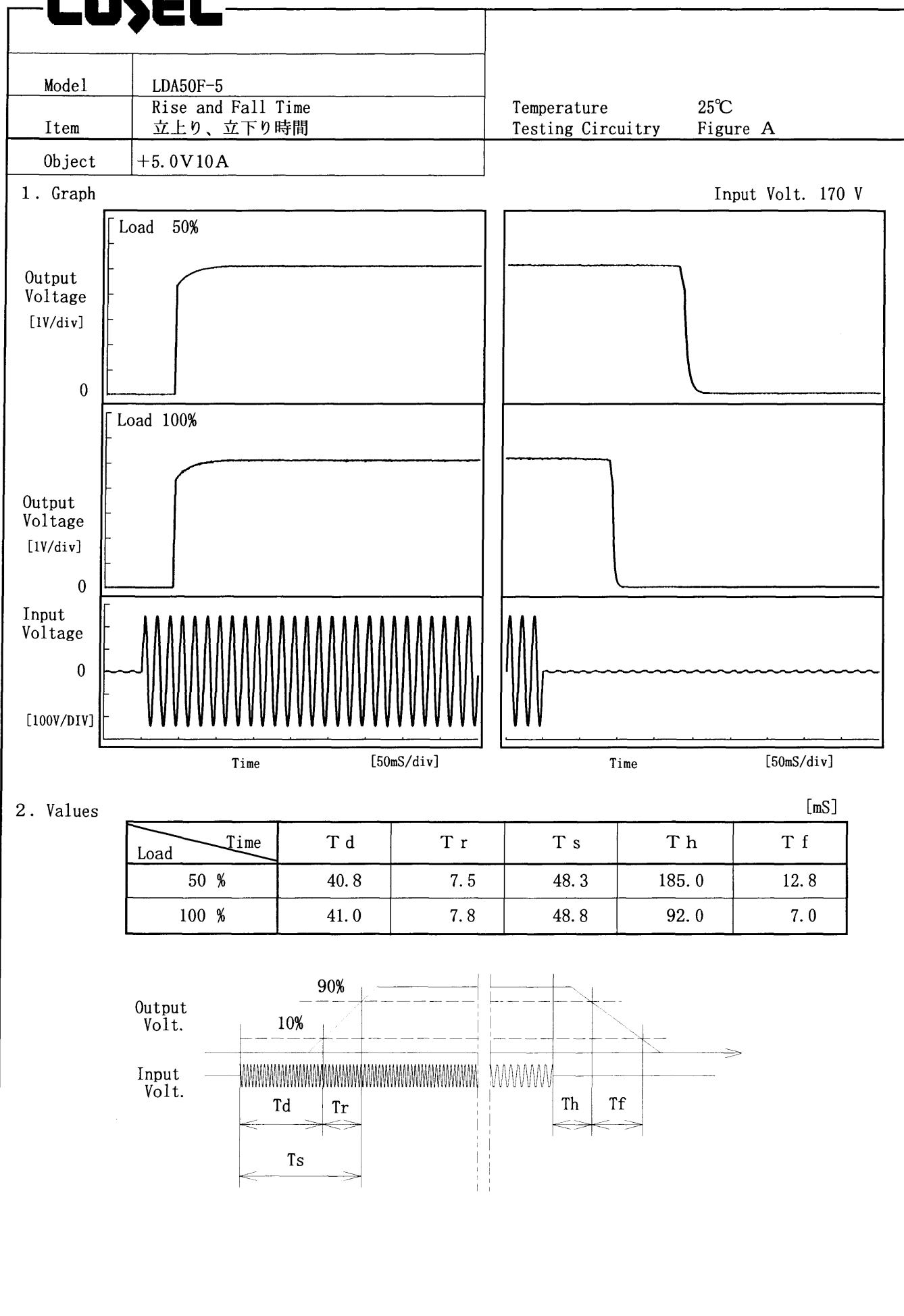
COSEL

Model	LDA50F-5		
Item	Dynamic Load Responce 動的負荷変動	Temperature	25℃
Object	+5.0V10A	Testing Circuitry	Figure A

Input Volt. 200 V
Cycle 1000 mS



COSEL

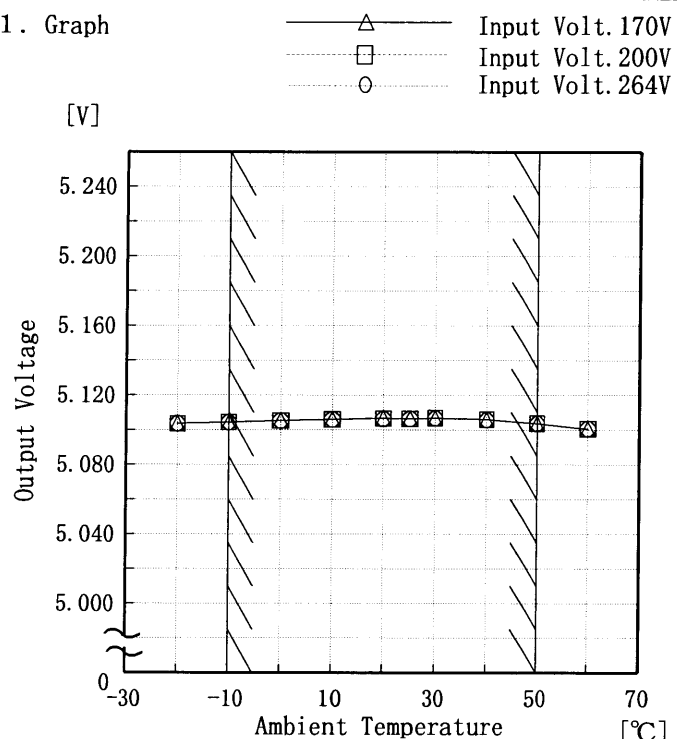


COSEL

Model	LDA50F-5
Item	Ambient Temperature Drift 周囲温度変動
Object	+5.0V10A

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]	Output Voltage [V]		
	Input Volt. 170 [V]	Input Volt. 200 [V]	Input Volt. 264 [V]
-20	5.104	5.104	5.104
-10	5.104	5.104	5.104
0	5.105	5.105	5.105
10	5.106	5.106	5.106
20	5.107	5.107	5.106
25	5.106	5.106	5.106
30	5.107	5.107	5.107
40	5.106	5.106	5.106
50	5.104	5.104	5.104
60	5.101	5.101	5.101
—	—	—	—

COSEL

Model		LDA50F-5	
Item		Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧	
Object		+5.0V10A	

1. Graph

□ Load 50%

△ Load 100%

Input Voltage [V]

COSEL

Model LDA50F-5		Testing Circuitry Figure A																																				
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)																																					
Object	+5.0V10A																																					
1. Graph <div style="display: flex; justify-content: flex-end; align-items: center; margin-top: 10px;"> <div style="margin-right: 20px;">□ Load 50%</div> <div>△ Load 100%</div> </div> <p style="text-align: center;">Input Volt. 200 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" style="margin-top: 20px; width: 100%;"> <thead> <tr> <th>Ambient Temp. [°C]</th><th>Load 50% Ripple Output Volt. [mV]</th><th>Load 100% Ripple Output Volt. [mV]</th></tr> </thead> <tbody> <tr><td>-20</td><td>45</td><td>50</td></tr> <tr><td>-10</td><td>40</td><td>40</td></tr> <tr><td>0</td><td>35</td><td>35</td></tr> <tr><td>10</td><td>30</td><td>30</td></tr> <tr><td>20</td><td>25</td><td>30</td></tr> <tr><td>25</td><td>25</td><td>25</td></tr> <tr><td>30</td><td>20</td><td>25</td></tr> <tr><td>40</td><td>20</td><td>25</td></tr> <tr><td>50</td><td>20</td><td>25</td></tr> <tr><td>60</td><td>20</td><td>20</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>	Ambient Temp. [°C]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]	-20	45	50	-10	40	40	0	35	35	10	30	30	20	25	30	25	25	25	30	20	25	40	20	25	50	20	25	60	20	20	—	—	—
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COSEL

COSEL																									
Model	LDA50F-5	Temperature	25℃																						
Item	Time Lapse Drift 経時ドリフト	Testing Circuitry	Figure A																						
Object	+5.0V10A																								
1. Graph		2.Values																							
<div>[V]</div> <div><p>Output Voltage</p><p>Time [H]</p><p>Input Volt. 200V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.122</td></tr><tr><td>0.5</td><td>5.119</td></tr><tr><td>1.0</td><td>5.119</td></tr><tr><td>2.0</td><td>5.119</td></tr><tr><td>3.0</td><td>5.120</td></tr><tr><td>4.0</td><td>5.120</td></tr><tr><td>5.0</td><td>5.120</td></tr><tr><td>6.0</td><td>5.120</td></tr><tr><td>7.0</td><td>5.120</td></tr><tr><td>8.0</td><td>5.120</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.122	0.5	5.119	1.0	5.119	2.0	5.119	3.0	5.120	4.0	5.120	5.0	5.120	6.0	5.120	7.0	5.120	8.0	5.120
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COSEL

Model		LDA50F-5	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+5.0V10A	

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 : 170~264 V

Load Current : 0~10 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 170~264 V

負荷電流 0~10 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	25	264	0	5.122	±9	±0.2
Minimum Voltage	50	264	10	5.105		

COSEL

Model		LDA50F-5	Testing Circuitry Figure A
Item		Condensation 結露特性	
Object		+5.0V10A	

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]	5.107	Input Volt.: 200V, Load Current:10A
Line Regulation [mV]	2	Input Volt.: 170~264V, Load Current:10A
Load Regulation [mV]	16	Input Volt.: 200V, Load Current:0~10A

COSEL

Model		LDA50F-5		Temperature 25℃ Testing Circuitry Figure B
Item		Leakage Current 漏洩電流		
Object		_____		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	---	---	---
(B) IEC60950	---	---	---

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B) IEC60950	0.18	0.21	0.26

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。

COSEL

Model	LDA50F-5	Temperature 25℃ Testing Circuitry Figure C
Item	Line Noise Tolerance 入力雑音耐量	
Object	+5.0V10A	

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

COSEL

Model	LDA50F-5	Temperature 25℃ Testing Circuitry Figure D
Item	Conducted Emission 雑音端子電圧	
Object		

1. Graph

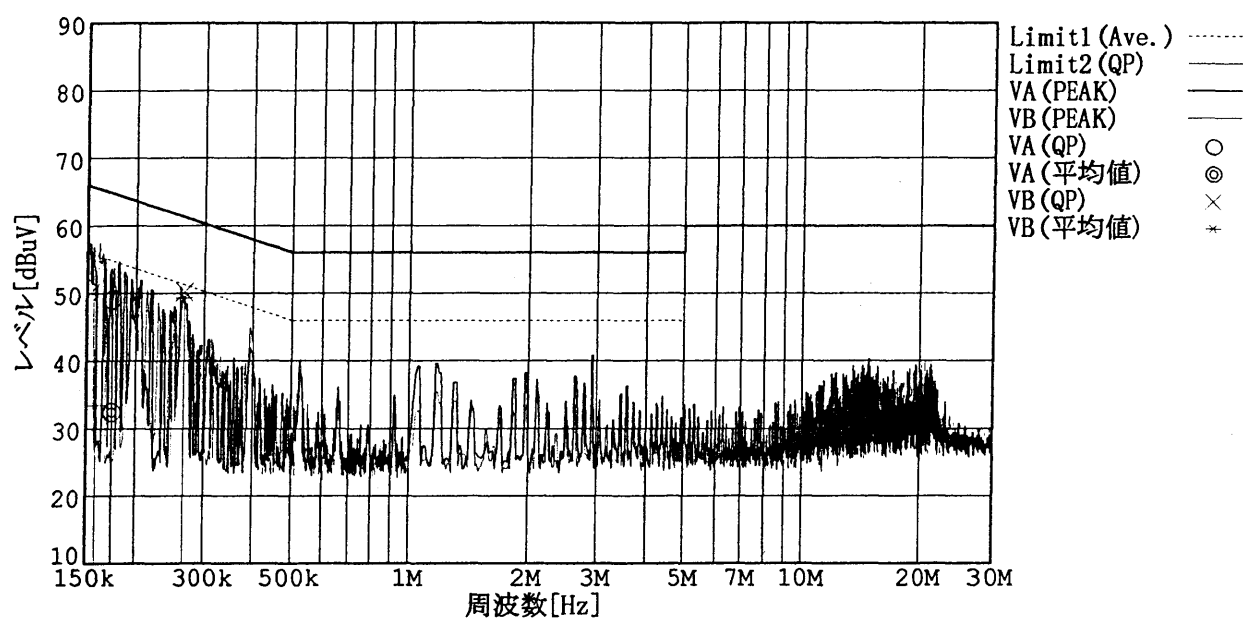
Remarks

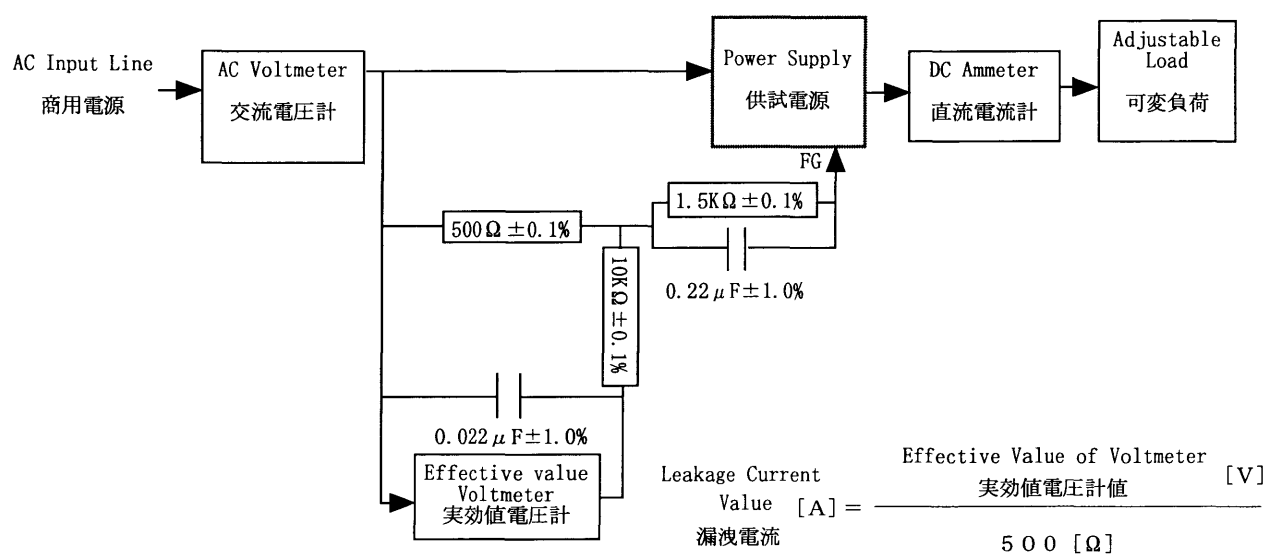
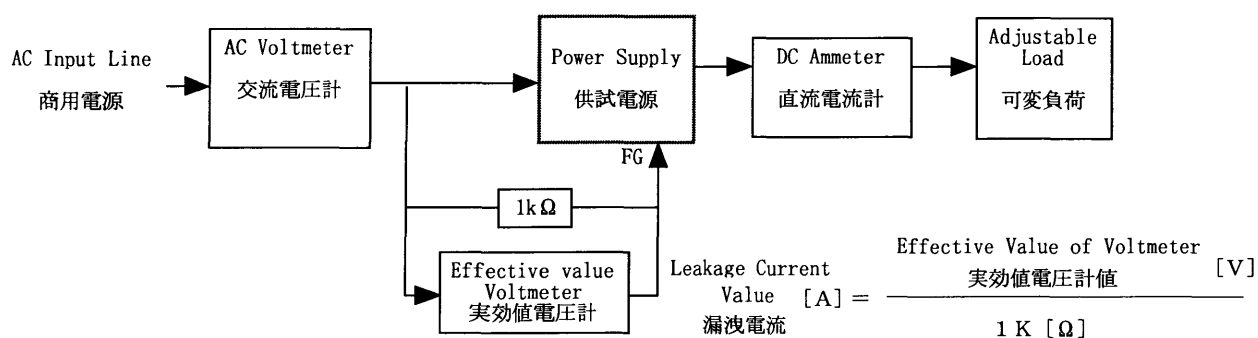
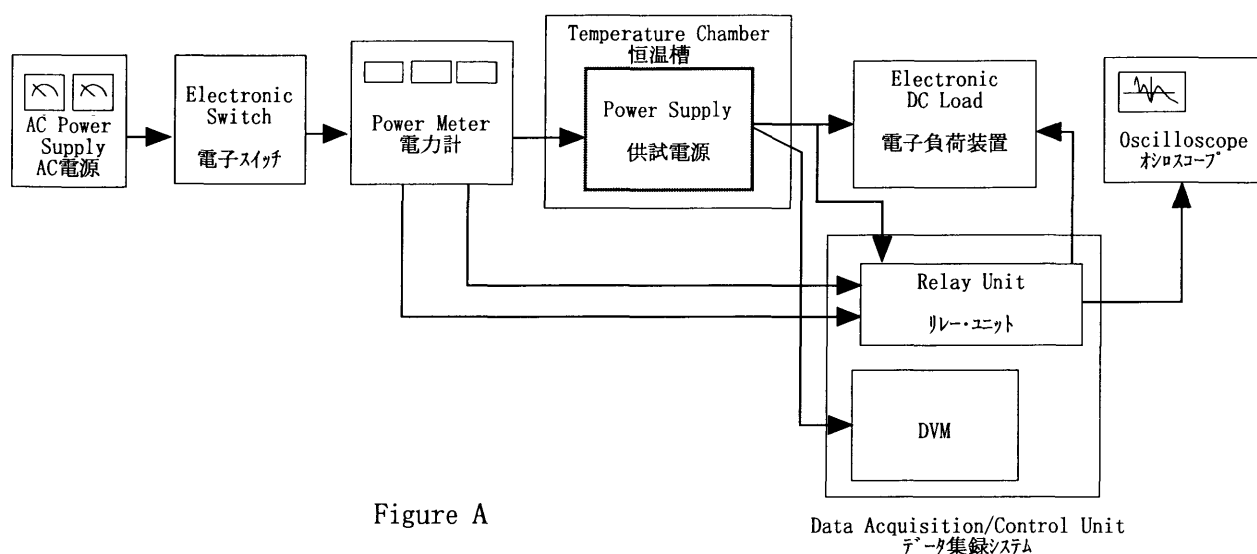
Input Volt. 230 V

Load 100 %

規格 1 : [EN 55022] Class B(平均値)

規格 2 : [EN 55022] Class B(QP)





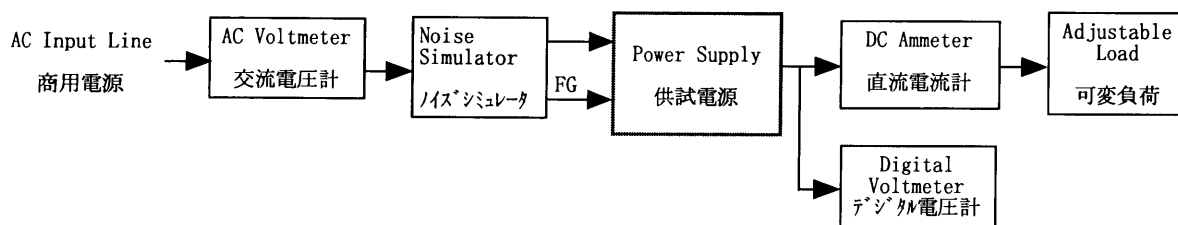


Figure C

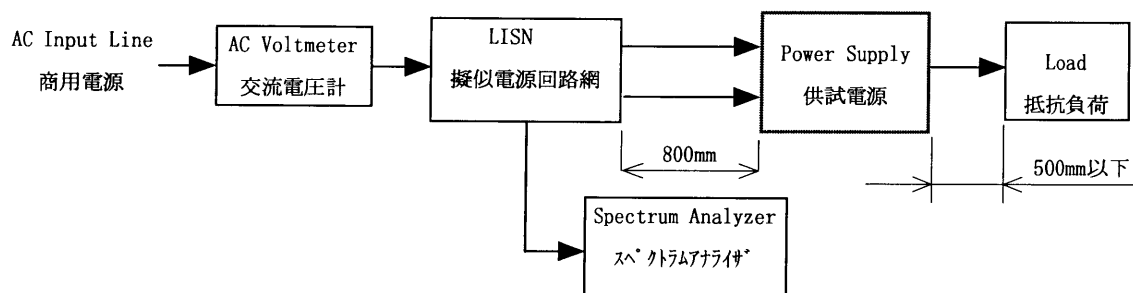


Figure D

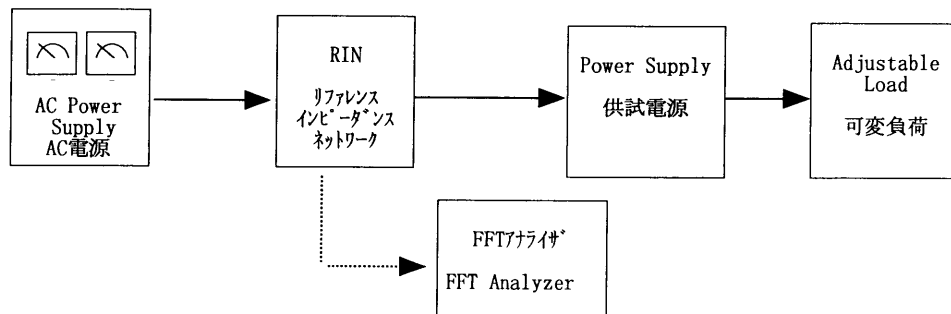


Figure E