



# TEST DATA OF LCA75S-3

Regulated DC Power Supply  
Jan.13. 2004

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Prepared by : *J. Asano*  
J.Asano Design Engineer

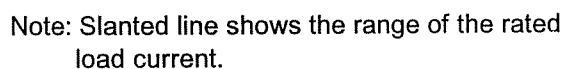
**COSEL CO.,LTD.**

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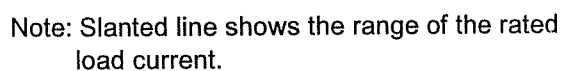
Temperature 25°C  
Testing Circuitry Figure A



Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	0.063	0.066	0.070
3.0	0.305	0.282	0.251
6.0	0.532	0.480	0.408
9.0	0.774	0.688	0.571
12.0	1.027	0.905	0.744
15.0	1.289	1.130	0.921
16.5	1.423	1.251	1.018
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Temperature 25°C  
Testing Circuitry Figure A

	Input Volt.	85V
	Input Volt.	100V
	Input Volt.	132V



Load Current [A]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	2.10	2.46	3.27
3.0	13.49	13.80	15.34
6.0	25.00	25.40	26.70
9.0	37.20	37.50	38.60
12.0	49.90	50.00	50.90
15.0	63.10	63.10	63.70
16.5	69.80	69.80	70.30
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model		LCA75S-3	Temperature Testing Circuitry	25°C Figure A																																
Item		Efficiency (by Input Voltage)																																		
Object																																				
1.Graph			2.Values																																	
<div><div><div><div><div></div><div></div></div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>Load 50%</div><div>Load 100%</div></div> <table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Efficiency [%]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>75</td><td>75.1</td><td>72.8</td></tr><tr><td>80</td><td>74.9</td><td>73.1</td></tr><tr><td>85</td><td>74.4</td><td>73.2</td></tr><tr><td>90</td><td>74.4</td><td>73.3</td></tr><tr><td>100</td><td>73.7</td><td>73.2</td></tr><tr><td>110</td><td>72.7</td><td>73.1</td></tr><tr><td>120</td><td>72.1</td><td>73.0</td></tr><tr><td>132</td><td>71.0</td><td>72.4</td></tr><tr><td>140</td><td>70.1</td><td>72.1</td></tr></tbody></table>			Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	75	75.1	72.8	80	74.9	73.1	85	74.4	73.2	90	74.4	73.3	100	73.7	73.2	110	72.7	73.1	120	72.1	73.0	132	71.0	72.4	140	70.1	72.1		
Input Voltage [V]	Efficiency [%]																																			
	Load 50%	Load 100%																																		
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Note: Slanted line shows the range of the rated input voltage.																																				

Temperature 25°C  
Testing Circuitry Figure A

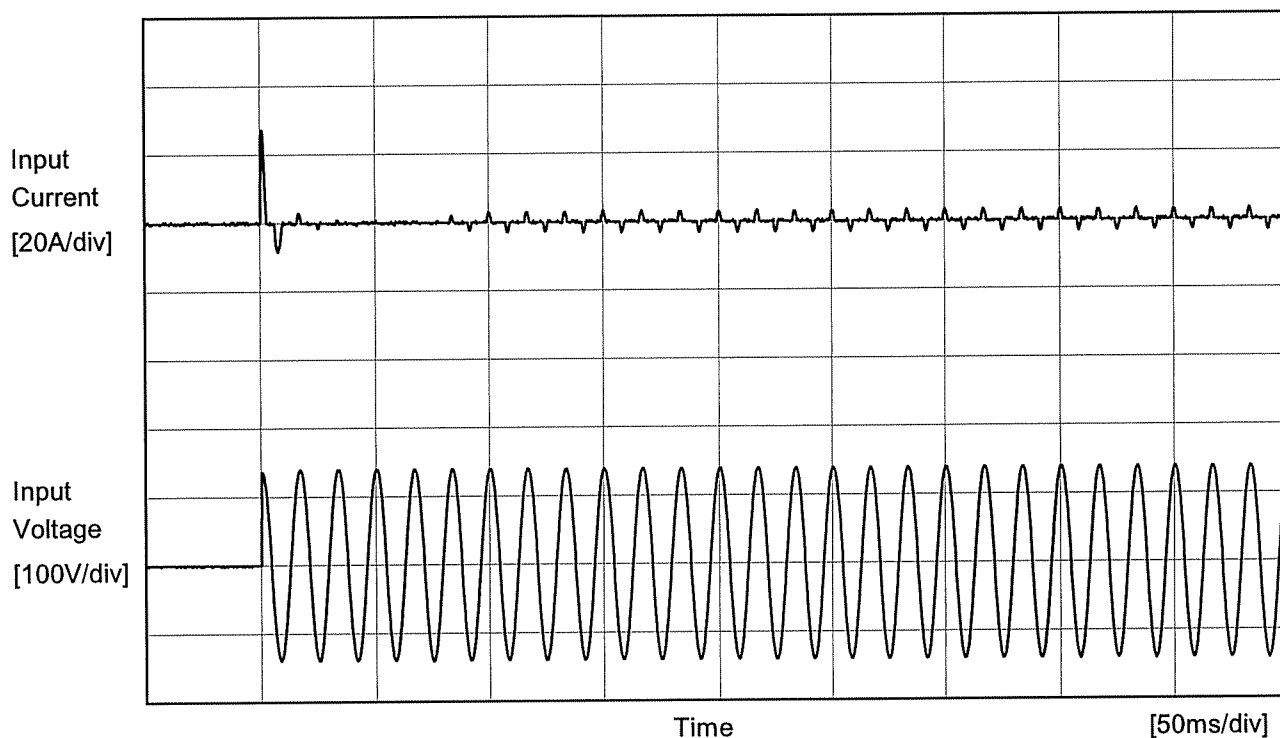


Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	-	-	-
3.0	68.4	66.8	60.1
6.0	73.8	72.6	69.1
9.0	74.4	73.8	71.7
12.0	74.0	73.8	72.5
15.0	73.1	73.1	72.4
16.5	72.7	72.7	72.2
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

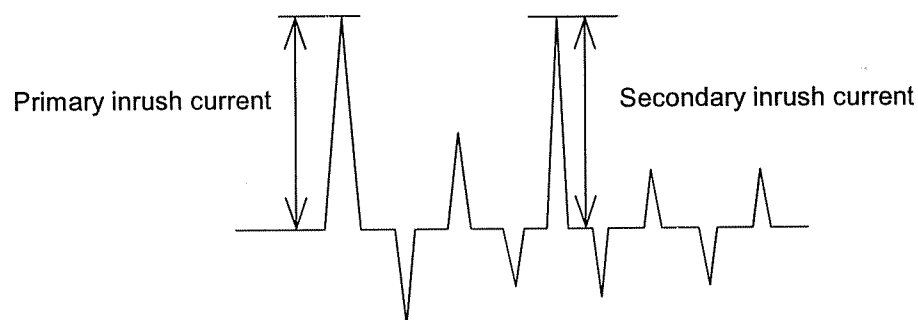
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Model	LCA75S-3	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	



Input Voltage 100 V  
Frequency 60 Hz  
Load 100 %

Primary inrush current 27.1 A  
Secondary inrush current 3.3 A





Model	LCA75S-3	Temperature 25°C Testing Circuitry Figure A																															
Item	Line Regulation																																
Object	+3V15A																																
1.Graph		2.Values																															
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] Load 50%</th><th>Output Voltage [V] Load 100%</th></tr></thead><tbody><tr><td>75</td><td>3.081</td><td>3.082</td></tr><tr><td>80</td><td>3.081</td><td>3.083</td></tr><tr><td>85</td><td>3.081</td><td>3.083</td></tr><tr><td>90</td><td>3.081</td><td>3.083</td></tr><tr><td>100</td><td>3.082</td><td>3.083</td></tr><tr><td>110</td><td>3.082</td><td>3.083</td></tr><tr><td>120</td><td>3.082</td><td>3.083</td></tr><tr><td>132</td><td>3.082</td><td>3.083</td></tr><tr><td>140</td><td>3.082</td><td>3.083</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	75	3.081	3.082	80	3.081	3.083	85	3.081	3.083	90	3.081	3.083	100	3.082	3.083	110	3.082	3.083	120	3.082	3.083	132	3.082	3.083	140	3.082	3.083		
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<div><div><div>—△—</div><div>Input Volt. 85V</div></div><div><div>---□---</div><div>Input Volt. 100V</div></div><div><div>-·-○-·-</div><div>Input Volt. 132V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<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>0.0</td><td>3.082</td><td>3.082</td><td>3.082</td></tr><tr><td>3.0</td><td>3.082</td><td>3.082</td><td>3.083</td></tr><tr><td>6.0</td><td>3.083</td><td>3.083</td><td>3.083</td></tr><tr><td>9.0</td><td>3.083</td><td>3.083</td><td>3.083</td></tr><tr><td>12.0</td><td>3.083</td><td>3.083</td><td>3.084</td></tr><tr><td>15.0</td><td>3.084</td><td>3.084</td><td>3.084</td></tr><tr><td>16.5</td><td>3.084</td><td>3.084</td><td>3.084</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]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	3.082	3.082	3.082	3.0	3.082	3.082	3.083	6.0	3.083	3.083	3.083	9.0	3.083	3.083	3.083	12.0	3.083	3.083	3.084	15.0	3.084	3.084	3.084	16.5	3.084	3.084	3.084	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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Model	LCA75S-3	Temperature	25°C																																						
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure A																																						
Object	+3V15A																																								
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 85V</div><div>- -○- - Input Volt. 132V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div> <div>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</div> <div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div><div>Ripple [mVp-p]</div><div>T1</div><div>T2</div></div> <div>Fig. Complex Ripple Wave Form</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><td>0.0</td><td>15</td><td>15</td></tr><tr><td>3.0</td><td>30</td><td>30</td></tr><tr><td>6.0</td><td>35</td><td>35</td></tr><tr><td>9.0</td><td>35</td><td>40</td></tr><tr><td>12.0</td><td>40</td><td>45</td></tr><tr><td>15.0</td><td>40</td><td>45</td></tr><tr><td>16.5</td><td>40</td><td>45</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]	Ripple Voltage [mV]		Input Volt. 85 [V]	Input Volt. 132 [V]	0.0	15	15	3.0	30	30	6.0	35	35	9.0	35	40	12.0	40	45	15.0	40	45	16.5	40	45	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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Model	LCA75S-3	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure A
Object	+3V15A		
1.Graph		2.Values	
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# COSEL

Model	LCA75S-3																																								
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry    Figure A																																							
Object	+3V15A																																								
1.Graph		2.Values																																							
<div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div> <p>Ripple Voltage [mV]</p> <p>Ambient Temperature [°C]</p> <p>Input Volt.      100V</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>-20</td><td>85</td><td>90</td></tr><tr><td>-10</td><td>65</td><td>80</td></tr><tr><td>0</td><td>55</td><td>70</td></tr><tr><td>10</td><td>50</td><td>60</td></tr><tr><td>20</td><td>45</td><td>55</td></tr><tr><td>25</td><td>40</td><td>45</td></tr><tr><td>30</td><td>40</td><td>40</td></tr><tr><td>40</td><td>35</td><td>40</td></tr><tr><td>50</td><td>35</td><td>35</td></tr><tr><td>60</td><td>30</td><td>35</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-20	85	90	-10	65	80	0	55	70	10	50	60	20	45	55	25	40	45	30	40	40	40	35	40	50	35	35	60	30	35	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
	Load 50%	Load 100%																																							
-20	85	90																																							
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0	55	70																																							
10	50	60																																							
20	45	55																																							
25	40	45																																							
30	40	40																																							
40	35	40																																							
50	35	35																																							
60	30	35																																							
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Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.																																									

- 10 -

BC-0945

# COSEL

Model		LCA75S-3
Item		Ambient Temperature Drift
Object		+3V15A

1.Graph

—△—

Input Volt. 85V

---□---

Input Volt. 100V

-·-○-·-

Input Volt. 132V

Output Voltage [V]

Ambient Temperature [°C]

Load 100%

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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	3.071	3.071	3.072
-10	3.074	3.074	3.074
0	3.076	3.077	3.077
10	3.079	3.079	3.079
20	3.081	3.081	3.081
25	3.082	3.082	3.083
30	3.083	3.083	3.083
40	3.084	3.085	3.085
50	3.086	3.086	3.086
60	3.087	3.087	3.087
--	-	-	-



Model		LCA75S-3	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+3V15A	

### 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 - 132V

Load Current : 0 - 15A

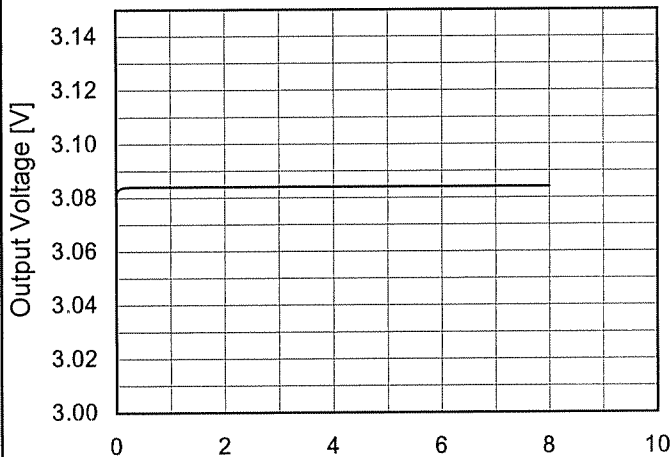
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

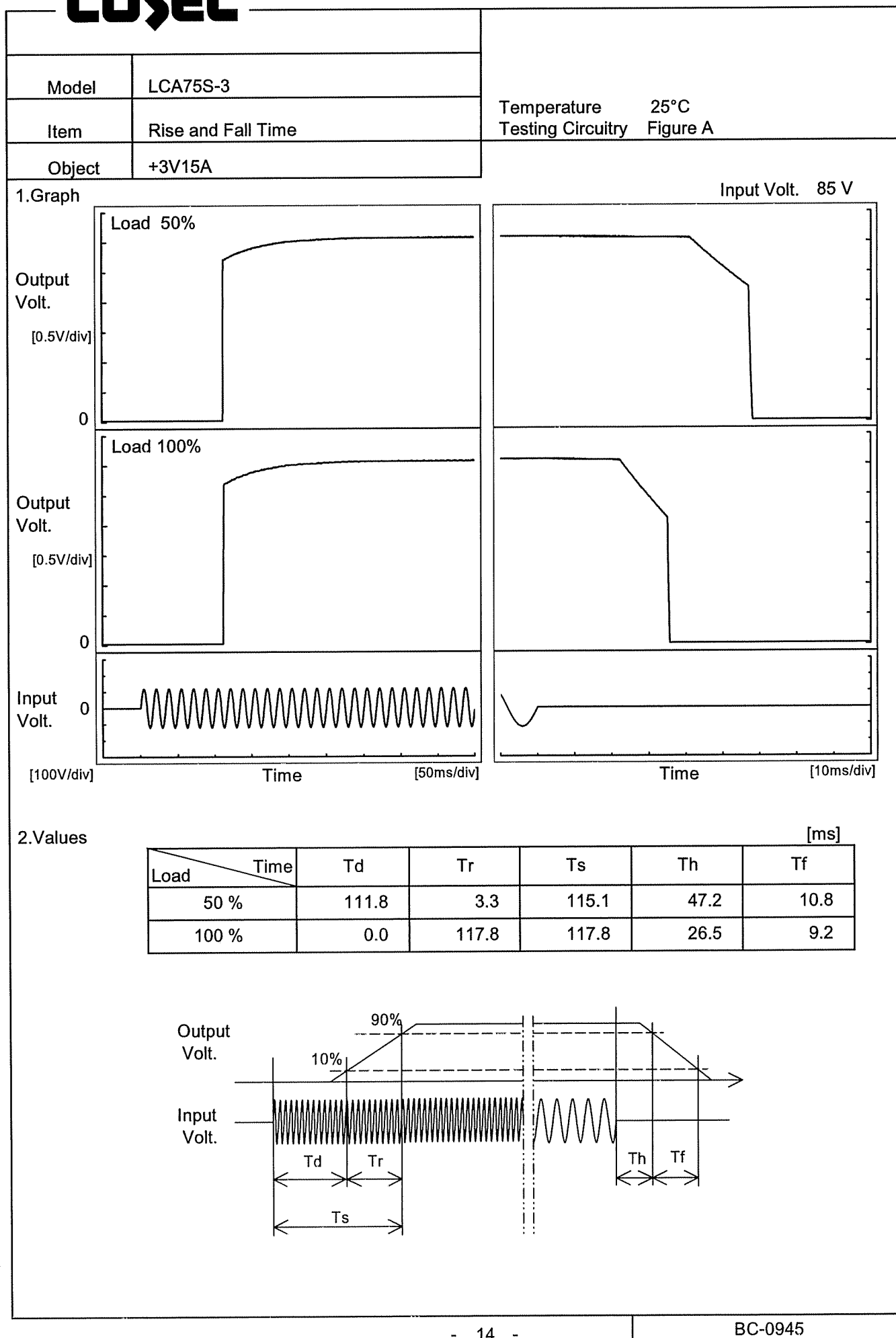
### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	132	15	3.087	±7	±0.2
Minimum Voltage	-10	85	0	3.074		

# COSEL

LUXEL																									
Model	LCA75S-3																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+3V15A																								
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V</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>3.082</td></tr><tr><td>0.5</td><td>3.084</td></tr><tr><td>1.0</td><td>3.084</td></tr><tr><td>2.0</td><td>3.084</td></tr><tr><td>3.0</td><td>3.084</td></tr><tr><td>4.0</td><td>3.084</td></tr><tr><td>5.0</td><td>3.084</td></tr><tr><td>6.0</td><td>3.084</td></tr><tr><td>7.0</td><td>3.084</td></tr><tr><td>8.0</td><td>3.084</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	3.082	0.5	3.084	1.0	3.084	2.0	3.084	3.0	3.084	4.0	3.084	5.0	3.084	6.0	3.084	7.0	3.084	8.0	3.084
Time since start [H]	Output Voltage [V]																								
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8.0	3.084																								

# COSEL





# COSEL

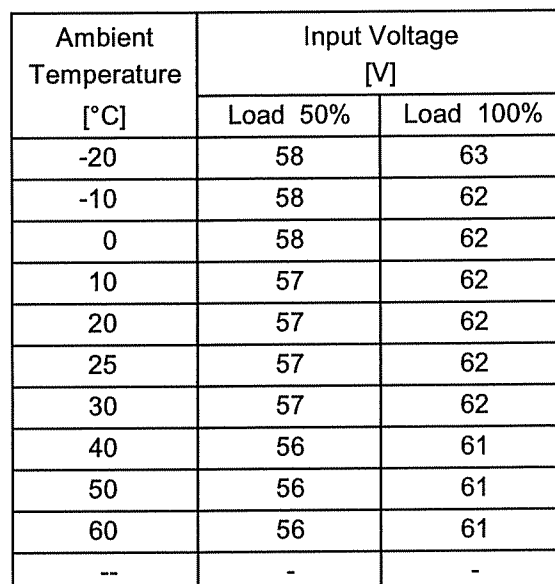
Model		LCA75S-3	Temperature Testing Circuitry	25°C Figure A																																
Item		Hold-Up Time																																		
Object		+3V15A																																		
1.Graph			2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><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>75</td><td>35</td><td>13</td></tr><tr><td>80</td><td>46</td><td>19</td></tr><tr><td>85</td><td>59</td><td>25</td></tr><tr><td>90</td><td>71</td><td>31</td></tr><tr><td>100</td><td>100</td><td>45</td></tr><tr><td>110</td><td>132</td><td>61</td></tr><tr><td>120</td><td>167</td><td>78</td></tr><tr><td>132</td><td>212</td><td>101</td></tr><tr><td>140</td><td>245</td><td>118</td></tr></tbody></table>			Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	35	13	80	46	19	85	59	25	90	71	31	100	100	45	110	132	61	120	167	78	132	212	101	140	245	118		
Input Voltage [V]	Hold-Up Time [ms]																																			
	Load 50%	Load 100%																																		
75	35	13																																		
80	46	19																																		
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100	100	45																																		
110	132	61																																		
120	167	78																																		
132	212	101																																		
140	245	118																																		
<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>																																				

# COSEL

Model	LCA75S-3	Temperature 25°C Testing Circuitry Figure A																																																					
Item	Instantaneous Interruption Compensation																																																						
Object	+3V15A																																																						
1.Graph		2.Values																																																					
<div><div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>---○---</div><div>Input Volt.</div><div>132V</div></div></div> <div><div><div>Instantaneous Compensation Time [ms]</div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>0</div><div>4</div><div>8</div><div>12</div><div>16</div></div><div></div><div><div>Load Current [A]</div></div></div> <div><div>Note: Slanted line shows the range of the rated load current.</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>3.0</td><td>150</td><td>246</td><td>496</td></tr><tr><td>6.0</td><td>76</td><td>129</td><td>267</td></tr><tr><td>9.0</td><td>48</td><td>84</td><td>178</td></tr><tr><td>12.0</td><td>35</td><td>60</td><td>131</td></tr><tr><td>15.0</td><td>25</td><td>46</td><td>102</td></tr><tr><td>16.5</td><td>21</td><td>41</td><td>92</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]	Time [ms]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	-	-	-	3.0	150	246	496	6.0	76	129	267	9.0	48	84	178	12.0	35	60	131	15.0	25	46	102	16.5	21	41	92	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	
Load Current [A]	Time [ms]																																																						
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Testing Circuitry    Figure A

## 2.Values



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

Temperature	25°C
Testing Circuitry	Figure A



Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
3.00	15.33	15.24	15.24
2.85	18.83	18.83	18.93
2.70	18.89	18.90	18.98
2.40	19.03	19.04	19.07
2.10	19.17	19.15	19.27
1.80	19.26	19.33	19.25
1.50	19.40	19.35	19.33
1.20	19.47	19.45	19.43
0.90	19.58	19.56	19.50
0.60	19.68	19.64	19.53
0.30	19.74	19.65	19.46
0.00	19.68	19.53	19.16

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



Model		LCA75S-3																																																				
Item		Overvoltage Protection																																																				
Object		+3V15A																																																				
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt. 85V</div></div><div><div>---□---</div><div>Input Volt. 100V</div></div><div><div>-·-○-·-</div><div>Input Volt. 132V</div></div></div> <div><p>Operating Point [V]</p><p>Ambient Temperature [°C]</p><p>Load 0%</p><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Operating Point [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>-20</td><td>4.93</td><td>4.93</td><td>4.93</td></tr><tr><td>-10</td><td>4.86</td><td>4.92</td><td>4.86</td></tr><tr><td>0</td><td>4.86</td><td>4.86</td><td>4.86</td></tr><tr><td>10</td><td>4.80</td><td>4.85</td><td>4.85</td></tr><tr><td>20</td><td>4.80</td><td>4.85</td><td>4.85</td></tr><tr><td>25</td><td>4.80</td><td>4.80</td><td>4.80</td></tr><tr><td>30</td><td>4.80</td><td>4.80</td><td>4.80</td></tr><tr><td>40</td><td>4.75</td><td>4.80</td><td>4.80</td></tr><tr><td>50</td><td>4.75</td><td>4.75</td><td>4.74</td></tr><tr><td>60</td><td>4.75</td><td>4.74</td><td>4.74</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	4.93	4.93	4.93	-10	4.86	4.92	4.86	0	4.86	4.86	4.86	10	4.80	4.85	4.85	20	4.80	4.85	4.85	25	4.80	4.80	4.80	30	4.80	4.80	4.80	40	4.75	4.80	4.80	50	4.75	4.75	4.74	60	4.75	4.74	4.74	--	-	-	-
Ambient Temperature [°C]	Operating Point [V]																																																					
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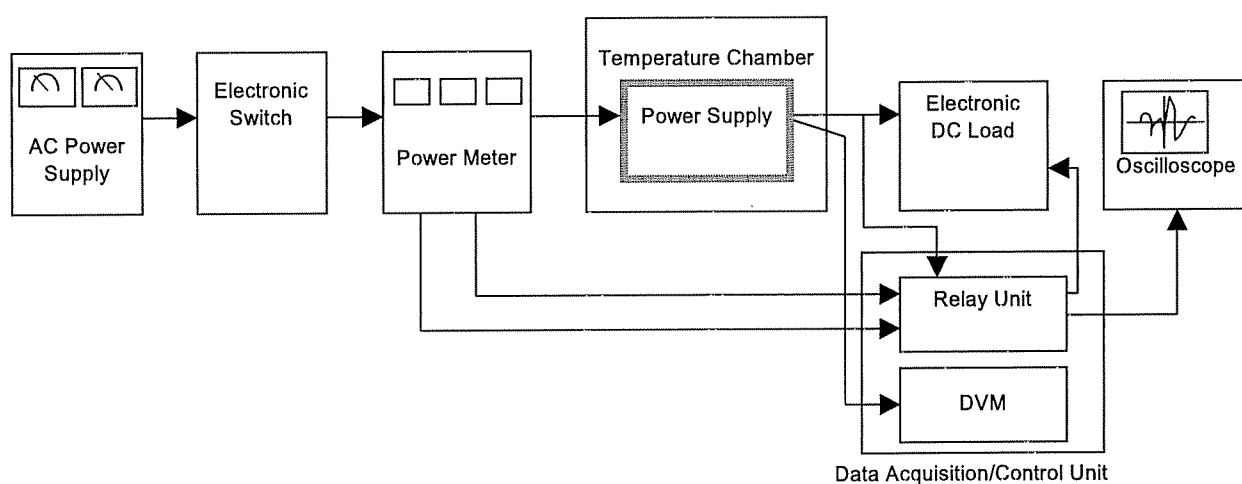


Figure A

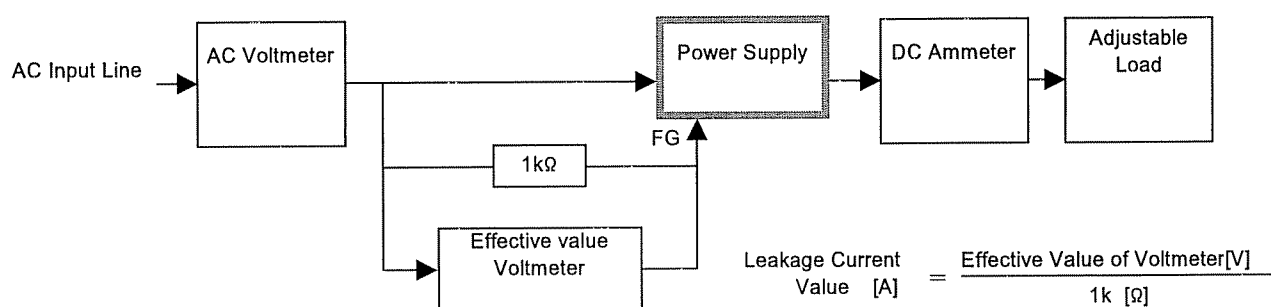


Figure B ( DEN-AN )

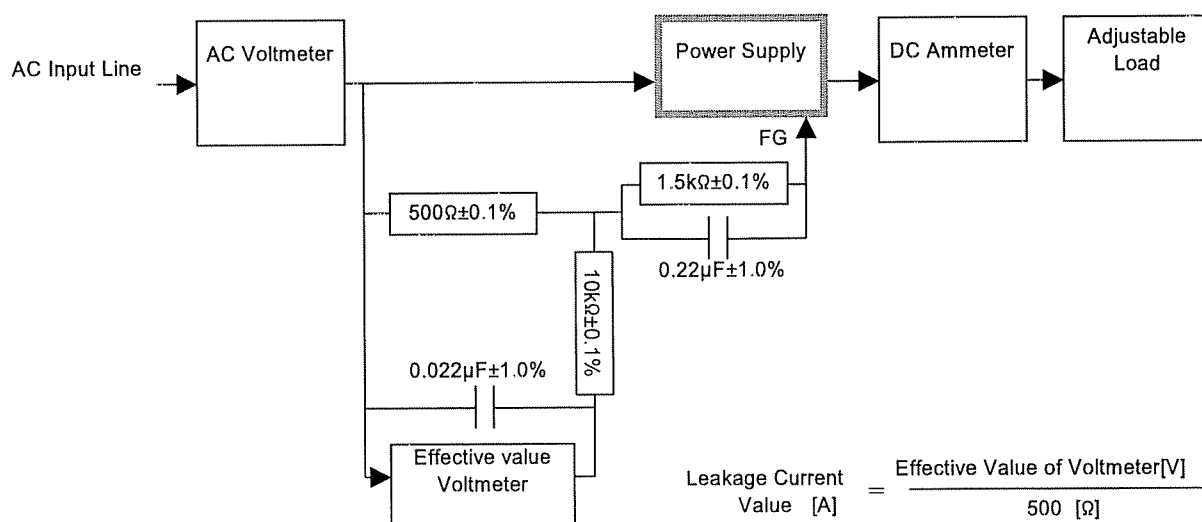


Figure B ( IEC60950 )