



TEST DATA OF LCA50S-3

Regulated DC Power Supply

Approved by :

Kenichi Shibutani

Design Manager

Prepared by :

Jun Uchida

Design Engineer

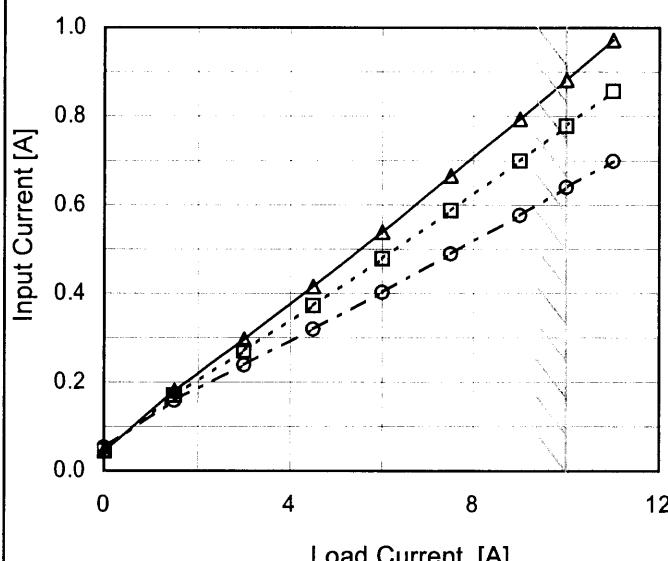
COSEL CO.,LTD.

CONTENTS

1.Input Current (by Load Current)	1
2.Input Power (by Load Current)	2
3.Efficiency (by Input Voltage)	3
4.Efficiency (by Load Current)	4
5.Inrush Current	5
6.Leakage Current	6
7.Line Regulation	7
8.Load Regulation	8
9.Dynamic Load Response	9
10.Ripple Voltage (by Load Current)	10
11.Ripple-Noise	11
12.Ripple Voltage (by Ambient Temperature)	12
13.Ambient Temperature Drift	13
14.Output Voltage Accuracy	14
15.Time Lapse Drift	15
16.Rise and Fall Time	16
17.Hold-Up Time	17
18.Instantaneous Interruption Compensation	18
19.Minimum Input Voltage for Regulated Output Voltage	19
20.Overcurrent Protection	20
21.Ovvervoltage Protection	21
22.Figure of Testing Circuitry	22

(Final Page 22)

COSEL

Model	LCA50S-3																																																							
Item	Input Current (by Load Current)	Temperature	25°C																																																					
Object	Testing Circuitry Figure A																																																							
1.Graph	—△— Input Volt. 85V - -□--- Input Volt. 100V - -○--- Input Volt. 132V																																																							
																																																								
Note: Slanted line shows the range of the rated load current.																																																								
2.Values			<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>0.0</td> <td>0.044</td> <td>0.046</td> <td>0.052</td> </tr> <tr> <td>1.5</td> <td>0.180</td> <td>0.170</td> <td>0.159</td> </tr> <tr> <td>3.0</td> <td>0.297</td> <td>0.271</td> <td>0.238</td> </tr> <tr> <td>4.5</td> <td>0.416</td> <td>0.373</td> <td>0.320</td> </tr> <tr> <td>6.0</td> <td>0.539</td> <td>0.479</td> <td>0.403</td> </tr> <tr> <td>7.5</td> <td>0.666</td> <td>0.588</td> <td>0.490</td> </tr> <tr> <td>9.0</td> <td>0.794</td> <td>0.700</td> <td>0.577</td> </tr> <tr> <td>10.0</td> <td>0.882</td> <td>0.779</td> <td>0.640</td> </tr> <tr> <td>11.0</td> <td>0.972</td> <td>0.857</td> <td>0.699</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>			Load Current [A]	Input Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	0.044	0.046	0.052	1.5	0.180	0.170	0.159	3.0	0.297	0.271	0.238	4.5	0.416	0.373	0.320	6.0	0.539	0.479	0.403	7.5	0.666	0.588	0.490	9.0	0.794	0.700	0.577	10.0	0.882	0.779	0.640	11.0	0.972	0.857	0.699	--	-	-	-	--	-	-	-
Load Current [A]	Input Current [A]																																																							
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																					
0.0	0.044	0.046	0.052																																																					
1.5	0.180	0.170	0.159																																																					
3.0	0.297	0.271	0.238																																																					
4.5	0.416	0.373	0.320																																																					
6.0	0.539	0.479	0.403																																																					
7.5	0.666	0.588	0.490																																																					
9.0	0.794	0.700	0.577																																																					
10.0	0.882	0.779	0.640																																																					
11.0	0.972	0.857	0.699																																																					
--	-	-	-																																																					
--	-	-	-																																																					

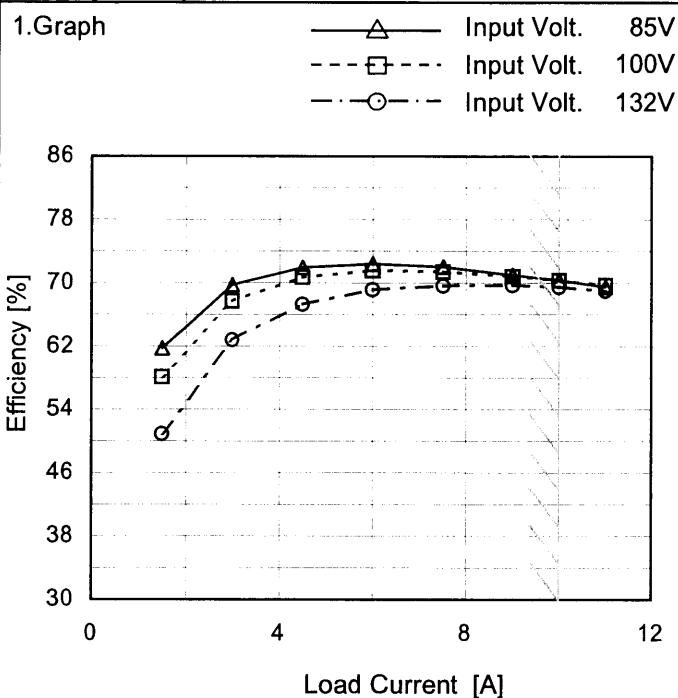
COSEL

Model	LCA50S-3																																																						
Item	Input Power (by Load Current)	Temperature Testing Circuitry	25°C Figure A																																																				
Object																																																							
1.Graph	<p>—△— Input Volt. 85V - - -□- - Input Volt. 100V - - ○ - - Input Volt. 132V</p> <table border="1"> <caption>Data points estimated from Figure A graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Input Power [W] (85V)</th> <th>Input Power [W] (100V)</th> <th>Input Power [W] (132V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>1.38</td><td>1.65</td><td>2.31</td></tr> <tr><td>1.5</td><td>7.59</td><td>8.07</td><td>9.21</td></tr> <tr><td>3.0</td><td>13.39</td><td>13.80</td><td>14.88</td></tr> <tr><td>4.5</td><td>19.40</td><td>19.74</td><td>20.75</td></tr> <tr><td>6.0</td><td>25.60</td><td>25.90</td><td>26.80</td></tr> <tr><td>7.5</td><td>32.00</td><td>32.30</td><td>33.10</td></tr> <tr><td>9.0</td><td>38.70</td><td>38.80</td><td>39.40</td></tr> <tr><td>10.0</td><td>43.20</td><td>43.20</td><td>43.70</td></tr> <tr><td>11.0</td><td>47.90</td><td>47.70</td><td>48.20</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Input Power [W] (85V)	Input Power [W] (100V)	Input Power [W] (132V)	0.0	1.38	1.65	2.31	1.5	7.59	8.07	9.21	3.0	13.39	13.80	14.88	4.5	19.40	19.74	20.75	6.0	25.60	25.90	26.80	7.5	32.00	32.30	33.10	9.0	38.70	38.80	39.40	10.0	43.20	43.20	43.70	11.0	47.90	47.70	48.20	--	-	-	-	--	-	-	-						
Load Current [A]	Input Power [W] (85V)	Input Power [W] (100V)	Input Power [W] (132V)																																																				
0.0	1.38	1.65	2.31																																																				
1.5	7.59	8.07	9.21																																																				
3.0	13.39	13.80	14.88																																																				
4.5	19.40	19.74	20.75																																																				
6.0	25.60	25.90	26.80																																																				
7.5	32.00	32.30	33.10																																																				
9.0	38.70	38.80	39.40																																																				
10.0	43.20	43.20	43.70																																																				
11.0	47.90	47.70	48.20																																																				
--	-	-	-																																																				
--	-	-	-																																																				
2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Power [W]</th> </tr> <tr> <th>Input Volt. 85[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>1.38</td><td>1.65</td><td>2.31</td></tr> <tr><td>1.5</td><td>7.59</td><td>8.07</td><td>9.21</td></tr> <tr><td>3.0</td><td>13.39</td><td>13.80</td><td>14.88</td></tr> <tr><td>4.5</td><td>19.40</td><td>19.74</td><td>20.75</td></tr> <tr><td>6.0</td><td>25.60</td><td>25.90</td><td>26.80</td></tr> <tr><td>7.5</td><td>32.00</td><td>32.30</td><td>33.10</td></tr> <tr><td>9.0</td><td>38.70</td><td>38.80</td><td>39.40</td></tr> <tr><td>10.0</td><td>43.20</td><td>43.20</td><td>43.70</td></tr> <tr><td>11.0</td><td>47.90</td><td>47.70</td><td>48.20</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Input Power [W]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	1.38	1.65	2.31	1.5	7.59	8.07	9.21	3.0	13.39	13.80	14.88	4.5	19.40	19.74	20.75	6.0	25.60	25.90	26.80	7.5	32.00	32.30	33.10	9.0	38.70	38.80	39.40	10.0	43.20	43.20	43.70	11.0	47.90	47.70	48.20	--	-	-	-	--	-	-	-			
Load Current [A]	Input Power [W]																																																						
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																				
0.0	1.38	1.65	2.31																																																				
1.5	7.59	8.07	9.21																																																				
3.0	13.39	13.80	14.88																																																				
4.5	19.40	19.74	20.75																																																				
6.0	25.60	25.90	26.80																																																				
7.5	32.00	32.30	33.10																																																				
9.0	38.70	38.80	39.40																																																				
10.0	43.20	43.20	43.70																																																				
11.0	47.90	47.70	48.20																																																				
--	-	-	-																																																				
--	-	-	-																																																				
Note:	Slanted line shows the range of the rated load current.																																																						

Model	LCA50S-3																																	
Item	Efficiency (by Input Voltage)	Temperature 25°C Testing Circuitry Figure A																																
Object	_____	_____																																
1.Graph																																		
<p>Efficiency [%]</p> <p>Input Voltage [V]</p> <p>Legend: Load 50% (dashed line with squares), Load 100% (solid line with triangles)</p>																																		
Note: Slanted line shows the range of the rated input voltage.																																		
2.Values																																		
<table border="1"> <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>73.0</td><td>70.1</td></tr> <tr><td>80</td><td>72.3</td><td>70.3</td></tr> <tr><td>85</td><td>72.3</td><td>70.4</td></tr> <tr><td>90</td><td>72.0</td><td>70.4</td></tr> <tr><td>100</td><td>71.3</td><td>70.5</td></tr> <tr><td>110</td><td>70.4</td><td>70.3</td></tr> <tr><td>120</td><td>69.5</td><td>70.0</td></tr> <tr><td>132</td><td>68.1</td><td>69.5</td></tr> <tr><td>140</td><td>67.2</td><td>69.2</td></tr> </tbody> </table>			Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	75	73.0	70.1	80	72.3	70.3	85	72.3	70.4	90	72.0	70.4	100	71.3	70.5	110	70.4	70.3	120	69.5	70.0	132	68.1	69.5	140	67.2	69.2
Input Voltage [V]	Efficiency [%]																																	
	Load 50%	Load 100%																																
75	73.0	70.1																																
80	72.3	70.3																																
85	72.3	70.4																																
90	72.0	70.4																																
100	71.3	70.5																																
110	70.4	70.3																																
120	69.5	70.0																																
132	68.1	69.5																																
140	67.2	69.2																																

COSEL

Model	LCA50S-3
Item	Efficiency (by Load Current)
Object	_____



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

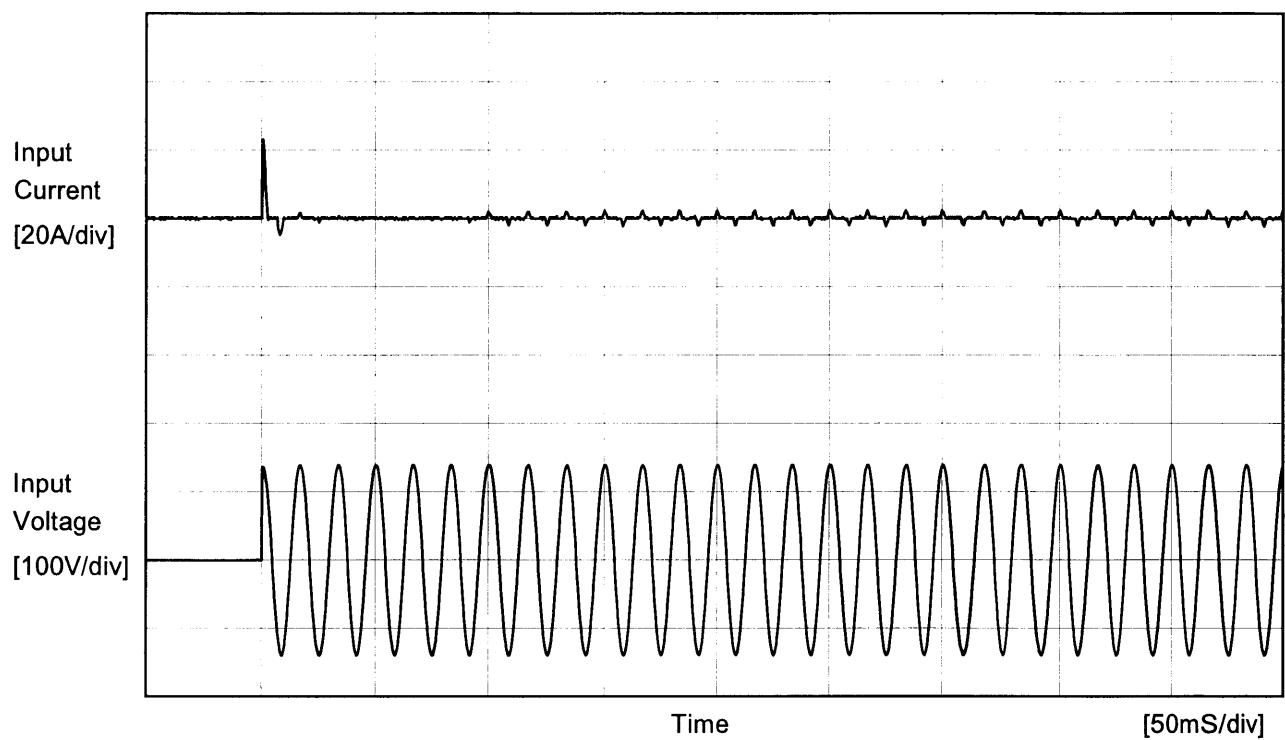
Temperature 25°C
 Testing Circuitry Figure A

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	-	-	-
1.5	61.8	58.1	50.9
3.0	69.7	67.7	62.8
4.5	71.9	70.7	67.3
6.0	72.4	71.6	69.2
7.5	72.0	71.4	69.6
9.0	71.0	70.8	69.7
10.0	70.3	70.3	69.5
11.0	69.5	69.7	69.0
--	-	-	-
--	-	-	-

COSEL

Model	LCA50S-3	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	<hr/>		



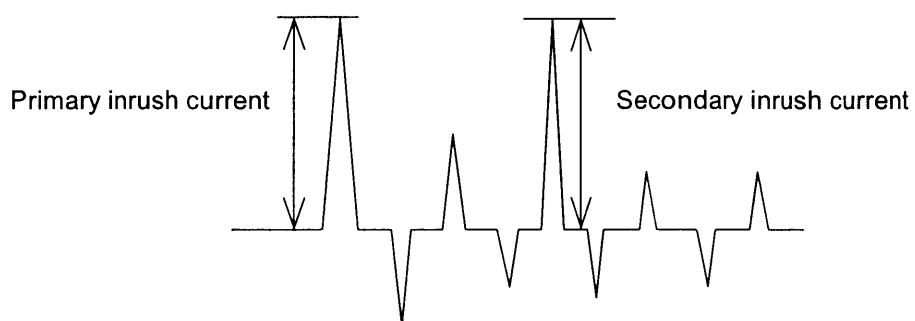
Input Voltage 100 V

Frequency 60 Hz

Load 100 %

Primary inrush current 23.0 A

Secondary inrush current 2.6 A





Model	LCA50S-3	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current		
Object	<hr/>		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.16	0.19	0.25
(B)IEC60950	0.16	0.19	0.25

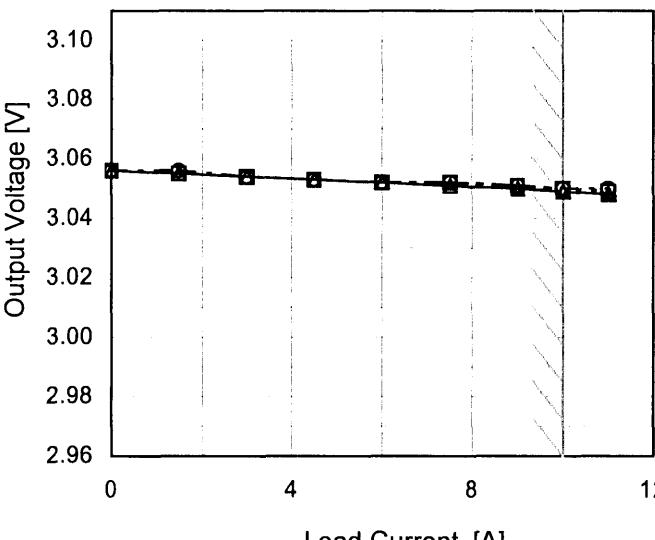
Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B)IEC60950	-	-	-

2. Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

Model	LCA50S-3	Temperature Testing Circuitry 25°C Figure A																																
Item	Line Regulation																																	
Object	+3V10A																																	
1.Graph		2.Values																																
<p>The graph plots Output Voltage [V] on the y-axis (2.96 to 3.10) against Input Voltage [V] on the x-axis (70 to 150). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series remain nearly constant at approximately 3.05 V across the entire input range. A slanted line on the graph indicates the range of the rated input voltage.</p>		<table border="1"> <thead> <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> </thead> <tbody> <tr><td>75</td><td>3.053</td><td>3.052</td></tr> <tr><td>80</td><td>3.053</td><td>3.052</td></tr> <tr><td>85</td><td>3.052</td><td>3.051</td></tr> <tr><td>90</td><td>3.052</td><td>3.051</td></tr> <tr><td>100</td><td>3.052</td><td>3.050</td></tr> <tr><td>110</td><td>3.051</td><td>3.049</td></tr> <tr><td>120</td><td>3.051</td><td>3.049</td></tr> <tr><td>132</td><td>3.051</td><td>3.048</td></tr> <tr><td>140</td><td>3.051</td><td>3.048</td></tr> </tbody> </table>	Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	3.053	3.052	80	3.053	3.052	85	3.052	3.051	90	3.052	3.051	100	3.052	3.050	110	3.051	3.049	120	3.051	3.049	132	3.051	3.048	140	3.051	3.048
Input Voltage [V]	Output Voltage [V]																																	
	Load 50%	Load 100%																																
75	3.053	3.052																																
80	3.053	3.052																																
85	3.052	3.051																																
90	3.052	3.051																																
100	3.052	3.050																																
110	3.051	3.049																																
120	3.051	3.049																																
132	3.051	3.048																																
140	3.051	3.048																																

Note: Slanted line shows the range of the rated input voltage.

Model	LCA50S-3	Temperature Testing Circuitry 25°C Figure A																																																			
Item	Load Regulation																																																				
Object	+3V10A																																																				
1.Graph	<p>—△— Input Volt. 85V - - -□- - Input Volt. 100V - - ○ - - Input Volt. 132V</p>  <p>Output Voltage [V]</p> <p>Load Current [A]</p>	2.Values																																																			
		<table border="1"> <thead> <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> </thead> <tbody> <tr><td>0.0</td><td>3.056</td><td>3.056</td><td>3.056</td></tr> <tr><td>1.5</td><td>3.055</td><td>3.055</td><td>3.056</td></tr> <tr><td>3.0</td><td>3.054</td><td>3.054</td><td>3.054</td></tr> <tr><td>4.5</td><td>3.053</td><td>3.053</td><td>3.053</td></tr> <tr><td>6.0</td><td>3.052</td><td>3.052</td><td>3.052</td></tr> <tr><td>7.5</td><td>3.051</td><td>3.052</td><td>3.052</td></tr> <tr><td>9.0</td><td>3.050</td><td>3.051</td><td>3.051</td></tr> <tr><td>10.0</td><td>3.049</td><td>3.050</td><td>3.050</td></tr> <tr><td>11.0</td><td>3.048</td><td>3.049</td><td>3.050</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	3.056	3.056	3.056	1.5	3.055	3.055	3.056	3.0	3.054	3.054	3.054	4.5	3.053	3.053	3.053	6.0	3.052	3.052	3.052	7.5	3.051	3.052	3.052	9.0	3.050	3.051	3.051	10.0	3.049	3.050	3.050	11.0	3.048	3.049	3.050	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																				
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																		
0.0	3.056	3.056	3.056																																																		
1.5	3.055	3.055	3.056																																																		
3.0	3.054	3.054	3.054																																																		
4.5	3.053	3.053	3.053																																																		
6.0	3.052	3.052	3.052																																																		
7.5	3.051	3.052	3.052																																																		
9.0	3.050	3.051	3.051																																																		
10.0	3.049	3.050	3.050																																																		
11.0	3.048	3.049	3.050																																																		
--	-	-	-																																																		
--	-	-	-																																																		

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

COSEL

Model LCA50S-3

Item Dynamic Load Response

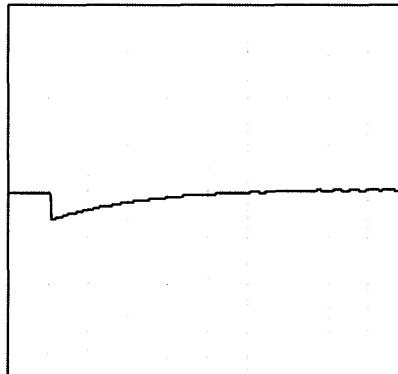
Object +3V10A

Temperature 25°C
Testing Circuitry Figure AInput Volt. 100 V
Cycle 1000 mS

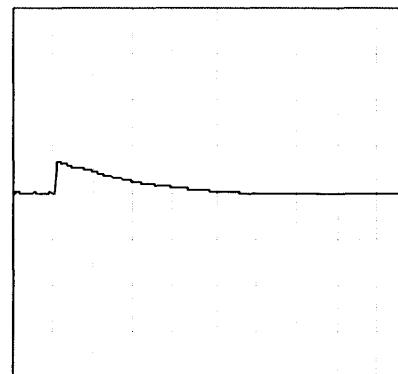
Load Current

Min. Load (0A) ↔
Load 100% (10A)

100mV/div



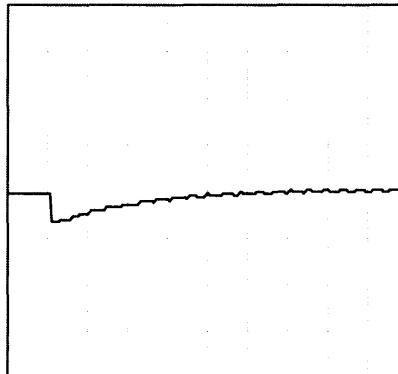
20ms/div



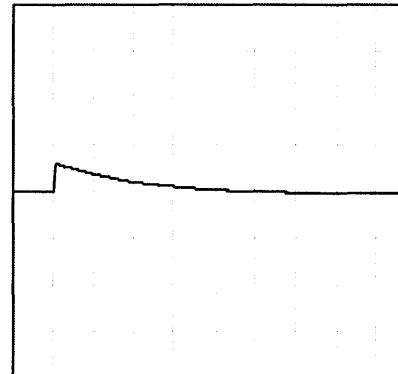
20ms/div

Min. Load (0A) ↔
Load 50% (5A)

100mV/div



20ms/div



20ms/div

COSEL

Model	LCA50S-3																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure A																																						
Object	+3V10A																																							
1. Graph																																								
		2. Values																																						
<table border="1"> <thead> <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> </thead> <tbody> <tr><td>0.0</td><td>10</td><td>10</td></tr> <tr><td>1.5</td><td>20</td><td>20</td></tr> <tr><td>3.0</td><td>20</td><td>20</td></tr> <tr><td>4.5</td><td>30</td><td>30</td></tr> <tr><td>6.0</td><td>30</td><td>30</td></tr> <tr><td>7.5</td><td>30</td><td>30</td></tr> <tr><td>9.0</td><td>30</td><td>30</td></tr> <tr><td>10.0</td><td>30</td><td>30</td></tr> <tr><td>11.0</td><td>30</td><td>30</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV]		Input Volt. 85 [V]	Input Volt. 132 [V]	0.0	10	10	1.5	20	20	3.0	20	20	4.5	30	30	6.0	30	30	7.5	30	30	9.0	30	30	10.0	30	30	11.0	30	30	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																							
	Input Volt. 85 [V]	Input Volt. 132 [V]																																						
0.0	10	10																																						
1.5	20	20																																						
3.0	20	20																																						
4.5	30	30																																						
6.0	30	30																																						
7.5	30	30																																						
9.0	30	30																																						
10.0	30	30																																						
11.0	30	30																																						
--	-	-																																						
--	-	-																																						
<p>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.</p>																																								
<p>T1: Due to AC Input Line T2: Due to Switching</p>																																								
<p>Fig. Complex Ripple Wave Form</p>																																								

COSEL

Model	LCA50S-3																																							
Item	Ripple-Noise	Temperature 25°C Testing Circuitry Figure A																																						
Object	+3V10A																																							
1. Graph																																								
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 200 mV, and the X-axis ranges from 0 to 12 A. Two curves are shown: Input Volt. 85V (solid line with triangle markers) and Input Volt. 132V (dashed line with circle markers). Both curves show a slight increase in noise as load current increases. A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple-Noise [mV] (Input Volt. 85V)</th> <th>Ripple-Noise [mV] (Input Volt. 132V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15</td><td>15</td></tr> <tr><td>1.5</td><td>20</td><td>30</td></tr> <tr><td>3.0</td><td>25</td><td>30</td></tr> <tr><td>4.5</td><td>25</td><td>40</td></tr> <tr><td>6.0</td><td>30</td><td>40</td></tr> <tr><td>7.5</td><td>40</td><td>40</td></tr> <tr><td>9.0</td><td>40</td><td>40</td></tr> <tr><td>10.0</td><td>40</td><td>40</td></tr> <tr><td>11.0</td><td>40</td><td>40</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Ripple-Noise [mV] (Input Volt. 85V)	Ripple-Noise [mV] (Input Volt. 132V)	0.0	15	15	1.5	20	30	3.0	25	30	4.5	25	40	6.0	30	40	7.5	40	40	9.0	40	40	10.0	40	40	11.0	40	40	--	-	-	--	-	-			
Load Current [A]	Ripple-Noise [mV] (Input Volt. 85V)	Ripple-Noise [mV] (Input Volt. 132V)																																						
0.0	15	15																																						
1.5	20	30																																						
3.0	25	30																																						
4.5	25	40																																						
6.0	30	40																																						
7.5	40	40																																						
9.0	40	40																																						
10.0	40	40																																						
11.0	40	40																																						
--	-	-																																						
--	-	-																																						
2. Values																																								
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 85 [V]</th> <th>Input Volt. 132 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15</td><td>15</td></tr> <tr><td>1.5</td><td>20</td><td>30</td></tr> <tr><td>3.0</td><td>25</td><td>30</td></tr> <tr><td>4.5</td><td>25</td><td>40</td></tr> <tr><td>6.0</td><td>30</td><td>40</td></tr> <tr><td>7.5</td><td>40</td><td>40</td></tr> <tr><td>9.0</td><td>40</td><td>40</td></tr> <tr><td>10.0</td><td>40</td><td>40</td></tr> <tr><td>11.0</td><td>40</td><td>40</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Ripple-Noise [mV]		Input Volt. 85 [V]	Input Volt. 132 [V]	0.0	15	15	1.5	20	30	3.0	25	30	4.5	25	40	6.0	30	40	7.5	40	40	9.0	40	40	10.0	40	40	11.0	40	40	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																							
	Input Volt. 85 [V]	Input Volt. 132 [V]																																						
0.0	15	15																																						
1.5	20	30																																						
3.0	25	30																																						
4.5	25	40																																						
6.0	30	40																																						
7.5	40	40																																						
9.0	40	40																																						
10.0	40	40																																						
11.0	40	40																																						
--	-	-																																						
--	-	-																																						
<p>Measured by 20 MHz Oscilloscope. Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p> <p>T1: Due to AC Input Line T2: Due to Switching</p> <p>Fig. Complex Ripple Wave Form</p>																																								

COSEL

Model	LCA50S-3																																							
Item	Ripple Voltage (by Ambient Temp.)																																							
Object	+3V10A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C] for LCA50S-3 at Input Volt. 100V. The graph shows two data series: Load 50% (dashed line with open squares) and Load 100% (solid line with solid squares). Both series show a decreasing trend as ambient temperature increases from -20°C to 60°C. A slanted line indicates the rated ambient temperature range.</p> <table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Ripple Voltage [mV] (Load 50%)</th> <th>Ripple Voltage [mV] (Load 100%)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>80</td><td>80</td></tr> <tr><td>-10</td><td>70</td><td>70</td></tr> <tr><td>0</td><td>50</td><td>50</td></tr> <tr><td>10</td><td>40</td><td>40</td></tr> <tr><td>20</td><td>35</td><td>35</td></tr> <tr><td>25</td><td>30</td><td>30</td></tr> <tr><td>30</td><td>30</td><td>30</td></tr> <tr><td>40</td><td>30</td><td>30</td></tr> <tr><td>50</td><td>30</td><td>30</td></tr> <tr><td>60</td><td>25</td><td>25</td></tr> </tbody> </table>		Ambient Temperature [°C]	Ripple Voltage [mV] (Load 50%)	Ripple Voltage [mV] (Load 100%)	-20	80	80	-10	70	70	0	50	50	10	40	40	20	35	35	25	30	30	30	30	30	40	30	30	50	30	30	60	25	25						
Ambient Temperature [°C]	Ripple Voltage [mV] (Load 50%)	Ripple Voltage [mV] (Load 100%)																																						
-20	80	80																																						
-10	70	70																																						
0	50	50																																						
10	40	40																																						
20	35	35																																						
25	30	30																																						
30	30	30																																						
40	30	30																																						
50	30	30																																						
60	25	25																																						
2.Values																																								
<table border="1"> <thead> <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> </thead> <tbody> <tr><td>-20</td><td>80</td><td>80</td></tr> <tr><td>-10</td><td>70</td><td>70</td></tr> <tr><td>0</td><td>50</td><td>50</td></tr> <tr><td>10</td><td>40</td><td>40</td></tr> <tr><td>20</td><td>35</td><td>35</td></tr> <tr><td>25</td><td>30</td><td>30</td></tr> <tr><td>30</td><td>30</td><td>30</td></tr> <tr><td>40</td><td>30</td><td>30</td></tr> <tr><td>50</td><td>30</td><td>30</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 Voltage [mV]		Load 50%	Load 100%	-20	80	80	-10	70	70	0	50	50	10	40	40	20	35	35	25	30	30	30	30	30	40	30	30	50	30	30	60	25	25	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																							
	Load 50%	Load 100%																																						
-20	80	80																																						
-10	70	70																																						
0	50	50																																						
10	40	40																																						
20	35	35																																						
25	30	30																																						
30	30	30																																						
40	30	30																																						
50	30	30																																						
60	25	25																																						
--	-	-																																						

Model	LCA50S-3																																																
Item	Ambient Temperature Drift																																																
Object	+3V10A																																																
1.Graph	—△— Input Volt. 85V ---□--- Input Volt. 100V —○— Input Volt. 132V	2.Values																																															
<p>The graph plots Output Voltage [V] on the y-axis (2.98 to 3.12) against Ambient Temperature [°C] on the x-axis (-40 to 60). Three data series are shown for input voltages of 85V, 100V, and 132V. All series show a slight decrease in output voltage as temperature increases. A slanted line is drawn through the data points, representing the rated ambient temperature range from -20°C to 60°C.</p> <table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Output Voltage [V] (85V)</th> <th>Output Voltage [V] (100V)</th> <th>Output Voltage [V] (132V)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>3.073</td><td>3.073</td><td>3.073</td></tr> <tr><td>-10</td><td>3.067</td><td>3.067</td><td>3.067</td></tr> <tr><td>0</td><td>3.060</td><td>3.060</td><td>3.061</td></tr> <tr><td>10</td><td>3.056</td><td>3.057</td><td>3.056</td></tr> <tr><td>20</td><td>3.051</td><td>3.051</td><td>3.051</td></tr> <tr><td>25</td><td>3.051</td><td>3.050</td><td>3.050</td></tr> <tr><td>30</td><td>3.050</td><td>3.049</td><td>3.049</td></tr> <tr><td>45</td><td>3.048</td><td>3.048</td><td>3.048</td></tr> <tr><td>50</td><td>3.047</td><td>3.047</td><td>3.047</td></tr> <tr><td>60</td><td>3.046</td><td>3.046</td><td>3.045</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Output Voltage [V] (85V)	Output Voltage [V] (100V)	Output Voltage [V] (132V)	-20	3.073	3.073	3.073	-10	3.067	3.067	3.067	0	3.060	3.060	3.061	10	3.056	3.057	3.056	20	3.051	3.051	3.051	25	3.051	3.050	3.050	30	3.050	3.049	3.049	45	3.048	3.048	3.048	50	3.047	3.047	3.047	60	3.046	3.046	3.045	--	-	-	-	
Ambient Temperature [°C]	Output Voltage [V] (85V)	Output Voltage [V] (100V)	Output Voltage [V] (132V)																																														
-20	3.073	3.073	3.073																																														
-10	3.067	3.067	3.067																																														
0	3.060	3.060	3.061																																														
10	3.056	3.057	3.056																																														
20	3.051	3.051	3.051																																														
25	3.051	3.050	3.050																																														
30	3.050	3.049	3.049																																														
45	3.048	3.048	3.048																																														
50	3.047	3.047	3.047																																														
60	3.046	3.046	3.045																																														
--	-	-	-																																														

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



Model	LCA50S-3	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+3V10A	

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 - 10A

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

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	85	0	3.072	± 11	± 0.4
Minimum Voltage	50	132	10	3.050		

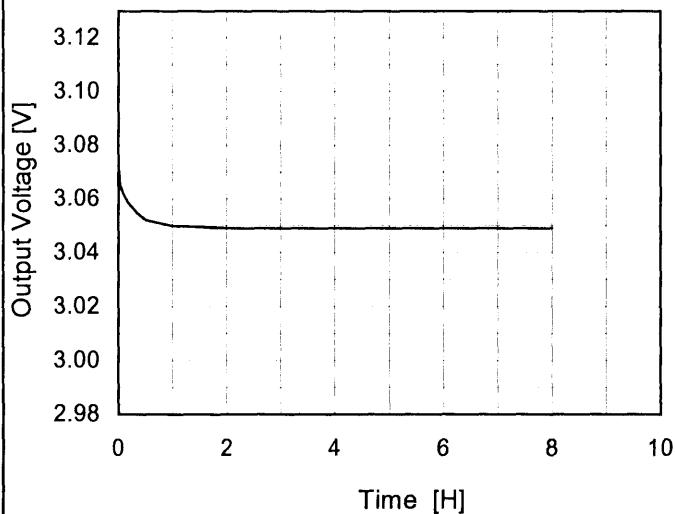
COSEL

Model LCA50S-3

Item Time Lapse Drift

Object +3V10A

1.Graph



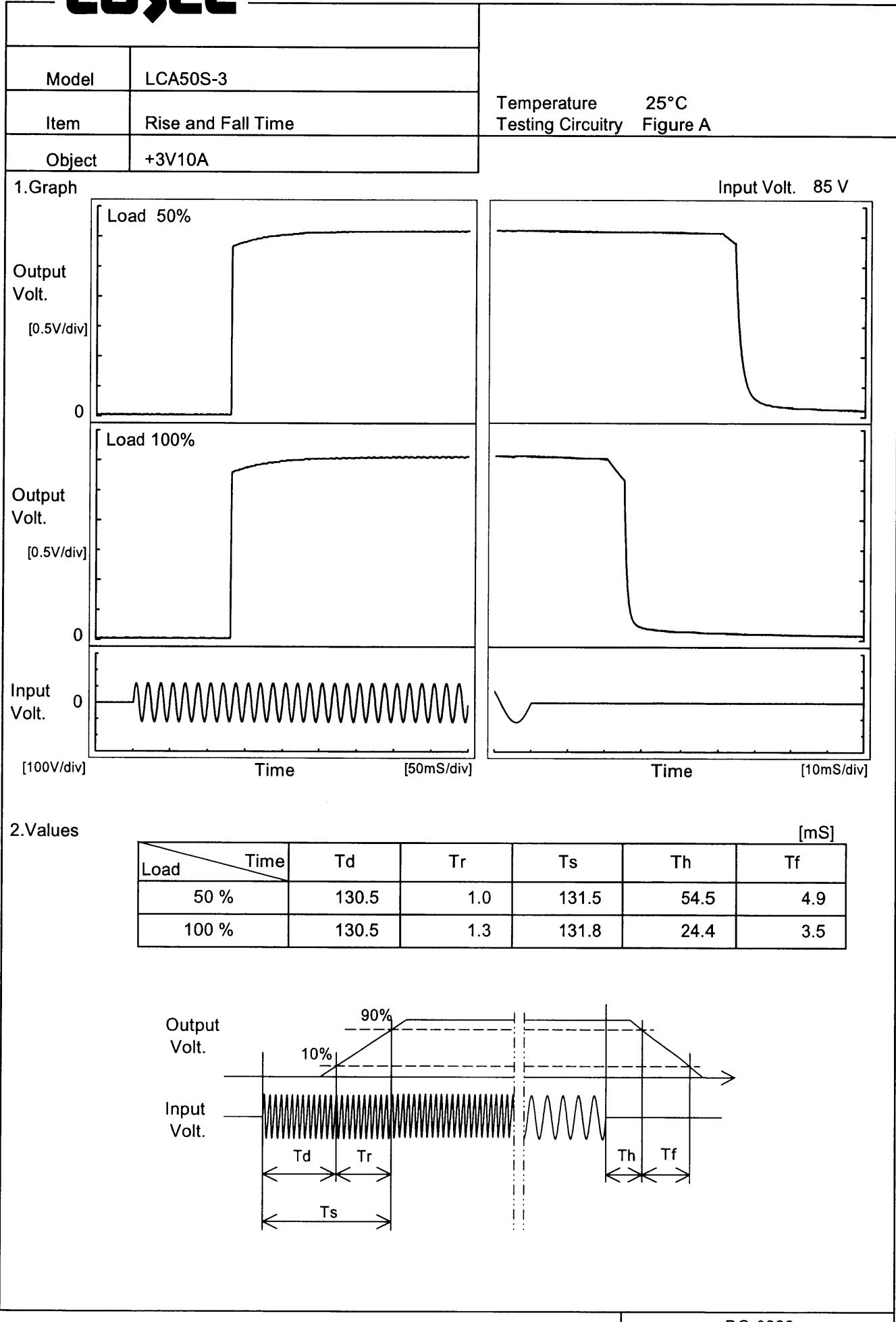
Input Volt. 100V

Load 100%

Temperature 25°C
Testing Circuitry Figure A

2.Values

Time since start [H]	Output Voltage [V]
0.0	3.072
0.5	3.052
1.0	3.050
2.0	3.049
3.0	3.049
4.0	3.049
5.0	3.049
6.0	3.049
7.0	3.049
8.0	3.049

COSEL

Model	LCA50S-3																																	
Item	Hold-Up Time	Temperature 25°C Testing Circuitry Figure A																																
Object	+3V10A																																	
1. Graph																																		
<p>Y-axis: Hold-Up Time [mS] (logarithmic scale: 1, 10, 100, 1000)</p> <p>X-axis: Input Voltage [V] (linear scale: 70, 90, 110, 130, 150)</p> <p>Legend:</p> <ul style="list-style-type: none"> Load 50% (dashed line with squares) Load 100% (solid line with triangles) 																																		
2. Values																																		
<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>75</td><td>31</td><td>12</td></tr> <tr><td>80</td><td>41</td><td>16</td></tr> <tr><td>85</td><td>51</td><td>22</td></tr> <tr><td>90</td><td>62</td><td>27</td></tr> <tr><td>100</td><td>86</td><td>39</td></tr> <tr><td>110</td><td>112</td><td>53</td></tr> <tr><td>120</td><td>141</td><td>67</td></tr> <tr><td>132</td><td>179</td><td>87</td></tr> <tr><td>140</td><td>207</td><td>101</td></tr> </tbody> </table>			Input Voltage [V]	Hold-Up Time [mS]		Load 50%	Load 100%	75	31	12	80	41	16	85	51	22	90	62	27	100	86	39	110	112	53	120	141	67	132	179	87	140	207	101
Input Voltage [V]	Hold-Up Time [mS]																																	
	Load 50%	Load 100%																																
75	31	12																																
80	41	16																																
85	51	22																																
90	62	27																																
100	86	39																																
110	112	53																																
120	141	67																																
132	179	87																																
140	207	101																																
<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	LCA50S-3	Temperature 25°C Testing Circuitry Figure A																																																					
Item	Instantaneous Interruption Compensation																																																						
Object	+3V10A																																																						
1.Graph	<p>—△— Input Volt. 85V - - -□--- Input Volt. 100V - · -○--- Input Volt. 132V</p>																																																						
2.Values	<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>0.0</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>1.5</td><td>164</td><td>265</td><td>489</td></tr> <tr> <td>3.0</td><td>89</td><td>145</td><td>290</td></tr> <tr> <td>4.5</td><td>60</td><td>98</td><td>201</td></tr> <tr> <td>6.0</td><td>41</td><td>72</td><td>151</td></tr> <tr> <td>7.5</td><td>32</td><td>55</td><td>120</td></tr> <tr> <td>9.0</td><td>26</td><td>45</td><td>98</td></tr> <tr> <td>10.0</td><td>22</td><td>40</td><td>88</td></tr> <tr> <td>11.0</td><td>20</td><td>36</td><td>80</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				Load Current [A]	Time [mS]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	-	-	-	1.5	164	265	489	3.0	89	145	290	4.5	60	98	201	6.0	41	72	151	7.5	32	55	120	9.0	26	45	98	10.0	22	40	88	11.0	20	36	80	--	-	-	-	--	-	-	-
Load Current [A]	Time [mS]																																																						
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																				
0.0	-	-	-																																																				
1.5	164	265	489																																																				
3.0	89	145	290																																																				
4.5	60	98	201																																																				
6.0	41	72	151																																																				
7.5	32	55	120																																																				
9.0	26	45	98																																																				
10.0	22	40	88																																																				
11.0	20	36	80																																																				
--	-	-	-																																																				
--	-	-	-																																																				
Note:	Slanted line shows the range of the rated load current.																																																						

<p>Model LCA50S-3</p> <p>Item Minimum Input Voltage for Regulated Output Voltage</p> <p>Object +3V10A</p>	Testing Circuitry Figure A																											
	2.Values																											
	Ambient Temperature [°C]	Input Voltage [V]																										
	[°C]	Load 50% Load 100%																										
<table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Input Voltage [V]</th> </tr> <tr> <th></th> <th>Load 50% Load 100%</th> </tr> </thead> <tbody> <tr> <td>-20</td> <td>65 69</td> </tr> <tr> <td>-10</td> <td>62 66</td> </tr> <tr> <td>0</td> <td>60 64</td> </tr> <tr> <td>10</td> <td>60 64</td> </tr> <tr> <td>20</td> <td>59 63</td> </tr> <tr> <td>25</td> <td>59 63</td> </tr> <tr> <td>30</td> <td>59 63</td> </tr> <tr> <td>45</td> <td>58 62</td> </tr> <tr> <td>50</td> <td>58 62</td> </tr> <tr> <td>60</td> <td>57 62</td> </tr> <tr> <td>--</td> <td>- -</td> </tr> </tbody> </table>		Ambient Temperature [°C]	Input Voltage [V]		Load 50% Load 100%	-20	65 69	-10	62 66	0	60 64	10	60 64	20	59 63	25	59 63	30	59 63	45	58 62	50	58 62	60	57 62	--	- -	
Ambient Temperature [°C]	Input Voltage [V]																											
	Load 50% Load 100%																											
-20	65 69																											
-10	62 66																											
0	60 64																											
10	60 64																											
20	59 63																											
25	59 63																											
30	59 63																											
45	58 62																											
50	58 62																											
60	57 62																											
--	- -																											
<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																												

COSEL

Model	LCA50S-3																																																									
Item	Overcurrent Protection																																																									
Object	+3V10A																																																									
1.Graph																																																										
<p style="text-align: center;"> Input Volt. 85V Input Volt. 100V Input Volt. 132V </p>																																																										
<p>Note: Slanted line shows the range of the rated load current.</p>																																																										
Temperature 25°C Testing Circuitry Figure A																																																										
2.Values																																																										
<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 85[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> </thead> <tbody> <tr><td>3.00</td><td>11.21</td><td>11.32</td><td>11.31</td></tr> <tr><td>2.85</td><td>12.28</td><td>12.26</td><td>12.27</td></tr> <tr><td>2.70</td><td>12.30</td><td>12.27</td><td>12.35</td></tr> <tr><td>2.40</td><td>12.33</td><td>12.30</td><td>12.30</td></tr> <tr><td>2.10</td><td>12.40</td><td>12.34</td><td>12.33</td></tr> <tr><td>1.80</td><td>12.38</td><td>12.36</td><td>12.35</td></tr> <tr><td>1.50</td><td>12.40</td><td>12.39</td><td>12.37</td></tr> <tr><td>1.20</td><td>12.42</td><td>12.42</td><td>12.39</td></tr> <tr><td>0.90</td><td>12.44</td><td>12.43</td><td>12.39</td></tr> <tr><td>0.60</td><td>12.45</td><td>12.43</td><td>12.37</td></tr> <tr><td>0.30</td><td>12.43</td><td>12.40</td><td>12.31</td></tr> <tr><td>0.00</td><td>12.36</td><td>12.30</td><td>12.16</td></tr> </tbody> </table>				Output Voltage [V]	Load Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	3.00	11.21	11.32	11.31	2.85	12.28	12.26	12.27	2.70	12.30	12.27	12.35	2.40	12.33	12.30	12.30	2.10	12.40	12.34	12.33	1.80	12.38	12.36	12.35	1.50	12.40	12.39	12.37	1.20	12.42	12.42	12.39	0.90	12.44	12.43	12.39	0.60	12.45	12.43	12.37	0.30	12.43	12.40	12.31	0.00	12.36	12.30	12.16
Output Voltage [V]	Load Current [A]																																																									
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																							
3.00	11.21	11.32	11.31																																																							
2.85	12.28	12.26	12.27																																																							
2.70	12.30	12.27	12.35																																																							
2.40	12.33	12.30	12.30																																																							
2.10	12.40	12.34	12.33																																																							
1.80	12.38	12.36	12.35																																																							
1.50	12.40	12.39	12.37																																																							
1.20	12.42	12.42	12.39																																																							
0.90	12.44	12.43	12.39																																																							
0.60	12.45	12.43	12.37																																																							
0.30	12.43	12.40	12.31																																																							
0.00	12.36	12.30	12.16																																																							

<p>Model LCA50S-3</p> <p>Item Overvoltage Protection</p> <p>Object +3V10A</p>	Testing Circuitry Figure A																																																					
	1.Graph	—△— Input Volt. 85V	—□— Input Volt. 100V																																																			
		—○— Input Volt. 132V																																																				
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p>			2.Values																																																			
<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>-20</td><td>4.88</td><td>4.88</td><td>4.88</td></tr> <tr> <td>-10</td><td>4.88</td><td>4.88</td><td>4.87</td></tr> <tr> <td>0</td><td>4.82</td><td>4.87</td><td>4.87</td></tr> <tr> <td>10</td><td>4.81</td><td>4.81</td><td>4.81</td></tr> <tr> <td>20</td><td>4.81</td><td>4.81</td><td>4.81</td></tr> <tr> <td>25</td><td>4.70</td><td>4.81</td><td>4.81</td></tr> <tr> <td>30</td><td>4.70</td><td>4.81</td><td>4.81</td></tr> <tr> <td>45</td><td>4.70</td><td>4.70</td><td>4.70</td></tr> <tr> <td>50</td><td>4.70</td><td>4.70</td><td>4.70</td></tr> <tr> <td>60</td><td>4.69</td><td>4.69</td><td>4.69</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Ambient Temperature [°C]	Operating Point [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	4.88	4.88	4.88	-10	4.88	4.88	4.87	0	4.82	4.87	4.87	10	4.81	4.81	4.81	20	4.81	4.81	4.81	25	4.70	4.81	4.81	30	4.70	4.81	4.81	45	4.70	4.70	4.70	50	4.70	4.70	4.70	60	4.69	4.69	4.69	--	-	-	-	
Ambient Temperature [°C]	Operating Point [V]																																																					
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																			
-20	4.88	4.88	4.88																																																			
-10	4.88	4.88	4.87																																																			
0	4.82	4.87	4.87																																																			
10	4.81	4.81	4.81																																																			
20	4.81	4.81	4.81																																																			
25	4.70	4.81	4.81																																																			
30	4.70	4.81	4.81																																																			
45	4.70	4.70	4.70																																																			
50	4.70	4.70	4.70																																																			
60	4.69	4.69	4.69																																																			
--	-	-	-																																																			

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

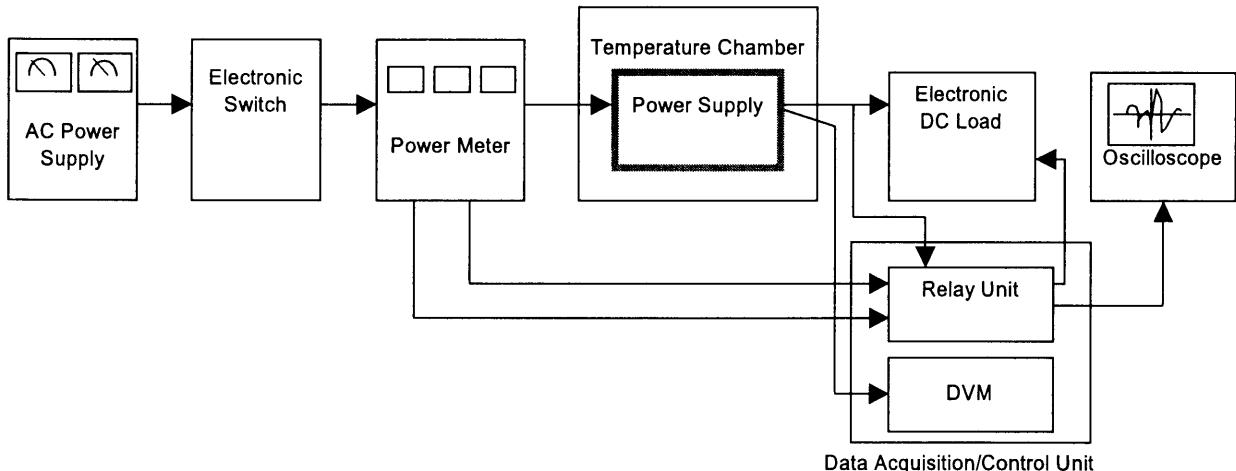


Figure A

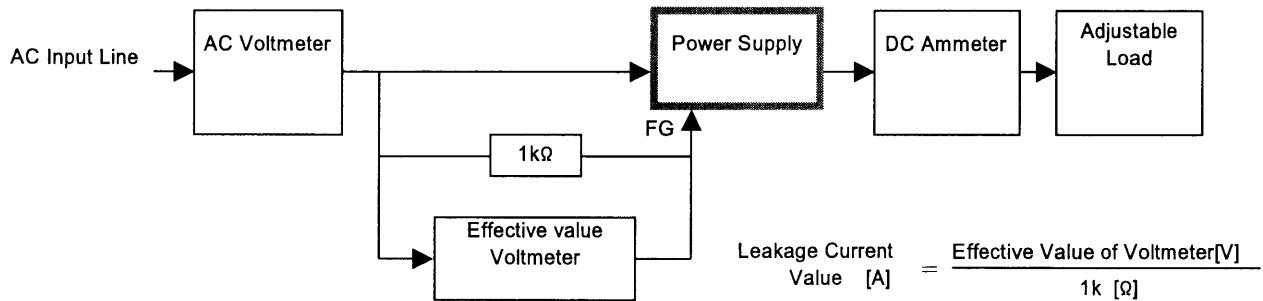


Figure B (DEN-AN)

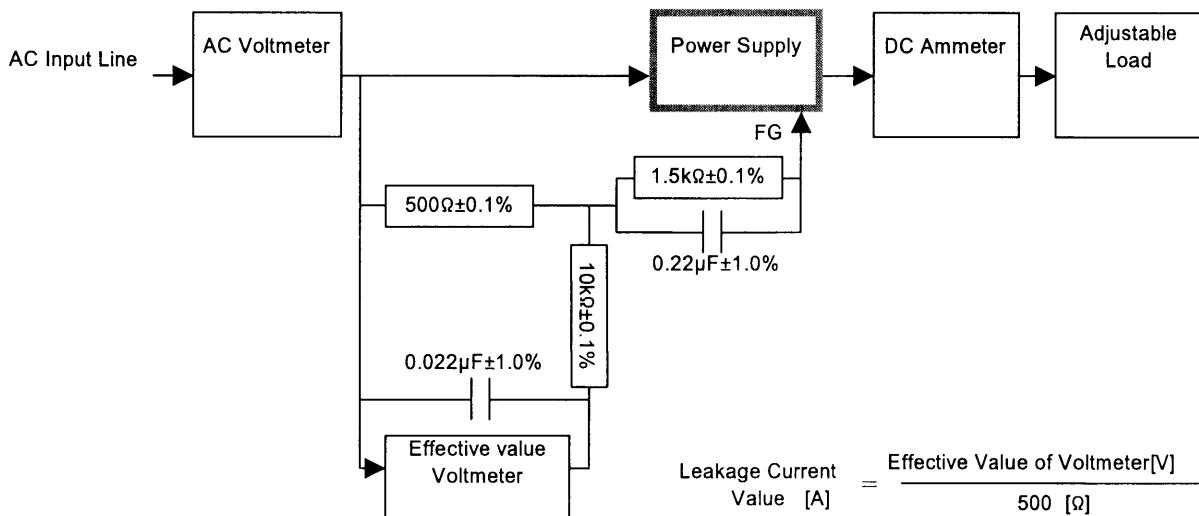


Figure B (IEC60950)