



TEST DATA OF LFA50F-5

Regulated DC Power Supply
August 10, 2009

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Yoshiaki Shimizu Design Manager

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COSEL CO.,LTD.



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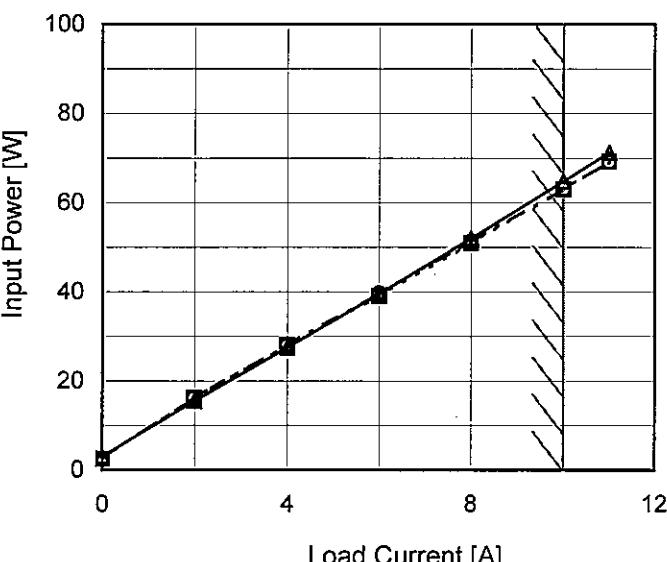
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<p>The graph plots Efficiency [%] on the y-axis (30 to 86) against Input Voltage [V] on the x-axis (50 to 300). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show efficiency increasing slightly with input voltage. A slanted line indicates the rated input voltage range.</p>		2. Values																																																																
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COSEL

Model LFA50F-5

Item Inrush Current

Temperature 25°C
Testing Circuitry Figure A

Object _____

Input
Current
[20A/div]Input
Voltage
[100V/div]Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current : 9.2 A
Secondary inrush current : 1.2 A

Time

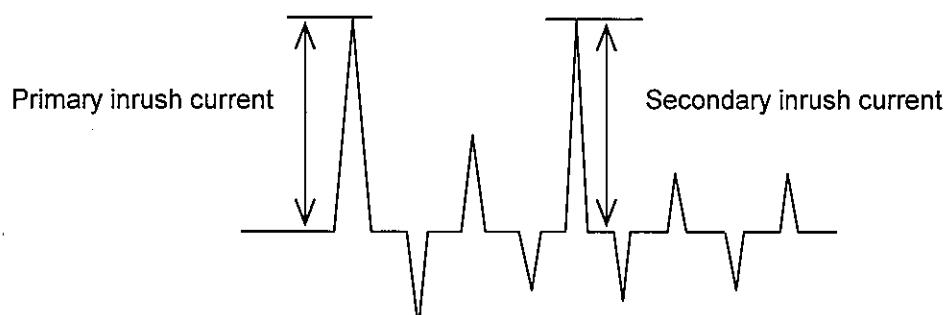
[50ms/div]

Input
Current
[20A/div]Input
Voltage
[200V/div]Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current : 23.0 A
Secondary inrush current : 1.2 A

Time

[50ms/div]





Model	LFA50F-5	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current		
Object	<hr/>		

1. Results

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.13	0.25	0.31	Operation
	One of phases	0.19	0.48	0.57	Stand by
IEC60950	Both phases	0.14	0.29	0.34	Operation
	One of phases	0.22	0.43	0.50	Stand by

The value for "One of phases" is the reference value only.

2. Condition

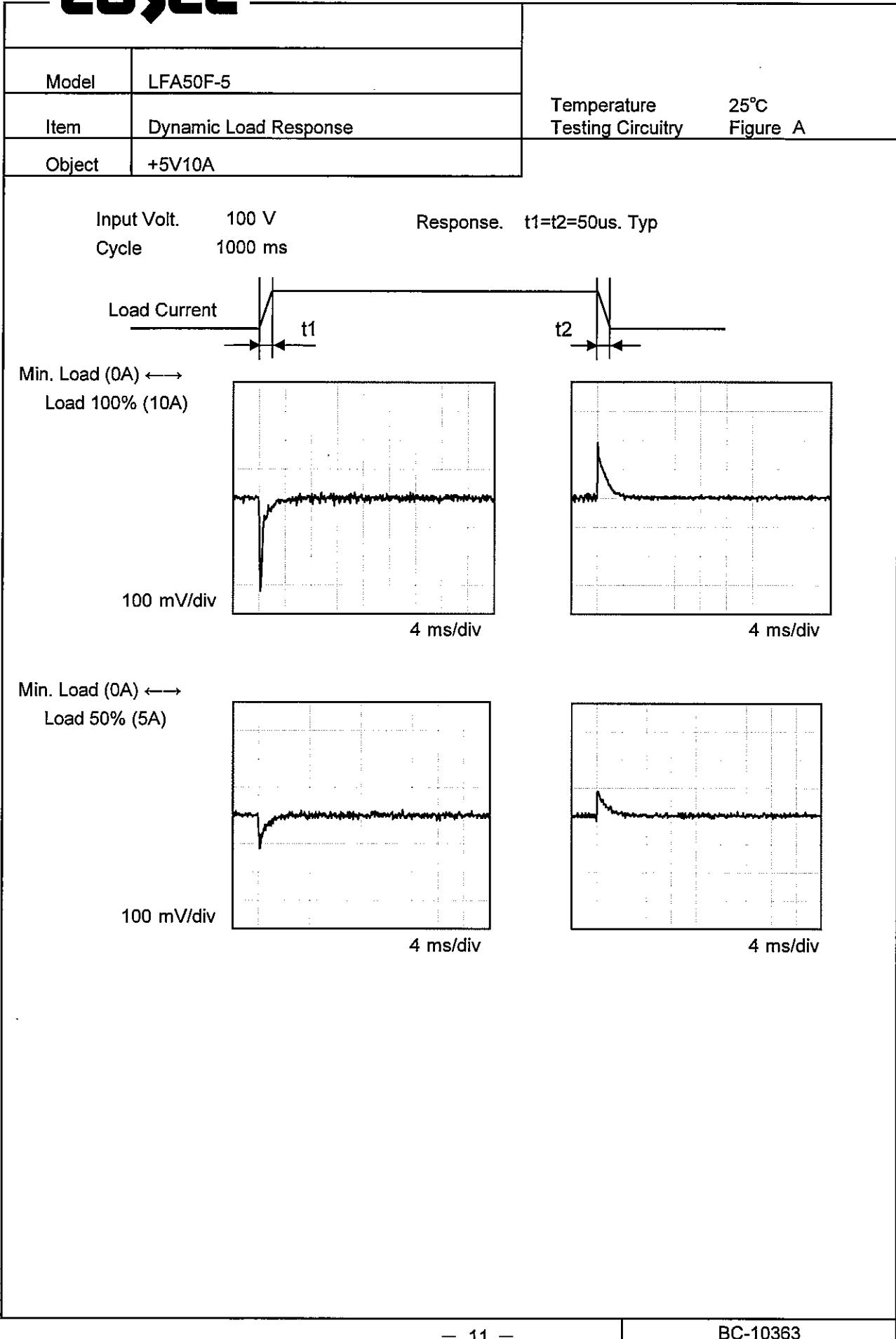
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	LFA50F-5																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+5V10A																																	
1.Graph																																		
<p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Legend:</p> <ul style="list-style-type: none"> Load 50% (Dashed line with squares) Load 100% (Solid line with triangles) 																																		
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<p>T1: Due to AC Input Line T2: Due to Switching</p>																																																																
<p>Fig. Complex Ripple Wave Form</p>																																																																

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Model	LFA50F-5	Temperature Testing Circuitry 25°C Figure C																																						
Item	Ripple-Noise																																							
Object	+5V10A																																							
1. Graph		2. Values																																						
<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 plotted: Input Volt. 100V (solid line with squares) and Input Volt. 200V (dashed line with circles). Both curves show an increase in noise with load current, with the 200V curve generally higher than the 100V curve. A slanted line indicates the rated load current range.</p>																																								
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<p>Diagram illustrating a Complex Ripple Wave Form. The diagram shows a waveform with noise superimposed on a base signal. Two time intervals are indicated: T1, which is the full width of the noise burst, and T2, which is the width of one individual noise pulse. The label "Ripple-Noise [mVp-p]" indicates the amplitude of the noise.</p>																																								
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<p>Measured by 20 MHz Oscilloscope.</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																							

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Model	LFA50F-5	Testing Circuitry Figure A		
Item	Ambient Temperature Drift			
Object	+5V10A			
1.Graph	<p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p> <p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 100V Input Volt. 200V Input Volt. 230V 	2.Values		
Ambient Temperature [°C]	Output Voltage [V]			
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	
-20	5.013	5.013	5.013	
-10	5.012	5.012	5.012	
0	5.011	5.011	5.011	
10	5.010	5.010	5.010	
20	5.009	5.009	5.009	
25	5.009	5.009	5.009	
30	5.009	5.009	5.009	
40	5.007	5.007	5.007	
50	5.004	5.004	5.003	
60	5.000	5.000	5.000	
--	-	-	-	

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



Model	LFA50F-5	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+5V10A	

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 - 264V

Load Current : 0 - 10A

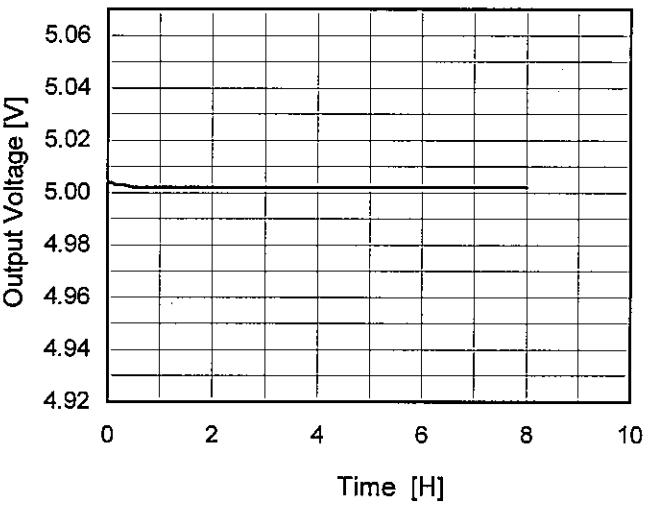
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

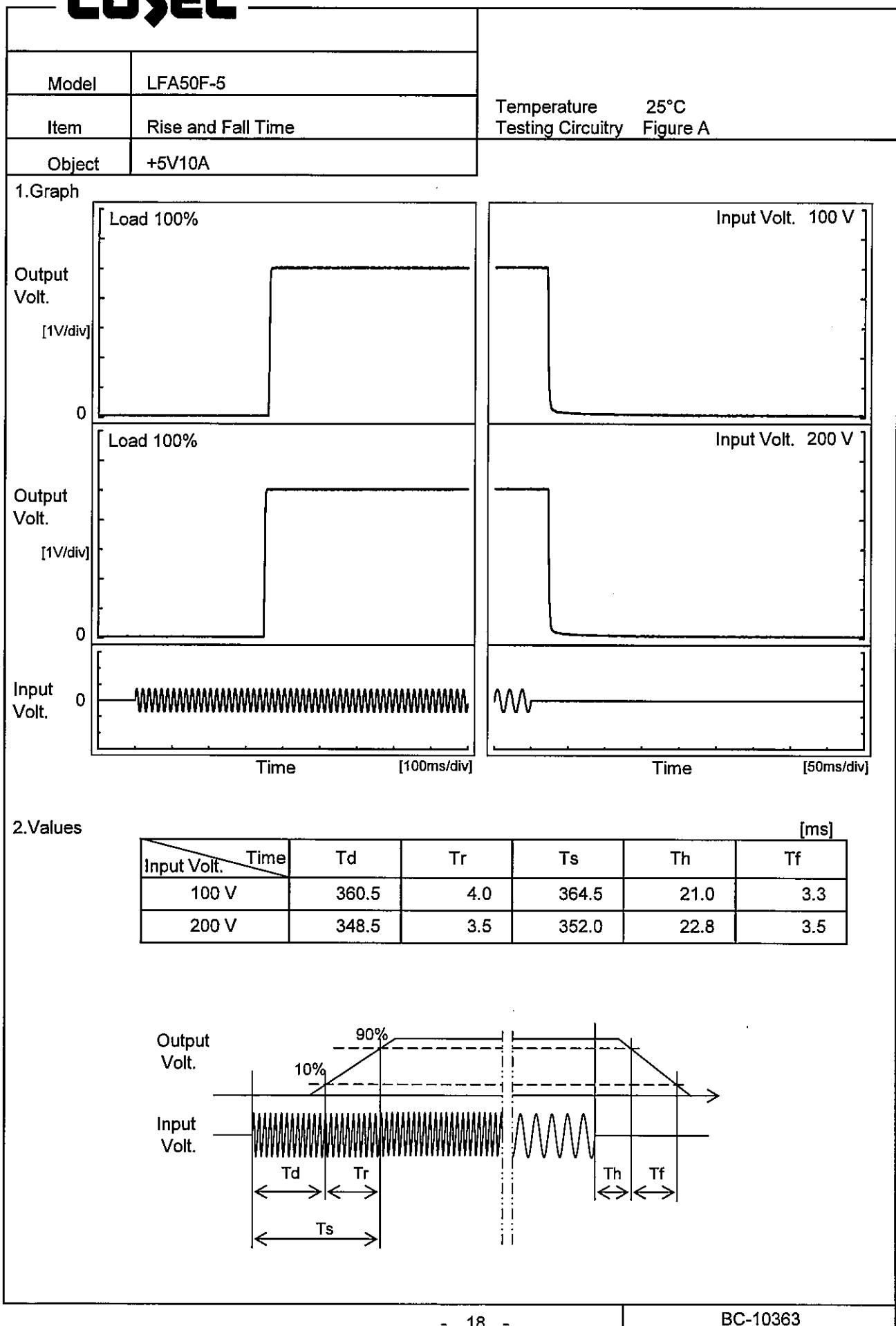
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	85	0	5.029	± 13	± 0.3
Minimum Voltage	50	264	15	5.003		

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Model	LFA50F-5	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+5V10A																								
1. Graph			2. Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 100V Load 100%</p>			<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.004</td></tr> <tr><td>0.5</td><td>5.002</td></tr> <tr><td>1.0</td><td>5.002</td></tr> <tr><td>2.0</td><td>5.002</td></tr> <tr><td>3.0</td><td>5.002</td></tr> <tr><td>4.0</td><td>5.002</td></tr> <tr><td>5.0</td><td>5.002</td></tr> <tr><td>6.0</td><td>5.002</td></tr> <tr><td>7.0</td><td>5.002</td></tr> <tr><td>8.0</td><td>5.002</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	5.004	0.5	5.002	1.0	5.002	2.0	5.002	3.0	5.002	4.0	5.002	5.0	5.002	6.0	5.002	7.0	5.002	8.0	5.002
Time since start [H]	Output Voltage [V]																								
0.0	5.004																								
0.5	5.002																								
1.0	5.002																								
2.0	5.002																								
3.0	5.002																								
4.0	5.002																								
5.0	5.002																								
6.0	5.002																								
7.0	5.002																								
8.0	5.002																								

* The characteristic of AC200V is equal.

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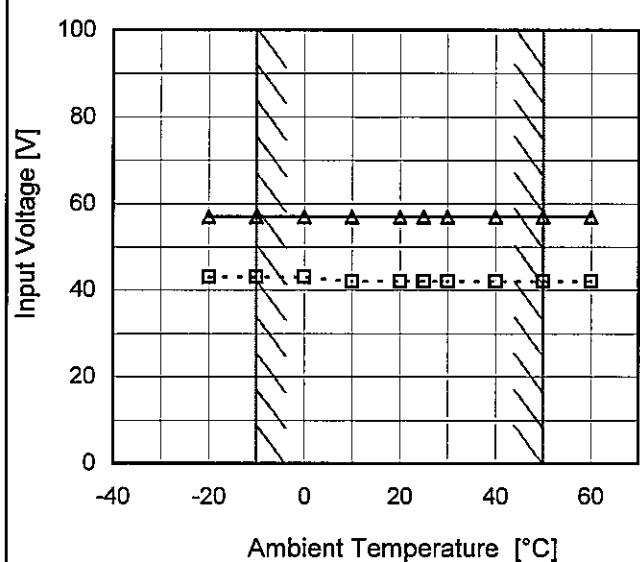
Model	LFA50F-5	Temperature Testing Circuitry	25°C Figure A																																
Item	Hold-Up Time																																		
Object	+5V10A																																		
1. Graph			2. Values																																
<p>Graph showing Hold-Up Time [ms] vs Input Voltage [V]. The Y-axis is logarithmic from 1 to 1000 ms. The X-axis is linear from 50 to 300 V. Two data series are shown: Load 50% (dashed line with squares) and Load 100% (solid line with triangles). Both series show a slight increase in hold-up time as input voltage increases. A slanted line indicates the rated input voltage range.</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>75</td> <td>44</td> <td>19</td> </tr> <tr> <td>85</td> <td>45</td> <td>20</td> </tr> <tr> <td>100</td> <td>46</td> <td>21</td> </tr> <tr> <td>120</td> <td>47</td> <td>22</td> </tr> <tr> <td>200</td> <td>48</td> <td>23</td> </tr> <tr> <td>230</td> <td>49</td> <td>23</td> </tr> <tr> <td>264</td> <td>50</td> <td>23</td> </tr> <tr> <td>280</td> <td>53</td> <td>24</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	44	19	85	45	20	100	46	21	120	47	22	200	48	23	230	49	23	264	50	23	280	53	24	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	44	19																																	
85	45	20																																	
100	46	21																																	
120	47	22																																	
200	48	23																																	
230	49	23																																	
264	50	23																																	
280	53	24																																	
--	-	-																																	
<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy. Note: Slanted line shows the range of the rated input voltage.</p>																																			

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Model	LFA50F-5																																																					
Item	Instantaneous Interruption Compensation																																																					
Object	+5V10A																																																					
1.Graph	<p>Graph showing Instantaneous Compensation Time [ms] vs Load Current [A]. The Y-axis is logarithmic from 1 to 1000 ms. The X-axis ranges from 0 to 12 A. Three curves are shown for Input Volt. 100V (solid line with triangles), Input Volt. 200V (dashed line with squares), and Input Volt. 230V (dash-dot line with circles). A slanted line indicates the rated load current range.</p>																																																					
Temperature	25°C																																																					
Testing Circuitry	Figure A																																																					
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. 100[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2</td><td>93</td><td>113</td><td>114</td></tr> <tr><td>4</td><td>48</td><td>56</td><td>60</td></tr> <tr><td>6</td><td>31</td><td>39</td><td>39</td></tr> <tr><td>8</td><td>23</td><td>30</td><td>30</td></tr> <tr><td>10</td><td>20</td><td>22</td><td>22</td></tr> <tr><td>11</td><td>14</td><td>18</td><td>19</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> </tbody> </table>			Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0	-	-	-	2	93	113	114	4	48	56	60	6	31	39	39	8	23	30	30	10	20	22	22	11	14	18	19	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
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Note:	Slanted line shows the range of the rated load current.																																																					

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Model LFA50F-5 Item Minimum Input Voltage for Regulated Output Voltage Object +5V10A	Testing Circuitry Figure A	
	2.Values	
Ambient Temperature [°C]	Input Voltage [V]	
[°C]	Load 50%	Load 100%
-20	43	57
-10	43	57
0	43	57
10	42	57
20	42	57
25	42	57
30	42	57
40	42	57
50	42	57
60	42	57
--	-	-

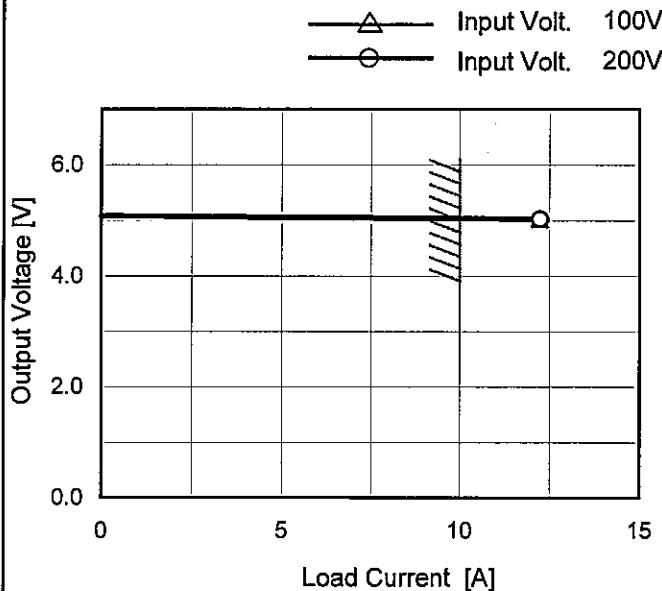


Note: Slanted line shows the range of the rated ambient temperature.

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Model	LFA50F-5
Item	Overcurrent Protection
Object	+5V10A

1. Graph



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

Intermittent operation occurs when the output voltage is less than rated output voltage.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
5.00	12.22	12.24
4.75	-	-
4.50	-	-
4.00	-	-
3.50	-	-
3.00	-	-
2.50	-	-
2.00	-	-
1.50	-	-
1.00	-	-
0.50	-	-
0.00	-	-

COSEL

Model	LFA50F-5																																							
Item	Overvoltage Protection																																							
Object	+5V10A																																							
1. Graph																																								
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>—△— Input Volt. 100V ---□--- Input Volt. 200V</p>																																								
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Testing Circuitry Figure A		2.Values																																						
<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> </tr> </thead> <tbody> <tr> <td>-20</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>-10</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>0</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>10</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>20</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>25</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>30</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>40</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>50</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>60</td><td>6.53</td><td>6.53</td> </tr> <tr> <td>--</td><td>-</td><td>-</td> </tr> </tbody> </table>			Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 200[V]	-20	6.53	6.53	-10	6.53	6.53	0	6.53	6.53	10	6.53	6.53	20	6.53	6.53	25	6.53	6.53	30	6.53	6.53	40	6.53	6.53	50	6.53	6.53	60	6.53	6.53	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																							
	Input Volt. 100[V]	Input Volt. 200[V]																																						
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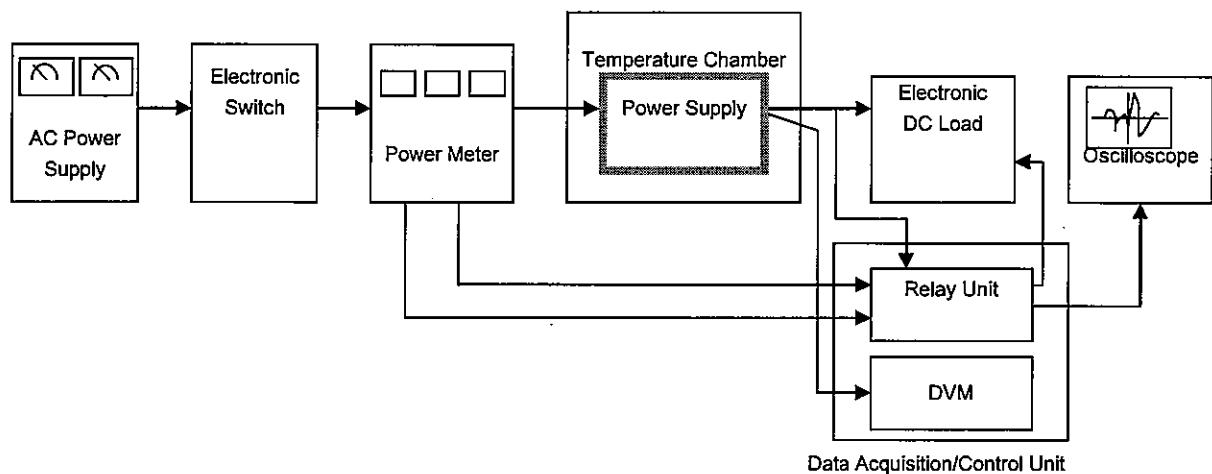


Figure A

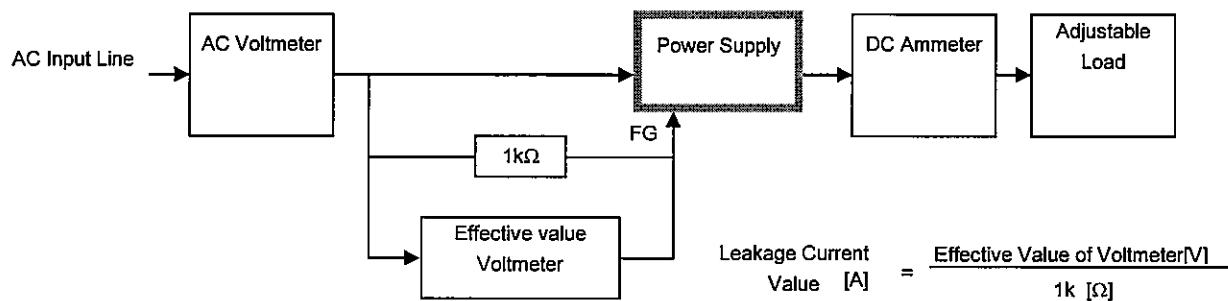


Figure B (DEN-AN)

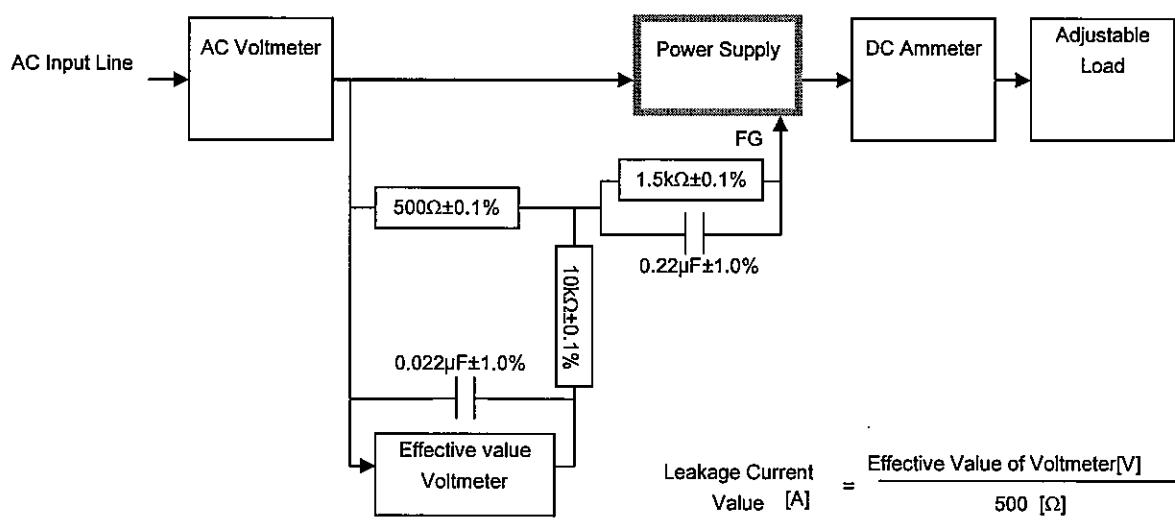


Figure B (IEC60950-1)

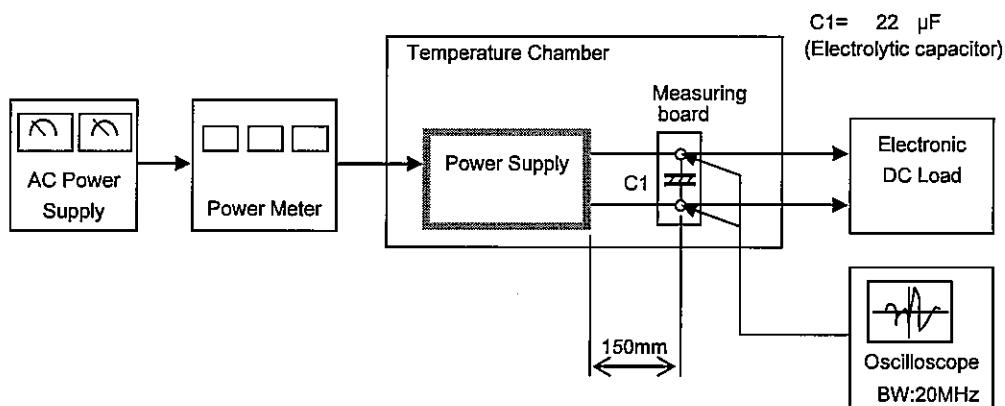
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Figure C