



TEST DATA OF LFA75F-12

Regulated DC Power Supply
August 10, 2009

Approved by : *Yoshiaki Shimizu*
Yoshiaki Shimizu Design Manager

Prepared by : *Koji Takahashi*
Koji Takahashi Design Engineer

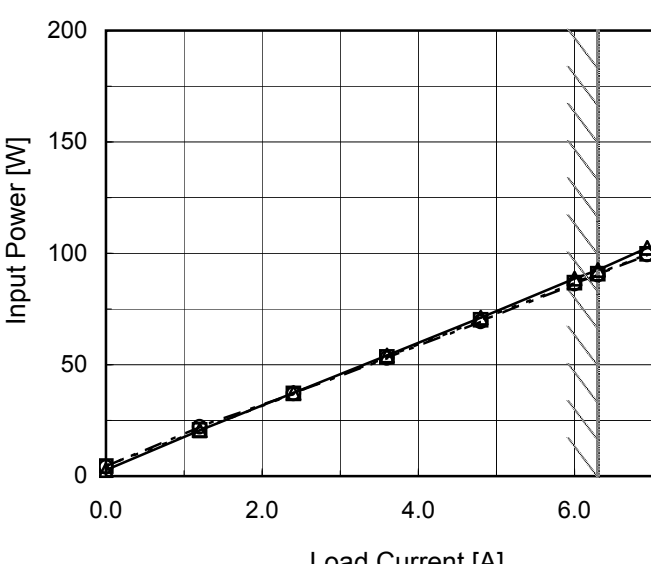
COSEL CO.,LTD.

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Model	LFA75F-12																																																					
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<div><div>—△— Input Volt. 100V</div><div>---□--- Input Volt. 200V</div><div>-·-○-·- Input Volt. 230V</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">Input Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>0.050</td><td>0.046</td><td>0.041</td></tr><tr><td>1.20</td><td>0.219</td><td>0.148</td><td>0.138</td></tr><tr><td>2.40</td><td>0.388</td><td>0.233</td><td>0.209</td></tr><tr><td>3.60</td><td>0.554</td><td>0.320</td><td>0.280</td></tr><tr><td>4.80</td><td>0.725</td><td>0.404</td><td>0.359</td></tr><tr><td>6.00</td><td>0.900</td><td>0.479</td><td>0.438</td></tr><tr><td>6.30</td><td>0.944</td><td>0.498</td><td>0.456</td></tr><tr><td>6.93</td><td>1.038</td><td>0.536</td><td>0.494</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Input Current [A]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	0.050	0.046	0.041	1.20	0.219	0.148	0.138	2.40	0.388	0.233	0.209	3.60	0.554	0.320	0.280	4.80	0.725	0.404	0.359	6.00	0.900	0.479	0.438	6.30	0.944	0.498	0.456	6.93	1.038	0.536	0.494	--	-	-	-	--	-	-	-	--	-	-	-
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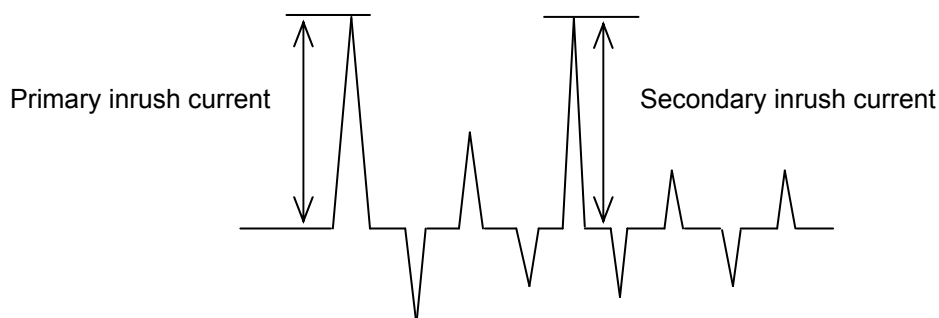
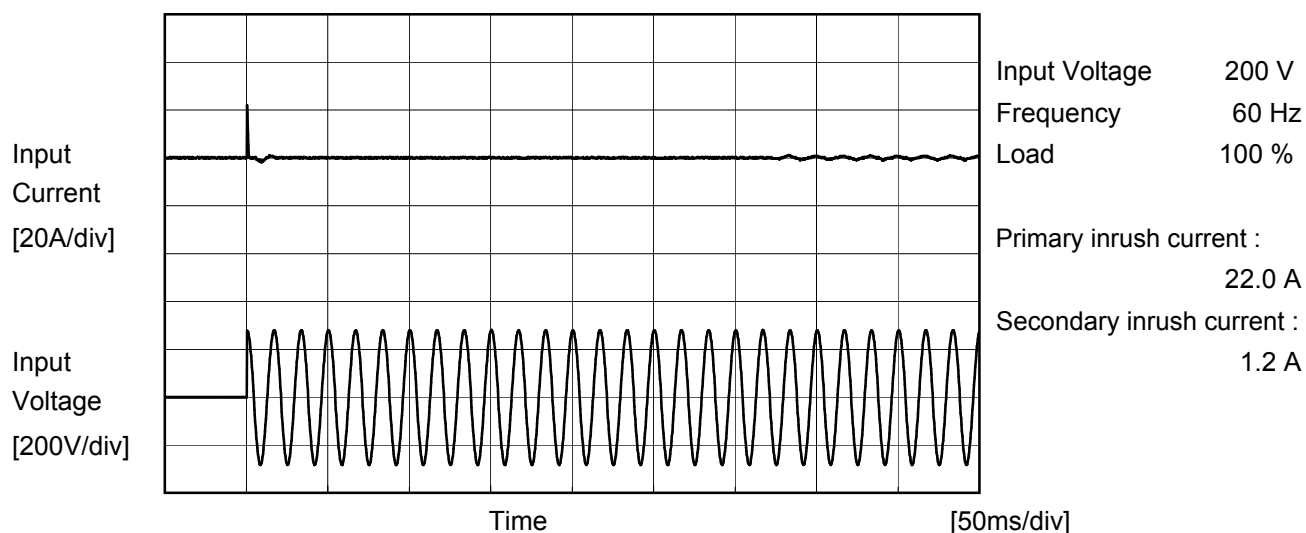
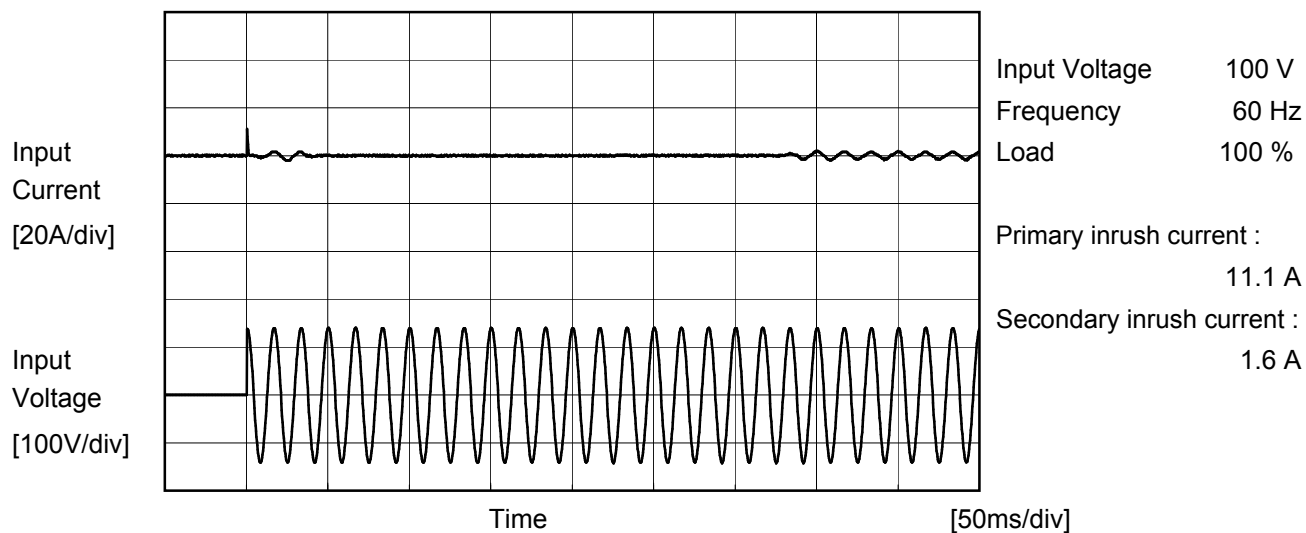
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BC-10371

Model	LFA75F-12	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



		Temperature 25°C Testing Circuitry Figure B
Model	LFA75F-12	
Item	Leakage Current	
Object	_____	

1.Results

[mA]

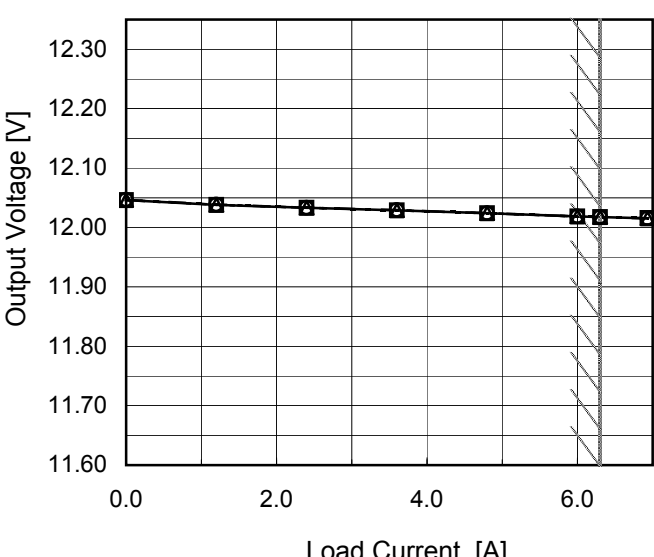
Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.13	0.26	0.32	Operation
	One of phases	0.22	0.45	0.57	Stand by
IEC60950	Both phases	0.14	0.30	0.38	Operation
	One of phases	0.22	0.44	0.54	Stand by

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.

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Item	Line Regulation	Temperature	25°C																														
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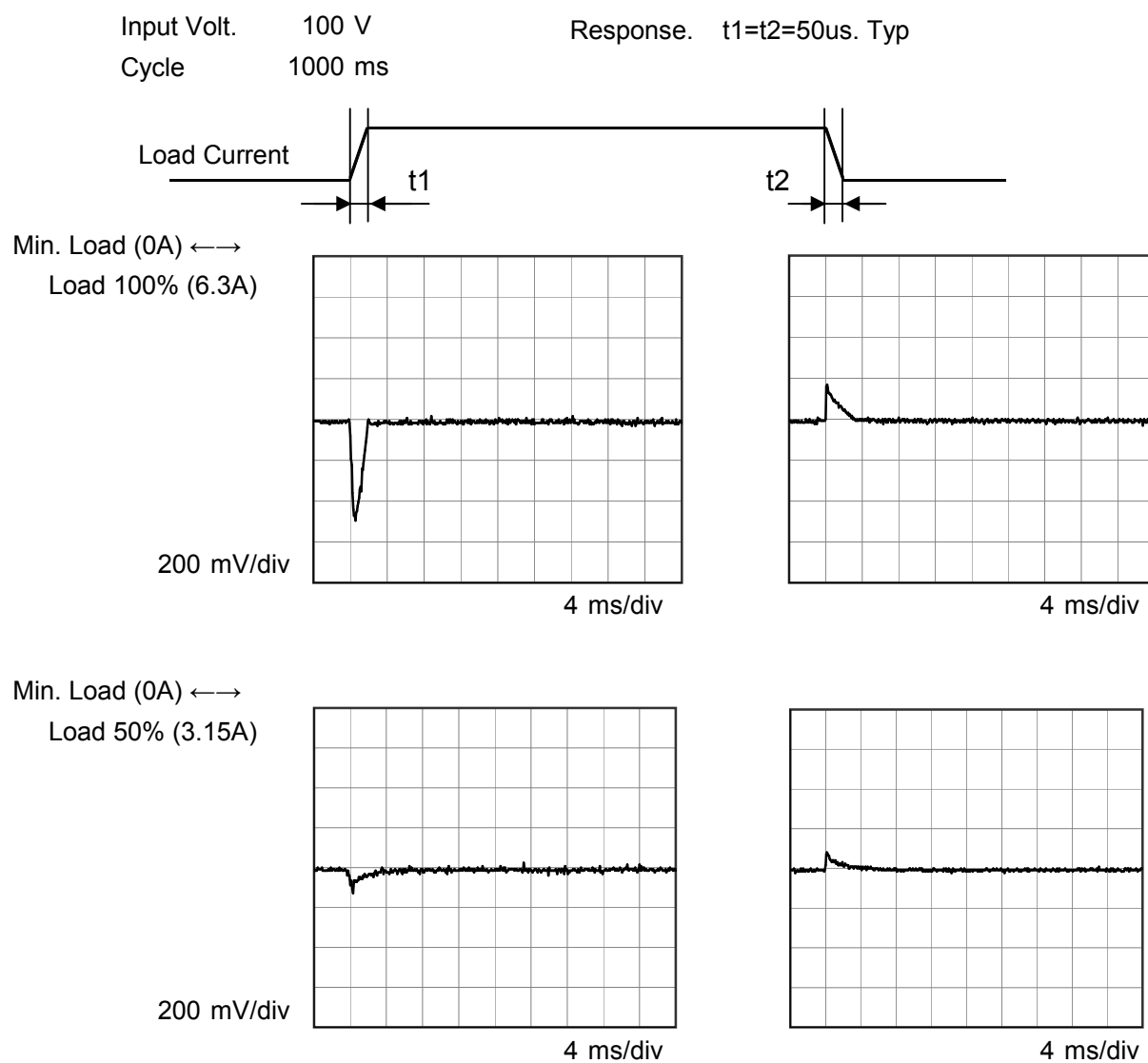
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<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>230V</div></div></div>  <p>Note: Slanted line shows the range of 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. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>12.046</td><td>12.046</td><td>12.047</td></tr><tr><td>1.20</td><td>12.038</td><td>12.038</td><td>12.039</td></tr><tr><td>2.40</td><td>12.033</td><td>12.033</td><td>12.033</td></tr><tr><td>3.60</td><td>12.029</td><td>12.029</td><td>12.029</td></tr><tr><td>4.80</td><td>12.024</td><td>12.024</td><td>12.024</td></tr><tr><td>6.00</td><td>12.019</td><td>12.019</td><td>12.019</td></tr><tr><td>6.30</td><td>12.018</td><td>12.018</td><td>12.018</td></tr><tr><td>6.93</td><td>12.016</td><td>12.016</td><td>12.016</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. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	12.046	12.046	12.047	1.20	12.038	12.038	12.039	2.40	12.033	12.033	12.033	3.60	12.029	12.029	12.029	4.80	12.024	12.024	12.024	6.00	12.019	12.019	12.019	6.30	12.018	12.018	12.018	6.93	12.016	12.016	12.016	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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Model	LFA75F-12	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+12V6.3A		



Model	LFA75F-12	Temperature 25°C Testing Circuitry Figure C																																							
Item	Ripple Voltage (by Load Current)																																								
Object	+12V6.3A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>-·-○-·-</div><div>Input Volt. 200V</div></div></div> <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>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 200 [V]</th></tr><tr><td>0.00</td><td>20</td><td>20</td></tr><tr><td>1.20</td><td>10</td><td>10</td></tr><tr><td>2.40</td><td>10</td><td>10</td></tr><tr><td>3.60</td><td>10</td><td>10</td></tr><tr><td>4.80</td><td>10</td><td>10</td></tr><tr><td>6.00</td><td>10</td><td>10</td></tr><tr><td>6.30</td><td>15</td><td>15</td></tr><tr><td>6.93</td><td>15</td><td>15</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. 100 [V]	Input Volt. 200 [V]	0.00	20	20	1.20	10	10	2.40	10	10	3.60	10	10	4.80	10	10	6.00	10	10	6.30	15	15	6.93	15	15	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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<p>T1: Due to AC Input Line T2: Due to Switching</p> <p>Fig. Complex Ripple Wave Form</p>																																									

Model	LFA75F-12																																								
Item	Ripple-Noise	Temperature	25°C																																						
Object	+12V6.3A	Testing Circuitry	Figure C																																						
1.Graph		2.Values																																							
<div><div><div><div></div><div>—△—</div><div>Input Volt. 100V</div></div><div><div></div><div>-·-○-·-</div><div>Input Volt. 200V</div></div></div><div><div><div><div>200</div><div>180</div><div>160</div><div>140</div><div>120</div><div>100</div><div>80</div><div>60</div><div>40</div><div>20</div><div>0</div></div><div><div>0.0</div><div>2.0</div><div>4.0</div><div>6.0</div></div><div><div>Ripple-Noise [mV]</div><div>Load Current [A]</div></div></div><div><p>Measured by 20 MHz Oscilloscope.</p><p>Ripple-Noise is shown as p-p in the figure below.</p><p>Note: Slanted line shows the range of the rated load current.</p></div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 200 [V]</th></tr><tr><td>0.00</td><td>30</td><td>25</td></tr><tr><td>1.20</td><td>35</td><td>35</td></tr><tr><td>2.40</td><td>35</td><td>35</td></tr><tr><td>3.60</td><td>35</td><td>35</td></tr><tr><td>4.80</td><td>35</td><td>35</td></tr><tr><td>6.00</td><td>55</td><td>55</td></tr><tr><td>6.30</td><td>70</td><td>70</td></tr><tr><td>6.93</td><td>70</td><td>70</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-Noise [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0.00	30	25	1.20	35	35	2.40	35	35	3.60	35	35	4.80	35	35	6.00	55	55	6.30	70	70	6.93	70	70	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
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1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 200V</div></div><div><div>-·-○-·-</div><div>Input Volt. 230V</div></div></div> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-20</td><td>12.017</td><td>12.017</td><td>12.017</td></tr><tr><td>-10</td><td>12.019</td><td>12.019</td><td>12.019</td></tr><tr><td>0</td><td>12.020</td><td>12.020</td><td>12.019</td></tr><tr><td>10</td><td>12.020</td><td>12.020</td><td>12.020</td></tr><tr><td>20</td><td>12.022</td><td>12.022</td><td>12.022</td></tr><tr><td>25</td><td>12.022</td><td>12.022</td><td>12.022</td></tr><tr><td>30</td><td>12.022</td><td>12.022</td><td>12.022</td></tr><tr><td>40</td><td>12.021</td><td>12.021</td><td>12.021</td></tr><tr><td>50</td><td>12.018</td><td>12.018</td><td>12.018</td></tr><tr><td>60</td><td>12.013</td><td>12.012</td><td>12.012</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	-20	12.017	12.017	12.017	-10	12.019	12.019	12.019	0	12.020	12.020	12.019	10	12.020	12.020	12.020	20	12.022	12.022	12.022	25	12.022	12.022	12.022	30	12.022	12.022	12.022	40	12.021	12.021	12.021	50	12.018	12.018	12.018	60	12.013	12.012	12.012	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
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10	12.020	12.020	12.020																																																			
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25	12.022	12.022	12.022																																																			
30	12.022	12.022	12.022																																																			
40	12.021	12.021	12.021																																																			
50	12.018	12.018	12.018																																																			
60	12.013	12.012	12.012																																																			
--	-	-	-																																																			

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		Testing Circuitry Figure A
Model	LFA75F-12	
Item	Output Voltage Accuracy	
Object	+12V6.3A	

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

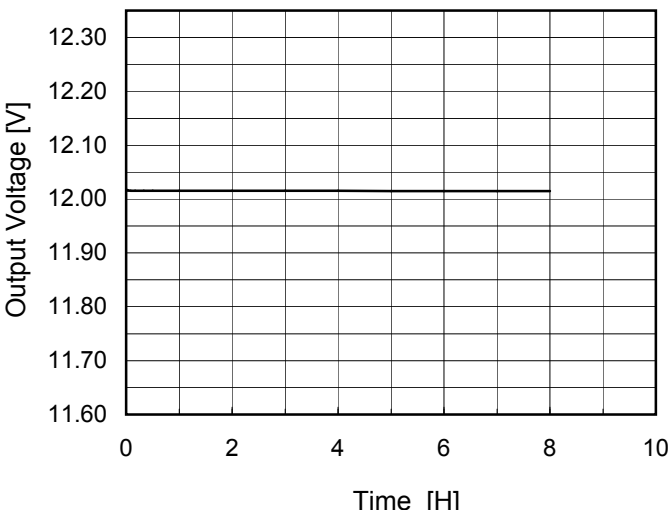
Load Current : 0 - 6.3A

* 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	30	85	0	12.048	±16	±0.1
Minimum Voltage	50	264	6.3	12.017		

Model	LFA75F-12																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+12V6.3A																								
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>12.018</td></tr><tr><td>0.5</td><td>12.016</td></tr><tr><td>1.0</td><td>12.016</td></tr><tr><td>2.0</td><td>12.016</td></tr><tr><td>3.0</td><td>12.015</td></tr><tr><td>4.0</td><td>12.015</td></tr><tr><td>5.0</td><td>12.015</td></tr><tr><td>6.0</td><td>12.015</td></tr><tr><td>7.0</td><td>12.015</td></tr><tr><td>8.0</td><td>12.015</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.018	0.5	12.016	1.0	12.016	2.0	12.016	3.0	12.015	4.0	12.015	5.0	12.015	6.0	12.015	7.0	12.015	8.0	12.015
Time since start [H]	Output Voltage [V]																								
0.0	12.018																								
0.5	12.016																								
1.0	12.016																								
2.0	12.016																								
3.0	12.015																								
4.0	12.015																								
5.0	12.015																								
6.0	12.015																								
7.0	12.015																								
8.0	12.015																								
* The characteristic of AC200V is equal.																									

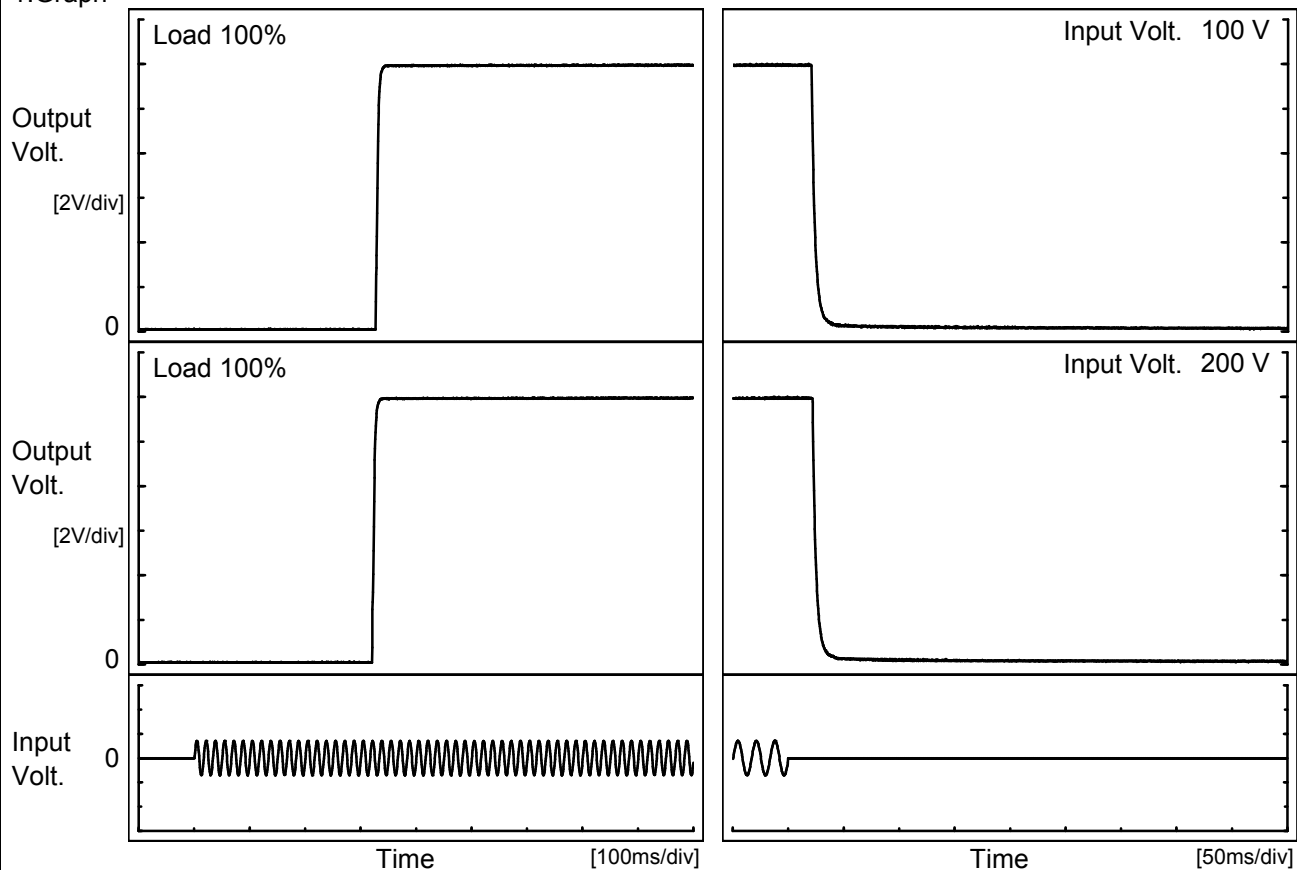
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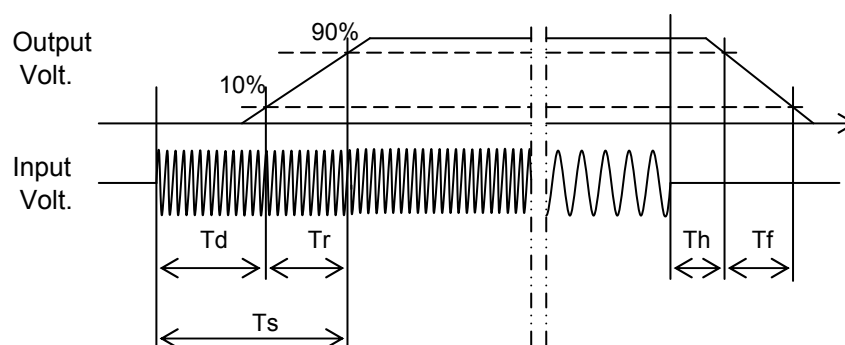
Model	LFA75F-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V6.3A		

1. Graph



2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	327.5	7.0	334.5	20.8	7.3
200 V	321.5	6.5	328.0	22.0	7.5



Model	LFA75F-12																																		
Item	Hold-Up Time	Temperature	25°C																																
		Testing Circuitry	Figure A																																
Object	+12V6.3A																																		
1.Graph		2.Values																																	
<div><div><div>---</div><div>□</div><div>---</div><div>Load 50%</div></div><div><div>—</div><div>△</div><div>—</div><div>Load 100%</div></div></div> <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. Note: Slanted line shows the range of the rated input voltage.</p>		<table><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><tr><td>75</td><td>47</td><td>19</td></tr><tr><td>85</td><td>48</td><td>20</td></tr><tr><td>100</td><td>49</td><td>21</td></tr><tr><td>120</td><td>50</td><td>21</td></tr><tr><td>200</td><td>51</td><td>22</td></tr><tr><td>230</td><td>51</td><td>22</td></tr><tr><td>264</td><td>52</td><td>23</td></tr><tr><td>280</td><td>54</td><td>23</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	47	19	85	48	20	100	49	21	120	50	21	200	51	22	230	51	22	264	52	23	280	54	23	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	47	19																																	
85	48	20																																	
100	49	21																																	
120	50	21																																	
200	51	22																																	
230	51	22																																	
264	52	23																																	
280	54	23																																	
--	-	-																																	

Model	LFA75F-12																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+12V6.3A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <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">Time [ms]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.20</td><td>105</td><td>122</td><td>127</td></tr><tr><td>2.40</td><td>54</td><td>64</td><td>64</td></tr><tr><td>3.60</td><td>36</td><td>44</td><td>44</td></tr><tr><td>4.80</td><td>27</td><td>30</td><td>31</td></tr><tr><td>6.00</td><td>21</td><td>22</td><td>22</td></tr><tr><td>6.30</td><td>20</td><td>21</td><td>21</td></tr><tr><td>6.93</td><td>13</td><td>15</td><td>15</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. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	-	-	-	1.20	105	122	127	2.40	54	64	64	3.60	36	44	44	4.80	27	30	31	6.00	21	22	22	6.30	20	21	21	6.93	13	15	15	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
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6.00	21	22	22																																																			
6.30	20	21	21																																																			
6.93	13	15	15																																																			
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[illegible]

Model	LFA75F-12																																											
Item	Overcurrent Protection	Temperature	25°C																																									
Object	+12V6.3A	Testing Circuitry	Figure A																																									
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<div><div><div>△</div><div>Input Volt. 100V</div></div><div><div>○</div><div>Input Volt. 200V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is less than rated output voltage.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th></tr><tr><td>12.0</td><td>7.80</td><td>7.80</td></tr><tr><td>11.4</td><td>-</td><td>-</td></tr><tr><td>10.8</td><td>-</td><td>-</td></tr><tr><td>9.6</td><td>-</td><td>-</td></tr><tr><td>8.4</td><td>-</td><td>-</td></tr><tr><td>7.2</td><td>-</td><td>-</td></tr><tr><td>6.0</td><td>-</td><td>-</td></tr><tr><td>4.8</td><td>-</td><td>-</td></tr><tr><td>3.6</td><td>-</td><td>-</td></tr><tr><td>2.4</td><td>-</td><td>-</td></tr><tr><td>1.2</td><td>-</td><td>-</td></tr><tr><td>0.0</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	12.0	7.80	7.80	11.4	-	-	10.8	-	-	9.6	-	-	8.4	-	-	7.2	-	-	6.0	-	-	4.8	-	-	3.6	-	-	2.4	-	-	1.2	-	-	0.0	-	-
Output Voltage [V]	Load Current [A]																																											
	Input Volt. 100[V]	Input Volt. 200[V]																																										
12.0	7.80	7.80																																										
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6.0	-	-																																										
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Model	LFA75F-12																																								
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<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 200V</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>		<table><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><tr><td>-20</td><td>14.75</td><td>14.75</td></tr><tr><td>-10</td><td>14.75</td><td>14.75</td></tr><tr><td>0</td><td>14.92</td><td>14.92</td></tr><tr><td>10</td><td>14.92</td><td>14.92</td></tr><tr><td>20</td><td>15.04</td><td>15.04</td></tr><tr><td>25</td><td>15.04</td><td>15.04</td></tr><tr><td>30</td><td>15.16</td><td>15.16</td></tr><tr><td>40</td><td>15.27</td><td>15.27</td></tr><tr><td>50</td><td>15.33</td><td>15.33</td></tr><tr><td>60</td><td>15.45</td><td>15.45</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 200[V]	-20	14.75	14.75	-10	14.75	14.75	0	14.92	14.92	10	14.92	14.92	20	15.04	15.04	25	15.04	15.04	30	15.16	15.16	40	15.27	15.27	50	15.33	15.33	60	15.45	15.45	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
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50	15.33	15.33																																							
60	15.45	15.45																																							
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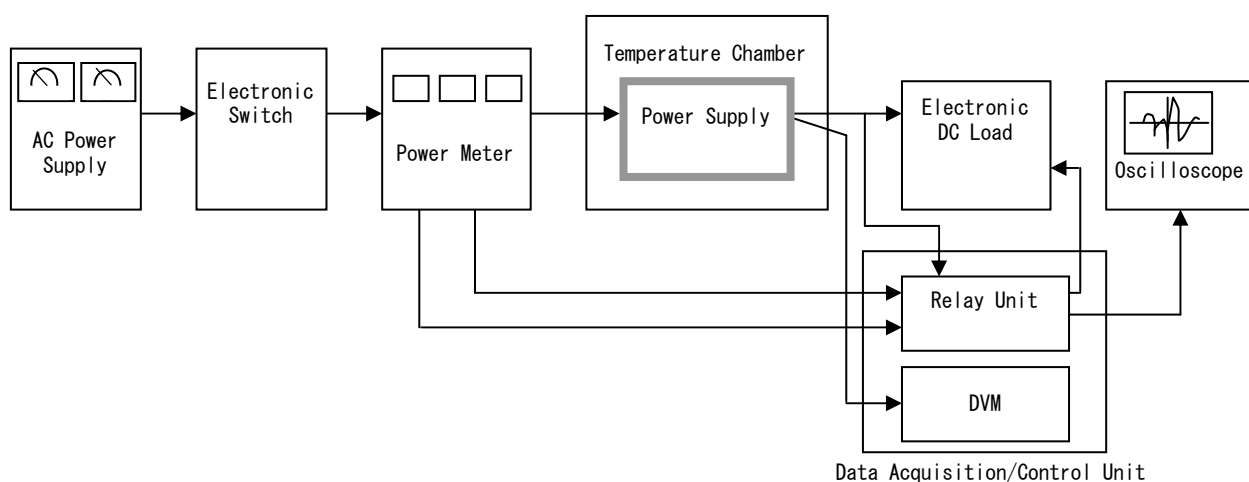


Figure A

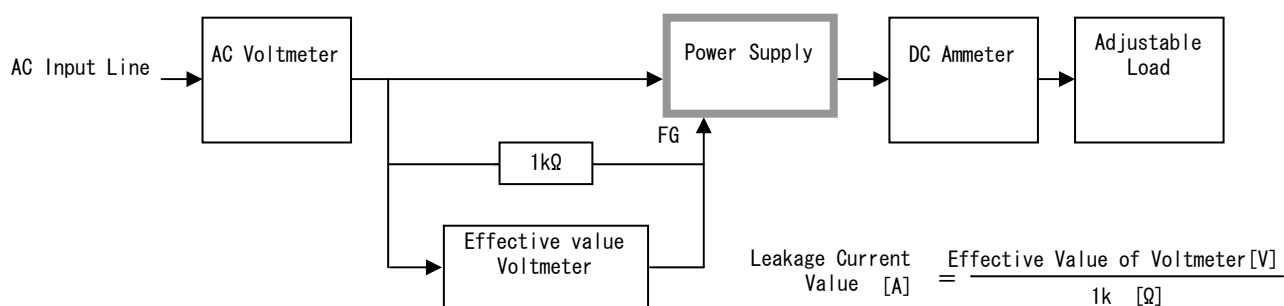


Figure B (DEN-AN)

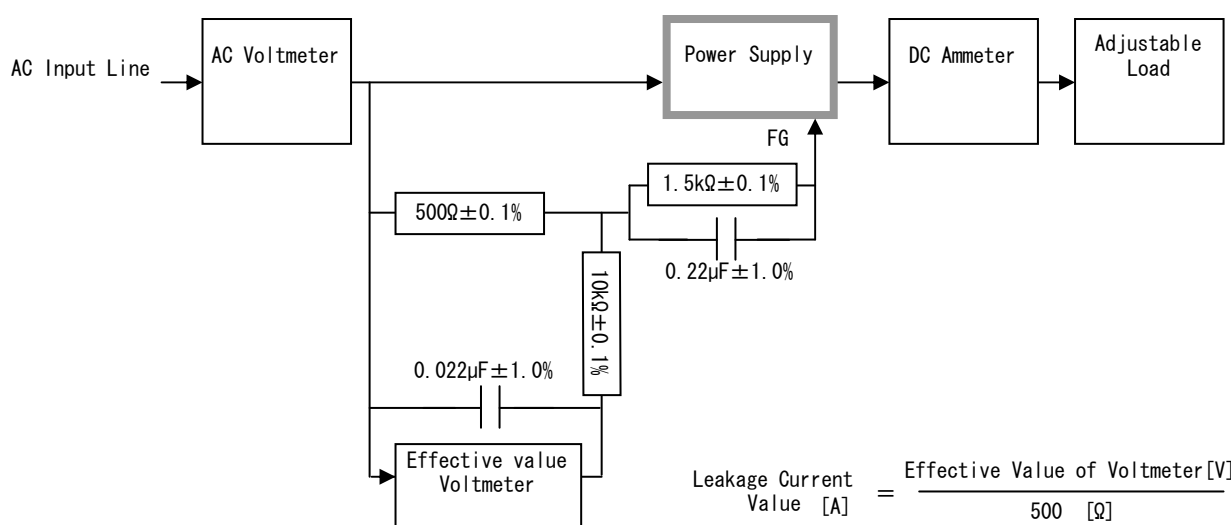


Figure B (IEC60950-1)

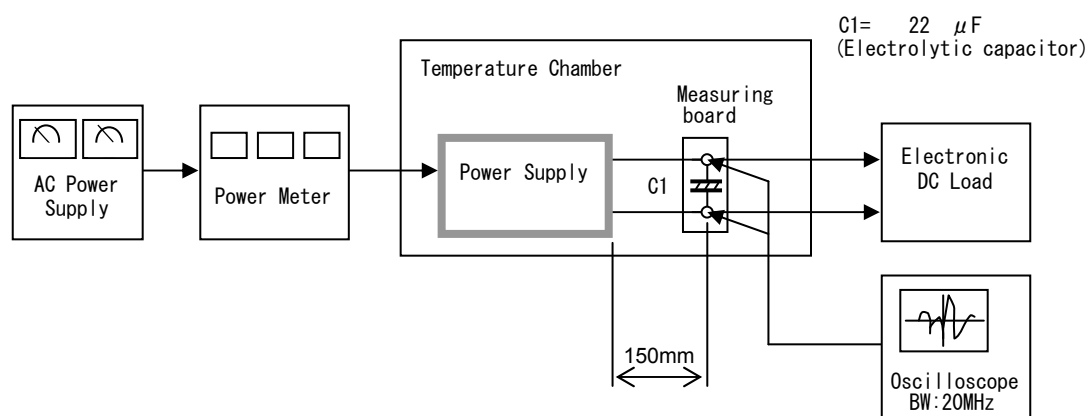


Figure C