

TEST DATA OF LEA150F-18

Regulated DC Power Supply
Dec 19, 2005

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Chikako Makino Design Manager

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COSEL CO.,LTD.

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Model	LEA150F-18																																																					
Item	Input Current (by Load Current)	Temperature Testing Circuitry	25°C Figure A																																																			
Object	_____																																																					
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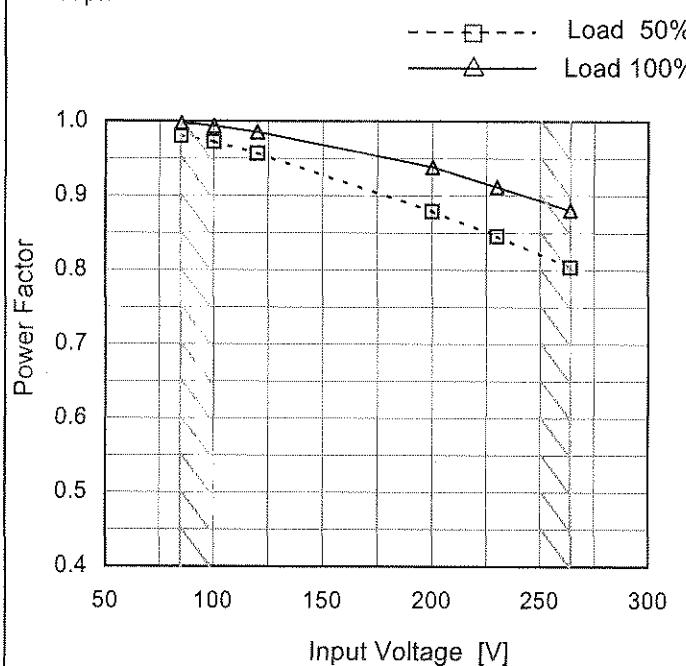
Model	LEA150F-18	Temperature Testing Circuitry 25°C Figure A																													
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<p>The graph plots Efficiency [%] on the y-axis (44 to 100) against Input Voltage [V] on the x-axis (50 to 300). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show an upward trend. A slanted line on the left indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>85</td><td>79.4</td><td>81.2</td></tr> <tr><td>100</td><td>80.2</td><td>82.5</td></tr> <tr><td>120</td><td>81.0</td><td>83.6</td></tr> <tr><td>200</td><td>82.1</td><td>85.2</td></tr> <tr><td>230</td><td>82.1</td><td>85.7</td></tr> <tr><td>264</td><td>82.4</td><td>86.1</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> </tbody> </table>		Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	85	79.4	81.2	100	80.2	82.5	120	81.0	83.6	200	82.1	85.2	230	82.1	85.7	264	82.4	86.1	--	-	-	--	-	-	--	-	-
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Model	LEA150F-18
Item	Power Factor (by Input Voltage)
Object	—

1. Graph



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

Temperature 25°C
Testing Circuitry Figure A

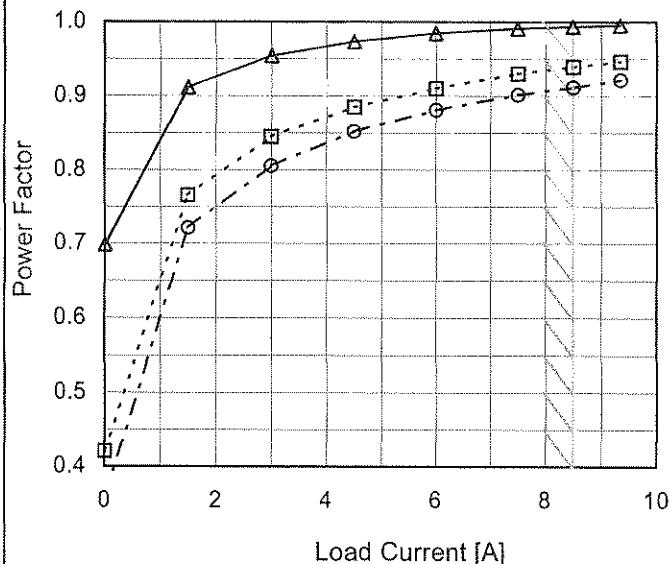
2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.981	0.998
100	0.972	0.994
120	0.957	0.986
200	0.879	0.939
230	0.846	0.912
264	0.804	0.881
--	-	-
--	-	-
--	-	-

Model	LEA150F-18
Item	Power Factor (by Load Current)
Object	_____

1. Graph

—△— Input Volt. 100V
 - - -□--- Input Volt. 200V
 - - -○--- Input Volt. 230V



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

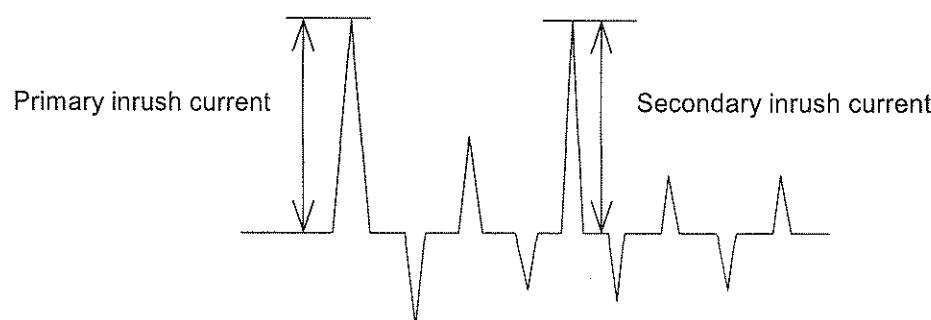
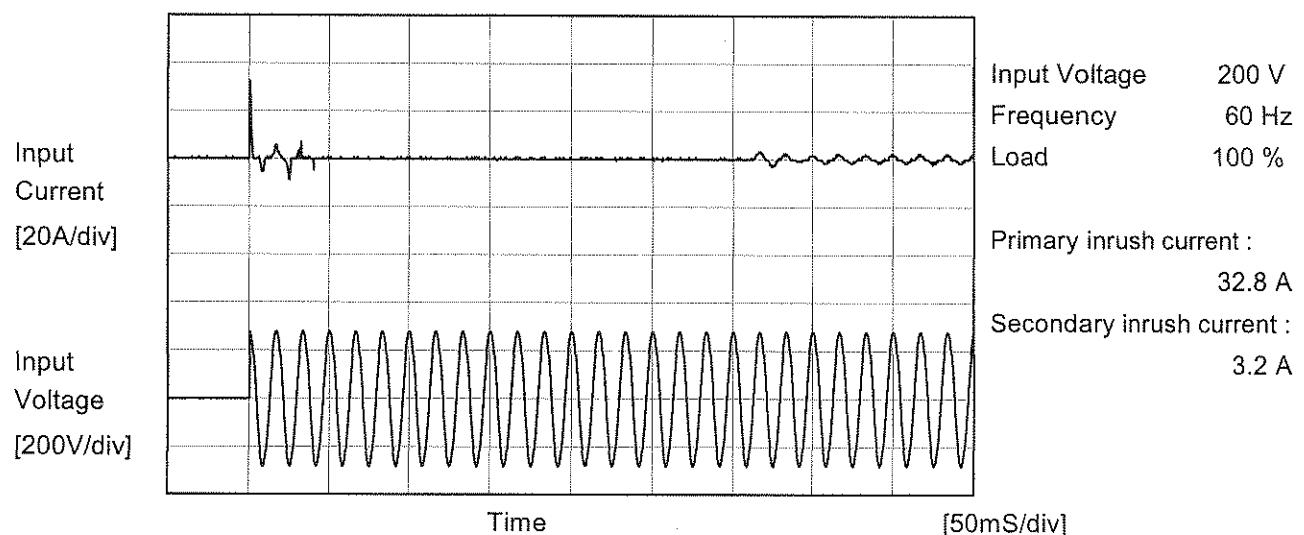
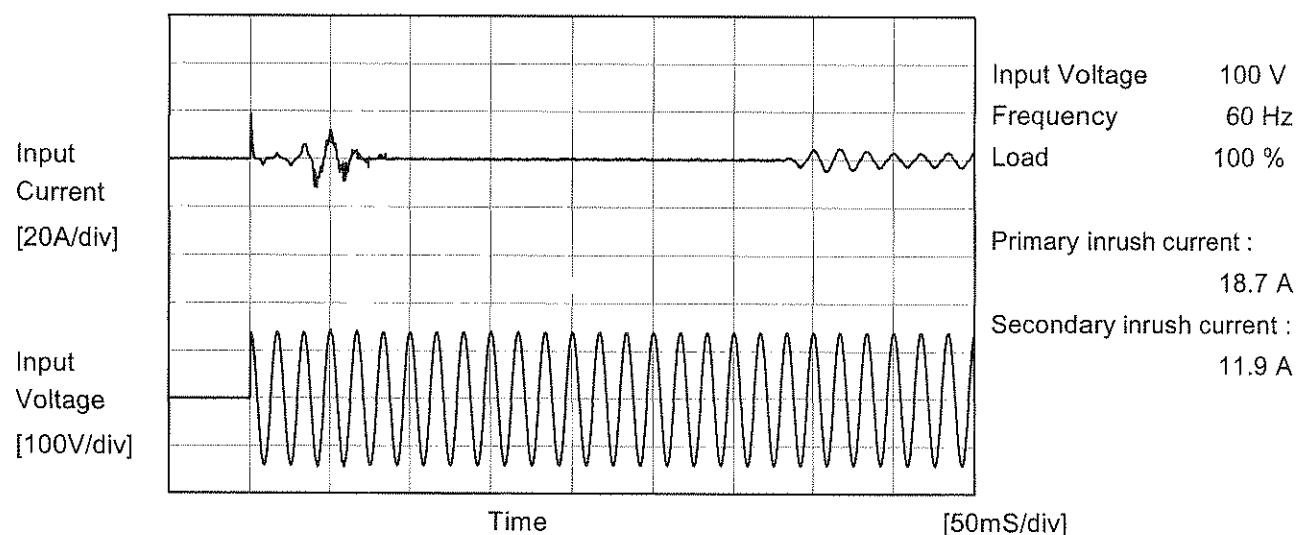
Temperature 25°C
Testing Circuitry Figure A

2. Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.699	0.421	0.359
1.50	0.912	0.766	0.722
3.00	0.954	0.845	0.806
4.50	0.974	0.885	0.852
6.00	0.985	0.910	0.881
7.50	0.992	0.930	0.902
8.50	0.994	0.939	0.912
9.35	0.996	0.946	0.922
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--	-	-	-

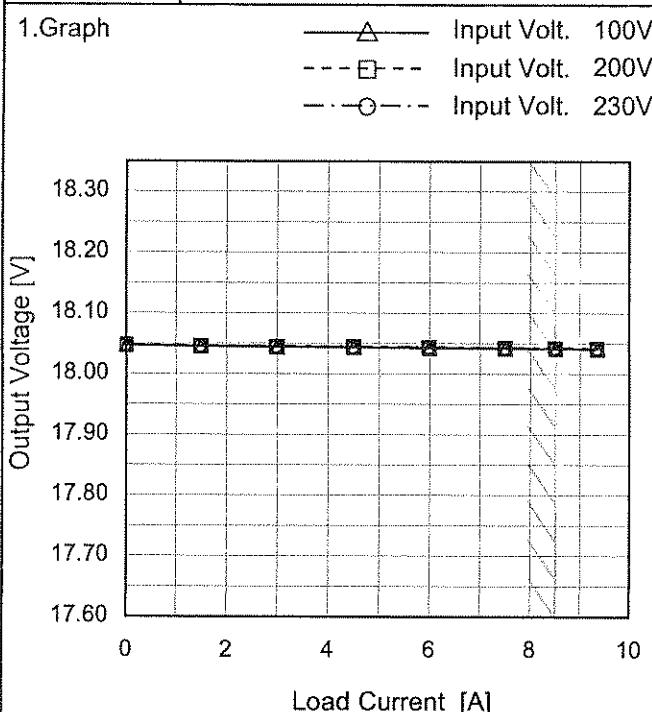
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Model	LEA150F-18	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



Model	LEA150F-18																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+18V8.5A																																	
1.Graph																																		
<p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Legend: Load 50% (dashed line with squares), Load 100% (solid line with triangles)</p>																																		
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Model	LEA150F-18
Item	Load Regulation
Object	+18V8.5A

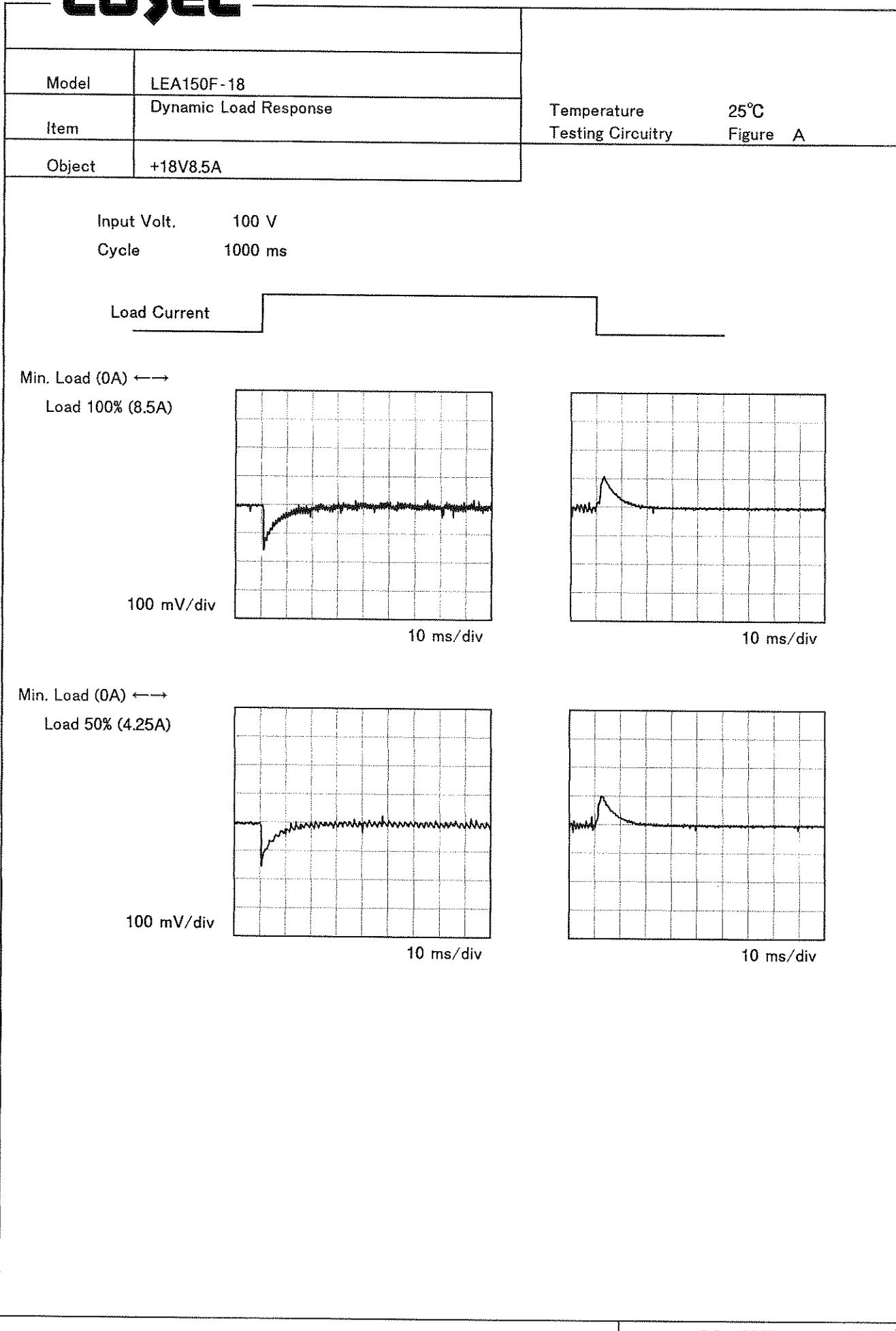


Note: Slanted line shows the range of the rated load current.

Temperature 25°C
Testing Circuitry Figure A

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	18.047	18.047	18.047
1.50	18.045	18.046	18.045
3.00	18.044	18.045	18.045
4.50	18.044	18.044	18.044
6.00	18.043	18.043	18.043
7.50	18.043	18.042	18.043
8.50	18.042	18.042	18.042
9.35	18.041	18.042	18.042
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--	-	-	-
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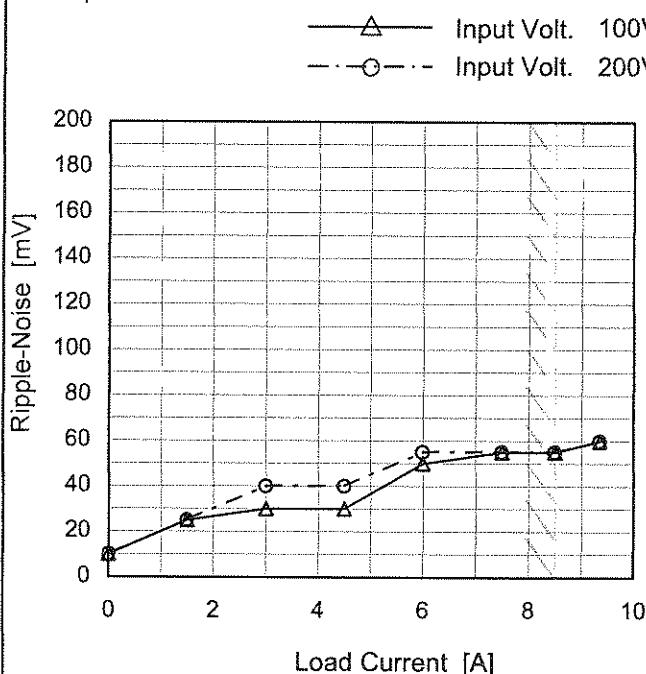
COSEL

<p>Model LEA150F-18</p> <p>Item Ripple Voltage (by Load Current)</p> <p>Object +18V8.5A</p>	Temperature 25°C Testing Circuitry Figure A																																						
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	<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 100V</th> <th>Input Volt. 200V</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>5</td><td>5</td></tr> <tr><td>1.50</td><td>15</td><td>15</td></tr> <tr><td>3.00</td><td>15</td><td>15</td></tr> <tr><td>4.50</td><td>20</td><td>15</td></tr> <tr><td>6.00</td><td>20</td><td>20</td></tr> <tr><td>7.50</td><td>20</td><td>20</td></tr> <tr><td>8.50</td><td>20</td><td>20</td></tr> <tr><td>9.35</td><td>20</td><td>25</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 100V	Input Volt. 200V	0.00	5	5	1.50	15	15	3.00	15	15	4.50	20	15	6.00	20	20	7.50	20	20	8.50	20	20	9.35	20	25	--	-	-	--	-	-	--	-
Load Current [A]	Ripple Voltage [mV]																																						
	Input Volt. 100V	Input Volt. 200V																																					
0.00	5	5																																					
1.50	15	15																																					
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<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>Ripple [mVp-p]</p> <p>Fig. Complex Ripple Wave Form</p>																																							

Model	LEA150F-18
Item	Ripple-Noise
Object	+18V8.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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.

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	10	10
1.50	25	25
3.00	30	40
4.50	30	40
6.00	50	55
7.50	55	55
8.50	55	55
9.35	60	60
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

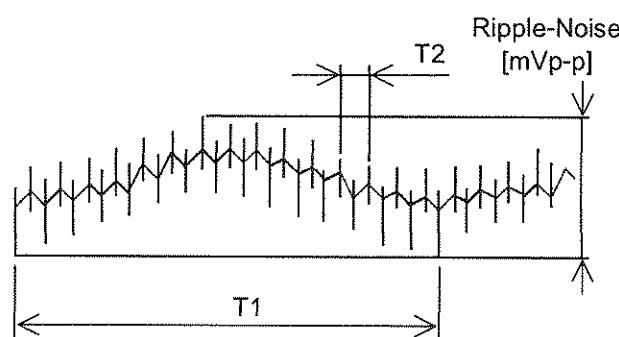


Fig. Complex Ripple Wave Form

Model	LEA150F-18	Testing Circuitry Figure A Object +18V8.5A																																			
Item	Ripple Voltage (by Ambient Temp.)																																				
Object	+18V8.5A																																				
1.Graph		2.Values																																			
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C] for LEA150F-18 at Input Voltages 100V and 200V. The graph shows two sets of data points (squares and triangles) connected by dashed lines. A solid line with open squares represents Input Volt. 100V, and a solid line with open triangles represents Input Volt. 200V. A slanted line indicates the rated ambient temperature range from -20°C to 60°C.</p> <table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Input Volt. 100 [V] [mV]</th> <th>Input Volt. 200 [V] [mV]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>45</td><td>35</td></tr> <tr><td>-10</td><td>35</td><td>35</td></tr> <tr><td>0</td><td>35</td><td>30</td></tr> <tr><td>10</td><td>25</td><td>25</td></tr> <tr><td>20</td><td>25</td><td>20</td></tr> <tr><td>25</td><td>20</td><td>20</td></tr> <tr><td>30</td><td>20</td><td>20</td></tr> <tr><td>40</td><td>20</td><td>20</td></tr> <tr><td>50</td><td>20</td><td>15</td></tr> <tr><td>60</td><td>15</td><td>15</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>		Ambient Temperature [°C]	Input Volt. 100 [V] [mV]	Input Volt. 200 [V] [mV]	-20	45	35	-10	35	35	0	35	30	10	25	25	20	25	20	25	20	20	30	20	20	40	20	20	50	20	15	60	15	15	--	-	-
Ambient Temperature [°C]	Input Volt. 100 [V] [mV]	Input Volt. 200 [V] [mV]																																			
-20	45	35																																			
-10	35	35																																			
0	35	30																																			
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30	20	20																																			
40	20	20																																			
50	20	15																																			
60	15	15																																			
--	-	-																																			

Measured by 20 MHz Oscilloscope.

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

Model	LEA150F-18
Item	Ambient Temperature Drift
Object	+18V8.5A

1.Graph

Output Voltage [V]

Ambient Temperature [°C]

Load 100%

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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	18.027	18.027	18.027
-10	18.033	18.034	18.034
0	18.039	18.040	18.040
10	18.045	18.045	18.045
20	18.050	18.050	18.051
25	18.053	18.053	18.053
30	18.054	18.054	18.054
40	18.053	18.053	18.053
50	18.049	18.049	18.049
60	18.044	18.044	18.043
--	-	-	-



Model	LEA150F-18	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+18V8.5A	

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 - 40°C

Input Voltage : 85 - 264V

Load Current : 0 - 8.5A

* 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

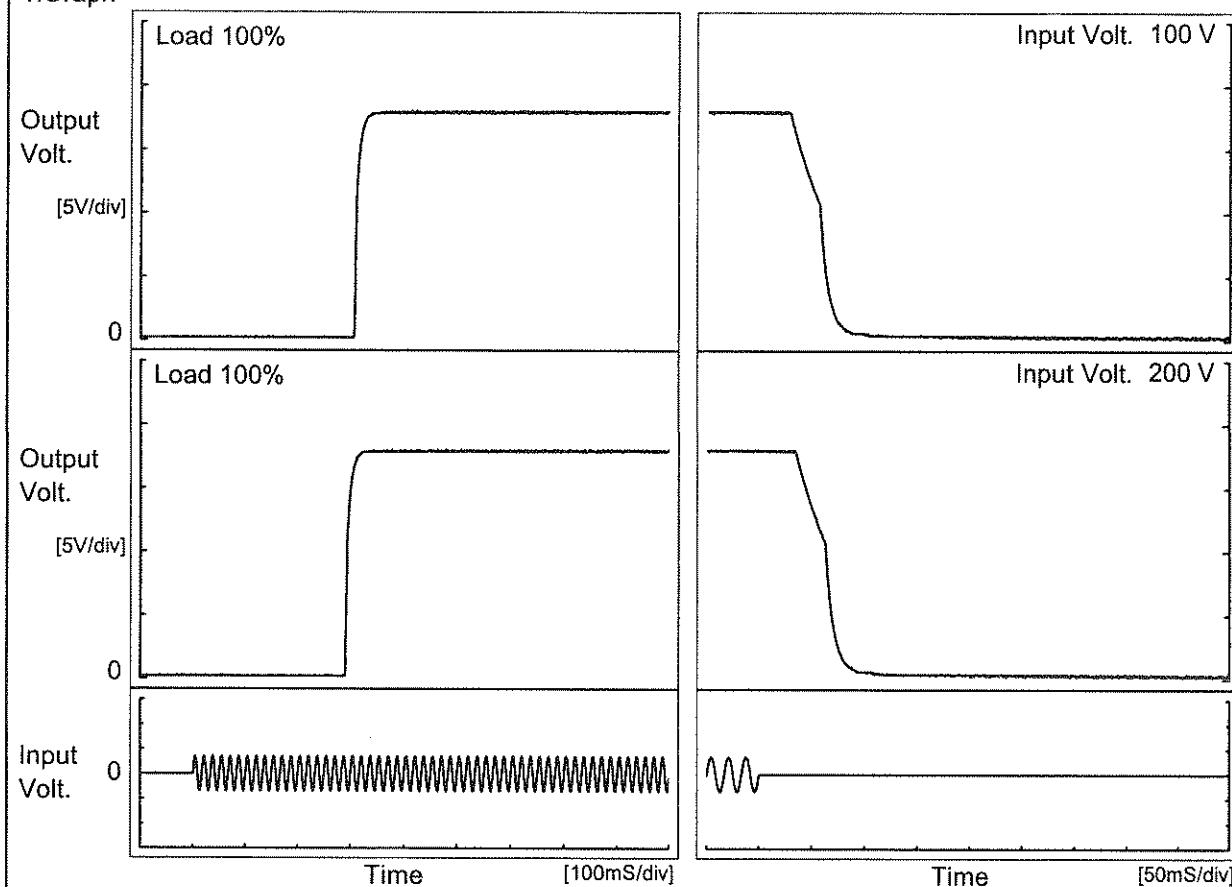
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	200	0	18.060	±12	±0.1
Minimum Voltage	-10	200	8.5	18.036		

Model	LEA150F-18	Temperature Testing Circuitry 25°C Figure A																					
Item	Time Lapse Drift																						
Object	+18V8.5A																						
1.Graph		2.Values																					
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 100V</p> <p>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>18.041</td></tr> <tr><td>0.5</td><td>18.043</td></tr> <tr><td>1.0</td><td>18.043</td></tr> <tr><td>2.0</td><td>18.045</td></tr> <tr><td>3.0</td><td>18.044</td></tr> <tr><td>4.0</td><td>18.045</td></tr> <tr><td>5.0</td><td>18.045</td></tr> <tr><td>6.0</td><td>18.045</td></tr> <tr><td>7.0</td><td>18.045</td></tr> <tr><td>8.0</td><td>18.045</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	18.041	0.5	18.043	1.0	18.043	2.0	18.045	3.0	18.044	4.0	18.045	5.0	18.045	6.0	18.045	7.0	18.045	8.0	18.045
Time since start [H]	Output Voltage [V]																						
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* The characteristic of AC200V is equal.

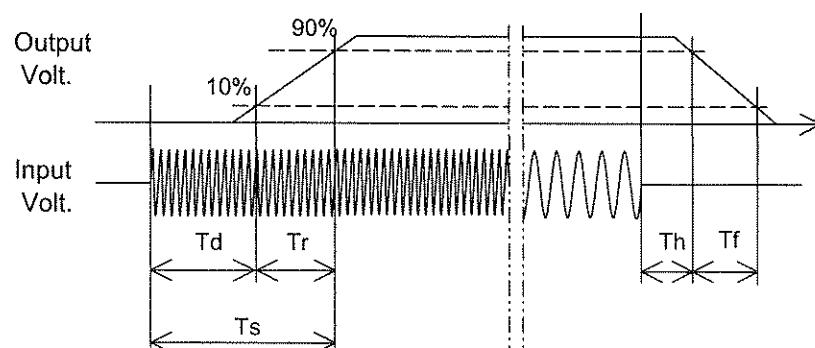
Model	LEA150F-18	Temperature Testing Circuitry Object	25°C Figure A
Item	Rise and Fall Time		
Object	+18V8.5A		

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[mS]
100 V		307.5	15.0	322.5	33.5	38.0	
200 V		291.0	14.5	305.5	39.8	38.0	



Model	LEA150F-18	Temperature Testing Circuitry	25°C Figure A																																
Item	Hold-Up Time																																		
Object	+18V8.5A																																		
1. Graph			2. Values																																
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<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>																																			

Model	LEA150F-18	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation	Testing Circuitry	Figure A																																																			
Object	+18V8.5A																																																					
1.Graph	<p>—△— Input Volt. 100V - -□--- Input Volt. 200V - ·○--- Input Volt. 230V</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>100V [ms]</th> <th>200V [ms]</th> <th>230V [ms]</th> </tr> </thead> <tbody> <tr><td>1.50</td><td>164</td><td>194</td><td>196</td></tr> <tr><td>3.00</td><td>80</td><td>102</td><td>105</td></tr> <tr><td>4.50</td><td>45</td><td>70</td><td>70</td></tr> <tr><td>6.00</td><td>40</td><td>52</td><td>55</td></tr> <tr><td>7.50</td><td>35</td><td>40</td><td>42</td></tr> <tr><td>8.50</td><td>30</td><td>36</td><td>37</td></tr> <tr><td>9.35</td><td>24</td><td>31</td><td>32</td></tr> </tbody> </table>			Load Current [A]	100V [ms]	200V [ms]	230V [ms]	1.50	164	194	196	3.00	80	102	105	4.50	45	70	70	6.00	40	52	55	7.50	35	40	42	8.50	30	36	37	9.35	24	31	32																			
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Note:	Slanted line shows the range of the rated load current.																																																					

Model	LEA150F-18	Testing Circuitry Figure A																																						
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+18V8.5A																																							
1.Graph		2.Values																																						
<p>The graph plots Input Voltage [V] on the Y-axis (0 to 100) against Ambient Temperature [°C] on the X-axis (-40 to 60). Two data series are shown: Load 50% (squares) and Load 100% (triangles). Both series show a slight upward trend. A slanted line at approximately 25°C indicates the rated ambient temperature range.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>-20</td> <td>73</td> <td>74</td> </tr> <tr> <td>-10</td> <td>73</td> <td>75</td> </tr> <tr> <td>0</td> <td>73</td> <td>75</td> </tr> <tr> <td>10</td> <td>74</td> <td>75</td> </tr> <tr> <td>20</td> <td>74</td> <td>75</td> </tr> <tr> <td>25</td> <td>74</td> <td>75</td> </tr> <tr> <td>30</td> <td>74</td> <td>75</td> </tr> <tr> <td>40</td> <td>74</td> <td>75</td> </tr> <tr> <td>50</td> <td>74</td> <td>75</td> </tr> <tr> <td>60</td> <td>74</td> <td>75</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-20	73	74	-10	73	75	0	73	75	10	74	75	20	74	75	25	74	75	30	74	75	40	74	75	50	74	75	60	74	75	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.

Model	LEA150F-18																																													
Item	Overcurrent Protection	Temperature 25°C Testing Circuitry Figure A																																												
Object	+18V8.5A																																													
1.Graph																																														
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Model	LEA150F-18																																							
Item	Overvoltage Protection																																							
Object	+18V8.5A																																							
1.Graph																																								
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 100V (Solid Line with △) Input Volt. 200V (Dashed Line with □) 																																								
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>22.21</td><td>22.21</td> </tr> <tr> <td>-10</td><td>22.45</td><td>22.45</td> </tr> <tr> <td>0</td><td>22.68</td><td>22.62</td> </tr> <tr> <td>10</td><td>22.86</td><td>22.80</td> </tr> <tr> <td>20</td><td>22.97</td><td>22.97</td> </tr> <tr> <td>25</td><td>23.09</td><td>23.03</td> </tr> <tr> <td>30</td><td>23.15</td><td>23.09</td> </tr> <tr> <td>40</td><td>23.38</td><td>23.32</td> </tr> <tr> <td>50</td><td>23.50</td><td>23.44</td> </tr> <tr> <td>60</td><td>23.67</td><td>23.55</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	22.21	22.21	-10	22.45	22.45	0	22.68	22.62	10	22.86	22.80	20	22.97	22.97	25	23.09	23.03	30	23.15	23.09	40	23.38	23.32	50	23.50	23.44	60	23.67	23.55	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.

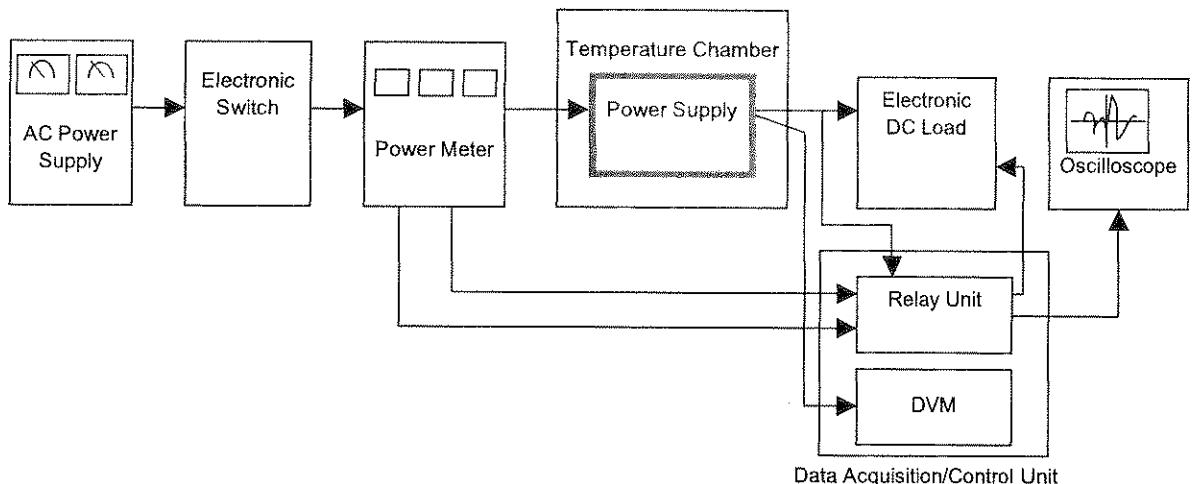


Figure A