

TEST DATA OF LFA240F-48

Regulated DC Power Supply
November 18, 2010

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COSEL CO.,LTD.

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(Final Page 25)

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Model

LFA240F-48

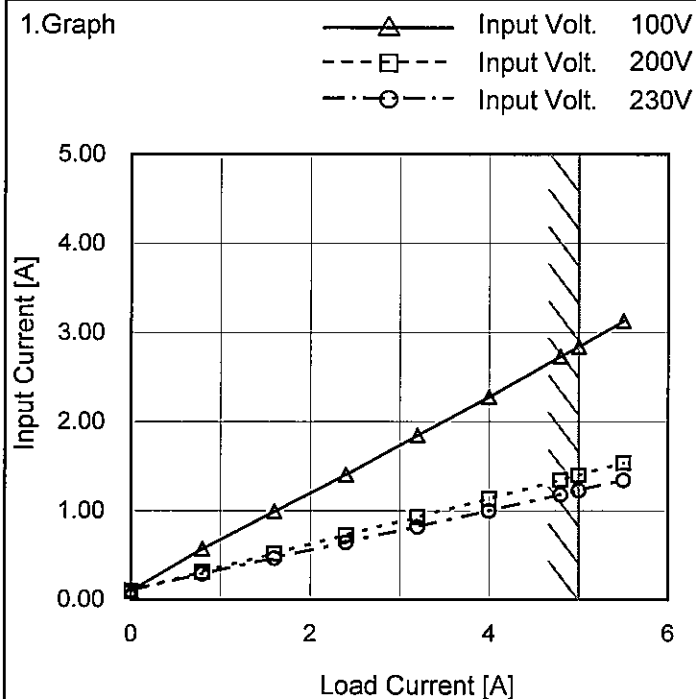
Item

Input Current (by Load Current)

Object

Temperature
Testing Circuitry25°C
Figure A

1. Graph



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

2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.101	0.102	0.102
0.8	0.572	0.314	0.292
1.6	0.991	0.518	0.468
2.4	1.405	0.726	0.644
3.2	1.847	0.926	0.818
4.0	2.279	1.136	0.998
4.8	2.734	1.342	1.180
5.0	2.841	1.398	1.230
5.5	3.128	1.536	1.344
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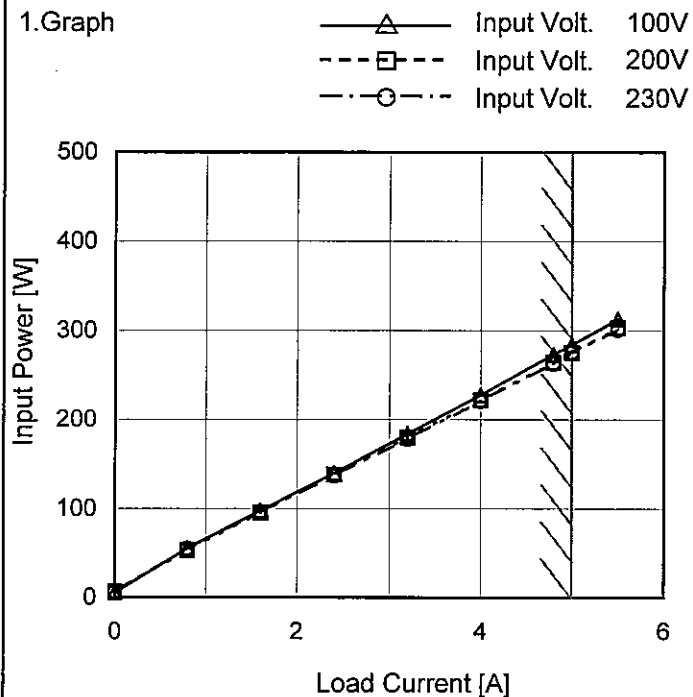
Model LFA240F-48

Item Input Power (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	5.3	6.5	6.0
0.8	55.2	53.0	55.0
1.6	97.8	95.0	96.0
2.4	139.8	138.0	137.0
3.2	184.2	180.0	178.0
4.0	227.7	222.0	221.0
4.8	273.2	264.0	263.0
5.0	284.3	275.0	275.0
5.5	313.0	303.0	301.0
--	-	-	-
--	-	-	-

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Model

LFA240F-48

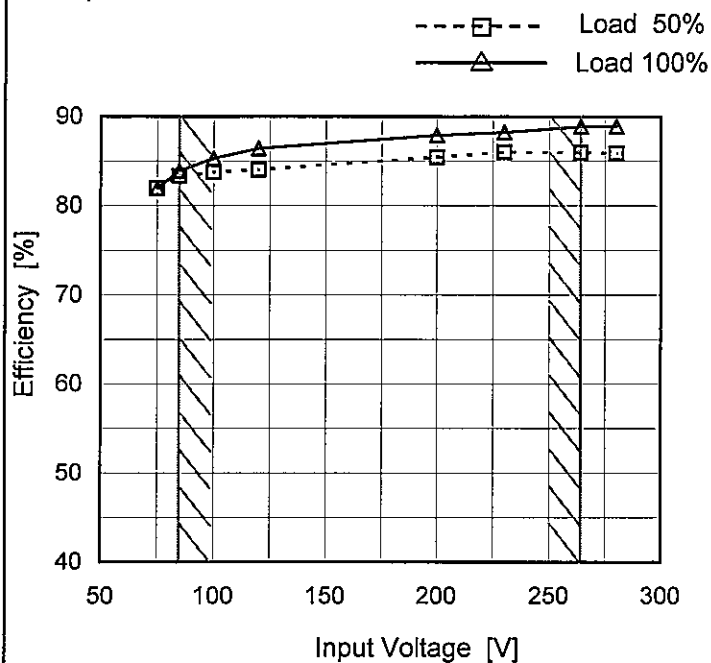
Item

Efficiency (by Input Voltage)

Object

Temperature
Testing Circuitry25°C
Figure A

1. Graph



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

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	82.0	82.0
85	83.3	83.9
100	83.8	85.3
120	84.0	86.4
200	85.4	87.9
230	86.0	88.2
264	85.9	88.9
280	85.9	88.9
--	-	-

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Model		LFA240F-48		Temperature 25°C																																																				
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<div><div><div>—△—</div><div>---□---</div><div>---○---</div></div><div><div>Input Volt. 100V</div><div>Input Volt. 200V</div><div>Input Volt. 230V</div></div></div> <div><div>Efficiency [%]</div><div>Load Current [A]</div></div>		2.Values																																																				
		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.8</td><td>72.8</td><td>75.8</td><td>73.0</td></tr><tr><td>1.6</td><td>80.5</td><td>82.9</td><td>81.9</td></tr><tr><td>2.4</td><td>83.9</td><td>85.1</td><td>85.6</td></tr><tr><td>3.2</td><td>84.7</td><td>86.6</td><td>87.6</td></tr><tr><td>4.0</td><td>85.4</td><td>87.6</td><td>88.0</td></tr><tr><td>4.8</td><td>85.3</td><td>88.3</td><td>88.6</td></tr><tr><td>5.0</td><td>85.4</td><td>88.2</td><td>88.2</td></tr><tr><td>5.5</td><td>85.3</td><td>88.0</td><td>88.6</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]	Efficiency [%]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	-	-	-	0.8	72.8	75.8	73.0	1.6	80.5	82.9	81.9	2.4	83.9	85.1	85.6	3.2	84.7	86.6	87.6	4.0	85.4	87.6	88.0	4.8	85.3	88.3	88.6	5.0	85.4	88.2	88.2	5.5	85.3	88.0	88.6	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																					
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2.4	83.9	85.1	85.6																																																					
3.2	84.7	86.6	87.6																																																					
4.0	85.4	87.6	88.0																																																					
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Note: Slanted line shows the range of the rated load current.																																																								

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BC-10490

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Model

LFA240F-48

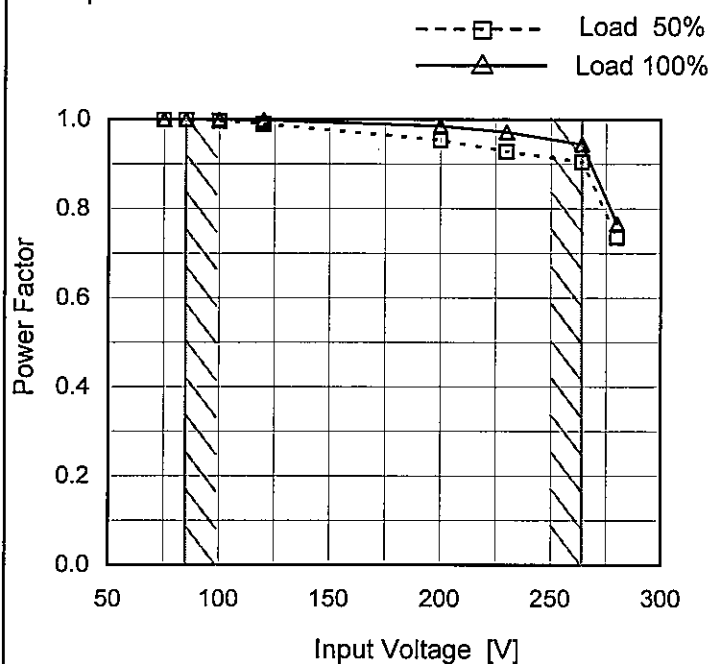
Item

Power Factor (by Input Voltage)

Object

Temperature
Testing Circuitry25°C
Figure A

1. Graph

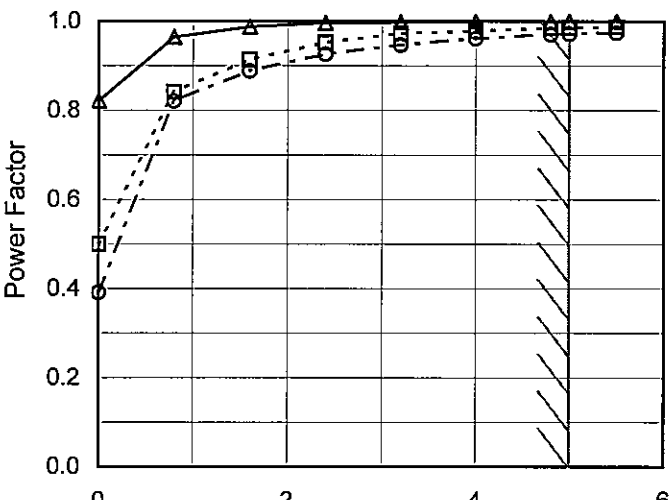


Note: Slanted line shows the range of the rated input voltage.

2. Values

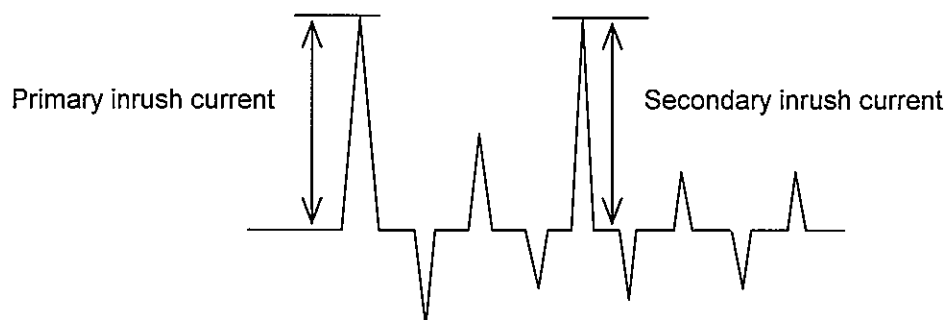
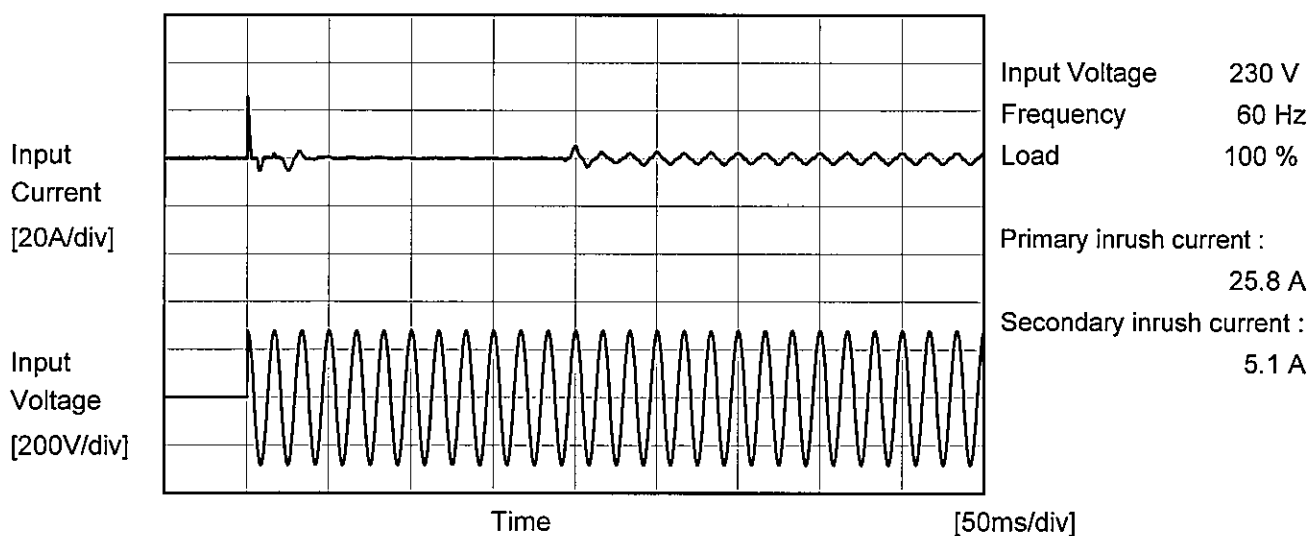
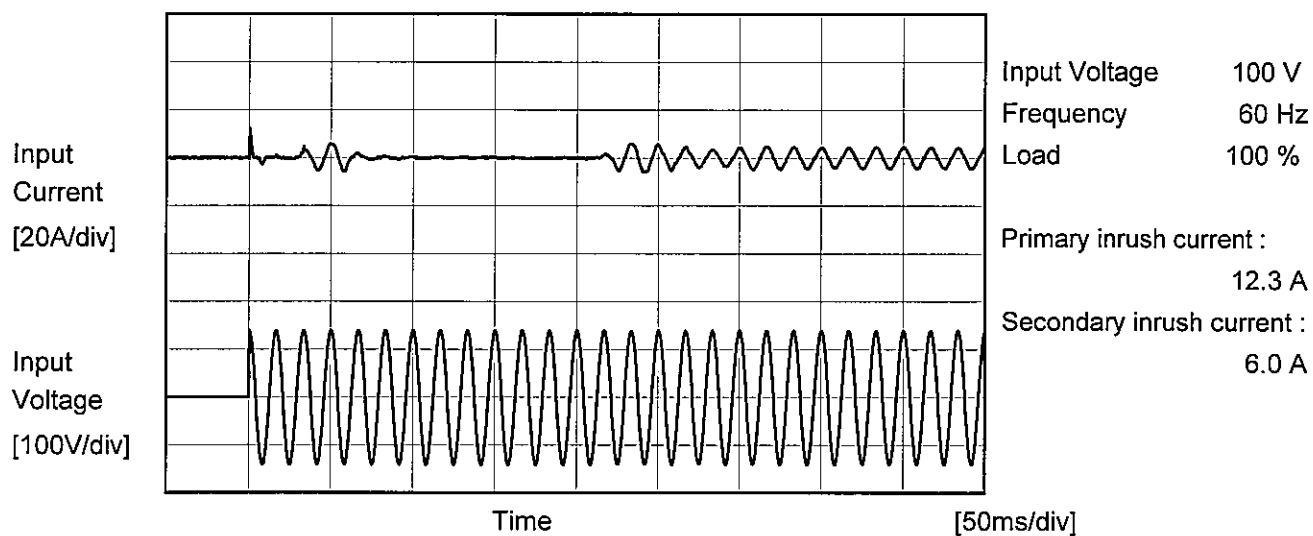
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.999	0.999
85	0.999	0.999
100	0.997	0.999
120	0.990	0.999
200	0.953	0.986
230	0.928	0.972
264	0.904	0.945
280	0.736	0.767
--	-	-

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Model		LFA240F-48		Temperature 25°C	
Item		Power Factor (by Load Current)		Testing Circuitry Figure A	
Object		_____			
1.Graph					
		—△— Input Volt. 100V		2.Values	
		---□--- Input Volt. 200V			
		---○--- Input Volt. 230V			
					
Power Factor		Load Current [A]			
		</			

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Model	LFA240F-48	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



		Temperature 25°C Testing Circuitry Figure B
Model	LFA240F-48	
Item	Leakage Current	
Object	_____	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.23	0.28	0.30	Operation
	One of phase	0.17	0.38	0.46	stand by
IEC60950-1	Both phases	0.09	0.20	0.24	Operation
	One of phase	0.17	0.36	0.44	stand by

The value for "One phase" 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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Model

LFA240F-48

Item

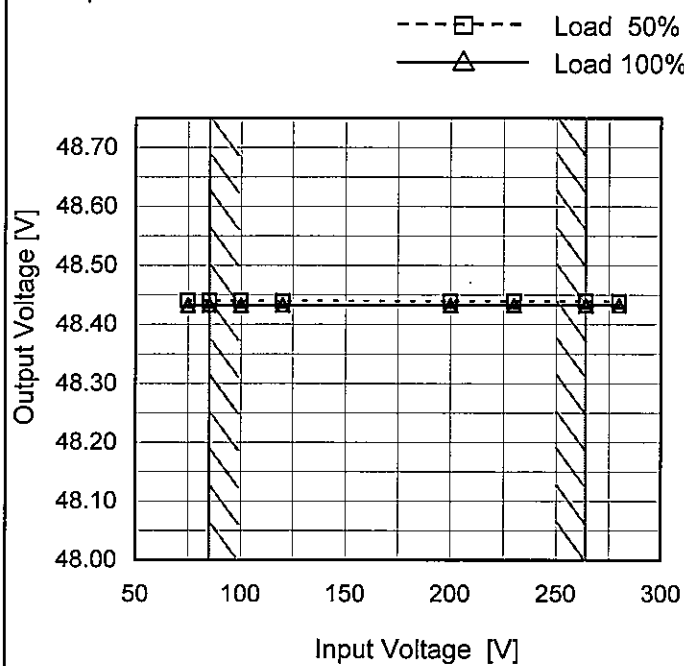
Line Regulation

Object

+48V5A

 Temperature 25°C
 Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	48.440	48.433
85	48.440	48.433
100	48.440	48.433
120	48.439	48.433
200	48.439	48.433
230	48.439	48.433
264	48.439	48.433
280	48.439	48.433
---	-	-

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Model

LFA240F-48

Item

Load Regulation

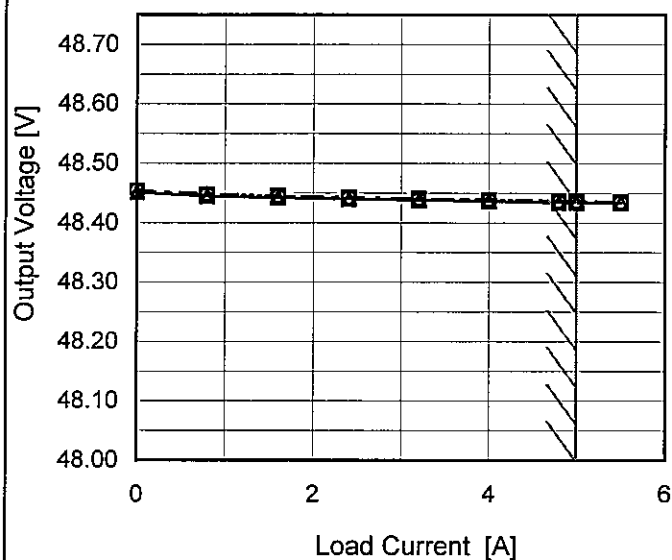
Object

+48V5A

Temperature
Testing Circuitry25°C
Figure A

1. Graph

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



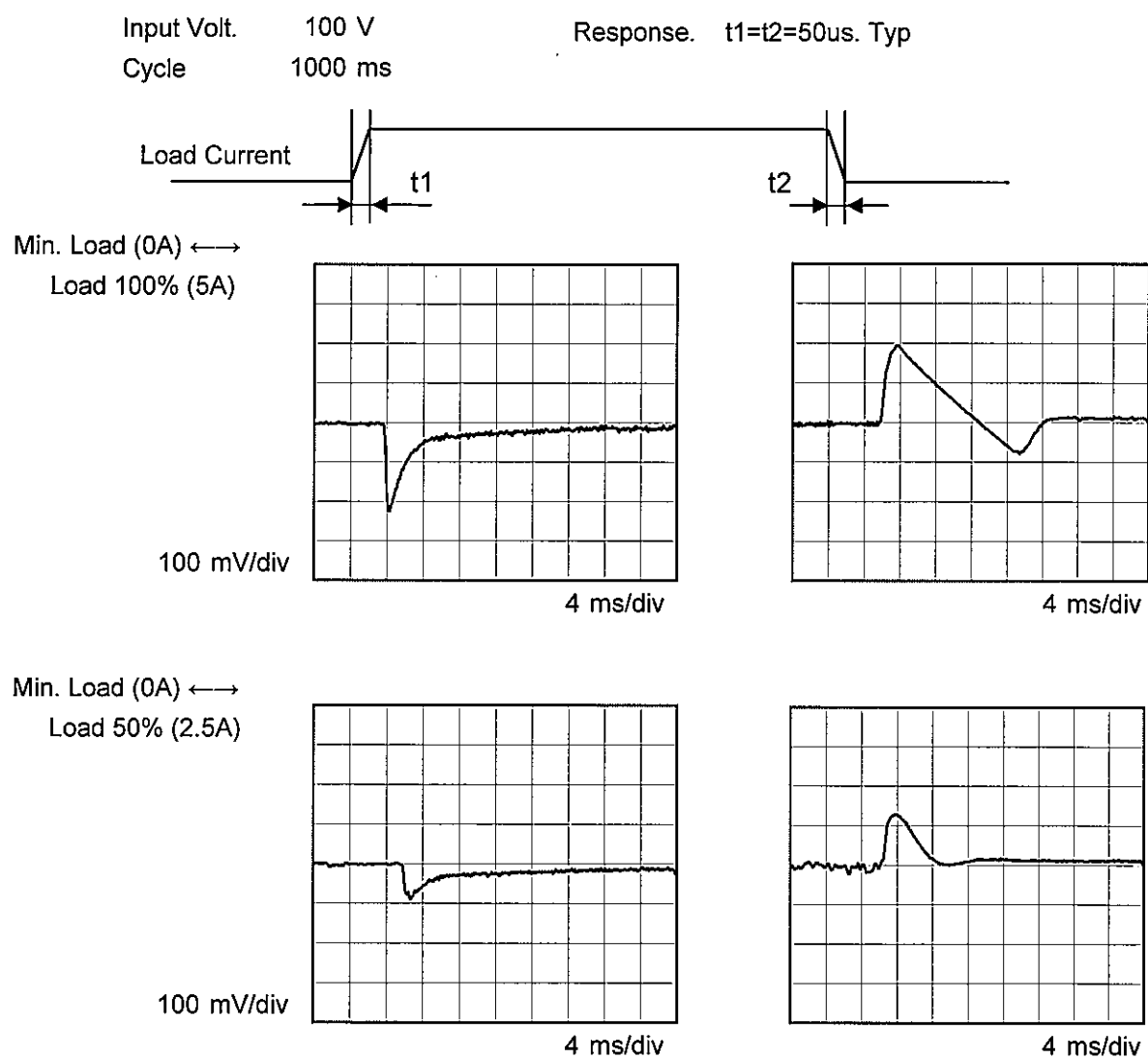
Note: Slanted line shows the range of the rated load current.

2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	48.451	48.454	48.455
0.8	48.445	48.447	48.448
1.6	48.443	48.445	48.445
2.4	48.440	48.442	48.443
3.2	48.439	48.441	48.440
4.0	48.437	48.439	48.439
4.8	48.435	48.437	48.437
5.0	48.434	48.436	48.436
5.5	48.433	48.435	48.435
--	-	-	-
--	-	-	-

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Model	LFA240F-48	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+48V5A		



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Model

LFA240F-48

Item

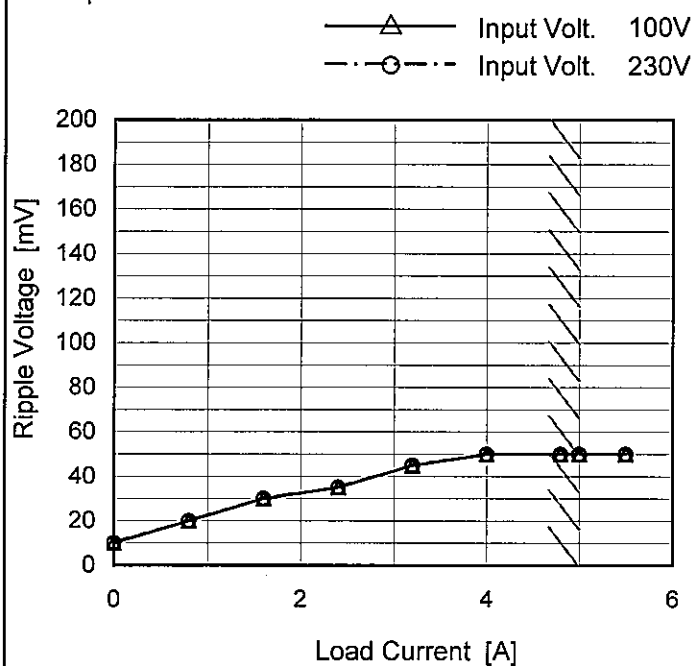
Ripple Voltage (by Load Current)

Object

+48V5A

Temperature
Testing Circuitry25°C
Figure C

1. Graph



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.

2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	10	10
0.8	20	20
1.6	30	30
2.4	35	35
3.2	45	45
4.0	50	50
4.8	50	50
5.0	50	50
5.5	50	50
--	-	-
--	-	-

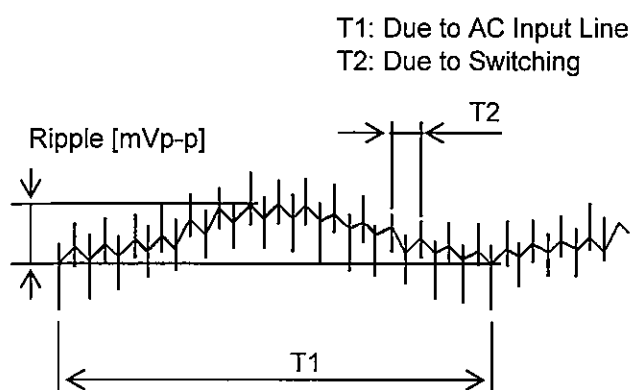
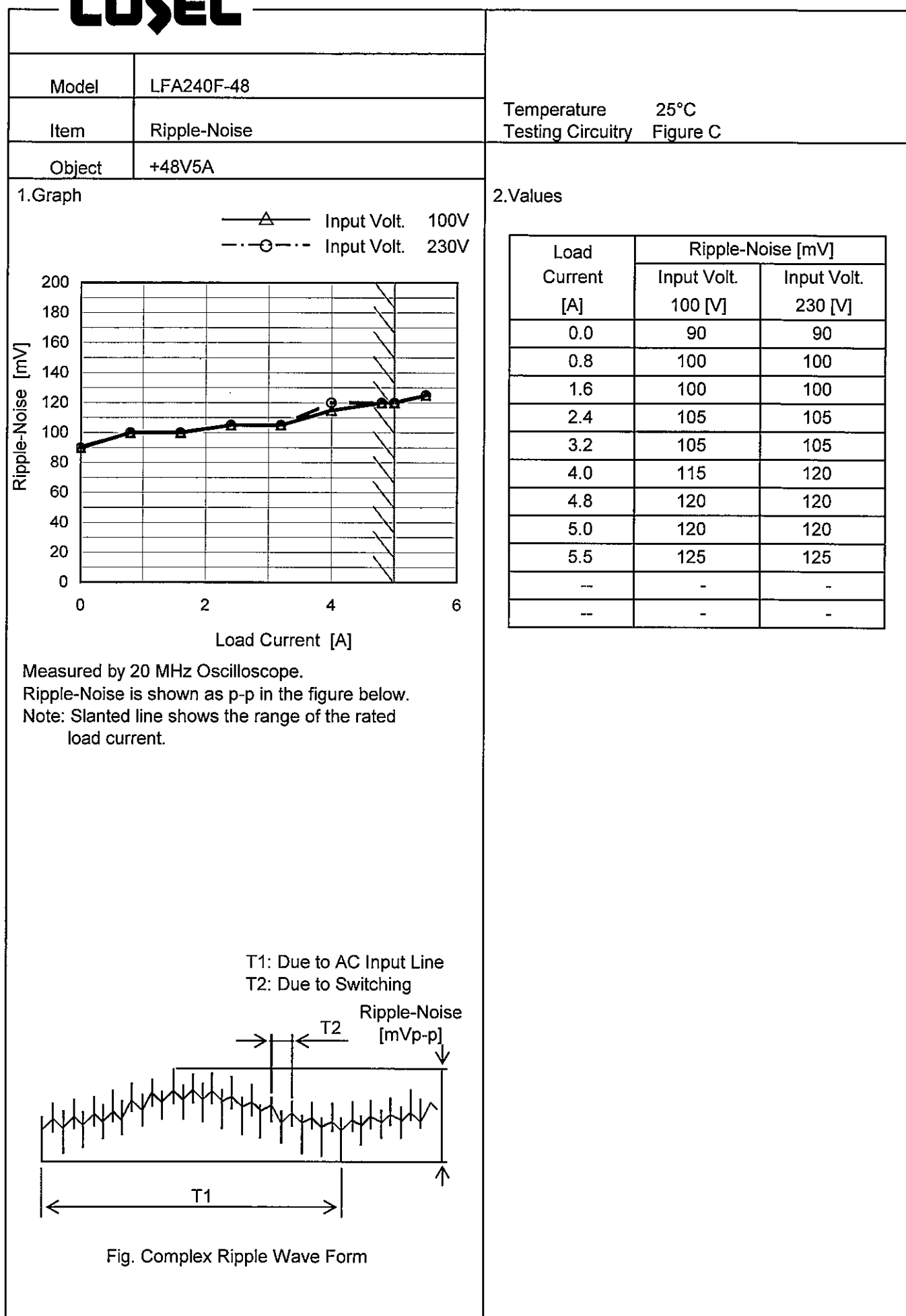


Fig. Complex Ripple Wave Form

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Model

LFA240F-48

Item

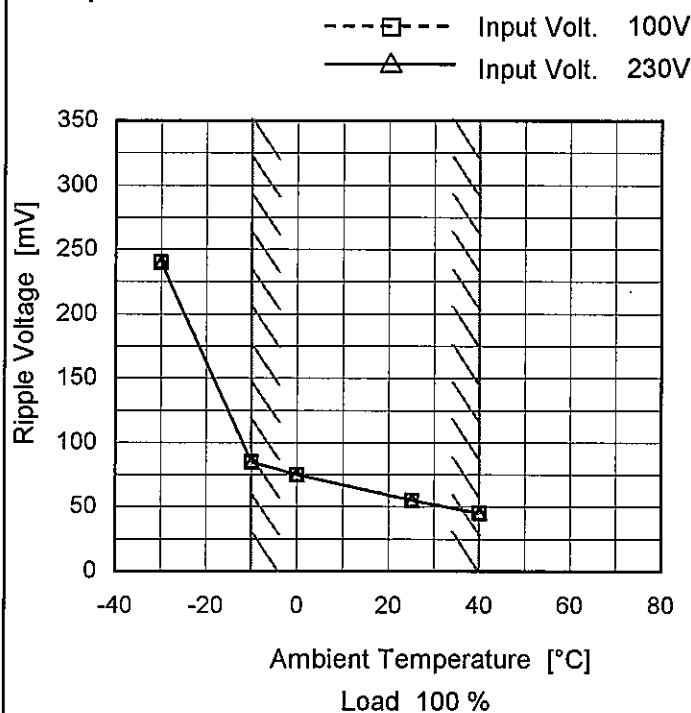
Ripple Voltage (by Ambient Temp.)

Object

+48V5A

Testing Circuitry Figure C

1. Graph



Measured by 20 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	240	240
-10	85	85
0	75	75
25	50	50
40	45	45
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Model		LFA240F-48																																																				
Item		Ambient Temperature Drift																																																				
Object		+48V5A																																																				
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>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>48.381</td><td>48.381</td><td>48.382</td></tr><tr><td>-10</td><td>48.389</td><td>48.390</td><td>48.391</td></tr><tr><td>0</td><td>48.398</td><td>48.399</td><td>48.399</td></tr><tr><td>10</td><td>48.409</td><td>48.409</td><td>48.410</td></tr><tr><td>20</td><td>48.424</td><td>48.425</td><td>48.426</td></tr><tr><td>25</td><td>48.439</td><td>48.439</td><td>48.439</td></tr><tr><td>30</td><td>48.445</td><td>48.444</td><td>48.444</td></tr><tr><td>40</td><td>48.447</td><td>48.447</td><td>48.446</td></tr><tr><td>50</td><td>48.450</td><td>48.449</td><td>48.449</td></tr><tr><td>60</td><td>48.445</td><td>48.443</td><td>48.442</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	48.381	48.381	48.382	-10	48.389	48.390	48.391	0	48.398	48.399	48.399	10	48.409	48.409	48.410	20	48.424	48.425	48.426	25	48.439	48.439	48.439	30	48.445	48.444	48.444	40	48.447	48.447	48.446	50	48.450	48.449	48.449	60	48.445	48.443	48.442	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
-20	48.381	48.381	48.382																																																			
-10	48.389	48.390	48.391																																																			
0	48.398	48.399	48.399																																																			
10	48.409	48.409	48.410																																																			
20	48.424	48.425	48.426																																																			
25	48.439	48.439	48.439																																																			
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60	48.445	48.443	48.442																																																			
--	-	-	-																																																			



		Testing Circuitry Figure A
Model	LFA240F-48	
Item	Output Voltage Accuracy	
Object	+48V5A	

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 : -20 - 60°C

Input Voltage : 85 - 264V

Load Current : 0 - 5A

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

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

2. Values

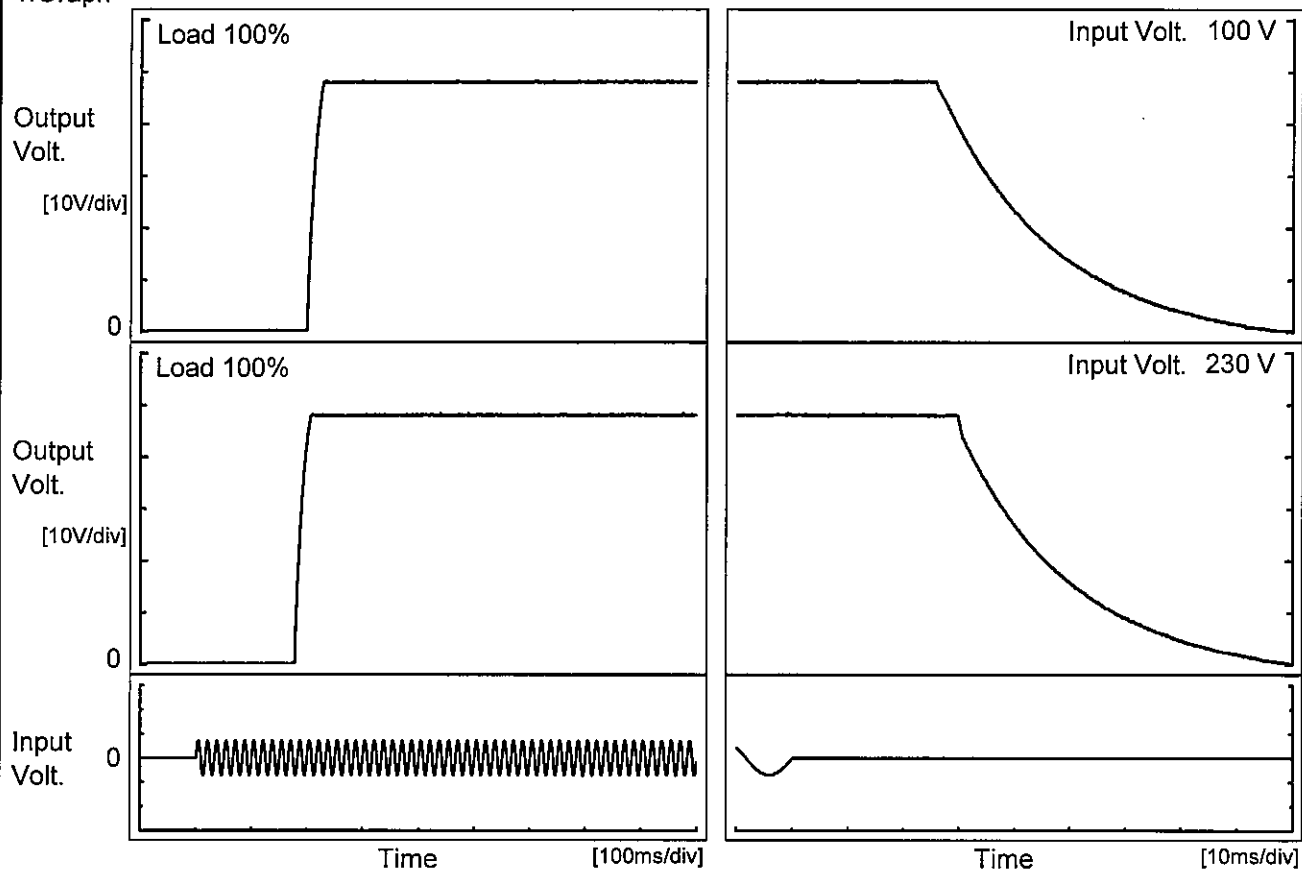
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	264	0	48.468	±44	±0.1
Minimum Voltage	-20	85	5	48.380		

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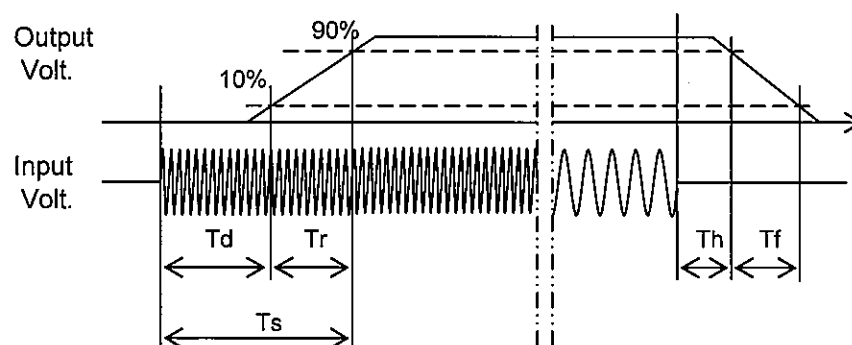
Model	LFA240F-48	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+48V5A		

1.Graph



2.Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		201.0	21.0	222.0	29.4	48.9
230 V		180.0	21.0	201.0	32.4	49.1



<div> <div>Model</div> <div>LFA240F-48</div> </div> <div> <div>Item</div> <div>Hold-Up Time</div> </div> <div> <div>Object</div> <div>+48V5A</div> </div>		<div> <div>Temperature</div> <div>25°C</div> </div> <div> <div>Testing Circuitry</div> <div>Figure A</div> </div>																																
<div>1.Graph</div> <div> <div> <div> <div> <div>---</div> <div>□</div> <div>---</div> </div> <div>Load 50%</div> </div> <div> <div>—</div> <div>△</div> <div>—</div> </div> <div>Load 100%</div> </div> </div> <div> <div>Hold-Up Time [ms]</div> <div>1000</div> <div>100</div> <div>10</div> <div>1</div> <div>50</div> <div>100</div> <div>150</div> <div>200</div> <div>250</div> <div>300</div> <div>Input Voltage [V]</div> </div> <div> <div> <div>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</div> <div>Note: Slanted line shows the range of the rated input voltage.</div> </div> </div>		<div>2.Values</div> <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>54</td><td>26</td></tr> <tr><td>85</td><td>55</td><td>26</td></tr> <tr><td>100</td><td>56</td><td>28</td></tr> <tr><td>120</td><td>58</td><td>29</td></tr> <tr><td>200</td><td>62</td><td>31</td></tr> <tr><td>230</td><td>64</td><td>31</td></tr> <tr><td>264</td><td>66</td><td>32</td></tr> <tr><td>280</td><td>67</td><td>33</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	54	26	85	55	26	100	56	28	120	58	29	200	62	31	230	64	31	264	66	32	280	67	33	--	-	-
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Model	LFA240F-48																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+48V5A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div>—△— Input Volt. 100V</div><div>---□--- Input Volt. 200V</div><div>---○--- Input Volt. 230V</div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</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>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.8</td><td>128</td><td>181</td><td>186</td></tr><tr><td>1.6</td><td>65</td><td>95</td><td>97</td></tr><tr><td>2.4</td><td>43</td><td>63</td><td>64</td></tr><tr><td>3.2</td><td>31</td><td>46</td><td>47</td></tr><tr><td>4.0</td><td>26</td><td>38</td><td>38</td></tr><tr><td>4.8</td><td>22</td><td>29</td><td>30</td></tr><tr><td>5.0</td><td>21</td><td>29</td><td>30</td></tr><tr><td>5.5</td><td>20</td><td>27</td><td>28</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]	0.0	-	-	-	0.8	128	181	186	1.6	65	95	97	2.4	43	63	64	3.2	31	46	47	4.0	26	38	38	4.8	22	29	30	5.0	21	29	30	5.5	20	27	28	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
0.0	-	-	-																																																			
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--	-	-	-																																																			
Note: Slanted line shows the range of the rated load current.																																																						

[illegible]

Model		LFA240F-48	
Item		Overcurrent Protection	
Object		+48V5A	

1.Graph

Input Volt. 100V

Input Volt. 230V

Output Voltage [V]

60

40

20

0

0

2

4

6

8

Load Current [A]

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

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
45.6	6.62	6.61
43.2	6.58	6.57
38.4	6.75	6.75
33.6	6.85	6.84
28.8	6.93	6.92
24.0	7.02	7.01
19.2	7.10	7.08
14.4	7.14	7.05
9.6	7.14	7.05
4.8	7.21	7.09
0.0	7.16	7.11
--	-	-

- 22 -

BC-10490

Model		LFA240F-48	
Item		Overvoltage Protection	
Object		+48V5A	
1.Graph		2.Values	

COSEL

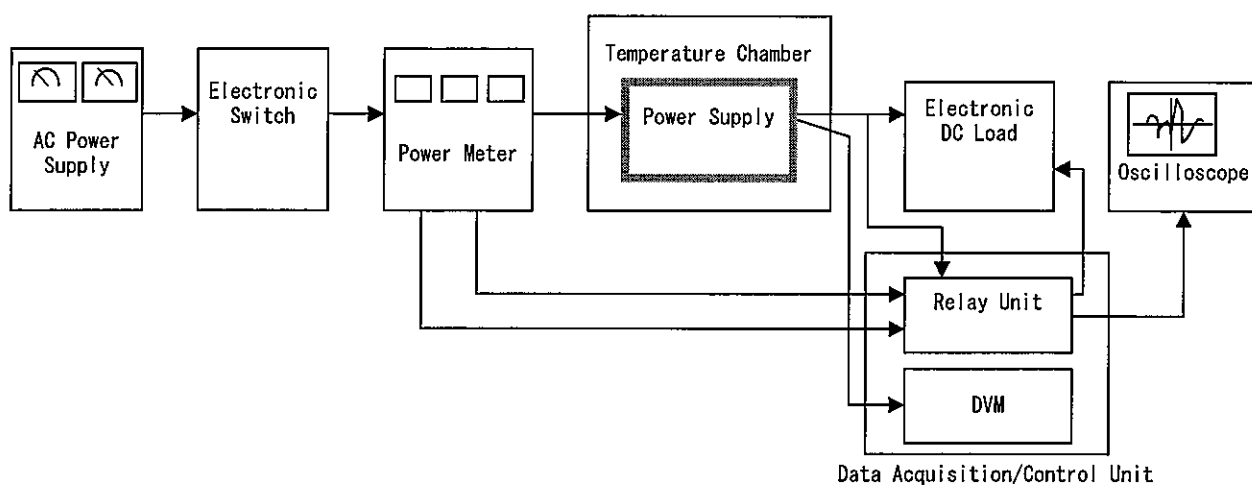


Figure A

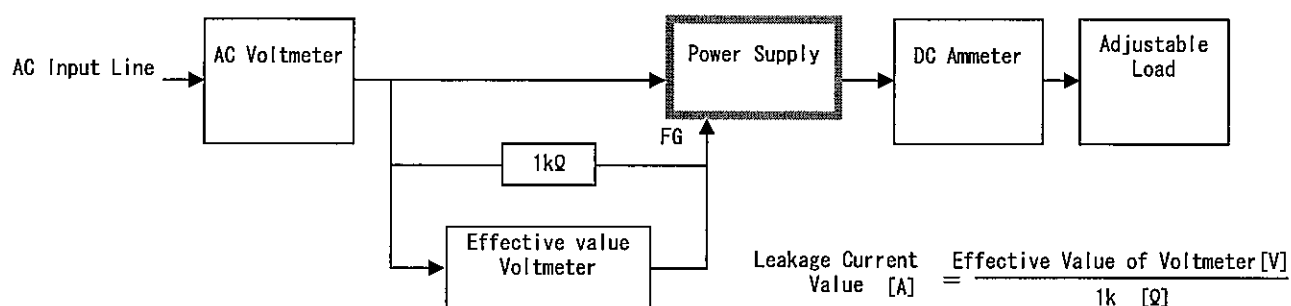


Figure B (DEN-AN)

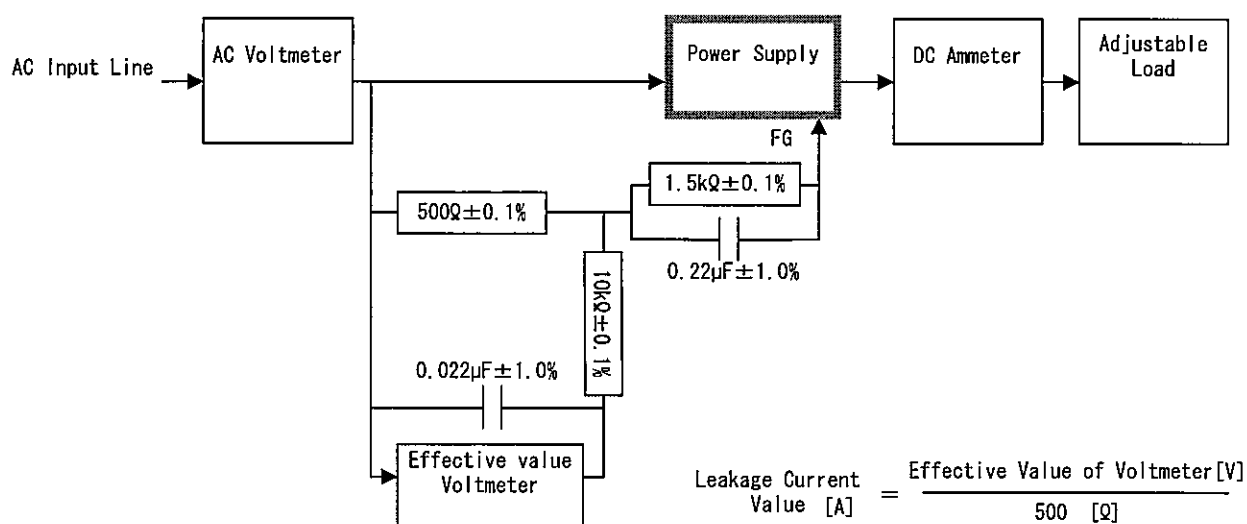


Figure B (IEC60950-1)

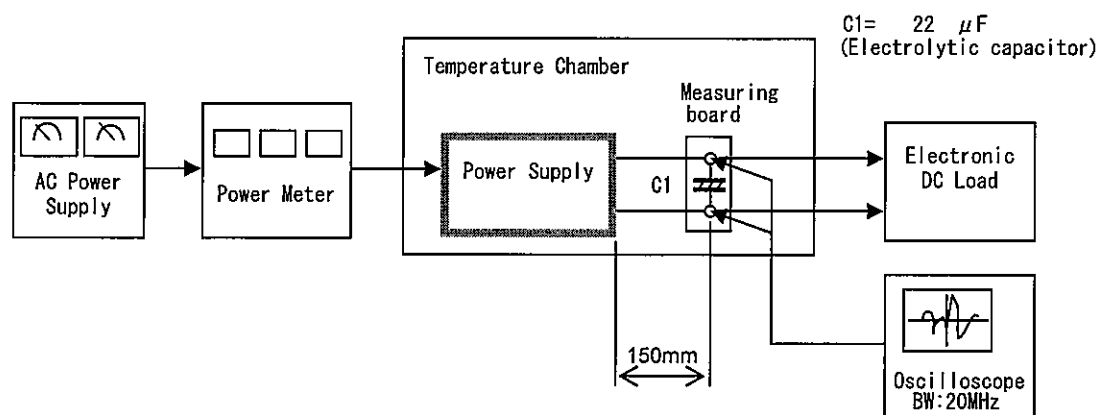


Figure C