



TEST DATA OF LFA50F-24

Regulated DC Power Supply
August 10, 2009

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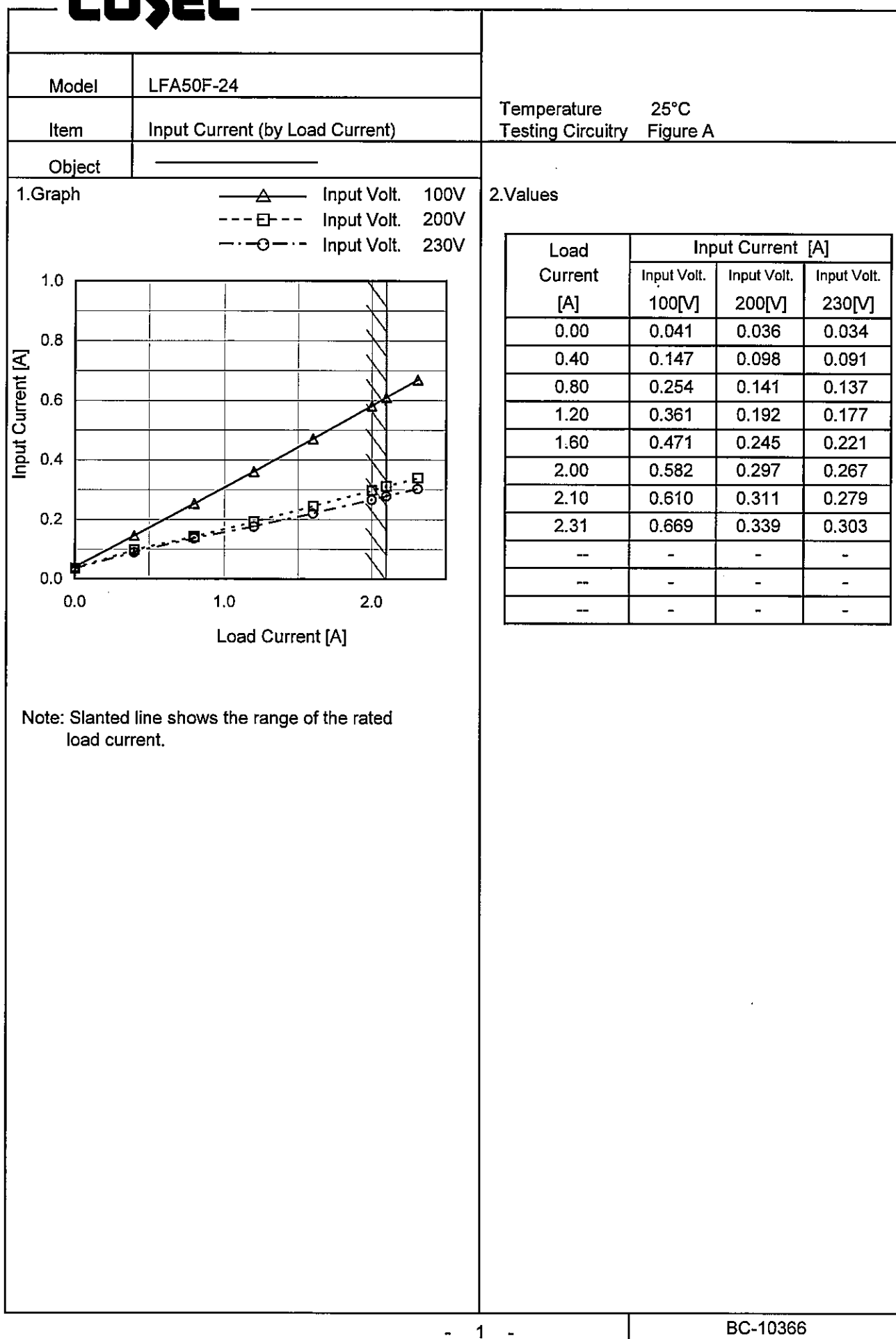
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Model LFA50F-24

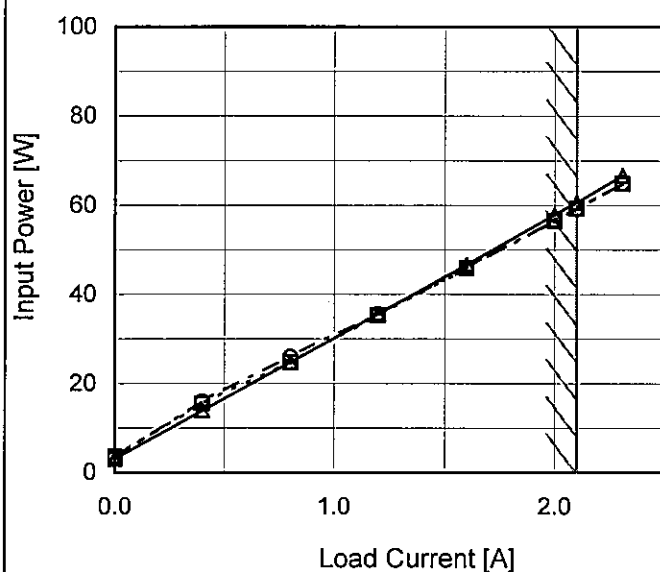
Item Input Power (by Load Current)

Object

Temperature 25°C
Testing Circuitry 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]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	3.06	3.60	3.40
0.40	13.92	15.50	16.00
0.80	24.75	24.80	26.10
1.20	35.61	35.30	35.60
1.60	46.70	45.90	46.00
2.00	57.90	56.50	56.60
2.10	60.60	59.20	59.20
2.31	66.70	64.80	64.90
--	-	-	-
--	-	-	-
--	-	-	-

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Model	LFA50F-24
Item	Efficiency (by Input Voltage)
Object	_____

1.Graph

---□--- Load 50%

—△— Load 100%

Input Voltage [V]	Efficiency [%] (Load 50%)	Efficiency [%] (Load 100%)
75	78.5	80.4
85	79.0	81.9
100	79.8	83.0
120	80.2	83.8
200	80.1	84.9
230	78.8	84.9
264	76.2	84.4
280	81.1	84.5

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

Temperature 25°C
 Testing Circuitry Figure A

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	78.5	80.4
85	79.0	81.9
100	79.8	83.0
120	80.2	83.8
200	80.1	84.9
230	78.8	84.9
264	76.2	84.4
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—	-	-

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Model		LFA50F-24																																																				
Item		Efficiency (by Load Current)																																																				
Object																																																						
1.Graph		2.Values																																																				
<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>86</div><div>78</div><div>70</div><div>62</div><div>54</div><div>46</div><div>38</div><div>30</div></div> <div><div>0.0</div><div>1.0</div><div>2.0</div></div> <div>Load Current [A]</div>		<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>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.40</td><td>68.8</td><td>61.7</td><td>59.9</td></tr><tr><td>0.80</td><td>77.4</td><td>77.2</td><td>73.4</td></tr><tr><td>1.20</td><td>80.7</td><td>81.3</td><td>80.7</td></tr><tr><td>1.60</td><td>82.0</td><td>83.4</td><td>83.3</td></tr><tr><td>2.00</td><td>82.7</td><td>84.7</td><td>84.6</td></tr><tr><td>2.10</td><td>83.0</td><td>84.9</td><td>84.9</td></tr><tr><td>2.31</td><td>82.9</td><td>85.3</td><td>85.2</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]	Efficiency [%]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	-	-	-	0.40	68.8	61.7	59.9	0.80	77.4	77.2	73.4	1.20	80.7	81.3	80.7	1.60	82.0	83.4	83.3	2.00	82.7	84.7	84.6	2.10	83.0	84.9	84.9	2.31	82.9	85.3	85.2	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.																																																						

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Model		LFA50F-24	
Item		Power Factor (by Input Voltage)	
Object			

1.Graph

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Model	LFA50F-24																																																					
Item	Power Factor (by Load Current)	Temperature	25°C																																																			
Object		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>Power Factor</p> <p>Load Current [A]</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Power Factor</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>0.750</td><td>0.500</td><td>0.430</td></tr><tr><td>0.40</td><td>0.949</td><td>0.795</td><td>0.766</td></tr><tr><td>0.80</td><td>0.975</td><td>0.876</td><td>0.826</td></tr><tr><td>1.20</td><td>0.985</td><td>0.919</td><td>0.875</td></tr><tr><td>1.60</td><td>0.992</td><td>0.939</td><td>0.907</td></tr><tr><td>2.00</td><td>0.995</td><td>0.950</td><td>0.922</td></tr><tr><td>2.10</td><td>0.995</td><td>0.953</td><td>0.924</td></tr><tr><td>2.31</td><td>0.997</td><td>0.956</td><td>0.930</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]	Power Factor			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	0.750	0.500	0.430	0.40	0.949	0.795	0.766	0.80	0.975	0.876	0.826	1.20	0.985	0.919	0.875	1.60	0.992	0.939	0.907	2.00	0.995	0.950	0.922	2.10	0.995	0.953	0.924	2.31	0.997	0.956	0.930	--	-	-	-	--	-	-	-	--	-	-	-
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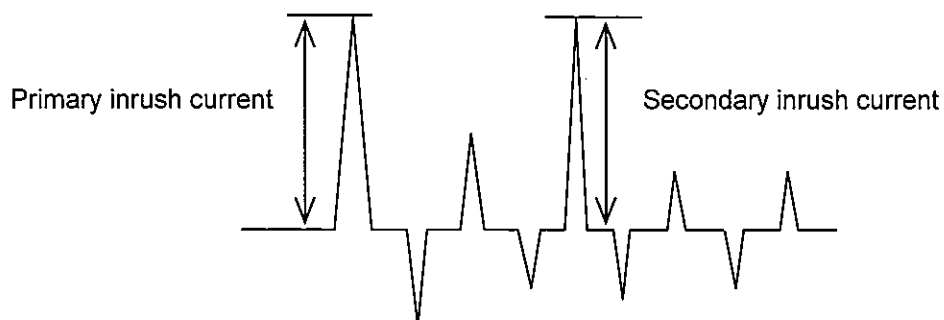
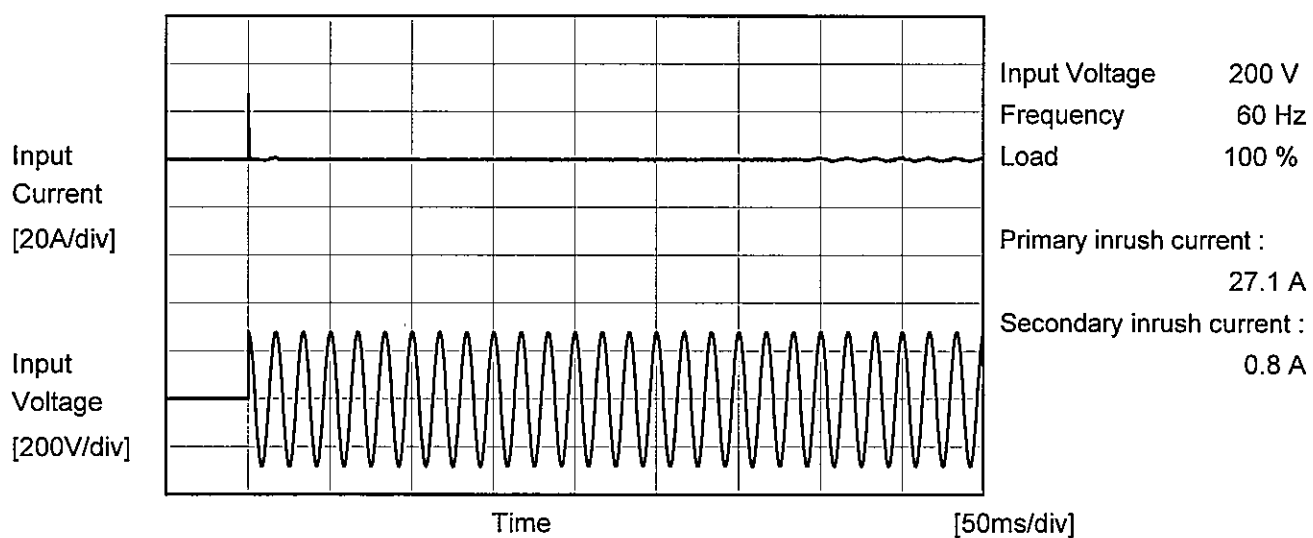
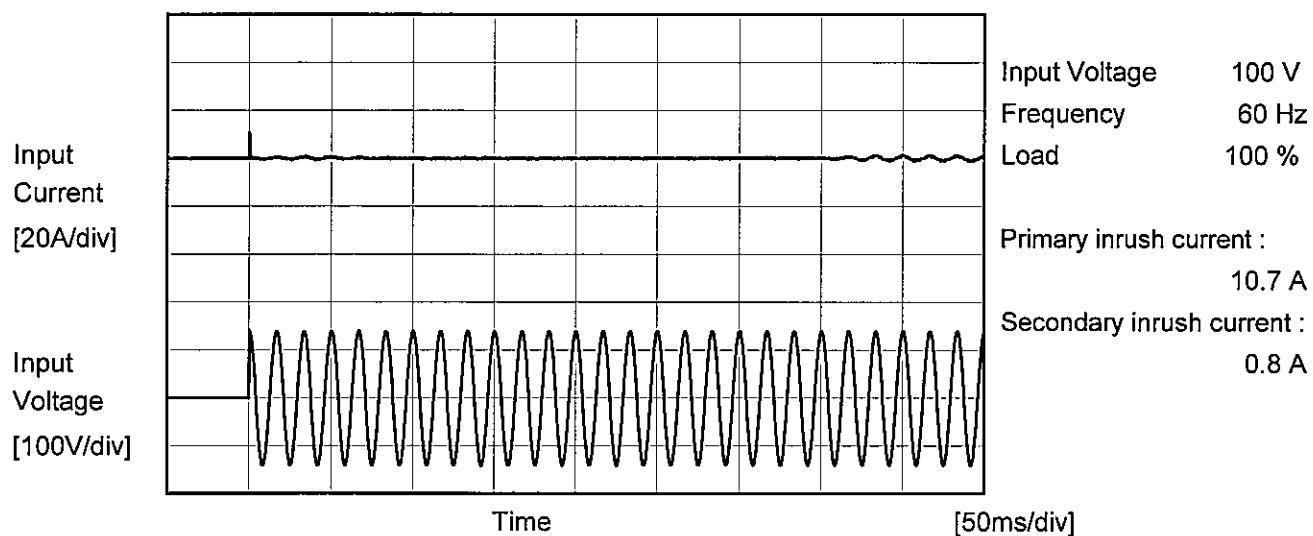
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Model	LFA50F-24	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		





		Temperature 25°C Testing Circuitry Figure B
Model	LFA50F-24	
Item	Leakage Current	
Object		

1.Results

[mA]

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

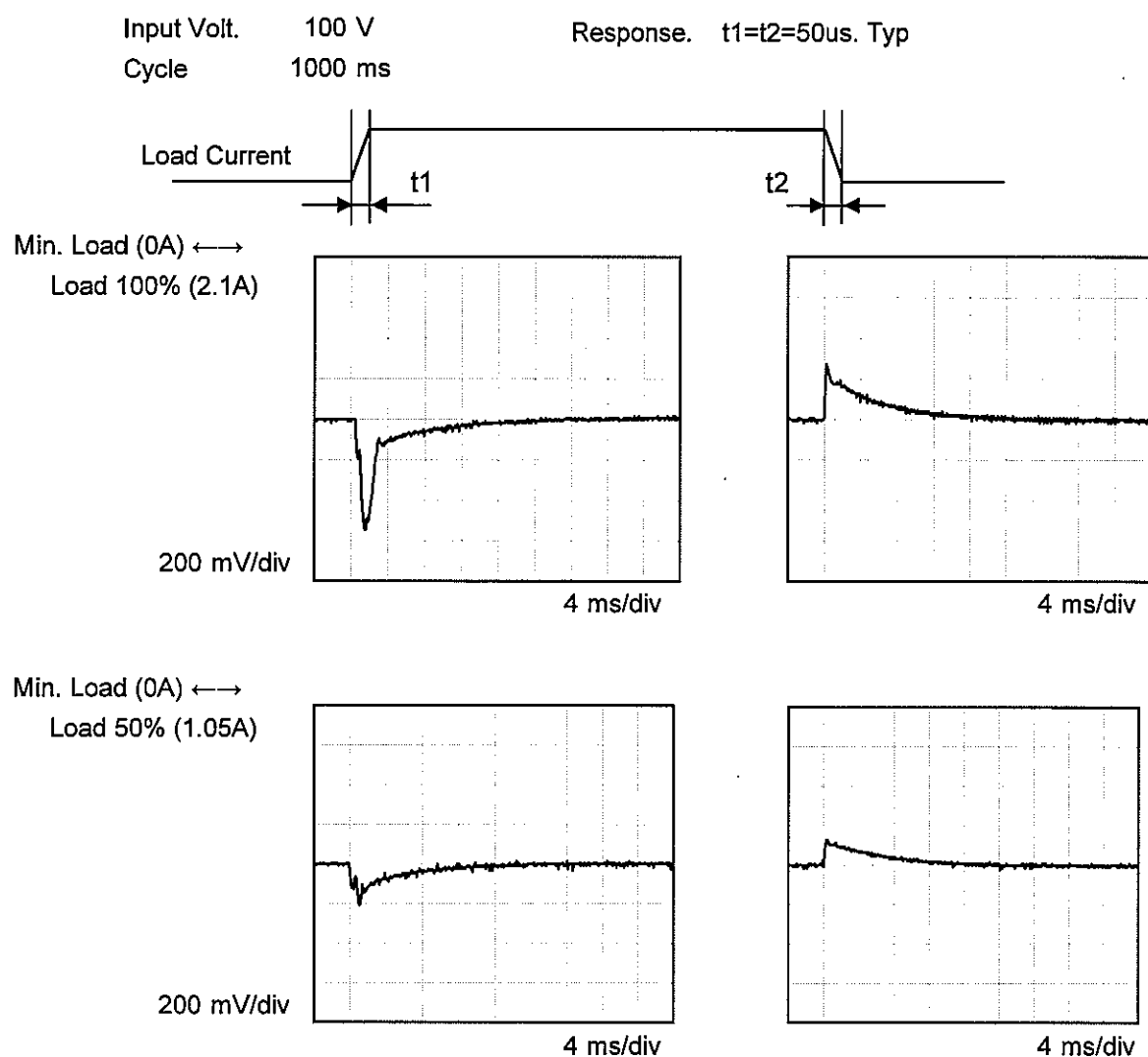
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

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Model		LFA50F-24																																	
Item		Line Regulation																																	
Object		+24V2.1A																																	
1.Graph		2.Values																																	
<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><div>Output Voltage [V]</div><div>24.30</div><div>24.20</div><div>24.10</div><div>24.00</div><div>23.90</div><div>23.80</div><div>23.70</div><div>23.60</div></div><div><div>50</div><div>100</div><div>150</div><div>200</div><div>250</div><div>300</div></div><div><div>Input Voltage [V]</div></div></div></div> <div><div>Note: Slanted line shows the range of the rated input voltage.</div></div>		<table><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><tr><td>75</td><td>24.045</td><td>24.037</td></tr><tr><td>85</td><td>24.045</td><td>24.037</td></tr><tr><td>100</td><td>24.045</td><td>24.036</td></tr><tr><td>120</td><td>24.045</td><td>24.036</td></tr><tr><td>200</td><td>24.045</td><td>24.036</td></tr><tr><td>230</td><td>24.045</td><td>24.035</td></tr><tr><td>264</td><td>24.045</td><td>24.035</td></tr><tr><td>280</td><td>24.045</td><td>24.035</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	24.045	24.037	85	24.045	24.037	100	24.045	24.036	120	24.045	24.036	200	24.045	24.036	230	24.045	24.035	264	24.045	24.035	280	24.045	24.035	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
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120	24.045	24.036																																	
200	24.045	24.036																																	
230	24.045	24.035																																	
264	24.045	24.035																																	
280	24.045	24.035																																	
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Model	LFA50F-24	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+24V2.1A		



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Model		LFA50F-24	
Item		Ripple Voltage (by Load Current)	
Object		+24V2.1A	
1.Graph		2.Values	

—△—

Input Volt.

100V

- - ○ - -

Input Volt.

200V

Ripple Voltage [mV]

100

90

80

70

60

50

40

30

20

10

0

0.0

1.0

2.0

Load Current [A]

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	15	15
0.40	10	10
0.80	10	10
1.20	10	10
1.60	15	15
2.00	15	15
2.10	15	15
2.31	15	15
--	-	-
--	-	-
--	-	-

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.

T1: Due to AC Input Line

T2: Due to Switching

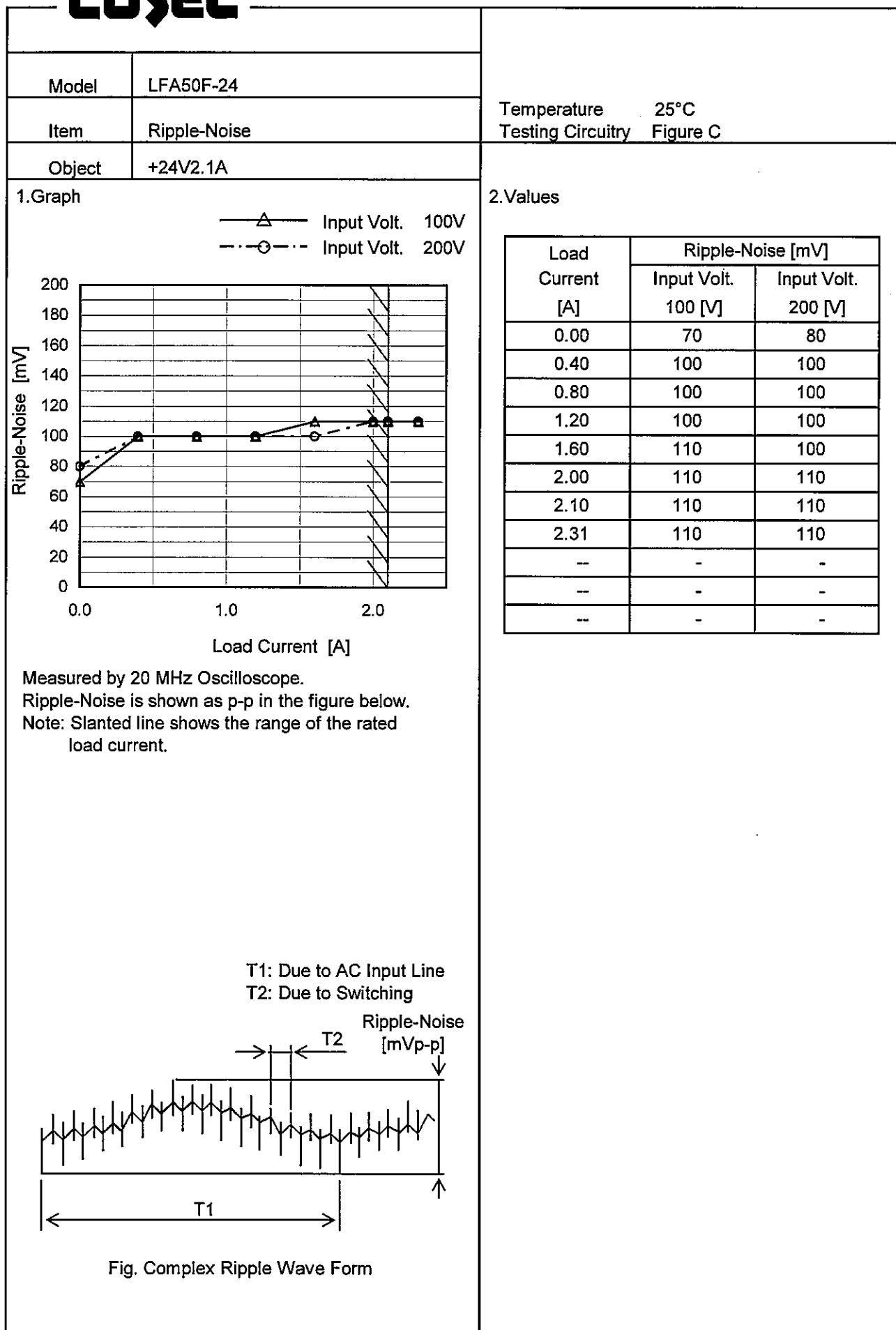
Ripple [mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

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Testing Circuitry Figure A



Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	24.031	24.031	24.031
-10	24.034	24.034	24.034
0	24.034	24.034	24.034
10	24.036	24.035	24.035
20	24.034	24.034	24.034
25	24.036	24.036	24.035
30	24.033	24.033	24.033
40	24.026	24.025	24.025
50	24.016	24.015	24.016
60	24.000	24.000	24.000
--	-	-	-

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

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		Testing Circuitry Figure A
Model	LFA50F-24	
Item	Output Voltage Accuracy	
Object	+24V2.1A	

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 - 2.1A

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

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

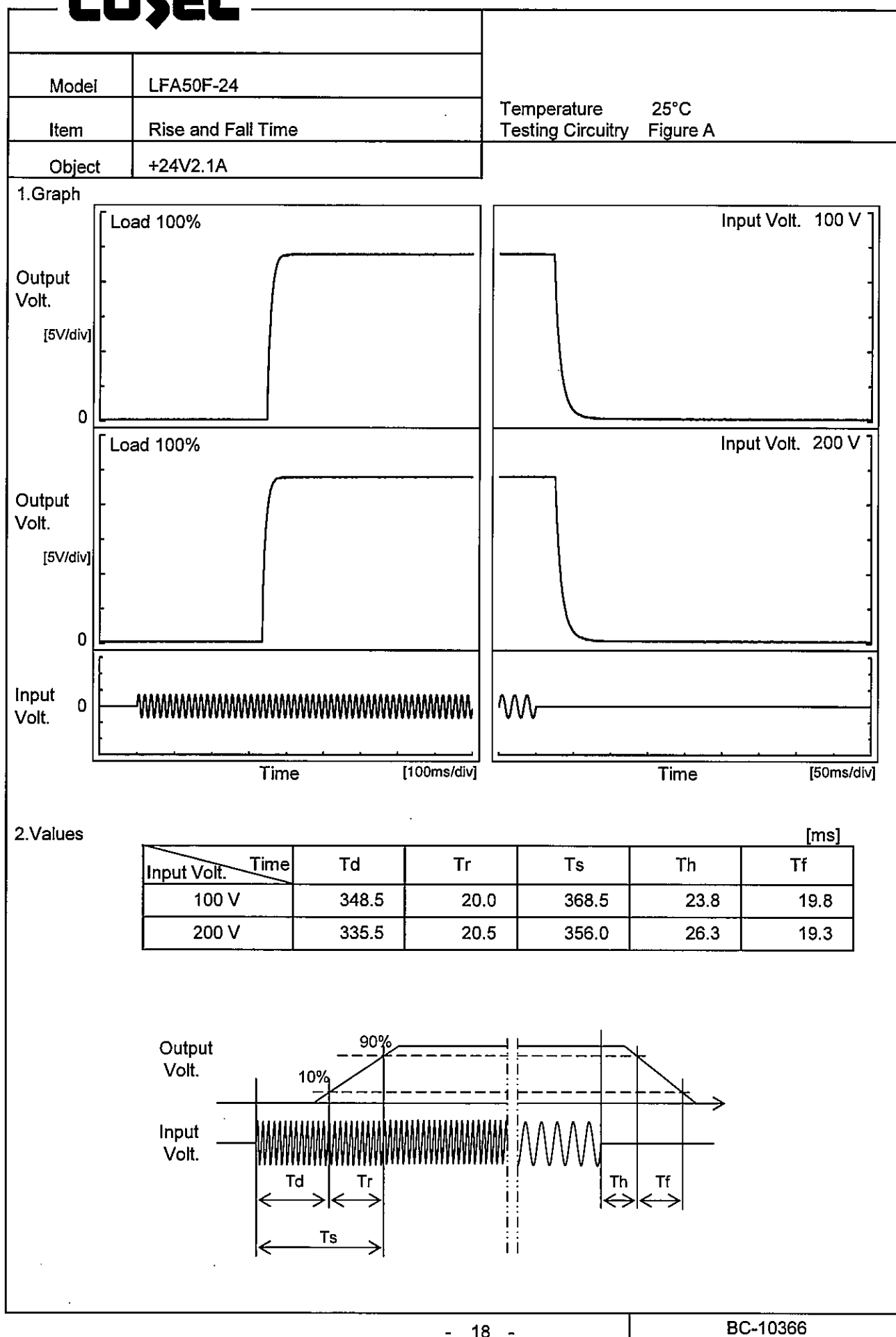
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	264	0	24.051	±18	±0.1
Minimum Voltage	50	264	2.1	24.015		

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Model		LFA50F-24	
Item		Time Lapse Drift	
Object		+24V2.1A	
1.Graph		2.Values	
<div><div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></di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Model		LFA50F-24	
Item		Hold-Up Time	
Object		+24V2.1A	
1.Graph		2.Values	

<

Temperature	25°C
Testing Circuitry	Figure A



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

BC-10366

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		Temperature 25°C Testing Circuitry Figure A																																									
Model	LFA50F-24																																										
Item	Overcurrent Protection																																										
Object	+24V2.1A																																										
1.Graph <div style="text-align: center;"> </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>		2.Values <table border="1"> <thead> <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> </thead> <tbody> <tr><td>24.0</td><td>2.55</td><td>2.60</td></tr> <tr><td>22.8</td><td>-</td><td>-</td></tr> <tr><td>21.6</td><td>-</td><td>-</td></tr> <tr><td>19.2</td><td>-</td><td>-</td></tr> <tr><td>16.8</td><td>-</td><td>-</td></tr> <tr><td>14.4</td><td>-</td><td>-</td></tr> <tr><td>12.0</td><td>-</td><td>-</td></tr> <tr><td>9.6</td><td>-</td><td>-</td></tr> <tr><td>7.2</td><td>-</td><td>-</td></tr> <tr><td>4.8</td><td>-</td><td>-</td></tr> <tr><td>2.4</td><td>-</td><td>-</td></tr> <tr><td>0.0</td><td>-</td><td>-</td></tr> </tbody> </table>	Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	24.0	2.55	2.60	22.8	-	-	21.6	-	-	19.2	-	-	16.8	-	-	14.4	-	-	12.0	-	-	9.6	-	-	7.2	-	-	4.8	-	-	2.4	-	-	0.0	-	-
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4.8	-	-																																									
2.4	-	-																																									
0.0	-	-																																									

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Model	LFA50F-24
Item	Overvoltage Protection
Object	+24V2.1A

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 200V

Operating Point [V]

Ambient Temperature [°C]

Load 0%

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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	30.13	30.07
-10	30.36	30.36
0	30.65	30.60
10	30.89	30.89
20	31.12	31.12
25	31.30	31.24
30	31.35	31.36
40	31.65	31.65
50	31.88	31.88
60	32.12	32.12
--	-	-

COSEL

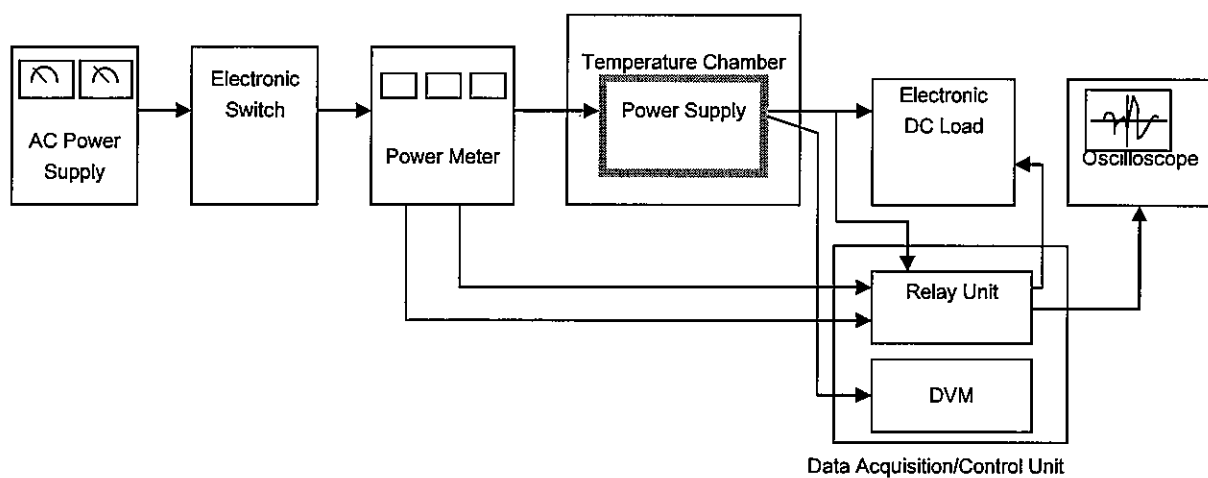


Figure A

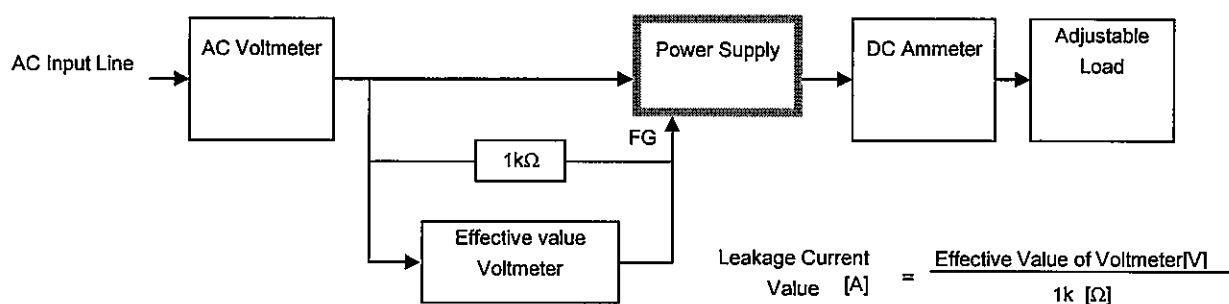


Figure B (DEN-AN)

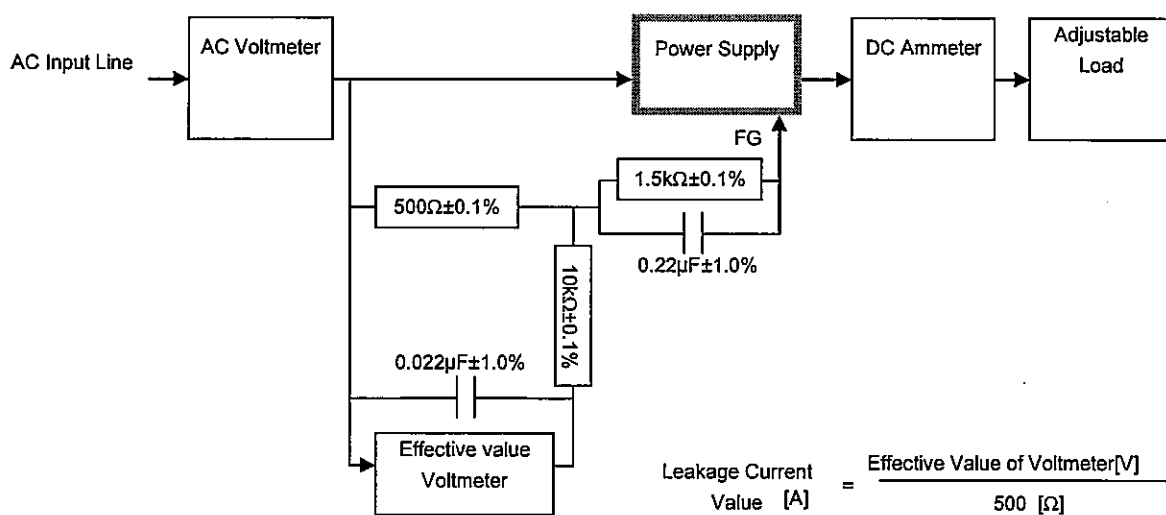


Figure B (IEC60950-1)

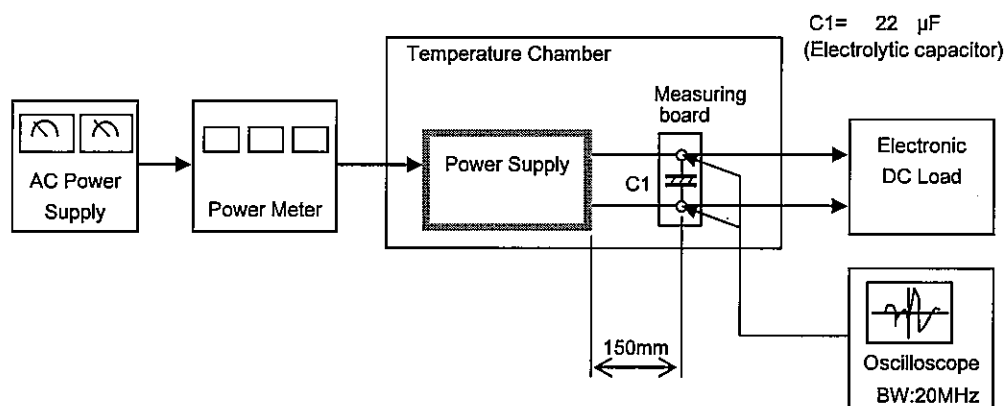


Figure C