



TEST DATA OF LGA50A-48

Regulated DC Power Supply
July 14, 2011

Approved by : Kenji Shiho Design Manager

Prepared by : Yosuke Saitou Design Engineer

COSEL CO.,LTD.

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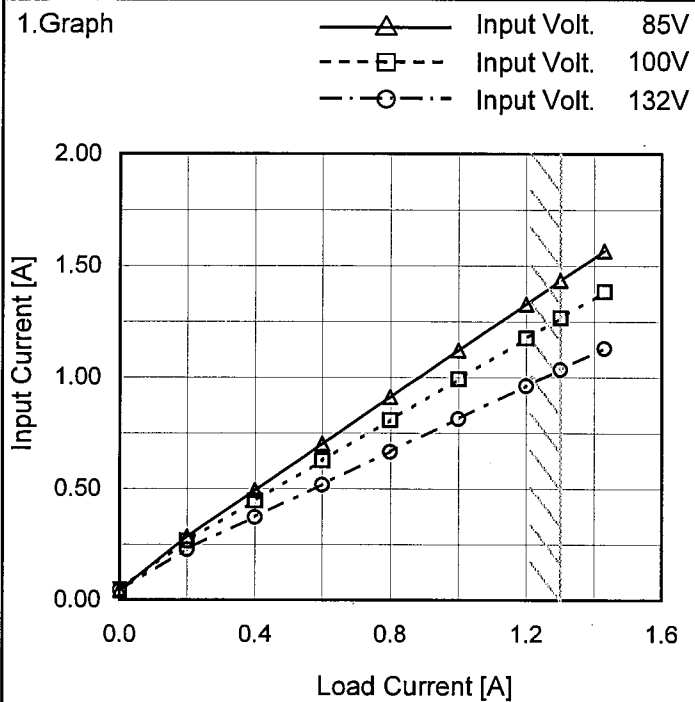
Model LGA50A-48

Item Input Current (by Load Current)

Object

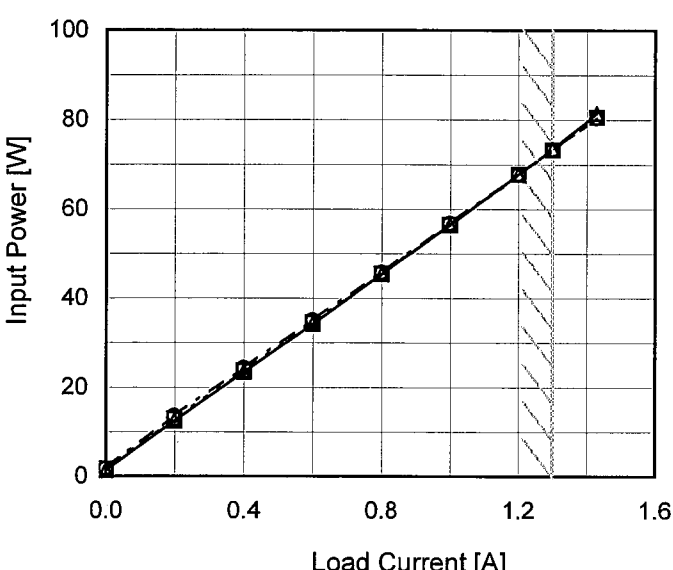
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.044	0.046	0.043
0.20	0.285	0.265	0.228
0.40	0.494	0.445	0.373
0.60	0.702	0.626	0.519
0.80	0.912	0.808	0.666
1.00	1.122	0.992	0.814
1.20	1.329	1.175	0.962
1.30	1.436	1.266	1.036
1.43	1.568	1.384	1.131
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<div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>---○---</div><div>Input Volt.</div><div>132V</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">Input Power [W]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.00</td><td>1.38</td><td>1.62</td><td>1.83</td></tr><tr><td>0.20</td><td>12.52</td><td>12.87</td><td>13.63</td></tr><tr><td>0.40</td><td>23.50</td><td>23.70</td><td>24.40</td></tr><tr><td>0.60</td><td>34.30</td><td>34.50</td><td>35.10</td></tr><tr><td>0.80</td><td>45.50</td><td>45.50</td><td>45.80</td></tr><tr><td>1.00</td><td>56.50</td><td>56.50</td><td>56.80</td></tr><tr><td>1.20</td><td>67.80</td><td>67.70</td><td>67.80</td></tr><tr><td>1.30</td><td>73.50</td><td>73.20</td><td>73.30</td></tr><tr><td>1.43</td><td>81.50</td><td>80.50</td><td>80.50</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 Power [W]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.00	1.38	1.62	1.83	0.20	12.52	12.87	13.63	0.40	23.50	23.70	24.40	0.60	34.30	34.50	35.10	0.80	45.50	45.50	45.80	1.00	56.50	56.50	56.80	1.20	67.80	67.70	67.80	1.30	73.50	73.20	73.30	1.43	81.50	80.50	80.50	—	-	-	-	—	-	-	-
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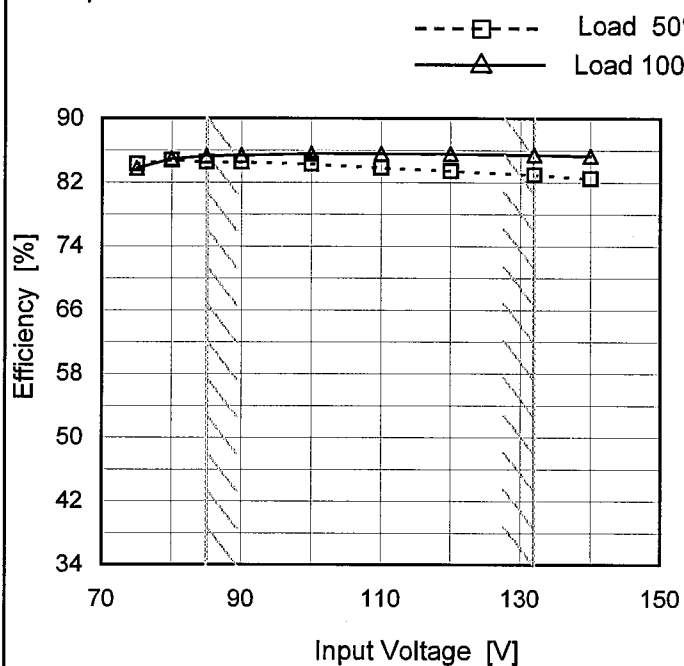
Model LGA50A-48

Item Efficiency (by Input Voltage)

Object

Temperature 25°C
Testing Circuitry 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	84.3	83.8
80	84.8	85.0
85	84.5	85.3
90	84.5	85.4
100	84.3	85.6
110	83.8	85.6
120	83.4	85.6
132	82.9	85.4
140	82.5	85.3

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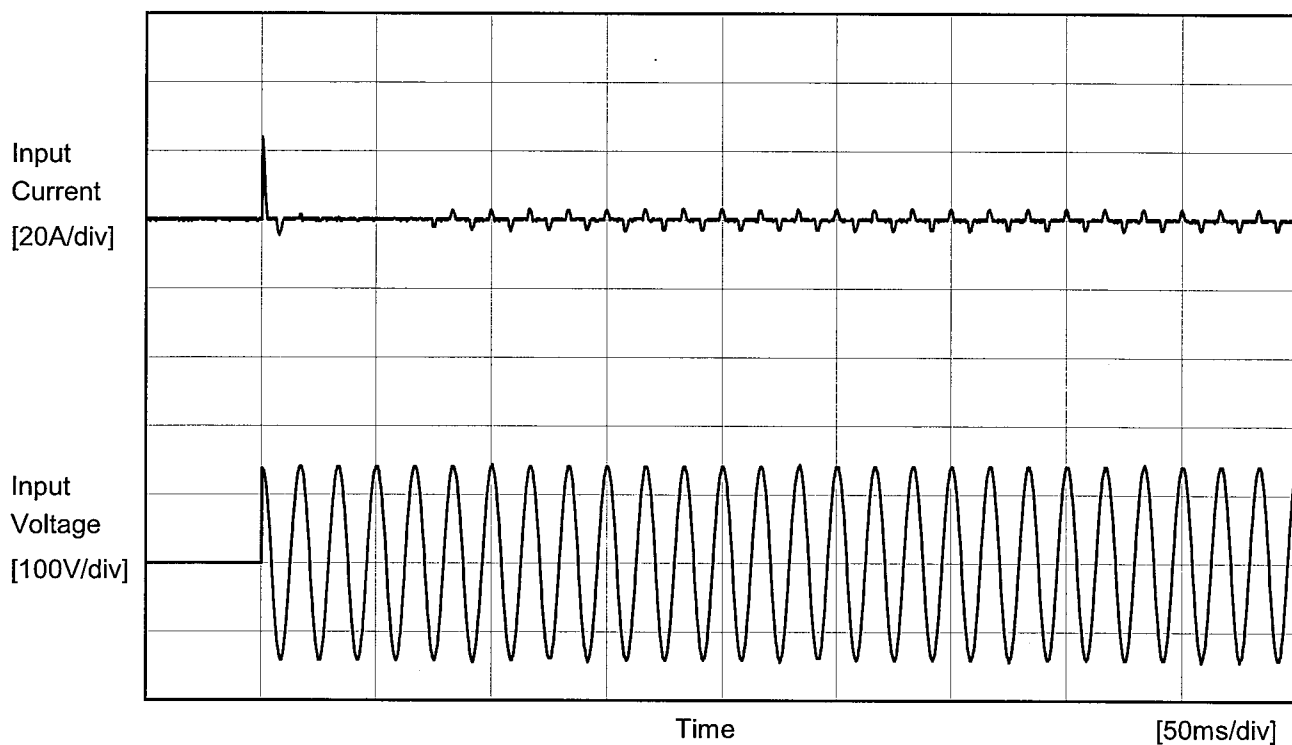
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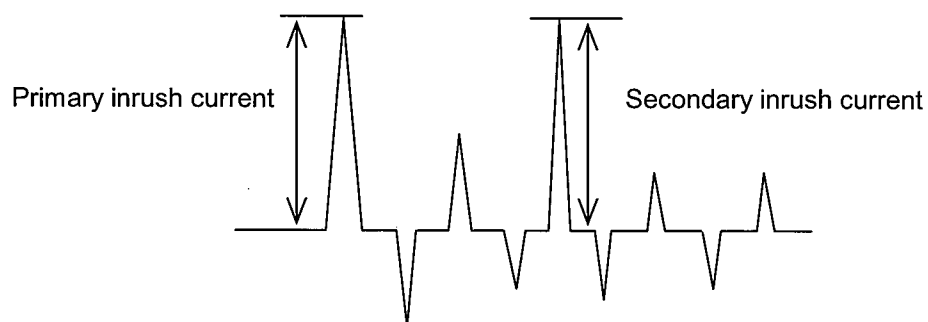
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Model	LGA50A-48	Temperature 25°C Testing Circuitry Figure A	
Item	Inrush Current		
Object			



Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current 23.9 A
Secondary inrush current 3.3 A



		Temperature 25°C Testing Circuitry Figure B
Model	LGA50A-48	
Item	Leakage Current	
Object	+48V1.3A	

1.Results

Standards	Leakage Current [mA]		
	Input Volt.	Input Volt.	Input Volt.
	100 [V]	120 [V]	132 [V]
(A)DEN-AN	0.18	0.20	0.24
(B)IEC60950	0.18	0.25	0.27

frequency 60Hz

2.Condition

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

Model	LGA50A-48																																		
Item	Line Regulation	Temperature	25°C																																
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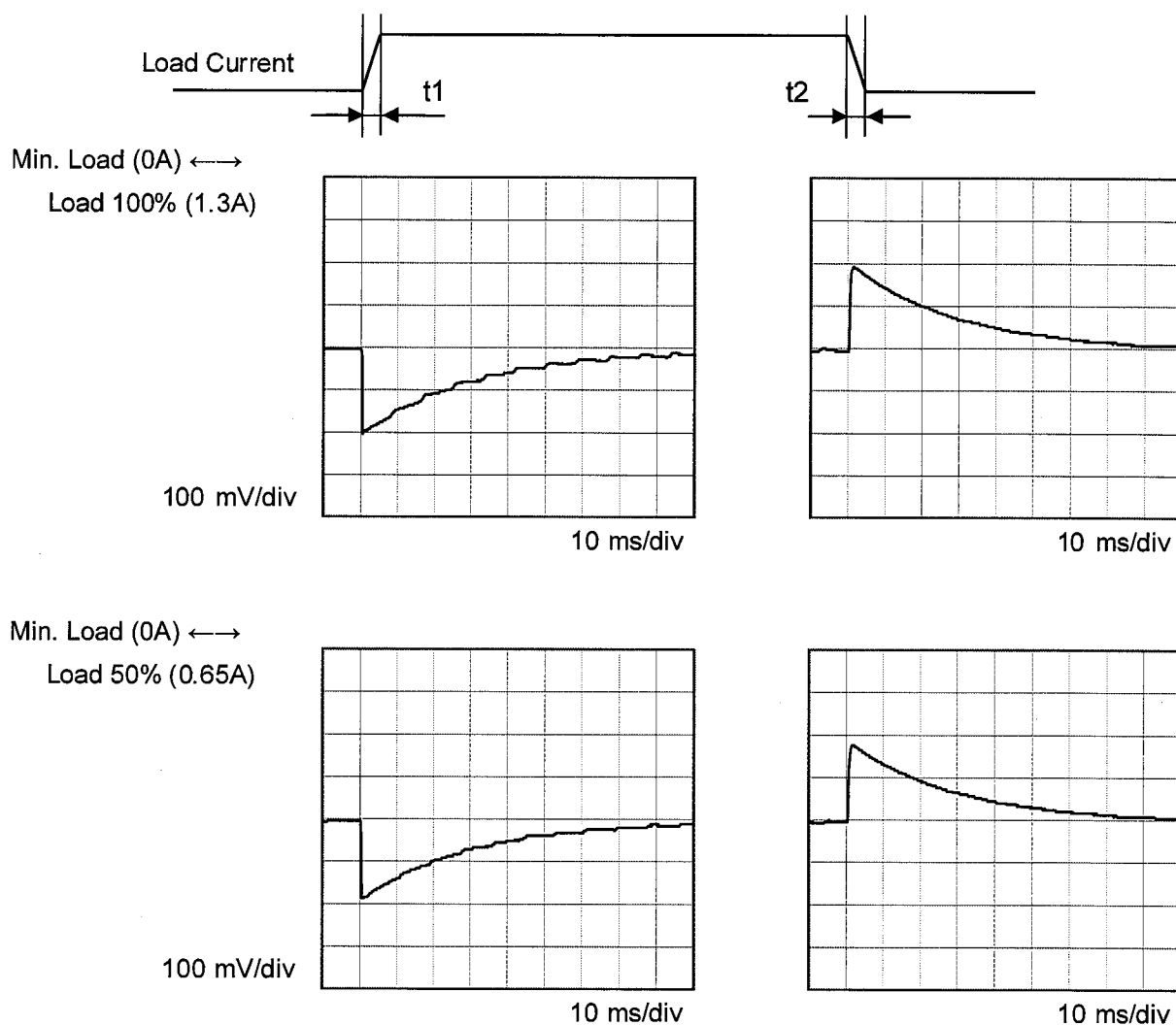
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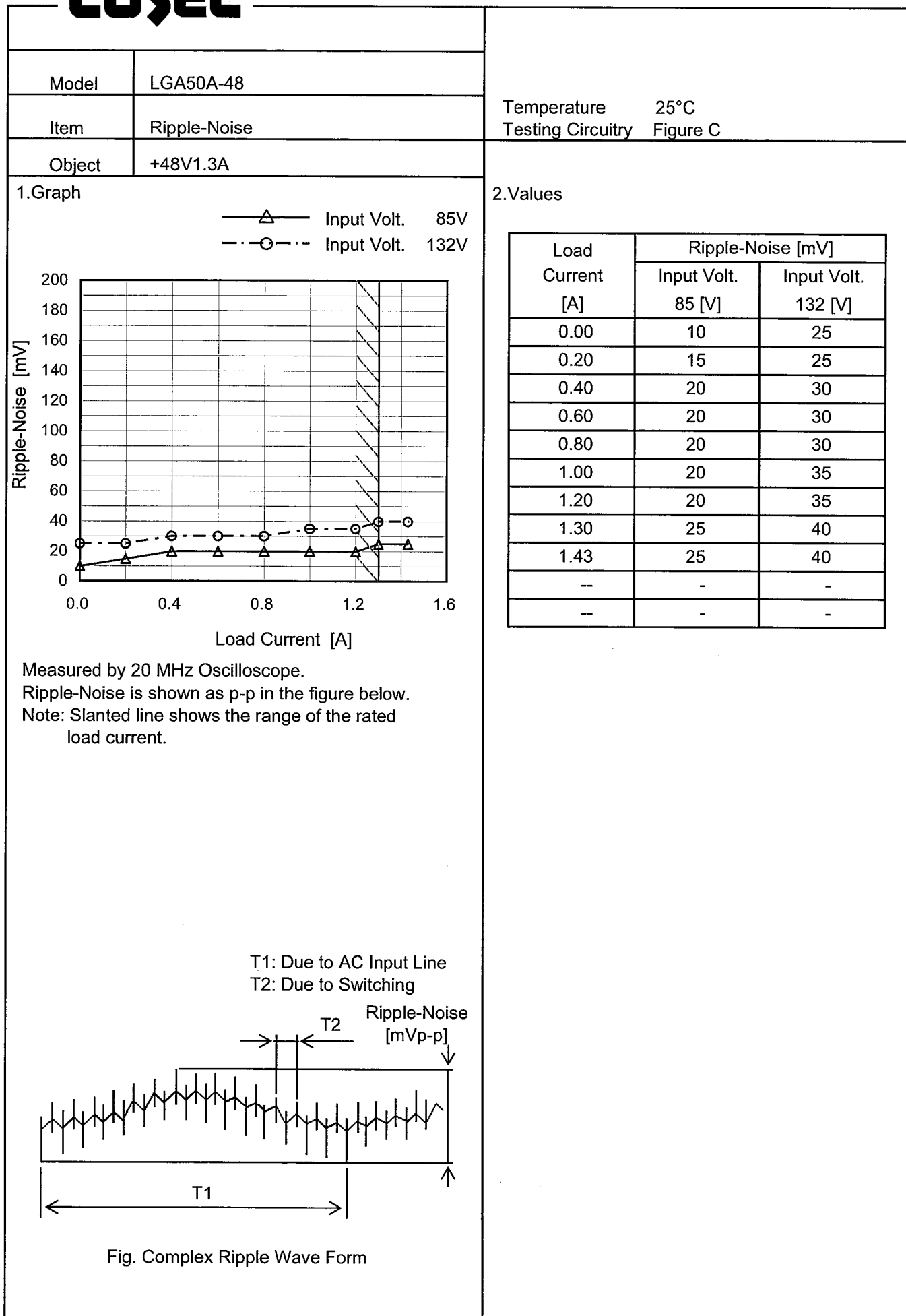
Model	LGA50A-48	Temperature Testing Circuitry	25°C Figure C
Item	Dynamic Load Response		
Object	+48V1.3A		

Input Volt. 100 V
Cycle 1000 ms

Response. $t_1=t_2=50 \mu s$. Typ



Model	LGA50A-48																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure C																																						
Object	+48V1.3A																																								
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 85V</div><div>-·-○-·- Input Volt. 132V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><td>0.00</td><td>10</td><td>15</td></tr><tr><td>0.20</td><td>10</td><td>20</td></tr><tr><td>0.40</td><td>15</td><td>20</td></tr><tr><td>0.60</td><td>15</td><td>20</td></tr><tr><td>0.80</td><td>15</td><td>20</td></tr><tr><td>1.00</td><td>15</td><td>20</td></tr><tr><td>1.20</td><td>15</td><td>20</td></tr><tr><td>1.30</td><td>15</td><td>20</td></tr><tr><td>1.43</td><td>15</td><td>20</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. 85 [V]	Input Volt. 132 [V]	0.00	10	15	0.20	10	20	0.40	15	20	0.60	15	20	0.80	15	20	1.00	15	20	1.20	15	20	1.30	15	20	1.43	15	20	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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<div>Measured by 20 MHz Oscilloscope.</div> <div>Ripple Voltage is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																									
<div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div>																																									
Fig. Complex Ripple Wave Form																																									



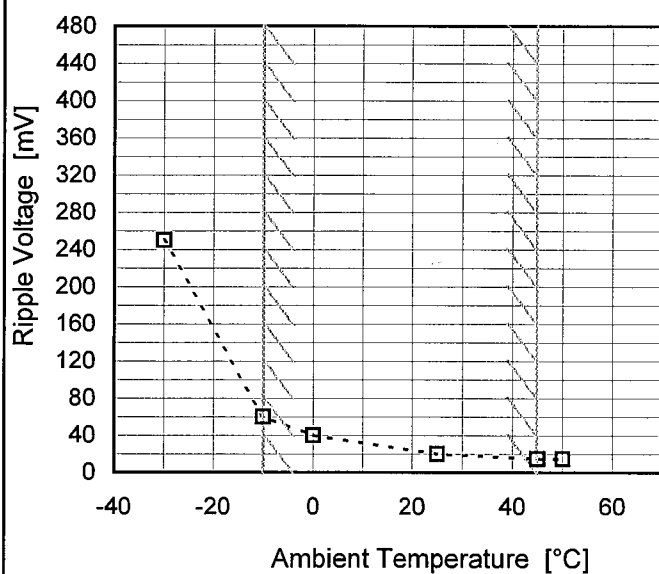
Model LGA50A-48

Item Ripple Voltage (by Ambient Temp.)

Object +48V1.3A

Testing Circuitry Figure C

1. Graph



Input Volt. 100V

Input Load. 100%

Measured by 20 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage
	[mV]
-30	250
-10	60
0	40
25	20
45	15
50	15
--	-
--	-
--	-
--	-
--	-

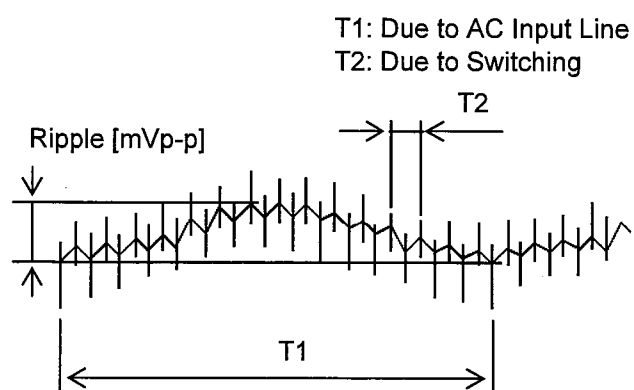


Fig. Complex Ripple Wave Form

Model		LGA50A-48	Testing Circuitry Figure A																																																		
Item		Ambient Temperature Drift																																																			
Object		+48V1.3A																																																			
1.Graph																																																					
		<div><div><div>—△—</div><div>Input Volt. 85V</div></div><div><div>---□---</div><div>Input Volt. 100V</div></div><div><div>-·-○-·-</div><div>Input Volt. 132V</div></div></div>	2.Values																																																		
<div><div><div>Output Voltage [V]</div><div><div>48.30</div><div>48.20</div><div>48.10</div><div>48.00</div><div>47.90</div><div>47.80</div><div>47.70</div><div>47.60</div></div><div><div>-40</div><div>-20</div><div>0</div><div>20</div><div>40</div><div>60</div></div><div>Ambient Temperature [°C]</div><div>Load 100%</div></div></div>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>-20</td><td>48.030</td><td>48.021</td><td>47.999</td></tr><tr><td>-10</td><td>48.034</td><td>48.026</td><td>48.003</td></tr><tr><td>0</td><td>48.037</td><td>48.029</td><td>48.006</td></tr><tr><td>10</td><td>48.040</td><td>48.032</td><td>48.009</td></tr><tr><td>20</td><td>48.045</td><td>48.037</td><td>48.011</td></tr><tr><td>25</td><td>48.052</td><td>48.043</td><td>48.017</td></tr><tr><td>30</td><td>48.054</td><td>48.045</td><td>48.019</td></tr><tr><td>45</td><td>48.049</td><td>48.039</td><td>48.009</td></tr><tr><td>50</td><td>48.046</td><td>48.037</td><td>48.006</td></tr><tr><td>60</td><td>48.034</td><td>48.022</td><td>47.991</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	48.030	48.021	47.999	-10	48.034	48.026	48.003	0	48.037	48.029	48.006	10	48.040	48.032	48.009	20	48.045	48.037	48.011	25	48.052	48.043	48.017	30	48.054	48.045	48.019	45	48.049	48.039	48.009	50	48.046	48.037	48.006	60	48.034	48.022	47.991	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																				
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Note: Slanted line shows the range of the rated ambient temperature.																																																					

Model		LGA50A-48	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+48V1.3A	

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 - 45°C

Input Voltage : 85 - 132V

Load Current : 0 - 1.3A

* 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	45	85	0	48.023	±28	±0.1
Minimum Voltage	-10	132	1.3	47.967		

COSEL

Model	LGA50A-48																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+48V1.3A																								
1.Graph		2.Values																							
<div><div><div>48.30</div><div>48.20</div><div>48.10</div><div>48.00</div><div>47.90</div><div>47.80</div><div>47.70</div><div>47.60</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>Output Voltage [V]</div><div>Time [H]</div></div><div><div>Input Volt.</div><div>Load</div></div><div><div>100V</div><div>100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>48.059</td></tr><tr><td>0.5</td><td>48.043</td></tr><tr><td>1.0</td><td>48.043</td></tr><tr><td>2.0</td><td>48.044</td></tr><tr><td>3.0</td><td>48.043</td></tr><tr><td>4.0</td><td>48.044</td></tr><tr><td>5.0</td><td>48.044</td></tr><tr><td>6.0</td><td>48.044</td></tr><tr><td>7.0</td><td>48.043</td></tr><tr><td>8.0</td><td>48.043</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	48.059	0.5	48.043	1.0	48.043	2.0	48.044	3.0	48.043	4.0	48.044	5.0	48.044	6.0	48.044	7.0	48.043	8.0	48.043
Time since start [H]	Output Voltage [V]																								
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BC-10542

COSEL

Model LGA50A-48

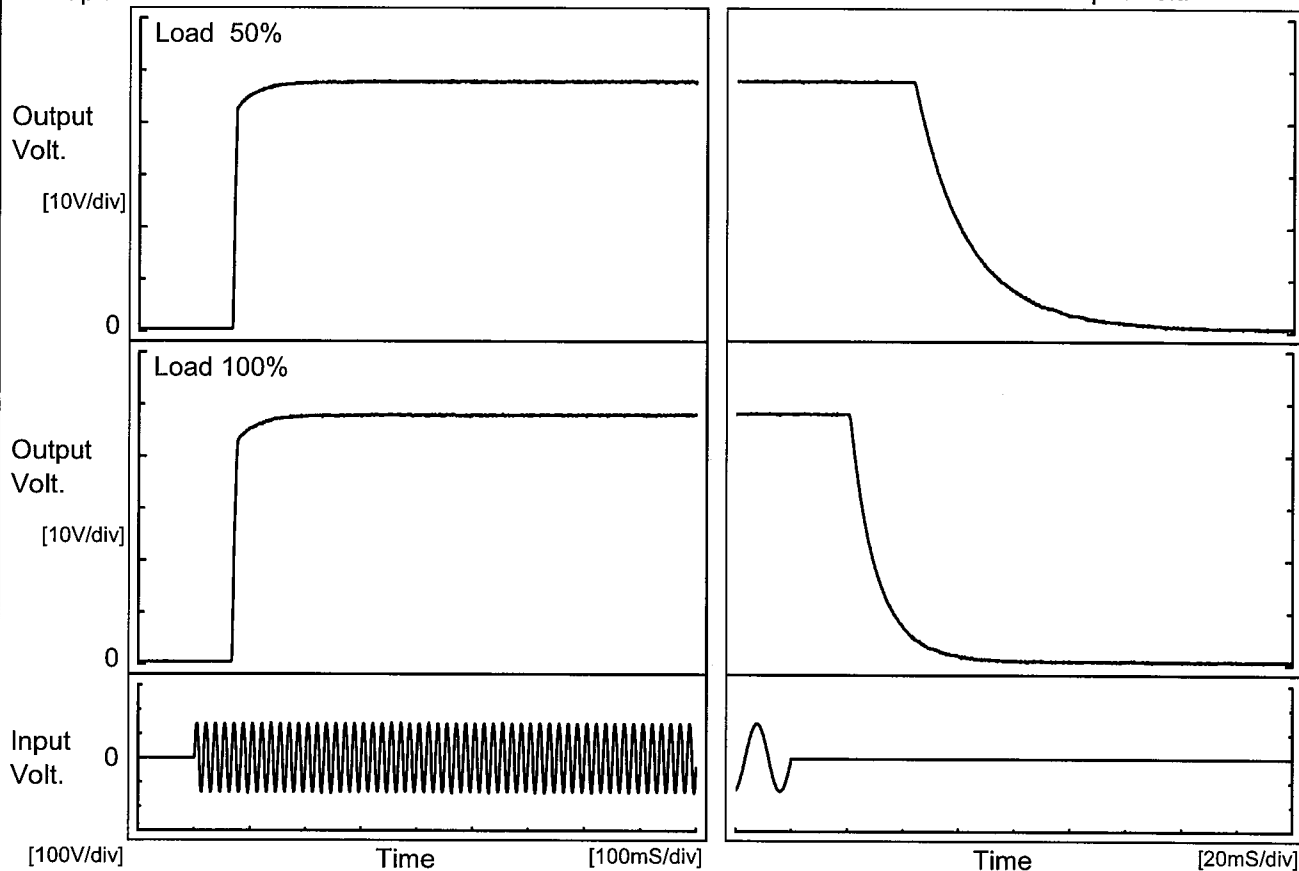
Item Rise and Fall Time

Object +48V1.3A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

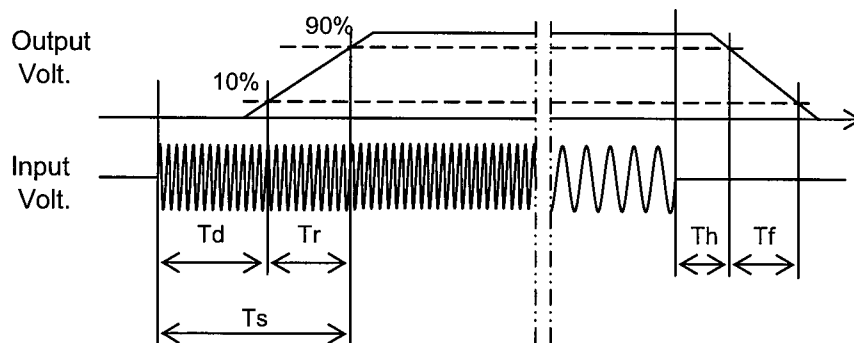
Input Volt. 100 V

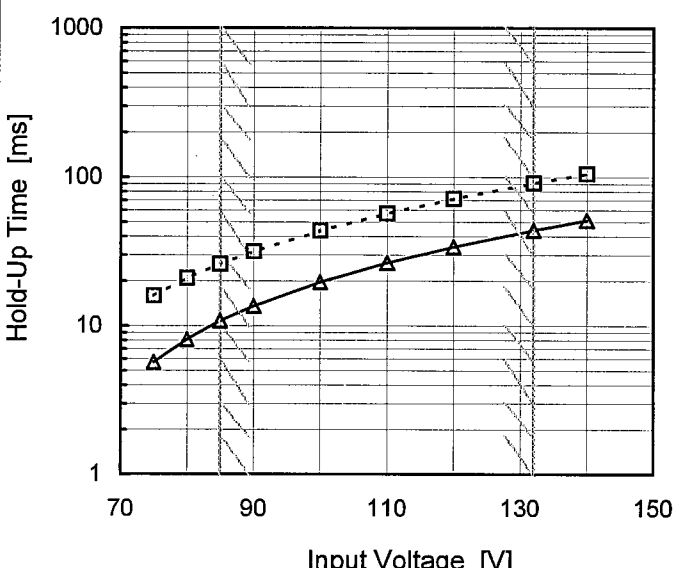


2. Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	68.5	13.0	81.5	45.6	43.3
100 %	68.5	12.0	80.5	21.8	22.4



Model		LGA50A-48	Temperature 25°C Testing Circuitry Figure A																																
Item		Hold-Up Time																																	
Object		+48V1.3A																																	
1.Graph			2.Values																																
<div><div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div><p>Hold-Up Time [ms]</p><p>Input Voltage [V]</p></div>																																			
<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>16</td><td>6</td></tr><tr><td>80</td><td>21</td><td>8</td></tr><tr><td>85</td><td>26</td><td>11</td></tr><tr><td>90</td><td>32</td><td>14</td></tr><tr><td>100</td><td>44</td><td>20</td></tr><tr><td>110</td><td>57</td><td>27</td></tr><tr><td>120</td><td>71</td><td>34</td></tr><tr><td>132</td><td>91</td><td>44</td></tr><tr><td>140</td><td>105</td><td>51</td></tr></table>	Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	16	6	80	21	8	85	26	11	90	32	14	100	44	20	110	57	27	120	71	34	132	91	44	140	105	51
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	16	6																																	
80	21	8																																	
85	26	11																																	
90	32	14																																	
100	44	20																																	
110	57	27																																	
120	71	34																																	
132	91	44																																	
140	105	51																																	

Model	LGA50A-48																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+48V1.3A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>132V</div></div></div> <div>Instantaneous Compensation Time [ms]</div> <div>Load Current [A]</div> <div>Note: Slanted line shows the range of the rated load current.</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.20</td><td>83</td><td>135</td><td>273</td></tr><tr><td>0.40</td><td>43</td><td>68</td><td>146</td></tr><tr><td>0.60</td><td>27</td><td>47</td><td>98</td></tr><tr><td>0.80</td><td>20</td><td>35</td><td>75</td></tr><tr><td>1.00</td><td>15</td><td>27</td><td>58</td></tr><tr><td>1.20</td><td>12</td><td>22</td><td>48</td></tr><tr><td>1.30</td><td>10</td><td>17</td><td>44</td></tr><tr><td>1.43</td><td>9</td><td>17</td><td>38</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. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.00	-	-	-	0.20	83	135	273	0.40	43	68	146	0.60	27	47	98	0.80	20	35	75	1.00	15	27	58	1.20	12	22	48	1.30	10	17	44	1.43	9	17	38	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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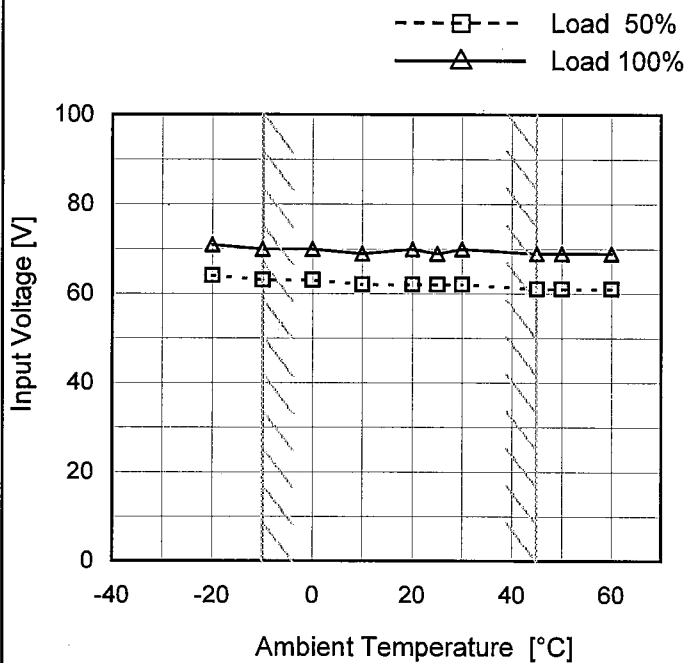
Model LGA50A-48

Item Minimum Input Voltage
for Regulated Output Voltage

Object +48V1.3A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	64	71
-10	63	70
0	63	70
10	62	69
20	62	70
25	62	69
30	62	70
45	61	69
50	61	69
60	61	69
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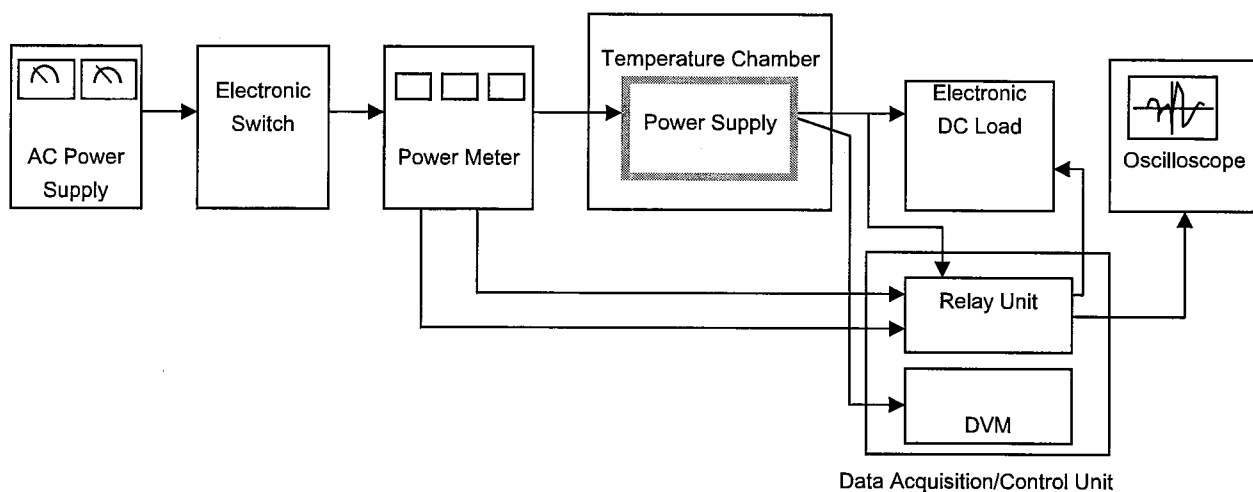


Figure A

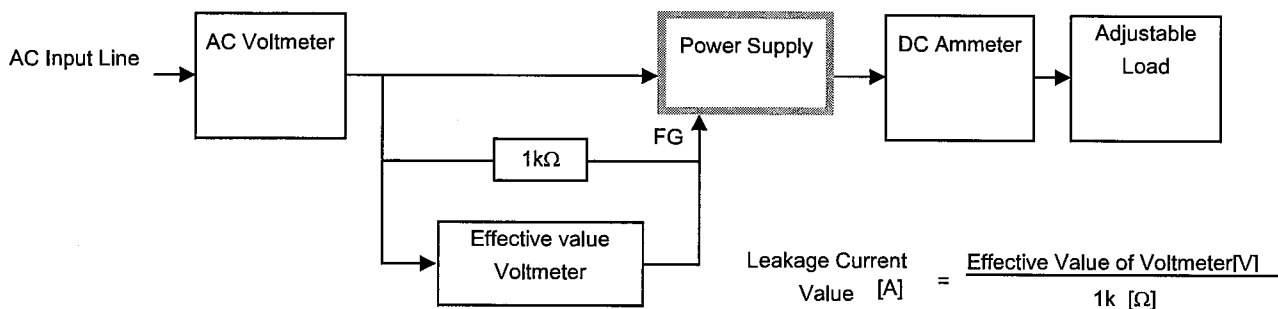


Figure B (DEN-AN)

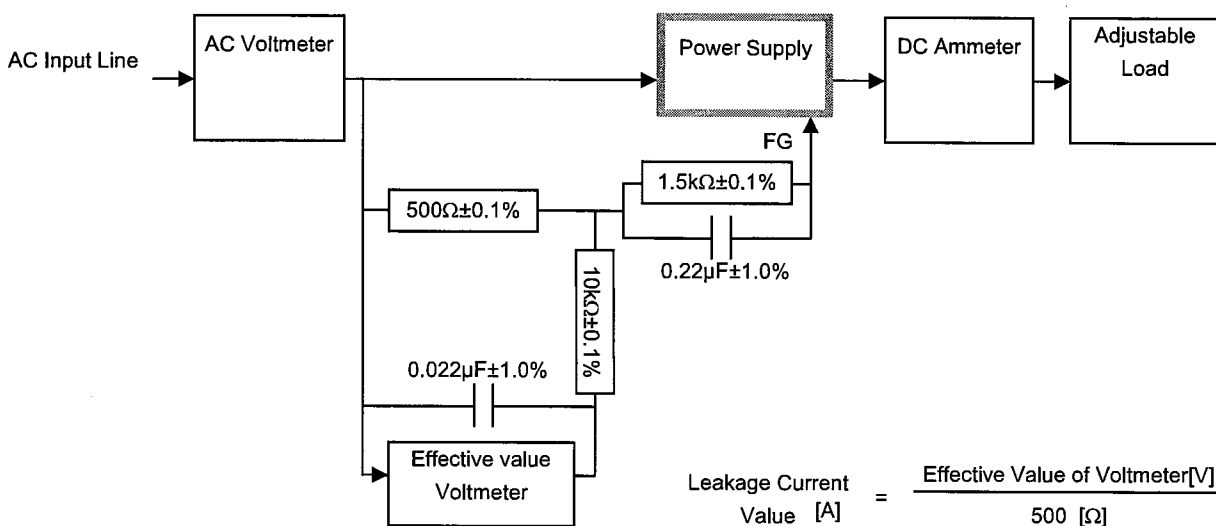


Figure B (IEC60950-1)

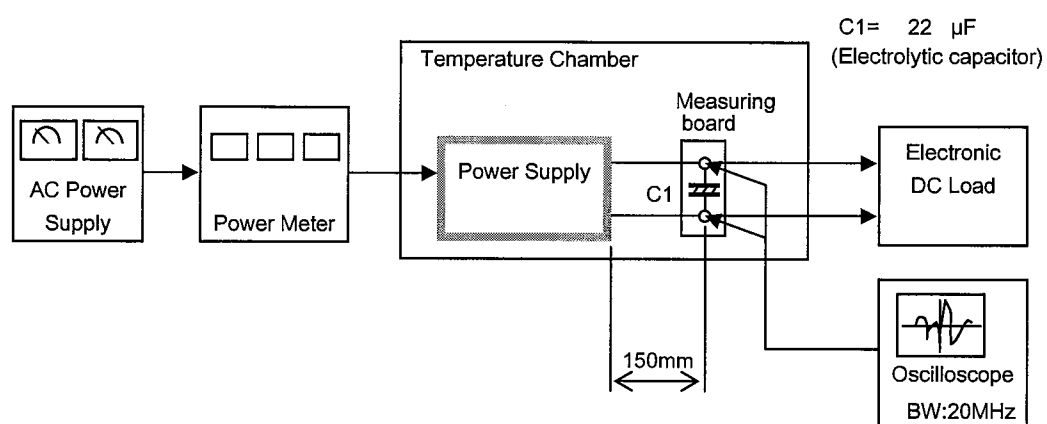


Figure C