



TEST DATA OF LGA100A-5-Y

Regulated DC Power Supply
April 15 , 2008

Approved by : *Yoshiaki Shimizu*
Yoshiaki Shimizu Design Manager

Prepared by : *Kazuo Ishimura*
Kazuo Ishimura Design Engineer

COSEL CO.,LTD.

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Model	LGA100A-5-Y	Temperature 25°C Testing Circuitry Figure A																																																				
Item	Input Current (by Load Current)																																																					
Object		2.Values																																																				
1.Graph	<div><div>—△—</div>Input Volt. 85V</div> <div><div>---□---</div>Input Volt. 100V</div> <div><div>-·-○-·-</div>Input Volt. 132V</div> <p>Note: Slanted line shows the range of the rated load current.</p>																																																					
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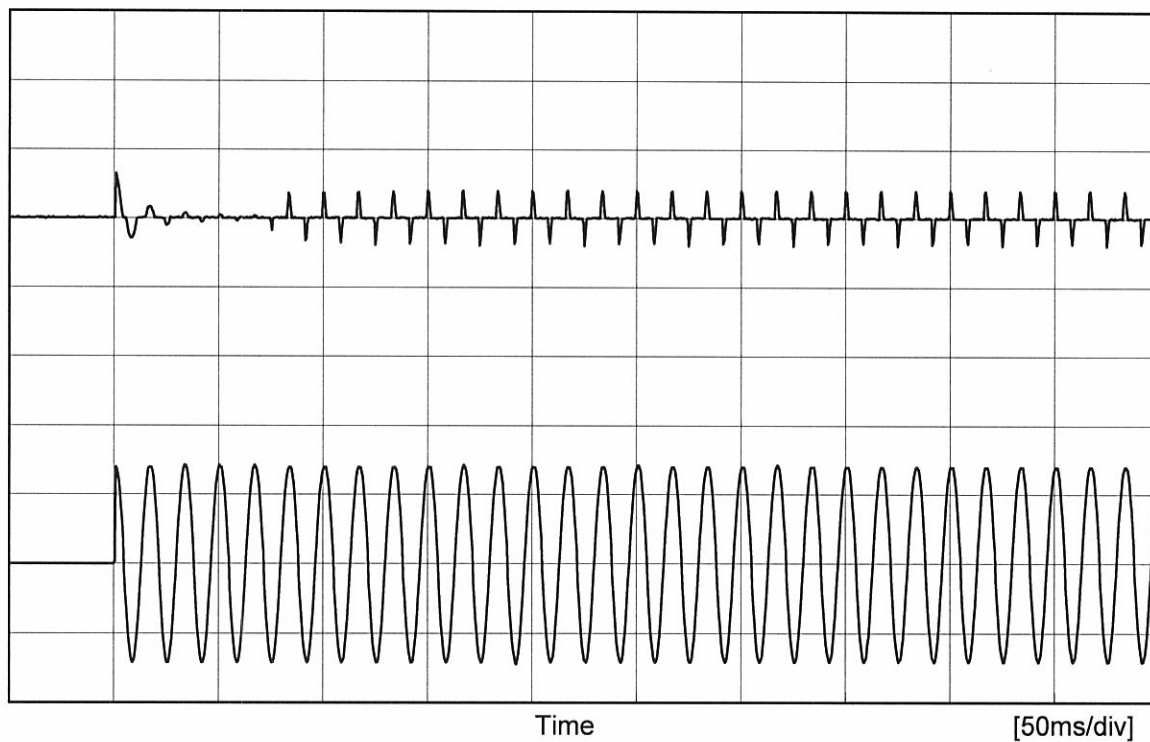
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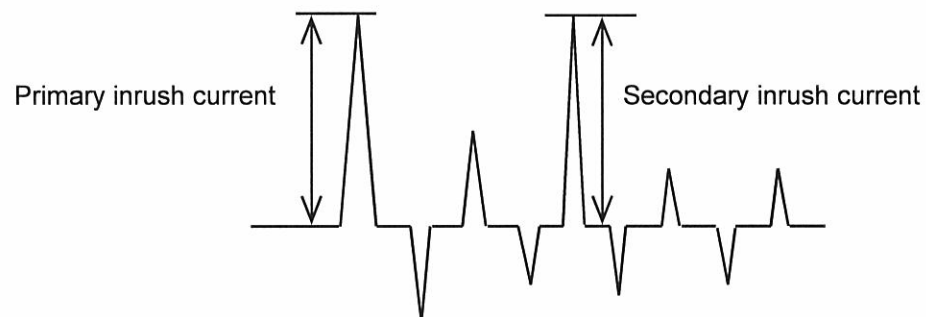
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Model	LGA100A-5-Y	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	

Input
Current
[20A/div]Input
Voltage
[100V/div]

Input Voltage	100 V
Frequency	60 Hz
Load	100 %

Primary inrush current	12.3 A
Secondary inrush current	8.9 A



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		Temperature 25°C Testing Circuitry Figure B
Model	LGA100A-5-Y	
Item	Leakage Current	
Object	_____	

1.Results

Standards	Leakage Current [mA]		
	Input Volt. 100 [V]	Input Volt. 120 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.29	0.37	0.41
(B)IEC60950	0.29	0.35	0.40

frequency 60Hz

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	LGA100A-5-Y																																
Item	Line Regulation	Temperature	25°C																														
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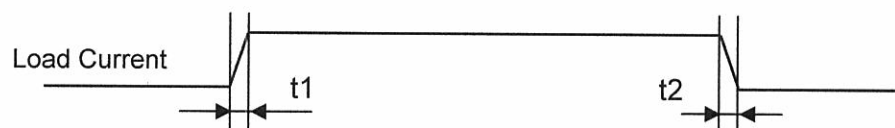
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<div><div><div>—△—</div><div>---□---</div><div>-·-○-·-</div></div><div>Input Volt. 85V</div><div>Input Volt. 100V</div><div>Input Volt. 132V</div></div> <p>Output Voltage [V]</p> <p>Load Current [A]</p>		<table><tr><th rowspan="2">Load Current [A]</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>0</td><td>5.127</td><td>5.127</td><td>5.127</td></tr><tr><td>4</td><td>5.121</td><td>5.121</td><td>5.121</td></tr><tr><td>8</td><td>5.115</td><td>5.115</td><td>5.114</td></tr><tr><td>12</td><td>5.108</td><td>5.108</td><td>5.108</td></tr><tr><td>16</td><td>5.102</td><td>5.102</td><td>5.102</td></tr><tr><td>20</td><td>5.096</td><td>5.096</td><td>5.096</td></tr><tr><td>22</td><td>5.093</td><td>5.093</td><td>5.093</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><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0	5.127	5.127	5.127	4	5.121	5.121	5.121	8	5.115	5.115	5.114	12	5.108	5.108	5.108	16	5.102	5.102	5.102	20	5.096	5.096	5.096	22	5.093	5.093	5.093	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																			
0	5.127	5.127	5.127																																																			
4	5.121	5.121	5.121																																																			
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Note: Slanted line shows the range of the rated load current.																																																						

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Model	LGA100A-5-Y	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+5V20A		

Input Volt. 100 V
Cycle 1000 ms

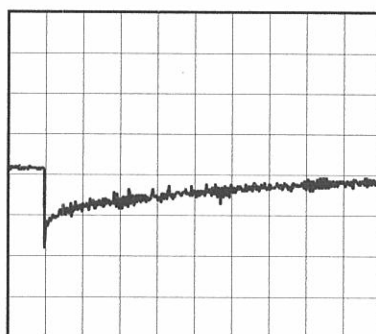
Response. $t_1=t_2=50\mu\text{s}$. Typ



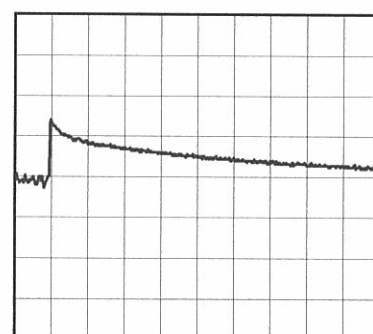
Min. Load (0A) \longleftrightarrow

Load 100% (20A)

100 mV/div



40 ms/div

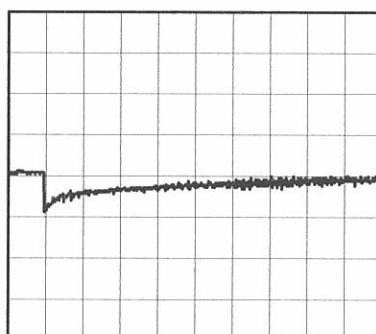


40 ms/div

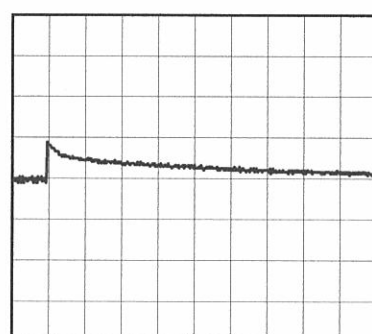
Min. Load (0A) \longleftrightarrow

Load 50% (10A)

100 mV/div

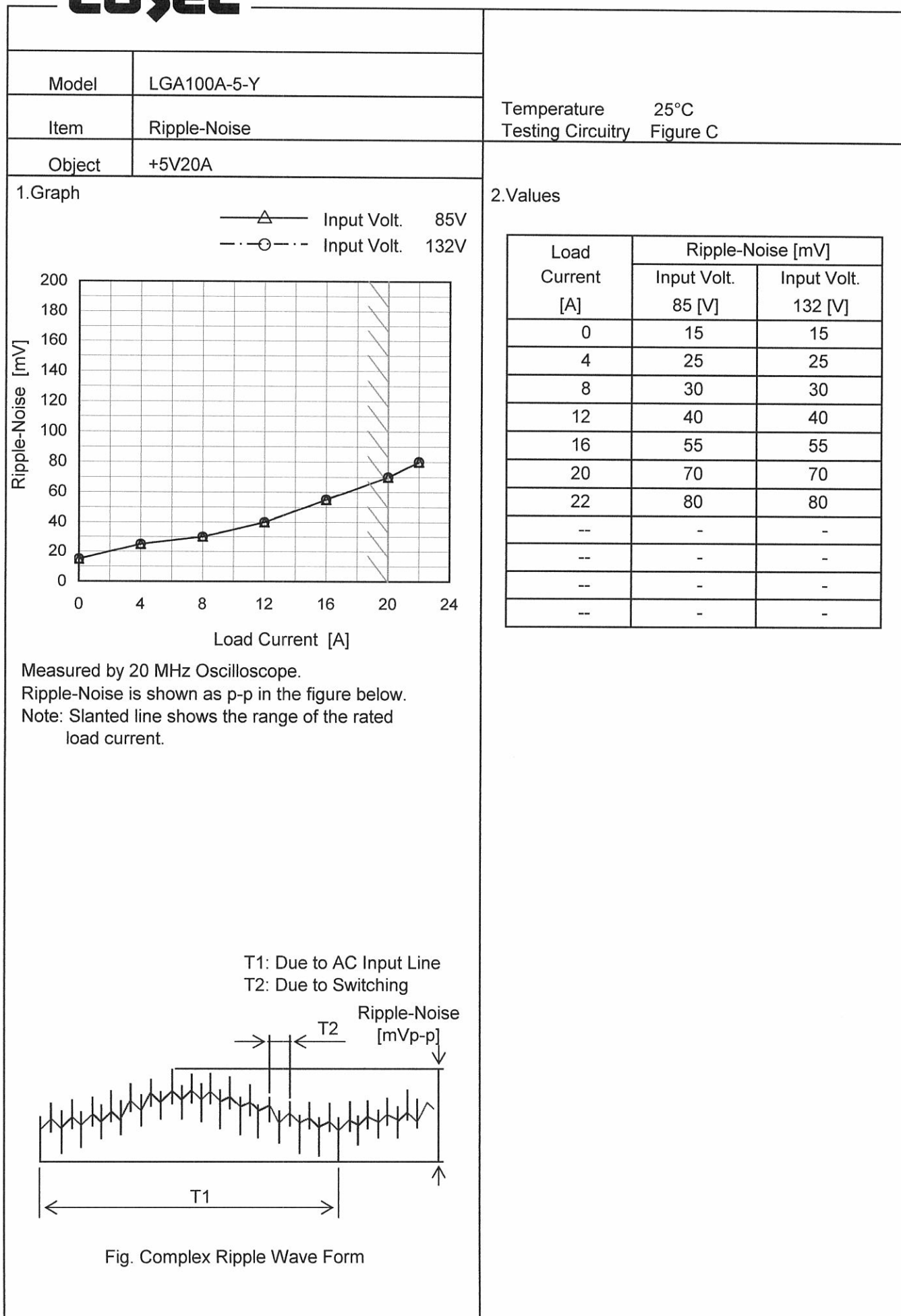


40 ms/div



40 ms/div

Model	LGA100A-5-Y																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
Object	+5V20A	Testing Circuitry	Figure C																																						
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 85V</div><div>-·-○-·- Input Volt. 132V</div></div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></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</td><td>10</td><td>10</td></tr><tr><td>4</td><td>15</td><td>15</td></tr><tr><td>8</td><td>15</td><td>15</td></tr><tr><td>12</td><td>20</td><td>20</td></tr><tr><td>16</td><td>25</td><td>25</td></tr><tr><td>20</td><td>25</td><td>25</td></tr><tr><td>22</td><td>30</td><td>30</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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 85 [V]	Input Volt. 132 [V]	0	10	10	4	15	15	8	15	15	12	20	20	16	25	25	20	25	25	22	30	30	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 85 [V]	Input Volt. 132 [V]																																							
0	10	10																																							
4	15	15																																							
8	15	15																																							
12	20	20																																							
16	25	25																																							
20	25	25																																							
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<p>Measured by 20 MHz Oscilloscope.</p> <p>Ripple Voltage 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>T1: Due to AC Input Line</div><div>T2: Due to Switching</div><p>Ripple [mVp-p]</p><p>T1</p><p>T2</p></div>																																									
Fig. Complex Ripple Wave Form																																									



		Testing Circuitry FigureC																								
Model	LGA100A-5-Y																									
Item	Ripple Voltage (by Ambient Temp.)																									
Object	+5V20A																									
1.Graph		2.Values																								
<div><table><thead><tr><th>Ambient Temperature [°C]</th><th>Ripple Voltage [mV]</th></tr></thead><tbody><tr><td>-30</td><td>145</td></tr><tr><td>-10</td><td>65</td></tr><tr><td>0</td><td>50</td></tr><tr><td>25</td><td>25</td></tr><tr><td>50</td><td>25</td></tr><tr><td>--</td><td>-</td></tr><tr><td>--</td><td>-</td></tr><tr><td>--</td><td>-</td></tr><tr><td>--</td><td>-</td></tr><tr><td>--</td><td>-</td></tr><tr><td>--</td><td>-</td></tr></tbody></table><p>Input Volt. 100V Input Load. 100%</p></div>			Ambient Temperature [°C]	Ripple Voltage [mV]	-30	145	-10	65	0	50	25	25	50	25	--	-	--	-	--	-	--	-	--	-	--	-
Ambient Temperature [°C]	Ripple Voltage [mV]																									
-30	145																									
-10	65																									
0	50																									
25	25																									
50	25																									
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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 ambient temperature.</p>																										
<div><p>T1: Due to AC Input Line T2: Due to Switching</p><p>Ripple [mVp-p]</p></div>																										
Fig. Complex Ripple Wave Form																										

Testing Circuitry Figure A



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



Model		LGA100A-5-Y	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+5V20A	

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 - 132V

Load Current : 0 - 20A

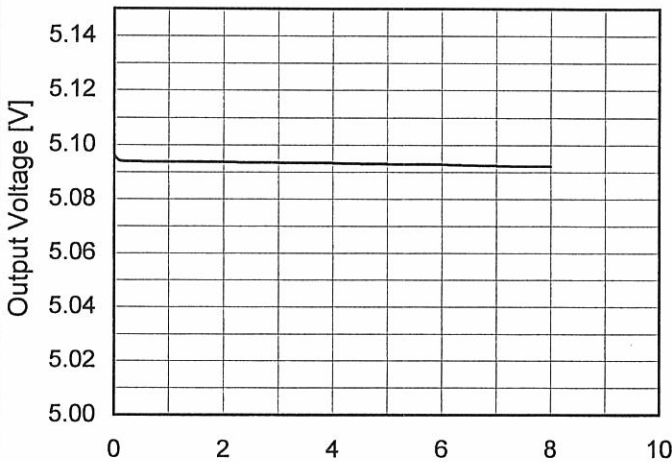
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

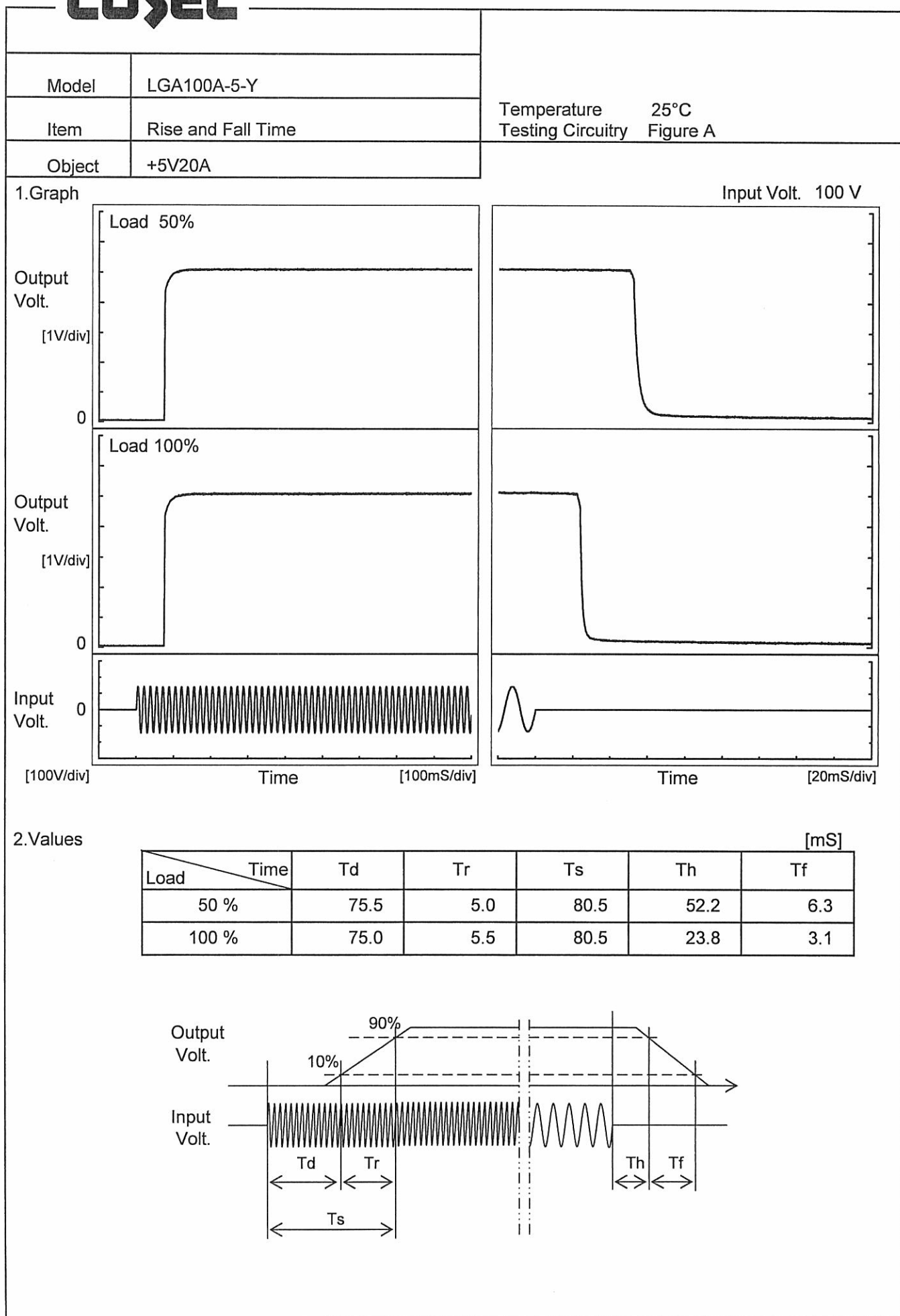
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	85	0	5.128	±16	±0.3
Minimum Voltage	50	132	20	5.096		



Model	LGA100A-5-Y	Temperature 25°C Testing Circuitry Figure A																							
Item	Time Lapse Drift																								
Object	+5V20A																								
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.096</td></tr><tr><td>0.5</td><td>5.094</td></tr><tr><td>1.0</td><td>5.094</td></tr><tr><td>2.0</td><td>5.094</td></tr><tr><td>3.0</td><td>5.094</td></tr><tr><td>4.0</td><td>5.093</td></tr><tr><td>5.0</td><td>5.093</td></tr><tr><td>6.0</td><td>5.093</td></tr><tr><td>7.0</td><td>5.093</td></tr><tr><td>8.0</td><td>5.092</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.096	0.5	5.094	1.0	5.094	2.0	5.094	3.0	5.094	4.0	5.093	5.0	5.093	6.0	5.093	7.0	5.093	8.0	5.092
Time since start [H]	Output Voltage [V]																								
0.0	5.096																								
0.5	5.094																								
1.0	5.094																								
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5.0	5.093																								
6.0	5.093																								
7.0	5.093																								
8.0	5.092																								

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Model		LGA100A-5-Y	
Item		Hold-Up Time	
Object		+5V20A	
1.Graph		2.Values	

Hold-Up Time [ms]

□

Load 50%

—

△

—

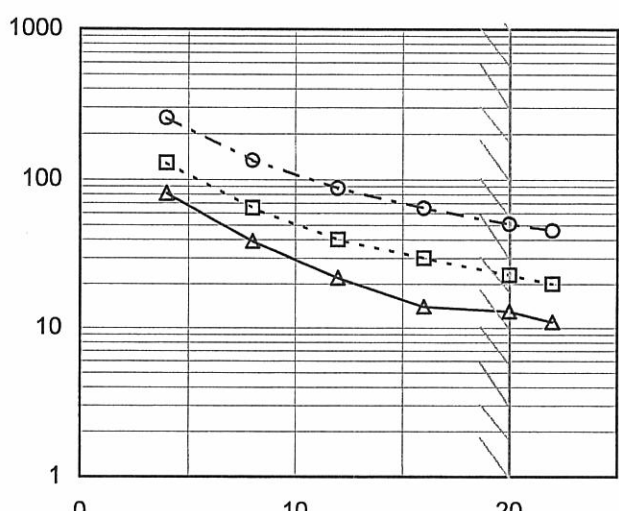
Load 100%

Input Voltage [V]	Load 50% [ms]	Load 100% [ms]
75	19	7
80	24	9
85	30	12
90	37	15
100	51	22
110	66	30
120	83	39
132	106	50
140	122	59

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.

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	19	7
80	24	9
85	30	12
90	37	15
100	51	22
110	66	30
120	83	39
132	106	50
140	122	59

Model		LGA100A-5-Y		Temperature 25°C Testing Circuitry Figure A
Item		Instantaneous Interruption Compensation		
Object		+5V20A		
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>		
<div>Instantaneous Compensation Time [ms]</div>				
		<div>Load Current [A]</div>		
Note: Slanted line shows the range of the rated load current.				
2.Values				
Load Current [A]		Time [ms]		
		Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0		-	-	-
4		81	129	256
8		39	65	134
12		22	40	88
16		14	30	65
20		13	23	51
22		11	20	46
--		-	-	-
--		-	-	-
--		-	-	-
--		-	-	-

		Testing Circuitry Figure A																																						
Model	LGA100A-5-Y																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+5V20A																																							
1.Graph		2.Values																																						
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div> <div>Input Voltage [V]</div> <div>Ambient Temperature [°C]</div>																																								
Note: Slanted line shows the range of the rated ambient temperature.																																								
		<table><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><tr><td>-20</td><td>61</td><td>68</td></tr><tr><td>-10</td><td>61</td><td>68</td></tr><tr><td>0</td><td>60</td><td>68</td></tr><tr><td>10</td><td>60</td><td>68</td></tr><tr><td>20</td><td>60</td><td>67</td></tr><tr><td>25</td><td>60</td><td>67</td></tr><tr><td>30</td><td>60</td><td>66</td></tr><tr><td>40</td><td>59</td><td>67</td></tr><tr><td>50</td><td>59</td><td>67</td></tr><tr><td>60</td><td>59</td><td>67</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>	Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-20	61	68	-10	61	68	0	60	68	10	60	68	20	60	67	25	60	67	30	60	66	40	59	67	50	59	67	60	59	67	--	-	-
Ambient Temperature [°C]	Input Voltage [V]																																							
	Load 50%	Load 100%																																						
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40	59	67																																						
50	59	67																																						
60	59	67																																						
--	-	-																																						

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Model	LGA100A-5-Y																																																						
Item	Overvoltage Protection	Testing Circuitry Figure A																																																					
Object	+5V20A																																																						
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> <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="3">Operating Point [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>6.42</td><td>6.42</td><td>6.42</td></tr><tr><td>-10</td><td>6.42</td><td>6.42</td><td>6.42</td></tr><tr><td>0</td><td>6.42</td><td>6.42</td><td>6.42</td></tr><tr><td>10</td><td>6.42</td><td>6.42</td><td>6.42</td></tr><tr><td>20</td><td>6.42</td><td>6.42</td><td>6.42</td></tr><tr><td>25</td><td>6.41</td><td>6.42</td><td>6.42</td></tr><tr><td>30</td><td>6.42</td><td>6.42</td><td>6.42</td></tr><tr><td>40</td><td>6.41</td><td>6.42</td><td>6.42</td></tr><tr><td>50</td><td>6.41</td><td>6.42</td><td>6.42</td></tr><tr><td>60</td><td>6.41</td><td>6.42</td><td>6.42</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>			Ambient Temperature [°C]	Operating Point [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	6.42	6.42	6.42	-10	6.42	6.42	6.42	0	6.42	6.42	6.42	10	6.42	6.42	6.42	20	6.42	6.42	6.42	25	6.41	6.42	6.42	30	6.42	6.42	6.42	40	6.41	6.42	6.42	50	6.41	6.42	6.42	60	6.41	6.42	6.42	--	-	-	-
Ambient Temperature [°C]	Operating Point [V]																																																						
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																				
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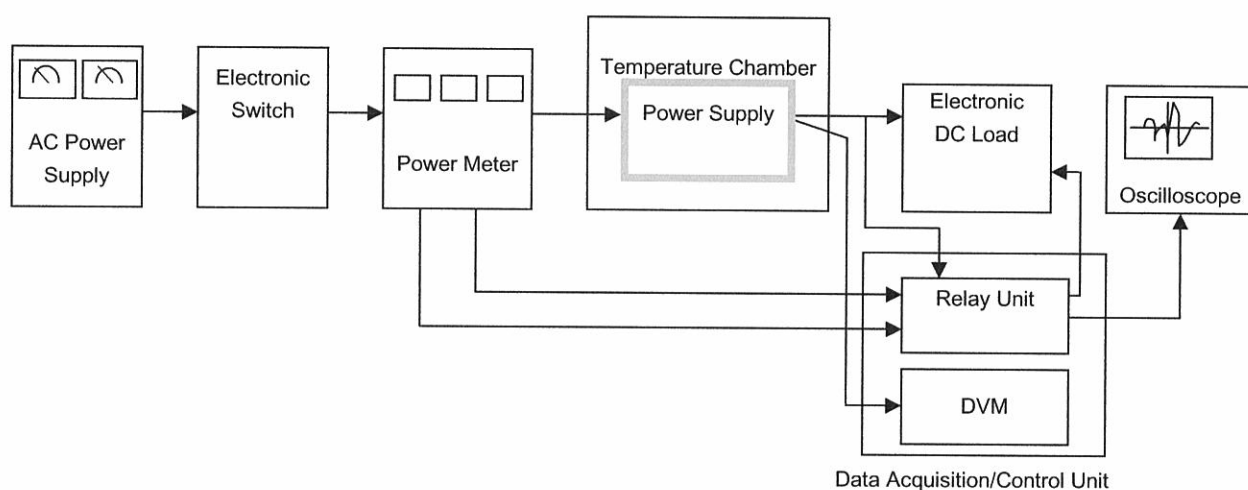


Figure A

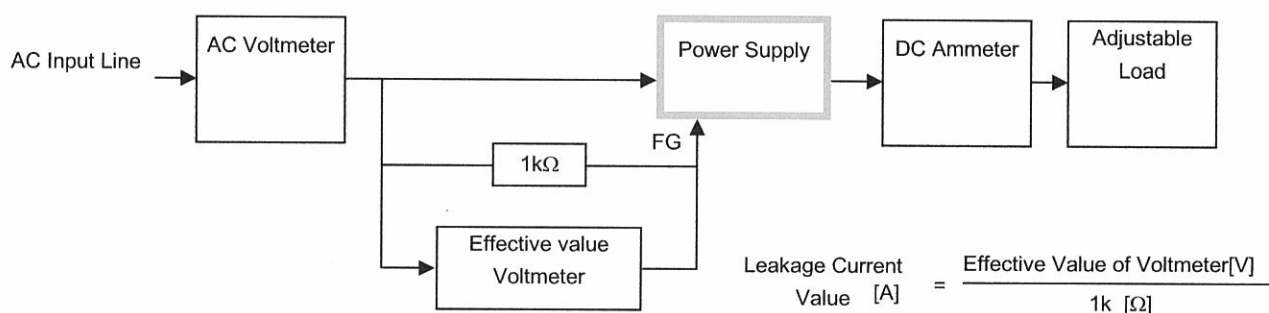


Figure B (DEN-AN)

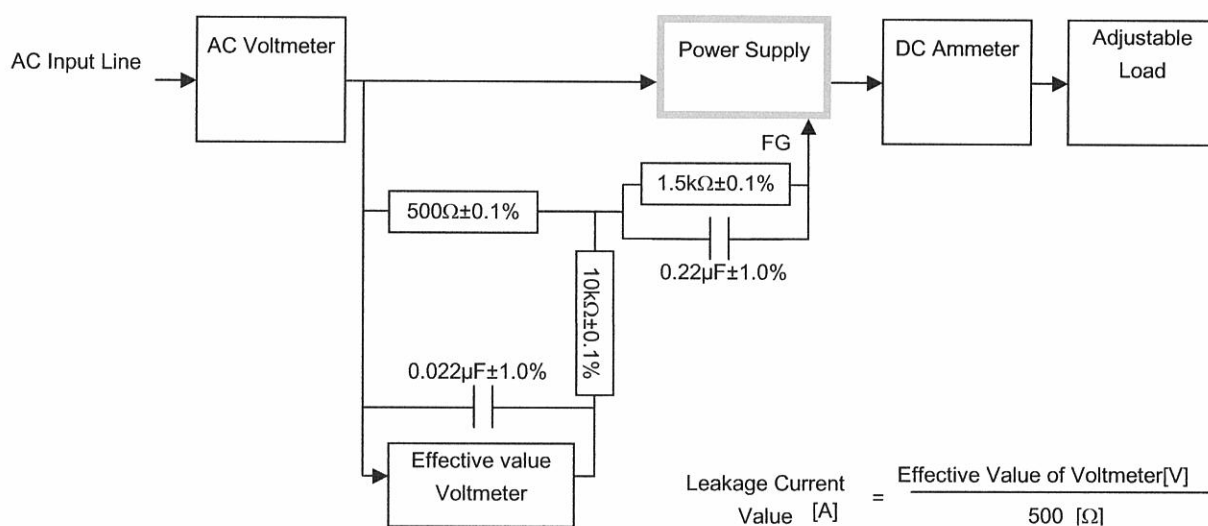


Figure B (IEC60950-1)

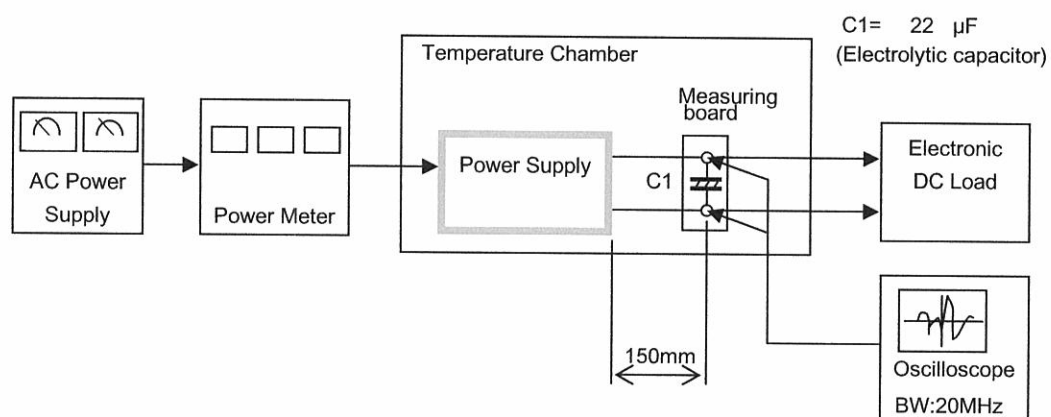


Figure C