

TEST DATA OF GHA300F-48

Regulated DC Power Supply
April 19, 2013

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Yoshiaki Shimizu Design Manager

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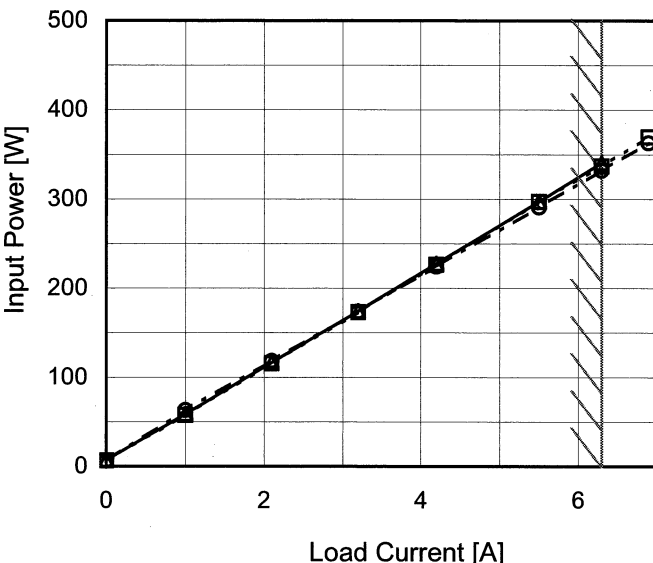
COSEL CO.,LTD.

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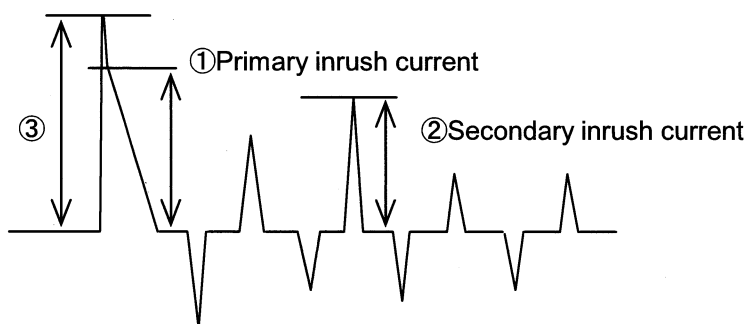
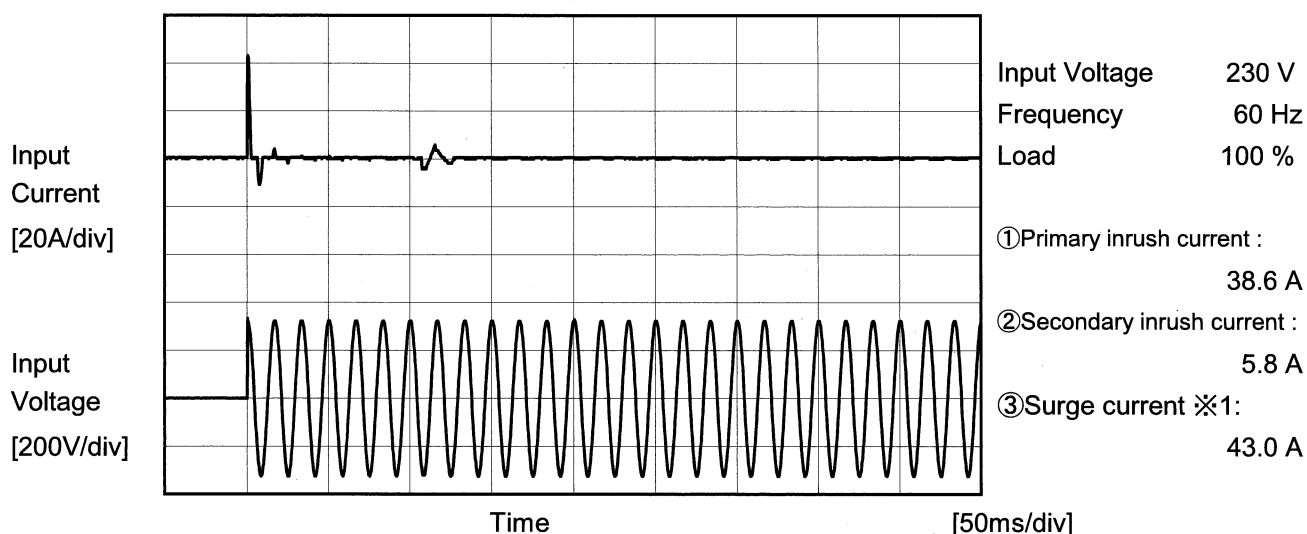
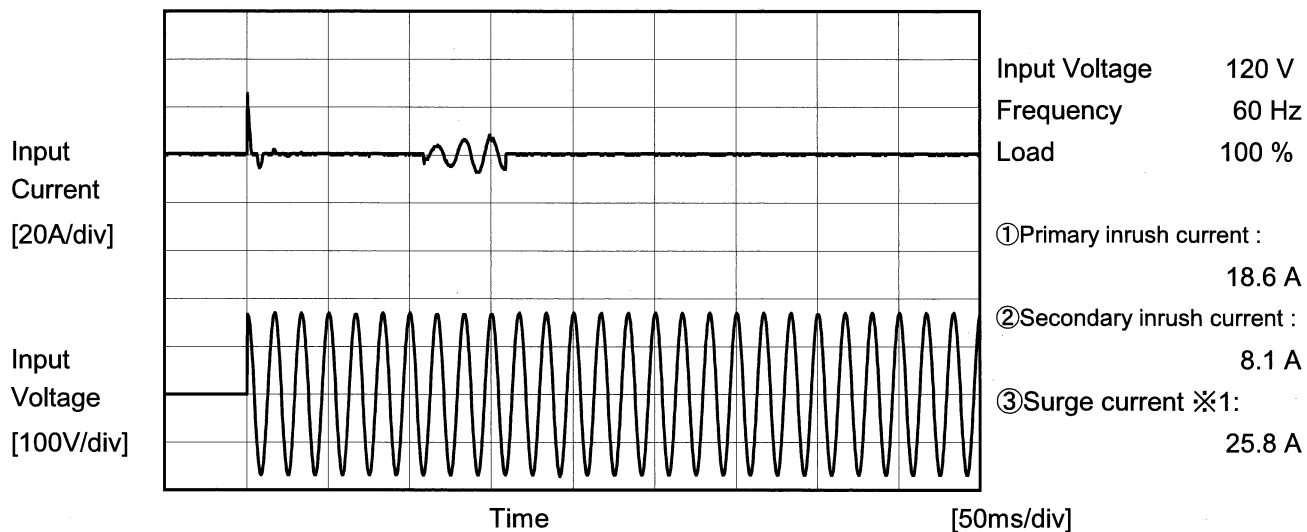
Model		GHA300F-48		Temperature 25°C																																																				
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BC-10748

COSEL

Model	GHA300F-48	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



※1 The specification of the primary inrush current means that the surge current to a built-in noise filter (0.2msec or less : waveform ③) is excluded.

COSEL

		Temperature 25°C Testing Circuitry Figure B
Model	GHA300F-48	
Item	Leakage Current	
Object	_____	

1.Results

[mA]

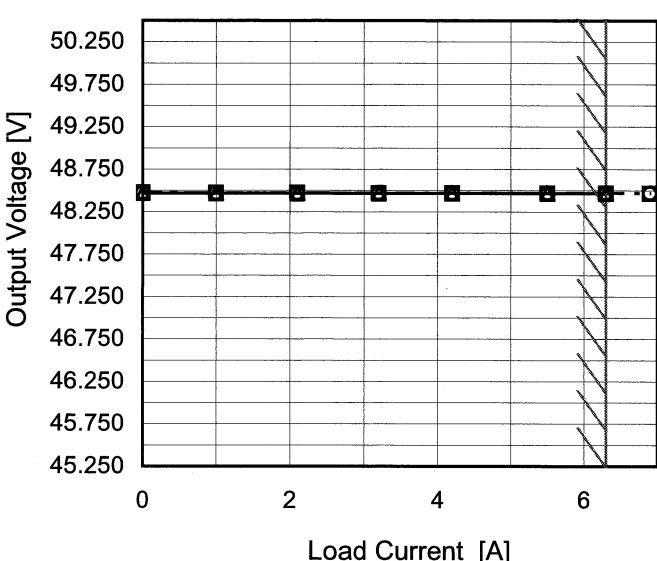
Standards		Input Volt.			Note
		100 [V]	120 [V]	240 [V]	
IEC60601	Both phases	0.08	0.09	0.17	Operation
	One of phases	0.14	0.15	0.31	Stand by

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.

Model	GHA300F-48																																		
Item	Line Regulation	Temperature	25°C																																
Object	+48V6.3A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
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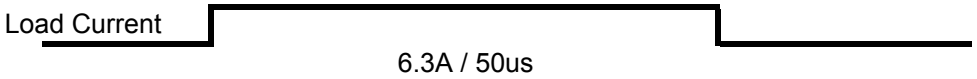
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Model	GHA300F-48
Item	Dynamic Load Response
Object	+48V 6.3A

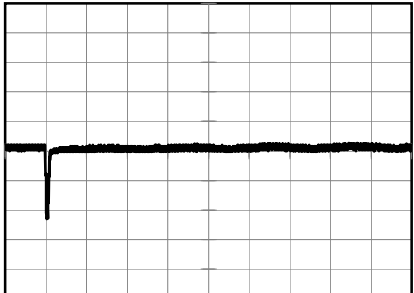
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 120V
Cycle 1000ms

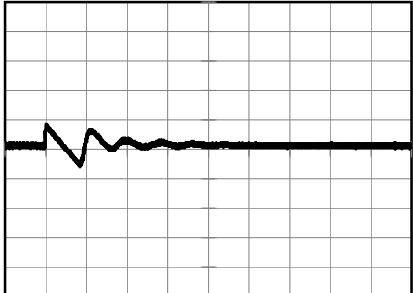


Min.Load (0A)←→
Load 100%(6.3A)

1 V/div



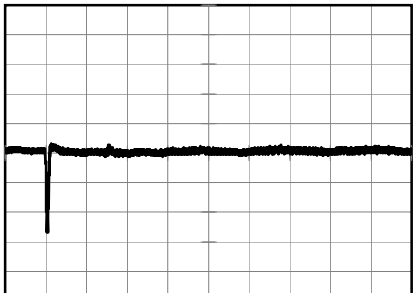
4 ms/div



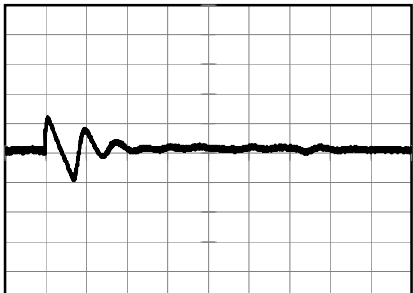
4 ms/div

Min.Load (0A)←→
Load 50%(3.15A)

500 mV/div



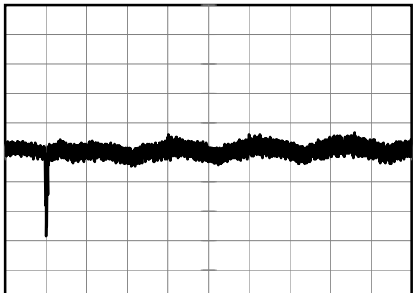
4 ms/div



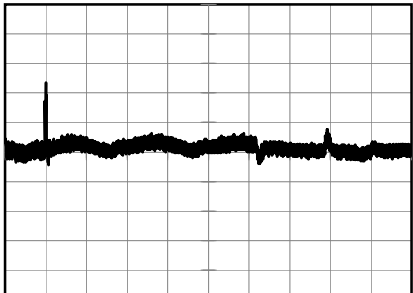
4 ms/div

Load 10% (0.63A)←→
Load 100% (6.3A)

200 mV/div



4 ms/div



4 ms/div

COSEL

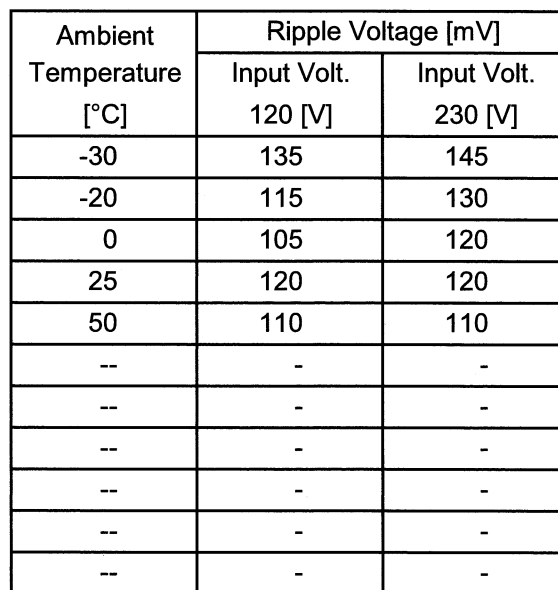
Model		GHA300F-48		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure A																																							
Object		+48V6.3A																																									
1.Graph				2.Values																																							
<div><div><div><div><div></div><div>—△—</div><div>Input Volt. 120V</div></div><div><div></div><div>- - -○- - -</div><div>Input Volt. 230V</div></div></div><div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div></div><table><thead><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 120 [V]</th><th>Input Volt. 230 [V]</th></tr></thead><tbody><tr><td>0.0</td><td>20</td><td>15</td></tr><tr><td>1.0</td><td>40</td><td>45</td></tr><tr><td>2.1</td><td>50</td><td>60</td></tr><tr><td>3.2</td><td>70</td><td>75</td></tr><tr><td>4.2</td><td>80</td><td>85</td></tr><tr><td>5.5</td><td>100</td><td>105</td></tr><tr><td>6.3</td><td>120</td><td>120</td></tr><tr><td>6.9</td><td>125</td><td>125</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></div>				Load Current [A]	Ripple Voltage [mV]		Input Volt. 120 [V]	Input Volt. 230 [V]	0.0	20	15	1.0	40	45	2.1	50	60	3.2	70	75	4.2	80	85	5.5	100	105	6.3	120	120	6.9	125	125	--	-	-	--	-	-	--	-	-		
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 120 [V]	Input Volt. 230 [V]																																									
0.0	20	15																																									
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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><div><div></div><div>Ripple [mVp-p]</div></div><div><div>Fig.Complex Ripple Wave Form</div></div></div></div>																																											

COSEL

COSEL																																									
Model	GHA300F-48																																								
Item	Ripple-Noise	Temperature	25°C																																						
Object	+48V6.3A	Testing Circuitry	Figure A																																						
1.Graph		2.Values																																							
<div><div><div><div><div></div><div>—△—</div><div>Input Volt. 120V</div></div><div><div>-·-○-·-</div><div>Input Volt. 230V</div></div></div><div><p>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.</p></div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 120 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0.0</td><td>45</td><td>50</td></tr><tr><td>1.0</td><td>90</td><td>90</td></tr><tr><td>2.1</td><td>100</td><td>100</td></tr><tr><td>3.2</td><td>105</td><td>105</td></tr><tr><td>4.2</td><td>110</td><td>110</td></tr><tr><td>5.5</td><td>120</td><td>120</td></tr><tr><td>6.3</td><td>140</td><td>140</td></tr><tr><td>6.9</td><td>145</td><td>145</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-Noise [mV]		Input Volt. 120 [V]	Input Volt. 230 [V]	0.0	45	50	1.0	90	90	2.1	100	100	3.2	105	105	4.2	110	110	5.5	120	120	6.3	140	140	6.9	145	145	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 120 [V]	Input Volt. 230 [V]																																							
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<div><div><div><div></div><div>Ripple Noise[mVp-p]</div></div><div></div></div><div>Fig.Complex Ripple Noise Wave Form</div></div>																																									

Testing Circuitry Figure A

2.Values



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

Model		GHA300F-48	
Item		Ambient Temperature Drift	
Object		+48V6.3A	
1.Graph		2.Values	

—△—

Input Volt. 100V

---□---

Input Volt. 120V

---○---

Input Volt. 230V

Ambient Temperature [°C]	Output Voltage [V] (100V)	Output Voltage [V] (120V)	Output Voltage [V] (230V)
-20	48.287	48.290	48.285
-10	48.329	48.331	48.333
0	48.371	48.373	48.376
10	48.417	48.419	48.421
20	48.456	48.457	48.460
25	48.462	48.463	48.463
30	48.474	48.476	48.478
40	48.499	48.500	48.501
50	48.527	48.527	48.529
60	48.534	48.537	48.535
--	-	-	-

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

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
-20	48.287	48.290	48.285
-10	48.329	48.331	48.333
0	48.371	48.373	48.376
10	48.417	48.419	48.421
20	48.456	48.457	48.460
25	48.462	48.463	48.463
30	48.474	48.476	48.478
40	48.499	48.500	48.501
50	48.527	48.527	48.529
60	48.534	48.537	48.535
--	-	-	-

Note: In case of Input Volt. 100V, Load 88%.
Other case Load 100%.

		Testing Circuitry Figure A
Model	GHA300F-48	
Item	Output Voltage Accuracy	
Object	+48V6.3A	

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 : -20 - 50°C

Input Voltage : 115 - 264V

Load Current : 0 - 6.3A

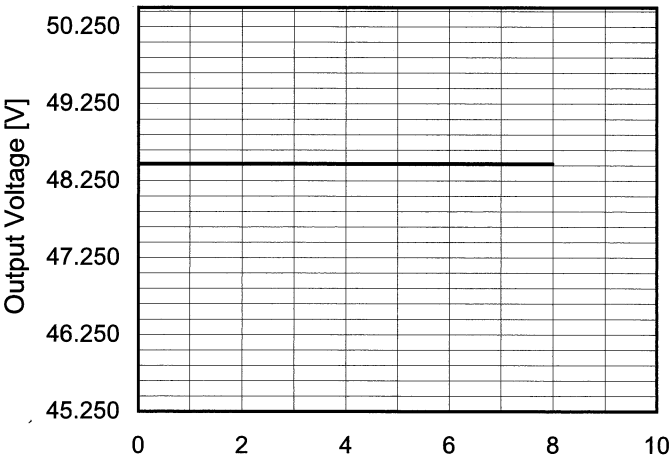
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

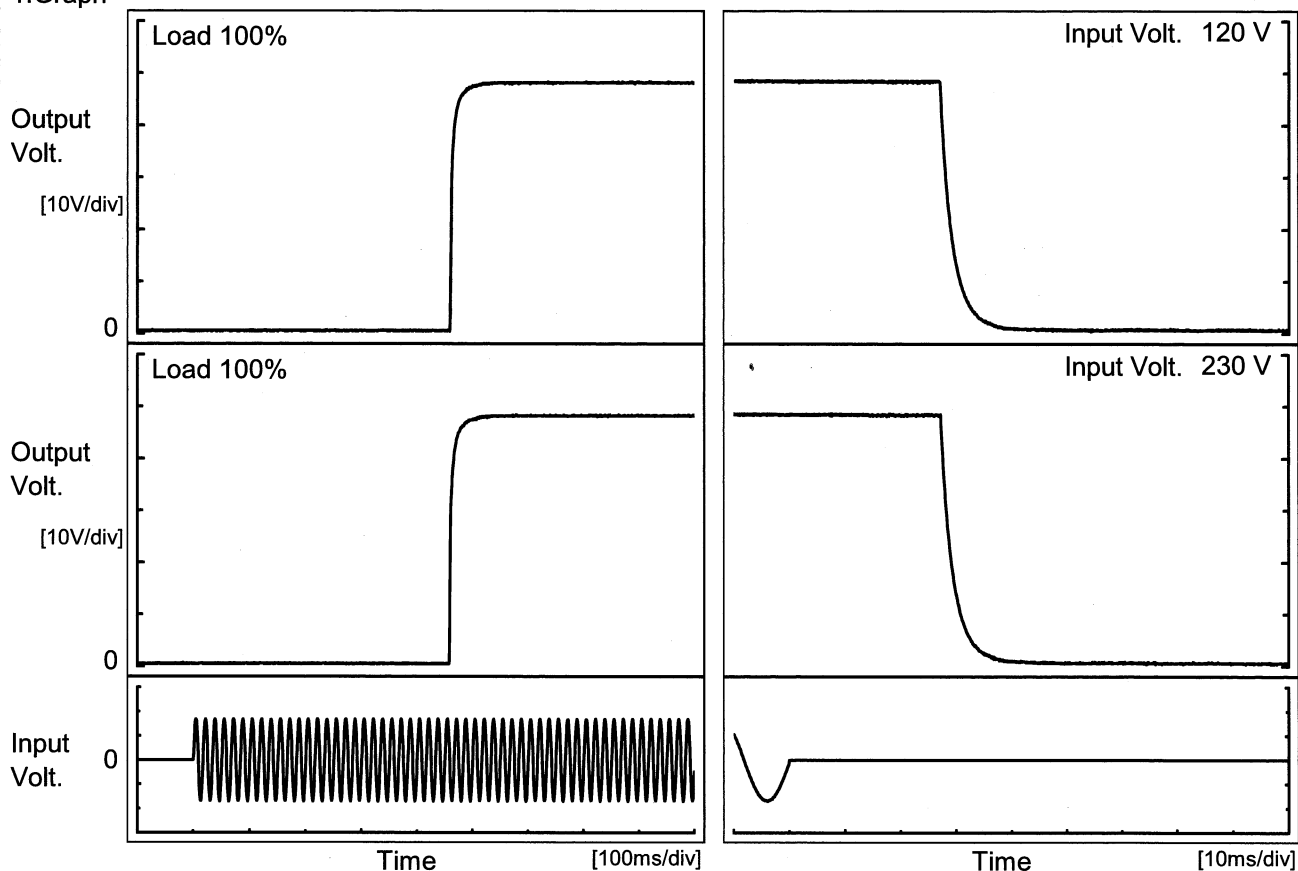
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	120	0	48.535	±125	±0.3
Minimum Voltage	-20	230	6.3	48.285		



Model	GHA300F-48																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+48V6.3A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 230V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>48.480</td></tr><tr><td>0.5</td><td>48.473</td></tr><tr><td>1.0</td><td>48.473</td></tr><tr><td>2.0</td><td>48.473</td></tr><tr><td>3.0</td><td>48.473</td></tr><tr><td>4.0</td><td>48.473</td></tr><tr><td>5.0</td><td>48.473</td></tr><tr><td>6.0</td><td>48.473</td></tr><tr><td>7.0</td><td>48.473</td></tr><tr><td>8.0</td><td>48.474</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	48.480	0.5	48.473	1.0	48.473	2.0	48.473	3.0	48.473	4.0	48.473	5.0	48.473	6.0	48.473	7.0	48.473	8.0	48.474
Time since start [H]	Output Voltage [V]																								
0.0	48.480																								
0.5	48.473																								
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2.0	48.473																								
3.0	48.473																								
4.0	48.473																								
5.0	48.473																								
6.0	48.473																								
7.0	48.473																								
8.0	48.474																								
* The characteristic of AC120V is equal.																									

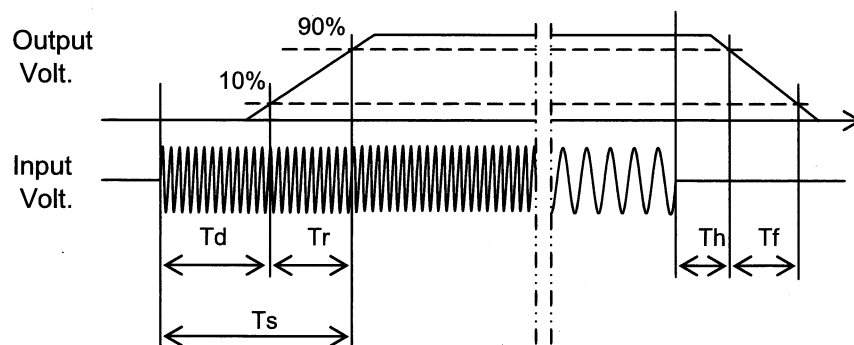
Model	GHA300F-48	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+48V6.3A		

1.Graph



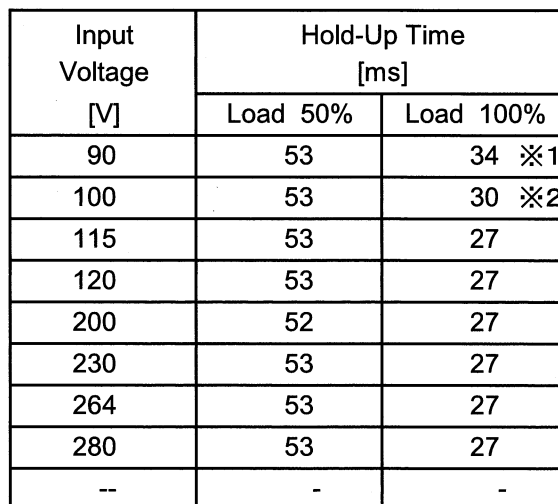
2.Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
120 V	461.0	13.0	474.0	27.3	5.2
230 V	459.5	12.5	472.0	27.4	5.3



Temperature	25°C
Testing Circuitry	Figure A

2.Values



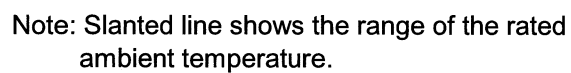
※2: Load 88%

- 19 -

Model	GHA300F-48		
Item	Instantaneous Interruption Compensation	Temperature	25°C
Object	+48V6.3A	Testing Circuitry	Figure A
<p>1.Graph</p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> △□○ </p> <p> </p>			

Testing Circuitry Figure A

2.Values



Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	72	73
-10	72	73
0	72	73
10	72	73
20	72	73
25	72	73
30	72	73
40	72	74
50	72	74
60	72	74
--	-	-

Model	GHA300F-48																																																	
Item	Overcurrent Protection	Temperature	25°C																																															
Object	+48V6.3A	Testing Circuitry	Figure A																																															
1.Graph		2.Values																																																
<div><div><div>○ Input Volt. 120V</div><div>□ Input Volt. 230V</div></div><p>Note: Slanted line shows the range of the rated load current.</p><p>Intermittent operation occurs when overcurrent protection is activated.</p></div>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 120[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>48</td><td>7.25</td><td>7.23</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><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><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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 120[V]	Input Volt. 230[V]	48	7.25	7.23	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Model	GHA300F-48																																								
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Object	+48V6.3A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 120V</div></div><div><div>---□---</div><div>Input Volt. 230V</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="2">Operating Point [V]</th></tr><tr><th>Input Volt. 120[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-20</td><td>56.26</td><td>56.26</td></tr><tr><td>-10</td><td>56.96</td><td>56.96</td></tr><tr><td>0</td><td>57.55</td><td>57.55</td></tr><tr><td>10</td><td>58.25</td><td>58.25</td></tr><tr><td>20</td><td>58.84</td><td>58.84</td></tr><tr><td>25</td><td>59.19</td><td>59.19</td></tr><tr><td>30</td><td>59.48</td><td>59.48</td></tr><tr><td>40</td><td>60.09</td><td>60.09</td></tr><tr><td>50</td><td>60.78</td><td>60.78</td></tr><tr><td>60</td><td>61.37</td><td>61.37</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 120[V]	Input Volt. 230[V]	-20	56.26	56.26	-10	56.96	56.96	0	57.55	57.55	10	58.25	58.25	20	58.84	58.84	25	59.19	59.19	30	59.48	59.48	40	60.09	60.09	50	60.78	60.78	60	61.37	61.37	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
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25	59.19	59.19																																							
30	59.48	59.48																																							
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60	61.37	61.37																																							
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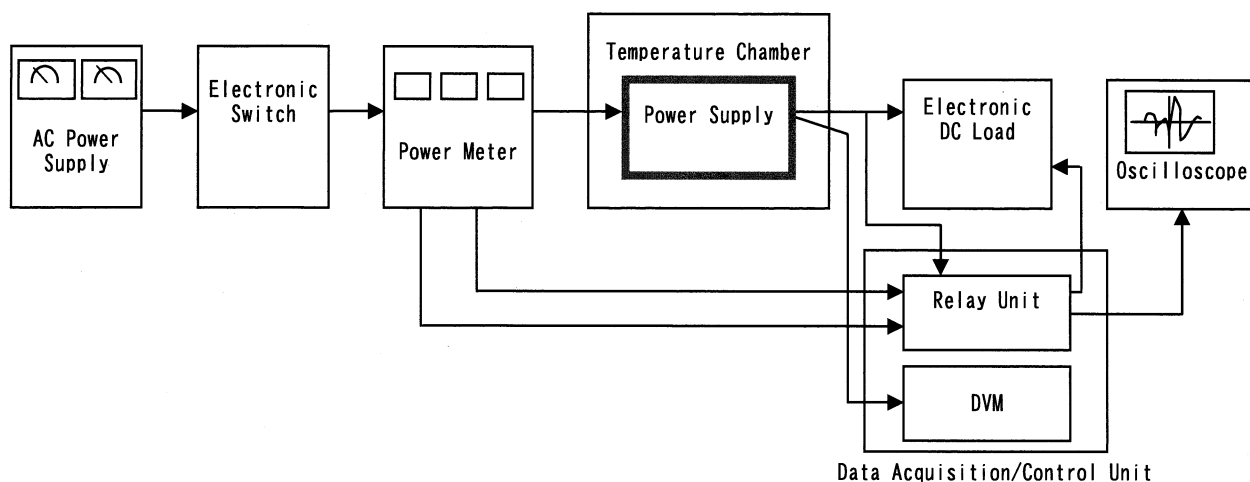


Figure A

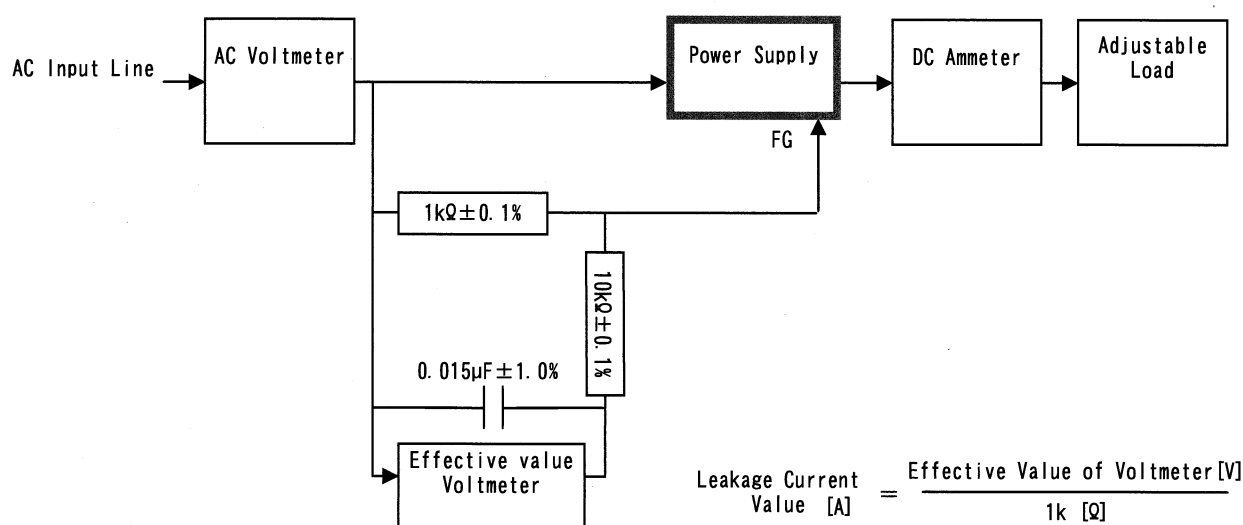


Figure B (IEC60601-1)