

# TEST DATA OF GHA300F-12-SNF

Regulated DC Power Supply  
June 9, 2016

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Masashi Shibata Design Engineer

**COSEL CO.,LTD.**

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# COSEL

Model

GHA300F-12-SNF

Item

Input Current (by Load Current)

Object

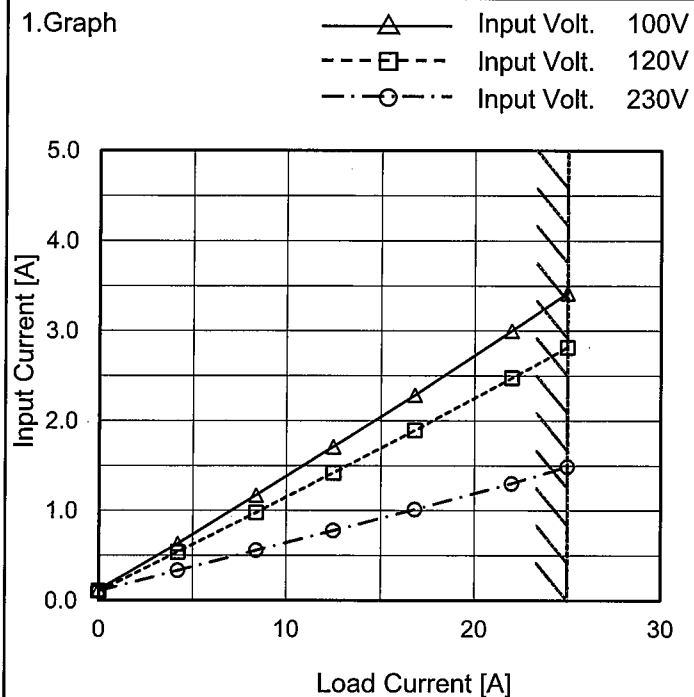
Temperature

25°C

Testing Circuitry

Figure A

## 1. Graph



## 2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	0.120	0.103	0.104
4.2	0.631	0.538	0.335
8.4	1.170	0.978	0.558
12.5	1.710	1.419	0.778
16.8	2.284	1.894	1.012
22.0	3.001	2.477	1.302
25.0	3.420	2.816	1.488
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

# COSEL

Model

GHA300F-12-SNF

Item

Input Power (by Load Current)

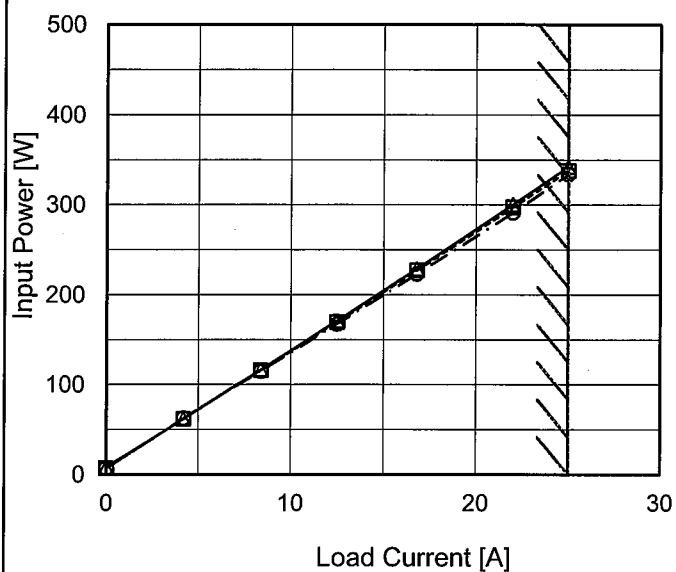
Object

Temperature 25°C

Testing Circuitry Figure A

## 1. Graph

—△— Input Volt. 100V  
 ---□--- Input Volt. 120V  
 ---○--- 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. 120[V]	Input Volt. 230[V]
0.0	8.0	7.0	6.8
4.2	61.8	62.1	62.5
8.4	116.5	116.0	115.0
12.5	171.0	169.6	167.5
16.8	228.8	227.1	223.1
22.0	300.5	297.3	291.4
25.0	342.3	338.1	334.0
--	-	-	-
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--	-	-	-
--	-	-	-

**COSEL**

Model

GHA300F-12-SNF

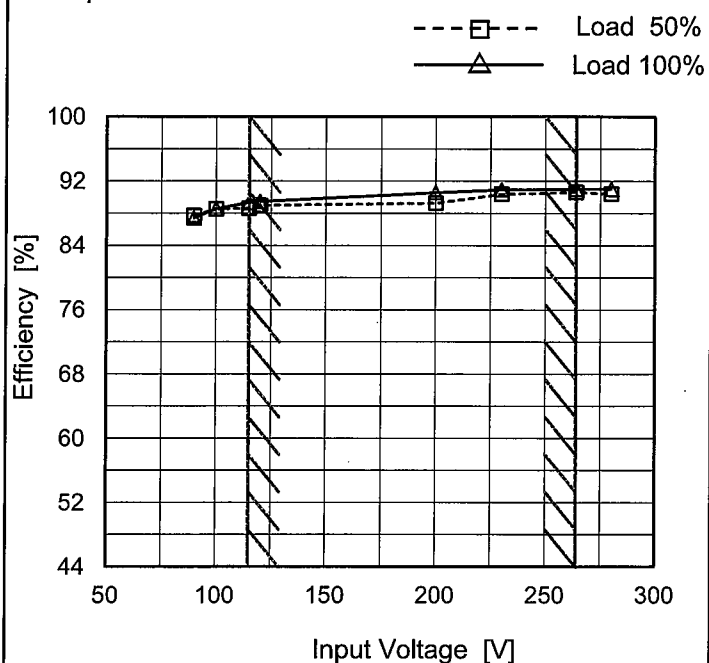
Item

Efficiency (by Input Voltage)

Object

 Temperature 25°C  
 Testing Circuitry Figure A

## 1. Graph



## 2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
90	87.7	87.4 ※1
100	88.5	88.6 ※2
115	88.6	89.3
120	89.0	89.5
200	89.3	90.6
230	90.4	91.0
264	90.6	91.0
280	90.4	91.0
--	-	-

※1 : Load 80%

※2 : Load 88%

**COSEL**

Model		GHA300F-12-SNF	
Item		Efficiency (by Load Current)	
Object			

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

120V

---○---

Input Volt.

230V

Efficiency [%]

**COSEL**

Model

GHA300F-12-SNF

Item

Power Factor (by Input Voltage)

Temperature

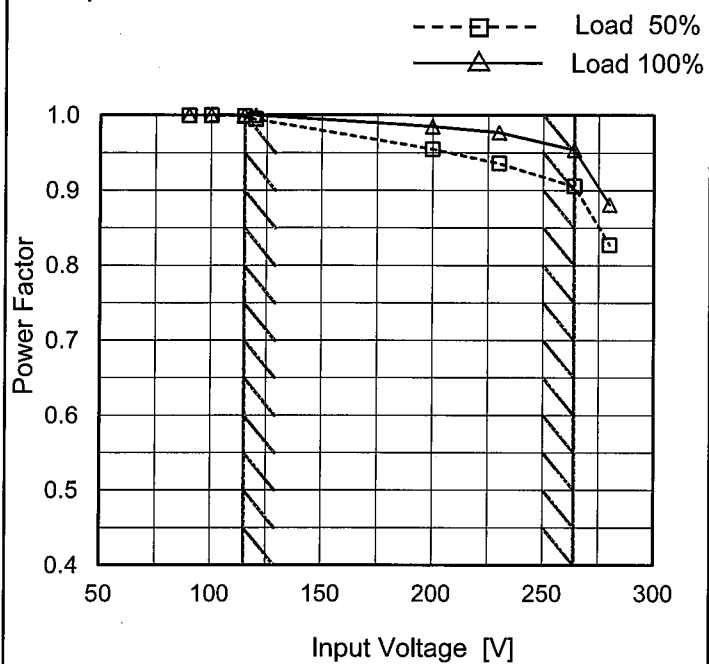
25°C

Testing Circuitry

Figure A

Object

## 1. Graph



## 2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
90	0.999	0.999 ※1
100	0.999	0.999 ※2
115	0.999	0.999
120	0.995	0.999
200	0.955	0.985
230	0.936	0.977
264	0.906	0.954
280	0.827	0.881
--	-	-

※1 : Load 80%

※2 : Load 88%

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Model

GHA300F-12-SNF

Item

Power Factor (by Load Current)

Object

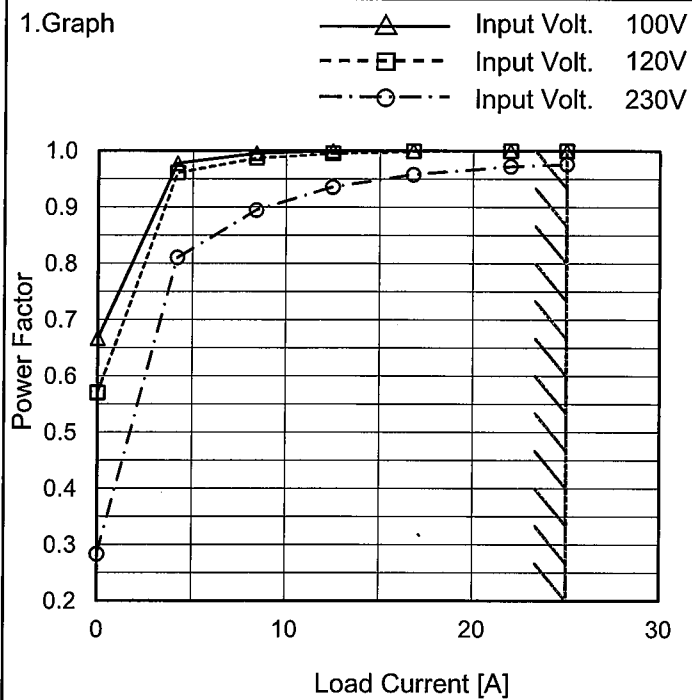
Temperature

25°C

Testing Circuitry

Figure A

## 1. Graph



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

## 2. Values

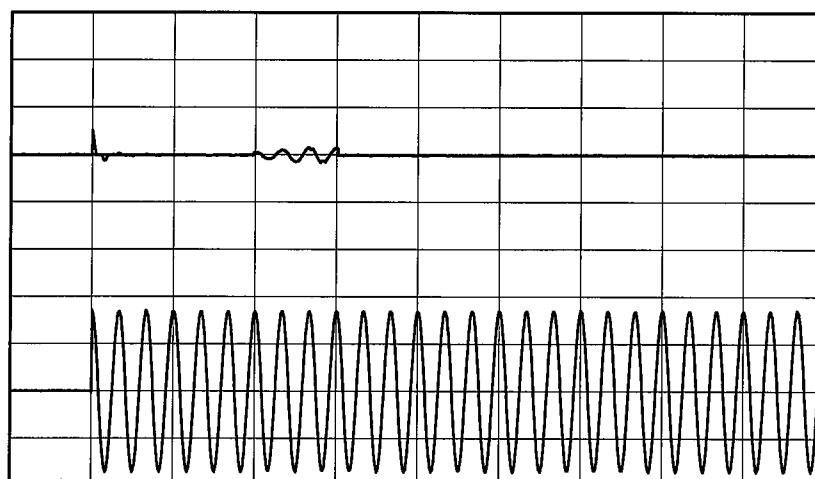
Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	0.667	0.570	0.283
4.2	0.978	0.961	0.811
8.4	0.996	0.987	0.895
12.5	0.999	0.995	0.936
16.8	0.999	0.999	0.958
22.0	0.999	0.999	0.973
25.0	0.999	0.999	0.977
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

# COSEL

Model		GHA300F-12-SNF	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		_____	

Input  
Current  
[50A/div]

Input  
Voltage  
[100V/div]



Time

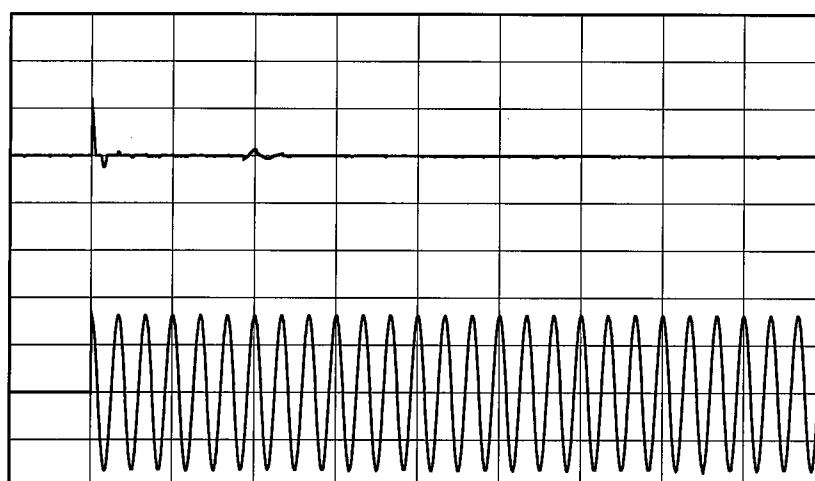
[50ms/div]

Input Voltage 120 V  
Frequency 60 Hz  
Load 100 %

①Primary inrush current : 21.2 A  
②Secondary inrush current : 8.2 A  
③Surge current ※1: 25.8 A

Input  
Current  
[50A/div]

Input  
Voltage  
[200V/div]

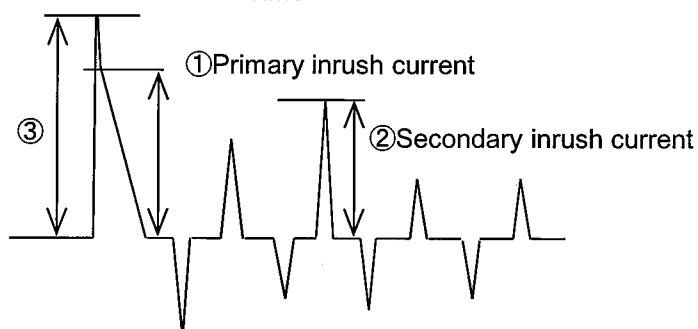


Time

[50ms/div]

Input Voltage 230 V  
Frequency 60 Hz  
Load 100 %

①Primary inrush current : 39.2 A  
②Secondary inrush current : 6.4 A  
③Surge current ※1: 60.2 A



※1 The specification of the primary inrush current means that the surge current to a built-in noise filter (0.4msec or less: waveform ③) is excluded.

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		Temperature 25°C Testing Circuitry Figure B
Model	GHA300F-12-SNF	
Item	Leakage Current	
Object	_____	

## 1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	120 [V]	240 [V]	
IEC60601	Both phases	0.05	0.06	0.13	Operation
	One of phases	0.10	0.11	0.26	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

GHA300F-12-SNF

Item

Line Regulation

Object

+12V25A

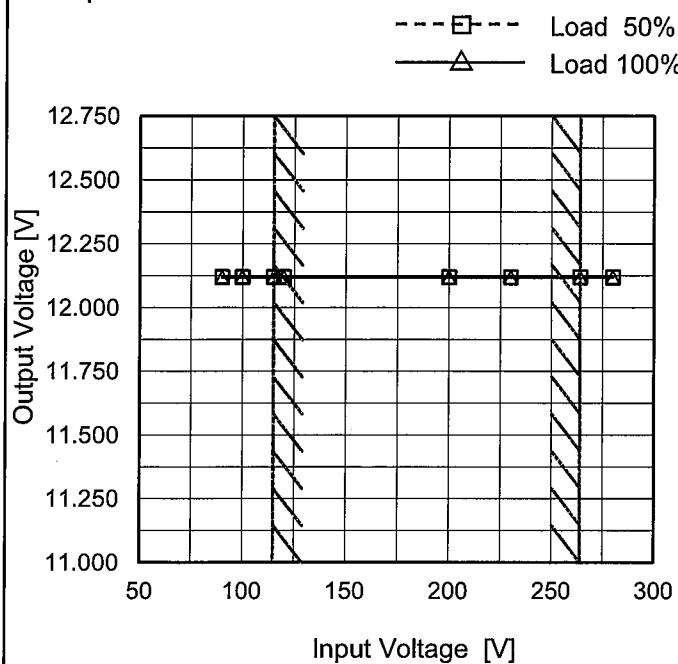
Temperature

25°C

Testing Circuitry

Figure A

## 1. Graph



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

## 2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
90	12.119	12.118 ※1
100	12.119	12.119 ※2
115	12.119	12.118
120	12.120	12.118
200	12.120	12.118
230	12.119	12.118
264	12.120	12.119
280	12.120	12.119
--	-	-

※1 : Load 80%

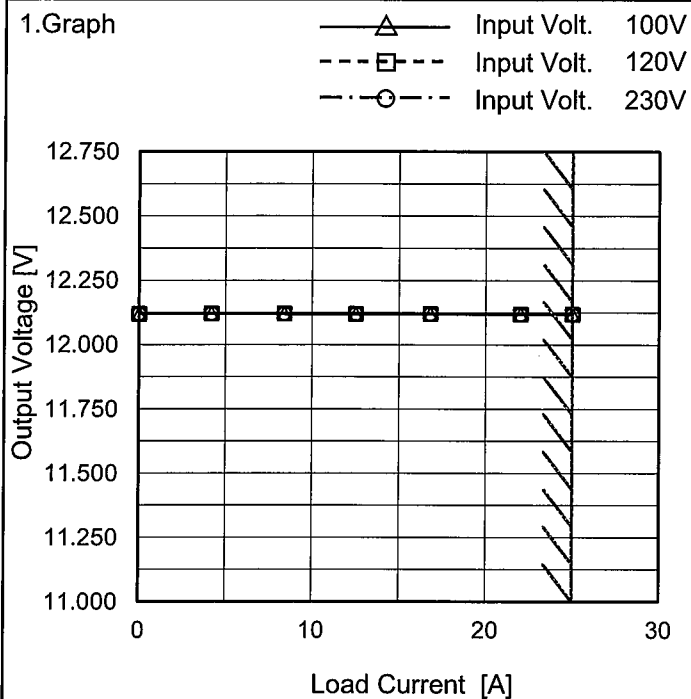
※2 : Load 88%

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Model GHA300F-12-SNF

Item Load Regulation

Object +12V25A

Temperature 25°C  
Testing Circuitry Figure A

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. 120[V]	Input Volt. 230[V]
0.0	12.120	12.120	12.120
4.2	12.121	12.121	12.121
8.4	12.120	12.120	12.121
12.5	12.119	12.120	12.120
16.8	12.119	12.119	12.119
22.0	12.119	12.119	12.119
25.0	12.119	12.118	12.118
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

**COSEL**

Model	GHA300F-12-SNF	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+12V25A	

Input Volt. 120 V  
Cycle 1000 ms

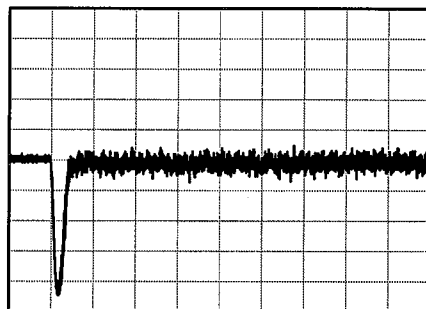
$t_1, t_2 = 50 \mu s$

Load Current

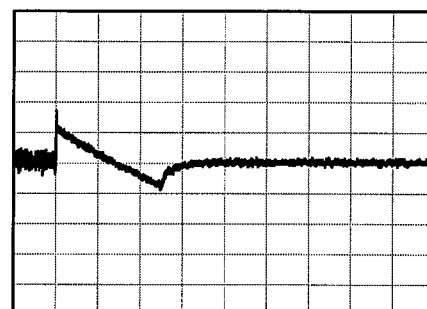


Min.Load (0A) ←→  
Load 100% (25A)

200 mV/div



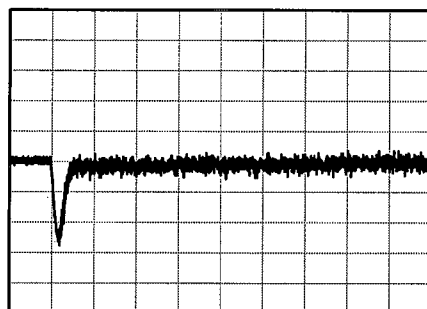
400  $\mu s$ /div



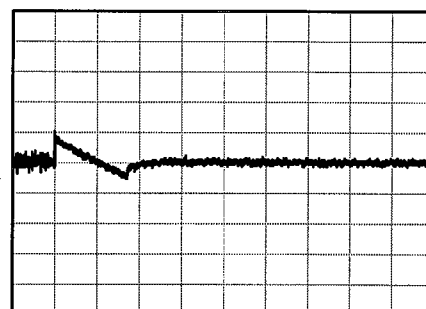
10 ms/div

Min.Load (0A) ←→  
Load 50% (12.5A)

200 mV/div



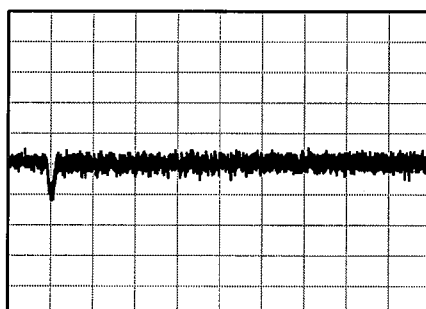
400  $\mu s$ /div



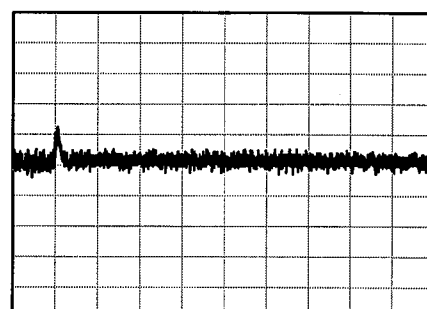
10 ms/div

Load 50% (12.5A) ←→  
Load 100% (25A)

200 mV/div



400  $\mu s$ /div



400  $\mu s$ /div

**COSEL**

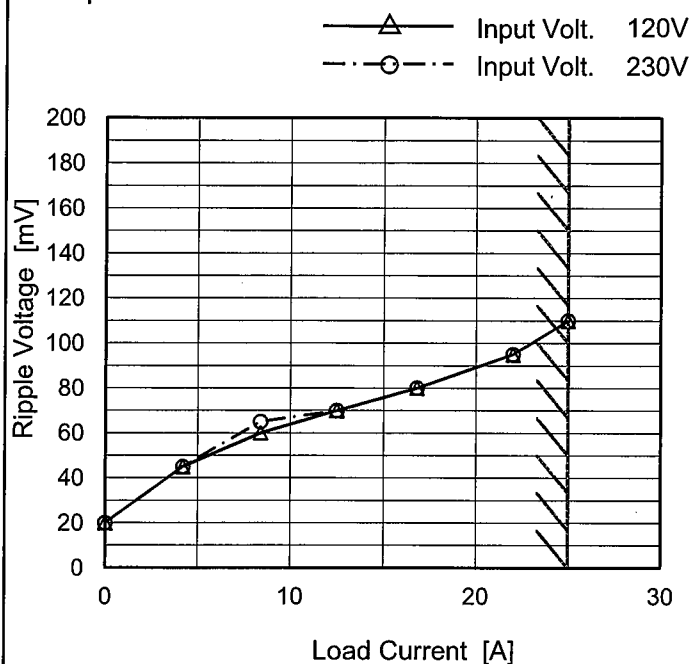
Model GHA300F-12-SNF

Item Ripple Voltage (by Load Current)

Object +12V25A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
0.0	20	20
4.2	45	45
8.4	60	65
12.5	70	70
16.8	80	80
22.0	95	95
25.0	110	110
--	-	-
--	-	-
--	-	-
--	-	-

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.

Ripple [mVp-p]

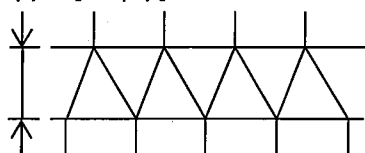


Fig. Complex Ripple Wave Form

**COSEL**

Model		GHA300F-12-SNF		Temperature 25°C																																																																											
Item		Ripple-Noise		Testing Circuitry Figure A																																																																											
Object		+12V25A																																																																													
1.Graph				2.Values																																																																											
<div><div><div>—△— Input Volt. 120V</div><div>-·-○-·- Input Volt. 230V</div></div><table><thead><tr><th>Load Current [A]</th><th>Input Volt. 120 [V]</th><th>Input Volt. 230 [V]</th></tr></thead><tbody><tr><td>0.0</td><td>25</td><td>25</td></tr><tr><td>4.2</td><td>50</td><td>50</td></tr><tr><td>8.4</td><td>75</td><td>75</td></tr><tr><td>12.5</td><td>80</td><td>80</td></tr><tr><td>16.8</td><td>120</td><td>120</td></tr><tr><td>22.0</td><td>125</td><td>125</td></tr><tr><td>25.0</td><td>130</td><td>130</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></tbody></table></div> <div><p>Measured by 20 MHz Oscilloscope.</p><p>Ripple-Noise is shown as p-p in the figure below.</p><p>Note: Slanted line shows the range of the rated load current.</p><p>Fig.Complex Ripple Noise Wave Form</p></div>				Load Current [A]	Input Volt. 120 [V]	Input Volt. 230 [V]	0.0	25	25	4.2	50	50	8.4	75	75	12.5	80	80	16.8	120	120	22.0	125	125	25.0	130	130	--	-	-	--	-	-	--	-	-	--	-	-	<table><thead><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></thead><tbody><tr><td>0.0</td><td>25</td><td>25</td></tr><tr><td>4.2</td><td>50</td><td>50</td></tr><tr><td>8.4</td><td>75</td><td>75</td></tr><tr><td>12.5</td><td>80</td><td>80</td></tr><tr><td>16.8</td><td>120</td><td>120</td></tr><tr><td>22.0</td><td>125</td><td>125</td></tr><tr><td>25.0</td><td>130</td><td>130</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></tbody></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 120 [V]	Input Volt. 230 [V]	0.0	25	25	4.2	50	50	8.4	75	75	12.5	80	80	16.8	120	120	22.0	125	125	25.0	130	130	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Input Volt. 120 [V]	Input Volt. 230 [V]																																																																													
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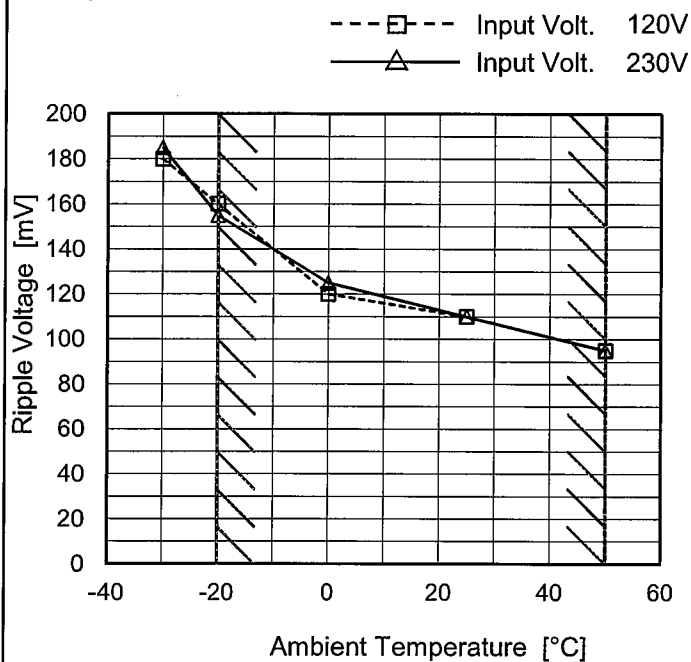
Model GHA300F-12-SNF

Item Ripple Voltage (by Ambient Temp.)

Object +12V25A

Testing Circuitry Figure A

## 1. Graph



Measured by 20 MHz Oscilloscope.

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

Ripple [mVp-p]

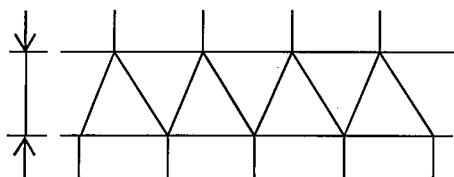


Fig. Complex Ripple Wave Form

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
-30	180	185
-20	160	155
0	120	125
25	110	110
50	95	95
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

# COSEL

Model

GHA300F-12-SNF

Item

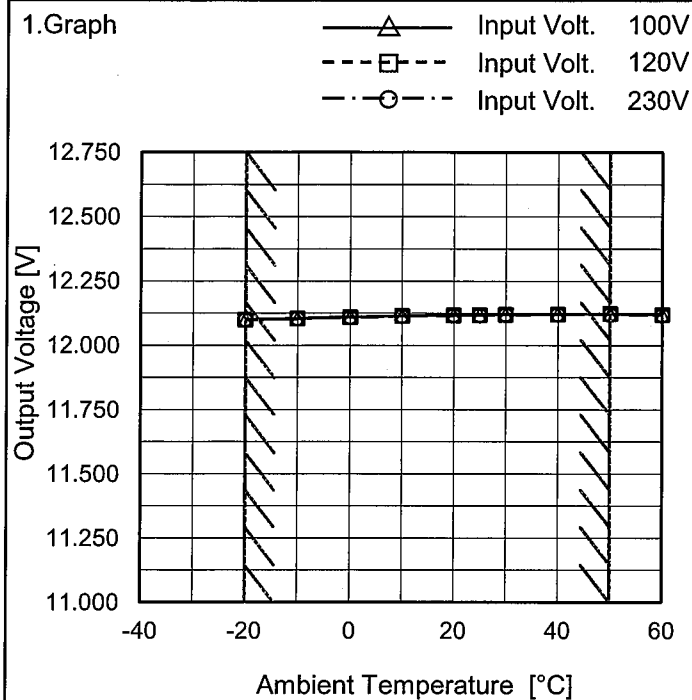
Ambient Temperature Drift

Object

+12V25A

Testing Circuitry Figure A

## 1. Graph



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

## 2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
-20	12.101	12.100	12.099
-10	12.105	12.104	12.104
0	12.111	12.110	12.109
10	12.115	12.114	12.114
20	12.118	12.117	12.116
25	12.119	12.118	12.118
30	12.121	12.120	12.119
40	12.122	12.121	12.120
50	12.124	12.123	12.121
60	12.120	12.119	12.118
--	-	-	-

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

**COSEL**

		Testing Circuitry Figure A
Model	GHA300F-12-SNF	
Item	Output Voltage Accuracy	
Object	+12V25A	

### 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 - 25A

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

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

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	230	0	12.120	±10	±0.1
Minimum Voltage	-20	115	25	12.100		

# COSEL

LUSEL			
Model	GHA300F-12-SNF		
Item	Time Lapse Drift	Temperature	25°C
Object	+12V25A	Testing Circuitry	Figure A
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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# COSEL

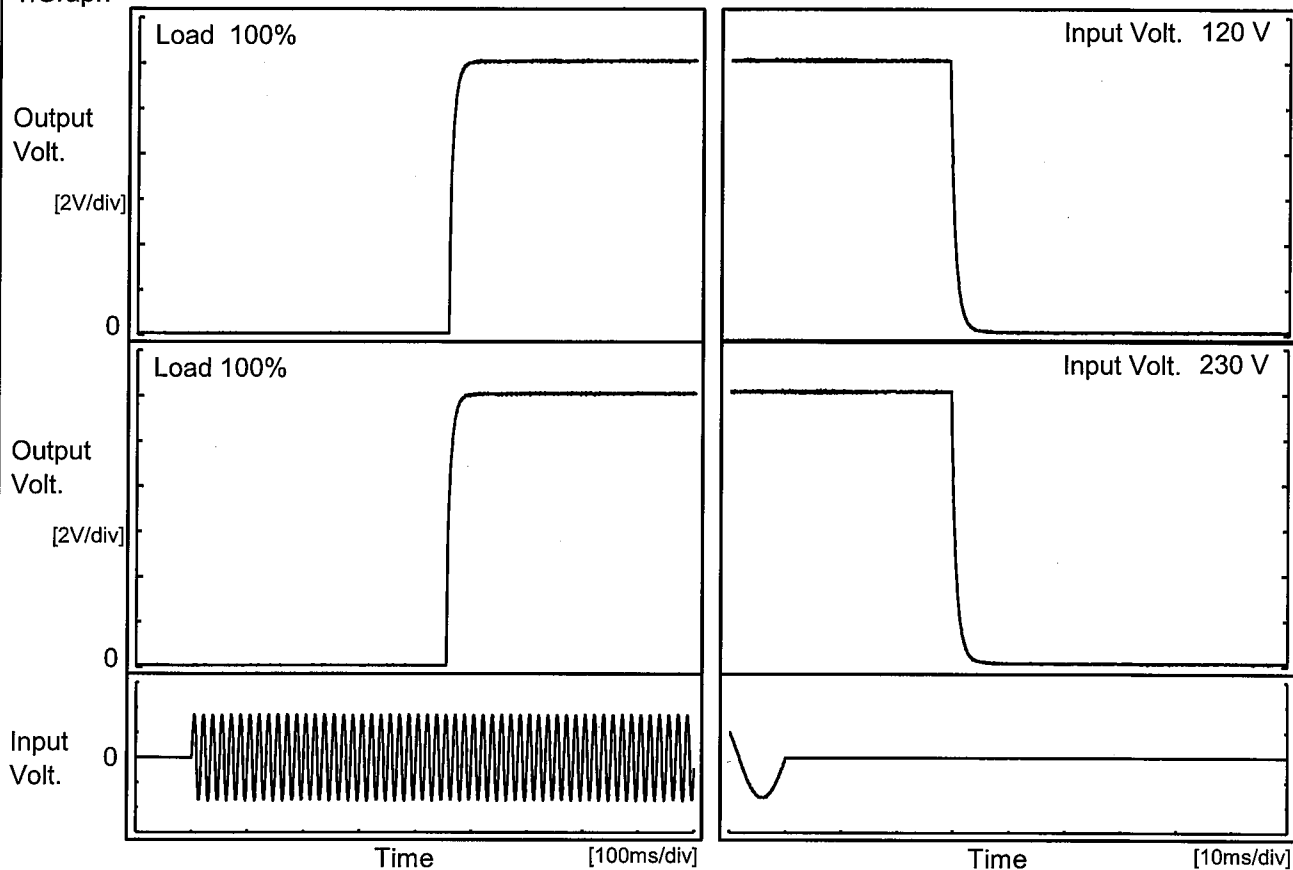
Model GHA300F-12-SNF

Item Rise and Fall Time

Object +12V25A

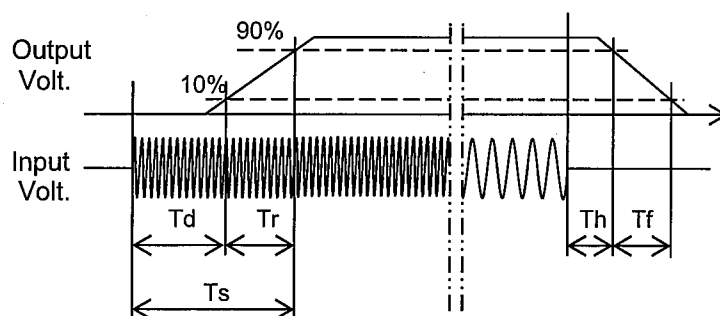
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
120V		457.0	13.5	470.5	29.3	2.1
230V		454.5	13.5	468.0	29.7	2.1



**COSEL**

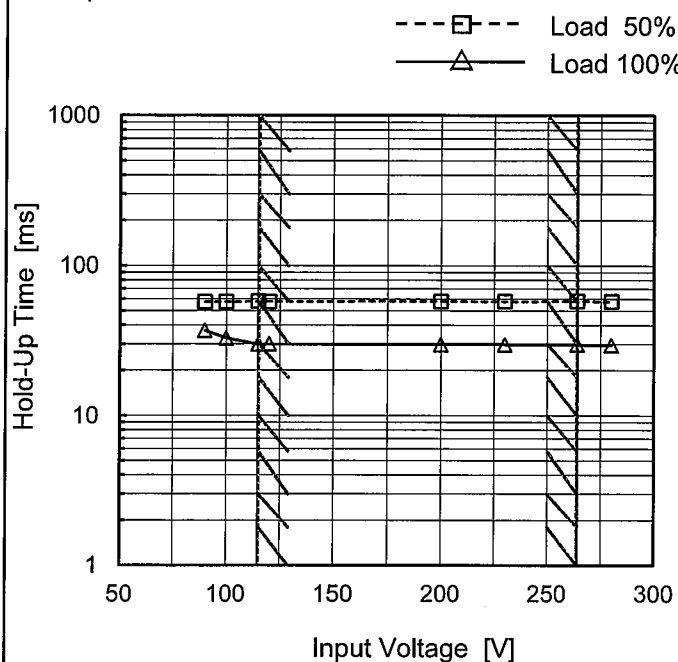
Model GHA300F-12-SNF

Item Hold-Up Time

Object +12V25A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



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.

## 2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
90	57	37 ※1
100	57	33 ※2
115	58	30
120	58	30
200	58	30
230	58	30
264	58	30
280	58	30
--	-	-

※1 : Load 80%

※2 : Load 88%

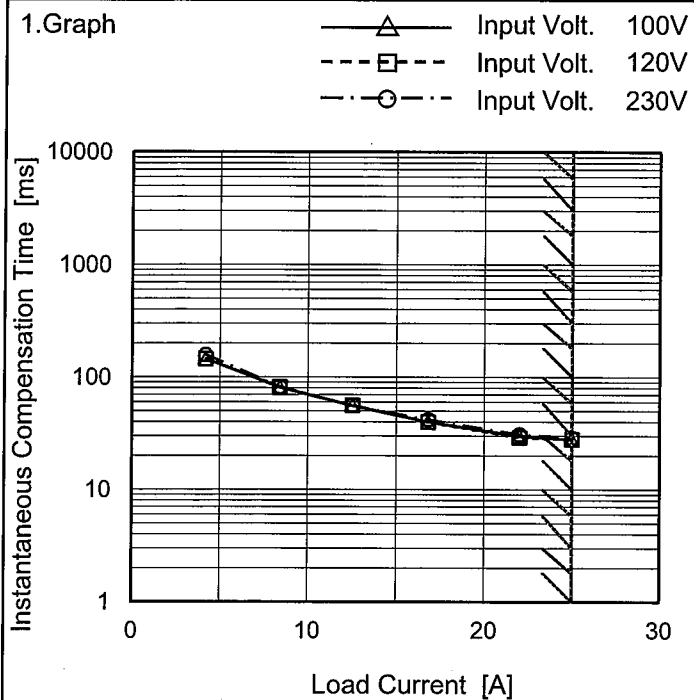
# COSEL

Model GHA300F-12-SNF

Item Instantaneous Interruption Compensation

Object +12V25A

Temperature 25°C  
Testing Circuitry Figure A



2. Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	-	-	-
4.2	145	145	158
8.4	81	82	82
12.5	56	56	56
16.8	40	40	42
22.0	30	29	31
25.0	28	28	29
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

**COSEL**

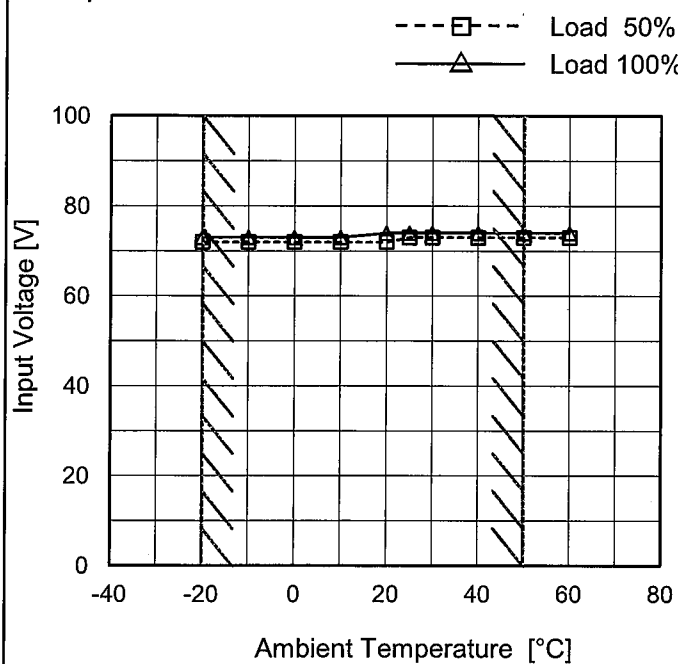
Model GHA300F-12-SNF

Item Minimum Input Voltage  
for Regulated Output Voltage

Object +12V25A

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	72	73
-10	72	73
0	72	73
10	72	73
20	72	74
25	73	74
30	73	74
40	73	74
50	73	74
60	73	74
--	-	-

**COSEL**

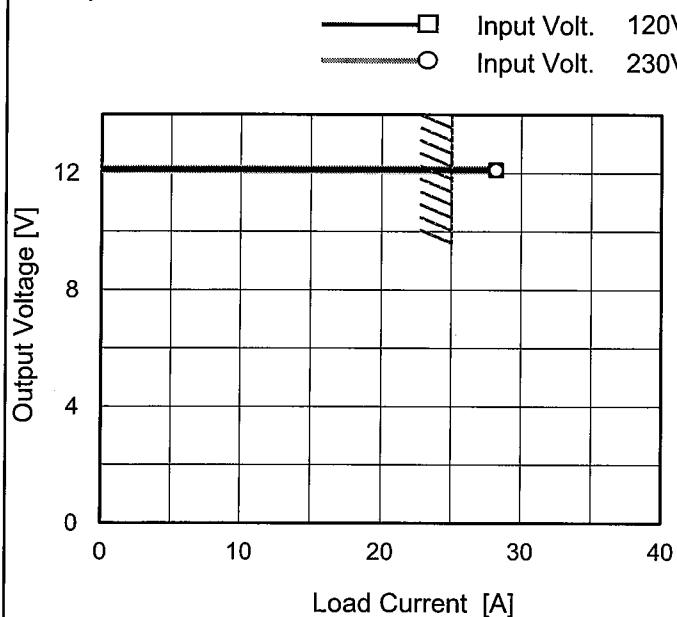
Model GHA300F-12-SNF

Item Overcurrent Protection

Object +12V25A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



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

Intermittent operation occurs when overcurrent protection is activated.

## 2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt.	Input Volt.
	120[V]	230[V]
12	28.18	28.18
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
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# COSEL

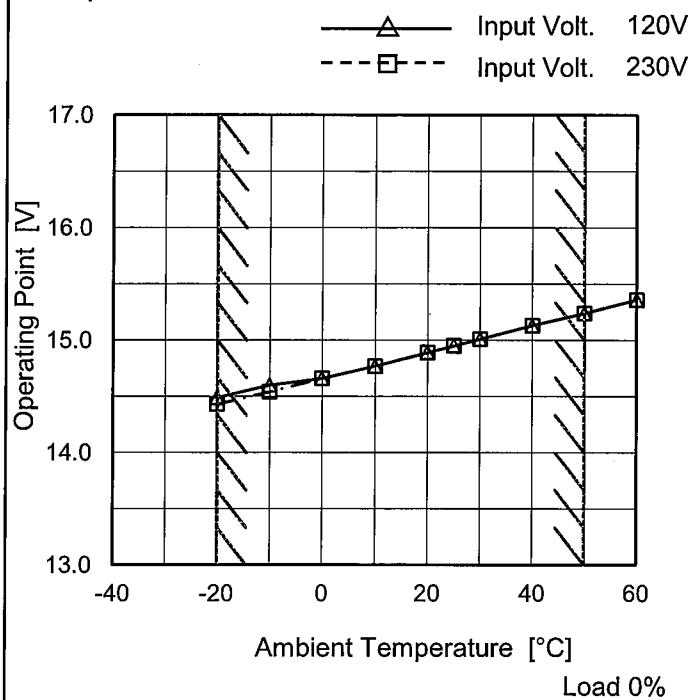
Model GHA300F-12-SNF

Item Overvoltage Protection

Object +12V25A

Testing Circuitry Figure A

## 1. Graph



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

## 2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 120[V]	Input Volt. 230[V]
-20	14.49	14.43
-10	14.60	14.54
0	14.66	14.66
10	14.77	14.77
20	14.89	14.89
25	14.95	14.95
30	15.01	15.01
40	15.13	15.13
50	15.24	15.24
60	15.36	15.36
--	-	-

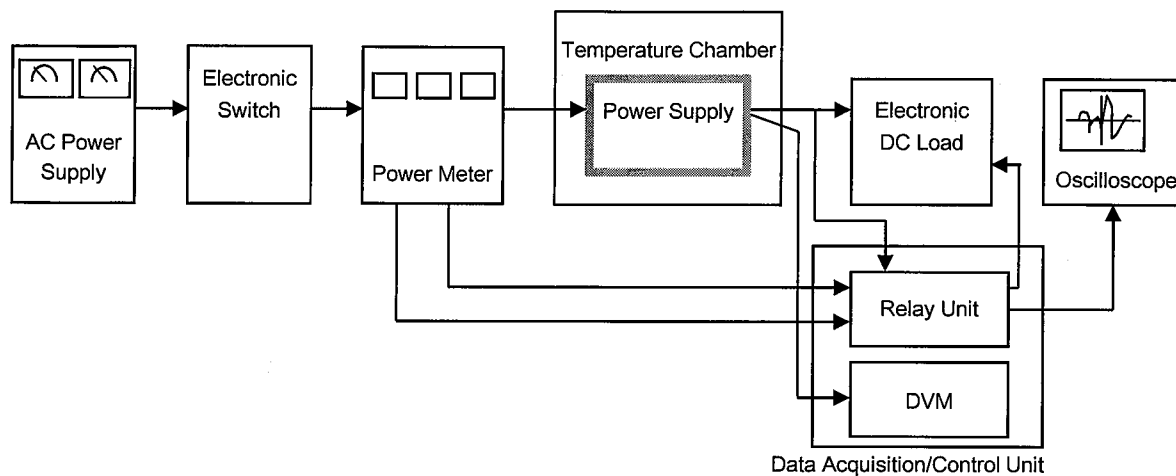


Figure A

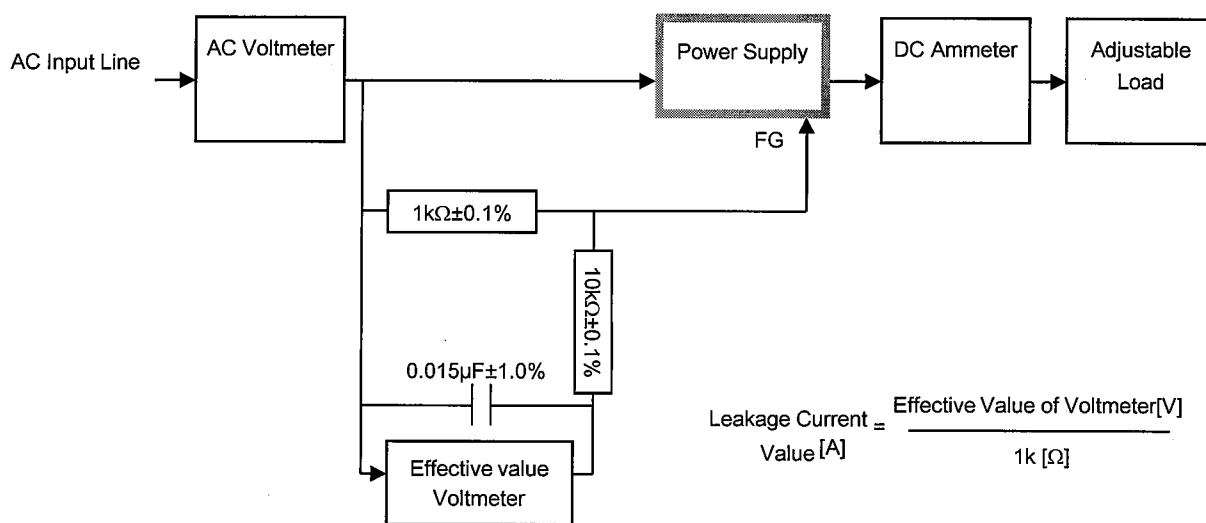


Figure B ( IEC60601-1 )