COSEL

TEST DATA OF GHA300F-48-SNF

Regulated DC Power Supply
June 9, 2016

Approved by : *Kenji Shiho*
Kenji Shiho   Design Manager

Prepared by : *Masashi Shibata*
Masashi Shibata   Design Engineer

COSEL CO.,LTD.

CO$EL

CONTENTS

(Final Page 24)

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Input Current (by Load Current)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   100V
- - -□- - - Input Volt.   120V
—·—○—·— Input Volt.   230V

Load Current [A]

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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	0.119	0.108	0.103
1.0	0.606	0.516	0.325
2.1	1.174	0.982	0.562
3.2	1.750	1.452	0.796
4.2	2.278	1.888	1.011
5.5	2.974	2.459	1.294
6.3	3.408	2.814	1.486
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11112

CO$EL

Model	GHA300F-48-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
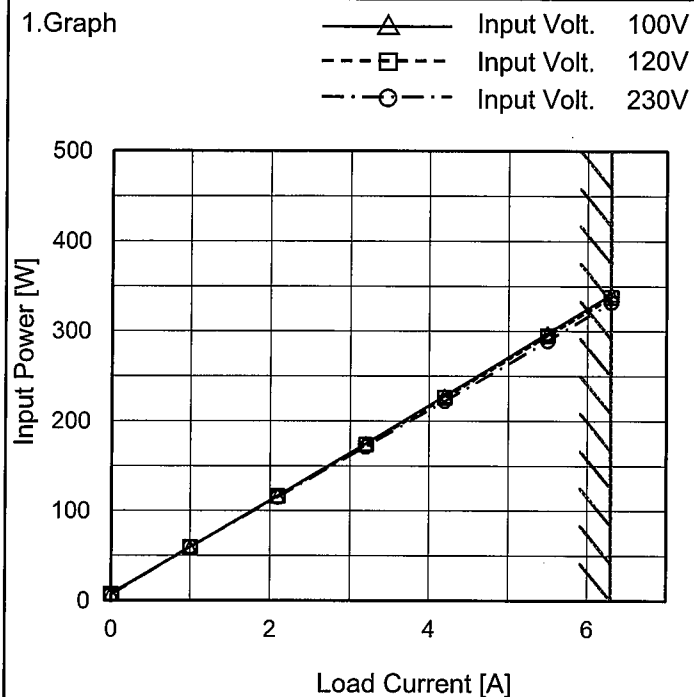
Load Current [A]

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	7.8	7.4	6.5
1.0	59.2	59.3	59.8
2.1	116.8	116.4	115.4
3.2	174.9	173.4	171.4
4.2	228.0	226.2	222.5
5.5	297.9	295.0	289.4
6.3	341.1	337.5	332.2
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Efficiency (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
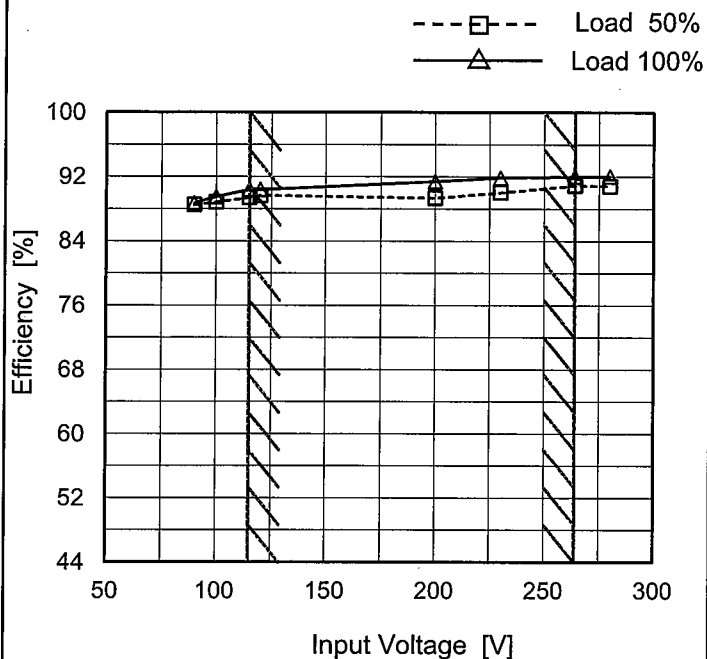
- - -◻- - -   Load 50%
———△———   Load 100%

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
90	88.5	88.7 ※1
100	88.8	89.5 ※2
115	89.4	90.4
120	89.7	90.4
200	89.4	91.4
230	90.0	91.9
264	90.9	92.0
280	90.9	92.1
--	-	-

※1 : Load 80%
※2 : Load 88%

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Efficiency (by Load Current)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
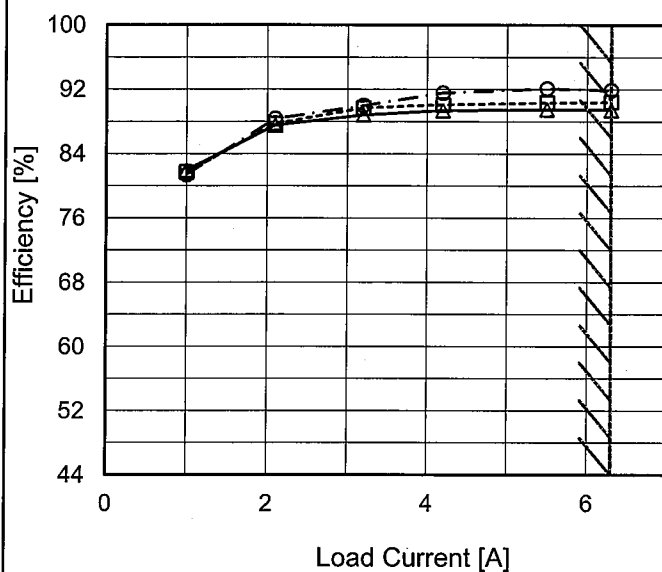
——△—— Input Volt.   100V
———⊟——— Input Volt.   120V
—·—○—·— Input Volt.   230V

Load Current [A]

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	-	-	-
1.0	81.9	81.7	81.4
2.1	87.6	87.7	88.4
3.2	88.8	89.7	90.0
4.2	89.4	90.1	91.6
5.5	89.5	90.4	92.1
6.3	89.5	90.4	91.9
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Power Factor (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

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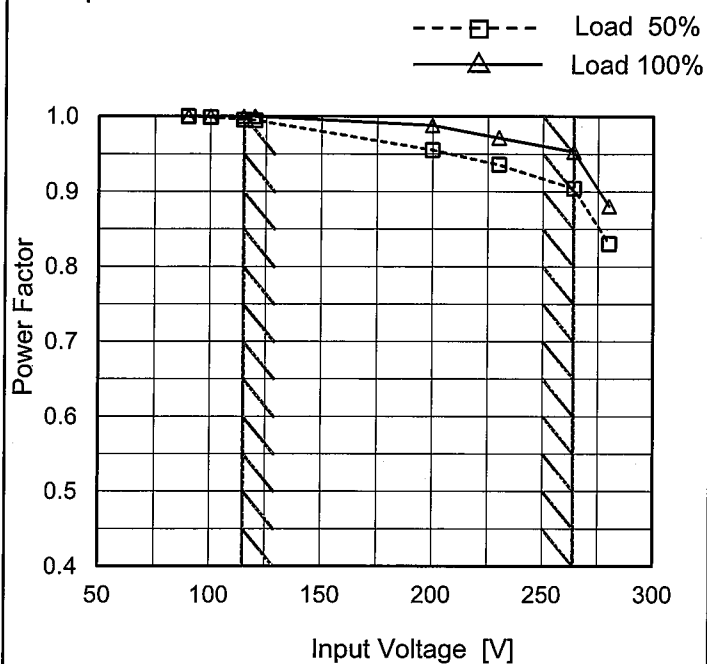
Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
90	0.999	0.999 ※1
100	0.999	0.999 ※2
115	0.996	0.999
120	0.995	0.999
200	0.955	0.988
230	0.936	0.972
264	0.904	0.953
280	0.831	0.881
--	-	-

※1 : Load 80%
※2 : Load 88%

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Power Factor (by Load Current)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
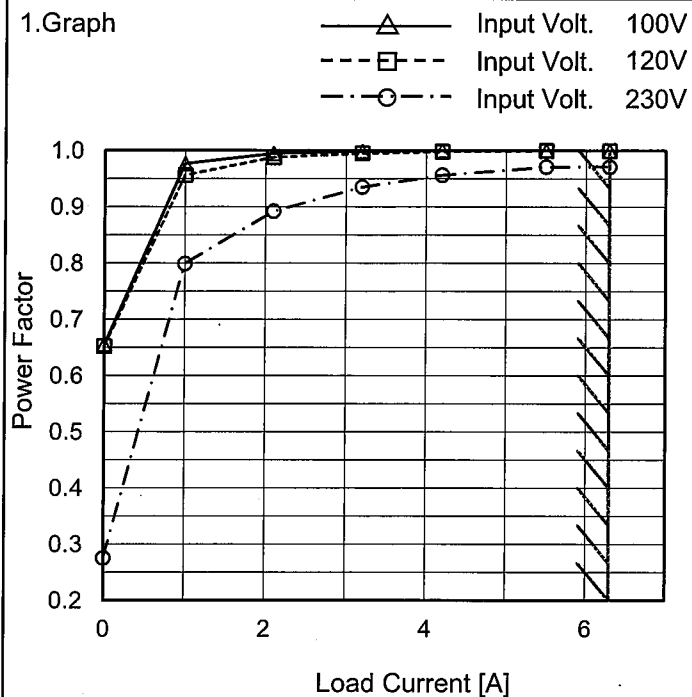
— △ — Input Volt.   100V
--- ⊟ --- Input Volt.   120V
—·—⊙—·· Input Volt.   230V

Power Factor

Load Current [A]

2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	0.655	0.652	0.275
1.0	0.977	0.956	0.799
2.1	0.995	0.988	0.892
3.2	0.999	0.995	0.936
4.2	0.999	0.998	0.957
5.5	0.999	0.999	0.971
6.3	0.999	0.999	0.972
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

BC-11112

CO$EL

| Model	GHA300F-48-SNF
Item	Inrush Current
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

Input
Current
[50A/div]

Input
Voltage
[100V/div]

Time   [50ms/div]

Input Voltage   120 V
Frequency   60 Hz
Load   100 %

①Primary inrush current :
                 18.0 A
②Secondary inrush current :
                 8.3 A
③Surge current ※1:
                 20.7 A

Input
Current
[50A/div]

Input
Voltage
[200V/div]

Time   [50ms/div]

Input Voltage   230 V
Frequency   60 Hz
Load   100 %

①Primary inrush current :
                 41.6 A
②Secondary inrush current :
                 7.1 A
③Surge current ※1:
                 60.2 A

③   ①Primary inrush current

②Secondary inrush current

※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.

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Leakage Current
Object	————————

Temperature 25°C
Testing Circuitry Figure B

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.

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Line Regulation
Object	+48V6.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -⊟- - - Load 50%
———△——— Load 100%

Output Voltage [V]
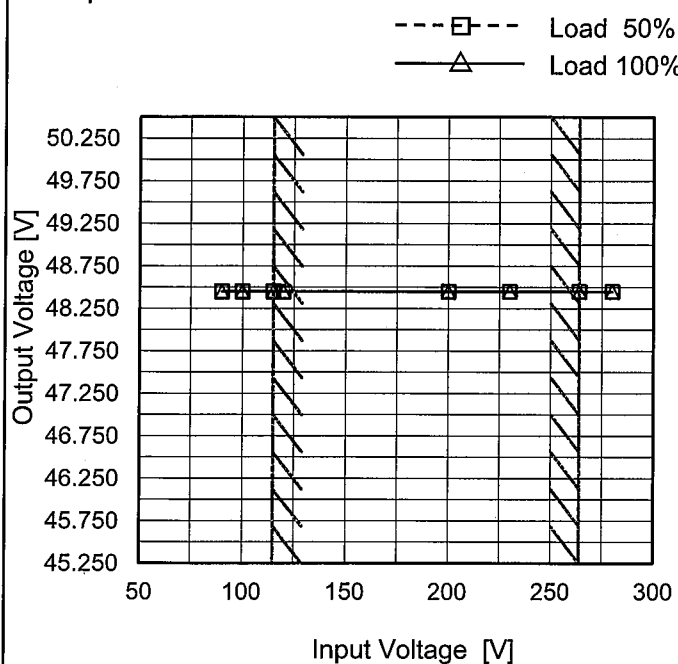
Input Voltage [V]

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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
90	48.449	48.447 ※1
100	48.449	48.447 ※2
115	48.449	48.447
120	48.448	48.447
200	48.450	48.448
230	48.450	48.449
264	48.450	48.449
280	48.450	48.450
--	-	-

※1 : Load 80%
※2 : Load 88%

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Load Regulation
Object	+48V6.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt. 100V
- - -◻- - - Input Volt. 120V
—··-○—·· Input Volt. 230V

Load Current [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	48.454	48.453	48.455
1.0	48.451	48.450	48.452
2.1	48.450	48.449	48.451
3.2	48.449	48.448	48.450
4.2	48.449	48.448	48.449
5.5	48.448	48.448	48.449
6.3	48.447	48.447	48.449
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Dynamic Load Response
Object	+48V6.3A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 120 V
Cycle 1000 ms

t1,t2 = 50 μ s

Load Current

t1   t2
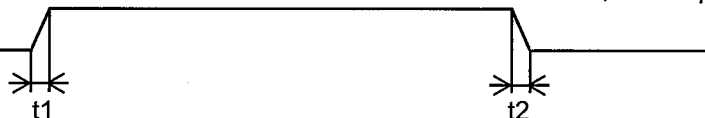
Min.Load (0A)←→
Load 100% (6.3A)

1 V/div
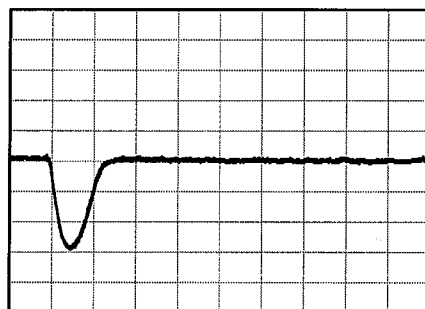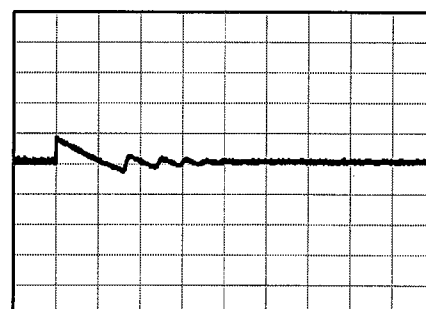
400 us/div   10 ms/div

Min.Load (0A)←→
Load 50% (3.15A)

1 V/div
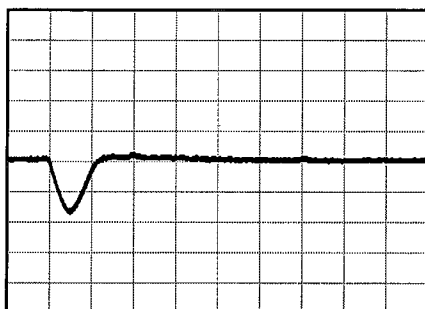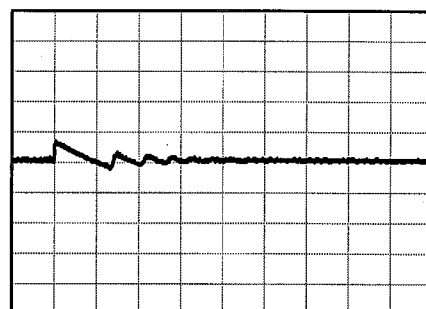
400 us/div   10 ms/div

Load 50% (3.15A)←→
Load 100% (6.3A)

1 V/div

400 us/div   10 ms/div

BC-11112

CO$EL
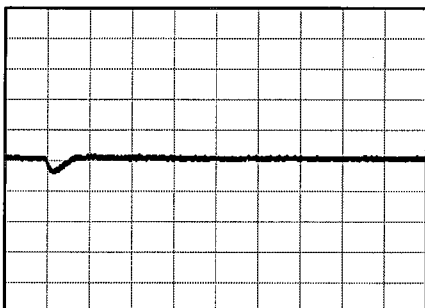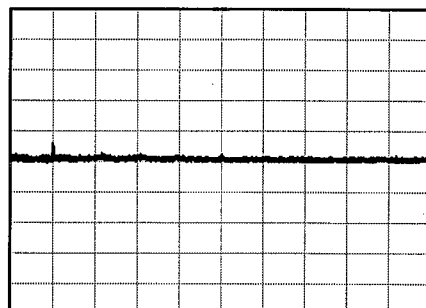
Model	GHA300F-48-SNF
Item	Ripple Voltage (by Load Current)
Object	+48V6.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   120V
—·—O—·— Input Volt.   230V

Load Current [A]

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
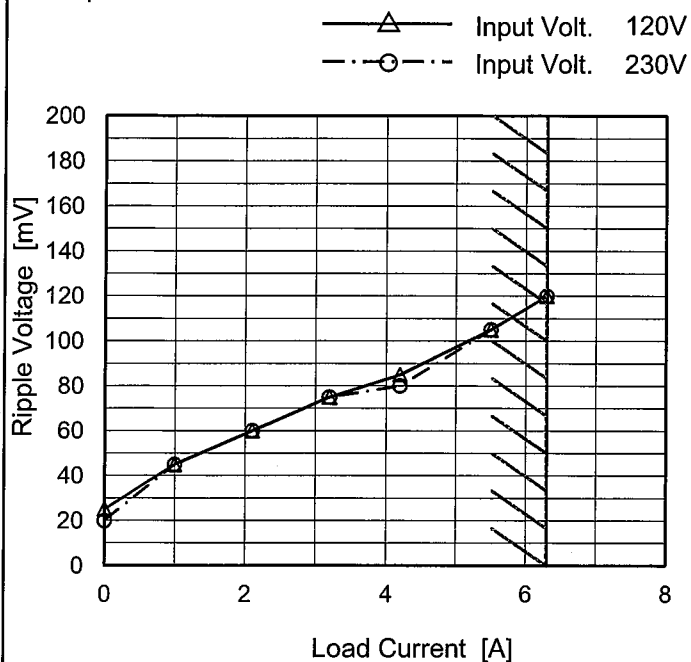
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
0.0	25	20
1.0	45	45
2.1	60	60
3.2	75	75
4.2	85	80
5.5	105	105
6.3	120	120
--	-	-
--	-	-
--	-	-
--	-	-

BC-11112
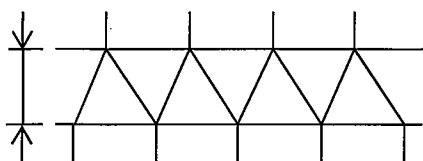
COSEL

Model	GHA300F-48-SNF
Item	Ripple-Noise
Object	+48V6.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   120V
—·—○—··— Input Volt.   230V
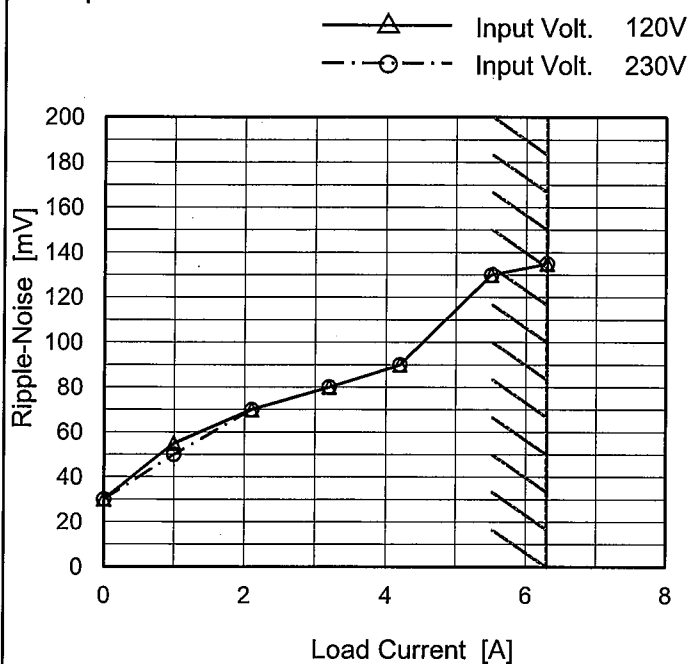
Load Current [A]

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.
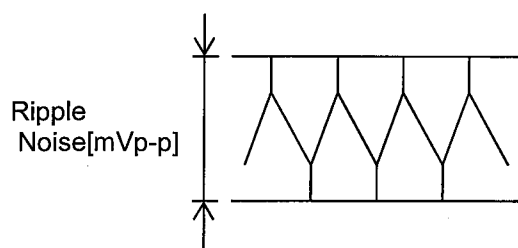
Ripple
Noise[mVp-p]

Fig.Complex Ripple Noise
Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
0.0	30	30
1.0	55	50
2.1	70	70
3.2	80	80
4.2	90	90
5.5	130	130
6.3	135	135
---	-	-
---	-	-
--	-	-
--	-	-

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Ripple Voltage (by Ambient Temp.)
Object	+48V6.3A

Testing Circuitry   Figure A

1.Graph

- - - ⊟ - - - Input Volt.   120V
——— △ ——— Input Volt.   230V

Ripple Voltage [mV]

Ambient Temperature [°C]
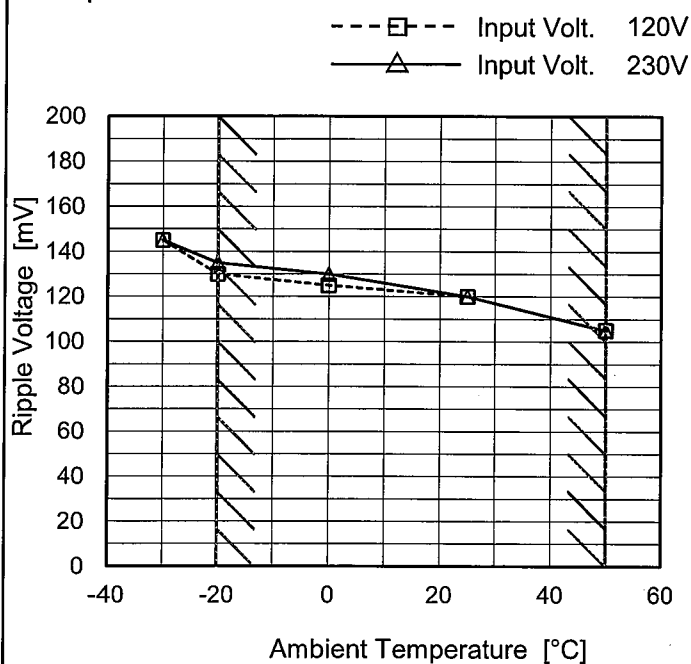
Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
        ambient temperature.

Ripple [mVp-p]
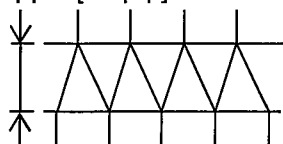
Fig.Complex Ripple
Wave Form

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
-30	145	145
-20	130	135
0	125	130
25	120	120
50	105	105
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Ambient Temperature Drift
Object	+48V6.3A

Testing Circuitry   Figure A
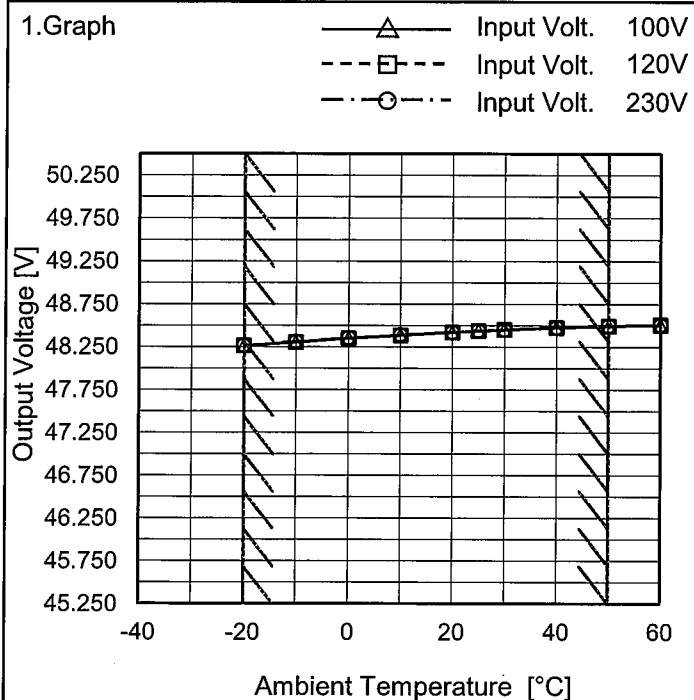
1.Graph

——△—— Input Volt.   100V
- - -☐- - - Input Volt.   120V
—·-○—·- Input Volt.   230V

Ambient Temperature [°C]

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	48.261	48.262	48.265
-10	48.303	48.304	48.311
0	48.348	48.348	48.354
10	48.385	48.386	48.391
20	48.418	48.419	48.423
25	48.436	48.436	48.440
30	48.450	48.450	48.453
40	48.475	48.475	48.477
50	48.494	48.494	48.497
60	48.506	48.507	48.508
--	-	-	-

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

- 15 -

BC-11112

COSEL

Model	GHA300F-48-SNF	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
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 = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

* Output Voltage Accuracy (Ratio) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}}$ × 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	48.504	±122	±0.3
Minimum Voltage	-20	115	6.3	48.261		

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Time Lapse Drift
Object	+48V6.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Time [H]

Input Volt.   230V
Load   100%

* The characteristic of AC120V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	48.449
0.5	48.449
1.0	48.450
2.0	48.449
3.0	48.449
4.0	48.449
5.0	48.450
6.0	48.449
7.0	48.449
8.0	48.449

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Rise and Fall Time
Object	+48V6.3A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

Load 100%

Output Volt. [10V/div]

Input Volt. 120 V

Load 100%

Output Volt. [10V/div]

Input Volt. 230 V

Input Volt. 0

Time [100ms/div]

Time [10ms/div]
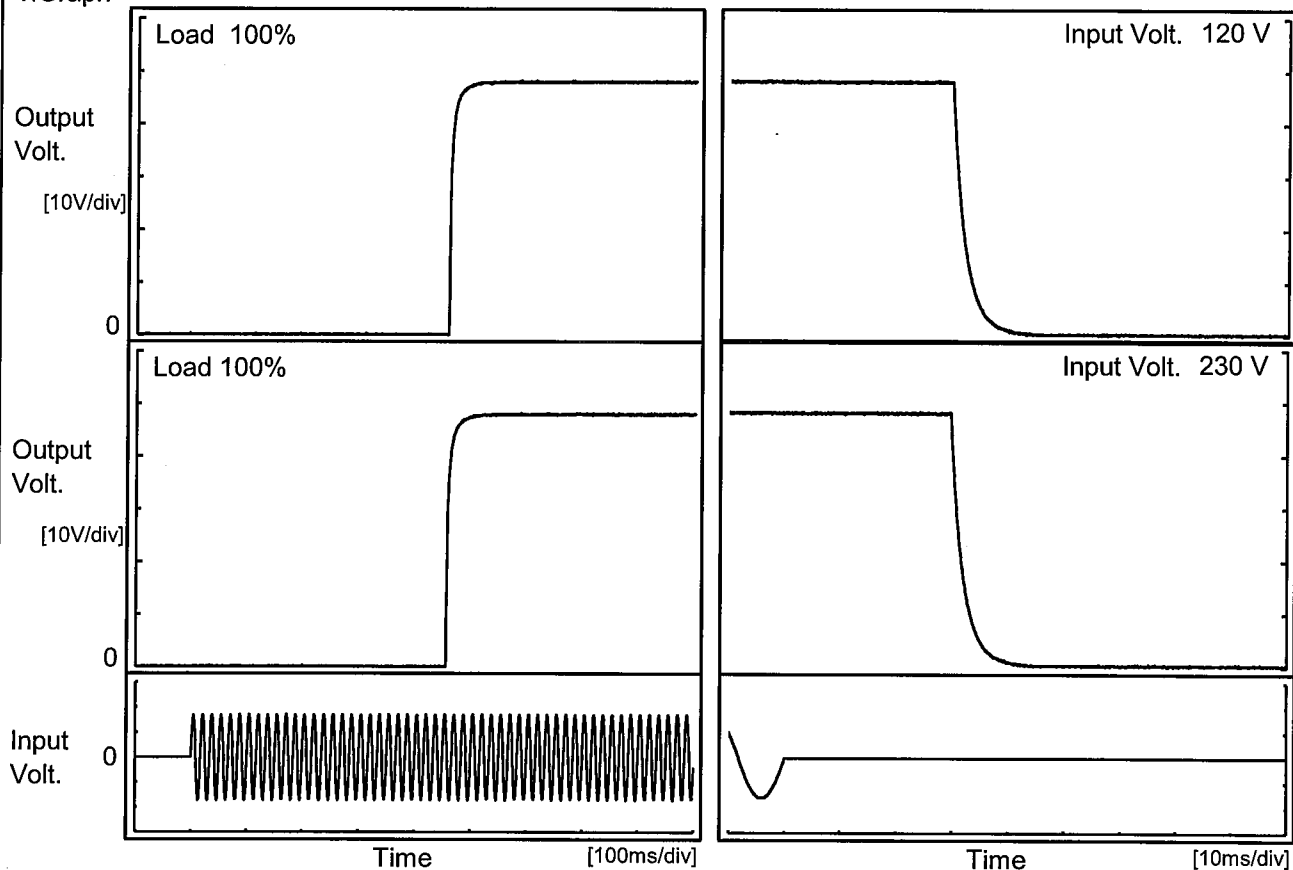
2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
120V	459.0	12.0	471.0	30.1	5.1
230V	455.5	12.5	468.0	30.0	5.0

Output Volt.

90%

10%

Input Volt.

Td Tr

Th Tf

Ts

BC-11112

CO$EL
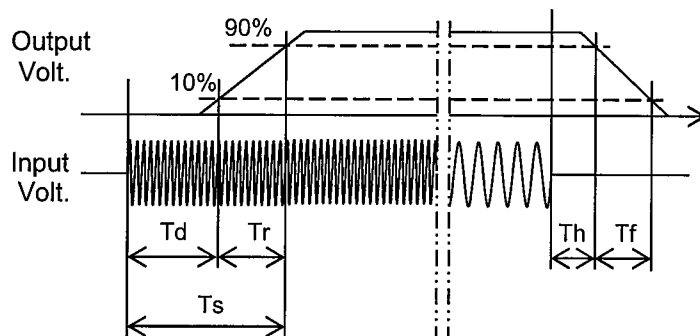
Model	GHA300F-48-SNF
Item	Hold-Up Time
Object	+48V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

--- ⊟ --- Load 50%
——— △ ——— Load 100%

Hold-Up Time [ms] vs Input Voltage [V]

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
90	58	40 ※1
100	57	33 ※2
115	58	30
120	57	30
200	58	30
230	58	30
264	58	30
280	58	30
--	-	-

※1 : Load 80%
※2 : Load 88%
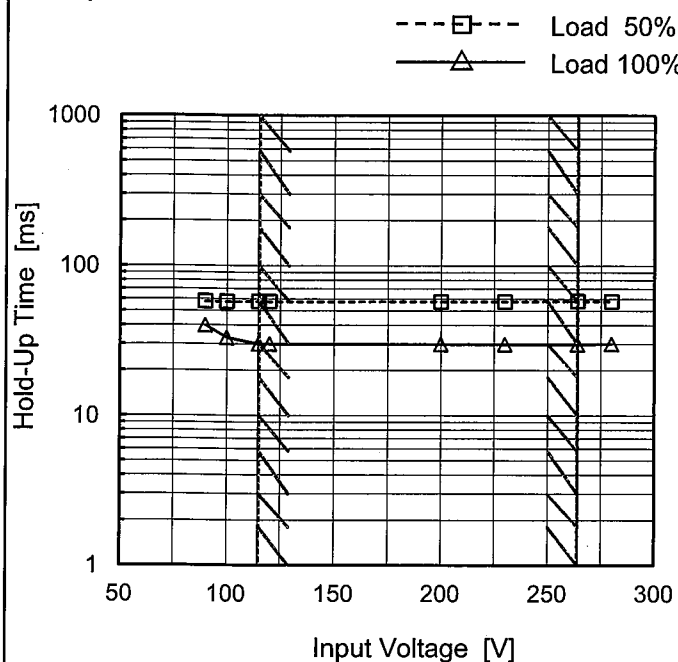
This duration covers from Shut-off of input
voltage to the moment when output voltage
descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated
input voltage.

BC-11112

COSEL

Model	GHA300F-48-SNF
Item	Instantaneous Interruption Compensation
Object	+48V6.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt. 100V
- - -⊟- - - Input Volt. 120V
—·—○—·· Input Volt. 230V
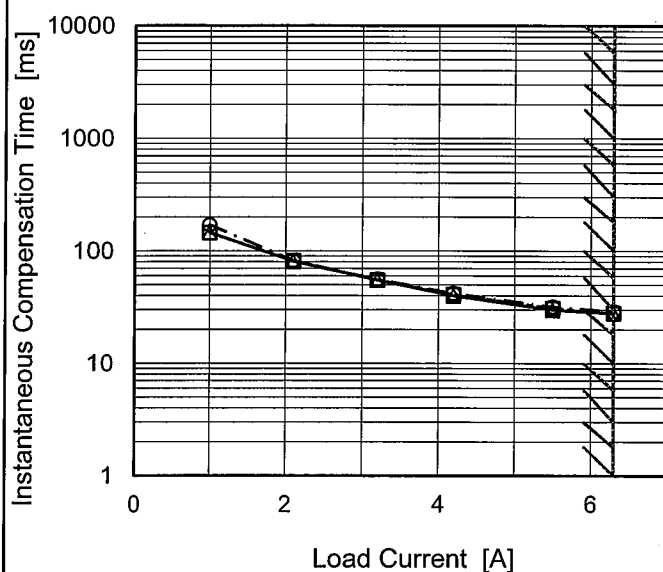
Load Current [A]

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

2.Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	-	-	-
1.0	146	145	171
2.1	81	82	82
3.2	55	55	56
4.2	40	41	42
5.5	30	31	32
6.3	28	28	29
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V6.3A

Testing Circuitry   Figure A
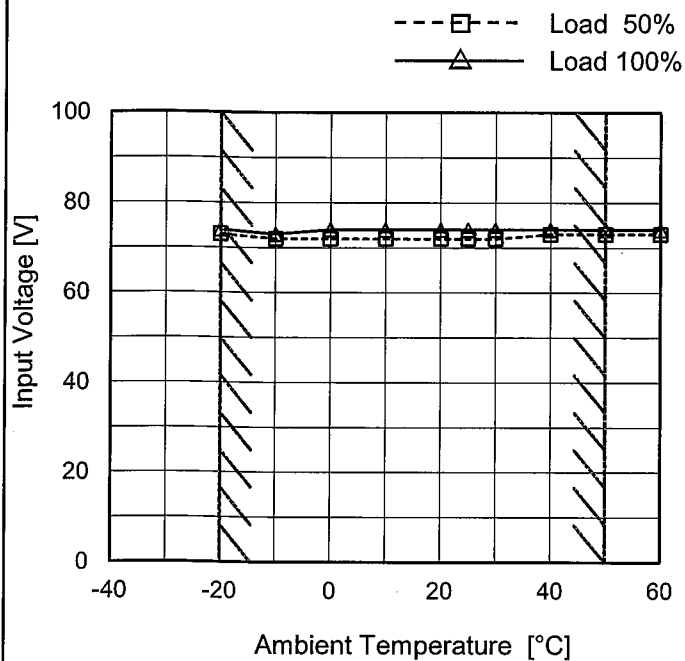
1.Graph

--- ⊟ --- Load 50%

——— △ ——— Load 100%

Ambient Temperature [°C]

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

2.Values

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

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Overcurrent Protection
Object	+48V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

———□ Input Volt. 120V
——○ Input Volt. 230V
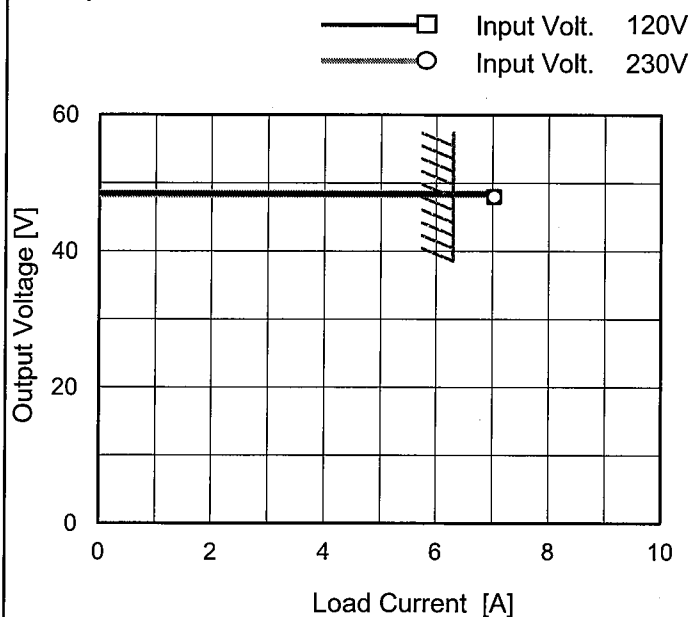
Note: Slanted line shows the range of the rated load current.

Intermittent operation occurs when overcurrent protection is activated.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 120[V]	Input Volt. 230[V]
48	7.03	7.03
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

BC-11112

CO$EL

Model	GHA300F-48-SNF
Item	Overvoltage Protection
Object	+48V6.3A

Testing Circuitry   Figure A
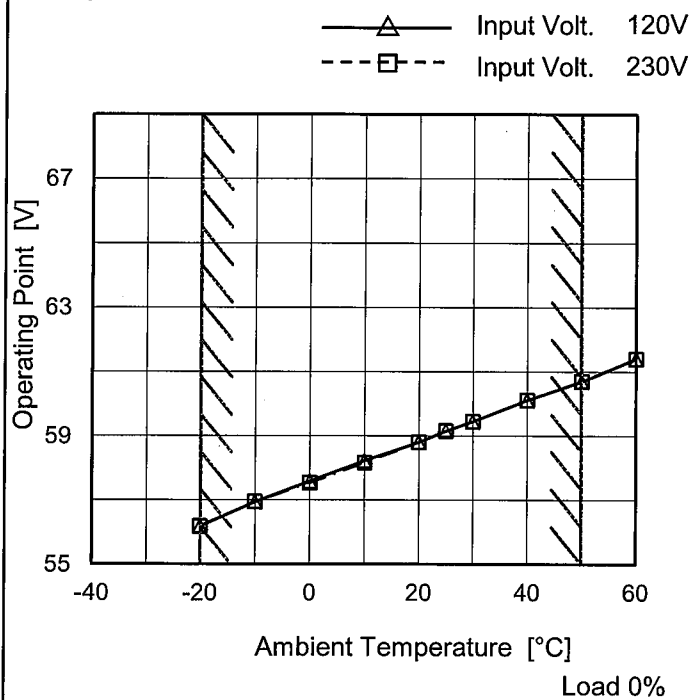
1.Graph

——△—— Input Volt.　120V
‑‑‑▫‑‑‑ Input Volt.　230V

Ambient Temperature [°C]

Load 0%

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	56.18	56.18
-10	56.94	56.94
0	57.58	57.53
10	58.22	58.16
20	58.80	58.80
25	59.15	59.15
30	59.44	59.44
40	60.11	60.11
50	60.69	60.70
60	61.40	61.40
--	-	-

BC-11112

CO$EL


Figure A

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{1k\ [\Omega]}$$

Figure B (IEC60601-1)

BC-11112