COSEL

参考資料

TEST DATA OF TUNS100F12

Regulated DC Power Supply
April 10, 2012

Approved by : Takayuki Fukuda
Takayuki Fukuda — Design Manager

Prepared by : Shintaro Mizukami
Shintaro Mizukami — Design Engineer

COSEL CO.,LTD.

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Object	———————

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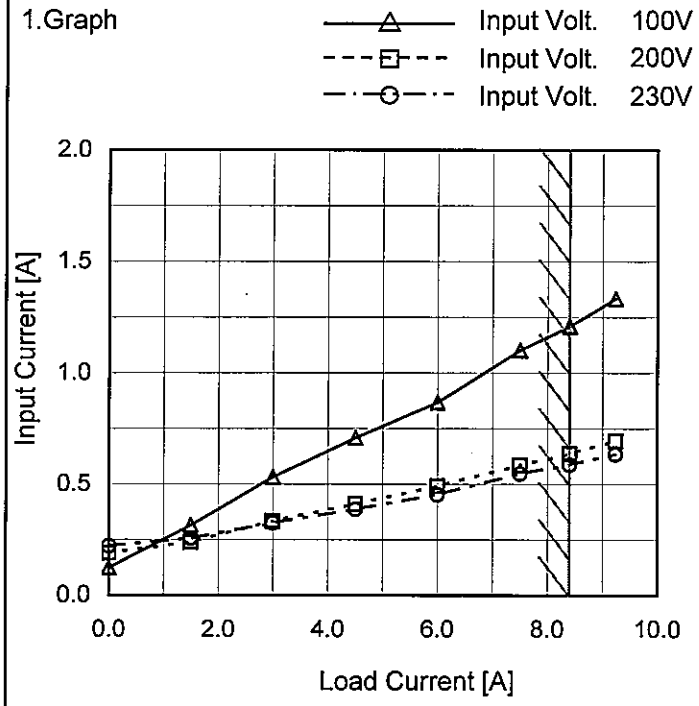

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.124	0.189	0.221
1.5	0.314	0.239	0.255
3.0	0.531	0.334	0.325
4.5	0.708	0.410	0.387
6.0	0.868	0.491	0.453
7.5	1.102	0.584	0.547
8.4	1.210	0.637	0.588
9.2	1.334	0.695	0.635
--	-	-	-
--	-	-	-
--	-	-	-

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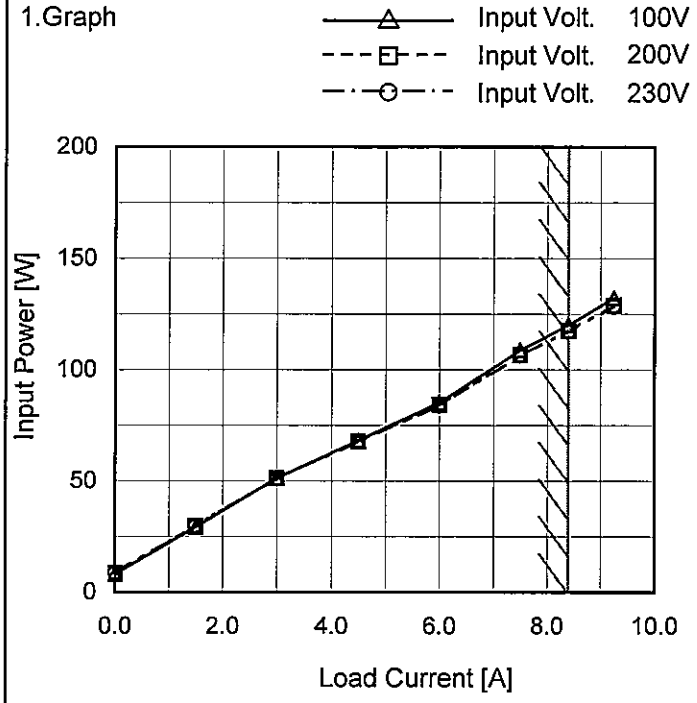
Model	TUNS100F12
Item	Input Power (by Load Current)
Object	———————

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]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	8.1	8.6	8.5
1.5	29.4	29.7	29.9
3.0	51.3	51.1	51.0
4.5	68.3	67.7	67.6
6.0	85.3	84.3	84.0
7.5	108.8	106.6	106.4
8.4	120.1	117.5	117.2
9.2	132.2	128.9	128.6
--	-	-	-
--	-	-	-
--	-	-	-

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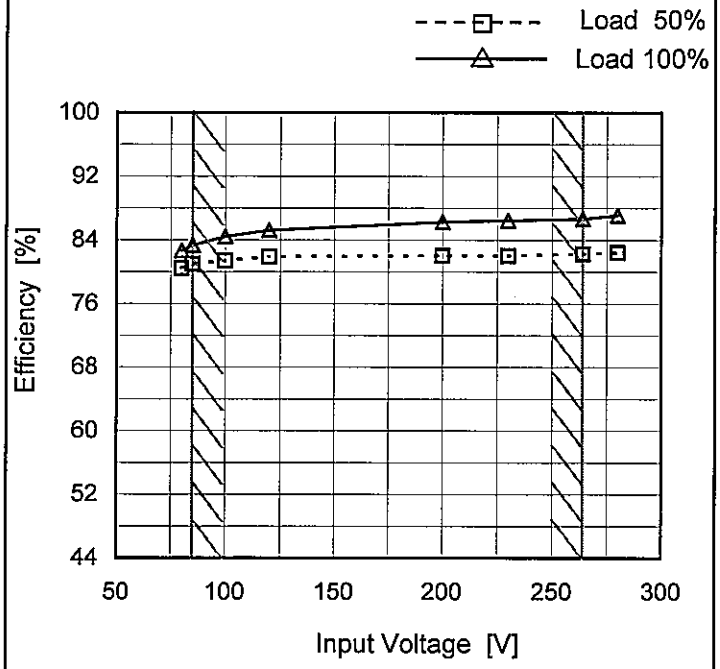
Model	TUNS100F12
Item	Efficiency (by Input Voltage)
Object	———————————

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%
80	80.5	82.6
85	81.0	83.3
100	81.4	84.4
120	81.9	85.2
200	82.0	86.3
230	82.0	86.5
264	82.3	86.7
280	82.4	87.1
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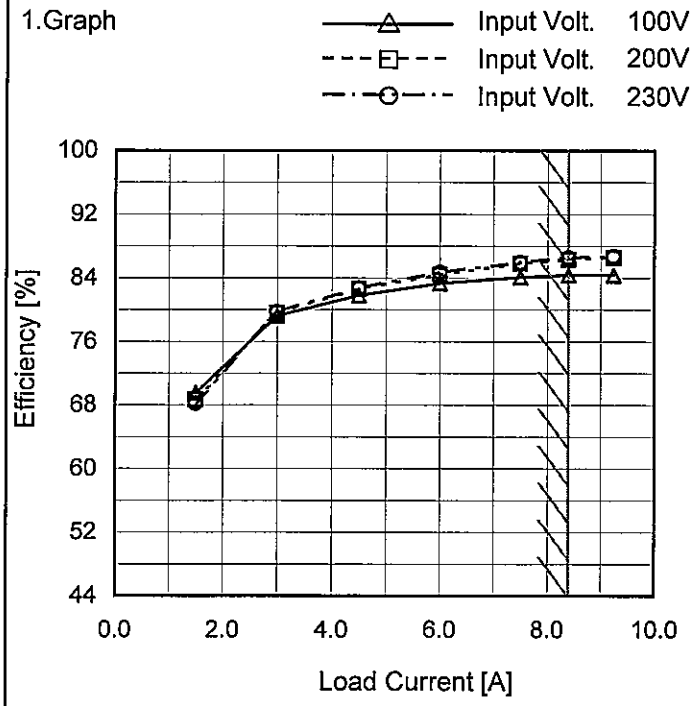
Model	TUNS100F12
Item	Efficiency (by Load Current)
Object	———————

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]	Efficiency [%] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.5	69.5	68.7	68.3
3.0	79.3	79.6	79.7
4.5	81.8	82.6	82.7
6.0	83.4	84.4	84.7
7.5	84.1	85.8	86.0
8.4	84.4	86.3	86.5
9.2	84.4	86.5	86.7
--	-	-	-
--	-	-	-
--	-	-	-

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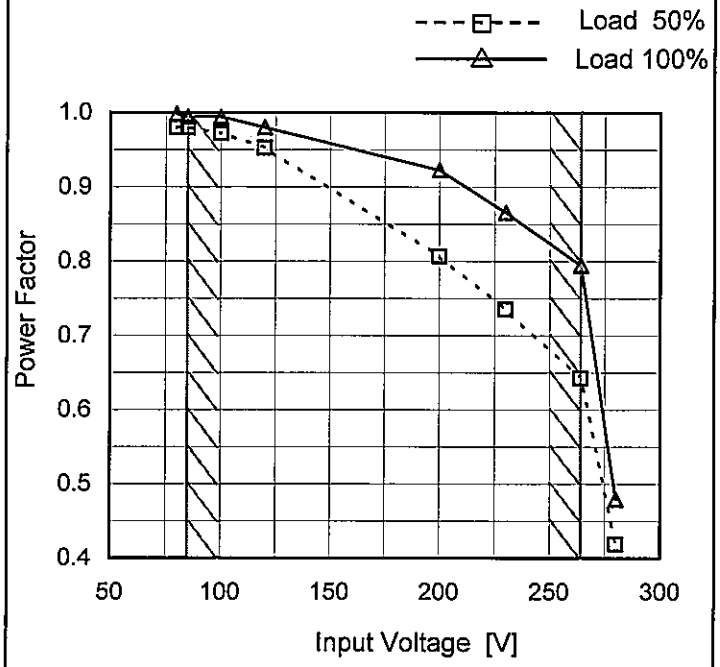
Model	TUNS100F12
Item	Power Factor (by Input Voltage)
Object	———————————

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%
80	0.980	0.998
85	0.980	0.994
100	0.972	0.994
120	0.952	0.980
200	0.807	0.923
230	0.735	0.866
264	0.643	0.795
280	0.419	0.479
--	-	-

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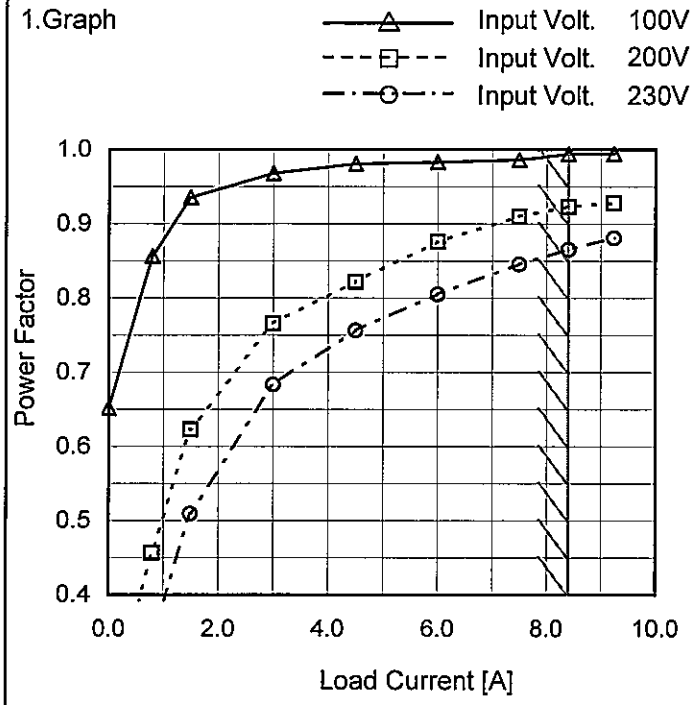
Model	TUNS100F12
Item	Power Factor (by Load Current)
Object	————————

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. 200[V]	Input Volt. 230[V]
0.0	0.652	0.228	0.167
0.8	0.857	0.457	0.339
1.5	0.936	0.623	0.509
3.0	0.968	0.766	0.684
4.5	0.981	0.822	0.756
6.0	0.983	0.876	0.805
7.5	0.986	0.910	0.846
8.4	0.994	0.923	0.866
9.2	0.994	0.928	0.881
--	-	-	-
--	-	-	-

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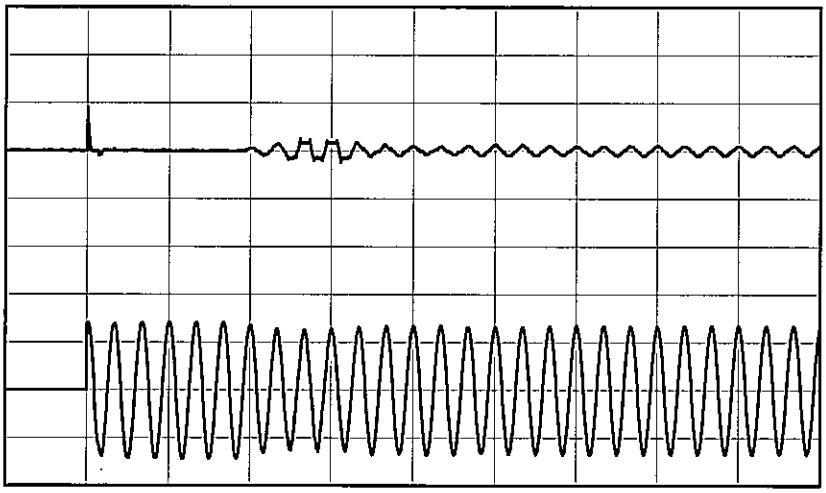
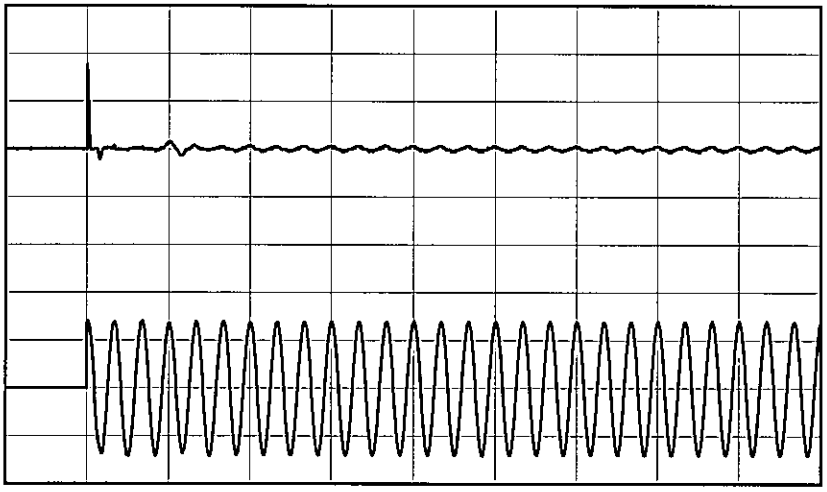
Model	TUNS100F12
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



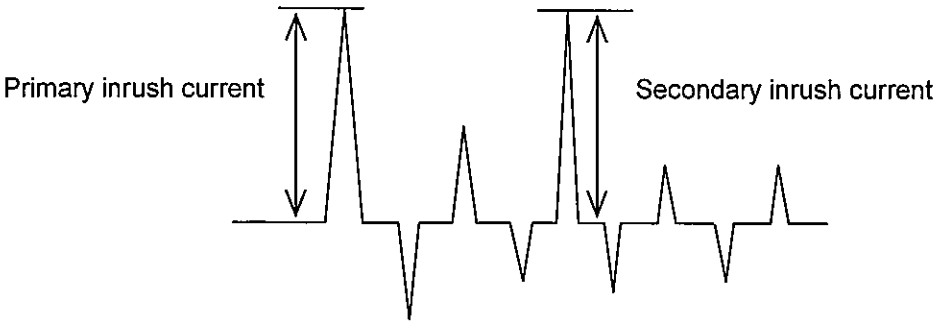
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
18.4 A
Secondary inrush current :
5.2 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
35.2 A
Secondary inrush current :
3.2 A



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Model	TUNS100F12	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	――――――――――	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	264[V]	
IEC60950-1	Both phases	0.17	0.37	0.49	Operation
	One of phase	0.22	0.48	0.65	stand by

The value for "One phase" 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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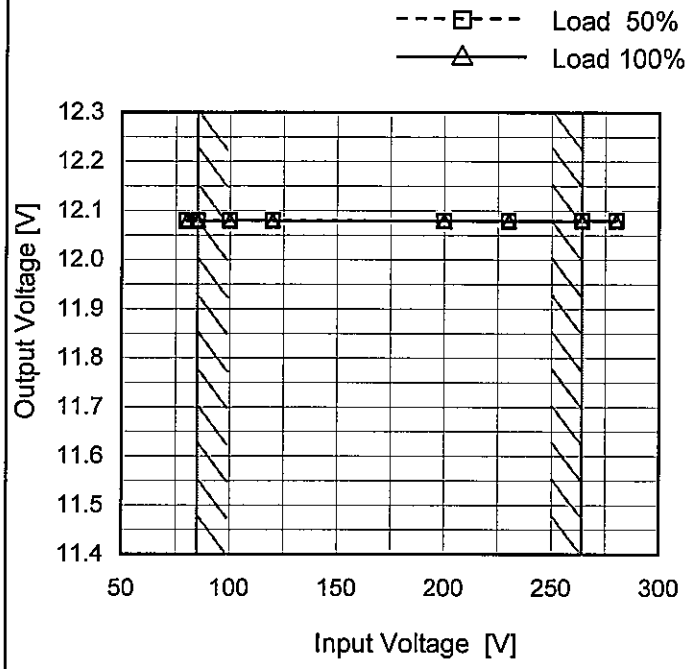
Model	TUNS100F12
Item	Line Regulation
Object	+12V8.4A

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%
80	12.080	12.079
85	12.080	12.079
100	12.080	12.079
120	12.080	12.080
200	12.080	12.079
230	12.080	12.079
264	12.080	12.080
280	12.080	12.080
--	-	-

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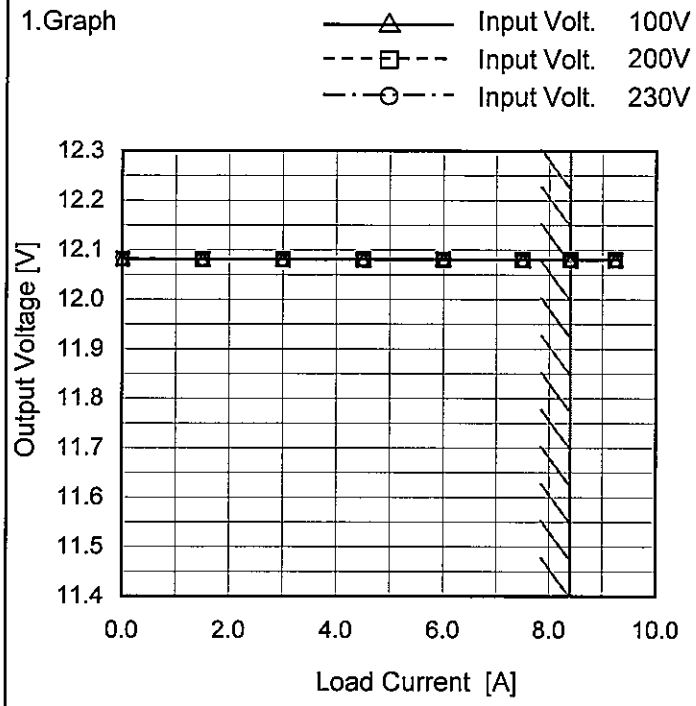
Model	TUNS100F12
Item	Load Regulation
Object	+12V8.4A

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]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	12.082	12.081	12.082
1.5	12.081	12.081	12.081
3.0	12.081	12.081	12.081
4.5	12.081	12.081	12.081
6.0	12.081	12.081	12.081
7.5	12.080	12.080	12.080
8.4	12.080	12.080	12.080
9.2	12.080	12.080	12.080
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUNS100F12
Item	Dynamic Load Response
Object	+12V8.4A

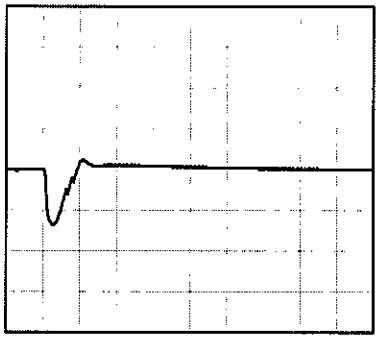
Temperature 25°C
Testing Circuitry Figure A

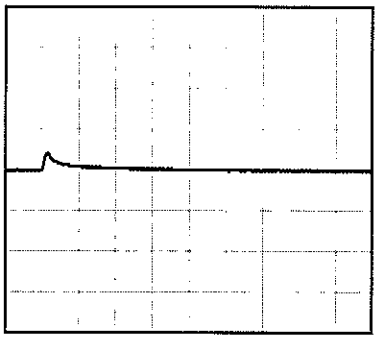
Input Volt. 100 V
Cycle 1000 ms

Load Current

8.4 A/50us

Min. Load (0A) ⟷
Load 100% (8.4A)



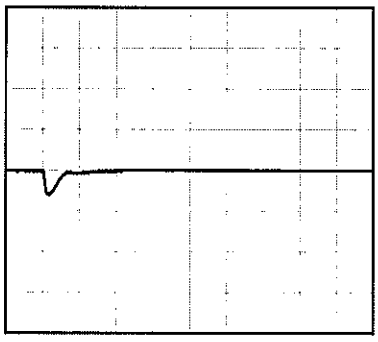


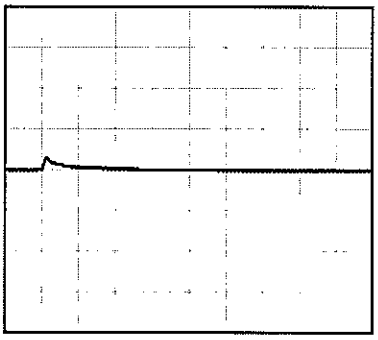
500 mV/div

200 µs/div

200 µs/div

Min. Load (0A) ⟷
Load 50% (4.2A)



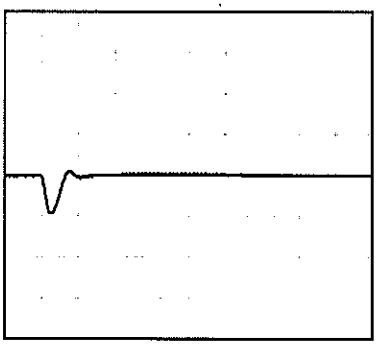


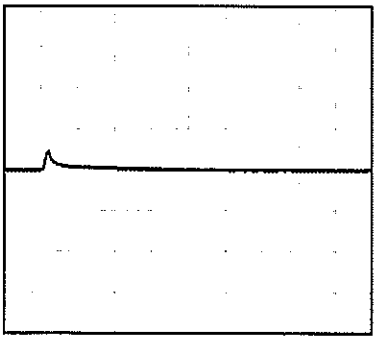
500 mV/div

200 µs/div

200 µs/div

Load 10% (0.84A) ⟷
Load 100% (8.4A)





500 mV/div

200 µs/div

200 µs/div

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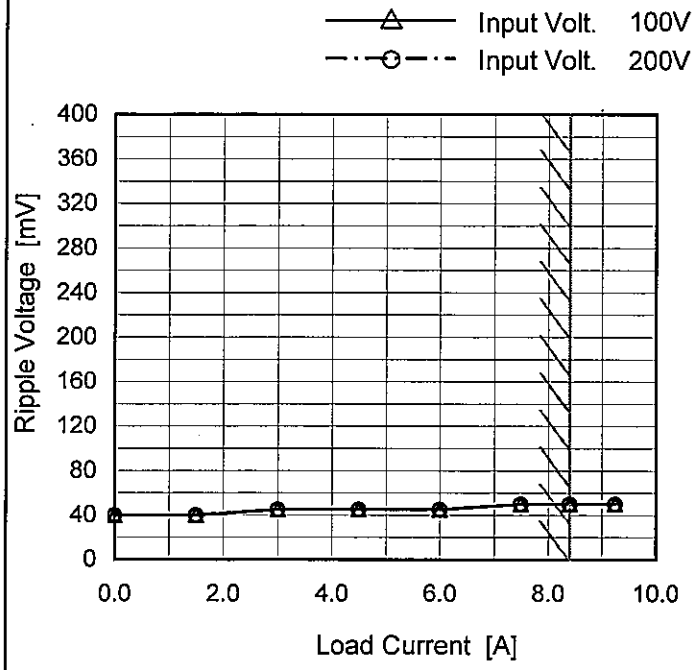
Model	TUNS100F12
Item	Ripple Voltage (by Load Current)
Object	+12V8.4A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



Measured by 100 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	40	40
1.5	40	40
3.0	45	45
4.5	45	45
6.0	45	45
7.5	50	50
8.4	50	50
9.2	50	50
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

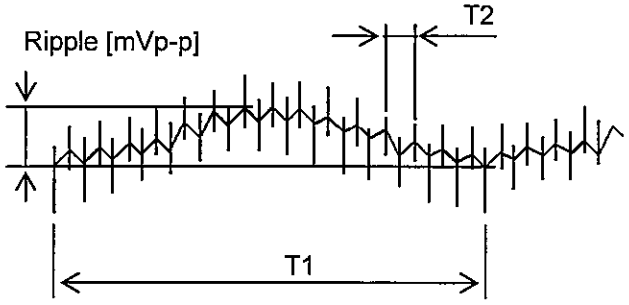


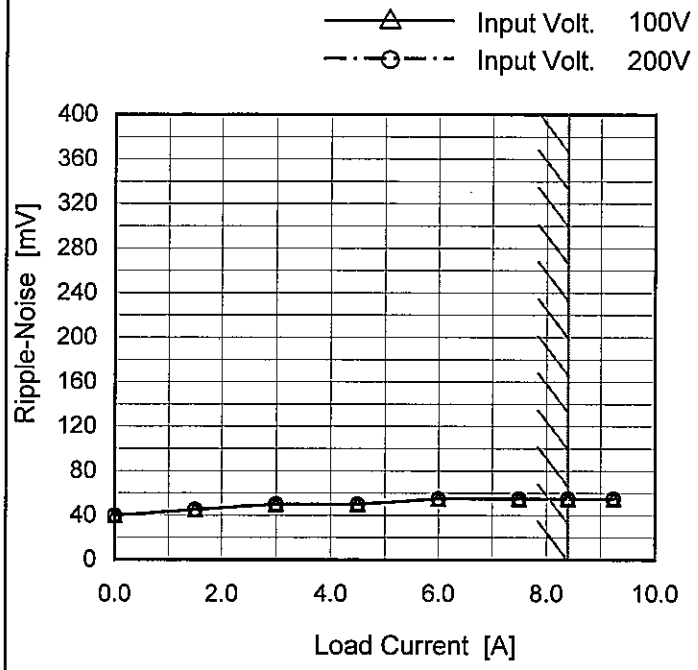
Fig. Complex Ripple Wave Form

COSEL

Model	TUNS100F12
Item	Ripple-Noise
Object	+12V8.4A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



Measured by 100 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Ripple-Noise [mV] Input Volt. 100 [V]	Ripple-Noise [mV] Input Volt. 200 [V]
0.0	40	40
1.5	45	45
3.0	50	50
4.5	50	50
6.0	55	55
7.5	55	55
8.4	55	55
9.2	55	55
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

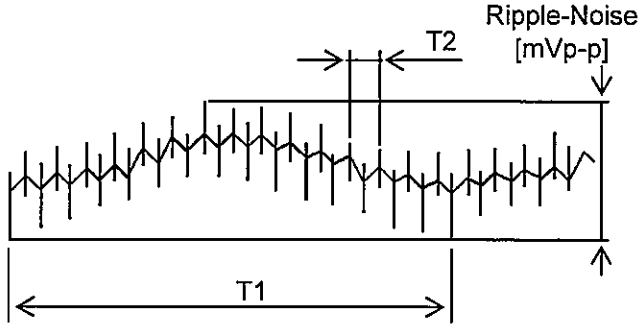


Fig. Complex Ripple Wave Form

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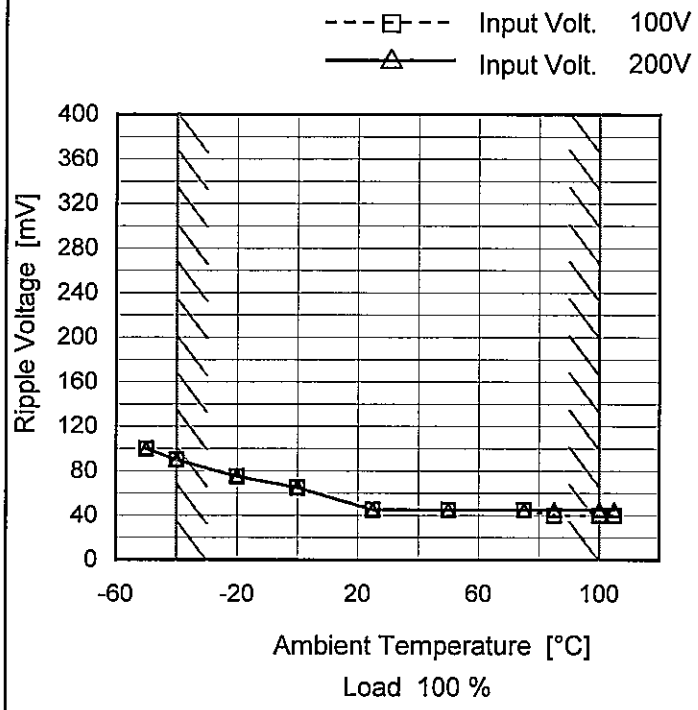
Model	TUNS100F12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V8.4A

Testing Circuitry Figure C

1.Graph



Measured by 100 MHz Oscilloscope.

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

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-50	100	100
-40	90	90
-20	75	75
0	65	65
25	45	45
50	45	45
75	45	45
85	40	45
100	40	45
105	40	45
--	-	-

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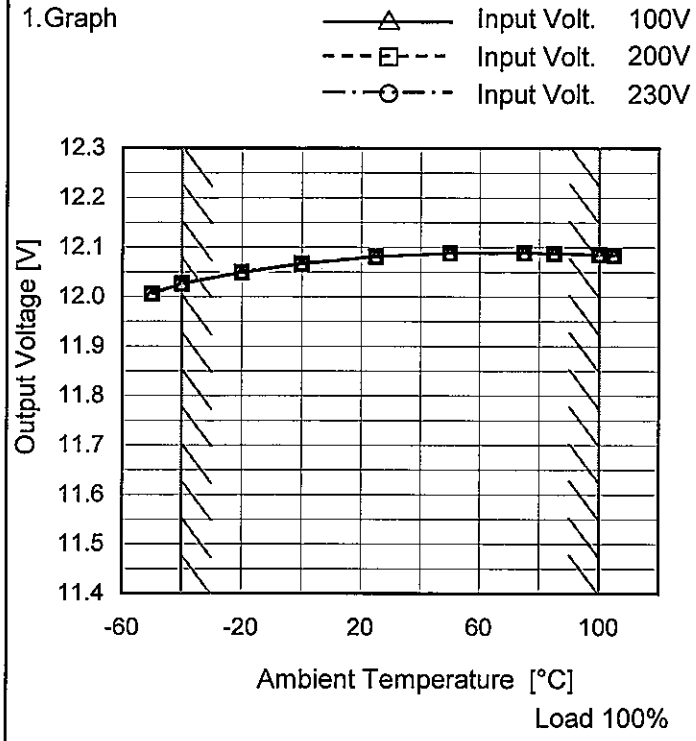
Model	TUNS100F12
Item	Ambient Temperature Drift
Object	+12V8.4A

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. 200[V]	Input Volt. 230[V]
-50	12.006	12.006	12.006
-40	12.026	12.027	12.026
-20	12.049	12.050	12.050
0	12.067	12.067	12.067
25	12.081	12.082	12.082
50	12.088	12.088	12.088
75	12.089	12.089	12.089
85	12.088	12.088	12.088
100	12.086	12.086	12.085
105	12.084	12.084	12.084
--	-	-	-

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Model	TUNS100F12	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V8.4A	

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 : -40 - 100°C
Input Voltage : 85 - 264V
Load Current : 0 - 8.4A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	75	85	0	12.092	±34	±0.3
Minimum Voltage	-40	264	0	12.025		

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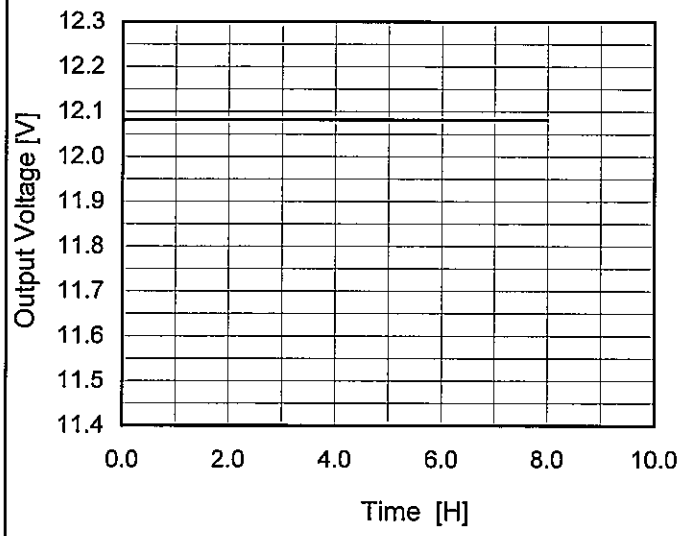
Model	TUNS100F12
Item	Time Lapse Drift
Object	+12V8.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.077
0.5	12.082
1.0	12.082
2.0	12.082
3.0	12.082
4.0	12.082
5.0	12.082
6.0	12.082
7.0	12.082
8.0	12.082

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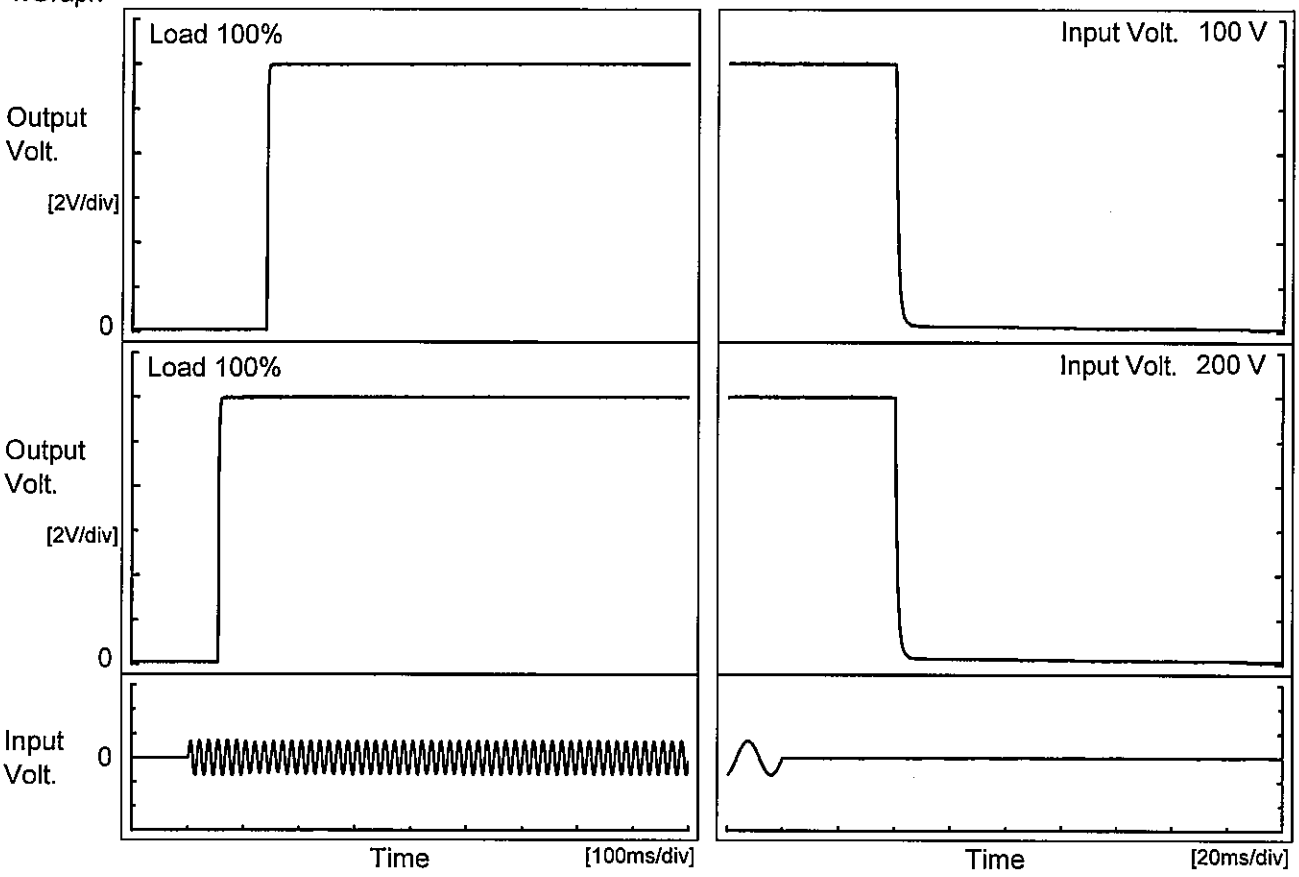
Model	TUNS100F12	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V8.4A	

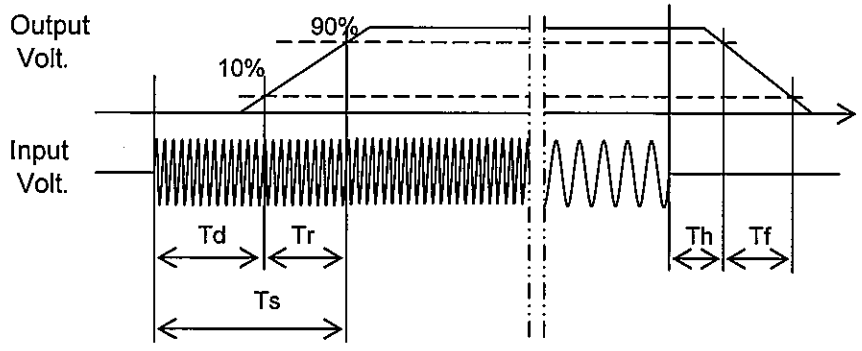
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	140.5	2.0	142.5	40.1	2.1
200 V	55.0	2.0	57.0	40.2	2.1



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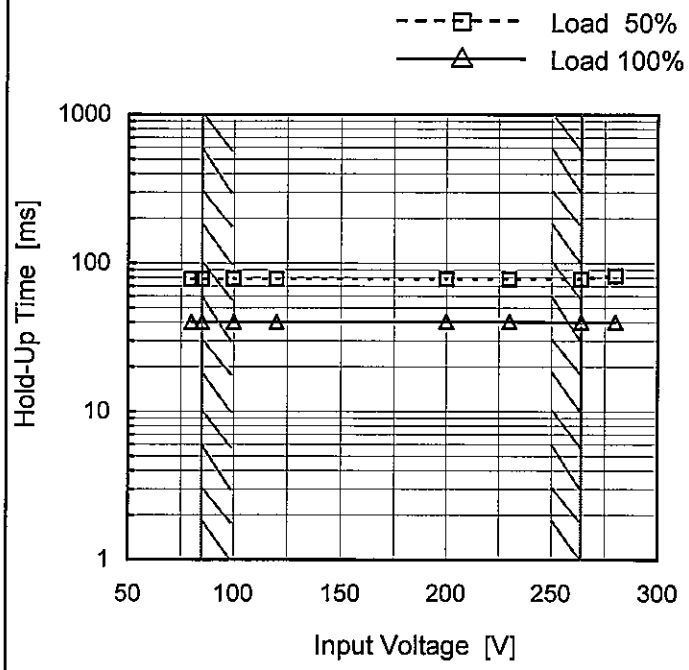
Model	TUNS100F12
Item	Hold-Up Time
Object	+12V8.4A

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%
80	78	40
85	78	40
100	78	40
120	78	40
200	78	40
230	78	40
264	78	40
280	82	40
--	-	-

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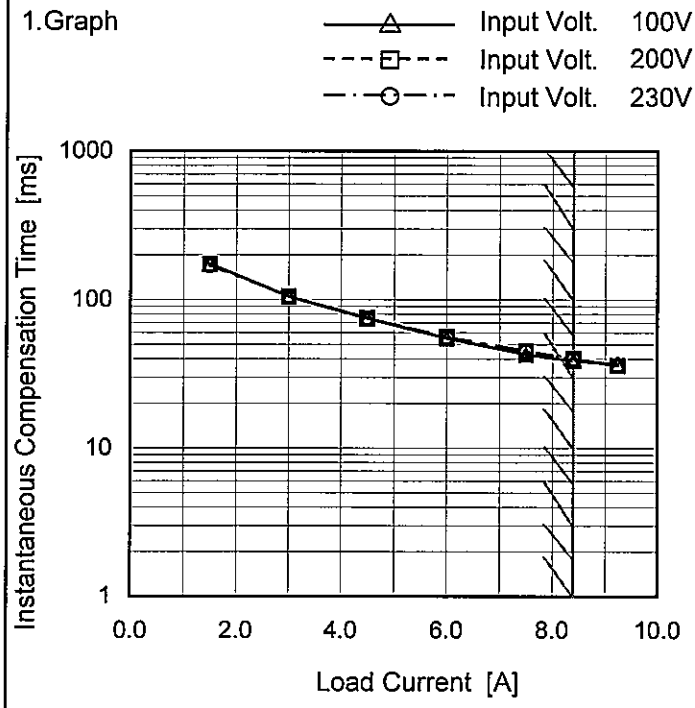
Model	TUNS100F12
Item	Instantaneous Interruption Compensation
Object	+12V8.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

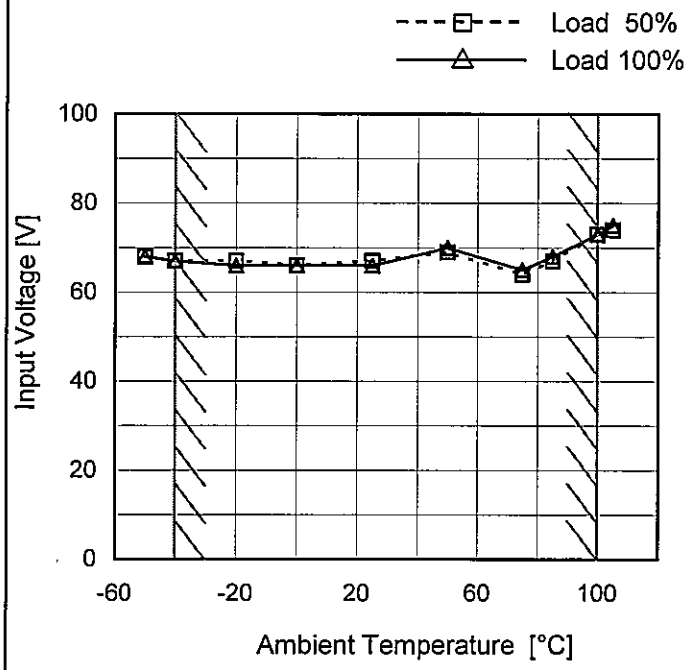
Load Current [A]	Time [ms] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.5	174	173	170
3.0	105	105	105
4.5	75	75	75
6.0	55	56	56
7.5	43	45	45
8.4	39	40	40
9.2	37	36	36
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	TUNS100F12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V8.4A

Testing Circuitry Figure A

1.Graph



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

2.Values

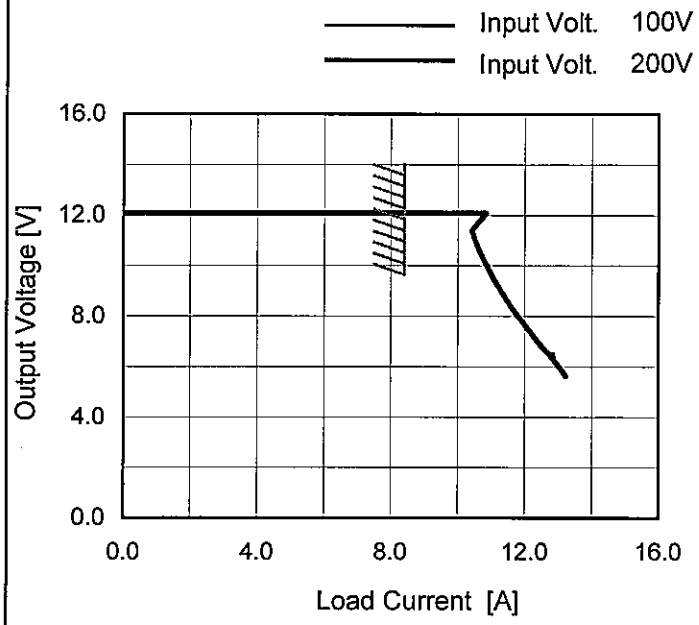
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	68	68
-40	67	67
-20	67	66
0	66	66
25	67	66
50	69	70
75	64	65
85	67	68
100	73	73
105	74	75
---	-	-

COSEL

Model	TUNS100F12
Item	Overcurrent Protection
Object	+12V8.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

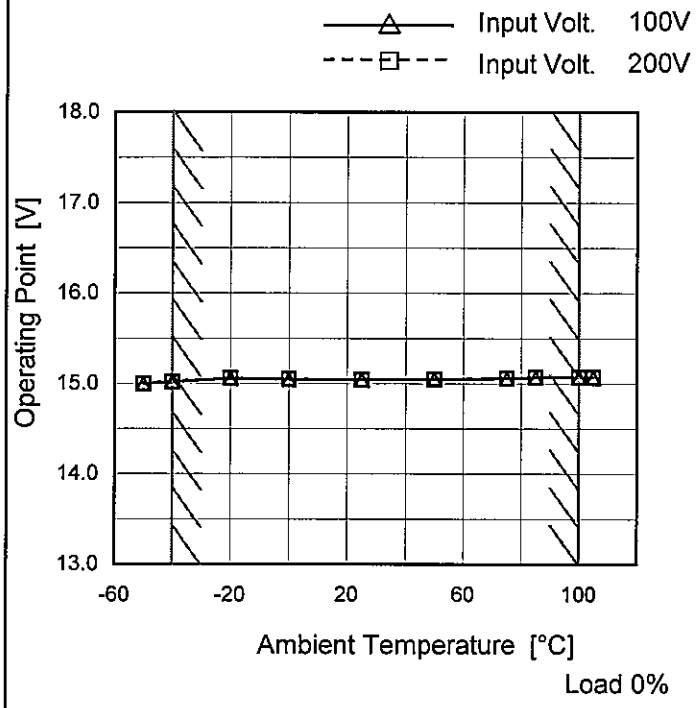
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
12.00	10.80	10.86
11.40	10.43	10.42
10.80	10.59	10.59
9.60	11.02	11.01
8.40	11.59	11.57
7.20	12.25	12.28
6.00	13.02	13.02
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	TUNS100F12
Item	Overvoltage Protection
Object	+12V8.4A

Testing Circuitry Figure A

1.Graph



Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-50	15.00	15.00
-40	15.02	15.02
-20	15.06	15.06
0	15.05	15.05
25	15.04	15.04
50	15.05	15.05
75	15.06	15.06
85	15.07	15.07
100	15.07	15.07
105	15.07	15.07
--	-	-

COSEL

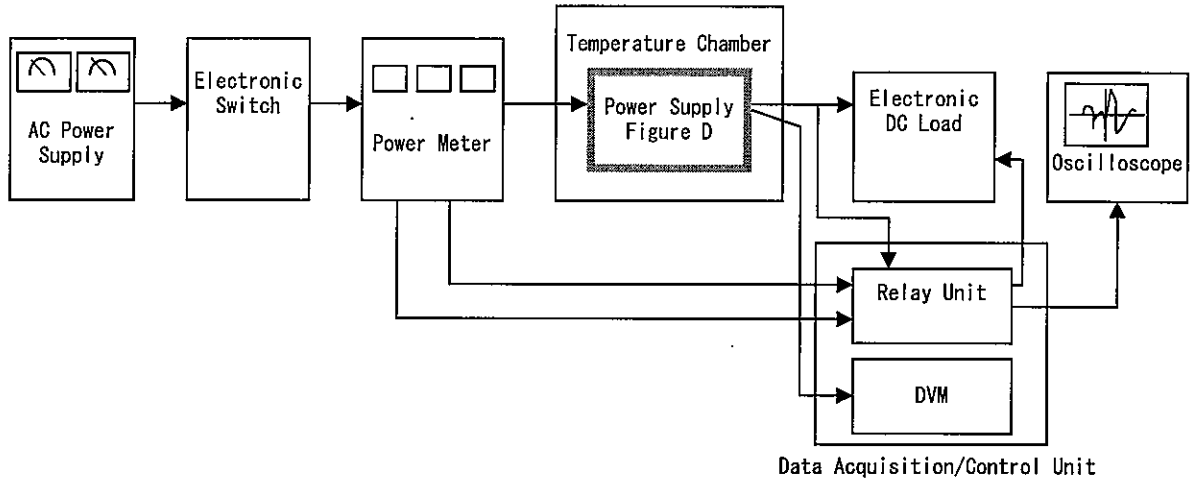


Figure A

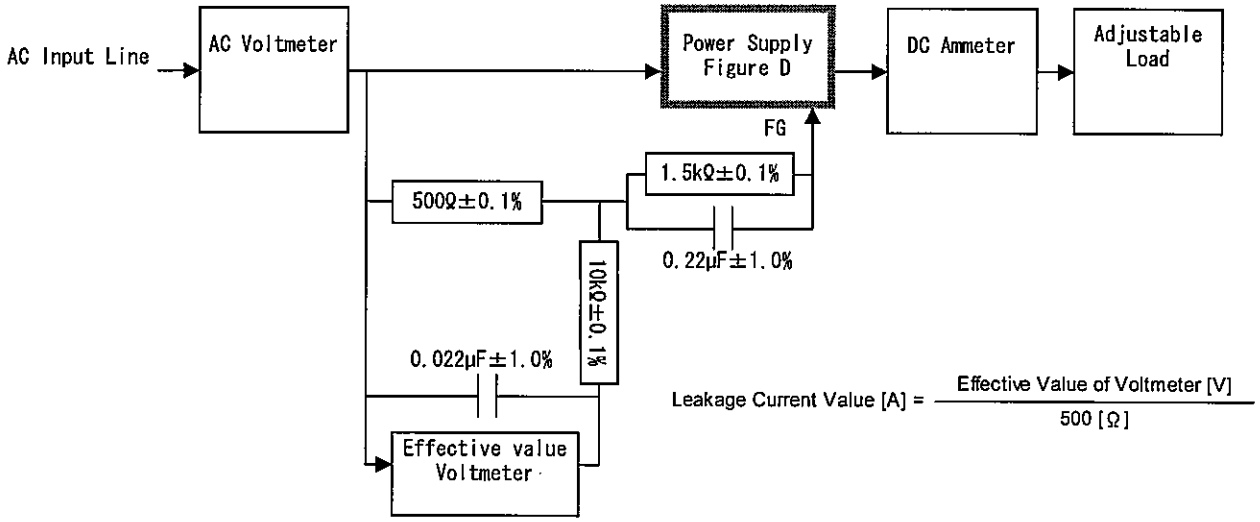
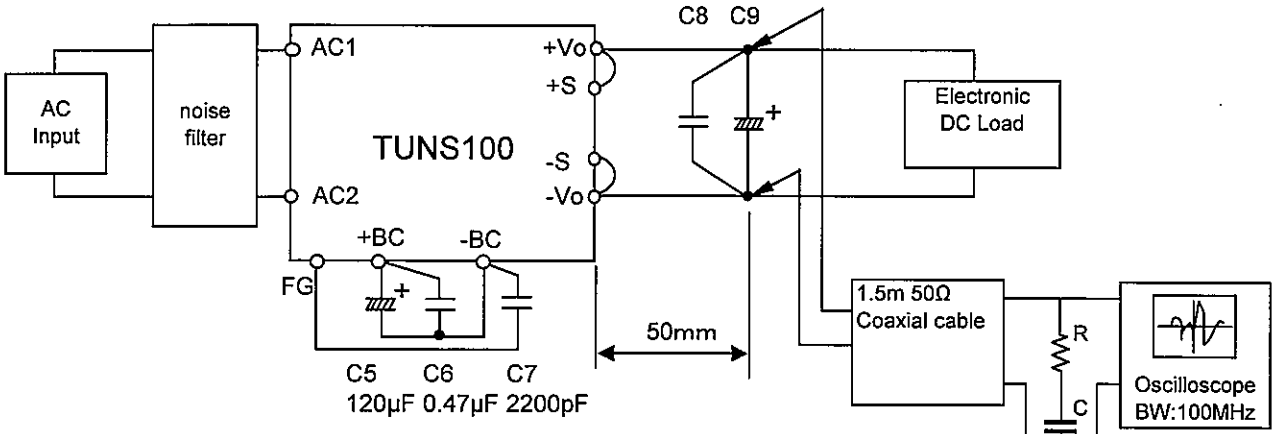


Figure B (IEC60950-1)

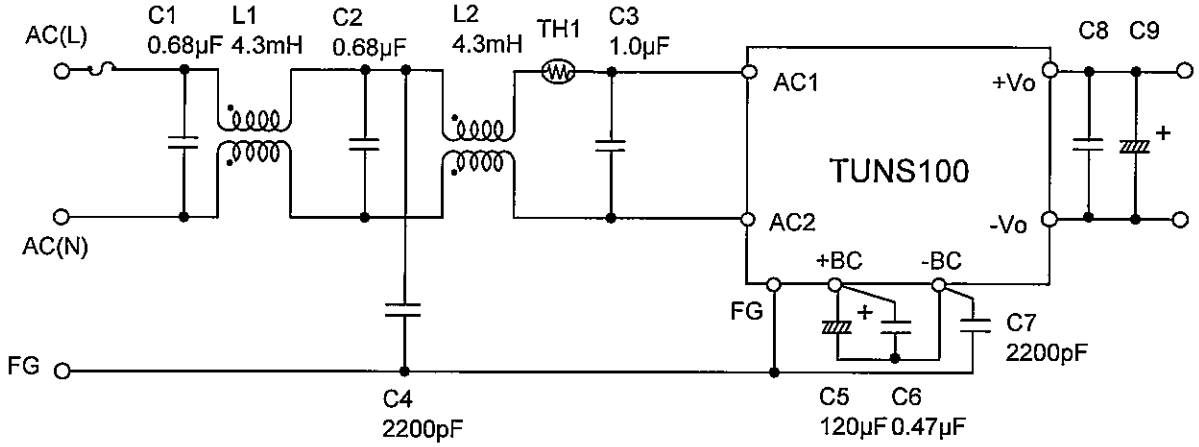


C8 : TUNS100F05 10μF
TUNS100F12 10μF
TUNS100F24 4.7μF

C9 : TUNS100F05 2200μF (0≦Tc≦100)
2200μF×3 (-40≦Tc<0)
TUNS100F12 470μF (0≦Tc≦100)
470μF×3 (-40≦Tc<0)
TUNS100F24 220μF (0≦Tc≦100)
220μF×3 (-40≦Tc<0)

Tc : Base Plate Temp.

Figure C



L1,L2 : SSB11V-R17043(NEC TOKIN)

TH1 : 8D2-11(SEMITEC)

C8 : TUNS100F05 10μF
TUNS100F12 10μF
TUNS100F24 4.7μF

C9 : TUNS100F05 2200μF (0≦Tc≦100)
2200μF×3 (-40≦Tc<0)
TUNS100F12 470μF (0≦Tc≦100)
470μF×3 (-40≦Tc<0)
TUNS100F24 220μF (0≦Tc≦100)
220μF×3 (-40≦Tc<0)

Tc : Base Plate Temp.

Figure D