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参考資料

TEST DATA OF TUNS300F48

Regulated DC Power Supply
October 1, 2014

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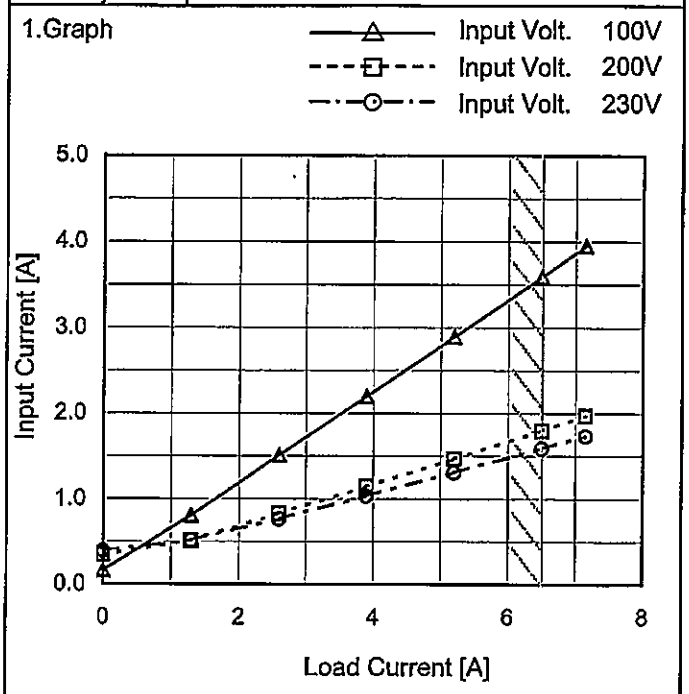
Model	TUNS300F48
Item	Input Current (by Load Current)
Object	————————

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 Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.163	0.340	0.391
1.30	0.810	0.513	0.514
2.60	1.512	0.826	0.767
3.90	2.197	1.143	1.033
5.20	2.892	1.470	1.311
6.50	3.593	1.800	1.593
7.15	3.950	1.967	1.736
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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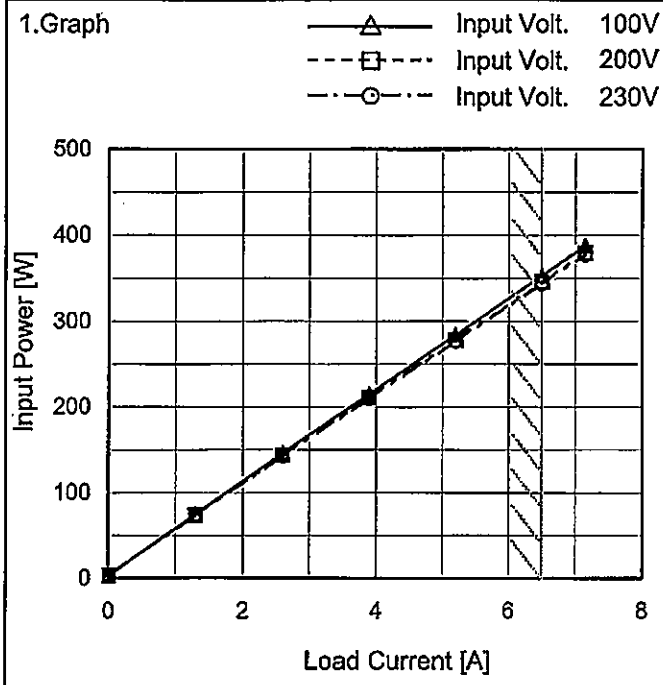
Model	TUNS300F48
Item	Input Power (by Load Current)
Object	————————

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]
0.00	3.3	3.2	3.2
1.30	74.9	73.6	73.4
2.60	146.6	143.6	143.1
3.90	215.0	210.7	209.9
5.20	284.1	277.9	276.9
6.50	353.1	345.5	344.1
7.15	388.1	379.4	377.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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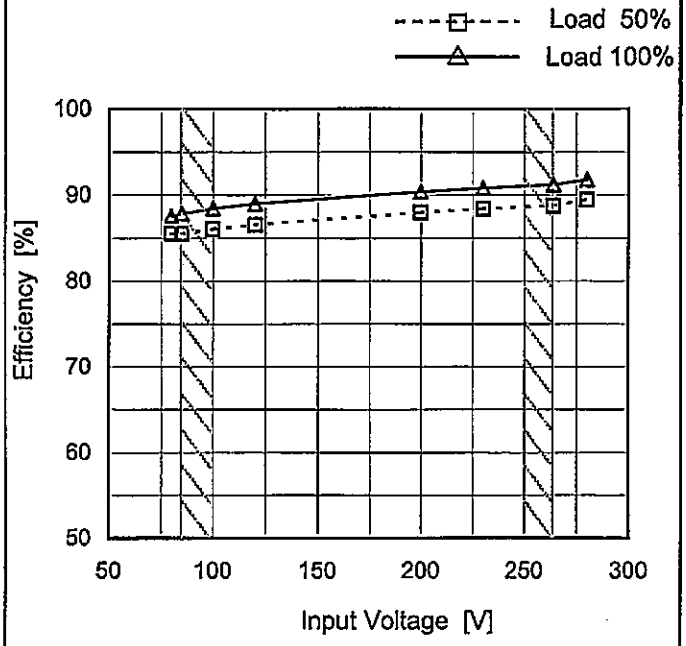
Model	TUNS300F48
Item	Efficiency (by Input Voltage)
Object	———————

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	85.5	87.6
85	85.5	87.9
100	86.0	88.5
120	86.5	89.0
200	88.0	90.4
230	88.4	90.8
264	88.8	91.2
280	89.5	91.8
--	-	-

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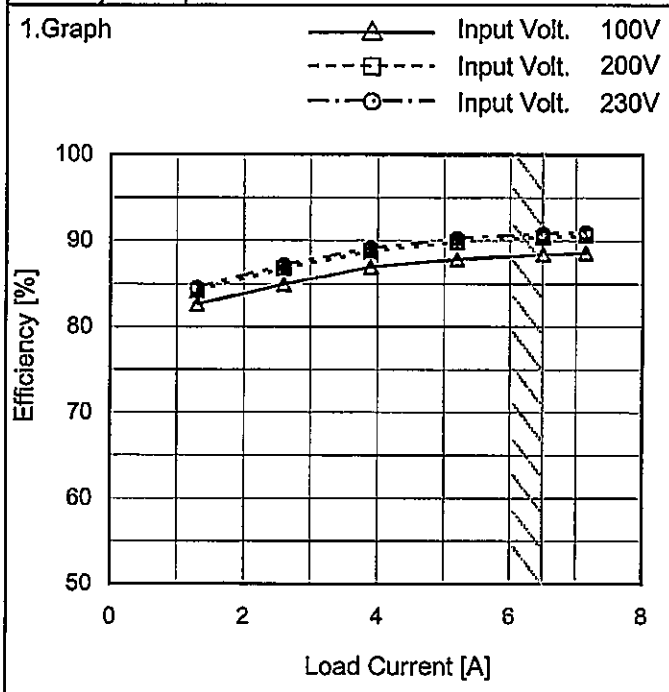
Model	TUNS300F48
Item	Efficiency (by Load Current)
Object	————————

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]
0.00	-	-	-
1.30	82.6	84.2	84.5
2.60	85.0	86.8	87.2
3.90	87.0	88.8	89.2
5.20	87.9	89.8	90.2
6.50	88.5	90.4	90.8
7.15	88.6	90.6	91.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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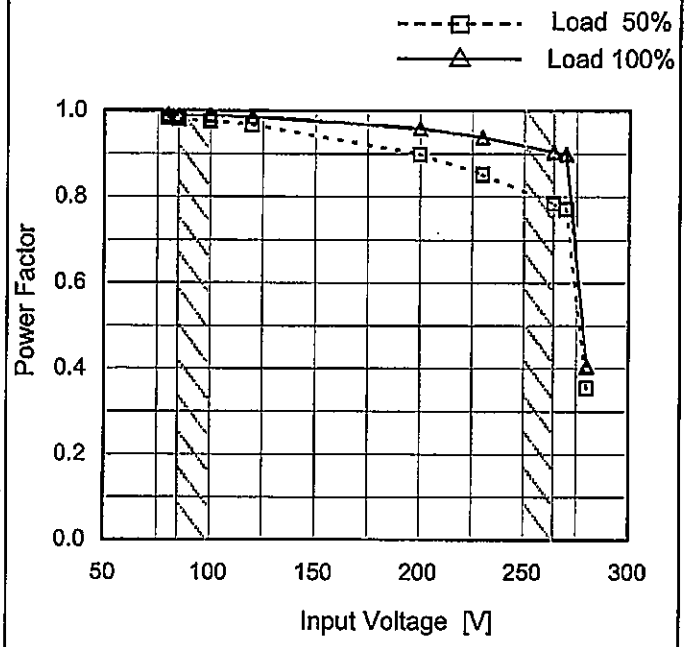
Model	TUNS300F48
Item	Power Factor (by Input Voltage)
Object	————————

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	0.984	0.990
85	0.981	0.989
100	0.976	0.990
120	0.967	0.987
200	0.899	0.959
230	0.853	0.939
264	0.785	0.905
270	0.772	0.900
280	0.355	0.406

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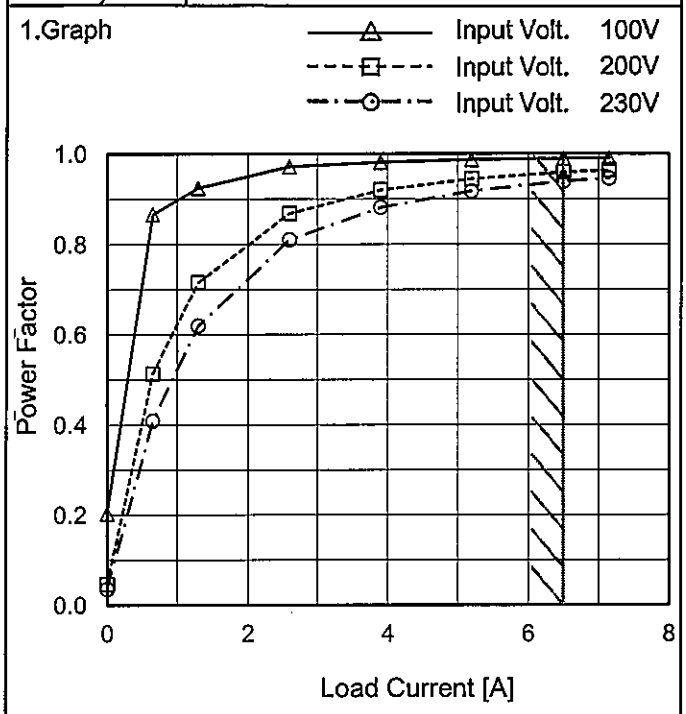
Model	TUNS300F48
Item	Power Factor (by Load Current)
Object	———————

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]
0.00	0.204	0.047	0.036
0.65	0.866	0.513	0.409
1.30	0.925	0.716	0.620
2.60	0.972	0.869	0.810
3.90	0.982	0.920	0.882
5.20	0.987	0.945	0.918
6.50	0.990	0.959	0.939
7.15	0.990	0.964	0.946
--	-	-	-
--	-	-	-
--	-	-	-

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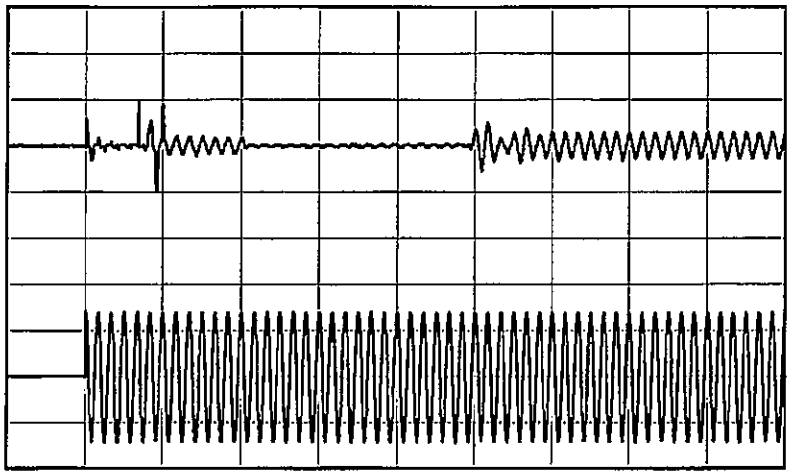
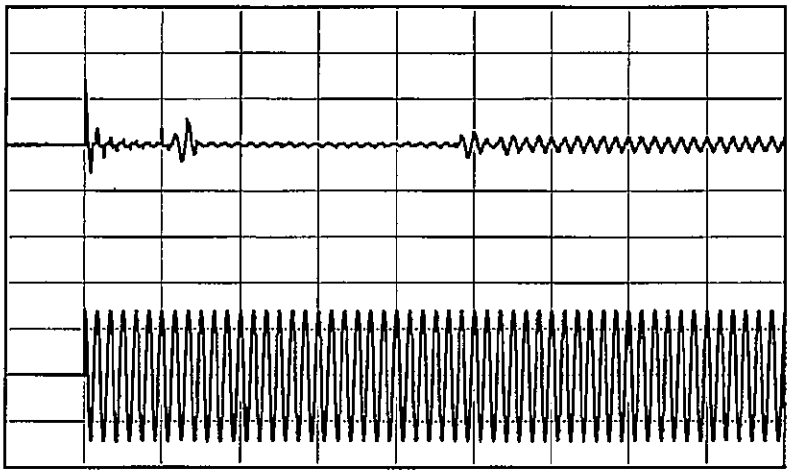
Model	TUNS300F48
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



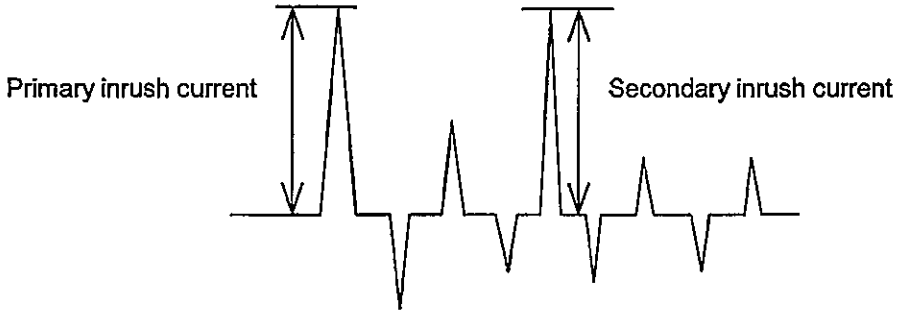
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
11.6 A
Secondary inrush current :
19.3 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
27.9 A
Secondary inrush current :
11.1 A



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Model	TUNS300F48	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	———	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240[V]	
IEC60950-1	Both phases	0.16	0.33	0.40	Operation
	One of phase	0.30	0.63	0.77	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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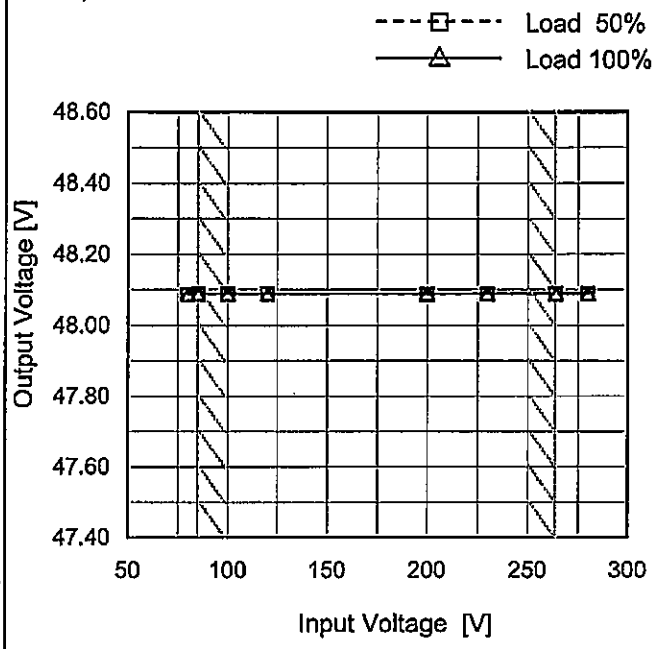
Model	TUNS300F48
Item	Line Regulation
Object	+48V6.5A

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	48.087	48.087
85	48.087	48.088
100	48.087	48.089
120	48.088	48.089
200	48.087	48.089
230	48.088	48.089
264	48.088	48.089
280	48.088	48.089
--	-	-

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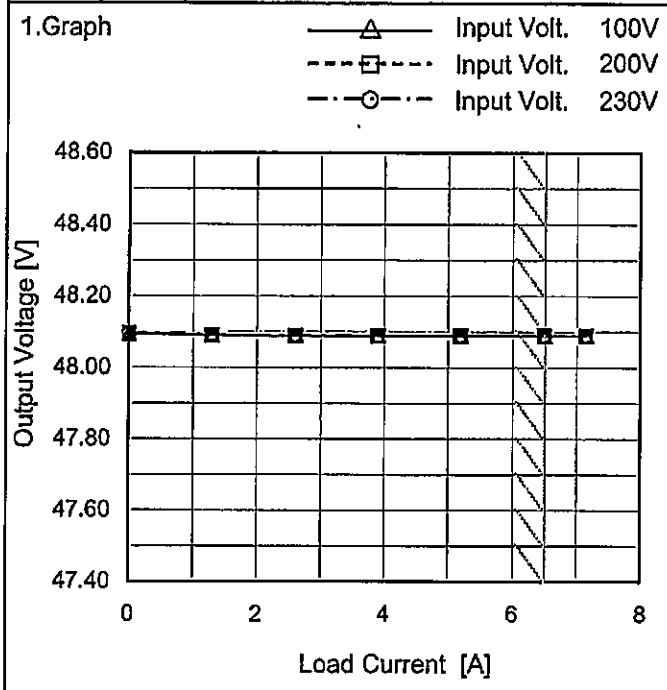
Model	TUNS300F48
Item	Load Regulation
Object	+48V6.5A

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]
0.00	48.094	48.095	48.096
1.30	48.090	48.090	48.091
2.60	48.089	48.089	48.089
3.90	48.089	48.089	48.089
5.20	48.089	48.088	48.089
6.50	48.089	48.089	48.089
7.15	48.089	48.089	48.089
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUNS300F48
Item	Dynamic Load Response
Object	+48V 6.5A

Temperature 25℃
Testing Circuitry Figure A

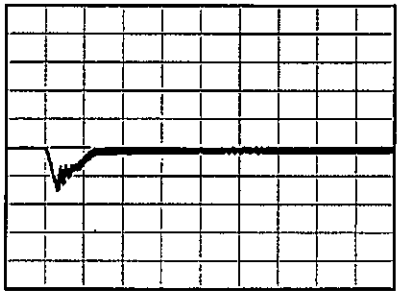
Input Volt. 100V
Cycle 1000ms

Load Current

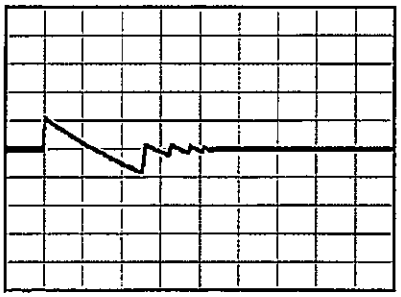
6.5A / 50us

Min.Load (0A)⟷
Load 100%(6.5A)

1 V/div



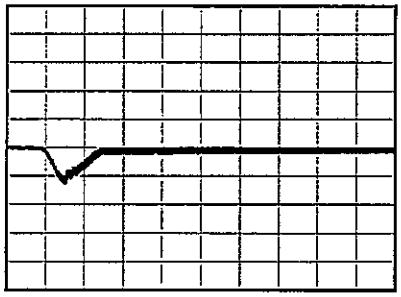
400 us/div



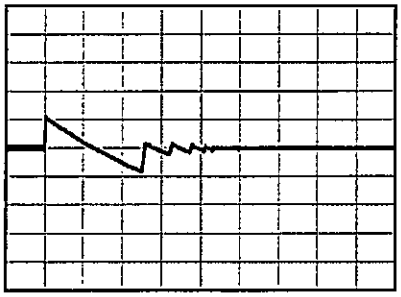
20 ms/div

Min.Load (0A)⟷
Load 50%(3.25A)

1 V/div



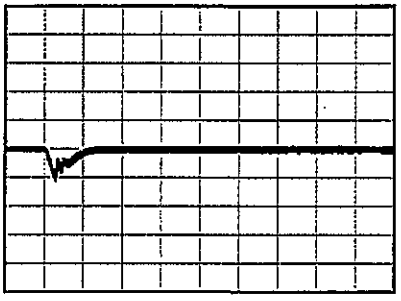
400 us/div



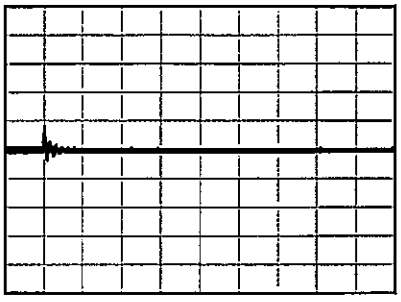
20 ms/div

Load 10% (0.65A)⟷
Load 100% (6.5A)

1 V/div



400 us/div

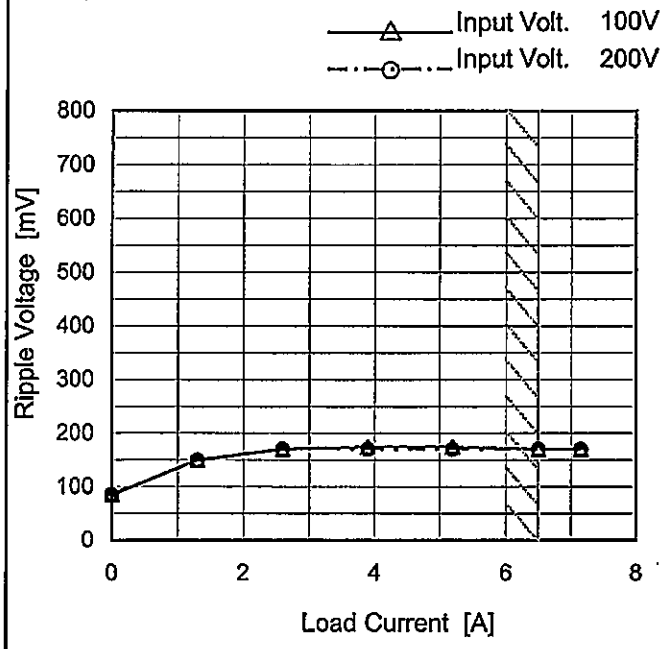


20 ms/div

Model	TUNS300F48
Item	Ripple Voltage (by Load Current)
Object	+48V6.5A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



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

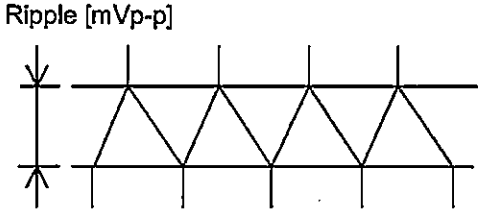


Fig.Complex Ripple Wave Form

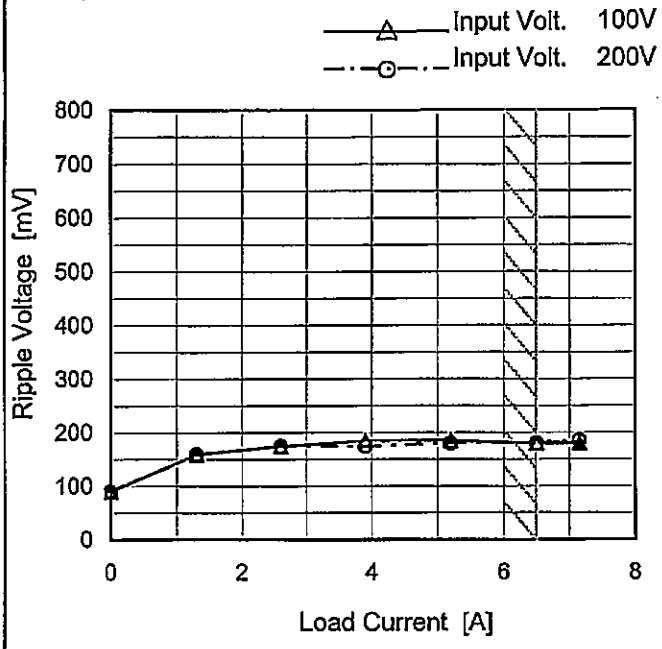
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	85	85
1.3	150	150
2.6	170	170
3.9	175	170
5.2	175	170
6.5	170	170
7.2	170	170
--	-	-
--	-	-
--	-	-
--	-	-

Model	TUNS300F48
Item	Ripple-Noise
Object	+48V6.5A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



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

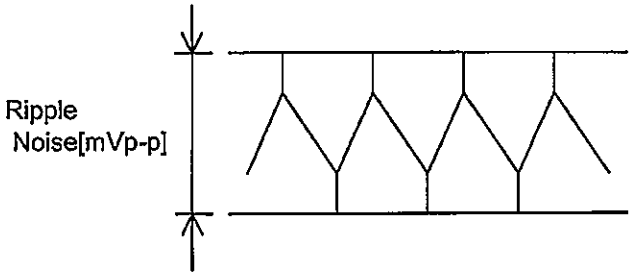


Fig.Complex Ripple Noise Wave Form

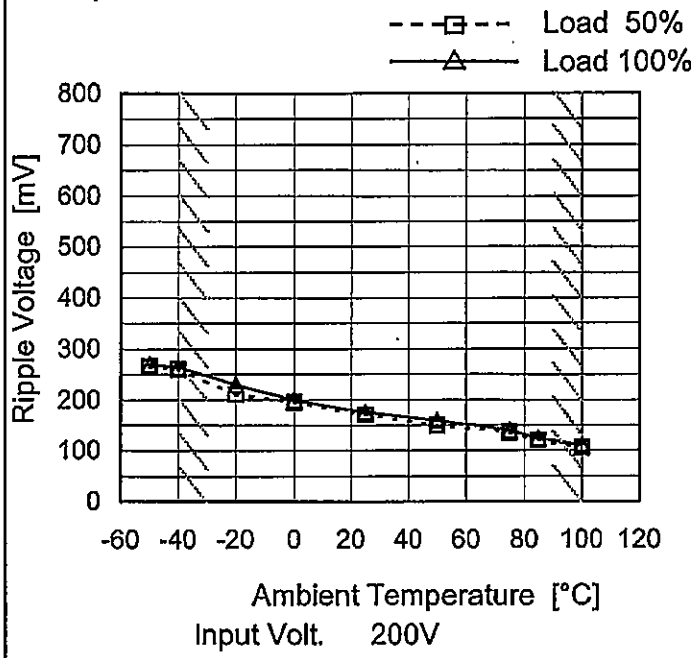
2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0	90	90
1.3	160	160
2.6	175	175
3.9	185	175
5.2	185	180
6.5	180	180
7.2	180	185
--	-	-
--	-	-
--	-	-
--	-	-

Model	TUNS300F48
Item	Ripple Voltage (by Ambient Temp.)
Object	+48V6.5A

Testing Circuitry Figure C

1.Graph



Input Volt. 200V

Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	265	270
-40	260	265
-20	210	230
0	195	200
25	170	175
50	150	160
75	135	140
85	120	125
100	105	110
105	105	105
--	-	-

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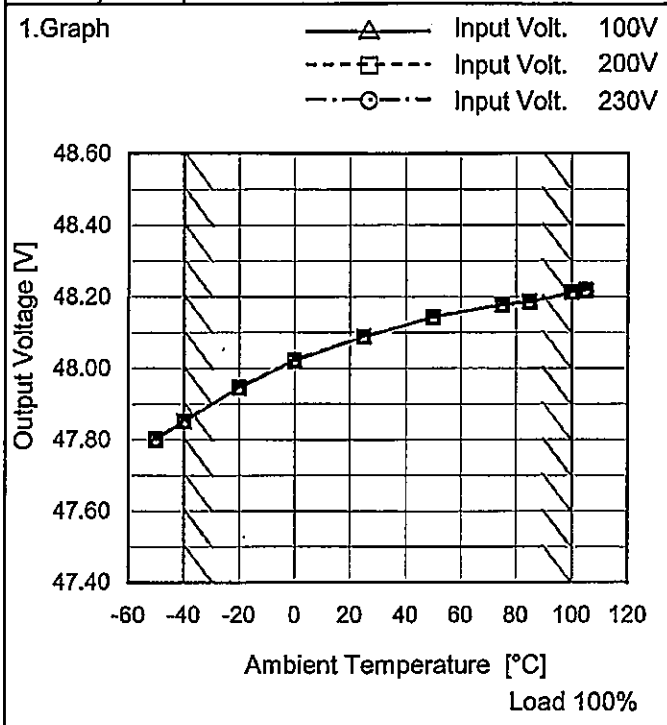
Model	TUNS300F48
Item	Ambient Temperature Drift
Object	+48V6.5A

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	47.801	47.802	47.802
-40	47.852	47.853	47.854
-20	47.947	47.947	47.947
0	48.023	48.024	48.025
25	48.089	48.089	48.089
50	48.143	48.143	48.143
75	48.178	48.178	48.178
85	48.186	48.186	48.186
100	48.212	48.212	48.212
105	48.219	48.219	48.220
--	-	-	-

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Model	TUNS300F48	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+48V6.5A	

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 - 6.5A

* 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	100	85	0	48.223	±186	±0.4
Minimum Voltage	-40	85	6.5	47.851		

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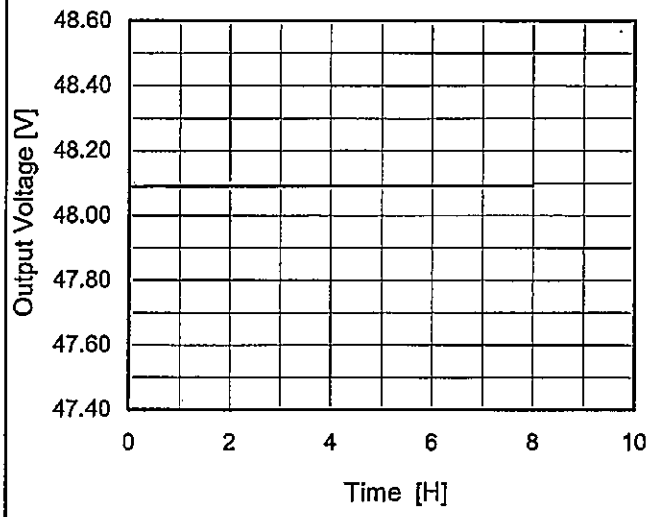
Model	TUNS300F48
Item	Time Lapse Drift
Object	+48V6.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

2.Values

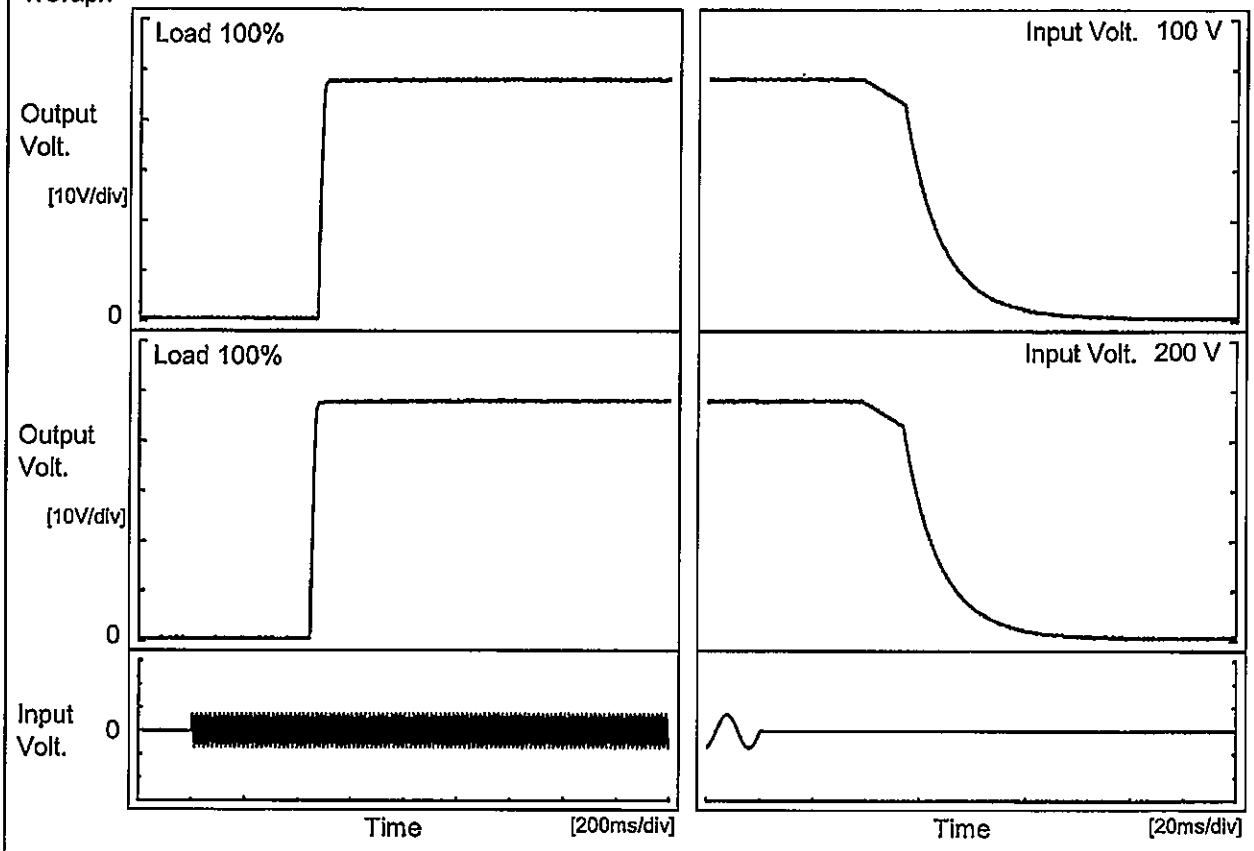
Time since start [H]	Output Voltage [V]
0.0	48.083
0.5	48.091
1.0	48.091
2.0	48.091
3.0	48.091
4.0	48.092
5.0	48.092
6.0	48.092
7.0	48.092
8.0	48.093

COSEL

Model	TUNS300F48
Item	Rise and Fall Time
Object	+48V6.5A

Temperature 25°C
Testing Circuitry Figure A

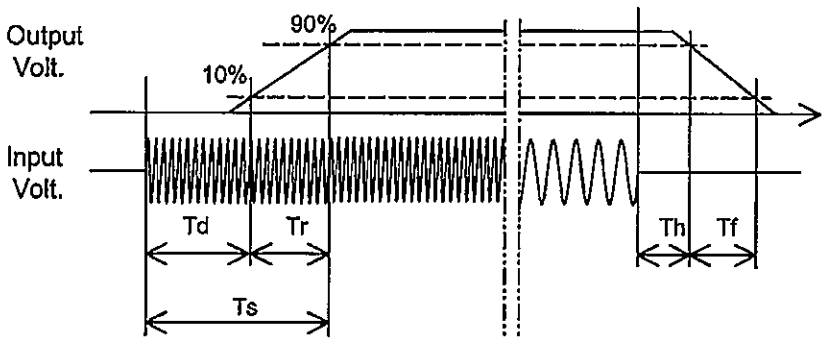
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	472.0	18.0	490.0	52.4	32.5
200 V	446.0	18.0	464.0	52.0	32.8

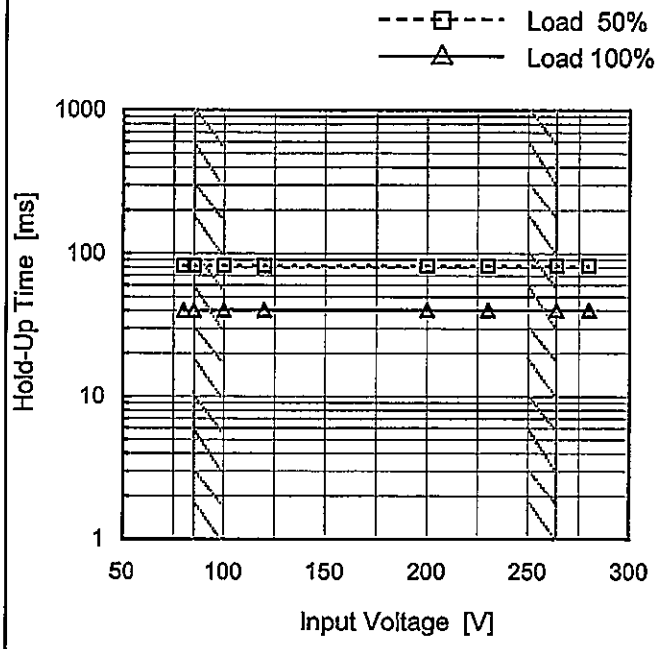


COSEL

Model	TUNS300F48
Item	Hold-Up Time
Object	+48V6.5A

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

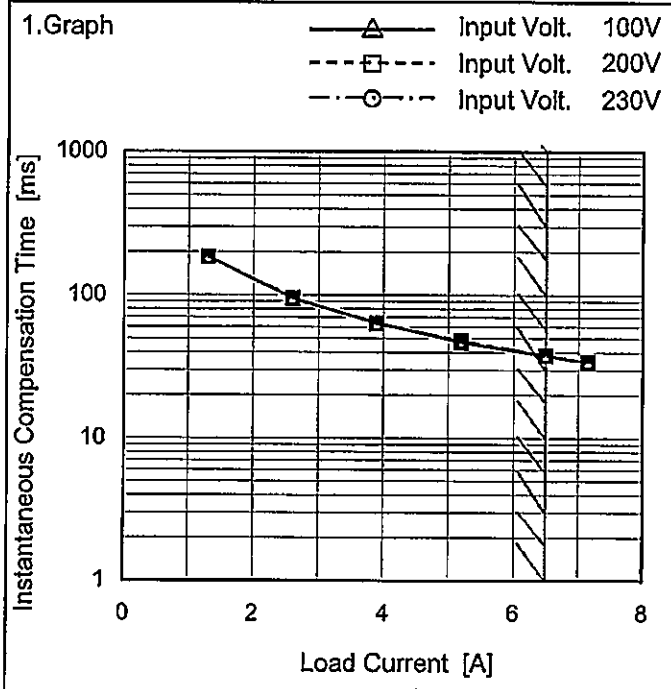
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
80	82	40
85	82	40
100	82	40
120	82	40
200	82	40
230	82	40
264	82	40
280	82	40
--	-	-

COSEL

Model	TUNS300F48
Item	Instantaneous Interruption Compensation
Object	+48V6.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

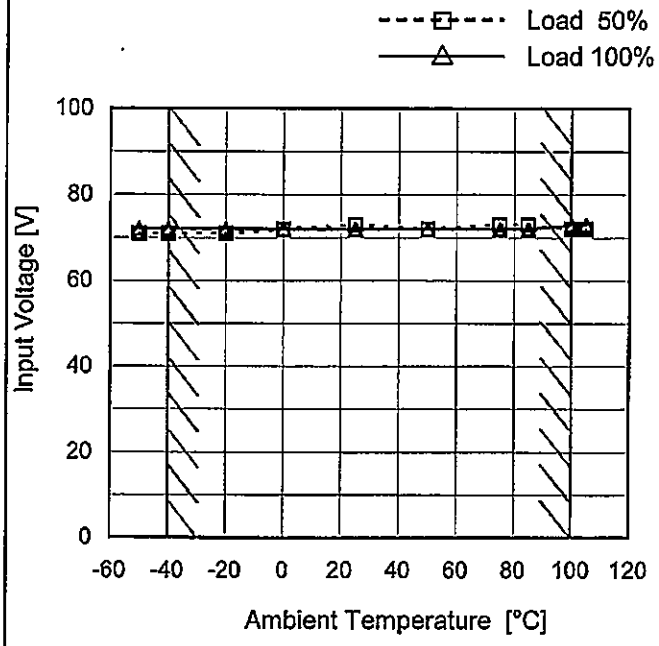
Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
1.30	185	185	185
2.60	95	95	95
3.90	64	63	63
5.20	47	48	48
6.50	38	38	38
7.15	34	34	34
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	TUNS300F48
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V6.5A

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	71	72
-40	71	72
-20	71	72
0	72	72
25	73	72
50	72	72
75	73	72
85	73	72
100	72	73
105	72	73
--	-	-

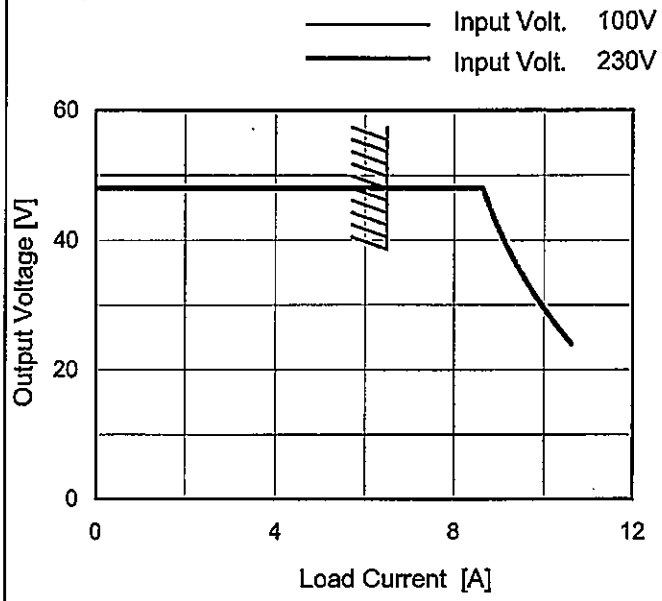
BC-10856

COSEL

Model	TUNS300F48
Item	Overcurrent Protection
Object	+48V6.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Intermittent operation occurs when the output voltage is from 24V to 0V.

2.Values

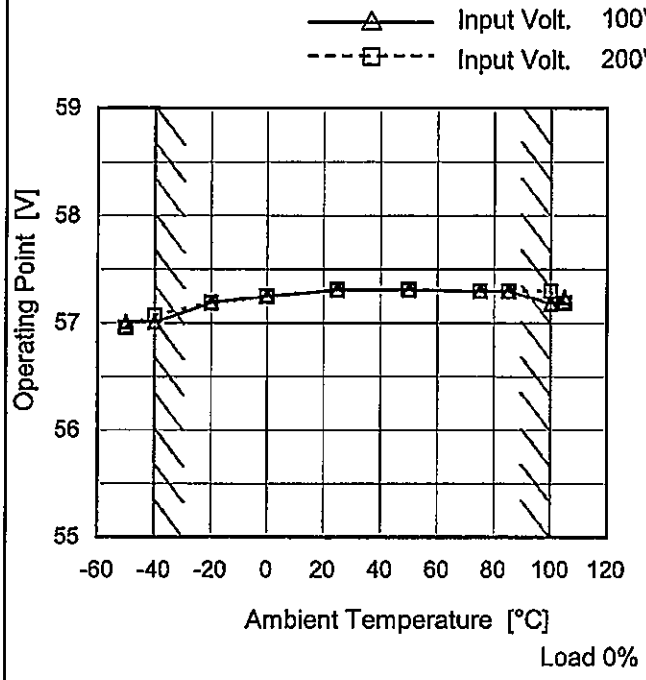
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
48.0	6.55	6.55
45.6	8.76	8.77
43.2	8.90	8.90
38.4	9.22	9.22
33.6	9.60	9.60
28.8	10.07	10.07
24.0	10.63	10.63
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	TUNS300F48
Item	Overvoltage Protection
Object	+48V6.5A

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. 100[V]	Input Volt. 200[V]
-50	57.01	56.96
-40	57.01	57.07
-20	57.19	57.19
0	57.25	57.25
25	57.31	57.31
50	57.31	57.31
75	57.30	57.30
85	57.30	57.30
100	57.18	57.30
105	57.24	57.19
--	-	-

COSEL

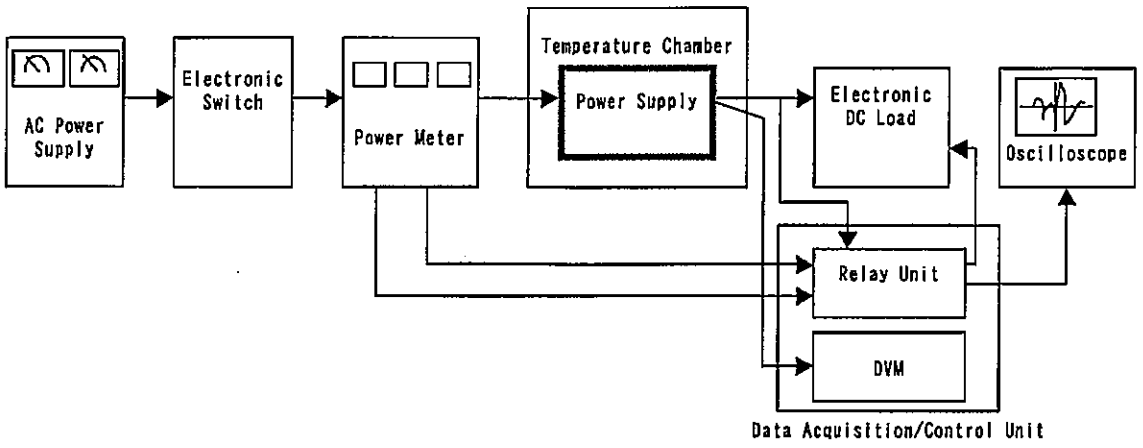


Figure A

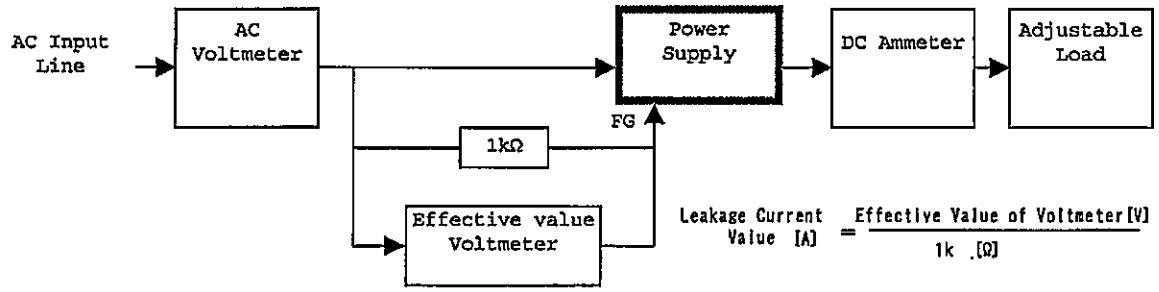


Figure B (DEN-AN)

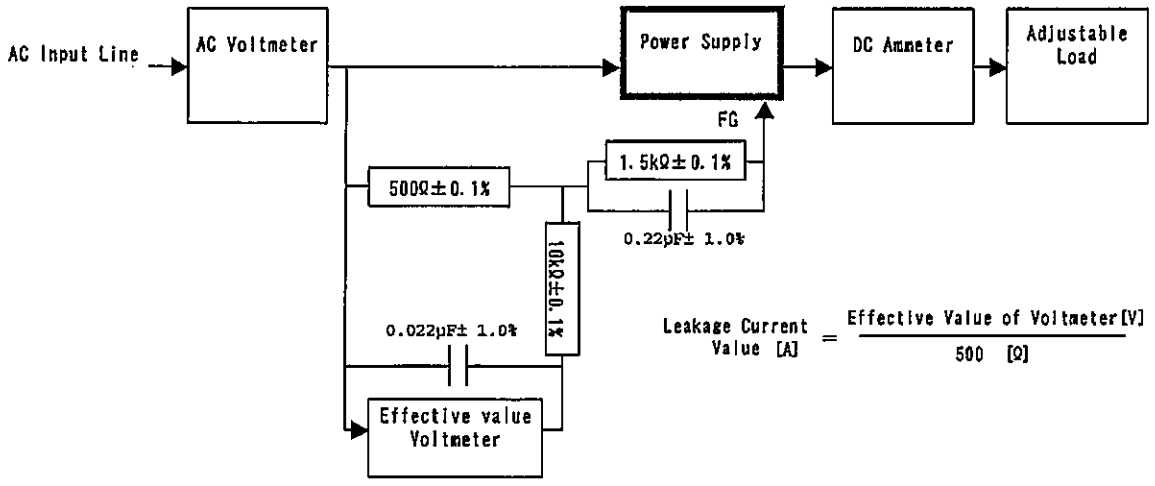
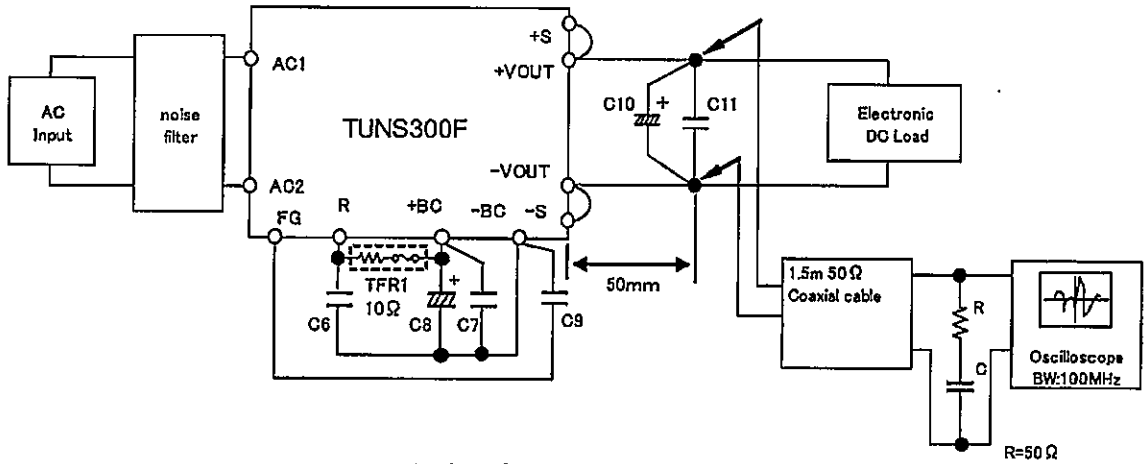


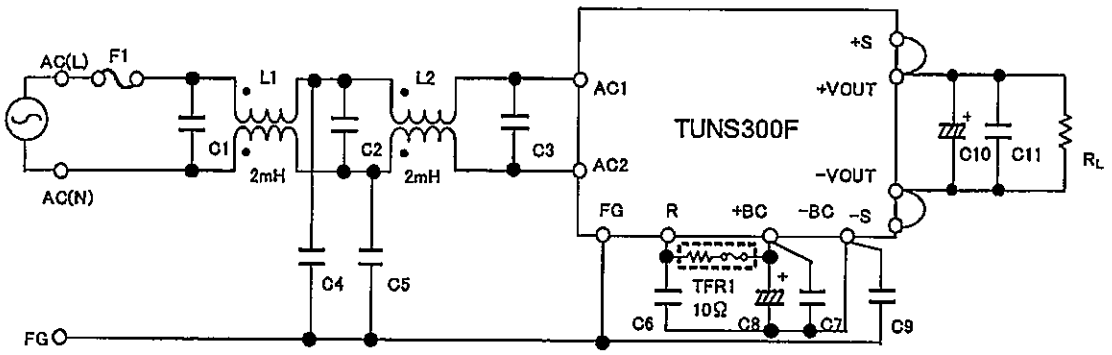
Figure B (IEC60950-1)



C10 : TUNS300F12 2200μF (0≦Tc≦100)
2200μF×3 (-40≦Tc<0)
TUNS300F28 1000μF (0≦Tc≦100)
1000μF×3 (-40≦Tc<0)
TUNS300F48 470μF (0≦Tc≦100)
470μF×3 (-40≦Tc<0)
Tc:Base Plate Temp.

C11 : TUNS300F12 10μF
TUNS300F28 4.7μF
TUNS300F48 2.2μF

Figure C



L1,L2 : SC-15-200(NEC TOKIN)
C1,C2 : 0.68μF 310V Film Capacitor × 2
C3 : 1.0μF 310V Film Capacitor × 2
C4,C5,C9 : 2200pF Ceramic Capacitor
C6,C7 : 0.68μF 450V Film Capacitor × 2
C8 : 470μF 450V Electrolytic Capacitor
C10 : TUNS300F12 2200μF 25V Electrolytic Capacitor
TUNS300F28 1000μF 50V Electrolytic Capacitor
TUNS300F48 470μF 63V Electrolytic Capacitor

C11 : TUNS300F12 10μF Ceramic Capacitor
TUNS300F28 4.7μF Ceramic Capacitor
TUNS300F48 2.2μF Ceramic Capacitor

Figure D