COSEL

参考資料

TEST DATA OF TUNS300F12

Regulated DC Power Supply
October 1, 2014

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COSEL CO.,LTD.

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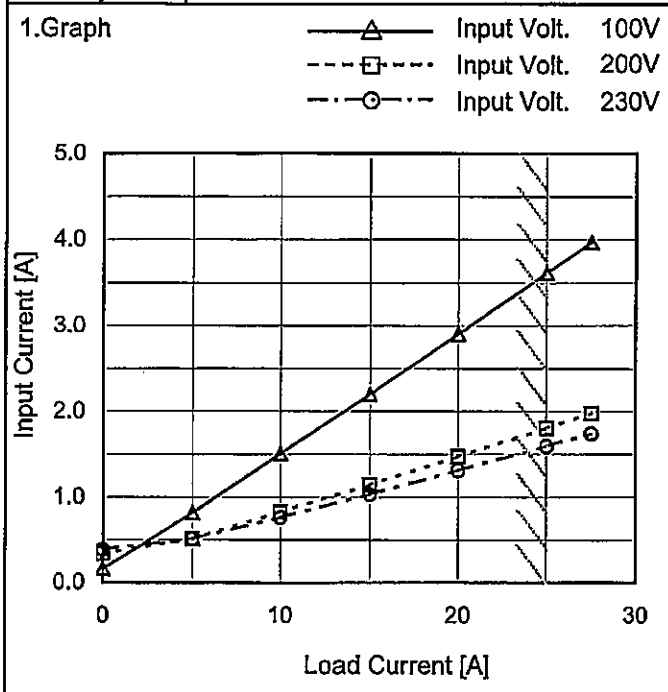

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.161	0.334	0.385
5.0	0.814	0.510	0.509
10.0	1.510	0.822	0.762
15.0	2.202	1.142	1.031
20.0	2.903	1.472	1.311
25.0	3.613	1.807	1.597
27.5	3.971	1.977	1.743
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-10854

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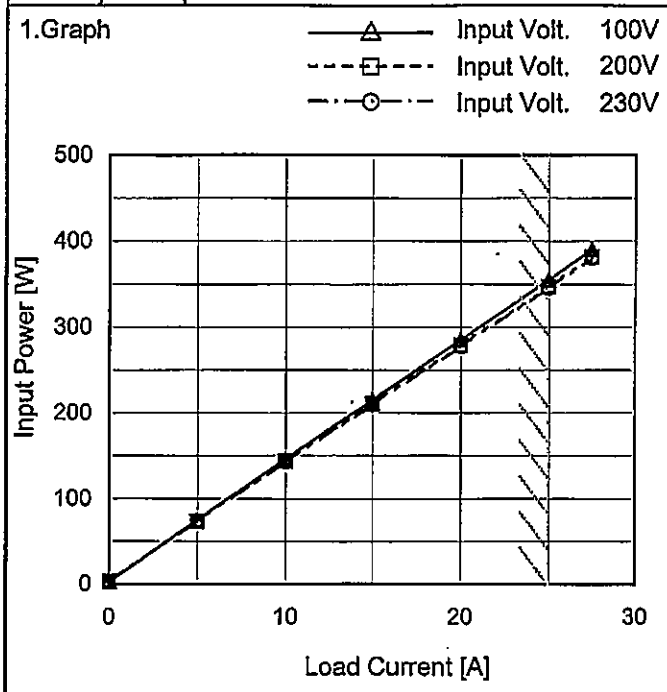
Model	TUNS300F12
Item	Input Power (by Load Current)
Object	

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	3.0	2.9	3.0
5.0	75.2	73.7	73.5
10.0	146.4	143.4	142.8
15.0	215.4	210.9	210.1
20.0	285.1	278.7	277.5
25.0	355.0	347.2	345.6
27.5	390.5	381.8	380.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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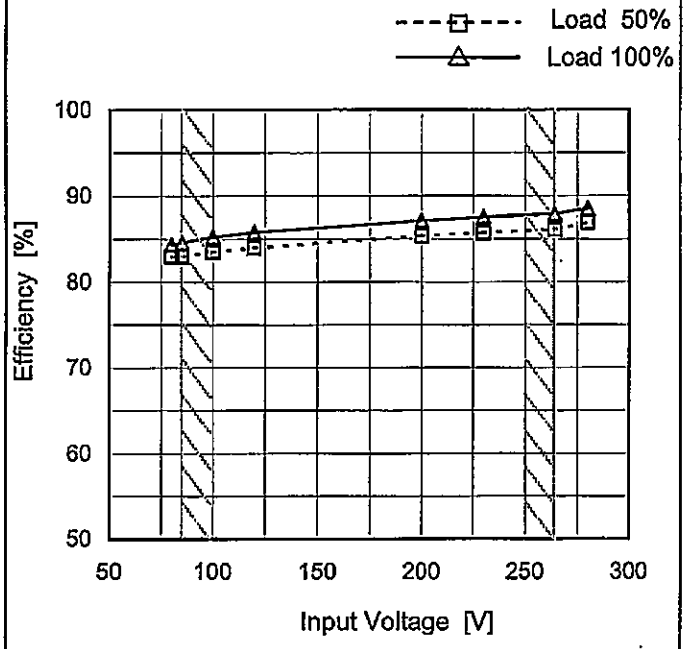
Model	TUNS300F12
Item	Efficiency (by Input Voltage)
Object	———————

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	82.9	84.3
85	83.0	84.6
100	83.5	85.2
120	84.0	85.8
200	85.3	87.1
230	85.7	87.6
264	86.1	87.9
280	86.9	88.5
--	-	-

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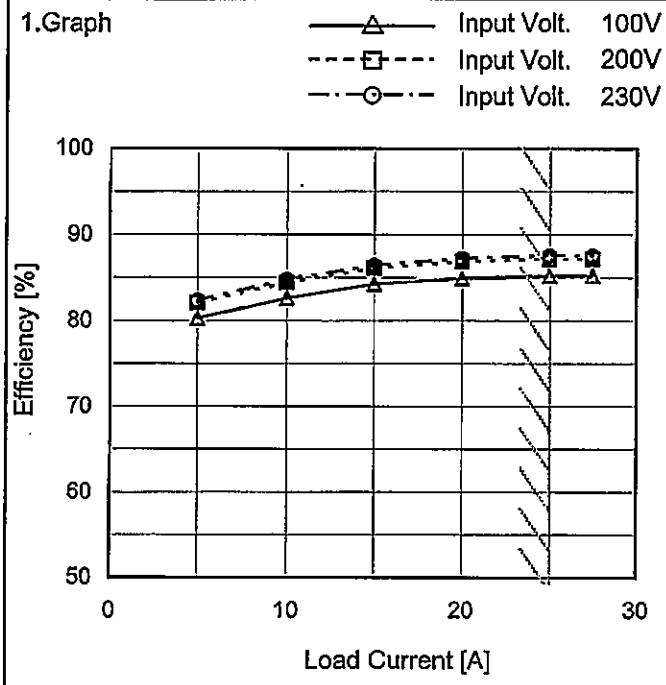
Model	TUNS300F12
Item	Efficiency (by Load Current)
Object	———————

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	-	-	-
5.0	80.3	82.0	82.3
10.0	82.6	84.4	84.8
15.0	84.2	86.1	86.4
20.0	84.9	86.9	87.2
25.0	85.2	87.1	87.6
27.5	85.2	87.2	87.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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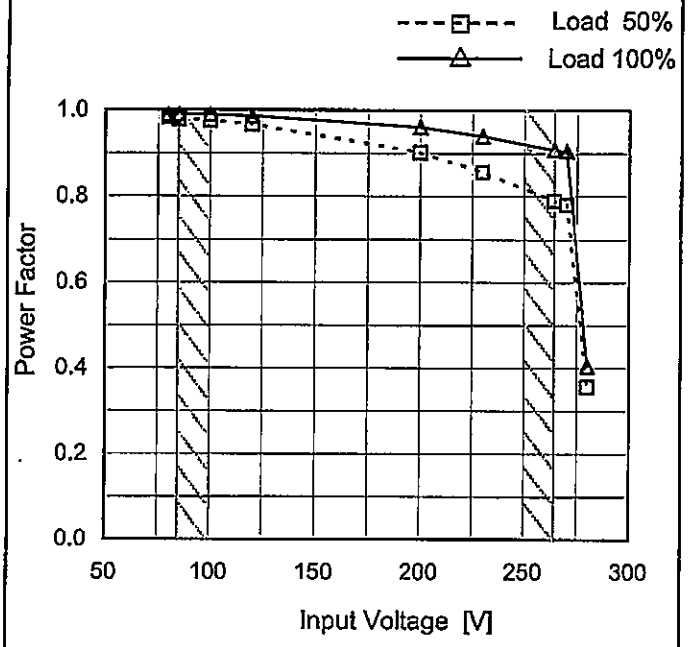
Model	TUNS300F12
Item	Power Factor (by Input Voltage)
Object	———————————

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	0.983	0.990
85	0.980	0.990
100	0.976	0.990
120	0.967	0.987
200	0.902	0.960
230	0.857	0.940
264	0.791	0.909
270	0.780	0.905
280	0.356	0.405

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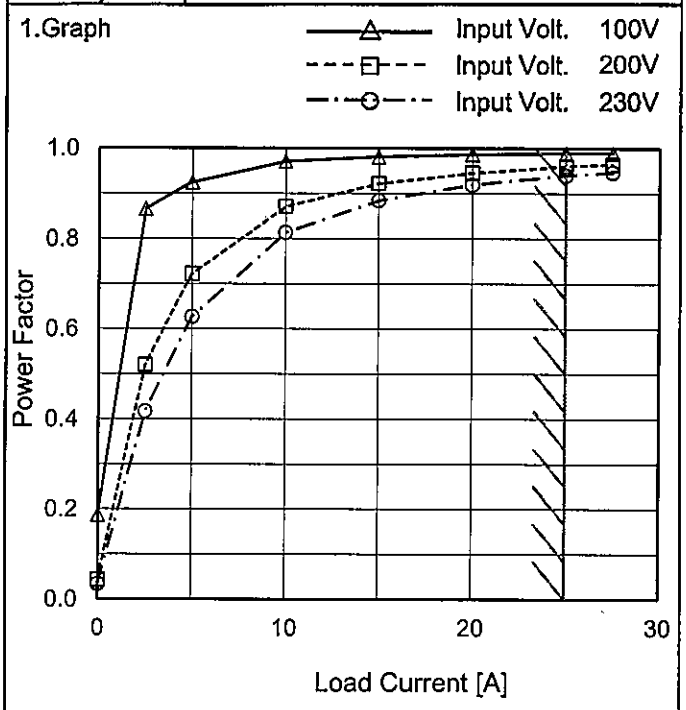
Model	TUNS300F12
Item	Power Factor (by Load Current)
Object	————————

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	0.187	0.043	0.033
2.5	0.866	0.521	0.417
5.0	0.925	0.722	0.627
10.0	0.971	0.871	0.814
15.0	0.982	0.922	0.885
20.0	0.987	0.946	0.920
25.0	0.990	0.960	0.940
27.5	0.990	0.965	0.947
--	-	-	-
--	-	-	-
--	-	-	-

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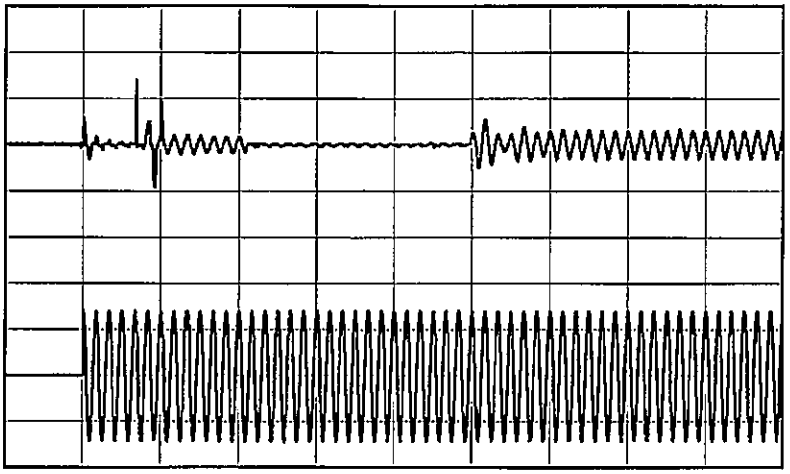
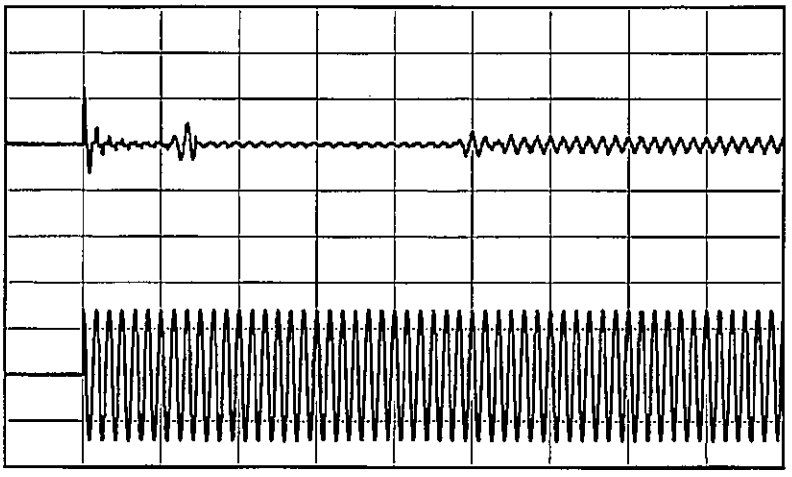
Model	TUNS300F12
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



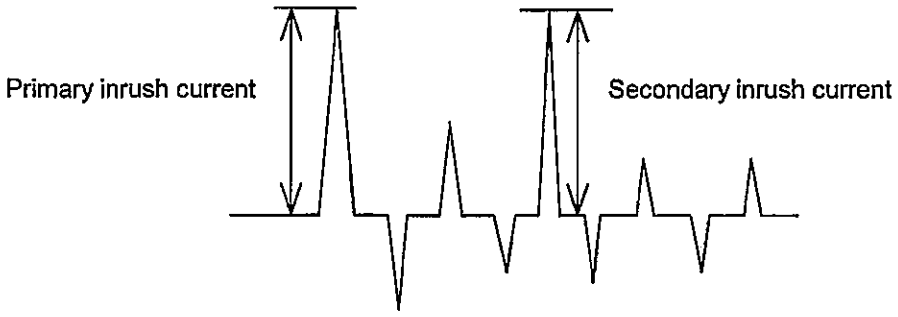
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
11.7 A
Secondary inrush current :
27.9 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
24.6 A
Secondary inrush current :
9.0 A



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Model	TUNS300F12		
Item	Leakage Current	Temperature	25°C
Object	———	Testing Circuitry	Figure B

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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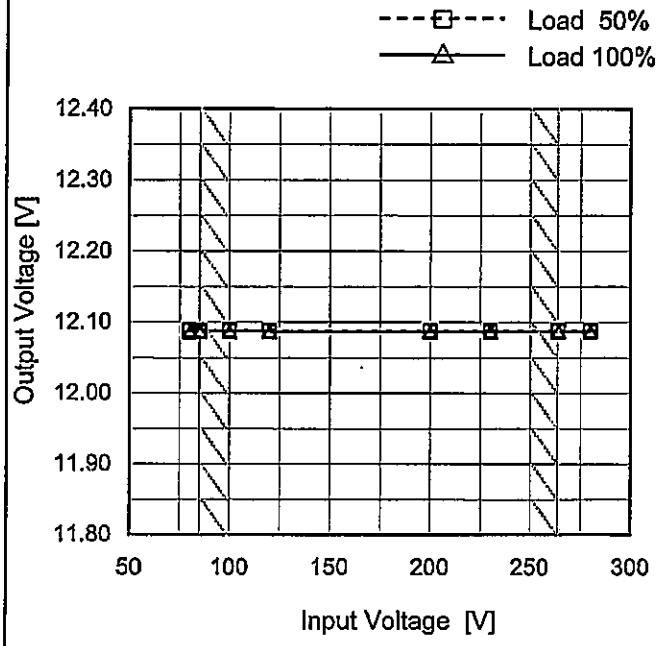
Model	TUNS300F12
Item	Line Regulation
Object	+12V25A

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%
80	12.088	12.087
85	12.088	12.087
100	12.088	12.087
120	12.088	12.087
200	12.088	12.087
230	12.088	12.087
264	12.088	12.087
280	12.088	12.087
--	-	-

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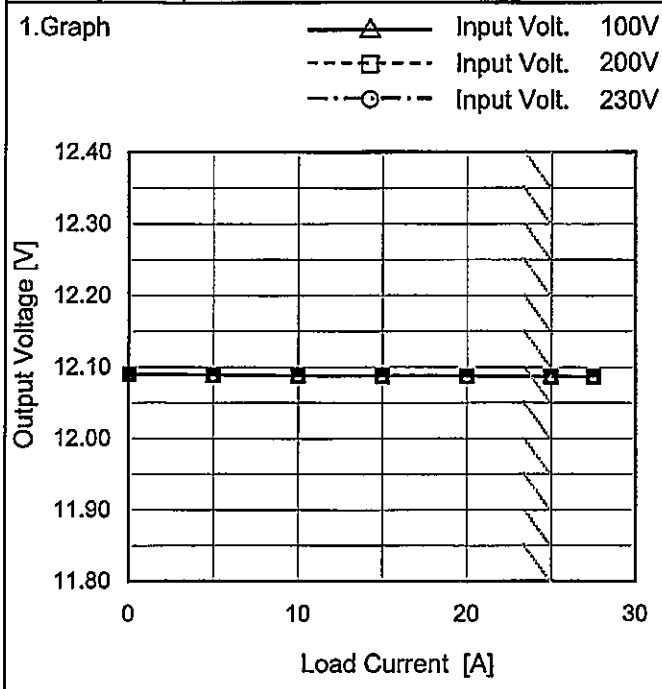
Model	TUNS300F12
Item	Load Regulation
Object	+12V25A

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	12.090	12.090	12.090
5.0	12.089	12.089	12.089
10.0	12.088	12.088	12.088
15.0	12.088	12.088	12.088
20.0	12.088	12.087	12.088
25.0	12.087	12.087	12.087
27.5	12.087	12.087	12.087
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUNS300F12
Item	Dynamic Load Response
Object	+12V 25A

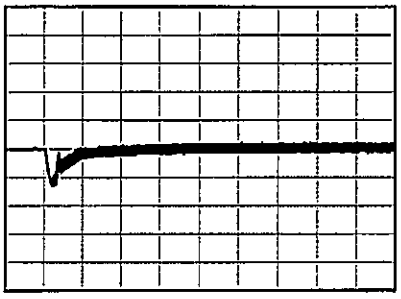
Temperature 25℃
Testing Circuitry Figure A

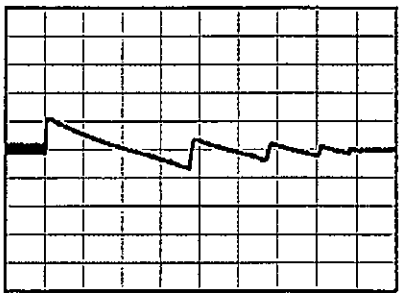
Input Volt. 100V
Cycle 1000ms

Load Current

25A / 50us

Min.Load (0A)←→
Load 100%(25A)



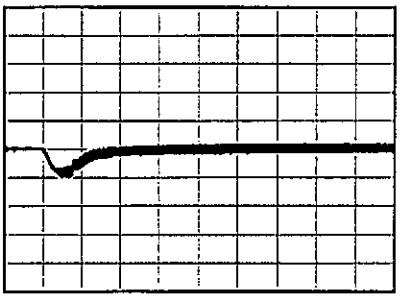


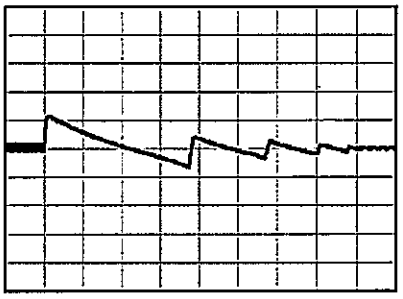
200 mV/div

200 us/div

10 ms/div

Min.Load (0A)←→
Load 50%(12.5A)



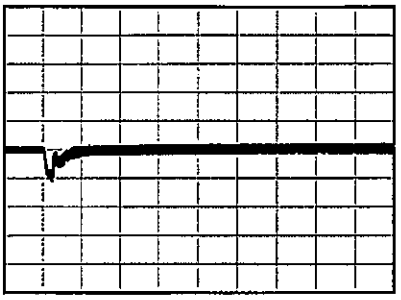


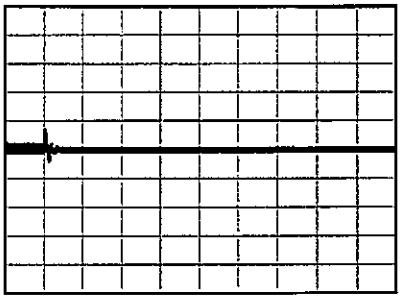
200 mV/div

200 us/div

10 ms/div

Load 10% (2.5A)←→
Load 100% (25A)





200 mV/div

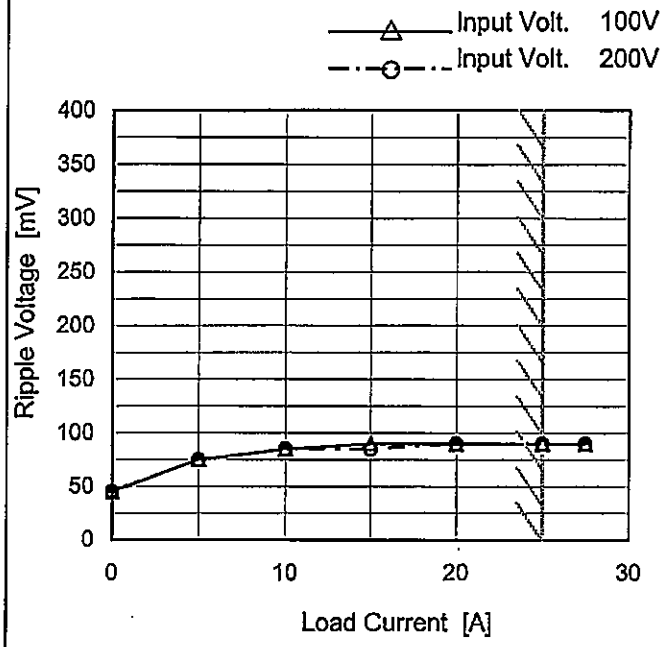
200 us/div

10 ms/div

Model	TUNS300F12
Item	Ripple Voltage (by Load Current)
Object	+12V25A

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.

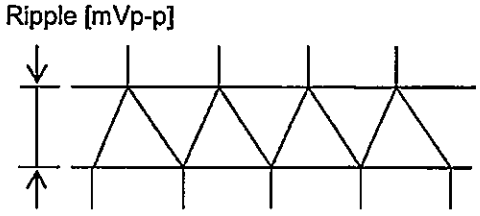


Fig.Complex Ripple Wave Form

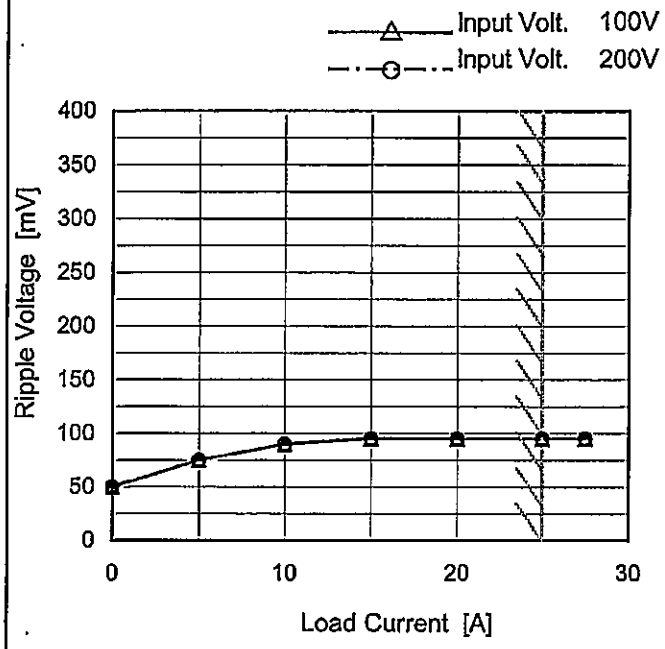
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	45	45
5.0	75	75
10.0	85	85
15.0	90	85
20.0	90	90
25.0	90	90
27.5	90	90
--	-	-
--	-	-
--	-	-
--	-	-

Model	TUNS300F12
Item	Ripple-Noise
Object	+12V25A

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.

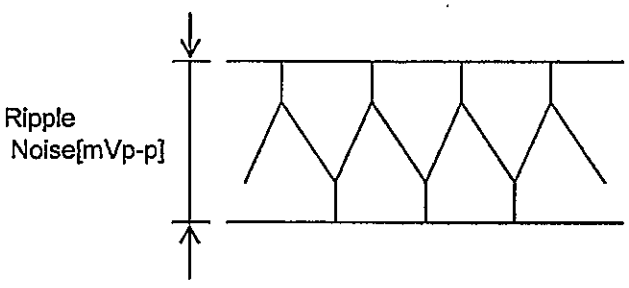


Fig.Complex Ripple Noise Wave Form

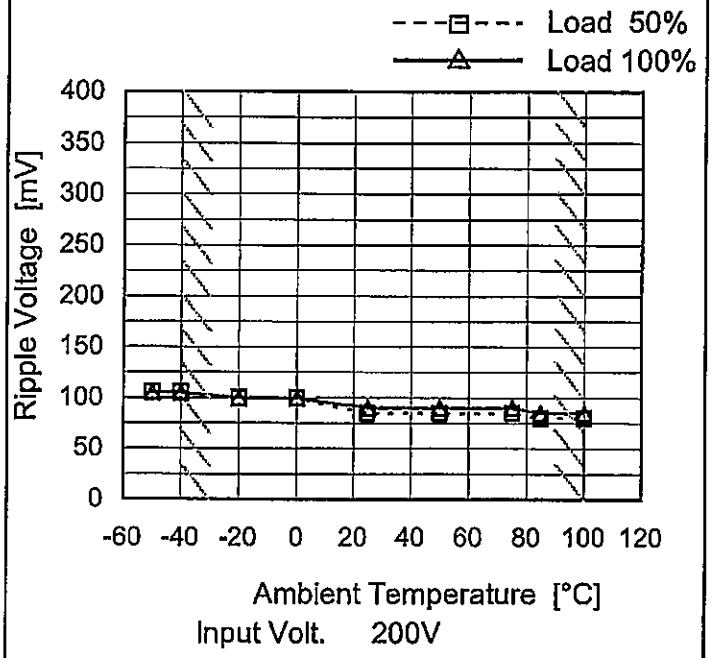
2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	50	50
5.0	75	75
10.0	90	90
15.0	95	95
20.0	95	95
25.0	95	95
27.5	95	95
--	-	-
--	-	-
--	-	-
--	-	-

Model	TUNS300F12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V25A

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	105	105
-40	105	105
-20	100	100
0	100	100
25	85	90
50	85	90
75	85	90
85	80	85
100	80	85
105	80	85
--	-	-

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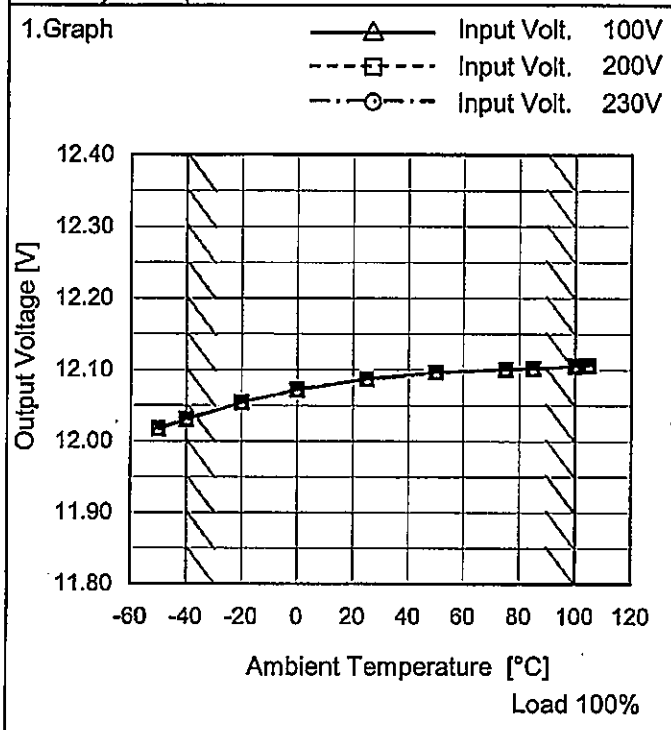
Model	TUNS300F12
Item	Ambient Temperature Drift
Object	+12V25A

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. 200[V]	Input Volt. 230[V]
-50	12.017	12.018	12.018
-40	12.030	12.031	12.031
-20	12.054	12.055	12.055
0	12.072	12.073	12.073
25	12.087	12.087	12.087
50	12.097	12.097	12.097
75	12.101	12.100	12.101
85	12.102	12.102	12.102
100	12.105	12.105	12.106
105	12.106	12.106	12.107
-	-	-	-

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Model	TUNS300F12	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
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 : -40 - 100°C
Input Voltage : 85 - 264V
Load Current : 0 - 25A

* 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	12.109	±40	±0.3
Minimum Voltage	-40	85	25	12.030		

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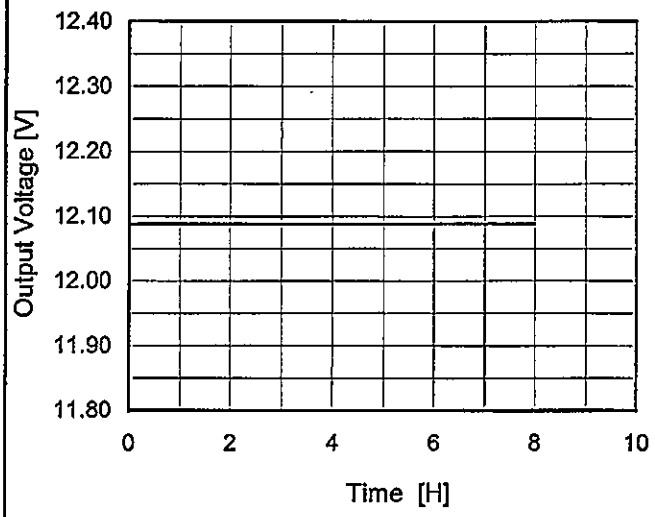
Model	TUNS300F12
Item	Time Lapse Drift
Object	+12V25A

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	12.086
0.5	12.088
1.0	12.088
2.0	12.088
3.0	12.088
4.0	12.089
5.0	12.088
6.0	12.088
7.0	12.088
8.0	12.088

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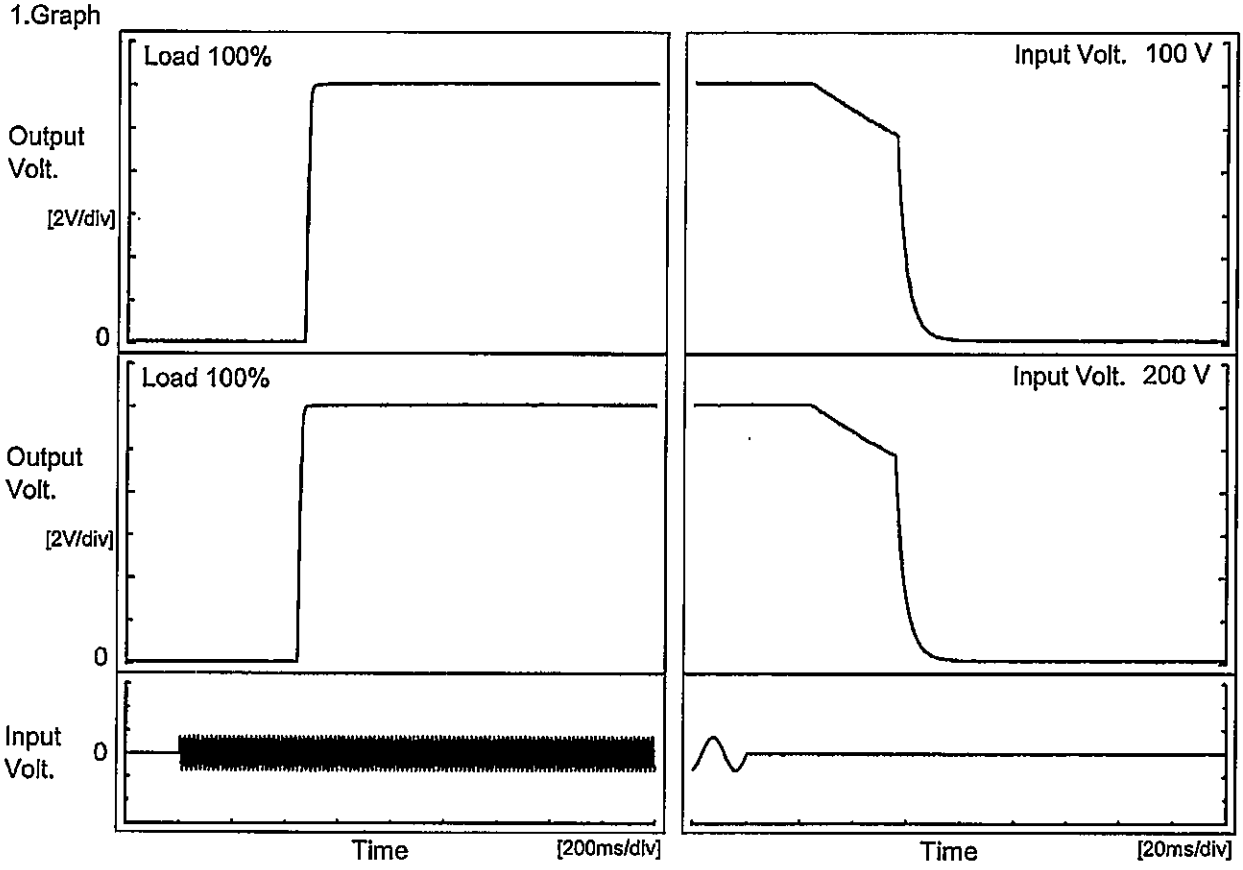
Model	TUNS300F12	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V25A	

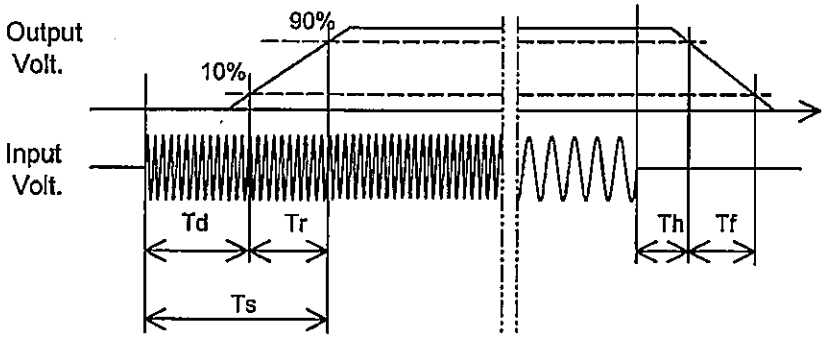
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	472.0	13.0	485.0	39.1	24.5
200 V	447.0	14.0	461.0	39.4	24.1



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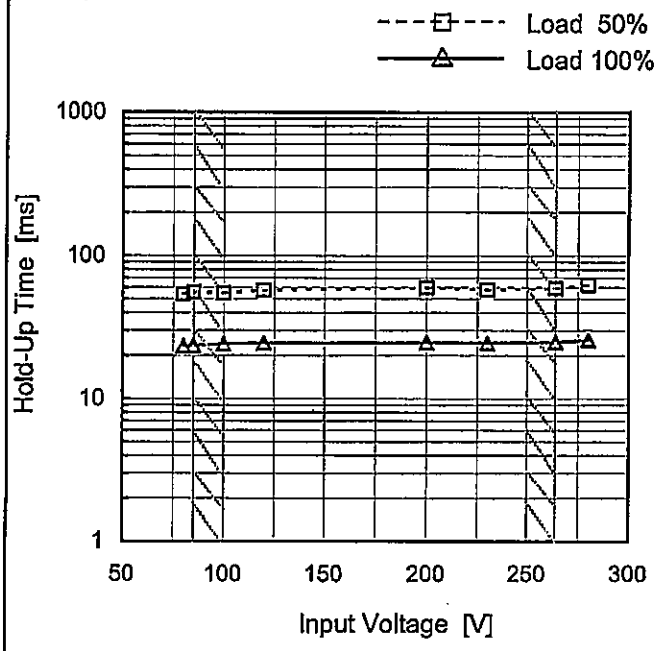
Model	TUNS300F12
Item	Hold-Up Time
Object	+12V25A

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%
80	54	23
85	56	24
100	55	24
120	58	25
200	60	25
230	58	25
264	59	25
280	63	26
--	-	-

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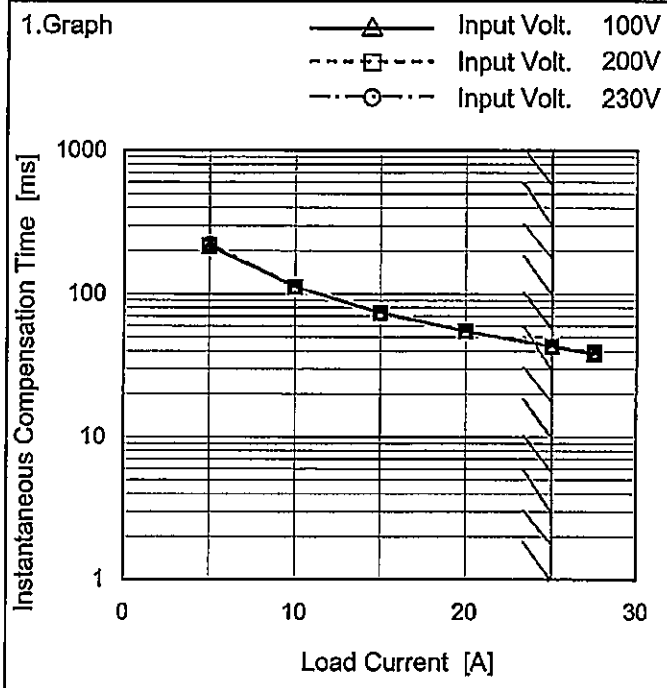
Model	TUNS300F12
Item	Instantaneous Interruption Compensation
Object	+12V25A

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	-	-	-
5.0	216	216	223
10.0	112	112	112
15.0	74	74	74
20.0	55	55	55
25.0	43	43	43
27.5	38	39	39
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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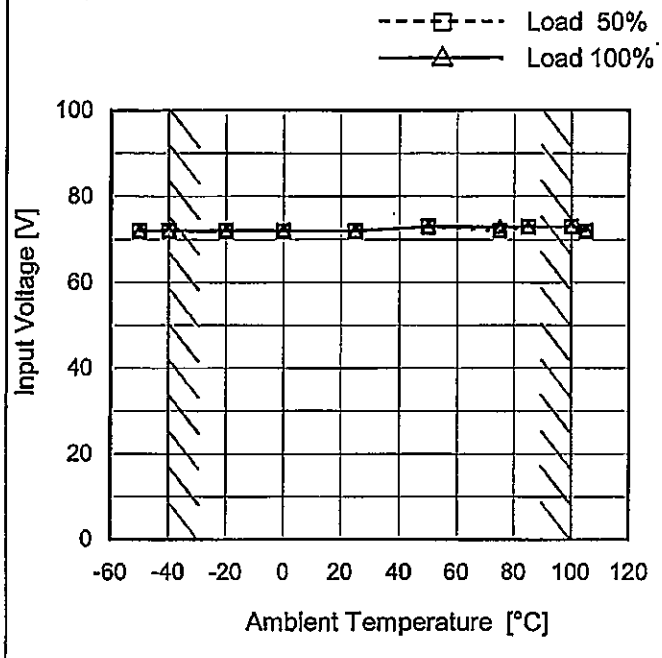
Model	TUNS300F12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V25A

Testing Circuitry Figure A

1.Graph



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

2.Values

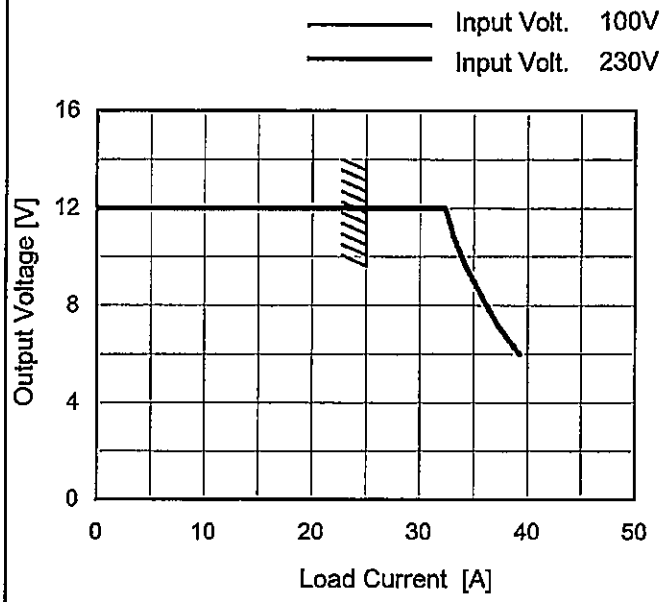
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	72	72
-40	72	72
-20	72	72
0	72	72
25	72	72
50	73	73
75	72	73
85	73	73
100	73	73
105	72	72
–	-	-

COSEL

Model	TUNS300F12
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 the output voltage is from 6V to 0V.

2.Values

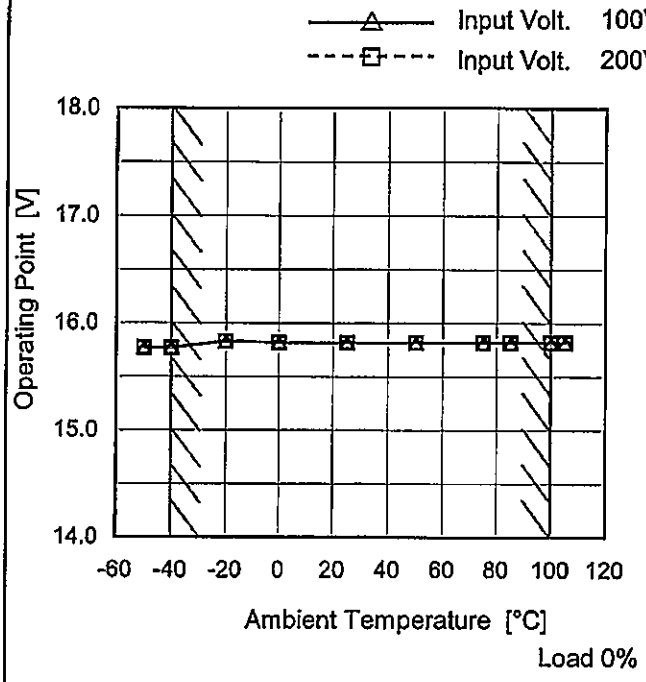
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
12.0	32.38	32.40
11.4	32.82	32.88
10.8	33.20	33.27
9.6	34.30	34.37
8.4	35.72	35.79
7.2	37.29	37.35
6.0	39.25	39.32
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	TUNS300F12
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. 100[V]	Input Volt. 200[V]
-50	15.77	15.77
-40	15.77	15.77
-20	15.83	15.83
0	15.82	15.82
25	15.82	15.82
50	15.82	15.82
75	15.82	15.82
85	15.82	15.82
100	15.82	15.82
105	15.82	15.82
--	-	-

COSEL

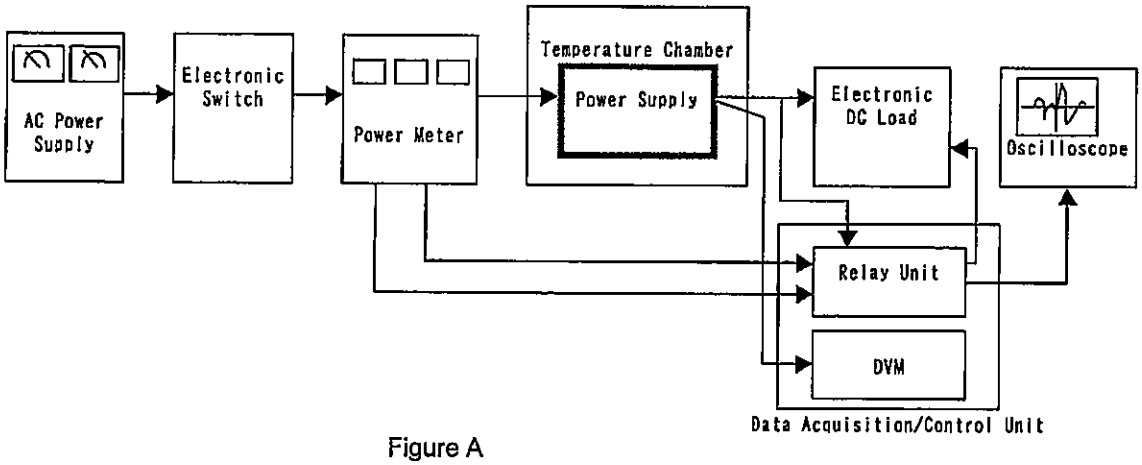


Figure A

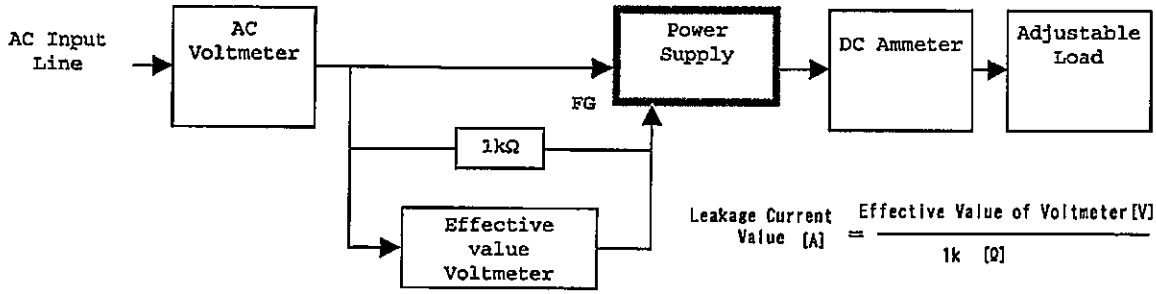


Figure B (DEN-AN)

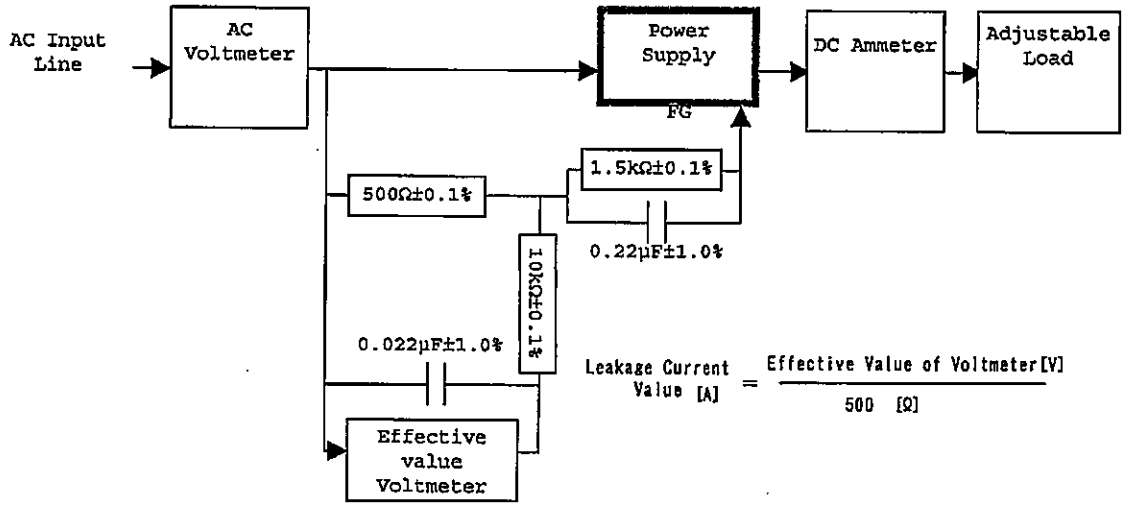
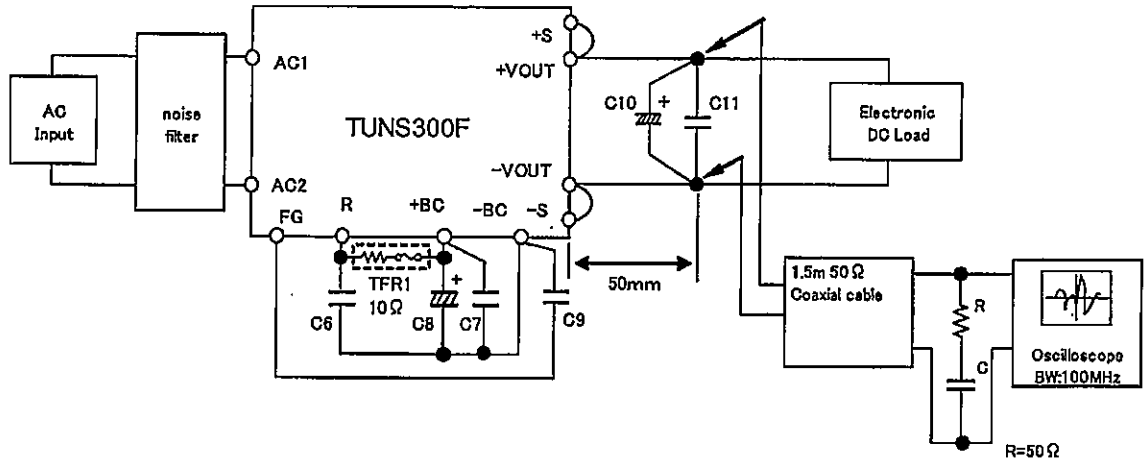


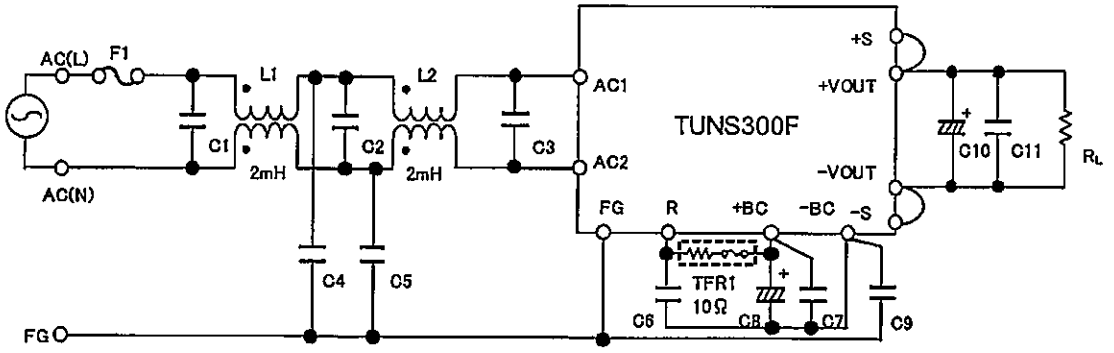
Figure B (IEC60950-1)



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