COSEL

参考資料

TEST DATA OF TUNS100F05

Regulated DC Power Supply
April 9, 2012

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COSEL CO.,LTD.

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Object	———————

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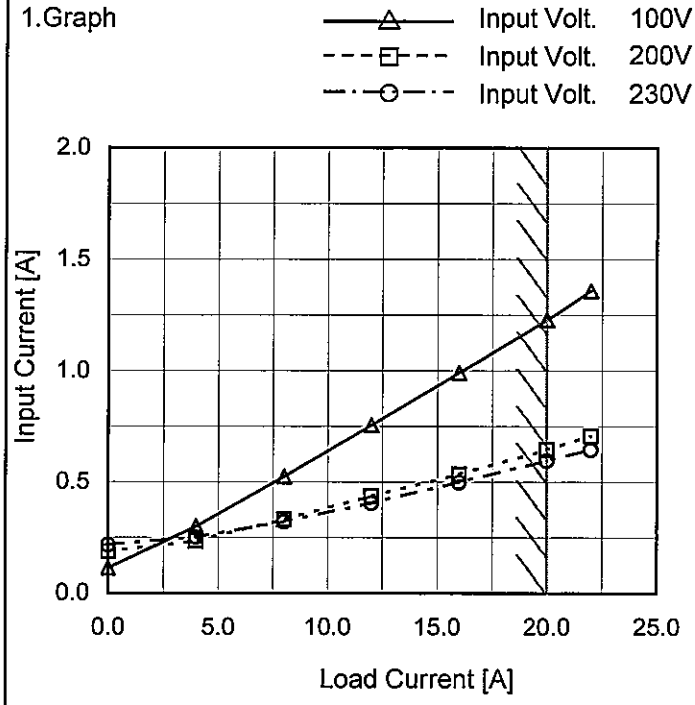

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.114	0.187	0.217
4.0	0.300	0.234	0.252
8.0	0.524	0.330	0.320
12.0	0.756	0.436	0.405
16.0	0.991	0.534	0.498
20.0	1.229	0.645	0.596
22.0	1.359	0.707	0.645
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-10665

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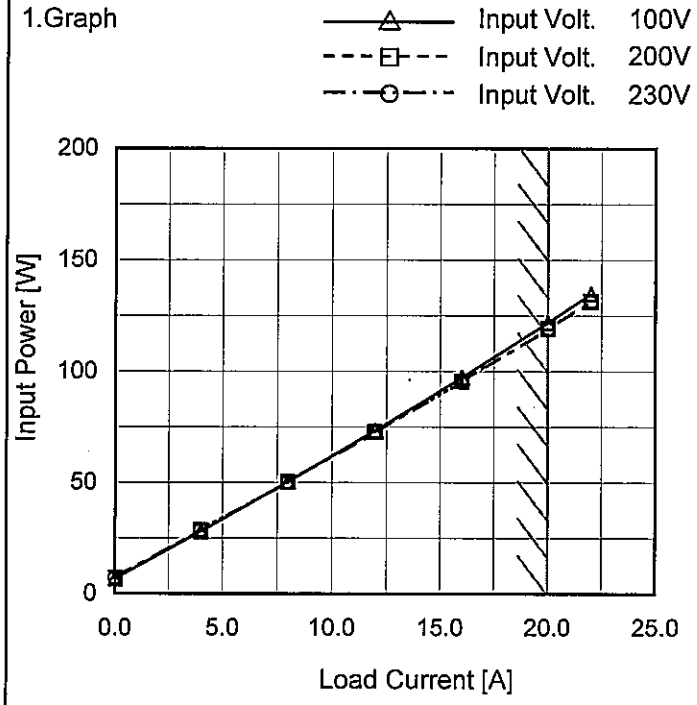
Model	TUNS100F05
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

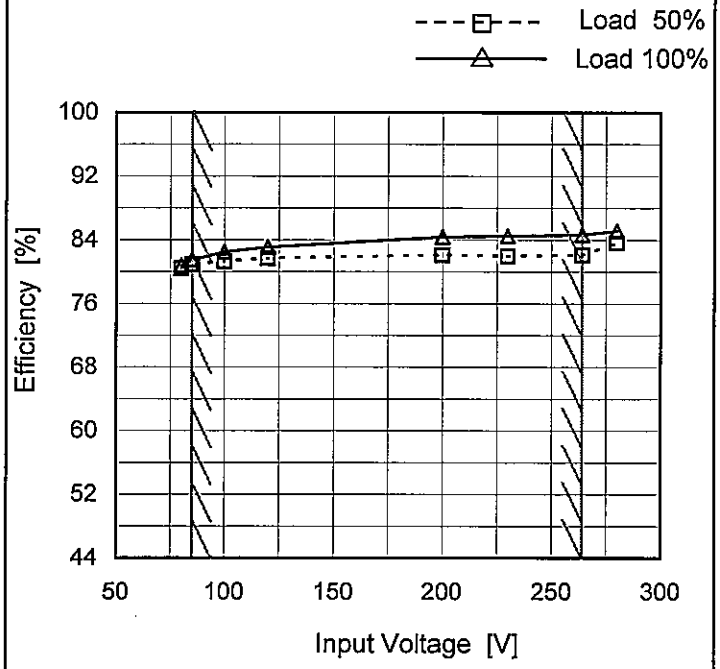
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	6.8	7.1	7.1
4.0	28.0	28.4	28.6
8.0	50.4	50.2	50.3
12.0	73.4	72.7	72.6
16.0	97.2	95.6	95.4
20.0	121.9	119.2	118.9
22.0	134.8	131.4	131.2
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	TUNS100F05
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	80.4	80.8
85	80.9	81.5
100	81.3	82.5
120	81.7	83.1
200	82.1	84.4
230	82.0	84.5
264	82.1	84.7
280	83.6	85.2
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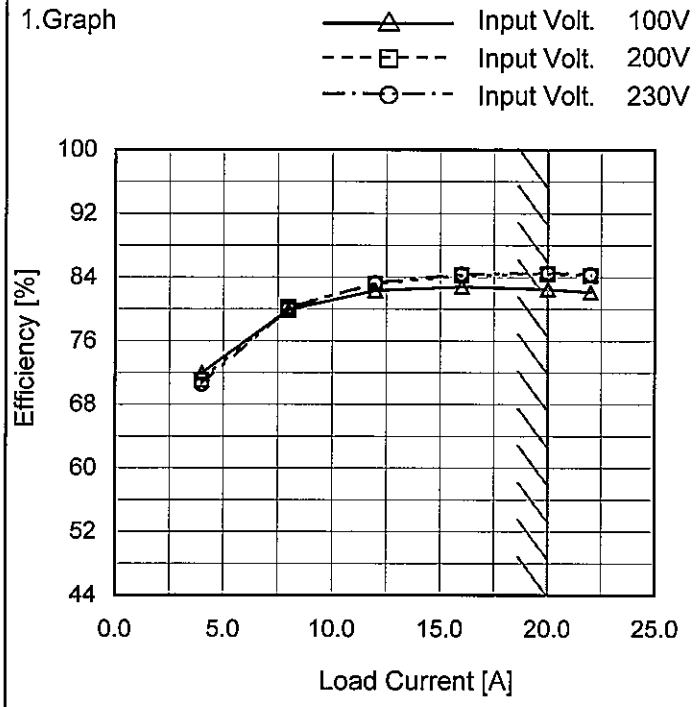
Model	TUNS100F05
Item	Efficiency (by Load Current)
Object	———————

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	-	-	-
4.0	72.0	71.0	70.5
8.0	79.9	80.2	80.1
12.0	82.3	83.1	83.2
16.0	82.8	84.2	84.4
20.0	82.5	84.4	84.5
22.0	82.1	84.2	84.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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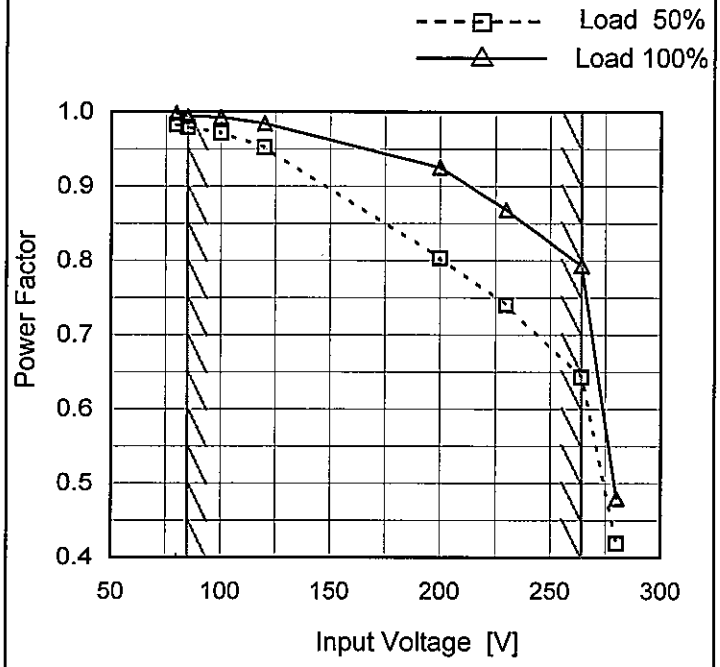
Model	TUNS100F05
Item	Power Factor (by Input Voltage)
Object	————————

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	0.998
85	0.980	0.994
100	0.972	0.993
120	0.952	0.985
200	0.803	0.925
230	0.741	0.869
264	0.643	0.793
280	0.419	0.480
--	-	-

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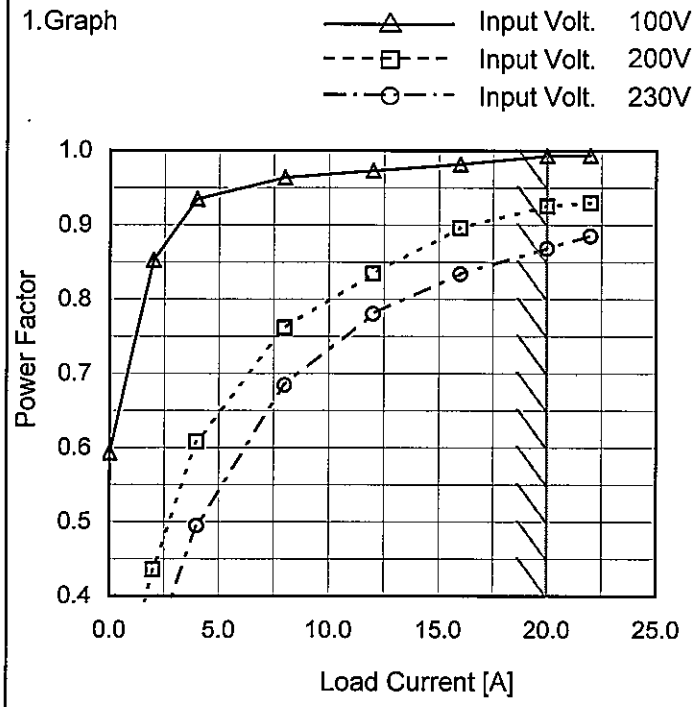
Model	TUNS100F05
Item	Power Factor (by Load Current)
Object	———————

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	0.593	0.190	0.143
2.0	0.853	0.436	0.325
4.0	0.935	0.608	0.495
8.0	0.964	0.762	0.684
12.0	0.973	0.835	0.781
16.0	0.982	0.896	0.834
20.0	0.993	0.925	0.869
22.0	0.994	0.930	0.885
--	-	-	-
--	-	-	-
--	-	-	-

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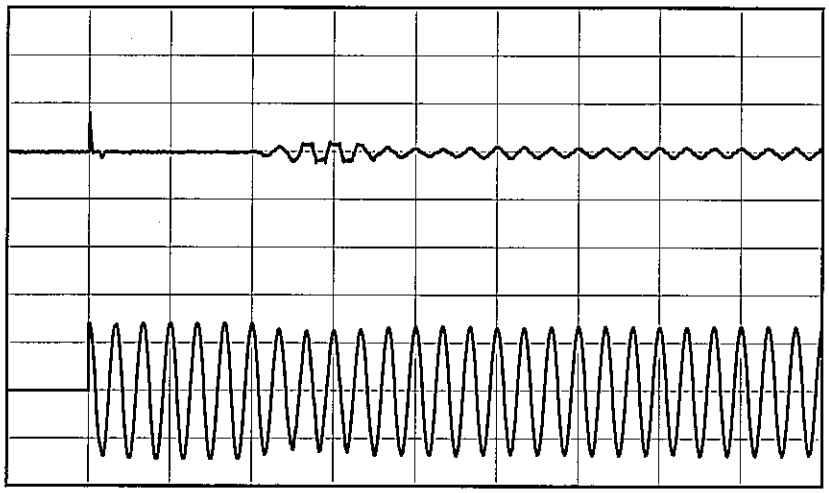
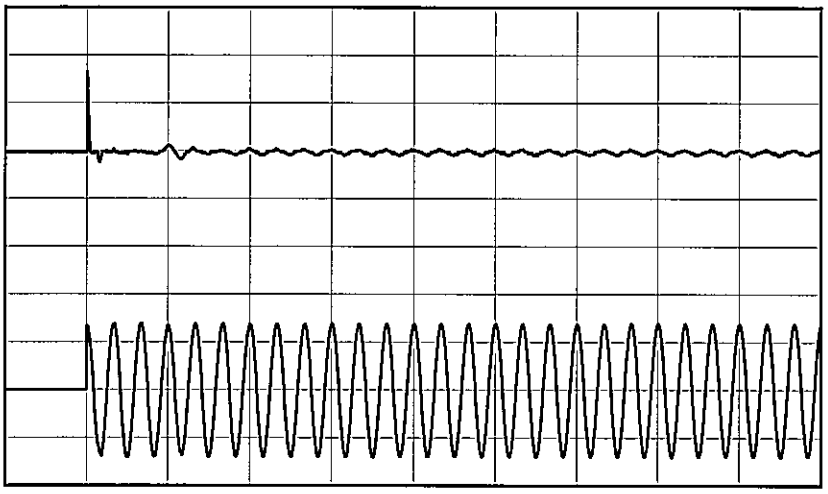
Model	TUNS100F05
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



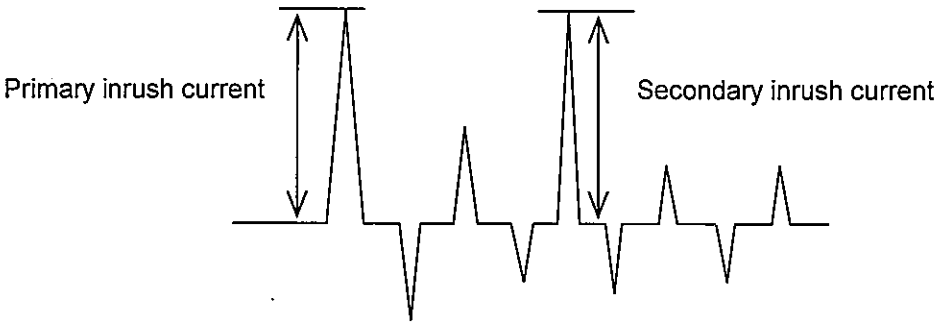
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
16.1 A
Secondary inrush current :
4.7 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
33.6 A
Secondary inrush current :
3.2 A



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Model	TUNS100F05		
Item	Leakage Current	Temperature	25°C
Object	———————	Testing Circuitry	Figure B

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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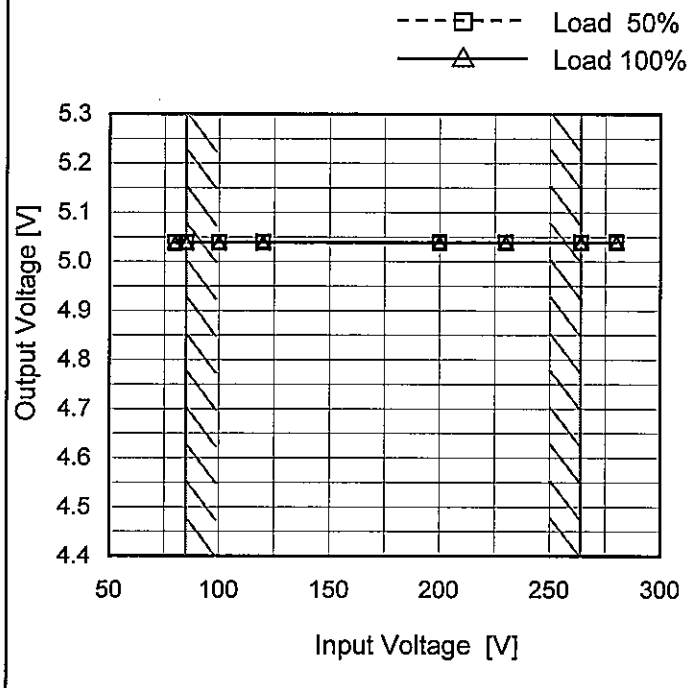
Model	TUNS100F05
Item	Line Regulation
Object	+5V20A

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	5.039	5.038
85	5.040	5.038
100	5.040	5.039
120	5.040	5.039
200	5.039	5.039
230	5.040	5.039
264	5.040	5.039
280	5.040	5.039
--	-	-

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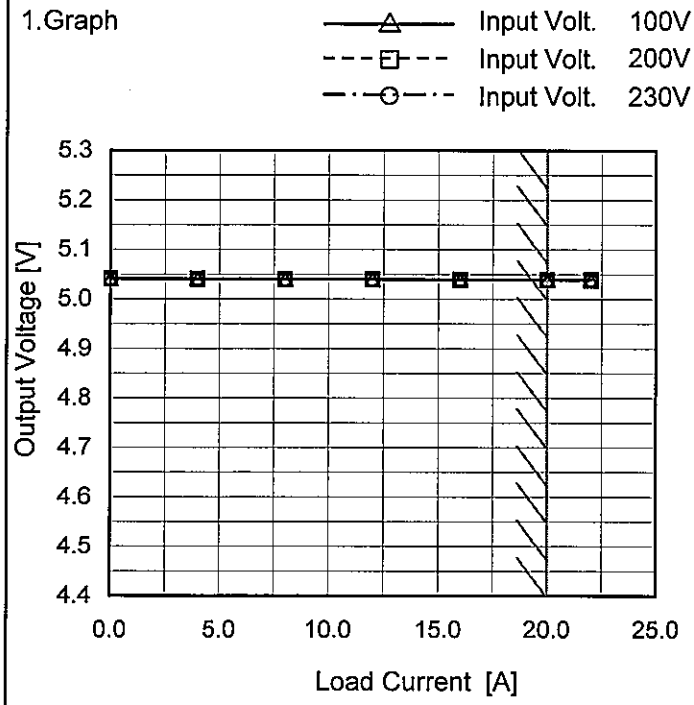
Model	TUNS100F05
Item	Load Regulation
Object	+5V20A

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	5.041	5.041	5.041
4.0	5.041	5.041	5.041
8.0	5.040	5.040	5.040
12.0	5.040	5.040	5.040
16.0	5.040	5.039	5.040
20.0	5.039	5.039	5.039
22.0	5.039	5.039	5.039
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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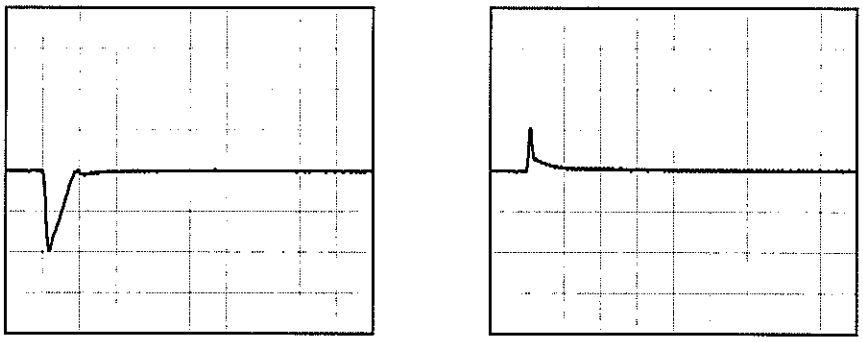
Model	TUNS100F05	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+5V20A	

Input Volt. 100 V
Cycle 1000 ms

Load Current

20 A/50us

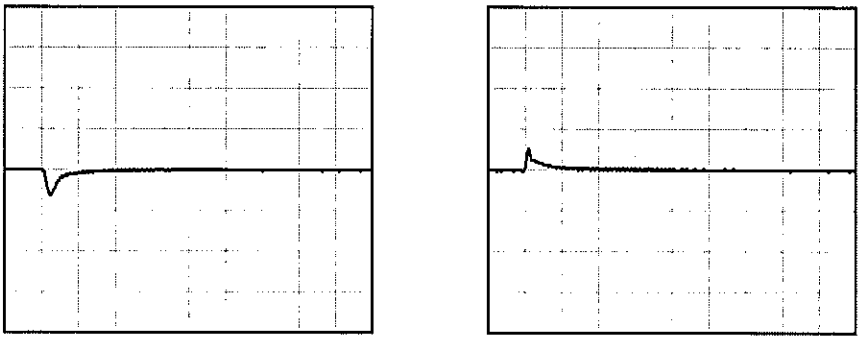
Min. Load (0A) ⟷ Load 100% (20A)



200 mV/div

200 µs/div 200 µs/div

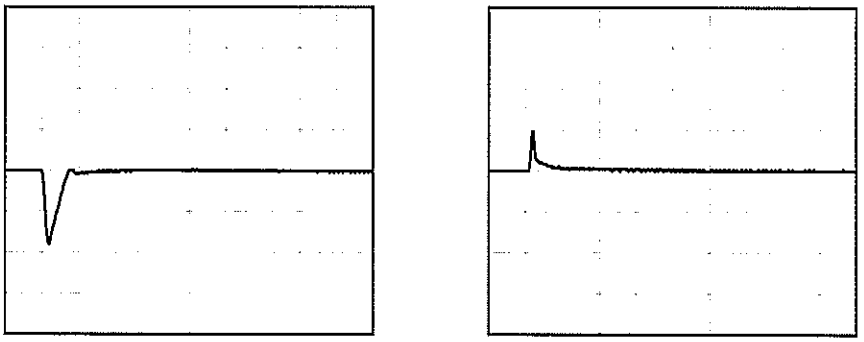
Min. Load (0A) ⟷ Load 50% (10A)



200 mV/div

200 µs/div 200 µs/div

Load 10% (2A) ⟷ Load 100% (20A)



200 mV/div

200 µs/div 200 µs/div

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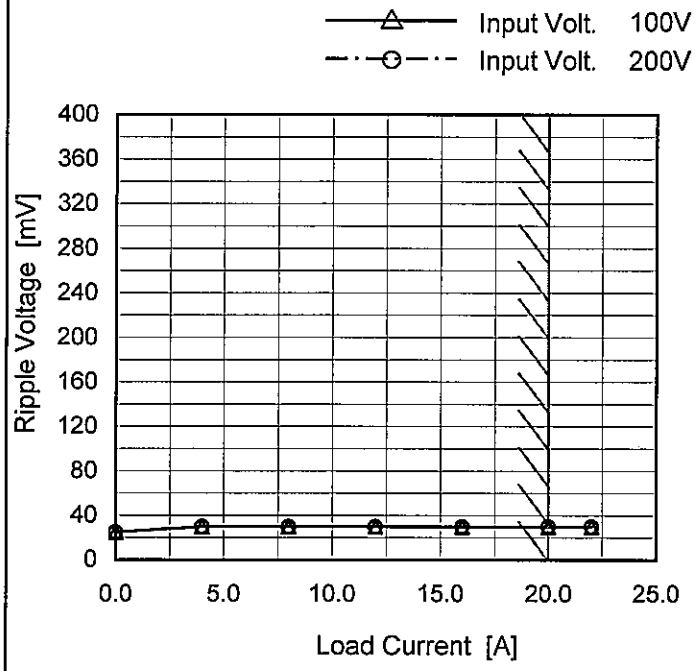
Model	TUNS100F05
Item	Ripple Voltage (by Load Current)
Object	+5V20A

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.

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

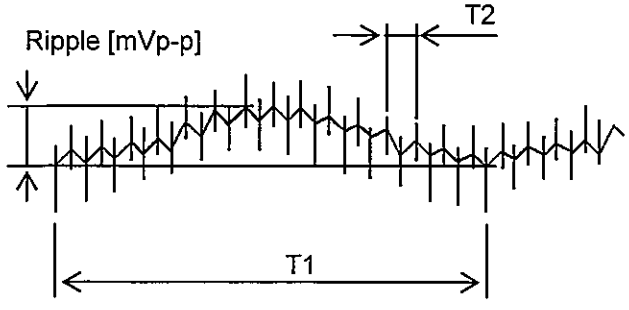


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	25	25
4.0	30	30
8.0	30	30
12.0	30	30
16.0	30	30
20.0	30	30
22.0	30	30
--	-	-
--	-	-
--	-	-
--	-	-

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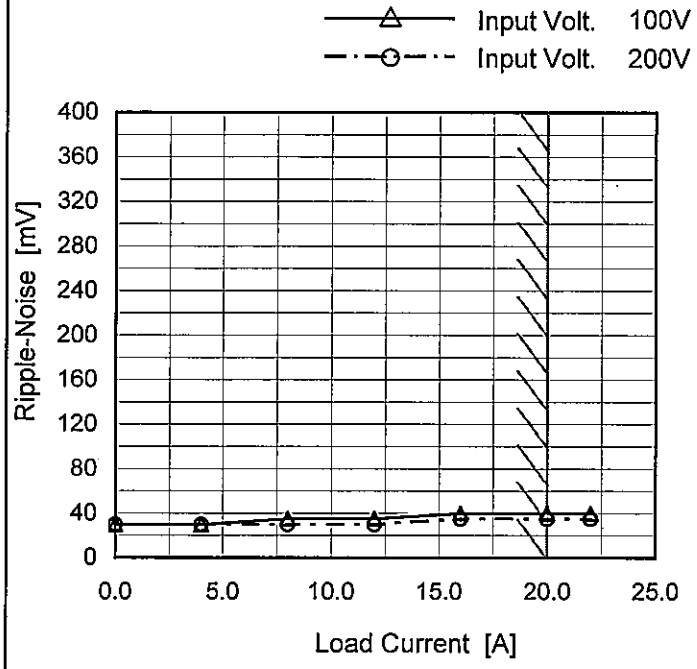
Model	TUNS100F05
Item	Ripple-Noise
Object	+5V20A

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]	Input Volt. 200 [V]
0.0	30	30
4.0	30	30
8.0	35	30
12.0	35	30
16.0	40	35
20.0	40	35
22.0	40	35
---	-	-
--	-	-
--	-	-
--	-	-

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

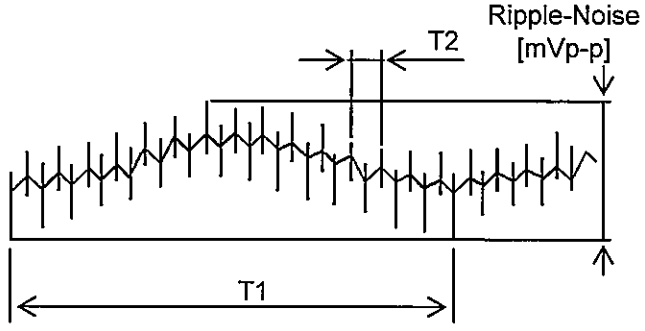


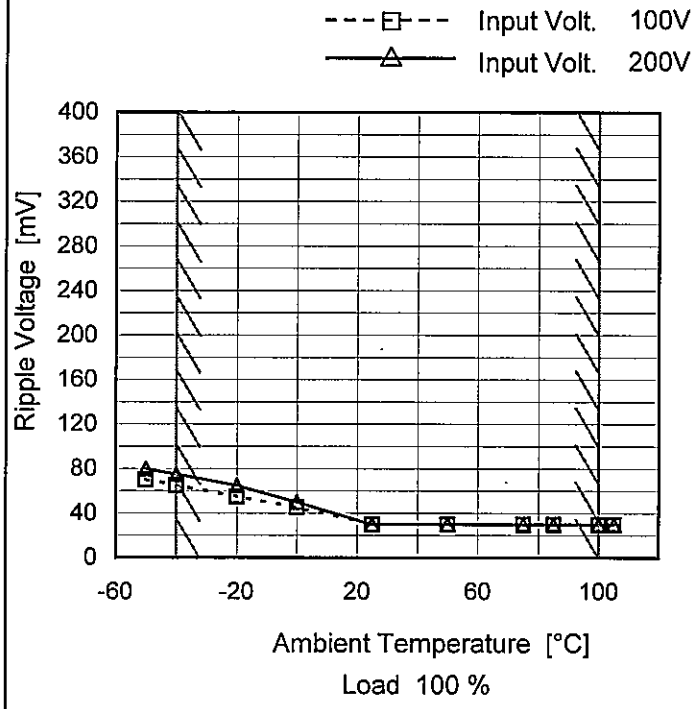
Fig. Complex Ripple Wave Form

COSEL

Model	TUNS100F05
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V20A

Testing Circuitry Figure C

1.Graph



Measured by 100 MHz Oscilloscope.

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

2.Values

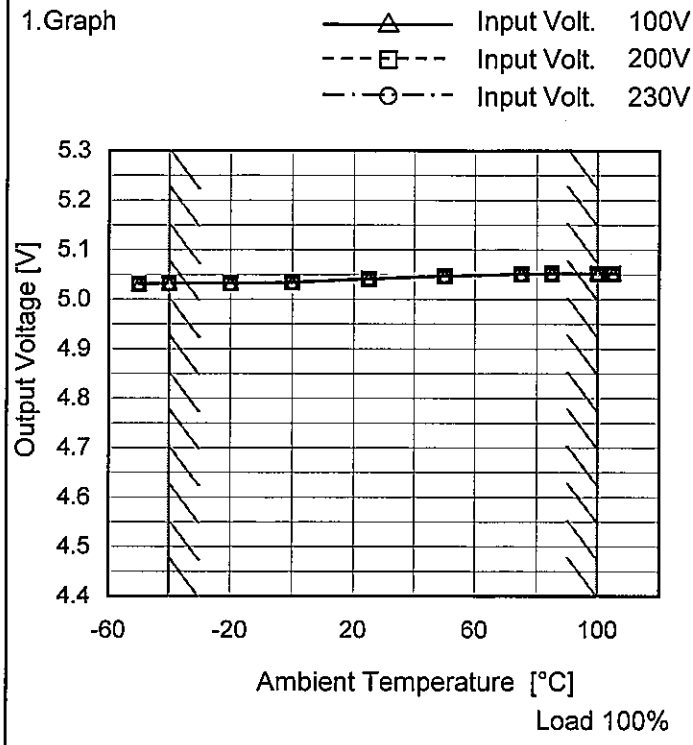
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-50	70	80
-40	65	75
-20	55	65
0	45	50
25	30	30
50	30	30
75	30	30
85	30	30
100	30	30
105	30	30
--	-	-

COSEL

Model	TUNS100F05
Item	Ambient Temperature Drift
Object	+5V20A

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	5.031	5.031	5.031
-40	5.032	5.032	5.032
-20	5.032	5.032	5.032
0	5.034	5.034	5.034
25	5.041	5.042	5.042
50	5.047	5.047	5.048
75	5.051	5.051	5.051
85	5.052	5.052	5.052
100	5.053	5.053	5.053
105	5.053	5.053	5.053
---	-	-	-

COSEL

Model	TUNS100F05	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+5V20A	

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 - 20A

* 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

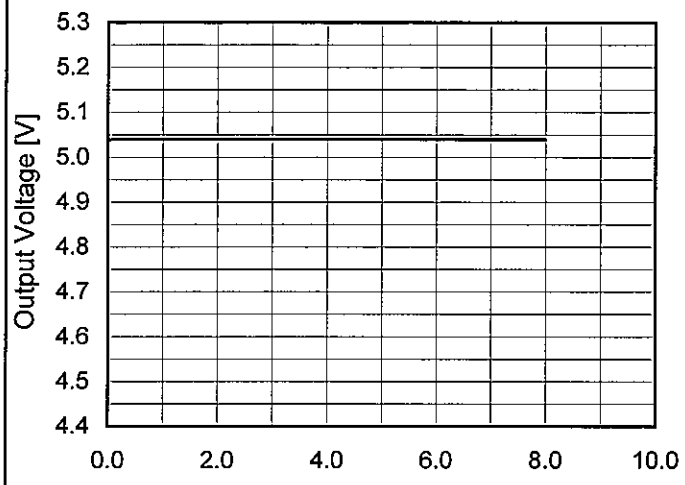
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	100	264	0	5.056	±13	±0.3
Minimum Voltage	-40	85	20	5.031		

COSEL

Model	TUNS100F05
Item	Time Lapse Drift
Object	+5V20A

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	5.037
0.5	5.040
1.0	5.040
2.0	5.040
3.0	5.040
4.0	5.040
5.0	5.040
6.0	5.040
7.0	5.040
8.0	5.040

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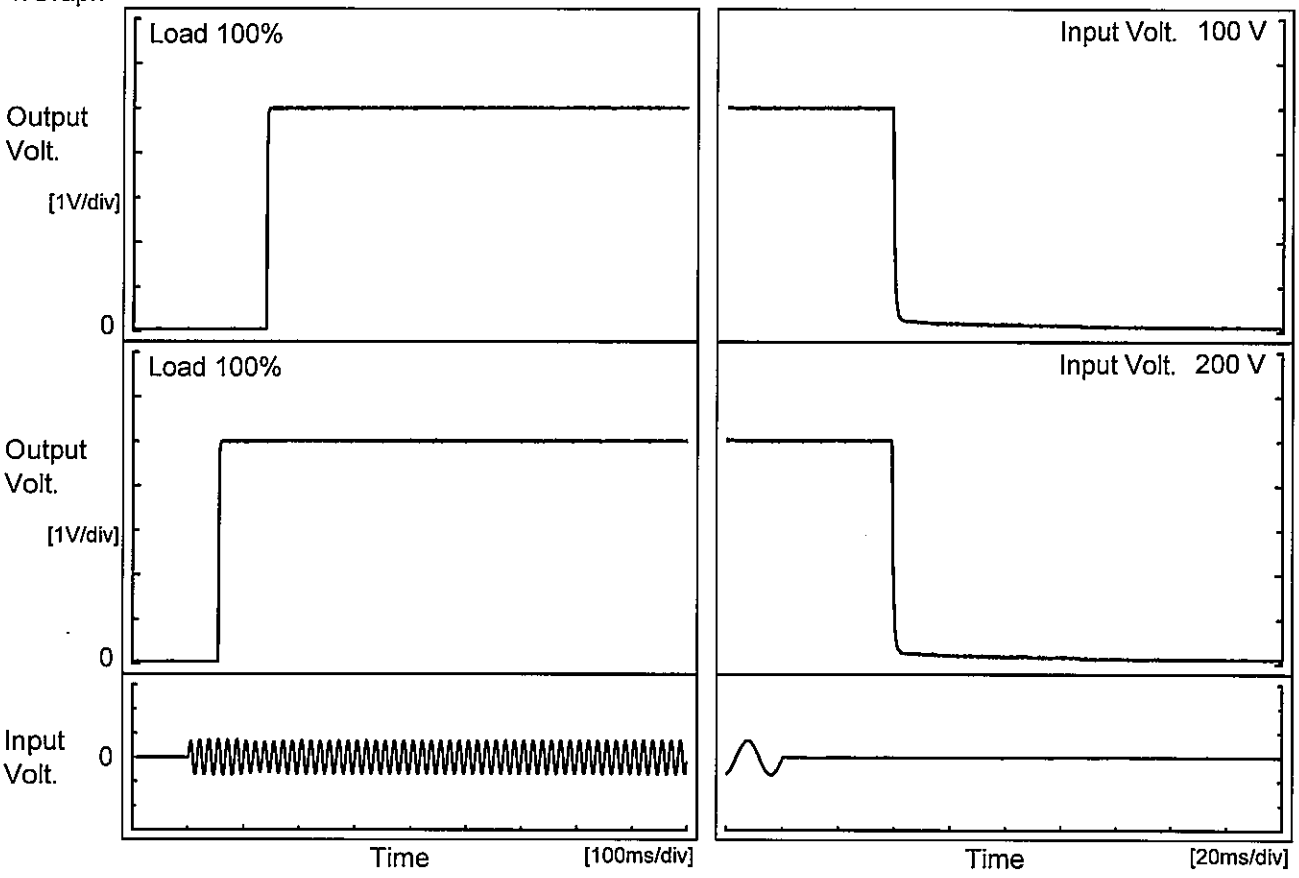
Model	TUNS100F05	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+5V20A	

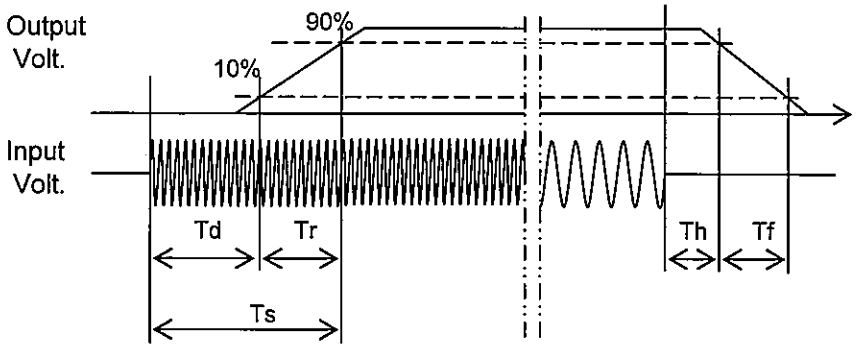
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	139.5	2.0	141.5	39.3	1.5
200 V	54.5	2.0	56.0	39.3	1.5

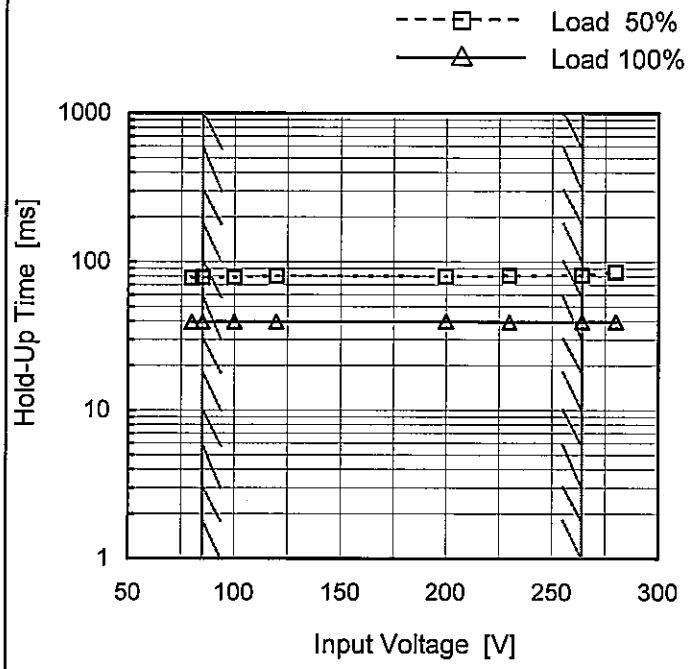


COSEL

Model	TUNS100F05
Item	Hold-Up Time
Object	+5V20A

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	39
85	78	40
100	79	40
120	81	40
200	79	40
230	80	39
264	81	40
280	85	40
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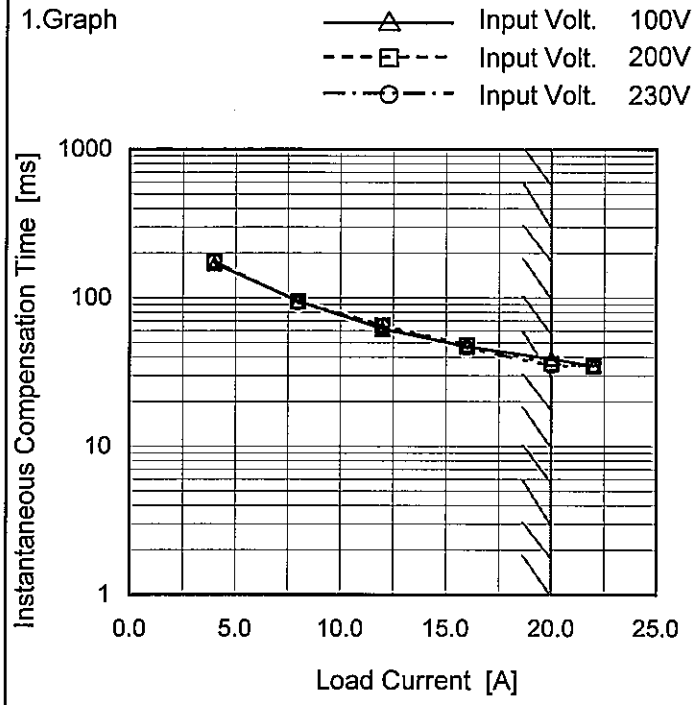
COSEL

Model	TUNS100F05
Item	Instantaneous Interruption Compensation
Object	+5V20A

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	-	-	-
4.0	171	176	177
8.0	95	94	93
12.0	62	65	65
16.0	47	48	46
20.0	39	36	35
22.0	35	35	35
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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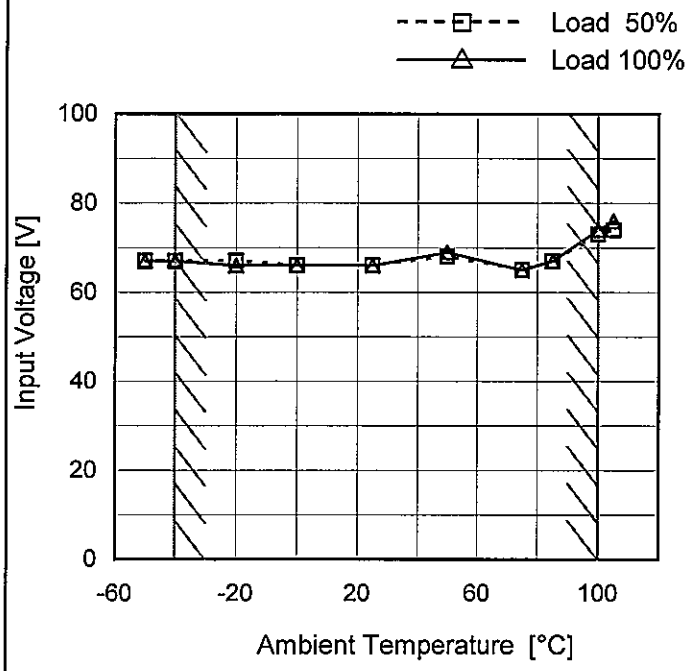
Model	TUNS100F05
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V20A

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	67	67
-40	67	67
-20	67	66
0	66	66
25	66	66
50	68	69
75	65	65
85	67	67
100	73	74
105	74	76
---	-	-

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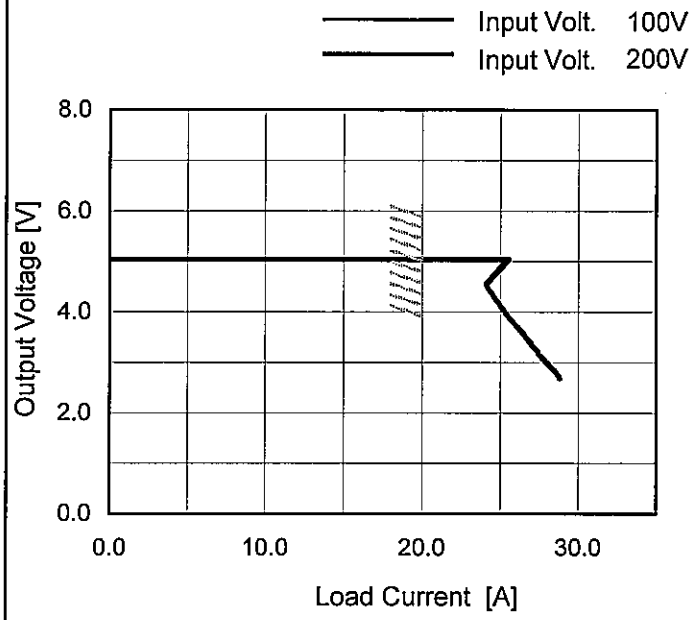
Model	TUNS100F05
Item	Overcurrent Protection
Object	+5V20A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

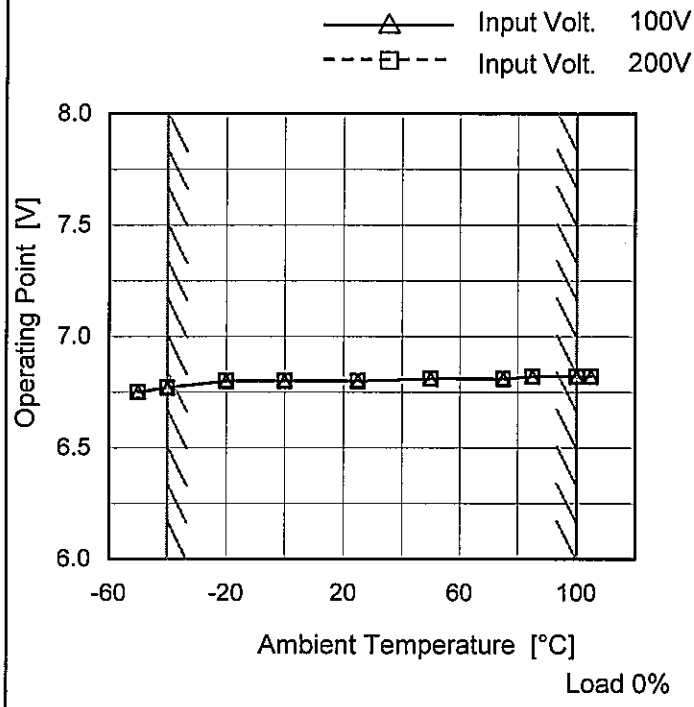
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
5.00	25.33	25.56
4.75	24.02	24.10
4.50	24.08	24.15
4.00	25.29	25.27
3.50	26.69	26.66
3.00	27.92	27.94
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	TUNS100F05
Item	Overvoltage Protection
Object	+5V20A

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	6.75	6.75
-40	6.77	6.77
-20	6.80	6.80
0	6.80	6.80
25	6.80	6.80
50	6.81	6.81
75	6.81	6.81
85	6.82	6.82
100	6.82	6.82
105	6.82	6.82
--	-	-

COSEL

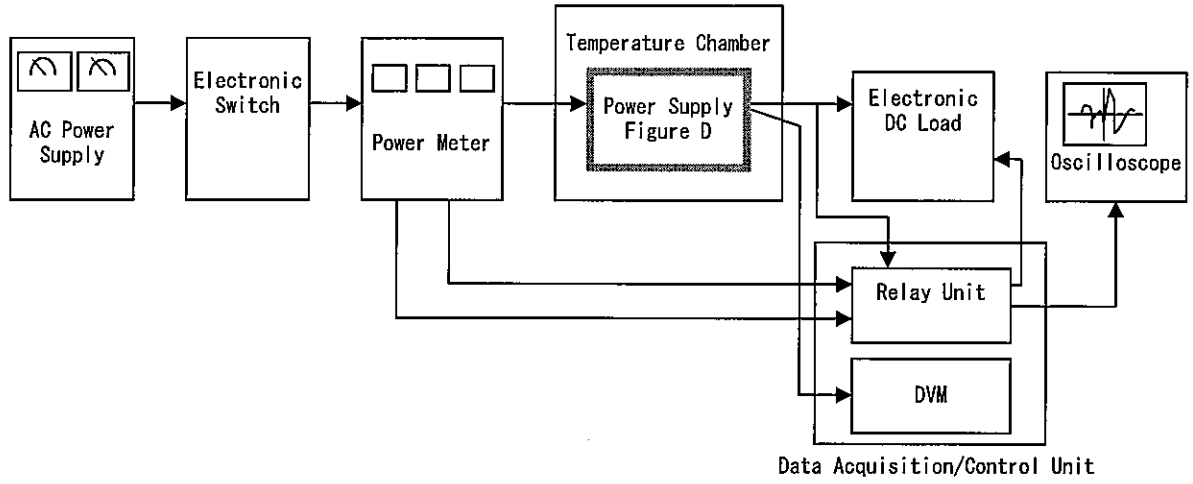


Figure A

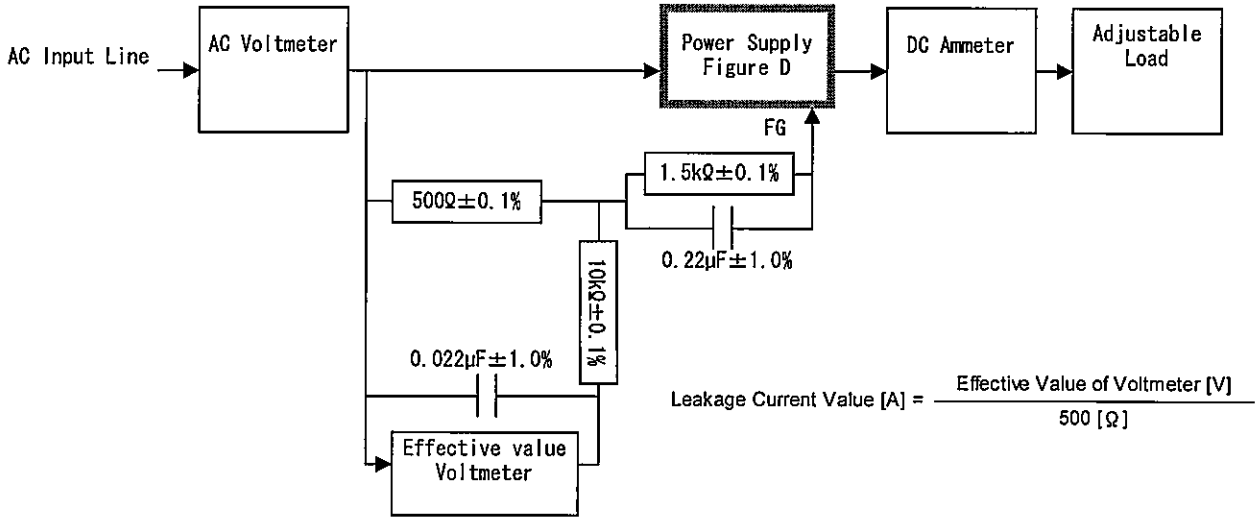
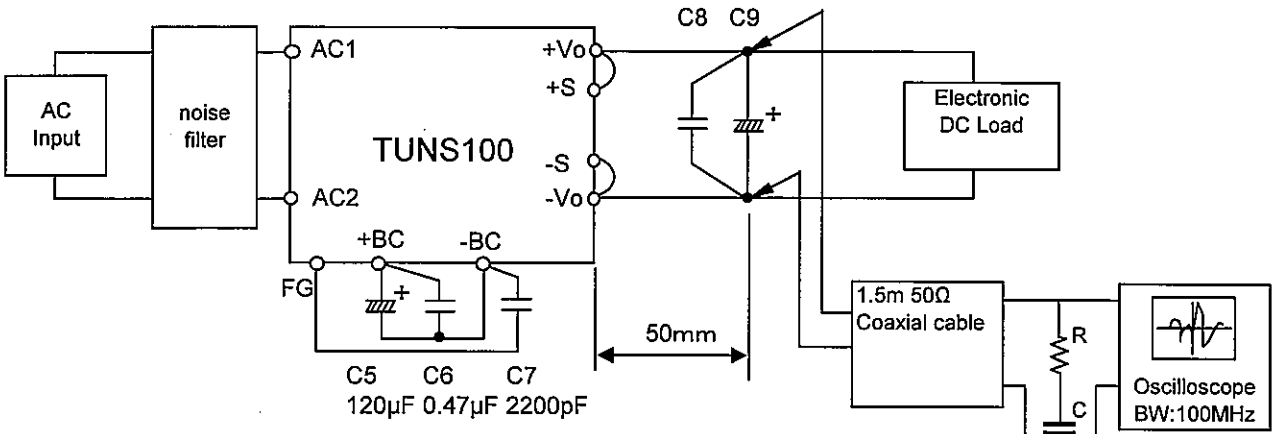


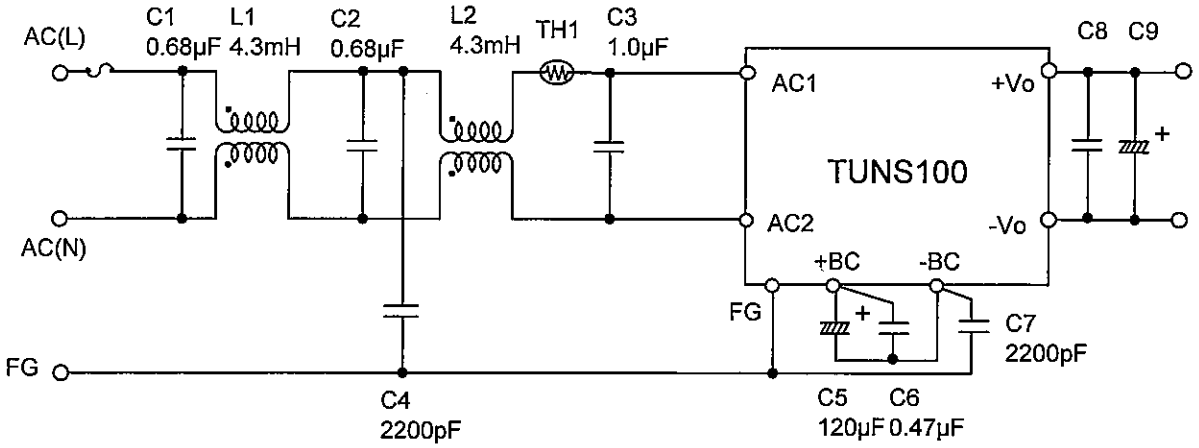
Figure B (IEC60950-1)



C8 : TUNS100F05	10μF	C9 : TUNS100F05	2200μF	(0≦Tc≦100)
TUNS100F12	10μF		2200μF×3	(-40≦Tc<0)
TUNS100F24	4.7μF	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