COSEL

参考資料

TEST DATA OF TUXS200F50

Regulated DC Power Supply
March 30, 2016

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COSEL CO.,LTD.

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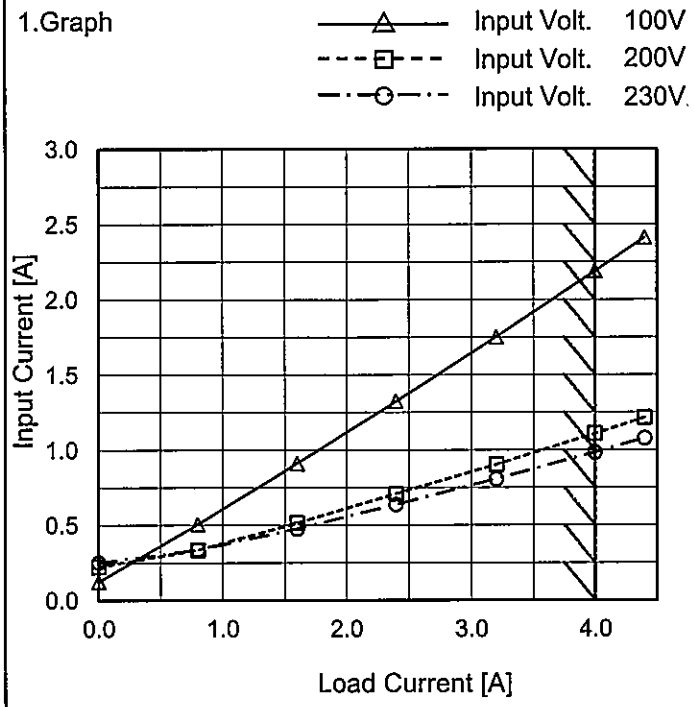
Model	TUXS200F50
Item	Input Current (by Load Current)
Object	———————

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]
0.0	0.124	0.223	0.252
0.8	0.507	0.336	0.337
1.6	0.911	0.515	0.477
2.4	1.324	0.709	0.639
3.2	1.751	0.903	0.807
4.0	2.189	1.109	0.984
4.4	2.411	1.215	1.078
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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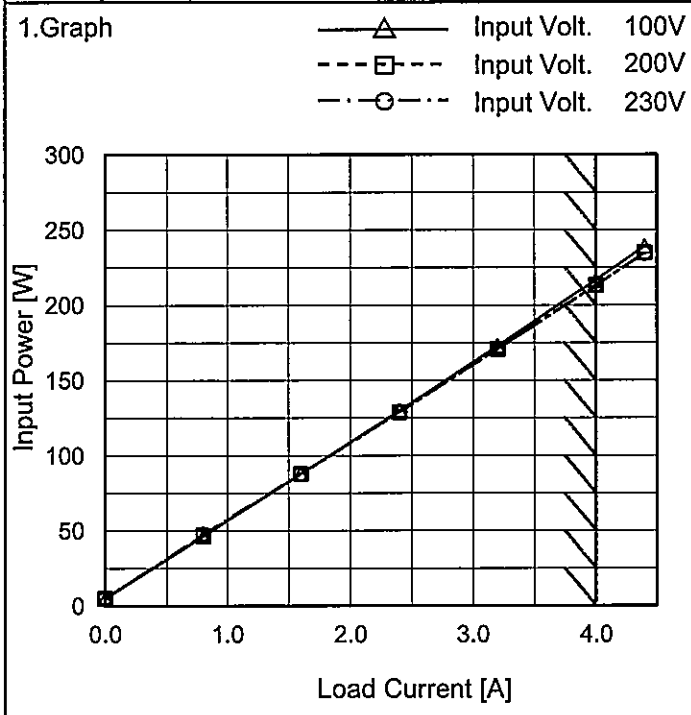
Model	TUXS200F50
Item	Input Power (by Load Current)
Object	————————

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	4.8	5.1	5.1
0.8	46.4	47.0	47.8
1.6	88.0	87.8	88.2
2.4	130.0	128.9	129.1
3.2	172.9	170.8	170.7
4.0	216.7	213.2	213.0
4.4	239.0	234.7	234.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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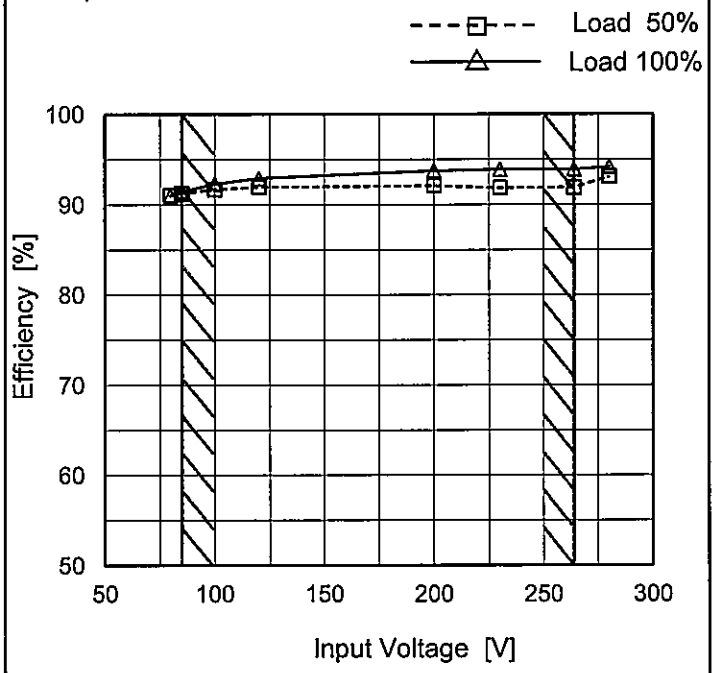
Model	TUXS200F50
Item	Efficiency (by Input Voltage)
Object	———————

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	91.0	91.0
85	91.3	91.5
100	91.7	92.3
120	92.0	92.9
200	92.1	93.8
230	91.9	93.9
264	91.9	93.9
280	93.1	94.2
--	-	-

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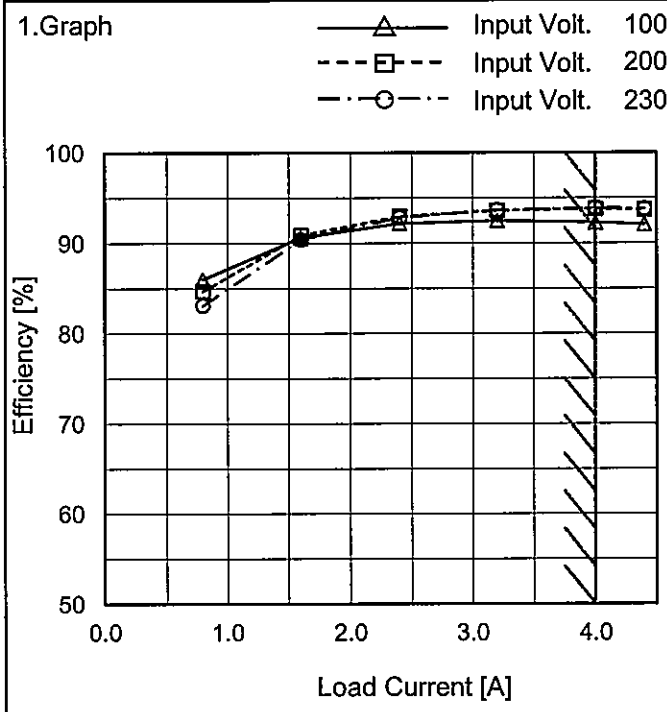
Model	TUXS200F50
Item	Efficiency (by Load Current)
Object	————————

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	-	-	-
0.8	86.0	84.7	83.1
1.6	90.6	90.9	90.4
2.4	92.2	93.0	92.8
3.2	92.5	93.6	93.7
4.0	92.3	93.8	93.9
4.4	92.1	93.7	93.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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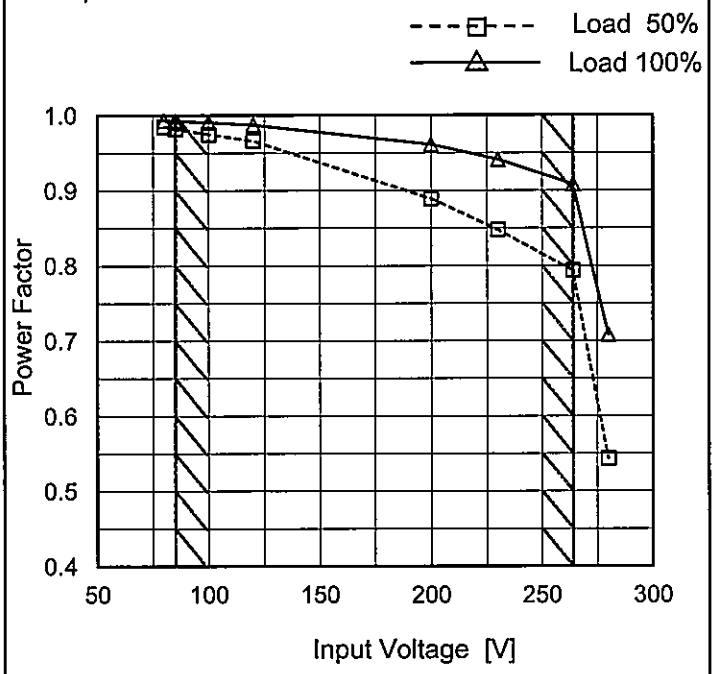
Model	TUXS200F50
Item	Power Factor (by Input Voltage)
Object	———————

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	0.985	0.993
85	0.982	0.993
100	0.975	0.991
120	0.966	0.988
200	0.889	0.961
230	0.848	0.941
264	0.794	0.908
280	0.543	0.708
--	-	-

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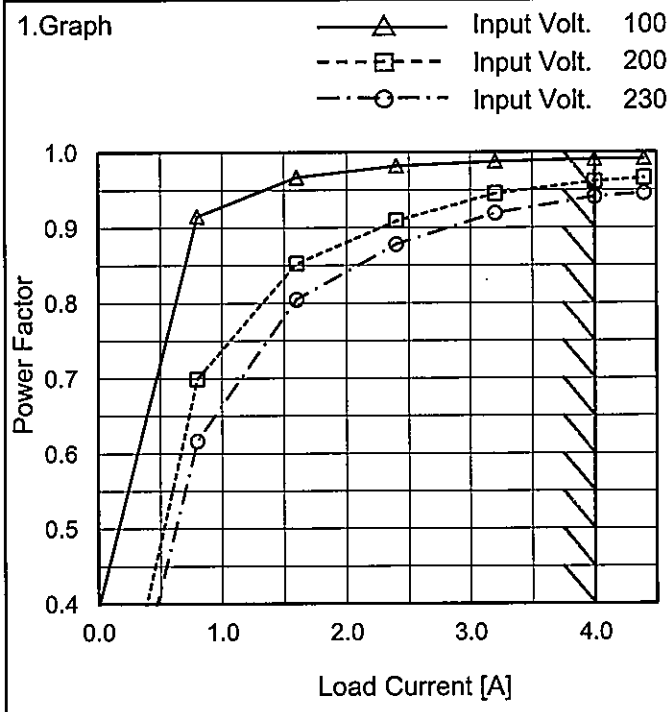
Model	TUXS200F50
Item	Power Factor (by Load Current)
Object	———————

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	0.392	0.114	0.088
0.8	0.915	0.699	0.617
1.6	0.967	0.852	0.805
2.4	0.982	0.909	0.878
3.2	0.988	0.945	0.919
4.0	0.991	0.961	0.941
4.4	0.992	0.966	0.946
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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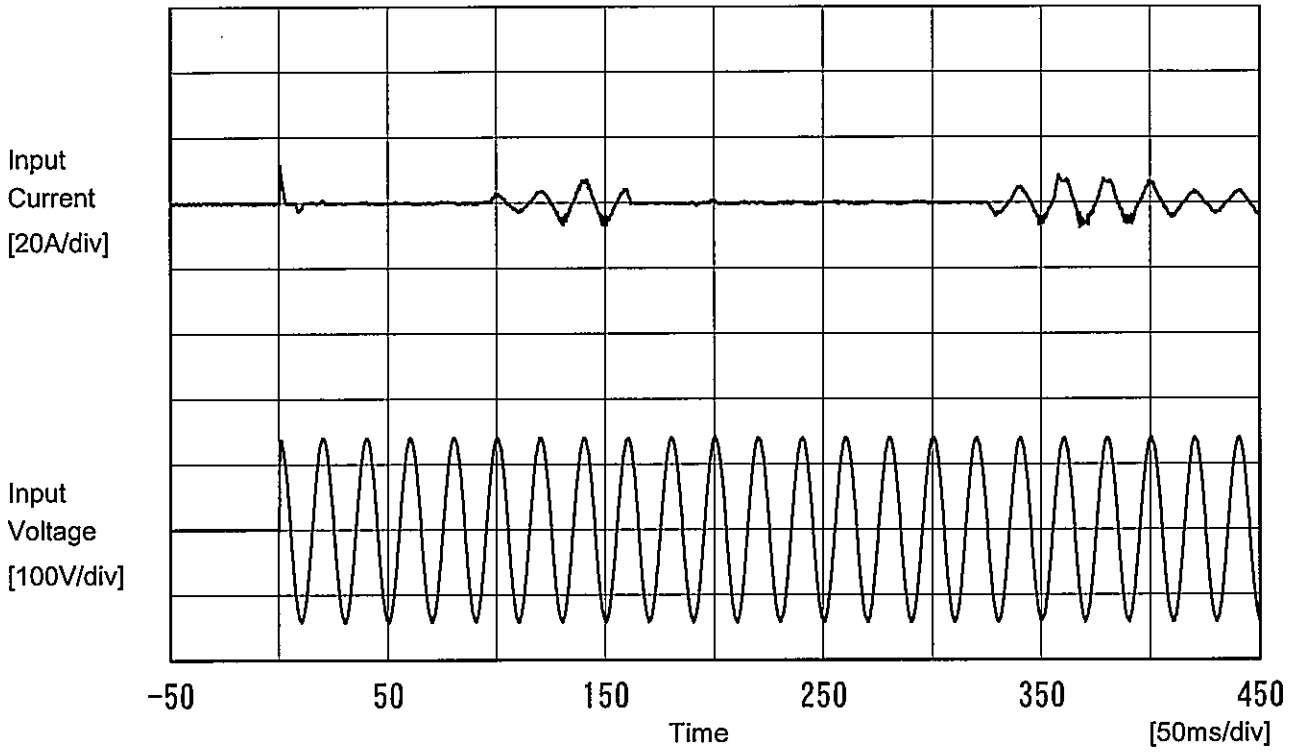
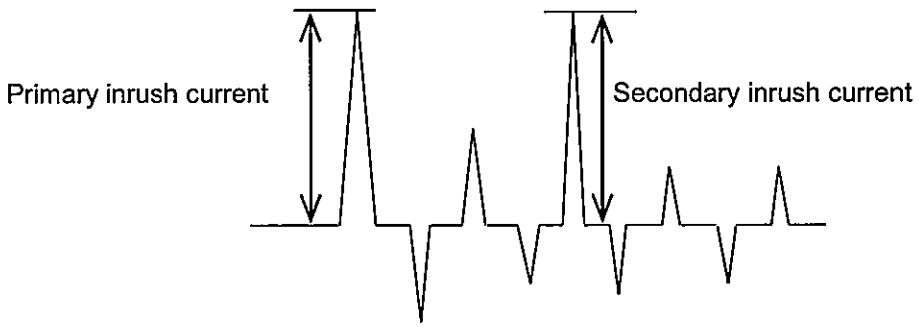
Model	TUXS200F50
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



Input Voltage	100 V
Frequency	50 Hz
Load	100 %
Primary inrush current	11.6 A
Secondary inrush current	8.4 A



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Model	TUXS200F50	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	———————	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.17	0.34	0.41	Operation
	One of phases	0.27	0.54	0.65	Stand by
IEC60950-1	Both phases	0.14	0.29	0.36	Operation
	One of phases	0.28	0.56	0.68	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.

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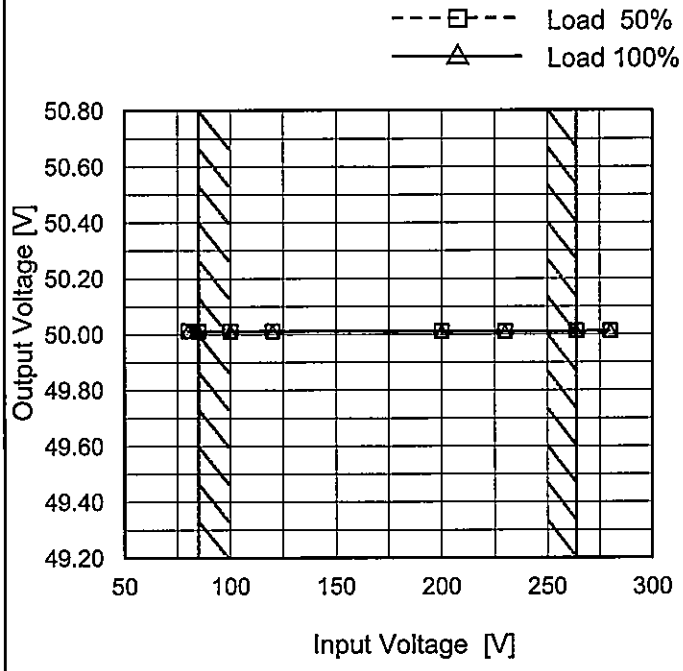
Model	TUXS200F50
Item	Line Regulation
Object	+50V4A

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	50.013	50.013
85	50.013	50.012
100	50.012	50.012
120	50.012	50.012
200	50.012	50.011
230	50.011	50.010
264	50.012	50.012
280	50.012	50.012
--	-	-

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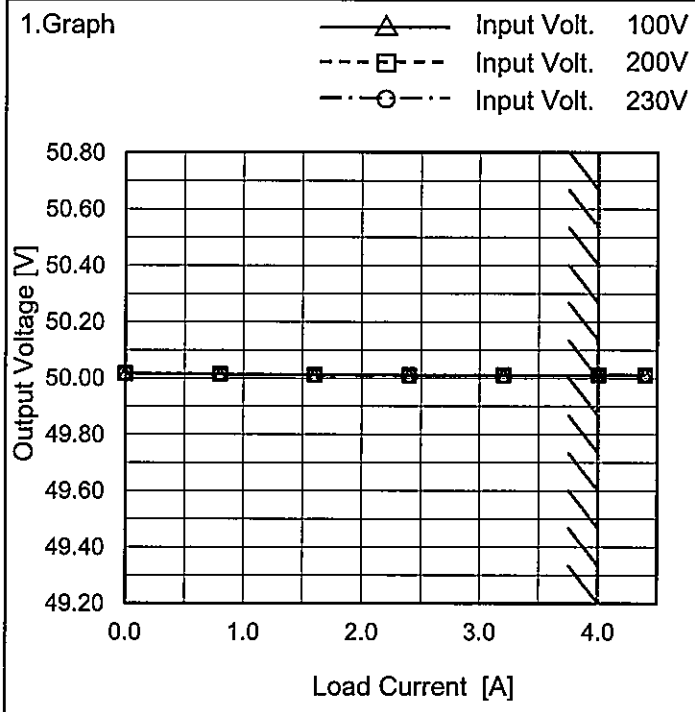
Model	TUXS200F50
Item	Load Regulation
Object	+50V4A

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	50.016	50.017	50.017
0.8	50.013	50.015	50.014
1.6	50.012	50.012	50.011
2.4	50.010	50.011	50.010
3.2	50.010	50.011	50.011
4.0	50.012	50.011	50.010
4.4	50.013	50.012	50.011
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS200F50		
Item	Dynamic Load Response	Temperature Testing Circuitry	25℃ Figure A
Object	+50V4A		

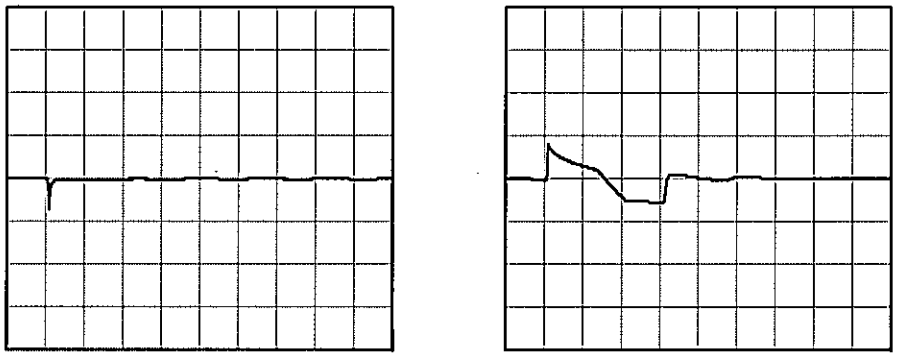
Input Volt. 100 V
Cycle 1000 ms

t1,t2=10 μ S

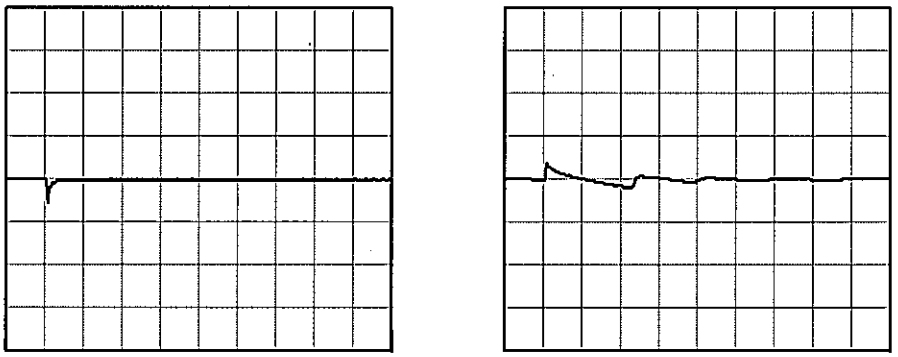
Load Current

t1 t2

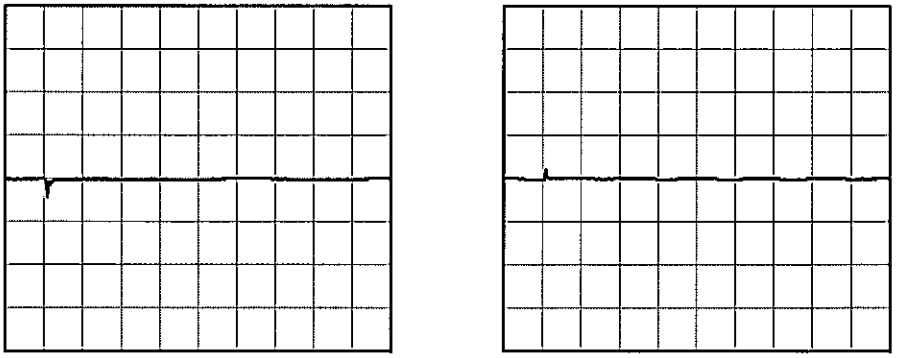
Min. Load (0A) ⟷
Load 100% (4A)



Min. Load (0A) ⟷
Load 50% (2A)



Load 50% (2A) ⟷
Load 100% (4A)



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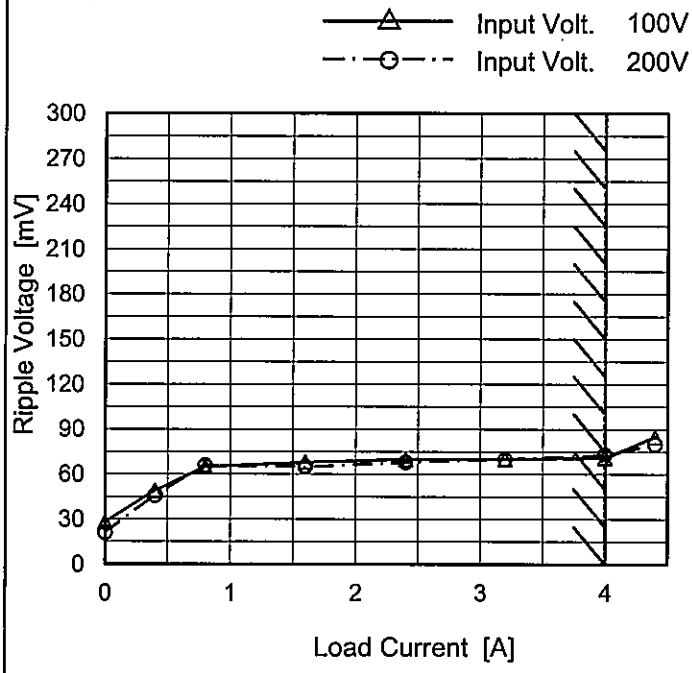
Model	TUXS200F50
Item	Ripple Voltage (by Load Current)
Object	+50V4A

Temperature 25°C
Testing Circuitry Figure A

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	28	21
0.4	49	46
0.8	65	66
1.6	68	65
2.4	70	68
3.2	70	70
4.0	71	73
4.4	85	80
--	-	-
---	-	-
--	-	-

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

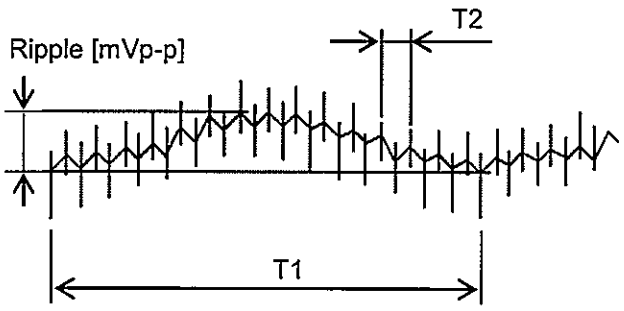


Fig. Complex Ripple Wave Form

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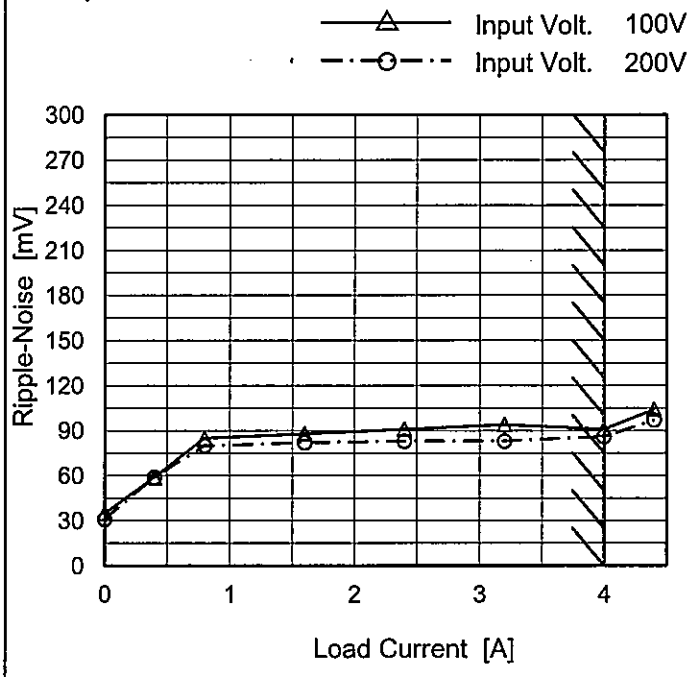
Model	TUXS200F50
Item	Ripple-Noise
Object	+50V4A

Temperature 25°C
Testing Circuitry Figure A

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	35	31
0.4	59	59
0.8	85	80
1.6	88	82
2.4	91	83
3.2	94	83
4.0	91	86
4.4	104	97
--	-	-
--	-	-
--	-	-

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

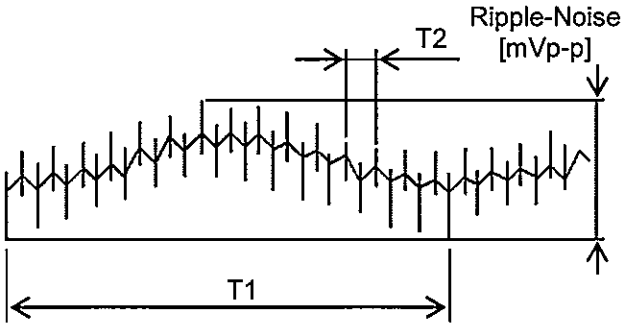


Fig. Complex Ripple Wave Form

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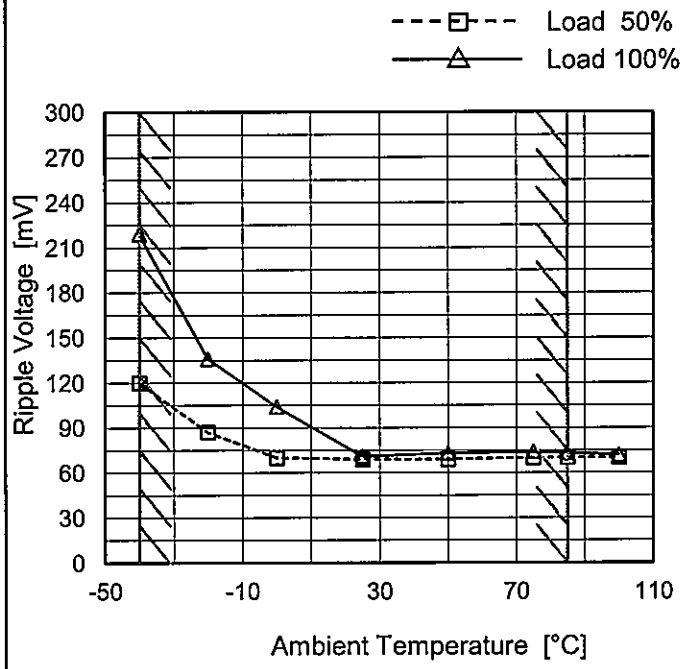
Model	TUXS200F50
Item	Ripple Voltage (by Ambient Temp.)
Object	+50V4A

Testing Circuitry Figure A

1.Graph



Input Volt. 100V

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%
-40	120	219
-20	87	136
0	70	104
25	69	71
50	69	73
75	70	74
85	70	73
100	70	72
--	-	-
--	-	-
--	-	-

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

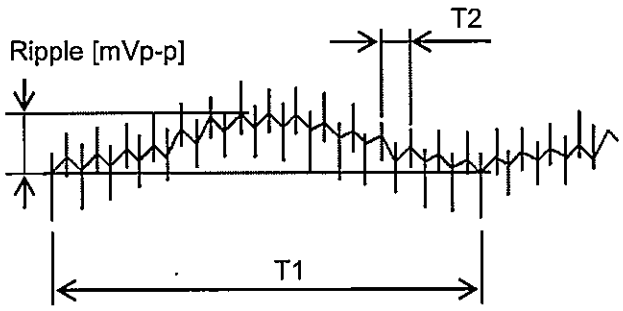


Fig. Complex Ripple Wave Form

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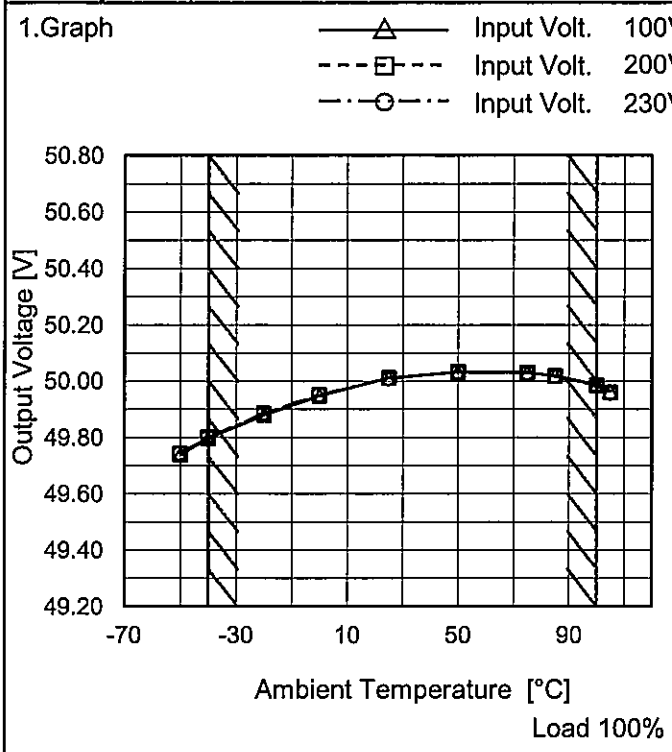
Model	TUXS200F50
Item	Ambient Temperature Drift
Object	+50V4A

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	49.739	49.743	49.745
-40	49.797	49.801	49.802
-20	49.880	49.885	49.886
0	49.948	49.952	49.953
25	50.012	50.011	50.010
50	50.032	50.034	50.034
75	50.031	50.031	50.030
85	50.020	50.019	50.018
100	49.988	49.985	49.983
105	49.964	49.960	49.959
--	-	-	-

COSEL

Model	TUXS200F50
Item	Output Voltage Accuracy
Object	+50V4A

Testing Circuitry Figure A

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 - 85°C
Input Voltage : 85 - 264V
Load Current : 0 - 4A

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

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

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	264	4	50.001	±120	±0.2
Minimum Voltage	-40	85	0	49.761		

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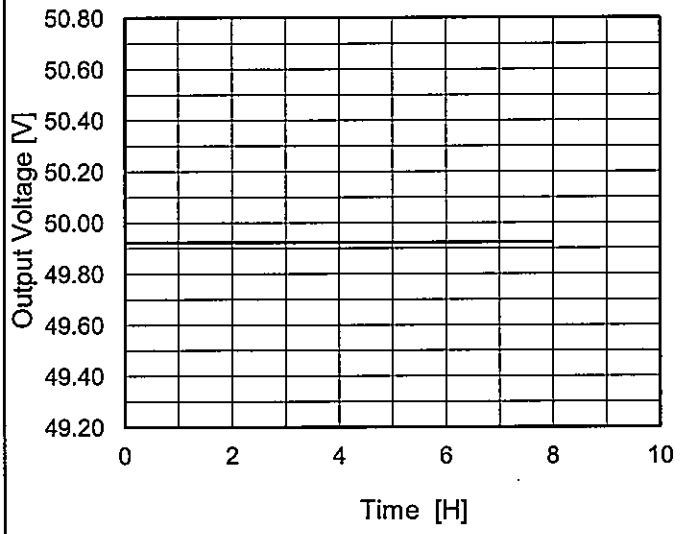
Model	TUXS200F50
Item	Time Lapse Drift
Object	+50V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	49.897
0.5	49.923
1.0	49.923
2.0	49.923
3.0	49.923
4.0	49.923
5.0	49.923
6.0	49.923
7.0	49.923
8.0	49.923

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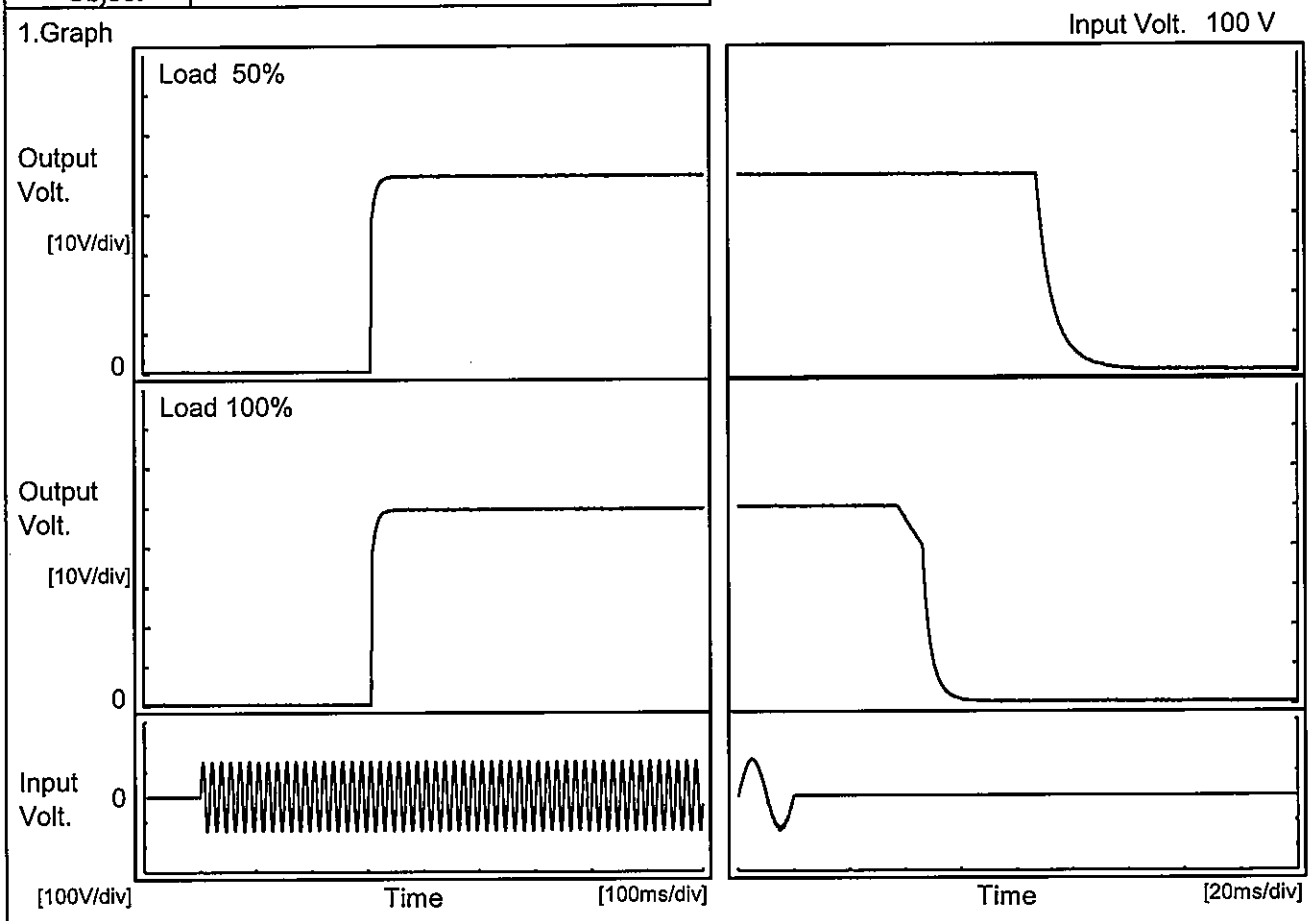
Model	TUXS200F50
Item	Rise and Fall Time
Object	+50V4A

Temperature 25°C
Testing Circuitry Figure A

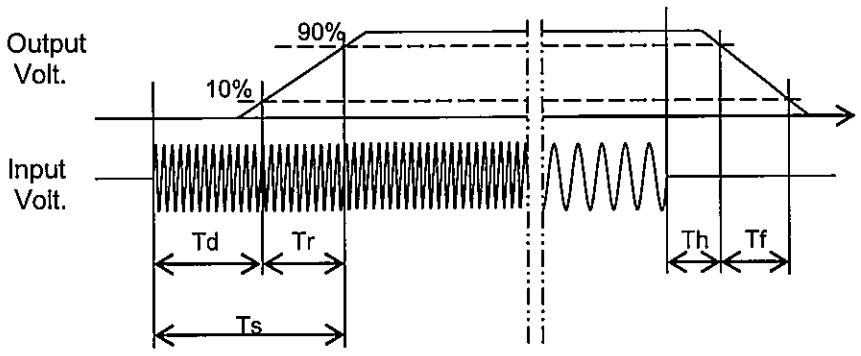
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	306.0	10.0	316.0	88.0	13.2
100 %	306.0	9.5	315.5	38.0	11.5

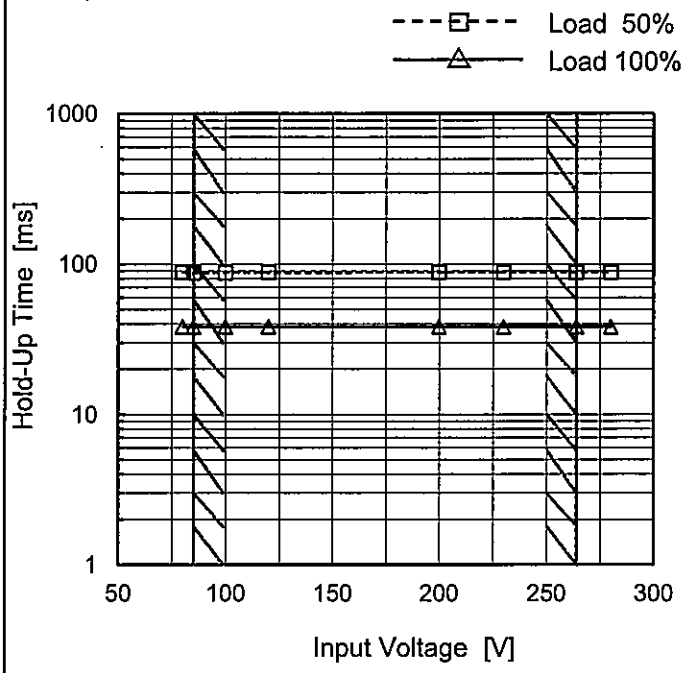


COSEL

Model	TUXS200F50
Item	Hold-Up Time
Object	+50V4A

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

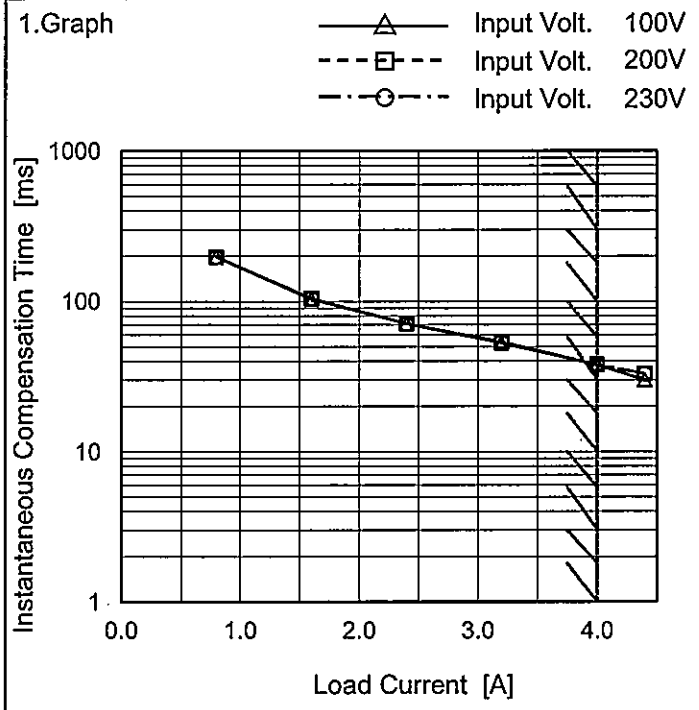
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
80	88	38
85	88	38
100	88	38
120	88	38
200	88	38
230	88	38
264	88	38
280	88	38
--	-	-

COSEL

Model	TUXS200F50
Item	Instantaneous Interruption Compensation
Object	+50V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

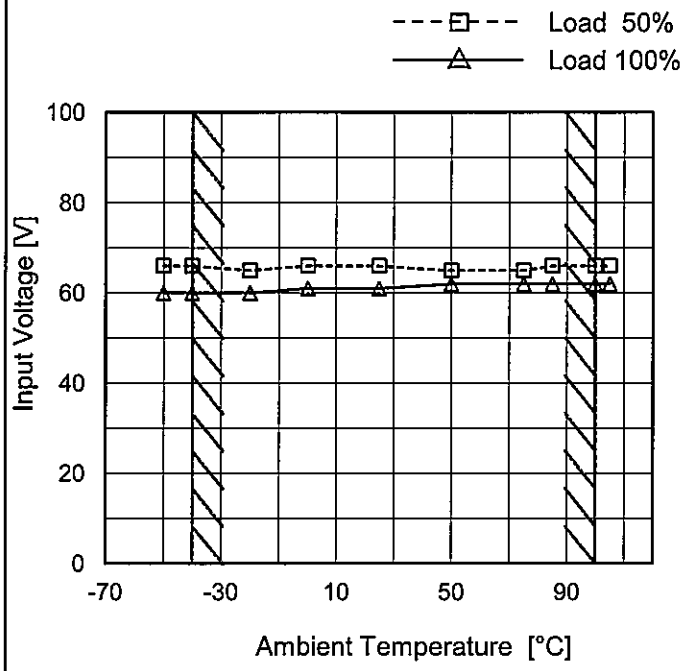
Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
0.8	198	198	198
1.6	104	105	105
2.4	71	71	71
3.2	53	54	54
4.0	38	38	38
4.4	30	33	33
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	TUXS200F50
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+50V4A

Testing Circuitry Figure A

1.Graph



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

2.Values

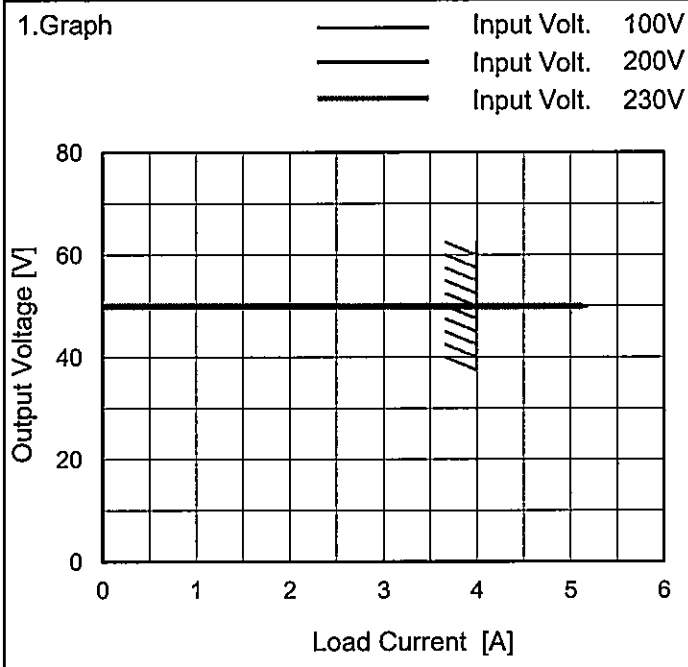
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	66	60
-40	66	60
-20	65	60
0	66	61
25	66	61
50	65	62
75	65	62
85	66	62
100	66	62
105	66	62
--	-	-

COSEL

Model	TUXS200F50
Item	Overcurrent Protection
Object	+50V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

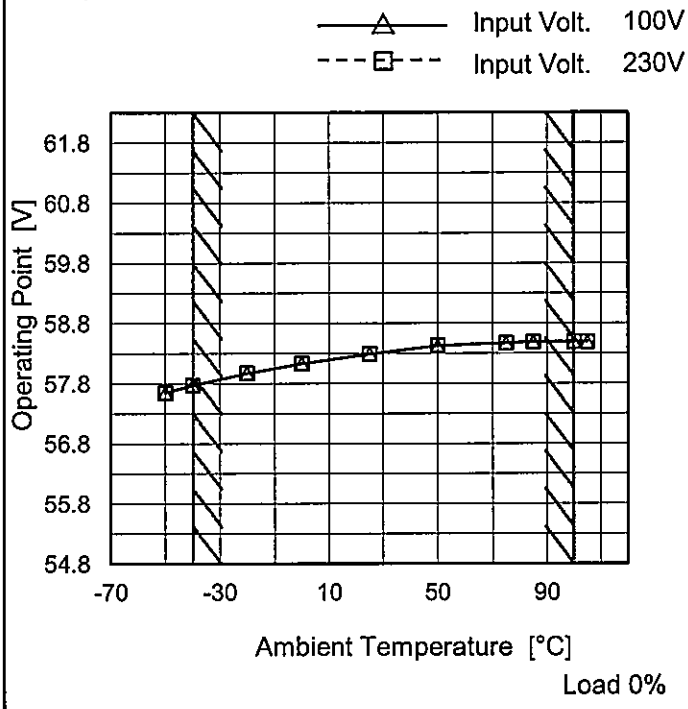
Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
50.0	5.12	5.11	5.11
47.5	5.14	5.11	5.11
45.0	0.00	0.00	0.00
40.0	0.00	0.00	0.00
35.0	0.00	0.00	0.00
30.0	0.00	0.00	0.00
25.0	0.00	0.00	0.00
20.0	0.00	0.00	0.00
15.0	0.00	0.00	0.00
10.0	0.00	0.00	0.00
5.0	0.00	0.00	0.00
0.0	0.00	0.00	0.00

COSEL

Model	TUXS200F50
Item	Overvoltage Protection
Object	+50V4A

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. 230[V]
-50	57.62	57.62
-40	57.74	57.74
-20	57.94	57.94
0	58.10	58.10
25	58.26	58.26
50	58.40	58.40
75	58.44	58.44
85	58.46	58.46
100	58.46	58.46
105	58.46	58.46
--	-	-

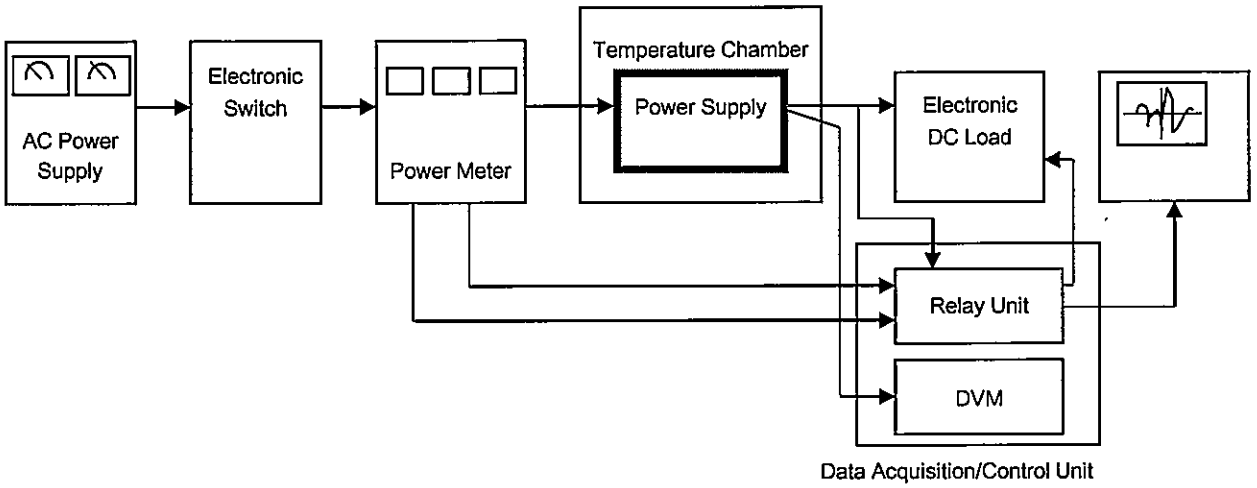


Figure A

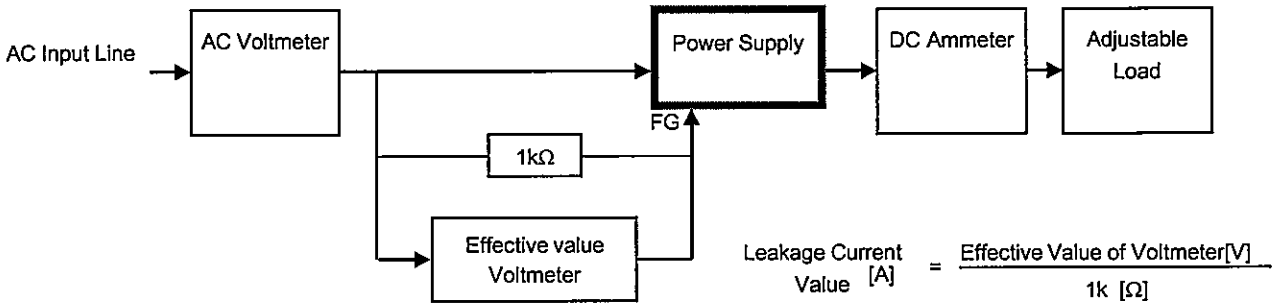


Figure B (DEN-AN)

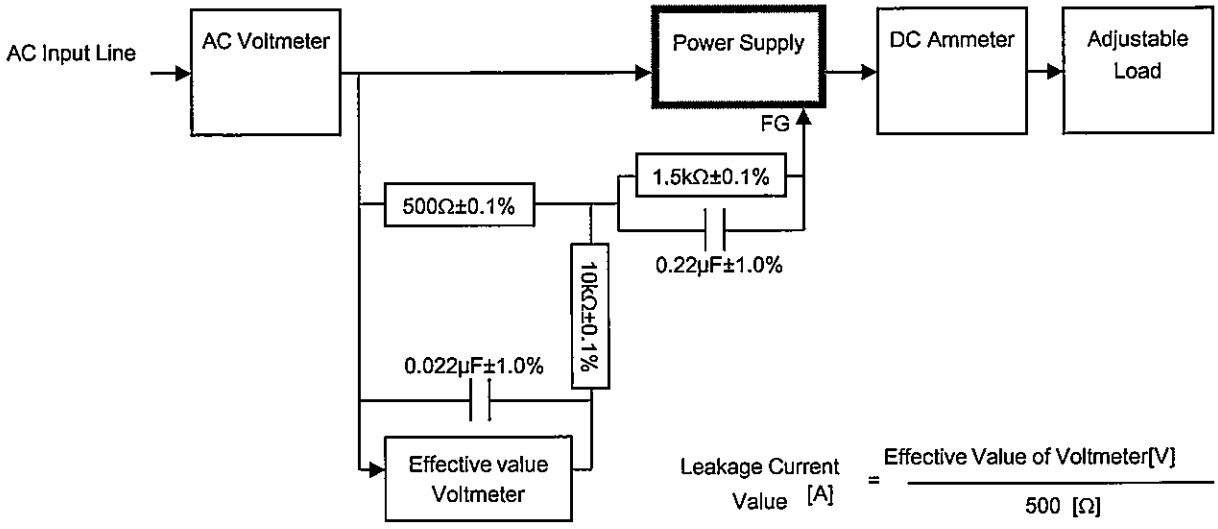
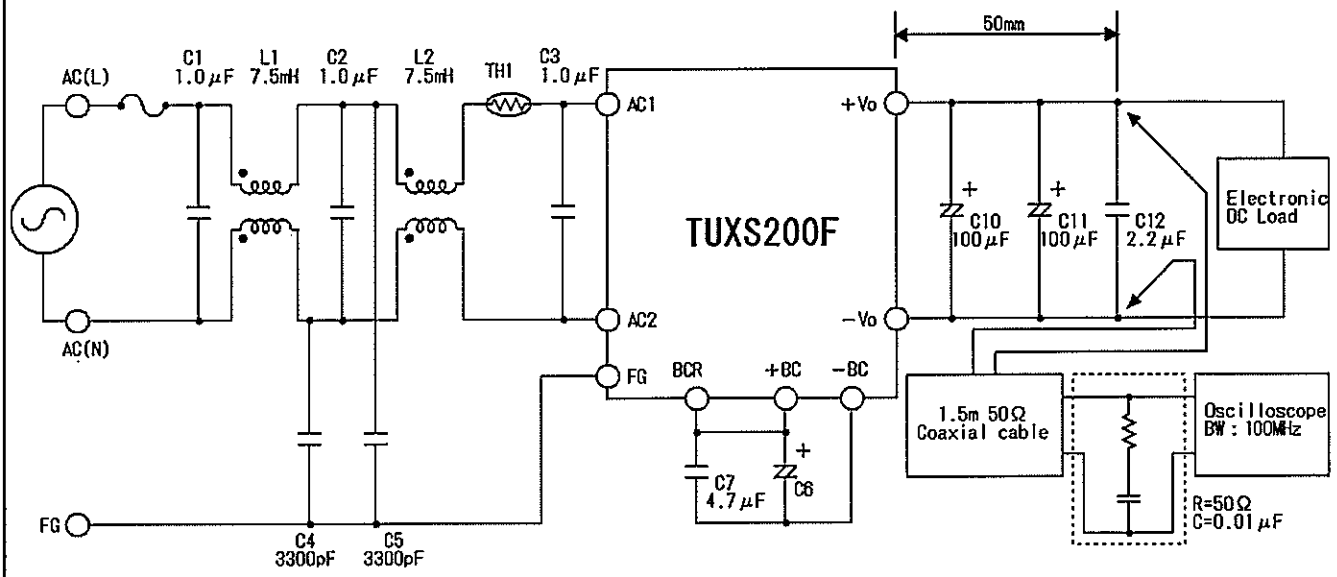


Figure B (IEC60950-1)



L1,L2	:	SCR22-060-1R0A075J(NEC TOKIN)
TH1	:	12D2-15LCS(SEMITEC)
C1,C2,C3	:	LE105-MX(OKAYA)
C4,C5	:	DE1E3KX332M(MURATA)
C6	:	EKXJ421ELL151MM50S(Nippon Chemi-Con)
C7	:	AFS450V474K(OKAYA)
C10,C11	:	PCR1J101MCL1GS(NICHICON)
C12	:	GRM31CR72A225K(MURATA)

Figure C