参考資料

TEST DATA OF TUXS200F28

Regulated DC Power Supply
October 21, 2016

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COSEL CO.,LTD.

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Object	———————

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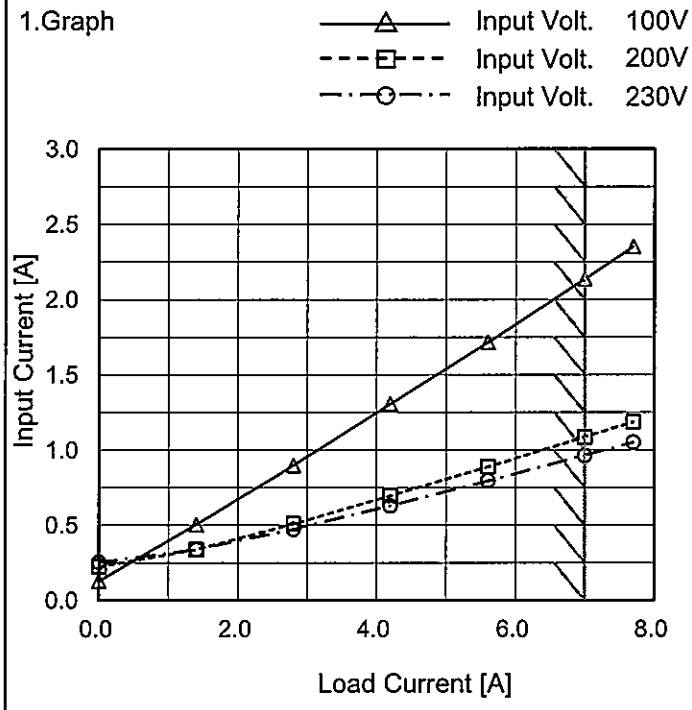


Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.128	0.224	0.254
1.4	0.504	0.338	0.338
2.8	0.899	0.510	0.475
4.2	1.307	0.697	0.630
5.6	1.716	0.889	0.795
7.0	2.136	1.086	0.965
7.7	2.351	1.187	1.051
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

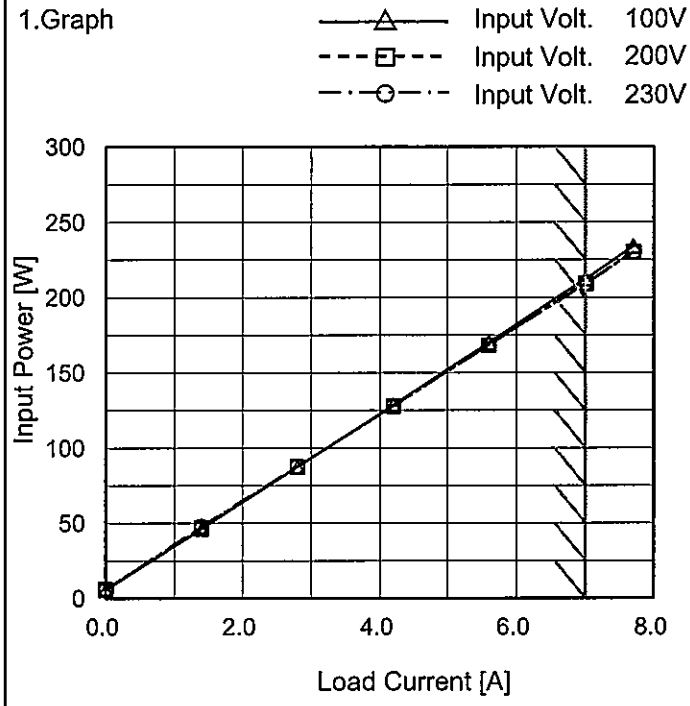
BC - 11145

COSEL

Model	TUXS200F28
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	5.6	6.0	5.9
1.4	46.3	47.1	47.9
2.8	87.3	87.5	87.9
4.2	128.6	127.8	128.1
5.6	170.1	168.3	168.3
7.0	212.3	209.2	209.1
7.7	233.9	230.1	229.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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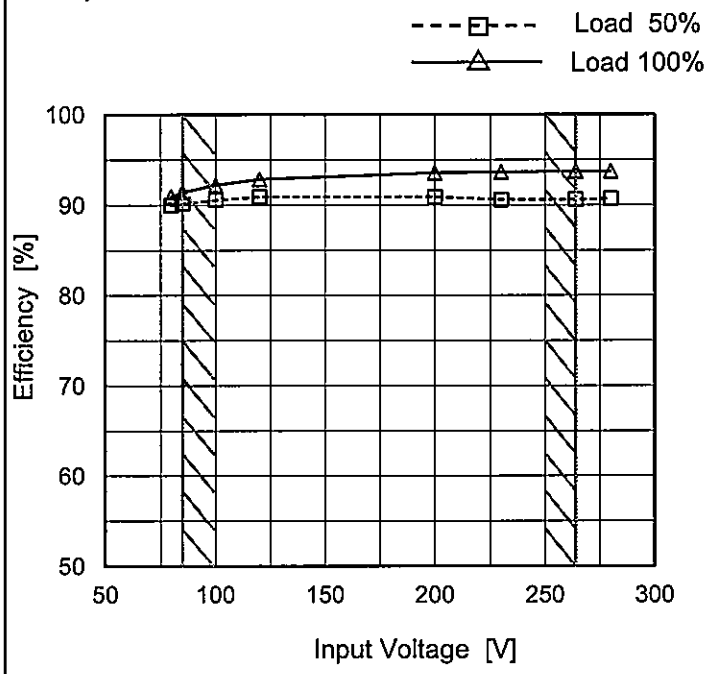
COSEL

Model	TUXS200F28
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	90.0	91.0
85	90.2	91.4
100	90.6	92.2
120	90.9	92.9
200	90.9	93.6
230	90.6	93.6
264	90.6	93.7
280	90.7	93.7
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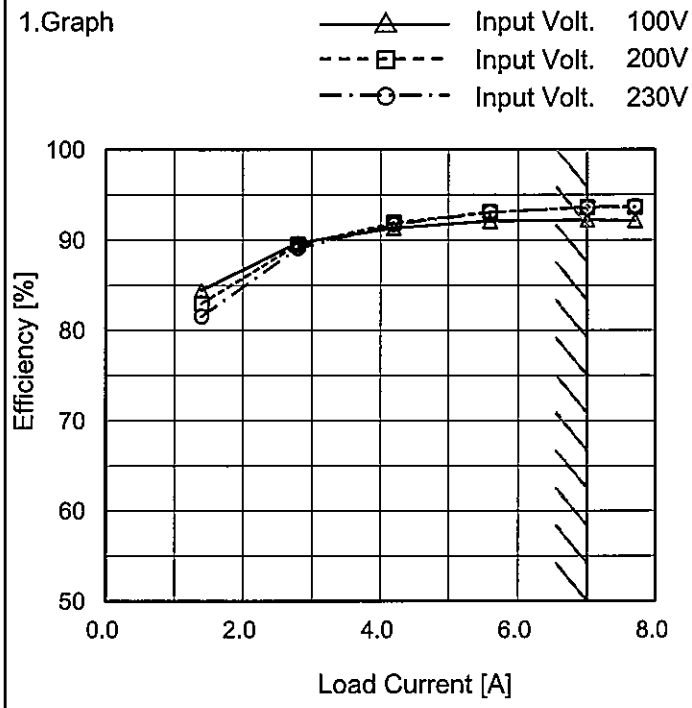
COSEL

Model	TUXS200F28
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	-	-	-
1.4	84.4	83.0	81.5
2.8	89.7	89.5	89.1
4.2	91.3	91.9	91.7
5.6	92.1	93.1	93.1
7.0	92.2	93.6	93.6
7.7	92.1	93.7	93.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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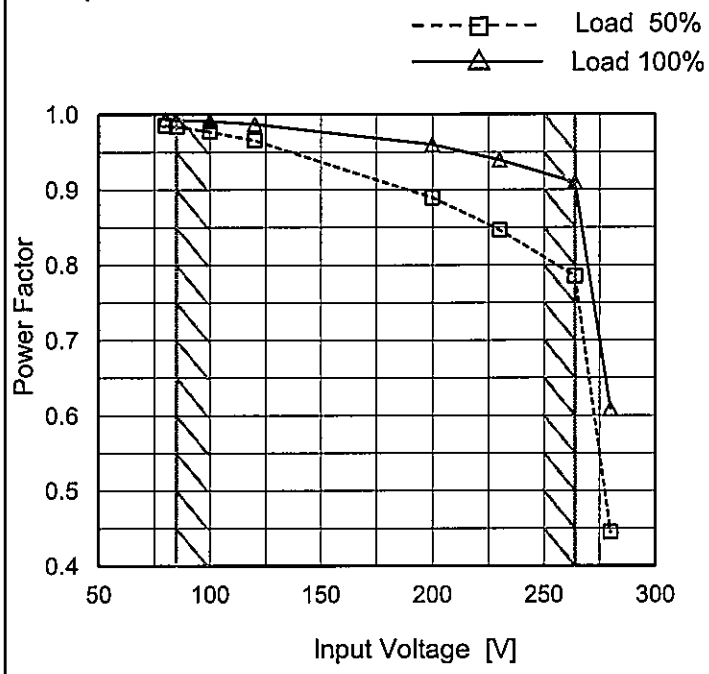
Model	TUXS200F28
Item	Power Factor (by Input Voltage)
Object	———————

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	0.994
85	0.984	0.993
100	0.977	0.991
120	0.966	0.987
200	0.890	0.960
230	0.847	0.940
264	0.786	0.910
280	0.445	0.609
--	-	-

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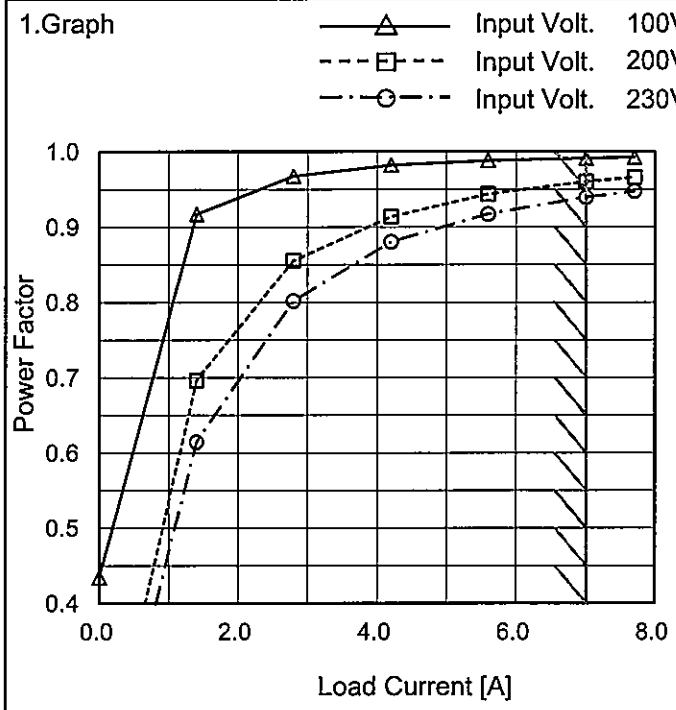
Model	TUXS200F28
Item	Power Factor (by Load Current)
Object	———————

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	0.434	0.134	0.101
1.4	0.917	0.696	0.614
2.8	0.968	0.856	0.802
4.2	0.982	0.914	0.881
5.6	0.988	0.944	0.917
7.0	0.991	0.960	0.940
7.7	0.992	0.966	0.947
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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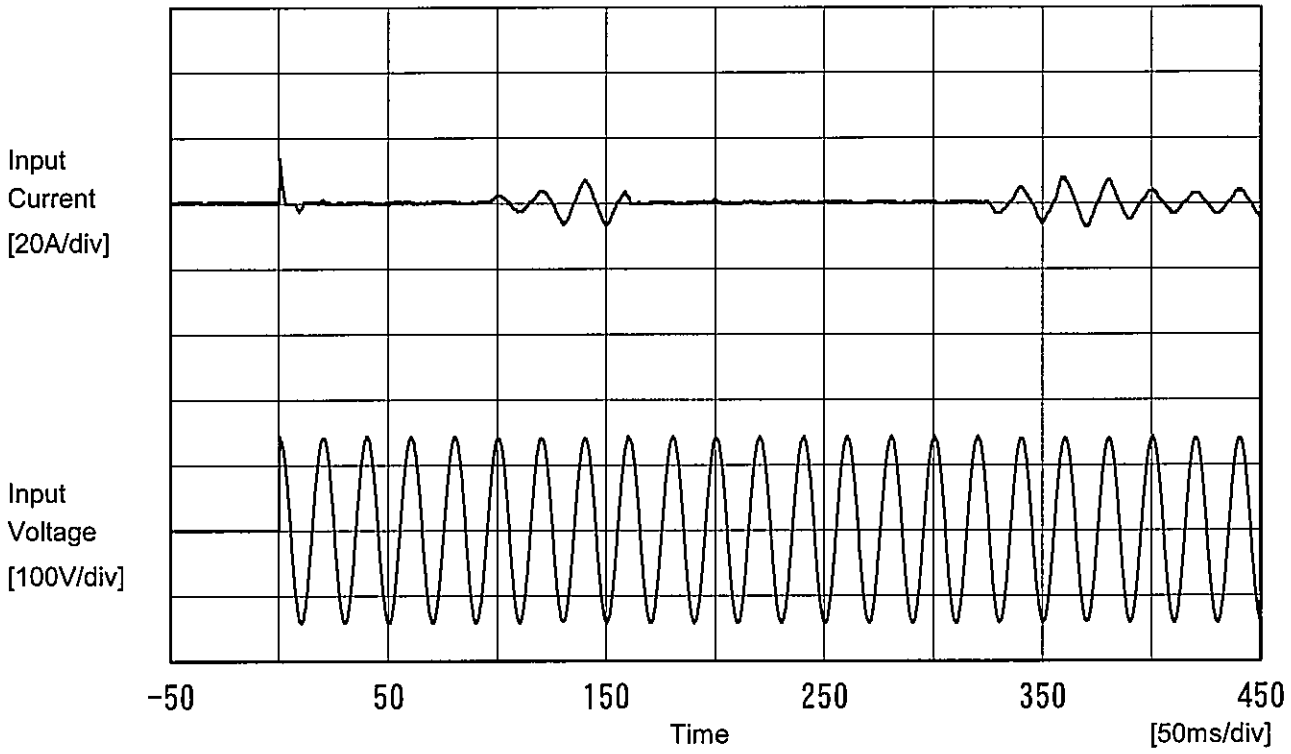
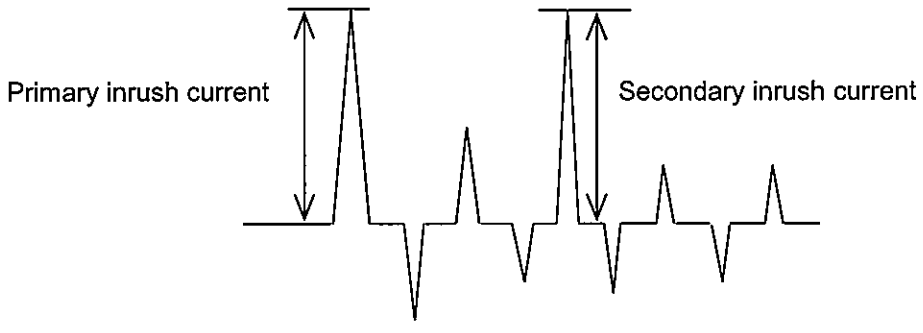
Model	TUXS200F28
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



Input Voltage	100 V
Frequency	50 Hz
Load	100 %
Primary inrush current	15.3 A
Secondary inrush current	7.7 A



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Model	TUXS200F28	
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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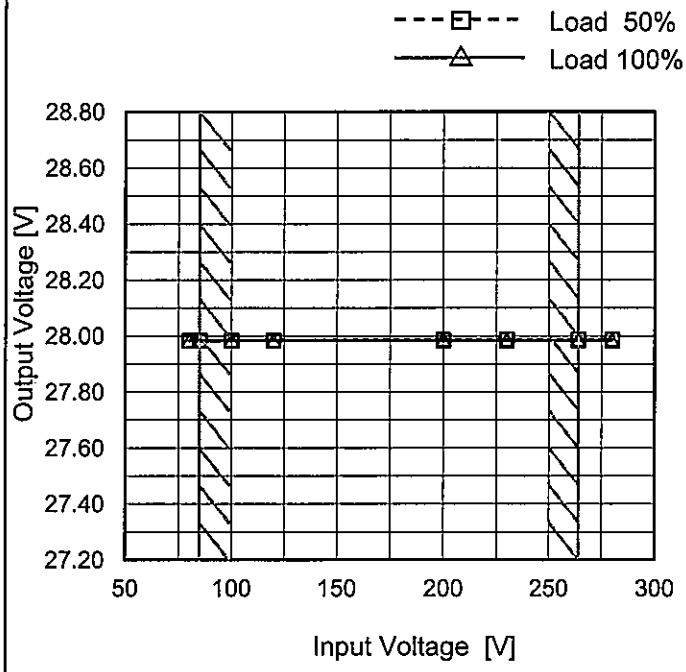
Model	TUXS200F28
Item	Line Regulation
Object	+28V7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated input voltage.

2.Values

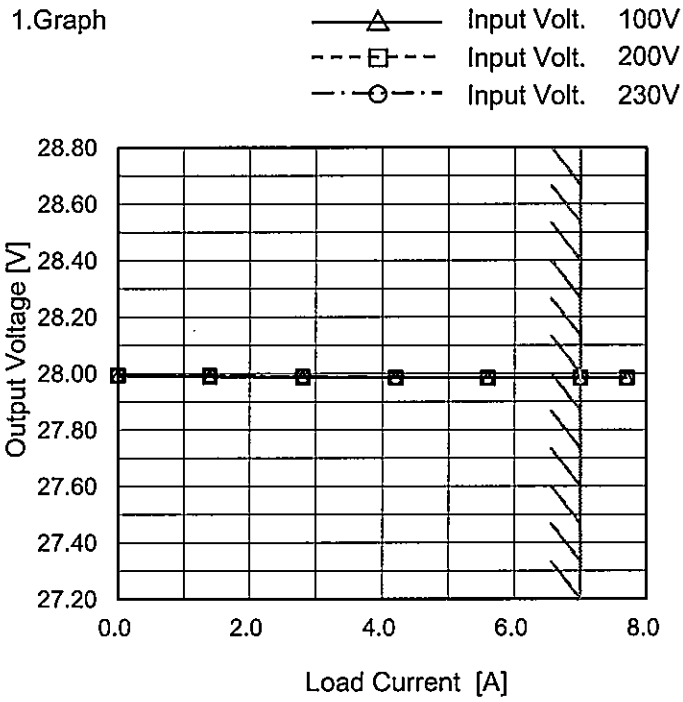
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
80	27.983	27.982
85	27.984	27.983
100	27.985	27.984
120	27.986	27.984
200	27.987	27.984
230	27.988	27.984
264	27.988	27.984
280	27.988	27.984
--	-	-

COSEL

Model	TUXS200F28
Item	Load Regulation
Object	+28V7A

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	27.993	27.995	27.996
1.4	27.989	27.992	27.992
2.8	27.986	27.989	27.990
4.2	27.985	27.986	27.987
5.6	27.984	27.985	27.986
7.0	27.984	27.984	27.984
7.7	27.984	27.984	27.984
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS200F28		
Item	Dynamic Load Response	Temperature Testing Circuitry	25℃ Figure A
Object	+28V7A		

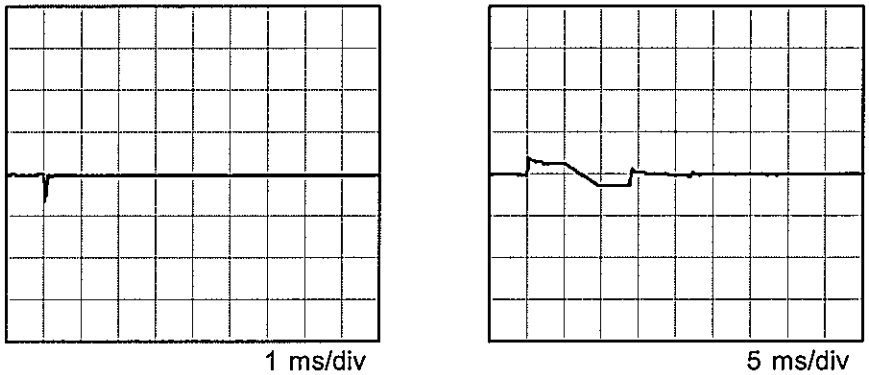
Input Volt. 100 V
Cycle 1000 ms

t1,t2=10 μ S

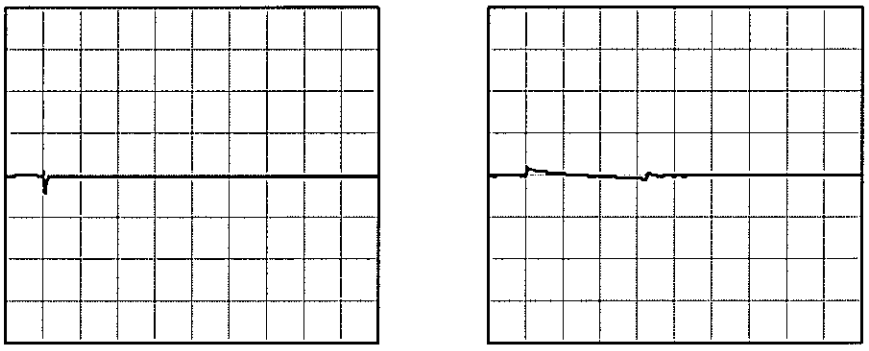
Load Current

t1 t2

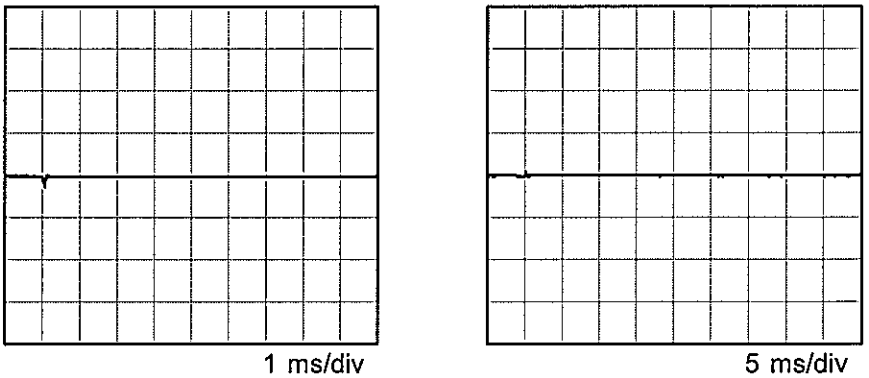
Min. Load (0A) ⟷
Load 100% (7A)



Min. Load (0A) ⟷
Load 50% (3.5A)



Load 50% (3.5A) ⟷
Load 100% (7A)



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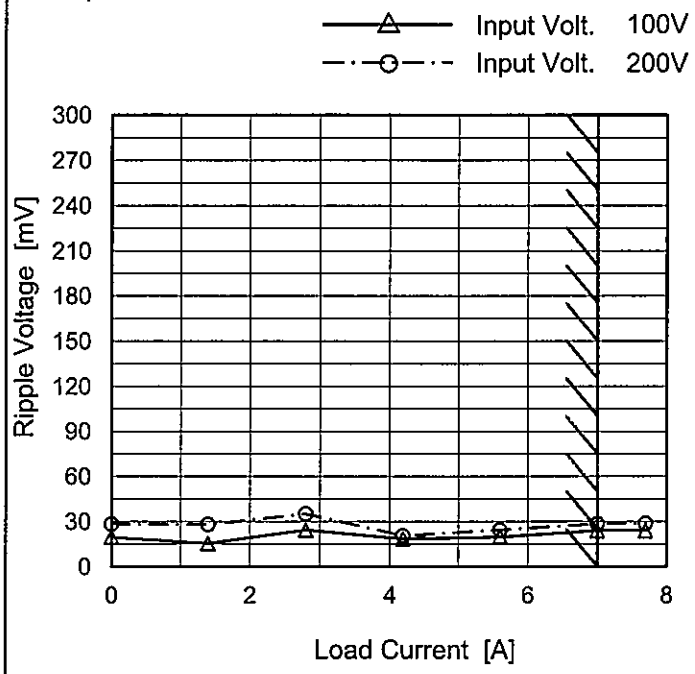
Model	TUXS200F28
Item	Ripple Voltage (by Load Current)
Object	+28V7A

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.

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

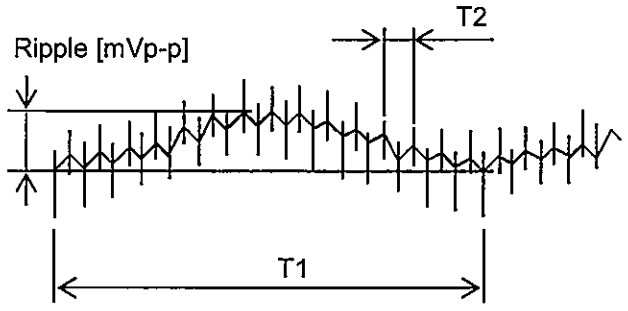


Fig. Complex Ripple Wave Form

2.Values

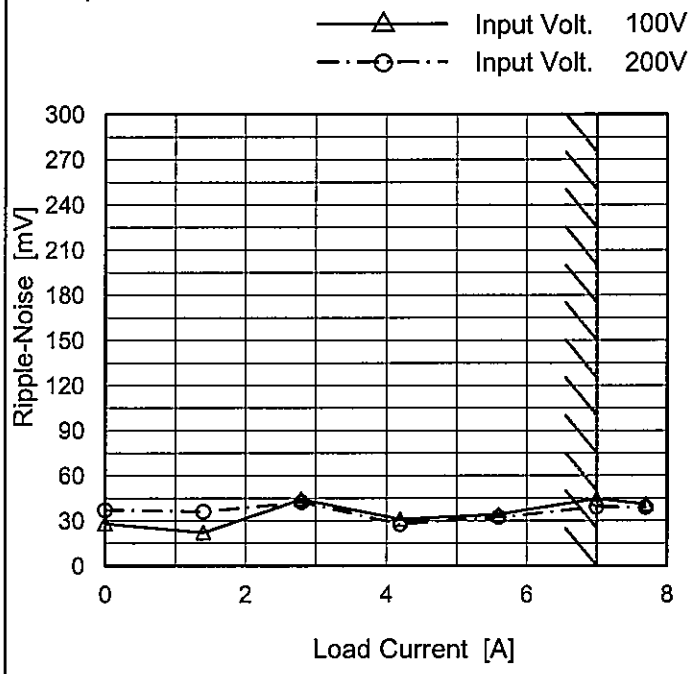
Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 200 [V]
0.0	20	28
1.4	16	28
2.8	24	35
4.2	19	21
5.6	20	24
7.0	24	29
7.7	24	29
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	TUXS200F28
Item	Ripple-Noise
Object	+28V7A

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	28	37
1.4	22	36
2.8	44	42
4.2	31	28
5.6	34	32
7.0	45	39
7.7	41	39
--	-	-
--	-	-
--	-	-
--	-	-

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

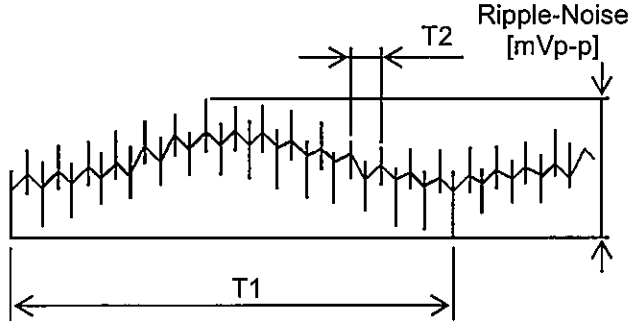


Fig. Complex Ripple Wave Form

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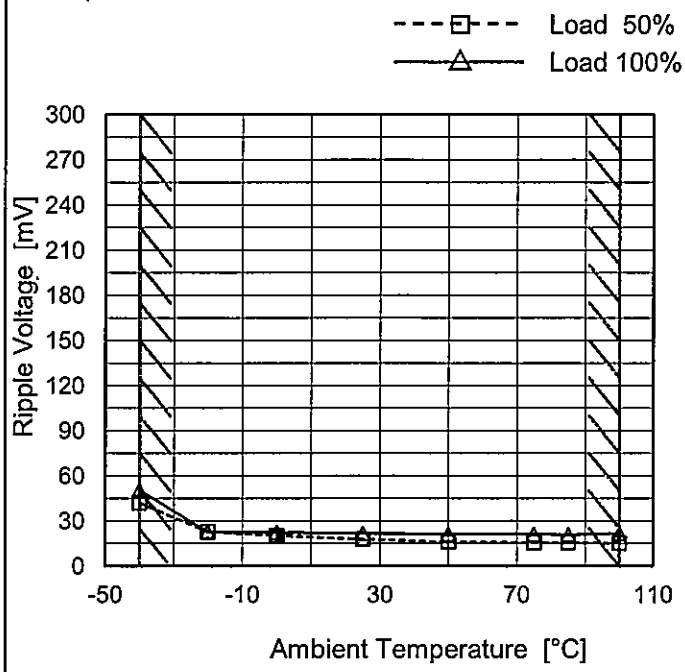
COSEL

Model	TUXS200F28
Item	Ripple Voltage (by Ambient Temp.)
Object	+28V7A

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.

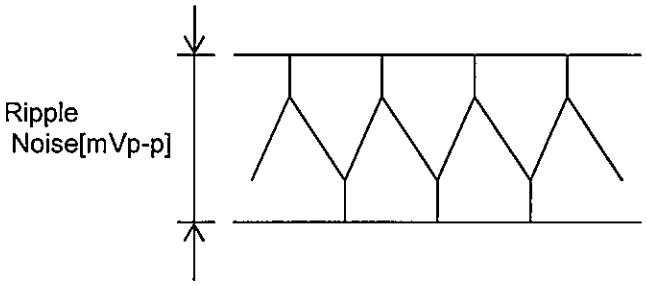


Fig.Complex Ripple Noise Wave Form

2.Values

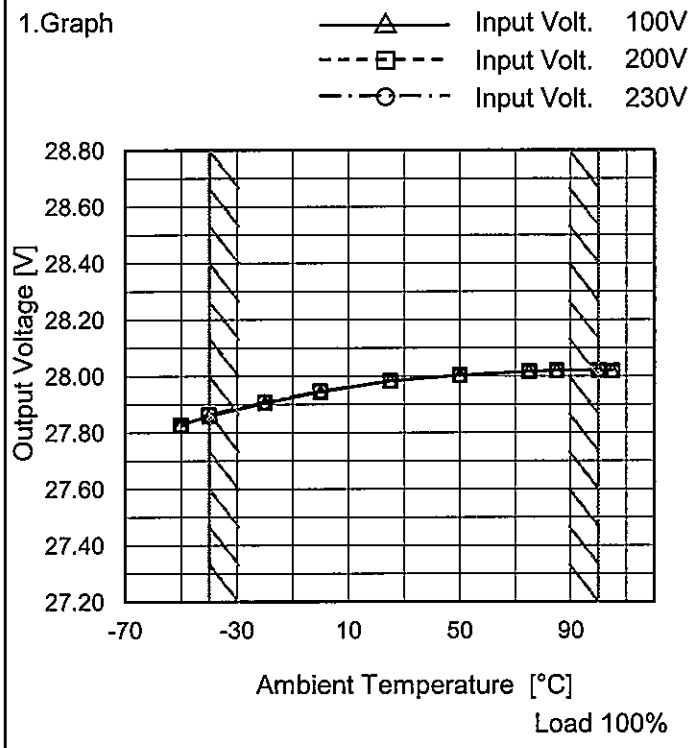
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	42	50
-20	23	23
0	20	22
25	18	22
50	16	21
75	16	21
85	16	21
100	15	22
--	-	-
--	-	-
--	-	-

COSEL

Model	TUXS200F28
Item	Ambient Temperature Drift
Object	+28V7A

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	27.830	27.828	27.825
-40	27.859	27.863	27.865
-20	27.905	27.908	27.910
0	27.944	27.947	27.949
25	27.984	27.984	27.984
50	28.003	28.004	28.005
75	28.016	28.017	28.017
85	28.020	28.020	28.021
100	28.021	28.022	28.022
105	28.019	28.019	28.019
--	-	-	-

COSEL

Model	TUXS200F28	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+28V7A	

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 : 100 - 230V
Load Current : 0 - 7A

* 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

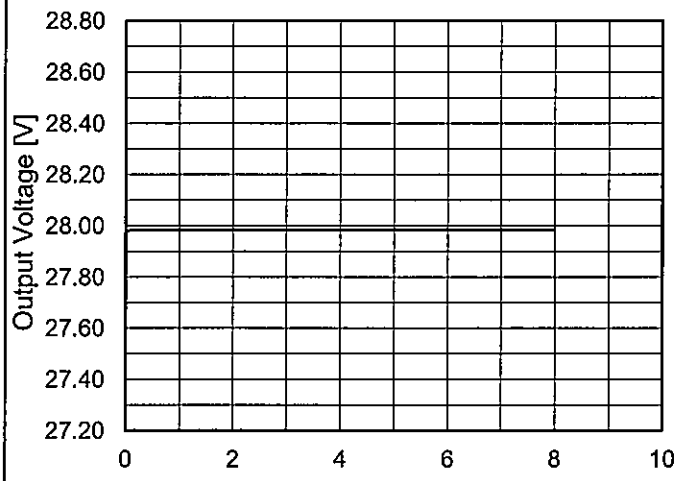
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	85	230	7	28.021	±92	±0.3
Minimum Voltage	-40	100	7	27.859		

COSEL

Model	TUXS200F28
Item	Time Lapse Drift
Object	+28V7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

2.Values

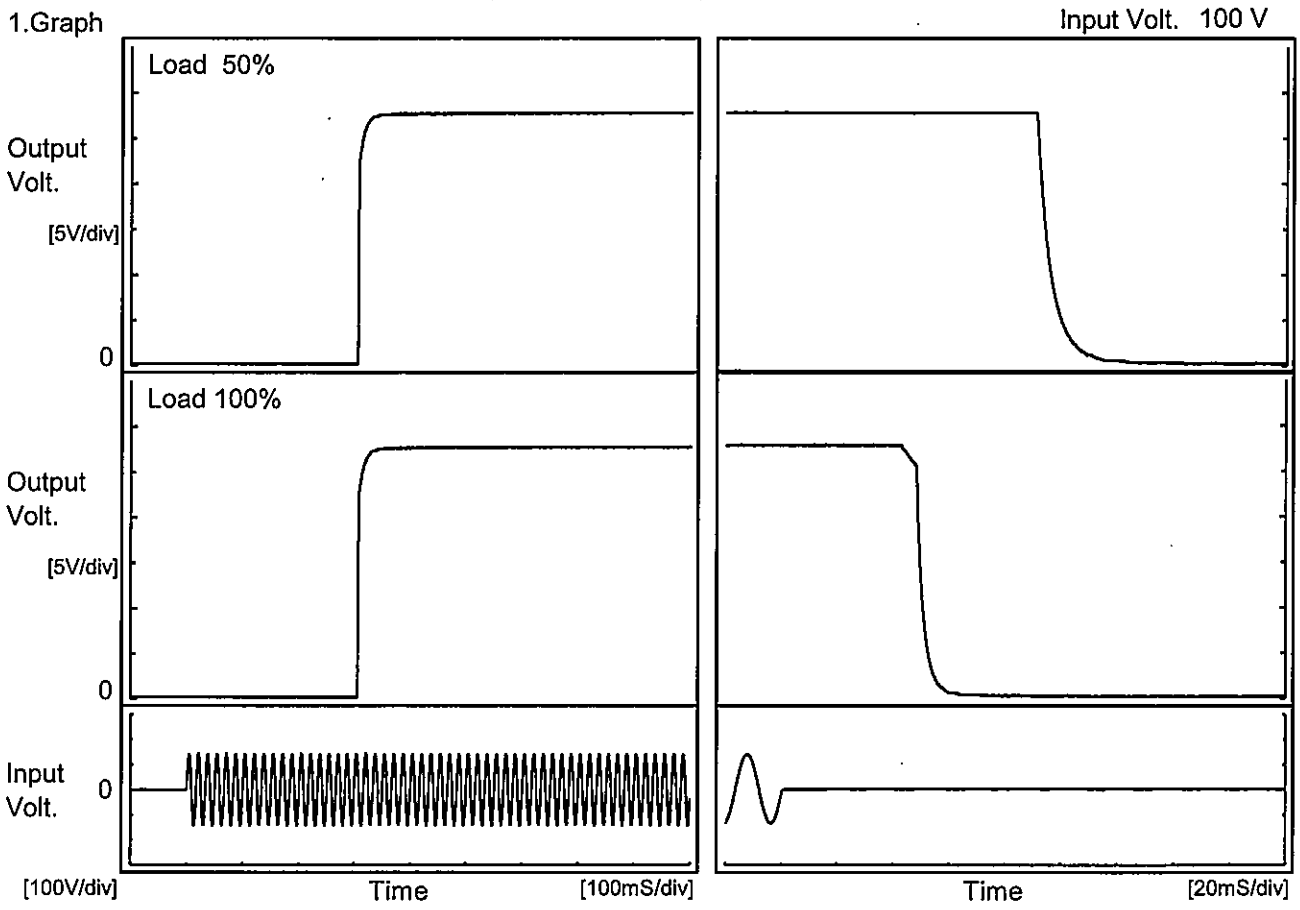
Time since start [H]	Output Voltage [V]
0.0	27.963
0.5	27.984
1.0	27.984
2.0	27.984
3.0	27.985
4.0	27.985
5.0	27.985
6.0	27.985
7.0	27.984
8.0	27.984

COSEL

Model	TUXS200F28
Item	Rise and Fall Time
Object	+28V7A

Temperature 25°C
Testing Circuitry Figure A

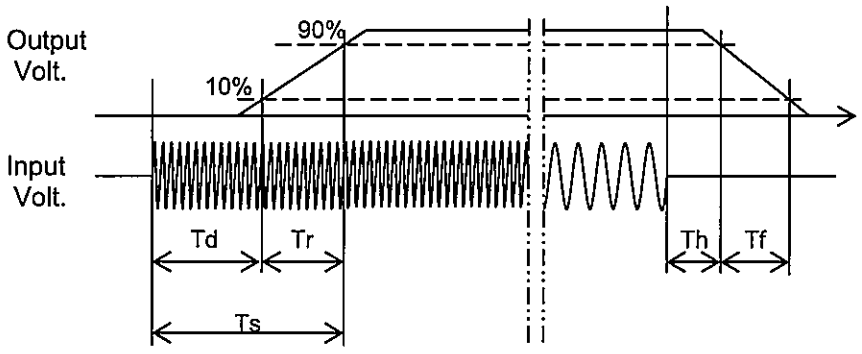
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	306.5	9.0	315.5	91.5	11.4
100 %	306.5	9.0	315.5	48.5	5.6

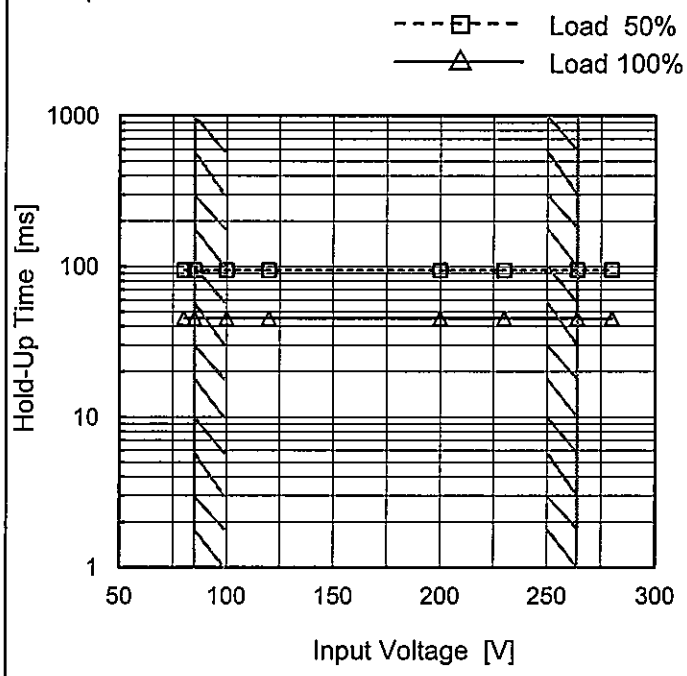


COSEL

Model	TUXS200F28
Item	Hold-Up Time
Object	+28V7A

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

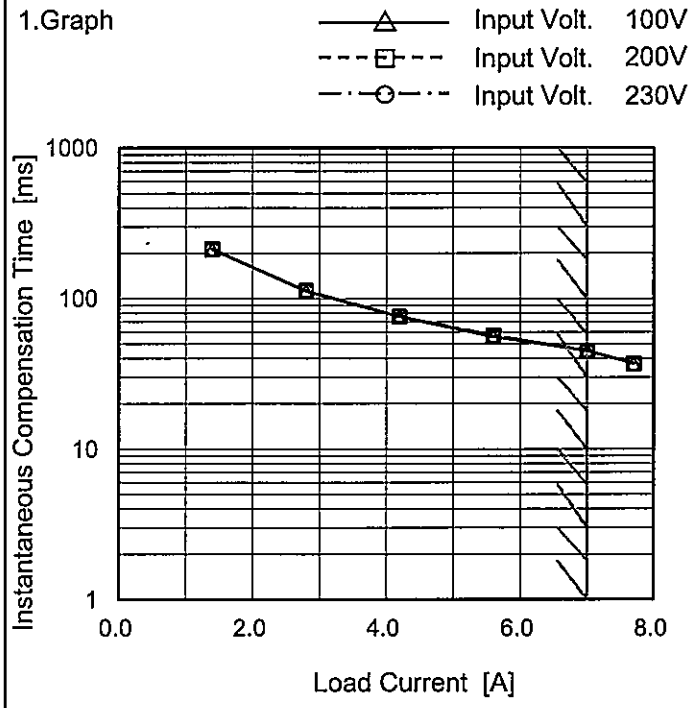
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
80	94	45
85	94	45
100	95	45
120	95	45
200	95	45
230	95	45
264	95	45
280	95	45
--	-	-

COSEL

Model	TUXS200F28
Item	Instantaneous Interruption Compensation
Object	+28V7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

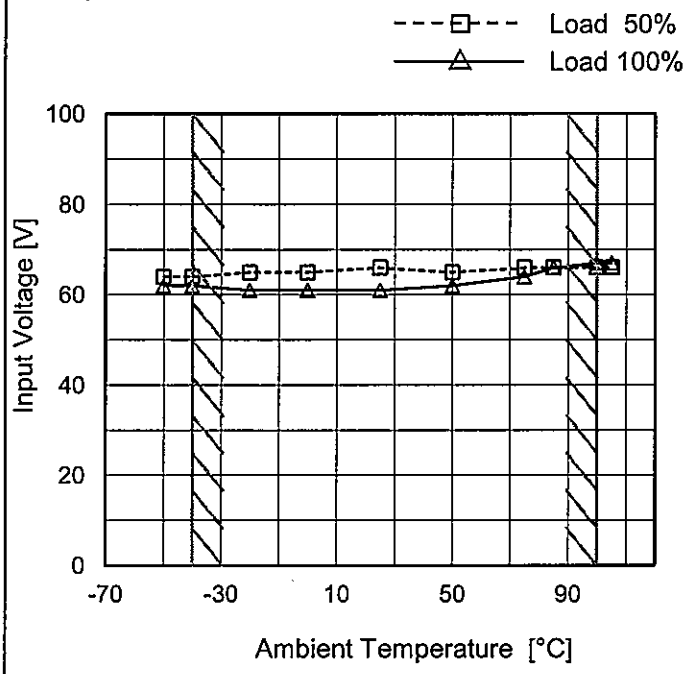
Load Current [A]	Time [ms] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.4	212	213	213
2.8	112	113	113
4.2	76	76	77
5.6	56	57	57
7.0	45	45	45
7.7	37	37	37
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	TUXS200F28
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+28V7A

Testing Circuitry Figure A

1.Graph



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

2.Values

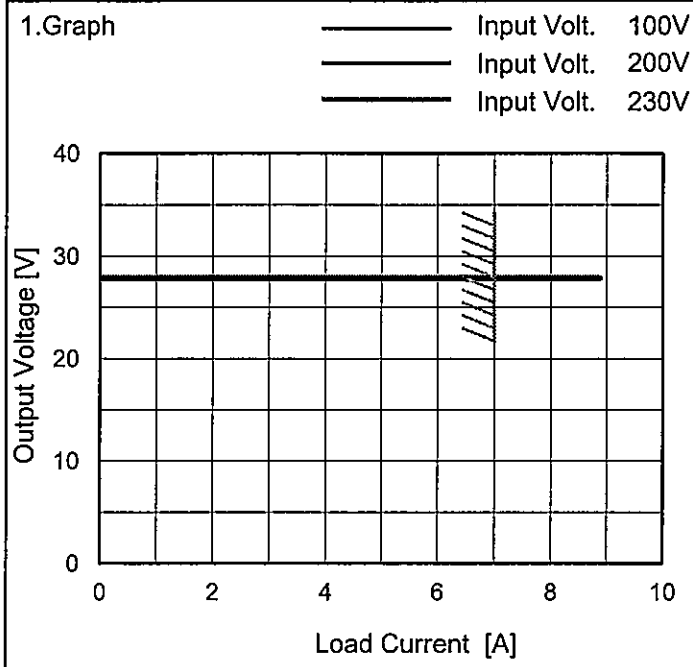
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	64	62
-40	64	62
-20	65	61
0	65	61
25	66	61
50	65	62
75	66	64
85	66	66
100	66	67
105	66	67
--	-	-

COSEL

Model	TUXS200F28
Item	Overcurrent Protection
Object	+28V7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

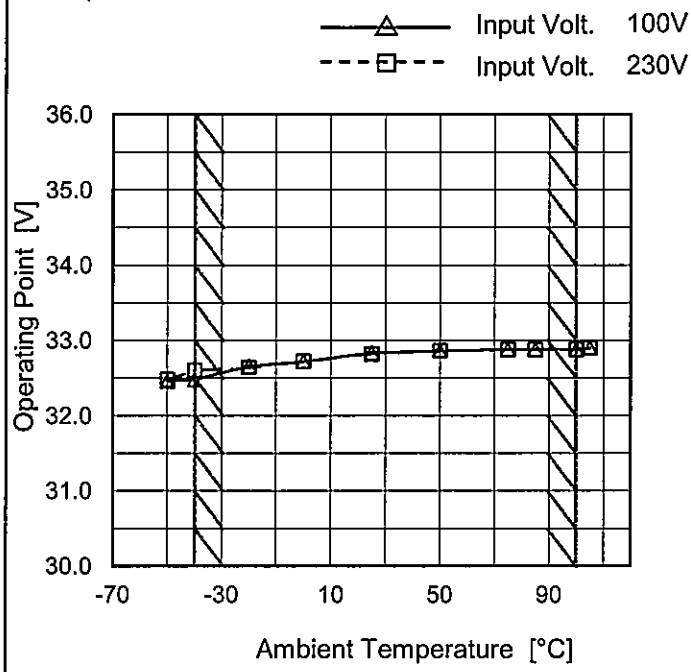
Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
28.0	8.88	8.90	8.86
26.6	0.00	0.00	0.00
25.2	0.00	0.00	0.00
22.4	0.00	0.00	0.00
19.6	0.00	0.00	0.00
16.8	0.00	0.00	0.00
14.0	0.00	0.00	0.00
11.2	0.00	0.00	0.00
8.4	0.00	0.00	0.00
5.6	0.00	0.00	0.00
2.8	0.00	0.00	0.00
0.0	0.00	0.00	0.00

COSEL

Model	TUXS200F28
Item	Overvoltage Protection
Object	+28V7A

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	32.46	32.48
-40	32.48	32.60
-20	32.66	32.64
0	32.72	32.72
25	32.84	32.82
50	32.86	32.86
75	32.88	32.88
85	32.88	32.88
100	32.88	32.88
105	32.90	32.90
---	-	-

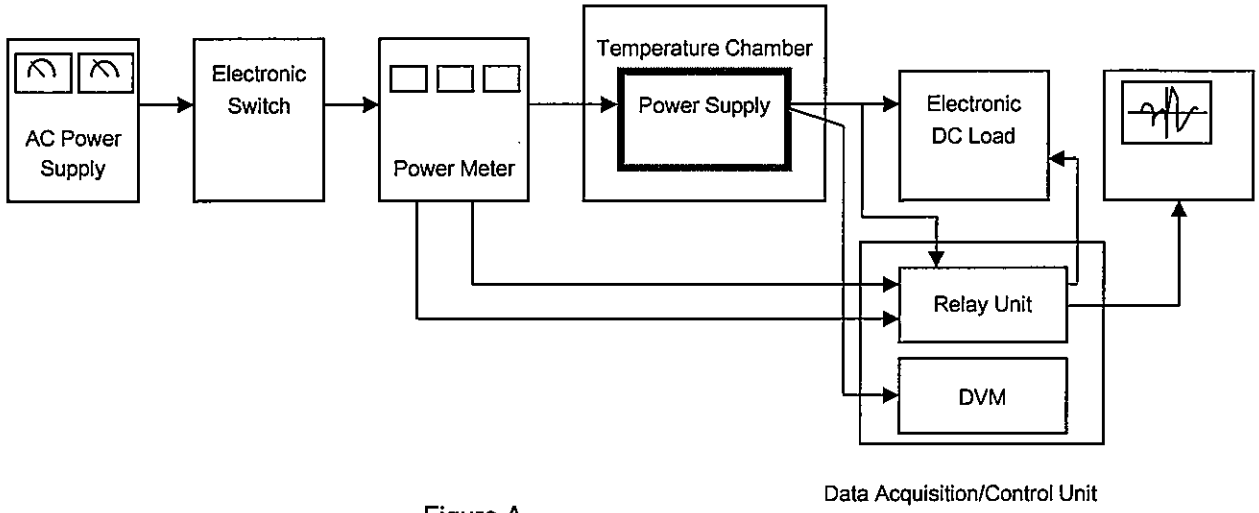


Figure A

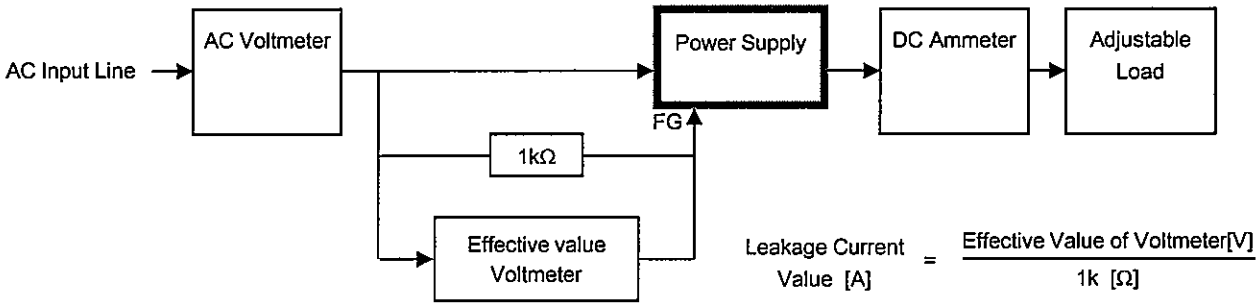


Figure B (DEN-AN)

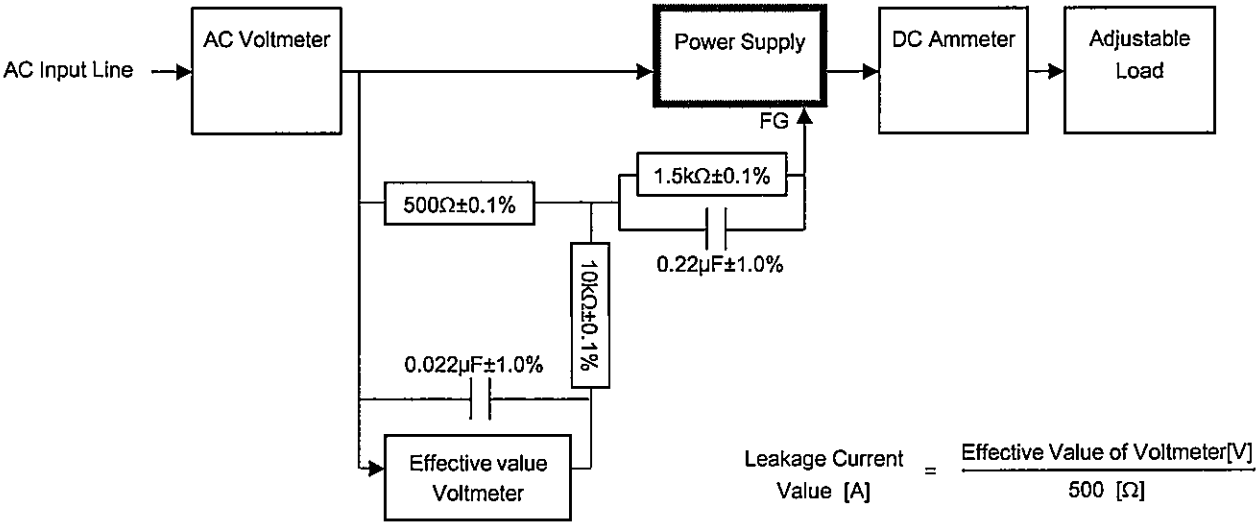
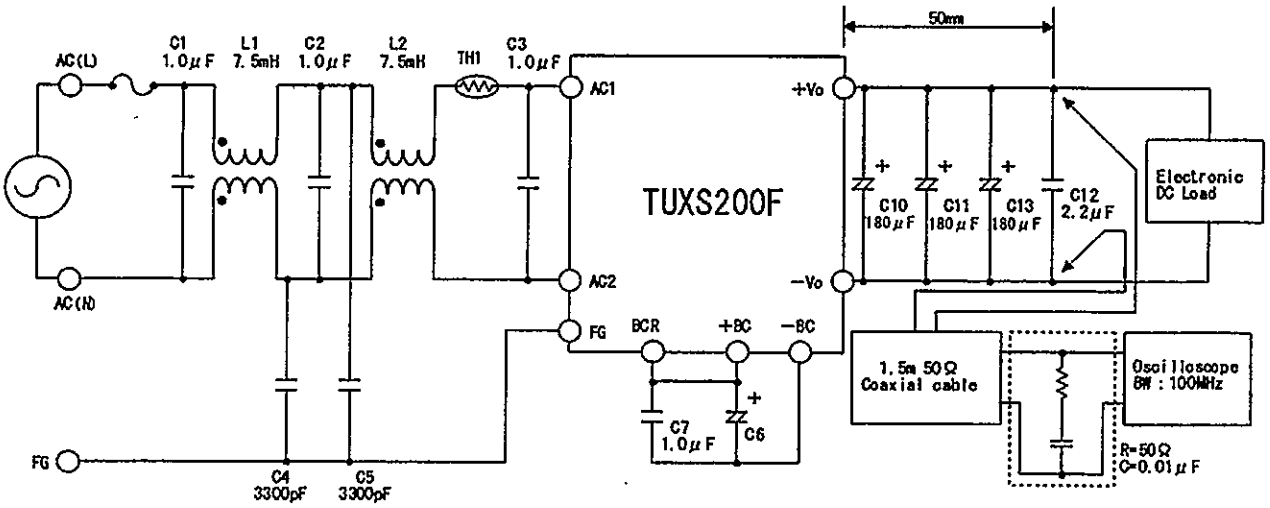


Figure B (IEC60950-1)



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	:	AFS450V105K(OKAYA)
C10,C11,C13	:	PCR1H181MCL1GS(NICHICON)
C12	:	GRM31CR72A225K(MURATA)

Figure C