COSEL

TEST DATA OF TUXS150F50

Regulated DC Power Supply
November 06, 2015

Approved by : *Yoshimichi Hirokawa*

Yoshimichi Hirokawa   Design Manager

Prepared by : *Tomoki Sodeno*

Tomoki Sodeno   Design Engineer

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Model	TUXS150F50
Item	Input Current (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V
- - -❏- - - Input Volt.   200V
—·—○—·· Input Volt.   230V

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	0.091	0.153	0.173
0.6	0.393	0.249	0.247
1.2	0.697	0.385	0.354
1.8	1.004	0.530	0.476
2.4	1.314	0.678	0.602
3.0	1.632	0.831	0.732
3.3	1.792	0.906	0.798
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS150F50

Item	Input Power (by Load Current)

Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—△— Input Volt.   100V
---⊟--- Input Volt.   200V
—··—○—··— Input Volt.   230V

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	4.7	5.0	5.2
0.6	35.8	36.7	37.4
1.2	66.7	67.1	67.5
1.8	97.8	97.5	97.9
2.4	129.1	128.1	128.3
3.0	161.1	159.1	159.0
3.3	177.0	174.7	174.7
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS150F50
Item	Efficiency (by Input Voltage)
Object	————————

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

- - - ▭ - - - Load 50%
———— △ ———— Load 100%

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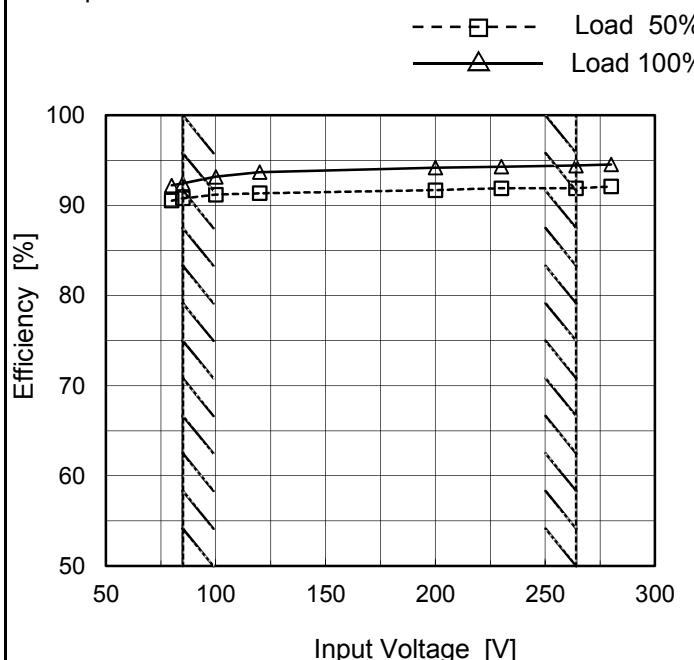
2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
80	90.5	92.2
85	90.8	92.5
100	91.2	93.2
120	91.4	93.7
200	91.7	94.2
230	91.9	94.3
264	91.9	94.4
280	92.1	94.6
--	-	-

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Model	TUXS150F50
Item	Efficiency (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

△ —— Input Volt.   100V
---◫--- Input Volt.   200V
—·--○—·-- Input Volt.   230V

Efficiency [%] vs Load Current [A]

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	-	-	-
0.6	84.0	82.4	81.1
1.2	89.9	89.6	89.1
1.8	91.9	92.2	92.0
2.4	92.9	93.6	93.5
3.0	93.2	94.2	94.3
3.3	93.3	94.3	94.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS150F50
Item	Power Factor (by Input Voltage)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

- - -□- - - Load 50%
———△——— Load 100%

Power Factor vs Input Voltage [V]

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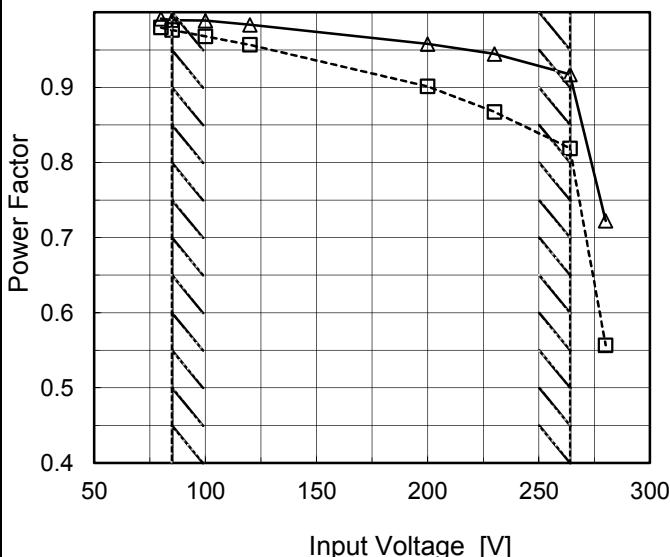
2.Values

Input Voltage	Power Factor	
[V]	Load 50%	Load 100%
80	0.980	0.991
85	0.976	0.990
100	0.968	0.989
120	0.957	0.983
200	0.901	0.958
230	0.868	0.945
264	0.819	0.917
280	0.557	0.722
--	-	-

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Model	TUXS150F50
Item	Power Factor (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
—△— Input Volt. 100V
--☐-- Input Volt. 200V
—·-○—·· Input Volt. 230V

Load Current [A]

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	0.510	0.163	0.131
0.6	0.911	0.738	0.661
1.2	0.958	0.873	0.829
1.8	0.976	0.922	0.896
2.4	0.984	0.945	0.927
3.0	0.989	0.958	0.945
3.3	0.990	0.965	0.953
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS150F50
Item	Inrush Current
Object	———————

Temperature　　25°C
Testing Circuitry　Figure A

Input
Current
[20A/div]

Input
Voltage
[100V/div]

-50　　　50　　　150　　　250　　　350　　　450

Time　　　　　　　　[50ms/div]
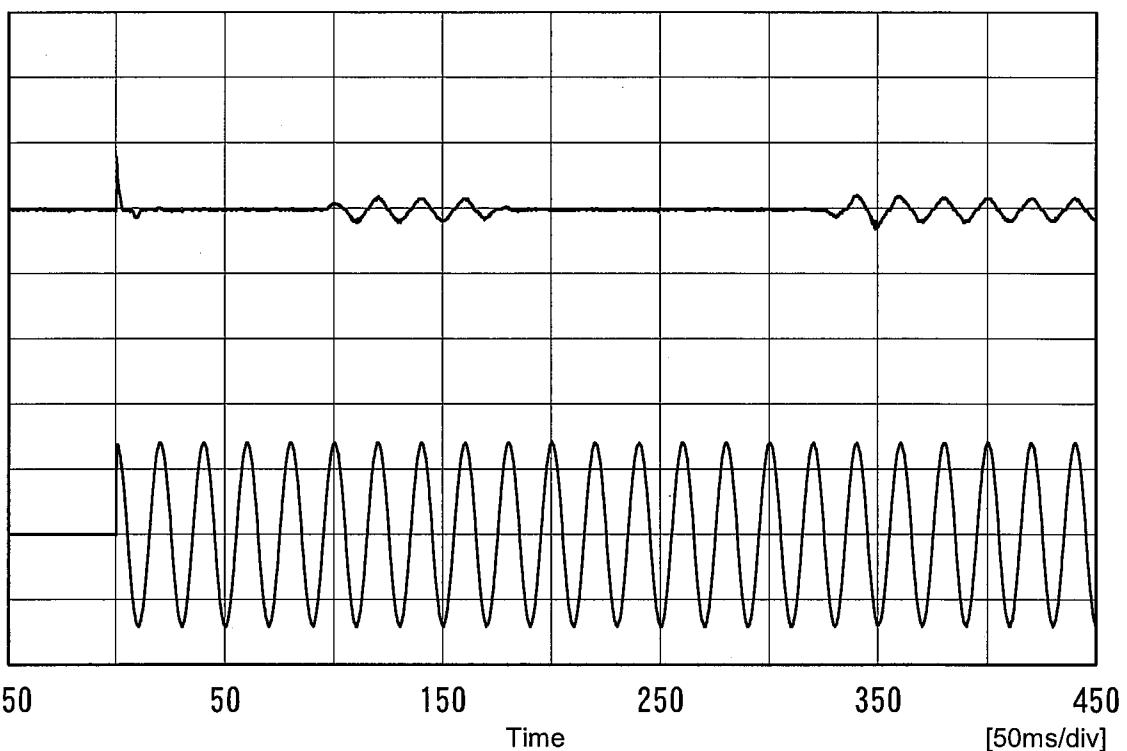
Input Voltage	100 V
Frequency	50 Hz
Load	100 %
Primary inrush current	15.9 A
Secondary inrush current	6.1 A

Primary inrush current　　　　　　　　Secondary inrush current

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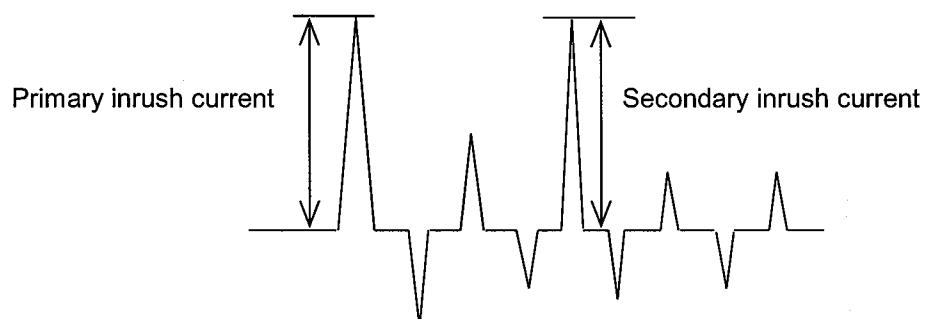
Model	TUXS150F50
Item	Leakage Current
Object	

Temperature	25°C
Testing Circuitry	Figure B

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.13	0.27	0.32	Operation
	One of phases	0.23	0.45	0.55	Stand by
IEC60950-1	Both phases	0.09	0.19	0.23	Operation
	One of phases	0.22	0.44	0.53	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	TUXS150F50
Item	Line Regulation
Object	+50V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

--- ⊟ --- Load 50%
——△—— Load 100%

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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
80	49.911	49.908
85	49.914	49.920
100	49.915	49.923
120	49.916	49.924
200	49.913	49.924
230	49.915	49.924
264	49.916	49.924
280	49.917	49.926
--	-	-

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参考資料

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Model	TUXS150F50
Item	Load Regulation
Object	+50V3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt. 100V
- - -⊟- - - Input Volt. 200V
—·—○—·· Input Volt. 230V

Output Voltage [V] vs Load Current [A]

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	49.918	49.915	49.925
0.6	49.917	49.914	49.922
1.2	49.917	49.914	49.920
1.8	49.916	49.914	49.918
2.4	49.916	49.914	49.918
3.0	49.923	49.924	49.924
3.3	49.924	49.925	49.926
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS150F50
Item	Dynamic Load Response
Object	+50V3A

Temperature	25℃
Testing Circuitry	Figure　A

Input Volt.　　　100 V

Cycle　　　　　1000 ms

t1,t2=10μS

Load Current

t1　　　　　　　　　　t2

Min. Load (0A) ←→
Load 100% (3A)

500 mV/div

1 ms/div

4 ms/div

Min. Load (0A) ←→
Load 50% (1.5A)

500 mV/div

1 ms/div

4 ms/div

Load 50% (1.5A) ←→
Load 100% (3A)

500 mV/div

1 ms/div

4 ms/div

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Model	TUXS150F50
Item	Ripple Voltage (by Load Current)
Object	+50V3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V

—·—○—·· Input Volt.   200V

Load Current [A]

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	11	12
0.3	46	46
0.6	54	54
1.2	44	40
1.8	54	46
2.4	56	58
3.0	65	67
3.3	75	71
--	-	-
--	-	-
--	-	-

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

Ripple [mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

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Model	TUXS150F50
Item	Ripple-Noise
Object	+50V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

―――△――― Input Volt. 100V
―・―○―・・― Input Volt. 200V

Ripple-Noise [mV] vs Load Current [A]
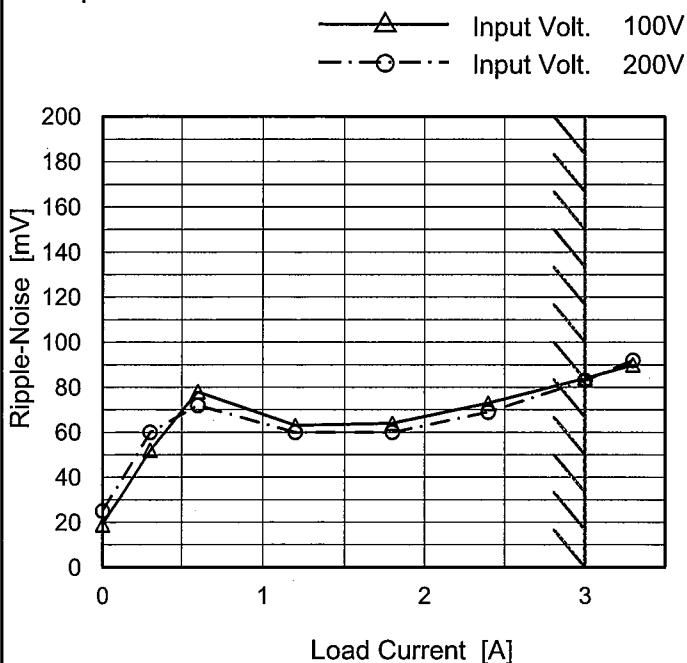
Load Current [A]

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	19	25
0.3	52	60
0.6	78	72
1.2	63	60
1.8	64	60
2.4	73	69
3.0	84	83
3.3	90	92
--	-	-
--	-	-
--	-	-

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

Fig. Complex Ripple Wave Form

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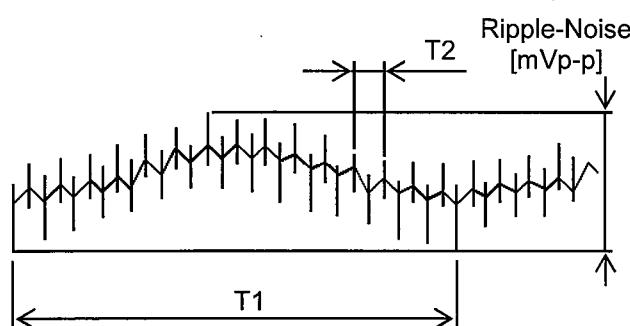
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Model	TUXS150F50
Item	Ripple Voltage (by Ambient Temp.)
Object	+50V3A

Testing Circuitry　Figure A

1.Graph

--- ⊟ --- 　Load 50%
—△— 　Load 100%

Ripple Voltage [mV] vs Ambient Temperature [°C]

Input Volt.　　100V

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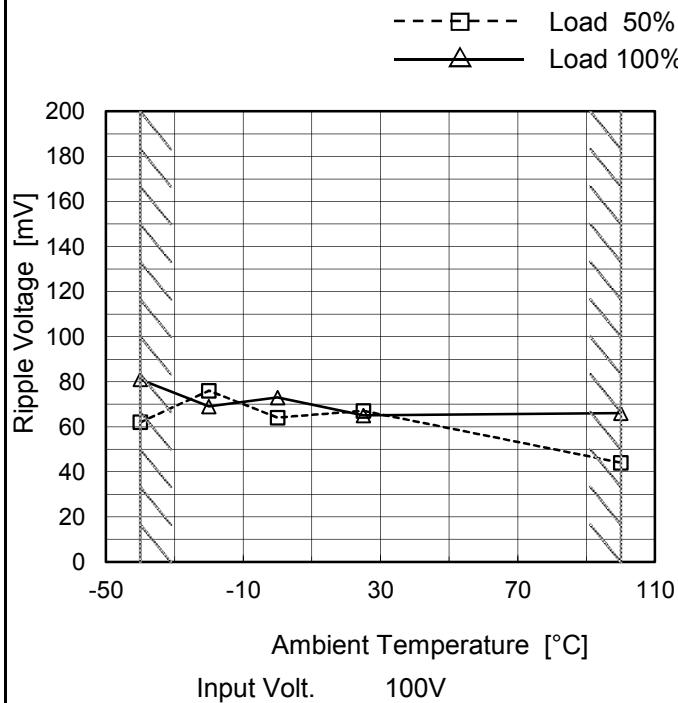
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	62	81
-20	76	69
0	64	73
25	67	65
100	44	66
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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

Ripple [mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

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参考資料
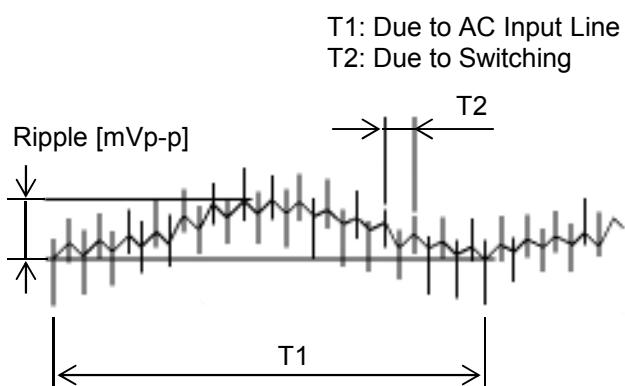
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Model	TUXS150F50

Item	Ambient Temperature Drift

Object	+50V3A
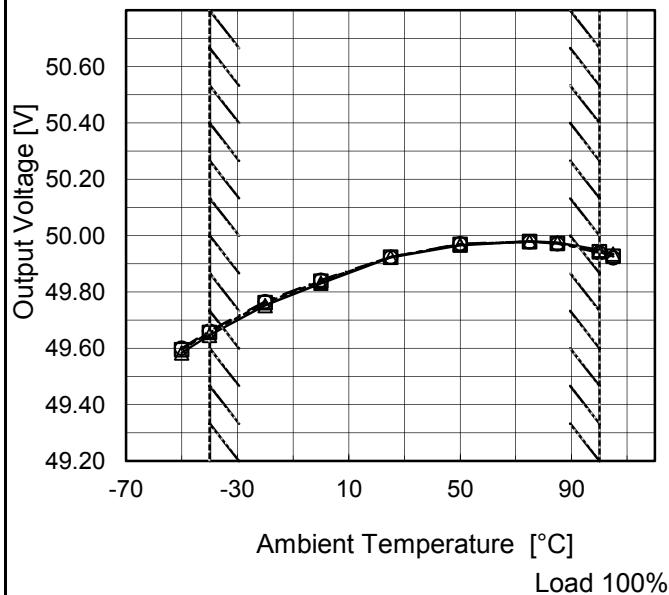
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.　100V
- - -⊞- - - Input Volt.　200V
—·—○—·— Input Volt.　230V

Ambient Temperature [°C]

Load 100%

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	49.584	49.595	49.600
-40	49.646	49.656	49.661
-20	49.752	49.762	49.766
0	49.831	49.838	49.842
25	49.923	49.924	49.924
50	49.966	49.969	49.971
75	49.980	49.979	49.978
85	49.976	49.973	49.971
100	49.949	49.942	49.940
105	49.934	49.927	49.922
--	-	-	-

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Model	TUXS150F50
Item	Output Voltage Accuracy
Object	+50V3A

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 - 3A

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

* Output Voltage Accuracy (Ration) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}}$ × 100

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	85	264	3	49.977	±162	±0.3
Minimum Voltage	-40	85	0	49.654		

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Model	TUXS150F50
Item	Time Lapse Drift
Object	+50V3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
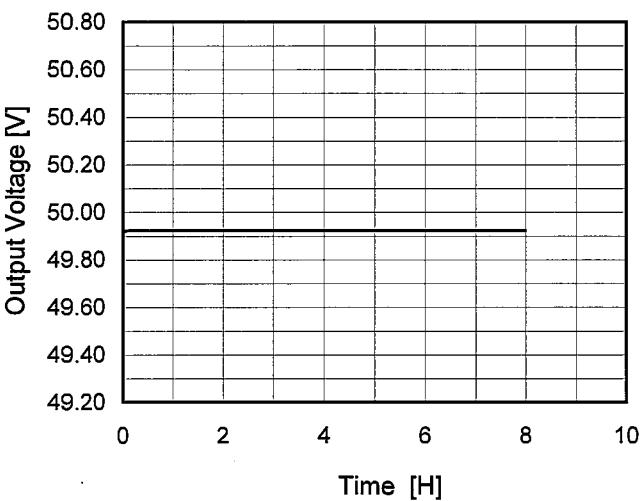
Input Volt.   100V
Load   100%

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	TUXS150F50
Item	Rise and Fall Time
Object	+50V3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Input Volt.   100 V

Load 50%

Output Volt. [10V/div]

0

Load 100%

Output Volt. [10V/div]

0

Input Volt.   0

[100V/div]   Time   [100mS/div]

Time   [20mS/div]
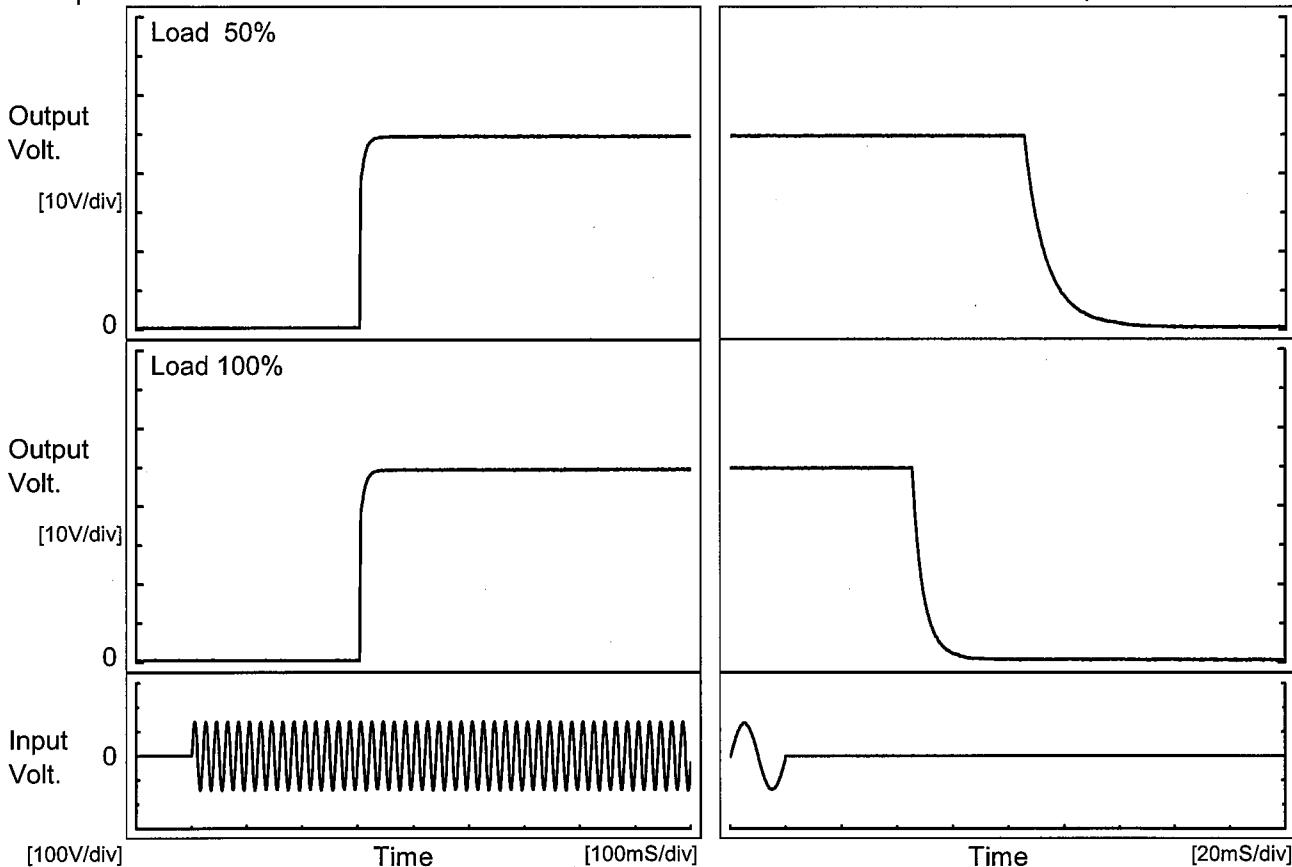
2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	304.5	10.0	314.5	86.1	18.1
100 %	304.5	10.0	314.5	45.8	9.1

Output Volt.

90%

10%

Input Volt.

Td   Tr

Th   Tf

Ts

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Model	TUXS150F50
Item	Hold-Up Time
Object	+50V3A

Temperature　　25°C
Testing Circuitry　Figure A

1.Graph

--- ⊟ --- Load 50%
——△—— Load 100%

Hold-Up Time [ms] vs Input Voltage [V]

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	119	59
85	118	59
100	119	59
120	119	59
200	119	58
230	118	59
264	118	59
280	118	58
--	-	-

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Model	TUXS150F50
Item	Instantaneous Interruption Compensation
Object	+50V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

———△——— Input Volt. 100V
- - -⊟- - - Input Volt. 200V
— · —○— · · Input Volt. 230V

Instantaneous Compensation Time [ms] vs Load Current [A]

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	-	-	-
0.6	267	268	266
1.2	140	142	142
1.8	96	96	97
2.4	72	73	73
3.0	57	58	53
3.3	52	52	52
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	TUXS150F50
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+50V3A

Testing Circuitry   Figure A

1.Graph

Input Voltage [V] vs Ambient Temperature [°C]

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	66
-40	67	66
-20	67	66
0	67	66
25	67	66
50	68	66
75	68	66
85	68	66
100	68	66
105	68	66
--	-	-

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Model	TUXS150F50
Item	Overcurrent Protection
Object	+50V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

—————— Input Volt. 100V
—————— Input Volt. 200V
～～～～～ Input Volt. 230V

Load Current [A]

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	3.01	3.02	3.02
47.5	2.97	2.98	2.98
45.0	3.97	3.93	3.93
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

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Model	TUXS150F50
Item	Overvoltage Protection
Object	+50V3A
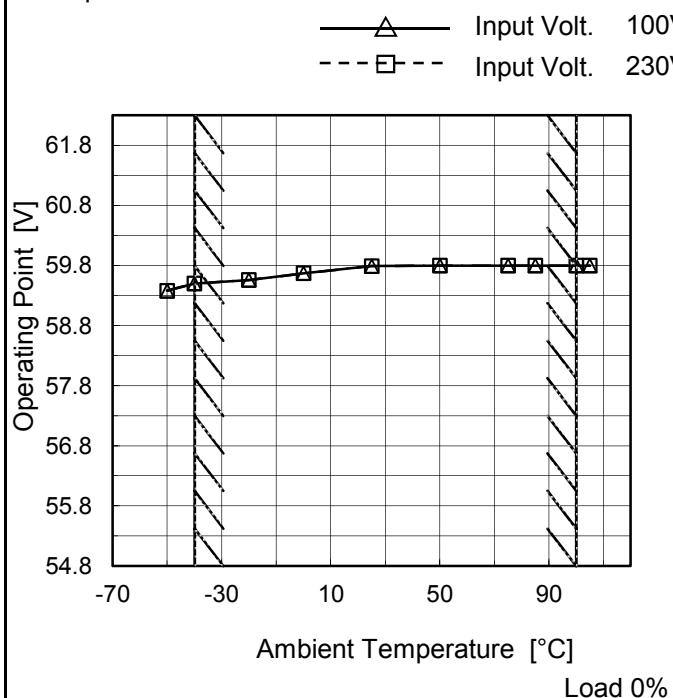
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V
---□--- Input Volt.   230V

Ambient Temperature [°C]

Load 0%

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	59.35	59.35
-40	59.47	59.47
-20	59.53	59.53
0	59.64	59.64
25	59.76	59.76
50	59.77	59.77
75	59.77	59.77
85	59.77	59.77
100	59.77	59.77
105	59.77	59.77
--	-	-

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Figure A

$$\text{Leakage Current Value} \ [A] = \frac{\text{Effective Value of Voltmeter}[V]}{1k \ [\Omega]}$$

Figure B (DEN-AN)

$$\text{Leakage Current Value} \ [A] = \frac{\text{Effective Value of Voltmeter}[V]}{500 \ [\Omega]}$$
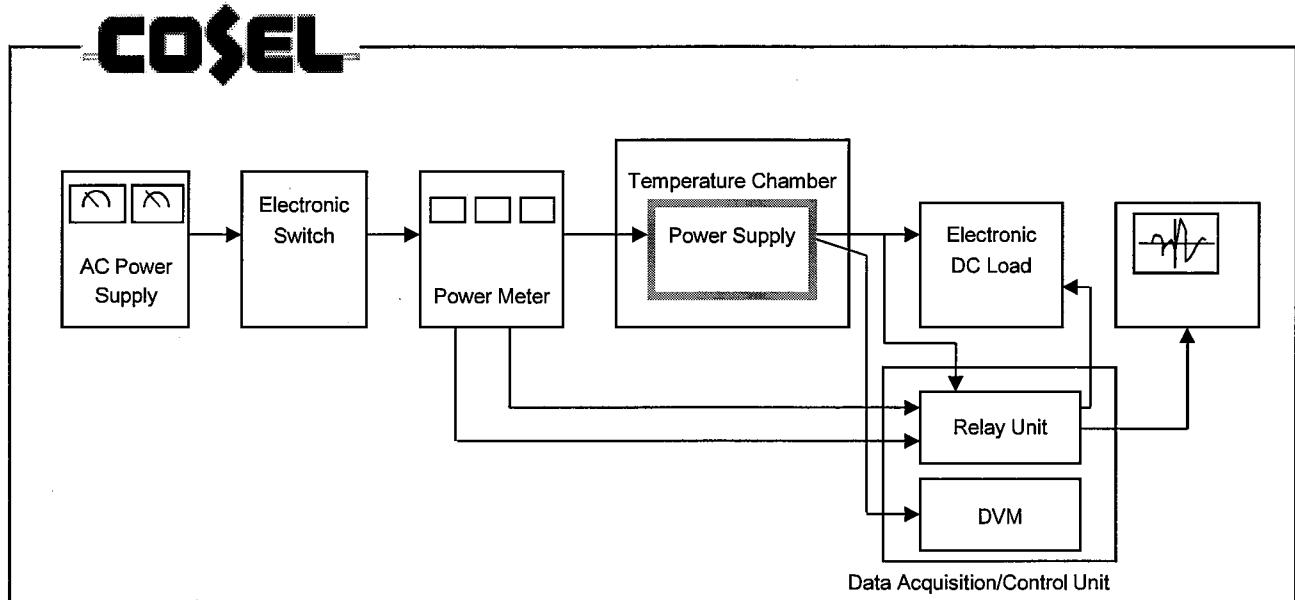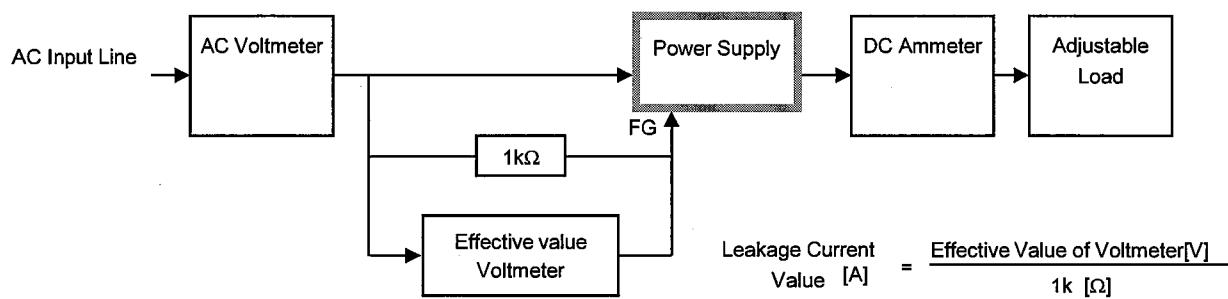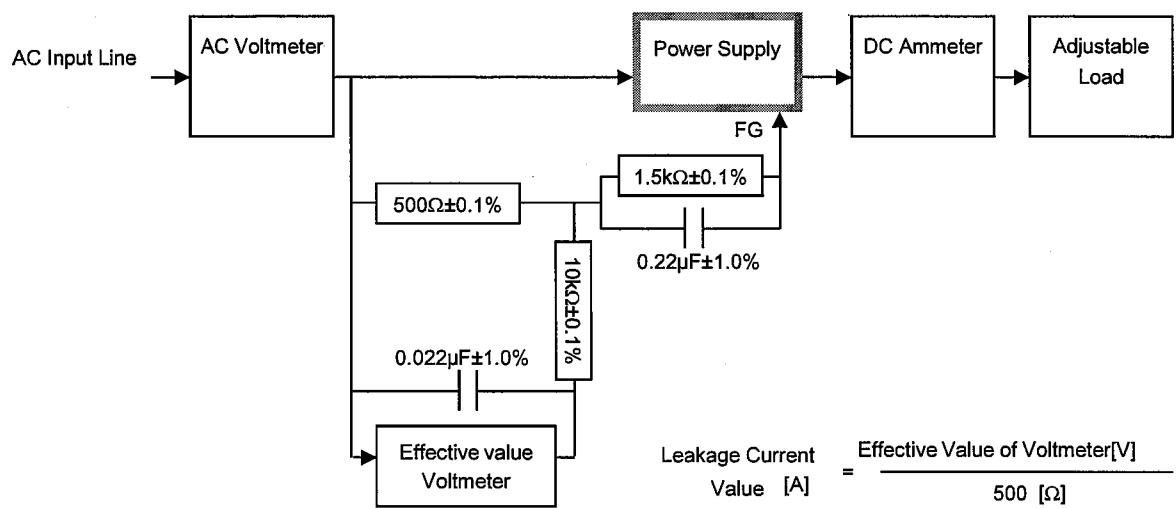
Figure B (IEC60950-1)

BC-10930
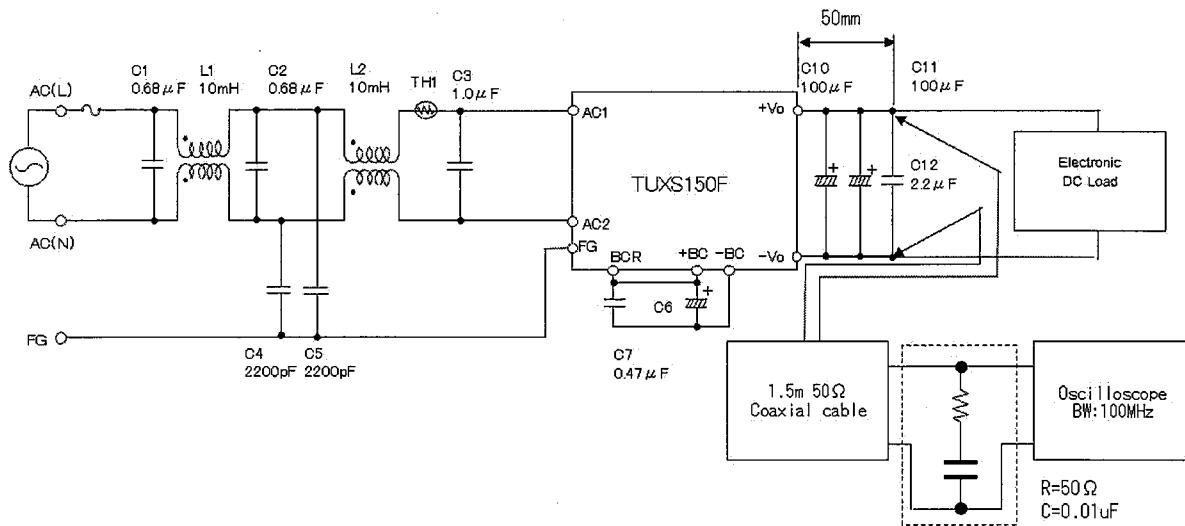
L1,L2 : SCR-040-0R8A100JH(NEC TOKIN)
TH1 : 12D2-15LCS(SEMITEC)
C1,C2 : LE684-MX(OKAYA)
C3 : LE105-MX(OKAYA)
C4,C5 : DE1E3KX222M(MURATA)
C6 : EKXJ421ELL151MM50S(Nippon Chemi-con)
C7 : AFS450V474K(OKAYA)
C10,C11 : PCR1J101MCL1GS(NICHICON)
C12 : GRM31CR72A225K(MURATA)

Figure C

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