

TEST DATA OF TUXS200F28

Regulated DC Power Supply
October 21, 2016

Approved by : Junichi Hatagishi
Junichi Hatagishi Design Manager

Prepared by : Hiroyuki Shoji
Hiroyuki Shoji Design Engineer

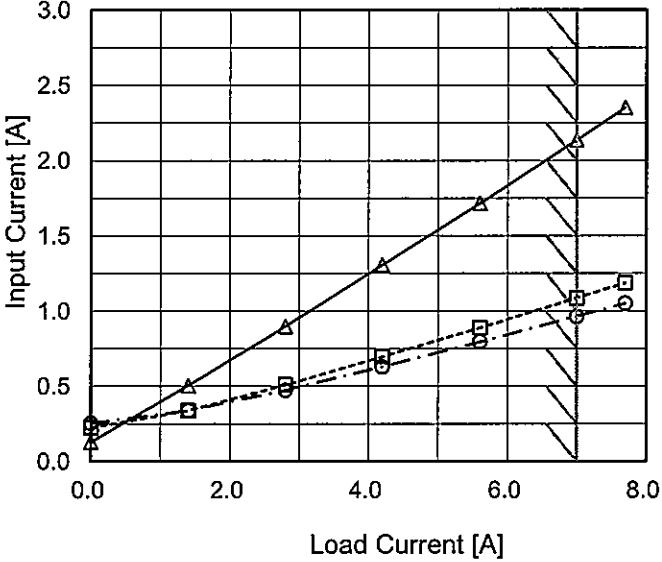
COSEL CO.,LTD.

CONTENTS

1.Input Current (by Load Current)	1
2.Input Power (by Load Current)	2
3.Efficiency (by Input Voltage)	3
4.Efficiency (by Load Current)	4
5.Power Factor (by Input Voltage)	5
6.Power Factor (by Load Current)	6
7.Inrush Current	7
8.Leakage Current	8
9.Line Regulation	9
10.Load Regulation	10
11.Dynamic Load Response	11
12.Ripple Voltage (by Load Current)	12
13.Ripple-Noise	13
14.Ripple Voltage (by Ambient Temperature)	14
15.Ambient Temperature Drift	15
16.Output Voltage Accuracy	16
17.Time Lapse Drift	17
18.Rise and Fall Time	18
19.Hold-Up Time	19
20.Instantaneous Interruption Compensation	20
21.Minimum Input Voltage for Regulated Output Voltage	21
22.Overcurrent Protection	22
23.Overshoot Protection	23
24.Figure of Testing Circuitry	24 25

(Final Page 25)

COSEL

Model	TUXS200F28																																																					
Item	Input Current (by Load Current)																																																					
Object	_____																																																					
1.Graph	—△— Input Volt. 100V - - -□--- Input Volt. 200V - - -○--- Input Volt. 230V																																																					
 <p>Note: Slanted line shows the range of the rated load current.</p>																																																						
Temperature 25°C Testing Circuitry Figure A																																																						
2.Values																																																						
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.128</td><td>0.224</td><td>0.254</td></tr> <tr><td>1.4</td><td>0.504</td><td>0.338</td><td>0.338</td></tr> <tr><td>2.8</td><td>0.899</td><td>0.510</td><td>0.475</td></tr> <tr><td>4.2</td><td>1.307</td><td>0.697</td><td>0.630</td></tr> <tr><td>5.6</td><td>1.716</td><td>0.889</td><td>0.795</td></tr> <tr><td>7.0</td><td>2.136</td><td>1.086</td><td>0.965</td></tr> <tr><td>7.7</td><td>2.351</td><td>1.187</td><td>1.051</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				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	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			

COSEL

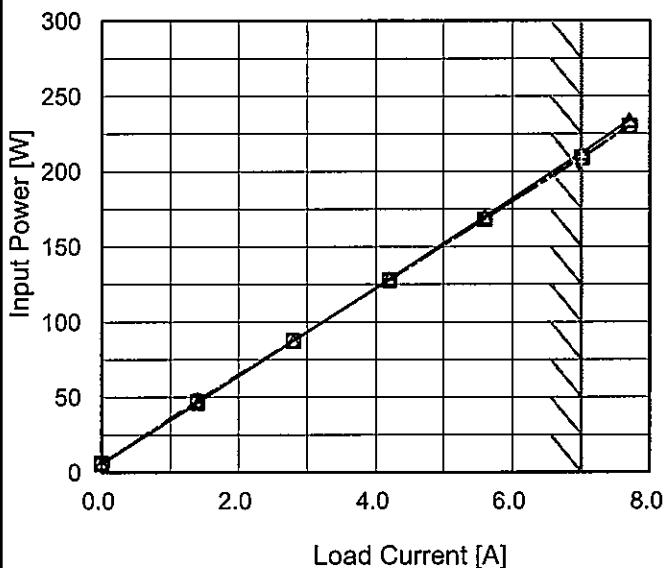
Model TUXS200F28

Item Input Power (by Load Current)

Object _____

1. Graph

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



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

 Temperature 25°C
 Testing Circuitry Figure A

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
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	TUXS200F28																																	
Item	Efficiency (by Input Voltage)	Temperature 25°C Testing Circuitry Figure A																																
Object	_____																																	
1.Graph																																		
<p>The graph plots Efficiency [%] on the y-axis (50 to 100) against Input Voltage [V] on the x-axis (50 to 300). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show efficiency increasing with input voltage. A slanted line on the graph indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>80</td><td>90.0</td><td>91.0</td></tr> <tr><td>85</td><td>90.2</td><td>91.4</td></tr> <tr><td>100</td><td>90.6</td><td>92.2</td></tr> <tr><td>120</td><td>90.9</td><td>92.9</td></tr> <tr><td>200</td><td>90.9</td><td>93.6</td></tr> <tr><td>230</td><td>90.6</td><td>93.6</td></tr> <tr><td>264</td><td>90.6</td><td>93.7</td></tr> <tr><td>280</td><td>90.7</td><td>93.7</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Input Voltage [V]	Efficiency Load 50% [%]	Efficiency 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	--	-	-		
Input Voltage [V]	Efficiency Load 50% [%]	Efficiency 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																																
--	-	-																																
2.Values																																		
<table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Efficiency [%]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>80</td><td>90.0</td><td>91.0</td></tr> <tr><td>85</td><td>90.2</td><td>91.4</td></tr> <tr><td>100</td><td>90.6</td><td>92.2</td></tr> <tr><td>120</td><td>90.9</td><td>92.9</td></tr> <tr><td>200</td><td>90.9</td><td>93.6</td></tr> <tr><td>230</td><td>90.6</td><td>93.6</td></tr> <tr><td>264</td><td>90.6</td><td>93.7</td></tr> <tr><td>280</td><td>90.7</td><td>93.7</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			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	--	-	-
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																																
--	-	-																																

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

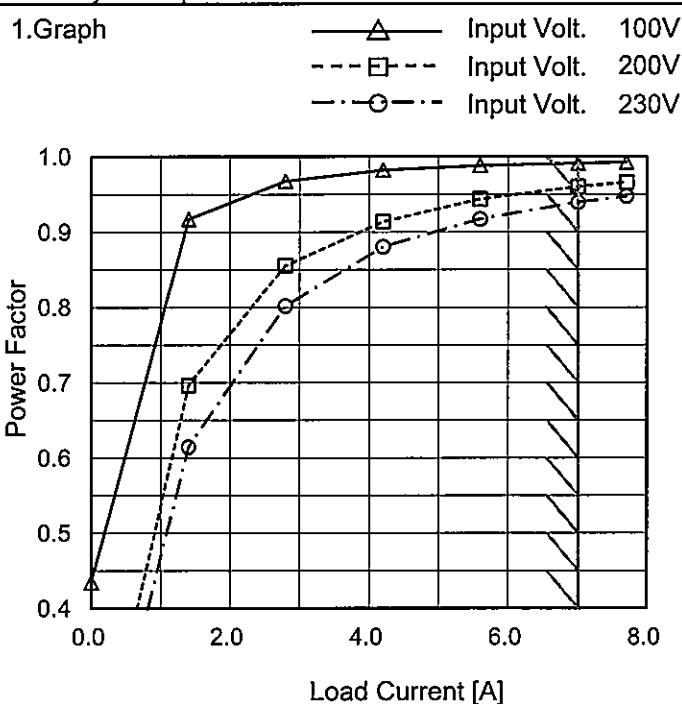
Model	TUXS200F28																																																					
Item	Efficiency (by Load Current)																																																					
Object	_____																																																					
1.Graph	<p>Efficiency [%]</p> <p>Load Current [A]</p> <p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 100V Input Volt. 200V Input Volt. 230V 																																																					
2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Efficiency [%]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr> <td>0.0</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>1.4</td><td>84.4</td><td>83.0</td><td>81.5</td></tr> <tr> <td>2.8</td><td>89.7</td><td>89.5</td><td>89.1</td></tr> <tr> <td>4.2</td><td>91.3</td><td>91.9</td><td>91.7</td></tr> <tr> <td>5.6</td><td>92.1</td><td>93.1</td><td>93.1</td></tr> <tr> <td>7.0</td><td>92.2</td><td>93.6</td><td>93.6</td></tr> <tr> <td>7.7</td><td>92.1</td><td>93.7</td><td>93.8</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			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	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
Note:	Slanted line shows the range of the rated load current.																																																					

COSSEL

Model	TUXS200F28																																	
Item	Power Factor (by Input Voltage)	Temperature 25°C Testing Circuitry Figure A																																
Object	—	—																																
1.Graph																																		
<p>--- □ --- Load 50% — △ — Load 100%</p> <p>Power Factor</p> <p>Input Voltage [V]</p>																																		
<p>Note: Slanted line shows the range of the rated input voltage.</p>																																		
2.Values																																		
<table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Power Factor</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>80</td><td>0.985</td><td>0.994</td> </tr> <tr> <td>85</td><td>0.984</td><td>0.993</td> </tr> <tr> <td>100</td><td>0.977</td><td>0.991</td> </tr> <tr> <td>120</td><td>0.966</td><td>0.987</td> </tr> <tr> <td>200</td><td>0.890</td><td>0.960</td> </tr> <tr> <td>230</td><td>0.847</td><td>0.940</td> </tr> <tr> <td>264</td><td>0.786</td><td>0.910</td> </tr> <tr> <td>280</td><td>0.445</td><td>0.609</td> </tr> <tr> <td>--</td><td>-</td><td>-</td> </tr> </tbody> </table>			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	--	-	-
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																																
--	-	-																																

COSSEL

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

Temperature 25°C
Testing Circuitry Figure A

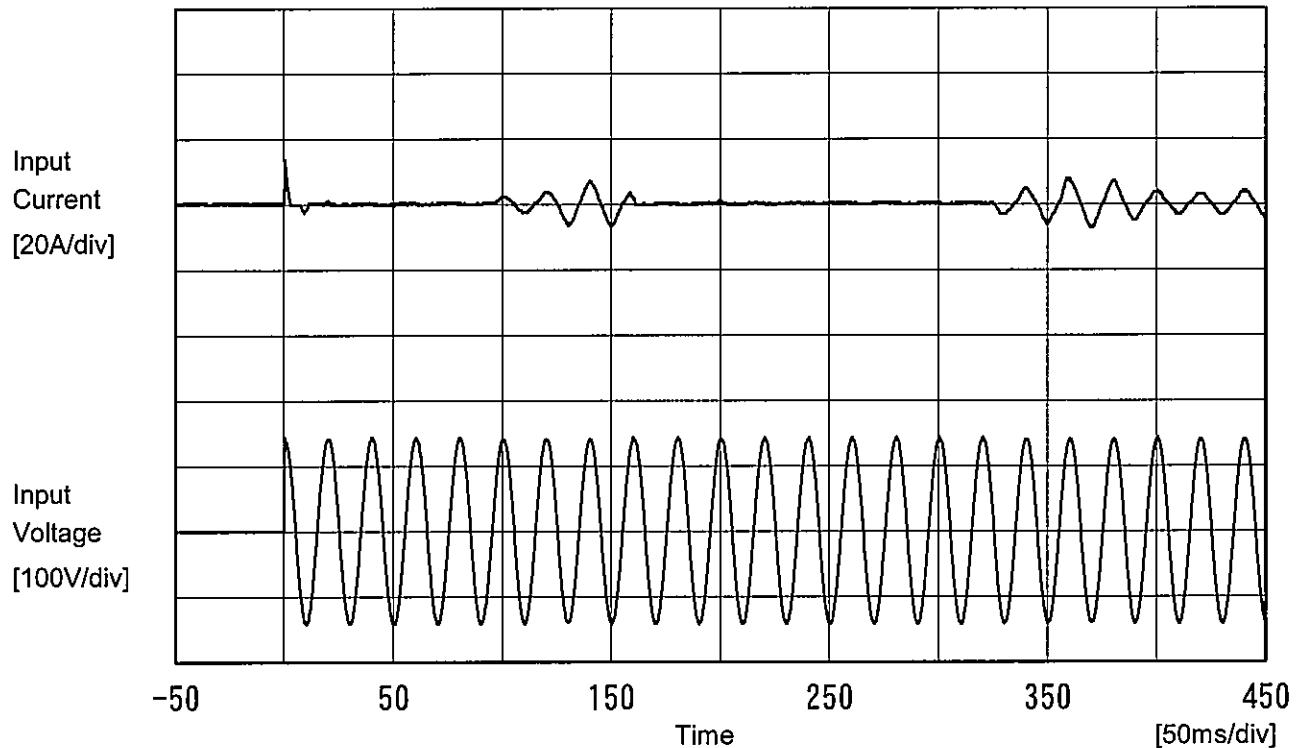
2.Values

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
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

COSEL

Model	TUXS200F28	Temperature Testing Circuitry Figure A
Item	Inrush Current	
Object	—	



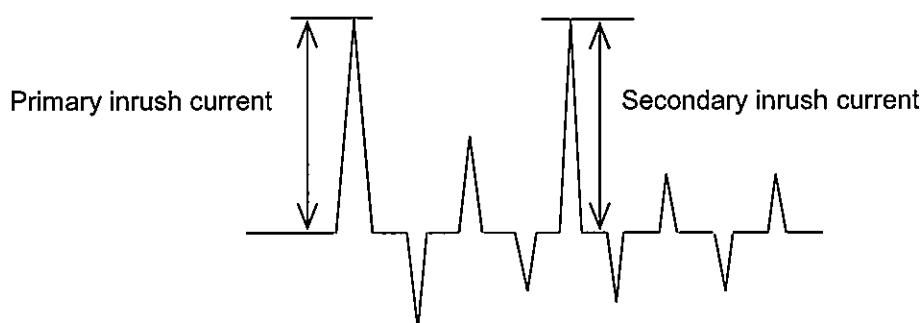
Input Voltage 100 V

Frequency 50 Hz

Load 100 %

Primary inrush current 15.3 A

Secondary inrush current 7.7 A





Model	TUXS200F28	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current		
Object	<hr/>		

1. Results

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

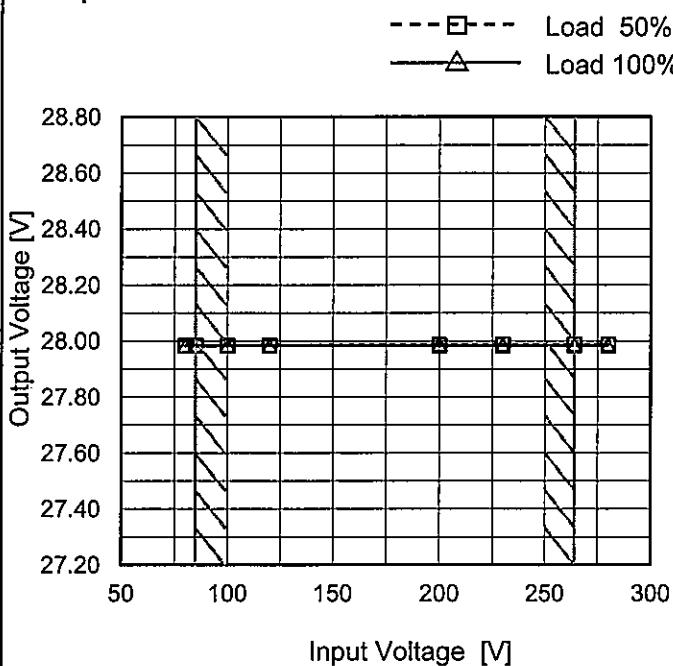
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	TXUS200F28
Item	Line Regulation
Object	+28V7A

Temperature 25°C
 Testing Circuitry Figure A

1. Graph



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
--	-	-

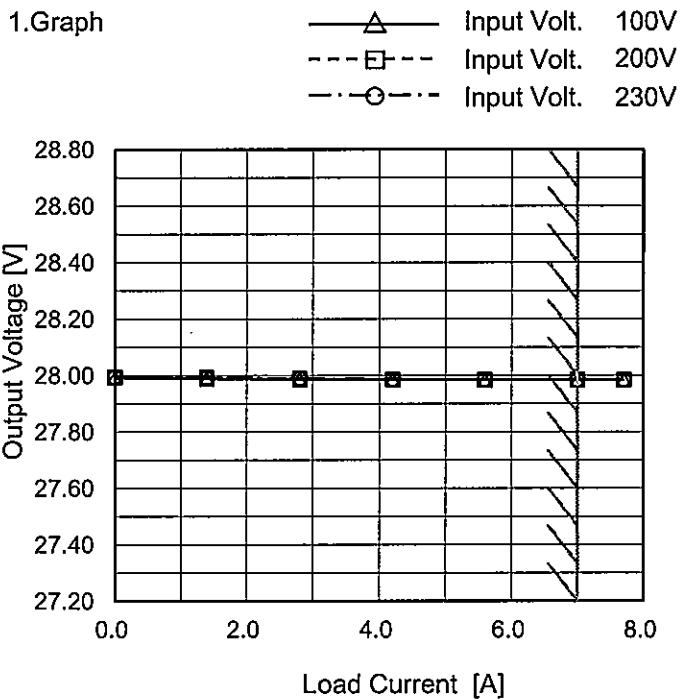
Note: Slanted line shows the range of the rated input voltage.

COSEL

Model TUXS200F28

Item Load Regulation

Object +28V7A

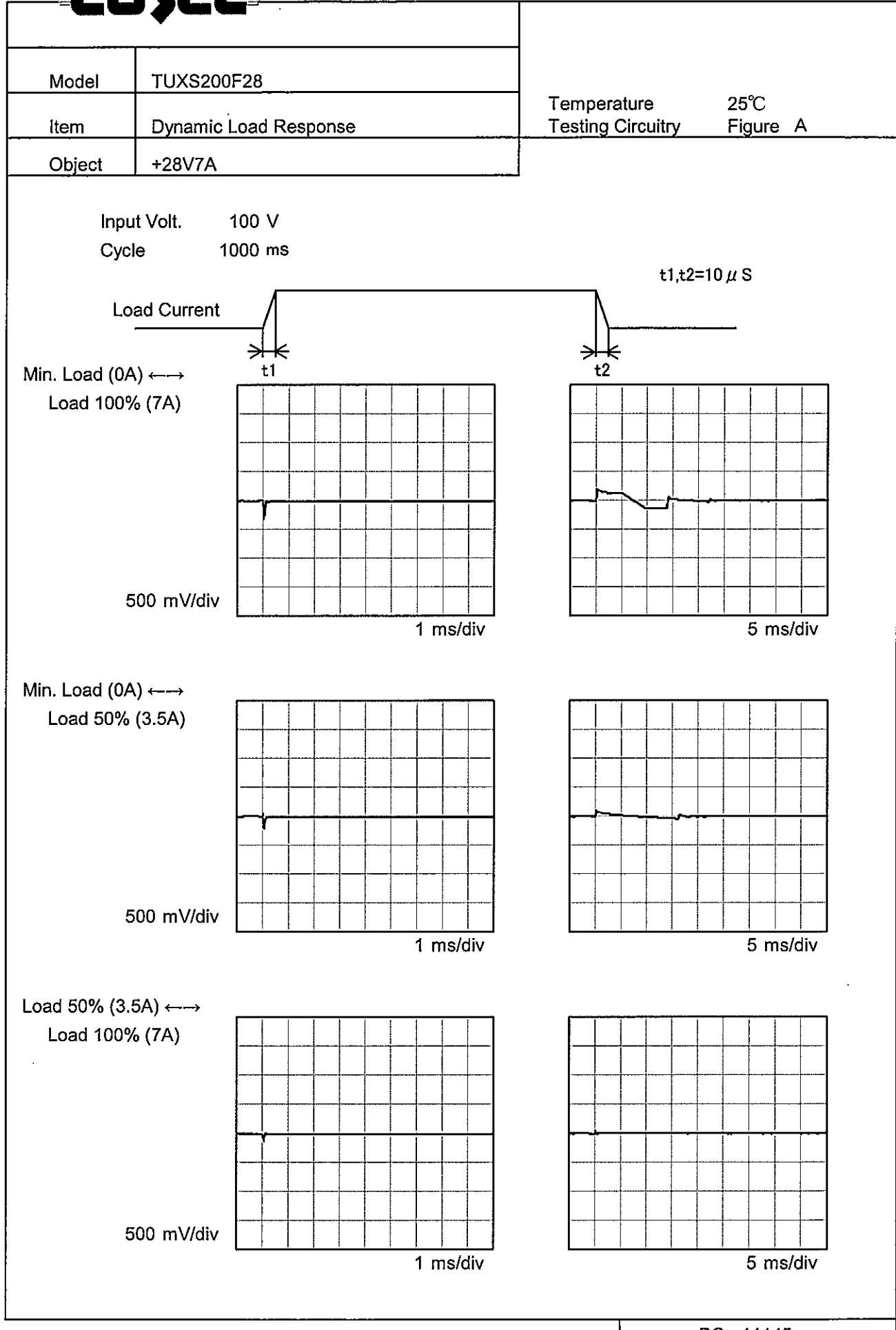


Note: Slanted line shows the range of the rated load current.

Temperature 25°C
Testing Circuitry Figure A

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
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

COSEL

Model	TUXS200F28																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure A																																						
Object	+28V7A																																							
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.																																								
Fig. Complex Ripple Wave Form																																								
2. Values																																								
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 100 [V]</th> <th>Input Volt. 200 [V]</th> </tr> </thead> <tbody> <tr> <td>0.0</td> <td>20</td> <td>28</td> </tr> <tr> <td>1.4</td> <td>16</td> <td>28</td> </tr> <tr> <td>2.8</td> <td>24</td> <td>35</td> </tr> <tr> <td>4.2</td> <td>19</td> <td>21</td> </tr> <tr> <td>5.6</td> <td>20</td> <td>24</td> </tr> <tr> <td>7.0</td> <td>24</td> <td>29</td> </tr> <tr> <td>7.7</td> <td>24</td> <td>29</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV]		Input Volt. 100 [V]	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	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																							
	Input Volt. 100 [V]	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

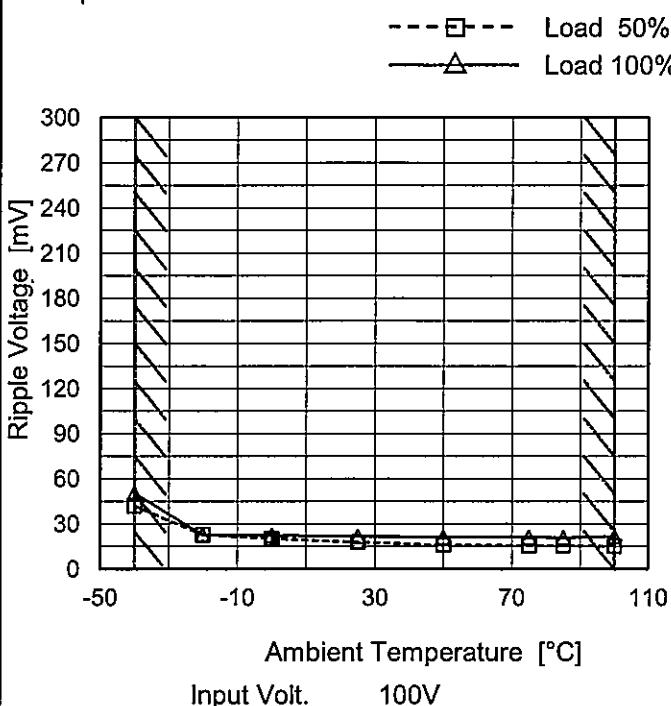
Model	TUXS200F28																																							
Item	Ripple-Noise																																							
Object	+28V7A																																							
1.Graph																																								
<p>—△— Input Volt. 100V -○--- Input Volt. 200V</p> <p>Ripple-Noise [mV]</p> <p>Load Current [A]</p>																																								
<p>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.</p>																																								
<p>T1: Due to AC Input Line T2: Due to Switching</p> <p>Ripple-Noise [mVp-p]</p> <p>T1</p> <p>T2</p>																																								
Fig. Complex Ripple Wave Form																																								
2.Values																																								
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 100 [V]</th> <th>Input Volt. 200 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>28</td><td>37</td></tr> <tr><td>1.4</td><td>22</td><td>36</td></tr> <tr><td>2.8</td><td>44</td><td>42</td></tr> <tr><td>4.2</td><td>31</td><td>28</td></tr> <tr><td>5.6</td><td>34</td><td>32</td></tr> <tr><td>7.0</td><td>45</td><td>39</td></tr> <tr><td>7.7</td><td>41</td><td>39</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			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	--	-	-	--	-	-	--	-	-	--	-	-
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																																						
--	-	-																																						
--	-	-																																						
--	-	-																																						
--	-	-																																						

COSEL

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

Testing Circuitry Figure A

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]	
	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
--	-	-
--	-	-
--	-	-

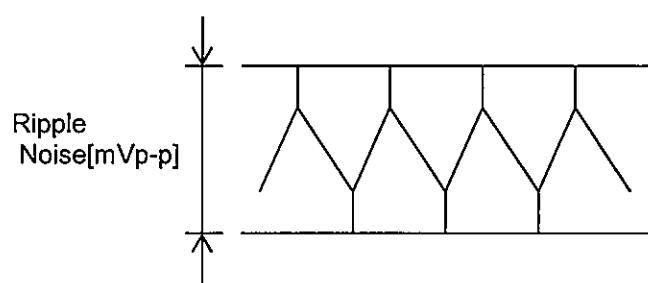


Fig.Complex Ripple Noise Wave Form

COSSEL

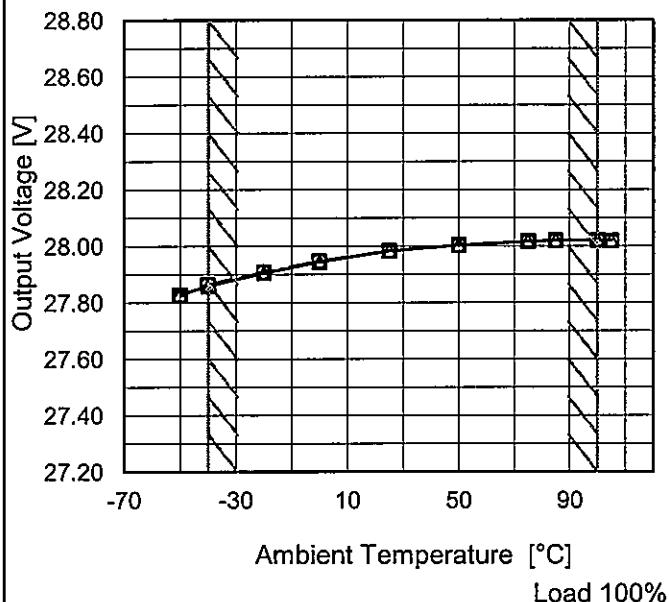
Model TUXS200F28

Item Ambient Temperature Drift

Object +28V7A

1.Graph

—△— Input Volt. 100V
 - - - □ - - Input Volt. 200V
 - - ○ - - Input Volt. 230V



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

Testing Circuitry Figure A

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
--	-	-	-



Model	TUXS200F28	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
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 = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

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

1.Graph

Output Voltage [V]

Time [H]

Input Volt. 100V
Load 100%

Temperature 25°C
Testing Circuitry Figure A

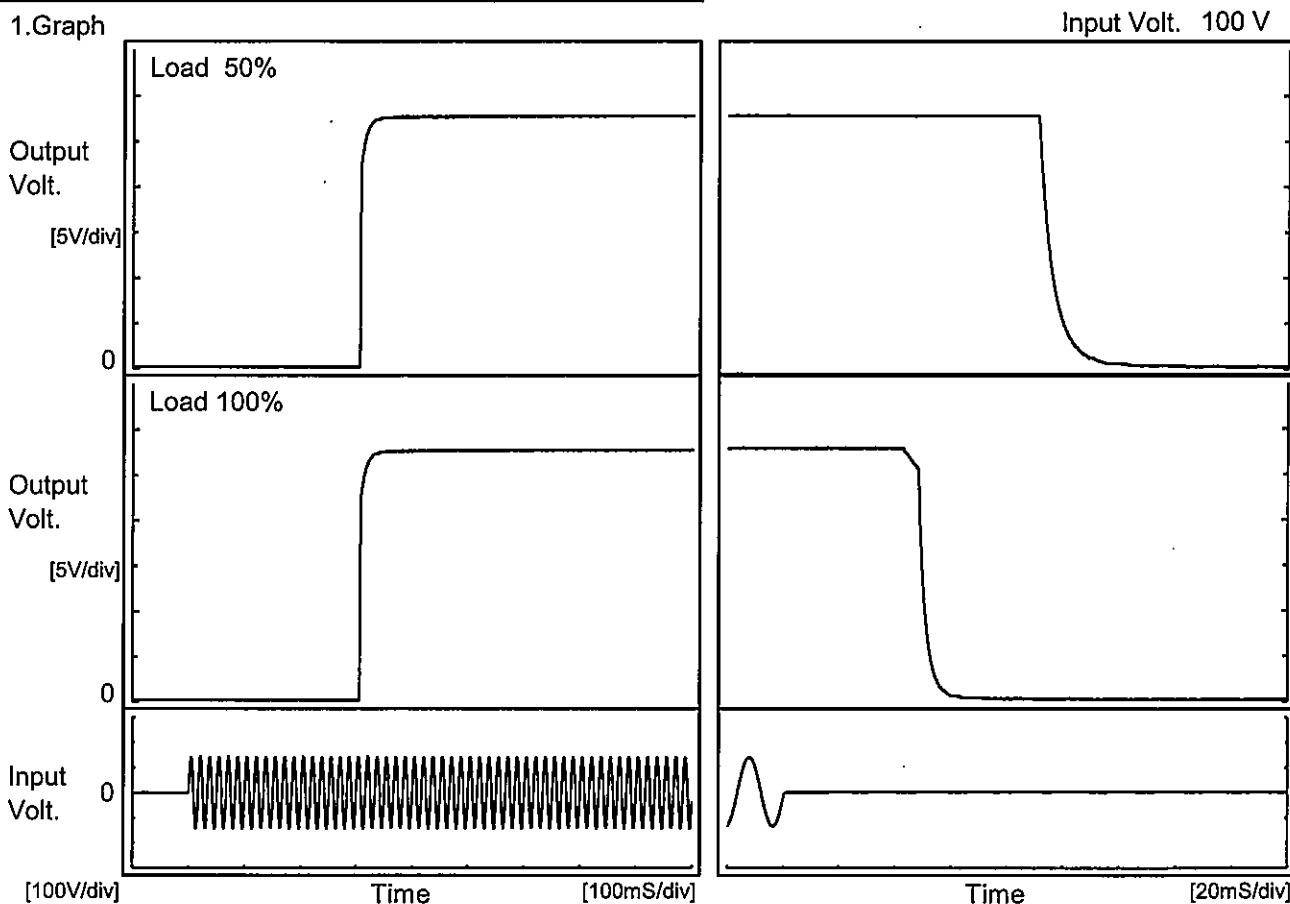
2.Values

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

COSCEL

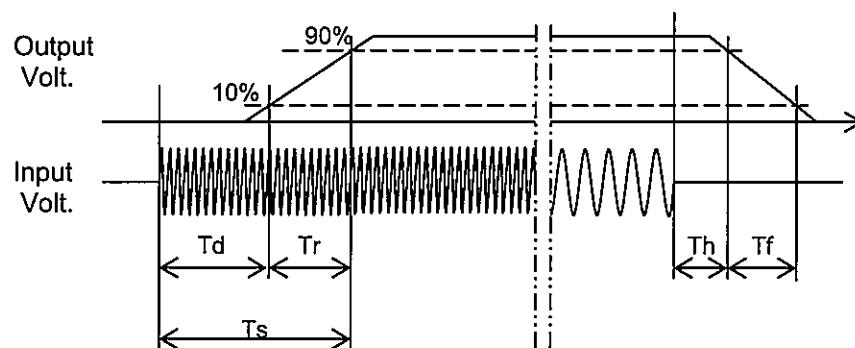
Model	TUXS200F28	Temperature Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+28V7A	

1. Graph



2. Values

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

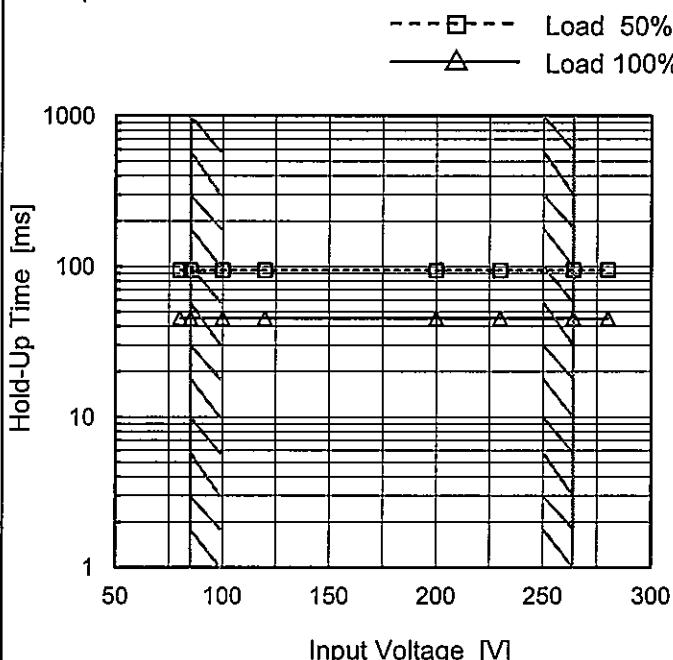


COSEL

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
--	-	-

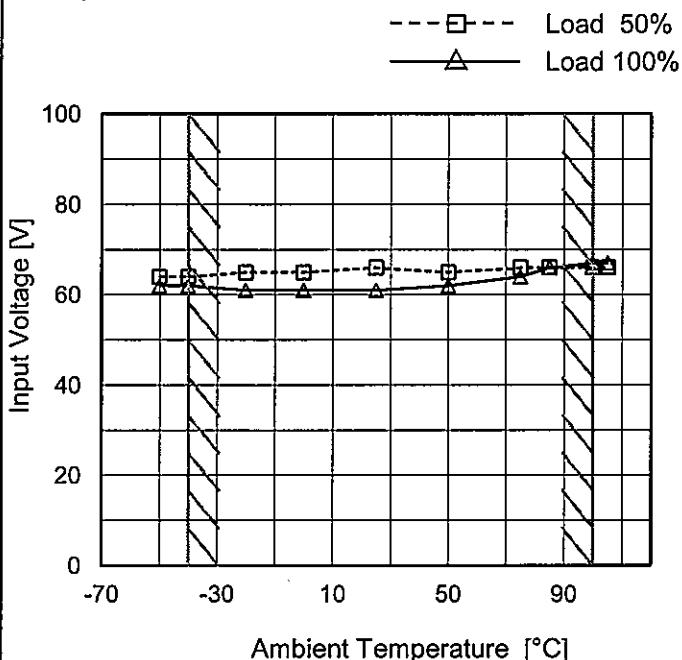
Model	TUXS200F28	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation	Testing Circuitry	Figure A																																																			
Object	+28V7A	2.Values																																																				
1.Graph	<p>Graph showing Instantaneous Compensation Time [ms] vs Load Current [A]. The Y-axis is logarithmic from 1 to 1000 ms. The X-axis ranges from 0.0 to 8.0 A. Three curves are plotted for Input Voltages: 100V (solid line with open triangle markers), 200V (dashed line with open square markers), and 230V (dash-dot line with open circle markers). A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>100[V] [ms]</th> <th>200[V] [ms]</th> <th>230[V] [ms]</th> </tr> </thead> <tbody> <tr><td>1.4</td><td>212</td><td>213</td><td>213</td></tr> <tr><td>2.8</td><td>112</td><td>113</td><td>113</td></tr> <tr><td>4.2</td><td>76</td><td>76</td><td>77</td></tr> <tr><td>5.6</td><td>56</td><td>57</td><td>57</td></tr> <tr><td>7.0</td><td>45</td><td>45</td><td>45</td></tr> <tr><td>7.7</td><td>37</td><td>37</td><td>37</td></tr> </tbody> </table>			Load Current [A]	100[V] [ms]	200[V] [ms]	230[V] [ms]	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																							
Load Current [A]	100[V] [ms]	200[V] [ms]	230[V] [ms]																																																			
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																																																			
		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Time [ms]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1.4</td><td>212</td><td>213</td><td>213</td></tr> <tr><td>2.8</td><td>112</td><td>113</td><td>113</td></tr> <tr><td>4.2</td><td>76</td><td>76</td><td>77</td></tr> <tr><td>5.6</td><td>56</td><td>57</td><td>57</td></tr> <tr><td>7.0</td><td>45</td><td>45</td><td>45</td></tr> <tr><td>7.7</td><td>37</td><td>37</td><td>37</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		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	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			

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

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

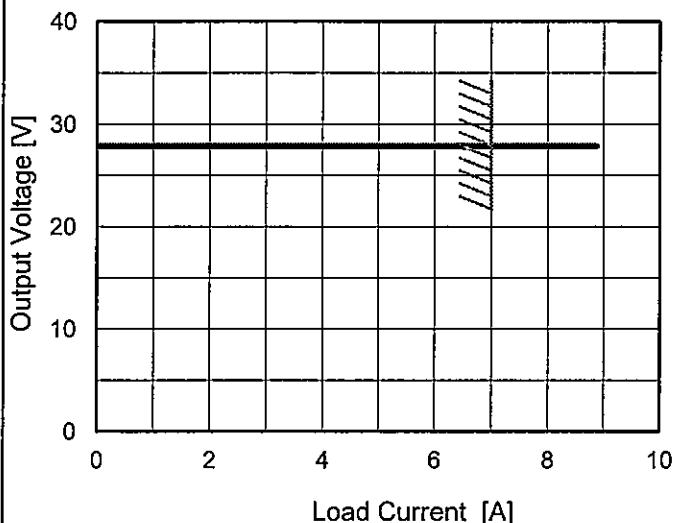
Model TUXS200F28

Item Overcurrent Protection

Object +28V7A

1. Graph

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



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

 Temperature 25°C
 Testing Circuitry Figure A

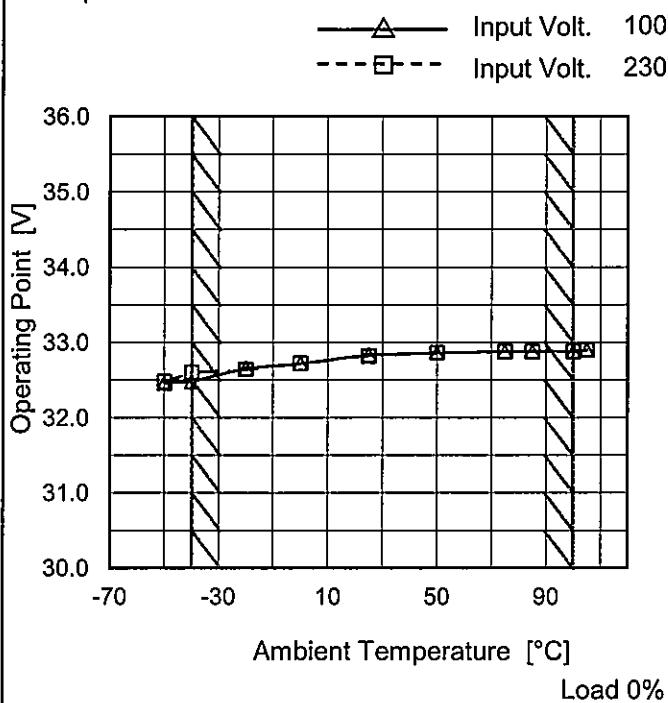
2. Values

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

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
...

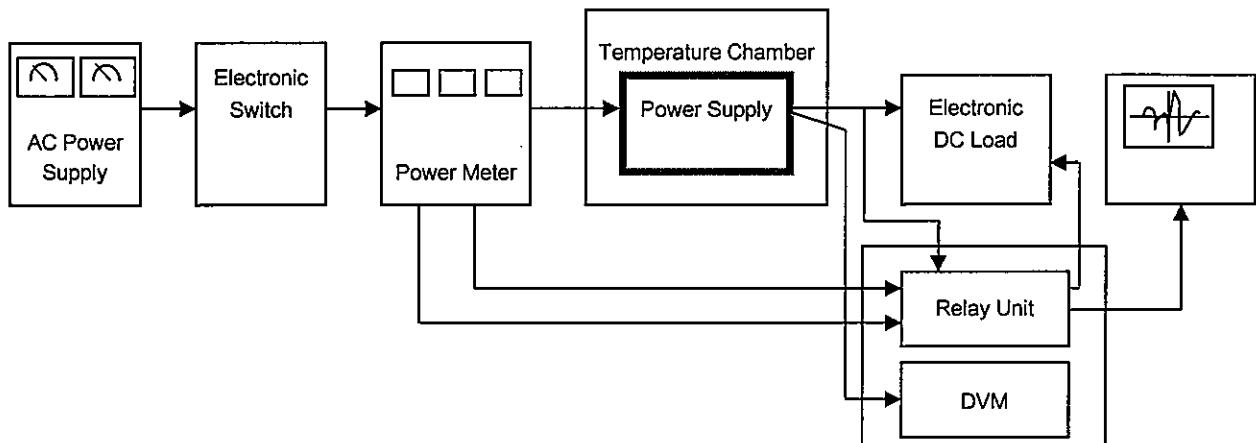


Figure A

Data Acquisition/Control Unit

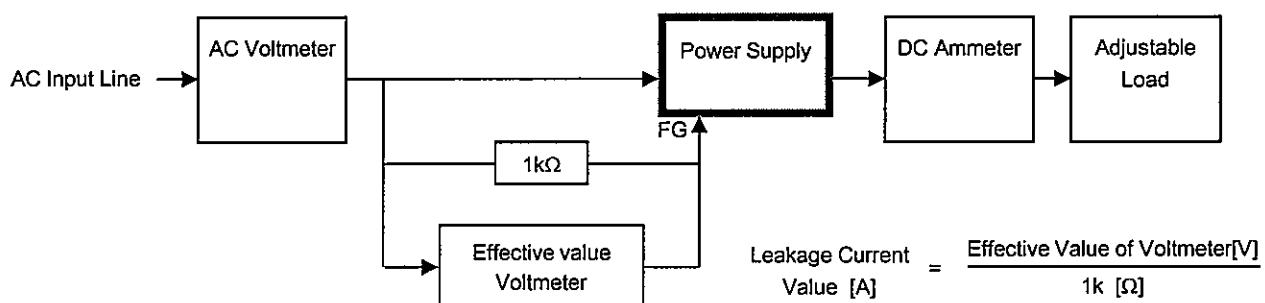


Figure B (DEN-AN)

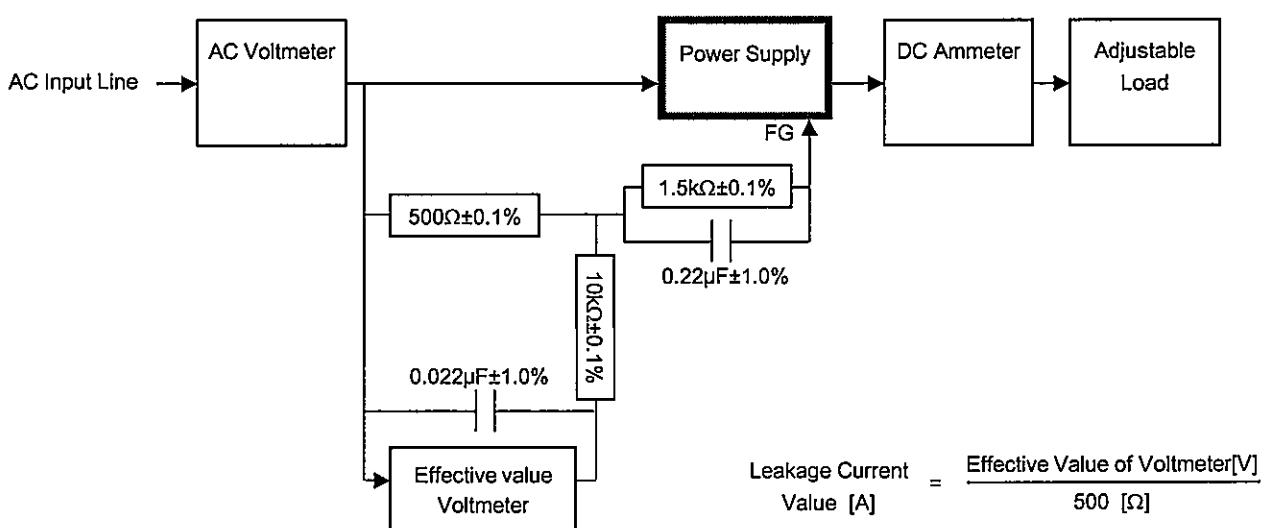
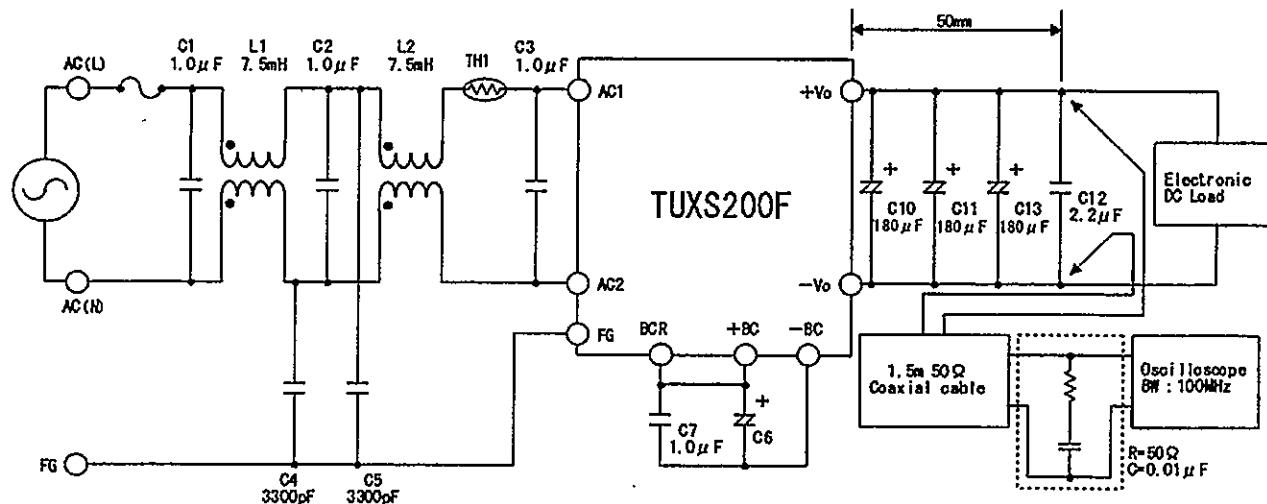


Figure B (IEC60950-1)

COSEL



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