



TEST DATA OF SCHAS/SCDA 10000T-48

Regulated DC Power Supply
May 28, 2009

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Katsuhiko Koizumi Design Manager

Prepared by : Koji Todo
Koji Todo Design Engineer

COSEL CO.,LTD.

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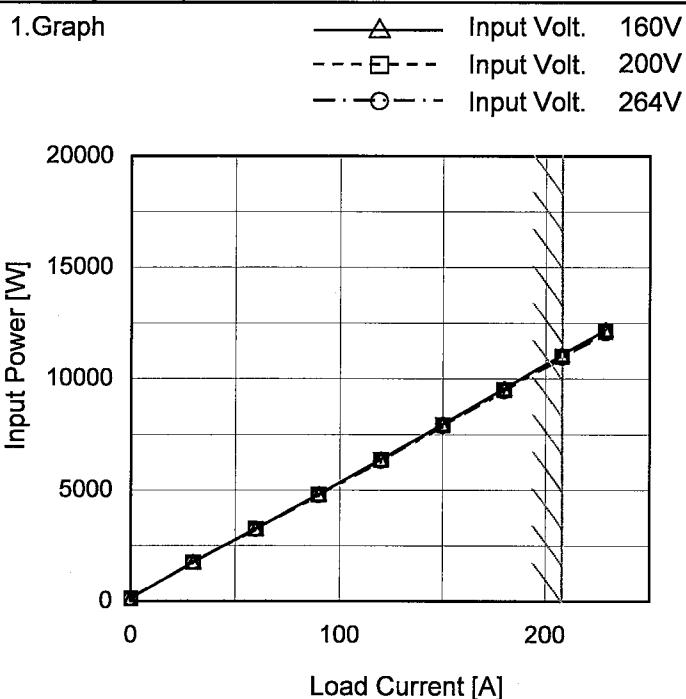
(Final Page 24)

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Model	SCHA/SCDA 10000T-48																																																					
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Model	SCHA/SCDA 10000T-48
Item	Input Power (by Load Current)
Object	_____



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

Temperature 25°C
Testing Circuitry Figure A

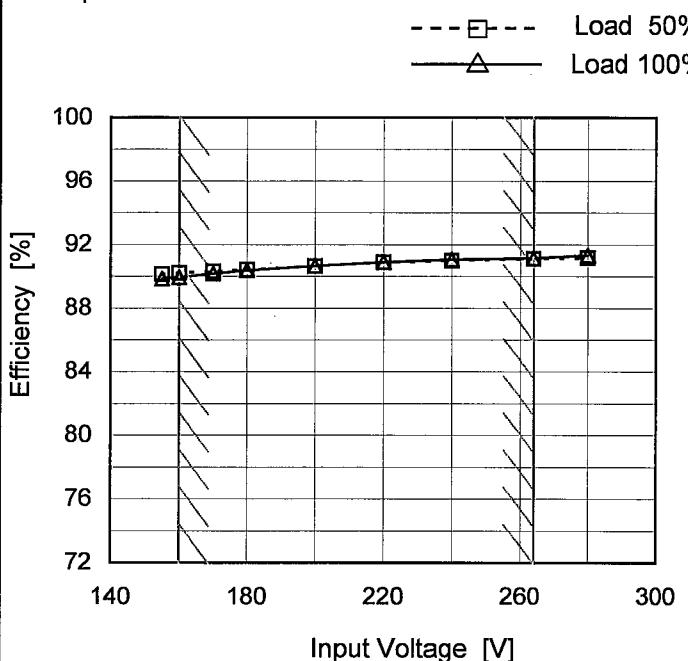
2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 160[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.0	113	115	104
30.0	1754	1741	1733
60.0	3265	3247	3231
90.0	4812	4784	4757
120.0	6382	6345	6300
150.0	7956	7910	7869
180.0	9553	9495	9444
208.0	11067	10992	10933
228.8	12195	12100	12037
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Model	SCHA/SCDA 10000T-48
Item	Efficiency (by Input Voltage)
Object	_____

1. Graph



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

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
155	90.1	89.8
160	90.2	89.9
170	90.3	90.2
180	90.4	90.4
200	90.6	90.6
220	90.9	90.9
240	91.0	91.0
264	91.1	91.1
280	91.2	91.3

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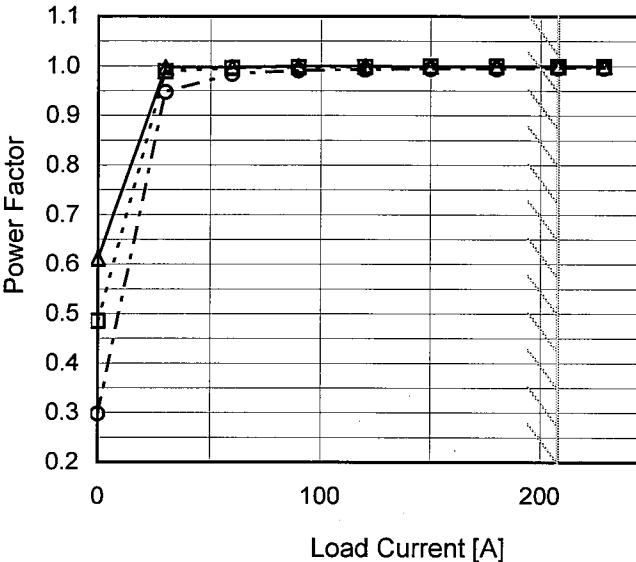
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Object	—																																
1. Graph		2. Values																															
<p>Graph showing Power Factor vs Input Voltage for SCHA/SCDA 10000T-48 at 25°C. The Y-axis is Power Factor (0.4 to 1.1) and the X-axis is Input Voltage [V] (140 to 300). Two data series are shown: Load 50% (dashed line with squares) and Load 100% (solid line with triangles). Both series show power factor values very close to 1.0 across the entire voltage range. A slanted line indicates the rated input voltage range.</p>																																	
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Note: Slanted line shows the range of the rated input voltage.

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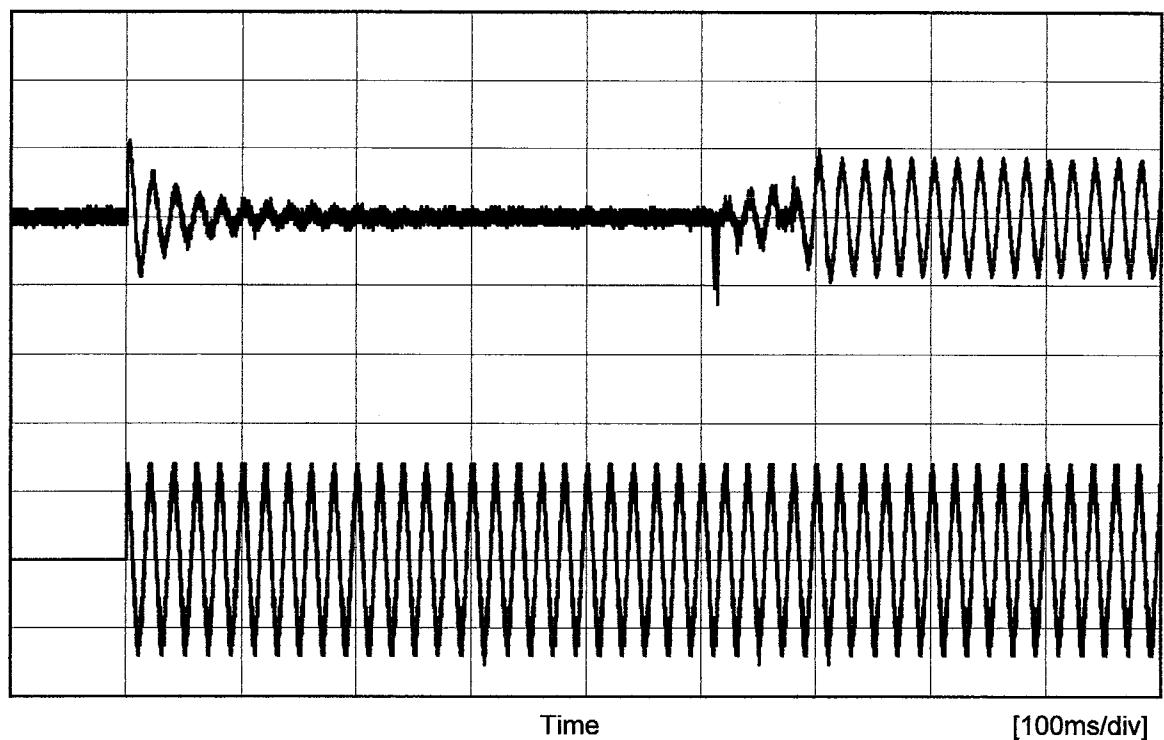
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Model	SCHA/SCDA 10000T-48
Item	Inrush Current
Object	_____

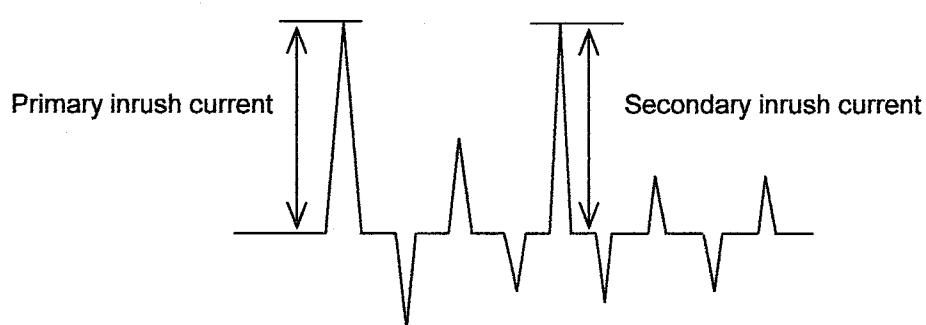
Temperature 25°C
Testing Circuitry Figure A

Input
Current
[50A/div]



Input Voltage 200 V
Frequency 50 Hz
Load 100 %

Primary inrush current 54.0 A
Secondary inrush current 66.0 A





Model	SCHA/SCDA 10000T-48	Temperature Testing Circuitry Figure B	25°C
Item	Leakage Current		Figure B
Object	_____		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DEN-AN	-	-	-
(B)IEC60950-1	-	-	-

Standards	Leakage Current [mA]		
	Input Volt. 200 [V]	Input Volt. 240 [V]	Input Volt. 264 [V]
(B)IEC60950-1	2.60	3.10	3.30

2. Condition

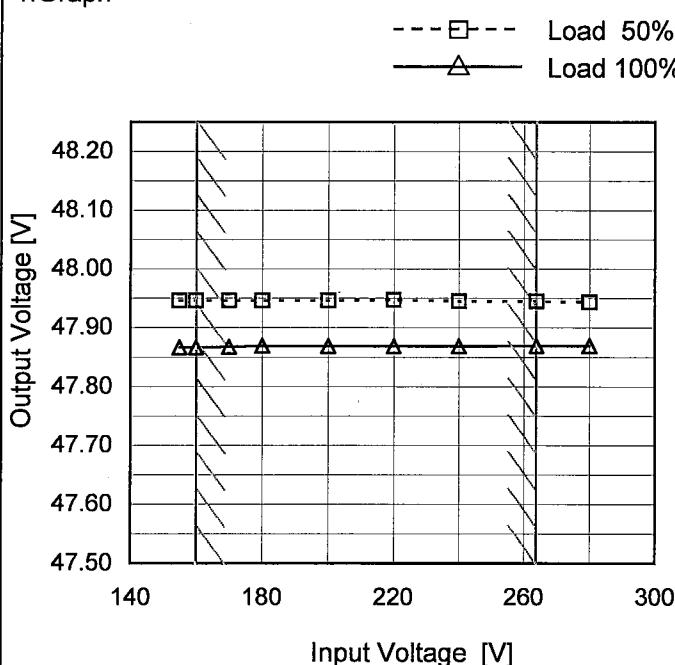
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

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Model	SCHA/SCDA 10000T-48
Item	Line Regulation
Object	+48V208A

Temperature 25°C
 Testing Circuitry Figure A

1.Graph



2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
155	47.946	47.866
160	47.946	47.866
170	47.946	47.867
180	47.946	47.869
200	47.946	47.868
220	47.947	47.868
240	47.945	47.868
264	47.945	47.869
280	47.943	47.869

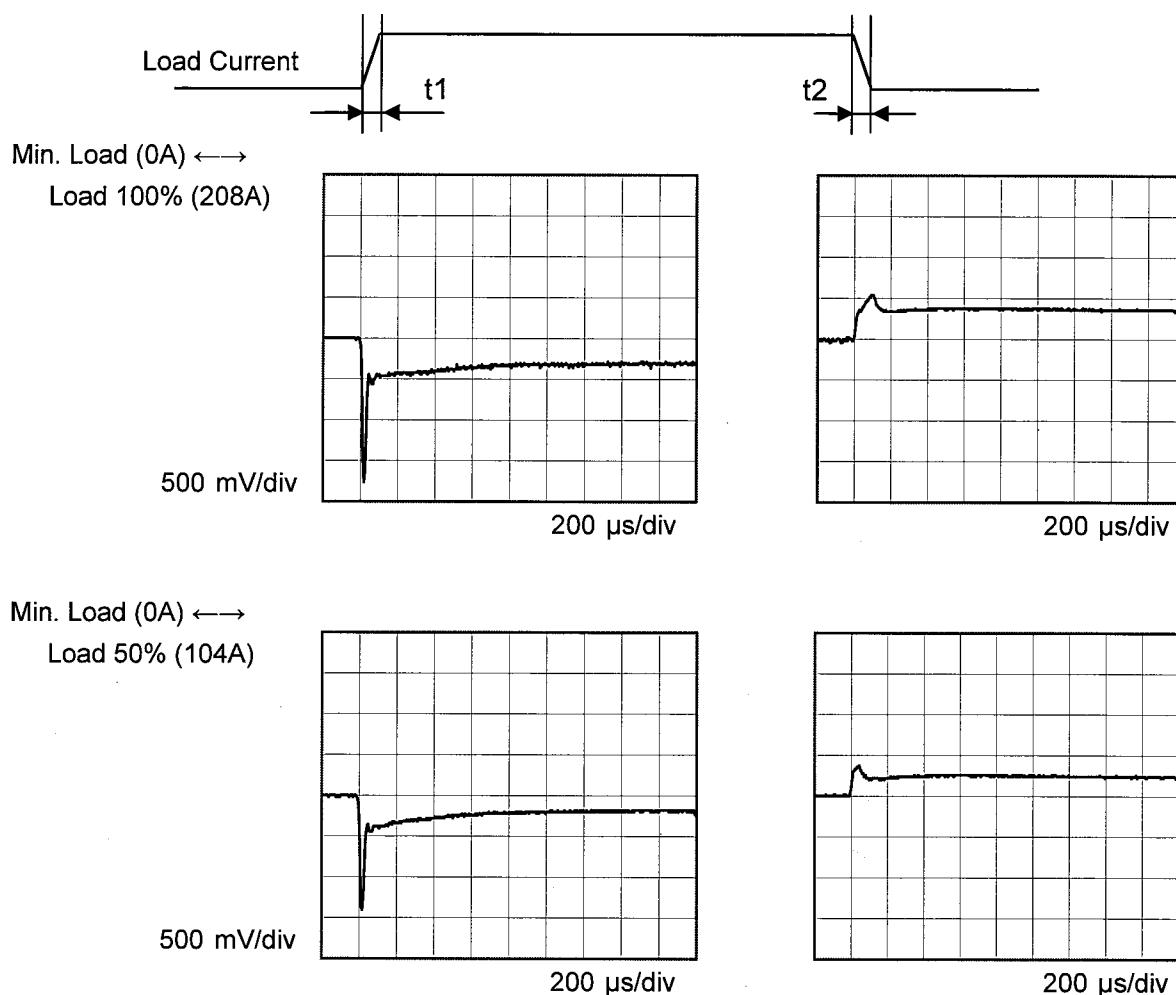
Note: Slanted line shows the range of the rated input voltage.

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1.Graph	<p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 160V Input Volt. 200V Input Volt. 264V <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (160V)</th> <th>Output Voltage [V] (200V)</th> <th>Output Voltage [V] (264V)</th> </tr> </thead> <tbody> <tr><td>0</td><td>48.048</td><td>48.046</td><td>48.045</td></tr> <tr><td>30.0</td><td>48.028</td><td>48.025</td><td>48.024</td></tr> <tr><td>60.0</td><td>48.003</td><td>48.001</td><td>48.000</td></tr> <tr><td>90.0</td><td>47.977</td><td>47.975</td><td>47.974</td></tr> <tr><td>120.0</td><td>47.944</td><td>47.942</td><td>47.941</td></tr> <tr><td>150.0</td><td>47.912</td><td>47.909</td><td>47.908</td></tr> <tr><td>180.0</td><td>47.877</td><td>47.875</td><td>47.874</td></tr> <tr><td>208.0</td><td>47.845</td><td>47.843</td><td>47.842</td></tr> <tr><td>228.8</td><td>47.821</td><td>47.819</td><td>47.818</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]	Output Voltage [V] (160V)	Output Voltage [V] (200V)	Output Voltage [V] (264V)	0	48.048	48.046	48.045	30.0	48.028	48.025	48.024	60.0	48.003	48.001	48.000	90.0	47.977	47.975	47.974	120.0	47.944	47.942	47.941	150.0	47.912	47.909	47.908	180.0	47.877	47.875	47.874	208.0	47.845	47.843	47.842	228.8	47.821	47.819	47.818	--	-	-	-	--	-	-	-			
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Note: Slanted line shows the range of the rated load current.																																																						

COSEL

Model	SCHA/SCDA 10000T-48
Item	Dynamic Load Response
Object	+48V208A

Temperature
Testing Circuitry 25°C
Figure AInput Volt. 200 V
Cycle 1000 msResponse. $t_1=t_2=100 \mu\text{s}$. Typ

COSEL

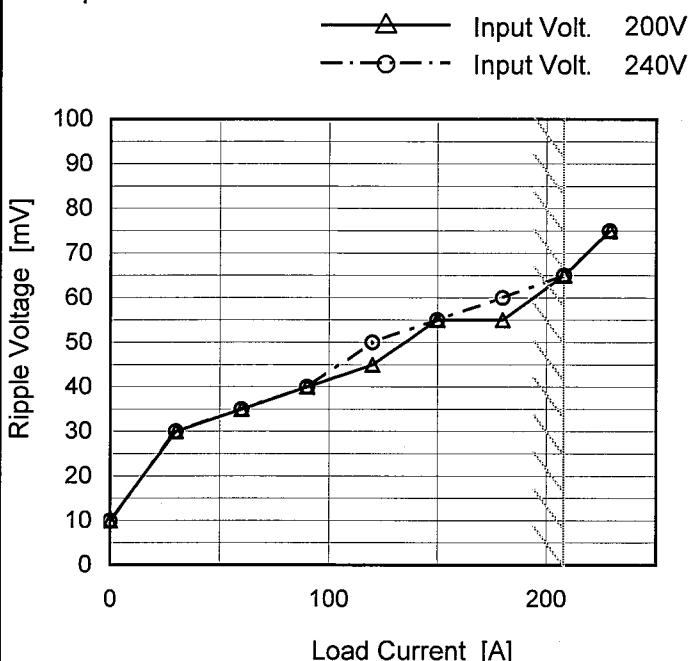
Model SCHA/SCDA 10000T-48

Item Ripple Voltage (by Load Current)

Object +48V208A

Temperature 25°C
Testing Circuitry Figure C

1. Graph



2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 200 [V]	Input Volt. 240 [V]
0.0	10	10
30.0	30	30
60.0	35	35
90.0	40	40
120.0	45	50
150.0	55	55
180.0	55	60
208.0	65	65
228.8	75	75
--	-	-
--	-	-

Measured by 500 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

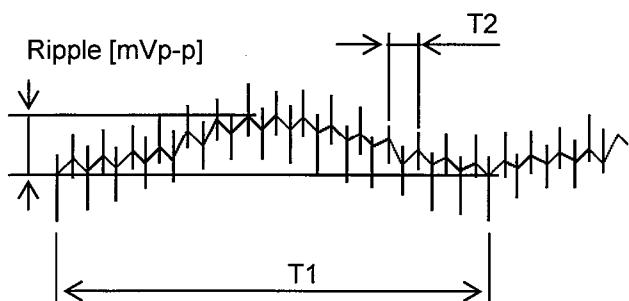


Fig. Complex Ripple Wave Form

COSEL

Model	SCHA/SCDA 10000T-48																																							
Item	Ripple-Noise	Temperature 25°C Testing Circuitry Figure C																																						
Object	+48V208A																																							
1. Graph																																								
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 120 mV, and the X-axis ranges from 0 to 200 A. Two curves are plotted: one for Input Volt. 200V (solid line with triangles) and one for Input Volt. 240V (dashed line with circles). Both curves show an increase in Ripple-Noise as Load Current increases. A slanted line indicates the range of the rated load current.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple-Noise [mV] (Input Volt. 200V)</th> <th>Ripple-Noise [mV] (Input Volt. 240V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>25</td><td>25</td></tr> <tr><td>30.0</td><td>45</td><td>45</td></tr> <tr><td>60.0</td><td>55</td><td>55</td></tr> <tr><td>90.0</td><td>65</td><td>60</td></tr> <tr><td>120.0</td><td>75</td><td>70</td></tr> <tr><td>150.0</td><td>85</td><td>80</td></tr> <tr><td>180.0</td><td>90</td><td>90</td></tr> <tr><td>208.0</td><td>105</td><td>105</td></tr> <tr><td>228.8</td><td>110</td><td>115</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. 200V)	Ripple-Noise [mV] (Input Volt. 240V)	0.0	25	25	30.0	45	45	60.0	55	55	90.0	65	60	120.0	75	70	150.0	85	80	180.0	90	90	208.0	105	105	228.8	110	115	--	-	-	--	-	-		
Load Current [A]	Ripple-Noise [mV] (Input Volt. 200V)	Ripple-Noise [mV] (Input Volt. 240V)																																						
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COSEL

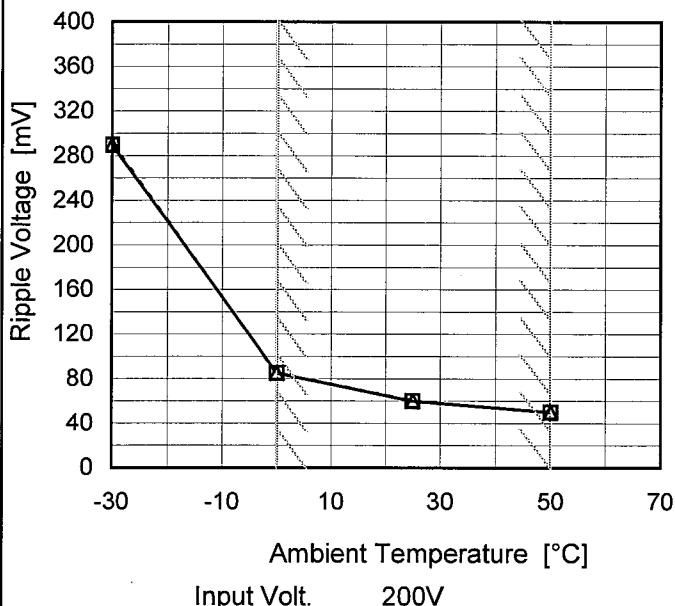
Model SCHA/SCDA 10000T-48

Item Ripple Voltage (by Ambient Temp.)

Object +48V208A

1. Graph

---□--- Load 50%
 —△— Load 100%



Input Volt. 200V

Measured by 500 MHz Oscilloscope.

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

Testing Circuitry Figure C

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-30	290	290
0	85	85
25	60	60
50	50	50
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

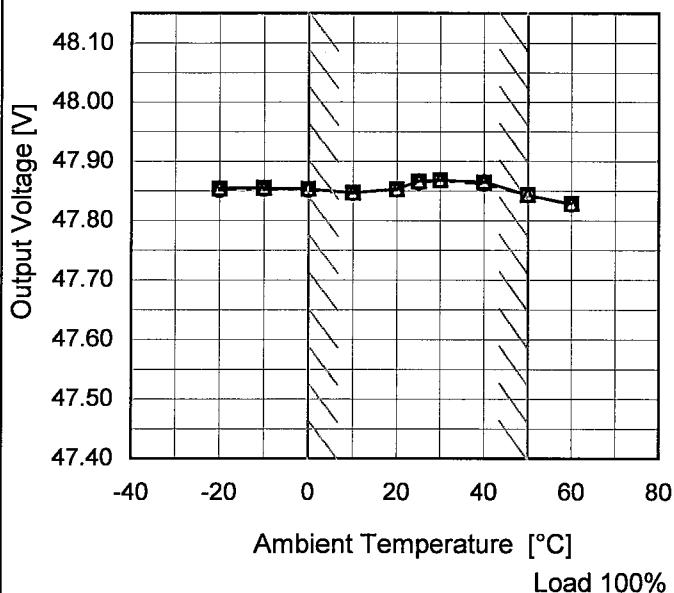
Model SCHA/SCDA 10000T-48

Item Ambient Temperature Drift

Object +48V208A

1. Graph

—△— Input Volt. 160V
 - - - □ - - Input Volt. 200V
 - - ○ - - Input Volt. 264V



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. 160[V]	Input Volt. 200[V]	Input Volt. 264[V]
-20	47.854	47.853	47.851
-10	47.854	47.855	47.852
0	47.853	47.853	47.851
10	47.847	47.846	47.845
20	47.853	47.852	47.851
25	47.866	47.865	47.863
30	47.868	47.868	47.867
40	47.866	47.864	47.861
50	47.843	47.843	47.843
60	47.828	47.828	47.827
--	-	-	-



Model	SCHA/SCDA 10000T-48	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+48V208A	

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 : 0 - 50°C

Input Voltage : 160 - 264V

Load Current : 0 - 208A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

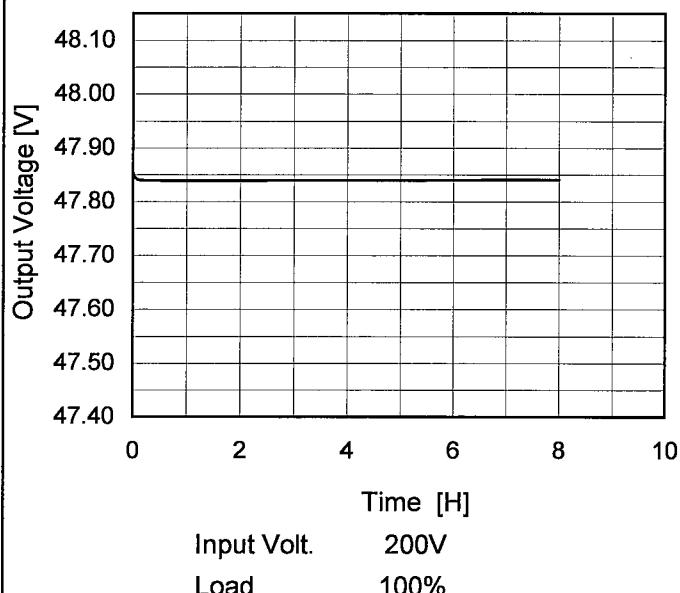
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	160	0	48.048	±103	±0.2
Minimum Voltage	25	264	208	47.842		

COSEL

Model	SCHA/SCDA 10000T-48
Item	Time Lapse Drift
Object	+48V208A

1.Graph


 Temperature 25°C
 Testing Circuitry Figure A

2.Values

Time since start [H]	Output Voltage [V]
0.0	47.854
0.5	47.839
1.0	47.839
2.0	47.839
3.0	47.839
4.0	47.839
5.0	47.839
6.0	47.840
7.0	47.840
8.0	47.840

COSEL

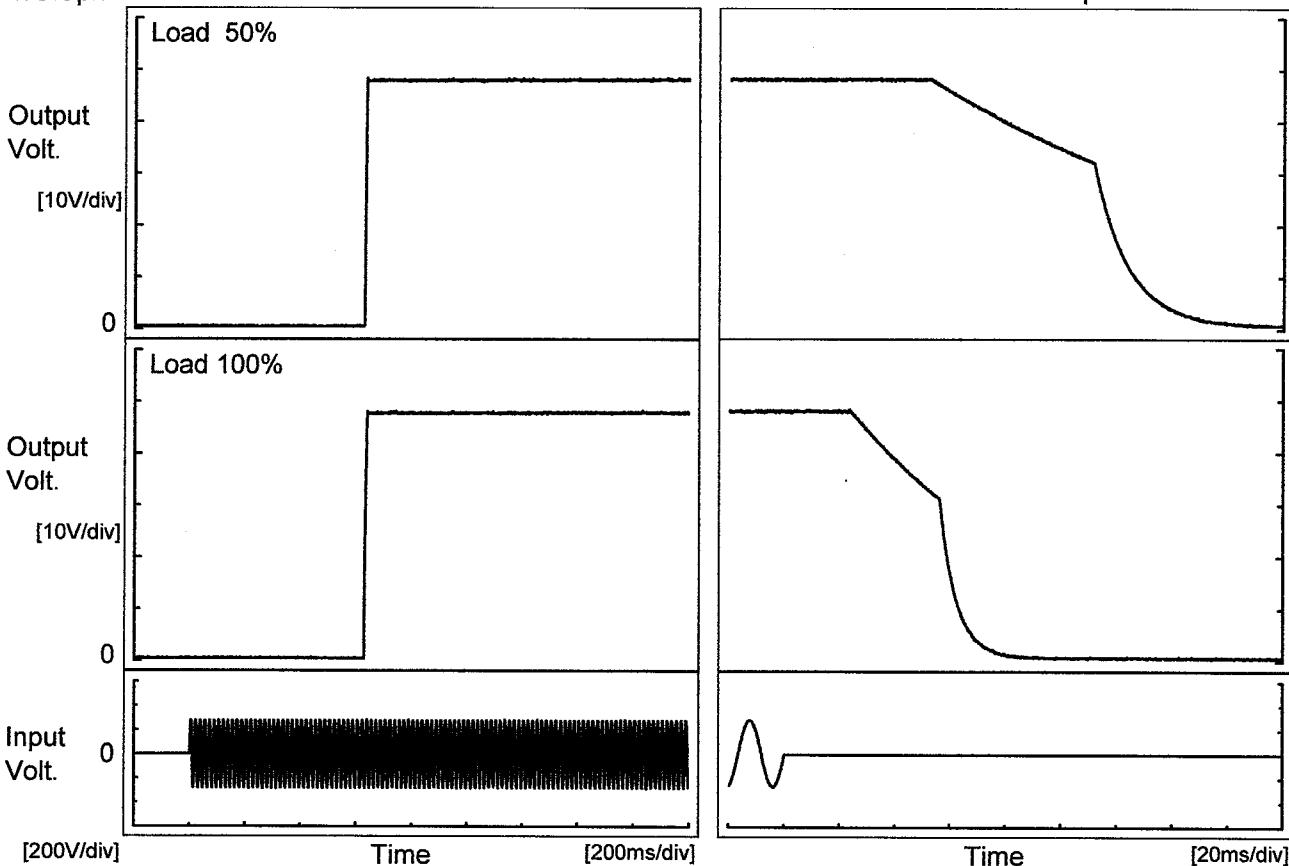
Model SCHA/SCDA 10000T-48

Item Rise and Fall Time

Object +48V208A

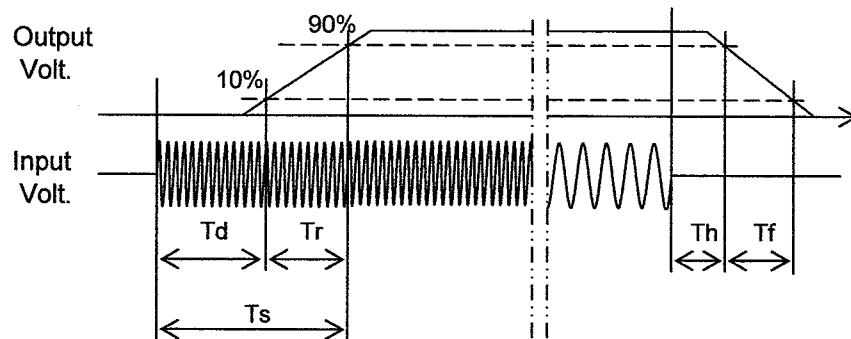
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		628.0	5.0	633.0	67.6	68.1	
100 %		628.0	8.0	636.0	31.3	36.7	

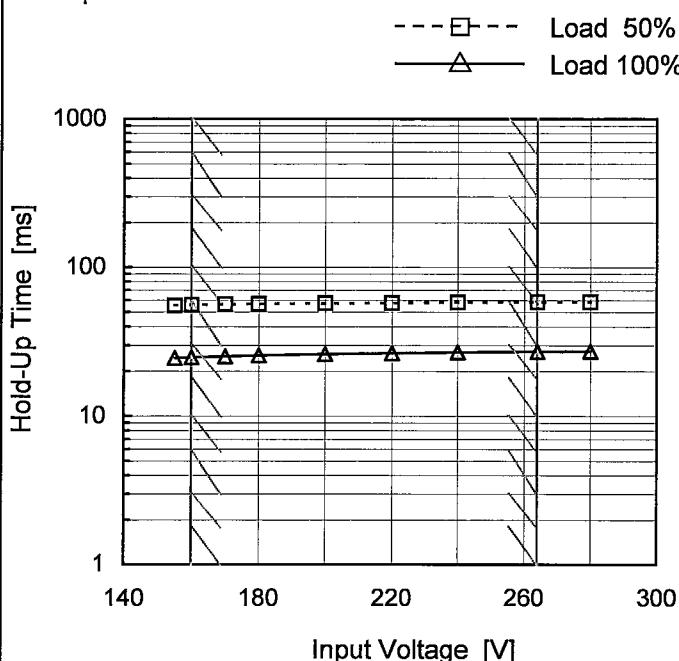


COSEL

Model	SCHA/SCDA 10000T-48
Item	Hold-Up Time
Object	+48V208A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
155	55	25
160	56	25
170	56	25
180	56	26
200	57	26
220	57	27
240	58	27
264	58	27
280	58	27

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.

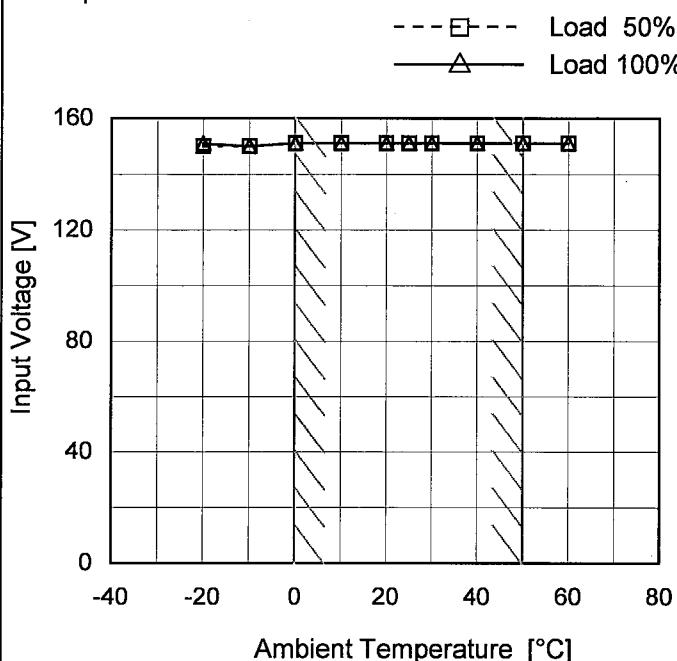
COSEL

Model	SCHA/SCDA 10000T-48																																																					
Item	Instantaneous Interruption Compensation																																																					
Object	+48V208A																																																					
1.Graph	<p>—△— Input Volt. 160V - - -□- - Input Volt. 200V - - ○ - - Input Volt. 264V</p>																																																					
Temperature	25°C																																																					
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Note:	Slanted line shows the range of the rated load current.																																																					

COSEL

Model	SCHA/SCDA 10000T-48
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V208A

1. Graph



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	150	151
-10	150	150
0	151	151
10	151	151
20	151	151
25	151	151
30	151	151
40	151	151
50	151	151
60	151	151
--	-	-

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

COSEL

Model	SCHA/SCDA 10000T-48																																																									
Item	Overcurrent Protection																																																									
Object	+48V208A																																																									
1.Graph	<p>The graph plots Output Voltage [V] on the Y-axis (0 to 60) against Load Current [A] on the X-axis (0 to 300). Three horizontal lines represent different input voltages: 160V (top), 200V (middle), and 264V (bottom). As load current increases from 0 to approximately 200A, the output voltage remains constant at these levels. At a load current of about 200A, a vertical line drops sharply to a lower level, and a slanted line extends from this point to the right, indicating the range of the rated load current where the output voltage begins to drop.</p>																																																									
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Note: Slanted line shows the range of the rated load current.

When the output voltage fell to less than 33.6V ,the unit shuts off the output by operating low voltage protection.



<table border="1"> <tr> <td>Model</td><td>SCHA/SCDA 10000T-48</td></tr> <tr> <td>Item</td><td>Ovvoltage Protection</td></tr> <tr> <td>Object</td><td>+48V208A</td></tr> </table> <p>1. Graph</p> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>	Model	SCHA/SCDA 10000T-48	Item	Ovvoltage Protection	Object	+48V208A	<p>Testing Circuitry Figure A</p> <p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Operating Point [V]</th></tr> <tr> <th>Input Volt. 160[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 264[V]</th></tr> </thead> <tbody> <tr> <td>-20</td><td>57.07</td><td>57.07</td><td>57.07</td></tr> <tr> <td>-10</td><td>57.07</td><td>57.07</td><td>57.07</td></tr> <tr> <td>0</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>10</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>20</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>25</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>30</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>40</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>50</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>60</td><td>57.06</td><td>57.06</td><td>57.06</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V]			Input Volt. 160[V]	Input Volt. 200[V]	Input Volt. 264[V]	-20	57.07	57.07	57.07	-10	57.07	57.07	57.07	0	57.06	57.06	57.06	10	57.06	57.06	57.06	20	57.06	57.06	57.06	25	57.06	57.06	57.06	30	57.06	57.06	57.06	40	57.06	57.06	57.06	50	57.06	57.06	57.06	60	57.06	57.06	57.06	--	-	-	-
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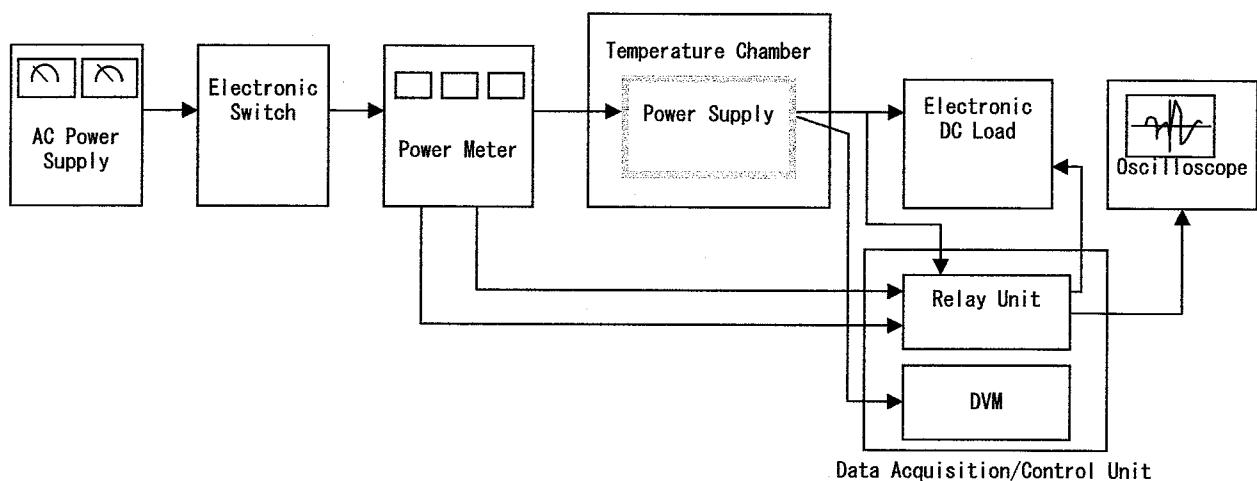


Figure A

