

TEST DATA OF SNTUNS50F05

Regulated DC Power Supply
July 23, 2013

Approved by : Takahiro Yoneda
Takahiro Yoneda Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

COSEL CO.,LTD.

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Model	SNTUNS50F05																																																					
Item	Input Current (by Load Current)	Temperature	25°C																																																			
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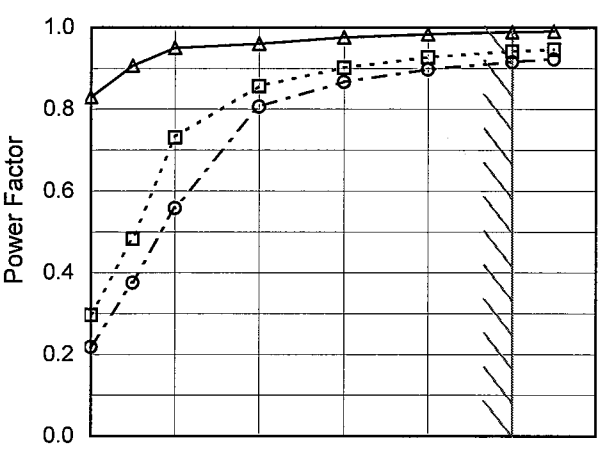
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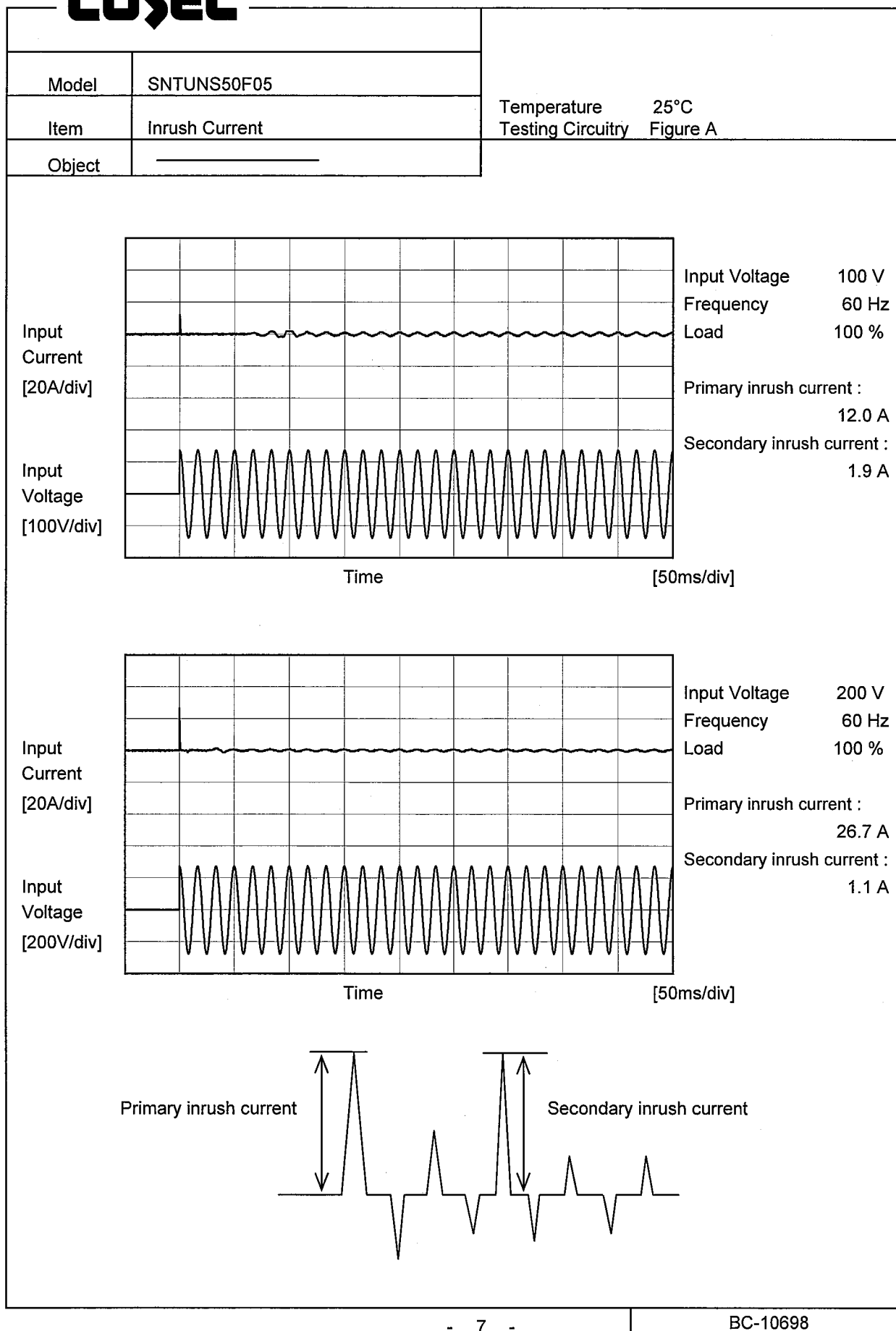
Model		SNTUNS50F05	
Item		Power Factor (by Input Voltage)	
Object			
1.Graph		2.Values	

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Model		SNTUNS50F05	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object		_____	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
IEC60950-1	Both phases	0.17	0.38	0.46	Operation
	One of phases	0.32	0.70	0.86	Stand by

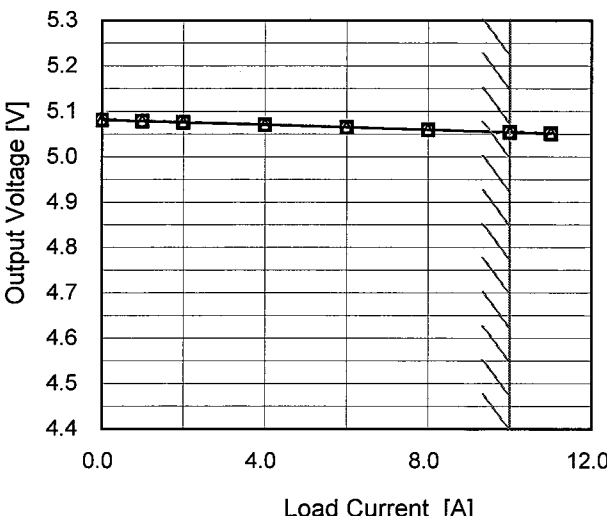
The value for "One of phases" is the reference value only.

2.Condition

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

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<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div>  <p>Note: Slanted line shows the range of the rated load current.</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>5.082</td><td>5.082</td><td>5.082</td></tr><tr><td>1.0</td><td>5.079</td><td>5.079</td><td>5.079</td></tr><tr><td>2.0</td><td>5.076</td><td>5.076</td><td>5.077</td></tr><tr><td>4.0</td><td>5.071</td><td>5.071</td><td>5.071</td></tr><tr><td>6.0</td><td>5.065</td><td>5.065</td><td>5.066</td></tr><tr><td>8.0</td><td>5.060</td><td>5.060</td><td>5.060</td></tr><tr><td>10.0</td><td>5.054</td><td>5.054</td><td>5.054</td></tr><tr><td>11.0</td><td>5.051</td><td>5.052</td><td>5.052</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></table>		Load Current [A]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	5.082	5.082	5.082	1.0	5.079	5.079	5.079	2.0	5.076	5.076	5.077	4.0	5.071	5.071	5.071	6.0	5.065	5.065	5.066	8.0	5.060	5.060	5.060	10.0	5.054	5.054	5.054	11.0	5.051	5.052	5.052	--	-	-	-	--	-	-	-	--	-	-	-
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COSEL

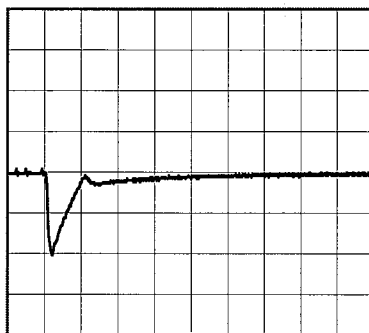
Model	SNTUNS50F05	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+5V10A	

Input Volt. 100 V
Cycle 1000 mS

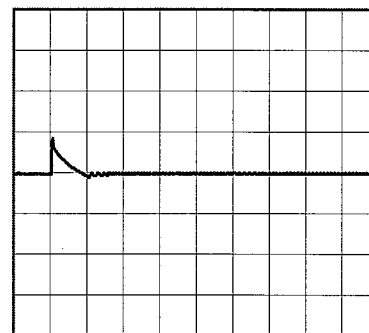
Load Current 10A/50 μ s

Min. Load (0A) \longleftrightarrow
Load 100% (10A)

200mV/div



500 μ s/div



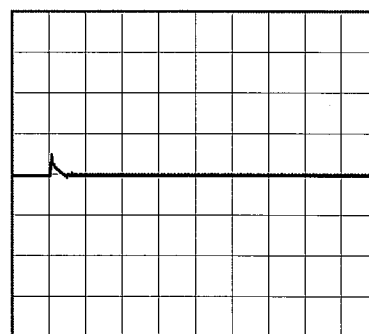
2ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (5A)

200mV/div



500 μ s/div



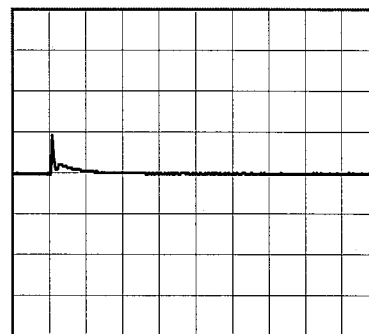
2ms/div

Load 10% (1A) \longleftrightarrow
Load 100% (10A)

200mV/div



500 μ s/div



2ms/div

COSEL

Model		SNTUNS50F05																																																																											
Item		Ripple Voltage (by Load Current)																																																																											
Object		+5V10A																																																																											
1.Graph		2.Values																																																																											
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>- -○ - -</div><div>Input Volt. 200V</div></div></div> <table><thead><tr><th>Load Current [A]</th><th>Input Volt. 100 [V]</th><th>Input Volt. 200 [V]</th></tr></thead><tbody><tr><td>0.0</td><td>48</td><td>48</td></tr><tr><td>1.0</td><td>24</td><td>26</td></tr><tr><td>2.0</td><td>24</td><td>26</td></tr><tr><td>4.0</td><td>28</td><td>30</td></tr><tr><td>6.0</td><td>20</td><td>20</td></tr><tr><td>8.0</td><td>28</td><td>30</td></tr><tr><td>10.0</td><td>42</td><td>44</td></tr><tr><td>11.0</td><td>52</td><td>52</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]	Input Volt. 100 [V]	Input Volt. 200 [V]	0.0	48	48	1.0	24	26	2.0	24	26	4.0	28	30	6.0	20	20	8.0	28	30	10.0	42	44	11.0	52	52	--	-	-	--	-	-	--	-	-	<table><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>48</td><td>48</td></tr><tr><td>1.0</td><td>24</td><td>26</td></tr><tr><td>2.0</td><td>24</td><td>26</td></tr><tr><td>4.0</td><td>28</td><td>30</td></tr><tr><td>6.0</td><td>20</td><td>20</td></tr><tr><td>8.0</td><td>28</td><td>30</td></tr><tr><td>10.0</td><td>42</td><td>44</td></tr><tr><td>11.0</td><td>52</td><td>52</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 Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0.0	48	48	1.0	24	26	2.0	24	26	4.0	28	30	6.0	20	20	8.0	28	30	10.0	42	44	11.0	52	52	--	-	-	--	-	-	--	-	-
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<p>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.</p>																																																																													
<div><div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div></div>																																																																													
Fig. Complex Ripple Wave Form																																																																													

COSEL

Model		SNTUNS50F05	
Item		Ripple-Noise	
Object		+5V10A	
1.Graph		2.Values	

<

Model	SNTUNS50F05																																							
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure C																																						
Object	+5V10A																																							
<p>1.Graph</p> <div style="text-align: right;"> ---□--- Input Volt. 100V —△— Input Volt. 200V </div> <p style="text-align: center;">Ambient Temperature [°C] Load 100 %</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</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>-30</td><td>110</td><td>120</td></tr> <tr><td>-20</td><td>80</td><td>80</td></tr> <tr><td>-10</td><td>65</td><td>65</td></tr> <tr><td>0</td><td>55</td><td>55</td></tr> <tr><td>25</td><td>40</td><td>40</td></tr> <tr><td>50</td><td>35</td><td>35</td></tr> <tr><td>70</td><td>35</td><td>35</td></tr> <tr><td>85</td><td>35</td><td>35</td></tr> <tr><td>95</td><td>30</td><td>35</td></tr> <tr><td>100</td><td>30</td><td>35</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	-30	110	120	-20	80	80	-10	65	65	0	55	55	25	40	40	50	35	35	70	35	35	85	35	35	95	30	35	100	30	35	--	-	-
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70	35	35																																						
85	35	35																																						
95	30	35																																						
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<p>Measured by 100 MHz Oscilloscope.</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																								

Testing Circuitry Figure A



Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	5.050	5.050	5.050
-20	5.050	5.050	5.050
-10	5.050	5.050	5.050
0	5.050	5.051	5.051
25	5.054	5.054	5.054
50	5.055	5.055	5.055
70	5.056	5.056	5.056
85	5.055	5.055	5.055
95	5.053	5.053	5.053
100	5.053	5.053	5.053
--	-	-	-

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		Testing Circuitry Figure A
Model	SNTUNS50F05	
Item	Output Voltage Accuracy	
Object	+5V10A	

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 : -20 - 95°C

Input Voltage : 85 - 264V

Load Current : 0 - 10A

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

* 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	70	85	0	5.087	±19	±0.4
Minimum Voltage	-10	85	10	5.050		

COSEL

Model		SNTUNS50F05																							
Item		Time Lapse Drift																							
Object		+5V10A																							
1.Graph		2.Values																							
<div><div><div>5.3</div><div>5.2</div><div>5.1</div><div>5.0</div><div>4.9</div><div>4.8</div><div>4.7</div><div>4.6</div><div>4.5</div><div>4.4</div></div><div><div>0.0</div><div>2.0</div><div>4.0</div><div>6.0</div><div>8.0</div><div>10.0</div></div><div><div>Output Voltage [V]</div><div>Time [H]</div></div><div><div>Input Volt.</div><div>100V</div></div><div><div>Load</div><div>100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.053</td></tr><tr><td>0.5</td><td>5.055</td></tr><tr><td>1.0</td><td>5.056</td></tr><tr><td>2.0</td><td>5.056</td></tr><tr><td>3.0</td><td>5.056</td></tr><tr><td>4.0</td><td>5.056</td></tr><tr><td>5.0</td><td>5.056</td></tr><tr><td>6.0</td><td>5.056</td></tr><tr><td>7.0</td><td>5.056</td></tr><tr><td>8.0</td><td>5.056</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.053	0.5	5.055	1.0	5.056	2.0	5.056	3.0	5.056	4.0	5.056	5.0	5.056	6.0	5.056	7.0	5.056	8.0	5.056
Time since start [H]	Output Voltage [V]																								
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8.0	5.056																								
* The characteristic of AC200V is equal.																									

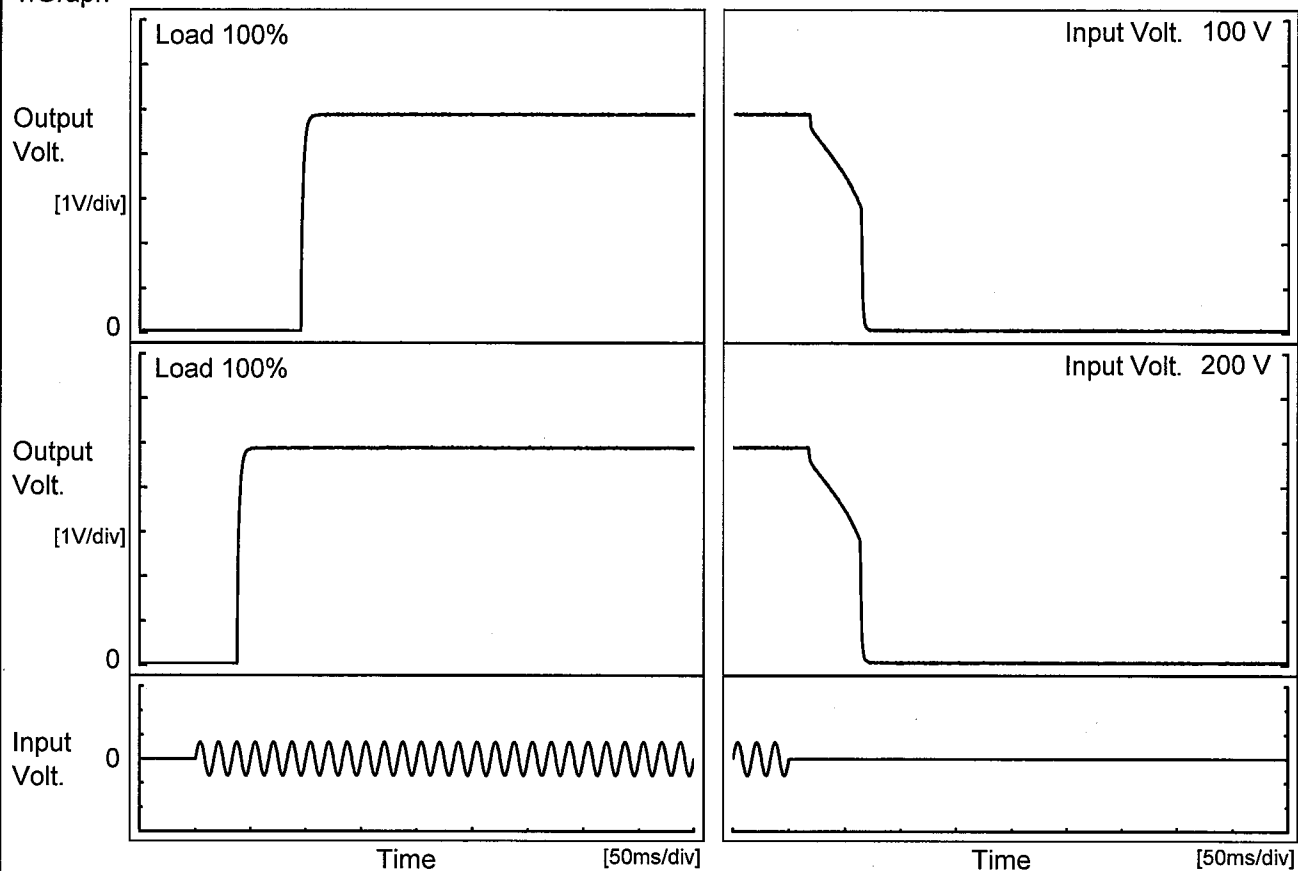
- 17 -

BC-10698

COSEL

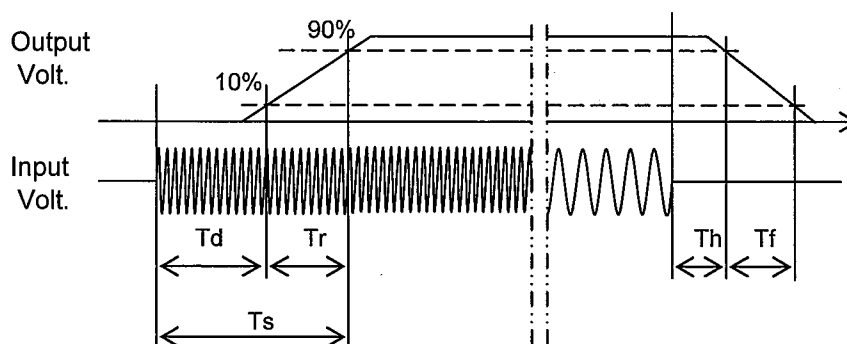
Model	SNTUNS50F05	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V10A		

1. Graph



2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	95.8	4.5	100.3	19.8	46.0
200 V	38.3	4.8	43.1	20.0	45.8



COSEL

Model		SNTUNS50F05	
Item		Hold-Up Time	
Object		+5V10A	
1.Graph		2.Values	

1000

100

10

1

50

100

150

200

250

300

Hold-Up Time [ms]

Input Voltage [V]

□

Load 50%

△

Load 100%

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.

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
80	90	18
85	90	18
100	90	18
120	90	18
200	90	18
230	89	18
264	89	18
280	89	18
--	-	-

- 19 -

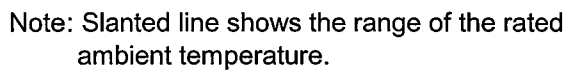
BC-10698

COSEL

Model		SNTUNS50F05		Temperature 25°C																																																				
Item		Instantaneous Interruption Compensation		Testing Circuitry Figure A																																																				
Object		+5V10A																																																						
1.Graph		<div><div><div>—△—</div>Input Volt. 100V</div><div><div>---□---</div>Input Volt. 200V</div><div><div>---○---</div>Input Volt. 230V</div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p>		2.Values																																																				
		<table><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><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.0</td><td>406</td><td>404</td><td>402</td></tr><tr><td>2.0</td><td>220</td><td>219</td><td>218</td></tr><tr><td>4.0</td><td>115</td><td>115</td><td>115</td></tr><tr><td>6.0</td><td>71</td><td>71</td><td>71</td></tr><tr><td>8.0</td><td>40</td><td>40</td><td>40</td></tr><tr><td>10.0</td><td>19</td><td>19</td><td>19</td></tr><tr><td>11.0</td><td>17</td><td>17</td><td>17</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></table>				Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	-	-	-	1.0	406	404	402	2.0	220	219	218	4.0	115	115	115	6.0	71	71	71	8.0	40	40	40	10.0	19	19	19	11.0	17	17	17	--	-	-	-	--	-	-	-	--	-	-	-
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		<p>Note: Slanted line shows the range of the rated load current.</p>																																																						

Testing Circuitry Figure A

2.Values



Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	56	59
-20	57	59
-10	57	60
0	57	60
25	59	61
50	59	60
70	58	60
85	58	60
95	57	59
100	57	59
--	-	-

COSEL

Model	SNTUNS50F05																																														
Item	Overcurrent Protection	Temperature	25°C																																												
Object	+5V10A	Testing Circuitry	Figure A																																												
1.Graph		2.Values																																													
<div><div><div></div><div>△ Input Volt. 100V</div></div><div><div></div><div>○ Input Volt. 200V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 5V to 0V.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th></tr><tr><td>5.0</td><td>10.91</td><td>10.93</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><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><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></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	5.0	10.91	10.93	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Model

SNTUNS50F05

Item

Overvoltage Protection

Object

+5V10A

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 200V

Operating Point [V]

8.0

7.6

7.2

6.8

6.4

6.0

-60

-20

20

60

100

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. 200[V]
-30	6.58	6.58
-20	6.58	6.58
-10	6.58	6.57
0	6.58	6.57
25	6.58	6.57
50	6.57	6.57
70	6.57	6.57
85	6.57	6.57
95	6.57	6.56
100	6.56	6.56
--	-	-

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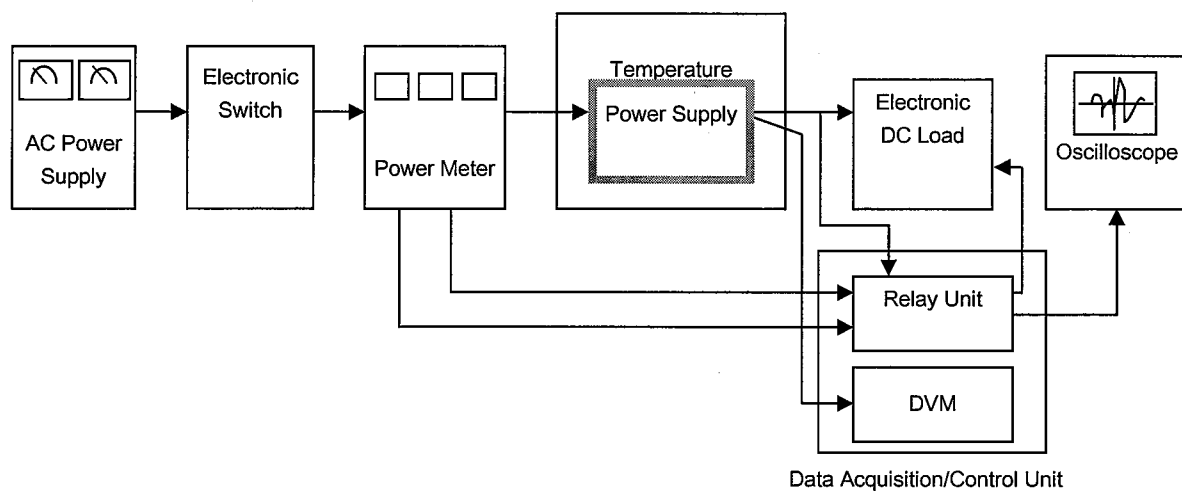


Figure A

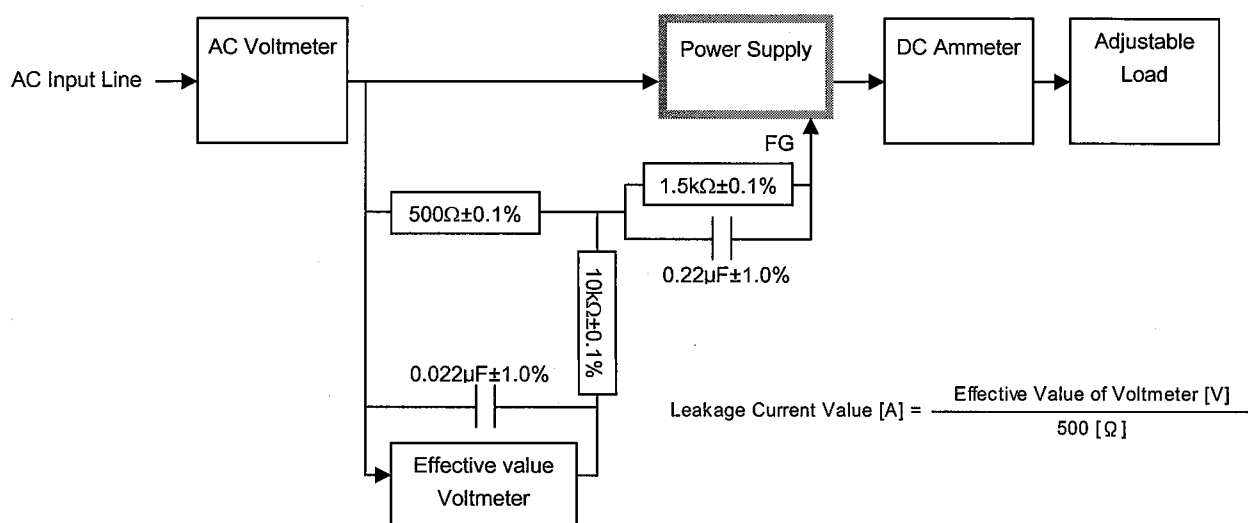


Figure B (IEC60950-1)

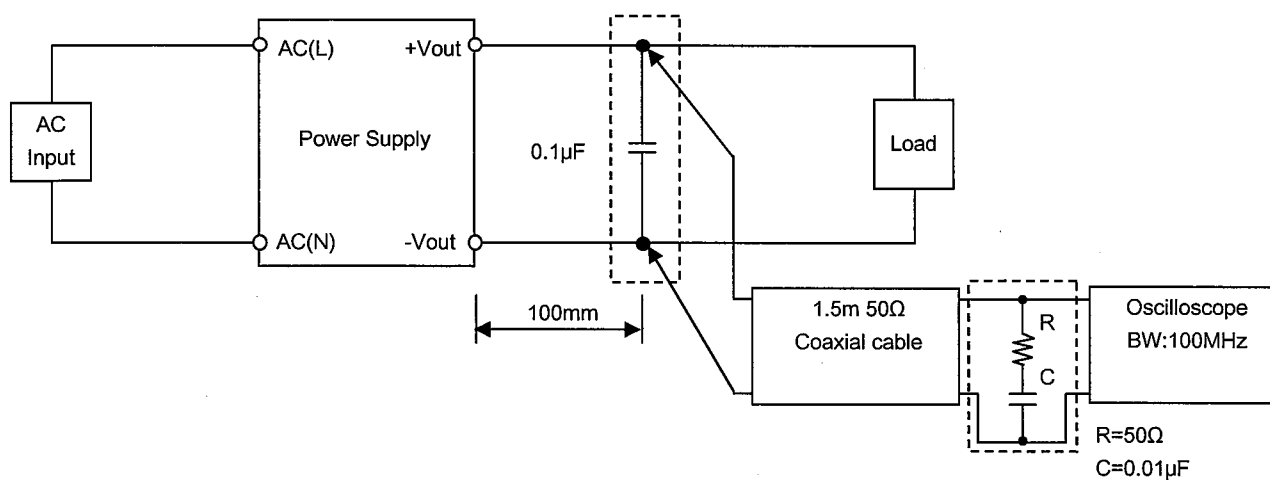


Figure C