

TEST DATA OF SNDHS200A05

Regulated DC Power Supply

April 10, 2012

Approved by : Takahiro Yoneda
Takahiro Yoneda Design Manager

Prepared by : Tadashi Arai
Tadashi Arai Design Engineer

COSEL CO.,LTD.

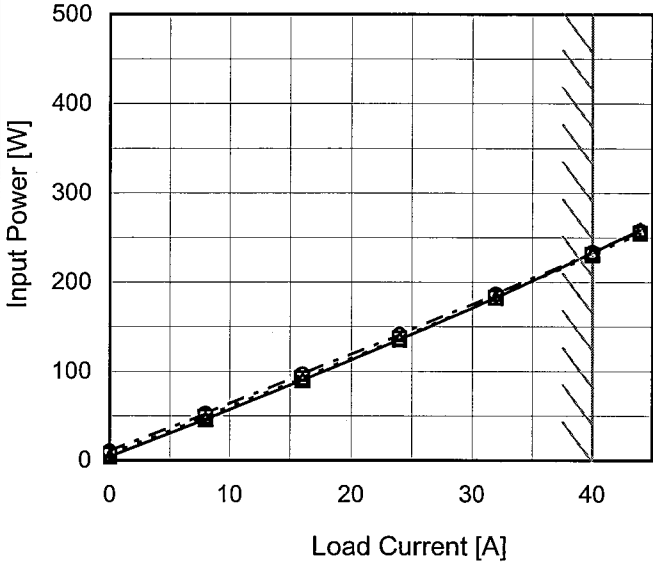
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Model		SNDHS200A05		Temperature 25°C																																																																																
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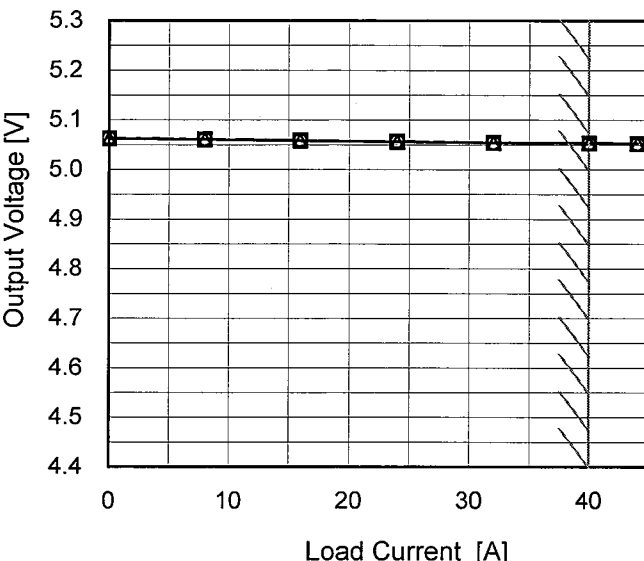
Model		SNDHS200A05	
Item		Efficiency (by Input Voltage)	
Object		+5V40A	
1.Graph		2.Values	

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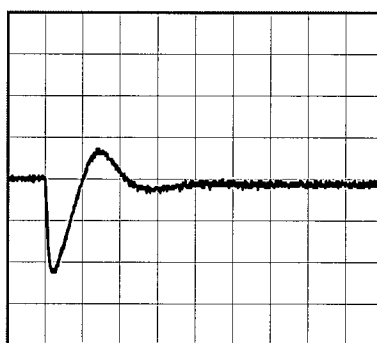
Model	SNDHS200A05	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+5V40A	

Input Volt. 110 V
Cycle 1000 ms

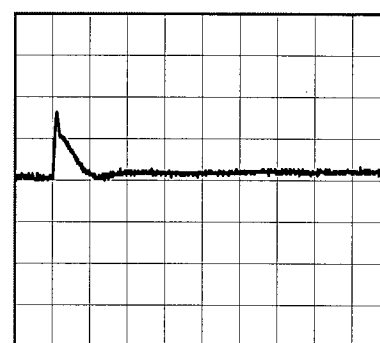
Load Current  40A/50 µs

Min. Load (0A) \longleftrightarrow
Load 100% (40A)

0.2 V/div



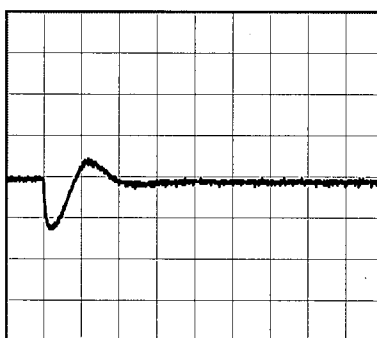
400µs/div



400µs/div

Min. Load (0A) \longleftrightarrow
Load 50% (20A)

0.2 V/div



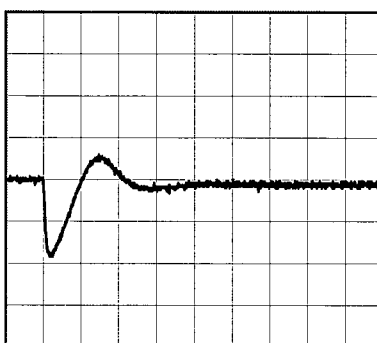
400µs/div



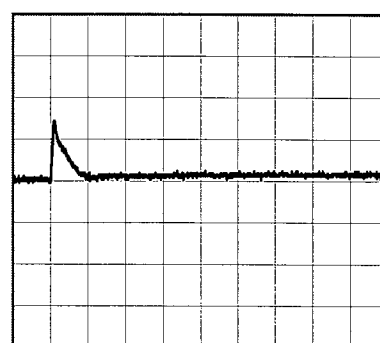
400µs/div

Load 10% (4A) \longleftrightarrow
Load 100% (40A)

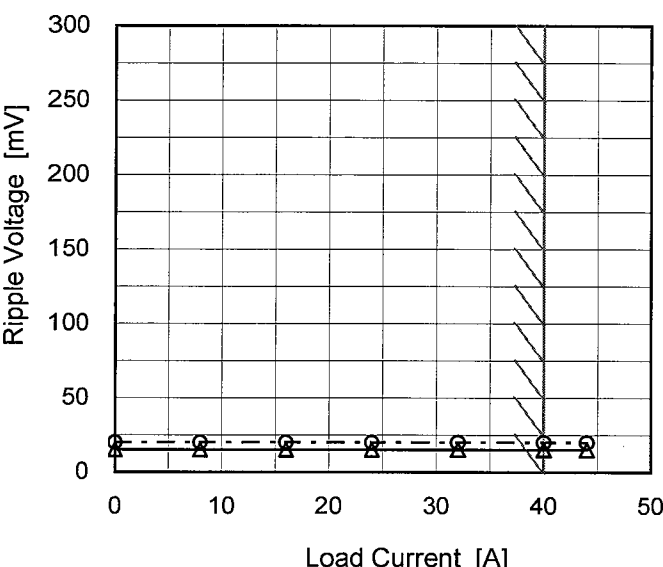
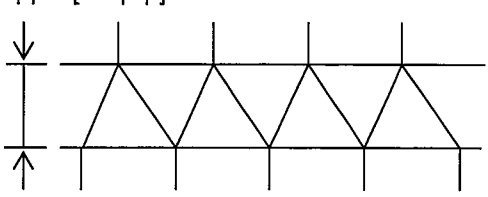
0.2 V/div



400µs/div



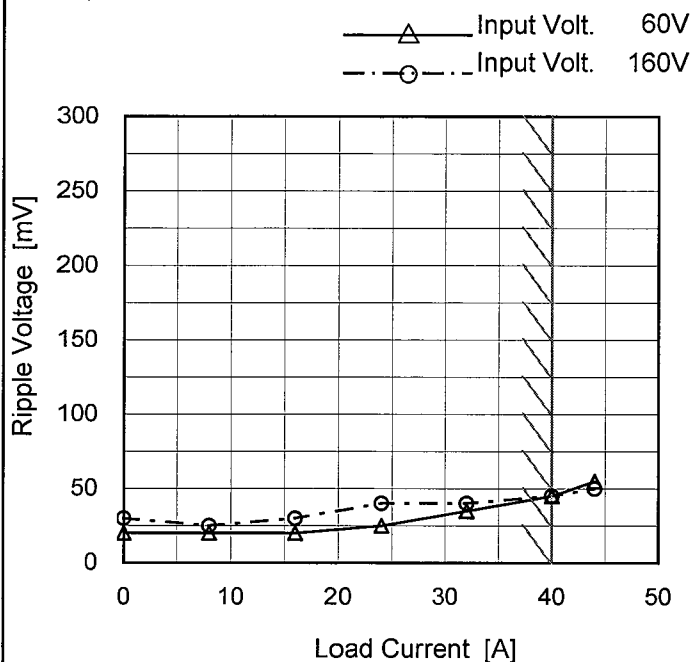
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Object	+5V40A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>60V</div></div><div><div>---○---</div><div>Input Volt.</div><div>160V</div></div></div>  <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 60 [V]</th><th>Input Volt. 160 [V]</th></tr><tr><td>0</td><td>15</td><td>20</td></tr><tr><td>8</td><td>15</td><td>20</td></tr><tr><td>16</td><td>15</td><td>20</td></tr><tr><td>24</td><td>15</td><td>20</td></tr><tr><td>32</td><td>15</td><td>20</td></tr><tr><td>40</td><td>15</td><td>20</td></tr><tr><td>44</td><td>15</td><td>20</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>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 60 [V]	Input Volt. 160 [V]	0	15	20	8	15	20	16	15	20	24	15	20	32	15	20	40	15	20	44	15	20	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 60 [V]	Input Volt. 160 [V]																																							
0	15	20																																							
8	15	20																																							
16	15	20																																							
24	15	20																																							
32	15	20																																							
40	15	20																																							
44	15	20																																							
--	-	-																																							
--	-	-																																							
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--	-	-																																							
<p>Measured by 100 MHz Oscilloscope.</p> <p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p>																																									
<p>Ripple [mVp-p]</p> 																																									
<p>Fig.Complex Ripple Wave Form</p>																																									

Model	SNDHS200A05
Item	Ripple-Noise
Object	+5V40A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 60 [V]	Input Volt. 160 [V]
0	20	30
8	20	25
16	20	30
24	25	40
32	35	40
40	45	45
44	55	50
--	-	-
--	-	-
--	-	-
--	-	-

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.

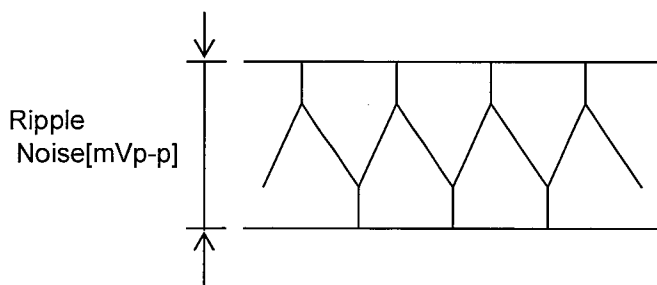
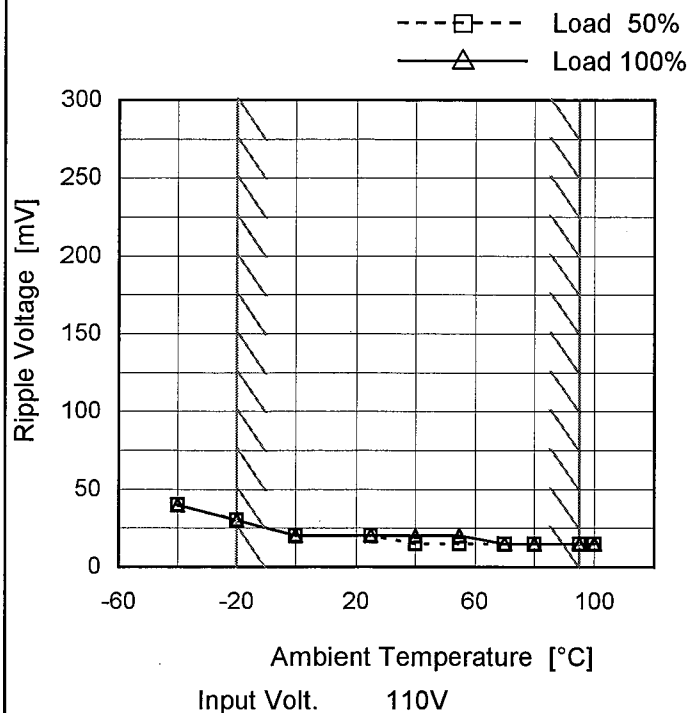


Fig.Complex Ripple Noise Wave Form

Model	SNDHS200A05
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V40A

Testing Circuitry Figure B

1. Graph



Measured by 100 MHz Oscilloscope.

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

Ripple [mVp-p]

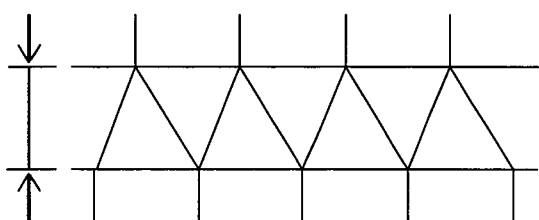


Fig. Complex Ripple Wave Form

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	40	40
-20	30	30
0	20	20
25	20	20
40	15	20
55	15	20
70	15	15
80	15	15
95	15	15
100	15	15
--	-	-

Testing Circuitry Figure A

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
-40	5.029	5.030	5.030
-20	5.038	5.039	5.039
0	5.046	5.046	5.047
25	5.053	5.053	5.053
40	5.055	5.055	5.055
55	5.057	5.057	5.057
70	5.057	5.057	5.057
80	5.058	5.058	5.058
95	5.061	5.061	5.061
100	5.062	5.062	5.061
--	-	-	-

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		Testing Circuitry Figure A
Model	SNDHS200A05	
Item	Output Voltage Accuracy	
Object	+5V40A	

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 : 60 - 160V

Load Current : 0 - 40A

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

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	95	60	0	5.095	±29	±0.6
Minimum Voltage	-20	60	40	5.038		

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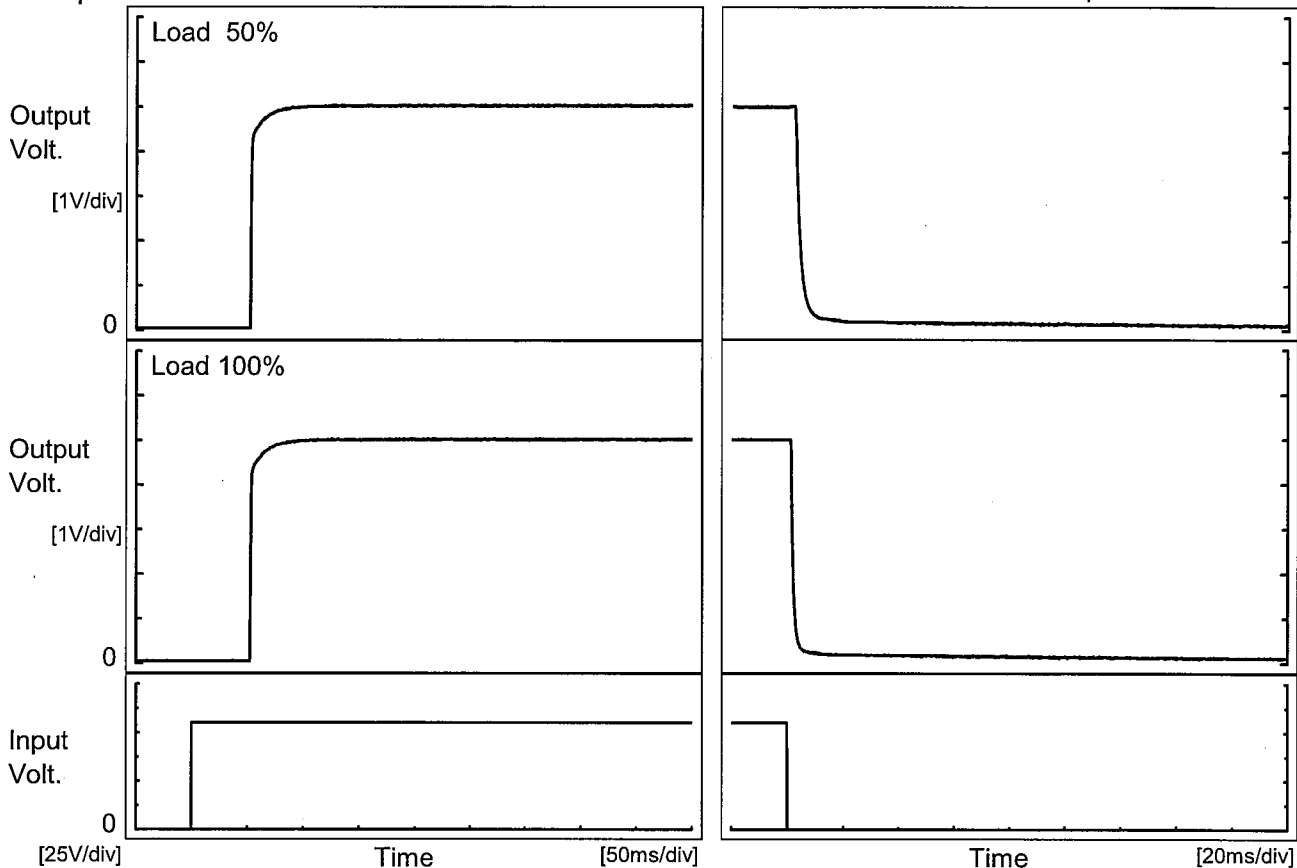
Model	SNDHS200A05	Temperature 25°C Testing Circuitry Figure A																							
Item	Time Lapse Drift																								
Object	+5V40A																								
1.Graph		2.Values																							
<div><div><div>5.3</div><div>5.2</div><div>5.1</div><div>5.0</div><div>4.9</div><div>4.8</div><div>4.7</div><div>4.6</div><div>4.5</div><div>4.4</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>Output Voltage [V]</div><div>Time [H]</div></div><div><div>Input Volt. 110V</div><div>Load 100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.051</td></tr><tr><td>0.5</td><td>5.054</td></tr><tr><td>1.0</td><td>5.054</td></tr><tr><td>2.0</td><td>5.054</td></tr><tr><td>3.0</td><td>5.054</td></tr><tr><td>4.0</td><td>5.054</td></tr><tr><td>5.0</td><td>5.054</td></tr><tr><td>6.0</td><td>5.054</td></tr><tr><td>7.0</td><td>5.054</td></tr><tr><td>8.0</td><td>5.054</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.051	0.5	5.054	1.0	5.054	2.0	5.054	3.0	5.054	4.0	5.054	5.0	5.054	6.0	5.054	7.0	5.054	8.0	5.054
Time since start [H]	Output Voltage [V]																								
0.0	5.051																								
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6.0	5.054																								
7.0	5.054																								
8.0	5.054																								

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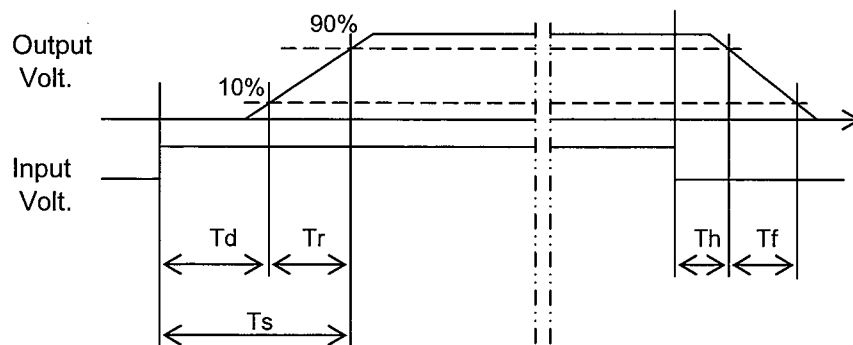
Model	SNDHS200A05		
Item	Rise and Fall Time	Temperature	25°C
Object	+5V40A	Testing Circuitry	Figure A

1.Graph



2.Values

		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		52.8	5.8	58.6	2.6	4.9
100 %		52.8	5.8	58.6	1.3	2.3



Model		SNDHS200A05	
Item		Minimum Input Voltage for Regulated Output Voltage	
Object		+5V40A	
1.Graph		2.Values	

</

Model	SNDHS200A05																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+5V40A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div>Input Volt. 60V</div><div><div></div>Input Volt. 110V</div><div><div></div>Input Volt. 160V</div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when overcurrent protection is activated.</p> <p>Intermittent operation occurs when the output voltage is from 2.5V to 0V.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 60[V]</th><th>Input Volt. 110[V]</th><th>Input Volt. 160[V]</th></tr><tr><td>4.75</td><td>47.04</td><td>46.57</td><td>47.55</td></tr><tr><td>4.50</td><td>47.00</td><td>47.03</td><td>47.87</td></tr><tr><td>4.00</td><td>49.48</td><td>46.15</td><td>48.27</td></tr><tr><td>3.50</td><td>48.89</td><td>47.29</td><td>48.76</td></tr><tr><td>3.00</td><td>51.51</td><td>51.05</td><td>49.07</td></tr><tr><td>2.50</td><td>51.98</td><td>51.36</td><td>49.58</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><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]	4.75	47.04	46.57	47.55	4.50	47.00	47.03	47.87	4.00	49.48	46.15	48.27	3.50	48.89	47.29	48.76	3.00	51.51	51.05	49.07	2.50	51.98	51.36	49.58	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Output Voltage [V]	Load Current [A]																																																									
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]																																																							
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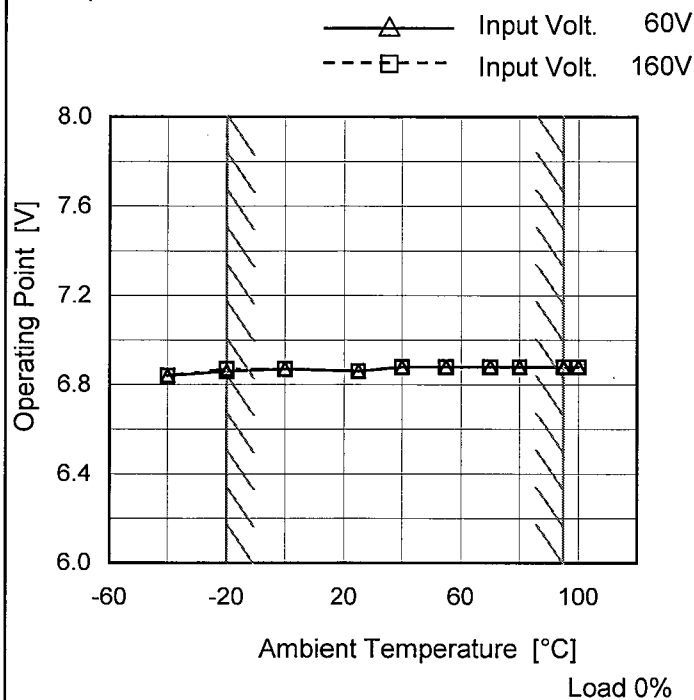
Model SNDHS200A05

Item Overvoltage Protection

Object +5V40A

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. 60[V]	Input Volt. 160[V]
-40	6.84	6.84
-20	6.86	6.87
0	6.87	6.87
25	6.86	6.86
40	6.88	6.88
55	6.88	6.88
70	6.88	6.88
80	6.88	6.88
95	6.88	6.88
100	6.88	6.88
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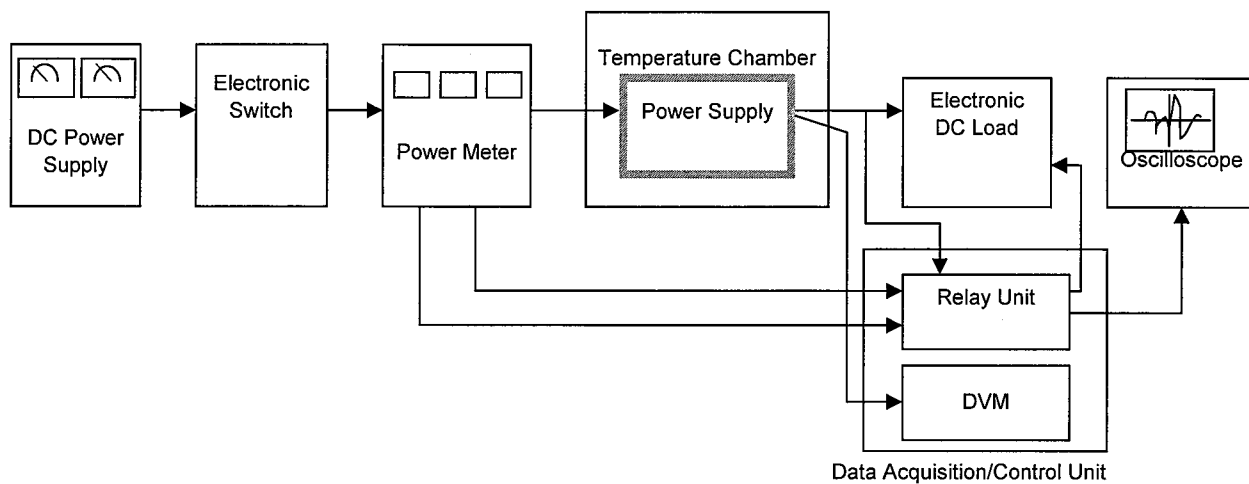


Figure A

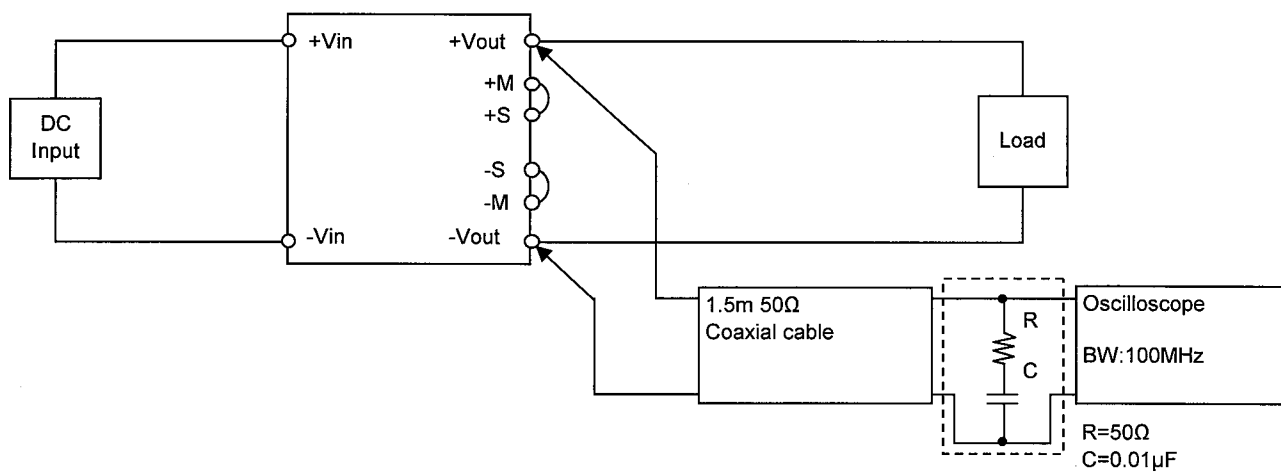


Figure B (Ripple and Ripple noise Characteristic)