

TEST DATA OF SNDDBS400B05

Regulated DC Power Supply
July 11, 2012

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COSEL CO.,LTD.

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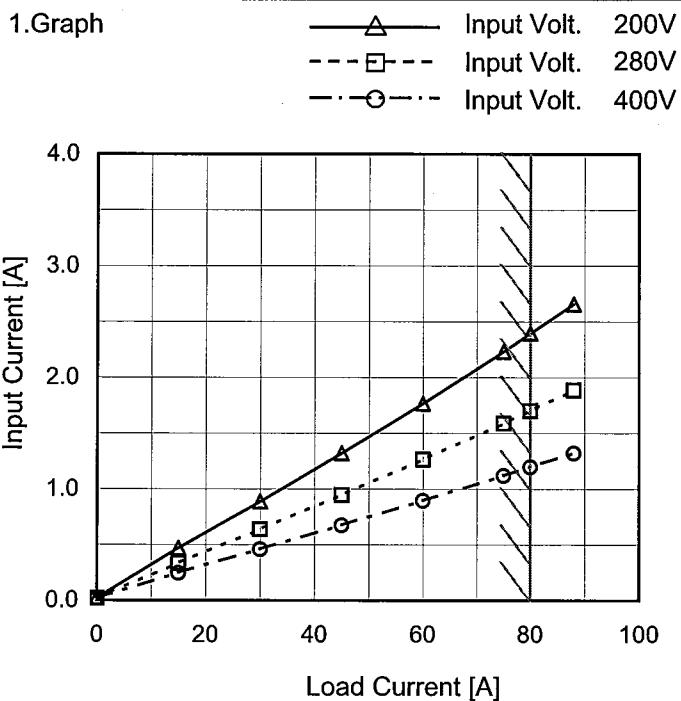
(Final Page 19)

Model	SNDBS400B05		
Item	Input Current (by Input Voltage)		
Object	_____		
1.Graph	<p>The graph plots Input Current [A] on the y-axis (0.0 to 4.0) against Input Voltage [V] on the x-axis (0 to 500). Three curves are shown: Load 100% (triangles), Load 50% (squares), and Load 0% (circles). All curves show a sharp increase in current from 0V to approximately 180V, followed by a gradual decrease. A slanted line is drawn through the peak of the Load 100% curve, indicating the rated input voltage range.</p>		
Note:	Slanted line shows the range of the rated input voltage.		
Temperature	25°C		
Testing Circuitry	Figure A		
2.Values			
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
50	0.000	0.000	0.000
100	0.000	0.000	0.000
150	0.000	0.000	0.000
165	0.024	1.486	2.644
170	0.024	1.430	2.710
175	0.023	1.378	2.738
180	0.023	1.331	2.648
200	0.022	1.183	2.396
250	0.020	0.946	1.886
280	0.019	0.849	1.701
300	0.019	0.794	1.569
350	0.018	0.688	1.347
400	0.018	0.609	1.198
420	0.018	0.582	1.130
--	-	-	-
--	-	-	-
--	-	-	-

Model SNDBS400B05

Item Input Current (by Load Current)

Object _____

Temperature 25°C
Testing Circuitry Figure A

2. Values

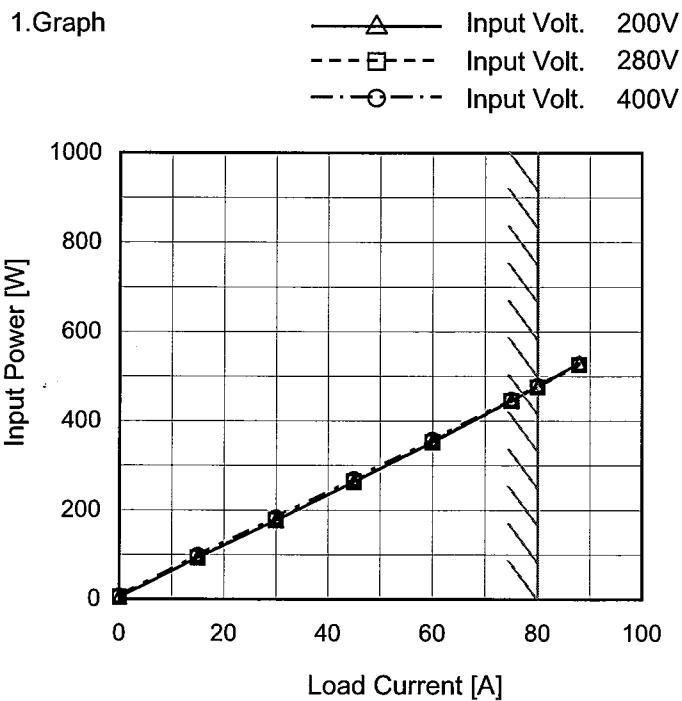
Load Current [A]	Input Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	0.022	0.019	0.018
15	0.470	0.333	0.248
30	0.889	0.637	0.461
45	1.322	0.946	0.676
60	1.766	1.265	0.897
75	2.234	1.590	1.122
80	2.396	1.701	1.198
88	2.658	1.884	1.322
--	-	-	-
--	-	-	-
--	-	-	-

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Model SNDBS400B05

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. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	4.3	5.3	7.2
15	93.7	93.1	99.1
30	177.5	178.2	184.2
45	263.5	264.5	270.2
60	352.8	353.8	358.6
75	446.0	444.7	448.0
80	478.0	475.8	479.0
88	530.0	526.0	528.0
--	-	-	-
--	-	-	-
--	-	-	-

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Model	SNDBS400B05																																	
Item	Efficiency (by Input Voltage)	Temperature 25°C Testing Circuitry Figure A																																
Object	_____	_____																																
1.Graph																																		
<p>Efficiency [%]</p> <p>Input Voltage [V]</p> <p>Legend: ---□--- Load 50% —△— Load 100%</p>																																		
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Model	SNDBS400B05																																
Item	Efficiency (by Load Current)																																
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1.Graph	<p>—△— Input Volt. 200V - - □ - - Input Volt. 280V - - ○ - - Input Volt. 400V</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Efficiency [200V] (%)</th> <th>Efficiency [280V] (%)</th> <th>Efficiency [400V] (%)</th> </tr> </thead> <tbody> <tr><td>15</td><td>80.8</td><td>81.3</td><td>76.4</td></tr> <tr><td>30</td><td>85.2</td><td>84.9</td><td>82.1</td></tr> <tr><td>45</td><td>85.8</td><td>85.5</td><td>83.7</td></tr> <tr><td>60</td><td>85.3</td><td>85.0</td><td>83.9</td></tr> <tr><td>75</td><td>84.1</td><td>84.3</td><td>83.7</td></tr> <tr><td>80</td><td>83.6</td><td>83.9</td><td>83.4</td></tr> <tr><td>88</td><td>82.8</td><td>83.4</td><td>83.1</td></tr> </tbody> </table>	Load Current [A]	Efficiency [200V] (%)	Efficiency [280V] (%)	Efficiency [400V] (%)	15	80.8	81.3	76.4	30	85.2	84.9	82.1	45	85.8	85.5	83.7	60	85.3	85.0	83.9	75	84.1	84.3	83.7	80	83.6	83.9	83.4	88	82.8	83.4	83.1
Load Current [A]	Efficiency [200V] (%)	Efficiency [280V] (%)	Efficiency [400V] (%)																														
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Temperature 25°C
 Testing Circuitry Figure A

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	-	-	-
15	80.8	81.3	76.4
30	85.2	84.9	82.1
45	85.8	85.5	83.7
60	85.3	85.0	83.9
75	84.1	84.3	83.7
80	83.6	83.9	83.4
88	82.8	83.4	83.1
--	-	-	-
--	-	-	-
--	-	-	-

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

Model	SNDBS400B05																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+5V80A																																	
1.Graph																																		
<p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Legend: ---□--- Load 50% —△— Load 100%</p>																																		
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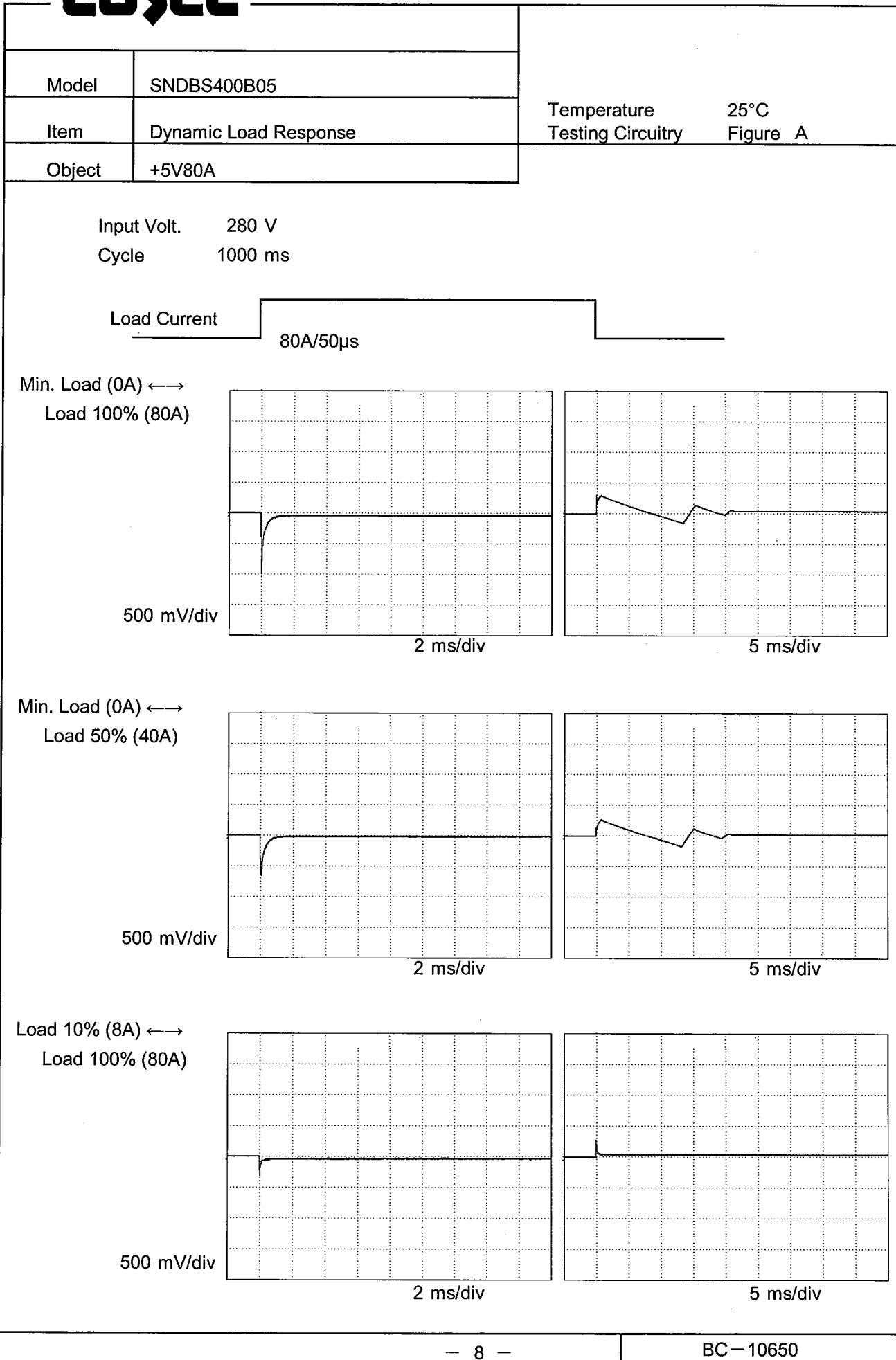
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Temperature 25°C
 Testing Circuitry Figure A

2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	5.094	5.094	5.094
15	5.082	5.082	5.081
30	5.070	5.070	5.069
45	5.058	5.058	5.058
60	5.044	5.043	5.043
75	5.032	5.032	5.032
80	5.028	5.027	5.026
88	5.020	5.020	5.020
--	-	-	-
--	-	-	-
--	-	-	-

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

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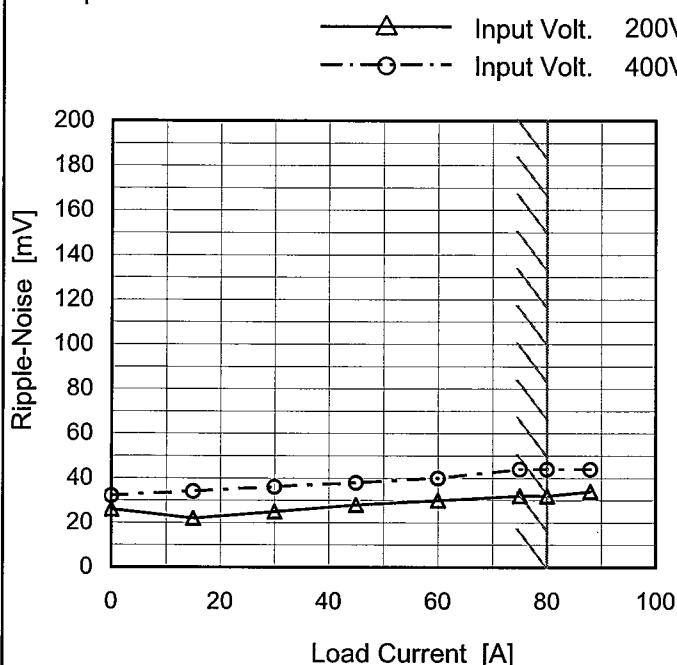
Model	SNDBS400B05																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+5V80A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 200 mV, and the X-axis ranges from 0 to 100 A. Two curves are plotted: one for Input Volt. 200V (solid line with triangle markers) and one for Input Volt. 400V (dashed line with circle markers). A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (Input Volt. 200V)</th> <th>Ripple Voltage [mV] (Input Volt. 400V)</th> </tr> </thead> <tbody> <tr><td>0</td><td>22</td><td>24</td></tr> <tr><td>15</td><td>16</td><td>27</td></tr> <tr><td>30</td><td>20</td><td>30</td></tr> <tr><td>45</td><td>22</td><td>32</td></tr> <tr><td>60</td><td>24</td><td>34</td></tr> <tr><td>75</td><td>26</td><td>34</td></tr> <tr><td>80</td><td>26</td><td>34</td></tr> <tr><td>88</td><td>28</td><td>34</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV] (Input Volt. 200V)	Ripple Voltage [mV] (Input Volt. 400V)	0	22	24	15	16	27	30	20	30	45	22	32	60	24	34	75	26	34	80	26	34	88	28	34											
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<p>Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p> <p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								

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Model	SNDBS400B05
Item	Ripple-Noise
Object	+5V80A

Temperature 25°C
 Testing Circuitry Figure B

1. Graph



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. 200 [V]	Input Volt. 400 [V]
0	26	32
15	22	34
30	25	36
45	28	38
60	30	40
75	32	44
80	32	44
88	34	44
--	-	-
--	-	-
--	-	-

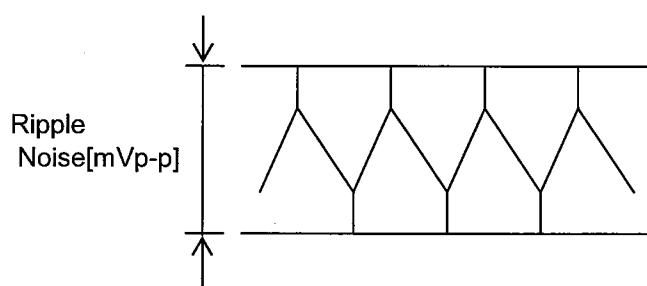


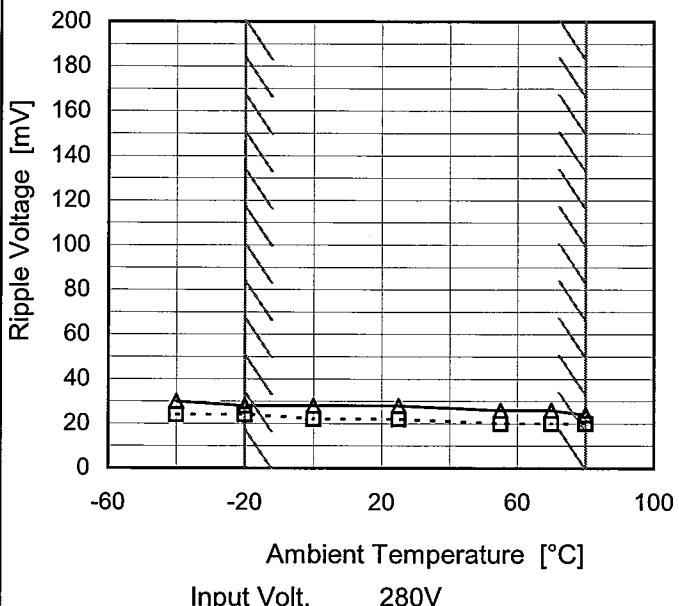
Fig.Complex Ripple Noise Wave Form

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Model	SNDBS400B05
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V80A

1. Graph

--- □ --- Load 50%
 —△— Load 100%



Input Volt. 280V

Measured by 100 MHz Oscilloscope.

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

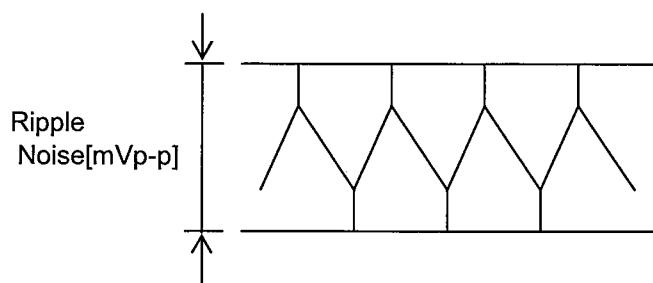


Fig.Complex Ripple Noise Wave Form

Testing Circuitry Figure B

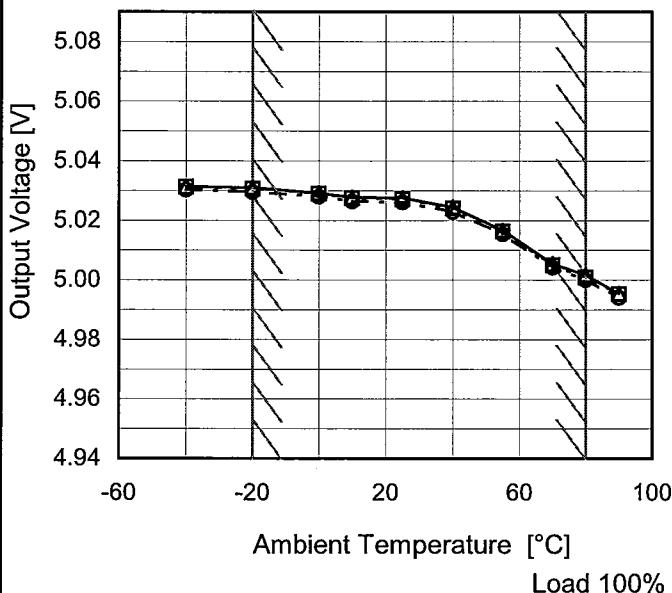
2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	24	30
-20	24	28
0	22	28
25	22	28
55	20	26
70	20	26
80	20	24
--	-	-
--	-	-
--	-	-
--	-	-

Model	SNDBS400B05
Item	Ambient Temperature Drift
Object	+5V80A

1. Graph

—△— Input Volt. 200V
 - -□--- Input Volt. 280V
 - -○--- Input Volt. 400V



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. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
-40	5.031	5.031	5.030
-20	5.031	5.031	5.030
0	5.029	5.029	5.028
10	5.028	5.028	5.026
25	5.028	5.027	5.026
40	5.025	5.024	5.023
55	5.017	5.016	5.015
70	5.006	5.005	5.004
80	5.002	5.001	5.000
90	4.996	4.995	4.994
--	-	-	-



Model	SNDBS400B05	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+5V80A	

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 - 80°C

Input Voltage : 200 - 400V

Load Current : 0 - 80A

* 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

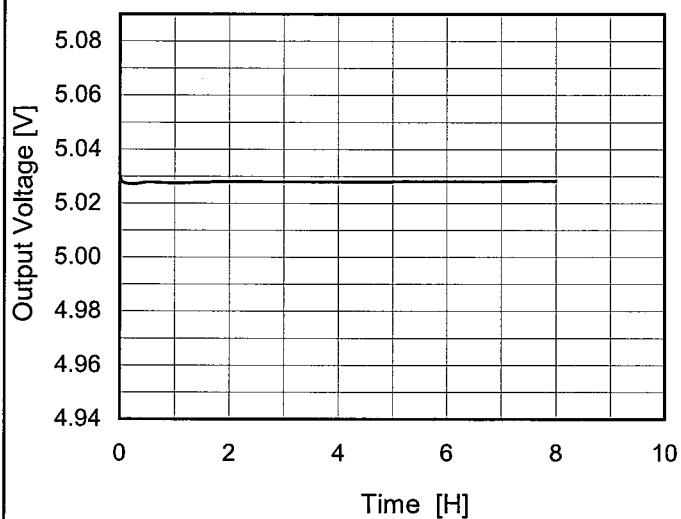
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	400	0	5.093	± 47	± 0.9
Minimum Voltage	80	400	80	5.000		

COSEL

Model	SNDBS400B05
Item	Time Lapse Drift
Object	+5V80A

Temperature 25°C
 Testing Circuitry Figure A

1. Graph



Input Volt. 280V
 Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	5.031
0.5	5.028
1.0	5.028
2.0	5.028
3.0	5.028
4.0	5.028
5.0	5.028
6.0	5.028
7.0	5.028
8.0	5.028

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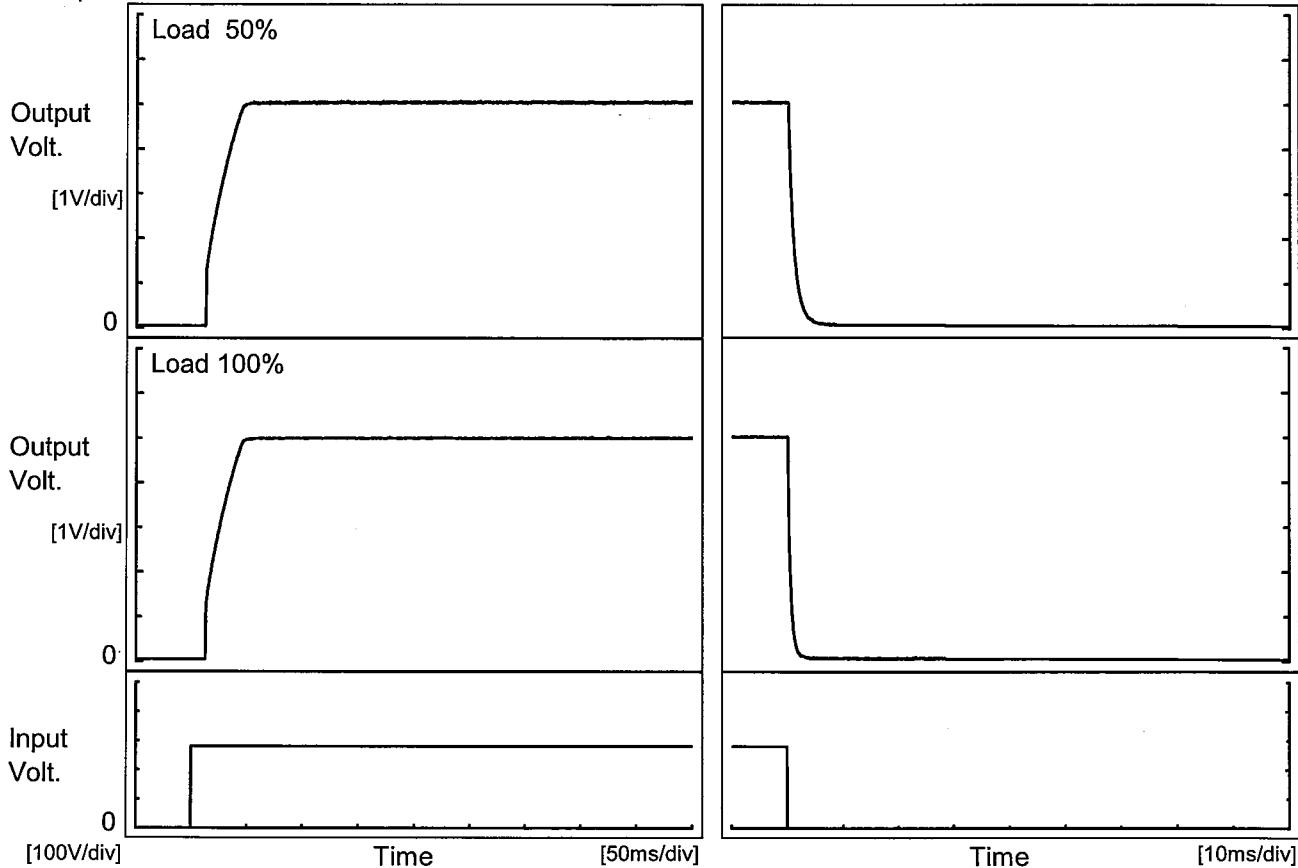
Model SNDBS400B05

Item Rise and Fall Time

Object +5V80A

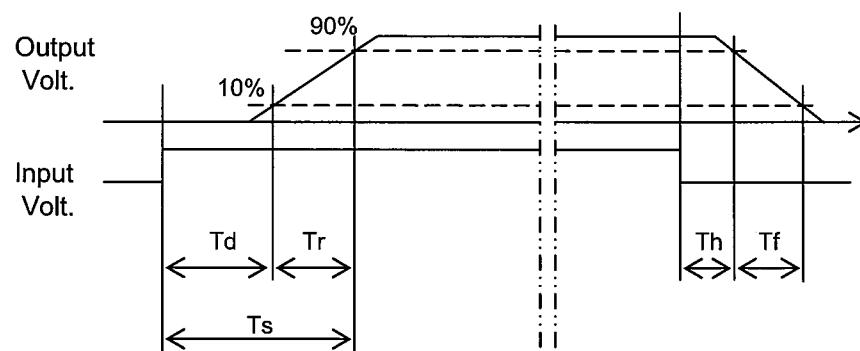
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

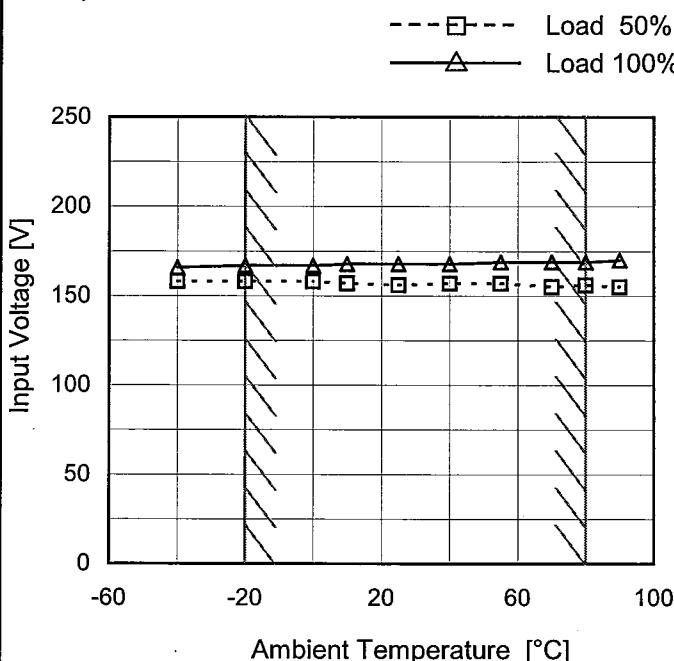
Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		13.3	27.5	40.8	0.1	2.4	
100 %		13.3	28.0	41.3	0.1	1.2	



Model	SNDBS400B05
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V80A

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%
-40	158	166
-20	158	167
0	158	167
10	157	168
25	156	168
40	157	168
55	157	169
70	155	169
80	156	169
90	155	170
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Model	SNDBS400B05																																																																	
Item	Overcurrent Protection																																																																	
Object	+5V80A																																																																	
1.Graph	<p>Input Volt. 200V Input Volt. 280V Input Volt. 400V</p>																																																																	
	<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>																																																																	
	<p>Intermittent operation occurs when the output voltage is from 3.5V to 0V.</p>																																																																	
Temperature Testing Circuitry	25°C Figure A																																																																	
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1.Graph																																							
<p>The graph plots the operating point voltage against ambient temperature. The x-axis ranges from -60 to 100 °C, and the y-axis ranges from 4.0 to 10.0 V. Two sets of curves are shown: one for an input voltage of 200V (solid line with triangle markers) and another for 400V (dashed line with square markers). Both sets of curves show a slight decrease in operating point voltage as ambient temperature increases. Vertical slanted lines on the graph indicate the rated ambient temperature range from -20°C to 70°C.</p>																																							
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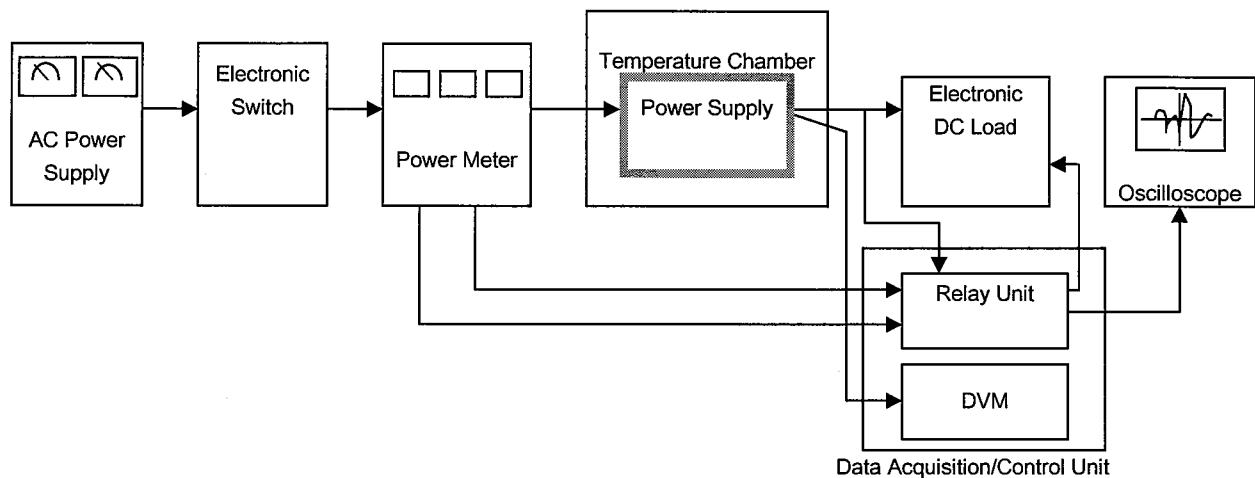


Figure A

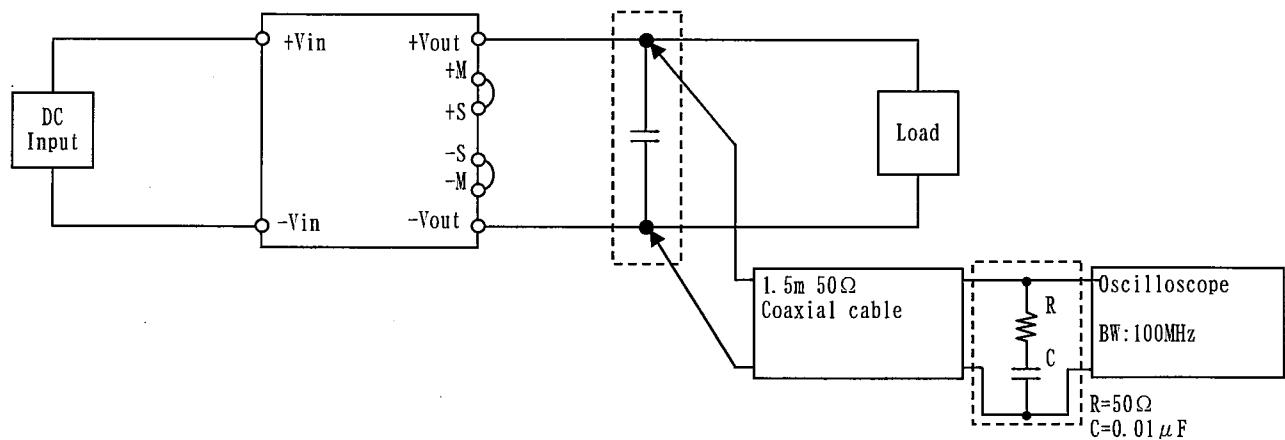


Figure B (Ripple and Ripple noise Characteristic)