COSEL

TEST DATA OF SNDHS250B05

Regulated DC Power Supply
June 30, 2011

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COSEL CO.,LTD.

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Model	SNDHS250B05
Item	Input Current (by Input Voltage)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Load 100%
---❏--- Load 50%
—·—○—·— Load 0%

Input Current [A] vs Input Voltage [V]

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

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
50	0.000	0.004	0.000
100	0.002	0.002	0.002
150	0.000	0.000	0.000
170	0.000	0.000	0.000
180	0.000	0.000	0.000
190	0.000	0.000	0.000
195	0.035	0.708	1.456
200	0.033	0.689	1.422
250	0.028	0.556	1.136
280	0.028	0.500	1.016
300	0.029	0.468	0.950
350	0.030	0.406	0.818
400	0.032	0.360	0.723
420	0.033	0.345	0.692
425	0.033	0.341	0.685
--	-	-	-
--	-	-	-

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Model	SNDHS250B05
Item	Input Current (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

— △ — Input Volt. 200V
- - - ☐ - - - Input Volt. 280V
— · — ⊖ — · — Input Volt. 400V

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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	0.032	0.029	0.032
10	0.289	0.213	0.159
20	0.555	0.403	0.293
30	0.834	0.601	0.430
40	1.122	0.804	0.572
50	1.423	1.014	0.721
55	1.579	1.123	0.799
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	SNDHS250B05
Item	Input Power (by Load Current)
Object	———————
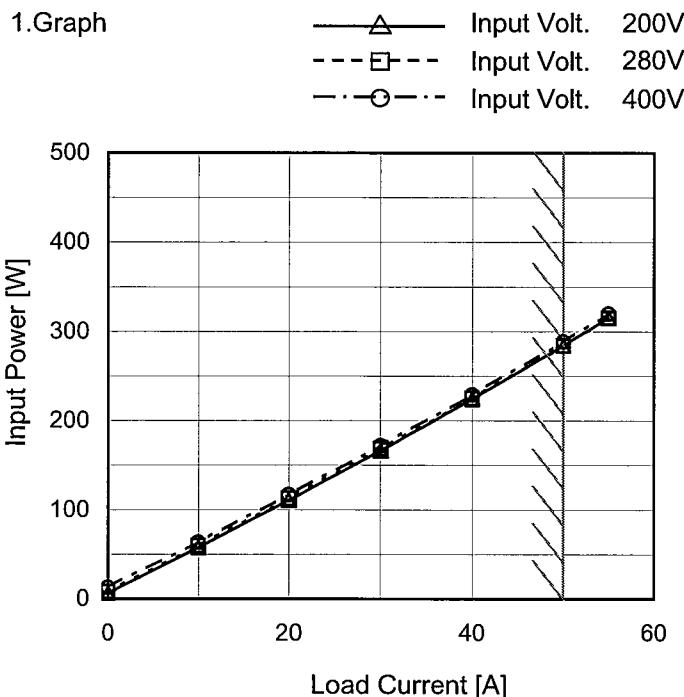
Temperature   25°C
Testing Circuitry   Figure A

1.Graph

     ——△——   Input Volt.   200V
     - - -☐- - -   Input Volt.   280V
     —·—○—··—   Input Volt.   400V

Load Current [A]

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

2.Values

Load Current	Input Power [W]		
[A]	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	6.5	8.0	13.1
10	57.7	59.6	63.7
20	111.0	112.9	117.2
30	166.6	168.4	172.2
40	224.5	225.2	229.0
50	284.4	284.2	288.7
55	315.6	314.9	319.9
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	SNDHS250B05
Item	Efficiency (by Input Voltage)
Object	————————
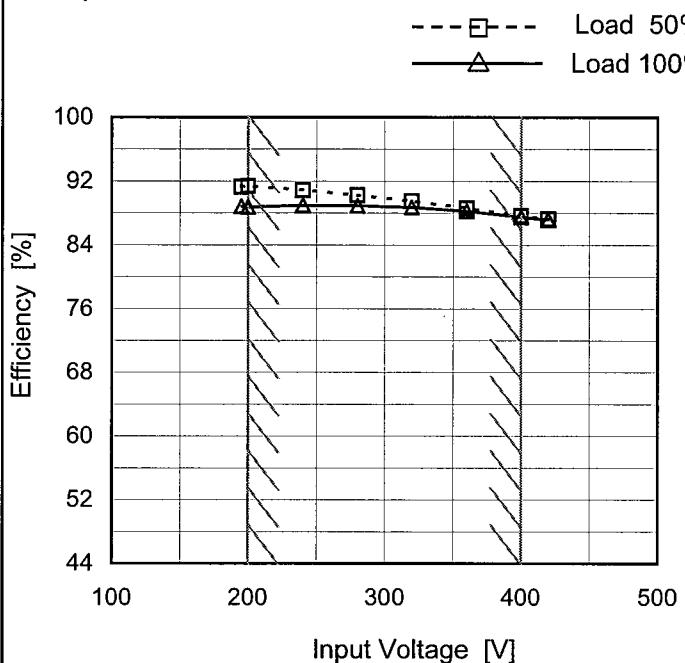
Temperature   25°C
Testing Circuitry   Figure A

1.Graph

--- ☐ ---   Load 50%
——— △ ———   Load 100%

Input Voltage [V]

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
195	91.3	88.8
200	91.4	88.8
240	90.8	89.0
280	90.2	88.9
320	89.5	88.7
360	88.6	88.3
400	87.6	87.5
420	87.2	87.2
--	-	-

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Model	SNDHS250B05
Item	Efficiency (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
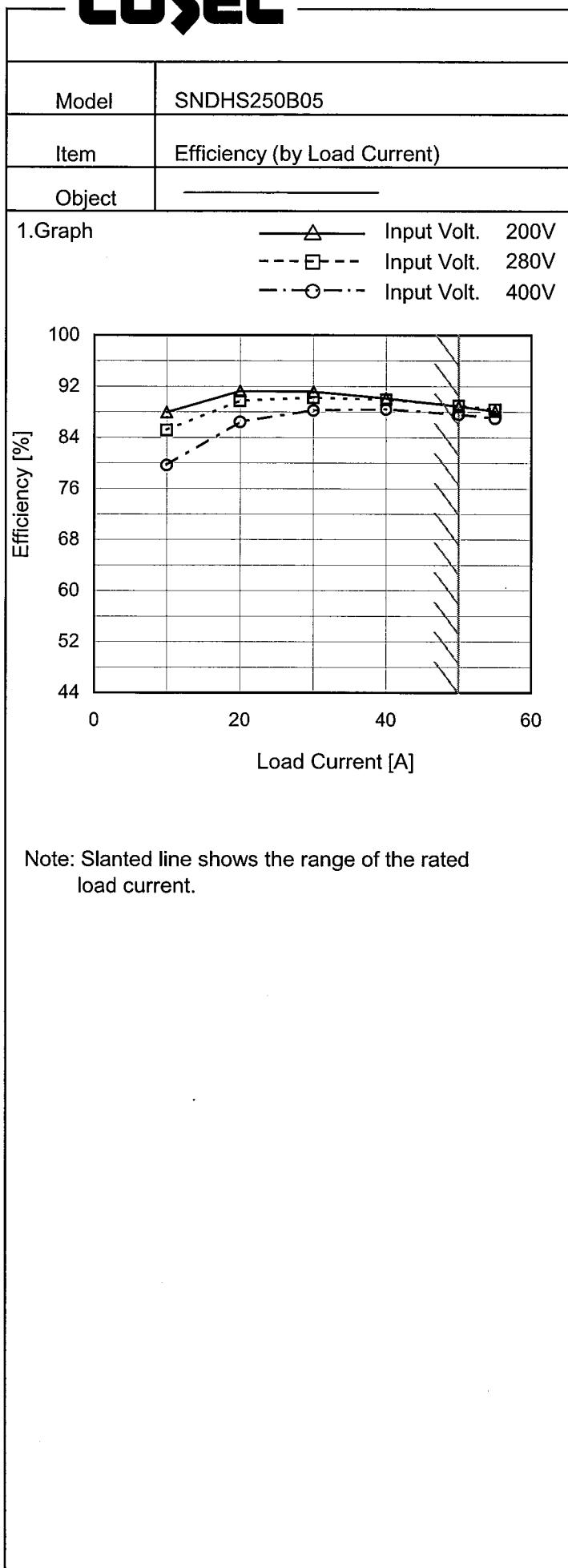
———△——— Input Volt.   200V
— — —🞖— — — Input Volt.   280V
— · —⊖— · — Input Volt.   400V

Load Current [A]

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	-	-	-
10	88.0	85.2	79.7
20	91.3	89.7	86.5
30	91.2	90.2	88.3
40	90.2	89.9	88.4
50	88.9	89.0	87.6
55	88.1	88.4	87.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	SNDHS250B05
Item	Line Regulation
Object	+5V50A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -◻- - -   Load 50%
———△———   Load 100%

Input Voltage [V]

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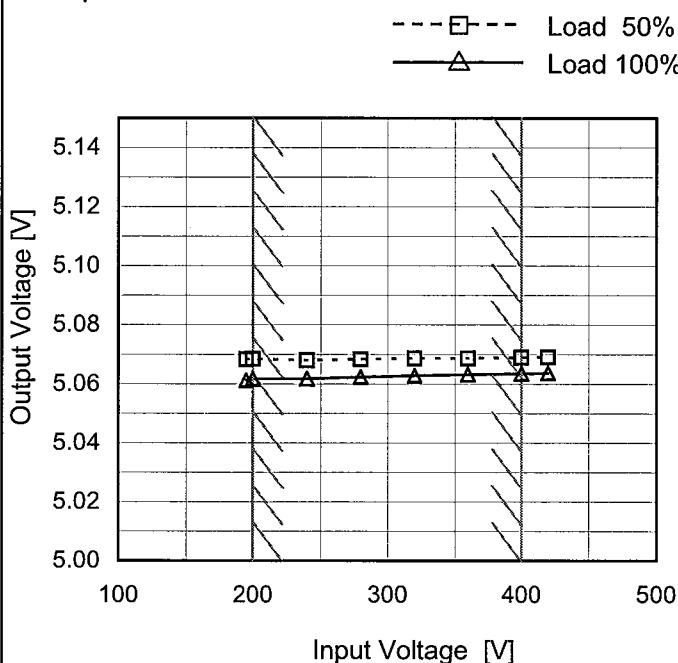
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
195	5.068	5.061
200	5.068	5.062
240	5.068	5.062
280	5.068	5.062
320	5.069	5.063
360	5.069	5.063
400	5.069	5.064
420	5.069	5.064
--	-	-

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Model	SNDHS250B05
Item	Load Regulation
Object	+5V50A
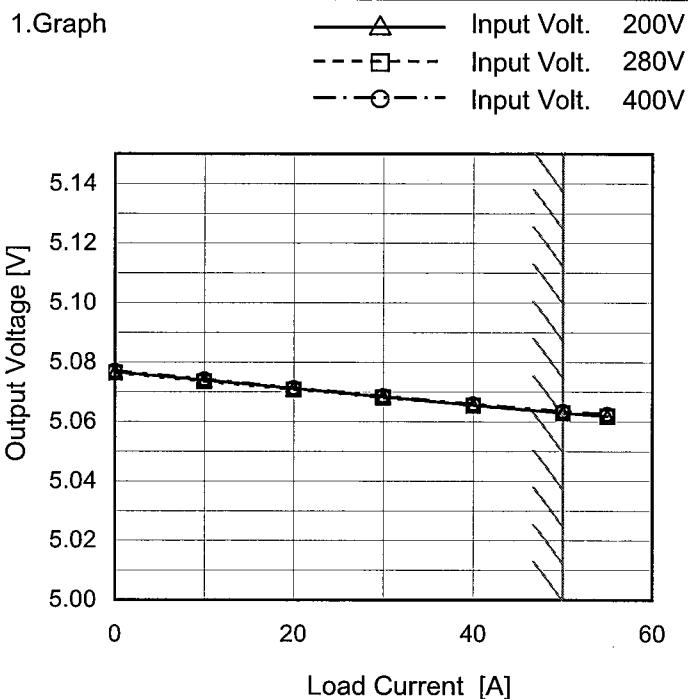
Temperature　　　25°C
Testing Circuitry　Figure A

1.Graph

————△———— Input Volt.　200V
— — —◻— — — Input Volt.　280V
—·—○—·— Input Volt.　400V

Load Current [A]

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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	5.077	5.076	5.077
10	5.074	5.074	5.074
20	5.071	5.071	5.071
30	5.068	5.068	5.069
40	5.066	5.065	5.066
50	5.063	5.063	5.064
55	5.062	5.062	5.063
---	-	-	-
---	-	-	-
---	-	-	-
---	-	-	-

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Model	SNDHS250B05
Item	Dynamic Load Response
Object	+5V50A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 280 V

Cycle 1000 ms

Load Current

50A/50 μ s

Min. Load (0A) ←→
Load 100% (50A)

0.2 V/div

200us/div   400us/div

Min. Load (0A) ←→
Load 50% (25A)

0.2 V/div

200us/div   400us/div

Load 10% (5A) ←→
Load 100% (50A)

0.2 V/div

200us/div   400us/div

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Model	SNDHS250B05
Item	Ripple Voltage (by Load Current)
Object	+5V50A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

——△—— Input Volt.   200V
—·—○—·— Input Volt.   400V

Load Current [A]

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.

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 200 [V]	Input Volt. 400 [V]
0	20	20
10	15	25
20	15	20
30	15	25
40	15	20
50	15	20
55	15	20
--	-	-
--	-	-
--	-	-
--	-	-

Ripple [mVp-p]

Fig.Complex Ripple Wave Form

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Model	SNDHS250B05
Item	Ripple-Noise
Object	+5V50A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

——△—— Input Volt.   200V
—·—○—·— Input Volt.   400V
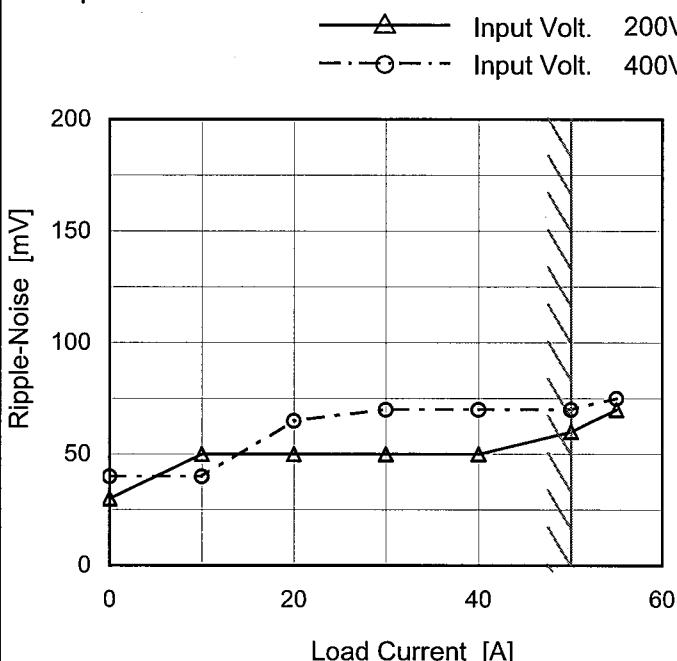
Load Current [A]

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	30	40
10	50	40
20	50	65
30	50	70
40	50	70
50	60	70
55	70	75
--	-	-
--	-	-
--	-	-
--	-	-
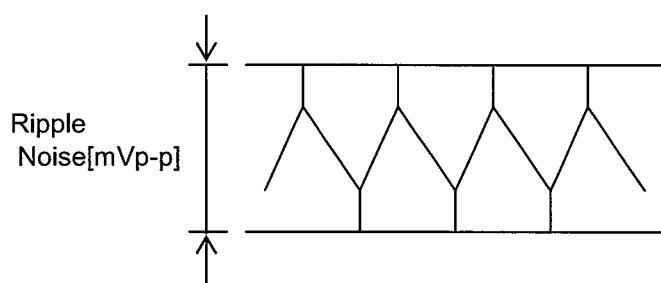
Ripple
Noise[mVp-p]

Fig.Complex Ripple Noise Wave Form

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Model	SNDHS250B05
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V50A

Testing Circuitry   Figure B

1.Graph

--- ⊟ --- Load 50%
——— △ ——— Load 100%

Ripple Voltage [mV]

Ambient Temperature [°C]

Input Volt.   280V
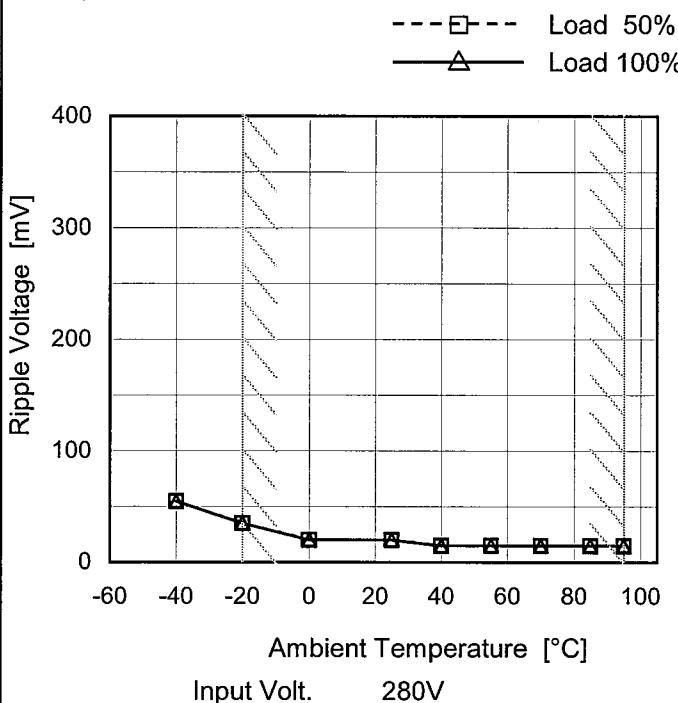
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
      ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	55	55
-20	35	35
0	20	20
25	20	20
40	15	15
55	15	15
70	15	15
85	15	15
95	15	15
--	-	-
--	-	-

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Model	SNDHS250B05
Item	Ambient Temperature Drift
Object	+5V50A
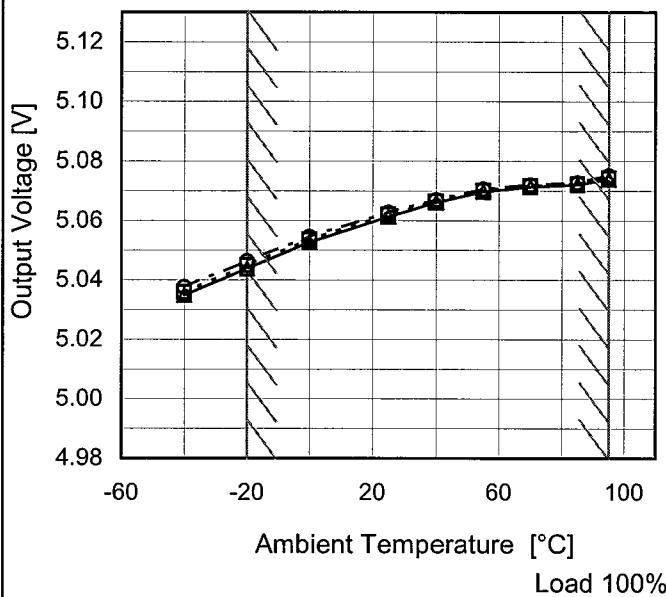
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   200V
- - -▣- - - Input Volt.   280V
—·—⊙—·— Input Volt.   400V

Output Voltage [V] (y-axis: 4.98 to 5.12)
Ambient Temperature [°C] (x-axis: -60 to 100)
Load 100%

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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
-40	5.035	5.036	5.038
-20	5.044	5.045	5.046
0	5.053	5.054	5.055
25	5.061	5.062	5.063
40	5.066	5.067	5.067
55	5.070	5.070	5.071
70	5.071	5.072	5.072
85	5.072	5.072	5.073
95	5.074	5.074	5.075
--	-	-	-
--	-	-	-

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Model	SNDHS250B05	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+5V50A	

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 : 200 - 400V
Load Current   : 0 - 50A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - 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	95	200	0	5.090	±23	±0.5
Minimum Voltage	-20	200	50	5.044		

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Model	SNDHS250B05
Item	Time Lapse Drift
Object	+5V50A

1.Graph

Input Volt.   280V
Load   100%
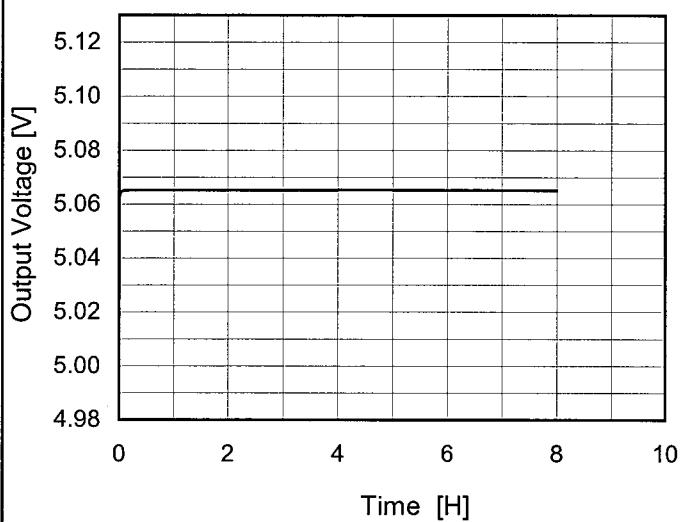
2.Values

Time since start [H]	Output Voltage [V]
0.0	5.062
0.5	5.065
1.0	5.065
2.0	5.065
3.0	5.065
4.0	5.065
5.0	5.065
6.0	5.065
7.0	5.065
8.0	5.065

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Model	SNDHS250B05		
Item	Rise and Fall Time	Temperature	25°C
		Testing Circuitry	Figure A
Object	+5V50A		

1.Graph

Input Volt. 280 V

Load 50%

Output Volt. [1V/div]

0

Load 100%

Output Volt. [1V/div]

0

Input Volt.

0

[100V/div]   Time   [50ms/div]   Time   [20ms/div]
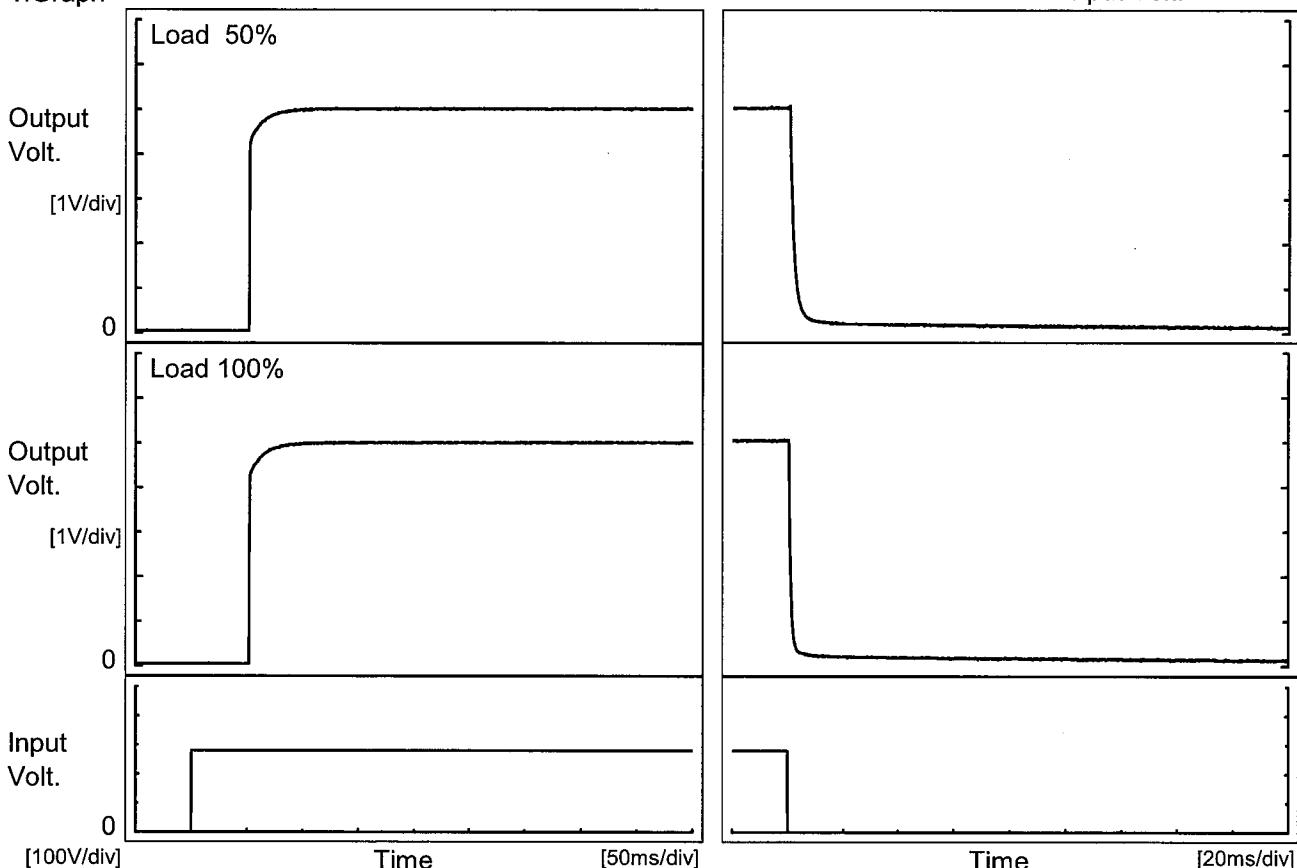
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	52.0	6.3	58.3	0.6	4.0
100 %	52.0	6.3	58.3	0.4	1.9

Output Volt.

90%

10%

Input Volt.

Td   Tr   Th   Tf

Ts

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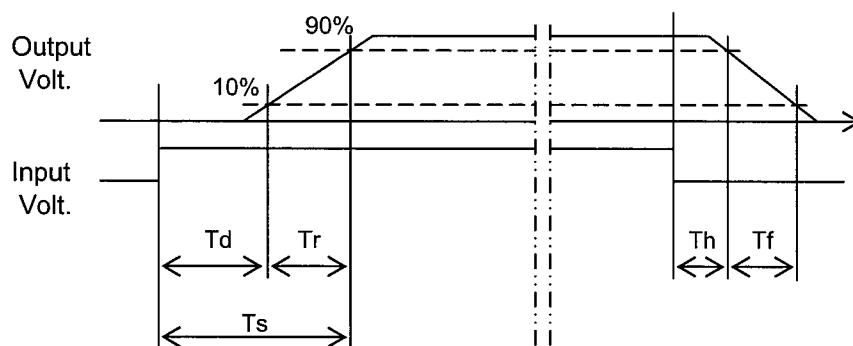
Model	SNDHS250B05
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V50A

Testing Circuitry   Figure A

1.Graph

--- ⊟ --- Load 50%
——— △ ——— Load 100%

Ambient Temperature [°C]

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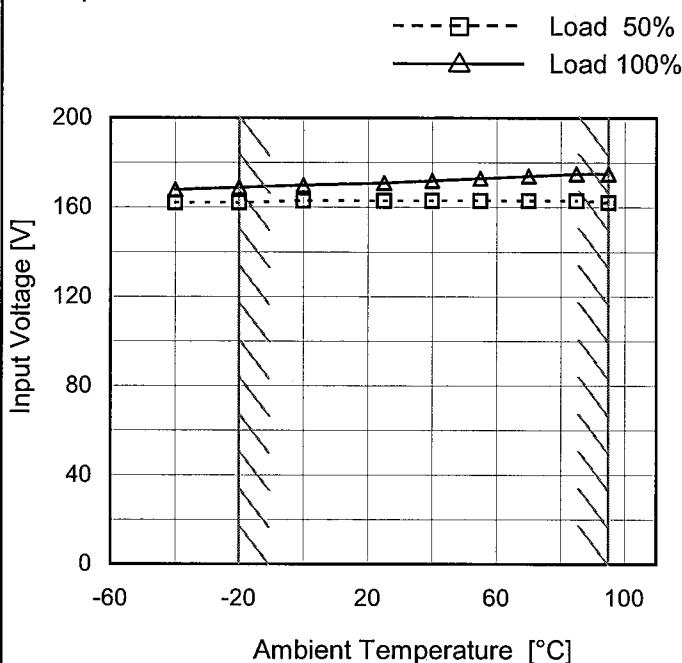
2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	162	168
-20	162	169
0	163	170
25	163	171
40	163	172
55	163	173
70	163	174
85	163	175
95	162	175
--	-	-
--	-	-

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Model	SNDHS250B05
Item	Overcurrent Protection
Object	+5V50A

Temperature　　　25°C
Testing Circuitry　Figure A

1.Graph

——————　Input Volt.　200V
——————　Input Volt.　280V
━━━━━━　Input Volt.　400V

Load Current [A]

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

Intermittent operation occurs when the output
voltage is from 3V to 0V.

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
4.75	60.98	61.62	60.78
4.50	61.41	62.06	61.78
4.00	62.30	63.05	62.11
3.50	63.11	64.00	62.89
3.00	64.54	64.98	64.36
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	SNDHS250B05
Item	Overvoltage Protection
Object	+5V50A
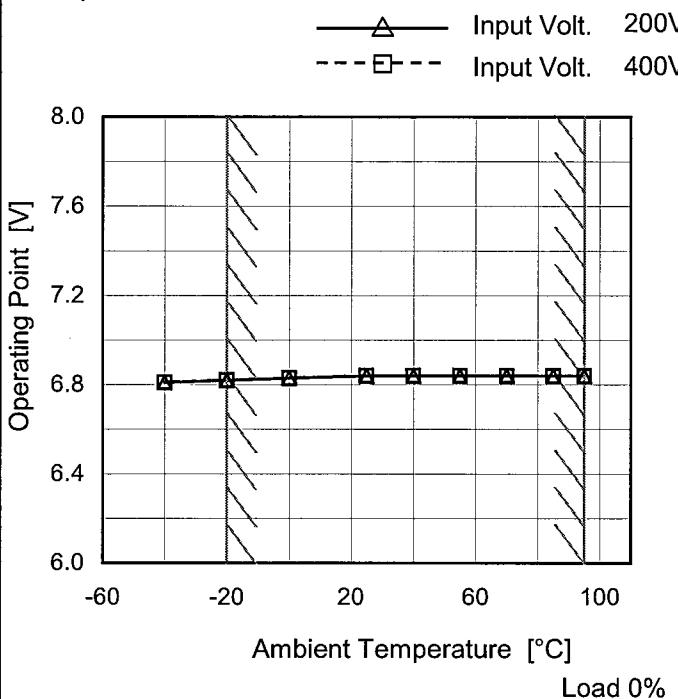
Testing Circuitry   Figure A

1.Graph

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

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. 200[V]	Input Volt. 400[V]
-40	6.81	6.81
-20	6.82	6.82
0	6.83	6.83
25	6.84	6.84
40	6.84	6.84
55	6.84	6.84
70	6.84	6.84
85	6.84	6.84
95	6.84	6.84
--	-	-
--	-	-

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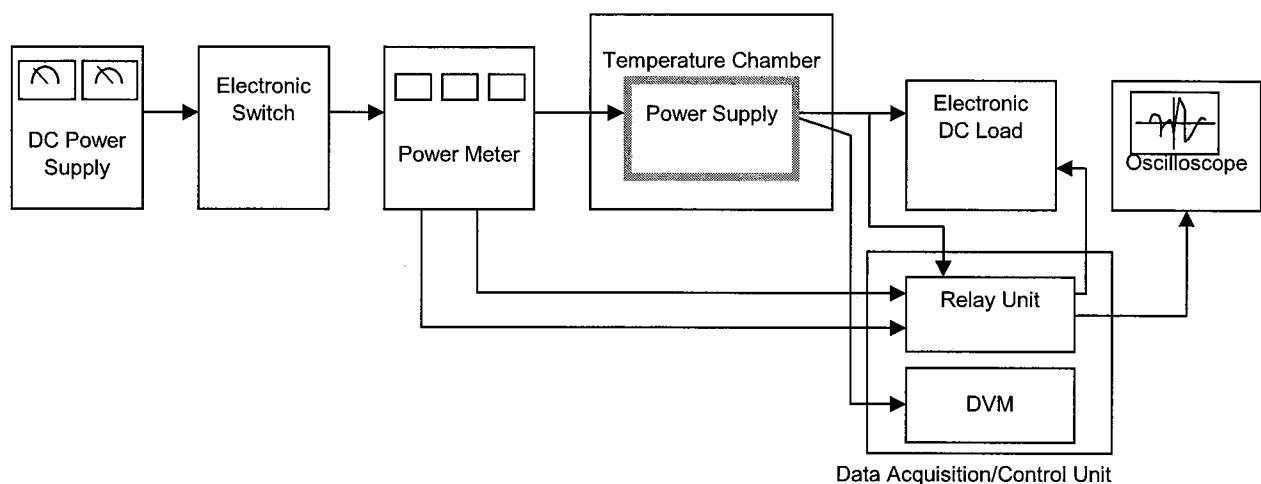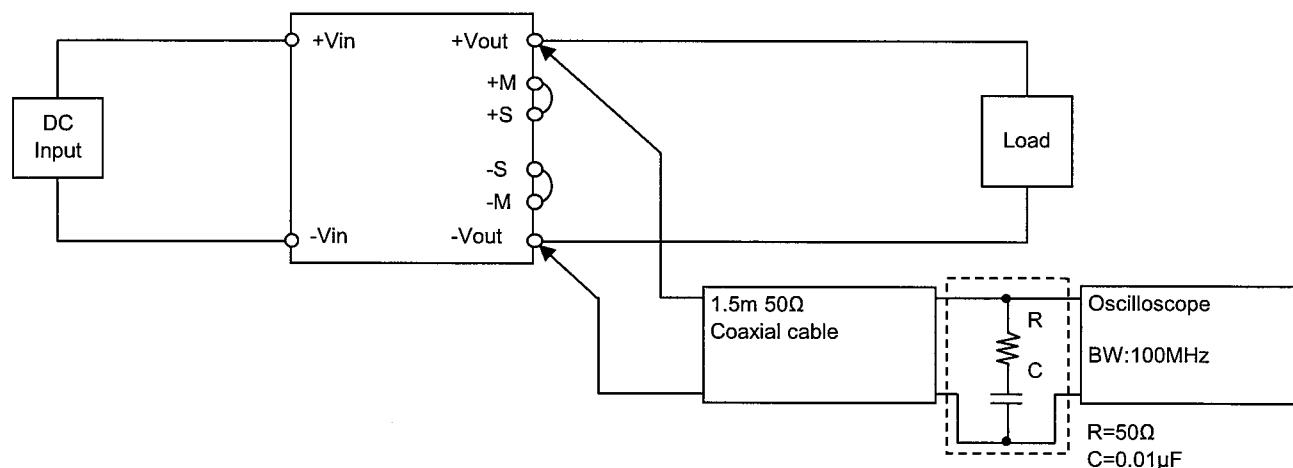
Figure A

Figure B (Ripple and Ripple noise Characteristic)

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