COSEL

TEST DATA OF SNDHS50B03

Regulated DC Power Supply
June 30, 2011

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COSEL CO.,LTD.

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Model	SNDHS50B03
Item	Input Current (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

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

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	0.000	0.000
100	0.000	0.000	0.000
150	0.002	0.002	0.002
170	0.003	0.003	0.003
180	0.024	0.127	0.240
200	0.023	0.114	0.215
250	0.019	0.092	0.174
280	0.016	0.084	0.157
300	0.014	0.080	0.148
350	0.012	0.072	0.130
400	0.011	0.066	0.117
420	0.011	0.064	0.113
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	SNDHS50B03
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	0.023	0.015	0.011
1.5	0.048	0.036	0.030
3.0	0.076	0.057	0.047
4.5	0.105	0.078	0.062
6.0	0.134	0.099	0.077
7.5	0.164	0.121	0.092
9.0	0.195	0.143	0.107
10.0	0.216	0.157	0.117
11.0	0.236	0.172	0.128
--	-	-	-
--	-	-	-

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Model	SNDHS50B03
Item	Input Power (by Load Current)
Object	

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

——△—— Input Volt. 200V
- - -⊟- - - Input Volt. 280V
—··-O—··- Input Volt. 400V

Load Current [A]

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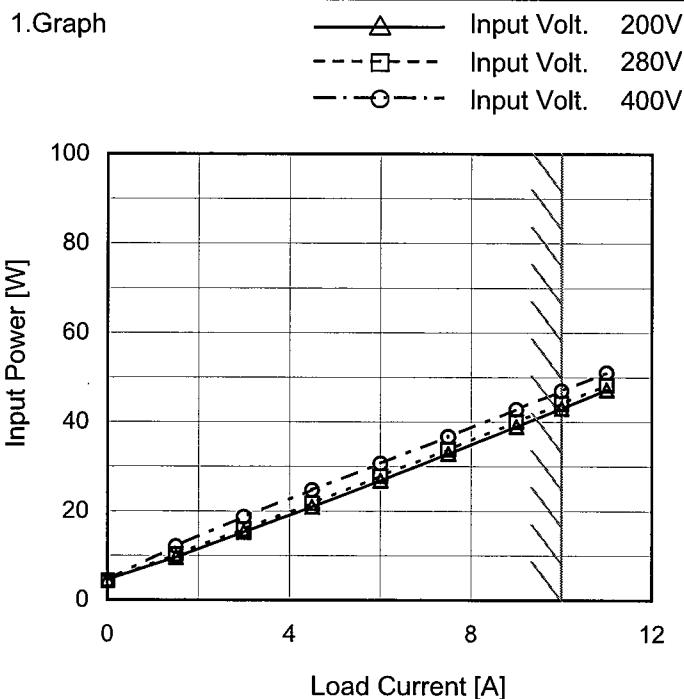
2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0.0	4.60	4.30	4.40
1.5	9.60	10.20	12.10
3.0	15.30	15.90	18.70
4.5	21.00	21.70	24.70
6.0	26.90	27.80	30.70
7.5	32.90	33.80	36.70
9.0	39.00	40.00	42.80
10.0	43.10	44.10	47.00
11.0	47.30	48.30	51.10
--	-	-	-
--	-	-	-

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Model	SNDHS50B03
Item	Efficiency (by Input Voltage)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

--- ⊟ --- Load 50%
——△—— Load 100%

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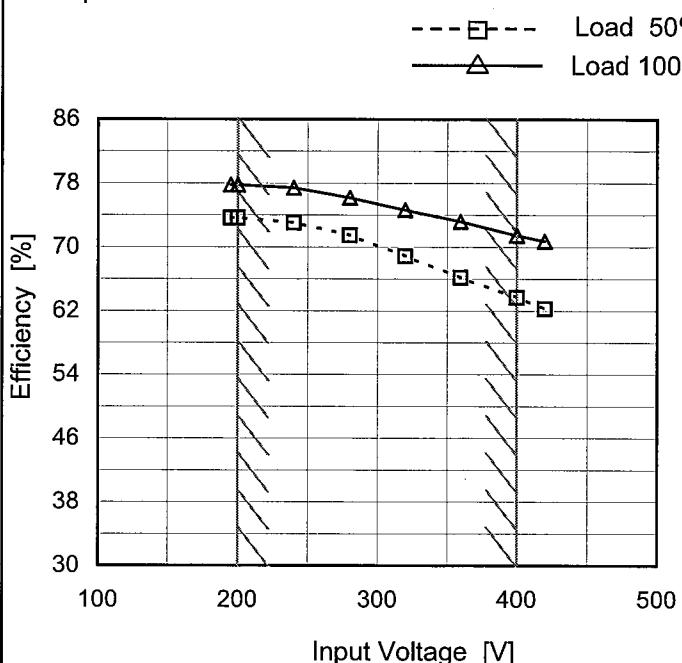
2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
195	73.7	77.8
200	73.7	77.8
240	73.0	77.4
280	71.5	76.2
320	68.9	74.7
360	66.2	73.2
400	63.7	71.5
420	62.3	70.7
--	-	-

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Model	SNDHS50B03
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]

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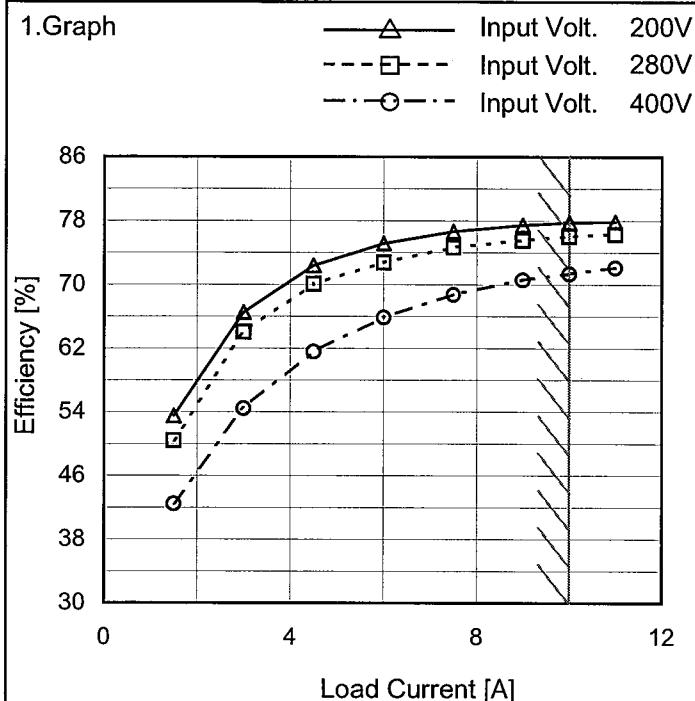
2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0.0	-	-	-
1.5	53.5	50.4	42.5
3.0	66.5	64.0	54.4
4.5	72.4	70.1	61.6
6.0	75.2	72.7	65.9
7.5	76.7	74.6	68.7
9.0	77.5	75.5	70.6
10.0	77.8	76.0	71.4
11.0	77.9	76.3	72.1
--	-	-	-
--	-	-	-

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Model	SNDHS50B03
Item	Line Regulation
Object	+3.3V10A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

--- ▣ --- Load 50%
—— △ —— Load 100%

Output Voltage [V] vs Input Voltage [V]

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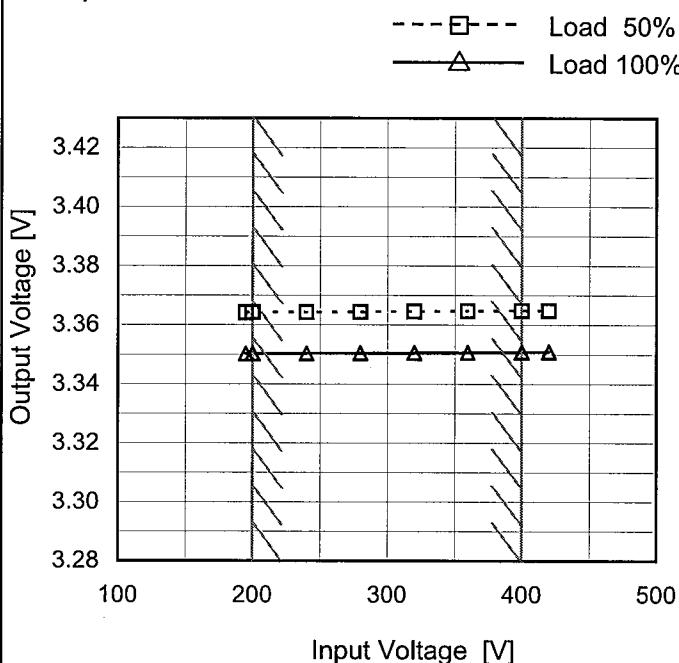
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
195	3.364	3.350
200	3.364	3.350
240	3.364	3.350
280	3.364	3.351
320	3.365	3.351
360	3.365	3.351
400	3.365	3.351
420	3.365	3.351
--	-	-

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Model	SNDHS50B03
Item	Load Regulation
Object	+3.3V10A

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]	Output Voltage [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0.0	3.380	3.380	3.380
1.5	3.374	3.375	3.375
3.0	3.370	3.370	3.371
4.5	3.366	3.366	3.367
6.0	3.362	3.362	3.362
7.5	3.358	3.358	3.358
9.0	3.353	3.354	3.354
10.0	3.350	3.351	3.351
11.0	3.348	3.348	3.348
--	-	-	-
--	-	-	-

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Model	SNDHS50B03
Item	Dynamic Load Response
Object	+3.3V10A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 280 V
Cycle 1000 ms

Load Current 10A/50 μ s

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

0.5 V/div

1ms/div

20ms/div

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

0.5 V/div

1ms/div

20ms/div

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

0.5 V/div

1ms/div

20ms/div

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Model	SNDHS50B03
Item	Ripple Voltage (by Load Current)
Object	+3.3V10A

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.
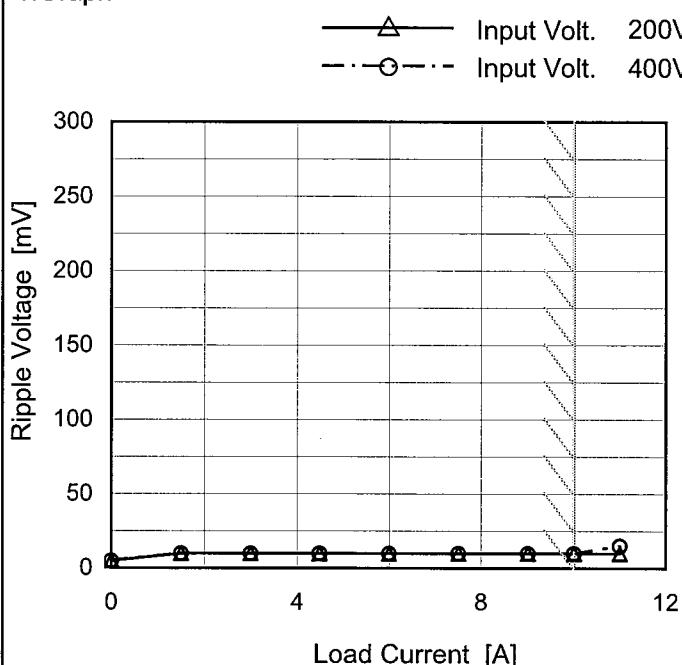
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 200 [V]	Input Volt. 400 [V]
0.0	5	5
1.5	10	10
3.0	10	10
4.5	10	10
6.0	10	10
7.5	10	10
9.0	10	10
10.0	10	10
11.0	10	15
--	-	-
--	-	-

Ripple [mVp-p]
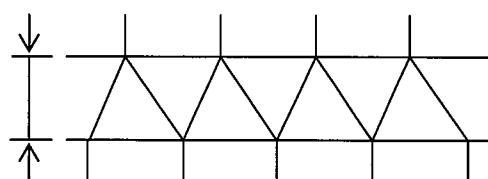
Fig.Complex Ripple Wave Form

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Model	SNDHS50B03
Item	Ripple-Noise
Object	+3.3V10A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

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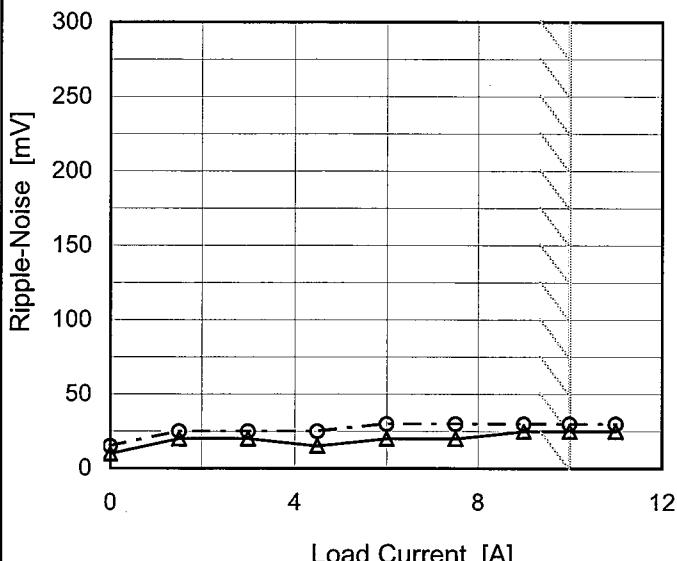
Load Current [A]

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]
0.0	10	15
1.5	20	25
3.0	20	25
4.5	15	25
6.0	20	30
7.5	20	30
9.0	25	30
10.0	25	30
11.0	25	30
--	-	-
--	-	-
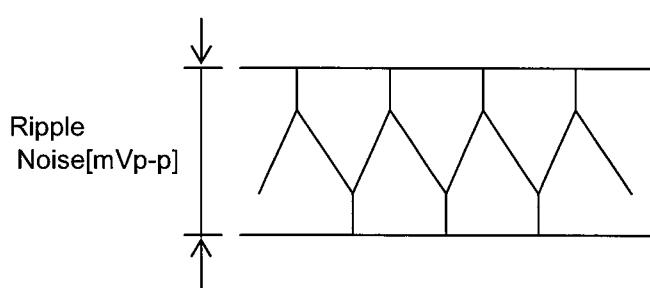
Ripple
Noise[mVp-p]

Fig.Complex Ripple Noise Wave Form

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Model	SNDHS50B03
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V10A

Testing Circuitry   Figure B

1.Graph

--- ⊟ --- Load 50%
—— △ —— Load 100%

Ambient Temperature [°C]

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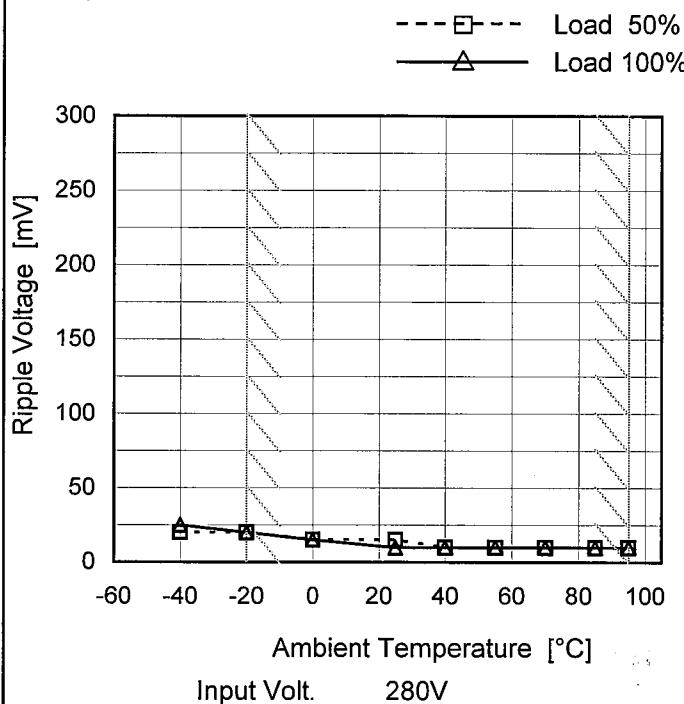
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	20	25
-20	20	20
0	15	15
25	15	10
40	10	10
55	10	10
70	10	10
85	10	10
95	10	10
---	-	-
---	-	-

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Model	SNDHS50B03
Item	Ambient Temperature Drift
Object	+3.3V10A
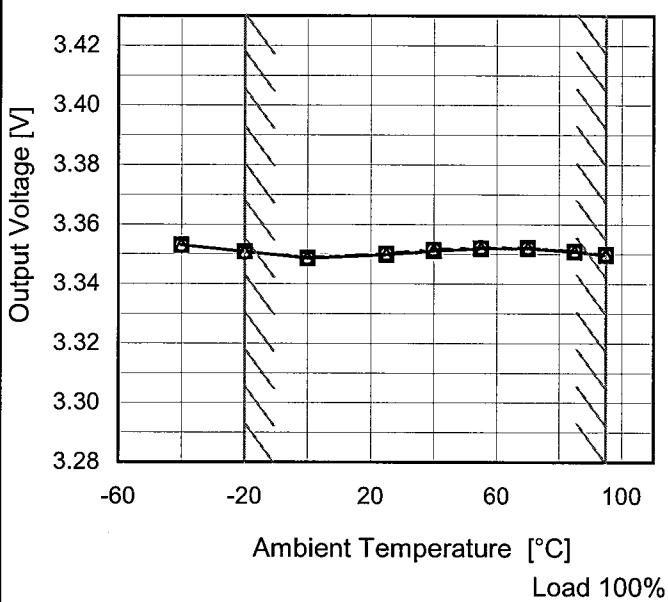
Testing Circuitry   Figure A

1.Graph

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

Output Voltage [V]

Ambient Temperature [°C]

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	3.353	3.353	3.353
-20	3.351	3.351	3.351
0	3.349	3.349	3.349
25	3.350	3.350	3.350
40	3.351	3.351	3.352
55	3.352	3.352	3.352
70	3.352	3.352	3.352
85	3.351	3.351	3.351
95	3.350	3.350	3.350
--	-	-	-
--	-	-	-

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Model	SNDHS50B03
Item	Output Voltage Accuracy
Object	+3.3V10A

Testing Circuitry   Figure A

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　-　10A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

* Output Voltage Accuracy (Ration) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}}$ × 100

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	95	400	0	3.387	±19	±0.6
Minimum Voltage	0	200	10	3.349		

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Model	SNDHS50B03
Item	Time Lapse Drift
Object	+3.3V10A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Output Voltage [V]

| 3.42 |
| 3.40 |
| 3.38 |
| 3.36 |
| 3.34 |
| 3.32 |
| 3.30 |
| 3.28 |

0 2 4 6 8 10

Time [H]

Input Volt. 280V
Load 100%
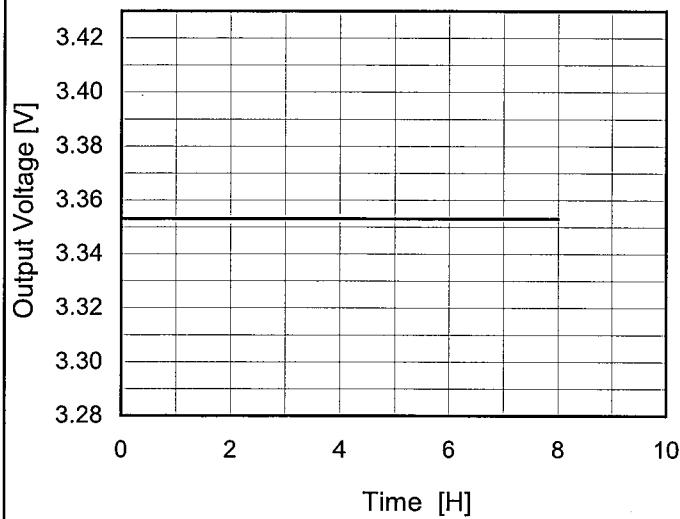
2.Values

Time since start [H]	Output Voltage [V]
0.0	3.353
0.5	3.353
1.0	3.353
2.0	3.353
3.0	3.353
4.0	3.353
5.0	3.353
6.0	3.353
7.0	3.353
8.0	3.353

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COSEL

Model	SNDHS50B03
Item	Rise and Fall Time
Object	+3.3V10A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

Input Volt.   280 V

Load 50%

Output Volt.

[0.5V/div]

0

Load 100%

Output Volt.

[0.5V/div]

0

Input Volt.

0

[100V/div]   Time   [50ms/div]   Time   [10ms/div]
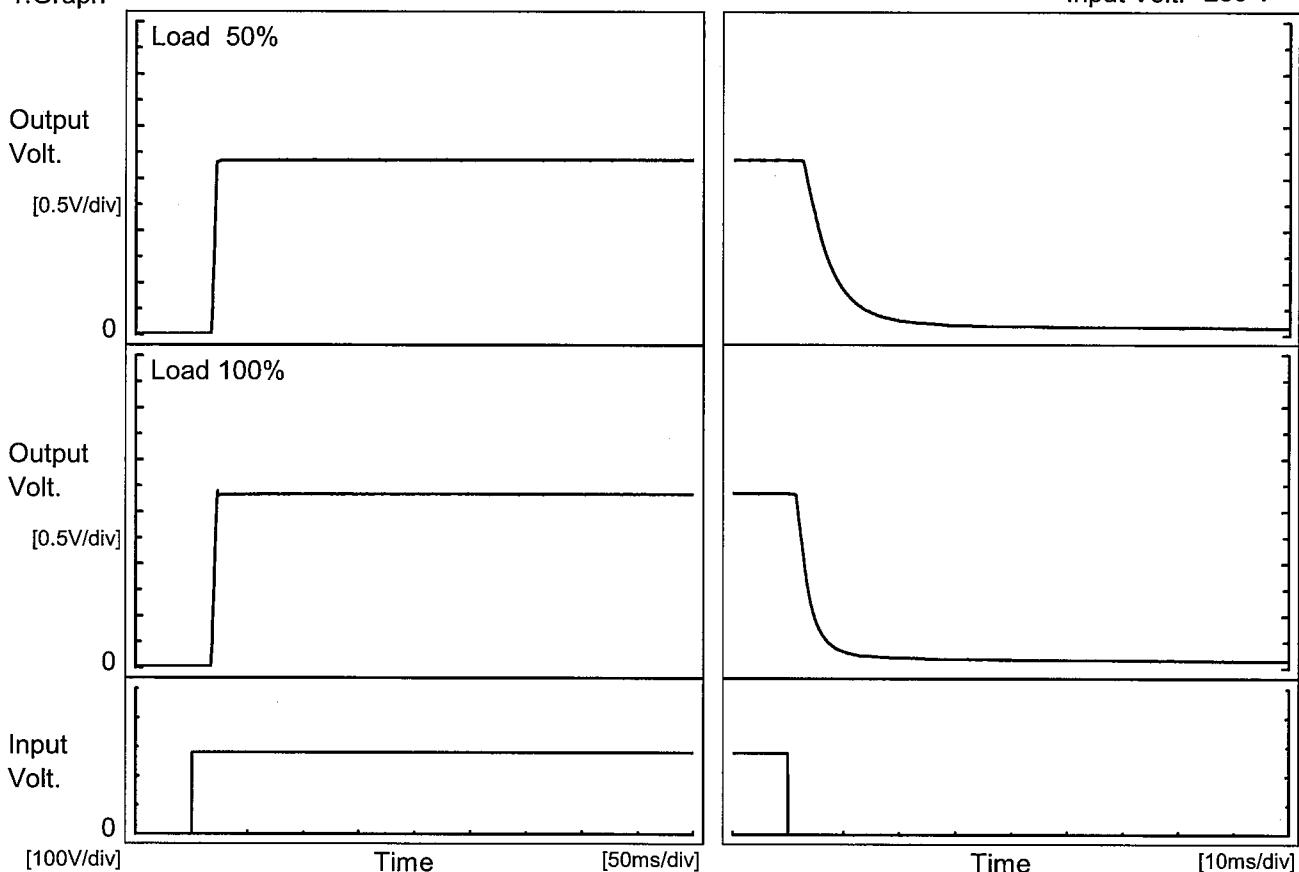
2.Values

[ms]

Load Time	Td	Tr	Ts	Th	Tf
50 %	18.0	3.5	21.5	3.3	14.1
100 %	18.0	4.0	22.0	1.7	7.5

Output Volt.

90%

10%

Input Volt.

Td   Tr   Th   Tf

Ts
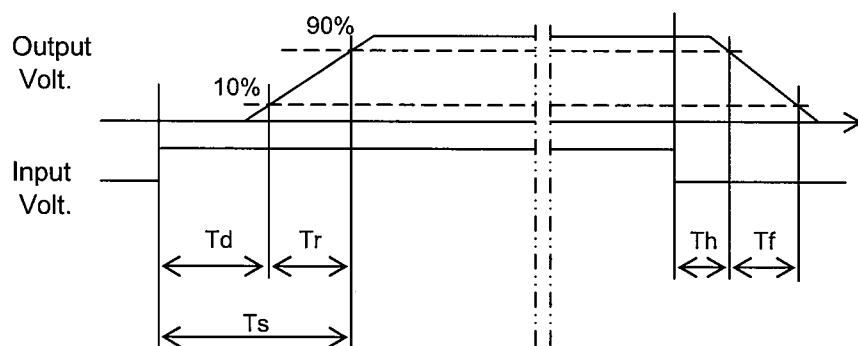
COSEL

Model	SNDHS50B03
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V10A
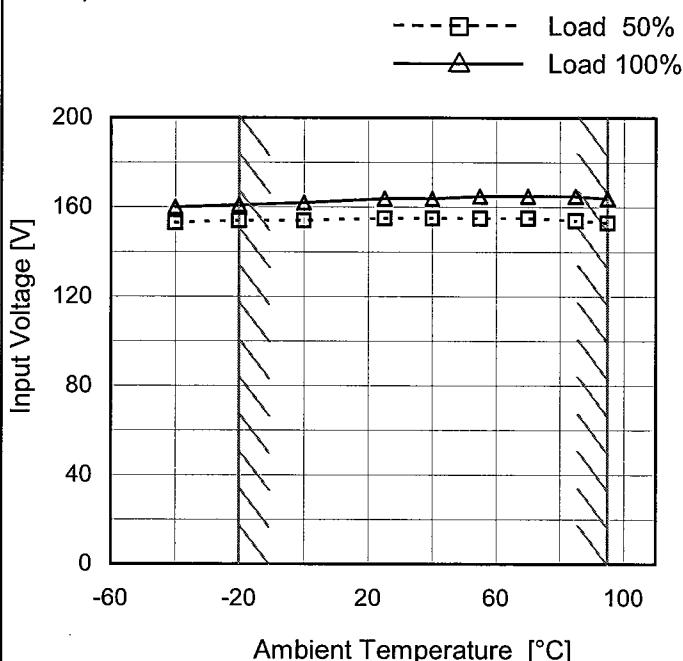
Testing Circuitry   Figure A

1.Graph

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

Input Voltage [V] vs 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	153	160
-20	154	161
0	154	162
25	155	164
40	155	164
55	155	165
70	155	165
85	154	165
95	153	164
--	-	-
--	-	-

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Model	SNDHS50B03
Item	Overcurrent Protection
Object	+3.3V10A
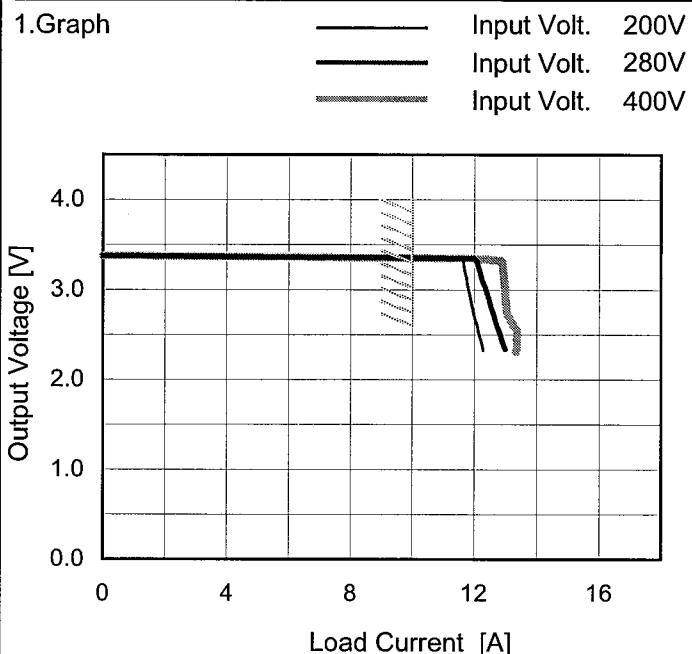
Temperature   25°C
Testing Circuitry   Figure A

1.Graph

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

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

Intermittent operation occurs when the output
voltage is from 2.31V to 0V.

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
3.14	11.76	12.25	12.96
2.97	11.81	12.38	12.99
2.64	12.06	12.65	13.17
2.31	12.29	13.00	13.33
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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CO$EL

Model	SNDHS50B03
Item	Overvoltage Protection
Object	+3.3V10A

1.Graph
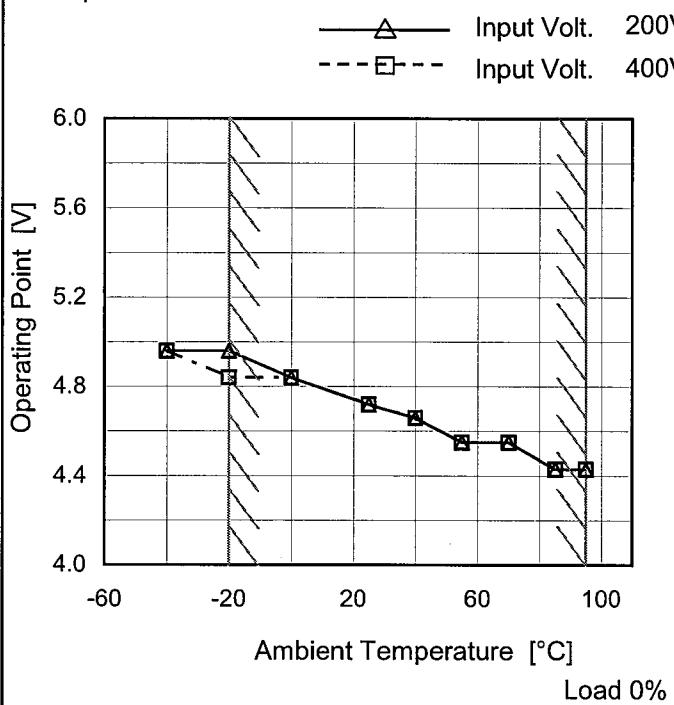
———△——— Input Volt.   200V
- - -⊟- - - Input Volt.   400V

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	4.96	4.96
-20	4.96	4.84
0	4.84	4.84
25	4.72	4.72
40	4.66	4.66
55	4.55	4.55
70	4.55	4.55
85	4.43	4.43
95	4.43	4.43
--	-	-
--	-	-

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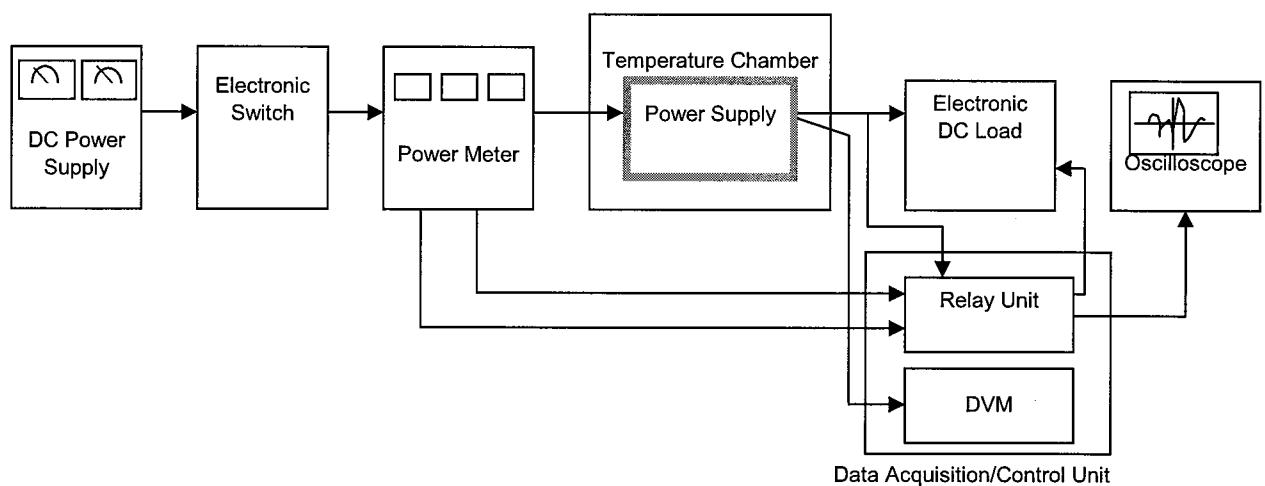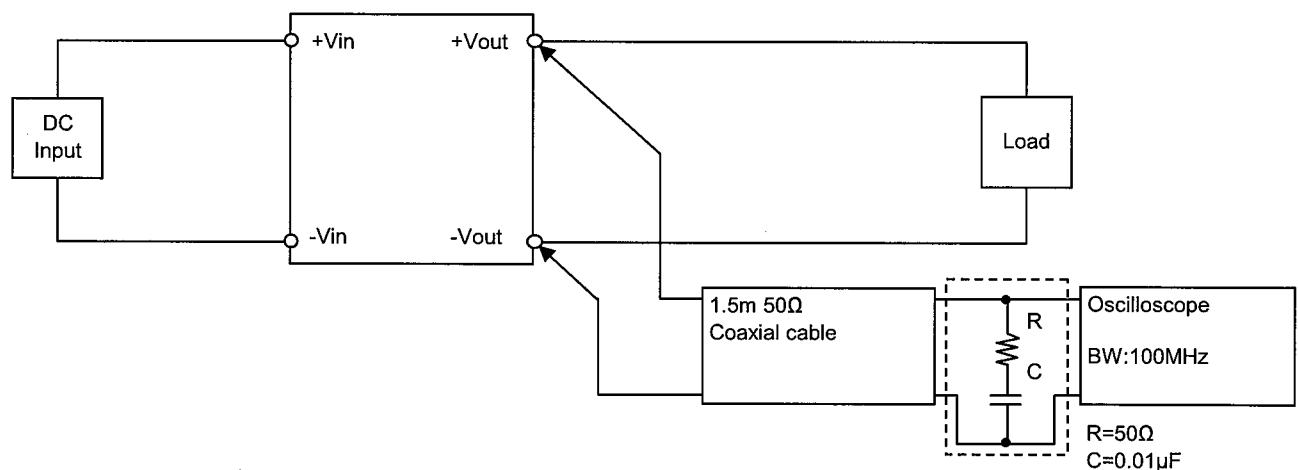
Figure A

Figure B (Ripple and Ripple noise Characteristic)

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