COSEL

参考資料

# TEST DATA OF SNDBS400B03

Regulated DC Power Supply
July 20, 2012

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**COSEL CO.,LTD.**

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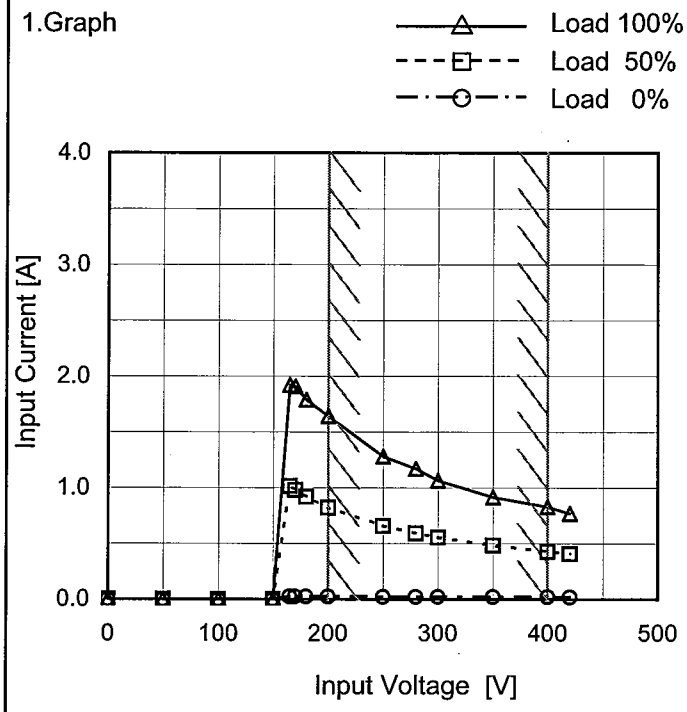
| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Input Current (by Input Voltage) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

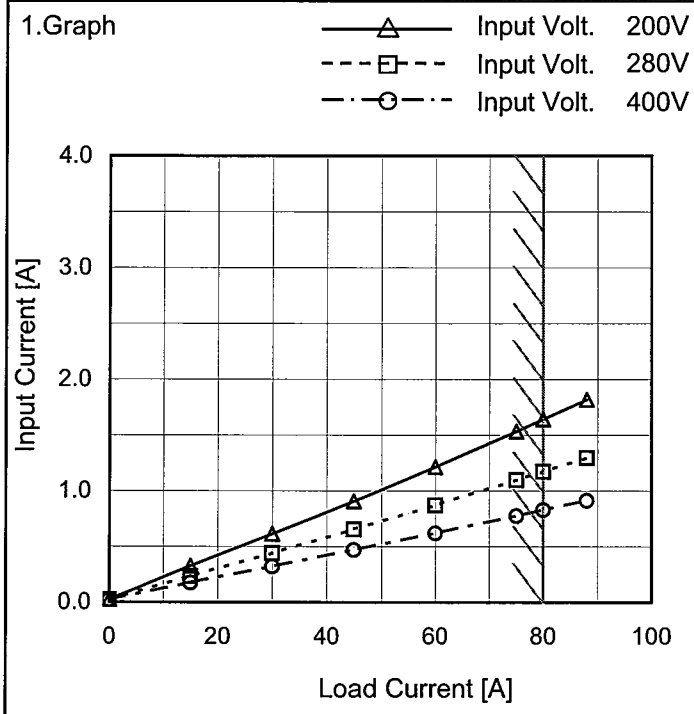
| Input Voltage [V] | Input Current [A] | | |
|---|---|---|---|
| | Load 0% | Load 50% | Load 100% |
| 0 | 0.000 | 0.000 | 0.000 |
| 50 | 0.000 | 0.000 | 0.000 |
| 100 | 0.000 | 0.000 | 0.000 |
| 150 | 0.000 | 0.000 | 0.000 |
| 165 | 0.026 | 1.015 | 1.922 |
| 170 | 0.026 | 0.980 | 1.908 |
| 180 | 0.025 | 0.920 | 1.790 |
| 200 | 0.025 | 0.821 | 1.643 |
| 250 | 0.024 | 0.659 | 1.282 |
| 280 | 0.022 | 0.592 | 1.173 |
| 300 | 0.022 | 0.555 | 1.066 |
| 350 | 0.022 | 0.482 | 0.916 |
| 400 | 0.022 | 0.427 | 0.830 |
| 420 | 0.021 | 0.409 | 0.769 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Input Current (by Load Current) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

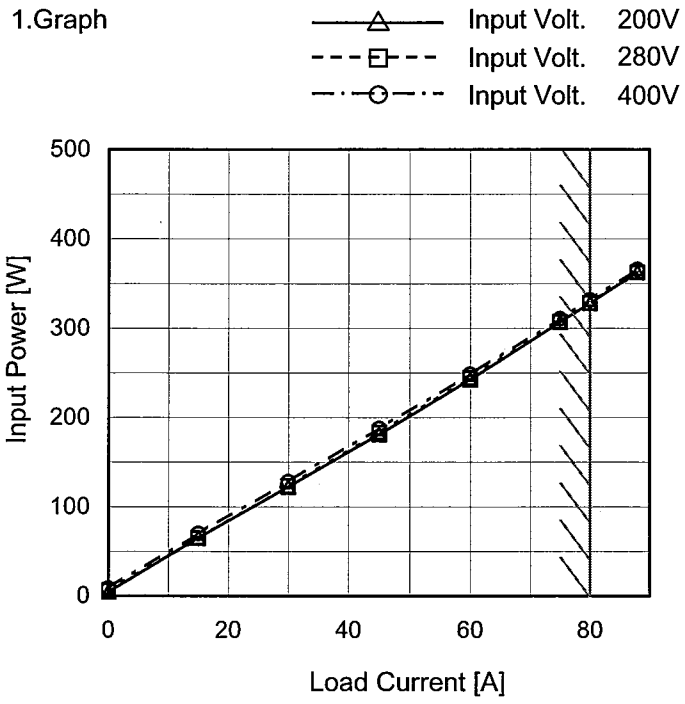
| Load Current [A] | Input Current [A] | | |
|---|---|---|---|
| | Input Volt. 200[V] | Input Volt. 280[V] | Input Volt. 400[V] |
| 0 | 0.025 | 0.022 | 0.022 |
| 15 | 0.328 | 0.231 | 0.175 |
| 30 | 0.614 | 0.440 | 0.321 |
| 45 | 0.908 | 0.654 | 0.470 |
| 60 | 1.216 | 0.872 | 0.622 |
| 75 | 1.535 | 1.097 | 0.777 |
| 80 | 1.643 | 1.173 | 0.830 |
| 88 | 1.818 | 1.295 | 0.915 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Input Power (by Load Current) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

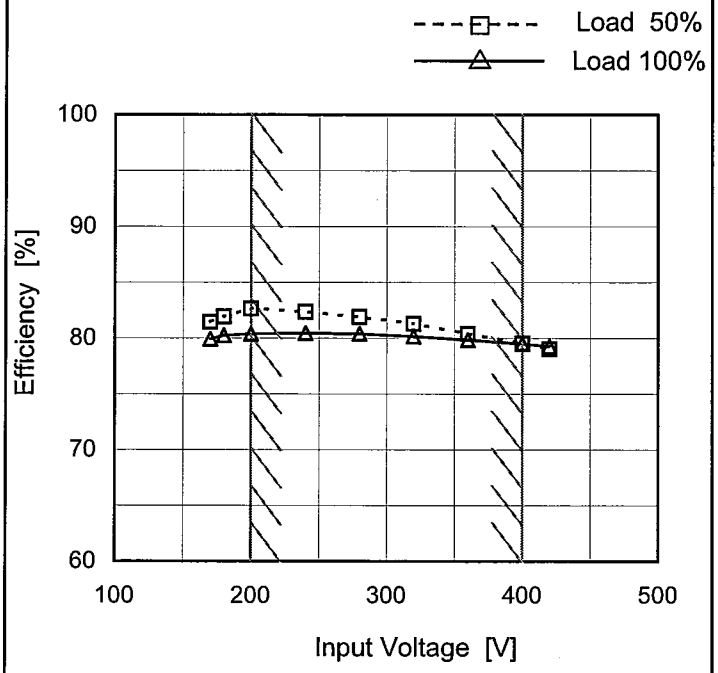
| Load Current [A] | Input Power [W] | | |
|---|---|---|---|
| | Input Volt. 200[V] | Input Volt. 280[V] | Input Volt. 400[V] |
| 0 | 4.8 | 6.2 | 8.5 |
| 15 | 65.5 | 64.7 | 70.1 |
| 30 | 122.5 | 123.2 | 128.4 |
| 45 | 181.4 | 183.2 | 187.7 |
| 60 | 242.9 | 244.2 | 248.6 |
| 75 | 307.0 | 307.2 | 310.8 |
| 80 | 328.3 | 328.3 | 332.0 |
| 88 | 363.1 | 362.6 | 365.9 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Efficiency (by Input Voltage) |
| Object | ——————————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

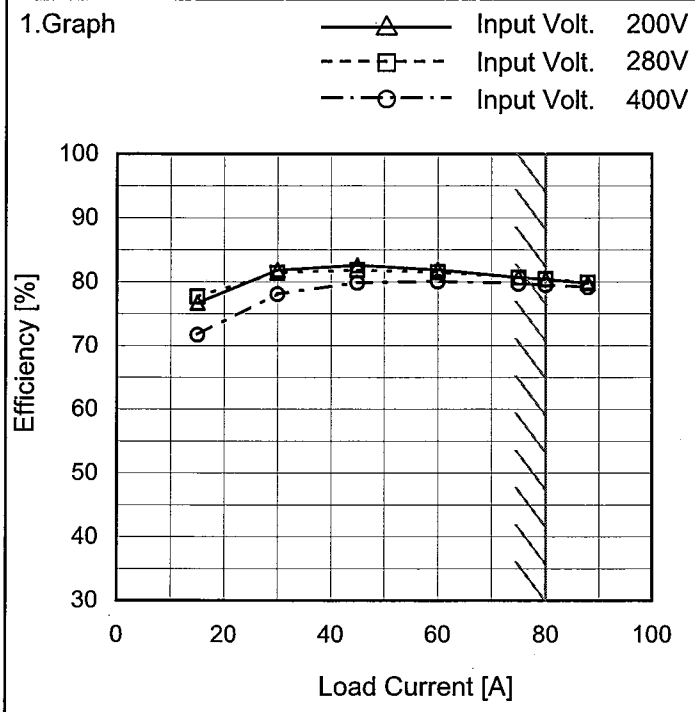
| Input Voltage [V] | Efficiency [%] | |
|---|---|---|
| | Load 50% | Load 100% |
| 170 | 81.4 | 79.9 |
| 180 | 81.9 | 80.3 |
| 200 | 82.6 | 80.4 |
| 240 | 82.3 | 80.5 |
| 280 | 81.9 | 80.4 |
| 320 | 81.3 | 80.2 |
| 360 | 80.4 | 79.9 |
| 400 | 79.5 | 79.5 |
| 420 | 79.0 | 79.3 |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Efficiency (by Load Current) |
| Object | ———————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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 | - | - | - |
| 15 | 76.7 | 77.7 | 71.7 |
| 30 | 81.8 | 81.4 | 78.1 |
| 45 | 82.6 | 81.8 | 79.8 |
| 60 | 81.9 | 81.5 | 80.0 |
| 75 | 80.7 | 80.6 | 79.7 |
| 80 | 80.4 | 80.4 | 79.5 |
| 88 | 79.8 | 79.9 | 79.1 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

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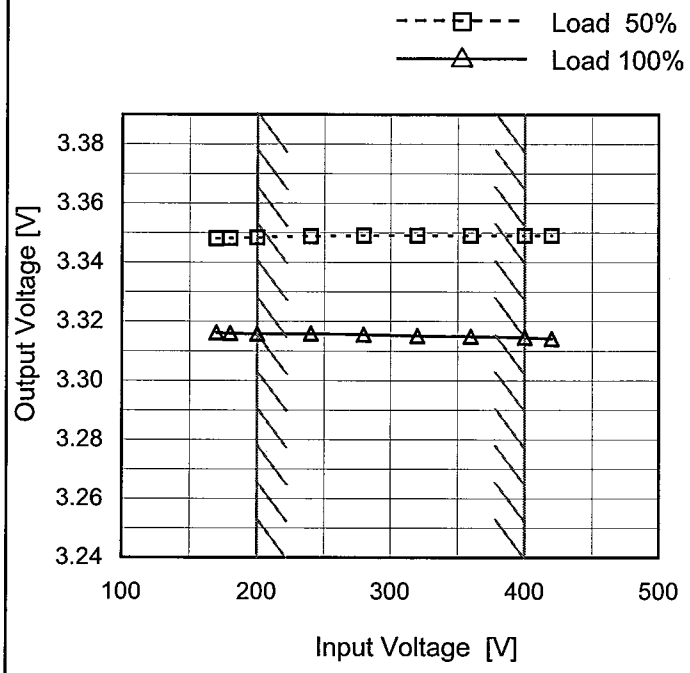
|---|---|
| Model | SNDBS400B03 |
| Item | Line Regulation |
| Object | +3.3V80A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

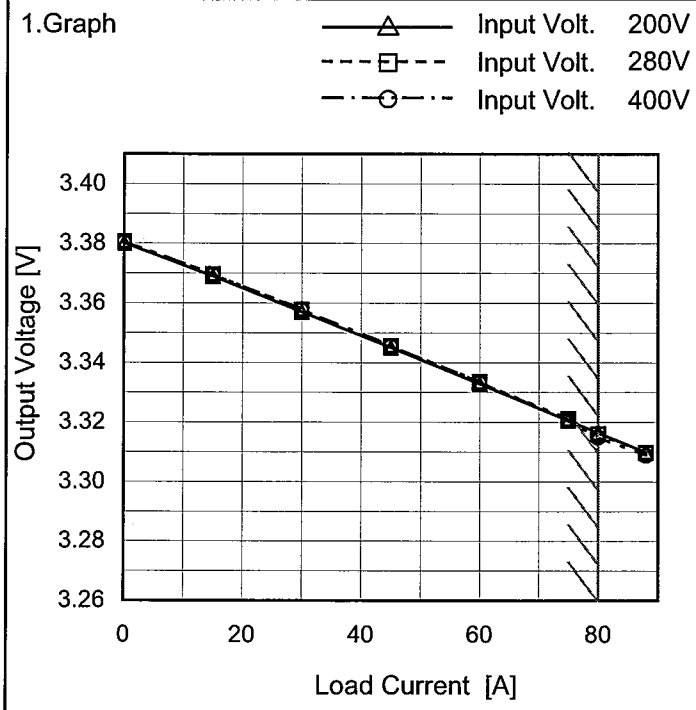
| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 170 | 3.348 | 3.316 |
| 180 | 3.348 | 3.316 |
| 200 | 3.348 | 3.316 |
| 240 | 3.349 | 3.316 |
| 280 | 3.349 | 3.316 |
| 320 | 3.349 | 3.315 |
| 360 | 3.349 | 3.315 |
| 400 | 3.349 | 3.315 |
| 420 | 3.349 | 3.314 |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Load Regulation |
| Object | +3.3V80A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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 | 3.380 | 3.381 | 3.381 |
| 15 | 3.369 | 3.370 | 3.370 |
| 30 | 3.357 | 3.358 | 3.358 |
| 45 | 3.345 | 3.346 | 3.346 |
| 60 | 3.333 | 3.334 | 3.333 |
| 75 | 3.321 | 3.321 | 3.321 |
| 80 | 3.317 | 3.316 | 3.315 |
| 88 | 3.310 | 3.310 | 3.309 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

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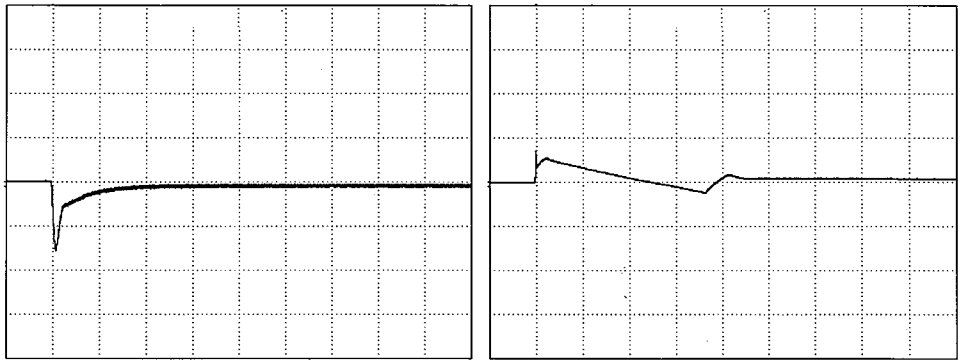
|---|---|---|---|
| Model | SNDBS400B03 | | |
| Item | Dynamic Load Response | Temperature<br>Testing Circuitry | 25°C<br>Figure A |
| Object | +3.3V80A | | |

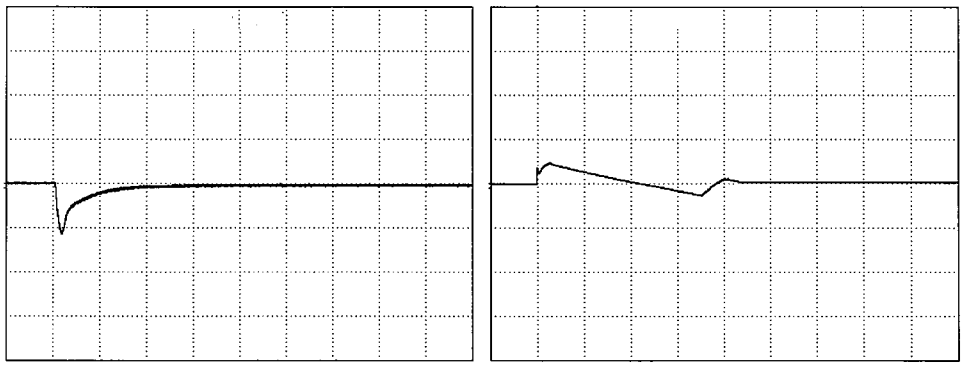
Input Volt. 280 V
Cycle 1000 ms

Load Current
80A/60μs

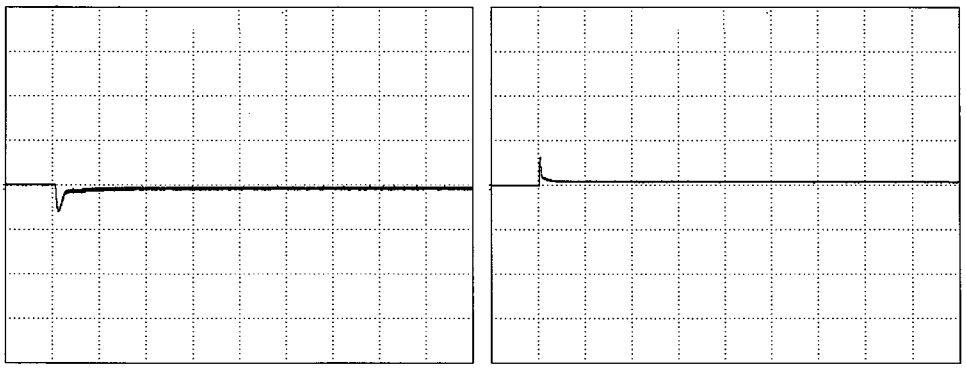
Min. Load (0A) ⟷
Load 100% (80A)




Min. Load (0A) ⟷
Load 50% (40A)




Load 10% (8A) ⟷
Load 100% (80A)

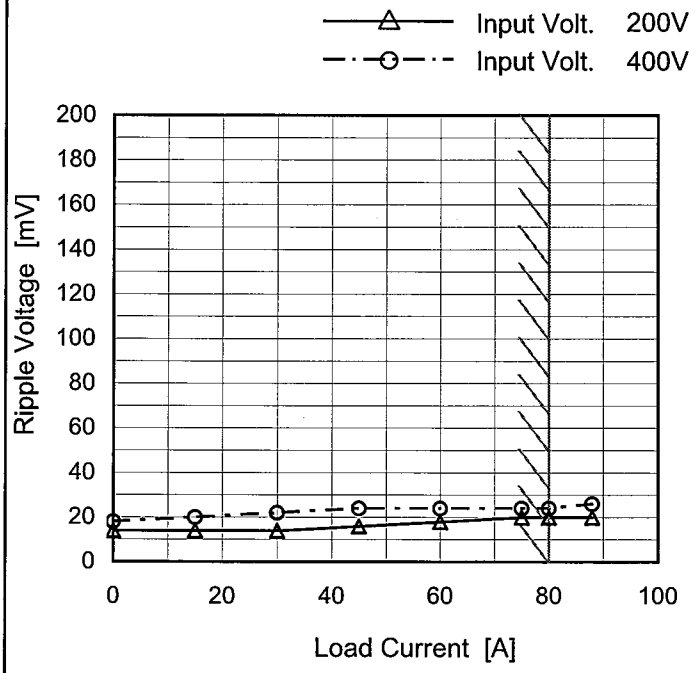


COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Ripple Voltage (by Load Current) |
| Object | +3.3V80A |

Temperature 25°C
Testing Circuitry Figure B

1.Graph




Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

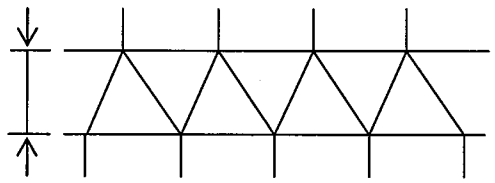


Fig.Complex Ripple Wave Form

2.Values

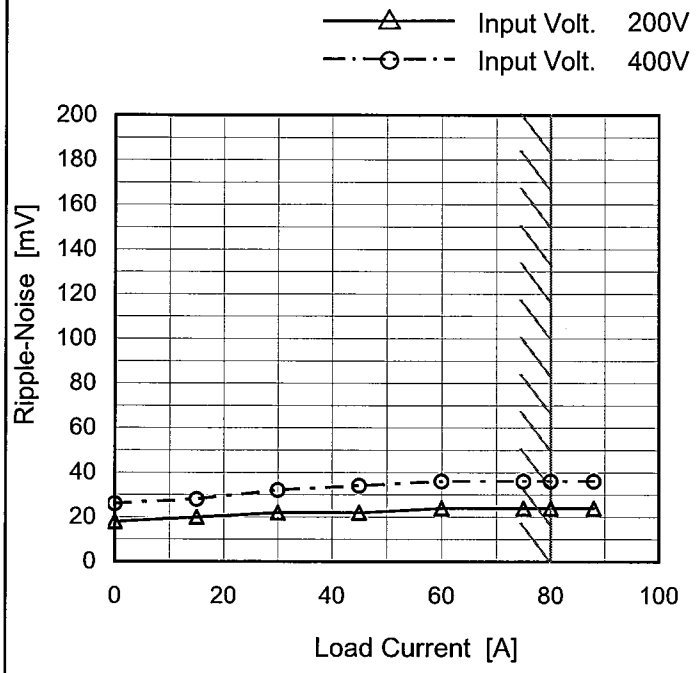
| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 200 [V] | Input Volt. 400 [V] |
| 0 | 14 | 18 |
| 15 | 14 | 20 |
| 30 | 14 | 22 |
| 45 | 16 | 24 |
| 60 | 18 | 24 |
| 75 | 20 | 24 |
| 80 | 20 | 24 |
| 88 | 20 | 26 |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Ripple-Noise |
| Object | +3.3V80A |

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.

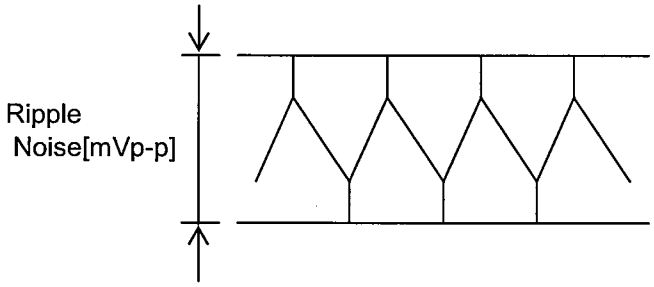



Fig.Complex Ripple Noise Wave Form

2.Values

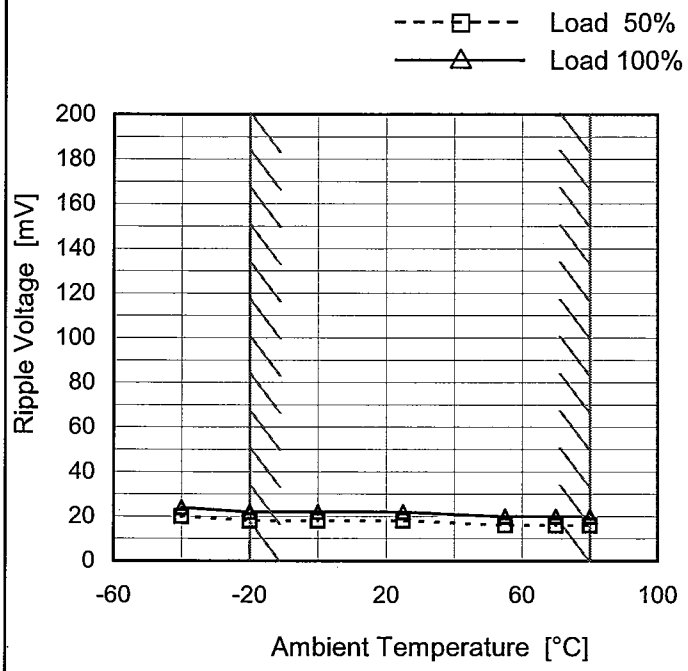
| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 200 [V] | Input Volt. 400 [V] |
| 0 | 18 | 26 |
| 15 | 20 | 28 |
| 30 | 22 | 32 |
| 45 | 22 | 34 |
| 60 | 24 | 36 |
| 75 | 24 | 36 |
| 80 | 24 | 36 |
| 88 | 24 | 36 |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +3.3V80A |

Testing Circuitry Figure B

1.Graph




Input Volt. 280V

Measured by 100 MHz Oscilloscope.

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

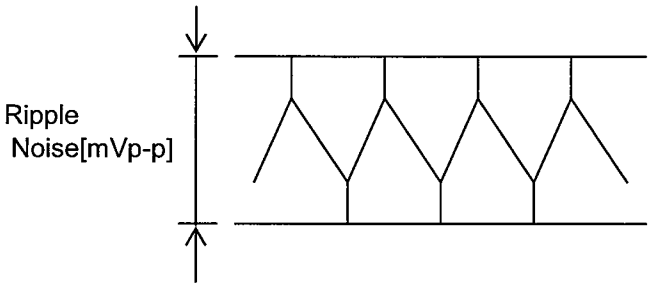



Fig.Complex Ripple Noise Wave Form

2.Values

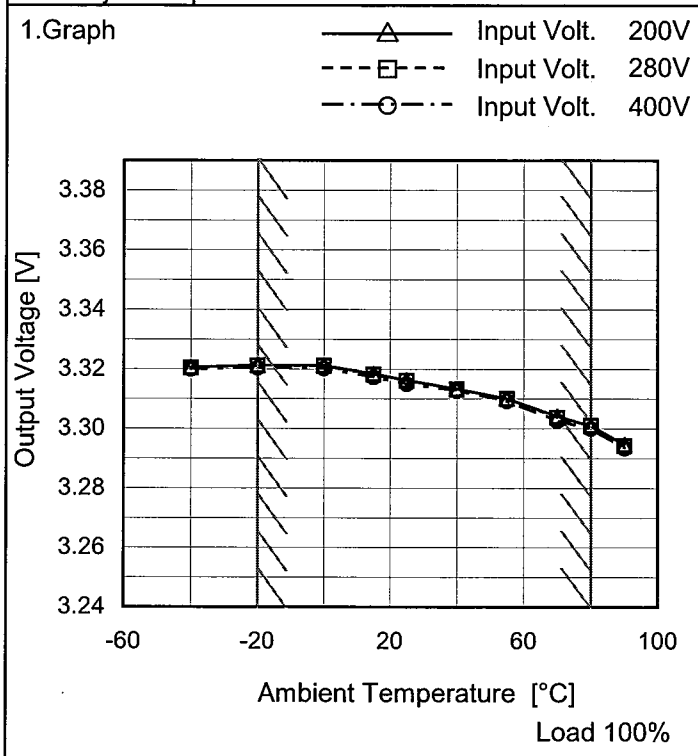
| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -40 | 20 | 24 |
| -20 | 18 | 22 |
| 0 | 18 | 22 |
| 25 | 18 | 22 |
| 55 | 16 | 20 |
| 70 | 16 | 20 |
| 80 | 16 | 20 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Ambient Temperature Drift |
| Object | +3.3V80A |

Testing Circuitry Figure A

1.Graph




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 | 3.321 | 3.320 | 3.320 |
| -20 | 3.321 | 3.321 | 3.320 |
| 0 | 3.321 | 3.321 | 3.320 |
| 15 | 3.318 | 3.318 | 3.317 |
| 25 | 3.316 | 3.316 | 3.315 |
| 40 | 3.313 | 3.313 | 3.313 |
| 55 | 3.310 | 3.310 | 3.309 |
| 70 | 3.304 | 3.304 | 3.303 |
| 80 | 3.301 | 3.301 | 3.300 |
| 90 | 3.295 | 3.294 | 3.293 |
| -- | - | - | - |

COSEL

| | | |
|---|---|---|
| Model | SNDBS400B03 | |
| Item | Output Voltage Accuracy | Testing Circuitry Figure A |
| Object | +3.3V80A | |

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 = ±(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

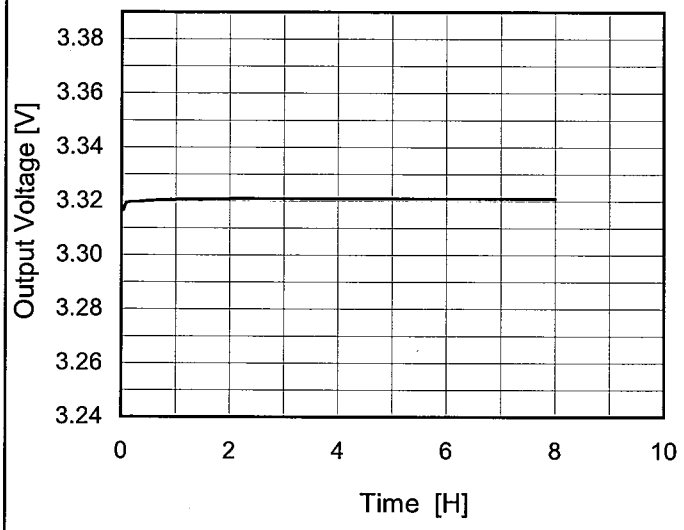
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
|---|---|---|---|---|---|---|
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | 55 | 400 | 0 | 3.383 | ±40 | ±1.2 |
| Minimum Voltage | 80 | 400 | 80 | 3.303 | | |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Time Lapse Drift |
| Object | +3.3V80A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Input Volt. 280V
Load 100%

2.Values

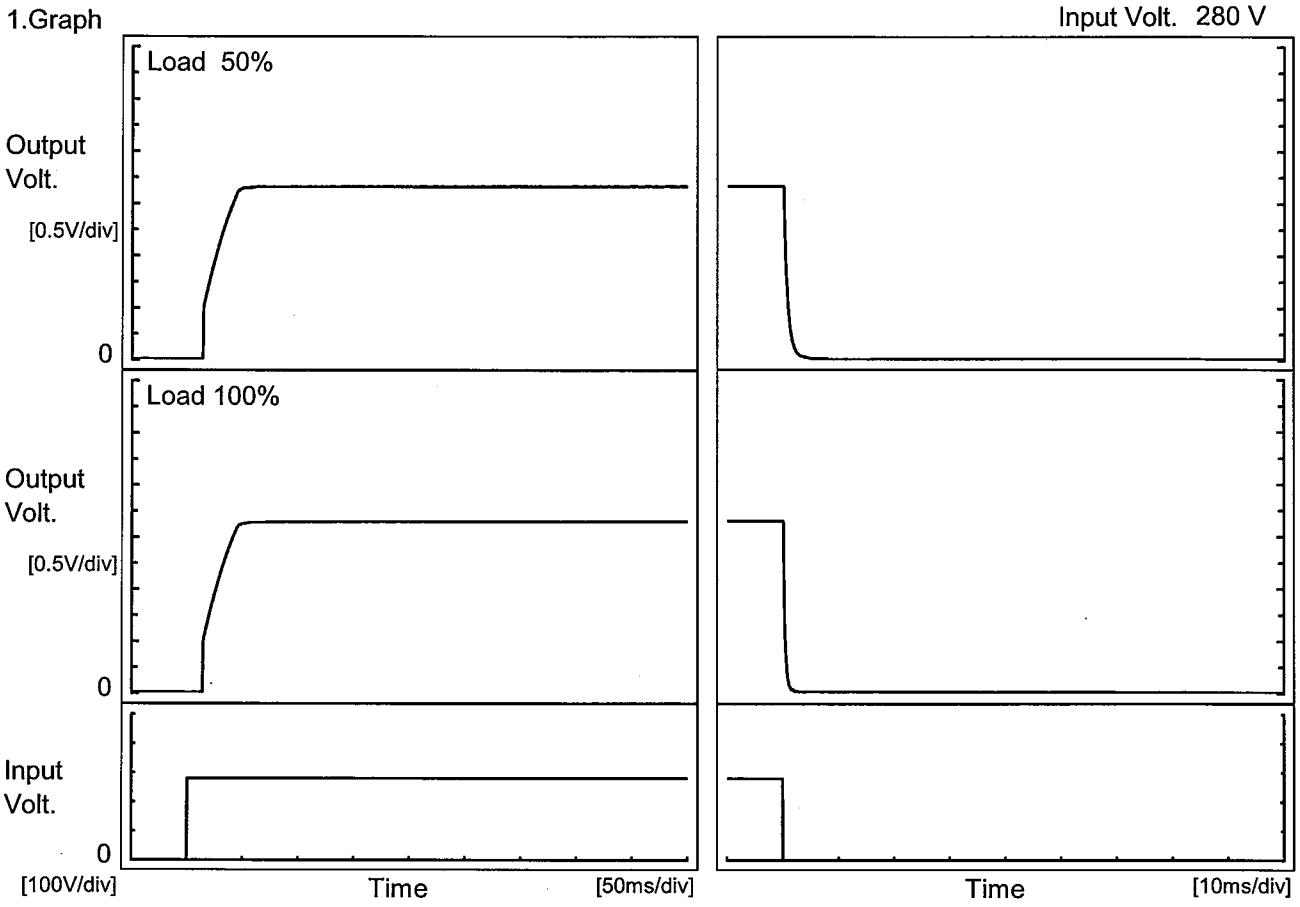
| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 3.319 |
| 0.5 | 3.320 |
| 1.0 | 3.321 |
| 2.0 | 3.321 |
| 3.0 | 3.321 |
| 4.0 | 3.321 |
| 5.0 | 3.321 |
| 6.0 | 3.321 |
| 7.0 | 3.321 |
| 8.0 | 3.321 |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Rise and Fall Time |
| Object | +3.3V80A |

Temperature 25°C
Testing Circuitry Figure A

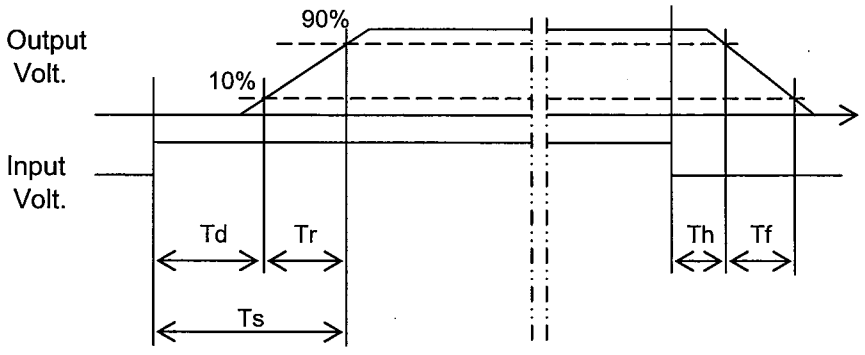
1.Graph




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 14.3 | 26.5 | 40.8 | 0.1 | 1.5 |
| 100 % | 14.3 | 27.0 | 41.3 | 0.1 | 0.7 |

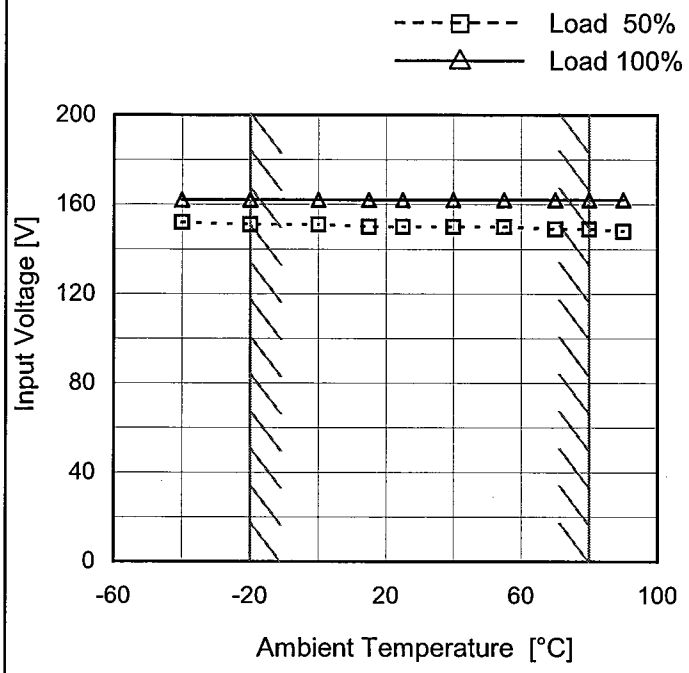


COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +3.3V80A |

Testing Circuitry Figure A

1.Graph




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

2.Values

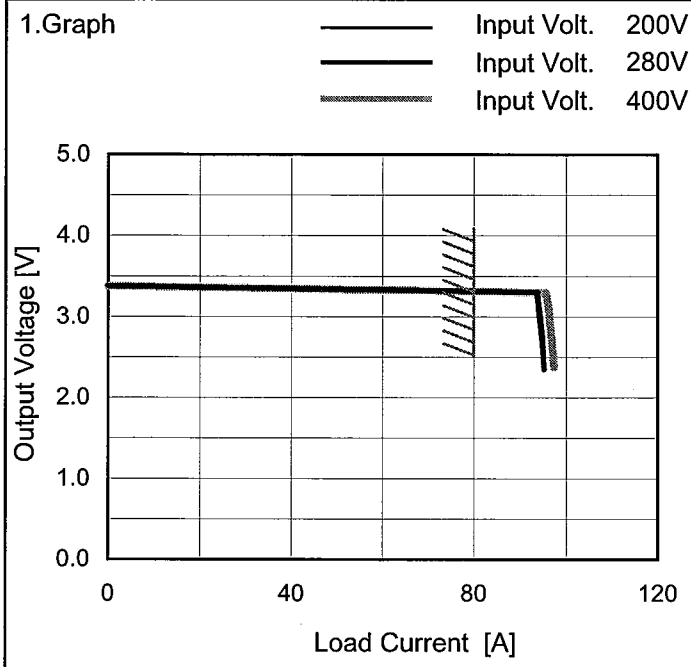
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -40 | 152 | 162 |
| -20 | 151 | 162 |
| 0 | 151 | 162 |
| 15 | 150 | 162 |
| 25 | 150 | 162 |
| 40 | 150 | 162 |
| 55 | 150 | 162 |
| 70 | 149 | 162 |
| 80 | 149 | 162 |
| 90 | 148 | 162 |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Overcurrent Protection |
| Object | +3.3V80A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

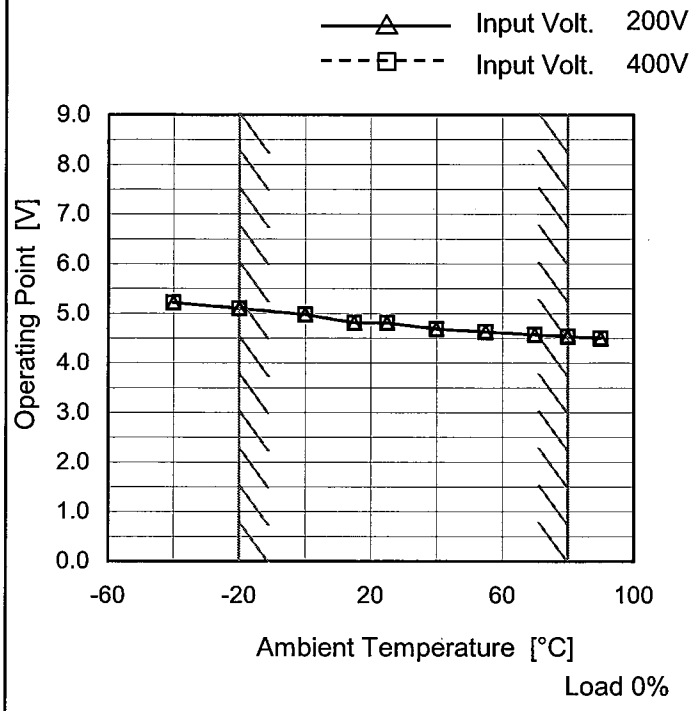
| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 200[V] | Input Volt. 280[V] | Input Volt. 400[V] |
| 3.14 | 93.63 | 94.09 | 96.14 |
| 2.97 | 93.85 | 94.40 | 96.32 |
| 2.64 | 94.51 | 94.86 | 96.93 |
| 2.31 | 94.93 | 95.19 | 97.35 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | SNDBS400B03 |
| Item | Overvoltage Protection |
| Object | +3.3V80A |

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. 200[V] | Input Volt. 400[V] |
| -40 | 5.22 | 5.22 |
| -20 | 5.10 | 5.10 |
| 0 | 4.98 | 4.98 |
| 15 | 4.81 | 4.81 |
| 25 | 4.81 | 4.81 |
| 40 | 4.69 | 4.69 |
| 55 | 4.63 | 4.63 |
| 70 | 4.57 | 4.57 |
| 80 | 4.54 | 4.54 |
| 90 | 4.50 | 4.50 |
| -- | - | - |

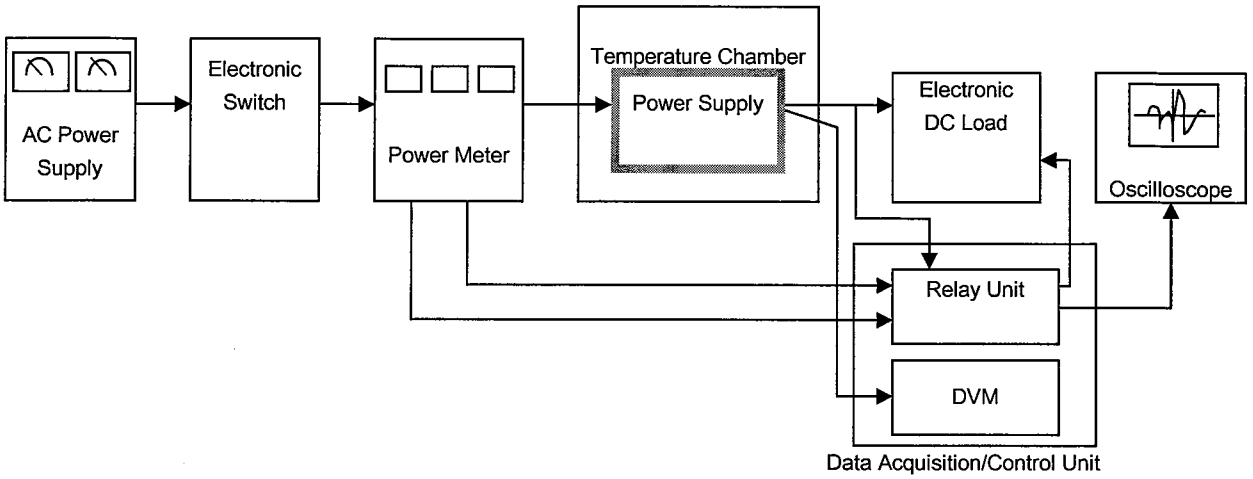



Figure A

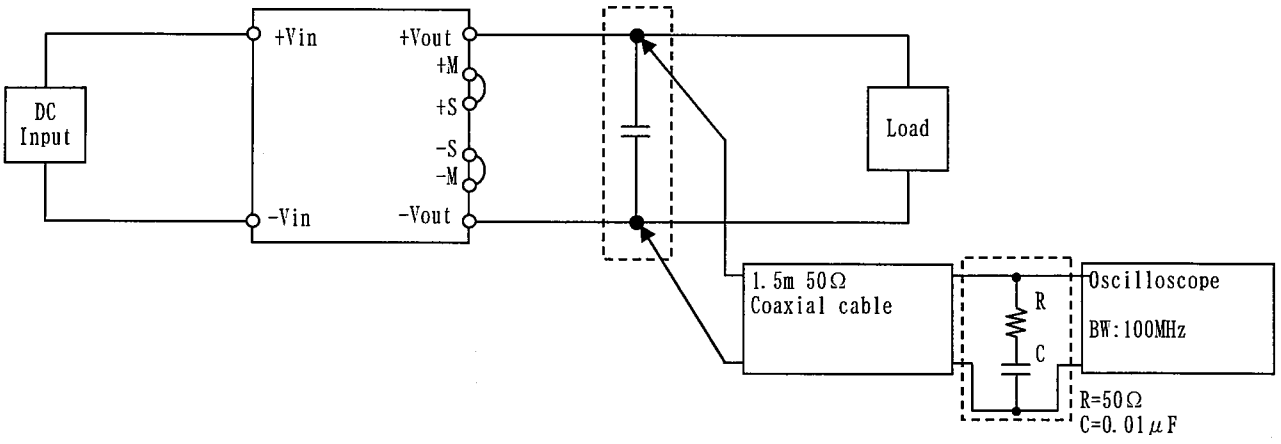



Figure B ( Ripple and Ripple noise Characteristic )