参考資料

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# TEST DATA OF DHS250B03

Regulated DC Power Supply
November 18, 2009

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Noriaki Nakase — Design Engineer

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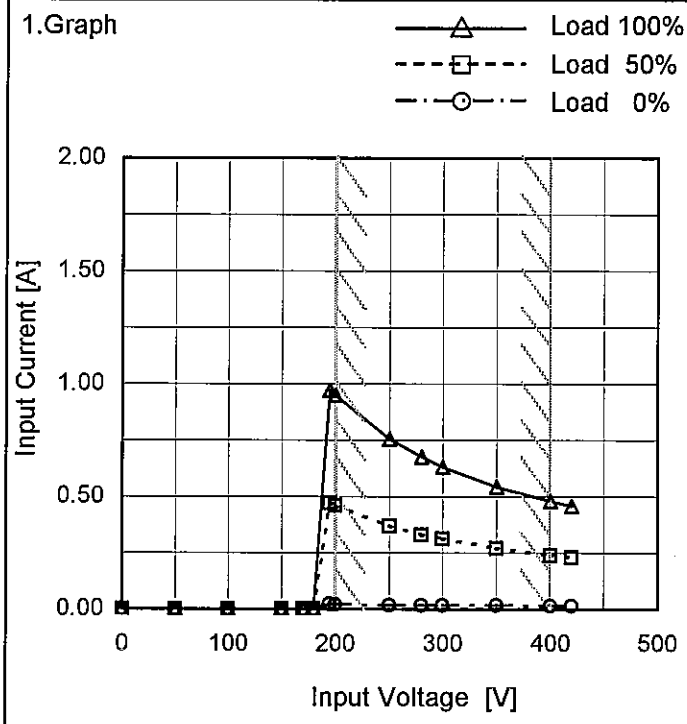
| | |
|---|---|
| Model | DHS250B03 |
| Item | Input Current (by Input Voltage) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

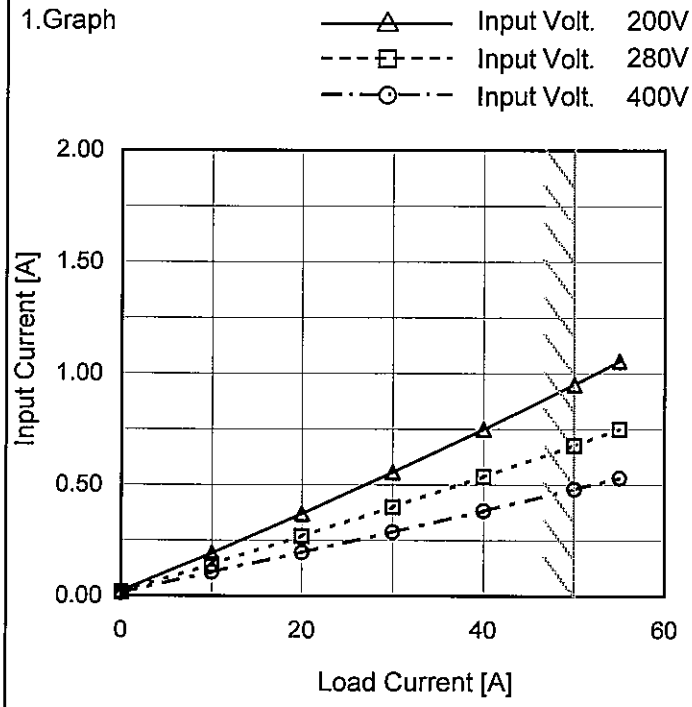
| Input Voltage [V] | Input Current [A] | | |
|---|---|---|---|
| | Load 0% | Load 50% | Load 100% |
| 0 | 0.000 | 0.000 | 0.000 |
| 50 | 0.000 | 0.000 | 0.000 |
| 100 | 0.000 | 0.000 | 0.000 |
| 150 | 0.000 | 0.000 | 0.000 |
| 170 | 0.000 | 0.000 | 0.000 |
| 180 | 0.000 | 0.000 | 0.000 |
| 195 | 0.021 | 0.473 | 0.971 |
| 200 | 0.021 | 0.461 | 0.950 |
| 250 | 0.017 | 0.370 | 0.757 |
| 280 | 0.018 | 0.330 | 0.677 |
| 300 | 0.017 | 0.312 | 0.632 |
| 350 | 0.018 | 0.271 | 0.544 |
| 400 | 0.014 | 0.240 | 0.480 |
| 420 | 0.013 | 0.230 | 0.457 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| 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 | 0.021 | 0.018 | 0.014 |
| 10 | 0.191 | 0.141 | 0.106 |
| 20 | 0.370 | 0.268 | 0.195 |
| 30 | 0.556 | 0.400 | 0.287 |
| 40 | 0.749 | 0.536 | 0.382 |
| 50 | 0.950 | 0.677 | 0.480 |
| 55 | 1.054 | 0.750 | 0.530 |
| --- | - | - | - |
| --- | - | - | - |
| --- | - | - | - |
| --- | - | - | - |



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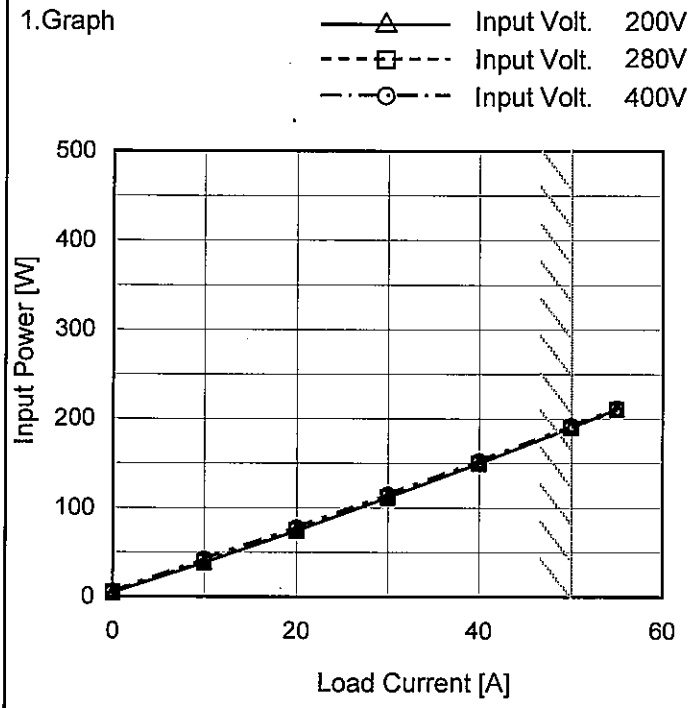
| | |
|---|---|
| Model | DHS250B03 |
| Item | Input Power (by Load Current) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

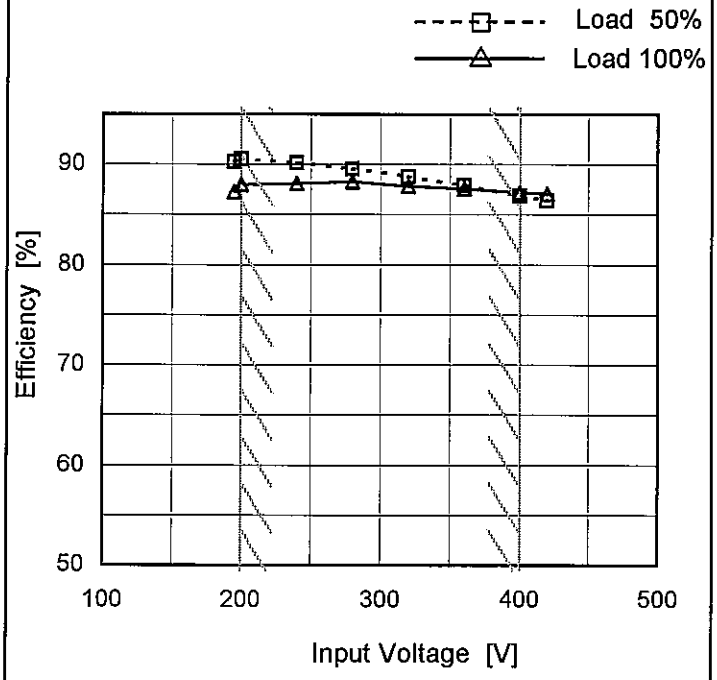
| Load Current [A] | Input Power [W] | | |
|---|---|---|---|
| | Input Volt. 200[V] | Input Volt. 280[V] | Input Volt. 400[V] |
| 0 | 4.2 | 5.0 | 5.6 |
| 10 | 38.2 | 39.5 | 42.4 |
| 20 | 74.0 | 75.0 | 78.0 |
| 30 | 111.2 | 112.0 | 114.8 |
| 40 | 149.8 | 150.1 | 152.8 |
| 50 | 190.0 | 189.6 | 192.0 |
| 55 | 210.8 | 210.0 | 212.0 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| 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

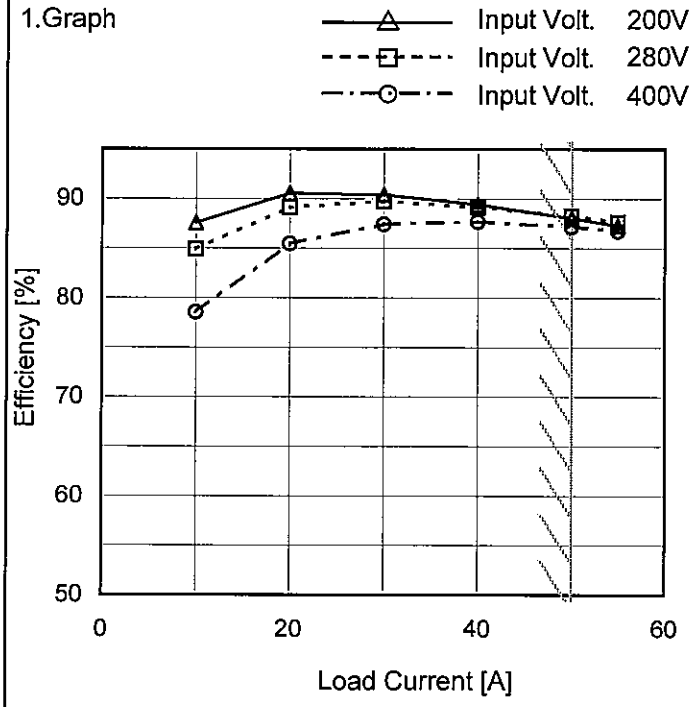
| Input Voltage [V] | Efficiency [%] | |
|---|---|---|
| | Load 50% | Load 100% |
| 195 | 90.3 | 87.3 |
| 200 | 90.5 | 88.0 |
| 240 | 90.2 | 88.1 |
| 280 | 89.6 | 88.3 |
| 320 | 88.8 | 87.9 |
| 360 | 87.9 | 87.6 |
| 400 | 86.9 | 87.2 |
| 420 | 86.3 | 87.1 |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| 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

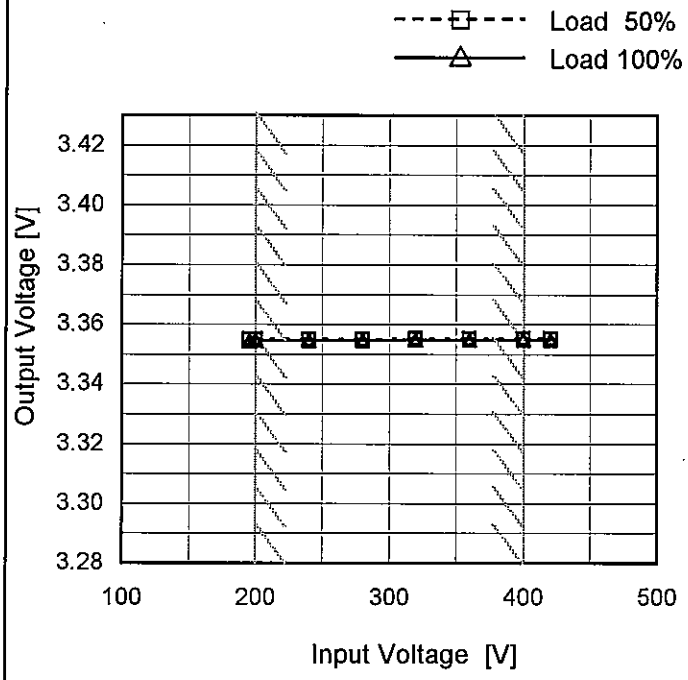
| Load Current [A] | Efficiency [%] | | |
|---|---|---|---|
| | Input Volt. 200[V] | Input Volt. 280[V] | Input Volt. 400[V] |
| 0 | - | - | - |
| 10 | 87.6 | 84.9 | 78.6 |
| 20 | 90.5 | 89.1 | 85.5 |
| 30 | 90.4 | 89.7 | 87.4 |
| 40 | 89.4 | 89.1 | 87.7 |
| 50 | 88.0 | 88.3 | 87.2 |
| 55 | 87.3 | 87.6 | 86.7 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Line Regulation |
| Object | +3.3V50A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

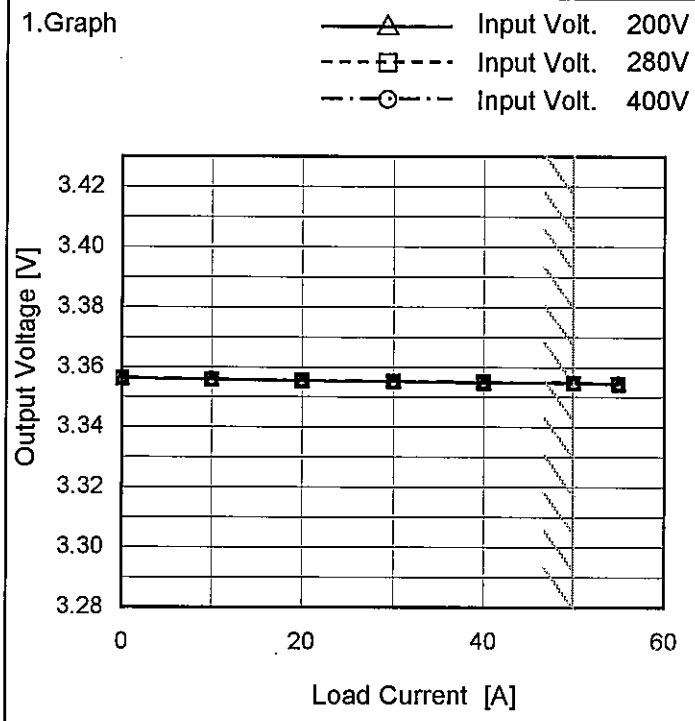
| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 195 | 3.355 | 3.355 |
| 200 | 3.355 | 3.355 |
| 240 | 3.355 | 3.355 |
| 280 | 3.355 | 3.355 |
| 320 | 3.355 | 3.355 |
| 360 | 3.355 | 3.355 |
| 400 | 3.355 | 3.355 |
| 420 | 3.355 | 3.355 |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Load Regulation |
| Object | +3.3V50A |

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 | 3.356 | 3.356 | 3.357 |
| 10 | 3.356 | 3.356 | 3.356 |
| 20 | 3.356 | 3.356 | 3.356 |
| 30 | 3.355 | 3.355 | 3.355 |
| 40 | 3.355 | 3.355 | 3.355 |
| 50 | 3.355 | 3.355 | 3.355 |
| 55 | 3.354 | 3.354 | 3.355 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

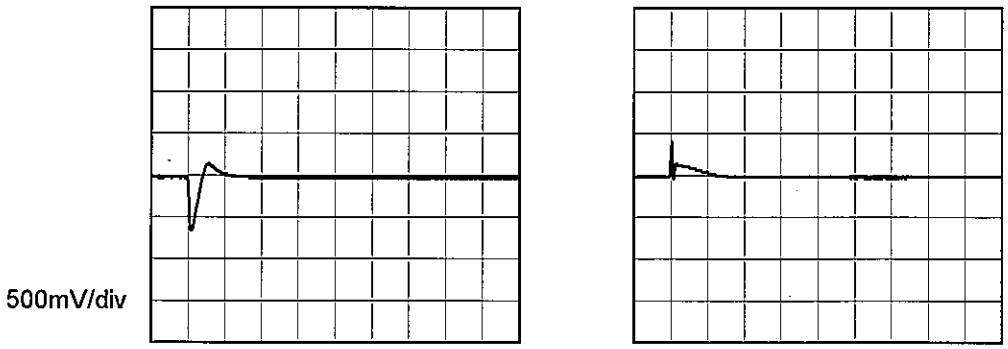
| | |
|---|---|
| Model | DHS250B03 |
| Item | Dynamic Load Response |
| Object | +3.3V50A |

Temperature 25°C
Testing Circuitry Figure A

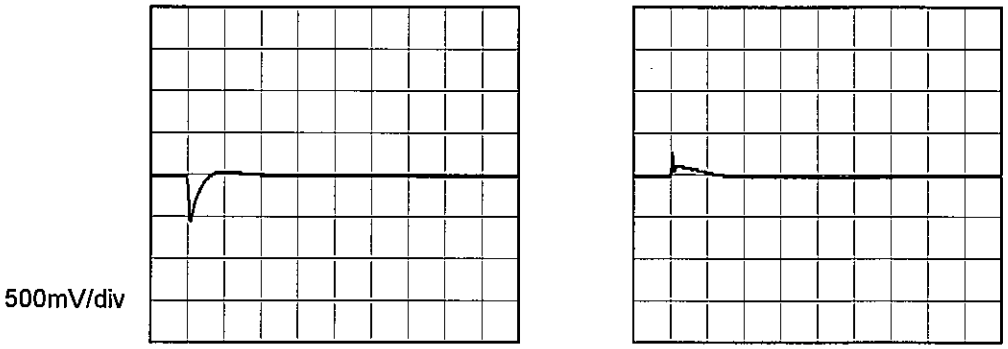
Input Volt. 280 V
Cycle 1000 mS

Load Current
50A/50 μs

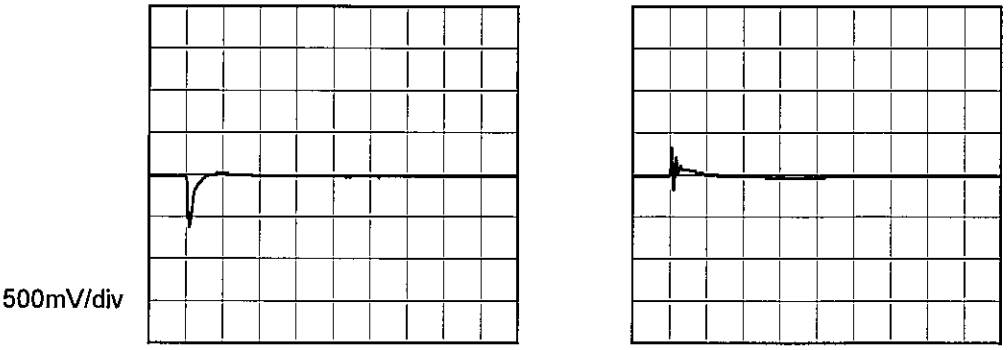
Min. Load (0A) ⟷
Load 100% (50A)




Min. Load (0A) ⟷
Load 50% (25A)




Load 10% (5A) ⟷
Load 100% (50A)

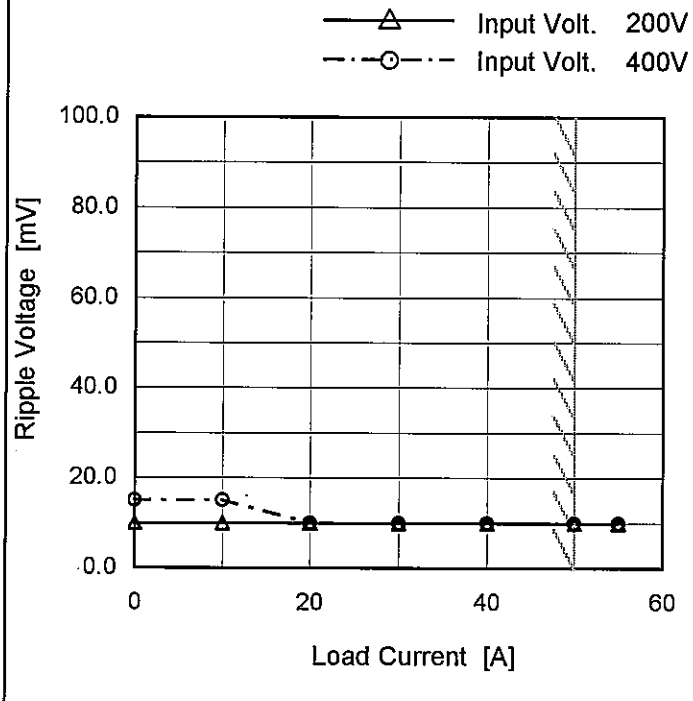


COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Ripple Voltage (by Load Current) |
| Object | +3.3V50A |

Temperature 25°C
Testing Circuitry Figure B

1.Graph




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.

Ripple [mVp-p]

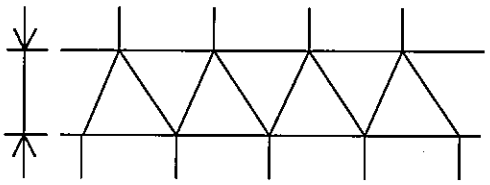


Fig.Complex Ripple Wave Form

2.Values

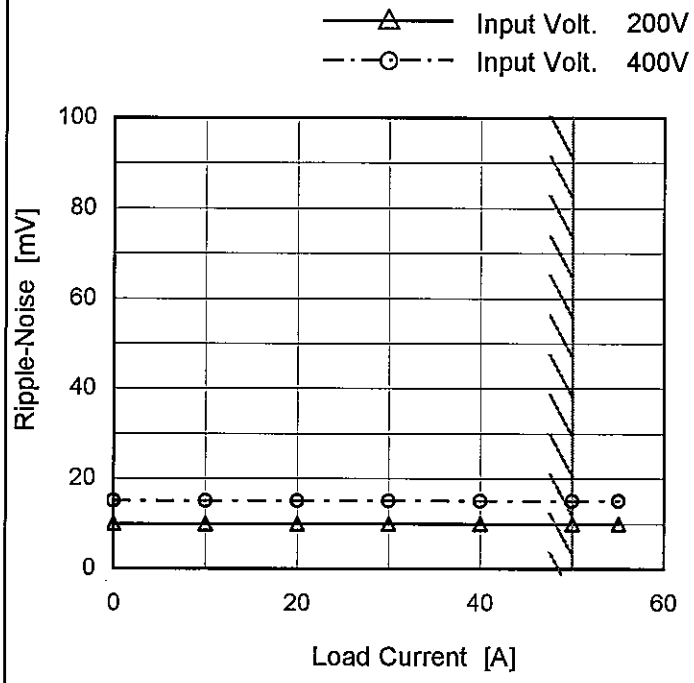
| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 200 [V] | Input Volt. 400 [V] |
| 0 | 10 | 15 |
| 10 | 10 | 15 |
| 20 | 10 | 10 |
| 30 | 10 | 10 |
| 40 | 10 | 10 |
| 50 | 10 | 10 |
| 55 | 10 | 10 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Ripple-Noise |
| Object | +3.3V50A |

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.

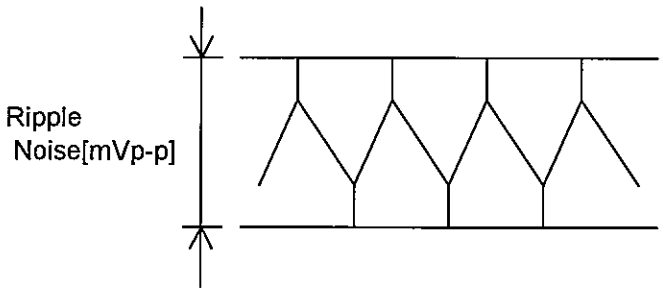



Fig.Complex Ripple Noise Wave Form

2.Values

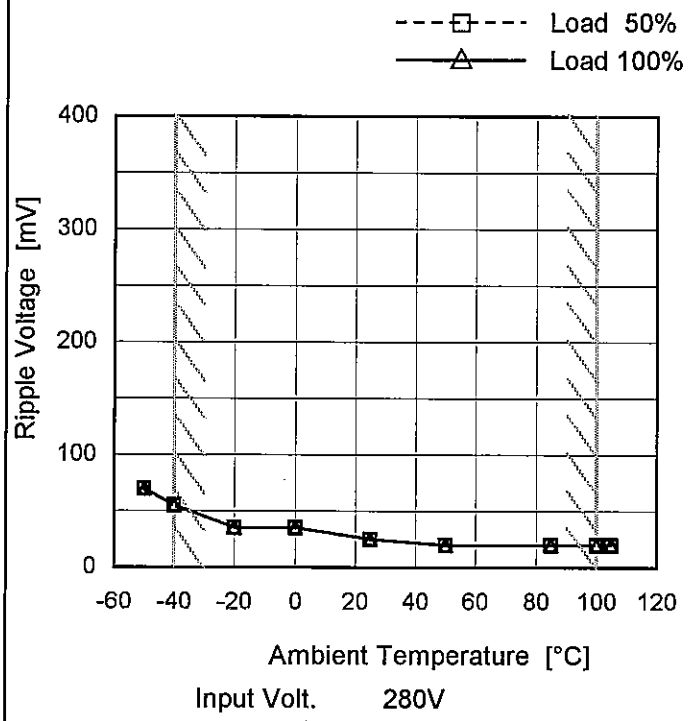
| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 200 [V] | Input Volt. 400 [V] |
| 0 | 10 | 15 |
| 10 | 10 | 15 |
| 20 | 10 | 15 |
| 30 | 10 | 15 |
| 40 | 10 | 15 |
| 50 | 10 | 15 |
| 55 | 10 | 15 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +3.3V50A |

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.

2.Values

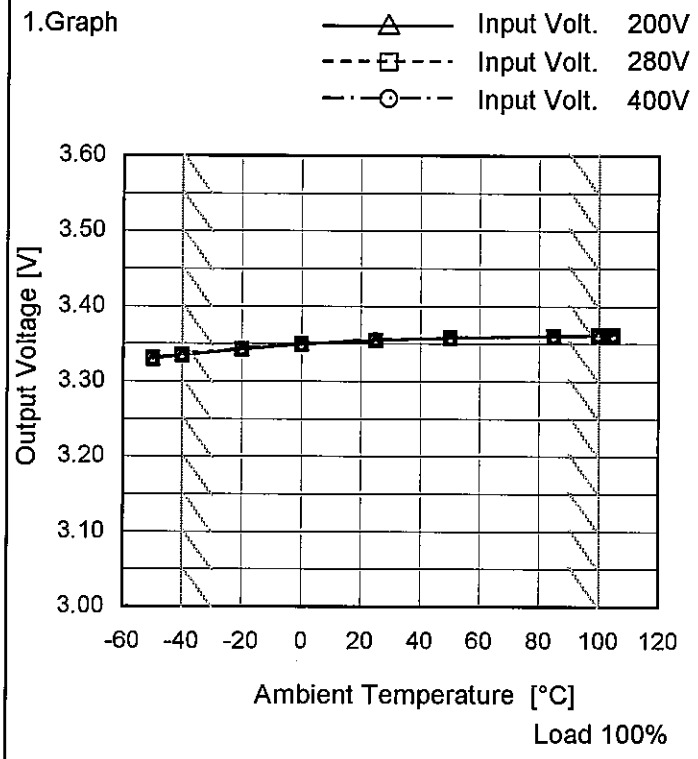
| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -50 | 70 | 70 |
| -40 | 55 | 55 |
| -20 | 35 | 35 |
| 0 | 35 | 35 |
| 25 | 25 | 25 |
| 50 | 20 | 20 |
| 85 | 20 | 20 |
| 100 | 20 | 20 |
| 105 | 20 | 20 |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Ambient Temperature Drift |
| Object | +3.3V50A |

Testing Circuitry Figure A

1.Graph




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] |
| -50 | 3.330 | 3.330 | 3.331 |
| -40 | 3.335 | 3.335 | 3.335 |
| -20 | 3.343 | 3.343 | 3.343 |
| 0 | 3.349 | 3.349 | 3.350 |
| 25 | 3.355 | 3.355 | 3.355 |
| 50 | 3.358 | 3.358 | 3.358 |
| 85 | 3.360 | 3.360 | 3.360 |
| 100 | 3.362 | 3.362 | 3.362 |
| 105 | 3.362 | 3.362 | 3.362 |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | | |
|---|---|---|
| Model | DHS250B03 | |
| Item | Output Voltage Accuracy | Testing Circuitry Figure A |
| Object | +3.3V50A | |

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 : -40 - 100°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

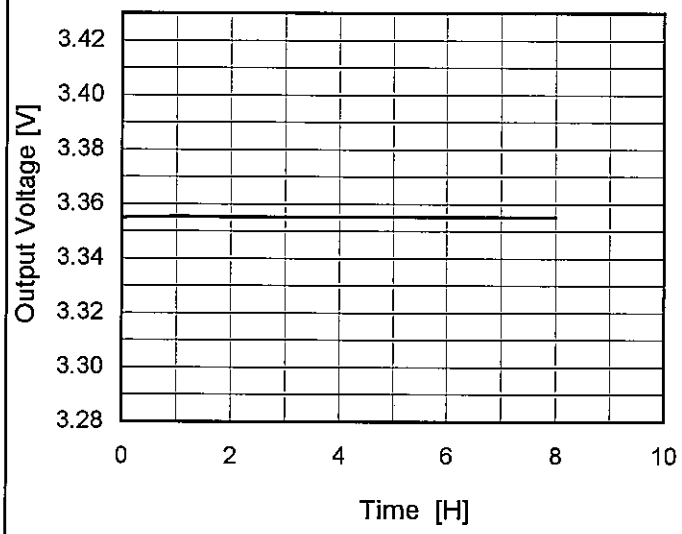
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
|---|---|---|---|---|---|---|
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | 100 | 200 | 0 | 3.364 | ±15 | ±0.5 |
| Minimum Voltage | -40 | 200 | 50 | 3.335 | | |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Time Lapse Drift |
| Object | +3.3V50A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Input Volt. 280V
Load 100%

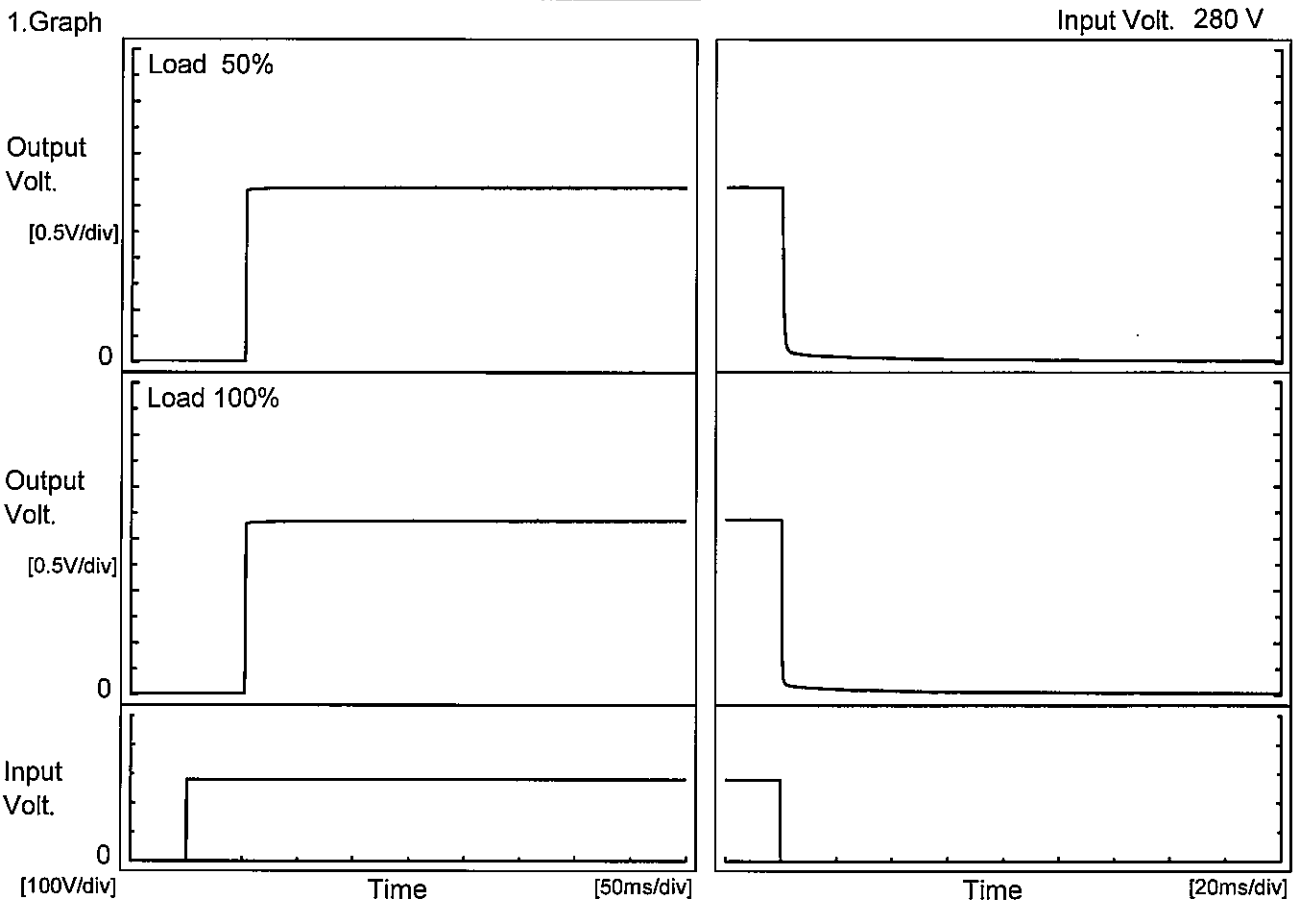
2.Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 3.353 |
| 0.5 | 3.355 |
| 1.0 | 3.355 |
| 2.0 | 3.355 |
| 3.0 | 3.355 |
| 4.0 | 3.355 |
| 5.0 | 3.355 |
| 6.0 | 3.355 |
| 7.0 | 3.355 |
| 8.0 | 3.355 |

COSEL

| | | |
|---|---|---|
| Model | DHS250B03 | |
| Item | Rise and Fall Time | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | +3.3V50A | |

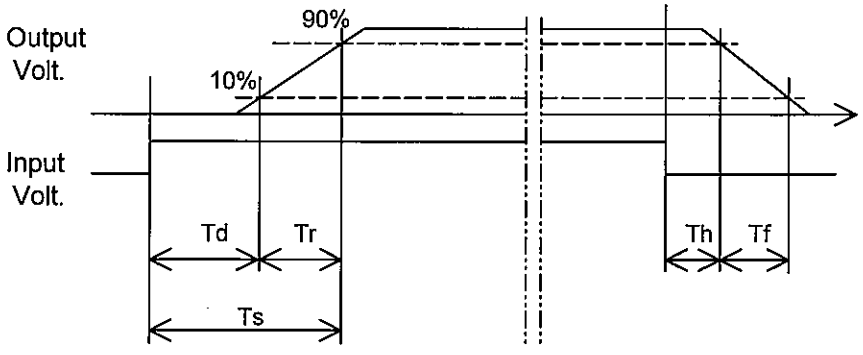
1.Graph




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 52.5 | 0.5 | 53.0 | 0.3 | 1.2 |
| 100 % | 52.5 | 0.8 | 53.3 | 0.3 | 0.5 |

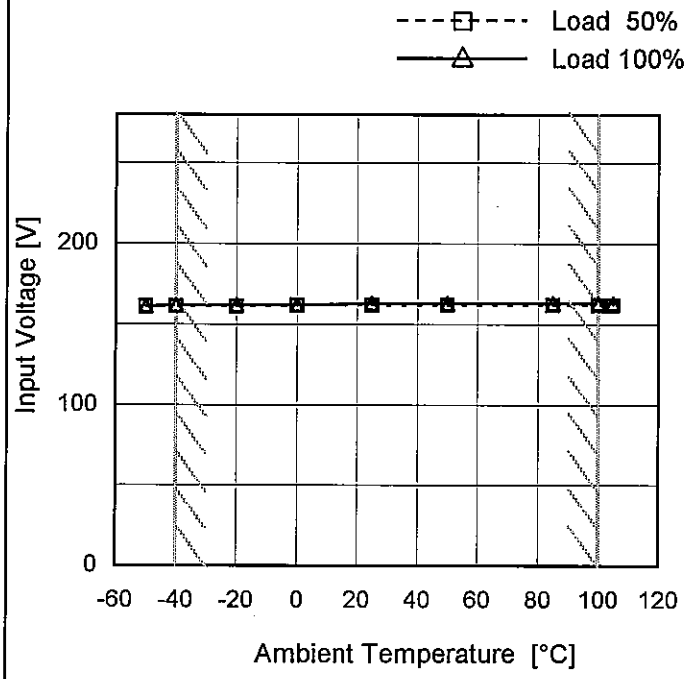


COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +3.3V50A |

Testing Circuitry Figure A

1.Graph




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

2.Values

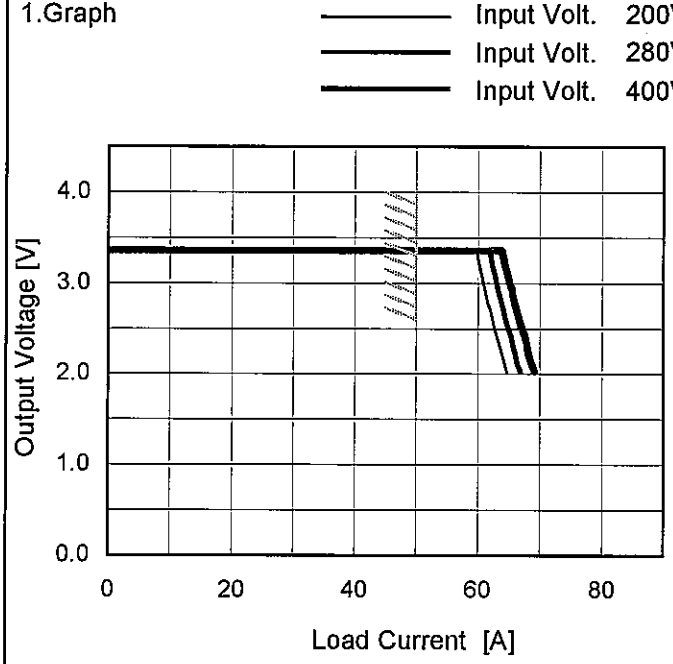
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -50 | 161 | 161 |
| -40 | 161 | 162 |
| -20 | 161 | 162 |
| 0 | 162 | 162 |
| 25 | 162 | 163 |
| 50 | 162 | 163 |
| 85 | 162 | 163 |
| 100 | 162 | 163 |
| 105 | 162 | 163 |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Overcurrent Protection |
| Object | +3.3V50A |

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 2V to 0V.

2.Values

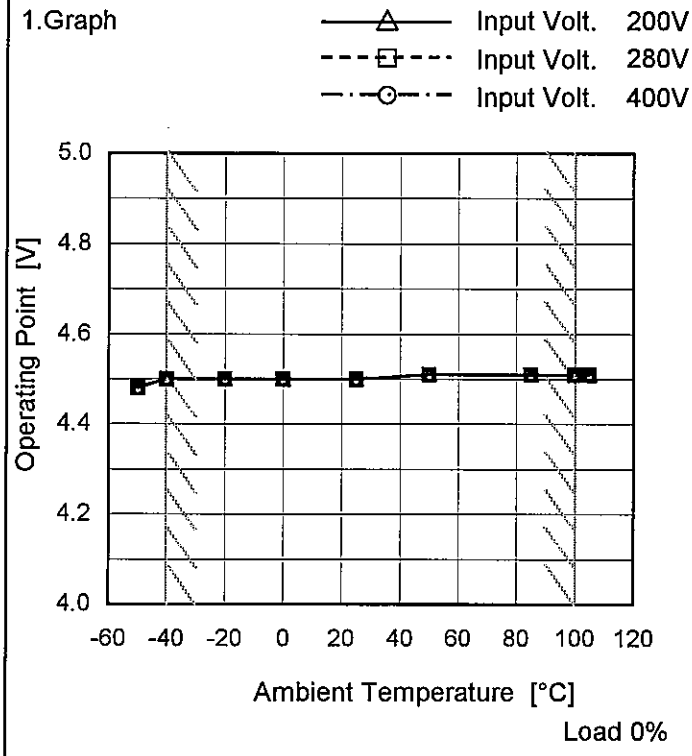
| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 200[V] | Input Volt. 280[V] | Input Volt. 400[V] |
| 3.30 | 51.00 | 51.00 | 51.01 |
| 3.14 | 59.67 | 61.68 | 63.02 |
| 2.97 | 60.12 | 62.15 | 63.28 |
| 2.64 | 61.42 | 63.22 | 64.47 |
| 2.31 | 62.71 | 64.76 | 65.51 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | DHS250B03 |
| Item | Overvoltage Protection |
| Object | +3.3V50A |

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. 280[V] | Input Volt. 400[V] |
|---|---|---|---|
| -50 | 4.48 | 4.48 | 4.48 |
| -40 | 4.50 | 4.50 | 4.50 |
| -20 | 4.50 | 4.50 | 4.50 |
| 0 | 4.50 | 4.50 | 4.50 |
| 25 | 4.50 | 4.50 | 4.50 |
| 50 | 4.51 | 4.51 | 4.51 |
| 85 | 4.51 | 4.51 | 4.51 |
| 100 | 4.51 | 4.51 | 4.51 |
| 105 | 4.51 | 4.51 | 4.51 |
| -- | - | - | - |
| -- | - | - | - |

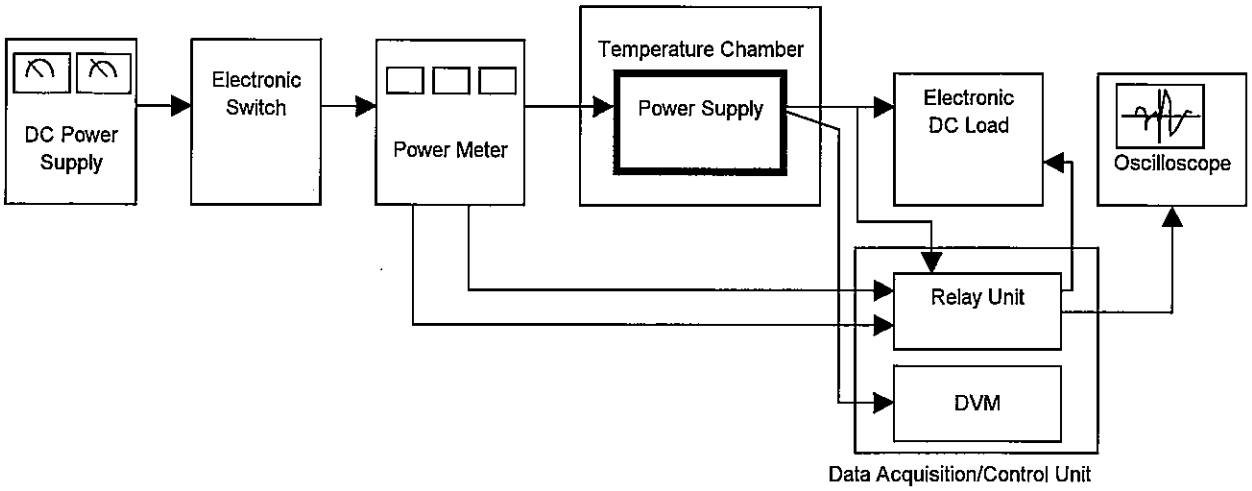
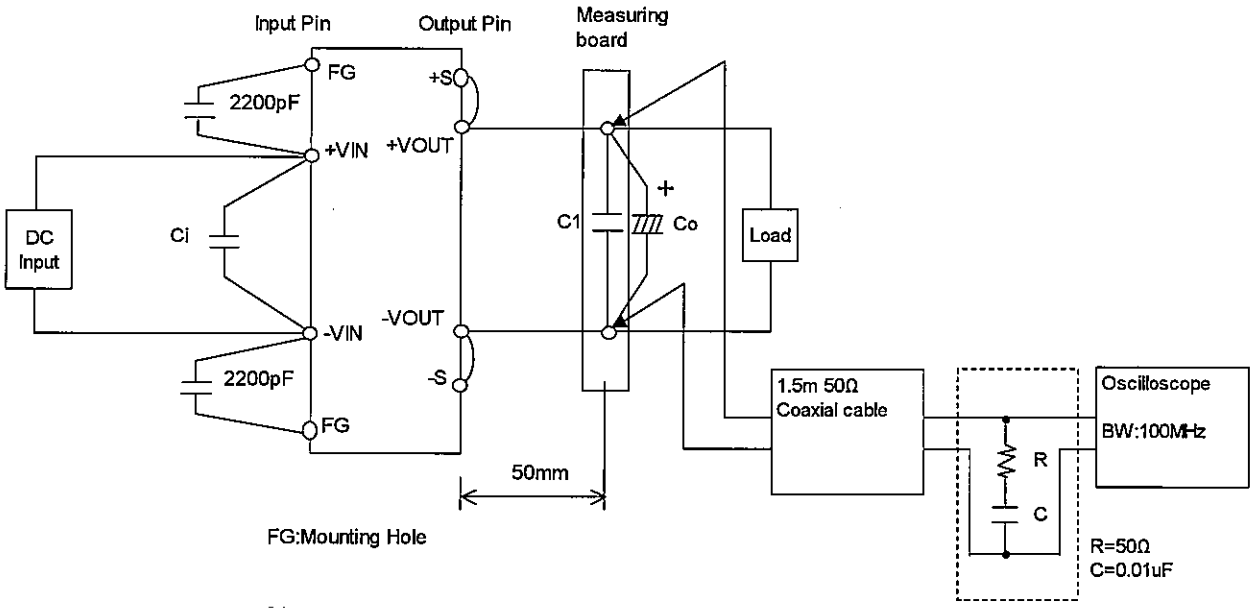



Figure A




| C1 | |
|---|---|
| DHS250B24 | 4.7μF |
| DHS250B28 | 4.7μF |
| DHS250B48 | 2.2μF |
| Others | 10μF |

| Co | |
|---|---|
| DHS250B03 | 2200μF |
| DHS250B05 | 2200μF |
| DHS250B07 | 2200μF |
| DHS250B12 | 1000μF |
| DHS250B15 | 1000μF |
| DHS250B24 | 470μF |
| DHS250B28 | 470μF |
| DHS250B48 | 330μF |

Figure B