参考資料

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# TEST DATA OF CHS3004828

Regulated DC Power Supply
September 26, 2019

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Tatsuya Nakagawa Design Engineer

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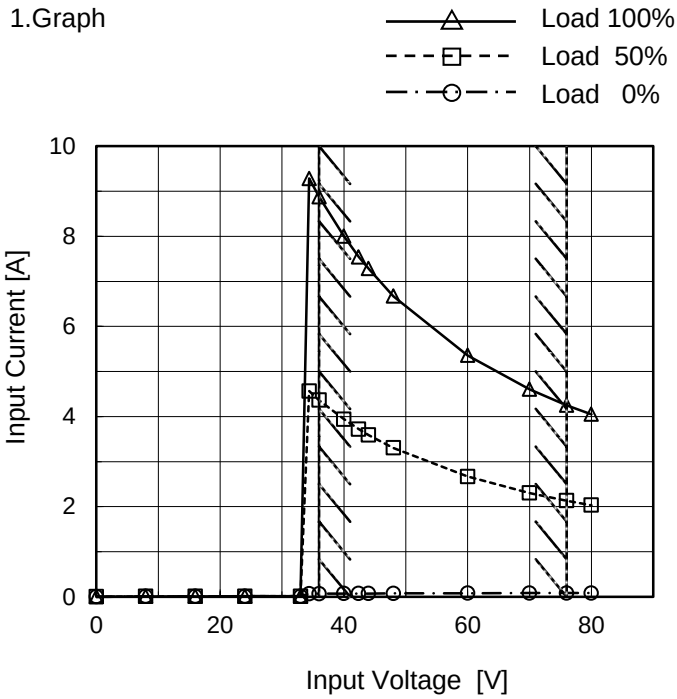
| | |
|---|---|
| Model | CHS3004828 |
| Item | Input Current (by Input Voltage) |
| Object | ———————— |

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 | 0.000 | 0.000 | 0.000 |
| 8.0 | 0.008 | 0.008 | 0.008 |
| 16.0 | 0.009 | 0.009 | 0.009 |
| 24.0 | 0.010 | 0.010 | 0.010 |
| 33.0 | 0.010 | 0.010 | 0.010 |
| 34.4 | 0.068 | 4.565 | 9.283 |
| 36.0 | 0.068 | 4.363 | 8.877 |
| 40.0 | 0.071 | 3.940 | 8.002 |
| 42.4 | 0.072 | 3.721 | 7.544 |
| 44.0 | 0.073 | 3.588 | 7.285 |
| 48.0 | 0.075 | 3.303 | 6.672 |
| 60.0 | 0.079 | 2.667 | 5.356 |
| 70.0 | 0.081 | 2.304 | 4.606 |
| 76.0 | 0.082 | 2.132 | 4.249 |
| 80.0 | 0.083 | 2.034 | 4.051 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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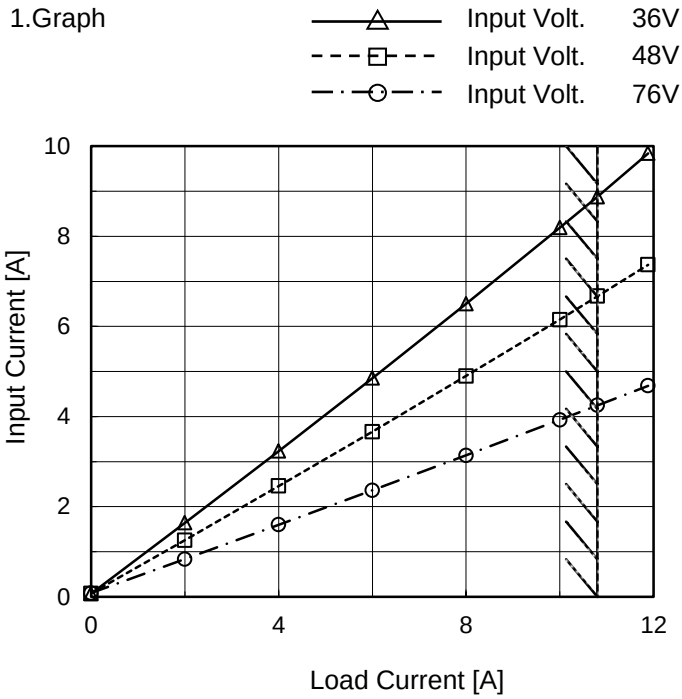
| | |
|---|---|
| Model | CHS3004828 |
| Item | Input Current (by Load Current) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

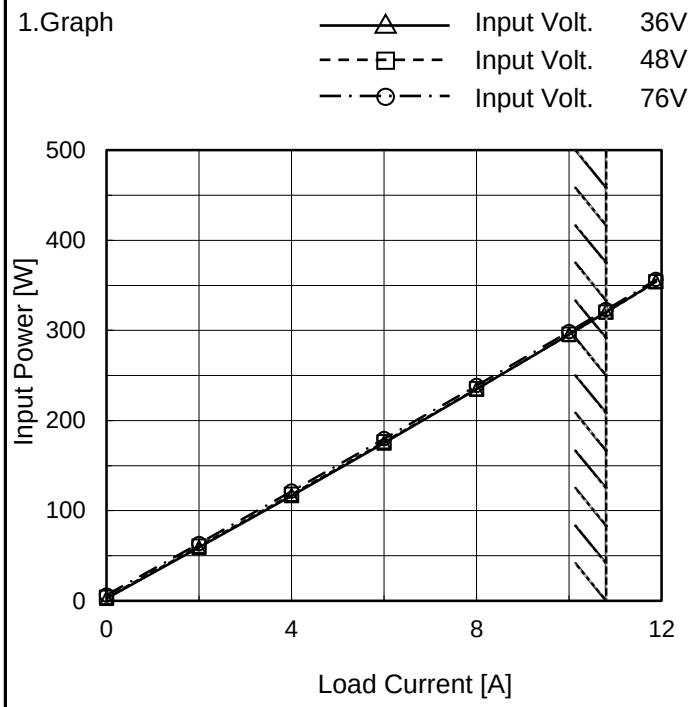
| Load Current [A] | Input Current [A] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0.00 | 0.068 | 0.075 | 0.082 |
| 2.00 | 1.643 | 1.256 | 0.835 |
| 4.00 | 3.232 | 2.457 | 1.599 |
| 6.00 | 4.852 | 3.665 | 2.364 |
| 8.00 | 6.502 | 4.899 | 3.139 |
| 10.00 | 8.193 | 6.149 | 3.927 |
| 10.80 | 8.877 | 6.672 | 4.249 |
| 11.88 | 9.841 | 7.369 | 4.684 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| 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. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0.00 | 2.5 | 3.6 | 6.2 |
| 2.00 | 59.1 | 60.4 | 63.5 |
| 4.00 | 116.6 | 118.0 | 121.6 |
| 6.00 | 175.0 | 176.2 | 179.8 |
| 8.00 | 234.6 | 235.2 | 238.7 |
| 10.00 | 295.5 | 295.7 | 298.7 |
| 10.80 | 320.4 | 320.3 | 323.0 |
| 11.88 | 354.2 | 353.9 | 356.3 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

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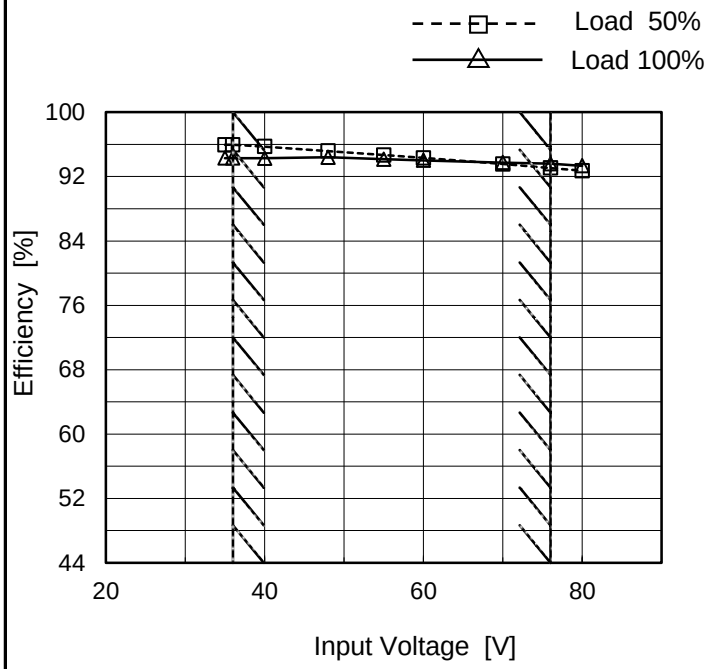
| | |
|---|---|
| Model | CHS3004828 |
| Item | Efficiency (by Input Voltage) |
| Object | ———————— |

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% |
| 35 | 95.9 | 94.3 |
| 36 | 95.9 | 94.3 |
| 40 | 95.7 | 94.3 |
| 48 | 95.2 | 94.4 |
| 55 | 94.7 | 94.2 |
| 60 | 94.3 | 94.0 |
| 70 | 93.6 | 93.7 |
| 76 | 93.1 | 93.6 |
| 80 | 92.7 | 93.3 |

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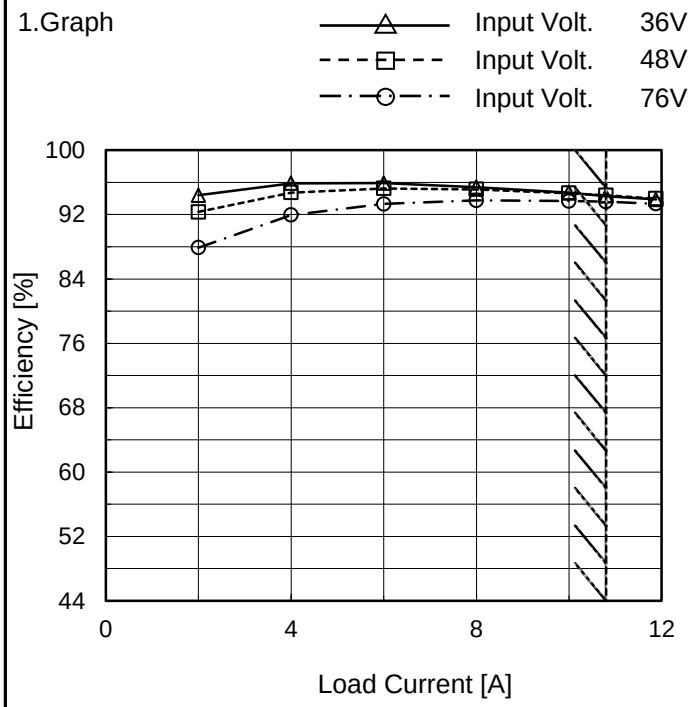
| | |
|---|---|
| Model | CHS3004828 |
| Item | Efficiency (by Load Current) |
| Object | ———————— |

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. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0.00 | - | - | - |
| 2.00 | 94.4 | 92.3 | 87.9 |
| 4.00 | 95.9 | 94.7 | 92.0 |
| 6.00 | 95.9 | 95.3 | 93.3 |
| 8.00 | 95.4 | 95.1 | 93.8 |
| 10.00 | 94.7 | 94.6 | 93.7 |
| 10.80 | 94.3 | 94.4 | 93.6 |
| 11.88 | 93.9 | 94.0 | 93.3 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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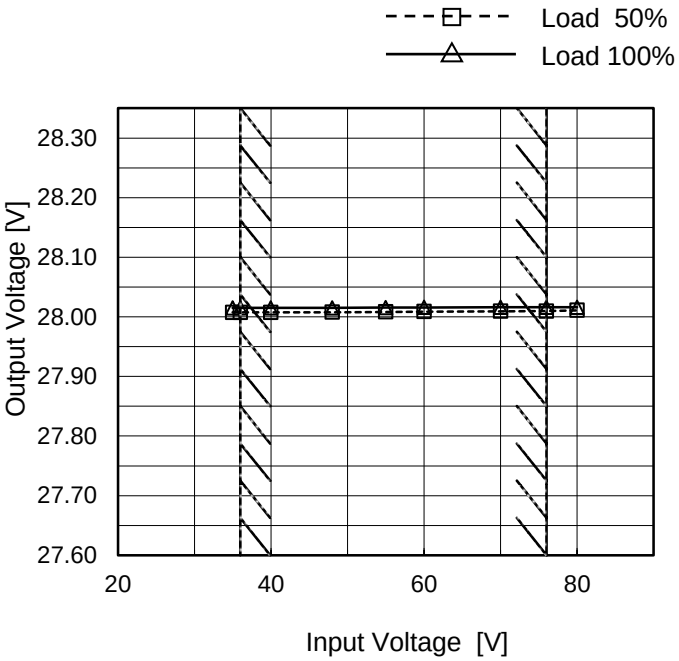
| | |
|---|---|
| Model | CHS3004828 |
| Item | Line Regulation |
| Object | +28V10.8A |

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% |
| 35 | 28.007 | 28.015 |
| 36 | 28.008 | 28.015 |
| 40 | 28.008 | 28.015 |
| 48 | 28.008 | 28.015 |
| 55 | 28.008 | 28.015 |
| 60 | 28.009 | 28.016 |
| 70 | 28.009 | 28.016 |
| 76 | 28.010 | 28.016 |
| 80 | 28.011 | 28.016 |

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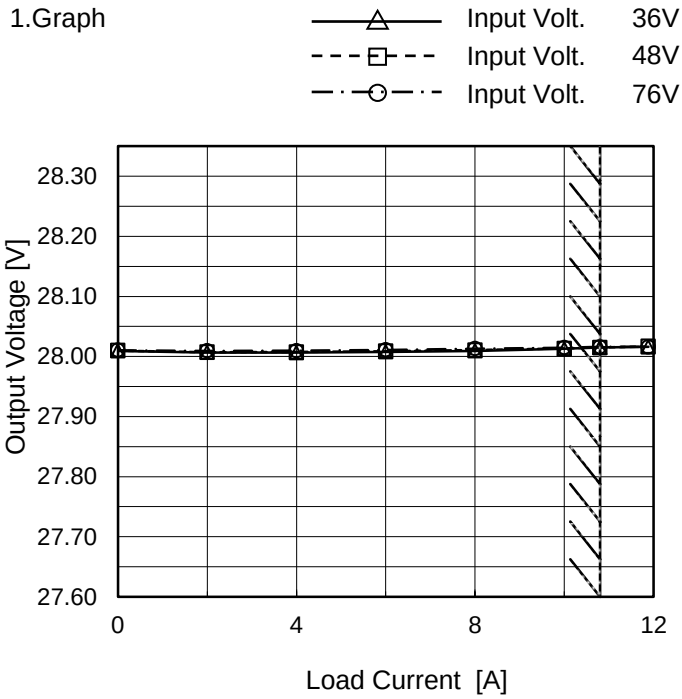
| | |
|---|---|
| Model | CHS3004828 |
| Item | Load Regulation |
| Object | +28V10.8A |

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. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0.00 | 28.009 | 28.010 | 28.011 |
| 2.00 | 28.007 | 28.007 | 28.009 |
| 4.00 | 28.006 | 28.008 | 28.010 |
| 6.00 | 28.008 | 28.009 | 28.011 |
| 8.00 | 28.009 | 28.011 | 28.013 |
| 10.00 | 28.013 | 28.013 | 28.015 |
| 10.80 | 28.015 | 28.015 | 28.016 |
| 11.88 | 28.016 | 28.017 | 28.016 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

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|---|---|---|---|
| Model | CHS3004828 | | |
| Item | Dynamic Load Response | Temperature | 25°C |
| | | Testing Circuitry | Figure A |
| Object | +28V10.8A | | |

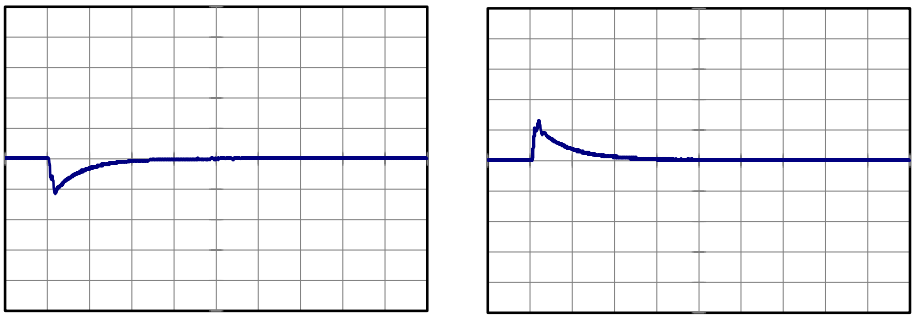
Input Volt. 48 V
Cycle 10 ms

t1,t2 = 50 μs

Load Current

t1 t2

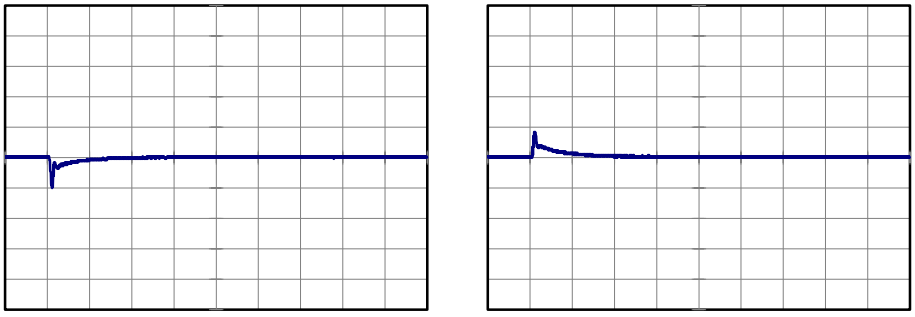
Min.Load (0A)←→
Load 100% (10.8A)



1 V/div

400 us/div 400 us/div

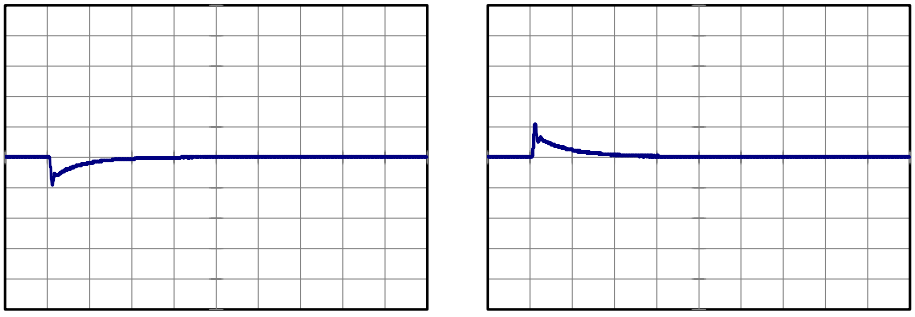
Min.Load (0A)←→
Load 50% (5.4A)



1 V/div

400 us/div 400 us/div

Load 50% (5.4A)←→
Load 100% (10.8A)



1 V/div

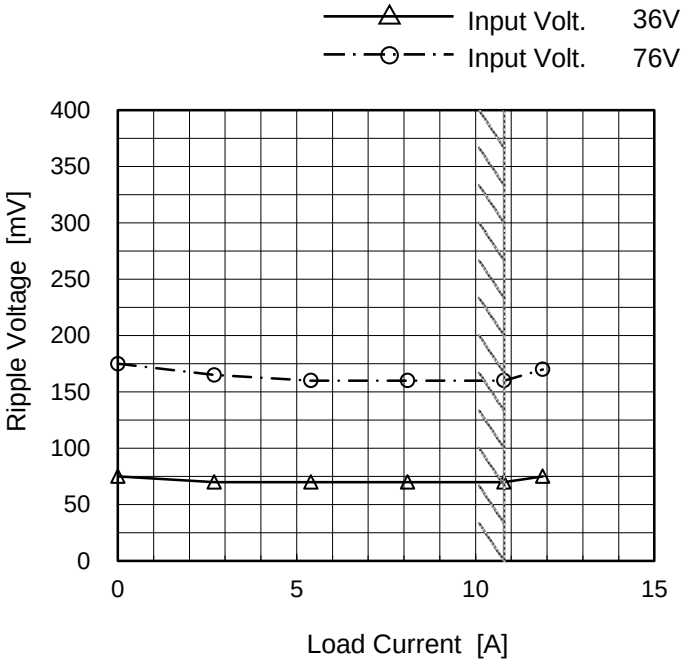
400 us/div 400 us/div

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Ripple Voltage (by Load Current) |
| Object | +28V10.8A |

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.

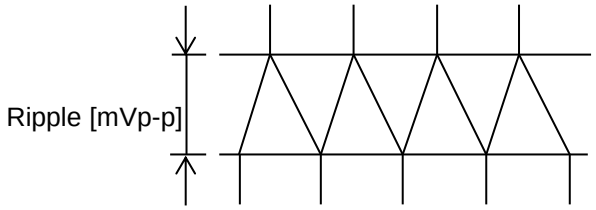



Fig.Complex Ripple Wave Form

2.Values

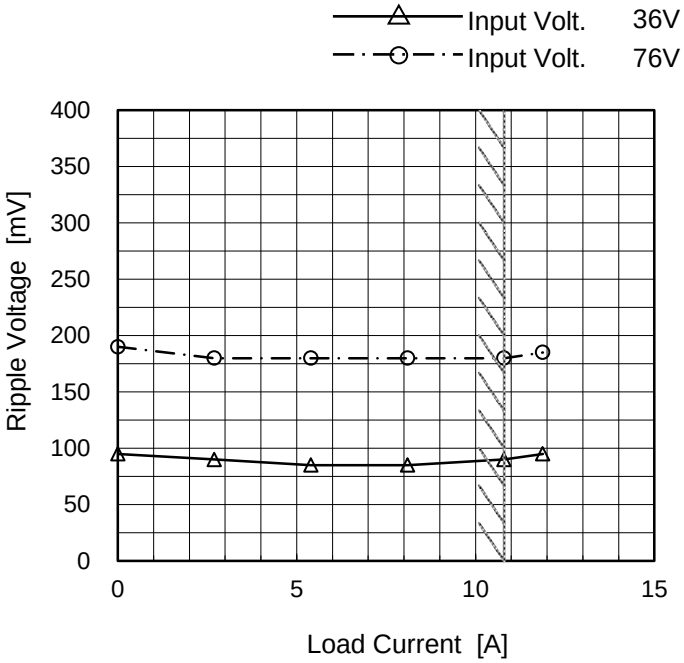
| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 36 [V] | Input Volt. 76 [V] |
| 0.00 | 75 | 175 |
| 2.70 | 70 | 165 |
| 5.40 | 70 | 160 |
| 8.10 | 70 | 160 |
| 10.80 | 70 | 160 |
| 11.88 | 75 | 170 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Ripple-Noise |
| Object | +28V10.8A |

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.

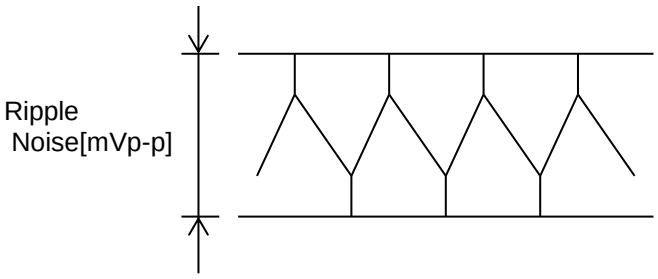



Fig.Complex Ripple Noise Wave Form

2.Values

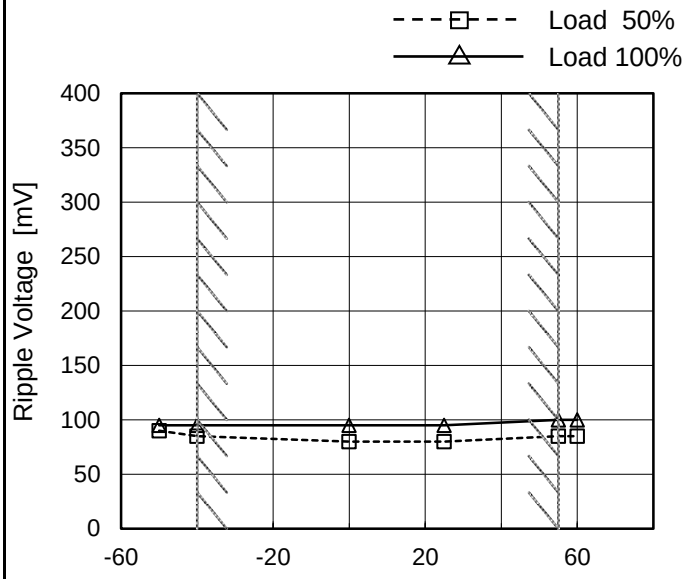
| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 36 [V] | Input Volt. 76 [V] |
| 0.00 | 95 | 190 |
| 2.70 | 90 | 180 |
| 5.40 | 85 | 180 |
| 8.10 | 85 | 180 |
| 10.80 | 90 | 180 |
| 11.88 | 95 | 185 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +28V10.8A |

Testing Circuitry Figure B

1.Graph




Input Volt. 48V

Measured by 100 MHz Oscilloscope.

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

2.Values

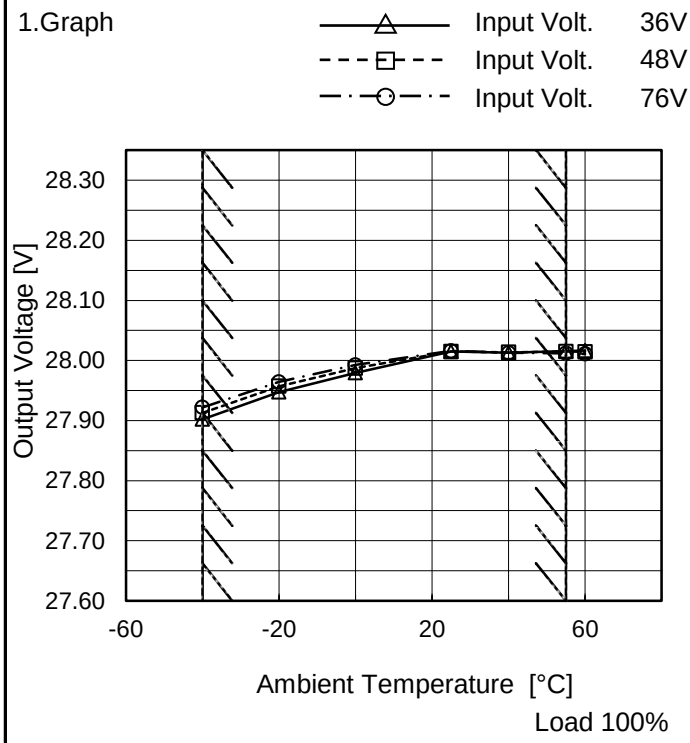
| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -50 | 90 | 95 |
| -40 | 85 | 95 |
| 0 | 80 | 95 |
| 25 | 80 | 95 |
| 55 | 85 | 100 |
| 60 | 85 | 100 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Ambient Temperature Drift |
| Object | +28V10.8A |

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. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| -40 | 27.902 | 27.913 | 27.922 |
| -20 | 27.948 | 27.957 | 27.964 |
| 0 | 27.980 | 27.987 | 27.992 |
| 25 | 28.015 | 28.015 | 28.016 |
| 40 | 28.013 | 28.014 | 28.013 |
| 55 | 28.016 | 28.015 | 28.012 |
| 60 | 28.017 | 28.015 | 28.011 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | | |
|---|---|---|
| Model | CHS3004828 | |
| Item | Output Voltage Accuracy | Testing Circuitry Figure A |
| Object | +28V10.8A | |

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 - 55°C
Input Voltage : 36 - 76V
Load Current : 0 - 10.8A

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

$$\text{* Output Voltage Accuracy (Ratio)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2.Values

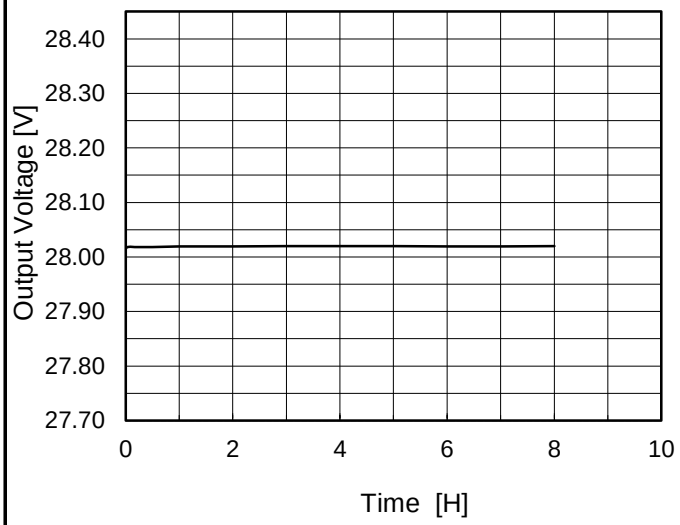
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
|---|---|---|---|---|---|---|
| | | | Current[A] | Voltage[V] | Value [mV] | Ratio [%] |
| Maximum Voltage | 55 | 36 | 10.8 | 28.016 | ±66 | ±0.2 |
| Minimum Voltage | -40 | 48 | 0 | 27.885 | | |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Time Lapse Drift |
| Object | +28V10.8A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Input Volt. 48V
Load 100%

2.Values

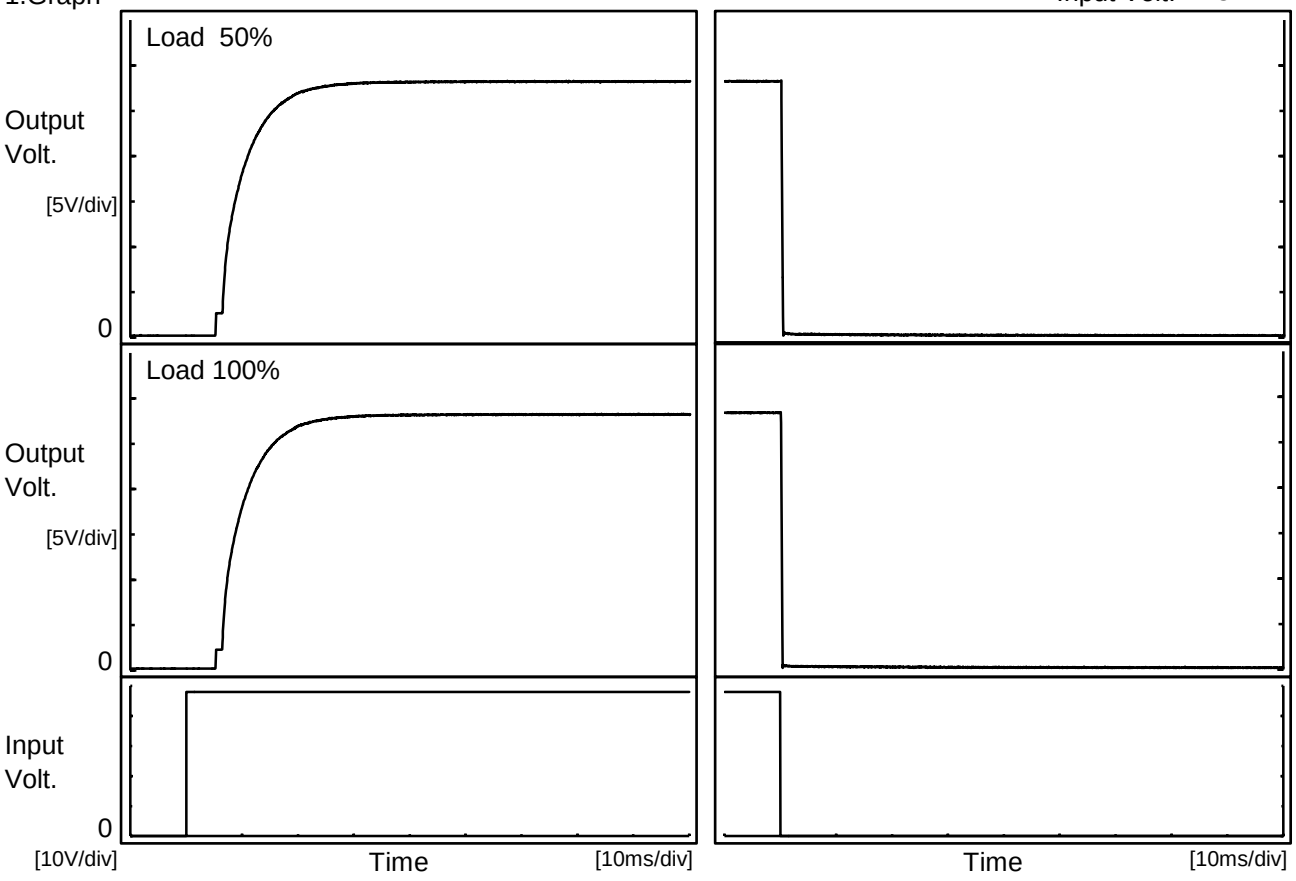
| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 28.015 |
| 0.5 | 28.018 |
| 1.0 | 28.019 |
| 2.0 | 28.019 |
| 3.0 | 28.020 |
| 4.0 | 28.020 |
| 5.0 | 28.020 |
| 6.0 | 28.020 |
| 7.0 | 28.019 |
| 8.0 | 28.020 |

COSEL

| | | |
|---|---|---|
| Model | CHS3004828 | |
| Item | Rise and Fall Time | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | +28V10.8A | |

1.Graph

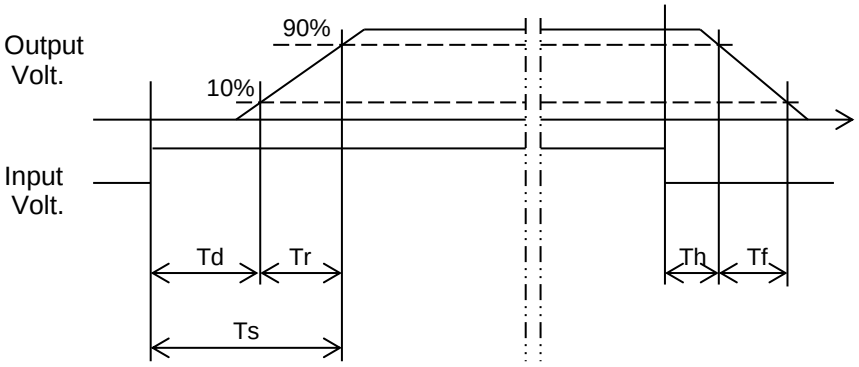
Input Volt. 48 V




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 5.4 | 10.9 | 16.3 | 0.2 | 0.2 |
| 100 % | 5.5 | 10.8 | 16.3 | 0.2 | 0.2 |

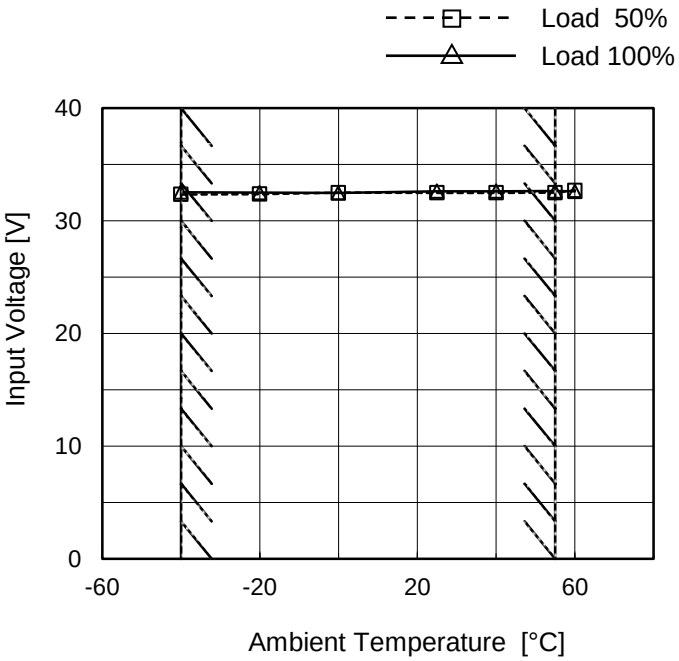


COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +28V10.8A |

Testing Circuitry Figure A

1.Graph




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

2.Values

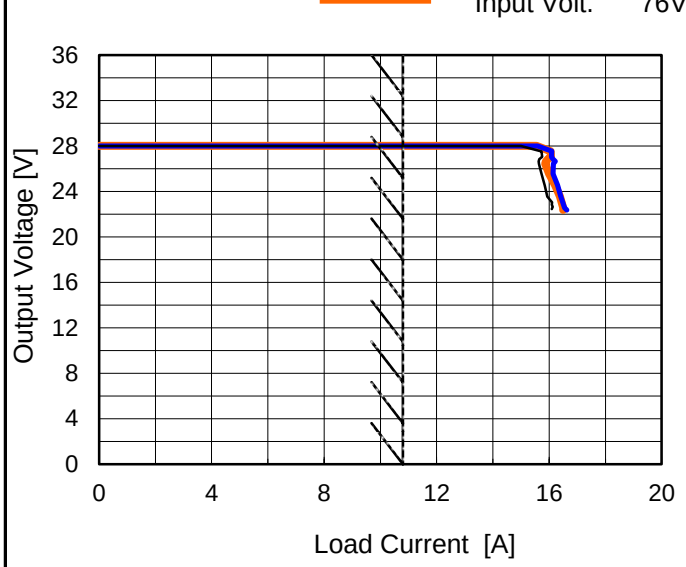
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -40 | 32.4 | 32.6 |
| -20 | 32.4 | 32.5 |
| 0 | 32.5 | 32.5 |
| 25 | 32.5 | 32.7 |
| 40 | 32.5 | 32.7 |
| 55 | 32.5 | 32.7 |
| 60 | 32.7 | 32.7 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Overcurrent Protection |
| Object | +28V10.8A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

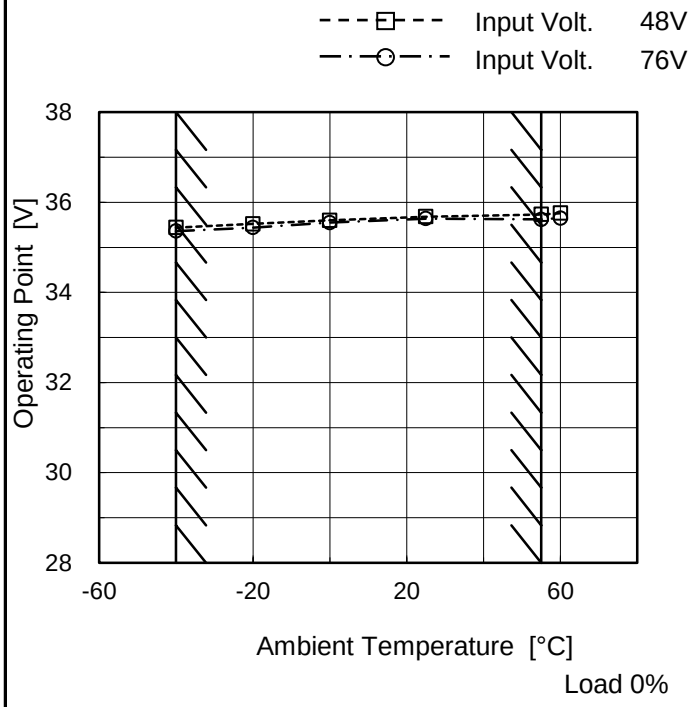
| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 26.6 | 15.65 | 16.22 | 15.89 |
| 25.2 | 15.73 | 16.14 | 16.00 |
| 23.8 | 15.94 | 16.41 | 16.39 |
| 22.4 | 16.09 | 16.63 | 16.49 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | CHS3004828 |
| Item | Overvoltage Protection |
| Object | +28V10.8A |

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. 48[V] | Input Volt. 76[V] |
| -40 | 35.44 | 35.36 |
| -20 | 35.52 | 35.44 |
| 0 | 35.60 | 35.55 |
| 25 | 35.68 | 35.64 |
| 55 | 35.73 | 35.62 |
| 60 | 35.76 | 35.65 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

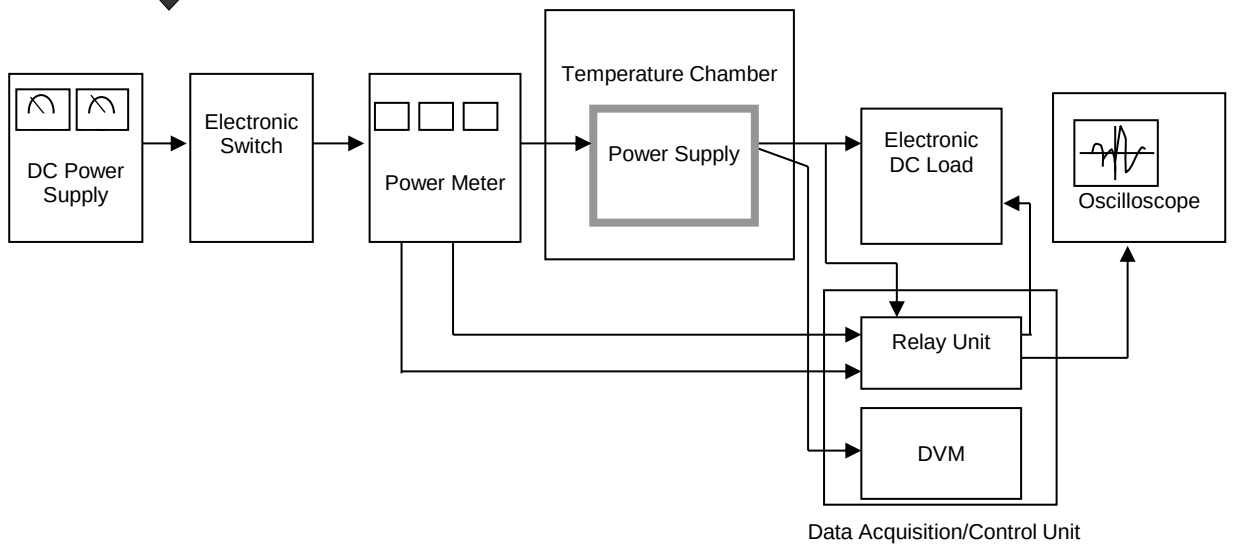



Figure A

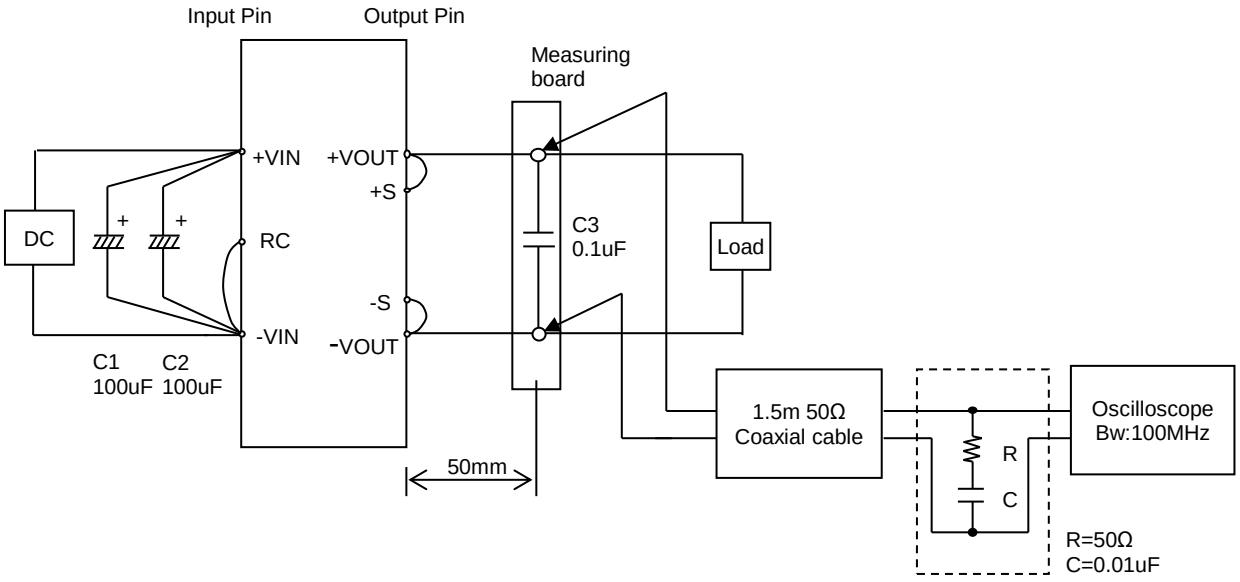



Figure B