参考資料

# TEST DATA OF MGFS3243R3

Regulated DC Power Supply
January 6, 2017

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Takaaki Sekiguchi
Takaaki Sekiguchi Design Engineer

**COSEL CO.,LTD.**

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# CONTENTS

1.Input Current (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Ripple Voltage (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・ 9
10.Ripple-Noise ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 10
11.Ripple Voltage (by Ambient Temperature) ・・・・・・・・・・・・・・・・・・ 11
12.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・ 12
13.Output Voltage Accuracy ・・・・・・・・・・・・・・・・・・・・・・・・・・ 13
14.Time Lapse Drift ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 14
15.Rise and Fall Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 15
16.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・・・ 16
17.Overcurrent Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 17
18.Switching frequency (by Load Current) ・・・・・・・・・・・・・・・・・・・ 18
19.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・・ 19
(Final Page 19)

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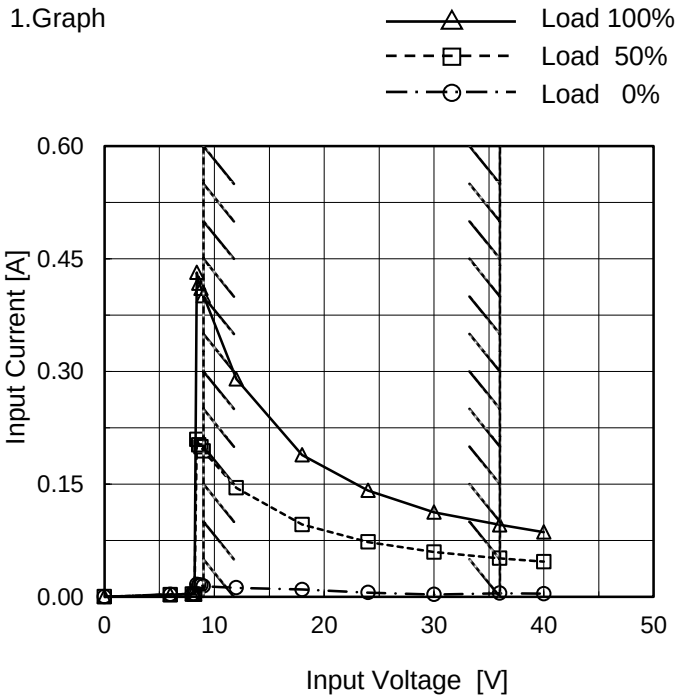
| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Input Current (by Input Voltage) |
| Object | ———————— |

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 |
| 6.0 | 0.003 | 0.003 | 0.003 |
| 8.0 | 0.004 | 0.003 | 0.003 |
| 8.2 | 0.004 | 0.003 | 0.004 |
| 8.4 | 0.016 | 0.210 | 0.432 |
| 8.6 | 0.015 | 0.202 | 0.418 |
| 8.8 | 0.015 | 0.200 | 0.411 |
| 9.0 | 0.014 | 0.194 | 0.401 |
| 12.0 | 0.012 | 0.145 | 0.290 |
| 18.0 | 0.010 | 0.096 | 0.189 |
| 24.0 | 0.006 | 0.073 | 0.142 |
| 30.0 | 0.003 | 0.059 | 0.113 |
| 36.0 | 0.005 | 0.051 | 0.096 |
| 40.0 | 0.004 | 0.047 | 0.086 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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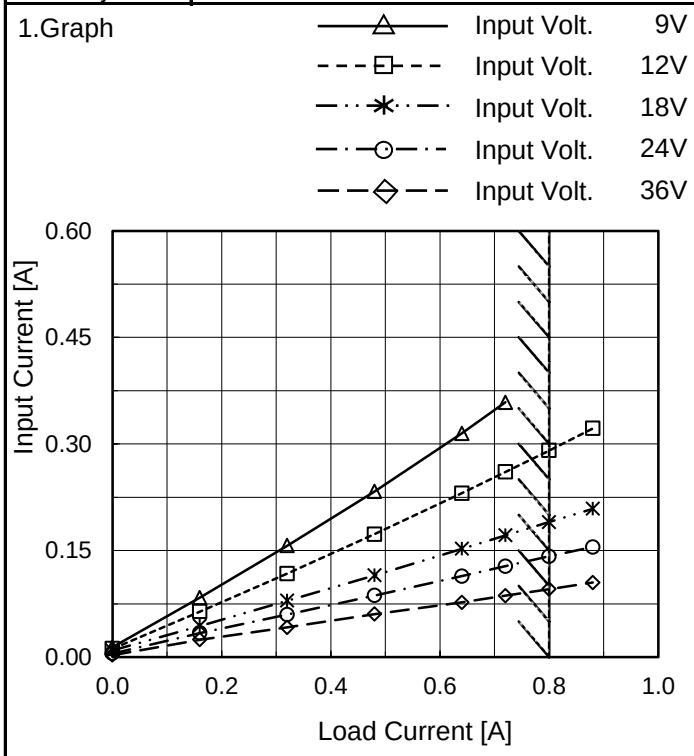
| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Input Current (by Load Current) |
| Object | ―――――― |

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. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
| 0.00 | 0.014 | 0.012 | 0.010 | 0.005 | 0.003 |
| 0.16 | 0.084 | 0.064 | 0.044 | 0.034 | 0.025 |
| 0.32 | 0.157 | 0.118 | 0.079 | 0.060 | 0.042 |
| 0.48 | 0.233 | 0.173 | 0.115 | 0.087 | 0.061 |
| 0.64 | 0.315 | 0.231 | 0.152 | 0.114 | 0.077 |
| 0.72 | 0.359 | 0.261 | 0.171 | 0.128 | 0.086 |
| 0.80 | - ※ | 0.291 | 0.190 | 0.142 | 0.096 |
| 0.88 | - ※ | 0.322 | 0.209 | 0.155 | 0.105 |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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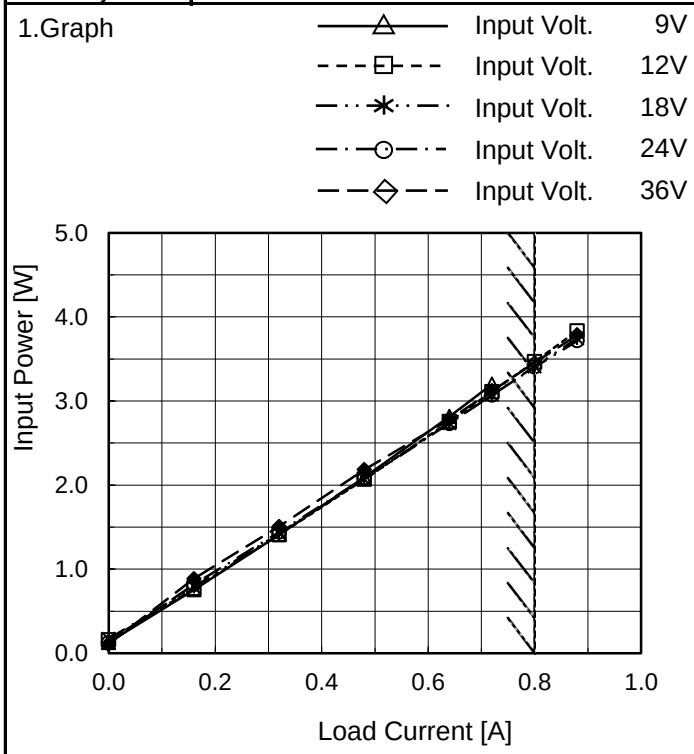
| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Input Power (by Load Current) |
| Object | ———————— |

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. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
| 0.00 | 0.13 | 0.16 | 0.17 | 0.12 | 0.11 |
| 0.16 | 0.75 | 0.77 | 0.79 | 0.82 | 0.89 |
| 0.32 | 1.41 | 1.41 | 1.43 | 1.44 | 1.51 |
| 0.48 | 2.09 | 2.07 | 2.07 | 2.08 | 2.18 |
| 0.64 | 2.81 | 2.75 | 2.73 | 2.73 | 2.78 |
| 0.72 | 3.20 | 3.11 | 3.07 | 3.07 | 3.12 |
| 0.80 | - ※ | 3.47 | 3.41 | 3.40 | 3.46 |
| 0.88 | - ※ | 3.83 | 3.74 | 3.72 | 3.78 |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |

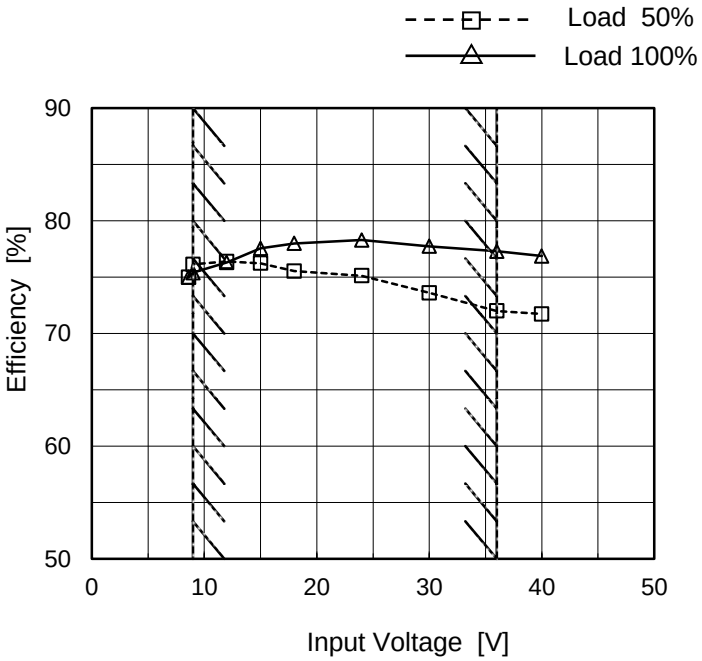
※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| 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% |
| 8.6 | 75.0 | 75.0 ※1 |
| 9.0 | 76.1 | 75.4 ※1 |
| 12.0 | 76.4 | 76.3 |
| 15.0 | 76.2 | 77.6 |
| 18.0 | 75.5 | 78.0 |
| 24.0 | 75.1 | 78.3 |
| 30.0 | 73.6 | 77.7 |
| 36.0 | 72.0 | 77.3 |
| 40.0 | 71.7 | 76.9 |

※1:Load 80%

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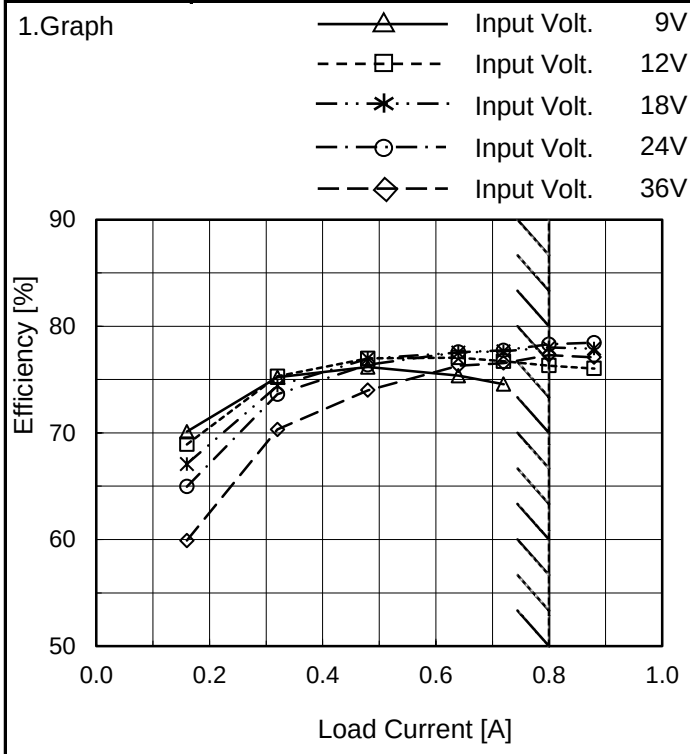
| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Efficiency (by Load Current) |
| Object | ―――――― |

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. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
|---|---|---|---|---|---|
| 0.00 | - | - | - | - | - |
| 0.16 | 70.1 | 68.9 | 67.1 | 65.0 | 59.9 |
| 0.32 | 75.2 | 75.3 | 74.4 | 73.6 | 70.3 |
| 0.48 | 76.2 | 77.0 | 77.0 | 76.4 | 74.0 |
| 0.64 | 75.4 | 77.1 | 77.5 | 77.6 | 76.3 |
| 0.72 | 74.6 | 76.7 | 77.6 | 77.7 | 76.6 |
| 0.80 | - ※ | 76.3 | 78.0 | 78.3 | 77.3 |
| 0.88 | - ※ | 76.0 | 77.9 | 78.5 | 77.1 |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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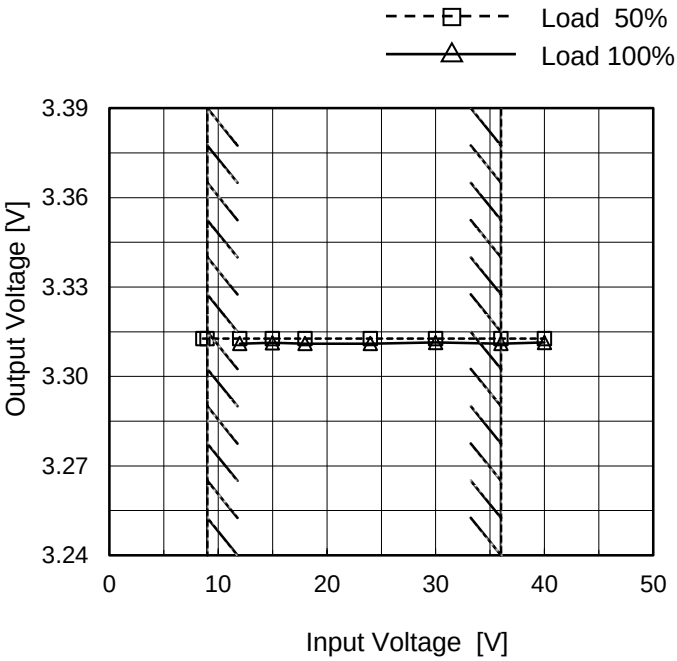
| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Line Regulation |
| Object | +3.3V0.8A |

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% |
| 8.6 | 3.313 | - ※ |
| 9.0 | 3.313 | - ※ |
| 12.0 | 3.313 | 3.311 |
| 15.0 | 3.313 | 3.311 |
| 18.0 | 3.313 | 3.311 |
| 24.0 | 3.313 | 3.311 |
| 30.0 | 3.313 | 3.311 |
| 36.0 | 3.313 | 3.311 |
| 40.0 | 3.313 | 3.311 |

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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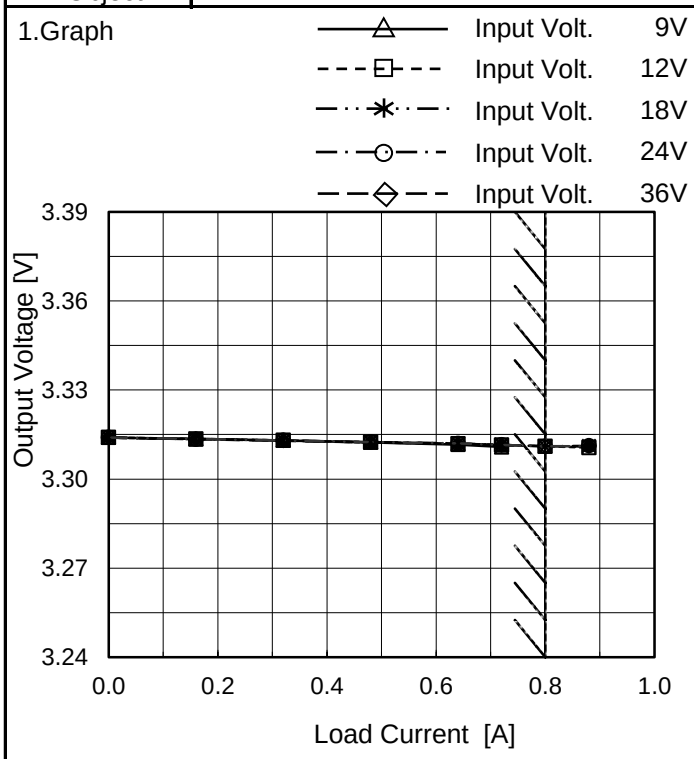
| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Load Regulation |
| Object | +3.3V0.8A |

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. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
|---|---|---|---|---|---|
| 0.00 | 3.314 | 3.314 | 3.314 | 3.314 | 3.314 |
| 0.16 | 3.314 | 3.314 | 3.314 | 3.313 | 3.313 |
| 0.32 | 3.313 | 3.313 | 3.313 | 3.313 | 3.313 |
| 0.48 | 3.312 | 3.312 | 3.313 | 3.313 | 3.312 |
| 0.64 | 3.312 | 3.312 | 3.312 | 3.312 | 3.312 |
| 0.72 | 3.311 | 3.311 | 3.312 | 3.312 | 3.311 |
| 0.80 | - ※ | 3.311 | 3.311 | 3.311 | 3.311 |
| 0.88 | - ※ | 3.311 | 3.311 | 3.311 | 3.311 |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.



BC-10998

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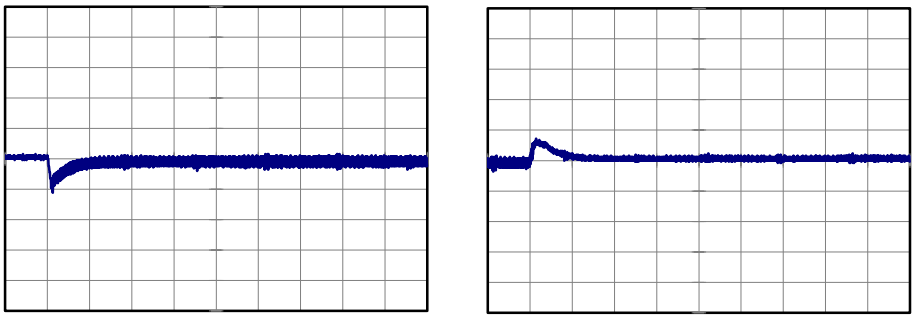
| | | |
|---|---|---|
| Model | MGFS3243R3 | |
| Item | Dynamic Load Response | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | +3.3V0.8A | |

Input Volt. 24 V
Cycle 100 ms

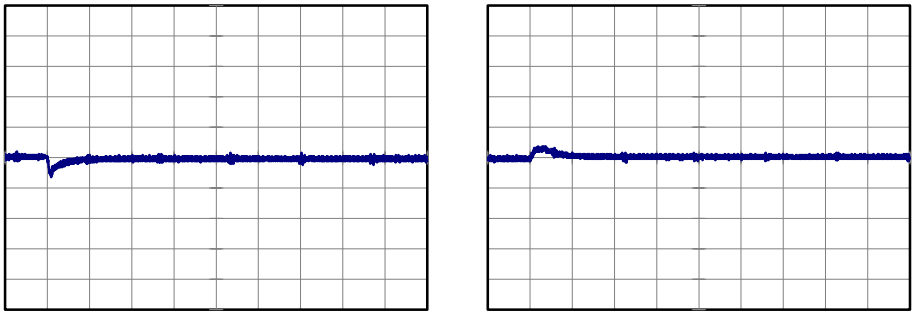
Min.Load (0A)←→
Load 100% (0.8A)



100 mV/div

400 μs/div 400 μs/div

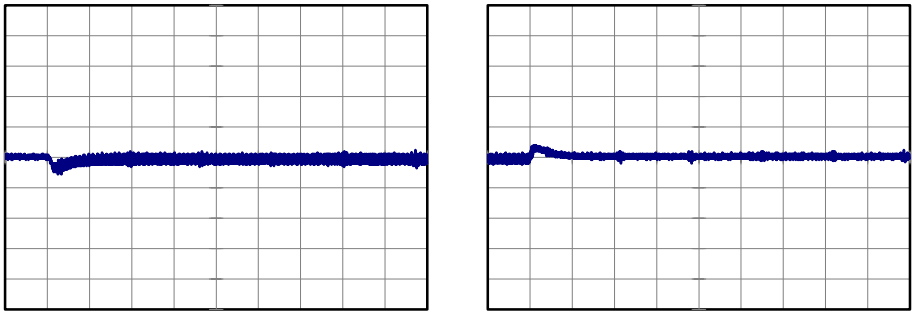
Min.Load (0A)←→
Load 50% (0.4A)



100 mV/div

400 μs/div 400 μs/div

Load 50% (0.4A)←→
Load 100% (0.8A)



100 mV/div

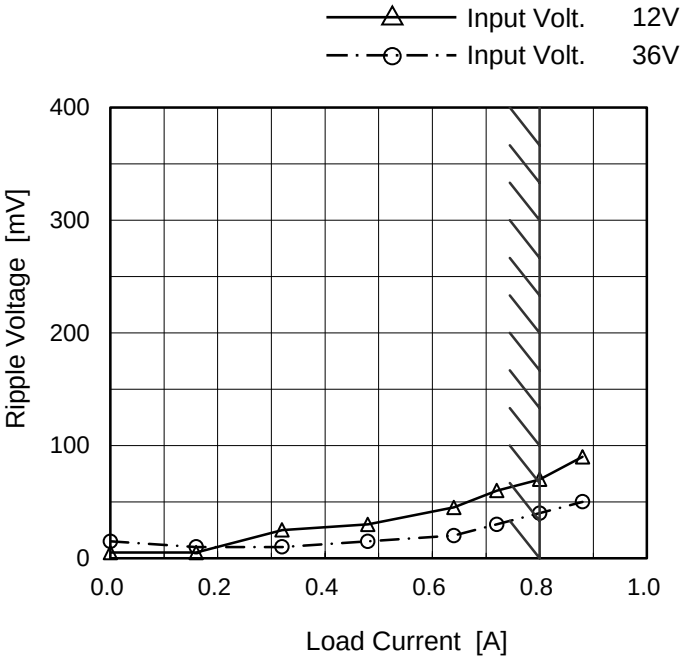
400 μs/div 400 μs/div

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Ripple Voltage (by Load Current) |
| Object | +3.3V0.8A |

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.

Ripple [mVp-p]

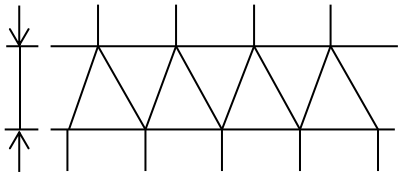


Fig.Complex Ripple Wave Form

2.Values

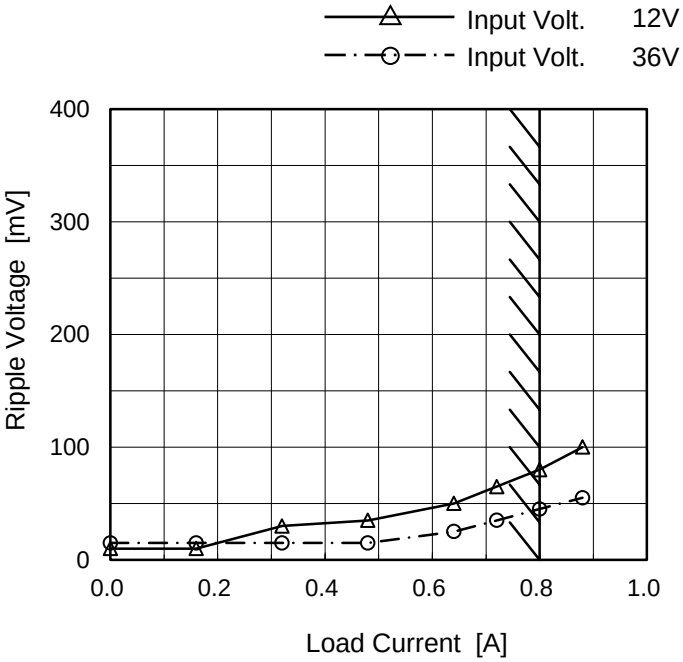
| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 12 [V] | Input Volt. 36 [V] |
| 0.00 | 5 | 15 |
| 0.16 | 5 | 10 |
| 0.32 | 25 | 10 |
| 0.48 | 30 | 15 |
| 0.64 | 45 | 20 |
| 0.72 | 60 | 30 |
| 0.80 | 70 | 40 |
| 0.88 | 90 | 50 |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Ripple-Noise |
| Object | +3.3V0.8A |

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.

Ripple Noise[mVp-p]

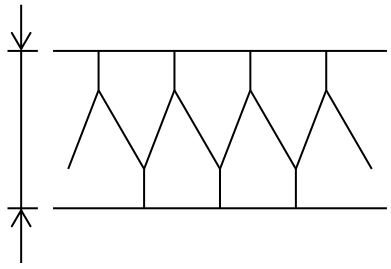


Fig.Complex Ripple Noise Wave Form

2.Values

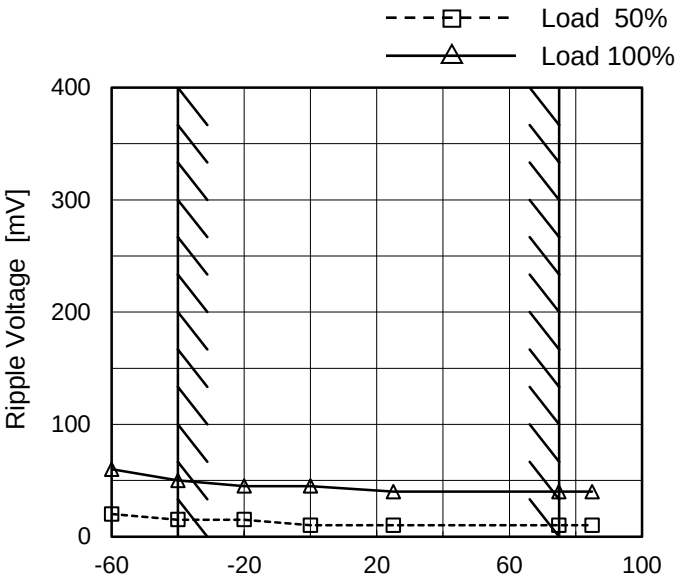
| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 12 [V] | Input Volt. 36 [V] |
| 0.00 | 10 | 15 |
| 0.16 | 10 | 15 |
| 0.32 | 30 | 15 |
| 0.48 | 35 | 15 |
| 0.64 | 50 | 25 |
| 0.72 | 65 | 35 |
| 0.80 | 80 | 45 |
| 0.88 | 100 | 55 |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +3.3V0.8A |

Testing Circuitry Figure B

1.Graph




Input Volt. 24V

Measured by 100 MHz Oscilloscope.

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

2.Values

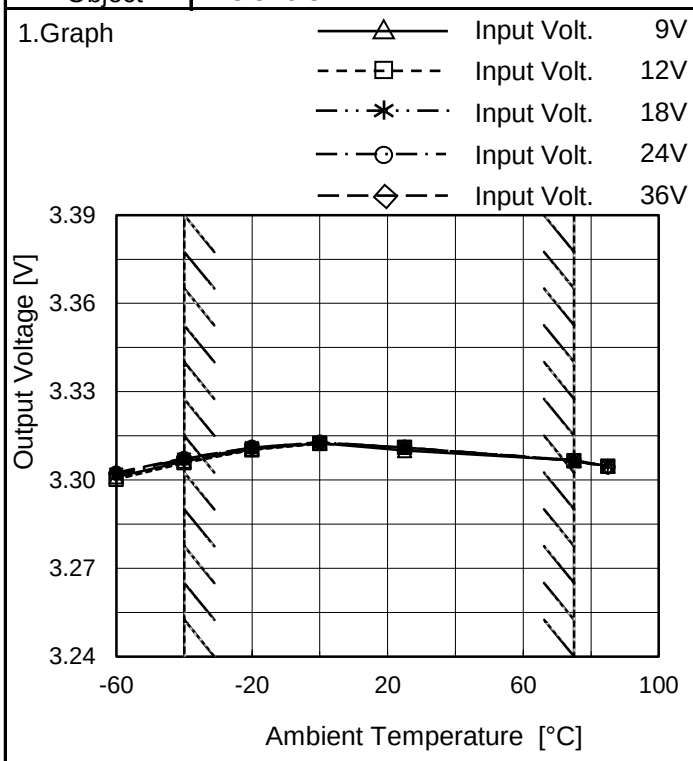
| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -60 | 20 | 60 |
| -40 | 15 | 50 |
| -20 | 15 | 45 |
| 0 | 10 | 45 |
| 25 | 10 | 40 |
| 75 | 10 | 40 |
| 85 | 10 | 40 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Ambient Temperature Drift |
| Object | +3.3V0.8A |

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. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
|---|---|---|---|---|---|
| -60 | 3.301 | 3.300 | 3.302 | 3.302 | 3.303 |
| -40 | 3.306 | 3.306 | 3.307 | 3.307 | 3.307 |
| -20 | 3.311 | 3.310 | 3.311 | 3.311 | 3.311 |
| 0 | 3.313 | 3.312 | 3.313 | 3.313 | 3.313 |
| 25 | 3.310 | 3.311 | 3.311 | 3.311 | 3.311 |
| 75 | 3.307 | 3.307 | 3.307 | 3.307 | 3.307 |
| 85 | 3.305 | 3.305 | 3.305 | 3.304 | 3.304 |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |

Note: In case of Input Volt. 9V, Load 80%. Other case Load 100%.

| | | |
|---|---|---|
| Model | MGFS3243R3 | |
| Item | Output Voltage Accuracy | Testing Circuitry Figure A |
| Object | +3.3V0.8A | |

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 - 75°C
Input Voltage : 12 - 36V
Load Current : 0 - 0.8A

* 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

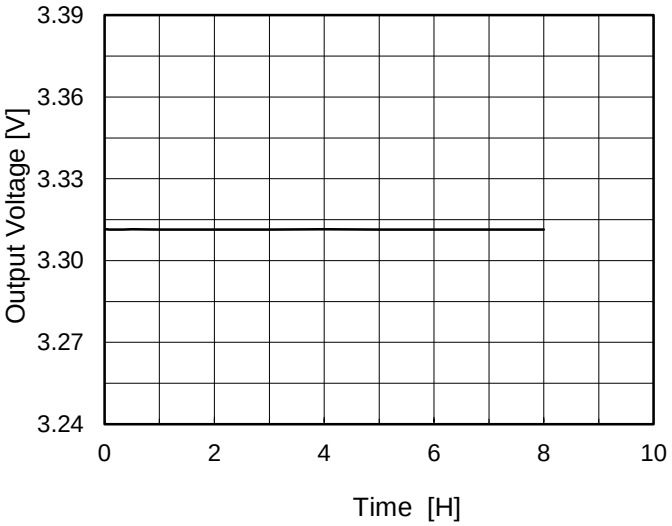
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
|---|---|---|---|---|---|---|
| | | | Current[A] | Voltage[V] | Value [mV] | Ratio [%] |
| Maximum Voltage | 25 | 12 | 0 | 3.315 | ±5 | ±0.2 |
| Minimum Voltage | -40 | 12 | 0.8 | 3.306 | | |

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Time Lapse Drift |
| Object | +3.3V0.8A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Input Volt. 24V
Load 100%

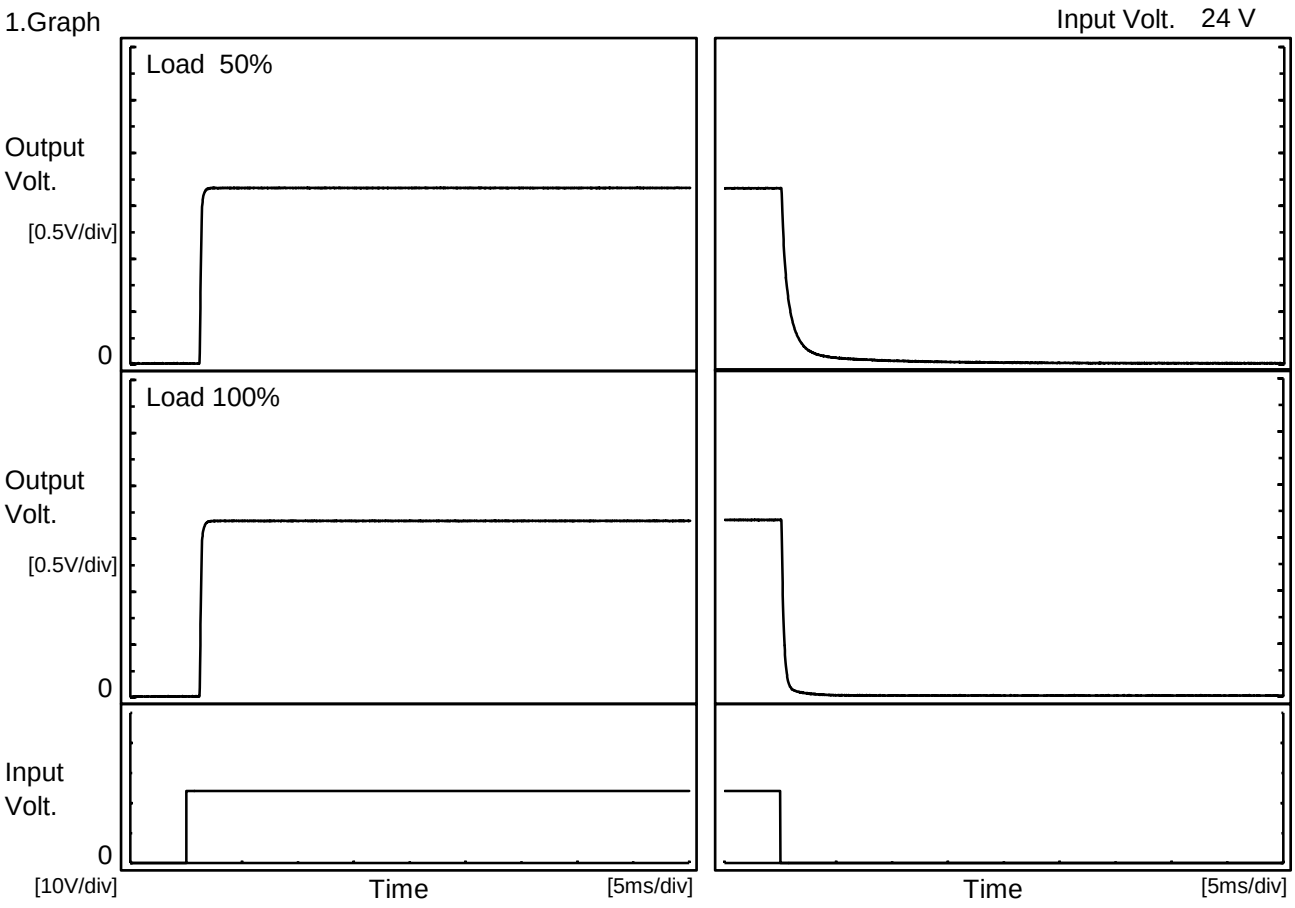
2.Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 3.311 |
| 0.5 | 3.312 |
| 1.0 | 3.311 |
| 2.0 | 3.311 |
| 3.0 | 3.311 |
| 4.0 | 3.312 |
| 5.0 | 3.311 |
| 6.0 | 3.311 |
| 7.0 | 3.311 |
| 8.0 | 3.311 |

COSEL

| | | |
|---|---|---|
| Model | MGFS3243R3 | |
| Item | Rise and Fall Time | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | +3.3V0.8A | |

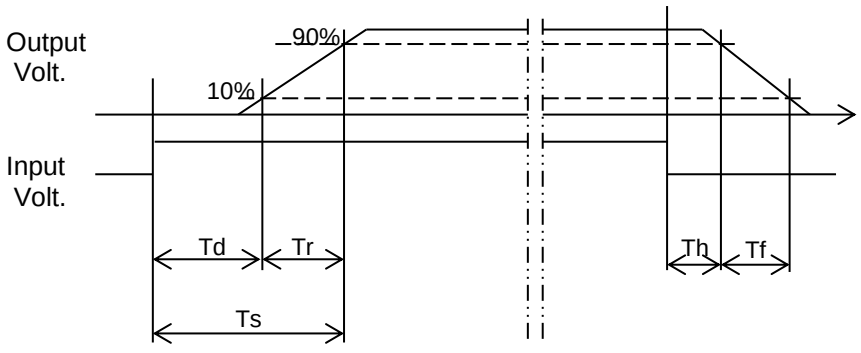
1.Graph




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 1.2 | 0.2 | 1.4 | 0.2 | 1.9 |
| 100 % | 1.2 | 0.2 | 1.4 | 0.1 | 0.5 |

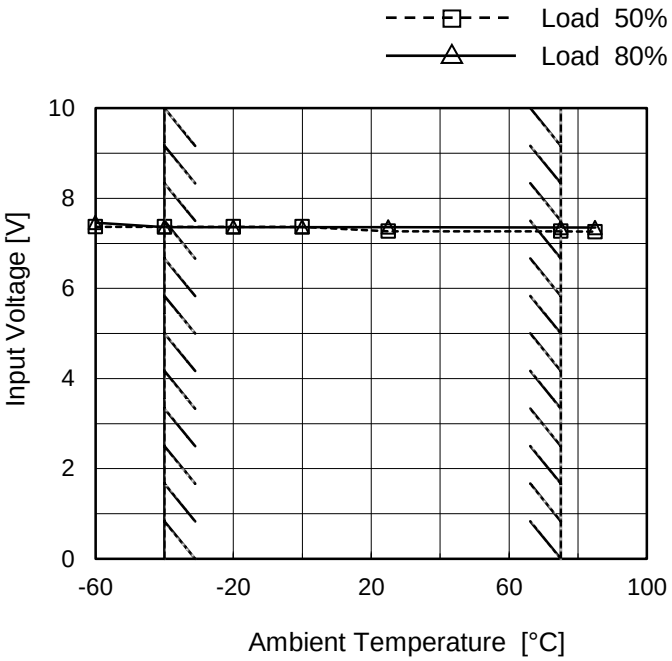


COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +3.3V0.8A |

Testing Circuitry Figure A

1.Graph




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

2.Values

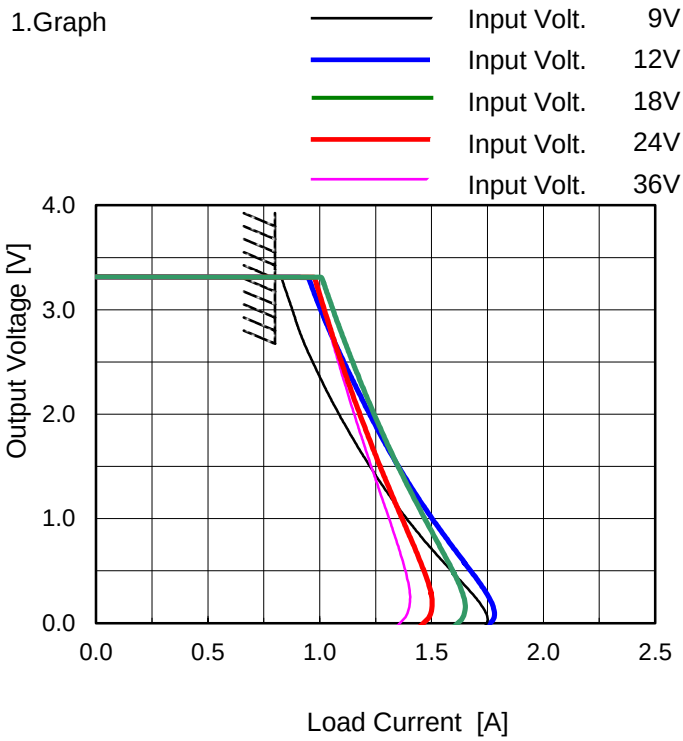
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 80% |
| -60 | 7.4 | 7.5 |
| -40 | 7.4 | 7.4 |
| -20 | 7.4 | 7.4 |
| 0 | 7.4 | 7.4 |
| 25 | 7.3 | 7.4 |
| 75 | 7.3 | 7.4 |
| 85 | 7.3 | 7.4 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Overcurrent Protection |
| Object | +3.3V0.8A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

Maximum output current at minimum input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

2.Values

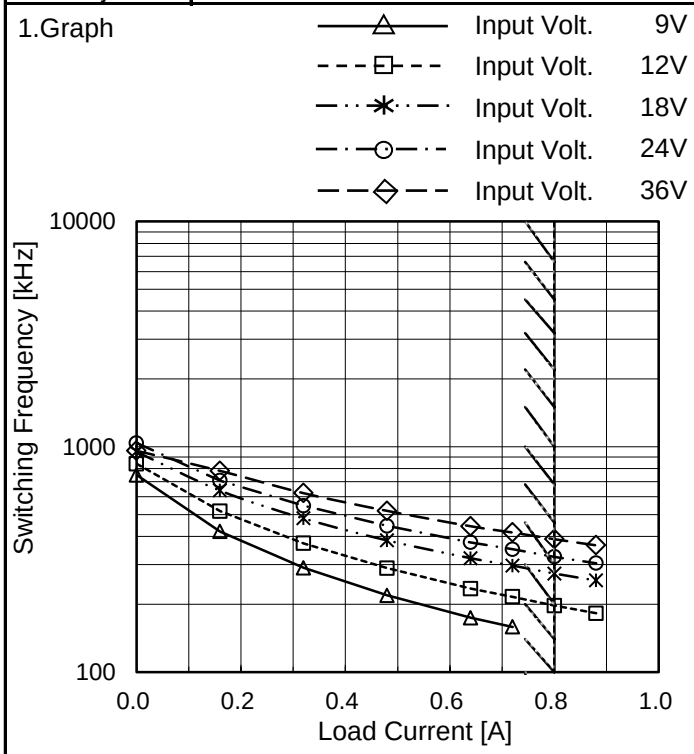
| Output Voltage [V] | Load Current [A] | | | | |
|---|---|---|---|---|---|
| | Input Volt. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
| 3.14 | 0.856 | 0.980 | 1.037 | 1.002 | 1.003 |
| 2.97 | 0.882 | 1.010 | 1.064 | 1.025 | 1.022 |
| 2.64 | 0.938 | 1.075 | 1.121 | 1.074 | 1.061 |
| 2.31 | 1.008 | 1.148 | 1.180 | 1.125 | 1.108 |
| 1.98 | 1.090 | 1.227 | 1.247 | 1.183 | 1.157 |
| 1.65 | 1.181 | 1.311 | 1.314 | 1.241 | 1.205 |
| 1.32 | 1.278 | 1.404 | 1.389 | 1.305 | 1.257 |
| 0.99 | 1.392 | 1.505 | 1.472 | 1.368 | 1.311 |
| 0.66 | 1.519 | 1.614 | 1.554 | 1.435 | 1.362 |
| 0.33 | 1.657 | 1.731 | 1.631 | 1.491 | 1.400 |
| 0.00 | 1.739 | 1.735 | 1.568 | 1.410 | 1.302 |
| -- | - | - | - | - | - |

COSEL

| | |
|---|---|
| Model | MGFS3243R3 |
| Item | Switching frequency (by Load Current) |
| Object | +3.3V0.8A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

When load current is low, MG operates intermittently, so switching frequency would not become constant.

2.Values

| Load Current [A] | Input Current [A] | | | | |
|---|---|---|---|---|---|
| | Input Volt. 9[V] | Input Volt. 12[V] | Input Volt. 18[V] | Input Volt. 24[V] | Input Volt. 36[V] |
| 0.00 | 750 | 840 | 950 | 1040 | 960 |
| 0.16 | 421 | 518 | 639 | 708 | 782 |
| 0.32 | 290 | 373 | 481 | 548 | 623 |
| 0.48 | 219 | 289 | 384 | 446 | 520 |
| 0.64 | 174 | 235 | 320 | 376 | 444 |
| 0.72 | 159 | 216 | 297 | 351 | 416 |
| 0.80 | - ※ | 197 | 274 | 325 | 389 |
| 0.88 | - ※ | 182 | 255 | 304 | 365 |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |
| -- | - | - | - | - | - |

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.



BC-10998

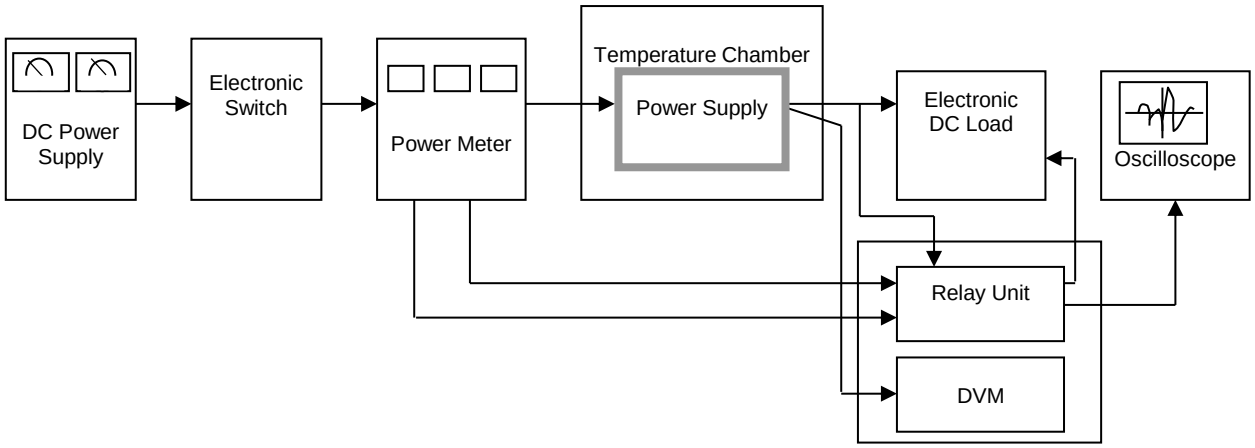



Figure A

Data Acquisition/Control Unit

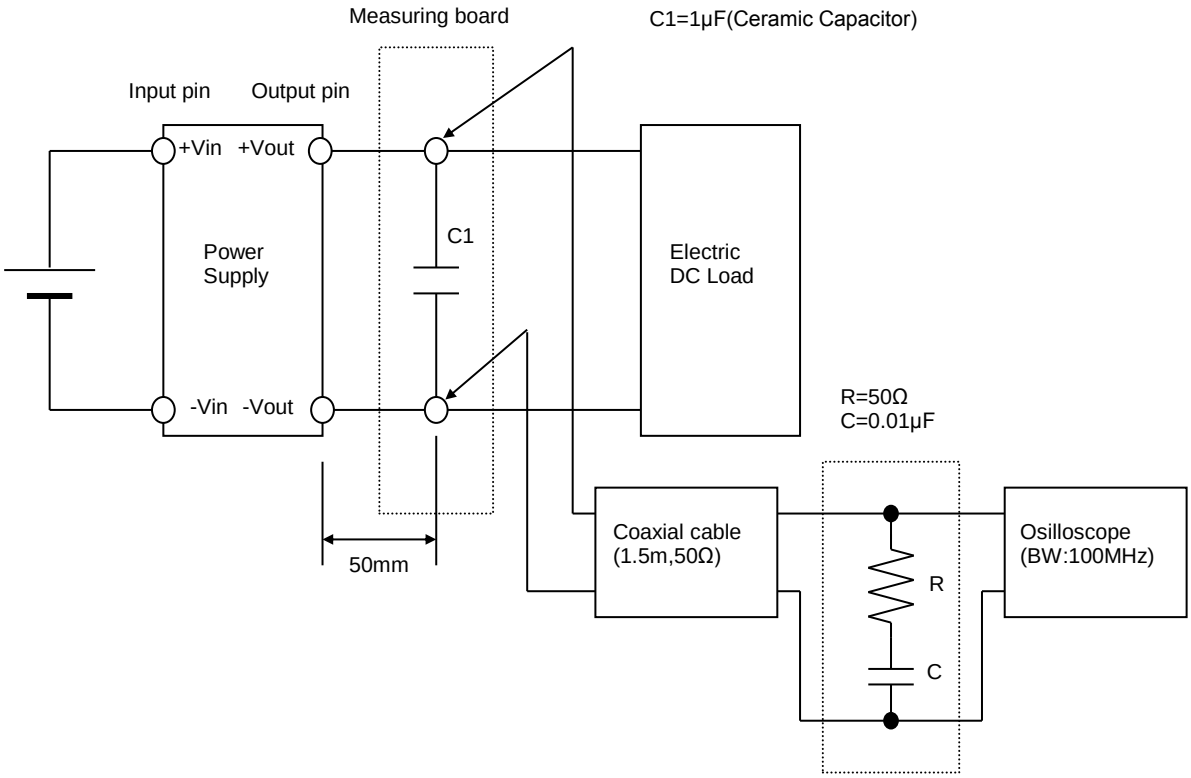



Figure B（Ripple and Ripple noise Characteristic）