

# TEST DATA OF MGFS32415

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.**



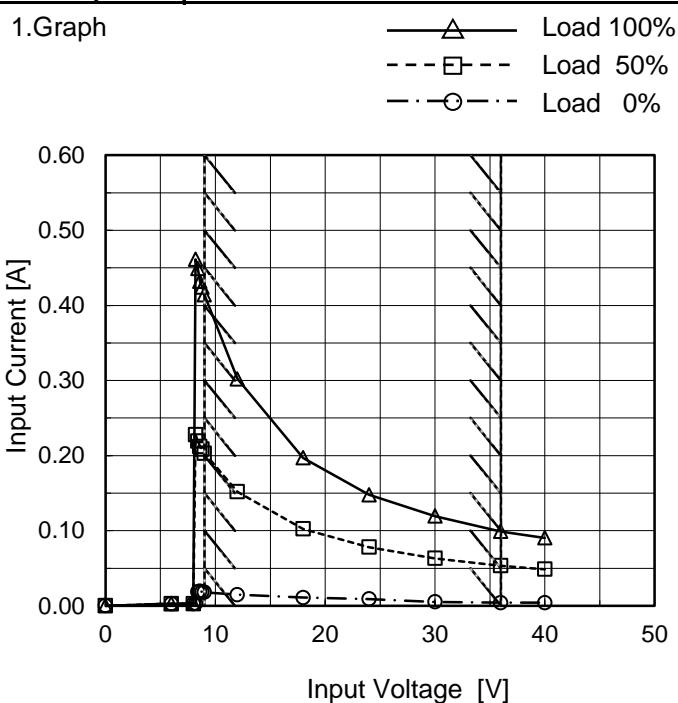
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(Final Page 19)

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Model	MGFS32415
Item	Input Current (by Input Voltage)
Object	_____



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

Temperature 25°C  
Testing Circuitry Figure A

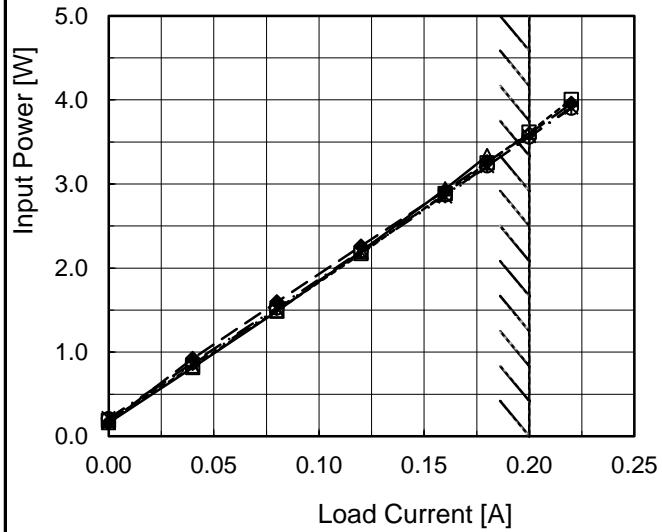
## 2. Values

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	0.003	0.003	0.003
8.2	0.003	0.228	0.461
8.4	0.018	0.219	0.449
8.6	0.019	0.212	0.432
8.8	0.019	0.209	0.424
9.0	0.018	0.203	0.414
12.0	0.015	0.152	0.302
18.0	0.011	0.102	0.197
24.0	0.009	0.078	0.148
30.0	0.005	0.063	0.120
36.0	0.004	0.053	0.099
40.0	0.004	0.049	0.090
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Model	MGFS32415	Temperature Testing Circuitry	25°C Figure A																																																																													
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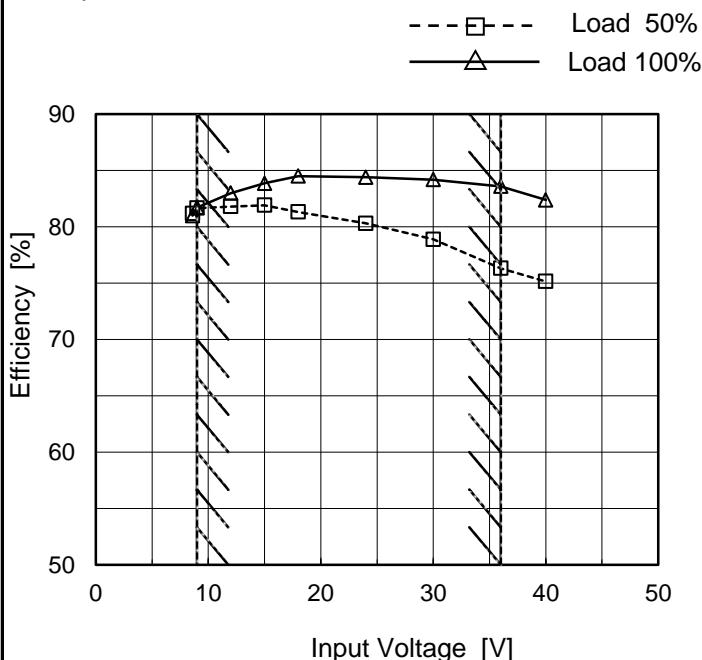
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Model	MGFS32415
Item	Efficiency (by Input Voltage)
Object	_____

 Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



## 2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.6	81.2	81.0
9.0	81.7	81.7
12.0	81.8	83.0
15.0	81.9	83.9
18.0	81.3	84.5
24.0	80.3	84.4
30.0	78.9	84.2
36.0	76.3	83.6
40.0	75.2	82.4

※1: Load 80%

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

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Object	+15V0.2A																																																																																	
1.Graph	<p>Legend:</p> <ul style="list-style-type: none"> <li>Input Volt. 9V</li> <li>Input Volt. 12V</li> <li>Input Volt. 18V</li> <li>Input Volt. 24V</li> <li>Input Volt. 36V</li> </ul>																																																																																	
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**COSEL**

Model	MGFS32415	Temperature Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+15V0.2A	

Input Volt. 24 V  
 Cycle 100 ms



Min.Load (0A)↔  
 Load 100% (0.2A)

100 mV/div

4 ms/div

4 ms/div

Min.Load (0A)↔  
 Load 50% (0.1A)

100 mV/div

4 ms/div

4 ms/div

Load 50% (0.1A)↔  
 Load 100% (0.2A)

100 mV/div

4 ms/div

4 ms/div

**COSEL**

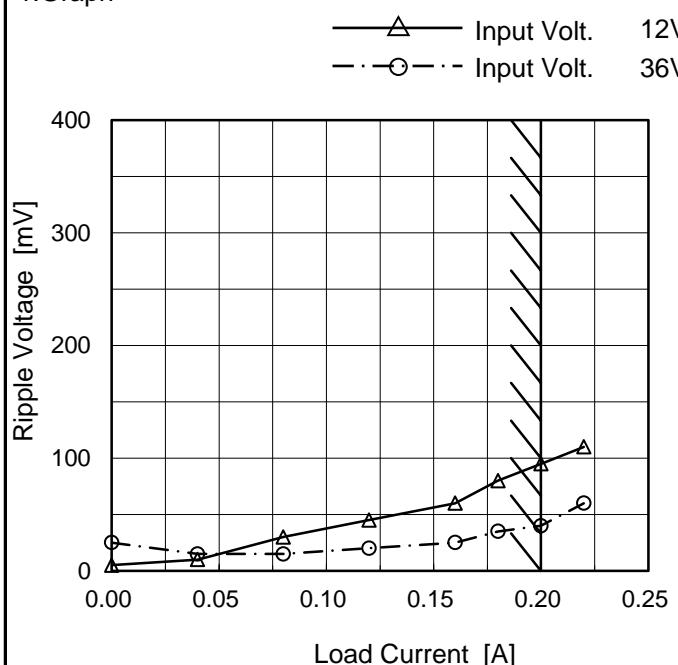
Model	MGFS32415																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+15V0.2A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 400 mV, and the X-axis ranges from 0.00 to 0.25 A. Two curves are plotted: one for Input Volt. 12V (solid line with triangles) and one for Input Volt. 36V (dashed line with circles). Both curves show an increase in ripple voltage as load current increases, with a slanted line indicating the rated load current range.</p>		2.Values																																						
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 12 [V]</th> <th>Input Volt. 36 [V]</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>5</td> <td>20</td> </tr> <tr> <td>0.04</td> <td>10</td> <td>10</td> </tr> <tr> <td>0.08</td> <td>30</td> <td>15</td> </tr> <tr> <td>0.12</td> <td>40</td> <td>15</td> </tr> <tr> <td>0.16</td> <td>55</td> <td>20</td> </tr> <tr> <td>0.18</td> <td>70</td> <td>30</td> </tr> <tr> <td>0.20</td> <td>85</td> <td>35</td> </tr> <tr> <td>0.22</td> <td>100</td> <td>55</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 12 [V]	Input Volt. 36 [V]	0.00	5	20	0.04	10	10	0.08	30	15	0.12	40	15	0.16	55	20	0.18	70	30	0.20	85	35	0.22	100	55	--	-	-	--	-	-	--	-	-	
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<p>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.</p> <p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								

**COSEL**

Model	MGFS32415
Item	Ripple-Noise
Object	+15V0.2A

 Temperature 25°C  
 Testing Circuitry Figure B

## 1.Graph



## 2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.00	5	25
0.04	10	15
0.08	30	15
0.12	45	20
0.16	60	25
0.18	80	35
0.20	95	40
0.22	110	60
--	-	-
--	-	-
--	-	-

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]

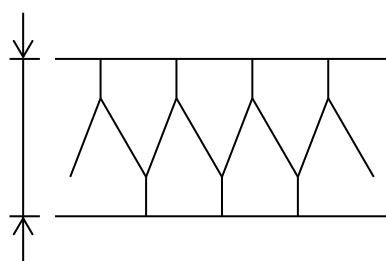
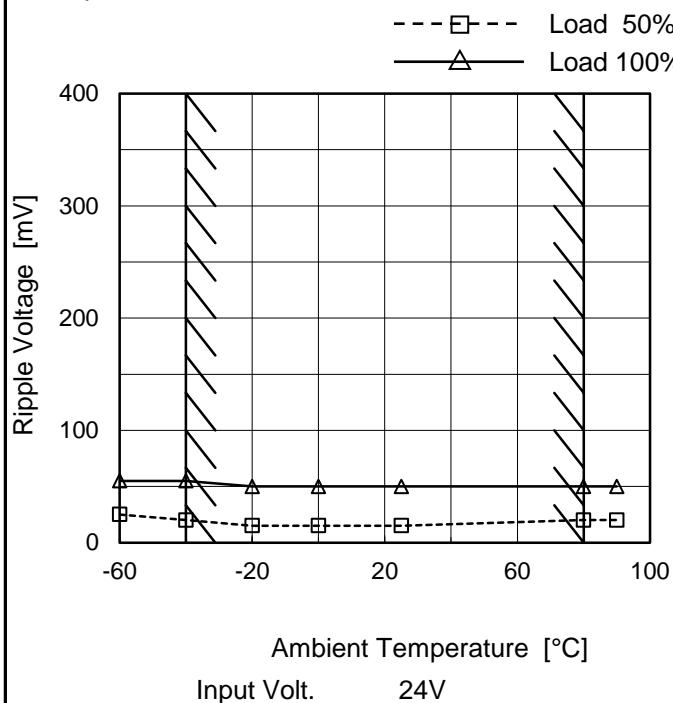


Fig.Complex Ripple Noise Wave Form

**COSEL**

Model	MGFS32415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.2A

## 1. Graph



Measured by 100 MHz Oscilloscope.

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

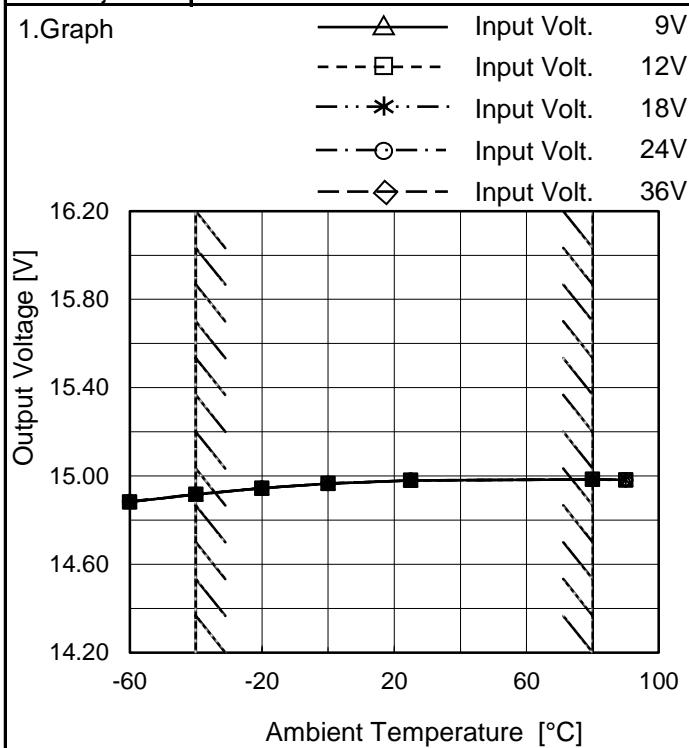
Testing Circuitry Figure B

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	25	55
-40	20	55
-20	15	50
0	15	50
25	15	50
80	20	50
90	20	50
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**

Model	MGFS32415
Item	Ambient Temperature Drift
Object	+15V0.2A



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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	9[V]	12[V]	18[V]	24[V]	36[V]
-60	14.883	14.883	14.884	14.884	14.883
-40	14.917	14.916	14.917	14.917	14.916
-20	14.945	14.944	14.945	14.945	14.944
0	14.966	14.966	14.966	14.966	14.965
25	14.980	14.980	14.980	14.980	14.980
80	14.985	14.985	14.985	14.984	14.984
90	14.982	14.982	14.982	14.982	14.982
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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



Model	MGFS32415	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+15V0.2A	

### 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 - 80°C

Input Voltage : 12 - 36V

Load Current : 0 - 0.2A

\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

### 2. Values

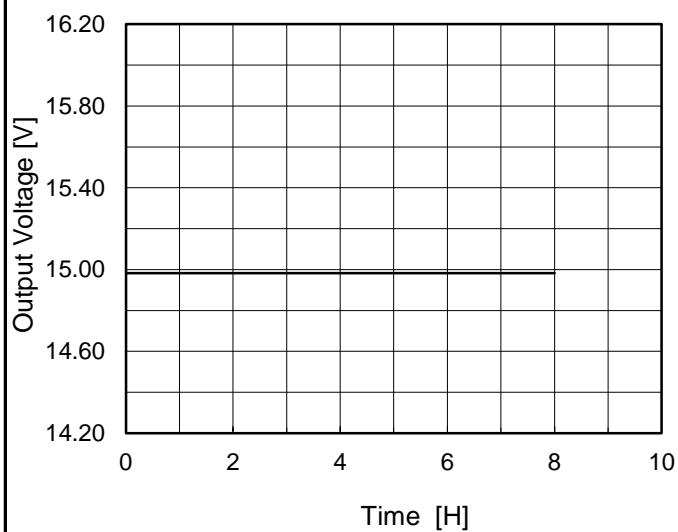
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	70	36	0	14.999	±42	±0.3
Minimum Voltage	-40	12	0.2	14.916		

**COSEL**

Model	MGFS32415
Item	Time Lapse Drift
Object	+15V0.2A

Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



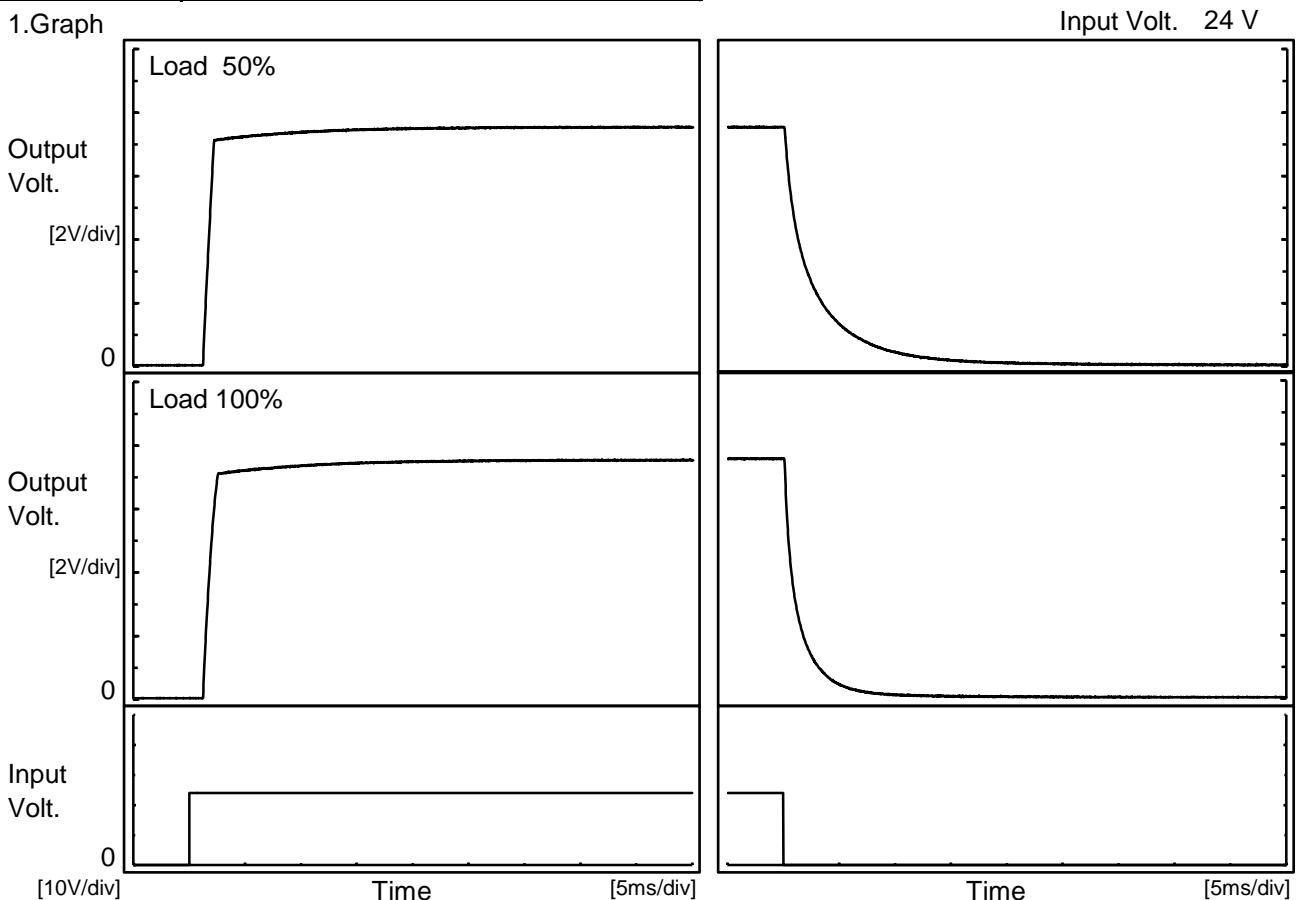
## 2.Values

Time since start [H]	Output Voltage [V]
0.0	14.980
0.5	14.983
1.0	14.983
2.0	14.983
3.0	14.983
4.0	14.983
5.0	14.983
6.0	14.983
7.0	14.983
8.0	14.983

**COSEL**

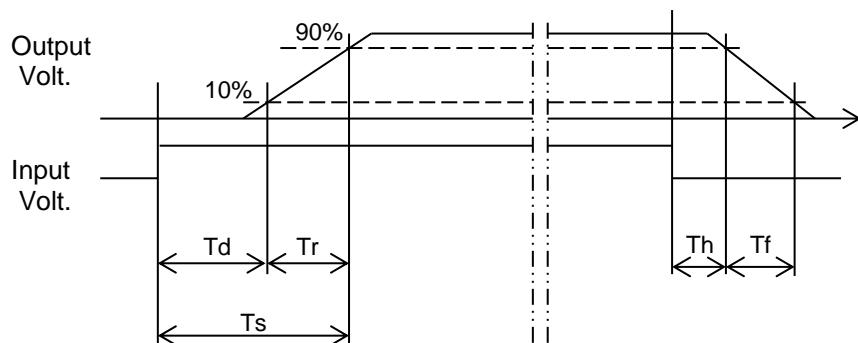
Model	MGFS32415	Temperature Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+15V0.2A	

## 1. Graph



## 2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		1.3	0.9	2.2	0.3	7.2	
100 %		1.3	1.1	2.4	0.2	3.5	

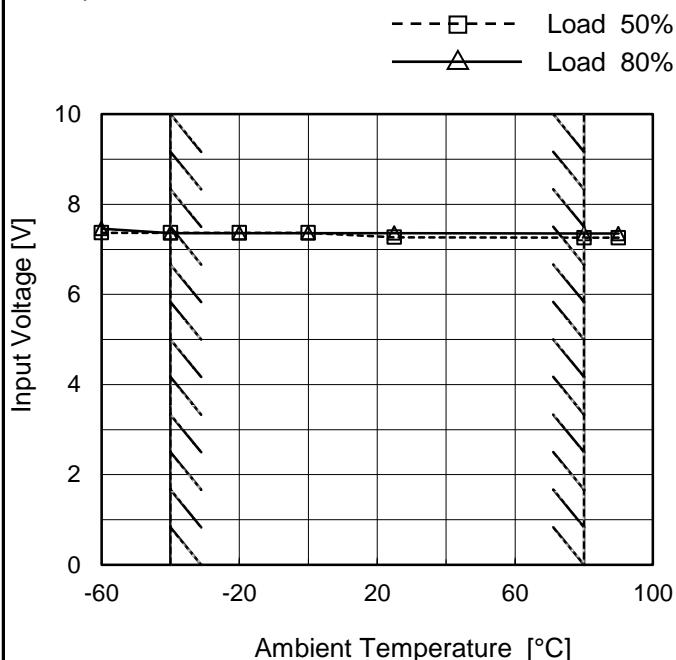


**COSEL**

Model	MGFS32415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.2A

Testing Circuitry Figure A

## 1. Graph



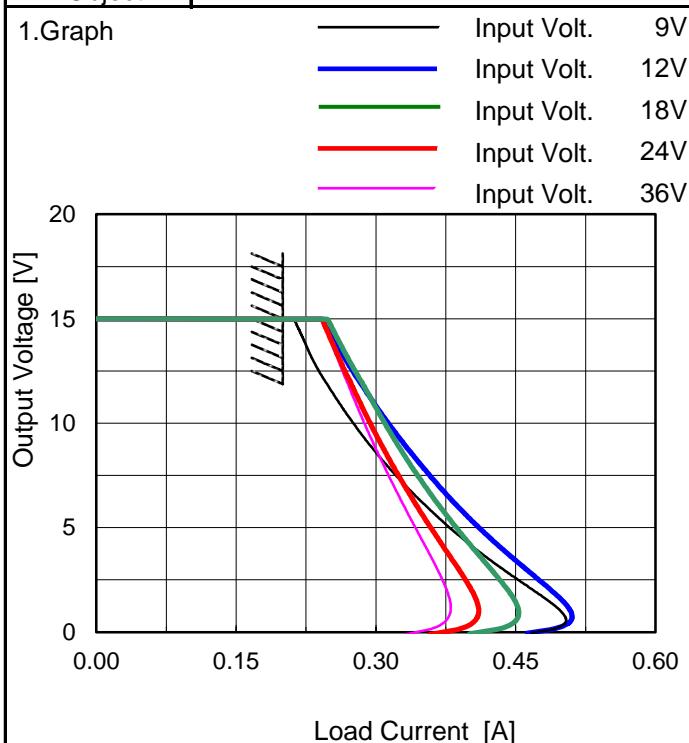
Note: Slanted line shows the range of the rated ambient temperature.

## 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
80	7.3	7.4
90	7.3	7.4
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**

Model	MGFS32415
Item	Overcurrent Protection
Object	+15V0.2A



Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Output Voltage [V]	Load Current [A]				
	9[V]	12[V]	18[V]	24[V]	36[V]
14.3	0.220	0.252	0.257	0.249	0.249
13.5	0.227	0.261	0.265	0.257	0.256
12.0	0.245	0.282	0.284	0.272	0.269
10.5	0.267	0.305	0.303	0.288	0.283
9.0	0.293	0.330	0.323	0.305	0.297
7.5	0.321	0.357	0.344	0.324	0.313
6.0	0.355	0.387	0.368	0.344	0.331
4.5	0.392	0.422	0.395	0.366	0.348
3.0	0.436	0.461	0.424	0.389	0.366
1.5	0.485	0.500	0.449	0.408	0.379
0.0	0.467	0.463	0.401	0.358	0.328
--	-	-	-	-	-

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.

**COSEL**

Model	MGFS32415																																																																																	
Item	Switching frequency (by Load Current)				Temperature 25°C Testing Circuitry Figure A																																																																													
Object	+15V0.2A																																																																																	
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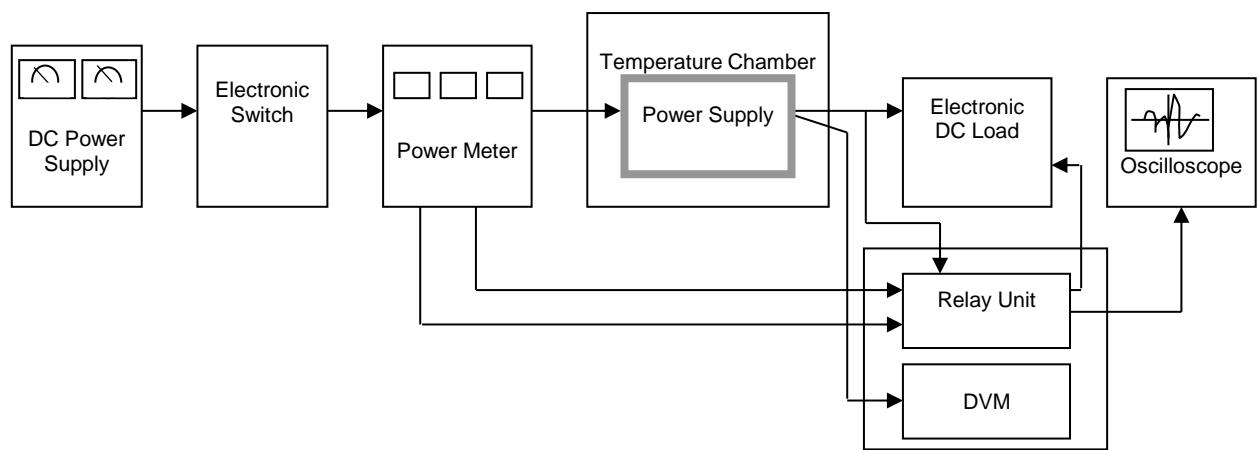


Figure A

Data Acquisition/Control Unit

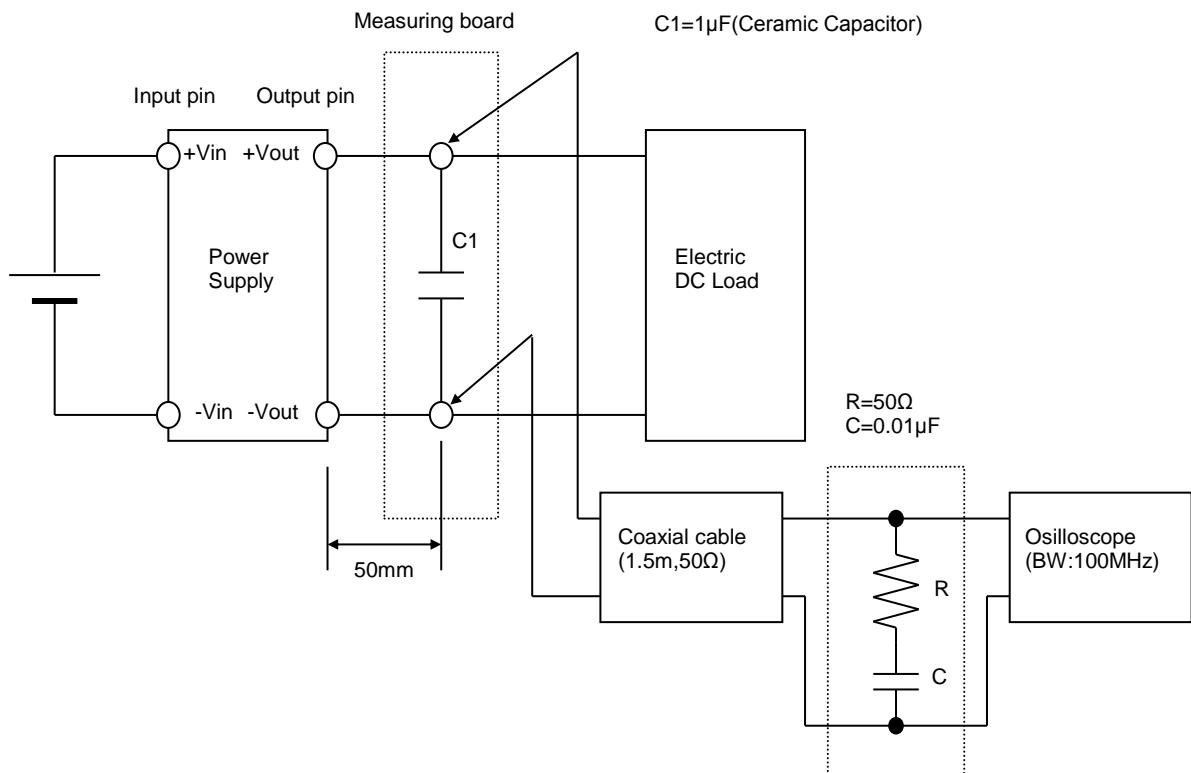


Figure B (Ripple and Ripple noise Characteristic)