

# TEST DATA OF MGFS402415

Regulated DC Power Supply  
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**COSEL CO.,LTD.**

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Model		MGFS402415		Temperature 25°C	
Item		Input Current (by Input Voltage)		Testing Circuitry Figure A	
Object					
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Model

MGFS402415

Item

Input Current (by Load Current)

Object

1.Graph

—△—

Input Volt.

9V

---□---

Input Volt.

12V

-·-·\*-·-

Input Volt.

18V

-·-·○-·-

Input Volt.

24V

--◇--

Input Volt.

36V

Input Current [A]

8.0

6.4

4.8

3.2

1.6

0.0

0.0

1.0

2.0

3.0

4.0

Load Current [A]

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	0.053	0.043	0.033	0.023	0.015
0.54	1.024	0.774	0.522	0.396	0.272
1.08	1.994	1.492	0.999	0.754	0.512
1.35	2.462	1.850	1.225	0.924	0.627
1.62	2.965	2.215	1.474	1.109	0.747
1.89	3.484	2.586	1.712	1.285	0.864
2.16	- ※1	2.961	1.963	1.469	0.984
2.70	- ※1	- ※2	2.464	1.834	1.218
2.97	- ※1	- ※2	2.712	2.027	1.349
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.

※2 Maximum output current at 12V input Voltage is 80% of rated load current.

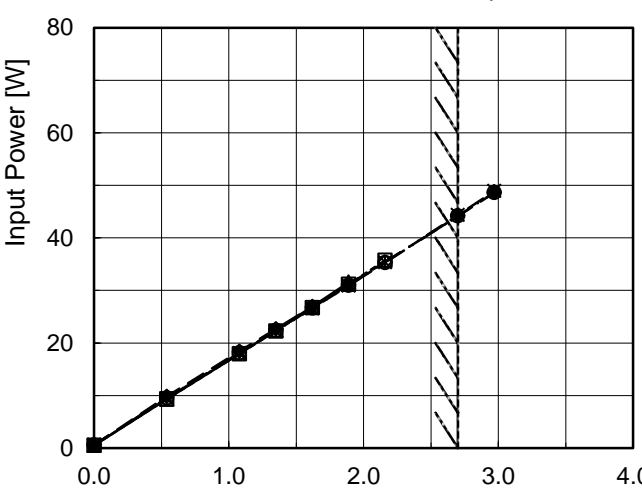
Refer to instruction manuals for details of input derating.

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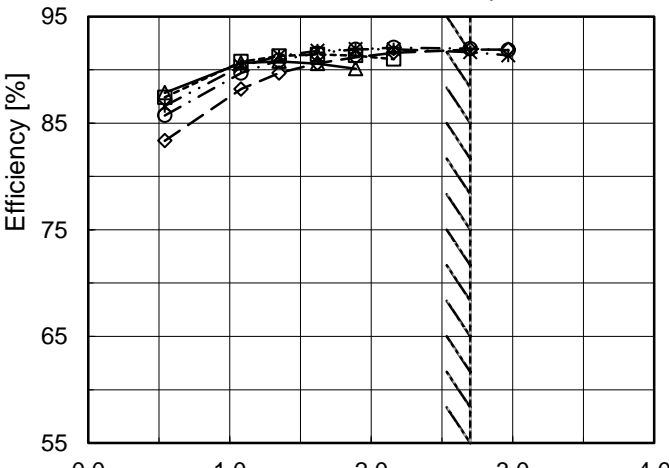
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Model		MGFS402415																																																																														
Item		Input Power (by Load Current)																																																																														
Object																																																																																
1.Graph		<div><div><div>—△—</div><div>Input Volt. 9V</div></div><div><div>---□---</div><div>Input Volt. 12V</div></div><div><div>-·-·*-·-</div><div>Input Volt. 18V</div></div><div><div>-·-·○-·-</div><div>Input Volt. 24V</div></div><div><div>---◇---</div><div>Input Volt. 36V</div></div></div>  <p>Note: Slanted line shows the range of the rated load current.</p>																																																																														
2.Values		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Input Power [W]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th></tr><tr><td>0.00</td><td>0.48</td><td>0.52</td><td>0.60</td><td>0.54</td><td>0.55</td></tr><tr><td>0.54</td><td>9.29</td><td>9.33</td><td>9.41</td><td>9.52</td><td>9.82</td></tr><tr><td>1.08</td><td>17.96</td><td>17.94</td><td>18.03</td><td>18.12</td><td>18.44</td></tr><tr><td>1.35</td><td>22.40</td><td>22.27</td><td>22.28</td><td>22.36</td><td>22.66</td></tr><tr><td>1.62</td><td>26.93</td><td>26.68</td><td>26.58</td><td>26.63</td><td>26.89</td></tr><tr><td>1.89</td><td>31.57</td><td>31.17</td><td>30.93</td><td>30.95</td><td>31.17</td></tr><tr><td>2.16</td><td>- ※1</td><td>35.73</td><td>35.37</td><td>35.30</td><td>35.47</td></tr><tr><td>2.70</td><td>- ※1</td><td>- ※2</td><td>44.34</td><td>44.17</td><td>44.19</td></tr><tr><td>2.97</td><td>- ※1</td><td>- ※2</td><td>48.93</td><td>48.66</td><td>48.62</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table> <div><div>※1 Maximum output current at minimum input Voltage is 70% of rated load current.</div><div>※2 Maximum output current at 12V input Voltage is 80% of rated load current.</div><div>Refer to instruction manuals for details of input derating.</div></div>		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	0.48	0.52	0.60	0.54	0.55	0.54	9.29	9.33	9.41	9.52	9.82	1.08	17.96	17.94	18.03	18.12	18.44	1.35	22.40	22.27	22.28	22.36	22.66	1.62	26.93	26.68	26.58	26.63	26.89	1.89	31.57	31.17	30.93	30.95	31.17	2.16	- ※1	35.73	35.37	35.30	35.47	2.70	- ※1	- ※2	44.34	44.17	44.19	2.97	- ※1	- ※2	48.93	48.66	48.62	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Input Power [W]																																																																															
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1.62	26.93	26.68	26.58	26.63	26.89																																																																											
1.89	31.57	31.17	30.93	30.95	31.17																																																																											
2.16	- ※1	35.73	35.37	35.30	35.47																																																																											
2.70	- ※1	- ※2	44.34	44.17	44.19																																																																											
2.97	- ※1	- ※2	48.93	48.66	48.62																																																																											
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Model		MGFS402415		Temperature 25°C	
Item		Efficiency (by Load Current)		Testing Circuitry Figure A	
Object					
1.Graph		<div><div><div>—△—</div><div>Input Volt.</div><div>9V</div></div><div><div>---□---</div><div>Input Volt.</div><div>12V</div></div><div><div>-·-*·-</div><div>Input Volt.</div><div>18V</div></div><div><div>-·-○-</div><div>Input Volt.</div><div>24V</div></div><div><div>---◇---</div><div>Input Volt.</div><div>36V</div></div></div>  <div><div>Efficiency [%]</div><div>95</div><div>85</div><div>75</div><div>65</div><div>55</div><div>0.0</div><div>1.0</div><div>2.0</div><div>3.0</div><div>4.0</div><div>Load Current [A]</div></div>		2.Values	
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Model		MGFS402415																																																																	
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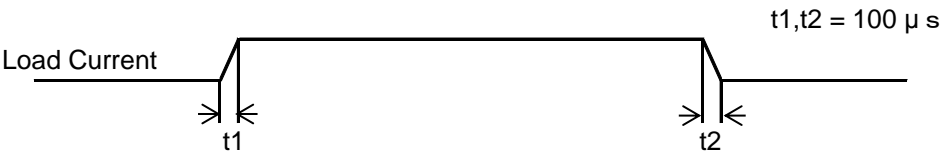


Model		MGFS402415		Temperature 25°C																																																																														
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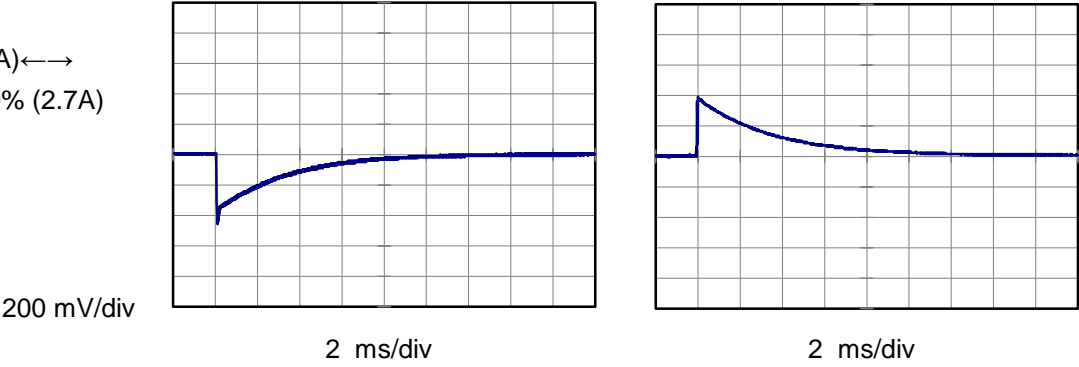


Model	MGFS402415		
Item	Dynamic Load Response	Temperature	25°C
Object	+15V2.7A	Testing Circuitry	Figure A

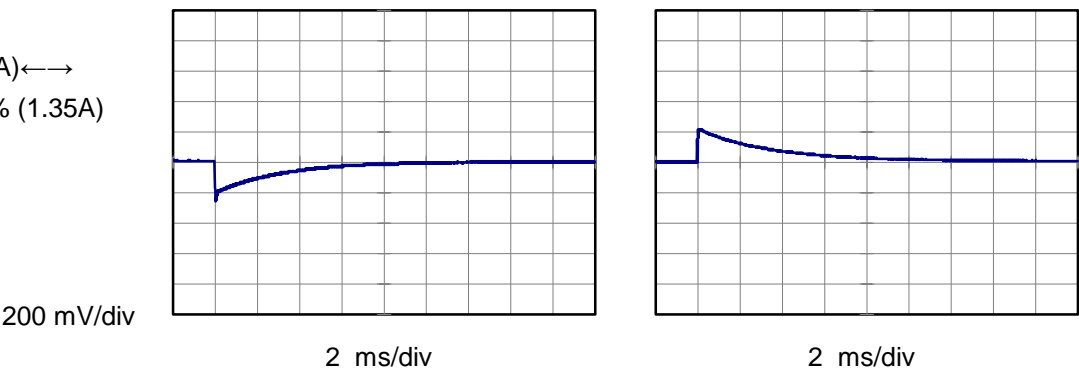
Input Volt. 24 V  
Cycle 100 ms



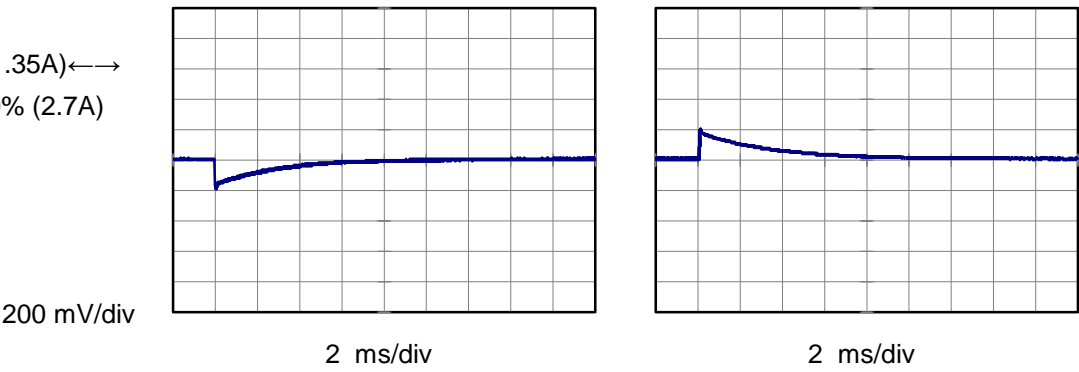
Min.Load (0A) ←→  
Load 100% (2.7A)



Min.Load (0A) ←→  
Load 50% (1.35A)



Load 50% (1.35A) ←→  
Load 100% (2.7A)

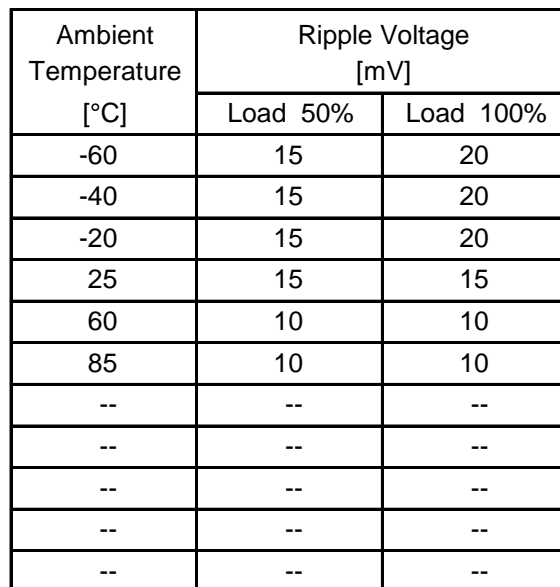


Model		MGFS402415		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+15V2.7A																																									
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																											

Model		MGFS402415		Temperature 25°C																																							
Item		Ripple-Noise		Testing Circuitry Figure B																																							
Object		+15V2.7A																																									
1.Graph				2.Values																																							
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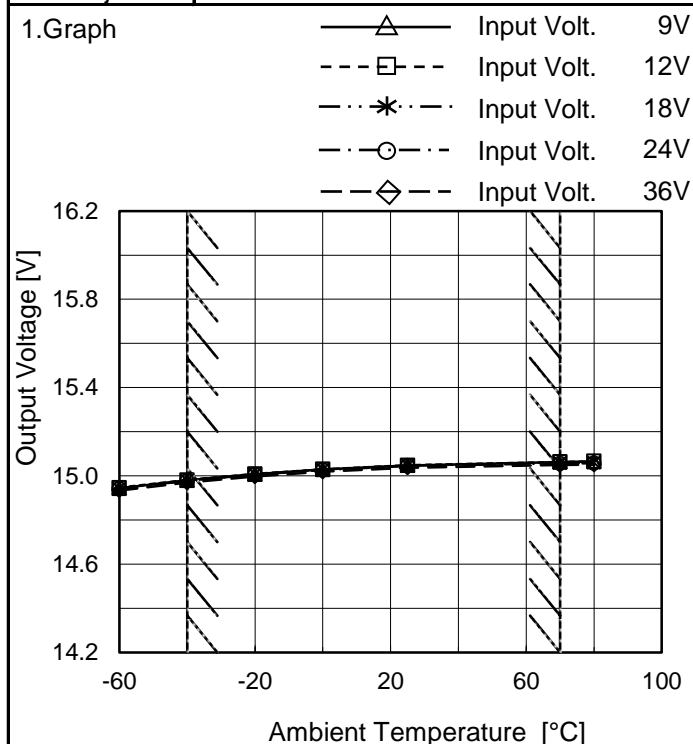
### Testing Circuitry Figure B

## 2.Values



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

Model	MGFS402415
Item	Ambient Temperature Drift
Object	+15V2.7A



Testing Circuitry Figure A

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	14.943	14.946	14.942	14.942	14.934
-40	14.979	14.981	14.978	14.978	14.970
-20	15.007	15.008	15.007	15.005	14.997
0	15.029	15.029	15.029	15.027	15.019
25	15.047	15.048	15.047	15.045	15.037
70	15.062	15.063	15.059	15.056	15.049
80	15.065	15.065	15.060	15.057	15.050
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of input Volt.9V, Load 70%.  
 12V, Load 80%.  
 Other case Load 100%.



Model		MGFS402415	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+15V2.7A	

### 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 - 70°C

Input Voltage : 9 - 36V

Load Current : 0 - 2.7A

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

\* 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	15.070	±52	±0.3
Minimum Voltage	-40	24	0	14.967		



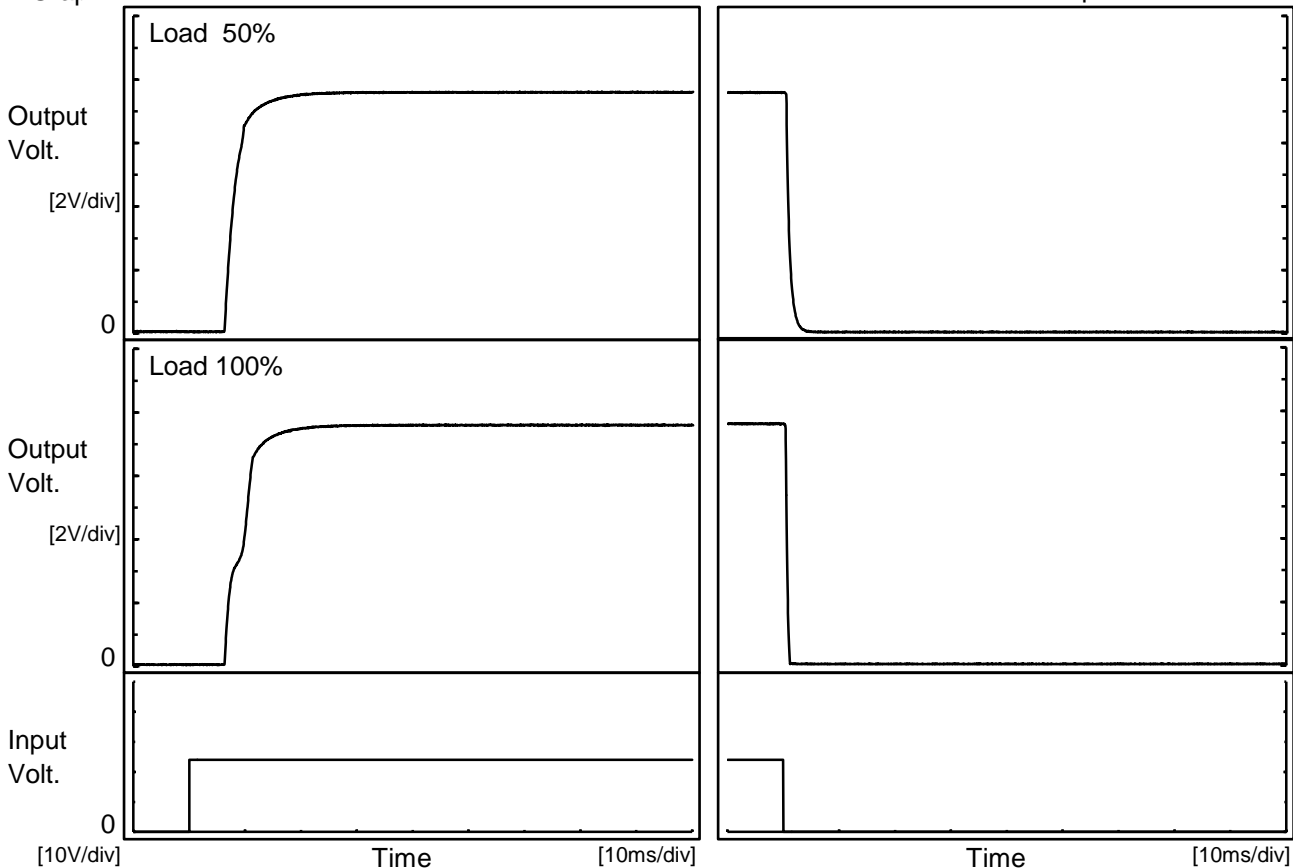
Model		MGFS402415	Temperature25°C Testing CircuitryFigure A
Item		Time Lapse Drift	
Object		+15V2.7A	
1.Graph			2.Values
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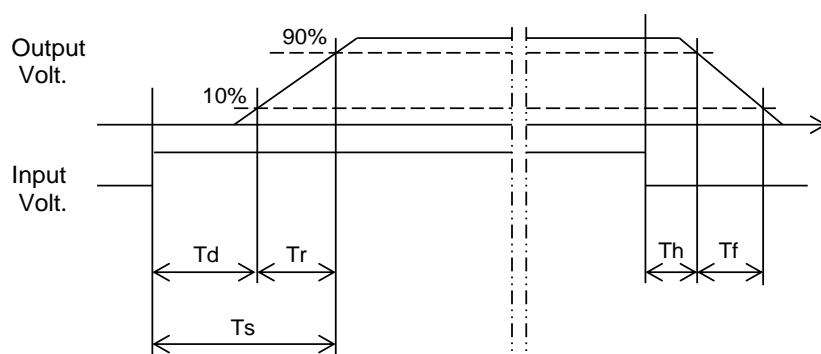
Model	MGFS402415	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V2.7A		


# 1.Graph



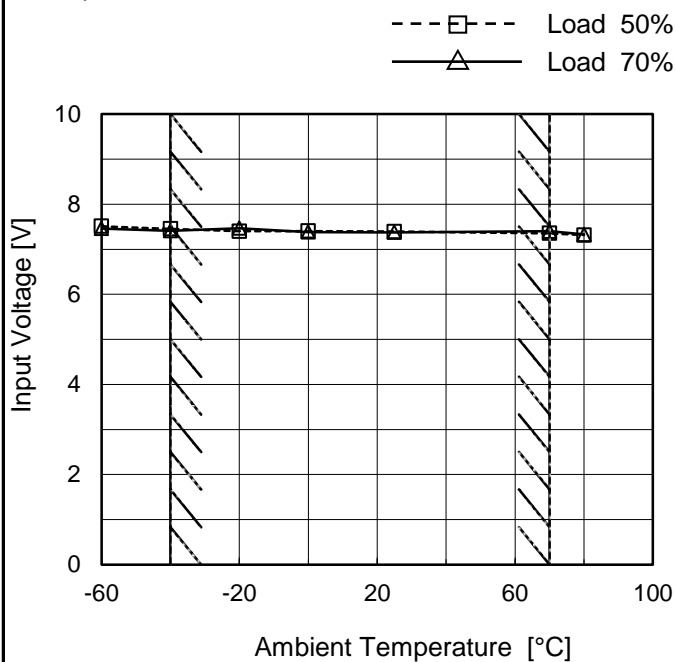
# 2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.6	4.1	10.7	0.6	1.4
100 %	6.6	5.6	12.2	0.5	0.5



	
Model	MGFS402415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V2.7A

## 1.Graph

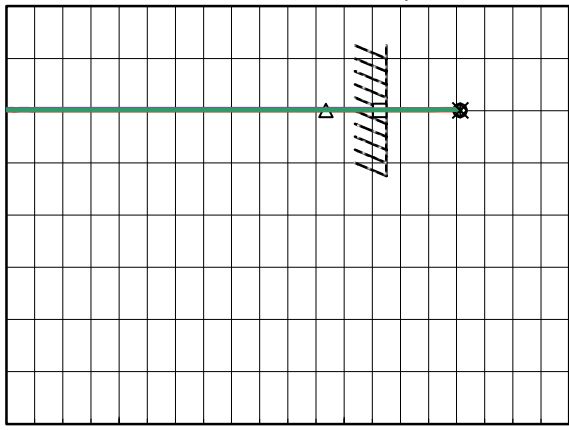


Note: Slanted line shows the range of the rated ambient temperature.

## Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	7.6	7.5
-40	7.5	7.5
-20	7.4	7.5
0	7.4	7.4
25	7.4	7.4
70	7.4	7.4
80	7.4	7.4
--	-	-
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Model		MGFS402415		Temperature 25°C																																																																																				
Item		Overcurrent Protection		Testing Circuitry Figure A																																																																																				
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1.Graph		<div><div><div>—△</div><div>Input Volt.</div><div>9V</div></div><div><div>—□</div><div>Input Volt.</div><div>12V</div></div><div><div>—*</div><div>Input Volt.</div><div>18V</div></div><div><div>—○</div><div>Input Volt.</div><div>24V</div></div><div><div>—◇</div><div>Input Volt.</div><div>36V</div></div></div> <div><div>Output Voltage [V]</div><div><div>20</div><div>15</div><div>10</div><div>5</div><div>0</div></div><div><div>0.0</div><div>0.8</div><div>1.6</div><div>2.4</div><div>3.2</div><div>4.0</div></div><div>Load Current [A]</div></div>		2.Values																																																																																				
		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="5">Load Current [A]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th></tr><tr><td>15.0</td><td>2.271</td><td>2.654</td><td>3.227</td><td>3.225</td><td>3.225</td></tr><tr><td>14.3</td><td>- ※1</td><td>- ※2</td><td>-</td><td>-</td><td>-</td></tr><tr><td>13.5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>12.0</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>10.5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>9.0</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>7.5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>6.0</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>4.5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>3.0</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>				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]	15.0	2.271	2.654	3.227	3.225	3.225	14.3	- ※1	- ※2	-	-	-	13.5	-	-	-	-	-	12.0	-	-	-	-	-	10.5	-	-	-	-	-	9.0	-	-	-	-	-	7.5	-	-	-	-	-	6.0	-	-	-	-	-	4.5	-	-	-	-	-	3.0	-	-	-	-	-	1.5	-	-	-	-	-	0.0	-	-	-	-	-
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Intermittent operation activates when overcurrent protection is activated.																																																																																								
		<div>※1 Maximum output current at minimum input Voltage is 70% of rated load current.</div> <div>※2 Maximum output current at 12V input Voltage is 80% of rated load current.</div> <div>Refer to instruction manuals for details of input derating.</div>																																																																																						

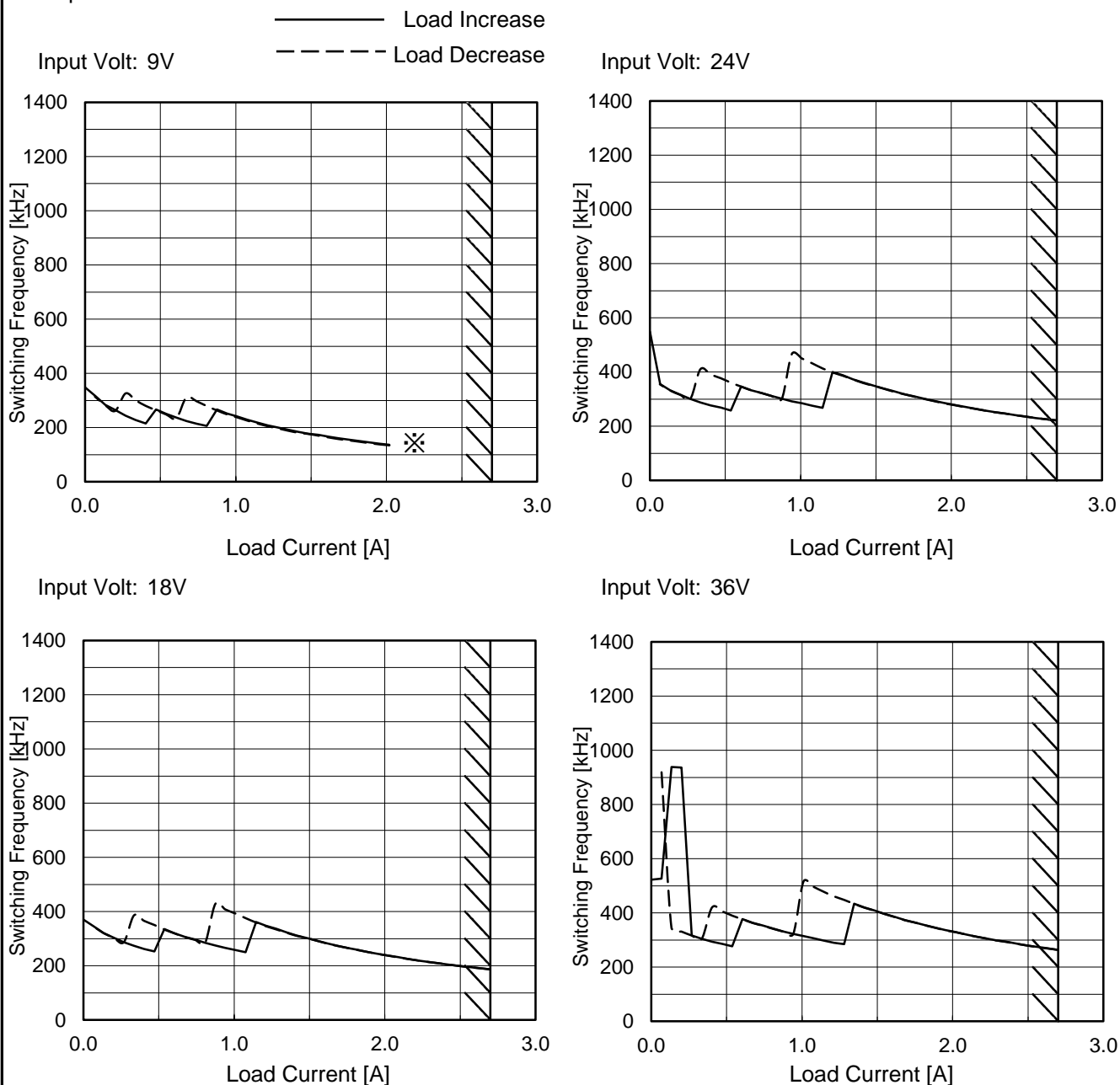
Note: Slanted line shows the range of the rated load current.

Intermittent operation activates when overcurrent protection is activated.

Model	MGFS402415		
Item	Overvoltage Protection	Temperature	25°C
Object	+15V2.7A	Testing Circuitry	Figure A
<p>1.Graph</p> <p> <span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span>△<span style="display: inline-block; width: 20px; border-bottom: 1px dashed black; margin-right: 5px;"></span>□<span style="display: inline-block; width: 20px; border-bottom: 1px dotted black; margin-right: 5px;"></span>*<span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span> </p> <p> <span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span>△<span style="display: inline-block; width: 20px; border-bottom: 1px dashed black; margin-right: 5px;"></span>□<span style="display: inline-block; width: 20px; border-bottom: 1px dotted black; margin-right: 5px;"></span>*<span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span> </p> <p> <span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span>△<span style="display: inline-block; 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Model	MGFS402415	Temperature	25°C
Item	Switching frequency (by Load Current)	Testing Circuitry	Figure A
Object	+15V2.7A		

1. Graph



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

-switching frequency of MG40 changes depending on load current and input voltage.  
When load current is low, switching frequency becomes high and step down to low frequency at certain point.  
There is hysteresis, so characteristic is different between load increase (sweep from 0% to 100%) and load decrease (sweep from 100% to 0%).

-When load current is low, MG40 operates intermittently, so switching frequency can not be stable.

※ Maximum output current at minimum input Voltage is 70% of rated load current.

Refer to instruction manuals for details of input derating.

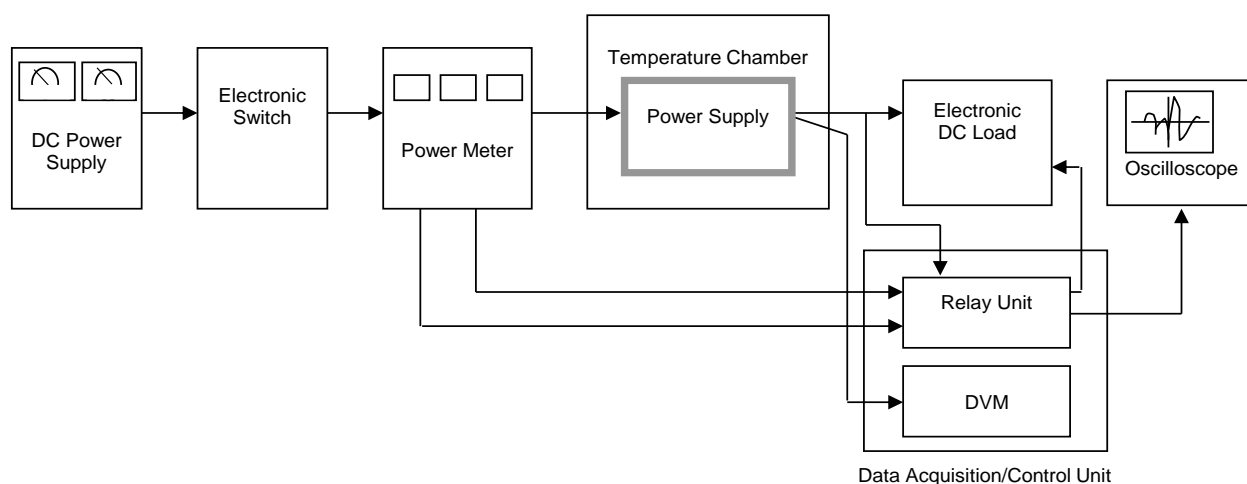


Figure A

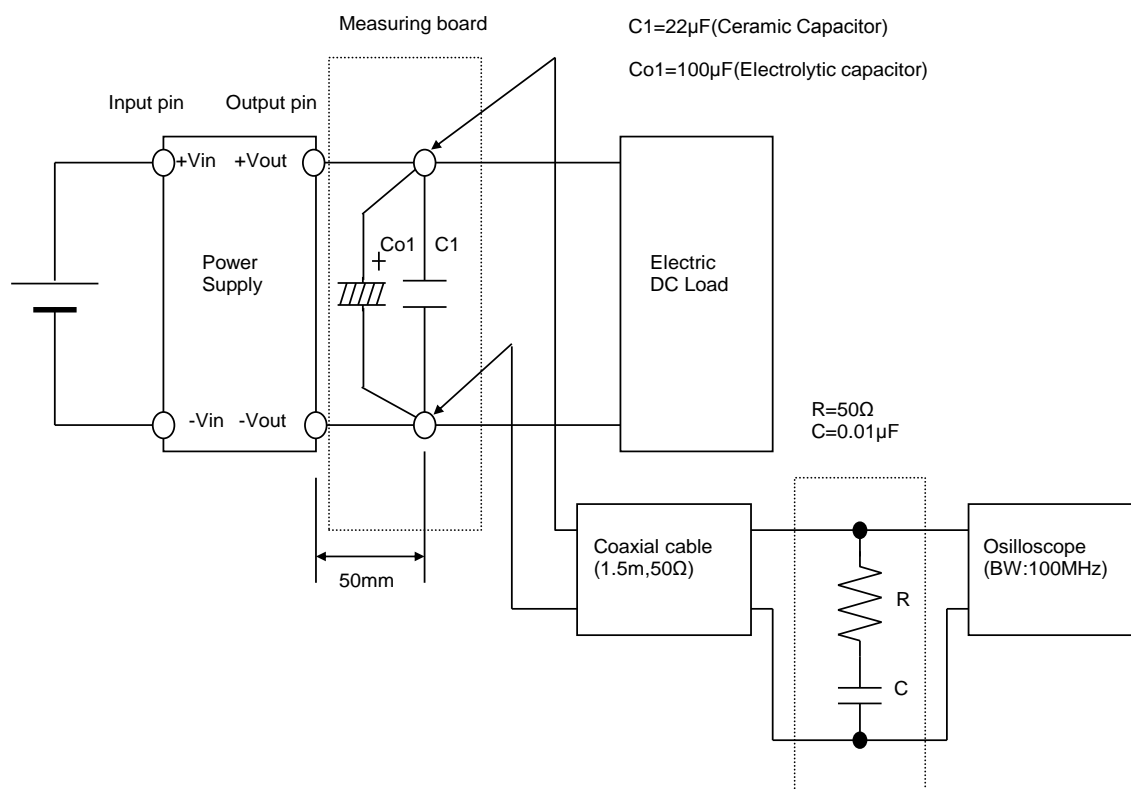


Figure B (Ripple and Ripple noise Characteristic)