

TEST DATA OF MGFS804815

Regulated DC Power Supply
April 18, 2019

Approved by : Junichi Hatagishi
Junichi Hatagishi Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

COSEL CO.,LTD.

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.Overvoltage Protection	18
19.Switching frequency (by Load Current)	19
20.Figure of Testing Circuitry	20

(Final Page 20)

Model		MGFS804815																																																																																
Item		Input Current (by Input Voltage)																																																																																
Object																																																																																		
1.Graph		<div><div><div><div></div></div><div>Load 100%</div></div><div><div><div></div></div><div>Load 50%</div></div><div><div><div></div></div><div>Load 0%</div></div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>																																																																																
2.Values		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Load 0%</th><th>Load 50%</th><th>Load 100%</th></tr><tr><td>0.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>15.2</td><td>0.004</td><td>0.004</td><td>- ※</td></tr><tr><td>15.6</td><td>0.004</td><td>0.004</td><td>- ※</td></tr><tr><td>16.0</td><td>0.004</td><td>0.004</td><td>- ※</td></tr><tr><td>16.4</td><td>0.004</td><td>0.004</td><td>- ※</td></tr><tr><td>16.8</td><td>0.030</td><td>2.562</td><td>- ※</td></tr><tr><td>17.2</td><td>0.029</td><td>2.498</td><td>- ※</td></tr><tr><td>17.6</td><td>0.029</td><td>2.436</td><td>- ※</td></tr><tr><td>18.0</td><td>0.028</td><td>2.392</td><td>- ※</td></tr><tr><td>24.0</td><td>0.024</td><td>1.783</td><td>- ※</td></tr><tr><td>36.0</td><td>0.012</td><td>1.189</td><td>2.383</td></tr><tr><td>48.0</td><td>0.012</td><td>0.901</td><td>1.787</td></tr><tr><td>76.0</td><td>0.012</td><td>0.583</td><td>1.137</td></tr><tr><td>80.0</td><td>0.012</td><td>0.556</td><td>1.080</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table> <p>※During this area, overcurrent protection activates and power supply operates in hiccup mode.</p>		Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0.0	0.000	0.000	0.000	15.2	0.004	0.004	- ※	15.6	0.004	0.004	- ※	16.0	0.004	0.004	- ※	16.4	0.004	0.004	- ※	16.8	0.030	2.562	- ※	17.2	0.029	2.498	- ※	17.6	0.029	2.436	- ※	18.0	0.028	2.392	- ※	24.0	0.024	1.783	- ※	36.0	0.012	1.189	2.383	48.0	0.012	0.901	1.787	76.0	0.012	0.583	1.137	80.0	0.012	0.556	1.080	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Input Voltage [V]	Input Current [A]																																																																																	
	Load 0%	Load 50%	Load 100%																																																																															
0.0	0.000	0.000	0.000																																																																															
15.2	0.004	0.004	- ※																																																																															
15.6	0.004	0.004	- ※																																																																															
16.0	0.004	0.004	- ※																																																																															
16.4	0.004	0.004	- ※																																																																															
16.8	0.030	2.562	- ※																																																																															
17.2	0.029	2.498	- ※																																																																															
17.6	0.029	2.436	- ※																																																																															
18.0	0.028	2.392	- ※																																																																															
24.0	0.024	1.783	- ※																																																																															
36.0	0.012	1.189	2.383																																																																															
48.0	0.012	0.901	1.787																																																																															
76.0	0.012	0.583	1.137																																																																															
80.0	0.012	0.556	1.080																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															

Model		MGFS804815		Temperature 25°C																																																																												
Item		Input Current (by Load Current)		Testing Circuitry Figure A																																																																												
Object																																																																																
1.Graph		<div><div>—△—</div>Input Volt. 18V</div> <div><div>---□---</div>Input Volt. 24V</div> <div><div>-·-*·-</div>Input Volt. 36V</div> <div><div>-·-○-</div>Input Volt. 48V</div> <div><div>--◇--</div>Input Volt. 76V</div>		2.Values																																																																												
<div><div>Input Current [A]</div><div><div>Load Current [A]</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Input Current [A]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.0</td><td>0.028</td><td>0.024</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td>1.1</td><td>0.987</td><td>0.745</td><td>0.500</td><td>0.378</td><td>0.249</td></tr><tr><td>2.2</td><td>1.955</td><td>1.466</td><td>0.981</td><td>0.741</td><td>0.478</td></tr><tr><td>3.2</td><td>2.848</td><td>2.117</td><td>1.411</td><td>1.064</td><td>0.684</td></tr><tr><td>3.8</td><td>3.377</td><td>2.524</td><td>1.674</td><td>1.259</td><td>0.808</td></tr><tr><td>4.3</td><td>- ※1</td><td>2.855</td><td>1.894</td><td>1.422</td><td>0.911</td></tr><tr><td>5.4</td><td>- ※1</td><td>- ※2</td><td>2.383</td><td>1.787</td><td>1.137</td></tr><tr><td>5.9</td><td>- ※1</td><td>- ※2</td><td>2.608</td><td>1.953</td><td>1.241</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><tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Input Current [A]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	0.028	0.024	0.012	0.012	0.012	1.1	0.987	0.745	0.500	0.378	0.249	2.2	1.955	1.466	0.981	0.741	0.478	3.2	2.848	2.117	1.411	1.064	0.684	3.8	3.377	2.524	1.674	1.259	0.808	4.3	- ※1	2.855	1.894	1.422	0.911	5.4	- ※1	- ※2	2.383	1.787	1.137	5.9	- ※1	- ※2	2.608	1.953	1.241	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Input Current [A]																																																																															
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																																											
0.0	0.028	0.024	0.012	0.012	0.012																																																																											
1.1	0.987	0.745	0.500	0.378	0.249																																																																											
2.2	1.955	1.466	0.981	0.741	0.478																																																																											
3.2	2.848	2.117	1.411	1.064	0.684																																																																											
3.8	3.377	2.524	1.674	1.259	0.808																																																																											
4.3	- ※1	2.855	1.894	1.422	0.911																																																																											
5.4	- ※1	- ※2	2.383	1.787	1.137																																																																											
5.9	- ※1	- ※2	2.608	1.953	1.241																																																																											
--	-	-	-	-	-																																																																											
--	-	-	-	-	-																																																																											
--	-	-	-	-	-																																																																											
Note: Slanted line shows the range of the rated load current.		※1 Maximum output current at minimum input Voltage is 70% of rated load current.		※2 Maximum output current at 24V input Voltage is 80% of rated load current.																																																																												
		Refer to instruction manuals for details of input derating.																																																																														

- 2 -

BC-11376

Model		MGFS804815	
Item		Input Power (by Load Current)	
Object			
1.Graph		<div><div><div>—△—</div>Input Volt. 18V</div><div><div>---□---</div>Input Volt. 24V</div><div><div>-··*·-</div>Input Volt. 36V</div><div><div>-··○-</div>Input Volt. 48V</div><div><div>--◇--</div>Input Volt. 76V</div></div> <div><div>Input Power [W]</div><div>Load Current [A]</div></div>	
Note: Slanted line shows the range of the rated load current.			

Temperature 25°C	
Testing Circuitry Figure A	

2.Values

Load Current [A]	Input Power [W]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	0.51	0.58	0.44	0.56	0.88
1.1	17.86	17.94	18.02	18.16	18.95
2.2	35.33	35.24	35.39	35.56	36.36
3.2	51.26	50.96	50.90	51.08	52.03
3.8	61.06	60.59	60.37	60.49	61.47
4.3	- ※1	68.70	68.31	68.37	69.31
5.4	- ※1	- ※2	85.97	85.85	86.42
5.9	- ※1	- ※2	94.09	93.86	94.35
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

※2 Maximum output current at 24V input Voltage is 80% of rated load current.

Refer to instruction manuals for details of input derating.



Model		MGFS804815	
Item		Efficiency (by Input Voltage)	
Object			

1.Graph

Load 50%

Load 100%

Efficiency [%]

100

90

80

70

60

0

15

30

45

60

75

90

Input Voltage [V]

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	94.0	93.4 ※1
18	94.2	93.8 ※1
24	94.5	94.3 ※2
30	94.6	94.3
36	94.4	94.6
48	93.8	94.8
60	93.1	94.6
76	91.5	94.1
80	91.1	93.9

※1: Load 70%

※2: Load 80%

Model		MGFS804815		Temperature 25°C																																																																														
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																																														
Object																																																																																		
1.Graph		<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><div>Input Volt.</div><div>48V</div></div><div><div>---◇---</div><div>Input Volt.</div><div>76V</div></div></div> <div><p>Efficiency [%]</p><p>Load Current [A]</p><p>Note: Slanted line shows the range of the rated load current.</p></div>																																																																																
2.Values				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Efficiency [%]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.1</td><td>92.7</td><td>92.3</td><td>91.9</td><td>91.2</td><td>87.3</td></tr><tr><td>2.2</td><td>93.7</td><td>94.0</td><td>93.6</td><td>93.2</td><td>91.1</td></tr><tr><td>3.2</td><td>94.1</td><td>94.6</td><td>94.7</td><td>94.4</td><td>92.6</td></tr><tr><td>3.8</td><td>93.8</td><td>94.5</td><td>94.8</td><td>94.6</td><td>93.1</td></tr><tr><td>4.3</td><td>- ※1</td><td>94.3</td><td>94.8</td><td>94.7</td><td>93.4</td></tr><tr><td>5.4</td><td>- ※1</td><td>- ※2</td><td>94.6</td><td>94.8</td><td>94.1</td></tr><tr><td>5.9</td><td>- ※1</td><td>- ※2</td><td>94.5</td><td>94.7</td><td>94.2</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><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 24V input Voltage is 80% of rated load current.</div><div>Refer to instruction manuals for details of input derating.</div></div>		Load Current [A]	Efficiency [%]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	-	-	-	-	-	1.1	92.7	92.3	91.9	91.2	87.3	2.2	93.7	94.0	93.6	93.2	91.1	3.2	94.1	94.6	94.7	94.4	92.6	3.8	93.8	94.5	94.8	94.6	93.1	4.3	- ※1	94.3	94.8	94.7	93.4	5.4	- ※1	- ※2	94.6	94.8	94.1	5.9	- ※1	- ※2	94.5	94.7	94.2	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Efficiency [%]																																																																																	
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																																													
0.0	-	-	-	-	-																																																																													
1.1	92.7	92.3	91.9	91.2	87.3																																																																													
2.2	93.7	94.0	93.6	93.2	91.1																																																																													
3.2	94.1	94.6	94.7	94.4	92.6																																																																													
3.8	93.8	94.5	94.8	94.6	93.1																																																																													
4.3	- ※1	94.3	94.8	94.7	93.4																																																																													
5.4	- ※1	- ※2	94.6	94.8	94.1																																																																													
5.9	- ※1	- ※2	94.5	94.7	94.2																																																																													
--	-	-	-	-	-																																																																													
--	-	-	-	-	-																																																																													
--	-	-	-	-	-																																																																													

Model		MGFS804815	
Item		Line Regulation	
Object		+15V5.4A	
1.Graph		2.Values	

---□--- Load 50%	
—△— Load 100%	

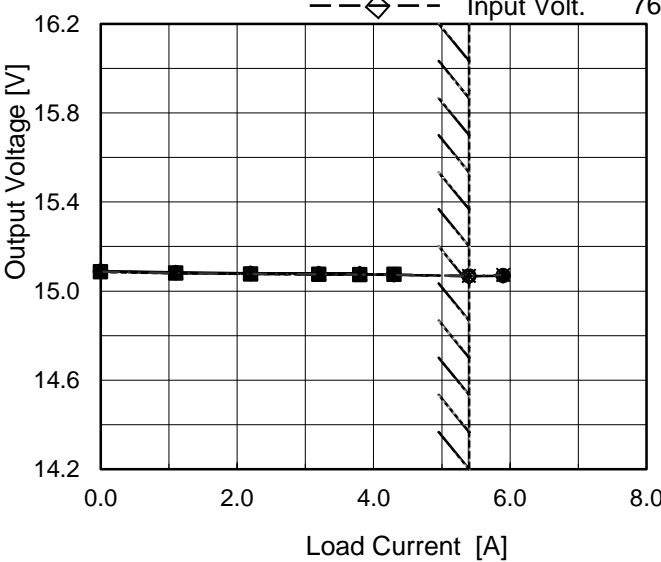
Output Voltage [V]	Input Voltage [V]	
	Load 50%	Load 100%
16.2		
15.8		
15.4		
15.0		
14.6		
14.2		
	0	90

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	15.074	- ※1
18	15.074	- ※1
24	15.074	- ※2
30	15.076	15.075
36	15.076	15.068
48	15.077	15.067
60	15.077	15.070
76	15.078	15.067
80	15.078	15.071

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

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

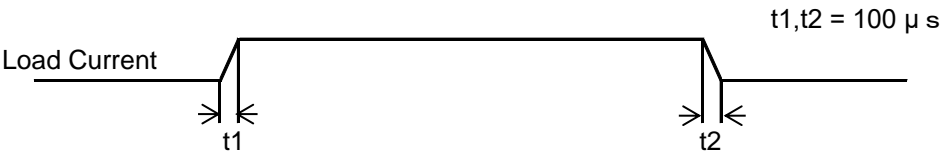
COSEL

Model		MGFS804815		Temperature 25°C																																																																																
Item		Load Regulation		Testing Circuitry Figure A																																																																																
Object		+15V5.4A																																																																																		
1.Graph		<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><div>Input Volt.</div><div>48V</div></div><div><div>---◇---</div><div>Input Volt.</div><div>76V</div></div></div> <div></div> <div>Note: Slanted line shows the range of the rated load current.</div>		2.Values		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Output Voltage [V]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.0</td><td>15.091</td><td>15.086</td><td>15.087</td><td>15.088</td><td>15.088</td></tr><tr><td>1.1</td><td>15.084</td><td>15.080</td><td>15.080</td><td>15.082</td><td>15.082</td></tr><tr><td>2.2</td><td>15.080</td><td>15.077</td><td>15.077</td><td>15.078</td><td>15.078</td></tr><tr><td>3.2</td><td>15.079</td><td>15.074</td><td>15.075</td><td>15.077</td><td>15.074</td></tr><tr><td>3.8</td><td>15.079</td><td>15.074</td><td>15.073</td><td>15.075</td><td>15.075</td></tr><tr><td>4.3</td><td>- ※1</td><td>15.075</td><td>15.072</td><td>15.073</td><td>15.074</td></tr><tr><td>5.4</td><td>- ※1</td><td>- ※2</td><td>15.068</td><td>15.067</td><td>15.067</td></tr><tr><td>5.9</td><td>- ※1</td><td>- ※2</td><td>15.072</td><td>15.069</td><td>15.068</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><tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Output Voltage [V]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	15.091	15.086	15.087	15.088	15.088	1.1	15.084	15.080	15.080	15.082	15.082	2.2	15.080	15.077	15.077	15.078	15.078	3.2	15.079	15.074	15.075	15.077	15.074	3.8	15.079	15.074	15.073	15.075	15.075	4.3	- ※1	15.075	15.072	15.073	15.074	5.4	- ※1	- ※2	15.068	15.067	15.067	5.9	- ※1	- ※2	15.072	15.069	15.068	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Output Voltage [V]																																																																																			
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																																															
0.0	15.091	15.086	15.087	15.088	15.088																																																																															
1.1	15.084	15.080	15.080	15.082	15.082																																																																															
2.2	15.080	15.077	15.077	15.078	15.078																																																																															
3.2	15.079	15.074	15.075	15.077	15.074																																																																															
3.8	15.079	15.074	15.073	15.075	15.075																																																																															
4.3	- ※1	15.075	15.072	15.073	15.074																																																																															
5.4	- ※1	- ※2	15.068	15.067	15.067																																																																															
5.9	- ※1	- ※2	15.072	15.069	15.068																																																																															
--	-	-	-	-	-																																																																															
--	-	-	-	-	-																																																																															
--	-	-	-	-	-																																																																															
				<div>※1 Maximum output current at minimum input Voltage is 70% of rated load current.</div> <div>※2 Maximum output current at 24V input Voltage is 80% of rated load current.</div> <div>Refer to instruction manuals for details of input derating.</div>																																																																																

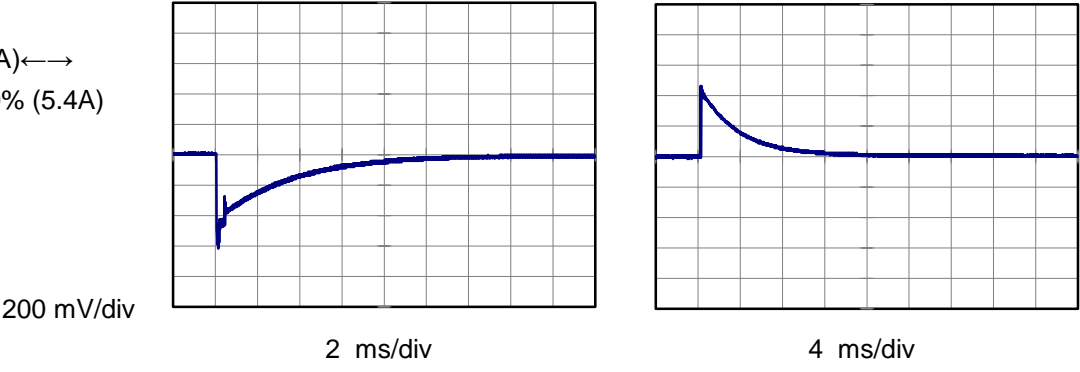


Model	MGFS804815		
Item	Dynamic Load Response	Temperature	25°C
Object	+15V5.4A	Testing Circuitry	Figure A

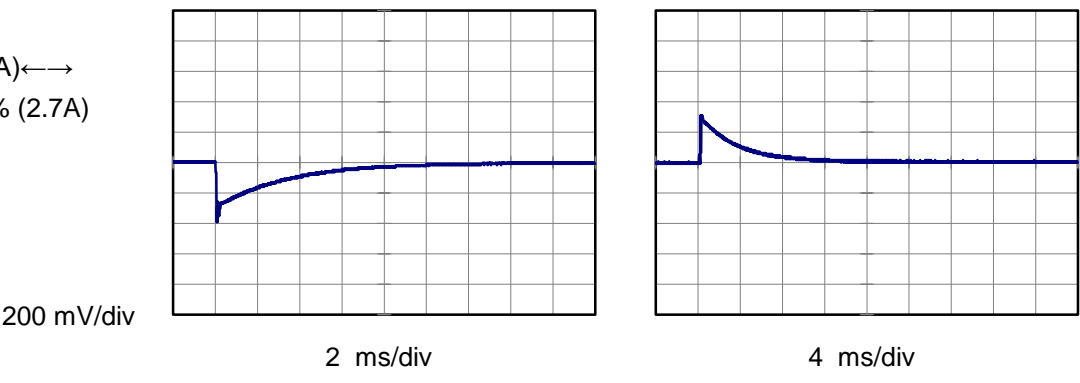
Input Volt. 48 V
Cycle 100 ms



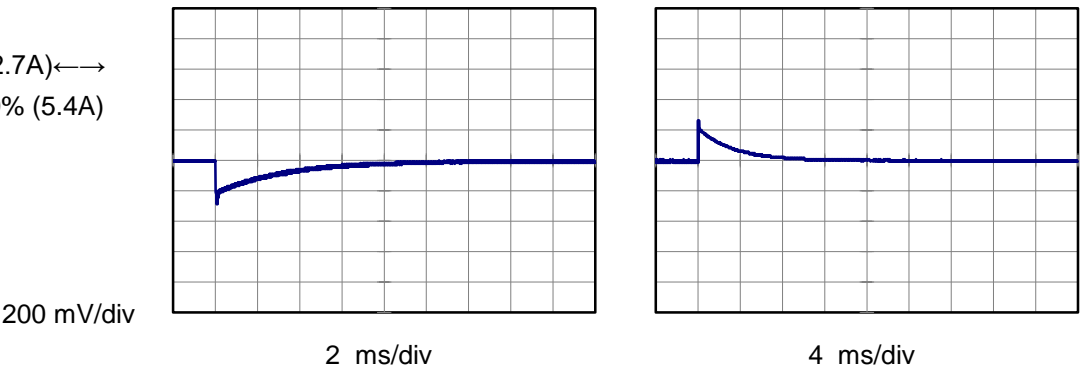
Min.Load (0A) ←→
Load 100% (5.4A)



Min.Load (0A) ←→
Load 50% (2.7A)




Load 50% (2.7A) ←→
Load 100% (5.4A)

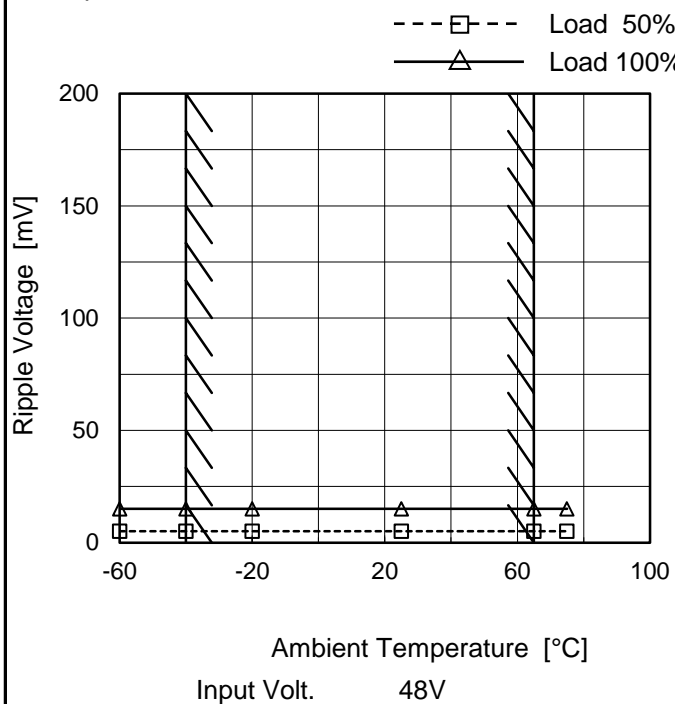


Model		MGFS804815		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+15V5.4A																																									
1.Graph				2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>18V</div></div><div><div>- - ○ - -</div><div>Input Volt.</div><div>76V</div></div></div> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 18 [V]</th><th>Input Volt. 76 [V]</th></tr><tr><td>0.0</td><td>15</td><td>30</td></tr><tr><td>1.1</td><td>5</td><td>5</td></tr><tr><td>2.2</td><td>10</td><td>5</td></tr><tr><td>3.2</td><td>15</td><td>5</td></tr><tr><td>3.8</td><td>25</td><td>5</td></tr><tr><td>4.3</td><td>- ※</td><td>10</td></tr><tr><td>5.4</td><td>- ※</td><td>10</td></tr><tr><td>5.9</td><td>- ※</td><td>15</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></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 76 [V]	0.0	15	30	1.1	5	5	2.2	10	5	3.2	15	5	3.8	25	5	4.3	- ※	10	5.4	- ※	10	5.9	- ※	15	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 18 [V]	Input Volt. 76 [V]																																									
0.0	15	30																																									
1.1	5	5																																									
2.2	10	5																																									
3.2	15	5																																									
3.8	25	5																																									
4.3	- ※	10																																									
5.4	- ※	10																																									
5.9	- ※	15																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
<p>Measured by 100 MHz Oscilloscope.</p> <p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p>				<p>※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.</p>																																							
<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																											

Model		MGFS804815																																							
Item		Ripple-Noise																																							
Object		+15V5.4A																																							
1.Graph		2.Values																																							
<div><div><div>△</div><div>Input Volt.</div><div>18V</div></div><div><div>○</div><div>Input Volt.</div><div>76V</div></div></div> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 18 [V]</th><th>Input Volt. 76 [V]</th></tr><tr><td>0.0</td><td>15</td><td>30</td></tr><tr><td>1.1</td><td>10</td><td>10</td></tr><tr><td>2.2</td><td>15</td><td>15</td></tr><tr><td>3.2</td><td>20</td><td>15</td></tr><tr><td>3.8</td><td>25</td><td>15</td></tr><tr><td>4.3</td><td>- ※</td><td>20</td></tr><tr><td>5.4</td><td>- ※</td><td>20</td></tr><tr><td>5.9</td><td>- ※</td><td>25</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></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 18 [V]	Input Volt. 76 [V]	0.0	15	30	1.1	10	10	2.2	15	15	3.2	20	15	3.8	25	15	4.3	- ※	20	5.4	- ※	20	5.9	- ※	25	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 18 [V]	Input Volt. 76 [V]																																							
0.0	15	30																																							
1.1	10	10																																							
2.2	15	15																																							
3.2	20	15																																							
3.8	25	15																																							
4.3	- ※	20																																							
5.4	- ※	20																																							
5.9	- ※	25																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
<p>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.</p> <p>Ripple Noise[mVp-p]</p>		<p>※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.</p>																																							
Fig.Complex Ripple Noise Wave Form																																									

	
Model	MGFS804815
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V5.4A

1.Graph



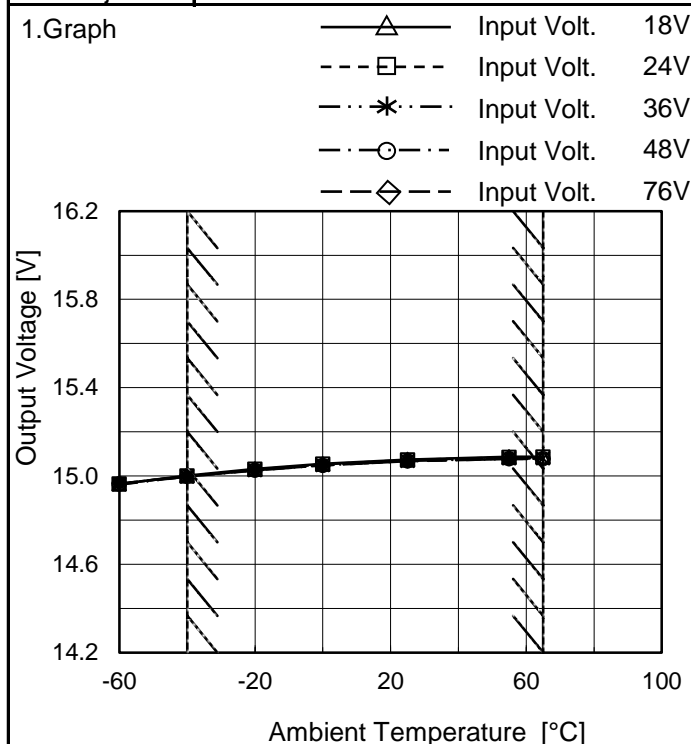
Measured by 100 MHz Oscilloscope.

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

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	15
-40	5	15
-20	5	15
25	5	15
65	5	15
75	5	15
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Model	MGFS804815
Item	Ambient Temperature Drift
Object	+15V5.4A



Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	14.964	14.964	14.961	14.963	14.965
-40	15.002	15.000	14.997	14.997	14.998
-20	15.032	15.030	15.026	15.025	15.027
0	15.055	15.053	15.049	15.048	15.048
25	15.074	15.072	15.068	15.067	15.067
55	15.087	15.084	15.079	15.077	15.077
65	15.088	15.085	15.079	15.078	15.077
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of input Volt.18V, Load 70%.
 24V, Load 80%.
 Other case Load 100%.

COSEL

		Testing Circuitry Figure A
Model	MGFS804815	
Item	Output Voltage Accuracy	
Object	+15V5.4A	

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 - 65°C

Input Voltage : 18 - 76V

Load Current : 0 - 5.4A

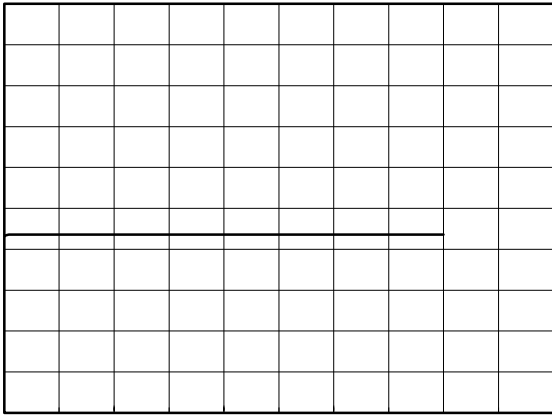
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* 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	55	18	0	15.098	±51	±0.3
Minimum Voltage	-40	36	5.4	14.997		



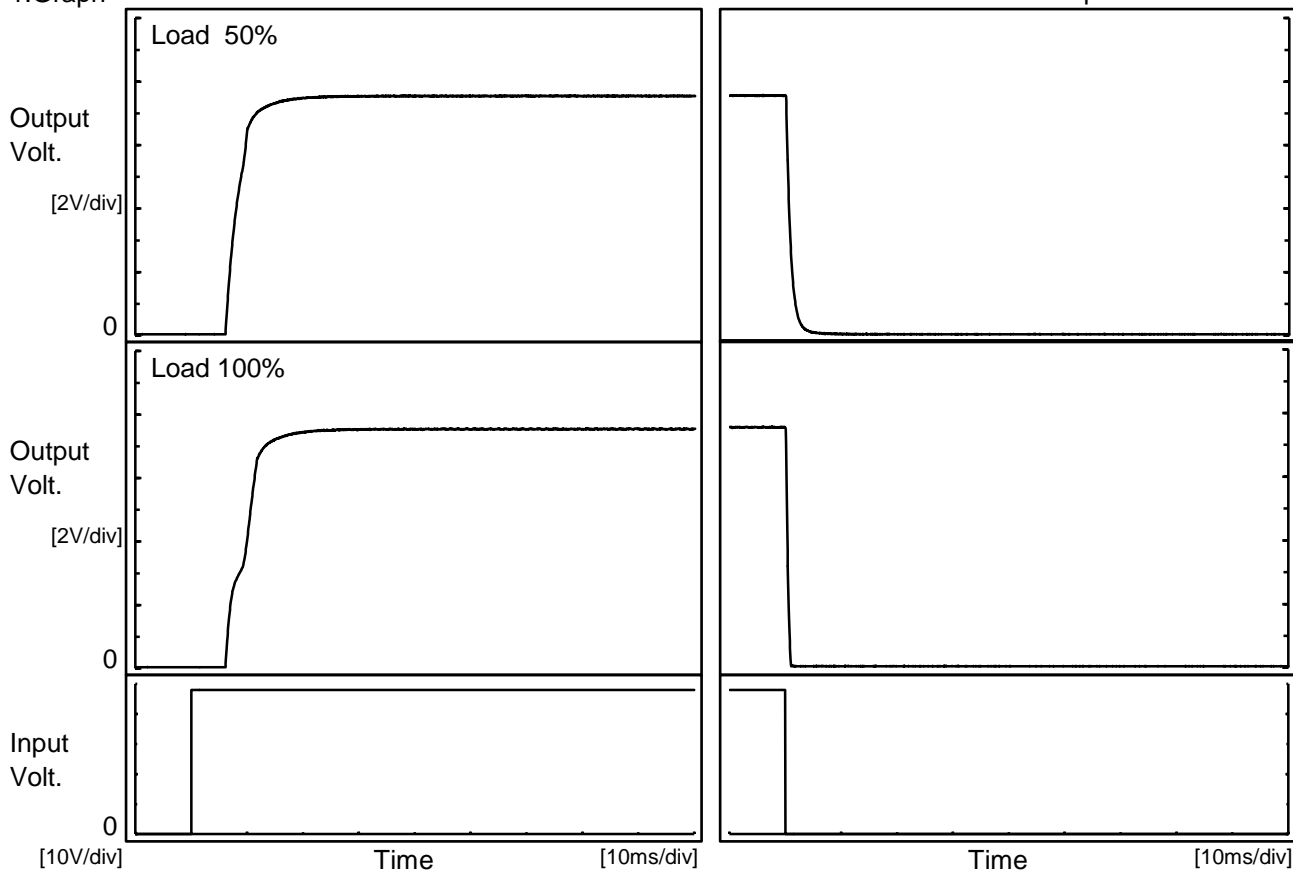
Model		MGFS804815	Temperature 25°C Testing Circuitry Figure A																						
Item		Time Lapse Drift																							
Object		+15V5.4A																							
1.Graph			2.Values																						
<div><div><div><div>Output Voltage [V]</div><div></div><div>Time [H]</div></div><div><div>Input Volt.</div><div>48V</div><div>Load</div><div>100%</div></div></div></div>			<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>15.063</td></tr><tr><td>0.5</td><td>15.072</td></tr><tr><td>1.0</td><td>15.072</td></tr><tr><td>2.0</td><td>15.072</td></tr><tr><td>3.0</td><td>15.072</td></tr><tr><td>4.0</td><td>15.072</td></tr><tr><td>5.0</td><td>15.072</td></tr><tr><td>6.0</td><td>15.072</td></tr><tr><td>7.0</td><td>15.072</td></tr><tr><td>8.0</td><td>15.072</td></tr></table>	Time since start [H]	Output Voltage [V]	0.0	15.063	0.5	15.072	1.0	15.072	2.0	15.072	3.0	15.072	4.0	15.072	5.0	15.072	6.0	15.072	7.0	15.072	8.0	15.072
Time since start [H]	Output Voltage [V]																								
0.0	15.063																								
0.5	15.072																								
1.0	15.072																								
2.0	15.072																								
3.0	15.072																								
4.0	15.072																								
5.0	15.072																								
6.0	15.072																								
7.0	15.072																								
8.0	15.072																								



Model	MGFS804815	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V5.4A		

1.Graph

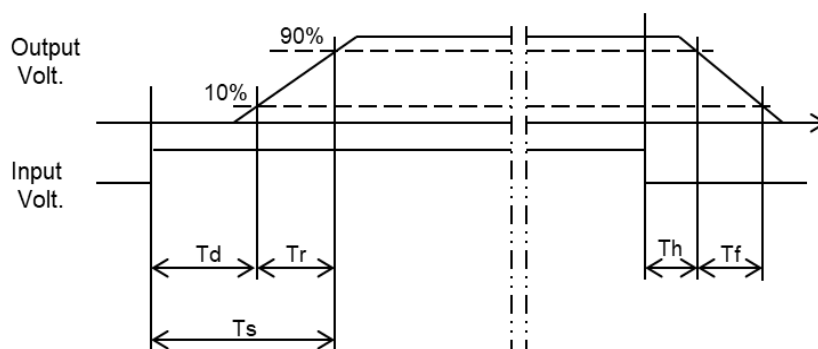
Input Volt. 48 V




2.Values

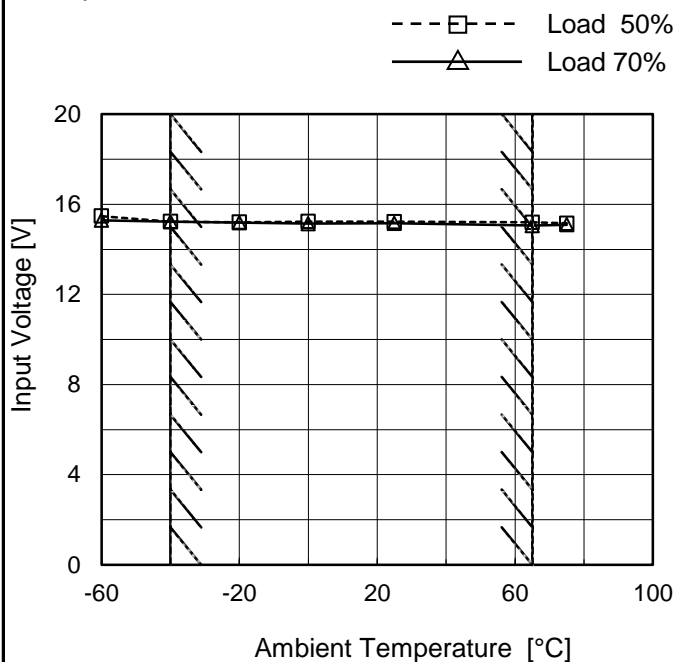
[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.4	4.4	10.8	0.2	1.8
100 %	6.4	6.0	12.4	0.2	0.7



	
Model	MGFS804815
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V/3.78A

1.Graph



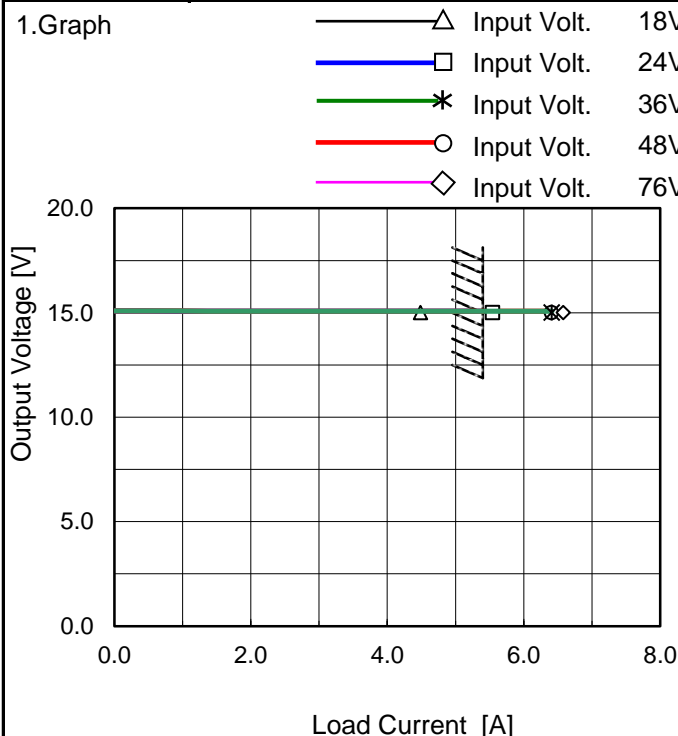
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	15.5	15.3
-40	15.3	15.3
-20	15.2	15.2
0	15.3	15.2
25	15.3	15.2
65	15.2	15.1
75	15.2	15.1
--	-	-
--	-	-
--	-	-
--	-	-

Model		MGFS804815																																																																																				
Item		Overcurrent Protection																																																																																				
Object		+15V5.4A																																																																																				
1.Graph		<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><div>Input Volt.</div><div>48V</div></div><div><div>◇</div><div>Input Volt.</div><div>76V</div></div></div><div><table><thead><tr><th>Output Voltage [V]</th><th>18[V]</th><th>24[V]</th><th>36[V]</th><th>48[V]</th><th>76[V]</th></tr></thead><tbody><tr><td>15.0</td><td>4.490</td><td>5.544</td><td>6.413</td><td>6.410</td><td>6.584</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></tbody></table></div></div>		Output Voltage [V]	18[V]	24[V]	36[V]	48[V]	76[V]	15.0	4.490	5.544	6.413	6.410	6.584	14.3	- ※1	- ※2	-	-	-	13.5	-	-	-	-	-	12.0	-	-	-	-	-	10.5	-	-	-	-	-	9.0	-	-	-	-	-	7.5	-	-	-	-	-	6.0	-	-	-	-	-	4.5	-	-	-	-	-	3.0	-	-	-	-	-	1.5	-	-	-	-	-	0.0	-	-	-	-	-					
Output Voltage [V]	18[V]	24[V]	36[V]	48[V]	76[V]																																																																																	
15.0	4.490	5.544	6.413	6.410	6.584																																																																																	
14.3	- ※1	- ※2	-	-	-																																																																																	
13.5	-	-	-	-	-																																																																																	
12.0	-	-	-	-	-																																																																																	
10.5	-	-	-	-	-																																																																																	
9.0	-	-	-	-	-																																																																																	
7.5	-	-	-	-	-																																																																																	
6.0	-	-	-	-	-																																																																																	
4.5	-	-	-	-	-																																																																																	
3.0	-	-	-	-	-																																																																																	
1.5	-	-	-	-	-																																																																																	
0.0	-	-	-	-	-																																																																																	
Note: Slanted line shows the range of the rated load current. Intermittent operation occurs when overcurrent protection is activated.		2.Values																																																																																				
		<table><thead><tr><th rowspan="2">Output Voltage [V]</th><th colspan="5">Load Current [A]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr></thead><tbody><tr><td>15.0</td><td>4.490</td><td>5.544</td><td>6.413</td><td>6.410</td><td>6.584</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></tbody></table>		Output Voltage [V]	Load Current [A]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	15.0	4.490	5.544	6.413	6.410	6.584	14.3	- ※1	- ※2	-	-	-	13.5	-	-	-	-	-	12.0	-	-	-	-	-	10.5	-	-	-	-	-	9.0	-	-	-	-	-	7.5	-	-	-	-	-	6.0	-	-	-	-	-	4.5	-	-	-	-	-	3.0	-	-	-	-	-	1.5	-	-	-	-	-	0.0	-	-	-	-	-
Output Voltage [V]	Load Current [A]																																																																																					
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																																																	
15.0	4.490	5.544	6.413	6.410	6.584																																																																																	
14.3	- ※1	- ※2	-	-	-																																																																																	
13.5	-	-	-	-	-																																																																																	
12.0	-	-	-	-	-																																																																																	
10.5	-	-	-	-	-																																																																																	
9.0	-	-	-	-	-																																																																																	
7.5	-	-	-	-	-																																																																																	
6.0	-	-	-	-	-																																																																																	
4.5	-	-	-	-	-																																																																																	
3.0	-	-	-	-	-																																																																																	
1.5	-	-	-	-	-																																																																																	
0.0	-	-	-	-	-																																																																																	
		※1 Maximum output current at minimum input Voltage is 70% of rated load current. ※2 Maximum output current at 24V input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.																																																																																				



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

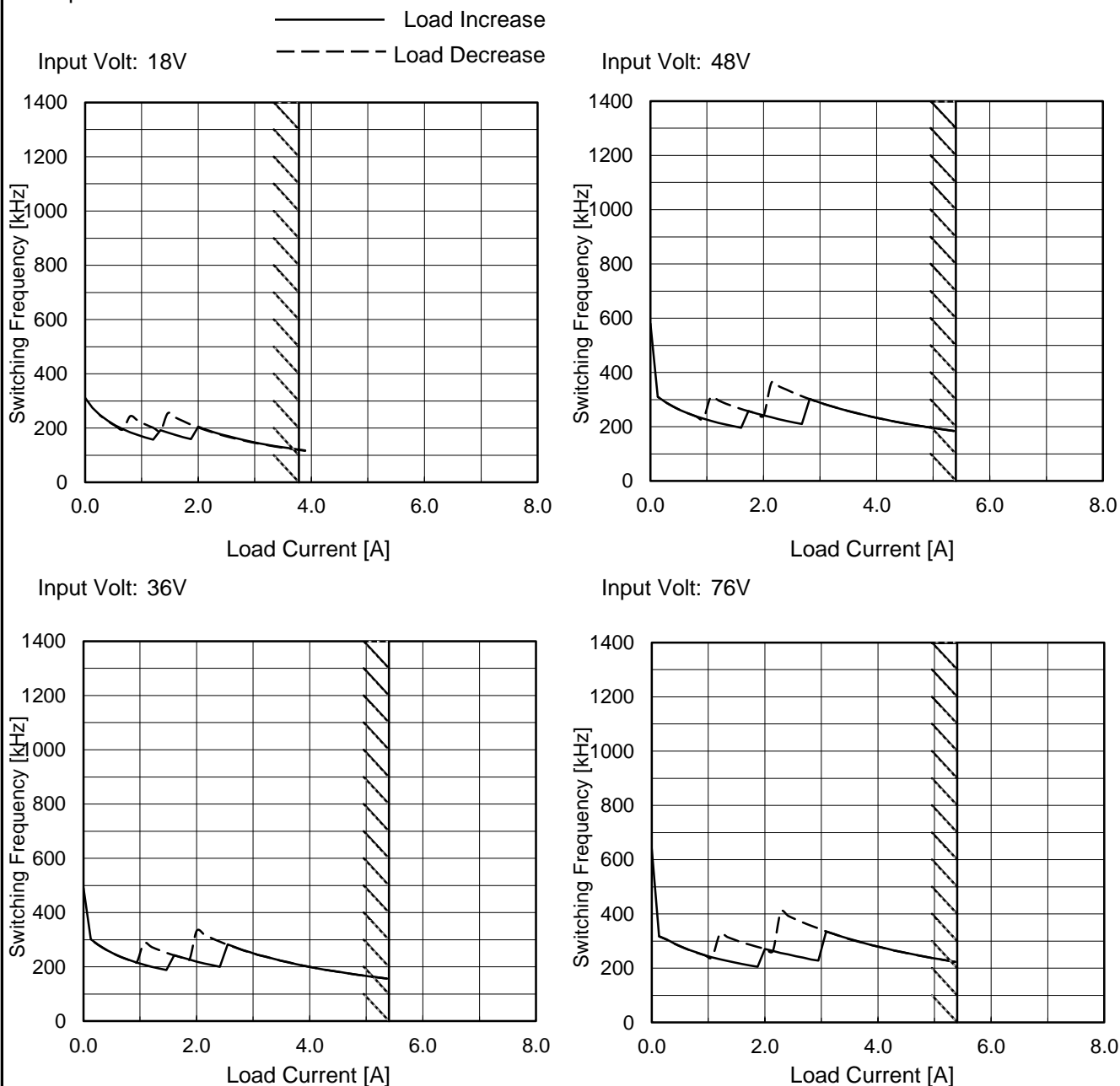
Intermittent operation occurs when overcurrent protection is activated.

Model		MGFS804815																																																																														
Item		Overvoltage Protection																																																																														
Object		+15V5.4A																																																																														
1.Graph		2.Values																																																																														
<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><div>Input Volt.</div><div>48V</div></div><div><div>---◇---</div><div>Input Volt.</div><div>76V</div></div></div> <p>Operating Point [%]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="5">Operating Point [%]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>-60</td><td>127</td><td>127</td><td>127</td><td>126</td><td>126</td></tr><tr><td>-40</td><td>127</td><td>127</td><td>127</td><td>127</td><td>127</td></tr><tr><td>-20</td><td>127</td><td>127</td><td>127</td><td>127</td><td>127</td></tr><tr><td>0</td><td>127</td><td>127</td><td>127</td><td>127</td><td>127</td></tr><tr><td>25</td><td>128</td><td>128</td><td>128</td><td>128</td><td>128</td></tr><tr><td>55</td><td>128</td><td>128</td><td>128</td><td>128</td><td>128</td></tr><tr><td>65</td><td>128</td><td>128</td><td>128</td><td>128</td><td>128</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><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>		Ambient Temperature [°C]	Operating Point [%]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-60	127	127	127	126	126	-40	127	127	127	127	127	-20	127	127	127	127	127	0	127	127	127	127	127	25	128	128	128	128	128	55	128	128	128	128	128	65	128	128	128	128	128	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
Ambient Temperature [°C]	Operating Point [%]																																																																															
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																																											
-60	127	127	127	126	126																																																																											
-40	127	127	127	127	127																																																																											
-20	127	127	127	127	127																																																																											
0	127	127	127	127	127																																																																											
25	128	128	128	128	128																																																																											
55	128	128	128	128	128																																																																											
65	128	128	128	128	128																																																																											
--	-	-	-	-	-																																																																											
--	-	-	-	-	-																																																																											
--	-	-	-	-	-																																																																											
--	-	-	-	-	-																																																																											

COSEL

Model	MGFS804815	Temperature	25°C
Item	Switching frequency (by Load Current)	Testing Circuitry	Figure A
Object	+15V5.4A		

1. Graph



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

-switching frequency of MG80 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, MG80 operates intermittently, so switching frequency would not become constant.
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

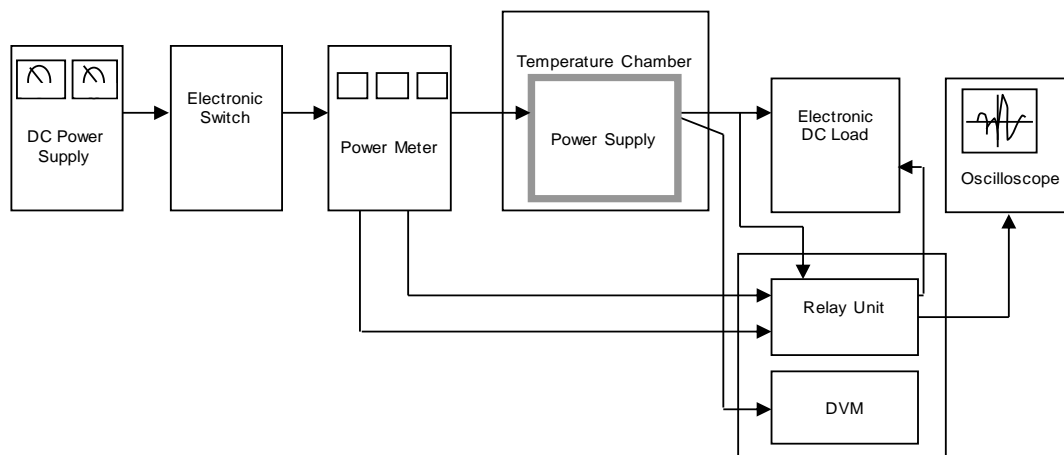


Figure A

Data Acquisition/Control Unit

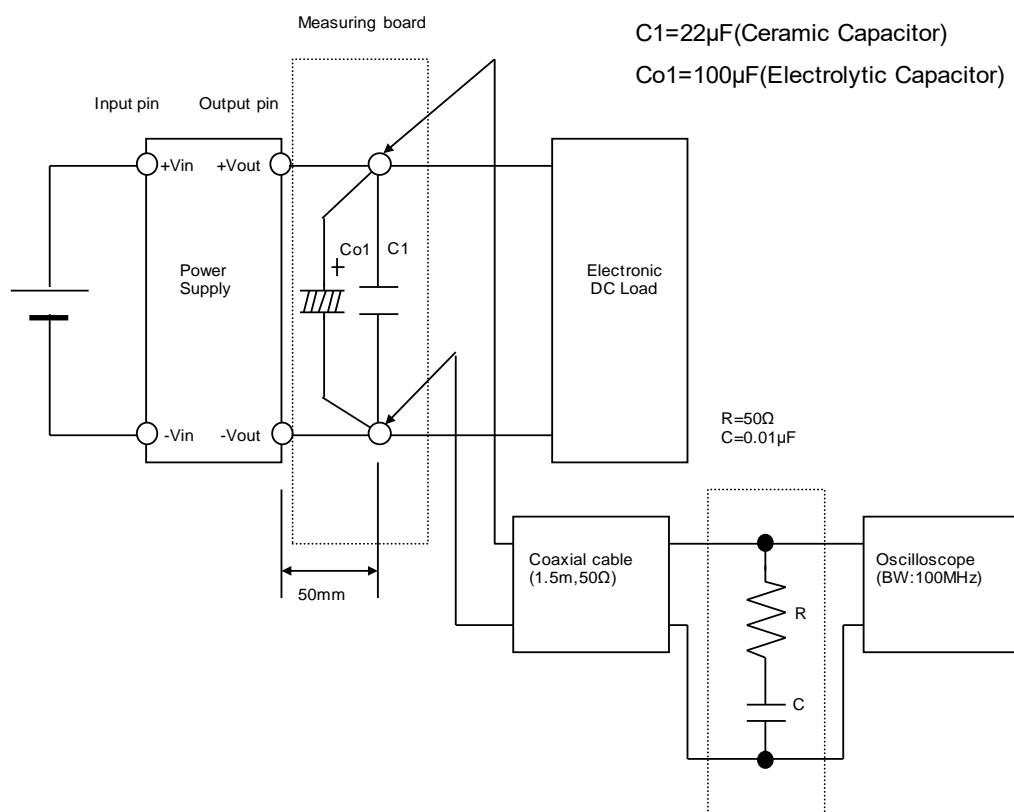


Figure B (Ripple and Ripple noise Characteristic)