

# TEST DATA OF MGFS400505

Regulated DC Power Supply  
December 3, 2018

Approved by : Junichi Hatagishi  
Junichi Hatagishi Design Manager

Prepared by : Shohei Mukaide  
Shohei Mukaide Design Engineer

**COSEL CO.,LTD.**

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Model		MGFS400505		Temperature 25°C																																																																																
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<div><div><div><div></div><div>Load 100%</div></div><div><div></div><div>Load 50%</div></div><div><div></div><div>Load 0%</div></div></div><p>Note: Slanted line shows the range of the rated input voltage.</p></div>				<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>3.8</td><td>0.106</td><td>0.004</td><td>0.004</td></tr><tr><td>3.9</td><td>0.104</td><td>4.048</td><td>1.619</td></tr><tr><td>4.0</td><td>0.093</td><td>4.152</td><td>9.202</td></tr><tr><td>4.1</td><td>0.101</td><td>4.160</td><td>8.755</td></tr><tr><td>4.2</td><td>0.091</td><td>4.032</td><td>8.918</td></tr><tr><td>4.3</td><td>0.099</td><td>3.920</td><td>8.461</td></tr><tr><td>4.4</td><td>0.097</td><td>3.838</td><td>8.194</td></tr><tr><td>4.5</td><td>0.096</td><td>3.787</td><td>7.715</td></tr><tr><td>5.0</td><td>0.089</td><td>3.363</td><td>6.869</td></tr><tr><td>7.0</td><td>0.025</td><td>2.389</td><td>4.859</td></tr><tr><td>9.0</td><td>0.021</td><td>1.888</td><td>3.747</td></tr><tr><td>13.0</td><td>0.022</td><td>1.338</td><td>2.600</td></tr><tr><td>15.0</td><td>0.024</td><td>1.145</td><td>2.325</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>		Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0.0	0.000	0.000	0.000	3.8	0.106	0.004	0.004	3.9	0.104	4.048	1.619	4.0	0.093	4.152	9.202	4.1	0.101	4.160	8.755	4.2	0.091	4.032	8.918	4.3	0.099	3.920	8.461	4.4	0.097	3.838	8.194	4.5	0.096	3.787	7.715	5.0	0.089	3.363	6.869	7.0	0.025	2.389	4.859	9.0	0.021	1.888	3.747	13.0	0.022	1.338	2.600	15.0	0.024	1.145	2.325	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model		MGFS400505	
Item		Input Current (by Load Current)	
Object			

1.Graph

—△—

Input Volt.

4.5V

---□---

Input Volt.

5V

-·-\*·-

Input Volt.

7V

-·-○-

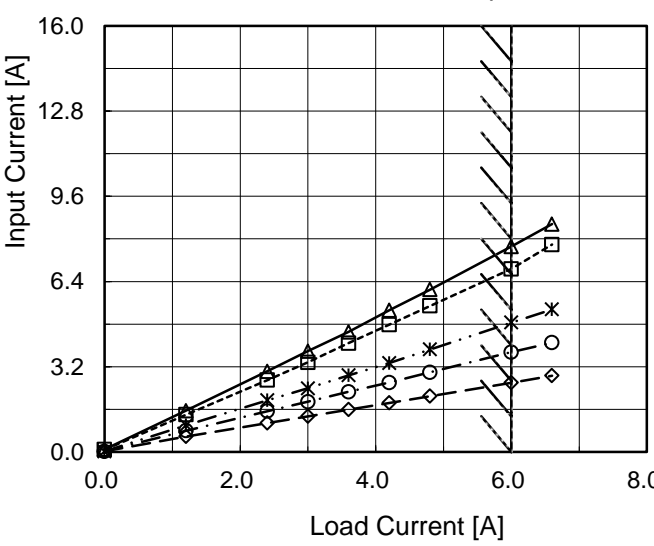
Input Volt.

9V

---◇---

Input Volt.

13V



2.Values

Load Current [A]	Input Current [A]				
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 7[V]	Input Volt. 9[V]	Input Volt. 13[V]
0.0	0.096	0.089	0.025	0.021	0.022
1.2	1.551	1.396	1.000	0.796	0.584
2.4	3.028	2.696	1.937	1.529	1.087
3.0	3.787	3.363	2.389	1.888	1.338
3.6	4.505	4.084	2.879	2.257	1.590
4.2	5.321	4.780	3.338	2.609	1.843
4.8	6.097	5.486	3.852	2.993	2.097
6.0	7.715	6.869	4.859	3.747	2.600
6.6	8.553	7.784	5.352	4.102	2.866
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Note: Slanted line shows the range of the rated load current.



Model		MGFS400505		Temperature 25°C																																																																									
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<div> <div>Input Power [W]</div> <div> <div>80</div> <div>60</div> <div>40</div> <div>20</div> <div>0</div> </div> <div> <div>0.0</div> <div>2.0</div> <div>4.0</div> <div>6.0</div> <div>8.0</div> </div> <div>Load Current [A]</div> </div>		<div> <div>Input Power [W]</div> <div> <div>Input Volt.</div> <div>Input Volt.</div> <div>Input Volt.</div> <div>Input Volt.</div> <div>Input Volt.</div> </div> <div> <div>4.5[V]</div> <div>5[V]</div> <div>7[V]</div> <div>9[V]</div> <div>13[V]</div> </div> </div>		<table> <tr> <th>Load Current [A]</th><th>Input Volt. 4.5[V]</th><th>Input Volt. 5[V]</th><th>Input Volt. 7[V]</th><th>Input Volt. 9[V]</th><th>Input Volt. 13[V]</th></tr> <tr><td>0.0</td><td>0.43</td><td>0.45</td><td>0.17</td><td>0.19</td><td>0.29</td></tr> <tr><td>1.2</td><td>6.98</td><td>6.99</td><td>7.07</td><td>7.22</td><td>7.60</td></tr> <tr><td>2.4</td><td>13.69</td><td>13.65</td><td>13.66</td><td>13.77</td><td>14.18</td></tr> <tr><td>3.0</td><td>17.16</td><td>17.06</td><td>16.96</td><td>17.09</td><td>17.43</td></tr> <tr><td>3.6</td><td>20.51</td><td>20.41</td><td>20.27</td><td>20.35</td><td>20.81</td></tr> <tr><td>4.2</td><td>24.13</td><td>23.96</td><td>23.66</td><td>23.68</td><td>24.06</td></tr> <tr><td>4.8</td><td>27.76</td><td>27.53</td><td>27.07</td><td>27.02</td><td>27.32</td></tr> <tr><td>6.0</td><td>35.36</td><td>34.91</td><td>34.08</td><td>33.84</td><td>33.98</td></tr> <tr><td>6.6</td><td>39.36</td><td>38.86</td><td>37.67</td><td>37.31</td><td>37.36</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 Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 7[V]	Input Volt. 9[V]	Input Volt. 13[V]	0.0	0.43	0.45	0.17	0.19	0.29	1.2	6.98	6.99	7.07	7.22	7.60	2.4	13.69	13.65	13.66	13.77	14.18	3.0	17.16	17.06	16.96	17.09	17.43	3.6	20.51	20.41	20.27	20.35	20.81	4.2	24.13	23.96	23.66	23.68	24.06	4.8	27.76	27.53	27.07	27.02	27.32	6.0	35.36	34.91	34.08	33.84	33.98	6.6	39.36	38.86	37.67	37.31	37.36	--	-	-	-	-	-	--	-	-	-	-	-
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Model

MGFS400505

Item

Efficiency (by Load Current)

Object

1.Graph

—△—

Input Volt.

4.5V

---□---

Input Volt.

5V

---\*---

Input Volt.

7V

---○---

Input Volt.

9V

---◇---

Input Volt.

13V

Efficiency [%]

95

85

75

65

55

0.0

2.0

4.0

6.0

8.0

Load Current [A]

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

2.Values

Load Current [A]	Efficiency [%]				
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 7[V]	Input Volt. 9[V]	Input Volt. 13[V]
0.0	-	-	-	-	-
1.2	86.7	86.7	85.6	83.9	79.7
2.4	88.5	88.7	88.7	88.0	85.5
3.0	89.0	89.3	89.3	88.7	86.9
3.6	88.6	89.1	89.7	89.4	87.4
4.2	88.0	88.6	89.8	89.7	88.3
4.8	87.4	88.1	89.6	89.8	88.8
6.0	85.8	87.0	89.0	89.6	89.3
6.6	84.8	85.9	88.6	89.4	89.3
--	-	-	-	-	-
--	-	-	-	-	-

Temperature

25°C

Testing Circuitry

Figure A

BC-11310



Model	MGFS400505																																		
Item	Line Regulation	Temperature	25°C																																
Object	+5V6A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>4.3</td><td>5.057</td><td>5.056</td></tr><tr><td>4.5</td><td>5.057</td><td>5.056</td></tr><tr><td>5.0</td><td>5.057</td><td>5.056</td></tr><tr><td>7.0</td><td>5.056</td><td>5.056</td></tr><tr><td>9.0</td><td>5.056</td><td>5.056</td></tr><tr><td>11.0</td><td>5.056</td><td>5.056</td></tr><tr><td>13.0</td><td>5.056</td><td>5.056</td></tr><tr><td>15.0</td><td>5.056</td><td>5.056</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	4.3	5.057	5.056	4.5	5.057	5.056	5.0	5.057	5.056	7.0	5.056	5.056	9.0	5.056	5.056	11.0	5.056	5.056	13.0	5.056	5.056	15.0	5.056	5.056	--	-	-		
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
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4.5	5.057	5.056																																	
5.0	5.057	5.056																																	
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Note: Slanted line shows the range of the rated input voltage.																																			





Model		MGFS400505		Temperature 25°C																																																																												
Item		Load Regulation		Testing Circuitry Figure A																																																																												
Object		+5V6A																																																																														
1.Graph		<div><div><div>—△—</div>Input Volt. 4.5V</div><div><div>---□---</div>Input Volt. 5V</div><div><div>-··*·-</div>Input Volt. 7V</div><div><div>-··○-</div>Input Volt. 9V</div><div><div>--◇--</div>Input Volt. 13V</div></div>		2.Values																																																																												
<div><div>Output Voltage [V]</div><div><div>5.3</div><div>5.2</div><div>5.1</div><div>5.0</div><div>4.9</div><div>4.8</div></div><div><div>0.0</div><div>2.0</div><div>4.0</div><div>6.0</div><div>8.0</div></div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Output Voltage [V]</th></tr><tr><th>Input Volt. 4.5[V]</th><th>Input Volt. 5[V]</th><th>Input Volt. 7[V]</th><th>Input Volt. 9[V]</th><th>Input Volt. 13[V]</th></tr><tr><td>0.0</td><td>5.059</td><td>5.058</td><td>5.058</td><td>5.057</td><td>5.057</td></tr><tr><td>1.2</td><td>5.058</td><td>5.057</td><td>5.057</td><td>5.057</td><td>5.057</td></tr><tr><td>2.4</td><td>5.057</td><td>5.057</td><td>5.057</td><td>5.056</td><td>5.056</td></tr><tr><td>3.0</td><td>5.057</td><td>5.057</td><td>5.056</td><td>5.056</td><td>5.056</td></tr><tr><td>3.6</td><td>5.057</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</td></tr><tr><td>4.2</td><td>5.057</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</td></tr><tr><td>4.8</td><td>5.057</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</td></tr><tr><td>6.0</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</td></tr><tr><td>6.6</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</td><td>5.056</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. 4.5[V]	Input Volt. 5[V]	Input Volt. 7[V]	Input Volt. 9[V]	Input Volt. 13[V]	0.0	5.059	5.058	5.058	5.057	5.057	1.2	5.058	5.057	5.057	5.057	5.057	2.4	5.057	5.057	5.057	5.056	5.056	3.0	5.057	5.057	5.056	5.056	5.056	3.6	5.057	5.056	5.056	5.056	5.056	4.2	5.057	5.056	5.056	5.056	5.056	4.8	5.057	5.056	5.056	5.056	5.056	6.0	5.056	5.056	5.056	5.056	5.056	6.6	5.056	5.056	5.056	5.056	5.056	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Output Voltage [V]																																																																															
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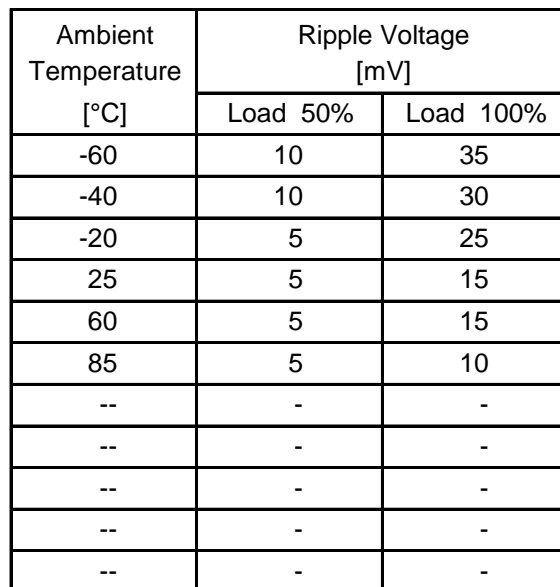


Model		MGFS400505		Temperature 25°C	
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B	
Object		+5V6A			
1.Graph				2.Values	
<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> 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<div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div>&lt;</div>					

Model		MGFS400505																																							
Item		Ripple-Noise																																							
Object		+5V6A																																							
1.Graph		2.Values																																							
<div><div><div><div><div></div><div>Input Volt. 4.5V</div></div><div><div></div><div>Input Volt. 13V</div></div></div><div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div></div><div><p>Measured by 100 MHz Oscilloscope.</p><p>Ripple-Noise is shown as p-p in the figure below.</p><p>Note: Slanted line shows the range of the rated load current.</p><p>Ripple Noise[mVp-p]</p><div></div><p>Fig.Complex Ripple Noise Wave Form</p></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 4.5 [V]</th><th>Input Volt. 13 [V]</th></tr><tr><td>0.0</td><td>10</td><td>10</td></tr><tr><td>1.2</td><td>10</td><td>10</td></tr><tr><td>2.4</td><td>10</td><td>10</td></tr><tr><td>3.6</td><td>10</td><td>10</td></tr><tr><td>4.8</td><td>15</td><td>10</td></tr><tr><td>6.0</td><td>30</td><td>15</td></tr><tr><td>6.6</td><td>40</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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 4.5 [V]	Input Volt. 13 [V]	0.0	10	10	1.2	10	10	2.4	10	10	3.6	10	10	4.8	15	10	6.0	30	15	6.6	40	15	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 4.5 [V]	Input Volt. 13 [V]																																							
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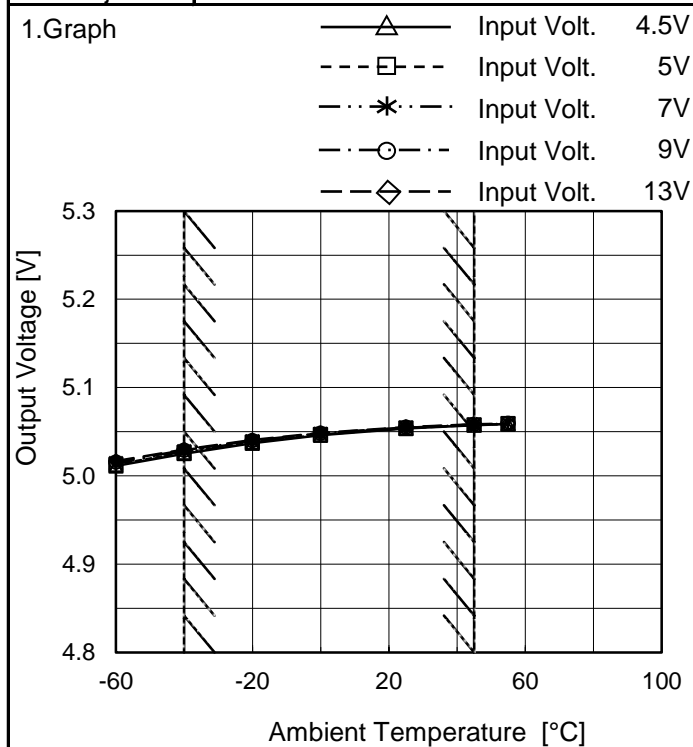
Testing Circuitry Figure B

## 2.Values



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

Model	MGFS400505
Item	Ambient Temperature Drift
Object	+5V6A



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

Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 7[V]	Input Volt. 9[V]	Input Volt. 13[V]
-60	5.011	5.013	5.014	5.016	5.017
-40	5.025	5.026	5.028	5.029	5.030
-20	5.037	5.038	5.039	5.040	5.041
0	5.046	5.047	5.048	5.048	5.049
25	5.054	5.054	5.055	5.055	5.055
45	5.057	5.058	5.058	5.058	5.058
55	5.059	5.059	5.059	5.059	5.059
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

**COSEL**

		Testing Circuitry Figure A
Model	MGFS400505	
Item	Output Voltage Accuracy	
Object	+5V6A	

### 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 - 45°C

Input Voltage : 4.5 - 13V

Load Current : 0 - 6A

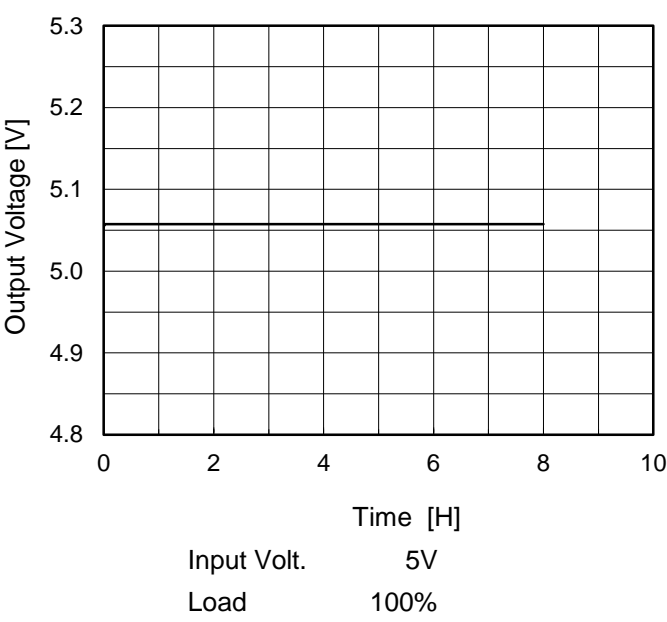
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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	45	4.5	0	5.060	±18	±0.4
Minimum Voltage	-40	4.5	6	5.025		



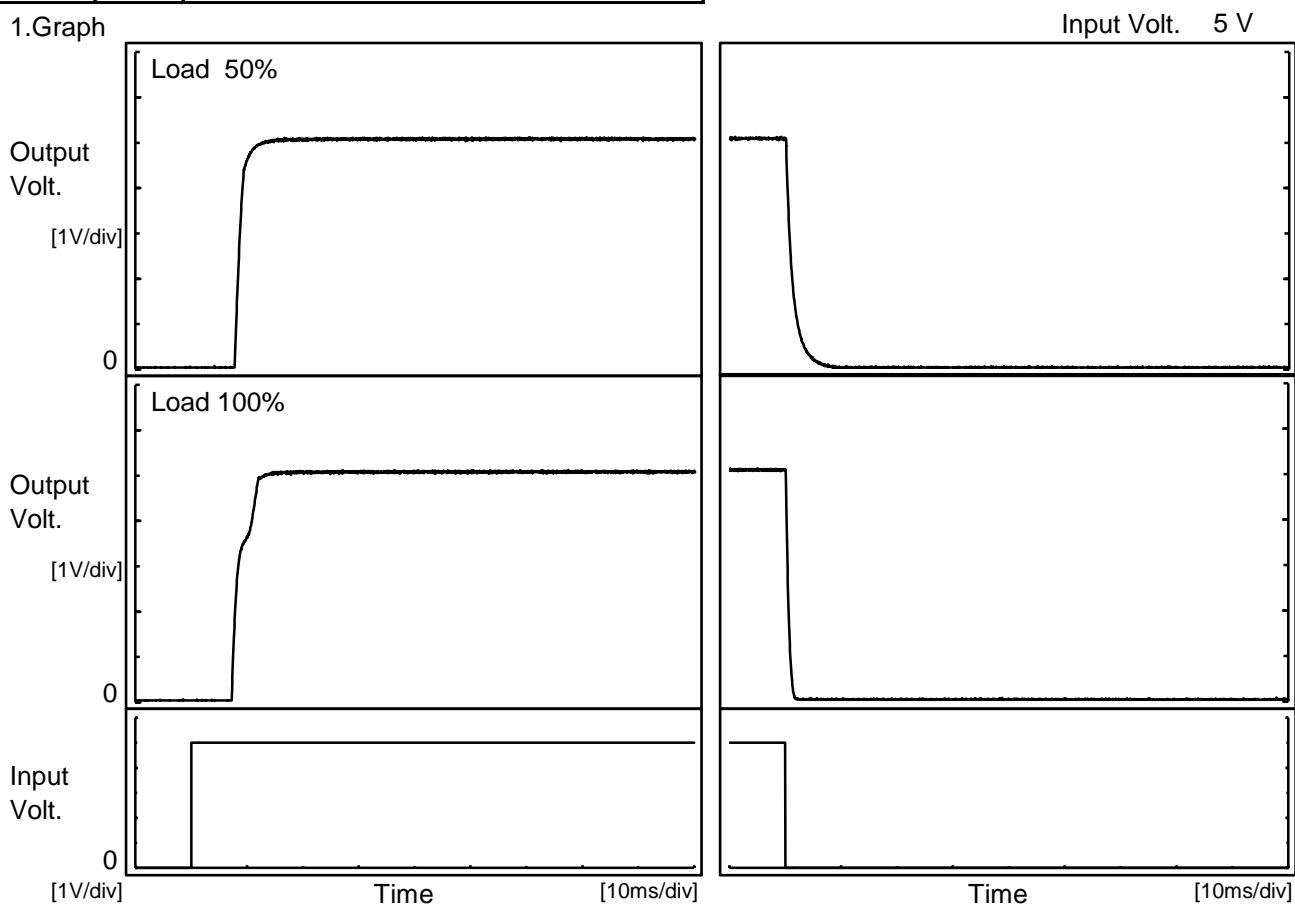
Model	MGFS400505																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+5V6A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.054</td></tr><tr><td>0.5</td><td>5.058</td></tr><tr><td>1.0</td><td>5.058</td></tr><tr><td>2.0</td><td>5.058</td></tr><tr><td>3.0</td><td>5.058</td></tr><tr><td>4.0</td><td>5.058</td></tr><tr><td>5.0</td><td>5.058</td></tr><tr><td>6.0</td><td>5.058</td></tr><tr><td>7.0</td><td>5.058</td></tr><tr><td>8.0</td><td>5.058</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.054	0.5	5.058	1.0	5.058	2.0	5.058	3.0	5.058	4.0	5.058	5.0	5.058	6.0	5.058	7.0	5.058	8.0	5.058
Time since start [H]	Output Voltage [V]																								
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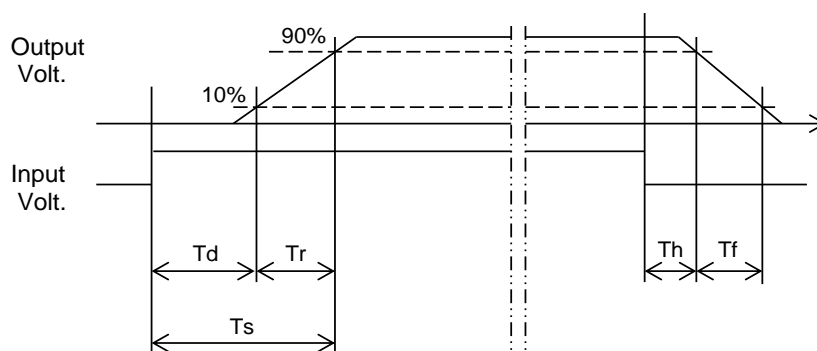
Model	MGFS400505	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V6A		

# 1.Graph



# 2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	7.9	1.9	9.8	0.2	3.1
100 %	7.4	4.2	11.6	0.2	1.0





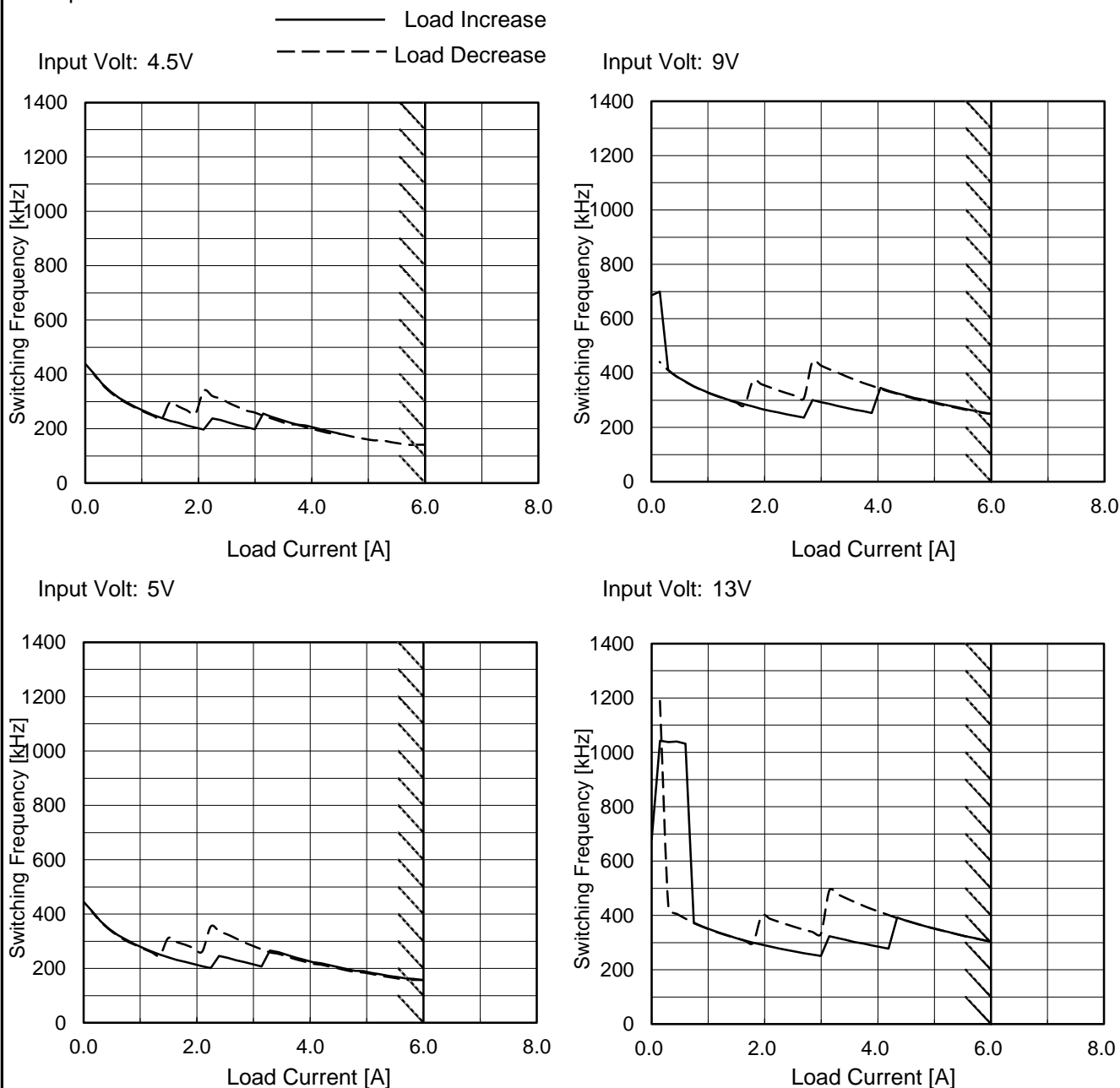
Model		MGFS400505	Testing Circuitry    Figure A
Item		Minimum Input Voltage for Regulated Output Voltage	
Object		+5V6A	
1.Graph			2.Values
<div><div><div><div><div></div><div></div></div><div></div><div></div></div><div><div></div><div></div></div><div></div><div></div></div><div><div></div><div></div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> <div></div> <div><div></div><div></div></div> <div></div> 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1.Graph		<div><div><div></div><div>△</div><div>Input Volt.</div><div>4.5V</div></div><div><div></div><div>□</div><div>Input Volt.</div><div>5V</div></div><div><div></div><div>*</div><div>Input Volt.</div><div>7V</div></div><div><div></div><div>○</div><div>Input Volt.</div><div>9V</div></div><div><div></div><div>◇</div><div>Input Volt.</div><div>13V</div></div></div> <div><table><thead><tr><th>Input Volt.</th><th>4.5V</th><th>5V</th><th>7V</th><th>9V</th><th>13V</th></tr></thead><tbody><tr><td>Output Voltage [V]</td><td>5.00</td><td>5.00</td><td>5.00</td><td>5.00</td><td>5.00</td></tr></tbody></table></div>		Input Volt.	4.5V	5V	7V	9V	13V	Output Voltage [V]	5.00	5.00	5.00	5.00	5.00	2.Values																																																																									
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Model	MGFS400505		
Item	Overvoltage Protection	Temperature	25°C
Object	+5V6A	Testing Circuitry	Figure A
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Model	MGFS400505	Temperature	25°C
Item	Switching frequency (by Load Current)	Testing Circuitry	Figure A
Object	5V6A		

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.

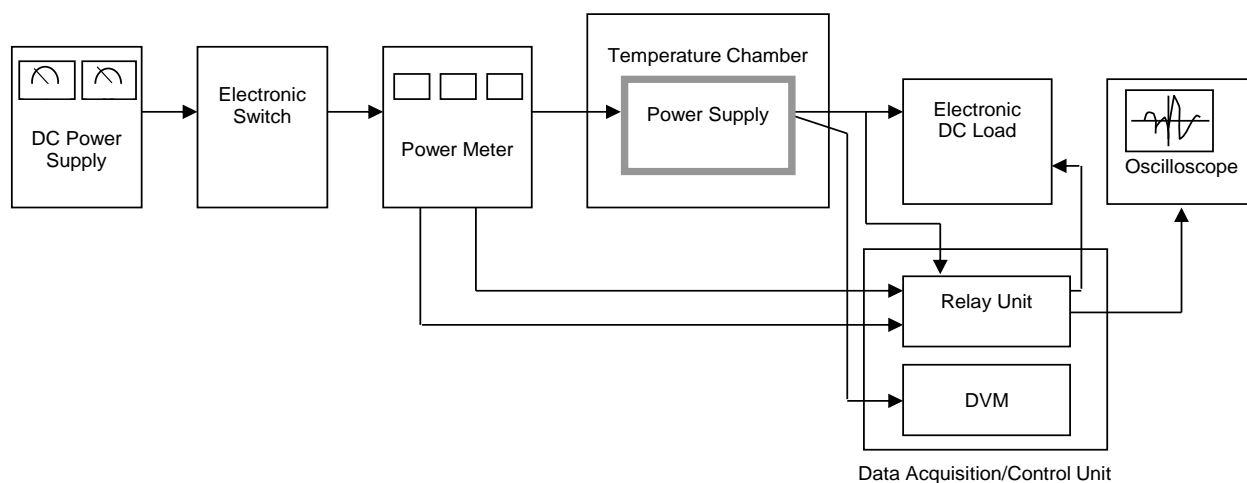


Figure A

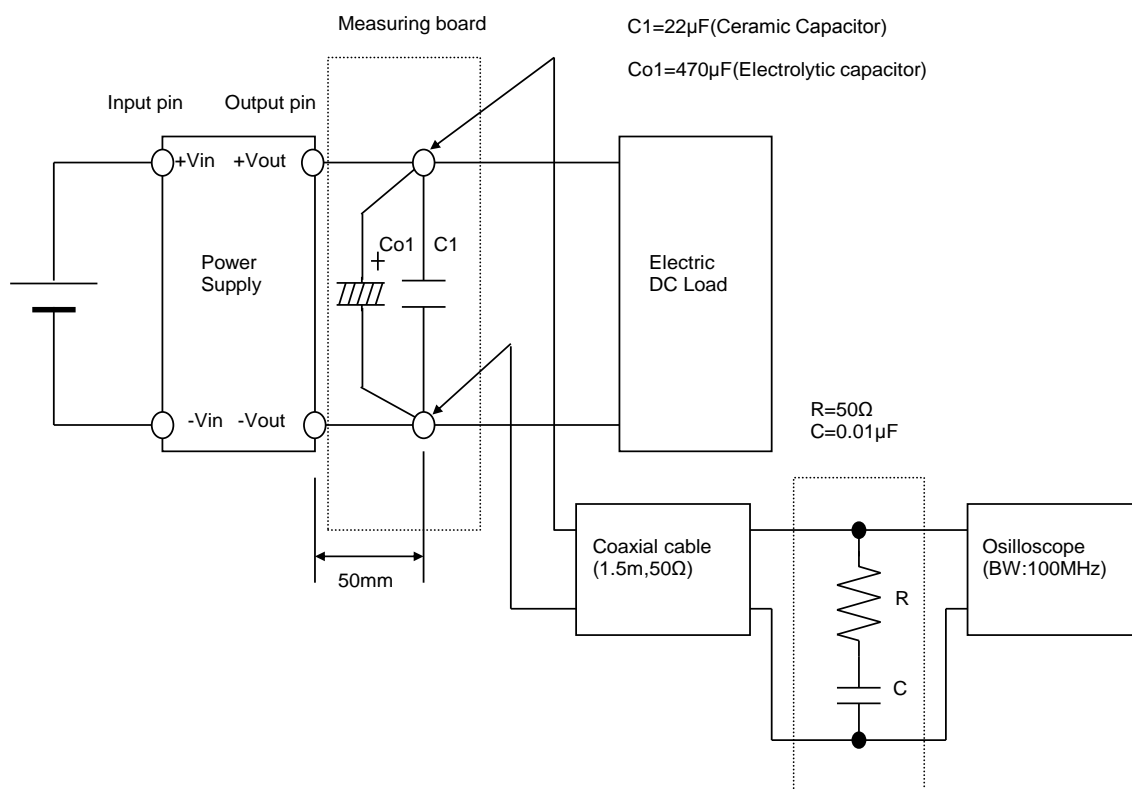


Figure B (Ripple and Ripple noise Characteristic)