

# TEST DATA OF MGFS40483R3

Regulated DC Power Supply  
December 7, 2018

Approved by : Junichi Hatagishi  
Junichi Hatagishi Design Manager

Prepared by : Shohei Mukaide  
Shohei Mukaide Design Engineer

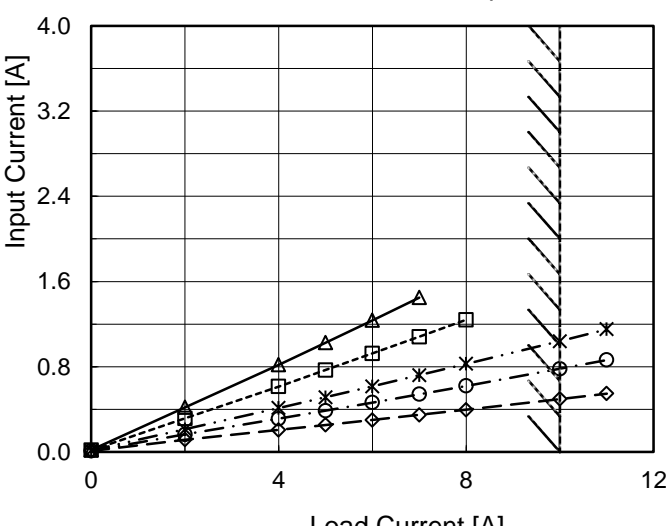
**COSEL CO.,LTD.**

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Model		MGFS40483R3		Temperature 25°C																																																																																
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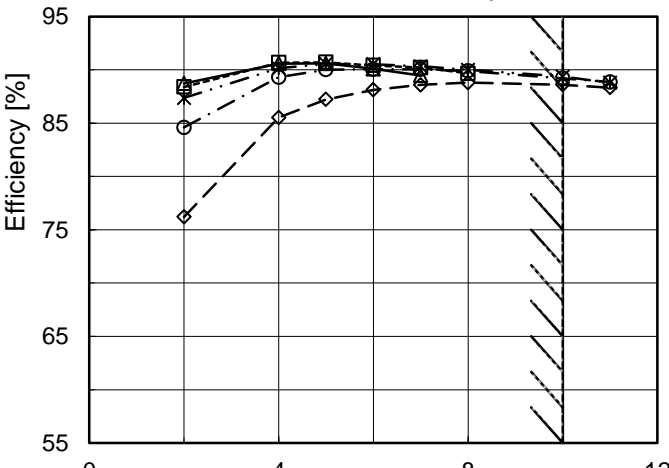
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Model		MGFS40483R3	
Item		Line Regulation	
Object		+3.3V10A	
1.Graph		2.Values	

---□---

Load 50%

—△—

Load 100%

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	3.349	- ※1
18	3.350	- ※1
24	3.350	- ※2
30	3.350	3.350
36	3.350	3.351
48	3.350	3.350
60	3.350	3.351
76	3.350	3.350
80	3.350	3.351

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		MGFS40483R3		Temperature 25°C																																																																														
Item		Load Regulation		Testing Circuitry Figure A																																																																														
Object		+3.3V10A																																																																																
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> <p>Output Voltage [V]</p> <p>Load Current [A]</p> <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">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</td><td>3.352</td><td>3.351</td><td>3.352</td><td>3.352</td><td>3.352</td></tr><tr><td>2</td><td>3.351</td><td>3.351</td><td>3.351</td><td>3.351</td><td>3.352</td></tr><tr><td>4</td><td>3.350</td><td>3.350</td><td>3.351</td><td>3.351</td><td>3.351</td></tr><tr><td>5</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.350</td></tr><tr><td>6</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.351</td></tr><tr><td>7</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.351</td></tr><tr><td>8</td><td>- ※1</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.351</td></tr><tr><td>10</td><td>- ※1</td><td>- ※2</td><td>3.350</td><td>3.350</td><td>3.350</td></tr><tr><td>11</td><td>- ※1</td><td>- ※2</td><td>3.350</td><td>3.350</td><td>3.350</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	3.352	3.351	3.352	3.352	3.352	2	3.351	3.351	3.351	3.351	3.352	4	3.350	3.350	3.351	3.351	3.351	5	3.350	3.350	3.350	3.350	3.350	6	3.350	3.350	3.350	3.350	3.351	7	3.350	3.350	3.350	3.350	3.351	8	- ※1	3.350	3.350	3.350	3.351	10	- ※1	- ※2	3.350	3.350	3.350	11	- ※1	- ※2	3.350	3.350	3.350	--	-	-	-	-	-	--	-	-	-	-	-
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- 7 -

BC-11321

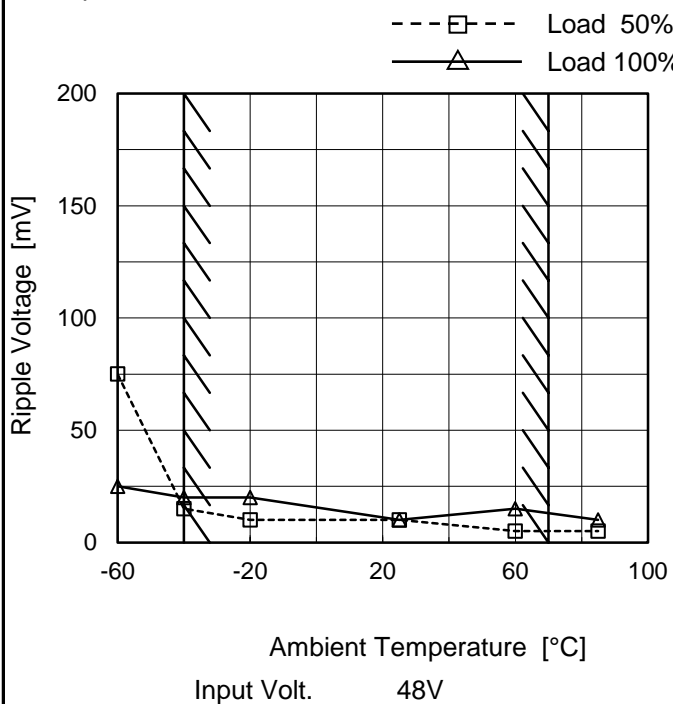


Model		MGFS40483R3																																							
Item		Ripple Voltage (by Load Current)																																							
Object		+3.3V10A																																							
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 18V</div><div>- -○- - Input Volt. 76V</div></div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div> <div><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><div><p>Ripple [mVp-p]</p></div><p>Fig.Complex Ripple Wave Form</p></div>		<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</td><td>15</td><td>50</td></tr><tr><td>2</td><td>5</td><td>5</td></tr><tr><td>4</td><td>5</td><td>5</td></tr><tr><td>6</td><td>10</td><td>10</td></tr><tr><td>7</td><td>20</td><td>10</td></tr><tr><td>8</td><td>- ※</td><td>10</td></tr><tr><td>10</td><td>- ※</td><td>20</td></tr><tr><td>11</td><td>- ※</td><td>20</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> <div><p>※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.</p></div>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 76 [V]	0	15	50	2	5	5	4	5	5	6	10	10	7	20	10	8	- ※	10	10	- ※	20	11	- ※	20	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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Model		MGFS40483R3																																							
Item		Ripple-Noise																																							
Object		+3.3V10A																																							
1.Graph		2.Values																																							
<div><div><div>△</div><div>Input Volt. 18V</div></div><div><div>○</div><div>Input Volt. 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</td><td>20</td><td>50</td></tr><tr><td>2</td><td>15</td><td>20</td></tr><tr><td>4</td><td>20</td><td>30</td></tr><tr><td>6</td><td>35</td><td>45</td></tr><tr><td>7</td><td>45</td><td>55</td></tr><tr><td>8</td><td>- ※</td><td>60</td></tr><tr><td>10</td><td>- ※</td><td>75</td></tr><tr><td>11</td><td>- ※</td><td>90</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	20	50	2	15	20	4	20	30	6	35	45	7	45	55	8	- ※	60	10	- ※	75	11	- ※	90	--	-	-	--	-	-	--	-	-
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Fig.Complex Ripple Noise Wave Form																																									

	
Model	MGFS40483R3
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V10A

## 1.Graph

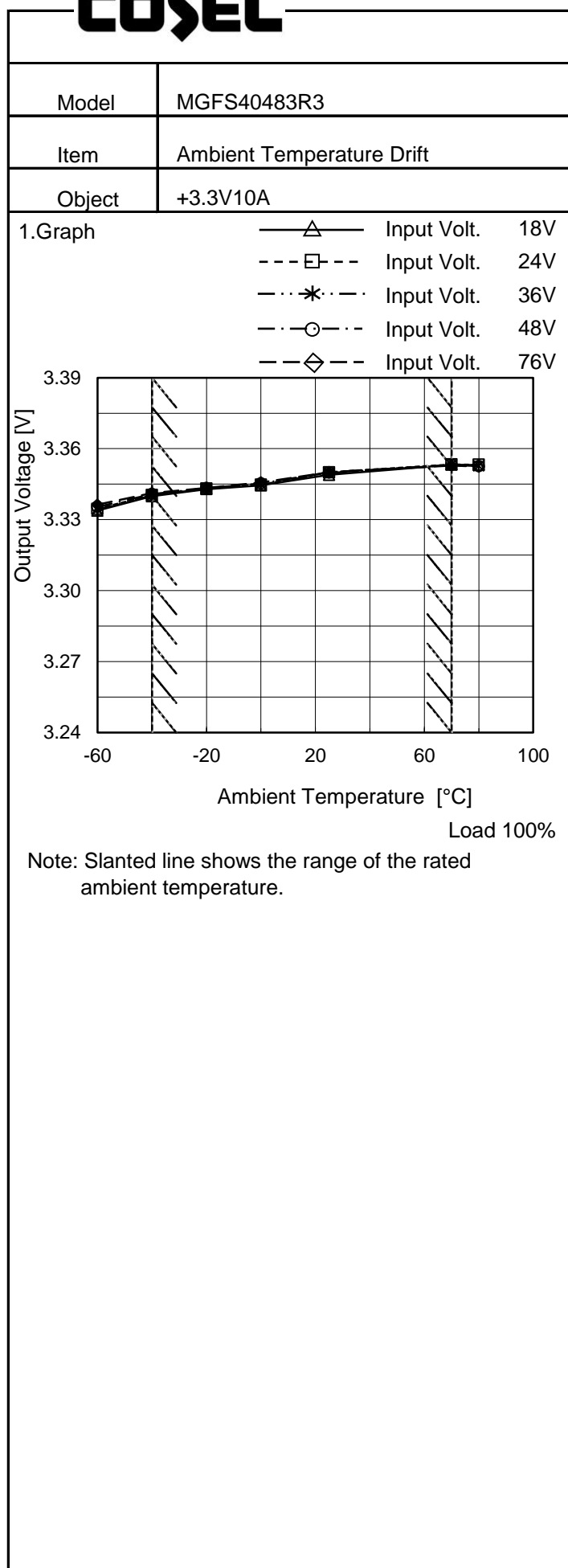


Measured by 100 MHz Oscilloscope.

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

## 2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	75	25
-40	15	20
-20	10	20
25	10	10
60	5	15
85	5	10
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--



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	3.334	3.335	3.334	3.335	3.336
-40	3.340	3.340	3.340	3.341	3.341
-20	3.343	3.343	3.343	3.343	3.343
0	3.344	3.345	3.345	3.345	3.346
25	3.349	3.350	3.350	3.350	3.350
70	3.353	3.353	3.353	3.353	3.353
80	3.353	3.353	3.353	3.353	3.352
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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



Model		MGFS40483R3	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+3.3V10A	

### 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 : 18 - 76V

Load Current : 0 - 10A

\* 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	18	0	3.356	±8	±0.2
Minimum Voltage	-40	18	7	3.340		



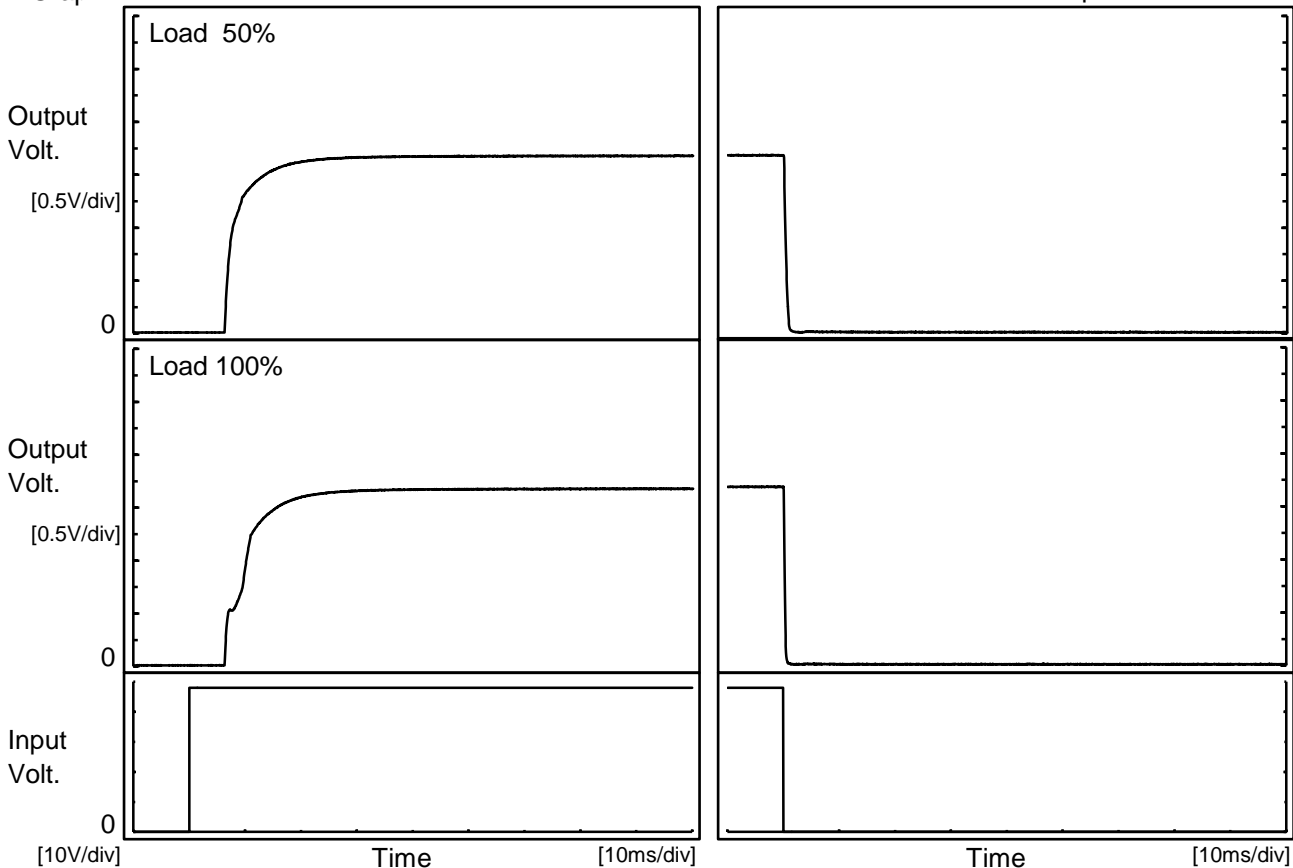
Model		MGFS40483R3	Temperature25°C Testing CircuitryFigure A
Item		Time Lapse Drift	
Object		+3.3V10A	
1.Graph			2.Values
<div><div><div><div><div>3.39</div><div>3.36</div><div>3.33</div><div>3.30</div><div>3.27</div><div>3.24</div></div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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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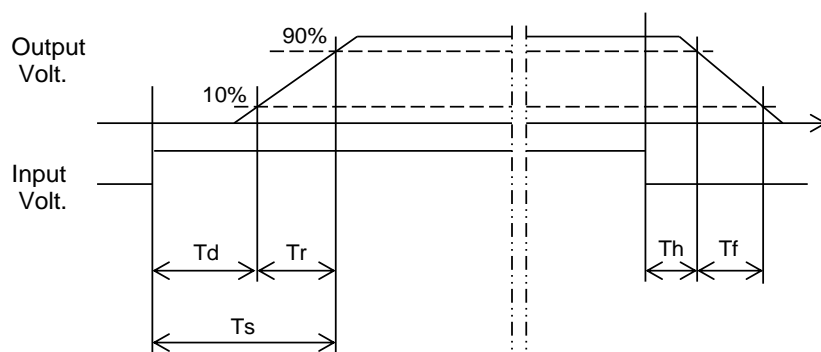
Model	MGFS40483R3	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3.3V10A		

# 1.Graph



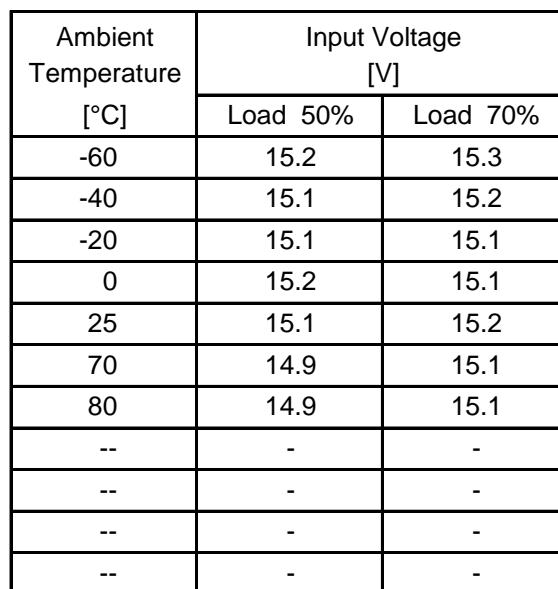
# 2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.5	7.0	13.5	0.2	0.7
100 %	6.5	9.0	15.5	0.1	0.3



Testing Circuitry Figure A

## 2.Values



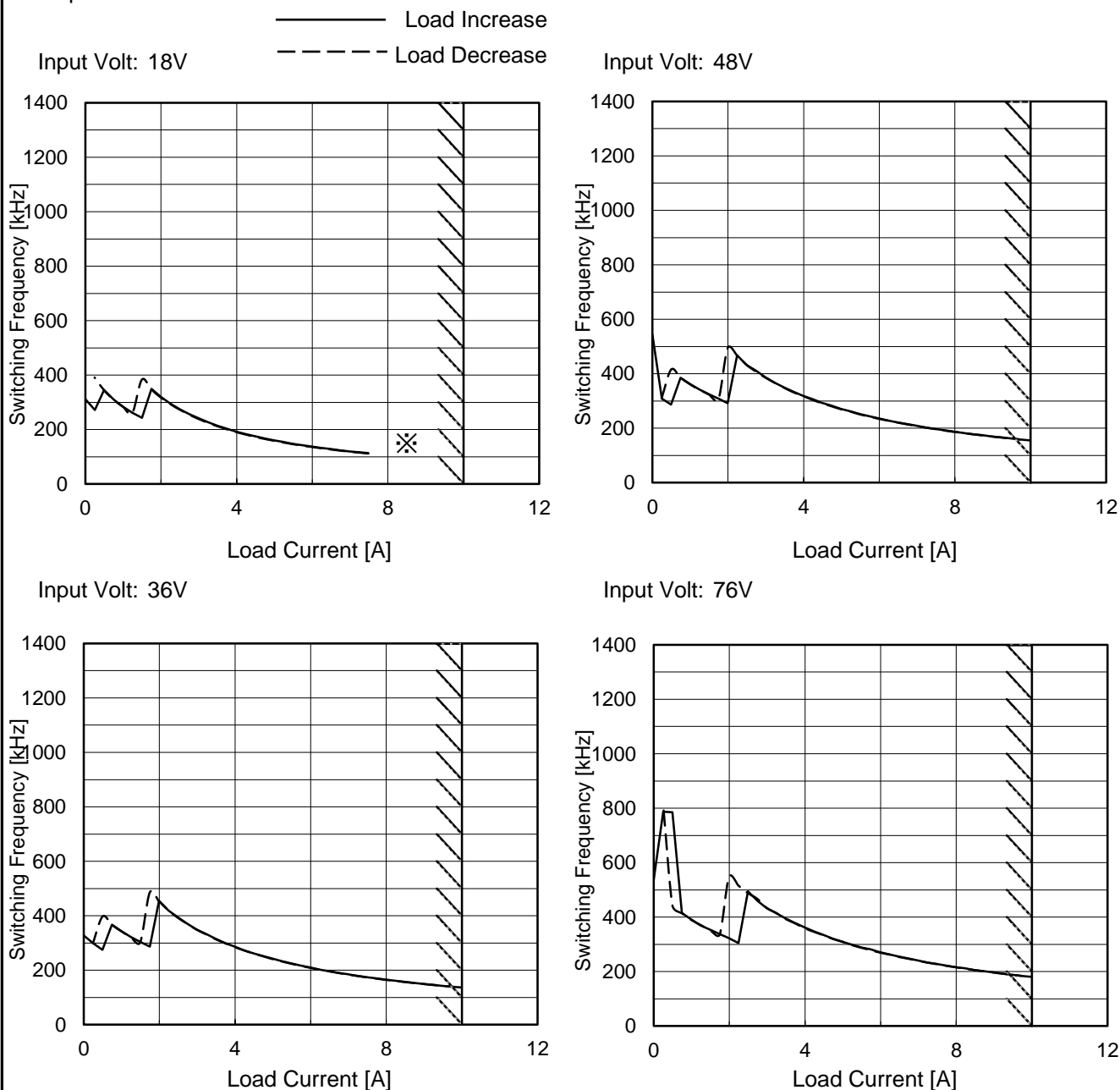
- 16 -

Model		MGFS40483R3		Temperature 25°C																																																																																				
Item		Overcurrent Protection		Testing Circuitry Figure A																																																																																				
Object		+3.3V10A																																																																																						
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>Output Voltage [V]</div> <div>Load Current [A]</div>		2.Values																																																																																				
		<table><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><tr><td>3.300</td><td>8.572</td><td>10.056</td><td>11.916</td><td>11.950</td><td>11.531</td></tr><tr><td>3.135</td><td>- ※1</td><td>- ※2</td><td>-</td><td>-</td><td>-</td></tr><tr><td>2.970</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>2.640</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>2.310</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.980</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.650</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.320</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.990</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.660</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.330</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.000</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></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]	3.300	8.572	10.056	11.916	11.950	11.531	3.135	- ※1	- ※2	-	-	-	2.970	-	-	-	-	-	2.640	-	-	-	-	-	2.310	-	-	-	-	-	1.980	-	-	-	-	-	1.650	-	-	-	-	-	1.320	-	-	-	-	-	0.990	-	-	-	-	-	0.660	-	-	-	-	-	0.330	-	-	-	-	-	0.000	-	-	-	-	-
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Note: Slanted line shows the range of the rated load current.																																																																																								
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 24V input Voltage is 80% of rated load current.</div> <div>Refer to instruction manuals for details of input derating.</div>																																																																																						

Model	MGFS40483R3		
Item	Overvoltage Protection	Temperature	25°C
Object	+3.3V10A	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 dash-dot 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 dash-dot 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	MGFS40483R3	Temperature	25°C
Item	Switching frequency (by Load Current)	Testing Circuitry	Figure A
Object	3.3V10A		

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.

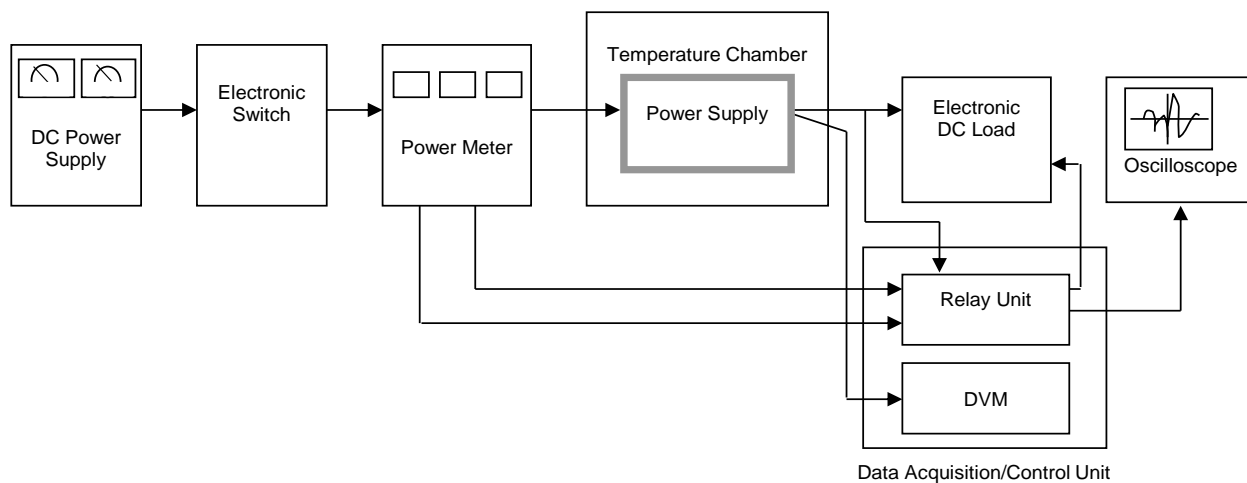


Figure A

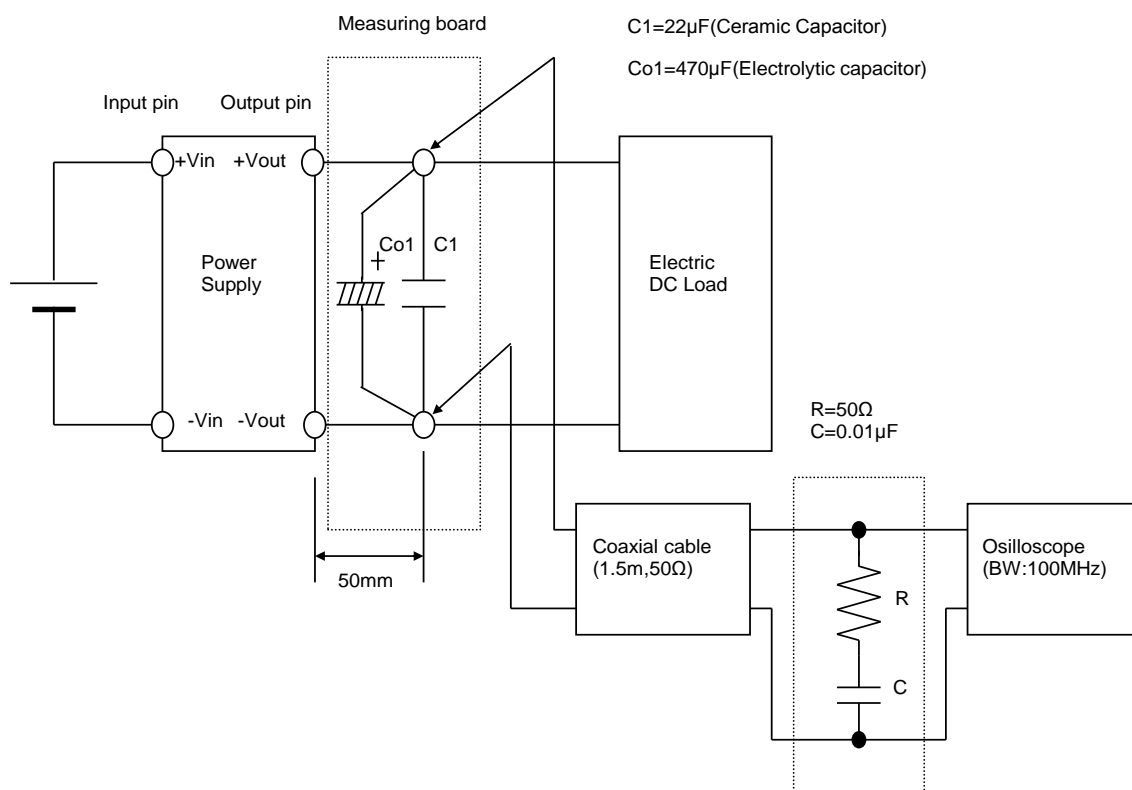


Figure B (Ripple and Ripple noise Characteristic)