

# TEST DATA OF MGFS80483R3

Regulated DC Power Supply  
April 10, 2019

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Junichi Hatagishi Design Manager

Prepared by : Satoshi Kinoshita  
Satoshi Kinoshita Design Engineer

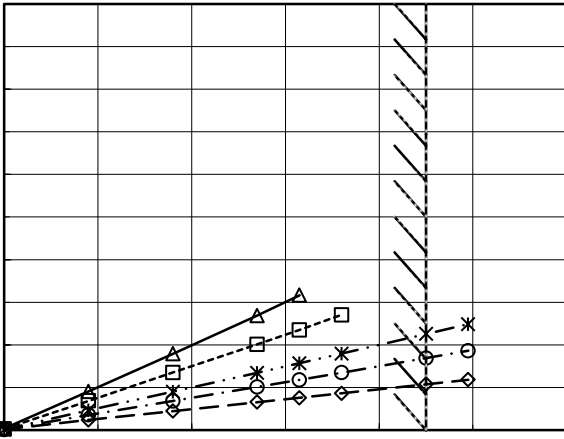
**COSEL CO.,LTD.**

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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><div><p>Note: Slanted line shows the range of the rated input voltage.</p></div></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>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>1.922</td><td>- ※</td></tr><tr><td>17.2</td><td>0.030</td><td>1.875</td><td>- ※</td></tr><tr><td>17.6</td><td>0.029</td><td>1.831</td><td>- ※</td></tr><tr><td>18.0</td><td>0.029</td><td>1.789</td><td>- ※</td></tr><tr><td>24.0</td><td>0.023</td><td>1.332</td><td>- ※</td></tr><tr><td>36.0</td><td>0.010</td><td>0.895</td><td>1.804</td></tr><tr><td>48.0</td><td>0.011</td><td>0.675</td><td>1.352</td></tr><tr><td>76.0</td><td>0.011</td><td>0.441</td><td>0.861</td></tr><tr><td>80.0</td><td>0.011</td><td>0.420</td><td>0.812</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	1.922	- ※	17.2	0.030	1.875	- ※	17.6	0.029	1.831	- ※	18.0	0.029	1.789	- ※	24.0	0.023	1.332	- ※	36.0	0.010	0.895	1.804	48.0	0.011	0.675	1.352	76.0	0.011	0.441	0.861	80.0	0.011	0.420	0.812	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Item		Input Power (by Load Current)		Testing Circuitry Figure A	
Object					
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<div> <div>Input Power [W]</div> <div> <div>160</div> <div>120</div> <div>80</div> <div>40</div> <div>0</div> </div> <div> <div>0</div> <div>8</div> <div>16</div> <div>24</div> </div> <div>Load Current [A]</div> </div>		<div> <div>Load Current [A]</div> <div> <div>0.0</div> <div>3.6</div> <div>7.2</div> <div>10.8</div> <div>12.6</div> <div>14.4</div> <div>18.0</div> <div>19.8</div> <div>--</div> <div>--</div> <div>--</div> </div> <div> <div>Input Power [W]</div> <div> <div>0.52</div> <div>13.12</div> <div>25.88</div> <div>38.89</div> <div>45.56</div> <div>- ※1</div> <div>- ※1</div> <div>- ※1</div> <div>-</div> <div>-</div> <div>-</div> </div> <div> <div>0.26</div> <div>13.16</div> <div>25.92</div> <div>38.76</div> <div>45.30</div> <div>- ※1</div> <div>- ※2</div> <div>- ※2</div> <div>-</div> <div>-</div> <div>-</div> </div> <div> <div>0.38</div> <div>13.39</div> <div>26.02</div> <div>38.77</div> <div>45.22</div> <div>51.73</div> <div>64.97</div> <div>71.72</div> <div>-</div> <div>-</div> <div>-</div> </div> <div> <div>0.50</div> <div>13.63</div> <div>26.24</div> <div>38.97</div> <div>45.36</div> <div>51.81</div> <div>64.93</div> <div>71.58</div> <div>-</div> <div>-</div> <div>-</div> </div> <div> <div>0.82</div> <div>14.53</div> <div>27.24</div> <div>39.87</div> <div>46.17</div> <div>52.53</div> <div>65.42</div> <div>71.98</div> <div>-</div> <div>-</div> <div>-</div> </div> </div> </div>		<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>	
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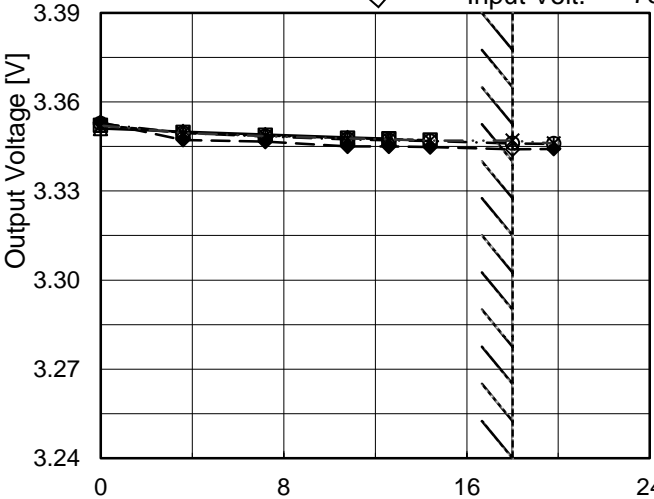


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Object		+3.3V18A	
1.Graph		2.Values	



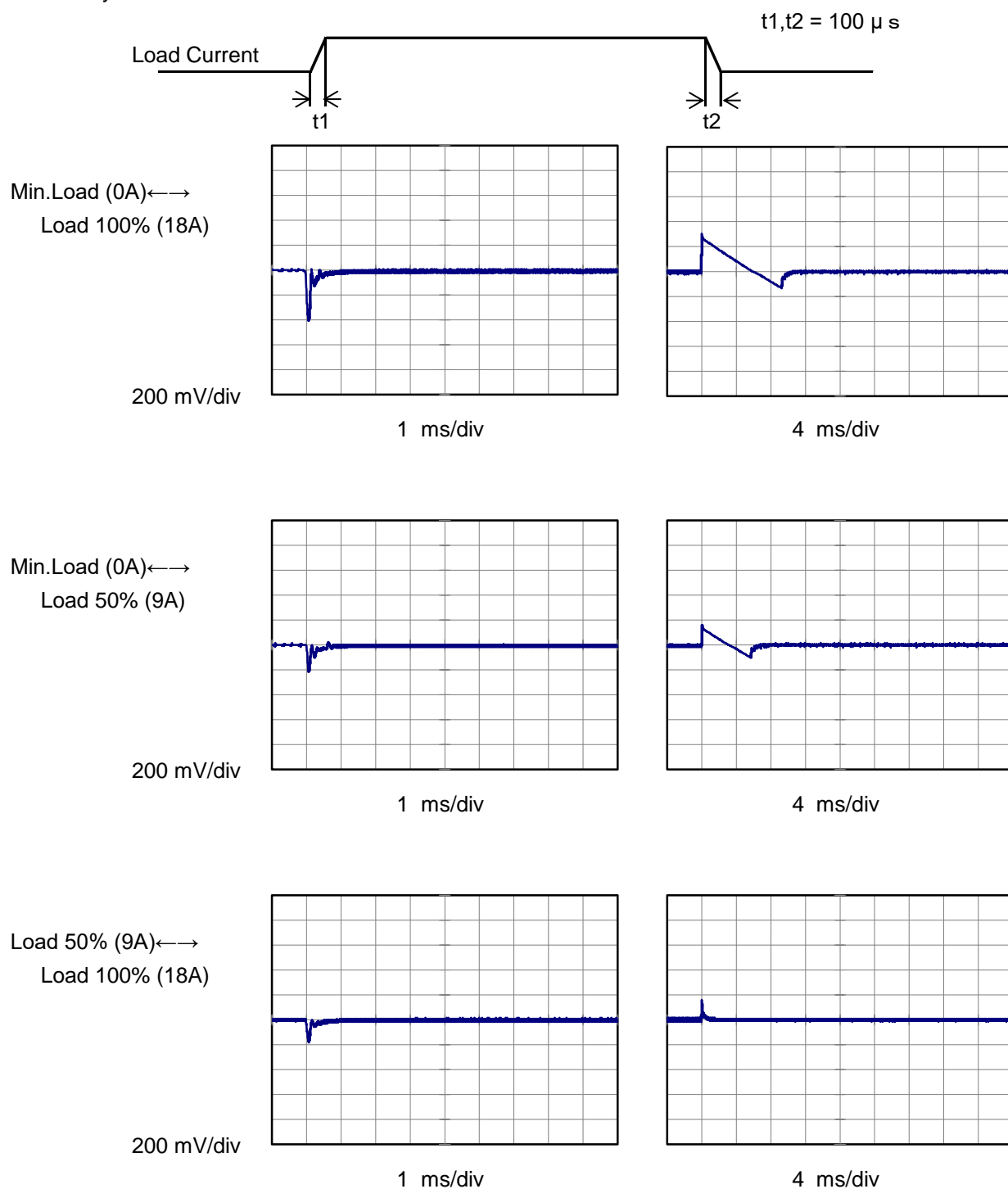
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2.Values				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Output Voltage [V]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.0</td><td>3.351</td><td>3.352</td><td>3.352</td><td>3.353</td><td>3.353</td></tr><tr><td>3.6</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.350</td><td>3.347</td></tr><tr><td>7.2</td><td>3.349</td><td>3.349</td><td>3.349</td><td>3.348</td><td>3.347</td></tr><tr><td>10.8</td><td>3.348</td><td>3.348</td><td>3.348</td><td>3.347</td><td>3.345</td></tr><tr><td>12.6</td><td>3.348</td><td>3.348</td><td>3.347</td><td>3.347</td><td>3.345</td></tr><tr><td>14.4</td><td>- ※1</td><td>3.347</td><td>3.347</td><td>3.347</td><td>3.345</td></tr><tr><td>18.0</td><td>- ※1</td><td>- ※2</td><td>3.347</td><td>3.346</td><td>3.344</td></tr><tr><td>19.8</td><td>- ※1</td><td>- ※2</td><td>3.346</td><td>3.346</td><td>3.344</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	3.351	3.352	3.352	3.353	3.353	3.6	3.350	3.350	3.350	3.350	3.347	7.2	3.349	3.349	3.349	3.348	3.347	10.8	3.348	3.348	3.348	3.347	3.345	12.6	3.348	3.348	3.347	3.347	3.345	14.4	- ※1	3.347	3.347	3.347	3.345	18.0	- ※1	- ※2	3.347	3.346	3.344	19.8	- ※1	- ※2	3.346	3.346	3.344	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Output Voltage [V]																																																																																	
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				<p>※1 Maximum output current at minimum input Voltage is 70% of rated load current.</p> <p>※2 Maximum output current at 24V input Voltage is 80% of rated load current.</p> <p>Refer to instruction manuals for details of input derating.</p>																																																																														

BC-11373

**COSEL**

Model	MGFS80483R3	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+3.3V18A	

Input Volt. 48 V  
Cycle 100 ms

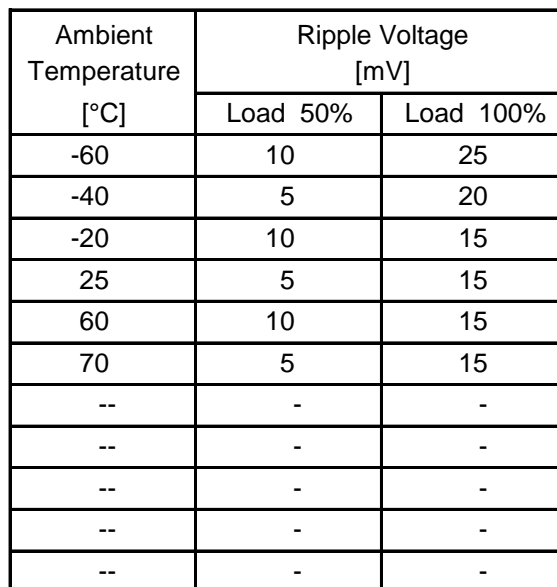


COSCEL																																									
Model	MGFS80483R3																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
Object	+3.3V18A	Testing Circuitry	Figure B																																						
1.Graph		2.Values																																							
<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>Measured by 100 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>		<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>35</td></tr><tr><td>3.6</td><td>5</td><td>10</td></tr><tr><td>7.2</td><td>5</td><td>10</td></tr><tr><td>10.8</td><td>15</td><td>10</td></tr><tr><td>12.6</td><td>30</td><td>10</td></tr><tr><td>14.4</td><td>- ※</td><td>10</td></tr><tr><td>18.0</td><td>- ※</td><td>10</td></tr><tr><td>19.8</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> <p>※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.</p>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 76 [V]	0.0	15	35	3.6	5	10	7.2	5	10	10.8	15	10	12.6	30	10	14.4	- ※	10	18.0	- ※	10	19.8	- ※	15	--	-	-	--	-	-	--	-	-
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

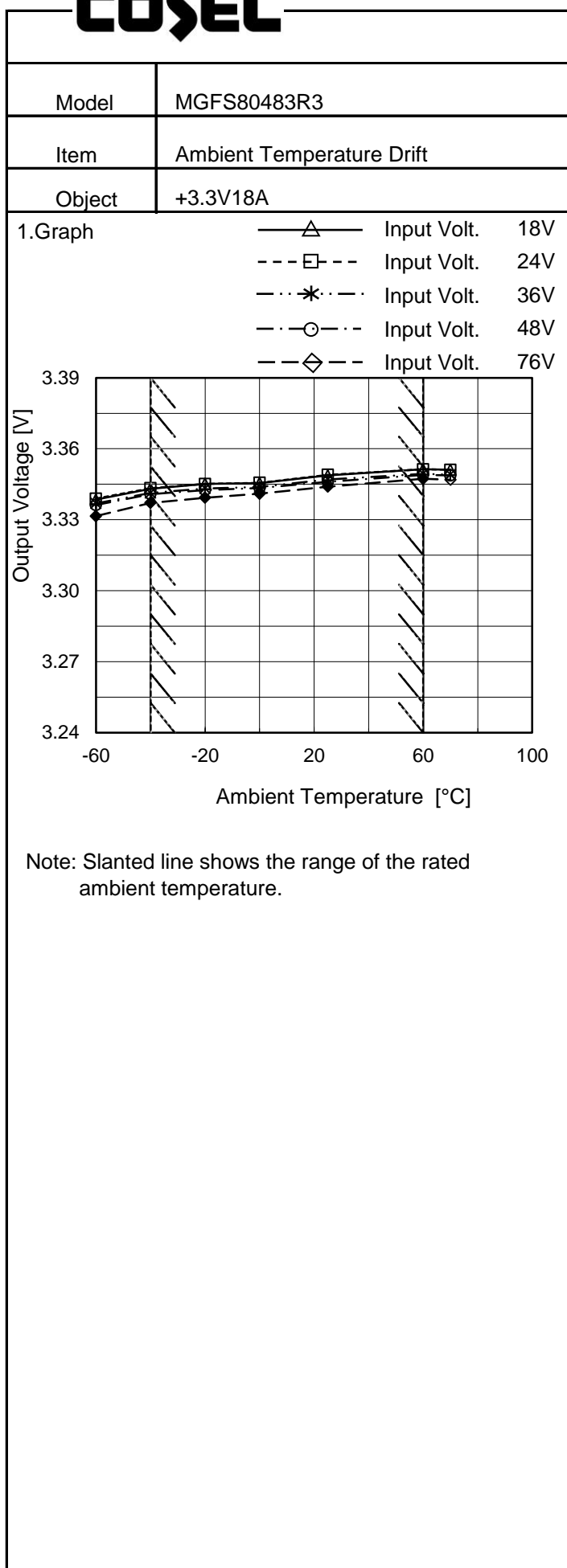
Model		MGFS80483R3																																							
Item		Ripple-Noise																																							
Object		+3.3V18A																																							
1.Graph		2.Values																																							
<div><div><div>△</div><div>Input Volt.</div><div>18V</div></div><div><div>○</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>35</td></tr><tr><td>3.6</td><td>10</td><td>15</td></tr><tr><td>7.2</td><td>10</td><td>15</td></tr><tr><td>10.8</td><td>20</td><td>15</td></tr><tr><td>12.6</td><td>35</td><td>15</td></tr><tr><td>14.4</td><td>- ※</td><td>15</td></tr><tr><td>18.0</td><td>- ※</td><td>15</td></tr><tr><td>19.8</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	35	3.6	10	15	7.2	10	15	10.8	20	15	12.6	35	15	14.4	- ※	15	18.0	- ※	15	19.8	- ※	25	--	-	-	--	-	-	--	-	-
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<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>Fig.Complex Ripple Noise Wave Form</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>																																							

Testing Circuitry Figure B

## 2.Values



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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	3.339	3.339	3.337	3.336	3.332
-40	3.343	3.343	3.341	3.341	3.337
-20	3.345	3.345	3.343	3.343	3.339
0	3.346	3.346	3.344	3.343	3.341
25	3.349	3.349	3.347	3.346	3.344
60	3.351	3.351	3.349	3.349	3.347
70	3.351	3.351	3.349	3.349	3.347
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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



Model		MGFS80483R3	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+3.3V18A	

### 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 - 60°C

Input Voltage : 18 - 76V

Load Current : 0 - 18A

\* 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	60	76	0	3.356	±10	±0.3
Minimum Voltage	-40	76	18.0	3.337		



Model		MGFS80483R3	Temperature 25°C Testing Circuitry Figure A
Item		Time Lapse Drift	
Object		+3.3V18A	
1.Graph			2.Values
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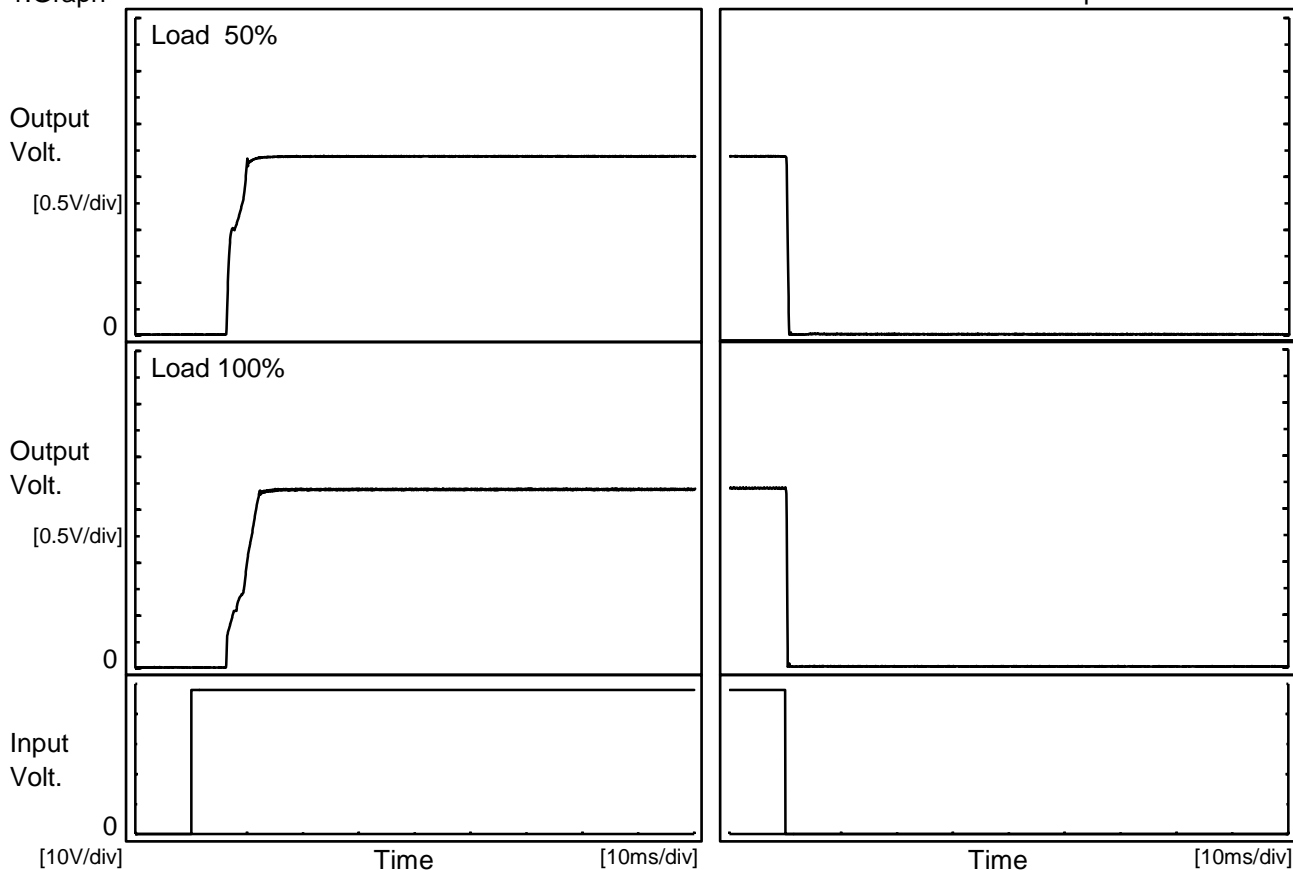




Model	MGFS80483R3	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3.3V18A		

# 1.Graph

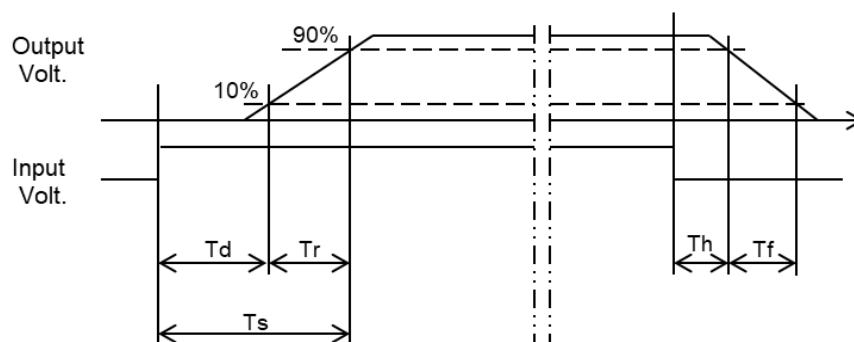
Input Volt. 48 V



# 2.Values

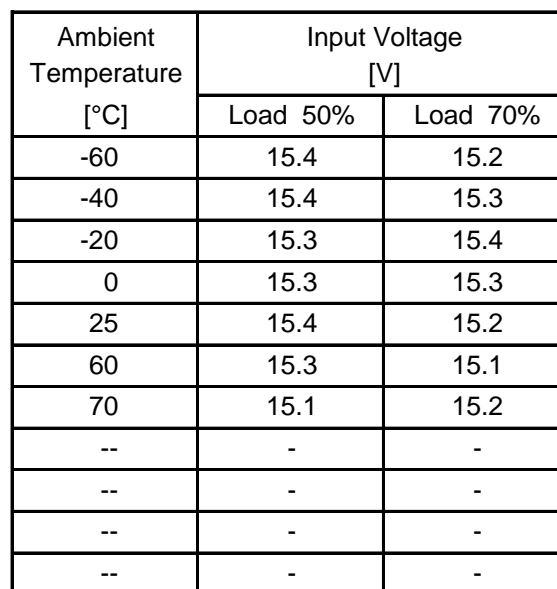
[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.4	3.4	9.8	0.3	0.4
100 %	6.4	5.2	11.6	0.2	0.2

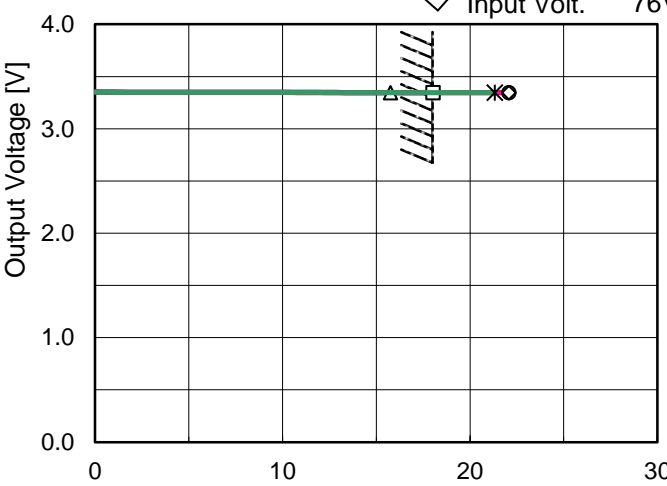


Testing Circuitry Figure A

## 2.Values



- 16 -

Model		MGFS80483R3		Temperature 25°C																																																																																				
Item		Overcurrent Protection		Testing Circuitry Figure A																																																																																				
Object		+3.3V18A																																																																																						
1.Graph		<div><div><div><div><div></div><div>△</div><div>Input Volt. 18V</div></div><div><div></div><div>□</div><div>Input Volt. 24V</div></div><div><div></div><div>*</div><div>Input Volt. 36V</div></div><div><div></div><div>○</div><div>Input Volt. 48V</div></div><div><div></div><div>◇</div><div>Input Volt. 76V</div></div></div><div>Output Voltage [V]</div><div>Load Current [A]</div></div></div>																																																																																						
Note: Slanted line shows the range of the rated load current.		Intermittent operation occurs when overcurrent protection is activated.																																																																																						
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				※2 Maximum output current at 24V input Voltage is 80% of rated load current.																																																																																				
				Refer to instruction manuals for details of input derating.																																																																																				

**LOREL**

Model	MGFS80483R3				
Item	Overvoltage Protection				
Object	+3.3V18A				

Testing Circuitry Figure A

### 1.Graph

Operating Point [%]

Ambient Temperature [°C]

Load 0%

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

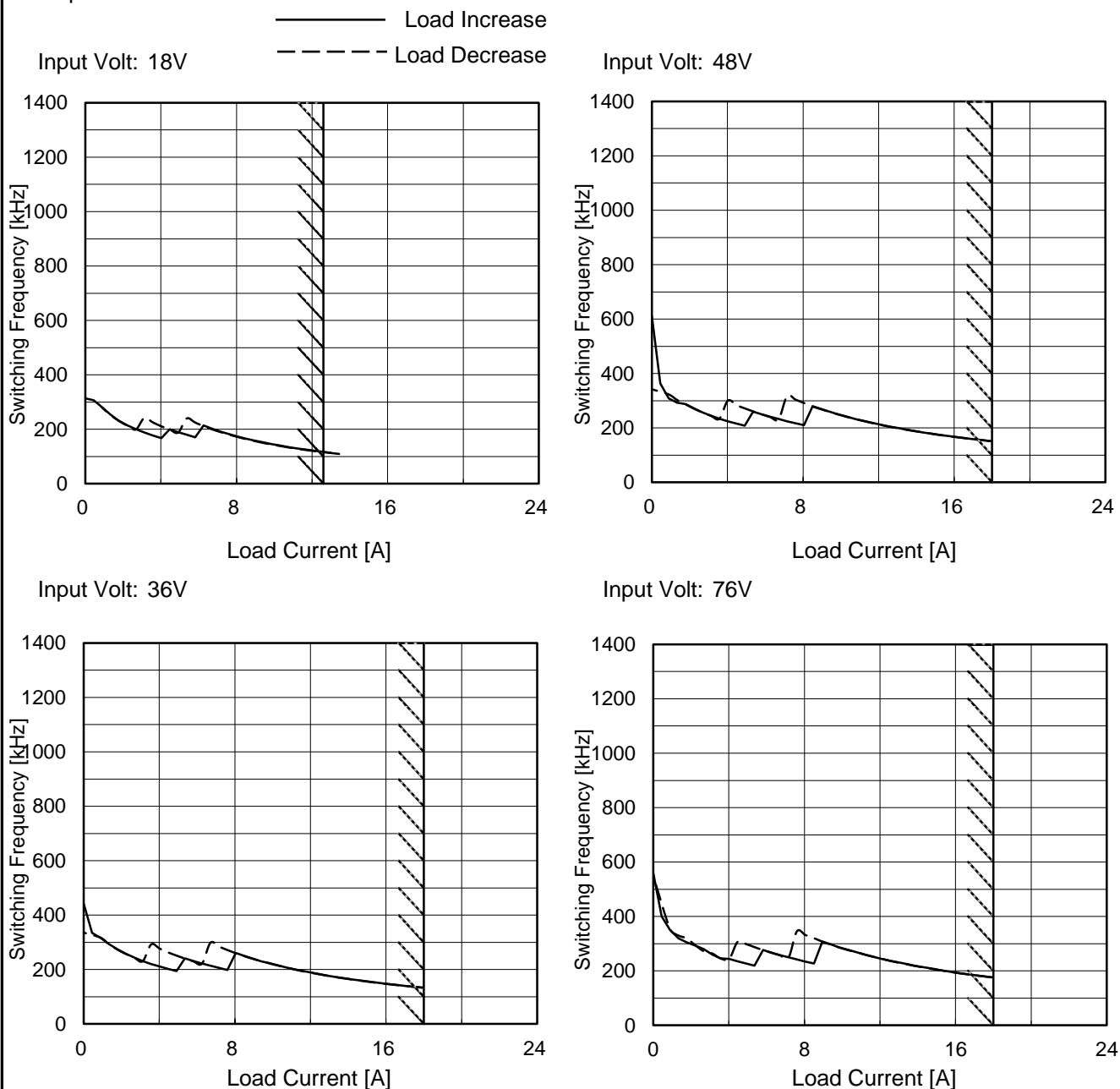
### 2.Values

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	125	125	125	124	124
-40	125	125	125	124	125
-20	125	125	125	125	125
0	126	126	125	126	126
25	126	126	126	126	126
60	126	126	126	126	126
70	126	126	126	126	126
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

# COSEL

Model	MGFS80483R3	Temperature	25°C
Item	Switching frequency (by Load Current)	Testing Circuitry	Figure A
Object	+3.3V18A		

## 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.

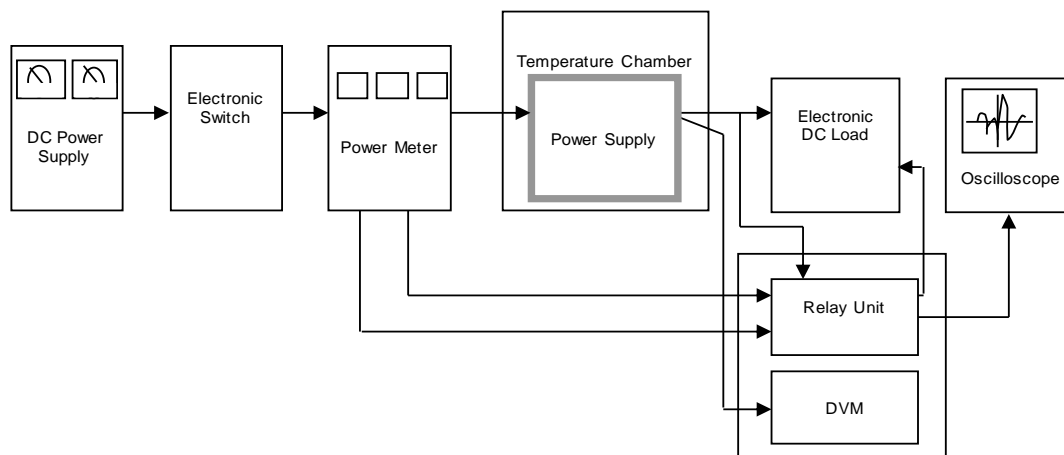


Figure A

Data Acquisition/Control Unit

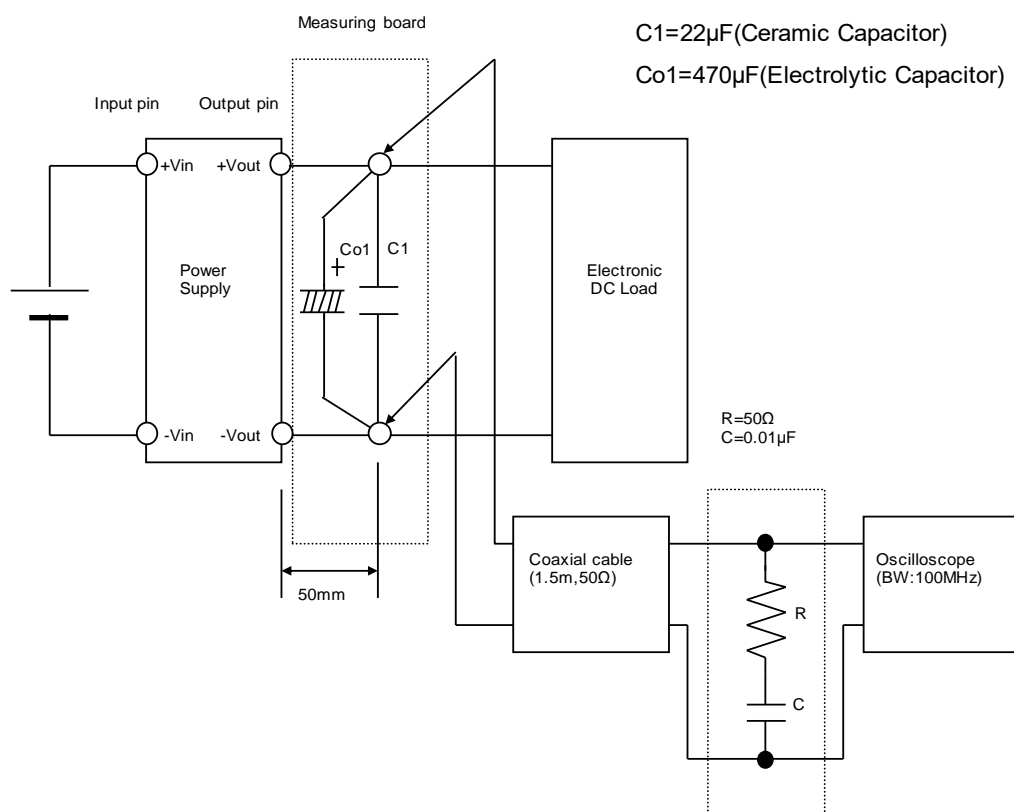


Figure B (Ripple and Ripple noise Characteristic)