

TEST DATA OF MGS15123R3

Regulated DC Power Supply
September 10, 2010

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Kazunari Asano Design Manager

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COSEL CO.,LTD.

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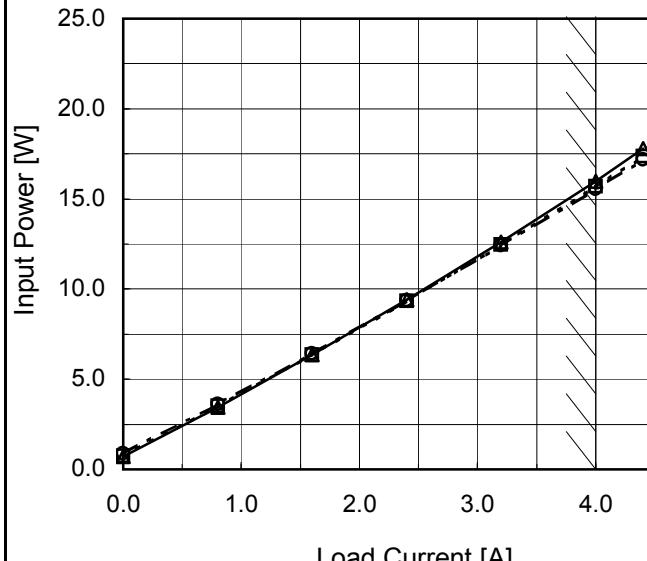
(Final Page 18)

Model	MGS15123R3	Temperature Testing Circuitry 25°C Figure A																																							
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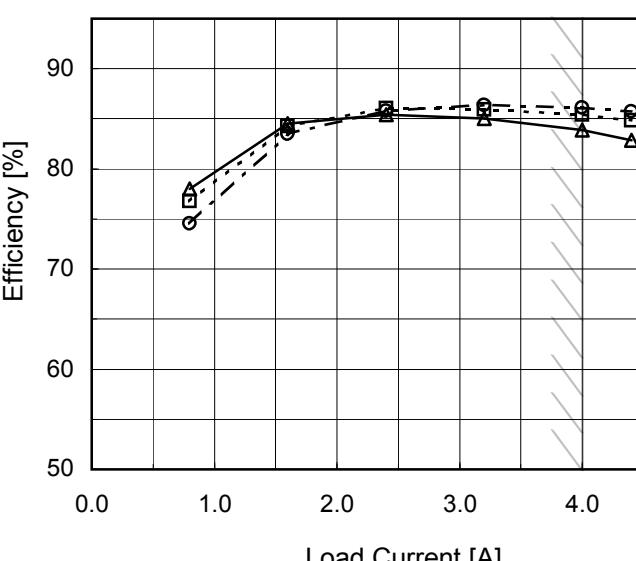
Note: Slanted line shows the range of the rated input voltage.

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
2.0	0.001	0.001	0.001
4.0	0.002	0.001	0.001
6.0	0.002	0.002	0.002
7.0	0.002	0.002	0.002
8.0	0.002	0.002	0.002
8.1	0.002	0.002	2.043
8.3	0.080	0.946	1.942
8.5	0.079	0.922	1.868
9.0	0.076	0.870	1.774
10.0	0.071	0.781	1.582
12.0	0.063	0.650	1.301
14.0	0.057	0.558	1.109
16.0	0.052	0.489	0.967
18.0	0.048	0.436	0.859
20.0	0.045	0.393	0.777
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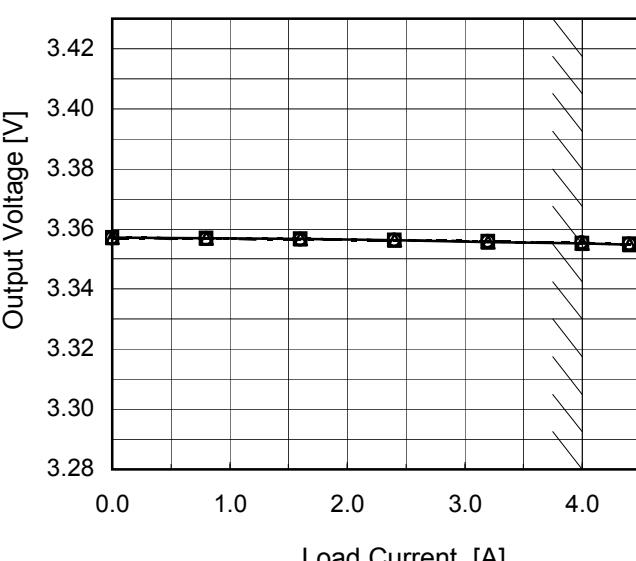
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<p>The graph plots Efficiency [%] on the y-axis (50 to 90) against Input Voltage [V] on the x-axis (6 to 22). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show efficiency increasing slightly with input voltage. A slanted line indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>8.5</td><td>84.8</td><td>83.2</td></tr> <tr><td>9.0</td><td>85.2</td><td>83.8</td></tr> <tr><td>10.0</td><td>85.4</td><td>84.3</td></tr> <tr><td>12.0</td><td>85.3</td><td>85.1</td></tr> <tr><td>15.0</td><td>85.4</td><td>85.7</td></tr> <tr><td>18.0</td><td>85.0</td><td>86.0</td></tr> <tr><td>20.0</td><td>84.9</td><td>86.0</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	8.5	84.8	83.2	9.0	85.2	83.8	10.0	85.4	84.3	12.0	85.3	85.1	15.0	85.4	85.7	18.0	85.0	86.0	20.0	84.9	86.0	--	-	-	--	-	-		
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4.4	82.8	84.8	85.7																																																		
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Note: Slanted line shows the range of the rated load current.

Model	MGS15123R3																																	
Item	Line Regulation	Temperature Testing Circuitry 25°C Figure A																																
Object	+3.3V4A																																	
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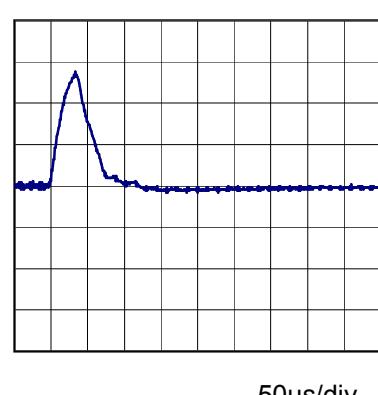
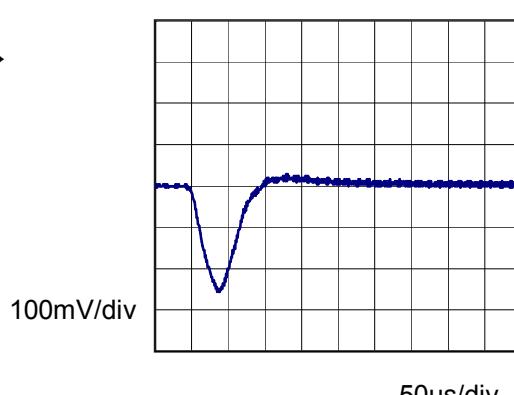
COSSEL

Model	MGS15123R3	Temperature Testing Circuitry 25°C Figure A
Item	Dynamic Load Response	
Object	+3.3V4A	

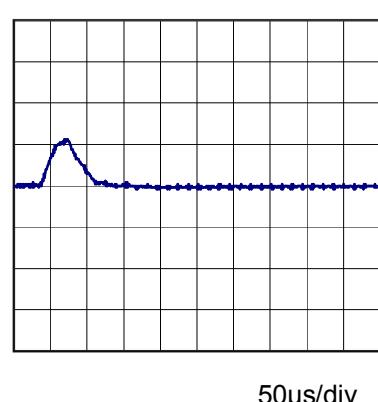
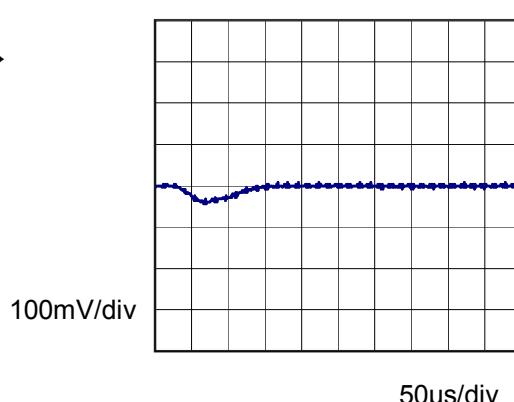
Input Volt. 12 V
 Cycle 1000 ms



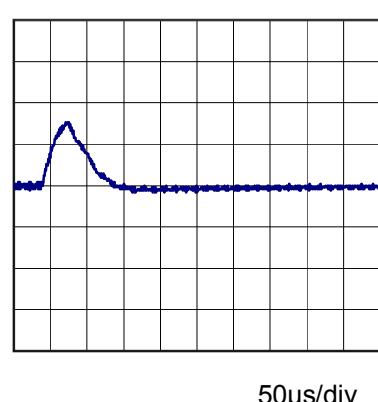
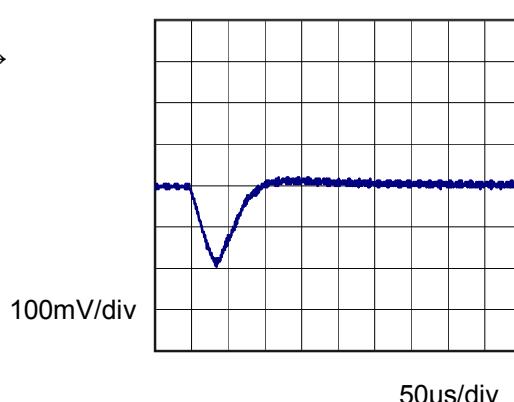
Min. Load (0A) ↔
 Load 100% (4A)



Min. Load (0A) ↔
 Load 50% (2A)



Load 50% (2A) ↔
 Load 100% (4A)



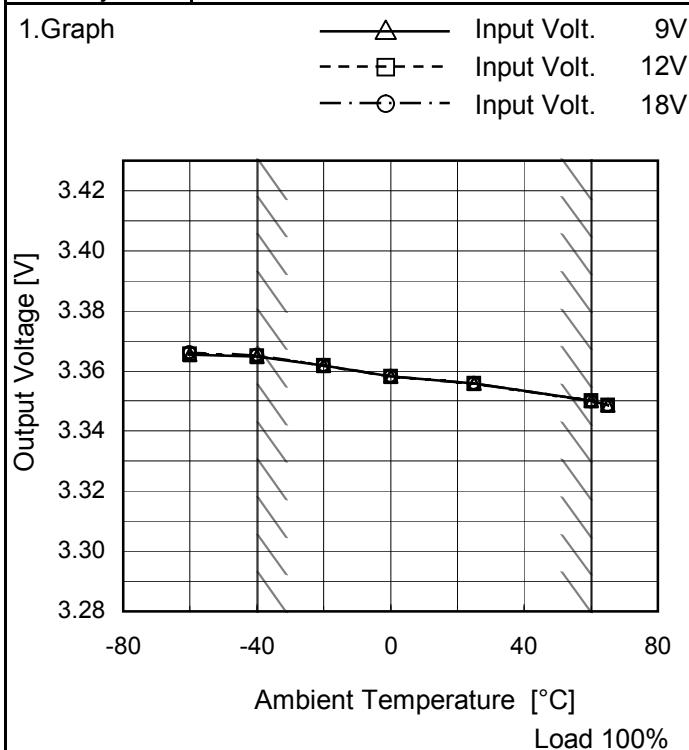
Model	MGS15123R3																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+3.3V4A																																							
1.Graph																																								
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Load Current [A]	Ripple Voltage [mV]																																							
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Model	MGS15123R3	Temperature Testing Circuitry	25°C Figure B																																						
Item	Ripple-Noise																																								
Object	+3.3V4A																																								
1.Graph			2.Values																																						
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The graph shows two curves: one for Input Volt. 9V (solid line with triangle markers) and one for Input Volt. 18V (dashed line with circle markers). The x-axis represents Load Current [A] from 0.0 to 4.0. The y-axis represents Ripple Voltage [mV] from 0 to 100. Both curves show a slight increase in ripple voltage as load current increases, with the 18V curve generally higher than the 9V curve. A vertical dashed line is drawn at approximately 3.8 A, indicating the rated load current range.</p>			<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 9 [V]</th> <th>Input Volt. 18 [V]</th> </tr> </thead> <tbody> <tr> <td>0.0</td> <td>8</td> <td>10</td> </tr> <tr> <td>0.8</td> <td>7</td> <td>10</td> </tr> <tr> <td>1.6</td> <td>7</td> <td>10</td> </tr> <tr> <td>2.4</td> <td>7</td> <td>11</td> </tr> <tr> <td>3.2</td> <td>10</td> <td>11</td> </tr> <tr> <td>4.0</td> <td>12</td> <td>11</td> </tr> <tr> <td>4.4</td> <td>13</td> <td>12</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Load Current [A]	Ripple-Noise [mV]		Input Volt. 9 [V]	Input Volt. 18 [V]	0.0	8	10	0.8	7	10	1.6	7	10	2.4	7	11	3.2	10	11	4.0	12	11	4.4	13	12	--	-	-	--	-	-	--	-	-	--	-	-
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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>Fig.Complex Ripple Noise Wave Form</p>																																									



Model	MGS15123R3	Testing Circuitry Figure B																																						
Item	Ripple Voltage (by Ambient Temp.)																																							
Object	+3.3V4A																																							
1. Graph		2. Values																																						
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C] for MGS15123R3 at Input Volt. 12V. The graph shows two data series: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show a slight increase in ripple voltage as ambient temperature increases from -60°C to 65°C. A slanted line indicates the rated ambient temperature range from -40°C to 0°C.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>-60</td><td>7</td><td>11</td> </tr> <tr> <td>-40</td><td>7</td><td>11</td> </tr> <tr> <td>-20</td><td>6</td><td>10</td> </tr> <tr> <td>0</td><td>6</td><td>9</td> </tr> <tr> <td>25</td><td>6</td><td>8</td> </tr> <tr> <td>60</td><td>6</td><td>7</td> </tr> <tr> <td>65</td><td>6</td><td>7</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> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	7	11	-40	7	11	-20	6	10	0	6	9	25	6	8	60	6	7	65	6	7	--	-	-	--	-	-	--	-	-	--	-	-
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60	6	7																																						
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<p>Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>																																								

Model	MGS15123R3
Item	Ambient Temperature Drift
Object	+3.3V4A



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	3.365	3.366	3.366
-40	3.365	3.365	3.365
-20	3.362	3.362	3.362
0	3.358	3.358	3.358
25	3.356	3.356	3.356
60	3.350	3.350	3.350
65	3.349	3.349	3.349
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model	MGS15123R3	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+3.3V4A	

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 : 9 - 18V

Load Current : 0 - 4A

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

$$\text{* Output Voltage Accuracy (Ration)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2. Values

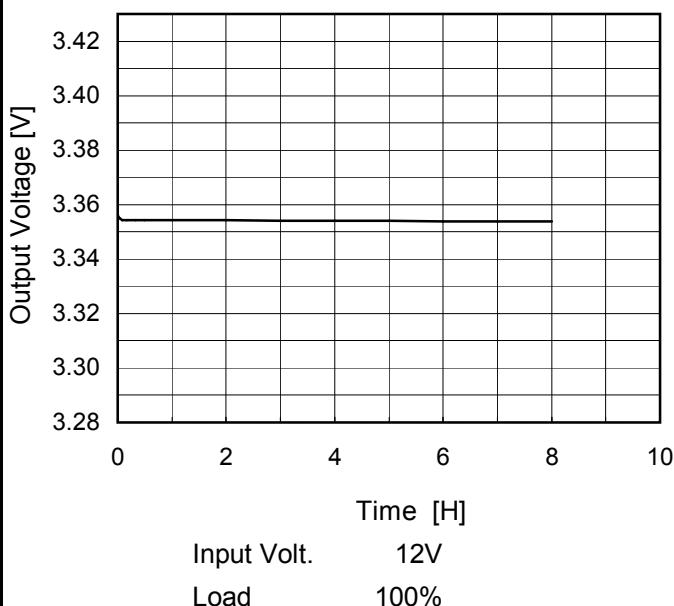
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	9	0	3.367	± 9	± 0.3
Minimum Voltage	60	18	4	3.350		

COSEL

Model	MGS15123R3
Item	Time Lapse Drift
Object	+3.3V4A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

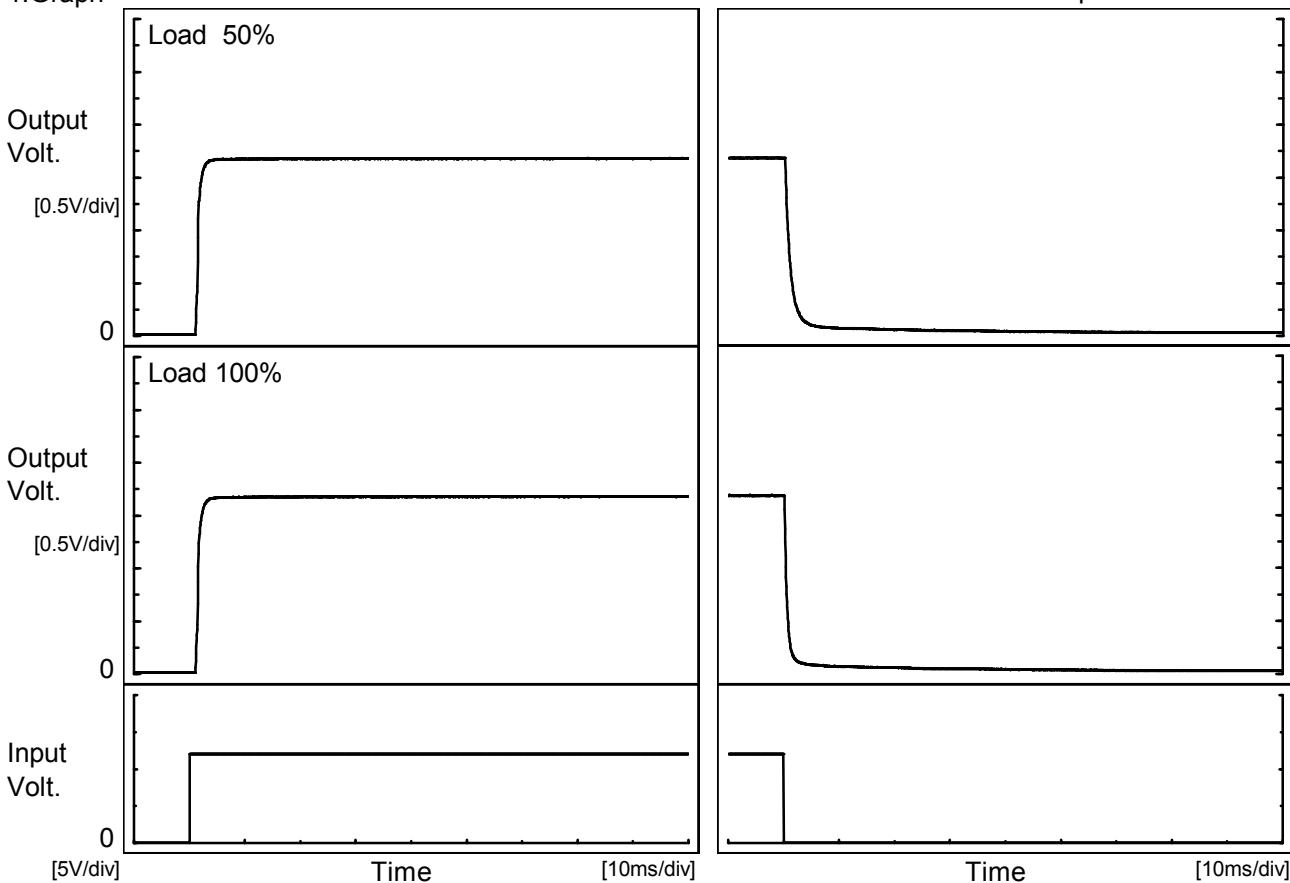
Time since start [H]	Output Voltage [V]
0.0	3.357
0.5	3.354
1.0	3.354
2.0	3.354
3.0	3.354
4.0	3.354
5.0	3.354
6.0	3.354
7.0	3.354
8.0	3.354

COSEL

Model	MGS15123R3
Item	Rise and Fall Time
Object	+3.3V4A

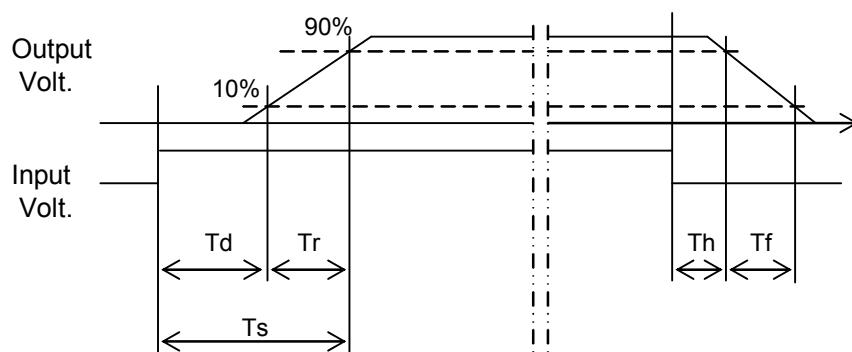
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

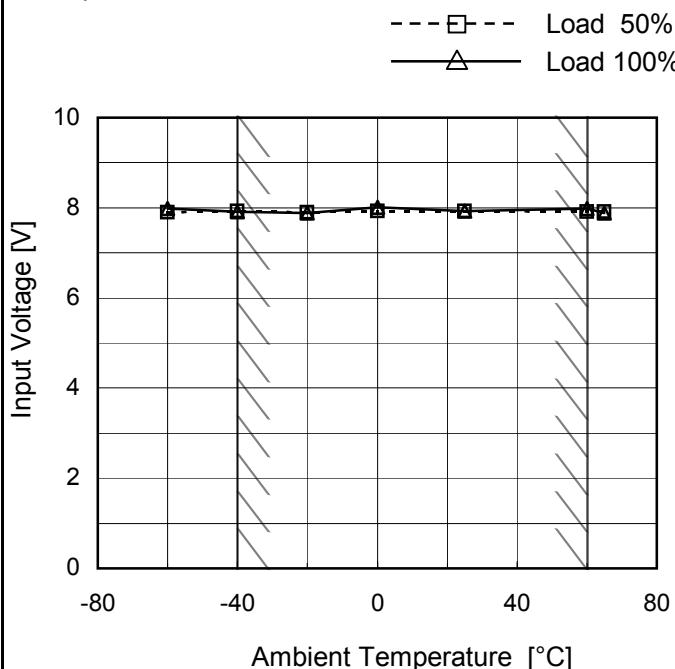
Load	Time	Td	Tr	Ts	Th	Tf
50 %		1.2	1.0	2.2	0.3	2.7
100 %		1.2	1.1	2.3	0.2	1.4



Model	MGS15123R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V4A

Testing Circuitry Figure A

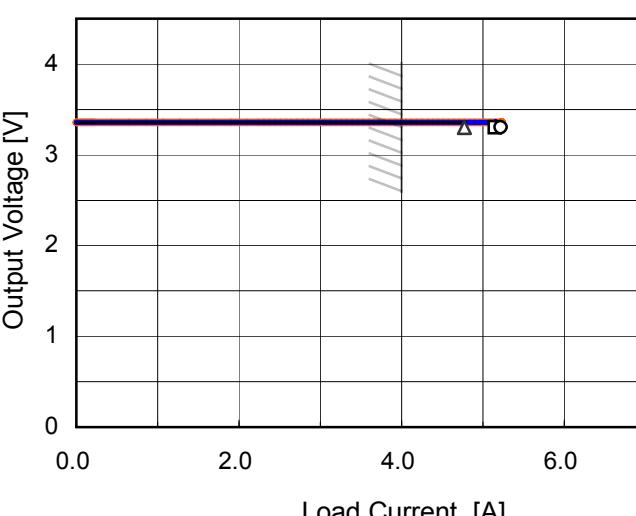
1. Graph



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	7.9	8.0
-40	8.0	8.0
-20	7.9	7.9
0	8.0	8.1
25	8.0	8.0
60	8.0	8.0
65	8.0	7.9
--	-	-
--	-	-
--	-	-
--	-	-

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

Model	MGS15123R3	Temperature Testing Circuitry 25°C Figure A																																																							
Item	Overcurrent Protection																																																								
Object	+3.3V4A																																																								
1.Graph	<p>—△— Input Volt. 9V —□— Input Volt. 12V —○— Input Volt. 18V</p>  <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when overcurrent protection is activated.</p>	2.Values																																																							
		<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 9[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 18[V]</th> </tr> </thead> <tbody> <tr><td>3.30</td><td>4.77</td><td>5.15</td><td>5.22</td></tr> <tr><td>3.14</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2.97</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2.64</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2.31</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1.98</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1.65</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1.32</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>0.99</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>0.66</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>0.33</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Output Voltage [V]	Load Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	3.30	4.77	5.15	5.22	3.14	-	-	-	2.97	-	-	-	2.64	-	-	-	2.31	-	-	-	1.98	-	-	-	1.65	-	-	-	1.32	-	-	-	0.99	-	-	-	0.66	-	-	-	0.33	-	-	-	0.00	-	-	-
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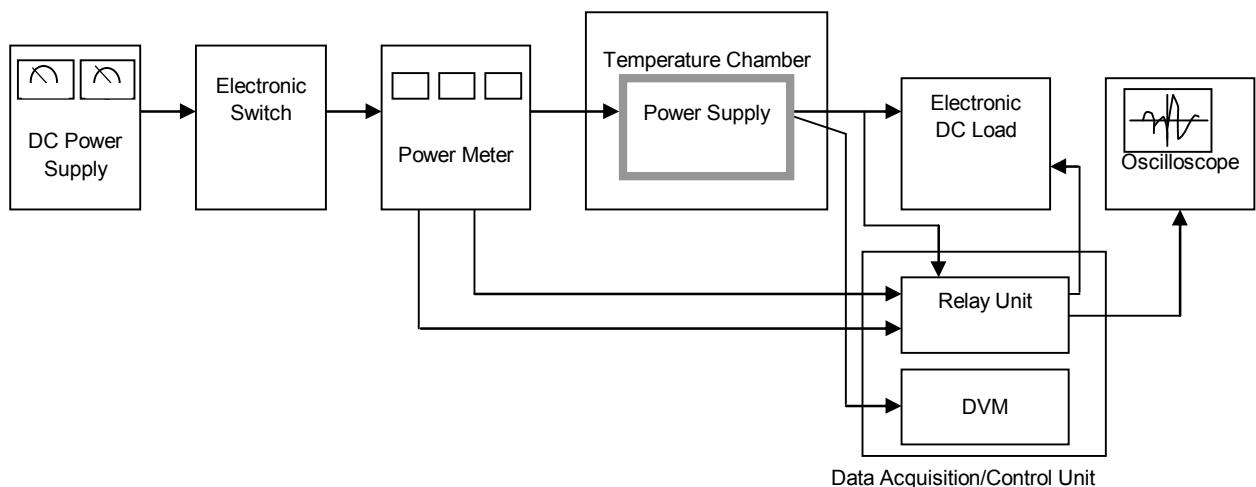


Figure A

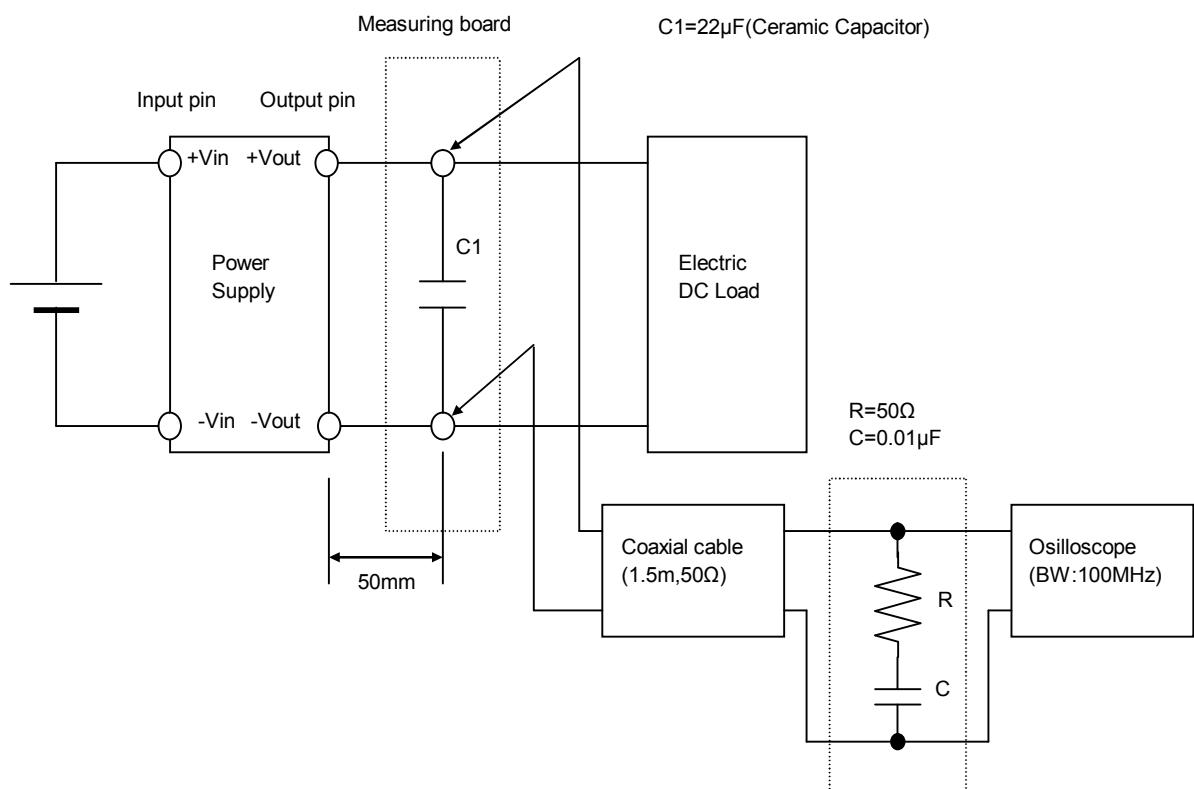


Figure B (Ripple and Ripple noise Characteristic)