



TEST DATA OF MGS10123R3

Regulated DC Power Supply
July 14, 2016

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Takayuki Fukuda Design Manager

Prepared by : Ryosuke Nakao
Ryosuke Nakao Design Engineer

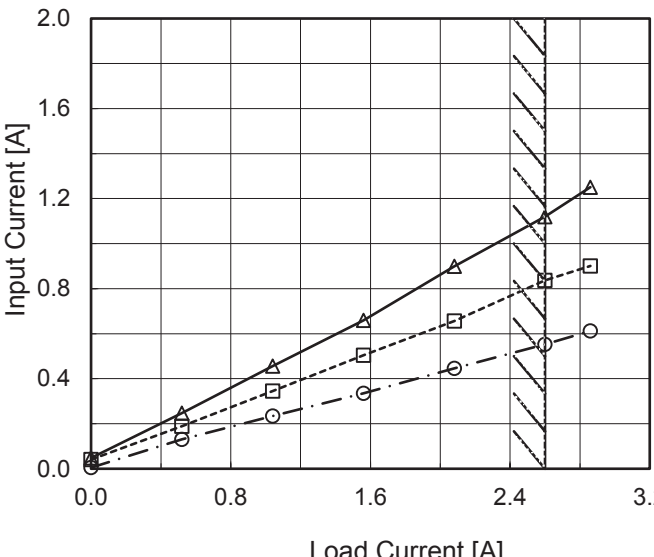
COSEL CO.,LTD.

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Model		MGS10123R3	Temperature 25°C																																																																																
Item		Input Current (by Input Voltage)	Testing Circuitry Figure A																																																																																
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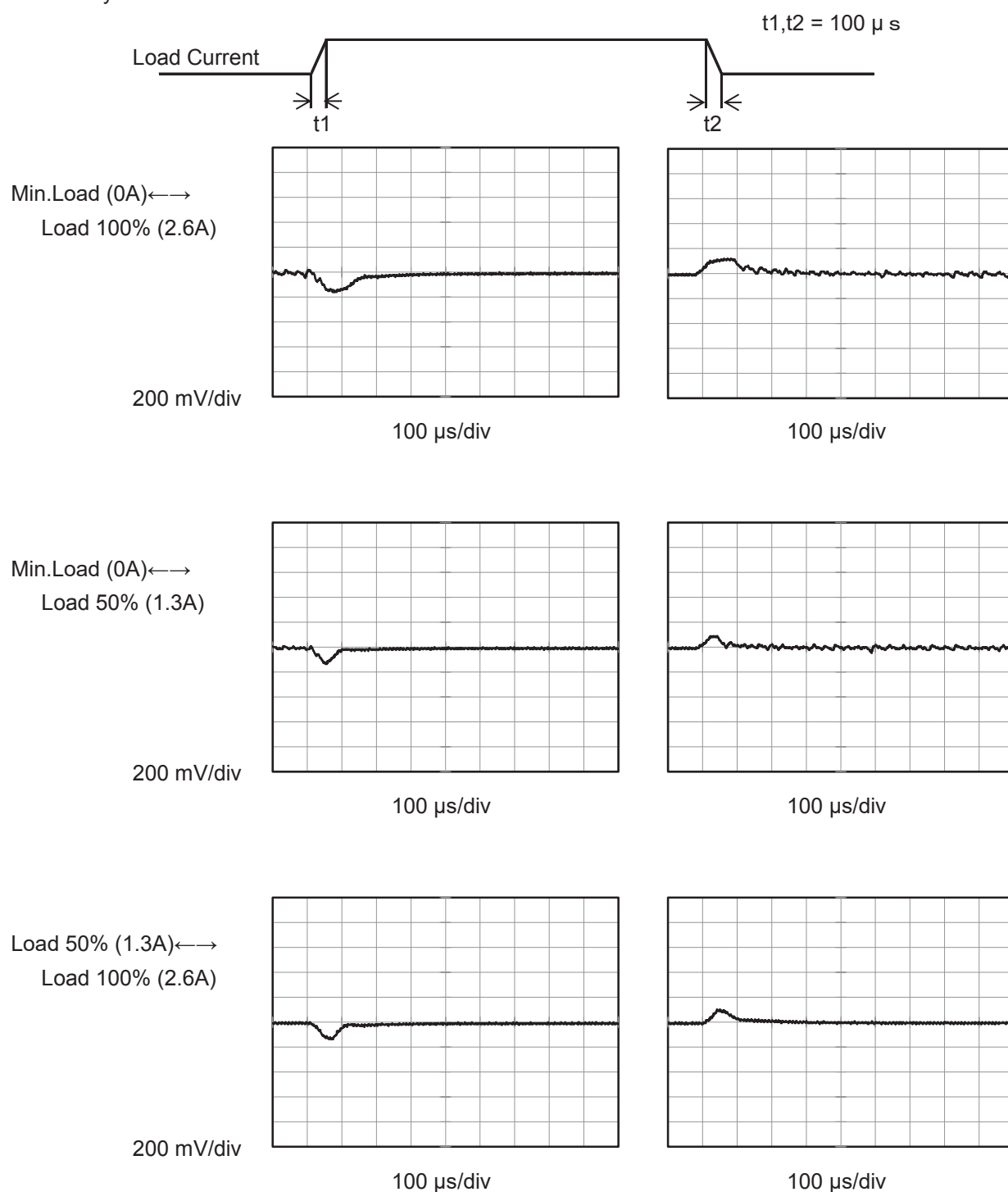
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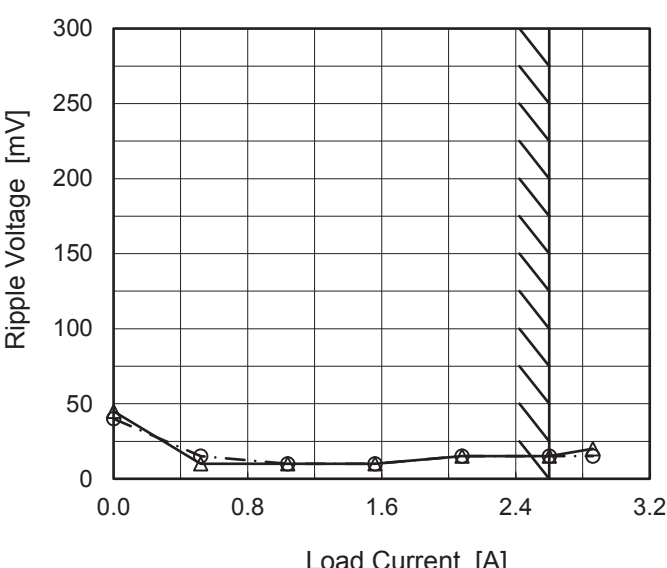
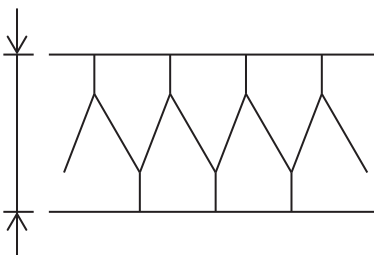


Model	MGS10123R3	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+3.3V2.6A	

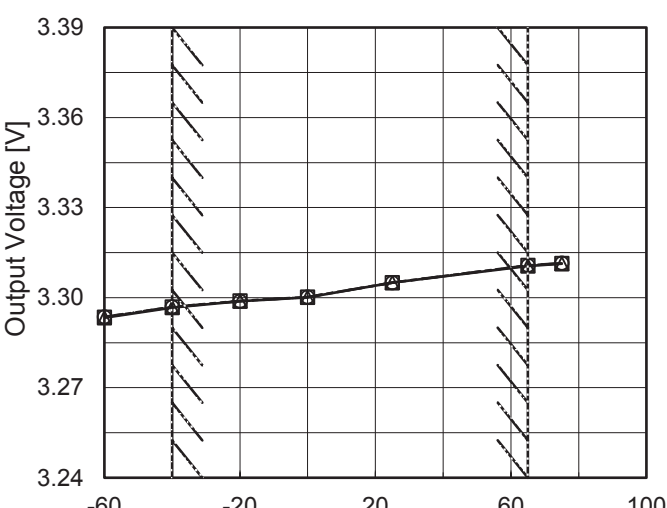
Input Volt. 12 V
Cycle 100 ms



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Item		Ripple Voltage (by Load Current)																																							
Object		+3.3V2.6A																																							
1.Graph		<div><div><div><div><div></div><div>Input Volt. 9V</div></div><div><div></div><div>Input Volt. 18V</div></div></div><div><table border="1"><caption>Ripple Voltage Data from Graph</caption><thead><tr><th>Load Current [A]</th><th>9V Input [mV]</th><th>18V Input [mV]</th></tr></thead><tbody><tr><td>0.00</td><td>45</td><td>40</td></tr><tr><td>0.52</td><td>5</td><td>10</td></tr><tr><td>1.04</td><td>5</td><td>5</td></tr><tr><td>1.56</td><td>5</td><td>5</td></tr><tr><td>2.08</td><td>10</td><td>5</td></tr><tr><td>2.60</td><td>10</td><td>5</td></tr><tr><td>2.86</td><td>10</td><td>5</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></div></div></div>	Load Current [A]	9V Input [mV]	18V Input [mV]	0.00	45	40	0.52	5	10	1.04	5	5	1.56	5	5	2.08	10	5	2.60	10	5	2.86	10	5	--	-	-	--	-	-	--	-	-	--	-	-	2.Values		
Load Current [A]	9V Input [mV]	18V Input [mV]																																							
0.00	45	40																																							
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		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 9 [V]</th><th>Input Volt. 18 [V]</th></tr><tr><td>0.00</td><td>45</td><td>40</td></tr><tr><td>0.52</td><td>5</td><td>10</td></tr><tr><td>1.04</td><td>5</td><td>5</td></tr><tr><td>1.56</td><td>5</td><td>5</td></tr><tr><td>2.08</td><td>10</td><td>5</td></tr><tr><td>2.60</td><td>10</td><td>5</td></tr><tr><td>2.86</td><td>10</td><td>5</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 Voltage [mV]		Input Volt. 9 [V]	Input Volt. 18 [V]	0.00	45	40	0.52	5	10	1.04	5	5	1.56	5	5	2.08	10	5	2.60	10	5	2.86	10	5	--	-	-	--	-	-	--	-	-	--	-	-	
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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.																																									
<div><div>Ripple [mVp-p]</div><div></div></div>																																									
Fig.Complex Ripple Wave Form																																									

Model		MGS10123R3																																							
Item		Ripple-Noise																																							
Object		+3.3V2.6A																																							
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 9V</div><div>- -○- - Input Volt. 18V</div></div><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></div>		<table><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><tr><td>0.00</td><td>45</td><td>40</td></tr><tr><td>0.52</td><td>10</td><td>15</td></tr><tr><td>1.04</td><td>10</td><td>10</td></tr><tr><td>1.56</td><td>10</td><td>10</td></tr><tr><td>2.08</td><td>15</td><td>15</td></tr><tr><td>2.60</td><td>15</td><td>15</td></tr><tr><td>2.86</td><td>20</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. 9 [V]	Input Volt. 18 [V]	0.00	45	40	0.52	10	15	1.04	10	10	1.56	10	10	2.08	15	15	2.60	15	15	2.86	20	15	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
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Model		MGS10123R3
Item		Ripple Voltage (by Ambient Temp.)
Object		+3.3V2.6A
1.Graph		2.Values

Model		MGS10123R3	Testing Circuitry Figure A
Item		Ambient Temperature Drift	
Object		+3.3V2.6A	
1.Graph			
		<div><div>—△—</div>Input Volt. 9V</div> <div><div>---□---</div>Input Volt. 12V</div> <div><div>-·-○-·-</div>Input Volt. 18V</div>	
			
		Ambient Temperature [°C]	
		Load 100%	
Note: Slanted line shows the range of the rated ambient temperature.			

2.Values																																																				
	<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>-60</td><td>3.293</td><td>3.294</td><td>3.294</td></tr><tr><td>-40</td><td>3.297</td><td>3.297</td><td>3.297</td></tr><tr><td>-20</td><td>3.299</td><td>3.299</td><td>3.299</td></tr><tr><td>0</td><td>3.300</td><td>3.300</td><td>3.300</td></tr><tr><td>25</td><td>3.305</td><td>3.305</td><td>3.305</td></tr><tr><td>65</td><td>3.311</td><td>3.311</td><td>3.311</td></tr><tr><td>75</td><td>3.311</td><td>3.311</td><td>3.312</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>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	-60	3.293	3.294	3.294	-40	3.297	3.297	3.297	-20	3.299	3.299	3.299	0	3.300	3.300	3.300	25	3.305	3.305	3.305	65	3.311	3.311	3.311	75	3.311	3.311	3.312	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																			
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--	-	-	-																																																	



Model		MGS10123R3	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+3.3V2.6A	

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 : 9 - 18V

Load Current : 0 - 2.6A

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

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

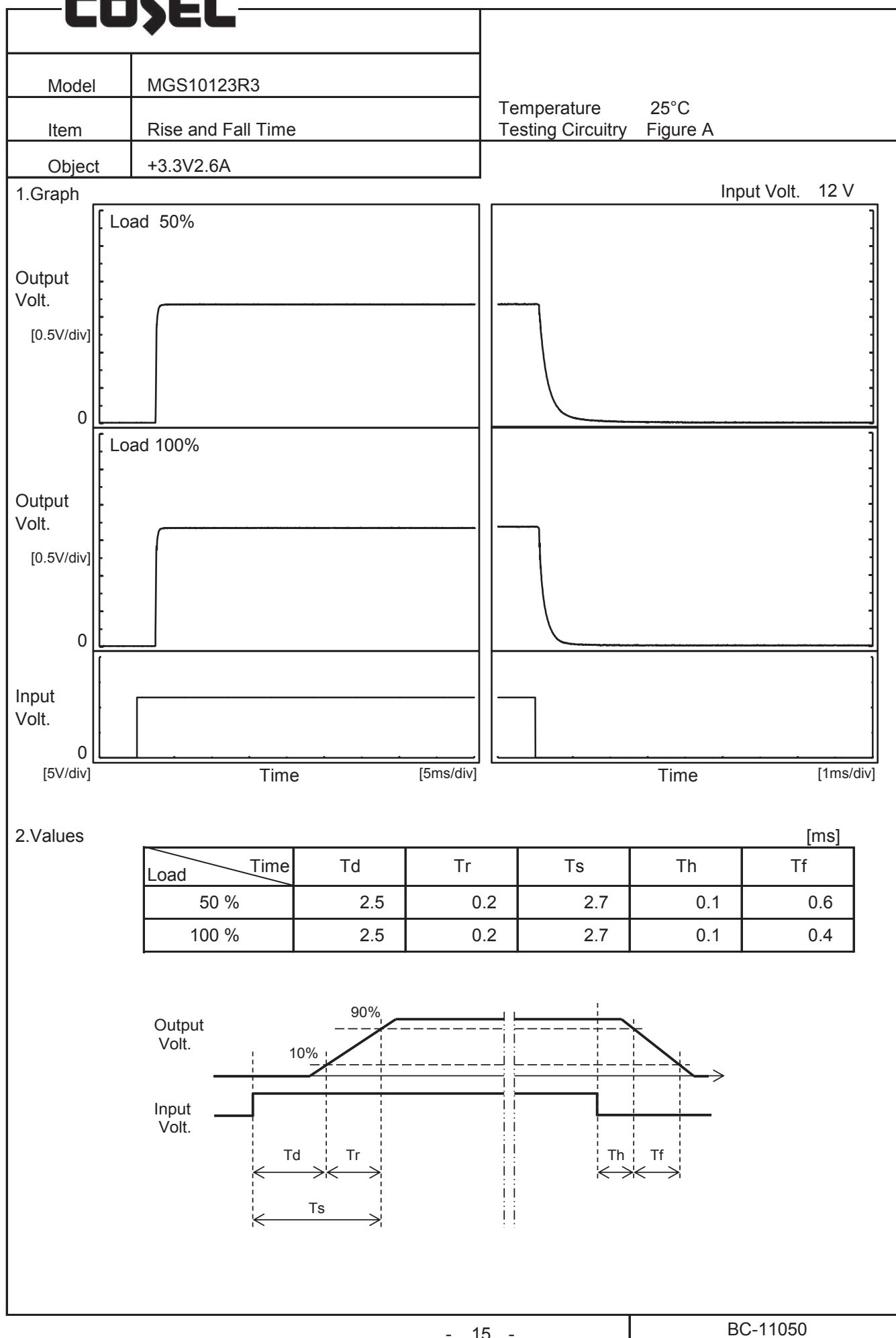
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	65	18	0	3.316	±10	±0.3
Minimum Voltage	-40	9	2.6	3.297		

Model		MGS10123R3	Temperature25°C Testing CircuitryFigure A																						
Item		Time Lapse Drift																							
Object		+3.3V2.6A																							
1.Graph			2.Values																						
<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>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>Output Voltage [V]</div><div>Time [H]</div></div><div><div>Input Volt.12V</div><div>Load100%</div></div></div>			<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>3.302</td></tr><tr><td>0.5</td><td>3.304</td></tr><tr><td>1.0</td><td>3.304</td></tr><tr><td>2.0</td><td>3.304</td></tr><tr><td>3.0</td><td>3.304</td></tr><tr><td>4.0</td><td>3.304</td></tr><tr><td>5.0</td><td>3.304</td></tr><tr><td>6.0</td><td>3.304</td></tr><tr><td>7.0</td><td>3.304</td></tr><tr><td>8.0</td><td>3.304</td></tr></table>	Time since start [H]	Output Voltage [V]	0.0	3.302	0.5	3.304	1.0	3.304	2.0	3.304	3.0	3.304	4.0	3.304	5.0	3.304	6.0	3.304	7.0	3.304	8.0	3.304
Time since start [H]	Output Voltage [V]																								
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7.0	3.304																								
8.0	3.304																								

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COSEL

<div>COSEL</div>		
Model	MGS10123R3	
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+3.3V2.6A	
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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			<table><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><tr><td>3.30</td><td>2.60</td><td>2.61</td><td>2.61</td></tr><tr><td>3.14</td><td>3.34</td><td>3.47</td><td>3.26</td></tr><tr><td>2.97</td><td>3.44</td><td>3.55</td><td>3.32</td></tr><tr><td>2.64</td><td>3.64</td><td>3.73</td><td>3.45</td></tr><tr><td>2.31</td><td>3.87</td><td>3.91</td><td>3.58</td></tr><tr><td>1.98</td><td>4.10</td><td>4.10</td><td>3.73</td></tr><tr><td>1.65</td><td>4.34</td><td>4.31</td><td>3.88</td></tr><tr><td>1.32</td><td>4.48</td><td>4.42</td><td>3.97</td></tr><tr><td>0.99</td><td>4.58</td><td>4.51</td><td>4.02</td></tr><tr><td>0.66</td><td>4.74</td><td>4.62</td><td>4.10</td></tr><tr><td>0.33</td><td>4.95</td><td>4.80</td><td>4.24</td></tr><tr><td>0.00</td><td>4.70</td><td>4.93</td><td>4.35</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	3.30	2.60	2.61	2.61	3.14	3.34	3.47	3.26	2.97	3.44	3.55	3.32	2.64	3.64	3.73	3.45	2.31	3.87	3.91	3.58	1.98	4.10	4.10	3.73	1.65	4.34	4.31	3.88	1.32	4.48	4.42	3.97	0.99	4.58	4.51	4.02	0.66	4.74	4.62	4.10	0.33	4.95	4.80	4.24	0.00	4.70	4.93	4.35
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<div>Note: Slanted line shows the range of the rated load current.</div> <div>-When load current is low, MG operates intermittently, so switching frequency would not become constant.</div>																																																						

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BC-11050

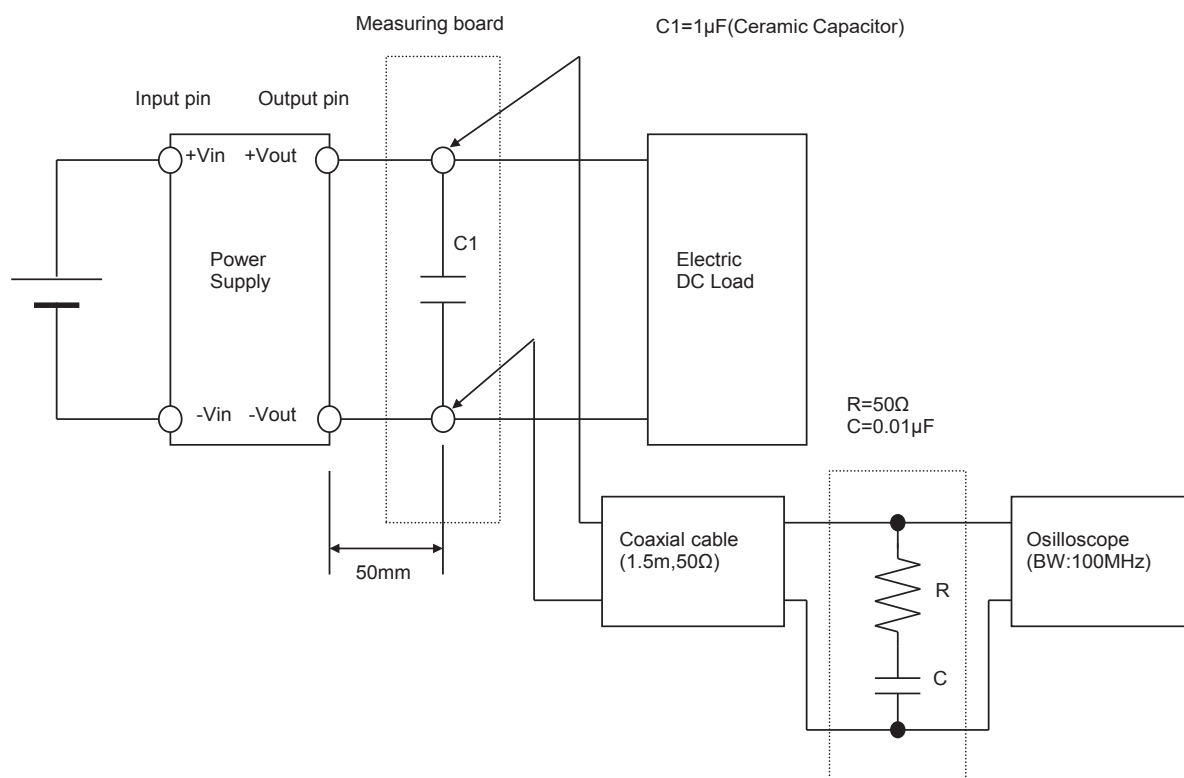
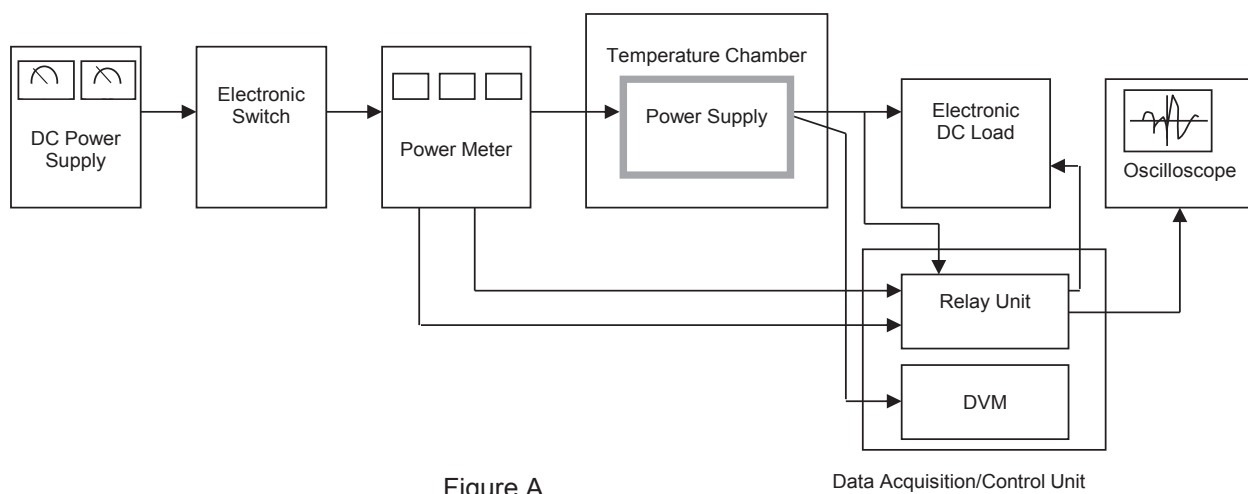


Figure B (Ripple and Ripple noise Characteristic)