

TEST DATA OF MGFW1R52415

Regulated DC Power Supply
December 28, 2016

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

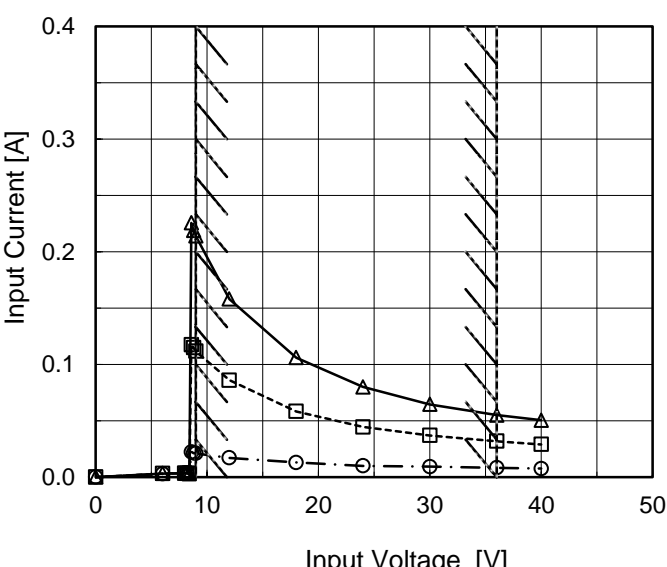
Prepared by : Takaaki Sekiguchi
Takaaki Sekiguchi Design Engineer

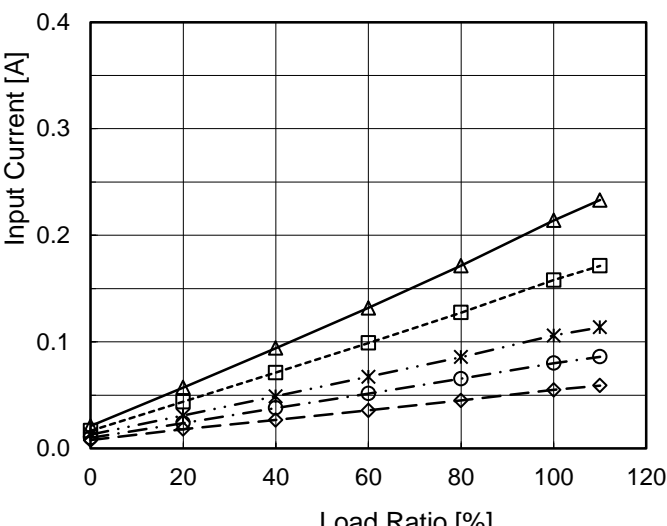
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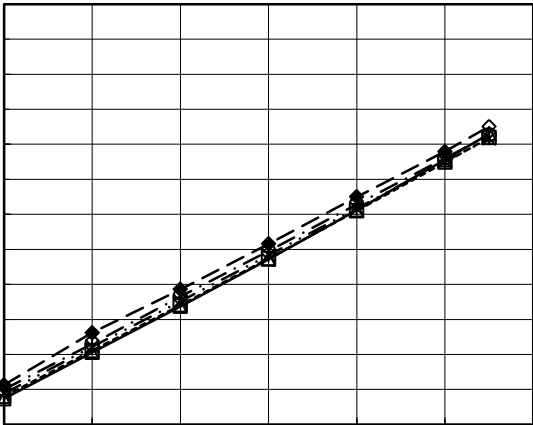
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Model		MGFW1R52415		Temperature 25°C																																																																																
Item		Input Current (by Input Voltage)		Testing Circuitry Figure A																																																																																
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		<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>6.0</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>8.0</td><td>0.004</td><td>0.004</td><td>0.003</td></tr><tr><td>8.2</td><td>0.004</td><td>0.003</td><td>0.004</td></tr><tr><td>8.4</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>8.6</td><td>0.022</td><td>0.118</td><td>0.226</td></tr><tr><td>8.8</td><td>0.021</td><td>0.115</td><td>0.219</td></tr><tr><td>9.0</td><td>0.021</td><td>0.112</td><td>0.214</td></tr><tr><td>12.0</td><td>0.017</td><td>0.086</td><td>0.158</td></tr><tr><td>18.0</td><td>0.013</td><td>0.058</td><td>0.106</td></tr><tr><td>24.0</td><td>0.010</td><td>0.045</td><td>0.080</td></tr><tr><td>30.0</td><td>0.009</td><td>0.037</td><td>0.065</td></tr><tr><td>36.0</td><td>0.008</td><td>0.032</td><td>0.055</td></tr><tr><td>40.0</td><td>0.008</td><td>0.029</td><td>0.051</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	6.0	0.003	0.003	0.003	8.0	0.004	0.004	0.003	8.2	0.004	0.003	0.004	8.4	0.003	0.003	0.003	8.6	0.022	0.118	0.226	8.8	0.021	0.115	0.219	9.0	0.021	0.112	0.214	12.0	0.017	0.086	0.158	18.0	0.013	0.058	0.106	24.0	0.010	0.045	0.080	30.0	0.009	0.037	0.065	36.0	0.008	0.032	0.055	40.0	0.008	0.029	0.051	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model		MGFW1R52415				
Item		Input Current (by Load Ratio)				
Object						
1.Graph						
		—△—	Input Volt. 9V			
		---□---	Input Volt. 12V			
		-·-*·-	Input Volt. 18V			
		-·-○-·-	Input Volt. 24V			
		--◇--	Input Volt. 36V			
						
2.Values						
Load Ratio [%]		Input Current [A]				
		Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0		0.021	0.017	0.013	0.010	0.008
20		0.057	0.044	0.031	0.024	0.018
40		0.094	0.071	0.049	0.038	0.027
60		0.132	0.099	0.067	0.052	0.036
80		0.172	0.128	0.086	0.066	0.045
100		0.214	0.158	0.106	0.080	0.055
110		0.233	0.171	0.114	0.086	0.059
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Item		Input Power (by Load Ratio)		Testing Circuitry Figure A																																																																														
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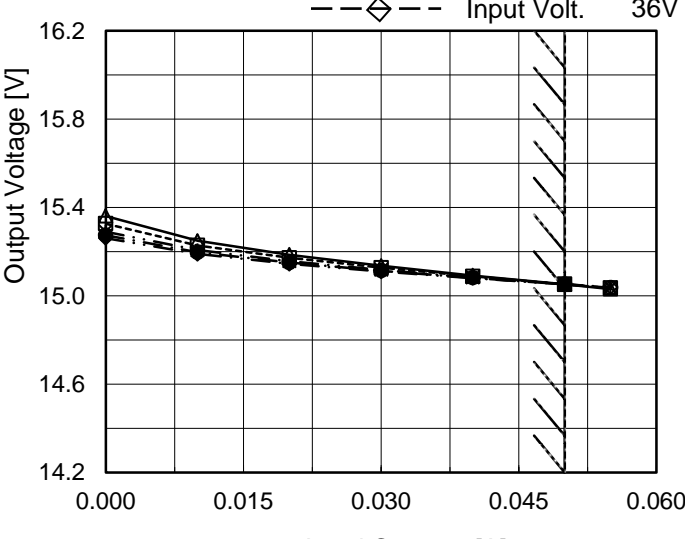
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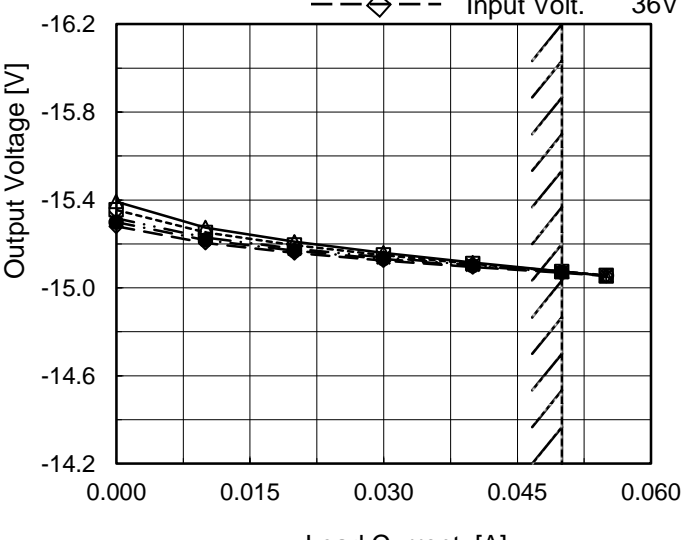
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BC-10971

Model		MGFW1R52415		Temperature 25°C																																																																														
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BC-10971

COSEL

Model	MGFW1R52415	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+15V0.05A	

Input Volt. 24 V
-15V:rated load current.
Cycle 100 ms

$t_1, t_2 = 100 \mu s$



Min.Load (0A) ←→
Load 100% (0.05A)

200 mV/div

4 ms/div

4 ms/div

Min.Load (0A) ←→
Load 50% (0.025A)

200 mV/div

4 ms/div

4 ms/div

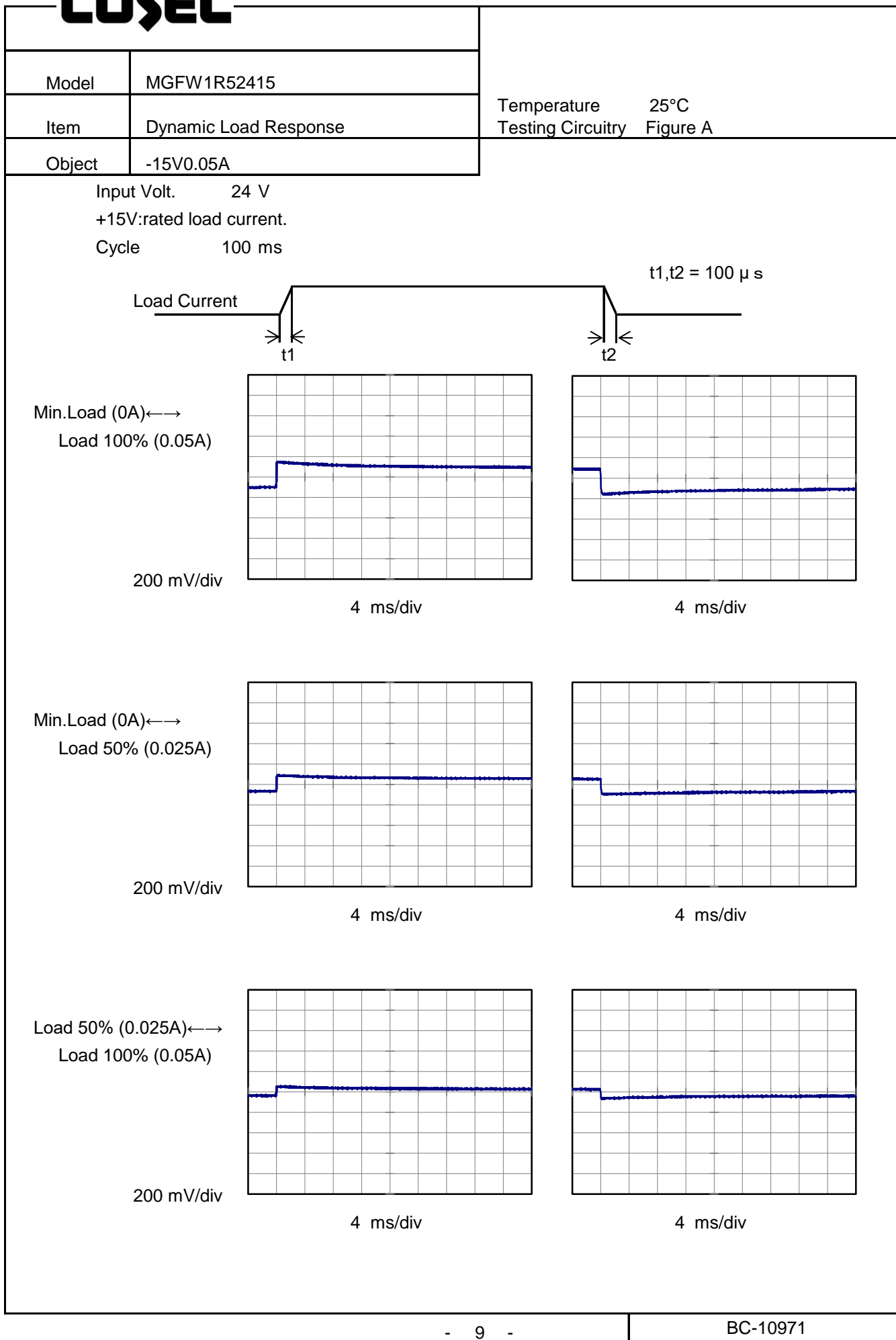
Load 50% (0.025A) ←→
Load 100% (0.05A)

200 mV/div

4 ms/div

4 ms/div

COSEL



Model		MGFW1R52415																																							
Item		Ripple Voltage (by Load Current)																																							
Object		+15V0.05A																																							
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<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> <p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

Model		MGFW1R52415		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
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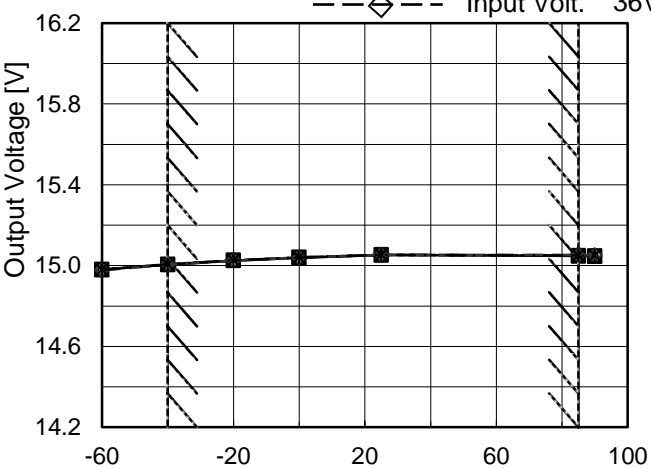
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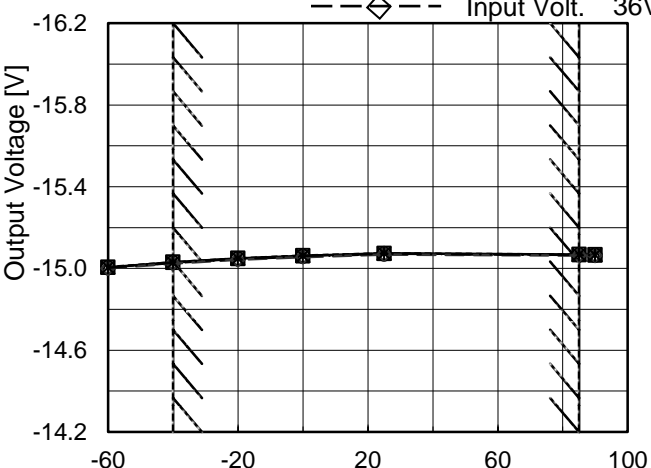
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Input Volt. 24V

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



Model		MGFW1R52415																																																															
Item		Output Voltage Accuracy		Testing Circuitry Figure A																																																													
<p>1. Output Voltage Accuracy</p> <p>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.</p> <p>Temperature : -40 - 85°C</p> <p>Input Voltage : 9 - 36V</p> <p>Load Current (AVR 1) : 0 - 0.05A (AVR 2) : 0 - 0.05A</p> <p>* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$</p> <p>* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$</p>																																																																	
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Model		MGFW1R52415		Temperature Testing Circuitry	25°C Figure A																						
Item		Time Lapse Drift																									
Object		+15V0.05A																									
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Time since start [H]	Output Voltage [V]																										
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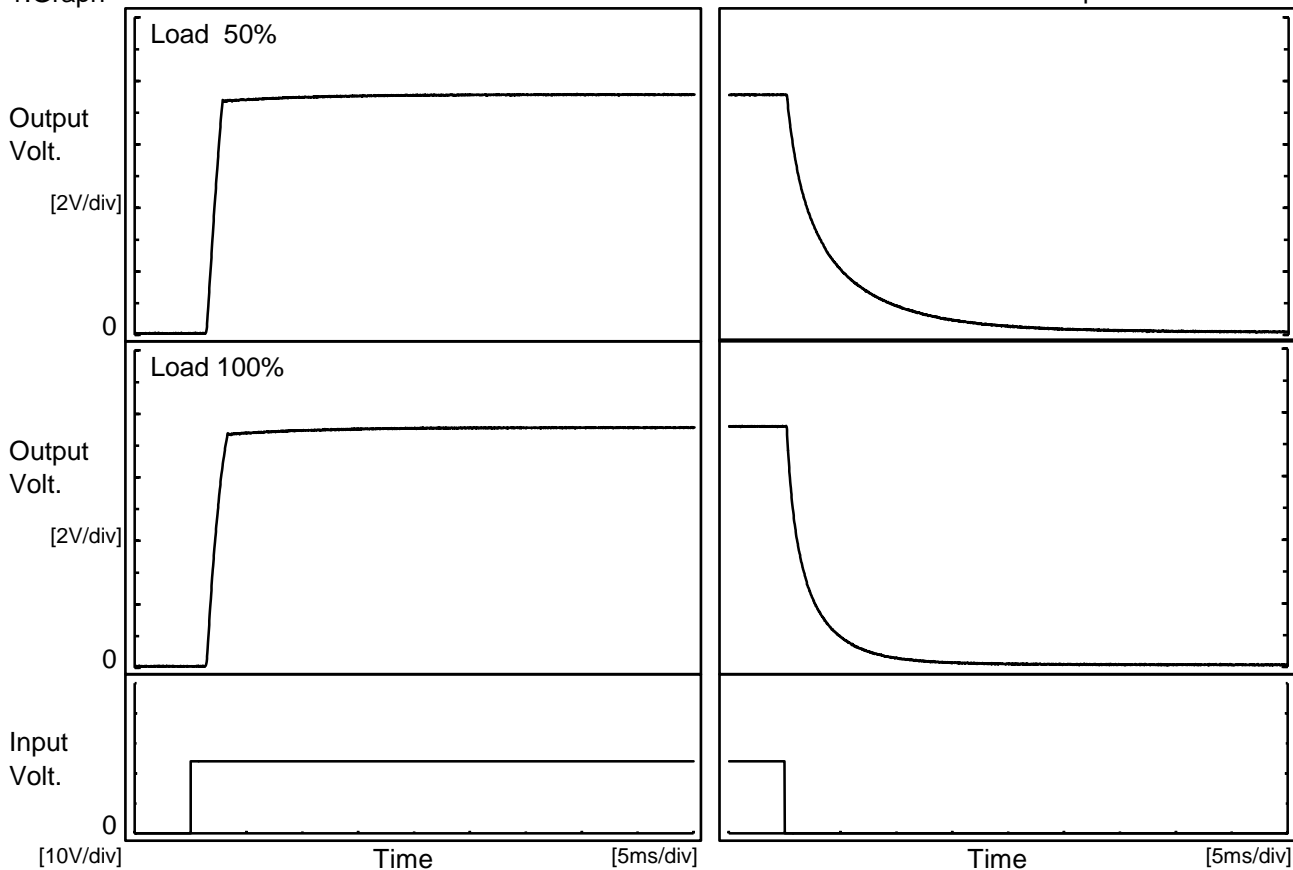
- 17 -

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COSEL

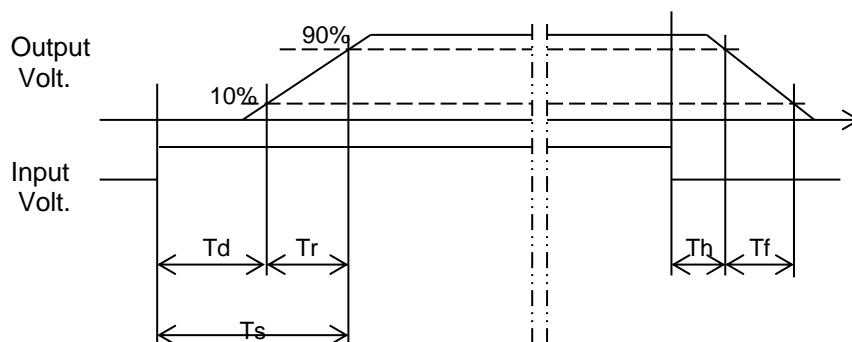
Model	MGFW1R52415	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V0.05A		

1.Graph



2.Values

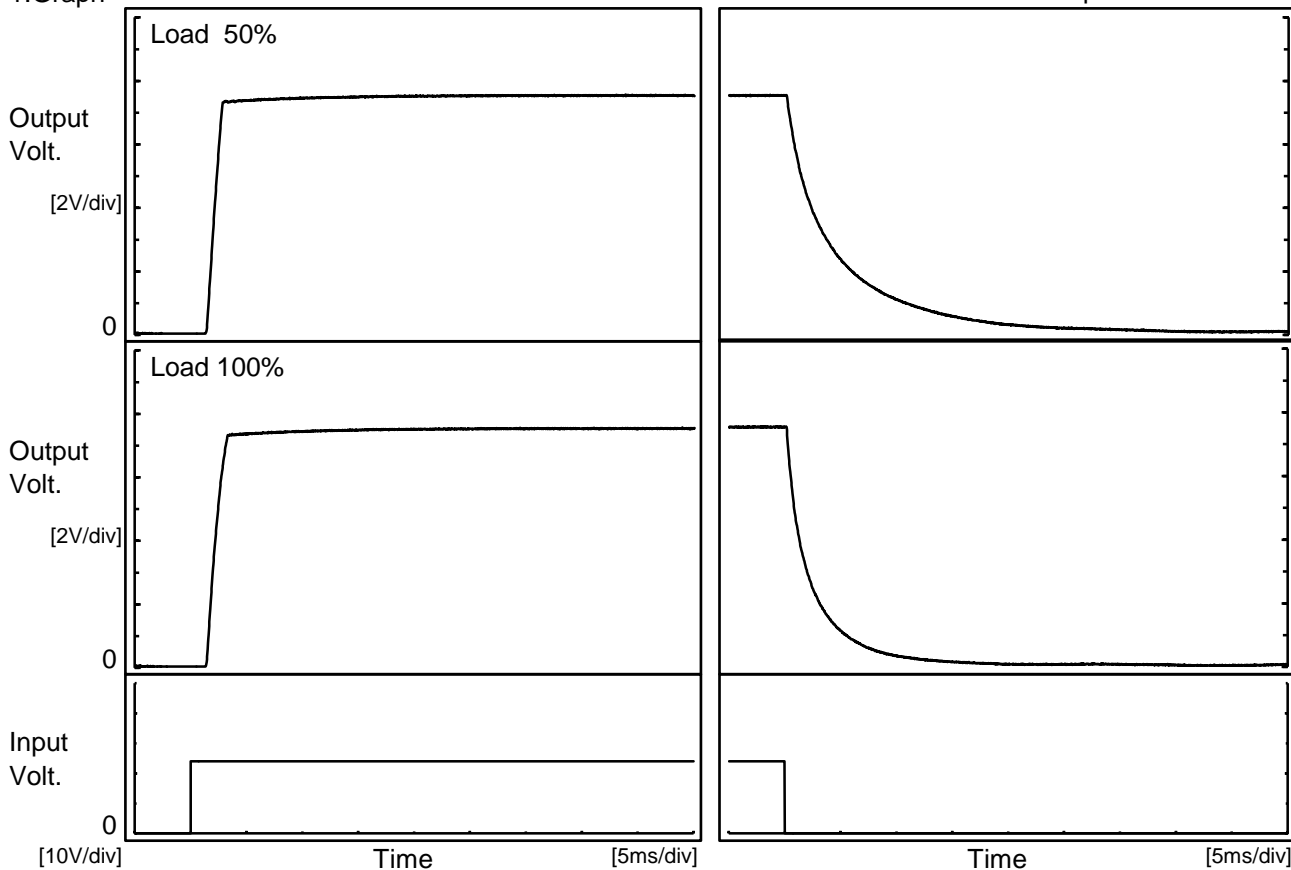
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.6	1.2	2.8	0.4	10.7
100 %	1.6	1.5	3.1	0.3	5.4



COSEL

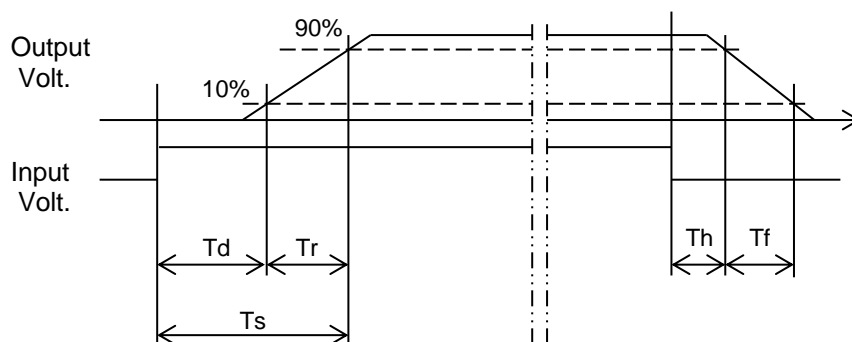
Model	MGFW1R52415	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-15V0.05A		

1.Graph



2.Values

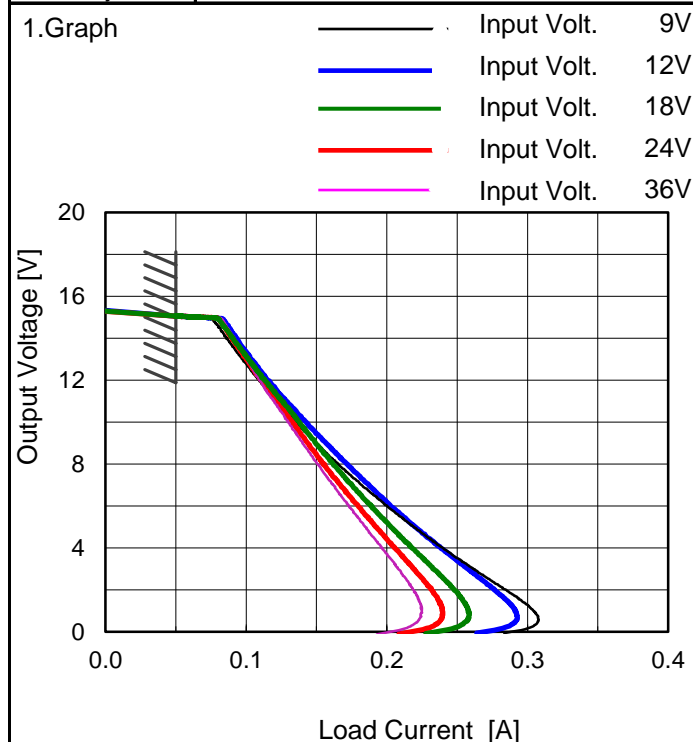
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.6	1.2	2.8	0.5	12.3
100 %	1.6	1.5	3.1	0.3	6.0





Model		MGFW1R52415		Testing Circuitry Figure A																																							
Item		Minimum Input Voltage for Regulated Output Voltage																																									
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Model	MGFW1R52415
Item	Overcurrent Protection
Object	+15V0.05A



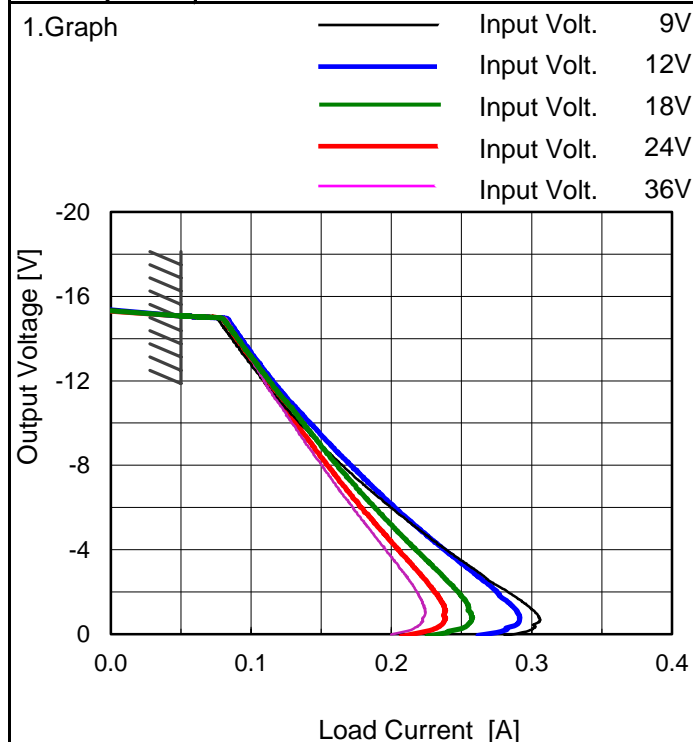
Temperature 25°C
Testing Circuitry Figure A

2.Values

Output Voltage [V]	Load Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
14.3	0.084	0.090	0.088	0.087	0.089
13.5	0.092	0.098	0.096	0.095	0.096
12.0	0.109	0.115	0.113	0.111	0.109
10.5	0.128	0.136	0.132	0.127	0.125
9.0	0.149	0.157	0.149	0.143	0.140
7.5	0.173	0.179	0.168	0.161	0.156
6.0	0.200	0.202	0.188	0.179	0.173
4.5	0.229	0.229	0.210	0.199	0.190
3.0	0.261	0.258	0.233	0.219	0.208
1.5	0.296	0.285	0.254	0.236	0.223
0.0	0.283	0.264	0.228	0.209	0.193
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-15V: Rated Load Current

Object	-15V0.05A
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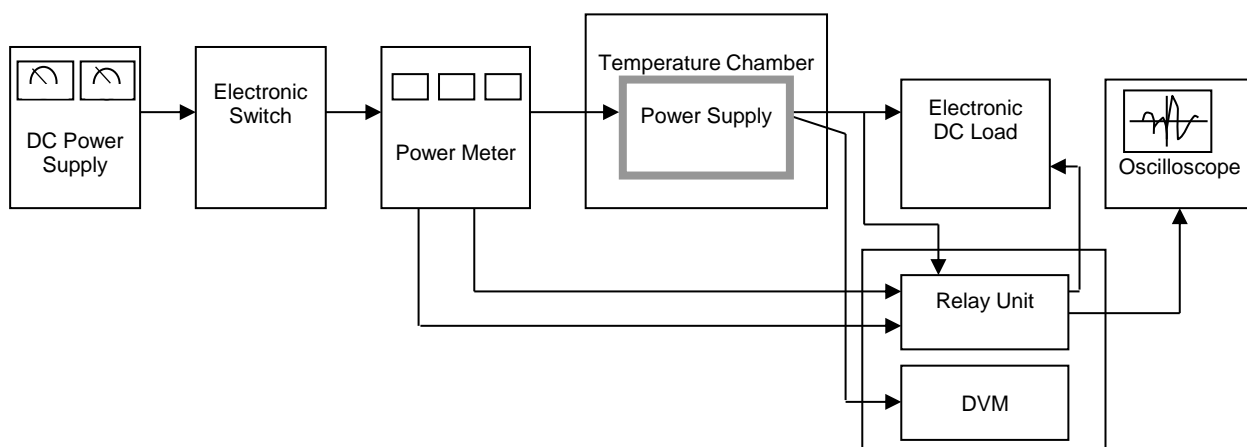
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-10.5	0.128	0.135	0.131	0.126	0.124
-9.0	0.149	0.156	0.149	0.143	0.139
-7.5	0.173	0.179	0.168	0.160	0.155
-6.0	0.199	0.202	0.188	0.178	0.173
-4.5	0.228	0.228	0.210	0.198	0.190
-3.0	0.261	0.257	0.233	0.218	0.208
-1.5	0.294	0.283	0.253	0.236	0.222
0.0	0.281	0.262	0.226	0.207	0.200
--	-	-	-	-	-

+15V: Rated Load Current

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

Model		MGFW1R52415		Temperature 25°C																																																																												
Item		Switching frequency (by Load Current)		Testing Circuitry Figure A																																																																												
Object		+/-15V0.05A																																																																														
1.Graph		<div><div>—△—</div>Input Volt. 9V</div> <div><div>---□---</div>Input Volt. 12V</div> <div><div>-...*...-</div>Input Volt. 18V</div> <div><div>-·-○-·-</div>Input Volt. 24V</div> <div><div>--◇--</div>Input Volt. 36V</div>		2.Values																																																																												
<div>Switching Frequency [kHz]</div> <div><div>10000</div><div>1000</div><div>100</div><div>0.000</div><div>0.015</div><div>0.030</div><div>0.045</div><div>0.060</div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Input Current [A]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th></tr><tr><td>0.000</td><td>492</td><td>573</td><td>670</td><td>740</td><td>777</td></tr><tr><td>0.010</td><td>359</td><td>442</td><td>548</td><td>615</td><td>683</td></tr><tr><td>0.020</td><td>281</td><td>357</td><td>460</td><td>527</td><td>599</td></tr><tr><td>0.030</td><td>232</td><td>300</td><td>396</td><td>460</td><td>531</td></tr><tr><td>0.040</td><td>195</td><td>258</td><td>347</td><td>409</td><td>479</td></tr><tr><td>0.050</td><td>168</td><td>226</td><td>310</td><td>368</td><td>436</td></tr><tr><td>0.055</td><td>158</td><td>213</td><td>294</td><td>350</td><td>417</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><tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Input Current [A]					Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.000	492	573	670	740	777	0.010	359	442	548	615	683	0.020	281	357	460	527	599	0.030	232	300	396	460	531	0.040	195	258	347	409	479	0.050	168	226	310	368	436	0.055	158	213	294	350	417	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
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Data Acquisition/Control Unit

Figure A

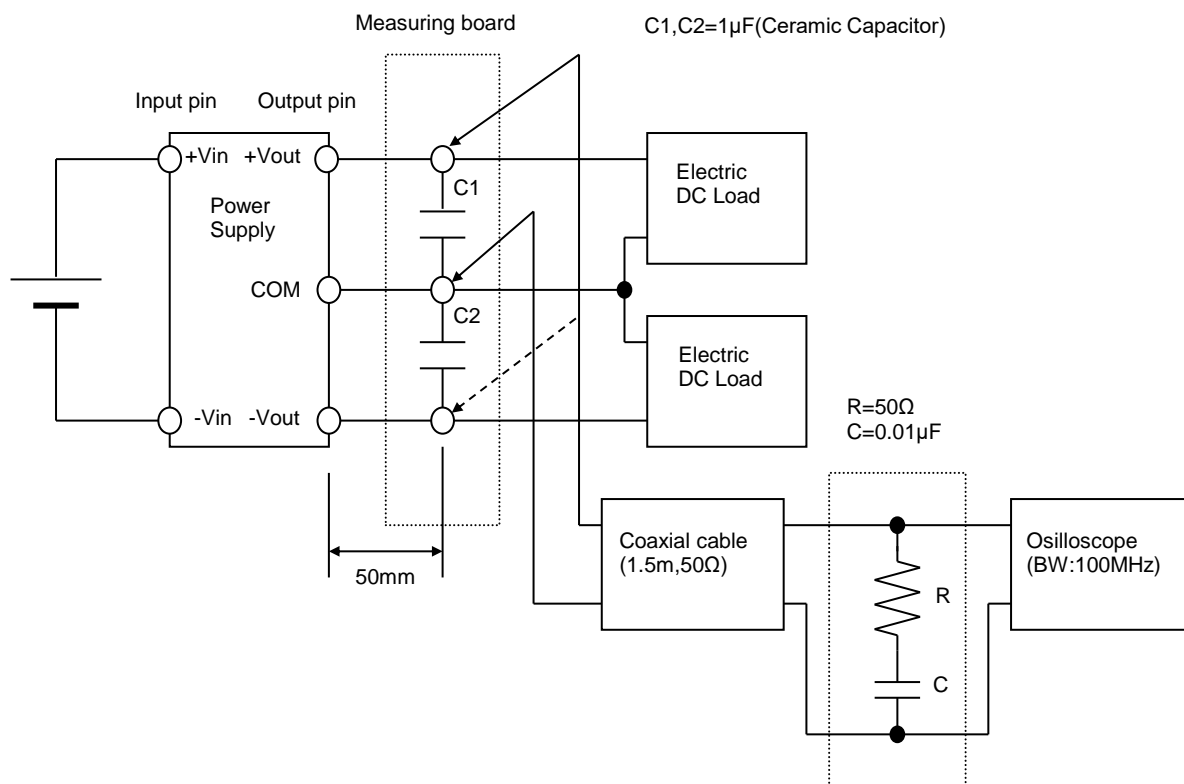


Figure B (Ripple and Ripple noise Characteristic)