

# TEST DATA OF MGFW302405

Regulated DC Power Supply  
November 19, 2010

Approved by : *Kazunari Asano*  
Kazunari Asano Design Manager

Prepared by : *Masashi Ueda*  
Masashi Ueda Design Engineer

**COSEL CO.,LTD.**

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<p>Model MGFW302405</p>		<p>Temperature 25°C</p>																																																																															
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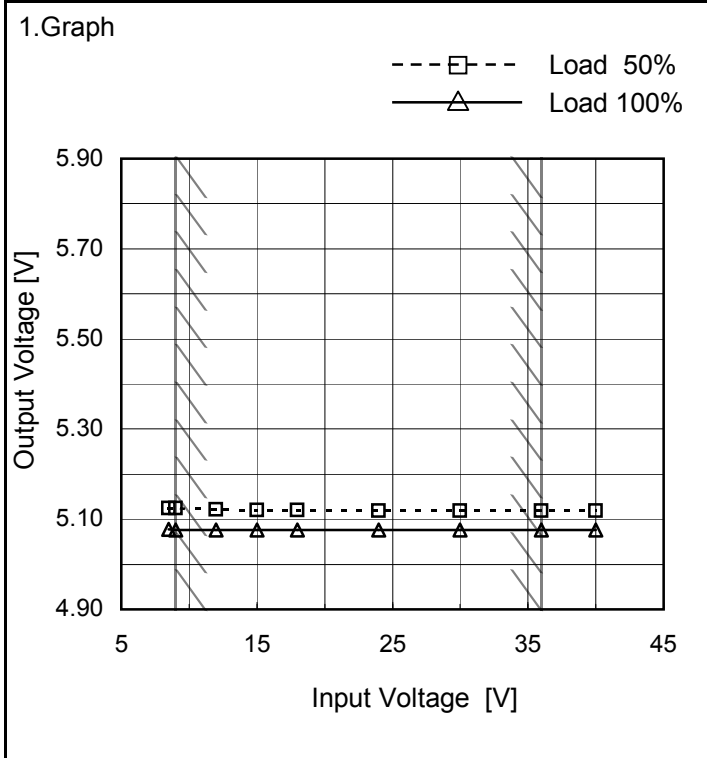


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Model	MGFW302405
Item	Line Regulation
Object	+5V2A

Temperature 25°C  
Testing Circuitry Figure A

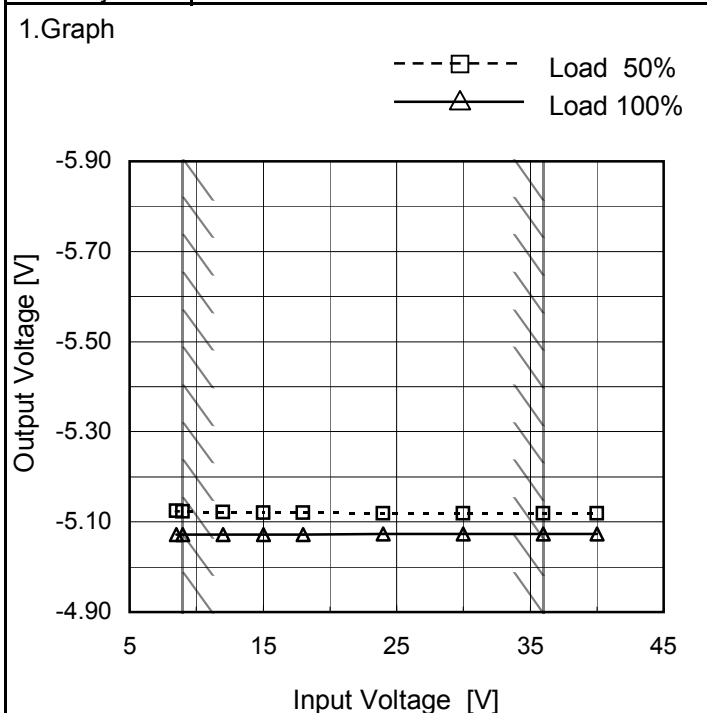


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	5.124	5.077
9.0	5.124	5.077
12.0	5.122	5.077
15.0	5.121	5.077
18.0	5.120	5.076
24.0	5.119	5.076
30.0	5.119	5.076
36.0	5.119	5.076
40.0	5.119	5.076

-5V: Rated output current

Object	-5V2A
--------	-------



2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	-5.124	-5.071
9.0	-5.124	-5.071
12.0	-5.121	-5.072
15.0	-5.120	-5.072
18.0	-5.120	-5.072
24.0	-5.119	-5.073
30.0	-5.119	-5.073
36.0	-5.119	-5.073
40.0	-5.119	-5.073

+5V: Rated output current

Note: Slanted line shows the range of the rated input voltage.



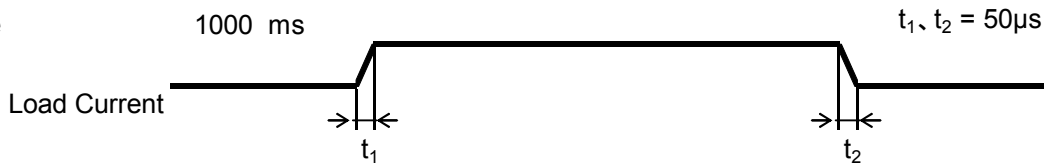


<p>Model MGFW302405</p> <p>Item Load Regulation</p> <p>Object +5V2A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure A</p>																																																																													
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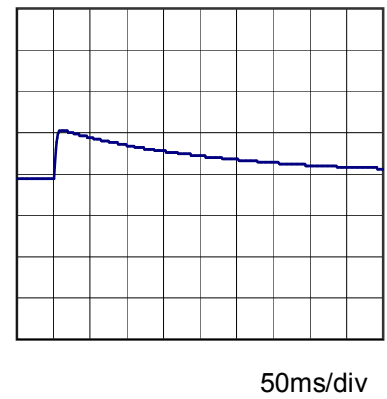
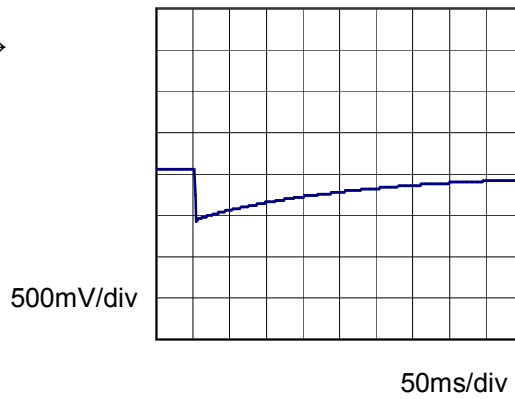


Model	MGFW302405	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+5V2A		

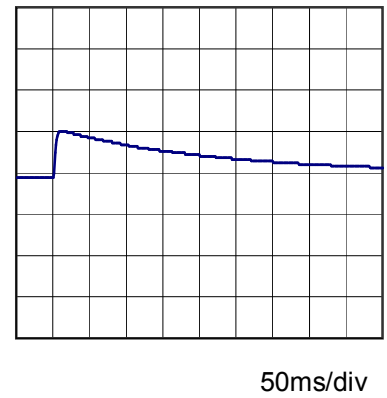
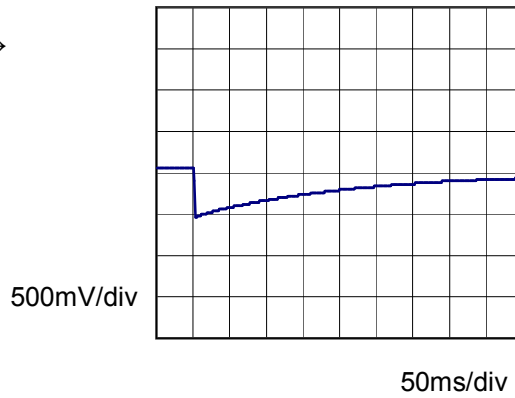
Input Volt. 24 V  
 Other output current rated  
 Cycle 1000 ms



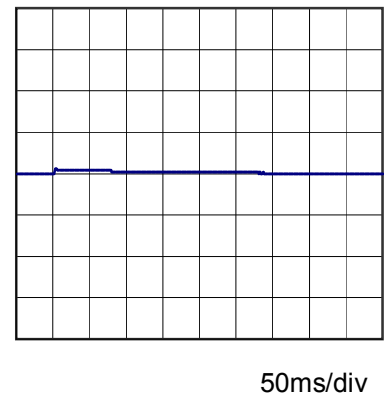
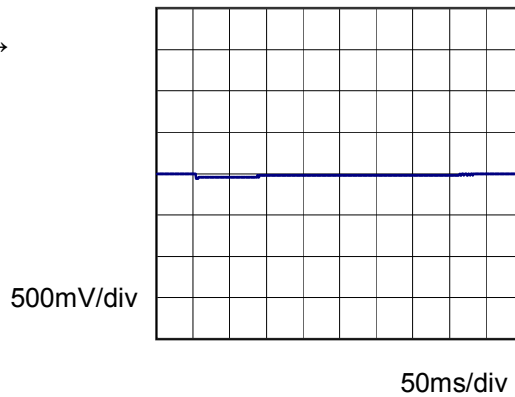
Min. Load (0A) ←→  
 Load 100% (2A)



Min. Load (0A) ←→  
 Load 50% (1A)



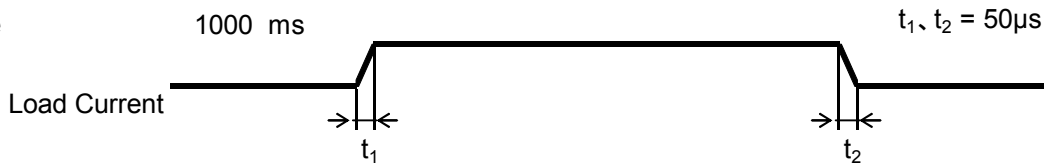
Load 50% (1A) ←→  
 Load 100% (2A)



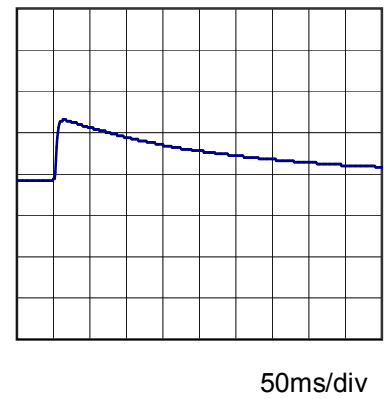
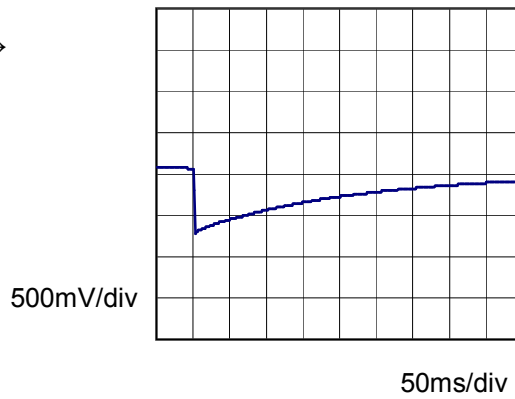


Model	MGFW302405	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-5V2A		

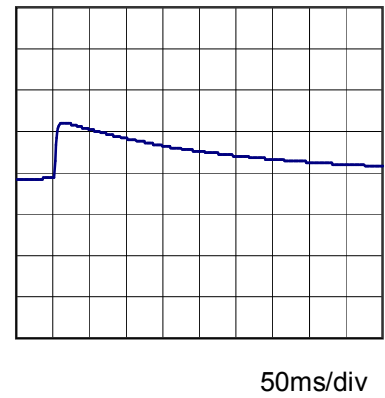
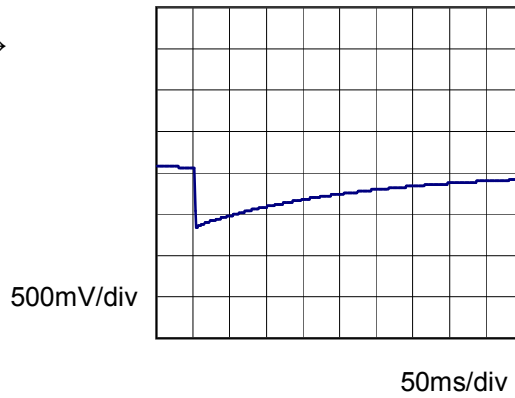
Input Volt. 24 V  
 Other output current rated  
 Cycle 1000 ms



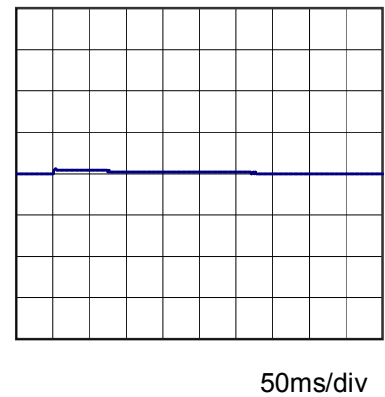
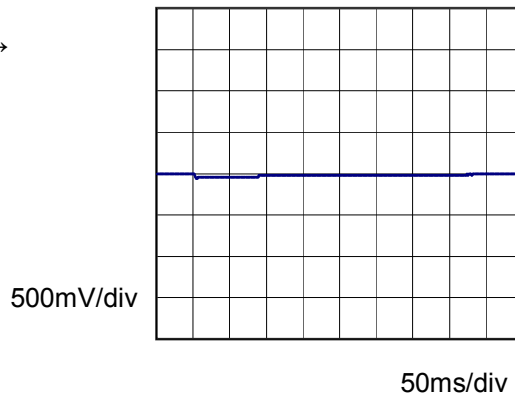
Min. Load (0A) ←→  
 Load 100% (2A)



Min. Load (0A) ←→  
 Load 50% (1A)



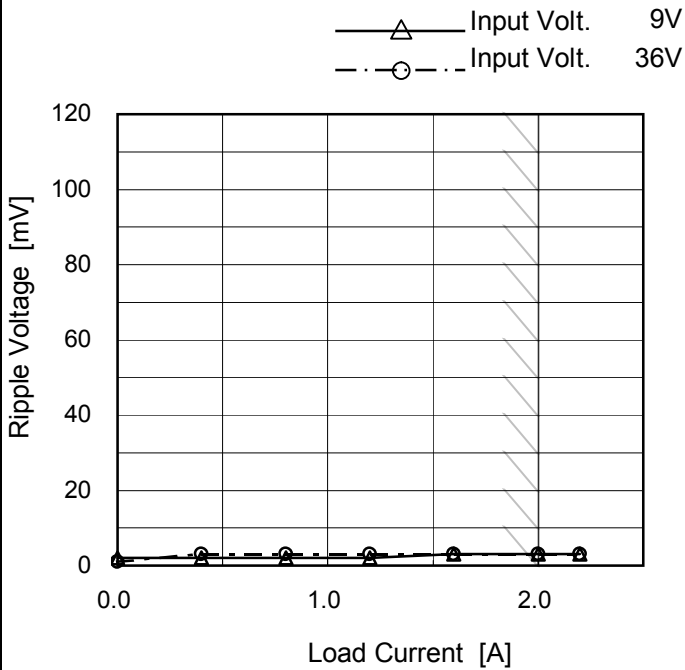
Load 50% (1A) ←→  
 Load 100% (2A)





Model	MGFW302405	Temperature	25°C
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure B
Object	+5V2A		

1. Graph



2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	2	1
0.4	2	3
0.8	2	3
1.2	2	3
1.6	3	3
2.0	3	3
2.2	3	3
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current

Ripple Voltage is shown as p-p in the figure below.  
 Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

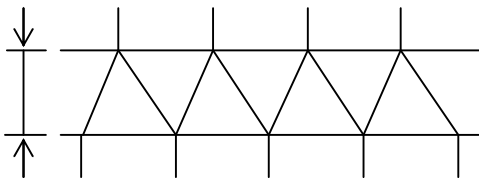


Fig. Complex Ripple Wave Form

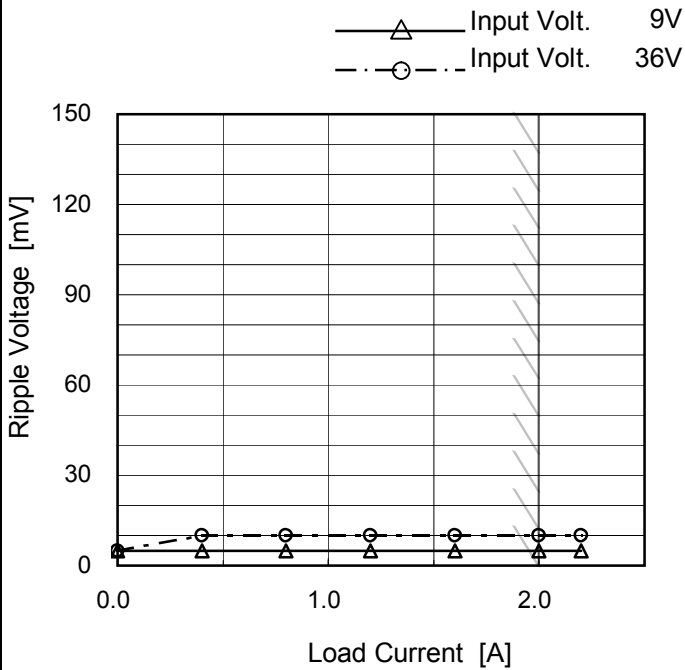


<b>COSEL</b>																																								
Model	MGFW302405																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
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<p>1.Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 9V</p> <p>- -○- - Input Volt. 36V</p> </div> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>		<p>2.Values</p> <table border="1"> <thead> <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. 36 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>2</td><td>1</td></tr> <tr><td>0.4</td><td>2</td><td>4</td></tr> <tr><td>0.8</td><td>2</td><td>4</td></tr> <tr><td>1.2</td><td>2</td><td>4</td></tr> <tr><td>1.6</td><td>3</td><td>4</td></tr> <tr><td>2.0</td><td>3</td><td>4</td></tr> <tr><td>2.2</td><td>3</td><td>4</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> <p>+5V: Rated output current</p>	Load Current [A]	Ripple Voltage [mV]		Input Volt. 9 [V]	Input Volt. 36 [V]	0.0	2	1	0.4	2	4	0.8	2	4	1.2	2	4	1.6	3	4	2.0	3	4	2.2	3	4	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																							
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								



Model	MGFW302405	
Item	Ripple-Noise	Temperature 25°C Testing Circuitry Figure B
Object	+5V2A	

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	5	5
0.4	5	10
0.8	5	10
1.2	5	10
1.6	5	10
2.0	5	10
2.2	5	10
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current

Ripple-Noise is shown as p-p in the figure below.  
 Note: Slanted line shows the range of the rated load current.

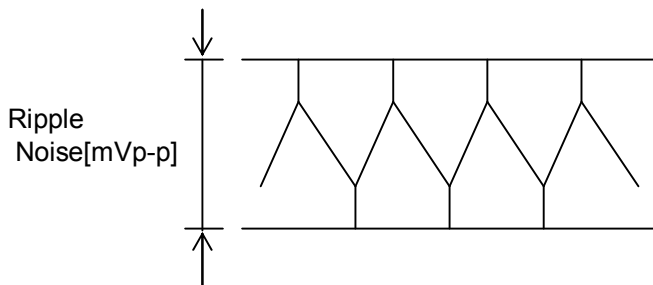
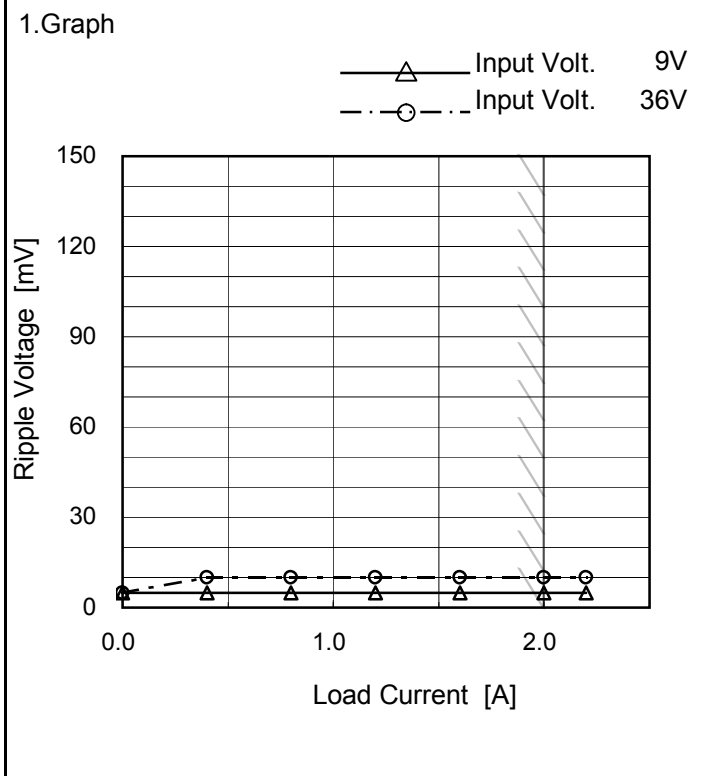


Fig. Complex Ripple Noise Wave Form



Model	MGFW302405	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	-5V2A		



2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	5	5
0.4	5	10
0.8	5	10
1.2	5	10
1.6	5	10
2.0	5	10
2.2	5	10
--	-	-
--	-	-
--	-	-
--	-	-

+5V: Rated output current

Ripple-Noise is shown as p-p in the figure below.  
 Note: Slanted line shows the range of the rated load current.

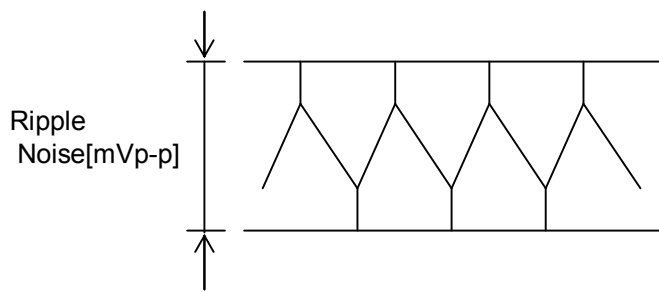
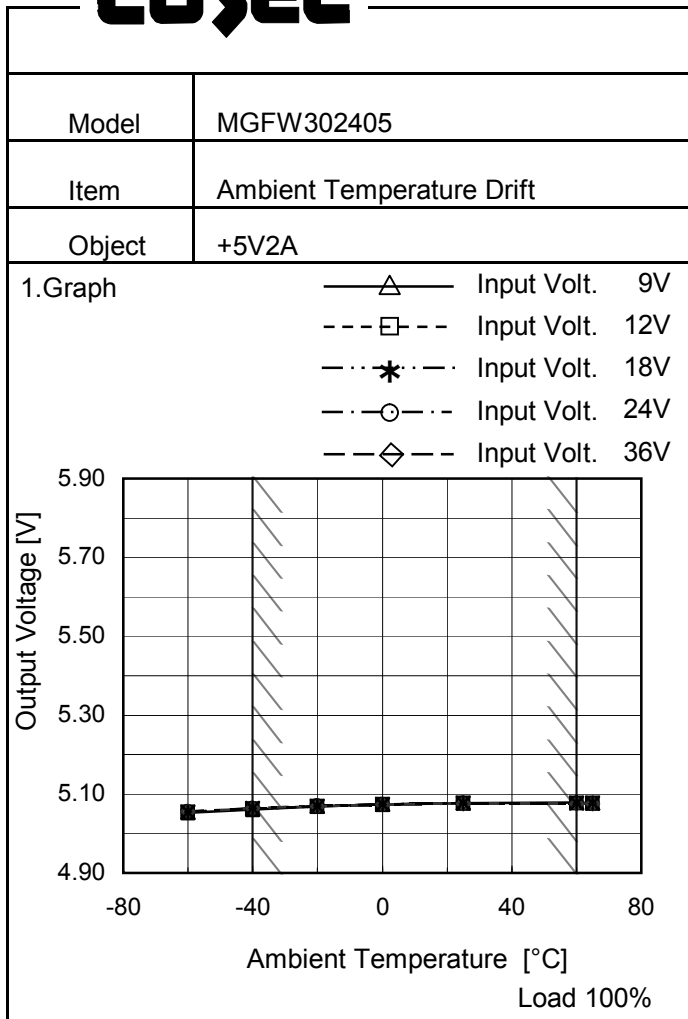


Fig.Complex Ripple Noise Wave Form



<b>Model</b> MGFW302405		Testing Circuitry Figure A																																							
<b>Item</b> Ripple Voltage (by Ambient Temp.)																																									
<b>Object</b> +5V2A																																									
<p>1.Graph</p> <div style="text-align: right;">             ---□--- Load 50%              —△— Load 100%         </div> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Input Volt. 24V</p>		<p>2.Values</p> <table border="1" style="width: 100%; text-align: center;"> <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>12</td><td>11</td></tr> <tr><td>-40</td><td>7</td><td>8</td></tr> <tr><td>-20</td><td>5</td><td>5</td></tr> <tr><td>0</td><td>4</td><td>4</td></tr> <tr><td>25</td><td>3</td><td>3</td></tr> <tr><td>60</td><td>3</td><td>3</td></tr> <tr><td>65</td><td>3</td><td>3</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> <p style="text-align: center;">-5V: Rated output current</p>	Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	12	11	-40	7	8	-20	5	5	0	4	4	25	3	3	60	3	3	65	3	3	--	-	-	--	-	-	--	-	-	--	-	-	
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
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<b>Object</b> -5V2A		Testing Circuitry Figure A																																							
<p>1.Graph</p> <div style="text-align: right;">             ---□--- Load 50%              —△— Load 100%         </div> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Input Volt. 24V</p> <p>Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>			<p>2.Values</p> <table border="1" style="width: 100%; text-align: center;"> <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>15</td><td>15</td></tr> <tr><td>-40</td><td>10</td><td>10</td></tr> <tr><td>-20</td><td>7</td><td>7</td></tr> <tr><td>0</td><td>6</td><td>6</td></tr> <tr><td>25</td><td>5</td><td>5</td></tr> <tr><td>60</td><td>4</td><td>4</td></tr> <tr><td>65</td><td>4</td><td>4</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> <p style="text-align: center;">+5V: Rated output current</p>	Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	15	15	-40	10	10	-20	7	7	0	6	6	25	5	5	60	4	4	65	4	4	--	-	-	--	-	-	--	-	-	--	-	-
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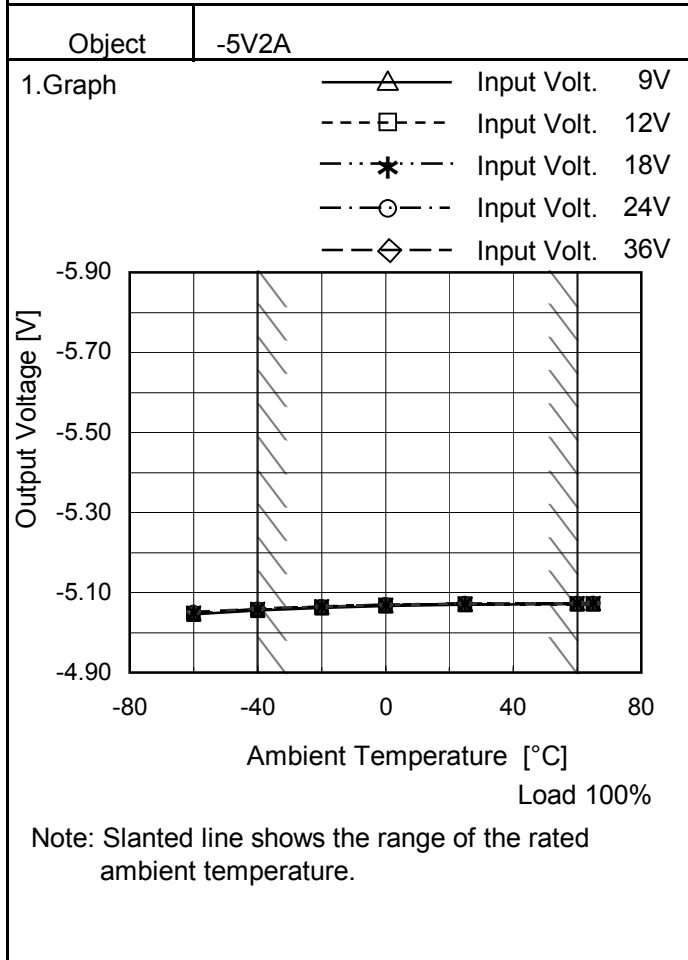




Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	5.053	5.054	5.055	5.056	5.056
-40	5.062	5.063	5.063	5.064	5.064
-20	5.069	5.069	5.070	5.070	5.070
0	5.074	5.074	5.074	5.074	5.074
25	5.077	5.077	5.077	5.077	5.076
60	5.078	5.078	5.077	5.077	5.076
65	5.078	5.077	5.077	5.076	5.075
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-



2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	-5.046	-5.048	-5.049	-5.051	-5.051
-40	-5.055	-5.057	-5.058	-5.059	-5.060
-20	-5.062	-5.063	-5.064	-5.065	-5.066
0	-5.067	-5.068	-5.068	-5.069	-5.070
25	-5.070	-5.071	-5.072	-5.072	-5.073
60	-5.071	-5.072	-5.073	-5.073	-5.073
65	-5.071	-5.072	-5.072	-5.073	-5.073
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-



<b>COSEL</b>		
Model	MGFW302405	
Item	Output Voltage Accuracy	Testing Circuitry Figure A

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 - 36V
- Load Current (AVR 1) : 0 - 2A (AVR 2) : 0 - 2A

\* Other Output : Rated Load

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

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

2. Values

Object		+5V2A		Output		Output Voltage Accuracy	
Item	Temperature [°C]	Input Voltage[V]	Output		Value [mV]	Ration [%]	
			Current[A]	Voltage[V]			
Maximum Voltage	-40	36	0	5.706	±322	±6.4	
Minimum Voltage	-40	9	2	5.062			

Object		-5V2A		Output		Output Voltage Accuracy	
Item	Temperature [°C]	Input Voltage[V]	Output		Value [mV]	Ration [%]	
			Current[A]	Voltage[V]			
Maximum Voltage	0	36	0	-5.697	±321	±6.4	
Minimum Voltage	-40	9	2	-5.055			



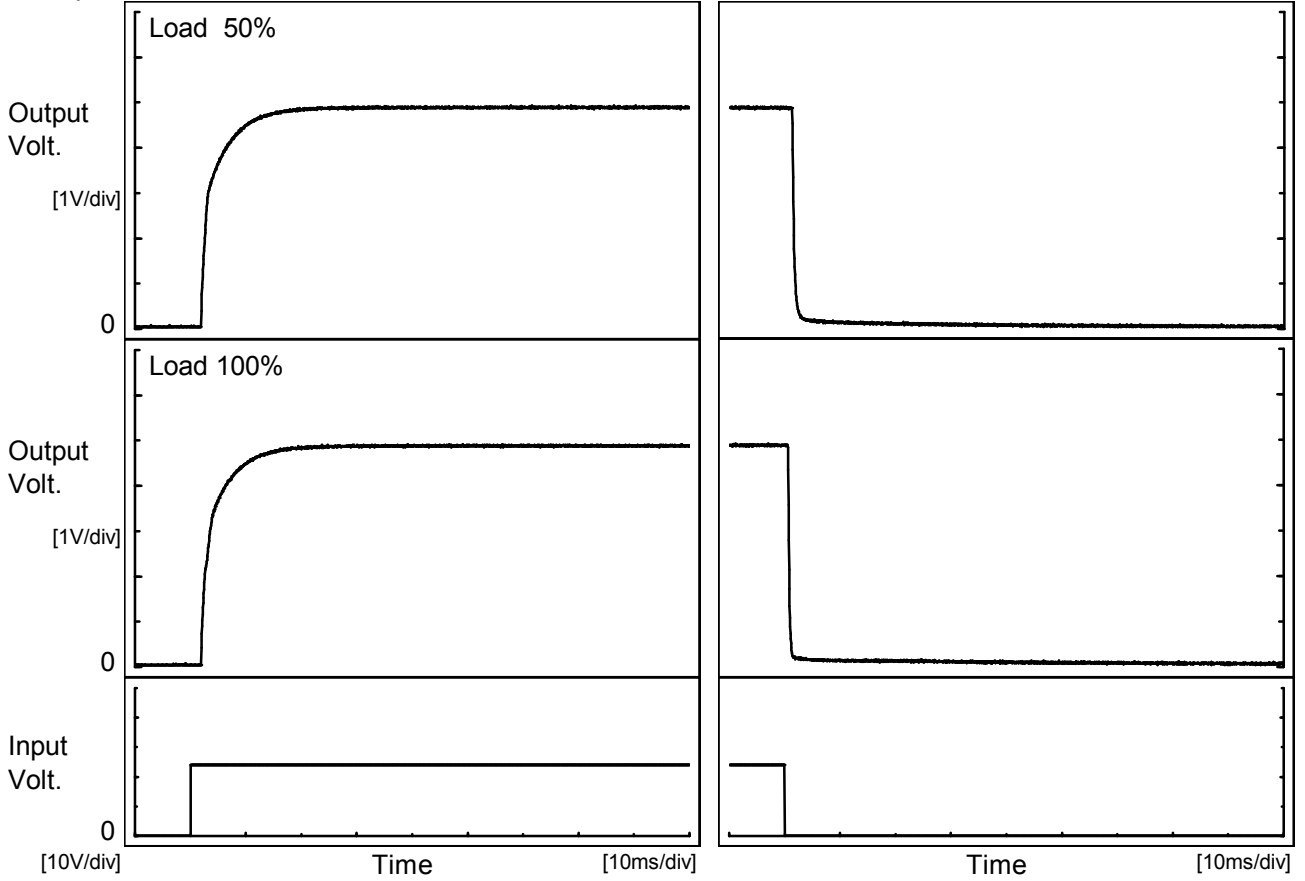
<b>COSEL</b>																								
Model	MGFW302405																							
Item	Time Lapse Drift	Temperature 25°C Testing Circuitry Figure A																						
Object	+5V2A																							
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p style="text-align: center;">Input Volt. 24V Load 100%</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.075</td></tr> <tr><td>0.5</td><td>5.077</td></tr> <tr><td>1.0</td><td>5.077</td></tr> <tr><td>2.0</td><td>5.077</td></tr> <tr><td>3.0</td><td>5.077</td></tr> <tr><td>4.0</td><td>5.077</td></tr> <tr><td>5.0</td><td>5.077</td></tr> <tr><td>6.0</td><td>5.077</td></tr> <tr><td>7.0</td><td>5.077</td></tr> <tr><td>8.0</td><td>5.077</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	5.075	0.5	5.077	1.0	5.077	2.0	5.077	3.0	5.077	4.0	5.077	5.0	5.077	6.0	5.077	7.0	5.077	8.0	5.077
Time since start [H]	Output Voltage [V]																							
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Model		MGFW302405	Temperature	25°C
Item		Rise and Fall Time	Testing Circuitry	Figure A
Object		+5V2A		

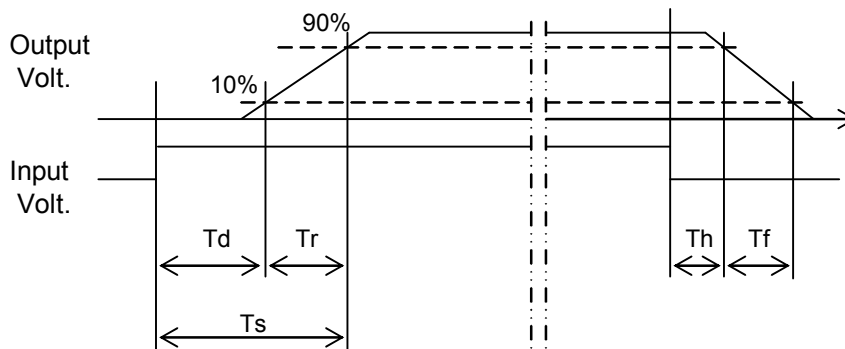
1. Graph

Input Volt. 24 V



2. Values

		[ms]				
Load \ Time	Td	Tr	Ts	Th	Tf	
50 %	2.1	8.4	10.5	1.3	0.8	
100 %	2.1	8.5	10.6	0.6	0.5	

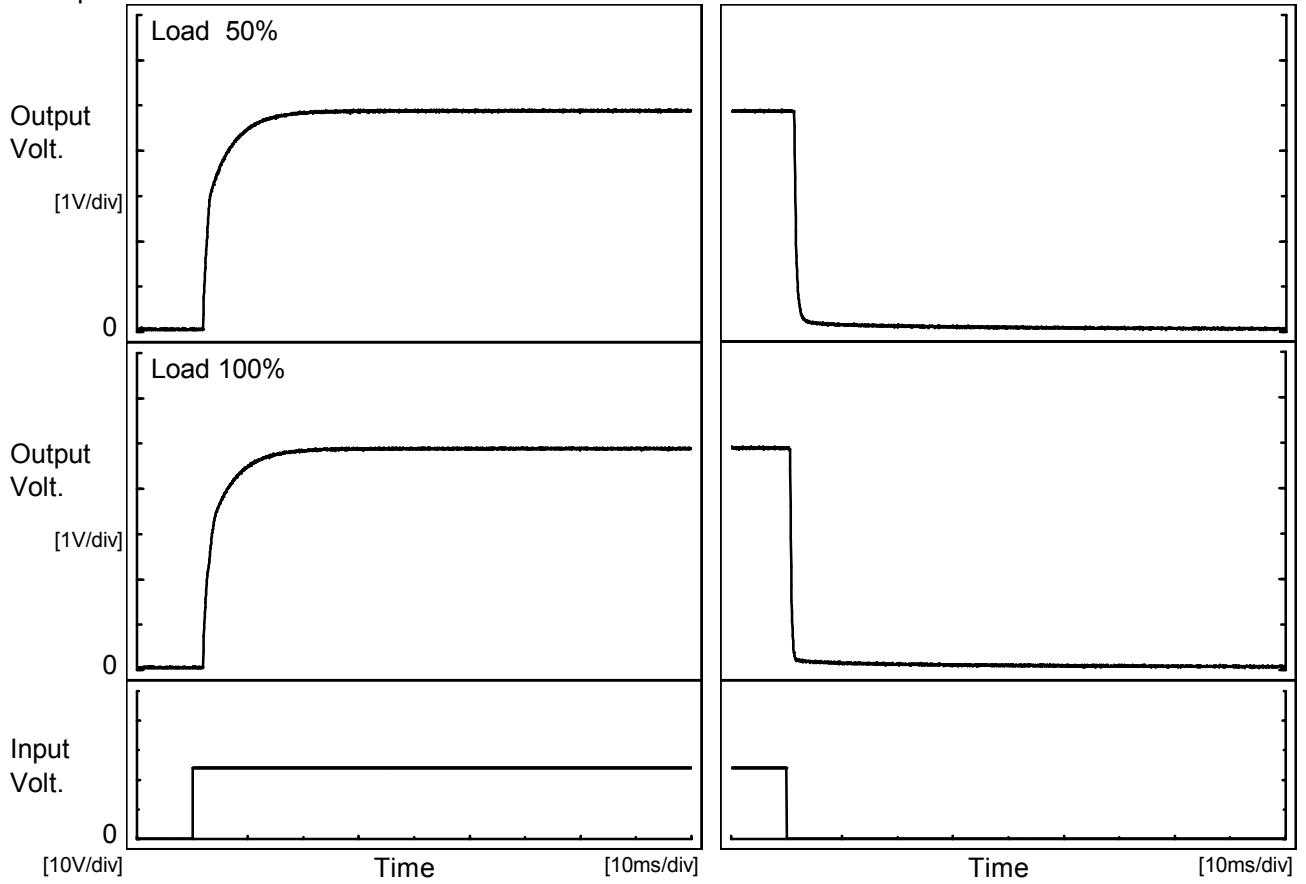




Model		MGFW302405	Temperature	25°C
Item		Rise and Fall Time	Testing Circuitry	Figure A
Object		-5V2A		

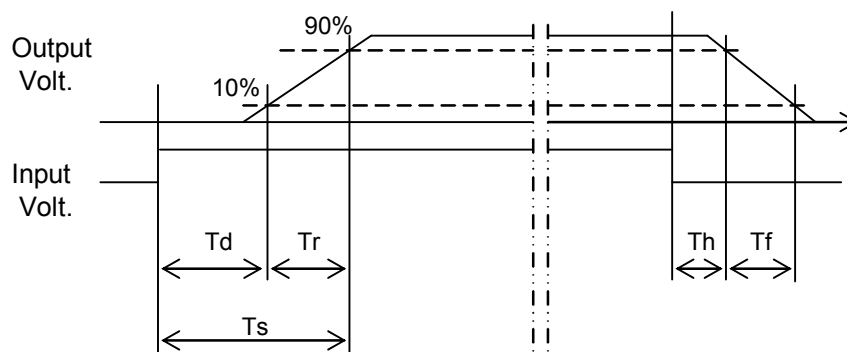
1. Graph

Input Volt. 24 V



2. Values

		[ms]				
Load \ Time	Time	Td	Tr	Ts	Th	Tf
50 %		2.1	8.5	10.6	1.3	1.0
100 %		2.1	8.4	10.5	0.6	0.6





<p>Model MGFW302405</p> <p>Item Minimum Input Voltage for Regulated Output Voltage</p> <p>Object +5V2A</p>		<p>Testing Circuitry Figure A</p>																																						
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<p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when overcurrent protection is activated.</p>																																																																																						



<b>COSEL</b>																																								
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Item	Overvoltage Protection	Testing Circuitry Figure A																																						
Object	+10V2.5A																																							
<p>1.Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 24V</p> <p>---□--- Input Volt. 36V</p> </div> <p style="text-align: center;">Ambient Temperature [°C] Load 0%</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>-60</td><td>13.41</td><td>13.42</td></tr> <tr><td>-40</td><td>13.48</td><td>13.49</td></tr> <tr><td>-20</td><td>13.63</td><td>13.64</td></tr> <tr><td>0</td><td>13.77</td><td>13.78</td></tr> <tr><td>25</td><td>13.98</td><td>14.00</td></tr> <tr><td>60</td><td>14.20</td><td>14.29</td></tr> <tr><td>65</td><td>14.28</td><td>14.29</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]	Operating Point [V]		Input Volt. 24[V]	Input Volt. 36[V]	-60	13.41	13.42	-40	13.48	13.49	-20	13.63	13.64	0	13.77	13.78	25	13.98	14.00	60	14.20	14.29	65	14.28	14.29	--	-	-	--	-	-	--	-	-	--	-	-
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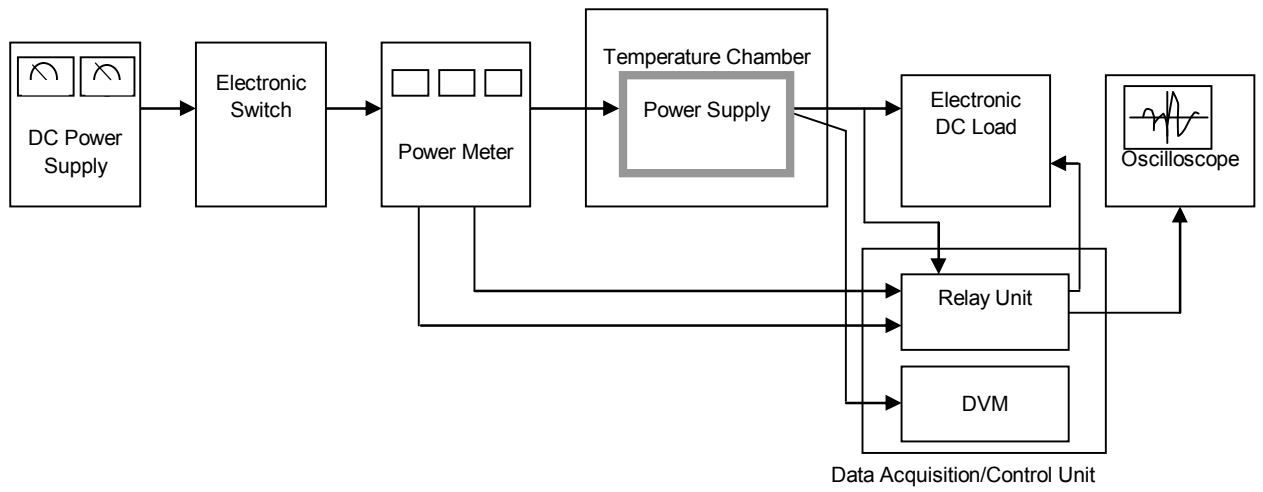


Figure A

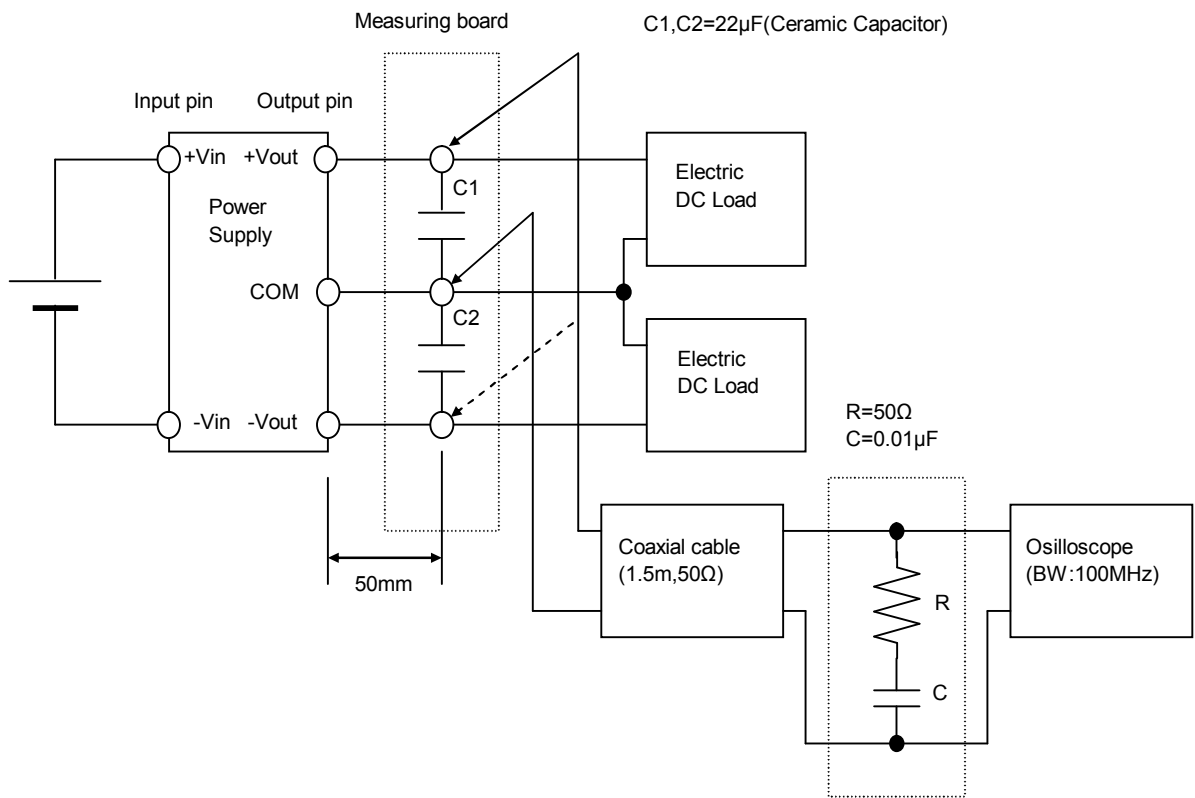


Figure B (Ripple and Ripple noise Characteristic)