

TEST DATA OF MGS152415

Regulated DC Power Supply
September 14, 2010

Approved by : *Kazunari Asano*
Kazunari Asano Design Manager

Prepared by : *Junki Nakayama*
Junki Nakayama Design Engineer

COSEL CO.,LTD.

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Model		MGS152415	Temperature	25°C																																																																															
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<p>The graph plots Input Current [A] on the y-axis (0.00 to 2.00) against Load Current [A] on the x-axis (0.0 to 1.2). Three data series are shown: 18V (solid line with triangles), 24V (dashed line with squares), and 36V (dash-dot line with circles). A vertical shaded region is present between approximately 0.95A and 1.1A on the x-axis.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.038</td><td>0.030</td><td>0.023</td></tr> <tr><td>0.2</td><td>0.201</td><td>0.152</td><td>0.104</td></tr> <tr><td>0.4</td><td>0.374</td><td>0.281</td><td>0.189</td></tr> <tr><td>0.6</td><td>0.555</td><td>0.413</td><td>0.277</td></tr> <tr><td>0.8</td><td>0.740</td><td>0.550</td><td>0.367</td></tr> <tr><td>1.0</td><td>0.941</td><td>0.697</td><td>0.461</td></tr> <tr><td>1.1</td><td>1.028</td><td>0.760</td><td>0.506</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> </tbody> </table>		Load Current [A]	Input Current [A]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.0	0.038	0.030	0.023	0.2	0.201	0.152	0.104	0.4	0.374	0.281	0.189	0.6	0.555	0.413	0.277	0.8	0.740	0.550	0.367	1.0	0.941	0.697	0.461	1.1	1.028	0.760	0.506	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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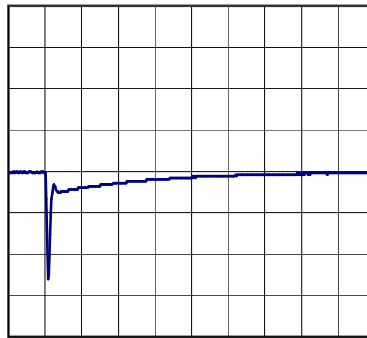
Model	MGS152415	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+15V1A	

Input Volt. 24 V
Cycle 1000 ms

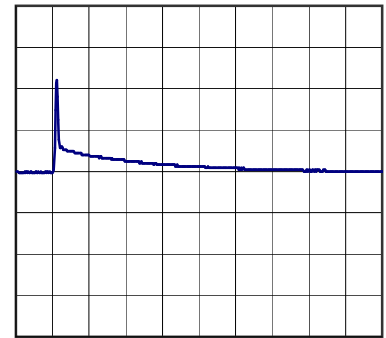


Min. Load (0A) \longleftrightarrow
Load 100% (1A)

200mV/div



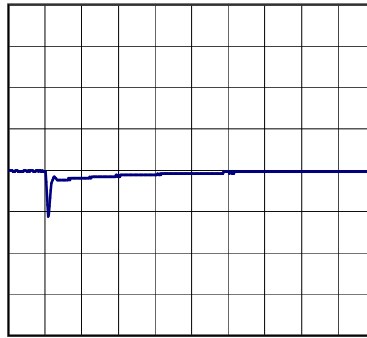
500µs/div



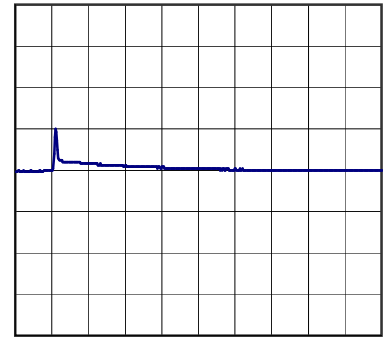
500µs/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.5A)

200mV/div



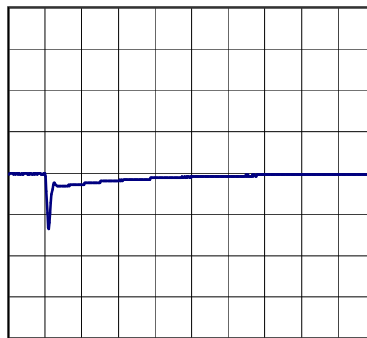
500µs/div



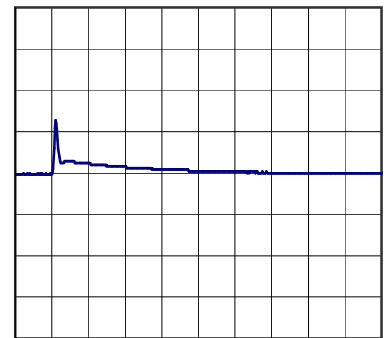
500µs/div

Load 50% (0.5A) \longleftrightarrow
Load 100% (1A)

200mV/div



500µs/div

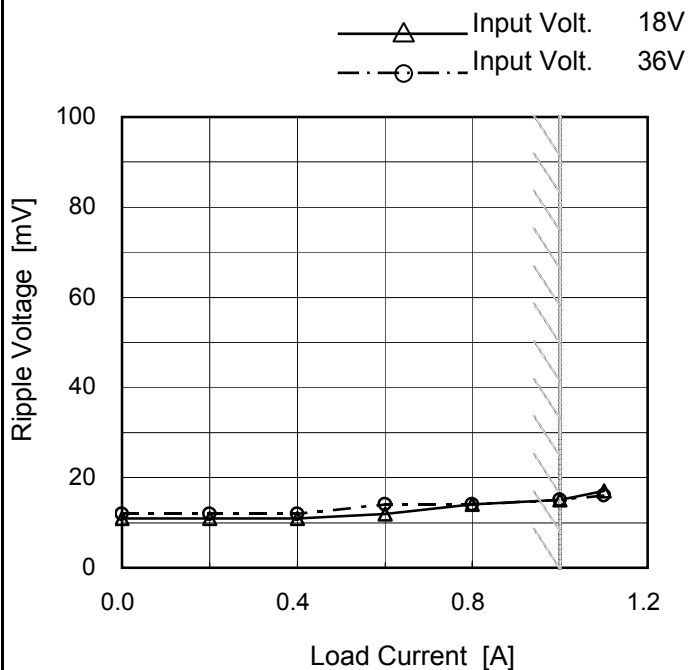


500µs/div

Model		MGS152415		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+15V1A																																									
1. Graph			2. Values																																								
			<table border="1"> <thead> <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. 36 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>8</td><td>10</td></tr> <tr><td>0.2</td><td>8</td><td>10</td></tr> <tr><td>0.4</td><td>8</td><td>10</td></tr> <tr><td>0.6</td><td>9</td><td>12</td></tr> <tr><td>0.8</td><td>10</td><td>12</td></tr> <tr><td>1.0</td><td>12</td><td>12</td></tr> <tr><td>1.1</td><td>12</td><td>13</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>			Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0.0	8	10	0.2	8	10	0.4	8	10	0.6	9	12	0.8	10	12	1.0	12	12	1.1	12	13	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
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<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>																																											
<p>Fig. Complex Ripple Wave Form</p>																																											

Model	MGS152415	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	+15V1A		

1.Graph



2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	11	12
0.2	11	12
0.4	11	12
0.6	12	14
0.8	14	14
1.0	15	15
1.1	17	16
--	-	-
--	-	-
--	-	-
--	-	-

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.

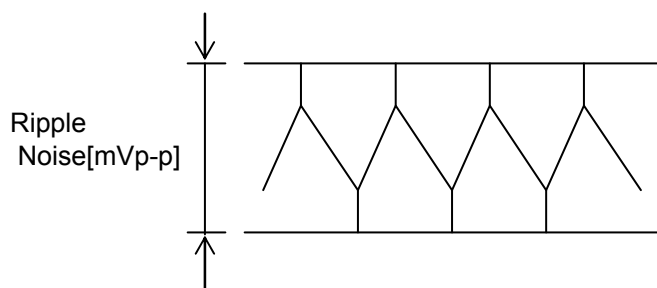
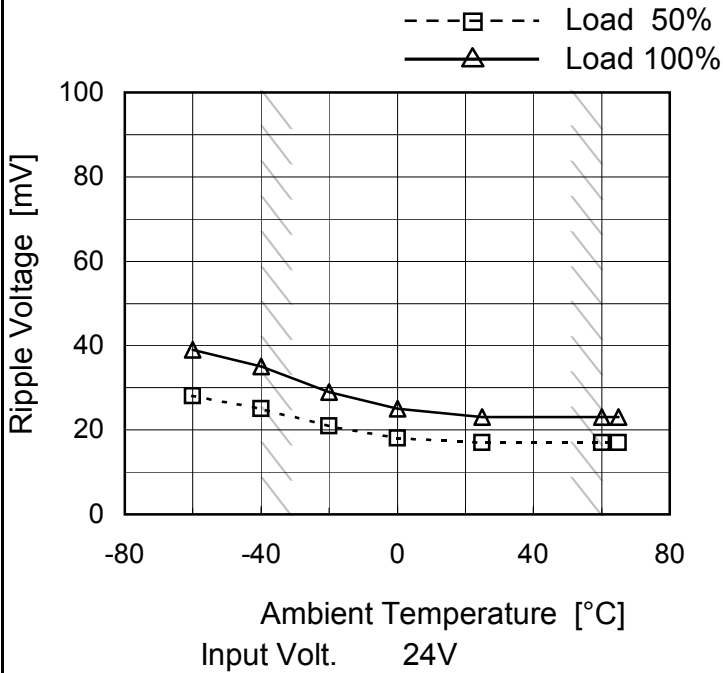


Fig.Complex Ripple Noise Wave Form

Model	MGS152415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V1A

Testing Circuitry Figure B

1.Graph



2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	28	39
-40	25	35
-20	21	29
0	18	25
25	17	23
60	17	23
65	17	23
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated ambient temperature.



COSEL																																																					
Model	MGS152415																																																				
Item	Ambient Temperature Drift	Testing Circuitry Figure A																																																			
Object	+15V1A																																																				
1.Graph	<p> —△— Input Volt. 18V ---□--- Input Volt. 24V ···○··· Input Volt. 36V </p> <p style="text-align: center;">Ambient Temperature [°C] Load 100%</p>	2.Values																																																			
		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>-60</td><td>14.965</td><td>14.965</td><td>14.966</td></tr> <tr><td>-40</td><td>14.997</td><td>14.997</td><td>14.997</td></tr> <tr><td>-20</td><td>15.021</td><td>15.022</td><td>15.022</td></tr> <tr><td>0</td><td>15.040</td><td>15.040</td><td>15.040</td></tr> <tr><td>25</td><td>15.053</td><td>15.053</td><td>15.053</td></tr> <tr><td>60</td><td>15.058</td><td>15.058</td><td>15.058</td></tr> <tr><td>65</td><td>15.057</td><td>15.057</td><td>15.057</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> </tbody> </table>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	-60	14.965	14.965	14.966	-40	14.997	14.997	14.997	-20	15.021	15.022	15.022	0	15.040	15.040	15.040	25	15.053	15.053	15.053	60	15.058	15.058	15.058	65	15.057	15.057	15.057	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																																					



COSEL		
Model	MGS152415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V1A	

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 - 36V

Load Current : 0 - 1A

* 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

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	24	0	15.060	±32	±0.2
Minimum Voltage	-40	18	1	14.997		



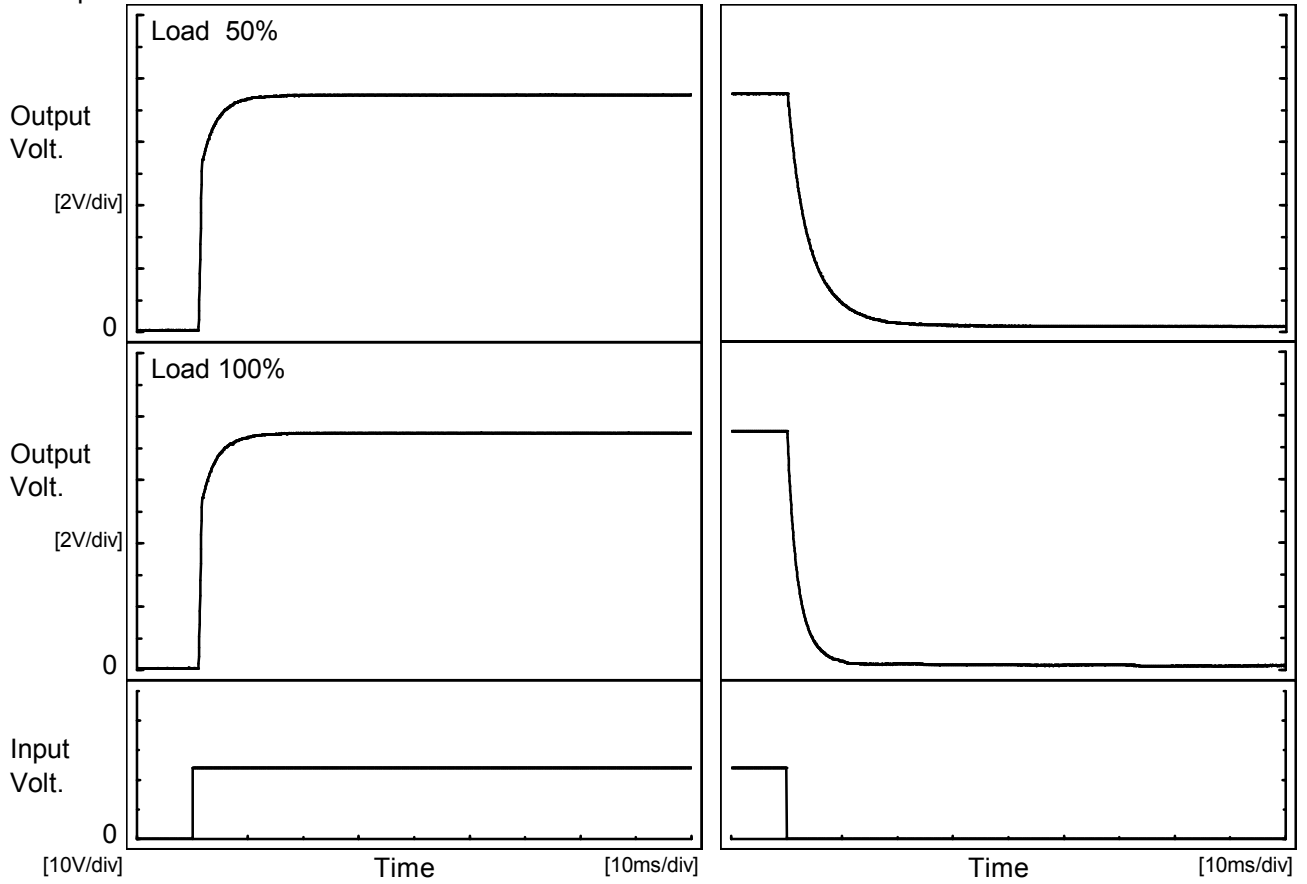
COSEL																								
Model	MGS152415																							
Item	Time Lapse Drift	Temperature 25°C Testing Circuitry Figure A																						
Object	+15V1A																							
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 24V Load 100%</p>		<p>2.Values</p> <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>15.051</td></tr> <tr><td>0.5</td><td>15.055</td></tr> <tr><td>1.0</td><td>15.055</td></tr> <tr><td>2.0</td><td>15.055</td></tr> <tr><td>3.0</td><td>15.055</td></tr> <tr><td>4.0</td><td>15.056</td></tr> <tr><td>5.0</td><td>15.056</td></tr> <tr><td>6.0</td><td>15.056</td></tr> <tr><td>7.0</td><td>15.056</td></tr> <tr><td>8.0</td><td>15.056</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	15.051	0.5	15.055	1.0	15.055	2.0	15.055	3.0	15.055	4.0	15.056	5.0	15.056	6.0	15.056	7.0	15.056	8.0	15.056
Time since start [H]	Output Voltage [V]																							
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7.0	15.056																							
8.0	15.056																							



Model		MGS152415	Temperature	25°C
Item		Rise and Fall Time	Testing Circuitry	Figure A
Object		+15V1A		

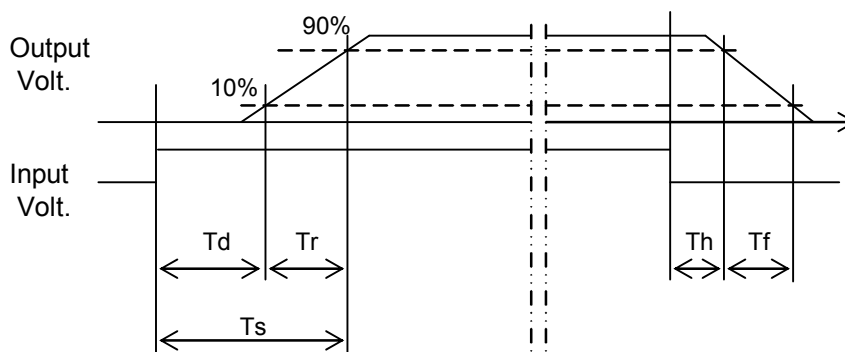
1. Graph

Input Volt. 24 V



2. Values

		[ms]				
Load \ Time	Time	Td	Tr	Ts	Th	Tf
50 %		1.3	3.7	5.0	0.5	10.4
100 %		1.3	3.6	4.9	0.3	5.0





COSEL																																								
Model	MGS152415																																							
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A																																						
Object	+15V1A																																							
<p>1.Graph</p> <p style="text-align: center;"> ---□--- Load 50% —△— Load 100% </p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-60</td><td>15.6</td><td>15.6</td></tr> <tr><td>-40</td><td>15.6</td><td>15.6</td></tr> <tr><td>-20</td><td>15.6</td><td>15.6</td></tr> <tr><td>0</td><td>15.6</td><td>15.6</td></tr> <tr><td>25</td><td>15.6</td><td>15.6</td></tr> <tr><td>60</td><td>15.6</td><td>15.6</td></tr> <tr><td>65</td><td>15.6</td><td>15.6</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]	Input Voltage [V]		Load 50%	Load 100%	-60	15.6	15.6	-40	15.6	15.6	-20	15.6	15.6	0	15.6	15.6	25	15.6	15.6	60	15.6	15.6	65	15.6	15.6	--	-	-	--	-	-	--	-	-	--	-	-
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																								



<p>Model MGS152415</p> <p>Item Overcurrent Protection</p> <p>Object +15V1A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure A</p>																																																							
<p>1.Graph</p> <p> —△ Input Volt. 18V —□ Input Volt. 24V —○ Input Volt. 36V </p> <p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when overcurrent protection is activated.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>1.49</td> <td>1.57</td> <td>1.54</td> </tr> <tr> <td>14.3</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>13.5</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>12.0</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>10.5</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>9.0</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>7.5</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>6.0</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>4.5</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>3.0</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1.5</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>0.0</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Output Voltage [V]	Load Current [A]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	15.0	1.49	1.57	1.54	14.3	-	-	-	13.5	-	-	-	12.0	-	-	-	10.5	-	-	-	9.0	-	-	-	7.5	-	-	-	6.0	-	-	-	4.5	-	-	-	3.0	-	-	-	1.5	-	-	-	0.0	-	-	-
Output Voltage [V]	Load Current [A]																																																								
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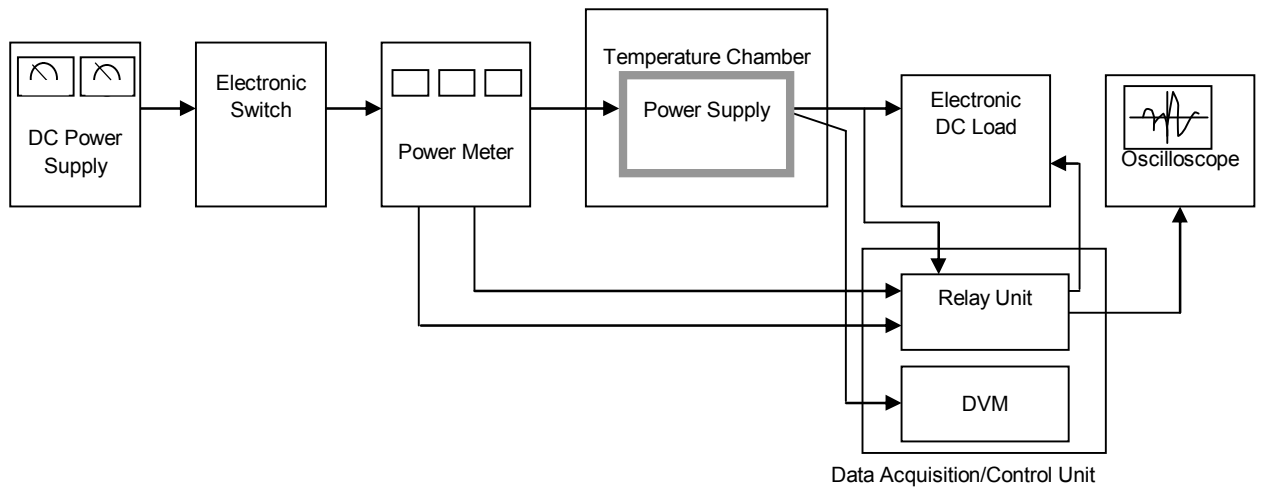


Figure A

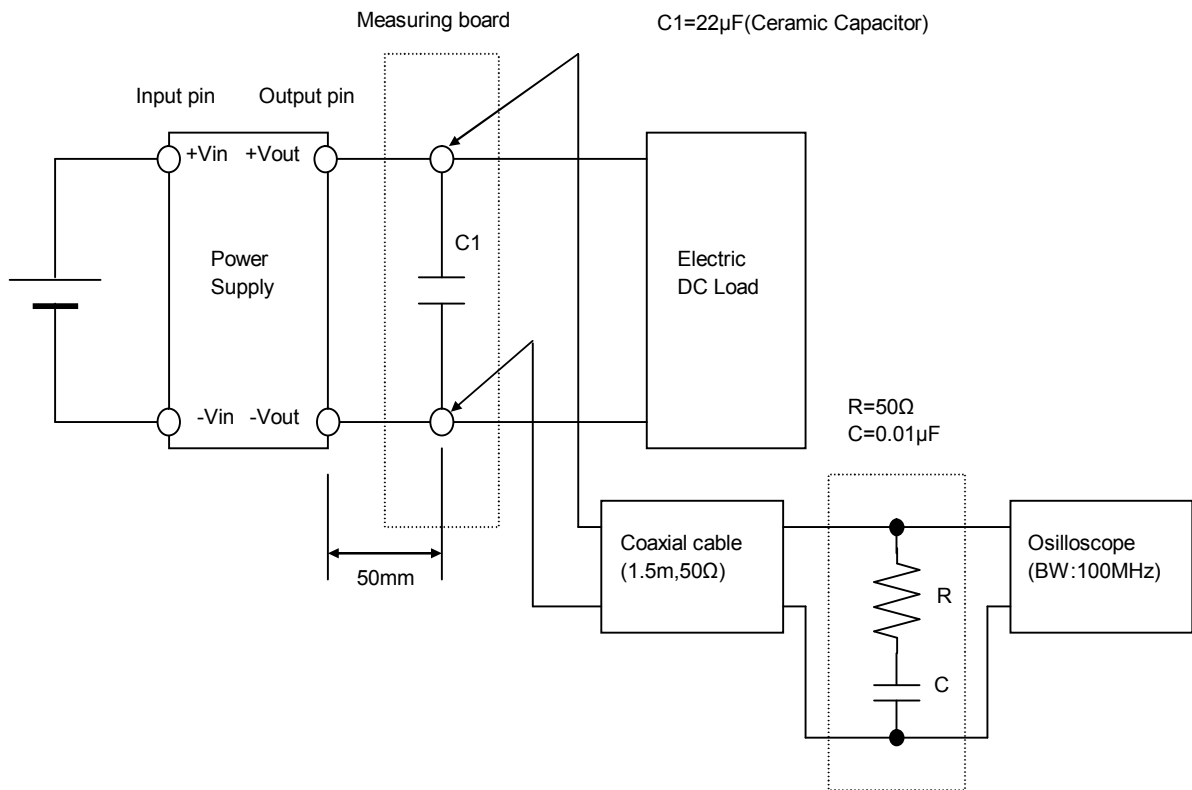


Figure B (Ripple and Ripple noise Characteristic)