

# TEST DATA OF MGS304812

Regulated DC Power Supply  
December 7, 2010

Approved by : Kazunari Asano  
Kazunari Asano Design Manager

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Sho Saito Design Engineer

**COSEL CO.,LTD.**

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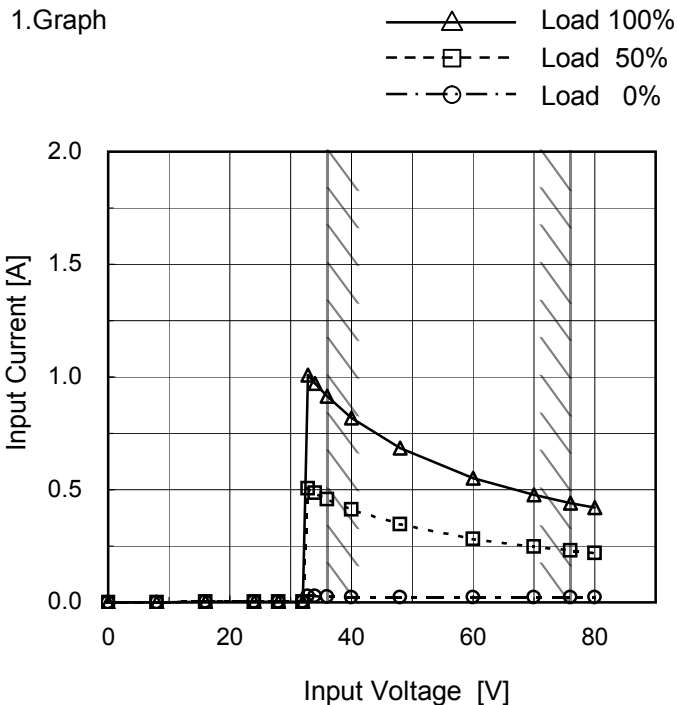
(Final Page 19)

Model MGS304812

Item Input Current (by Input Voltage)

Object

Temperature 25°C  
Testing Circuitry Figure A



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

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
8.0	0.000	0.000	0.000
16.0	0.002	0.002	0.002
24.0	0.002	0.002	0.002
28.0	0.002	0.002	0.002
32.0	0.002	0.002	0.002
32.8	0.029	0.507	1.009
34.0	0.027	0.487	0.971
36.0	0.025	0.458	0.914
40.0	0.023	0.412	0.819
48.0	0.023	0.347	0.684
60.0	0.023	0.282	0.550
70.0	0.023	0.246	0.476
76.0	0.023	0.229	0.441
80.0	0.023	0.219	0.421
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Model MGS304812

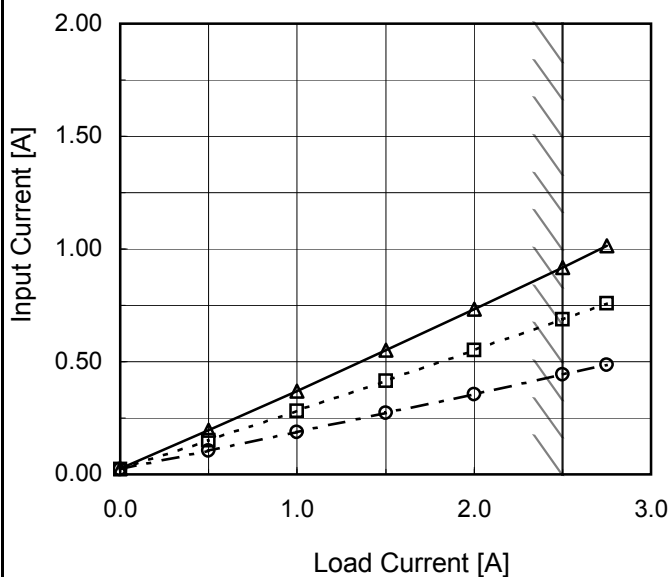
Item Input Current (by Load Current)

Object

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph

—△— Input Volt. 36V  
---□--- Input Volt. 48V  
-·-○-·- Input Volt. 76V



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

## 2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	0.025	0.023	0.023
0.50	0.196	0.151	0.105
1.00	0.371	0.282	0.188
1.50	0.550	0.415	0.271
2.00	0.733	0.550	0.356
2.50	0.918	0.688	0.442
2.75	1.015	0.758	0.486
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	MGS304812																																																					
Item	Input Power (by Load Current)	Temperature	25°C																																																			
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<div><div><div>—△—</div><div>Input Volt.</div><div>36V</div></div><div><div>---□---</div><div>Input Volt.</div><div>48V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>76V</div></div></div> <div>Input Power [W]</div> <div>Load Current [A]</div> <div>Note: Slanted line shows the range of the rated load current.</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.00</td><td>0.90</td><td>1.11</td><td>1.80</td></tr><tr><td>0.50</td><td>7.04</td><td>7.27</td><td>8.01</td></tr><tr><td>1.00</td><td>13.32</td><td>13.53</td><td>14.30</td></tr><tr><td>1.50</td><td>19.75</td><td>19.88</td><td>20.66</td></tr><tr><td>2.00</td><td>26.28</td><td>26.35</td><td>27.09</td></tr><tr><td>2.50</td><td>32.99</td><td>32.95</td><td>33.64</td></tr><tr><td>2.75</td><td>36.50</td><td>36.31</td><td>37.00</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>		Load Current [A]	Input Power [W]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.00	0.90	1.11	1.80	0.50	7.04	7.27	8.01	1.00	13.32	13.53	14.30	1.50	19.75	19.88	20.66	2.00	26.28	26.35	27.09	2.50	32.99	32.95	33.64	2.75	36.50	36.31	37.00	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model

MGS304812

Item

Efficiency (by Input Voltage)

Object

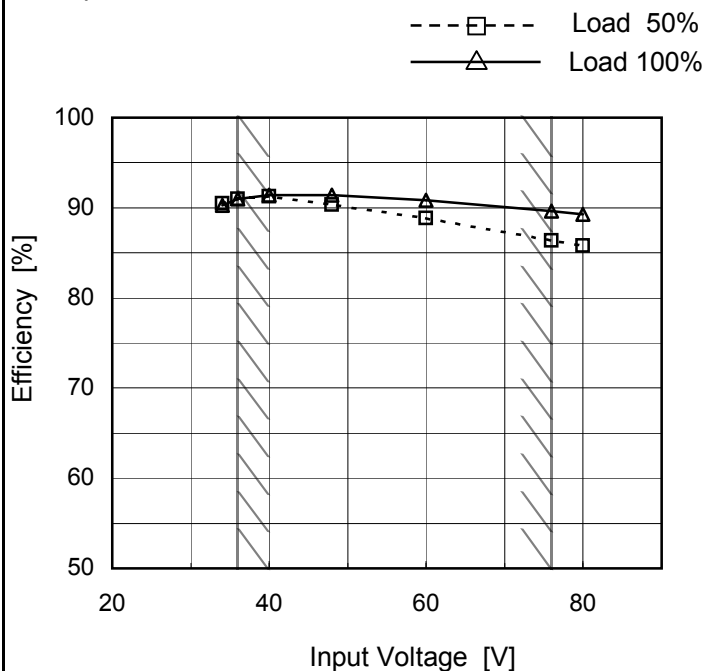
Temperature

25°C

Testing Circuitry

Figure A

## 1. Graph



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

## 2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
34	90.5	90.3
36	91.0	91.0
40	91.3	91.4
48	90.3	91.4
60	88.9	90.8
76	86.4	89.6
80	85.8	89.3
--	-	-
--	-	-

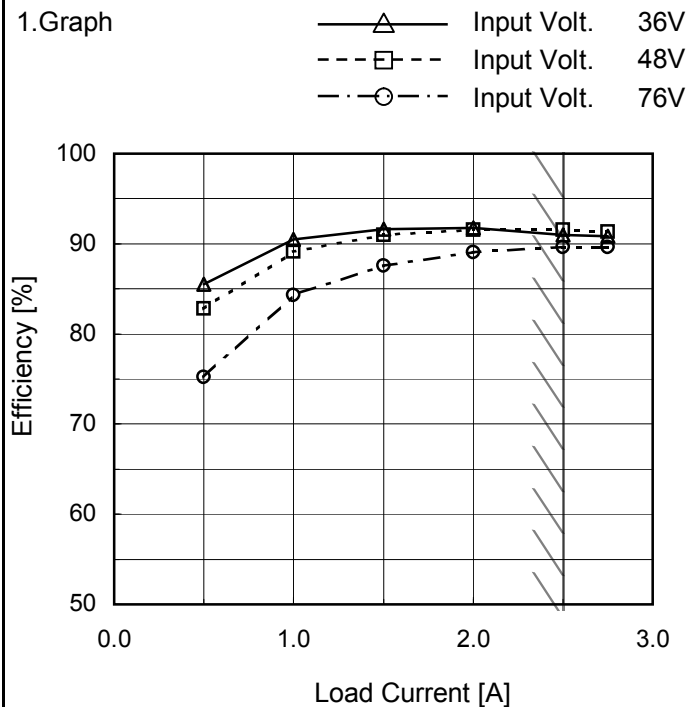
Model MGS304812

Item Efficiency (by Load Current)

Object

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph

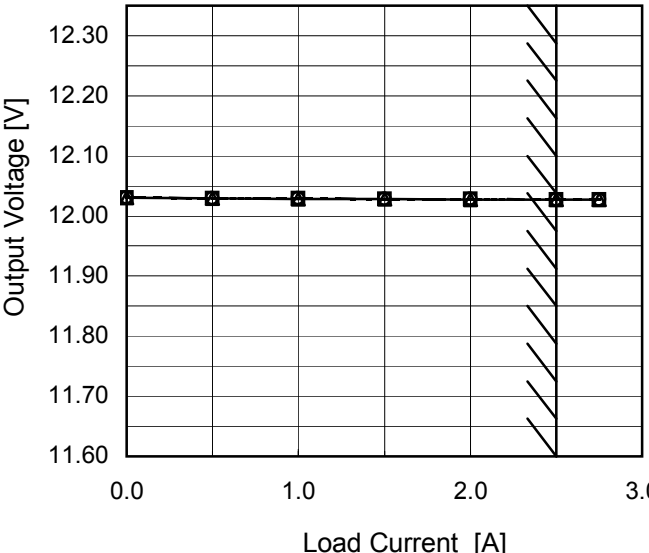


## 2. Values

Load Current [A]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	-	-	-
0.50	85.5	82.8	75.2
1.00	90.5	89.1	84.3
1.50	91.6	91.0	87.6
2.00	91.8	91.6	89.1
2.50	91.0	91.5	89.7
2.75	90.9	91.3	89.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

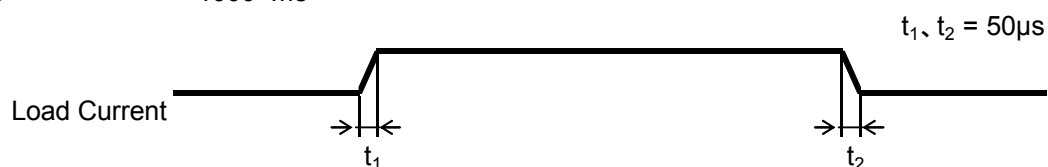
Model	MGS304812																																		
Item	Line Regulation	Temperature	25°C																																
Object	+12V2.5A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div><div>---</div><div>□</div><div>---</div><div>Load 50%</div></div><div><div>—</div><div>△</div><div>—</div><div>Load 100%</div></div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>34</td><td>12.027</td><td>12.026</td></tr><tr><td>36</td><td>12.027</td><td>12.026</td></tr><tr><td>40</td><td>12.027</td><td>12.027</td></tr><tr><td>48</td><td>12.027</td><td>12.027</td></tr><tr><td>60</td><td>12.027</td><td>12.027</td></tr><tr><td>76</td><td>12.027</td><td>12.027</td></tr><tr><td>80</td><td>12.027</td><td>12.027</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	34	12.027	12.026	36	12.027	12.026	40	12.027	12.027	48	12.027	12.027	60	12.027	12.027	76	12.027	12.027	80	12.027	12.027	--	-	-	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
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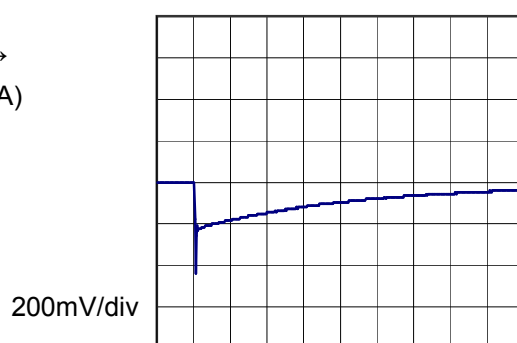
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<div><div><div>—△—</div><div>---□---</div><div>-·-○-·-</div></div><div><div>Input Volt.</div><div>Input Volt.</div><div>Input Volt.</div></div><div><div>36V</div><div>48V</div><div>76V</div></div></div>  <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.00</td><td>12.030</td><td>12.030</td><td>12.031</td></tr><tr><td>0.50</td><td>12.029</td><td>12.030</td><td>12.030</td></tr><tr><td>1.00</td><td>12.029</td><td>12.029</td><td>12.029</td></tr><tr><td>1.50</td><td>12.028</td><td>12.029</td><td>12.029</td></tr><tr><td>2.00</td><td>12.028</td><td>12.028</td><td>12.028</td></tr><tr><td>2.50</td><td>12.027</td><td>12.028</td><td>12.028</td></tr><tr><td>2.75</td><td>12.027</td><td>12.027</td><td>12.027</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>		Load Current [A]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.00	12.030	12.030	12.031	0.50	12.029	12.030	12.030	1.00	12.029	12.029	12.029	1.50	12.028	12.029	12.029	2.00	12.028	12.028	12.028	2.50	12.027	12.028	12.028	2.75	12.027	12.027	12.027	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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Model	MGS304812	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V2.5A		

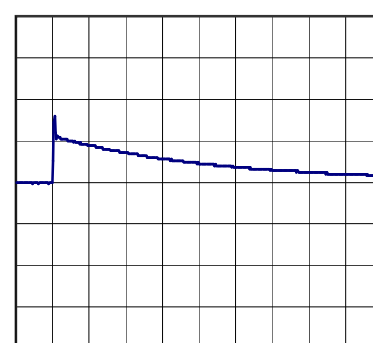
Input Volt. 48 V  
Cycle 1000 ms



Min. Load (0A)  $\longleftrightarrow$   
Load 100% (2.5A)

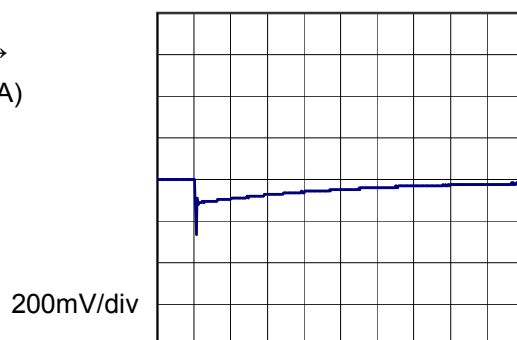


1ms/div

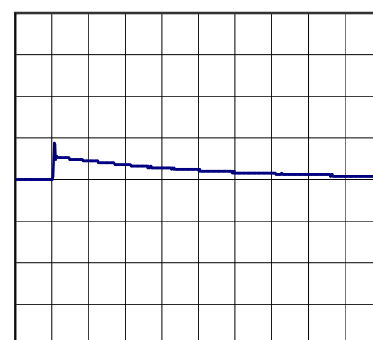


1ms/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (1.25A)

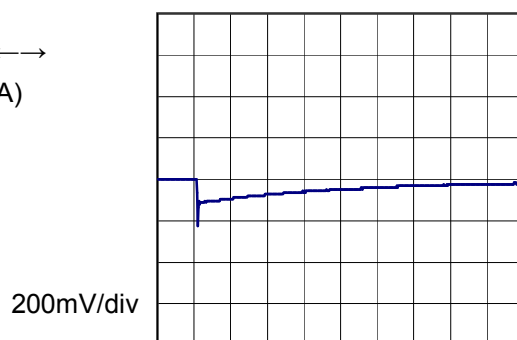


1ms/div

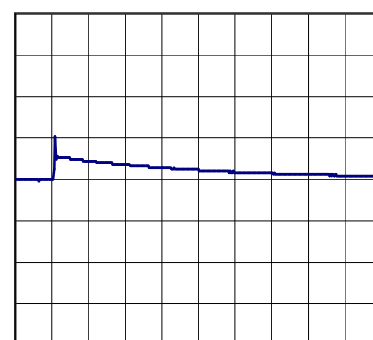


1ms/div

Load 50% (1.25A)  $\longleftrightarrow$   
Load 100% (2.5A)



1ms/div



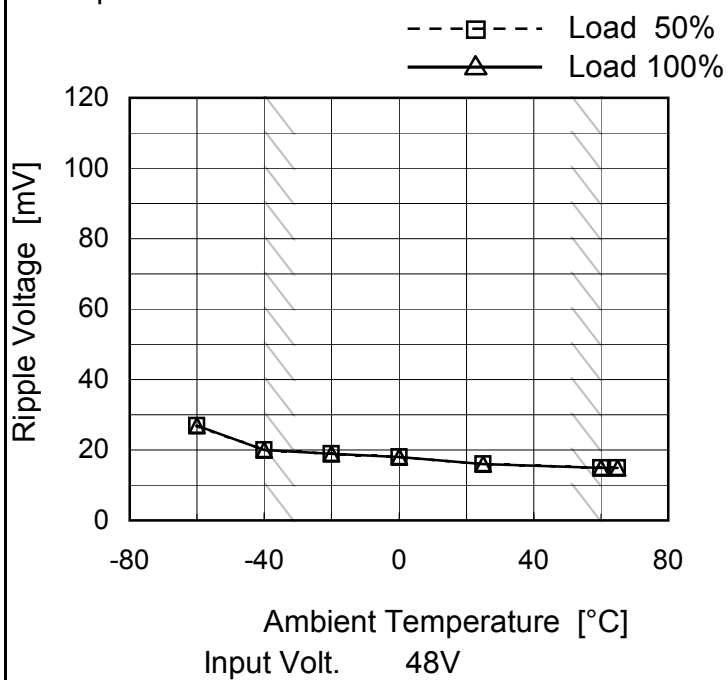
1ms/div

Model	MGS304812																																						
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																				
		Testing Circuitry	Figure B																																				
Object	+12V2.5A																																						
1.Graph		2.Values																																					
<div><div><div>△</div>Input Volt. 36V</div><div><div>○</div>Input Volt. 76V</div></div> <table><thead><tr><th>Load Current [A]</th><th>Input Volt. 36 [V]</th><th>Input Volt. 76 [V]</th></tr></thead><tbody><tr><td>0.00</td><td>13</td><td>21</td></tr><tr><td>0.50</td><td>13</td><td>21</td></tr><tr><td>1.00</td><td>13</td><td>21</td></tr><tr><td>1.50</td><td>13</td><td>21</td></tr><tr><td>2.00</td><td>13</td><td>21</td></tr><tr><td>2.50</td><td>13</td><td>21</td></tr><tr><td>2.75</td><td>13</td><td>21</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]	Input Volt. 36 [V]	Input Volt. 76 [V]	0.00	13	21	0.50	13	21	1.00	13	21	1.50	13	21	2.00	13	21	2.50	13	21	2.75	13	21	--	-	-	--	-	-	--	-	-	--	-	-		
Load Current [A]	Input Volt. 36 [V]	Input Volt. 76 [V]																																					
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<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	MGS304812																																								
Item	Ripple-Noise	Temperature	25°C																																						
Object	+12V2.5A	Testing Circuitry	Figure B																																						
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>36V</div></div><div><div>-.-○-.-</div><div>Input Volt.</div><div>76V</div></div></div> <div>Ripple Voltage [mV]</div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 36 [V]</th><th>Input Volt. 76 [V]</th></tr><tr><td>0.00</td><td>20</td><td>25</td></tr><tr><td>0.50</td><td>20</td><td>25</td></tr><tr><td>1.00</td><td>20</td><td>25</td></tr><tr><td>1.50</td><td>20</td><td>25</td></tr><tr><td>2.00</td><td>20</td><td>25</td></tr><tr><td>2.50</td><td>20</td><td>25</td></tr><tr><td>2.75</td><td>20</td><td>25</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. 36 [V]	Input Volt. 76 [V]	0.00	20	25	0.50	20	25	1.00	20	25	1.50	20	25	2.00	20	25	2.50	20	25	2.75	20	25	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
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2.00	20	25																																							
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2.75	20	25																																							
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<div>Ripple-Noise is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																									
<div><div>Ripple Noise[mVp-p]</div></div>																																									
Fig.Complex Ripple Noise Wave Form																																									

Model	MGS304812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V2.5A

## 1. Graph



Measured by 100 MHz Oscilloscope.

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

## Testing Circuitry Figure B

## 2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	27	27
-40	20	20
-20	19	19
0	18	18
25	16	16
60	15	15
65	15	15
--	-	-
--	-	-
--	-	-
--	-	-

Model

MGS304812

Item

Ambient Temperature Drift

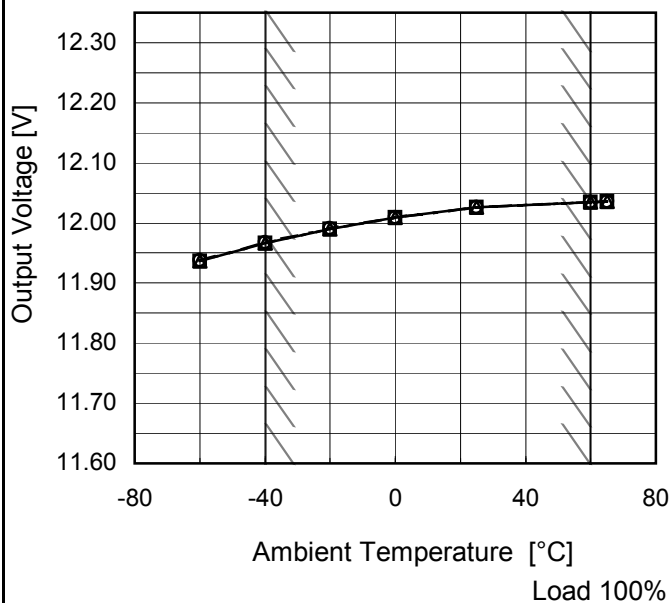
Object

+12V2.5A

Testing Circuitry Figure A

1. Graph

—△— Input Volt. 36V  
 ---□--- Input Volt. 48V  
 ---○--- Input Volt. 76V



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

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	11.936	11.937	11.938
-40	11.966	11.966	11.967
-20	11.990	11.990	11.991
0	12.009	12.009	12.010
25	12.027	12.027	12.027
60	12.035	12.035	12.035
65	12.036	12.036	12.036
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

		Testing Circuitry Figure A
Model	MGS304812	
Item	Output Voltage Accuracy	
Object	+12V2.5A	

## 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 : 36 - 76V

Load Current : 0 - 2.5A

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

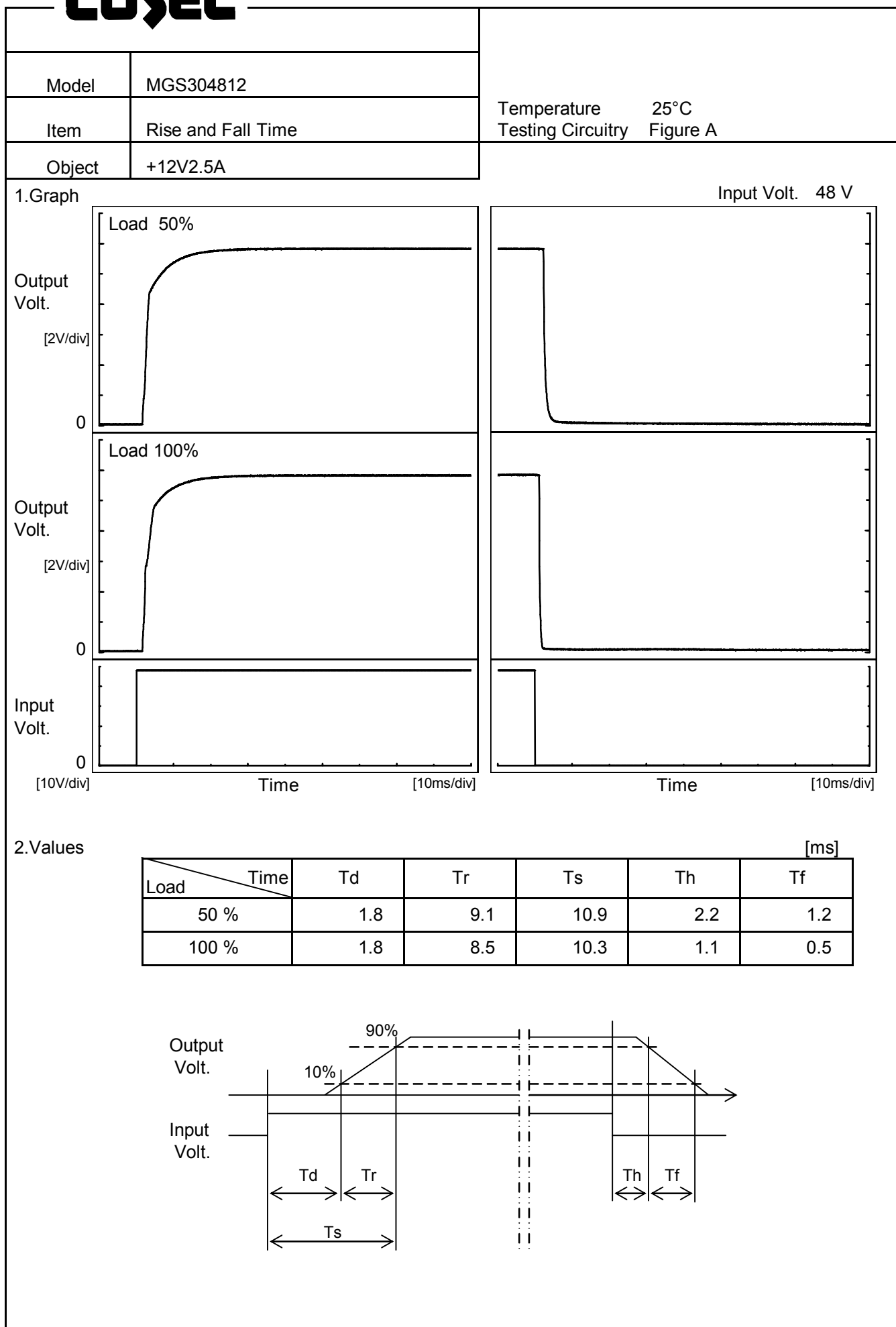
\* Output Voltage Accuracy (Ratio) =  $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

## 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	76	0	12.038	±36	±0.3
Minimum Voltage	-40	36	0	11.966		

Model	MGS304812		
Item	Time Lapse Drift	Temperature	25°C
		Testing Circuitry	Figure A
Object	+12V2.5A		
1.Graph		2.Values	
<div><div><div>Output Voltage [V]</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></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></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></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></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></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></di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Model

MGS304812

Item

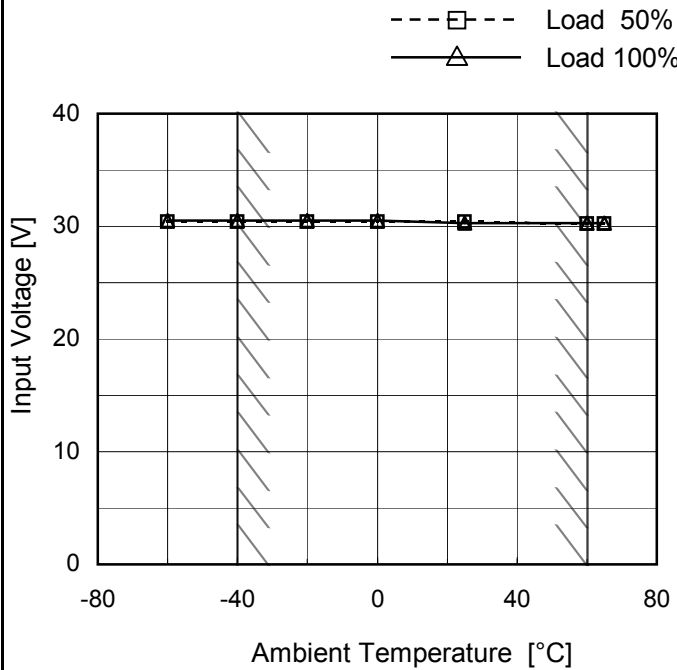
Minimum Input Voltage  
for Regulated Output Voltage

Object

+12V2.5A

Testing Circuitry Figure A

## 1. Graph



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

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	30.4	30.5
-40	30.4	30.6
-20	30.4	30.6
0	30.5	30.5
25	30.5	30.3
60	30.3	30.4
65	30.3	30.3
--	-	-
--	-	-
--	-	-
--	-	-

Model	MGS304812																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+12V2.5A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div><div></div><div></div></div><div><div>Input Volt. 36V</div><div>Input Volt. 48V</div><div>Input Volt. 76V</div></div></div> <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>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>12.0</td><td>3.33</td><td>3.38</td><td>3.37</td></tr><tr><td>11.4</td><td>-</td><td>-</td><td>-</td></tr><tr><td>10.8</td><td>-</td><td>-</td><td>-</td></tr><tr><td>9.6</td><td>-</td><td>-</td><td>-</td></tr><tr><td>8.4</td><td>-</td><td>-</td><td>-</td></tr><tr><td>7.2</td><td>-</td><td>-</td><td>-</td></tr><tr><td>6.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>4.8</td><td>-</td><td>-</td><td>-</td></tr><tr><td>3.6</td><td>-</td><td>-</td><td>-</td></tr><tr><td>2.4</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.2</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	12.0	3.33	3.38	3.37	11.4	-	-	-	10.8	-	-	-	9.6	-	-	-	8.4	-	-	-	7.2	-	-	-	6.0	-	-	-	4.8	-	-	-	3.6	-	-	-	2.4	-	-	-	1.2	-	-	-	0.0	-	-	-
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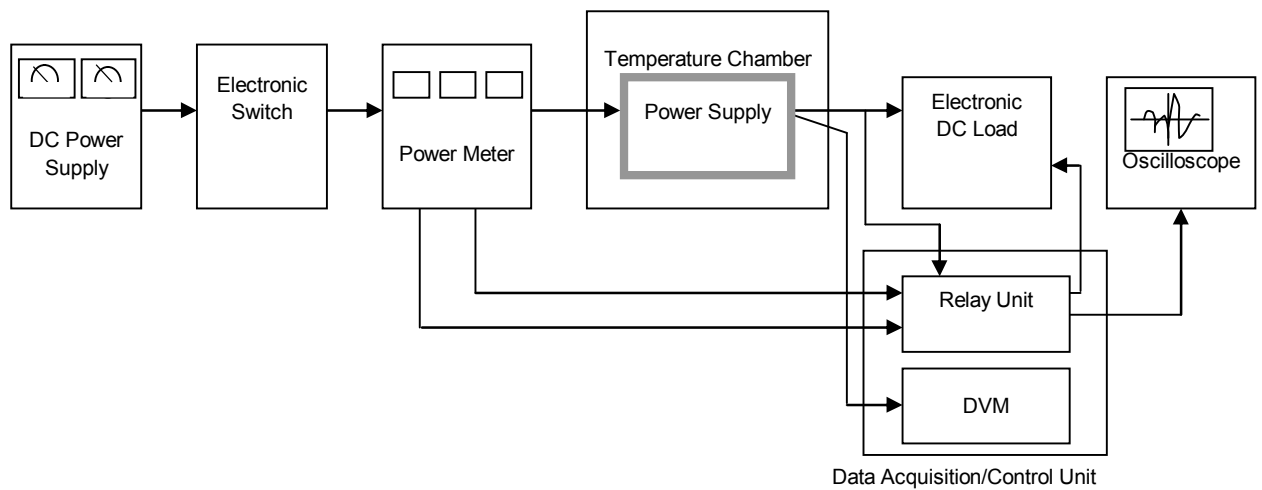


Figure A

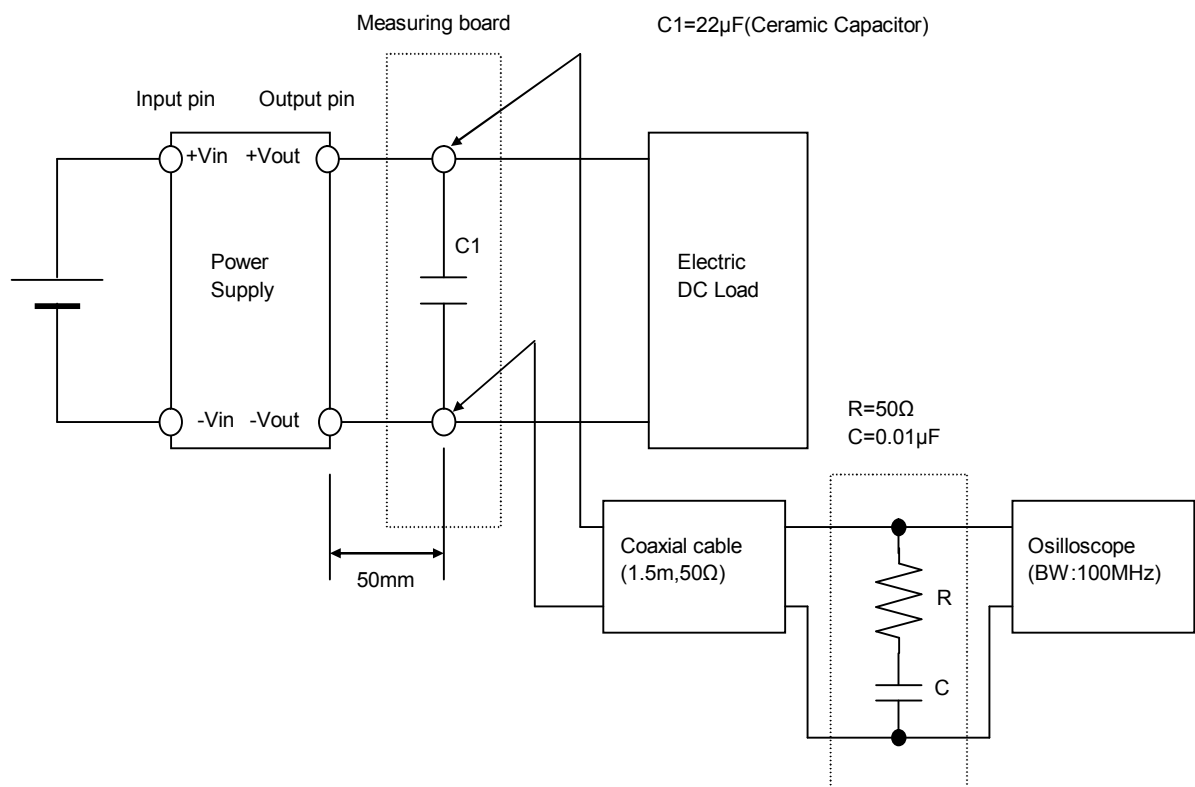


Figure B (Ripple and Ripple noise Characteristic)