

TEST DATA OF STMGFS304812

Regulated DC Power Supply
February 2, 2013

Approved by : Takahiro Yoneda
Takahiro Yoneda Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

COSEL CO.,LTD.

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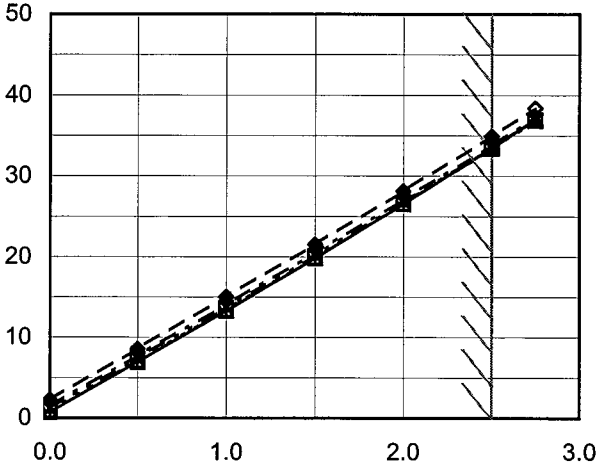
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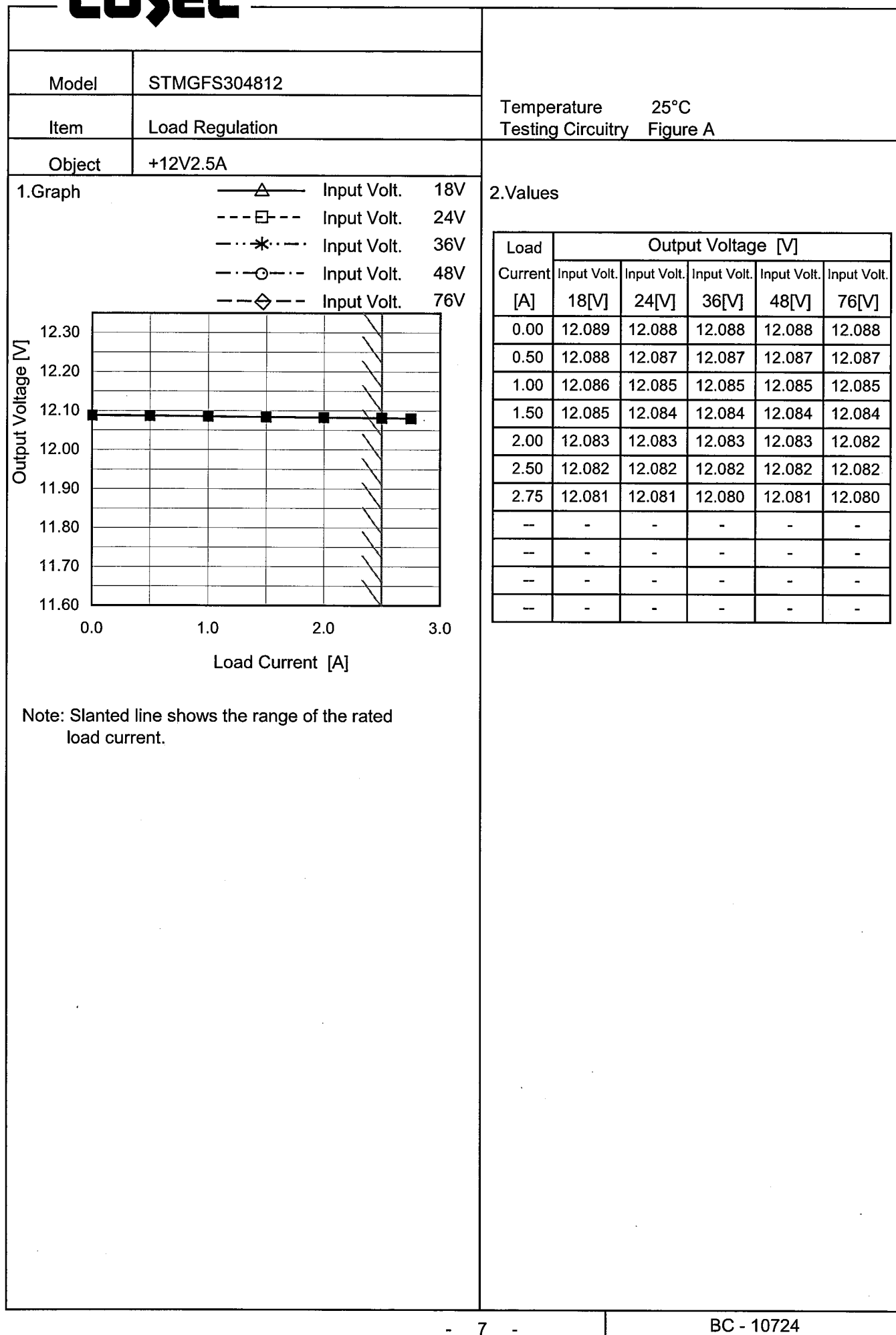
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<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] Load 50%</th><th>Output Voltage [V] Load 100%</th></tr></thead><tbody><tr><td>16</td><td>12.081</td><td>12.082</td></tr><tr><td>18</td><td>12.081</td><td>12.082</td></tr><tr><td>24</td><td>12.081</td><td>12.082</td></tr><tr><td>30</td><td>12.081</td><td>12.082</td></tr><tr><td>36</td><td>12.081</td><td>12.082</td></tr><tr><td>48</td><td>12.081</td><td>12.082</td></tr><tr><td>60</td><td>12.081</td><td>12.082</td></tr><tr><td>76</td><td>12.081</td><td>12.082</td></tr><tr><td>80</td><td>12.082</td><td>12.082</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	16	12.081	12.082	18	12.081	12.082	24	12.081	12.082	30	12.081	12.082	36	12.081	12.082	48	12.081	12.082	60	12.081	12.082	76	12.081	12.082	80	12.082	12.082		
Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%																															
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76	12.081	12.082																															
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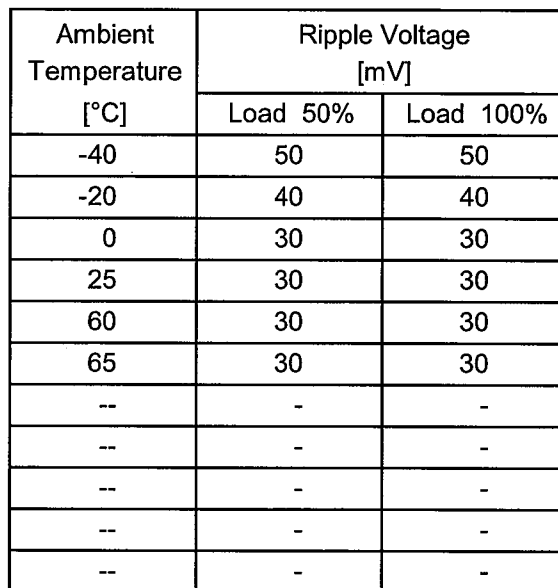
Model		STMGFS304812		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+12V2.5A																																									
1.Graph				2.Values																																							
<div><div><div><div><div></div><div>—△—</div><div>Input Volt.</div><div>18V</div></div><div><div>---○---</div><div>Input Volt.</div><div>76V</div></div></div><div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div></div></div>				<table><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. 76 [V]</th></tr><tr><td>0.00</td><td>30</td><td>30</td></tr><tr><td>0.50</td><td>30</td><td>30</td></tr><tr><td>1.00</td><td>30</td><td>30</td></tr><tr><td>1.50</td><td>30</td><td>30</td></tr><tr><td>2.00</td><td>30</td><td>30</td></tr><tr><td>2.50</td><td>30</td><td>30</td></tr><tr><td>2.75</td><td>30</td><td>30</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. 18 [V]	Input Volt. 76 [V]	0.00	30	30	0.50	30	30	1.00	30	30	1.50	30	30	2.00	30	30	2.50	30	30	2.75	30	30	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 18 [V]	Input Volt. 76 [V]																																									
0.00	30	30																																									
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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>																																											
<div><div><div><div></div><div>Ripple [mVp-p]</div></div><div><p>Fig.Complex Ripple Wave Form</p></div></div></div>																																											

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Model		STMGFS304812																																							
Item		Ripple-Noise																																							
Object		+12V2.5A																																							
1.Graph		2.Values																																							
<div><div><div><div><div></div><div>—△—</div><div>Input Volt.</div><div>18V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>76V</div></div></div><div><p>Ripple-Noise [mV]</p><p>Load Current [A]</p></div></div><div><p>Measured by 100 MHz Oscilloscope.</p><p>Ripple-Noise is shown as p-p in the figure below.</p><p>Note: Slanted line shows the range of the rated load current.</p><div><div><div><div></div><div>Ripple Noise[mVp-p]</div><div></div></div><div></div></div><p>Fig.Complex Ripple Noise Wave Form</p></div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 18 [V]</th><th>Input Volt. 76 [V]</th></tr><tr><td>0.00</td><td>40</td><td>40</td></tr><tr><td>0.50</td><td>40</td><td>40</td></tr><tr><td>1.00</td><td>40</td><td>40</td></tr><tr><td>1.50</td><td>40</td><td>45</td></tr><tr><td>2.00</td><td>45</td><td>45</td></tr><tr><td>2.50</td><td>45</td><td>45</td></tr><tr><td>2.75</td><td>45</td><td>45</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. 18 [V]	Input Volt. 76 [V]	0.00	40	40	0.50	40	40	1.00	40	40	1.50	40	45	2.00	45	45	2.50	45	45	2.75	45	45	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 18 [V]	Input Volt. 76 [V]																																							
0.00	40	40																																							
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2.75	45	45																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
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Testing Circuitry Figure B

2.Values



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

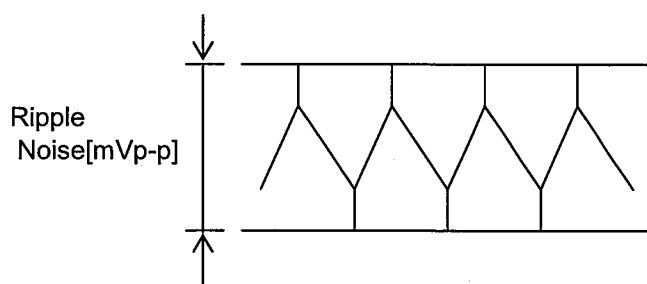
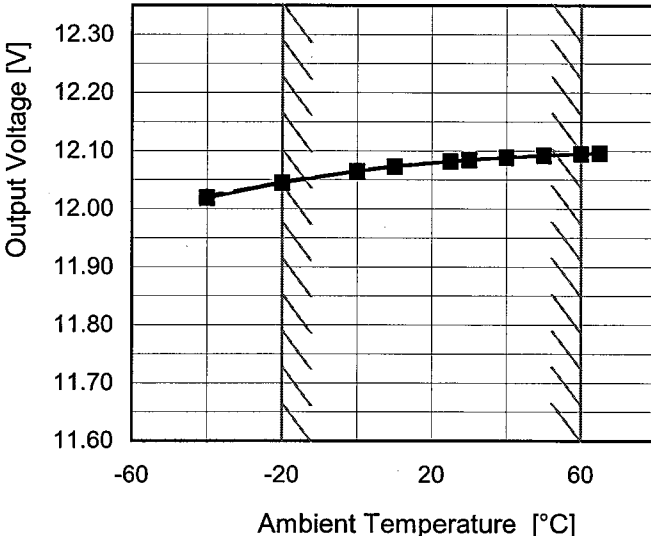


Fig.Complex Ripple Noise Wave Form

Model	STMGFS304812																																																																																	
Item	Ambient Temperature Drift																																																																																	
Object	+12V2.5A																																																																																	
1.Graph		2.Values																																																																																
<div><div><div><div><div>—△—</div><div>Input Volt.</div><div>18V</div></div><div><div>---□---</div><div>Input Volt.</div><div>24V</div></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><p>Output Voltage [V]</p><p>Ambient Temperature [°C]</p><p>Load 100%</p></div><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div></div>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="5">Output Voltage [V]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>-40</td><td>12.019</td><td>12.019</td><td>12.020</td><td>12.020</td><td>12.021</td></tr><tr><td>-20</td><td>12.045</td><td>12.045</td><td>12.045</td><td>12.046</td><td>12.046</td></tr><tr><td>0</td><td>12.065</td><td>12.064</td><td>12.065</td><td>12.065</td><td>12.066</td></tr><tr><td>10</td><td>12.073</td><td>12.073</td><td>12.073</td><td>12.073</td><td>12.074</td></tr><tr><td>25</td><td>12.082</td><td>12.082</td><td>12.082</td><td>12.082</td><td>12.082</td></tr><tr><td>30</td><td>12.084</td><td>12.084</td><td>12.085</td><td>12.085</td><td>12.085</td></tr><tr><td>40</td><td>12.088</td><td>12.089</td><td>12.089</td><td>12.089</td><td>12.089</td></tr><tr><td>50</td><td>12.092</td><td>12.092</td><td>12.092</td><td>12.092</td><td>12.092</td></tr><tr><td>60</td><td>12.095</td><td>12.095</td><td>12.095</td><td>12.095</td><td>12.095</td></tr><tr><td>65</td><td>12.096</td><td>12.096</td><td>12.097</td><td>12.097</td><td>12.096</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>				Ambient Temperature [°C]	Output Voltage [V]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-40	12.019	12.019	12.020	12.020	12.021	-20	12.045	12.045	12.045	12.046	12.046	0	12.065	12.064	12.065	12.065	12.066	10	12.073	12.073	12.073	12.073	12.074	25	12.082	12.082	12.082	12.082	12.082	30	12.084	12.084	12.085	12.085	12.085	40	12.088	12.089	12.089	12.089	12.089	50	12.092	12.092	12.092	12.092	12.092	60	12.095	12.095	12.095	12.095	12.095	65	12.096	12.096	12.097	12.097	12.096	--	-	-	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																																																	
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65	12.096	12.096	12.097	12.097	12.096																																																																													
--	-	-	-	-	-																																																																													



		Testing Circuitry Figure A
Model	STMGFS304812	
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 : -20 - 60°C

Input Voltage : 18 - 76V

Load Current : 0 - 2.5A

* 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	18	0	12.103	±29	±0.2
Minimum Voltage	-20	18	2.5	12.045		

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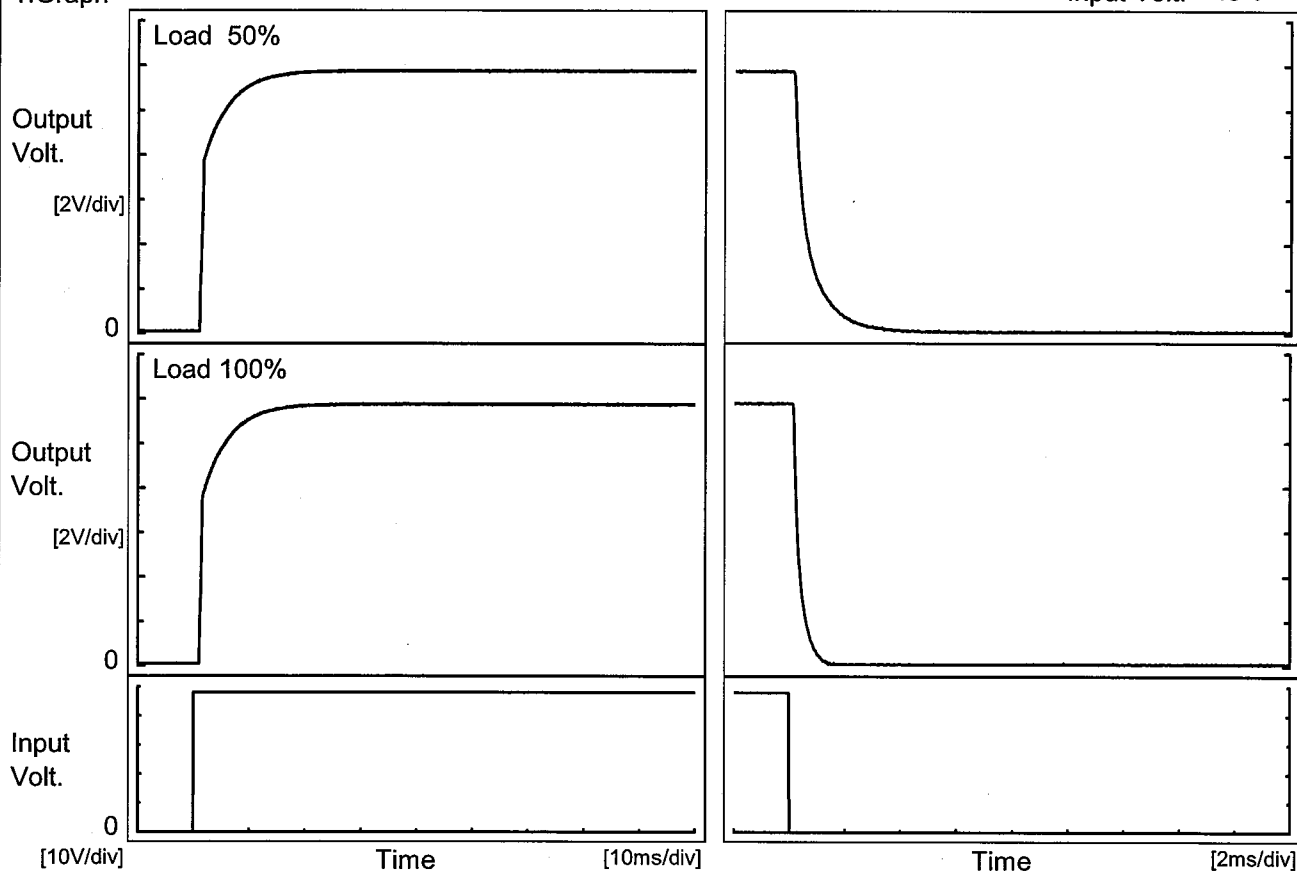
Model		STMGFS304812																							
Item		Time Lapse Drift																							
Object		+12V2.5A																							
1.Graph		2.Values																							
<div><div><div><div>12.30</div><div>12.20</div><div>12.10</div><div>12.00</div><div>11.90</div><div>11.80</div><div>11.70</div><div>11.60</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div></div><div><div>Output Voltage [V]</div><div>Time [H]</div></div><div><div>Input Volt.</div><div>Load</div></div><div><div>48V</div><div>100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.076</td></tr><tr><td>0.5</td><td>12.088</td></tr><tr><td>1.0</td><td>12.088</td></tr><tr><td>2.0</td><td>12.088</td></tr><tr><td>3.0</td><td>12.088</td></tr><tr><td>4.0</td><td>12.088</td></tr><tr><td>5.0</td><td>12.088</td></tr><tr><td>6.0</td><td>12.088</td></tr><tr><td>7.0</td><td>12.088</td></tr><tr><td>8.0</td><td>12.088</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.076	0.5	12.088	1.0	12.088	2.0	12.088	3.0	12.088	4.0	12.088	5.0	12.088	6.0	12.088	7.0	12.088	8.0	12.088
Time since start [H]	Output Voltage [V]																								
0.0	12.076																								
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6.0	12.088																								
7.0	12.088																								
8.0	12.088																								

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Model	STMGFS304812	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V2.5A		

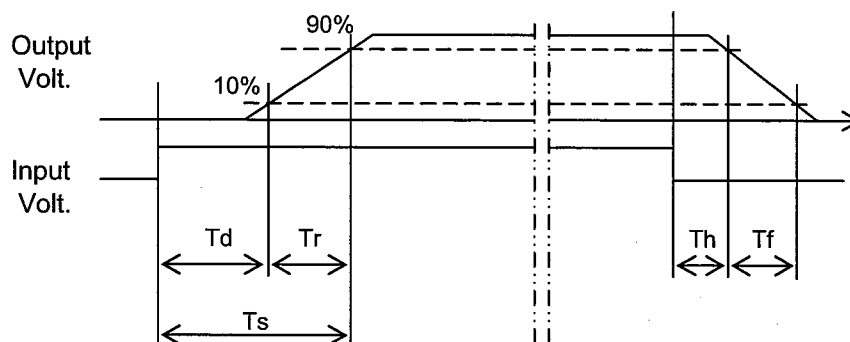
1. Graph

Input Volt. 48 V



2. Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.2	7.5	8.7	0.2	1.4
100 %	1.2	7.6	8.8	0.2	0.6



Model	STMGFS304812	Testing Circuitry Figure A																																					
Item	Minimum Input Voltage for Regulated Output Voltage																																						
Object	+12V2.5A																																						
1.Graph		2.Values																																					
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Ambient Temperature [°C]</th><th>Load 50% [V]</th><th>Load 100% [V]</th></tr></thead><tbody><tr><td>-40</td><td>15.7</td><td>15.8</td></tr><tr><td>-20</td><td>15.7</td><td>15.9</td></tr><tr><td>0</td><td>15.7</td><td>15.8</td></tr><tr><td>10</td><td>15.8</td><td>15.9</td></tr><tr><td>25</td><td>16.0</td><td>16.0</td></tr><tr><td>30</td><td>15.8</td><td>16.1</td></tr><tr><td>40</td><td>16.0</td><td>16.1</td></tr><tr><td>50</td><td>16.0</td><td>16.1</td></tr><tr><td>60</td><td>16.0</td><td>16.0</td></tr><tr><td>65</td><td>16.0</td><td>16.0</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		Ambient Temperature [°C]	Load 50% [V]	Load 100% [V]	-40	15.7	15.8	-20	15.7	15.9	0	15.7	15.8	10	15.8	15.9	25	16.0	16.0	30	15.8	16.1	40	16.0	16.1	50	16.0	16.1	60	16.0	16.0	65	16.0	16.0	--	-	-		
Ambient Temperature [°C]	Load 50% [V]	Load 100% [V]																																					
-40	15.7	15.8																																					
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10	15.8	15.9																																					
25	16.0	16.0																																					
30	15.8	16.1																																					
40	16.0	16.1																																					
50	16.0	16.1																																					
60	16.0	16.0																																					
65	16.0	16.0																																					
--	-	-																																					

Temperature 25°C
Testing Circuitry Figure A

Output Voltage [V]	Load Current [A]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
	18[V]	24[V]	36[V]	48[V]	76[V]
12.0	3.086	3.305	3.413	3.357	3.088
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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Model		STMGFS304812	
Item		Overvoltage Protection	
Object		+12V2.5A	
1.Graph		2.Values	

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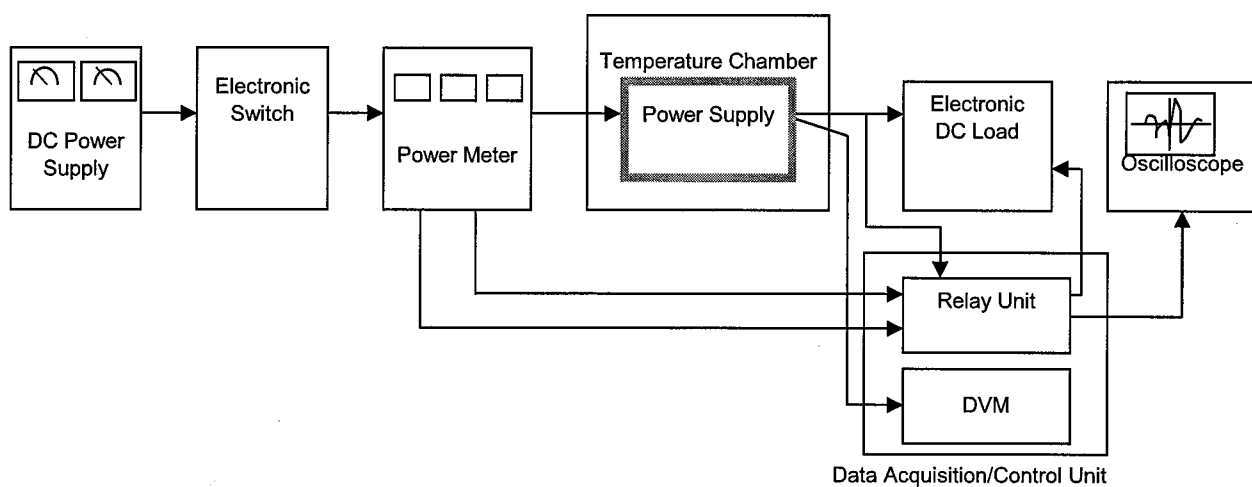


Figure A

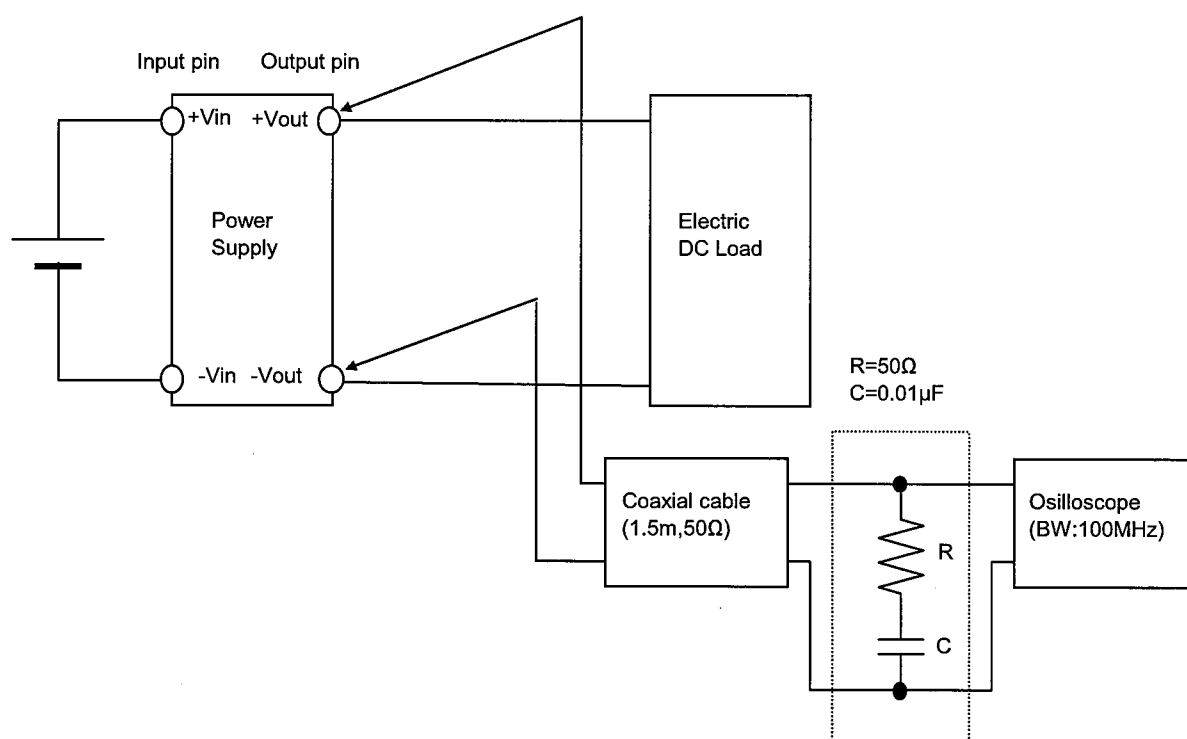


Figure B (Ripple and Ripple noise Characteristic)