

TEST DATA OF STMGFS152415

Regulated DC Power Supply
January 28, 2013

Approved by : Takahiro Yoneda
Takahiro Yoneda Design Manager

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COSEL CO.,LTD.

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Model	STMGFS152415																																																																																	
Item	Input Current (by Input Voltage)	Temperature	25°C																																																																															
Object		Testing Circuitry	Figure A																																																																															
1.Graph		2.Values																																																																																
<div><div><div>—△—</div><div>Load 100%</div></div><div><div>---□---</div><div>Load 50%</div></div><div><div>---○---</div><div>Load 0%</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="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>2.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>4.0</td><td>0.001</td><td>0.001</td><td>0.001</td></tr><tr><td>6.0</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>7.0</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>8.0</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>8.1</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>8.3</td><td>0.151</td><td>0.209</td><td>0.241</td></tr><tr><td>8.5</td><td>0.094</td><td>1.017</td><td>2.084</td></tr><tr><td>9.0</td><td>0.089</td><td>0.973</td><td>1.957</td></tr><tr><td>12.0</td><td>0.075</td><td>0.727</td><td>1.429</td></tr><tr><td>18.0</td><td>0.059</td><td>0.485</td><td>0.936</td></tr><tr><td>24.0</td><td>0.050</td><td>0.368</td><td>0.701</td></tr><tr><td>36.0</td><td>0.041</td><td>0.252</td><td>0.473</td></tr><tr><td>40.0</td><td>0.039</td><td>0.228</td><td>0.425</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	2.0	0.000	0.000	0.000	4.0	0.001	0.001	0.001	6.0	0.002	0.002	0.002	7.0	0.002	0.002	0.002	8.0	0.002	0.002	0.002	8.1	0.002	0.002	0.002	8.3	0.151	0.209	0.241	8.5	0.094	1.017	2.084	9.0	0.089	0.973	1.957	12.0	0.075	0.727	1.429	18.0	0.059	0.485	0.936	24.0	0.050	0.368	0.701	36.0	0.041	0.252	0.473	40.0	0.039	0.228	0.425	--	-	-	-	--	-	-	-	--	-	-	-
Input Voltage [V]	Input Current [A]																																																																																	
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Model

STMGFS152415

Item

Input Current (by Load Current)

Object

1.Graph

—△—

Input Volt.

9V

---□---

Input Volt.

12V

-·-·*-·-

Input Volt.

18V

-·-○-·-

Input Volt.

24V

---◇---

Input Volt.

36V

Input Current [A]

2.5

2.0

1.5

1.0

0.5

0.0

0.0

0.4

0.8

1.2

Load Current [A]

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

2.Values

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]
0.0	0.089	0.075	0.059	0.050	0.041
0.2	0.433	0.331	0.228	0.177	0.125
0.4	0.787	0.589	0.400	0.305	0.210
0.6	1.152	0.854	0.573	0.436	0.296
0.8	1.555	1.134	0.754	0.565	0.383
1.0	1.957	1.429	0.936	0.701	0.473
1.1	2.175	1.583	1.028	0.771	0.516
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Model		STMGFS152415		Temperature 25°C																																																																														
Item		Input Power (by Load Current)		Testing Circuitry Figure A																																																																														
Object																																																																																		
1.Graph		<div><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></div> <div>Input Power [W]</div> <div>Load Current [A]</div>		2.Values																																																																														
				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Input Power [W]</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>0.0</td><td>0.80</td><td>0.89</td><td>1.05</td><td>1.20</td><td>1.46</td></tr><tr><td>0.2</td><td>3.88</td><td>3.96</td><td>4.10</td><td>4.23</td><td>4.49</td></tr><tr><td>0.4</td><td>7.07</td><td>7.08</td><td>7.18</td><td>7.30</td><td>7.55</td></tr><tr><td>0.6</td><td>10.42</td><td>10.30</td><td>10.31</td><td>10.39</td><td>10.63</td></tr><tr><td>0.8</td><td>13.95</td><td>13.65</td><td>13.54</td><td>13.58</td><td>13.76</td></tr><tr><td>1.0</td><td>17.63</td><td>17.15</td><td>16.87</td><td>16.82</td><td>16.96</td></tr><tr><td>1.1</td><td>19.51</td><td>18.93</td><td>18.55</td><td>18.48</td><td>18.60</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 Power [W]					Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.0	0.80	0.89	1.05	1.20	1.46	0.2	3.88	3.96	4.10	4.23	4.49	0.4	7.07	7.08	7.18	7.30	7.55	0.6	10.42	10.30	10.31	10.39	10.63	0.8	13.95	13.65	13.54	13.58	13.76	1.0	17.63	17.15	16.87	16.82	16.96	1.1	19.51	18.93	18.55	18.48	18.60	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
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Note: Slanted line shows the range of the rated load current.

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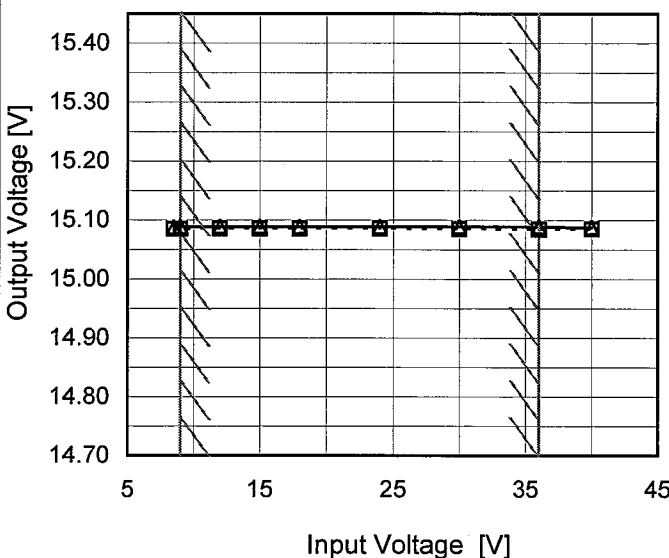
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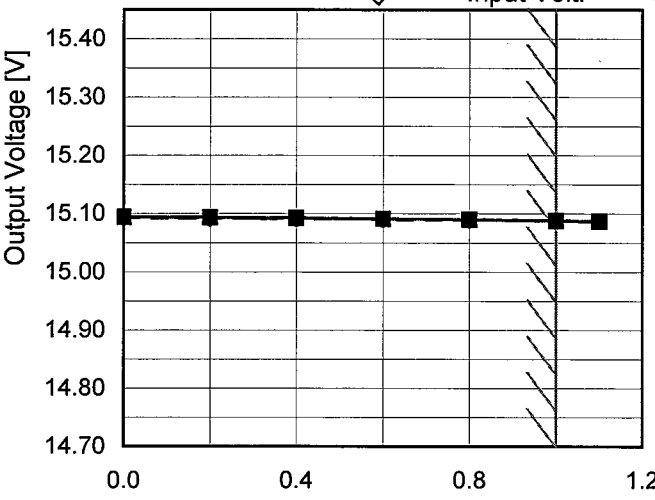
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<div><div><div><div><div>—△—</div><div>Input Volt.</div><div>9V</div></div><div>---□---</div><div>Input Volt.</div><div>12V</div></div><div><div>---*---</div><div>Input Volt.</div><div>18V</div></div><div><div>---○---</div><div>Input Volt.</div><div>24V</div></div><div><div>---◇---</div><div>Input Volt.</div><div>36V</div></div></div><div></div></div> <div><table><tr><th rowspan="2">Load Current [A]</th><th colspan="5">Output Voltage [V]</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>0.0</td><td>15.096</td><td>15.095</td><td>15.094</td><td>15.094</td><td>15.093</td></tr><tr><td>0.2</td><td>15.094</td><td>15.094</td><td>15.094</td><td>15.093</td><td>15.092</td></tr><tr><td>0.4</td><td>15.093</td><td>15.093</td><td>15.092</td><td>15.092</td><td>15.091</td></tr><tr><td>0.6</td><td>15.092</td><td>15.092</td><td>15.091</td><td>15.091</td><td>15.090</td></tr><tr><td>0.8</td><td>15.090</td><td>15.091</td><td>15.090</td><td>15.090</td><td>15.089</td></tr><tr><td>1.0</td><td>15.088</td><td>15.089</td><td>15.089</td><td>15.089</td><td>15.088</td></tr><tr><td>1.1</td><td>15.087</td><td>15.088</td><td>15.088</td><td>15.088</td><td>15.088</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></div> <div><p>Note: Slanted line shows the range of the rated load current.</p></div> <div><div>BC - 10713</div></div>		Load Current [A]	Output Voltage [V]					Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.0	15.096	15.095	15.094	15.094	15.093	0.2	15.094	15.094	15.094	15.093	15.092	0.4	15.093	15.093	15.092	15.092	15.091	0.6	15.092	15.092	15.091	15.091	15.090	0.8	15.090	15.091	15.090	15.090	15.089	1.0	15.088	15.089	15.089	15.089	15.088	1.1	15.087	15.088	15.088	15.088	15.088	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
Load Current [A]	Output Voltage [V]																																																																													
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COSEL

Model		STMGFS152415																																							
Item		Ripple Voltage (by Load Current)																																							
Object		+15V1A																																							
1.Graph		2.Values																																							
<div><div><div><div><div></div><div></div></div><div>Input Volt.</div><div>9V</div></div><div><div><div></div><div></div></div><div>Input Volt.</div><div>36V</div></div></div><div><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></div></div> <div><div><div><div></div><div></div></div><div>Ripple [mVp-p]</div></div><div></div><div>Fig.Complex Ripple Wave Form</div></div>		<table><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><tr><td>0.0</td><td>15</td><td>15</td></tr><tr><td>0.2</td><td>15</td><td>15</td></tr><tr><td>0.4</td><td>15</td><td>15</td></tr><tr><td>0.6</td><td>15</td><td>15</td></tr><tr><td>0.8</td><td>15</td><td>15</td></tr><tr><td>1.0</td><td>20</td><td>20</td></tr><tr><td>1.1</td><td>20</td><td>20</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. 9 [V]	Input Volt. 36 [V]	0.0	15	15	0.2	15	15	0.4	15	15	0.6	15	15	0.8	15	15	1.0	20	20	1.1	20	20	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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Model		STMGFS152415																																							
Item		Ripple-Noise																																							
Object		+15V1A																																							
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 9V</div><div>-○- Input Volt. 36V</div></div><p>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.</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 9 [V]</th><th>Input Volt. 36 [V]</th></tr><tr><td>0.0</td><td>20</td><td>20</td></tr><tr><td>0.2</td><td>25</td><td>25</td></tr><tr><td>0.4</td><td>30</td><td>30</td></tr><tr><td>0.6</td><td>30</td><td>30</td></tr><tr><td>0.8</td><td>30</td><td>30</td></tr><tr><td>1.0</td><td>30</td><td>40</td></tr><tr><td>1.1</td><td>30</td><td>40</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. 9 [V]	Input Volt. 36 [V]	0.0	20	20	0.2	25	25	0.4	30	30	0.6	30	30	0.8	30	30	1.0	30	40	1.1	30	40	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
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<div><div><div><div></div><div></div></div><div>Ripple Noise[mVp-p]</div></div><p>Fig.Complex Ripple Noise Wave Form</p></div>																																									

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BC - 10713

COSEL

Model		STMGFS152405
Item		Ripple Voltage (by Ambient Temp.)
Object		+15V1A

1.Graph

<

Testing Circuitry Figure A



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]
-40	15.020	15.023	15.025	15.025	15.024
-20	15.049	15.052	15.053	15.053	15.053
0	15.071	15.072	15.074	15.074	15.074
10	15.079	15.080	15.081	15.082	15.082
25	15.088	15.089	15.089	15.089	15.088
30	15.091	15.092	15.093	15.093	15.093
40	15.095	15.096	15.097	15.097	15.097
50	15.098	15.098	15.099	15.099	15.099
60	15.099	15.100	15.100	15.100	15.100
65	15.100	15.101	15.101	15.101	15.101
--	-	-	-	-	-

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		Testing Circuitry Figure A
Model	STMGFS152415	
Item	Output Voltage Accuracy	
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 : -20 - 60°C

Input Voltage : 9 - 36V

Load Current : 0 - 1A

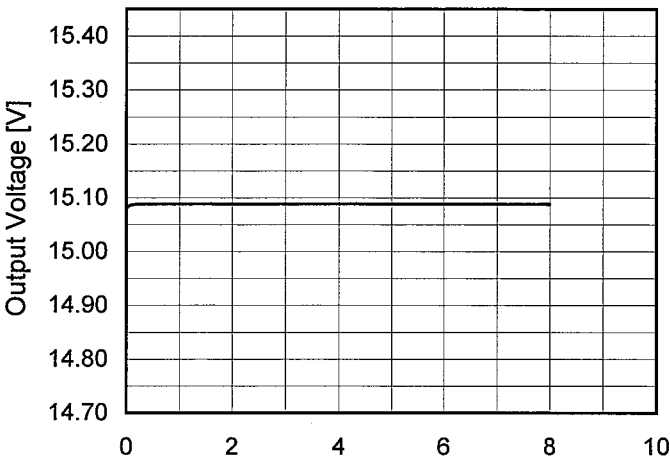
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* 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	9	0	15.105	±28	±0.2
Minimum Voltage	-20	9	1	15.049		



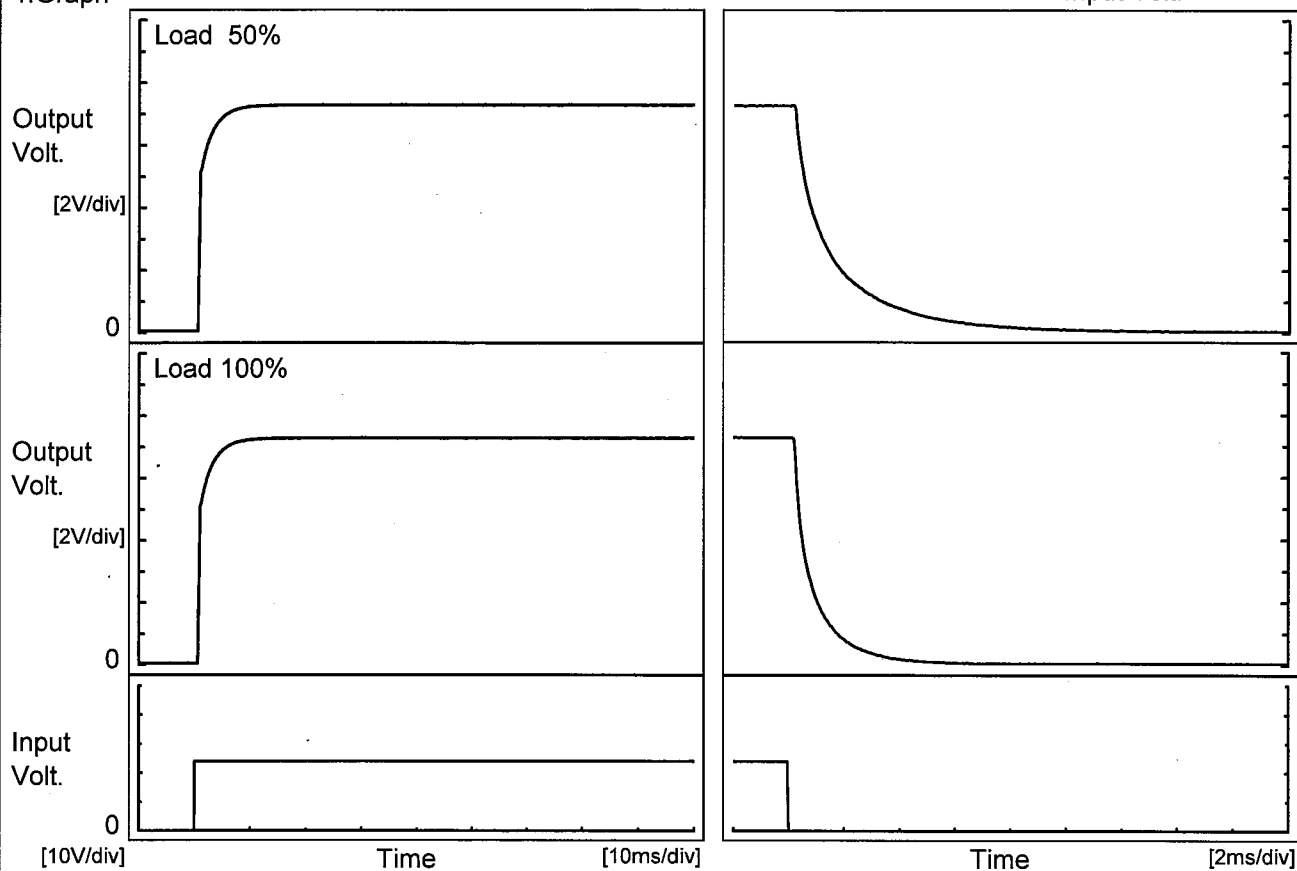
Model	STMGFS152415																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+15V1A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 24V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>15.080</td></tr><tr><td>0.5</td><td>15.089</td></tr><tr><td>1.0</td><td>15.089</td></tr><tr><td>2.0</td><td>15.089</td></tr><tr><td>3.0</td><td>15.089</td></tr><tr><td>4.0</td><td>15.089</td></tr><tr><td>5.0</td><td>15.089</td></tr><tr><td>6.0</td><td>15.089</td></tr><tr><td>7.0</td><td>15.088</td></tr><tr><td>8.0</td><td>15.089</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	15.080	0.5	15.089	1.0	15.089	2.0	15.089	3.0	15.089	4.0	15.089	5.0	15.089	6.0	15.089	7.0	15.088	8.0	15.089
Time since start [H]	Output Voltage [V]																								
0.0	15.080																								
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7.0	15.088																								
8.0	15.089																								

COSEL

Model	STMGFS152415	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V1A		

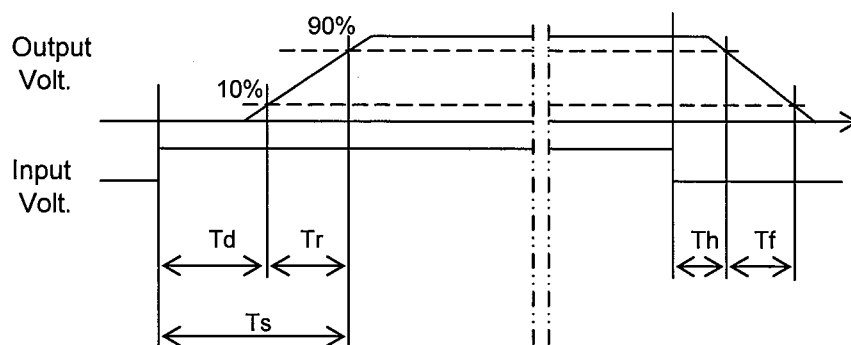
1. Graph

Input Volt. 24 V



2. Values

Load	Time	Td	Tr	Ts	Th	Tf
50 %		0.7	3.7	4.4	0.3	3.7
100 %		0.7	3.7	4.4	0.2	1.8



COSEL

		Testing Circuitry Figure A																																						
Model	STMGFS152415																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+15V1A																																							
1.Graph		2.Values																																						
<div><div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div><p>Input Voltage [V]</p><p>Ambient Temperature [°C]</p></div>																																								
<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																								
		<table><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><tr><td>-40</td><td>8.2</td><td>8.2</td></tr><tr><td>-20</td><td>8.2</td><td>8.3</td></tr><tr><td>0</td><td>8.2</td><td>8.3</td></tr><tr><td>10</td><td>8.2</td><td>8.3</td></tr><tr><td>25</td><td>8.2</td><td>8.3</td></tr><tr><td>30</td><td>8.2</td><td>8.3</td></tr><tr><td>40</td><td>8.2</td><td>8.3</td></tr><tr><td>50</td><td>8.1</td><td>8.3</td></tr><tr><td>60</td><td>8.1</td><td>8.3</td></tr><tr><td>65</td><td>8.1</td><td>8.3</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>	Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-40	8.2	8.2	-20	8.2	8.3	0	8.2	8.3	10	8.2	8.3	25	8.2	8.3	30	8.2	8.3	40	8.2	8.3	50	8.1	8.3	60	8.1	8.3	65	8.1	8.3	--	-	-
Ambient Temperature [°C]	Input Voltage [V]																																							
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60	8.1	8.3																																						
65	8.1	8.3																																						
--	-	-																																						

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Temperature	25°C
Testing Circuitry	Figure A

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]
15.0	1.206	1.350	1.490	1.494	1.334
14.3	-	-	-	-	-
13.5	-	-	-	-	-
12.0	-	-	-	-	-
10.5	-	-	-	-	-
9.0	-	-	-	-	-
7.5	-	-	-	-	-
6.0	-	-	-	-	-
4.5	-	-	-	-	-
3.0	-	-	-	-	-
1.5	-	-	-	-	-
0.0	-	-	-	-	-

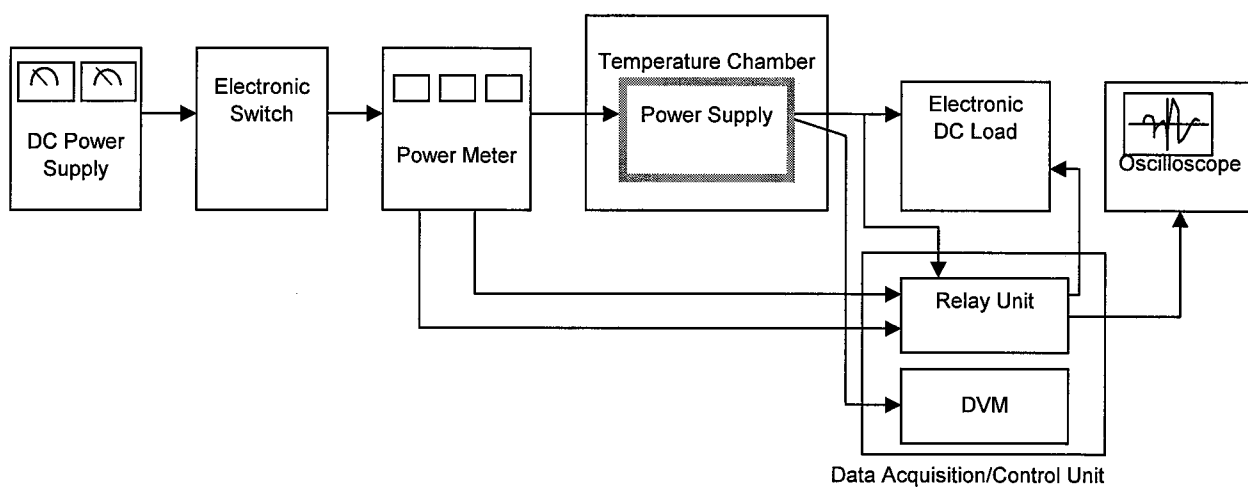


Figure A

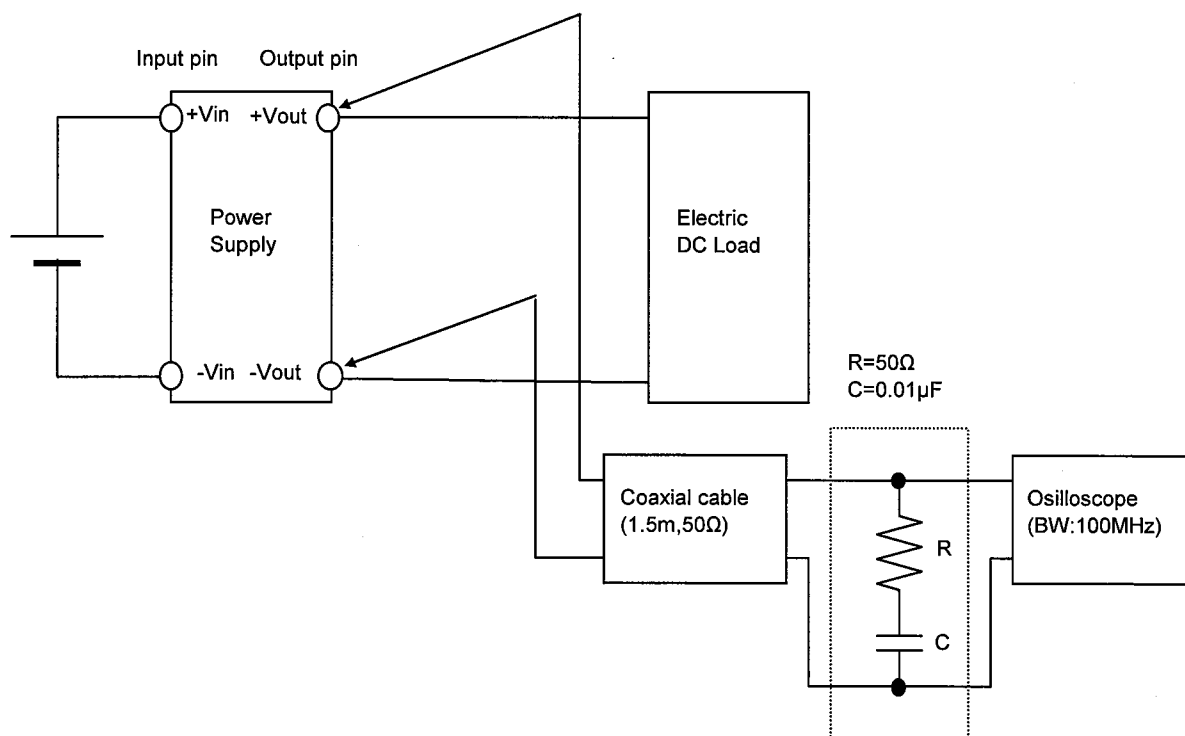


Figure B (Ripple and Ripple noise Characteristic)