

TEST DATA OF SUS1R51212

Regulated DC Power Supply
Sep 16, 2004

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Tetsuo Sugimori Design Manager

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COSEL CO.,LTD.

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Model		SUS1R51212	
Item		Input Current (by Input Voltage)	
Object			
1.Graph		2.Values	
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Model	SUS1R51212																																																					
Item	Input Current (by Load Current)	Temperature	25°C																																																			
Object		Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div>—△— Input Volt. 9V</div><div>---□--- Input Volt. 12V</div><div>-·-○-·- Input Volt. 18V</div></div> <p>Input Current [A]</p> <p>Load Current [A]</p> <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">Input Current [A]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>0.000</td><td>0.020</td><td>0.018</td><td>0.016</td></tr><tr><td>0.020</td><td>0.050</td><td>0.041</td><td>0.032</td></tr><tr><td>0.040</td><td>0.080</td><td>0.063</td><td>0.047</td></tr><tr><td>0.060</td><td>0.110</td><td>0.085</td><td>0.061</td></tr><tr><td>0.080</td><td>0.141</td><td>0.108</td><td>0.077</td></tr><tr><td>0.100</td><td>0.172</td><td>0.130</td><td>0.091</td></tr><tr><td>0.120</td><td>0.204</td><td>0.153</td><td>0.106</td></tr><tr><td>0.130</td><td>0.220</td><td>0.165</td><td>0.114</td></tr><tr><td>0.143</td><td>0.242</td><td>0.180</td><td>0.123</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 Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.000	0.020	0.018	0.016	0.020	0.050	0.041	0.032	0.040	0.080	0.063	0.047	0.060	0.110	0.085	0.061	0.080	0.141	0.108	0.077	0.100	0.172	0.130	0.091	0.120	0.204	0.153	0.106	0.130	0.220	0.165	0.114	0.143	0.242	0.180	0.123	--	-	-	-	--	-	-	-
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Model		SUS1R51212																																	
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Object																																			
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<div><div><div><div><div></div><div></div></div><div></div></div><div>Load 50%</div></div><div><div><div><div></div><div></div></div><div></div></div><div>Load 100%</div></div></div> <div><div><div><div>Efficiency [%]</div><div></div></div><div><div></div><div>80</div></div><div><div></div><div>70</div></div><div><div></div><div>60</div></div><div><div></div><div>50</div></div><div><div></div><div>40</div></div><div><div></div><div>30</div></div></div><div><div><div></div><div>6</div></div><div><div></div><div>10</div></div><div><div></div><div>14</div></div><div><div></div><div>18</div></div><div><div></div><div>22</div></div></div><div><div></div><div>Input Voltage [V]</div></div></div> <div><div>Note: Slanted line shows the range of the rated input voltage.</div></div>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Efficiency [%]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>8</td><td>73.9</td><td>77.9</td></tr><tr><td>9</td><td>73.5</td><td>78.5</td></tr><tr><td>10</td><td>72.8</td><td>78.7</td></tr><tr><td>12</td><td>71.4</td><td>78.4</td></tr><tr><td>15</td><td>69.1</td><td>77.4</td></tr><tr><td>18</td><td>66.4</td><td>75.9</td></tr><tr><td>20</td><td>64.1</td><td>74.4</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr></table>		Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	8	73.9	77.9	9	73.5	78.5	10	72.8	78.7	12	71.4	78.4	15	69.1	77.4	18	66.4	75.9	20	64.1	74.4	—	—	—	—	—	—
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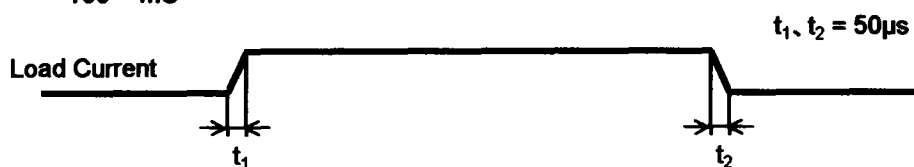
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<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>8</td><td>12.005</td><td>12.004</td></tr><tr><td>9</td><td>12.006</td><td>12.005</td></tr><tr><td>10</td><td>12.006</td><td>12.005</td></tr><tr><td>12</td><td>12.006</td><td>12.005</td></tr><tr><td>15</td><td>12.006</td><td>12.004</td></tr><tr><td>18</td><td>12.006</td><td>12.004</td></tr><tr><td>20</td><td>12.006</td><td>12.004</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%	8	12.005	12.004	9	12.006	12.005	10	12.006	12.005	12	12.006	12.005	15	12.006	12.004	18	12.006	12.004	20	12.006	12.004	--	-	-	--	-	-
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18	12.006	12.004																																	
20	12.006	12.004																																	
--	-	-																																	
--	-	-																																	

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COSEL

Model	SUS1R51212	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.13A		

Input Volt. 12 V
Cycle 100 mS

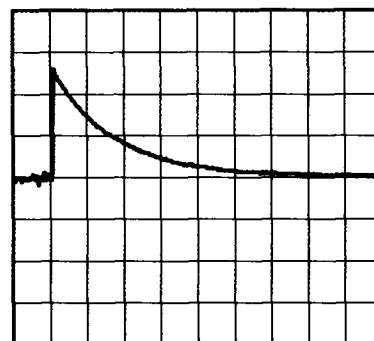


Min. Load (0A) \longleftrightarrow
Load 100% (0.13A)

100mV/div



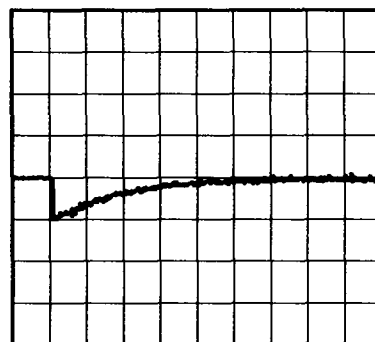
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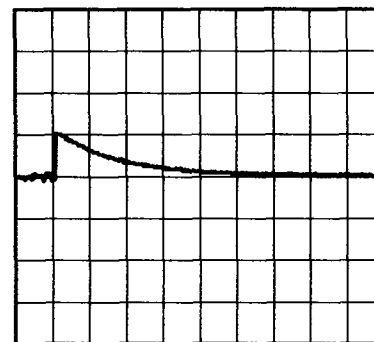
2ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.065A)

100mV/div



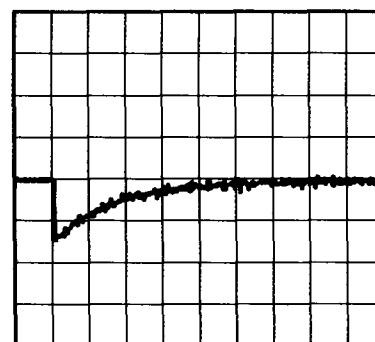
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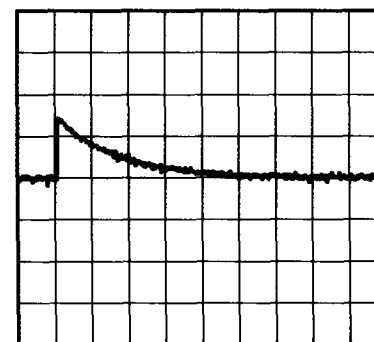
2ms/div

Load 50% (0.065A) \longleftrightarrow
Load 100% (0.13A)

100mV/div



2ms/div



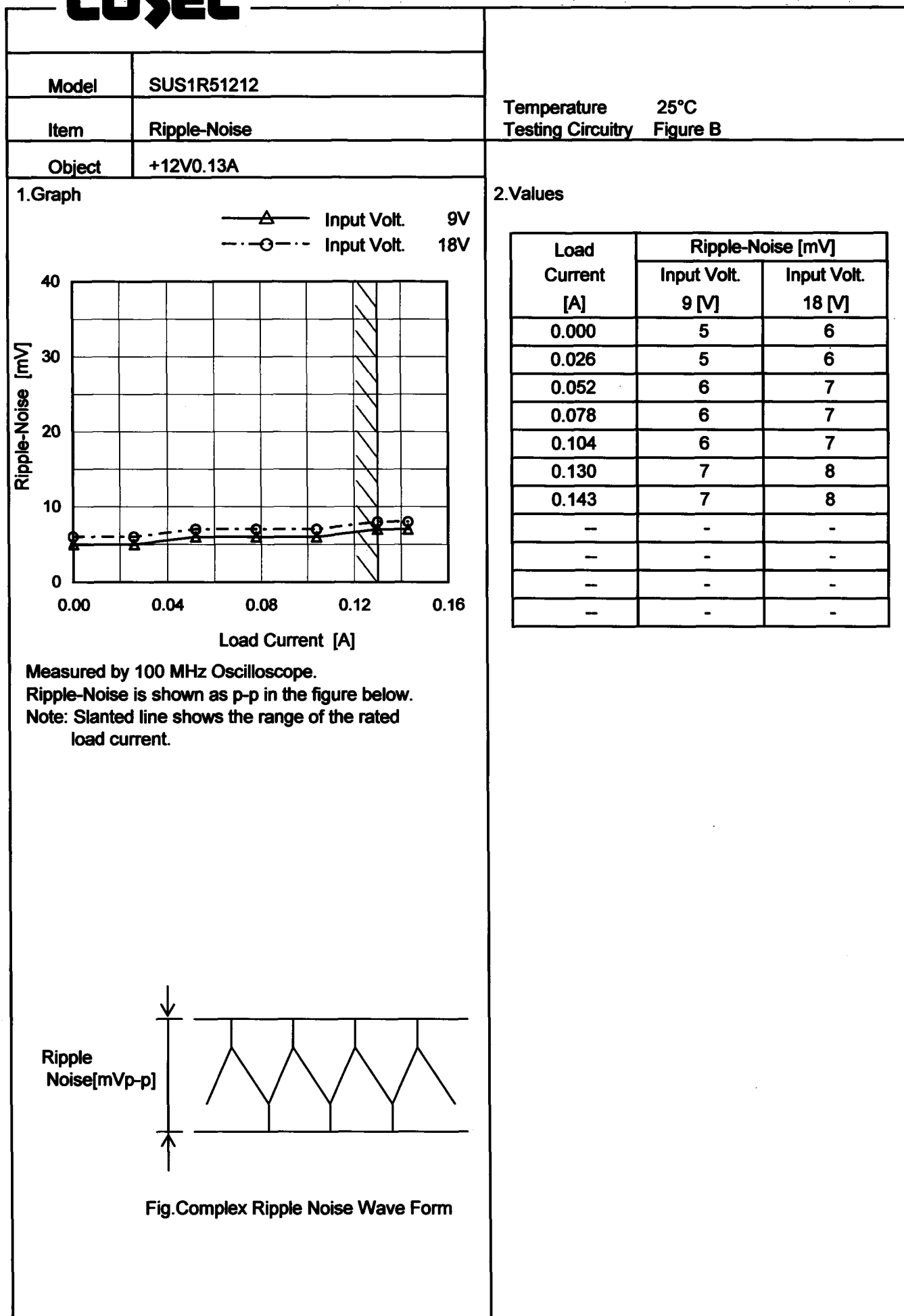
2ms/div

COSEL

Model	SUS1R51212																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
Object	+12V0.13A	Testing Circuitry	Figure B																																						
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>9V</div></div><div><div>---○---</div><div>Input Volt.</div><div>18V</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>		<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. 18 [V]</th></tr><tr><td>0.000</td><td>3</td><td>3</td></tr><tr><td>0.026</td><td>3</td><td>3</td></tr><tr><td>0.052</td><td>3</td><td>4</td></tr><tr><td>0.078</td><td>3</td><td>4</td></tr><tr><td>0.104</td><td>3</td><td>4</td></tr><tr><td>0.130</td><td>4</td><td>4</td></tr><tr><td>0.143</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></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 9 [V]	Input Volt. 18 [V]	0.000	3	3	0.026	3	3	0.052	3	4	0.078	3	4	0.104	3	4	0.130	4	4	0.143	4	4	—	—	—	—	—	—	—	—	—	—	—	—
Load Current [A]	Ripple Voltage [mV]																																								
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<p>Fig.Complex Ripple Wave Form</p>																																									

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COSEL

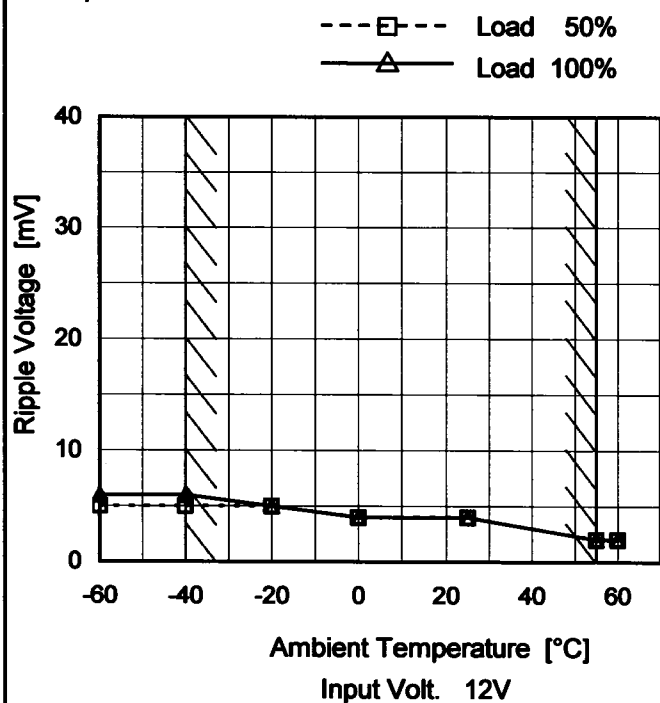
COSEL

Model SUS1R51212

Item Ripple Voltage (by Ambient Temp.)

Object +12V0.13A

Testing Circuitry Figure B

1. Graph


Measured by 100 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	6
-40	5	6
-20	5	5
0	4	4
25	4	4
55	2	2
60	2	2
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model		SUS1R51212																																																				
Item		Ambient Temperature Drift																																																				
Object		+12V0.13A																																																				
1.Graph		<div><div><div><div>—△—</div><div>Input Volt.</div><div>9V</div></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><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>																																																				
2.Values		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>-60</td><td>11.997</td><td>11.998</td><td>11.998</td></tr><tr><td>-40</td><td>12.008</td><td>12.009</td><td>12.008</td></tr><tr><td>-20</td><td>12.013</td><td>12.013</td><td>12.013</td></tr><tr><td>0</td><td>12.013</td><td>12.012</td><td>12.012</td></tr><tr><td>25</td><td>12.005</td><td>12.004</td><td>12.003</td></tr><tr><td>55</td><td>11.989</td><td>11.988</td><td>11.987</td></tr><tr><td>60</td><td>11.985</td><td>11.984</td><td>11.983</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>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	-60	11.997	11.998	11.998	-40	12.008	12.009	12.008	-20	12.013	12.013	12.013	0	12.013	12.012	12.012	25	12.005	12.004	12.003	55	11.989	11.988	11.987	60	11.985	11.984	11.983	—	-	-	-	—	-	-	-	—	-	-	-	—	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
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COSEL

		Testing Circuitry Figure A
Model	SUS1R51212	
Item	Output Voltage Accuracy	
Object	+12V0.13A	

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 - 55°C

Input Voltage : 9 - 18V

Load Current : 0 - 0.13A

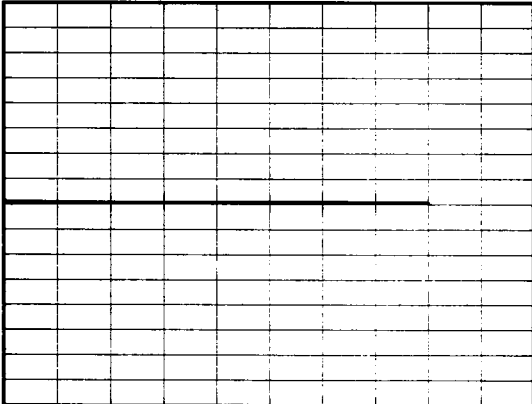
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

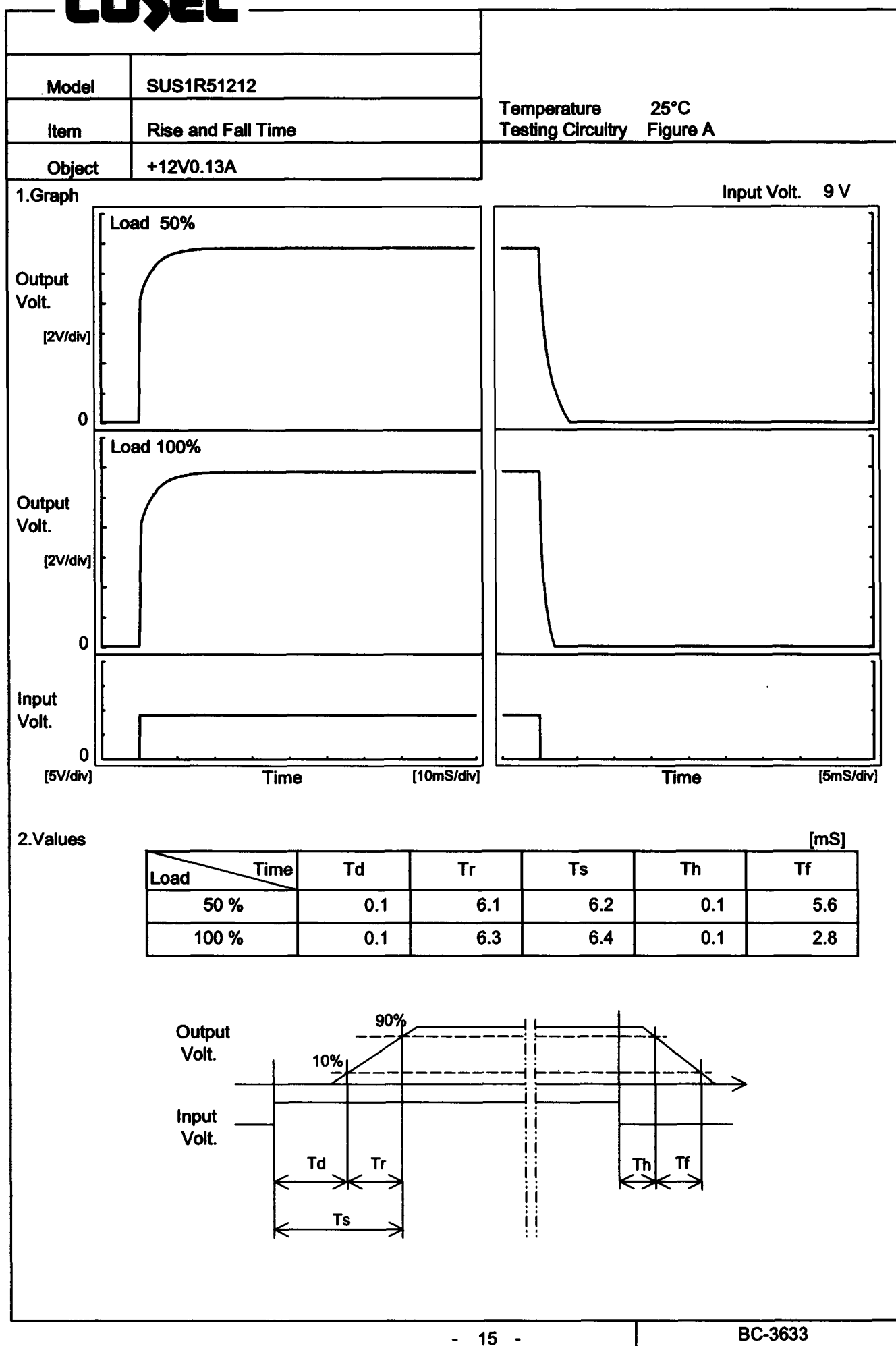
* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	-20	12	0	12.015	±14	±0.1
Minimum Voltage	55	18	0.13	11.987		

COSEL

Model	SUS1R51212																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+12V0.13A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><div><div>12.40</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>0246810</div></div><div>Output Voltage [V]</div><div>Time [H]</div><div>Input Volt. 12V</div><div>Load 100%</div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.009</td></tr><tr><td>0.5</td><td>12.004</td></tr><tr><td>1.0</td><td>12.005</td></tr><tr><td>2.0</td><td>12.004</td></tr><tr><td>3.0</td><td>12.004</td></tr><tr><td>4.0</td><td>12.004</td></tr><tr><td>5.0</td><td>12.004</td></tr><tr><td>6.0</td><td>12.004</td></tr><tr><td>7.0</td><td>12.004</td></tr><tr><td>8.0</td><td>12.004</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.009	0.5	12.004	1.0	12.005	2.0	12.004	3.0	12.004	4.0	12.004	5.0	12.004	6.0	12.004	7.0	12.004	8.0	12.004
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COSEL

COSEL

Model	SUS1R51212																																																																
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A																																																															
Object	+12V0.13A																																																																
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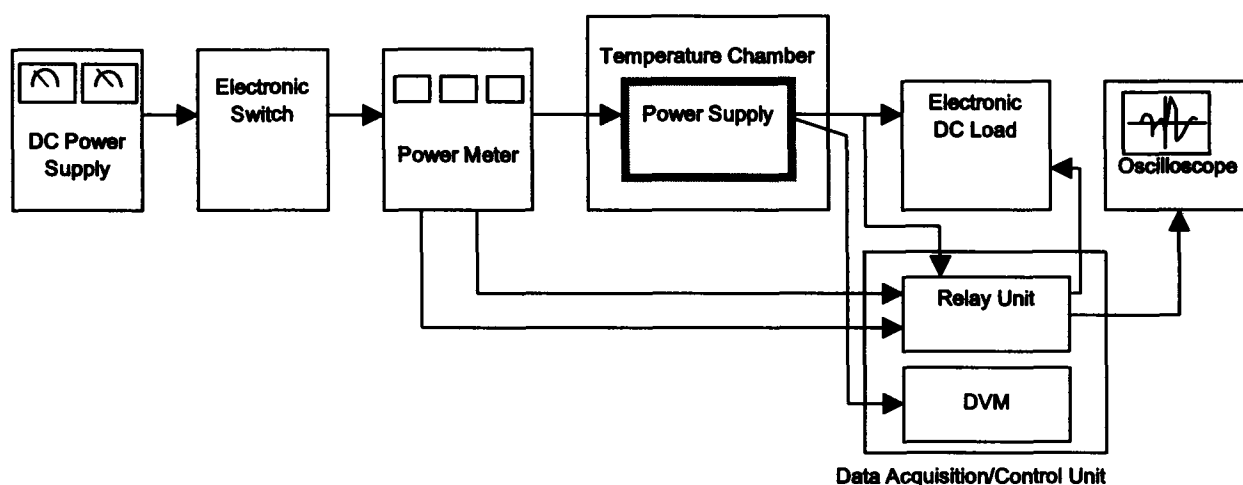


Figure A

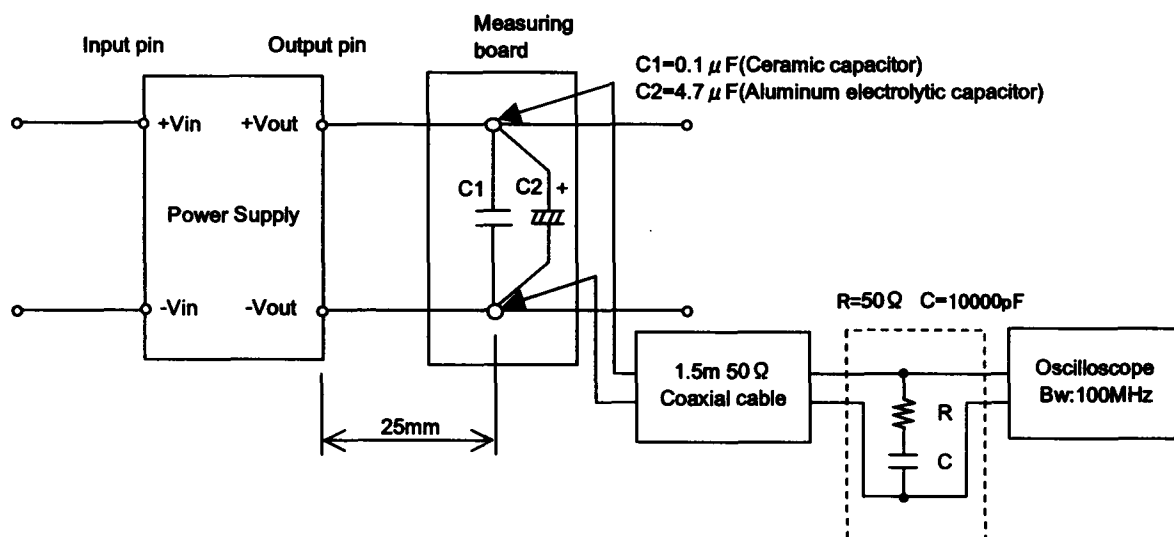


Figure B (Ripple and Ripple noise Characteristic)