

# TEST DATA OF SUCS1R51212

Regulated DC Power Supply  
Sep 17, 2004

Approved by : Tetsuo Sugimori  
Tetsuo Sugimori Design Manager

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Masahiro Shima Design Engineer

**COSEL CO.,LTD.**

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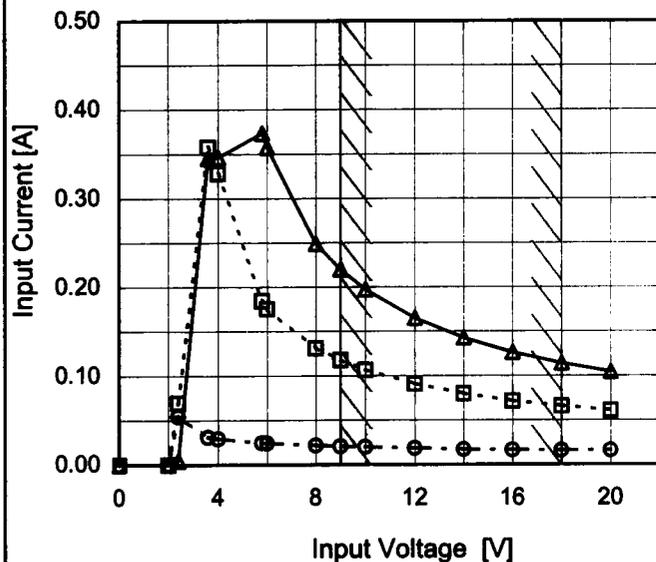
(Final Page 18)



Model	SUCS1R51212
Item	Input Current (by Input Voltage)
Object	_____

Temperature 25°C  
Testing Circuitry Figure A

1.Graph  
 —△— Load 100%  
 - - - □ - - - Load 50%  
 - - - ○ - - - Load 0%



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	0.000	0.000	0.000
2.0	0.000	0.000	0.000
2.4	0.054	0.070	0.005
3.6	0.031	0.358	0.346
4.0	0.029	0.328	0.346
5.8	0.024	0.185	0.373
6.0	0.024	0.176	0.358
8.0	0.022	0.131	0.249
9.0	0.021	0.118	0.220
10.0	0.020	0.107	0.198
12.0	0.018	0.091	0.165
14.0	0.017	0.080	0.143
16.0	0.016	0.072	0.126
18.0	0.016	0.066	0.114
20.0	0.016	0.061	0.104
-	-	-	-

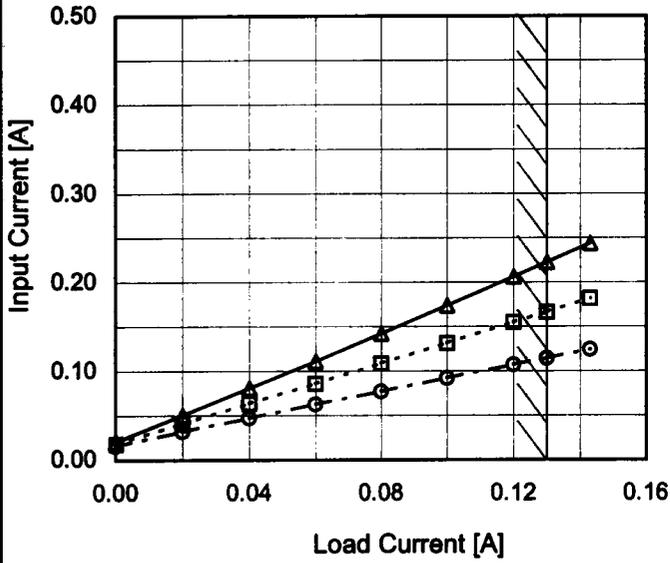


Model	SUCS1R51212
Item	Input Current (by Load Current)
Object	_____

Temperature 25°C  
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 9V  
- - □ - - Input Volt. 12V  
- · - ○ - · - Input Volt. 18V



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]
0.000	0.020	0.018	0.016
0.020	0.051	0.041	0.032
0.040	0.081	0.064	0.047
0.060	0.111	0.086	0.062
0.080	0.142	0.109	0.077
0.100	0.174	0.132	0.092
0.120	0.206	0.155	0.107
0.130	0.223	0.166	0.114
0.143	0.244	0.182	0.124
--	-	-	-
--	-	-	-

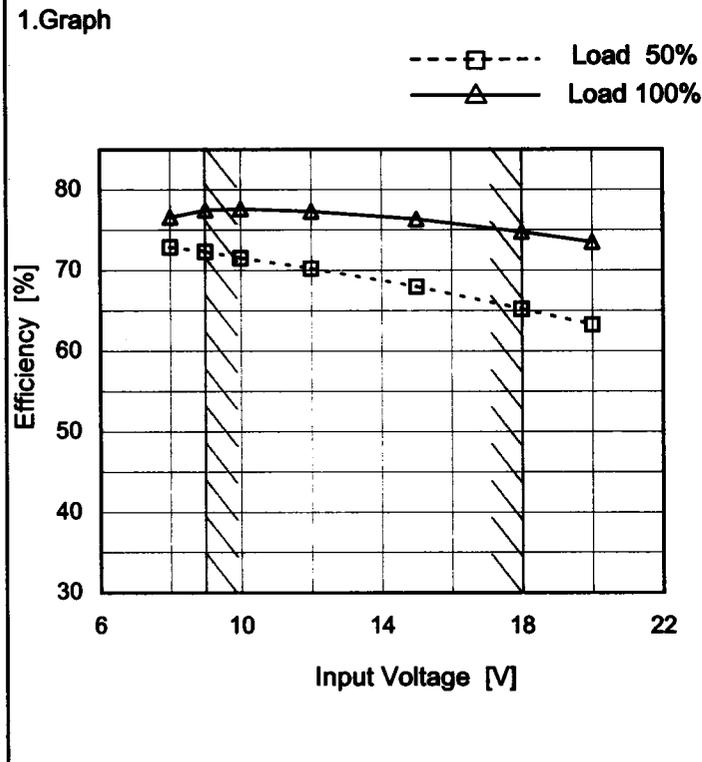


<b>Model</b>		SUCS1R51212		Temperature 25°C Testing Circuitry Figure A																																																			
<b>Item</b>		Input Power (by Load Current)																																																					
<b>Object</b>		_____																																																					
1. Graph <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 20%;"> <p>—△— Input Volt. 9V</p> <p>- - -□- - - Input Volt. 12V</p> <p>- - -○- - - Input Volt. 18V</p> </div> <div style="width: 80%;"> </div> </div>			2. Values <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Power [W]</th> </tr> <tr> <th>Input Volt. 9[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 18[V]</th> </tr> </thead> <tbody> <tr><td>0.000</td><td>0.19</td><td>0.22</td><td>0.29</td></tr> <tr><td>0.020</td><td>0.46</td><td>0.50</td><td>0.58</td></tr> <tr><td>0.040</td><td>0.74</td><td>0.77</td><td>0.86</td></tr> <tr><td>0.060</td><td>1.01</td><td>1.05</td><td>1.13</td></tr> <tr><td>0.080</td><td>1.30</td><td>1.32</td><td>1.41</td></tr> <tr><td>0.100</td><td>1.58</td><td>1.60</td><td>1.68</td></tr> <tr><td>0.120</td><td>1.88</td><td>1.88</td><td>1.96</td></tr> <tr><td>0.130</td><td>2.02</td><td>2.03</td><td>2.10</td></tr> <tr><td>0.143</td><td>2.22</td><td>2.21</td><td>2.28</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 Power [W]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.000	0.19	0.22	0.29	0.020	0.46	0.50	0.58	0.040	0.74	0.77	0.86	0.060	1.01	1.05	1.13	0.080	1.30	1.32	1.41	0.100	1.58	1.60	1.68	0.120	1.88	1.88	1.96	0.130	2.02	2.03	2.10	0.143	2.22	2.21	2.28	-	-	-	-	-	-	-	-
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Model	SUCS1R51212
Item	Efficiency (by Input Voltage)
Object	

Temperature 25°C  
Testing Circuitry Figure A



2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8	72.9	76.6
9	72.3	77.4
10	71.5	77.6
12	70.2	77.3
15	68.0	76.4
18	65.2	74.8
20	63.3	73.5
--	-	-
--	-	-

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

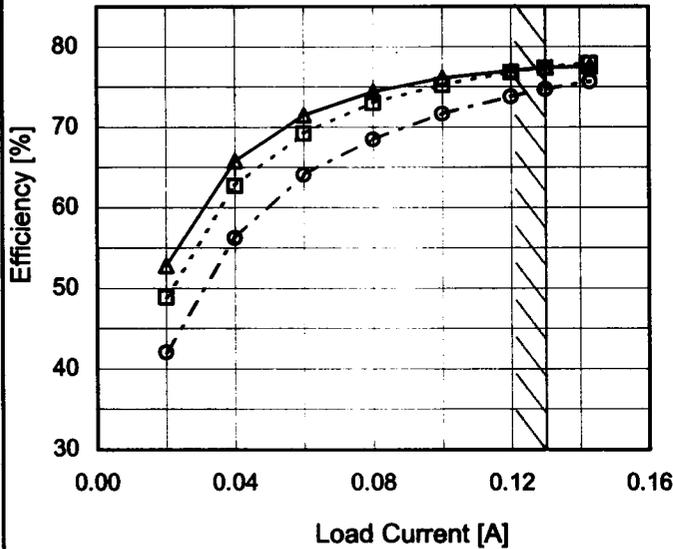


Model	SUCS1R51212
Item	Efficiency (by Load Current)
Object	_____

Temperature 25°C  
Testing Circuitry Figure A

1.Graph

- △— Input Volt. 9V
- - -□- - - Input Volt. 12V
- - -○- - - Input Volt. 18V



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

2.Values

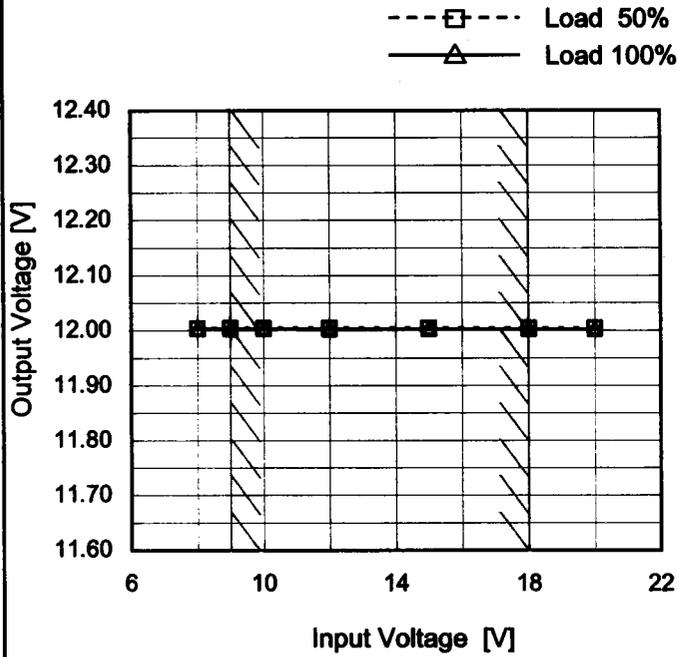
Load Current [A]	Efficiency [%]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.000	-	-	-
0.020	52.8	48.9	42.0
0.040	65.8	62.7	56.2
0.060	71.5	69.2	64.0
0.080	74.4	73.0	68.5
0.100	76.1	75.2	71.6
0.120	77.0	76.8	73.8
0.130	77.4	77.4	74.7
0.143	77.5	77.9	75.7
-	-	-	-
-	-	-	-



Model	SUCS1R51212
Item	Line Regulation
Object	+12V0.13A

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]	Output Voltage [V]	
	Load 50%	Load 100%
8	12.005	12.004
9	12.005	12.004
10	12.005	12.004
12	12.005	12.003
15	12.005	12.003
18	12.005	12.003
20	12.005	12.003
-	-	-
-	-	-

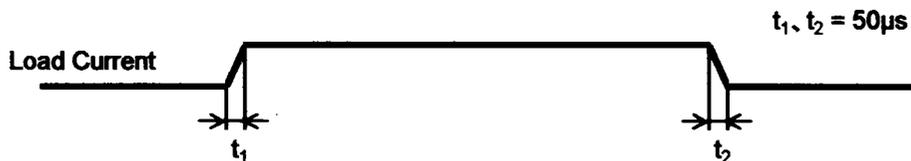


<b>Model</b> SUCS1R51212		<b>Temperature</b> 25°C <b>Testing Circuitry</b> Figure A																																																			
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<b>Object</b> +12V0.13A																																																					
<p>1.Graph</p> <p> <span style="display: inline-block; width: 1em; border-bottom: 1px solid black; margin-right: 0.5em;"></span> <span style="display: inline-block; width: 0.5em; height: 0.5em; border-left: 1px solid black; border-right: 1px solid black; margin-right: 0.5em;"></span> Input Volt. 9V  <span style="display: inline-block; width: 1em; border-bottom: 1px dashed black; margin-right: 0.5em;"></span> <span style="display: inline-block; width: 0.5em; height: 0.5em; border-left: 1px dashed black; border-right: 1px dashed black; margin-right: 0.5em;"></span> Input Volt. 12V  <span style="display: inline-block; width: 1em; border-bottom: 1px dash-dot black; margin-right: 0.5em;"></span> <span style="display: inline-block; width: 0.5em; height: 0.5em; border-left: 1px dash-dot black; border-right: 1px dash-dot black; margin-right: 0.5em;"></span> Input Volt. 18V                 </p> <p style="text-align: center;"><b>Output Voltage [V]</b></p> <p style="text-align: center;"><b>Load Current [A]</b></p>																																																					
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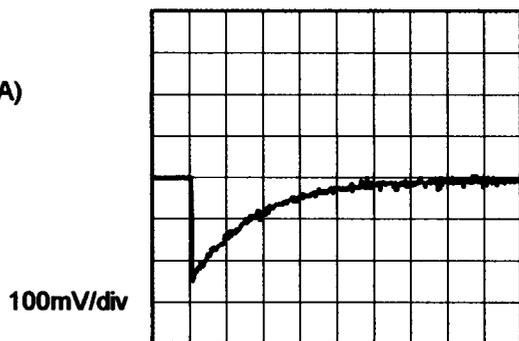


<b>Model</b>		SUCS1R51212	<b>Temperature</b> 25°C <b>Testing Circuitry</b> Figure A
<b>Item</b>		Dynamic Load Response	
<b>Object</b>		+12V0.13A	

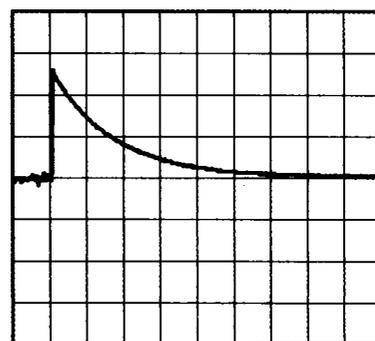
Input Volt. 12 V  
Cycle 100 mS



Min. Load (0A) ←→  
Load 100% (0.13A)

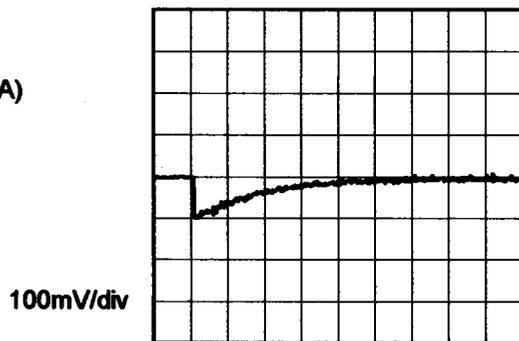


2ms/div

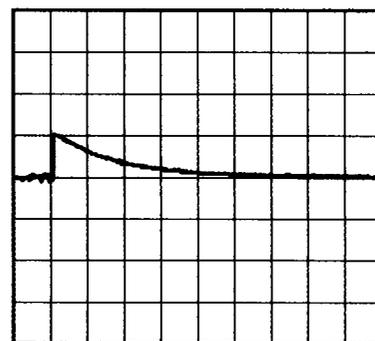


2ms/div

Min. Load (0A) ←→  
Load 50% (0.065A)

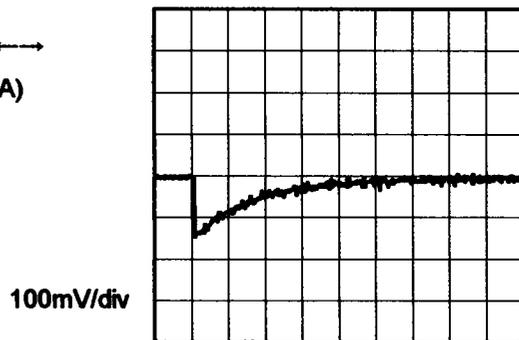


2ms/div

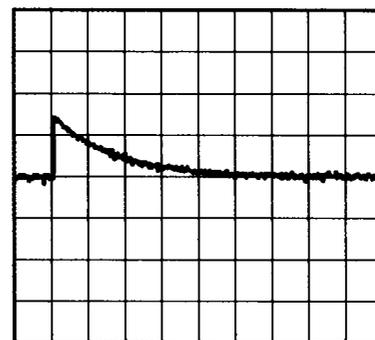


2ms/div

Load 50% (0.065A) ←→  
Load 100% (0.13A)



2ms/div



2ms/div



<b>Model</b> SUCS1R51212		Temperature 25°C Testing Circuitry Figure B																																						
<b>Item</b>	Ripple Voltage (by Load Current)																																							
<b>Object</b>	+12V0.13A																																							
<b>1.Graph</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: left;"> <p>—△— Input Volt. 9V - -○- - Input Volt. 18V</p> </div> </div>		<b>2.Values</b> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <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> </thead> <tbody> <tr><td>0.000</td><td>2</td><td>2</td></tr> <tr><td>0.026</td><td>2</td><td>2</td></tr> <tr><td>0.052</td><td>2</td><td>2</td></tr> <tr><td>0.078</td><td>2</td><td>2</td></tr> <tr><td>0.104</td><td>2</td><td>2</td></tr> <tr><td>0.130</td><td>2</td><td>2</td></tr> <tr><td>0.143</td><td>2</td><td>2</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. 9 [V]	Input Volt. 18 [V]	0.000	2	2	0.026	2	2	0.052	2	2	0.078	2	2	0.104	2	2	0.130	2	2	0.143	2	2	-	-	-	-	-	-	-	-	-	-	-	-
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								



<b>Model</b>		SUCS1R51212		<b>Temperature</b>		25°C																																							
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<b>Item</b>	Ripple Voltage (by Ambient Temp.)																																							
<b>Object</b>	+12V0.13A																																							
<b>1. Graph</b> <div style="text-align: center;"> <p>---□--- Load 50%</p> <p>—△— Load 100%</p> </div> <p style="text-align: center;">Ripple Voltage [mV]</p> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Input Volt. 12V</p>		<b>2. Values</b> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-60</td><td>3</td><td>3</td></tr> <tr><td>-40</td><td>3</td><td>3</td></tr> <tr><td>-20</td><td>3</td><td>3</td></tr> <tr><td>0</td><td>2</td><td>2</td></tr> <tr><td>25</td><td>2</td><td>2</td></tr> <tr><td>55</td><td>1</td><td>1</td></tr> <tr><td>60</td><td>1</td><td>1</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]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	3	3	-40	3	3	-20	3	3	0	2	2	25	2	2	55	1	1	60	1	1	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																							
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-20	3	3																																						
0	2	2																																						
25	2	2																																						
55	1	1																																						
60	1	1																																						
--	-	-																																						
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<p>Measured by 100 MHz Oscilloscope.</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																								

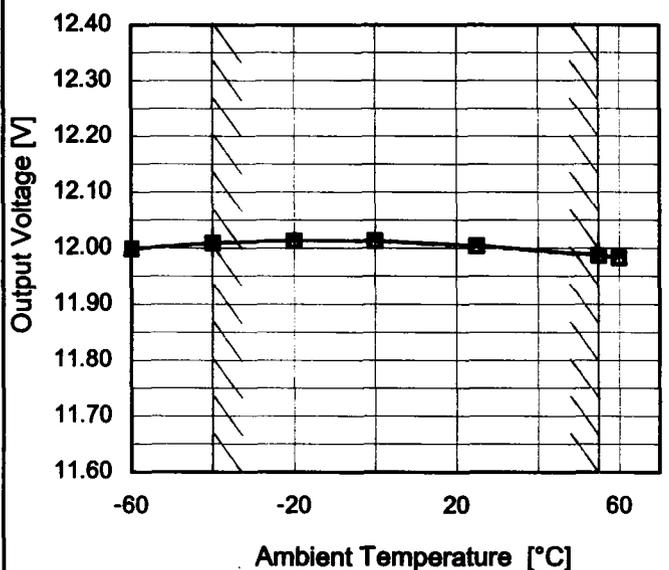


Model	SUCS1R51212
Item	Ambient Temperature Drift
Object	+12V0.13A

Testing Circuitry Figure A

1.Graph

—△— Input Volt. 9V  
 ---□--- Input Volt. 12V  
 -·-○-·- Input Volt. 18V



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	11.999	11.999	11.999
-40	12.009	12.009	12.009
-20	12.014	12.013	12.013
0	12.013	12.013	12.012
25	12.005	12.004	12.003
55	11.988	11.987	11.986
60	11.984	11.983	11.982
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-



<b>COSEL</b>		Testing Circuitry Figure A
Model	SUCS1R51212	
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 (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	-20	12	0	12.016	±15	±0.1
Minimum Voltage	55	18	0.13	11.986		

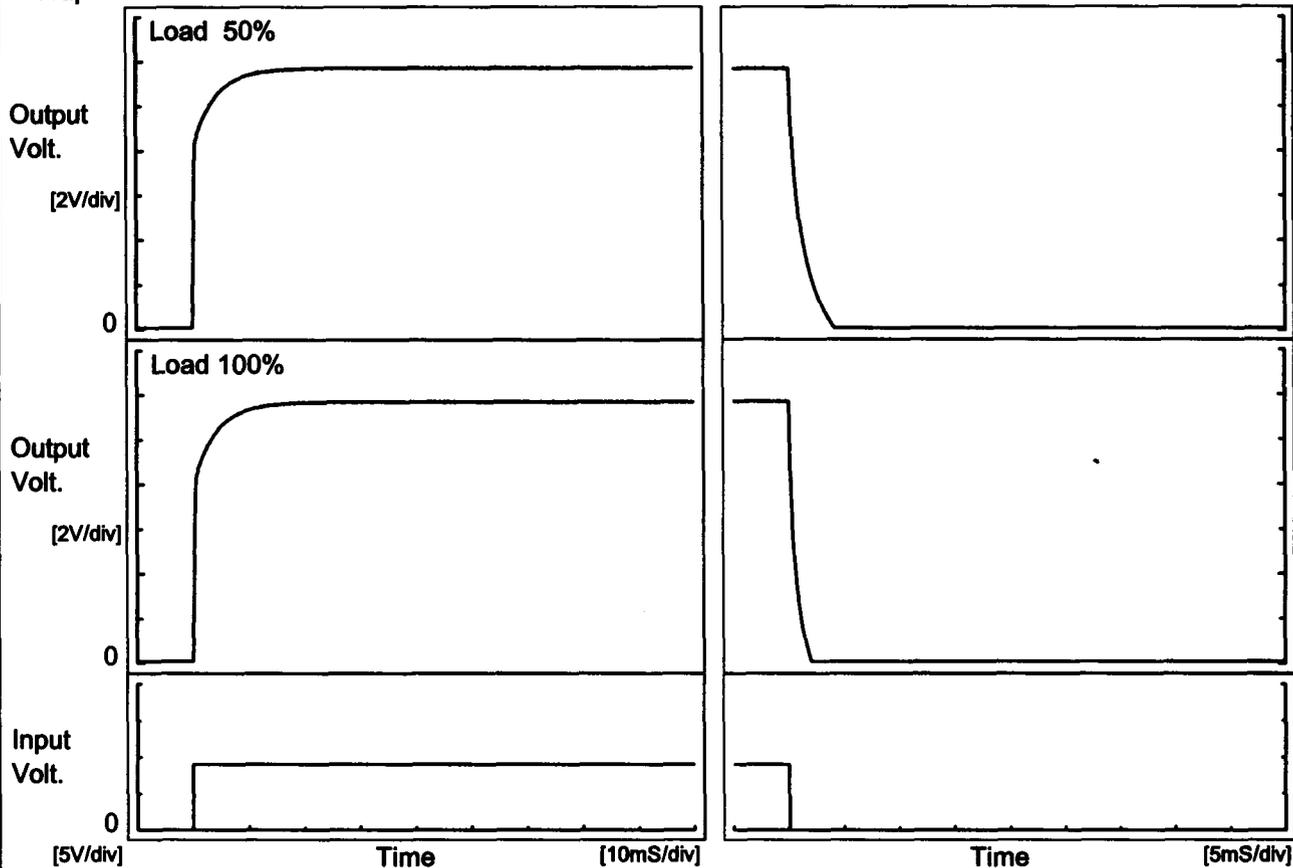


<b>COSEL</b>																								
<b>Model</b>	SUCS1R51212																							
<b>Item</b>	Time Lapse Drift	Temperature 25°C Testing Circuitry Figure A																						
<b>Object</b>	+12V0.13A																							
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 12V 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>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> </tbody> </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
Time since start [H]	Output Voltage [V]																							
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5.0	12.004																							
6.0	12.004																							
7.0	12.004																							
8.0	12.004																							



Model	SUCS1R51212	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V0.13A		

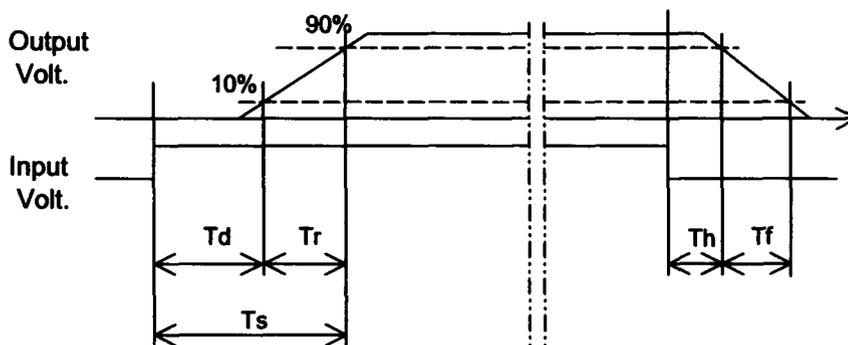
1. Graph



2. Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	6.1	6.2	0.1	5.6
100 %	0.1	6.3	6.4	0.1	2.8

[mS]

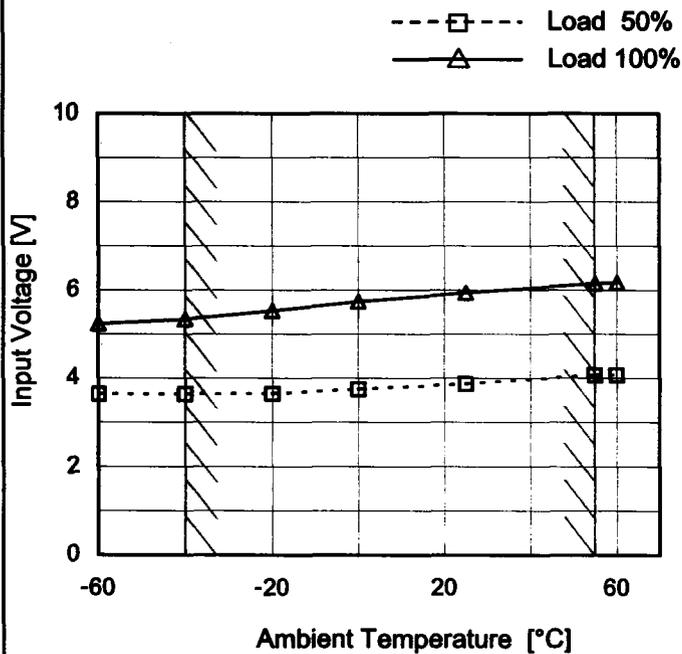




Model	SUCS1R51212
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.13A

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	3.7	5.3
-40	3.7	5.4
-20	3.7	5.6
0	3.8	5.8
25	3.9	6.0
55	4.1	6.2
60	4.1	6.2
-	-	-
-	-	-
-	-	-
-	-	-

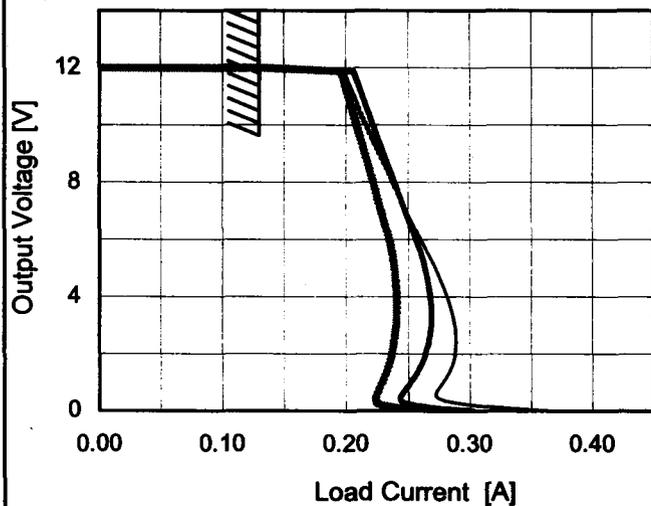


Model	SUCS1R51212
Item	Overcurrent Protection
Object	+12V0.13A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph

— Input Volt. 9V  
— Input Volt. 12V  
— Input Volt. 18V



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

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
12.0	0.13	0.13	0.13
11.4	0.20	0.21	0.20
10.8	0.21	0.21	0.20
9.6	0.22	0.23	0.21
8.4	0.23	0.24	0.22
7.2	0.25	0.25	0.23
6.0	0.26	0.26	0.23
4.8	0.27	0.26	0.24
3.6	0.28	0.27	0.24
2.4	0.29	0.27	0.24
1.2	0.28	0.26	0.23
0.0	0.37	0.30	0.26

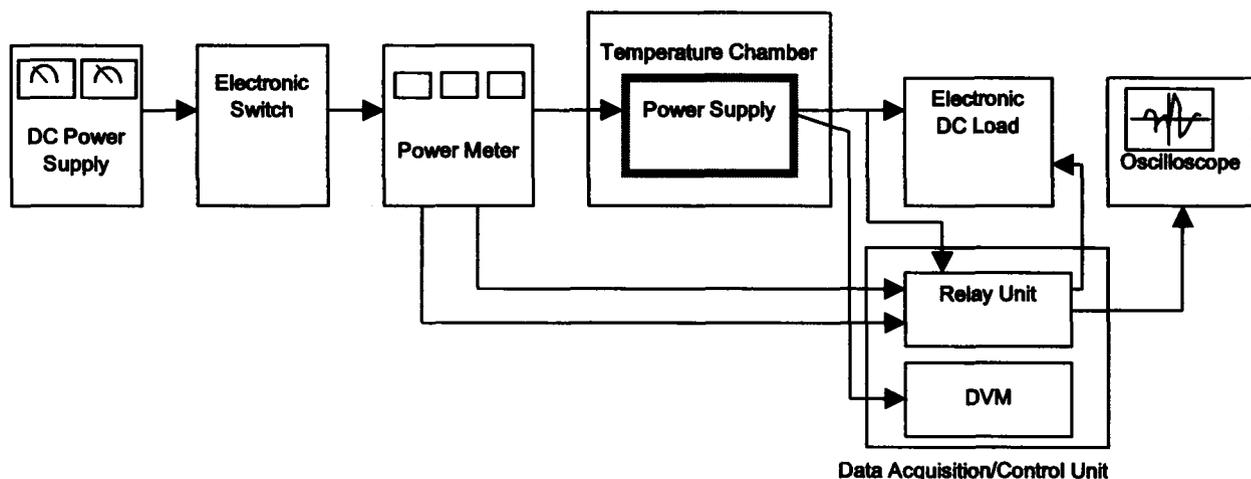


Figure A

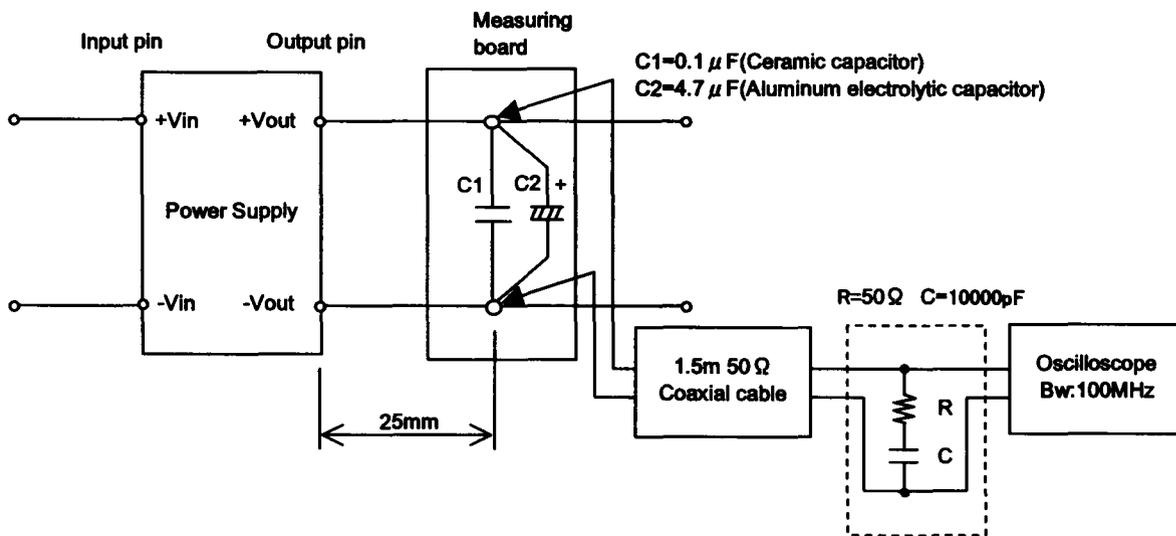


Figure B (Ripple and Ripple noise Characteristic)