

TEST DATA OF SUCS1R50505

Regulated DC Power Supply
Sep 15, 2004

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

Prepared by : Masahiro Shima
Masahiro Shima Design Engineer

COSEL CO.,LTD.



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Model	SUCS1R50505	Temperature 25°C																																																																								
Item	Input Current (by Input Voltage)	Testing Circuitry	Figure A																																																																							
Object	_____																																																																									
1.Graph		2.Values																																																																								
<p>The graph plots Input Current [A] on the y-axis (0.0 to 1.0) against Input Voltage [V] on the x-axis (0 to 10). Three curves are shown: Load 100% (triangles), Load 50% (squares), and Load 0% (circles). All curves show a sharp increase in current from 0V to approximately 2.5V, followed by a gradual decrease. A slanted line is drawn through the origin, representing the rated input voltage range.</p>		<table border="1"> <thead> <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> </thead> <tbody> <tr><td>0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>1.7</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>2.5</td><td>0.044</td><td>0.542</td><td>0.780</td></tr> <tr><td>3.0</td><td>0.039</td><td>0.395</td><td>0.808</td></tr> <tr><td>3.3</td><td>0.037</td><td>0.330</td><td>0.806</td></tr> <tr><td>4.0</td><td>0.034</td><td>0.270</td><td>0.566</td></tr> <tr><td>4.5</td><td>0.032</td><td>0.238</td><td>0.483</td></tr> <tr><td>5.0</td><td>0.031</td><td>0.210</td><td>0.420</td></tr> <tr><td>6.0</td><td>0.029</td><td>0.177</td><td>0.339</td></tr> <tr><td>7.0</td><td>0.027</td><td>0.155</td><td>0.285</td></tr> <tr><td>8.0</td><td>0.027</td><td>0.139</td><td>0.252</td></tr> <tr><td>9.0</td><td>0.026</td><td>0.127</td><td>0.227</td></tr> <tr><td>10.0</td><td>0.027</td><td>0.118</td><td>0.206</td></tr> <tr><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0	0.000	0.000	0.000	1.7	0.000	0.000	0.000	2.0	0.000	0.000	0.000	2.5	0.044	0.542	0.780	3.0	0.039	0.395	0.808	3.3	0.037	0.330	0.806	4.0	0.034	0.270	0.566	4.5	0.032	0.238	0.483	5.0	0.031	0.210	0.420	6.0	0.029	0.177	0.339	7.0	0.027	0.155	0.285	8.0	0.027	0.139	0.252	9.0	0.026	0.127	0.227	10.0	0.027	0.118	0.206	-	-	-	-	-	-	-	-
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Note: Slanted line shows the range of the rated input voltage.

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	0.24	1.64	1.62	1.67																									
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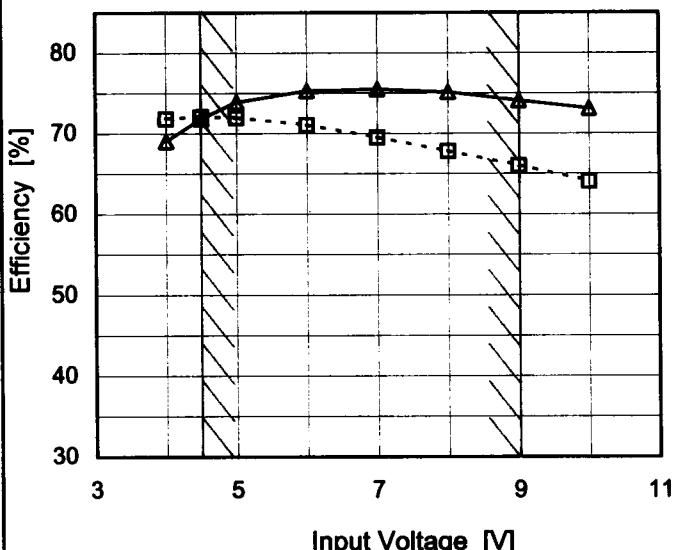
Note: Slanted line shows the range of the rated load current.

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Model	SUCCS1R50505
Item	Efficiency (by Input Voltage)
Object	_____

1.Graph

---□--- Load 50%
—△— Load 100%



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

Temperature 25°C
Testing Circuitry Figure A

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.0	71.8	69.0
4.5	72.1	71.9
5.0	72.0	73.9
6.0	71.1	75.3
7.0	69.5	75.5
8.0	67.8	75.2
9.0	66.0	74.1
10.0	64.0	73.1
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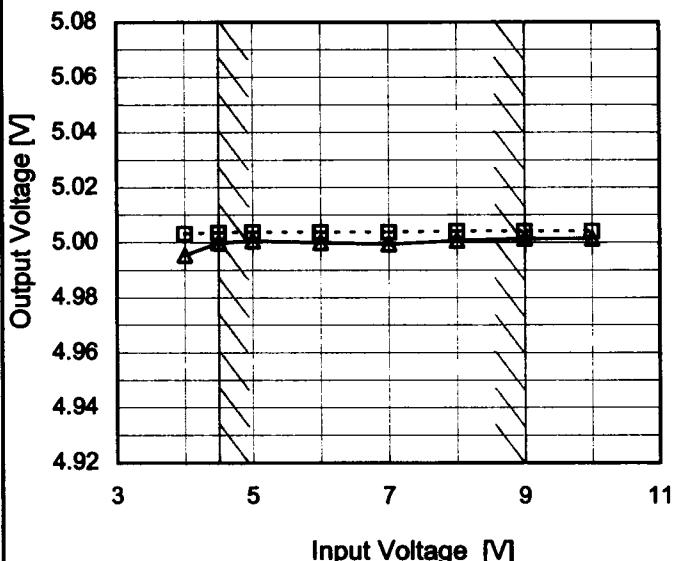
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Model	SUCS1R50505
Item	Line Regulation
Object	+5V0.3A

1. Graph

---□--- Load 50%
—△— Load 100%



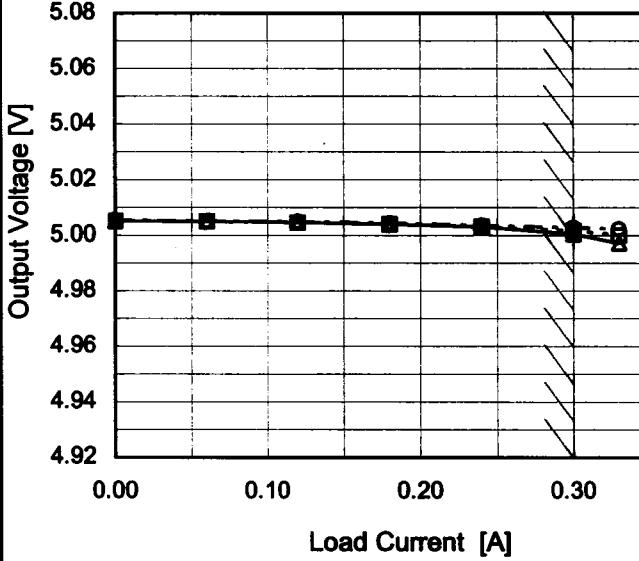
Note: Slanted line shows the range of the rated input voltage.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	5.003	4.995
4.5	5.004	5.000
5.0	5.004	5.001
6.0	5.004	5.000
7.0	5.004	5.000
8.0	5.004	5.001
9.0	5.004	5.002
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COSEL

Model SUCS1R50505

Item Dynamic Load Response

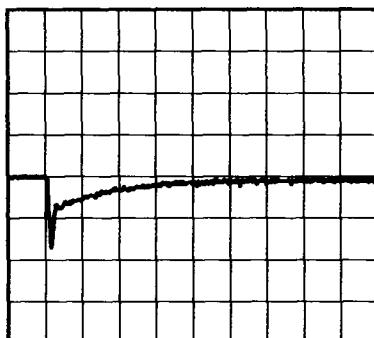
Object +5V0.3A

Temperature 25°C
Testing Circuitry Figure AInput Volt. 5 V
Cycle 100 mS $t_1, t_2 = 50\mu s$

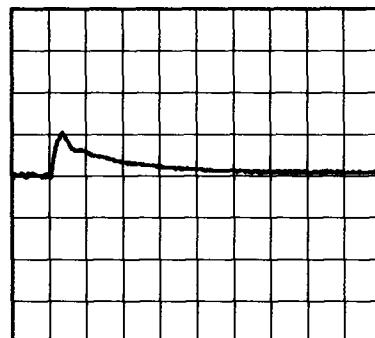
Load Current

 t_1 t_2 Min. Load (0A) ←→
Load 100% (0.3A)

100mV/div



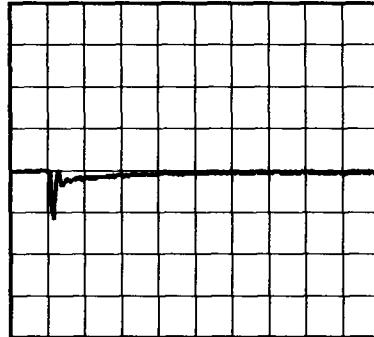
200μs/div



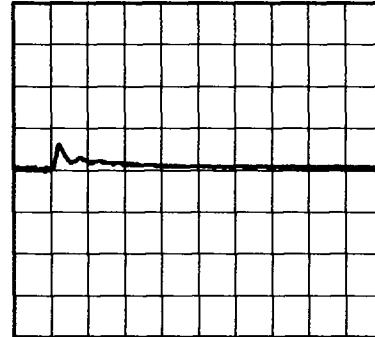
200μs/div

Min. Load (0A) ←→
Load 50% (0.15A)

100mV/div



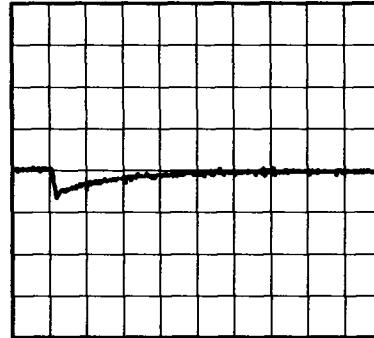
200μs/div



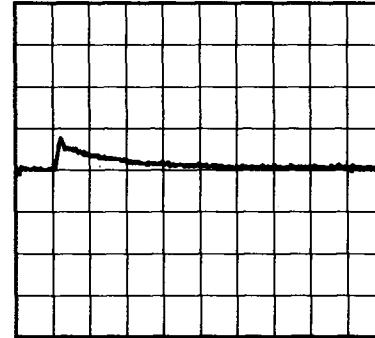
200μs/div

Load 50% (0.15A) ←→
Load 100% (0.3A)

100mV/div



200μs/div



200μs/div

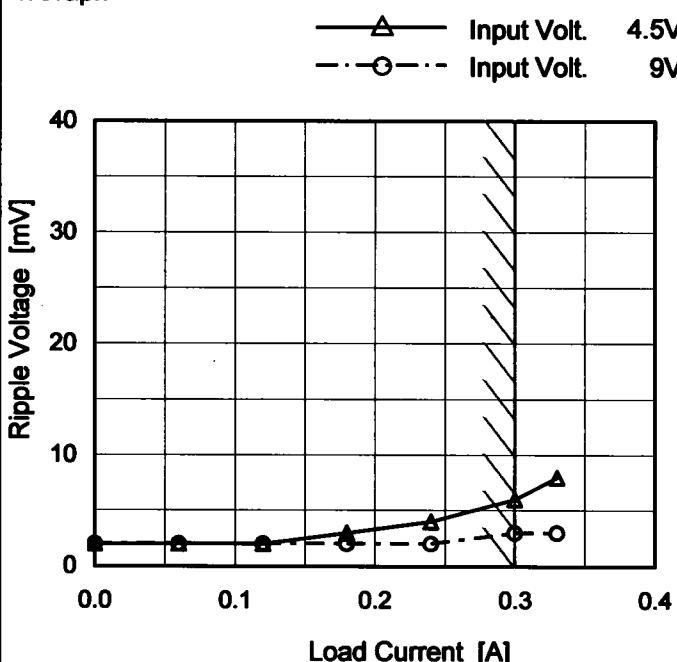
COSEL

Model SUCS1R50505

Item Ripple Voltage (by Load Current)

Object +5V0.3A

1. Graph



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.

Ripple [mVp-p]

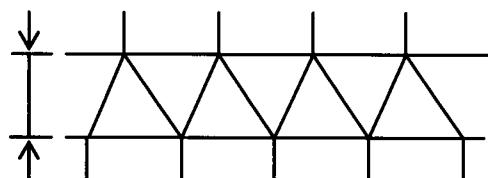


Fig.Complex Ripple Wave Form

Temperature 25°C
Testing Circuitry Figure B

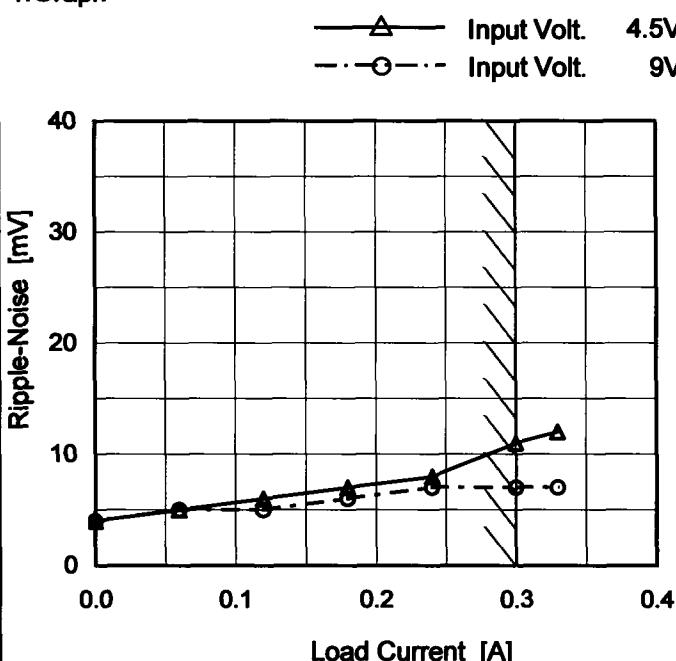
2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	2	2
0.06	2	2
0.12	2	2
0.18	3	2
0.24	4	2
0.30	6	3
0.33	8	3
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	SUCS1R50505
Item	Ripple-Noise
Object	+5V0.3A

1. Graph



Measured by 100 MHz Oscilloscope.

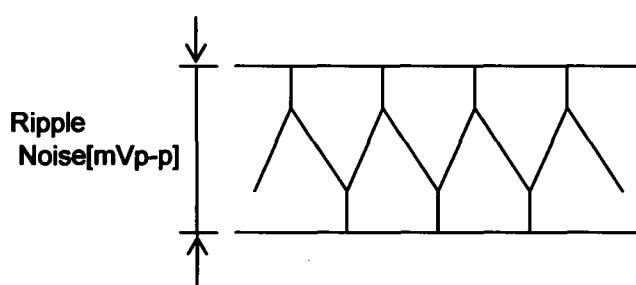
Ripple-Noise is shown as p-p in the figure below.

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

Temperature 25°C
Testing Circuitry Figure B

2. Values

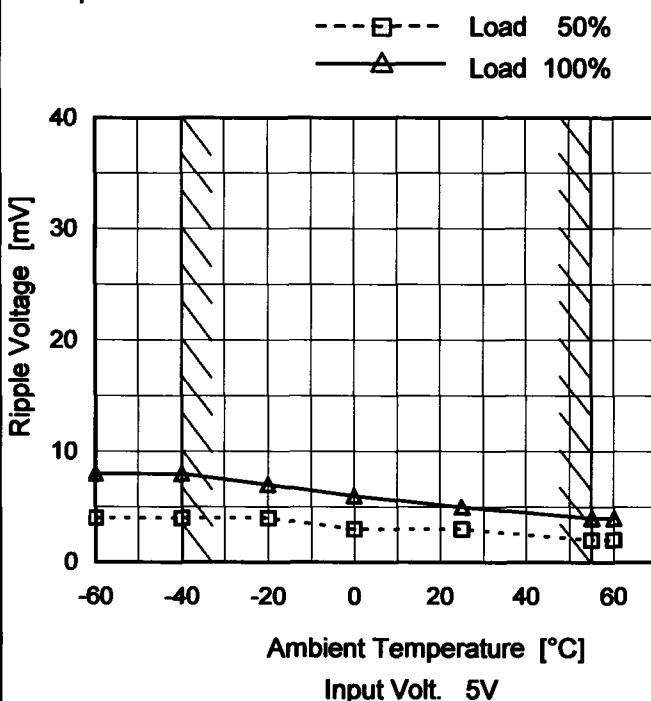
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	4	4
0.06	5	5
0.12	6	5
0.18	7	6
0.24	8	7
0.30	11	7
0.33	12	7
-	-	-
-	-	-
-	-	-
-	-	-



COSEL

Model	SUCS1R50505
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V0.3A

1. Graph



Measured by 100 MHz Oscilloscope.

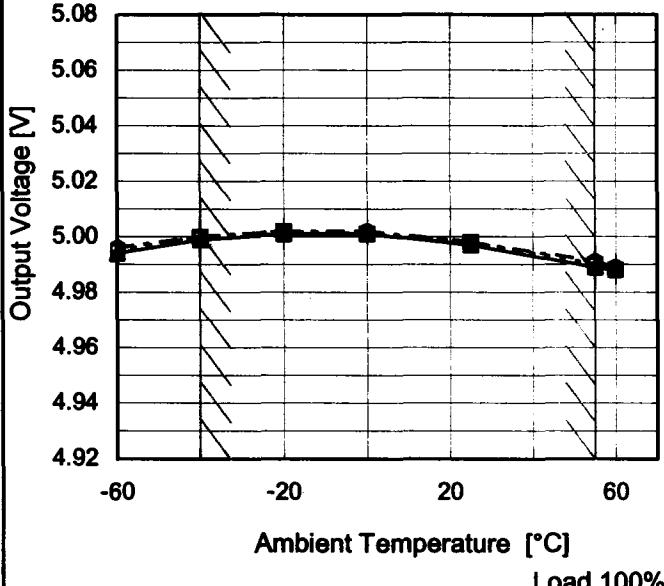
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure B

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	4	8
-40	4	8
-20	4	7
0	3	6
25	3	5
55	2	4
60	2	4
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	SUCS1R50505	Testing Circuitry Figure A																																																					
Item	Ambient Temperature Drift																																																						
Object	+5V0.3A																																																						
1.Graph	<p>—▲— Input Volt. 4.5V - - - □ - - Input Volt. 5V - - - ○ - - Input Volt. 9V</p>  <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																						
2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 4.5[V]</th> <th>Input Volt. 5[V]</th> <th>Input Volt. 9[V]</th> </tr> </thead> <tbody> <tr><td>-60</td><td>4.994</td><td>4.995</td><td>4.996</td></tr> <tr><td>-40</td><td>4.999</td><td>5.000</td><td>5.000</td></tr> <tr><td>-20</td><td>5.001</td><td>5.002</td><td>5.002</td></tr> <tr><td>0</td><td>5.001</td><td>5.001</td><td>5.002</td></tr> <tr><td>25</td><td>4.997</td><td>4.998</td><td>4.998</td></tr> <tr><td>55</td><td>4.989</td><td>4.990</td><td>4.991</td></tr> <tr><td>60</td><td>4.988</td><td>4.988</td><td>4.989</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> </tbody> </table>				Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	-60	4.994	4.995	4.996	-40	4.999	5.000	5.000	-20	5.001	5.002	5.002	0	5.001	5.001	5.002	25	4.997	4.998	4.998	55	4.989	4.990	4.991	60	4.988	4.988	4.989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Note:	Slanted line shows the range of the rated ambient temperature.																																																						



Model	SUCS1R50505	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+5V0.3A	

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 : 4.5 - 9V

Load Current : 0 - 0.3A

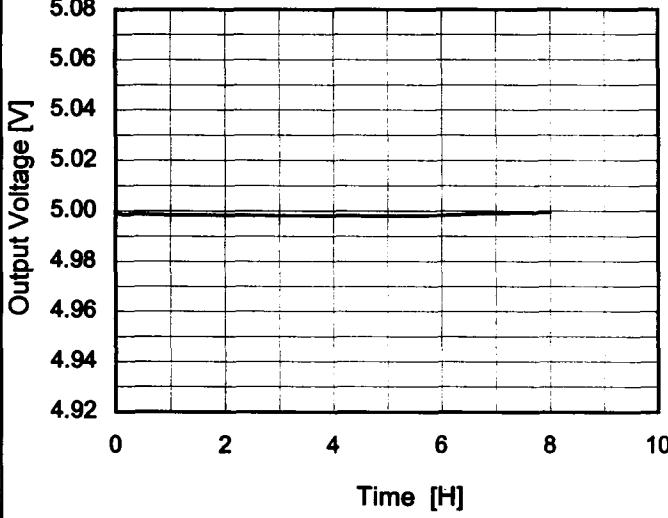
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	4.5	0	5.005	± 8	± 0.2
Minimum Voltage	55	4.5	0.3	4.989		

COSEL

Model	SUCS1R50505	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+5V0.3A																								
1.Graph			2.Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 5V Load 100%</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>5.001</td></tr> <tr><td>0.5</td><td>4.999</td></tr> <tr><td>1.0</td><td>4.999</td></tr> <tr><td>2.0</td><td>4.999</td></tr> <tr><td>3.0</td><td>4.998</td></tr> <tr><td>4.0</td><td>4.998</td></tr> <tr><td>5.0</td><td>4.998</td></tr> <tr><td>6.0</td><td>4.998</td></tr> <tr><td>7.0</td><td>4.999</td></tr> <tr><td>8.0</td><td>5.000</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	5.001	0.5	4.999	1.0	4.999	2.0	4.999	3.0	4.998	4.0	4.998	5.0	4.998	6.0	4.998	7.0	4.999	8.0	5.000
Time since start [H]	Output Voltage [V]																								
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COSEL

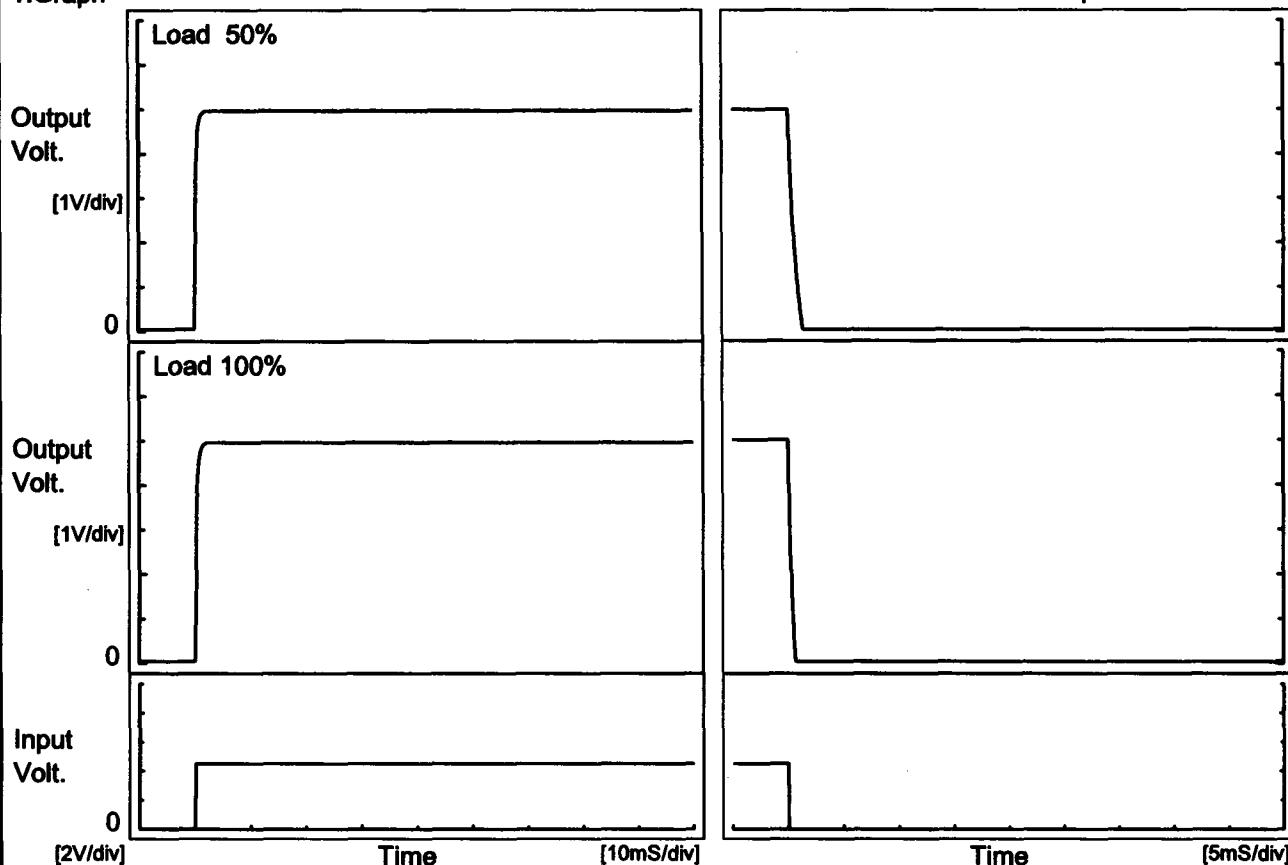
Model SUCS1R50505

Item Rise and Fall Time

Object +5V0.3A

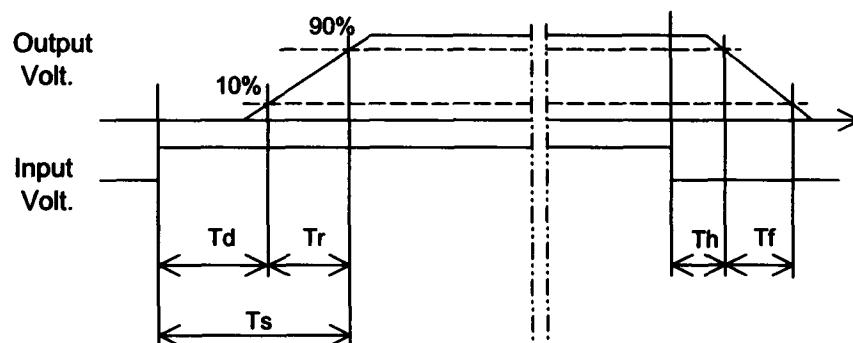
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[mS]
50 %		0.1	0.7	0.8	0.1	2.4	
100 %		0.1	0.8	0.9	0.1	1.2	



COSEL

<p>Model SUCS1R50505</p> <p>Item Minimum Input Voltage for Regulated Output Voltage</p> <p>Object +5V0.3A</p>	Testing Circuitry Figure A																																							
	2.Values																																							
	<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>-60</td><td>2.1</td><td>2.9</td></tr> <tr> <td>-40</td><td>2.2</td><td>3.0</td></tr> <tr> <td>-20</td><td>2.2</td><td>3.0</td></tr> <tr> <td>0</td><td>2.2</td><td>3.1</td></tr> <tr> <td>25</td><td>2.2</td><td>3.1</td></tr> <tr> <td>55</td><td>2.3</td><td>3.2</td></tr> <tr> <td>60</td><td>2.2</td><td>3.3</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]	Input Voltage [V]		Load 50%	Load 100%	-60	2.1	2.9	-40	2.2	3.0	-20	2.2	3.0	0	2.2	3.1	25	2.2	3.1	55	2.3	3.2	60	2.2	3.3	-	-	-	-	-	-	-	-	-	-	-	-
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COSEL

Model	SUCS1R50505	Temperature 25°C Testing Circuitry Figure A																																																									
Item	Overcurrent Protection																																																										
Object	+5V0.3A																																																										
1.Graph	<p>Input Volt. 4.5V Input Volt. 5V Input Volt. 9V</p> <p>The graph plots Output Voltage [V] on the y-axis (0 to 6) against Load Current [A] on the x-axis (0.0 to 0.8). Three curves are shown for different input voltages: 4.5V (top), 5V (middle), and 9V (bottom). All curves show a sharp drop in output voltage as load current increases beyond a certain point. A slanted line is drawn across the graph, intersecting the curves at approximately 0.35A, which represents the rated load current range.</p>																																																										
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COSEL

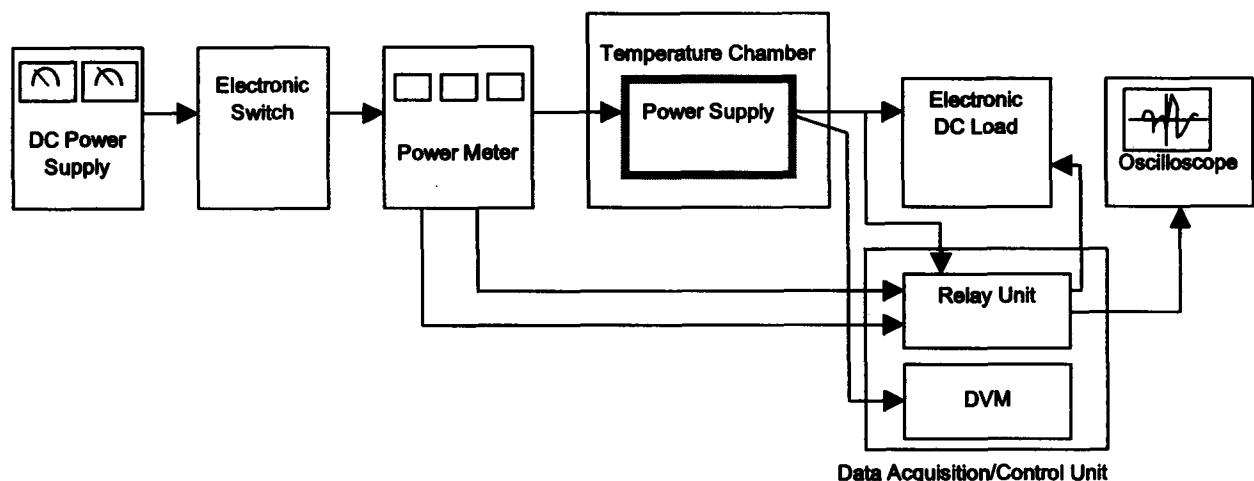


Figure A

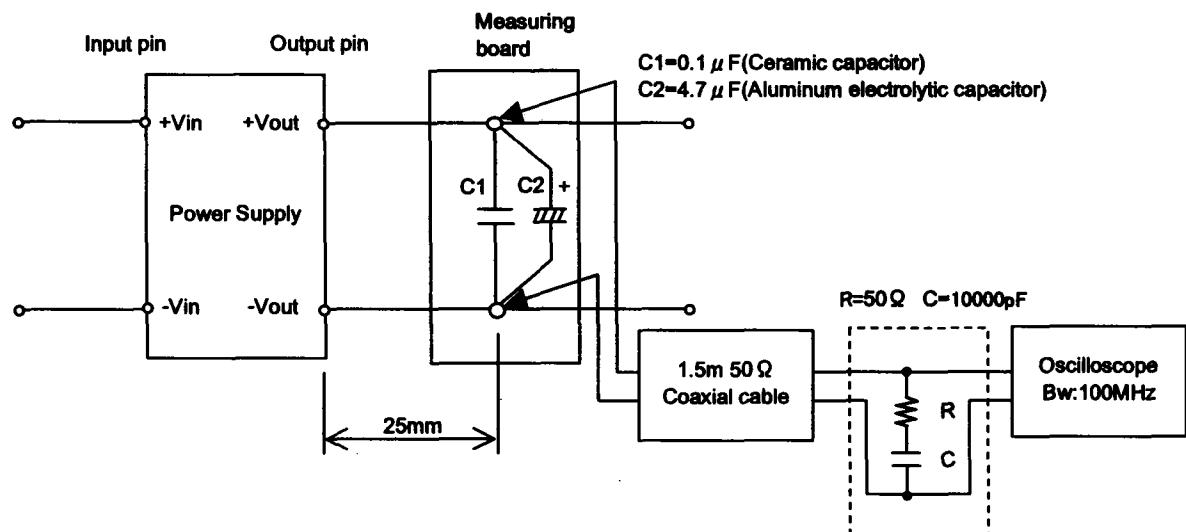


Figure B (Ripple and Ripple noise Characteristic)