



TEST DATA OF SUS30515

Regulated DC Power Supply
Mar 22, 2005

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

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Hayato Nakatsubo Design Engineer

COSEL CO.,LTD.

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(Final Page 18)

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Model

SUS30515

Item

Input Current (by Input Voltage)

Object

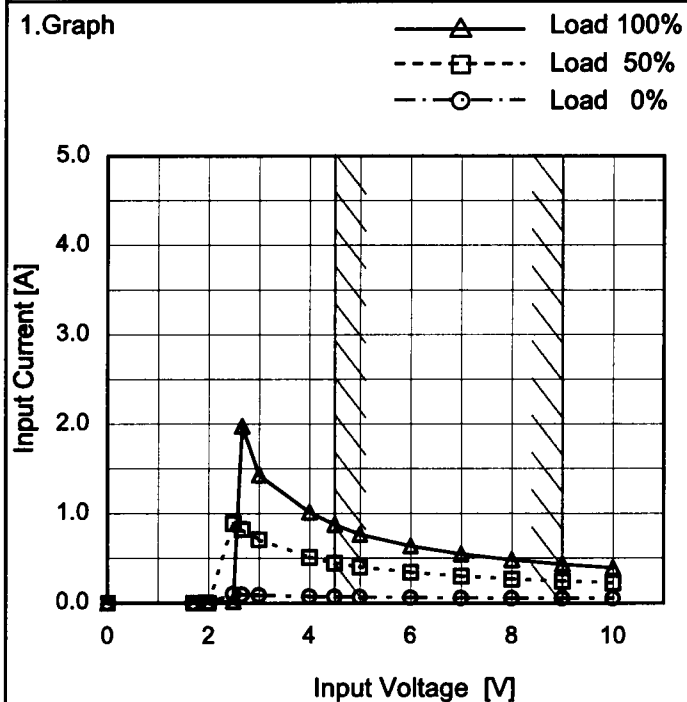
Temperature

25°C

Testing Circuitry

Figure A

1. Graph

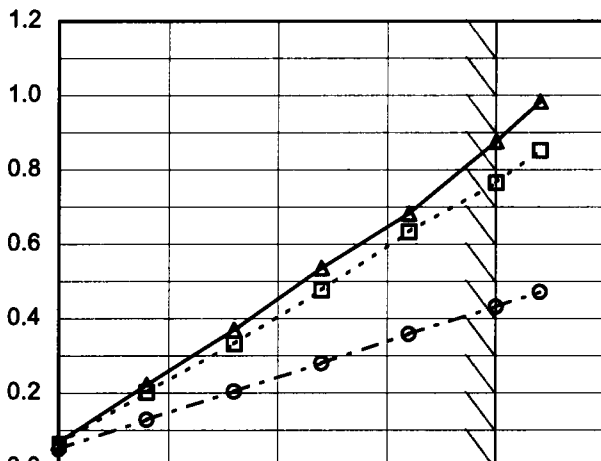


Note: Slanted line shows the range of the rated input voltage.

2. Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.00	0.000	0.000	0.000
1.70	0.000	0.000	0.000
2.00	0.000	0.000	0.000
2.49	0.100	0.888	0.016
2.66	0.095	0.823	1.975
3.00	0.087	0.709	1.429
4.00	0.073	0.509	1.014
4.50	0.068	0.446	0.878
5.00	0.063	0.401	0.767
6.00	0.058	0.343	0.634
7.00	0.054	0.298	0.547
8.00	0.051	0.265	0.481
9.00	0.050	0.241	0.430
10.00	0.050	0.222	0.393
--	-	-	-
--	-	-	-
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Model		SUS30515		Temperature 25°C																																																				
Item		Input Current (by Load Current)		Testing Circuitry Figure A																																																				
Object		_____																																																						
1.Graph		<div><div>—△—</div>Input Volt. 4.5V</div> <div><div>---□---</div>Input Volt. 5V</div> <div><div>-·-○-·-</div>Input Volt. 9V</div>		2.Values																																																				
<div><div>Input Current [A]</div><div></div><div><div>Load Current [A]</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 4.5[V]</th><th>Input Volt. 5[V]</th><th>Input Volt. 9[V]</th></tr><tr><td>0.00</td><td>0.067</td><td>0.063</td><td>0.050</td></tr><tr><td>0.04</td><td>0.223</td><td>0.202</td><td>0.128</td></tr><tr><td>0.08</td><td>0.370</td><td>0.333</td><td>0.204</td></tr><tr><td>0.12</td><td>0.536</td><td>0.477</td><td>0.281</td></tr><tr><td>0.16</td><td>0.683</td><td>0.633</td><td>0.359</td></tr><tr><td>0.20</td><td>0.876</td><td>0.766</td><td>0.432</td></tr><tr><td>0.22</td><td>0.983</td><td>0.853</td><td>0.471</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>		Load Current [A]	Input Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	0.00	0.067	0.063	0.050	0.04	0.223	0.202	0.128	0.08	0.370	0.333	0.204	0.12	0.536	0.477	0.281	0.16	0.683	0.633	0.359	0.20	0.876	0.766	0.432	0.22	0.983	0.853	0.471	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-		
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Note: Slanted line shows the range of the rated load current.																																																								

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Model

SUS30515

Item

Efficiency (by Input Voltage)

Object

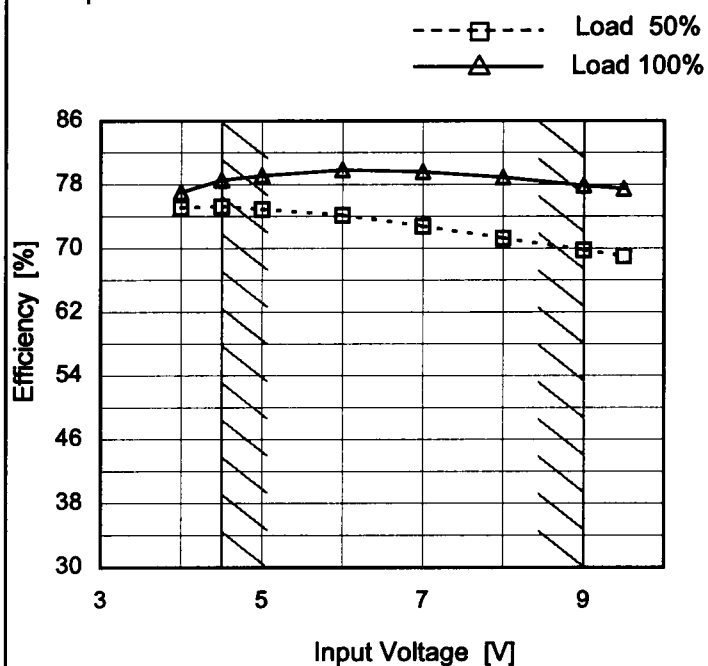
Temperature

25°C

Testing Circuitry

Figure A

1.Graph



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

2.Values

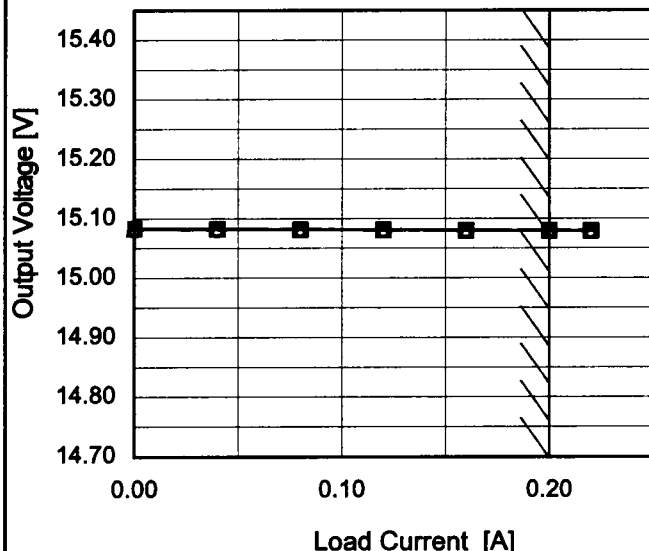
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.0	75.1	77.0
4.5	75.2	78.6
5.0	74.9	79.1
6.0	74.2	79.8
7.0	72.8	79.6
8.0	71.3	78.9
9.0	69.8	77.9
9.5	69.0	77.5
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Model	SUS30515																																		
Item	Line Regulation	Temperature	25°C																																
Object	+15V0.2A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<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>4.0</td><td>15.081</td><td>15.079</td></tr><tr><td>4.5</td><td>15.081</td><td>15.080</td></tr><tr><td>5.0</td><td>15.081</td><td>15.080</td></tr><tr><td>6.0</td><td>15.081</td><td>15.079</td></tr><tr><td>7.0</td><td>15.081</td><td>15.079</td></tr><tr><td>8.0</td><td>15.081</td><td>15.079</td></tr><tr><td>9.0</td><td>15.081</td><td>15.080</td></tr><tr><td>9.5</td><td>15.080</td><td>15.079</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	4.0	15.081	15.079	4.5	15.081	15.080	5.0	15.081	15.080	6.0	15.081	15.079	7.0	15.081	15.079	8.0	15.081	15.079	9.0	15.081	15.080	9.5	15.080	15.079	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
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9.5	15.080	15.079																																	
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Model	SUS30515	Temperature 25°C Testing Circuitry Figure A																																																				
Item	Load Regulation																																																					
Object	+15V0.2A																																																					
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>4.5V</div></div><div><div>---□---</div><div>Input Volt.</div><div>5V</div></div><div><div>---○---</div><div>Input Volt.</div><div>9V</div></div></div> 		<table><tr><th rowspan="2">Load Current [A]</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><tr><td>0.00</td><td>15.083</td><td>15.083</td><td>15.082</td></tr><tr><td>0.04</td><td>15.082</td><td>15.082</td><td>15.082</td></tr><tr><td>0.08</td><td>15.082</td><td>15.082</td><td>15.081</td></tr><tr><td>0.12</td><td>15.081</td><td>15.081</td><td>15.080</td></tr><tr><td>0.16</td><td>15.080</td><td>15.080</td><td>15.080</td></tr><tr><td>0.20</td><td>15.080</td><td>15.080</td><td>15.080</td></tr><tr><td>0.22</td><td>15.079</td><td>15.079</td><td>15.079</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>		Load Current [A]	Output Voltage [V]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	0.00	15.083	15.083	15.082	0.04	15.082	15.082	15.082	0.08	15.082	15.082	15.081	0.12	15.081	15.081	15.080	0.16	15.080	15.080	15.080	0.20	15.080	15.080	15.080	0.22	15.079	15.079	15.079	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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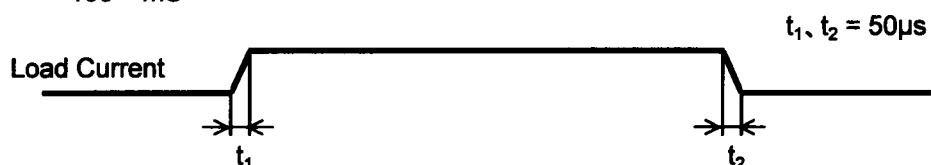
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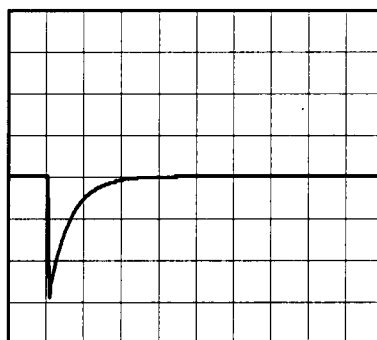
Model	SUS30515	Temperature 25°C Testing Circuitry Figure A	
Item	Dynamic Load Response		
Object	+15V0.2A		

Input Volt. 5 V
Cycle 100 mS



Min. Load (0A) \longleftrightarrow
Load 100% (0.2A)

200mV/div



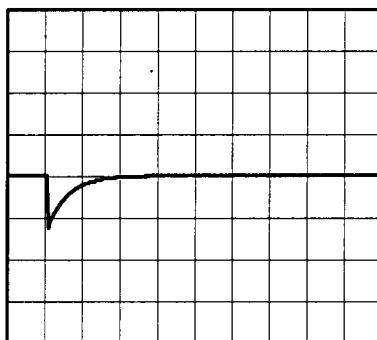
2ms/div



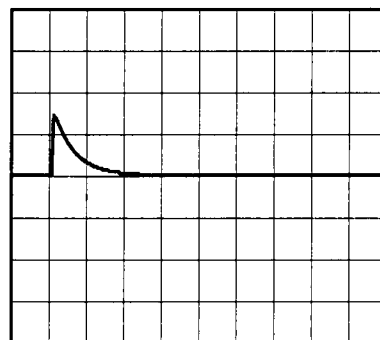
2ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.1A)

200mV/div



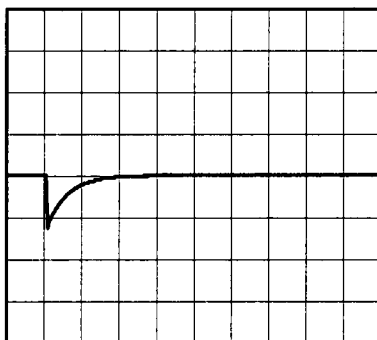
2ms/div



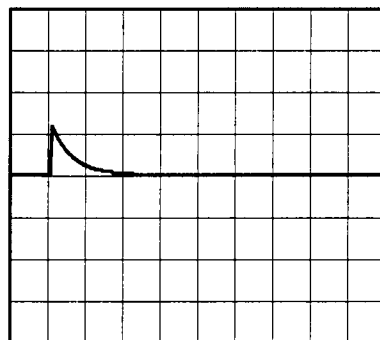
2ms/div

Load 50% (0.1A) \longleftrightarrow
Load 100% (0.2A)

200mV/div



2ms/div



2ms/div

Model		SUS30515	Temperature Testing Circuitry	25°C Figure B																																						
Item		Ripple Voltage (by Load Current)																																								
Object		+15V0.2A																																								
1.Graph			2.Values																																							
<div><div><div>—△— Input Volt. 4.5V</div><div>- -○- - Input Volt. 9V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 4.5 [V]</th><th>Input Volt. 9 [V]</th></tr><tr><td>0.00</td><td>2</td><td>1</td></tr><tr><td>0.04</td><td>2</td><td>1</td></tr><tr><td>0.08</td><td>2</td><td>1</td></tr><tr><td>0.12</td><td>2</td><td>1</td></tr><tr><td>0.16</td><td>3</td><td>2</td></tr><tr><td>0.20</td><td>3</td><td>2</td></tr><tr><td>0.22</td><td>4</td><td>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></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 4.5 [V]	Input Volt. 9 [V]	0.00	2	1	0.04	2	1	0.08	2	1	0.12	2	1	0.16	3	2	0.20	3	2	0.22	4	3	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																									
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<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>Ripple [mVp-p]</div><div>Fig.Complex Ripple Wave Form</div></div>																																										

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Model		SUS30515		Temperature 25°C																																							
Item		Ripple-Noise		Testing Circuitry Figure B																																							
Object		+15V0.2A																																									
1.Graph				2.Values																																							
<div><div><div>—△— Input Volt. 4.5V</div><div>-·-○-·- Input Volt. 9V</div></div><div>Ripple-Noise [mV]</div><div>Load Current [A]</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>Ripple Noise[mVp-p]</div></div><div>Fig.Complex Ripple Noise Wave Form</div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 4.5 [V]</th><th>Input Volt. 9 [V]</th></tr><tr><td>0.00</td><td>6</td><td>6</td></tr><tr><td>0.04</td><td>6</td><td>7</td></tr><tr><td>0.08</td><td>7</td><td>8</td></tr><tr><td>0.12</td><td>7</td><td>8</td></tr><tr><td>0.16</td><td>8</td><td>9</td></tr><tr><td>0.20</td><td>8</td><td>9</td></tr><tr><td>0.22</td><td>9</td><td>10</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. 4.5 [V]	Input Volt. 9 [V]	0.00	6	6	0.04	6	7	0.08	7	8	0.12	7	8	0.16	8	9	0.20	8	9	0.22	9	10	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																										
	Input Volt. 4.5 [V]	Input Volt. 9 [V]																																									
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Model

SUS30515

Item

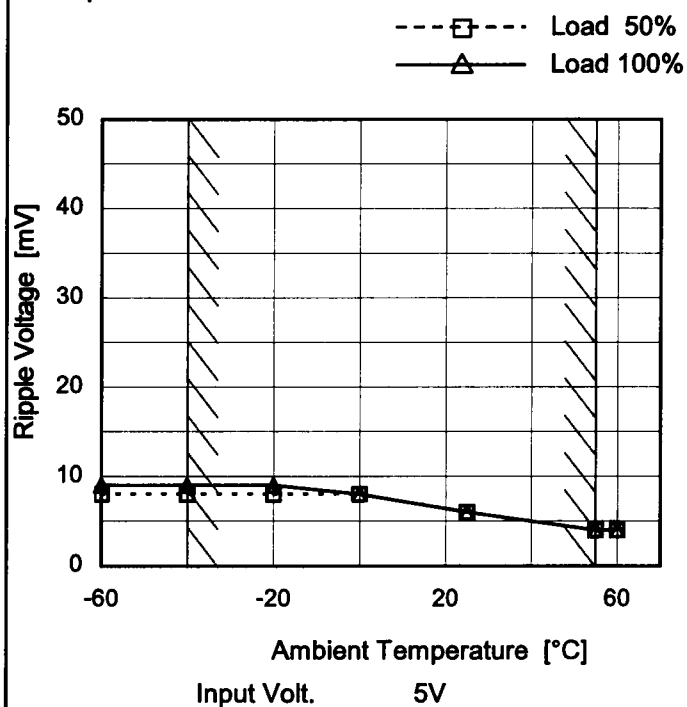
Ripple Voltage (by Ambient Temp.)

Object

+15V0.2A

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	8	9
-40	8	9
-20	8	9
0	8	8
25	6	6
55	4	4
60	4	4
--	-	-
--	-	-
--	-	-
--	-	-

Model		SUS30515																																																				
Item		Ambient Temperature Drift																																																				
Object		+15V0.2A																																																				
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>---□---</div><div>-·-○-·-</div></div><div><div>Input Volt.</div><div>Input Volt.</div><div>Input Volt.</div></div><div><div>4.5V</div><div>5V</div><div>9V</div></div></div> <div><p>Output Voltage [V]</p><p>Ambient Temperature [°C]</p><p>Load 100%</p><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div>		<table><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><tr><td>-60</td><td>15.000</td><td>15.003</td><td>15.004</td></tr><tr><td>-40</td><td>15.030</td><td>15.033</td><td>15.033</td></tr><tr><td>-20</td><td>15.052</td><td>15.054</td><td>15.054</td></tr><tr><td>0</td><td>15.069</td><td>15.070</td><td>15.070</td></tr><tr><td>25</td><td>15.079</td><td>15.079</td><td>15.079</td></tr><tr><td>55</td><td>15.079</td><td>15.079</td><td>15.079</td></tr><tr><td>60</td><td>15.078</td><td>15.078</td><td>15.077</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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	-60	15.000	15.003	15.004	-40	15.030	15.033	15.033	-20	15.052	15.054	15.054	0	15.069	15.070	15.070	25	15.079	15.079	15.079	55	15.079	15.079	15.079	60	15.078	15.078	15.077	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
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-40	15.030	15.033	15.033																																																			
-20	15.052	15.054	15.054																																																			
0	15.069	15.070	15.070																																																			
25	15.079	15.079	15.079																																																			
55	15.079	15.079	15.079																																																			
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		Testing Circuitry Figure A
Model	SUS30515	
Item	Output Voltage Accuracy	
Object	+15V0.2A	

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 - 0.2A

* 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	55	4.5	0	15.083	±27	±0.2
Minimum Voltage	-40	4.5	0.2	15.030		

COSEL

Model		SUS30515	
Item		Time Lapse Drift	
Object		+15V0.2A	
1.Graph		2.Values	
<div><div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></di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COSEL

Model SUS30515

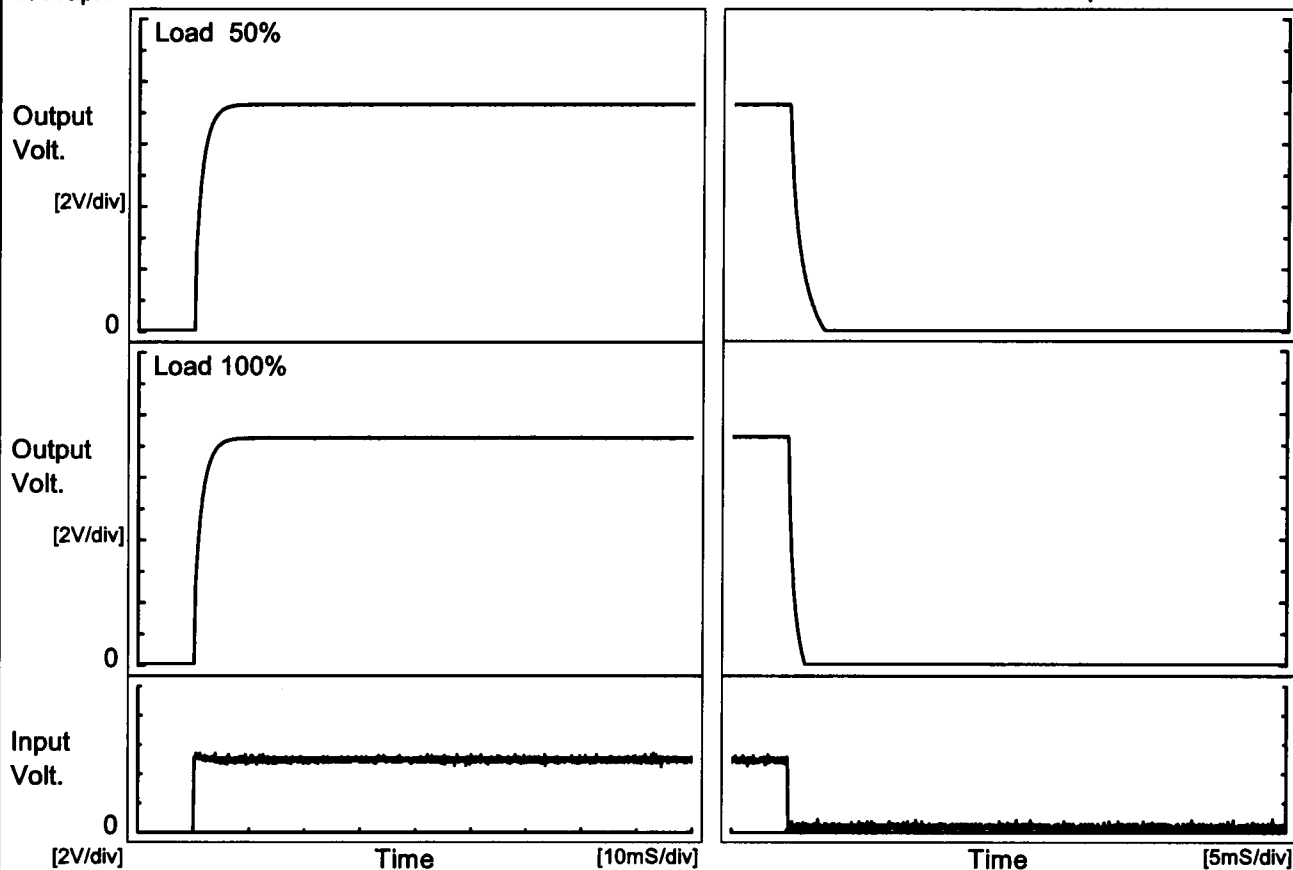
Item Rise and Fall Time

Object +15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

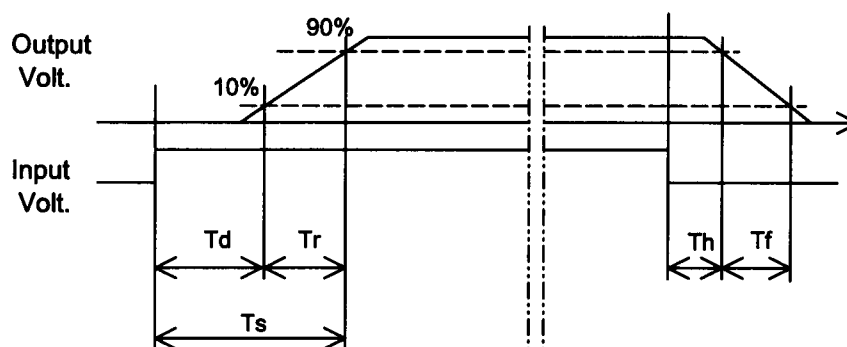
Input Volt. 5 V



2. Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.2	3.3	3.5	0.1	2.1
100 %	0.2	3.4	3.6	0.1	1.0



COSEL

Model

SUS30515

Item

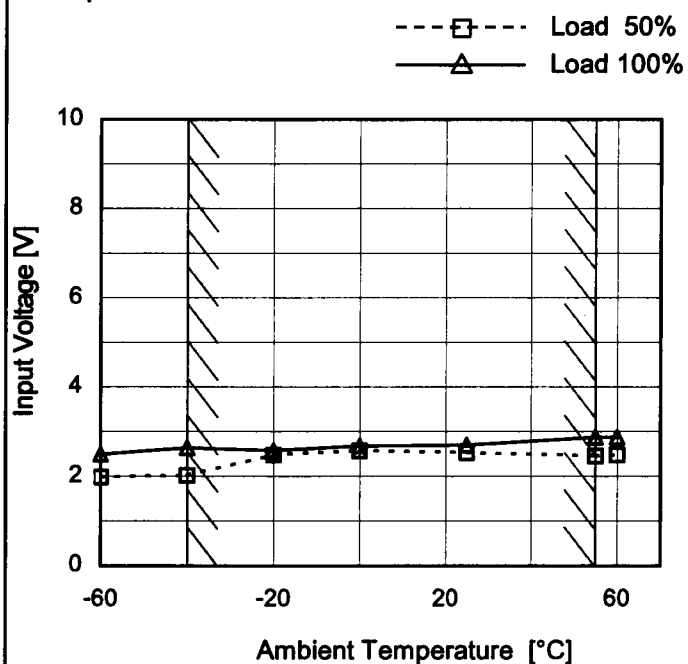
Minimum Input Voltage
for Regulated Output Voltage

Object

+15V0.2A

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	2.0	2.5
-40	2.1	2.7
-20	2.5	2.6
0	2.6	2.7
25	2.6	2.7
55	2.5	2.9
60	2.5	2.9
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUS30515																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+15V0.2A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div>Input Volt.4.5V</div><div><div></div>Input Volt.5V</div><div><div></div>Input Volt.9V</div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 4.5[V]</th><th>Input Volt. 5[V]</th><th>Input Volt. 9[V]</th></tr><tr><td>15.0</td><td>0.20</td><td>0.20</td><td>0.20</td></tr><tr><td>14.3</td><td>0.35</td><td>0.36</td><td>0.36</td></tr><tr><td>13.5</td><td>0.36</td><td>0.37</td><td>0.36</td></tr><tr><td>12.0</td><td>0.38</td><td>0.39</td><td>0.37</td></tr><tr><td>10.5</td><td>0.40</td><td>0.41</td><td>0.38</td></tr><tr><td>9.0</td><td>0.43</td><td>0.42</td><td>0.39</td></tr><tr><td>7.5</td><td>0.45</td><td>0.44</td><td>0.40</td></tr><tr><td>6.0</td><td>0.47</td><td>0.46</td><td>0.41</td></tr><tr><td>4.5</td><td>0.47</td><td>0.46</td><td>0.40</td></tr><tr><td>3.0</td><td>0.47</td><td>0.46</td><td>0.39</td></tr><tr><td>1.5</td><td>0.44</td><td>0.42</td><td>0.37</td></tr><tr><td>0.0</td><td>0.43</td><td>0.43</td><td>0.41</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	15.0	0.20	0.20	0.20	14.3	0.35	0.36	0.36	13.5	0.36	0.37	0.36	12.0	0.38	0.39	0.37	10.5	0.40	0.41	0.38	9.0	0.43	0.42	0.39	7.5	0.45	0.44	0.40	6.0	0.47	0.46	0.41	4.5	0.47	0.46	0.40	3.0	0.47	0.46	0.39	1.5	0.44	0.42	0.37	0.0	0.43	0.43	0.41
Output Voltage [V]	Load Current [A]																																																									
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]																																																							
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12.0	0.38	0.39	0.37																																																							
10.5	0.40	0.41	0.38																																																							
9.0	0.43	0.42	0.39																																																							
7.5	0.45	0.44	0.40																																																							
6.0	0.47	0.46	0.41																																																							
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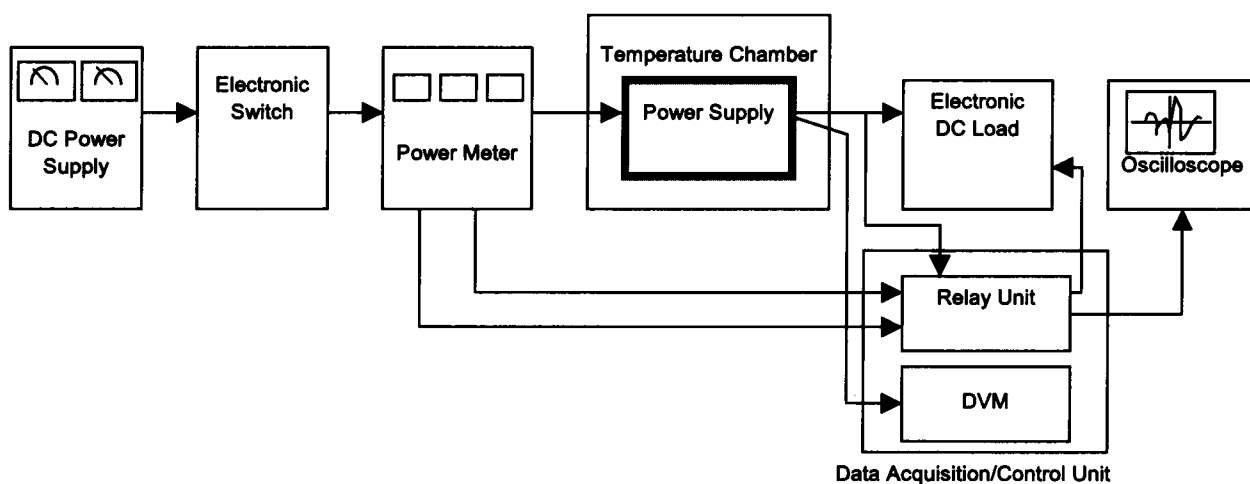


Figure A

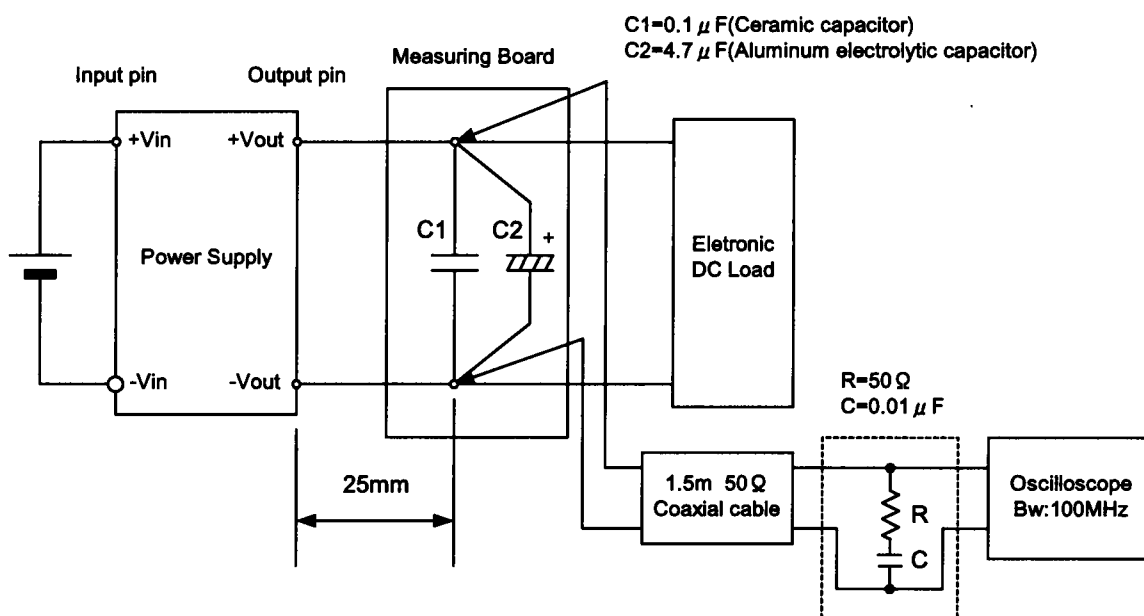


Figure B (Ripple and Ripple noise Characteristic)