



TEST DATA OF SUW100515 SUCW100515

Regulated DC Power Supply
Mar 28, 2005

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

Prepared by : Yoshimichi Hirokawa
Yoshimichi Hirokawa Design Engineer

COSEL CO.,LTD.

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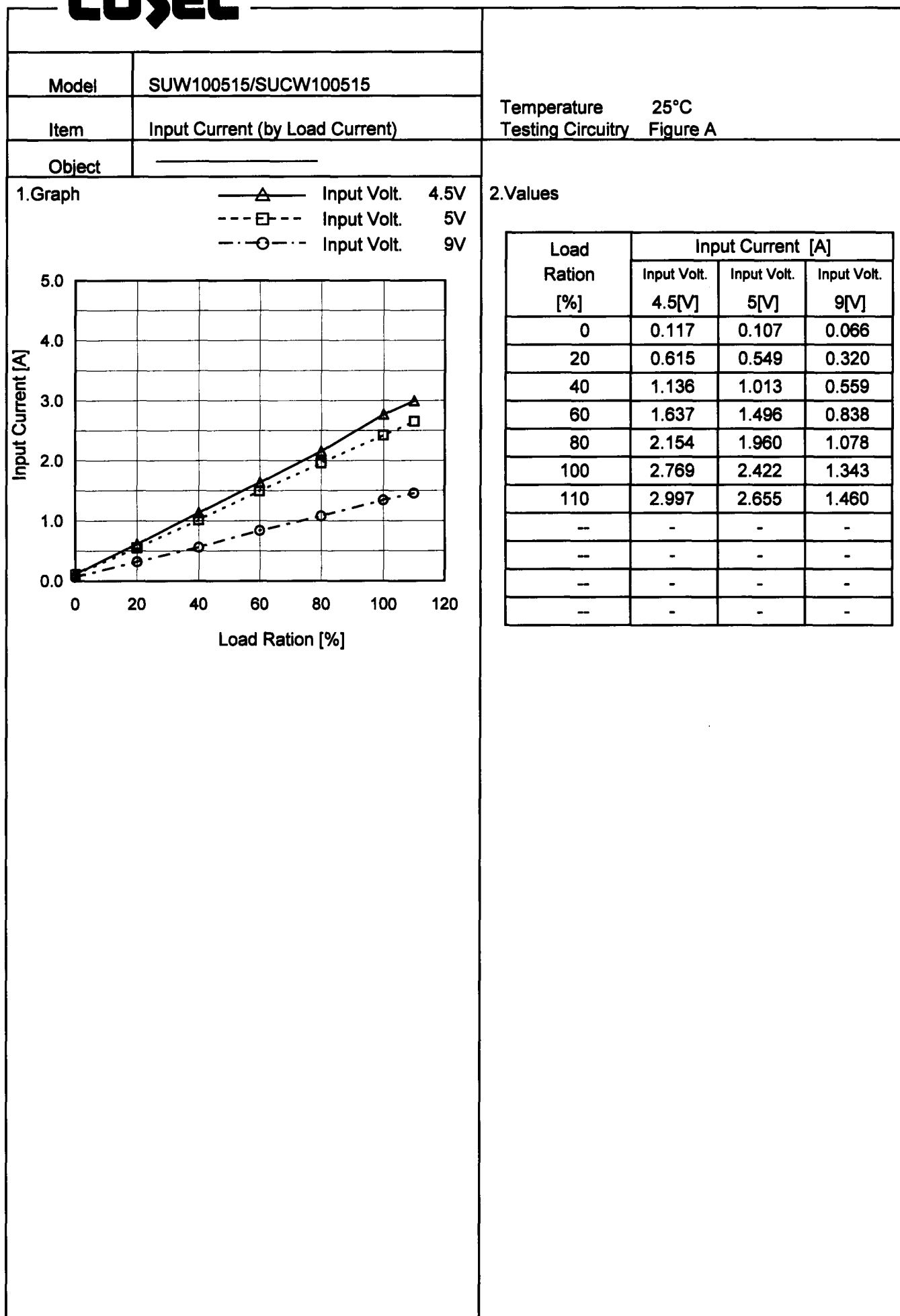
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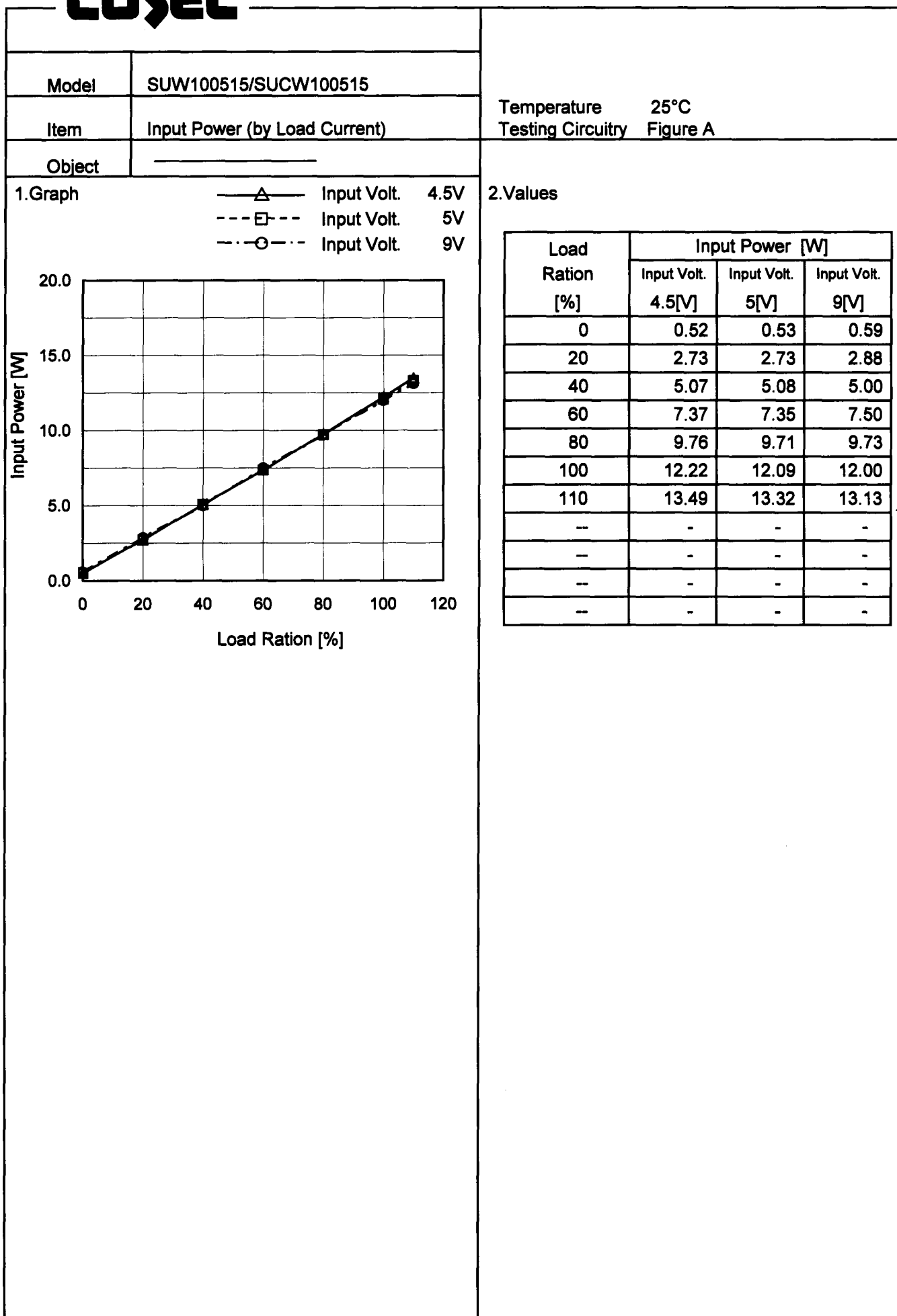
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Model		SUW100515/SUCW100515	
Item		Efficiency (by Input Voltage)	
Object			

1.Graph

□

Load 50%

△

Load 100%

Efficiency [%]

<

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Model SUW100515/SUCW100515

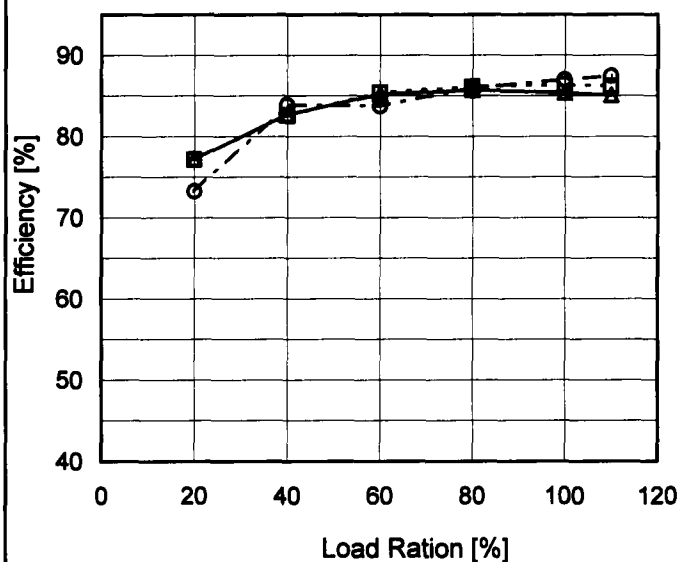
Item Efficiency (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 4.5V
---□--- Input Volt. 5V
---○--- Input Volt. 9V



2. Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	-	-	-
20	77.3	77.2	73.3
40	82.7	82.5	83.9
60	85.2	85.4	83.7
80	85.7	86.1	86.0
100	85.4	86.3	87.0
110	85.1	86.2	87.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model		SUW100515/SUCW100515																																	
Item		Line Regulation																																	
Object		+15V0.35A																																	
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<div><div><div><div>---</div><div>□</div><div>---</div></div><div>Load 50%</div></div><div><div>—</div><div>△</div><div>—</div></div><div>Load 100%</div></div> <table><thead><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></thead><tbody><tr><td>4.0</td><td>14.964</td><td>14.865</td></tr><tr><td>4.5</td><td>14.957</td><td>14.865</td></tr><tr><td>5.0</td><td>14.952</td><td>14.864</td></tr><tr><td>6.0</td><td>14.945</td><td>14.864</td></tr><tr><td>7.0</td><td>14.940</td><td>14.864</td></tr><tr><td>8.0</td><td>14.937</td><td>14.864</td></tr><tr><td>9.0</td><td>14.935</td><td>14.864</td></tr><tr><td>10.0</td><td>14.933</td><td>14.864</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	4.0	14.964	14.865	4.5	14.957	14.865	5.0	14.952	14.864	6.0	14.945	14.864	7.0	14.940	14.864	8.0	14.937	14.864	9.0	14.935	14.864	10.0	14.933	14.864	--	-	-		
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Item		Load Regulation		Testing Circuitry Figure A																																																		
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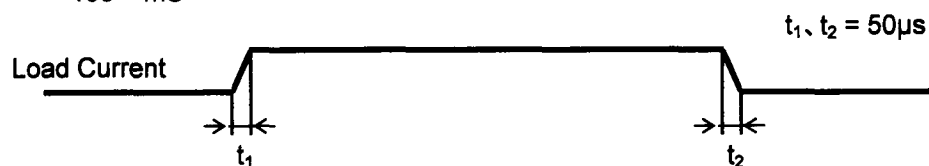
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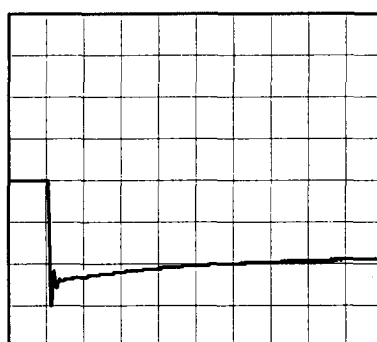
Model	SUW100515/SUCW100515	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V0.35A		

Input Volt. 5 V
Cycle 100 mS

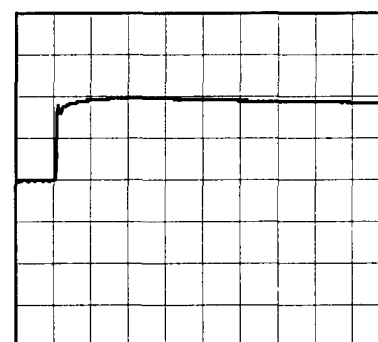


Min. Load (0A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



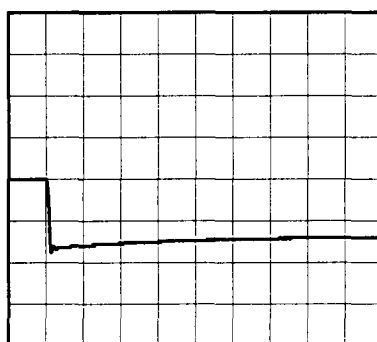
500µs/div



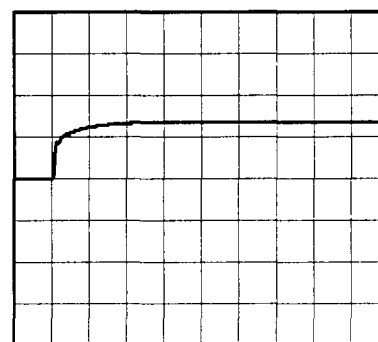
500µs/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.175A)

200mV/div



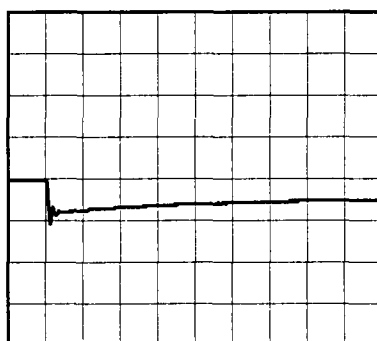
500µs/div



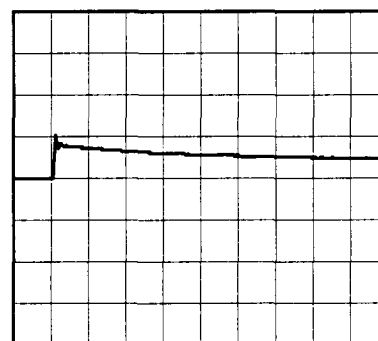
500µs/div

Load 50% (0.175A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



500µs/div

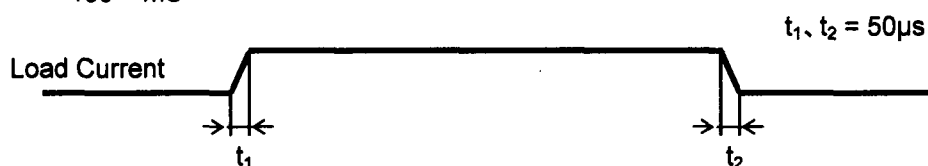


500µs/div

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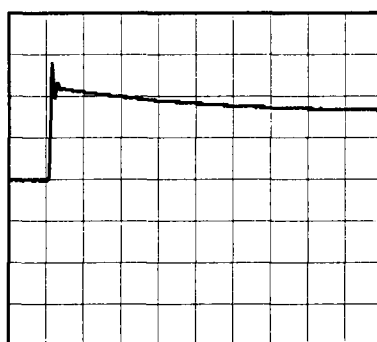
Model	SUW100515/SUCW100515	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-15V0.35A		

Input Volt. 5 V
Cycle 100 mS

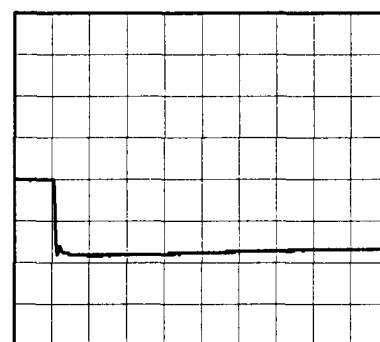


Min. Load (0A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



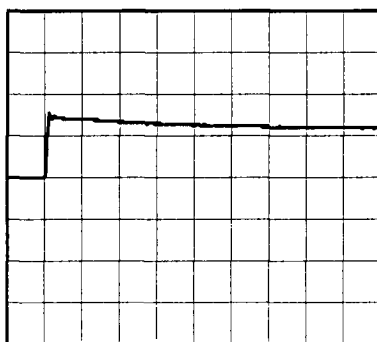
500µs/div



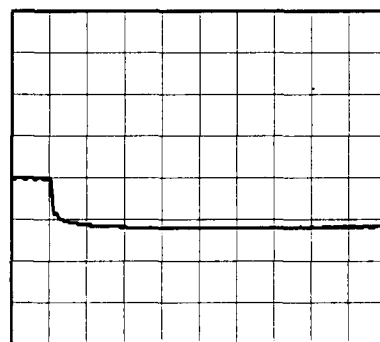
500µs/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.175A)

200mV/div



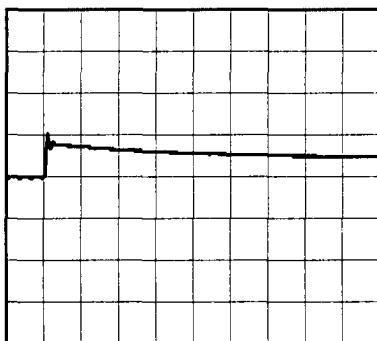
500µs/div



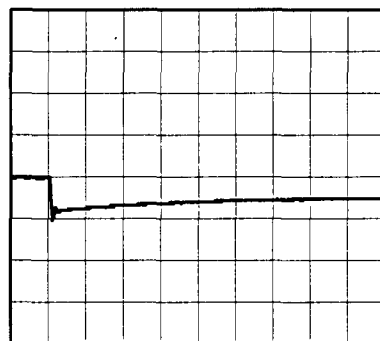
500µs/div

Load 50% (0.175A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



500µs/div



500µs/div

COSEL

Model		SUW100515/SUCW100515		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+15V0.35A																																									
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<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>0.000</td><td>2</td><td>3</td></tr><tr><td>0.070</td><td>2</td><td>3</td></tr><tr><td>0.140</td><td>3</td><td>3</td></tr><tr><td>0.210</td><td>4</td><td>4</td></tr><tr><td>0.280</td><td>5</td><td>4</td></tr><tr><td>0.350</td><td>6</td><td>5</td></tr><tr><td>0.385</td><td>6</td><td>5</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]	0.000	2	3	0.070	2	3	0.140	3	3	0.210	4	4	0.280	5	4	0.350	6	5	0.385	6	5	--	-	-	--	-	-	--	-	-	--	-	-
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<div><div>Ripple [mVp-p]</div><div>Fig.Complex Ripple Wave Form</div></div>																																											

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COSEL

Model		SUW100515/SUCW100515		Temperature Testing Circuitry	25°C Figure B																																				
Item		Ripple Voltage (by Load Current)																																							
Object		-15V0.35A																																							
1.Graph				2.Values																																					
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>Input Volt.</div><div>4.5V</div></div><div><div>Input Volt.</div><div>9V</div></div></div><div><div><div><div>80</div><div>60</div><div>40</div><div>20</div><div>0</div></div><div><div>Ripple Voltage [mV]</div></div><div><div><div>0.00</div><div>0.10</div><div>0.20</div><div>0.30</div><div>0.40</div></div><div><div>Load Current [A]</div></div></div></div></div><div><p>Measured by 100 MHz Oscilloscope.</p><p>Ripple Voltage 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><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>Ripple [mVp-p]</div></div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div></div></div><div><p>Fig.Complex Ripple Wave Form</p></div></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>0.000</td><td>2</td><td>3</td></tr><tr><td>0.070</td><td>2</td><td>3</td></tr><tr><td>0.140</td><td>3</td><td>3</td></tr><tr><td>0.210</td><td>4</td><td>4</td></tr><tr><td>0.280</td><td>5</td><td>4</td></tr><tr><td>0.350</td><td>6</td><td>5</td></tr><tr><td>0.385</td><td>6</td><td>5</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></div><div><div>- 11 -</div><div>BC-3797</div></div></div></div>				Load Current [A]	Ripple Voltage [mV]		Input Volt. 4.5 [V]	Input Volt. 9 [V]	0.000	2	3	0.070	2	3	0.140	3	3	0.210	4	4	0.280	5	4	0.350	6	5	0.385	6	5	--	-	-	--	-	-	--	-	-	--	-	-
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COSEL

Model		SUW100515/SUCW100515	
Item		Ripple-Noise	
Object		+15V0.35A	
1.Graph		2.Values	

COSEL

Model	SUW100515/SUCW100515																																								
Item	Ripple-Noise	Temperature	25°C																																						
Object	-15V0.35A	Testing Circuitry	Figure B																																						
1.Graph		2.Values																																							
<div><div><div><div></div><div>Input Volt.</div><div>4.5V</div></div><div><div></div><div>Input Volt.</div><div>9V</div></div></div><div>Ripple-Noise [mV]</div><div>Load Current [A]</div></div> <div>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.</div> <div><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>0.000</td><td>3</td><td>4</td></tr><tr><td>0.070</td><td>5</td><td>5</td></tr><tr><td>0.140</td><td>6</td><td>6</td></tr><tr><td>0.210</td><td>6</td><td>7</td></tr><tr><td>0.280</td><td>6</td><td>8</td></tr><tr><td>0.350</td><td>7</td><td>8</td></tr><tr><td>0.385</td><td>7</td><td>8</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]	0.000	3	4	0.070	5	5	0.140	6	6	0.210	6	7	0.280	6	8	0.350	7	8	0.385	7	8	--	-	-	--	-	-	--	-	-	--	-	-
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Object -15V0.35A

1.Graph

-----□----- Load 50%
———△——— Load 100%

Ripple Voltage [mV]

Ambient Temperature [°C]

Input Volt. 5V

Measured by 100 MHz Oscilloscope.

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

Ambient Temperature [°C]	Ripple Voltage [mV] (Load 50%)	Ripple Voltage [mV] (Load 100%)
-60	10	10
-40	10	10
-20	8	8
0	6	6
25	4	4
50	3	3
60	2	2

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	9	10
-40	9	10
-20	8	8
0	6	7
25	4	5
55	4	4
60	2	4
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model		SUW100515/SUCW100515																																																				
Item		Ambient Temperature Drift																																																				
Object		+15V0.35A																																																				
1.Graph		<div><div>—△—</div>Input Volt. 4.5V</div> <div><div>---□---</div>Input Volt. 5V</div> <div><div>-·-○-·-</div>Input Volt. 9V</div> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																				
2.Values		<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>14.912</td><td>14.911</td><td>14.912</td></tr><tr><td>-40</td><td>14.914</td><td>14.913</td><td>14.914</td></tr><tr><td>-20</td><td>14.908</td><td>14.907</td><td>14.907</td></tr><tr><td>0</td><td>14.893</td><td>14.893</td><td>14.893</td></tr><tr><td>25</td><td>14.867</td><td>14.866</td><td>14.866</td></tr><tr><td>55</td><td>14.824</td><td>14.823</td><td>14.822</td></tr><tr><td>60</td><td>14.816</td><td>14.815</td><td>14.814</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	14.912	14.911	14.912	-40	14.914	14.913	14.914	-20	14.908	14.907	14.907	0	14.893	14.893	14.893	25	14.867	14.866	14.866	55	14.824	14.823	14.822	60	14.816	14.815	14.814	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated ambient temperature.																																																						

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		Testing Circuitry Figure A
Model	SUW100515/SUCW100515	
Item	Output Voltage Accuracy	

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 (AVR 1) : 0 - 0.35A (AVR 2) : 0 - 0.35A

* Other Output : Rated Load

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

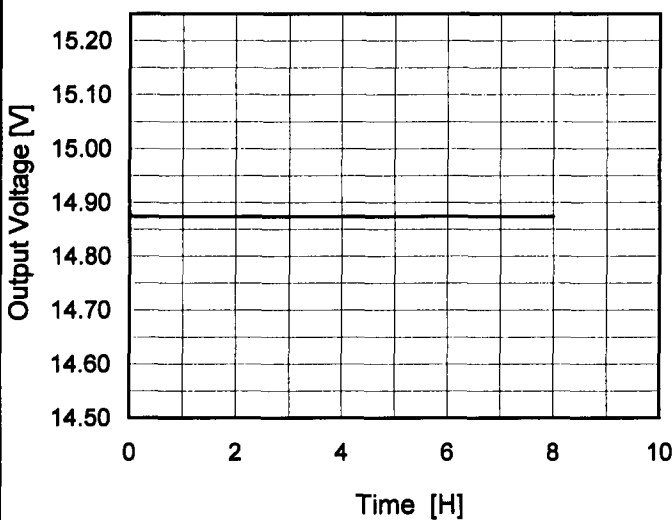
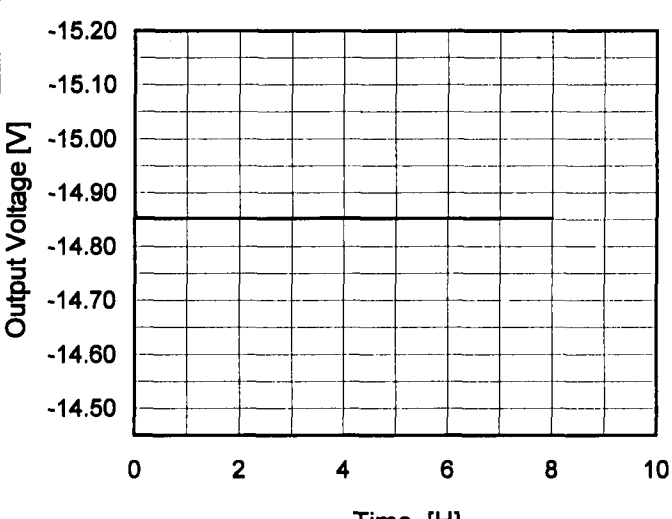
* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

Object	+15V0.35A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	9	0	15.258	±218	±1.5
Minimum Voltage	55	9	0.35	14.822		

Object	-15V0.35A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	9	0	-15.216	±199	±1.3
Minimum Voltage	55	9	0.35	-14.818		

COSEL

Model	SUW100515/SUCW100515																								
Item	Time Lapse Drift		Temperature 25°C																						
Object	+15V0.35A		Testing Circuitry Figure A																						
1.Graph		2.Values																							
<div><p>Input Volt. 5V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>14.886</td></tr><tr><td>0.5</td><td>14.874</td></tr><tr><td>1.0</td><td>14.874</td></tr><tr><td>2.0</td><td>14.874</td></tr><tr><td>3.0</td><td>14.874</td></tr><tr><td>4.0</td><td>14.874</td></tr><tr><td>5.0</td><td>14.874</td></tr><tr><td>6.0</td><td>14.874</td></tr><tr><td>7.0</td><td>14.874</td></tr><tr><td>8.0</td><td>14.874</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	14.886	0.5	14.874	1.0	14.874	2.0	14.874	3.0	14.874	4.0	14.874	5.0	14.874	6.0	14.874	7.0	14.874	8.0	14.874
Time since start [H]	Output Voltage [V]																								
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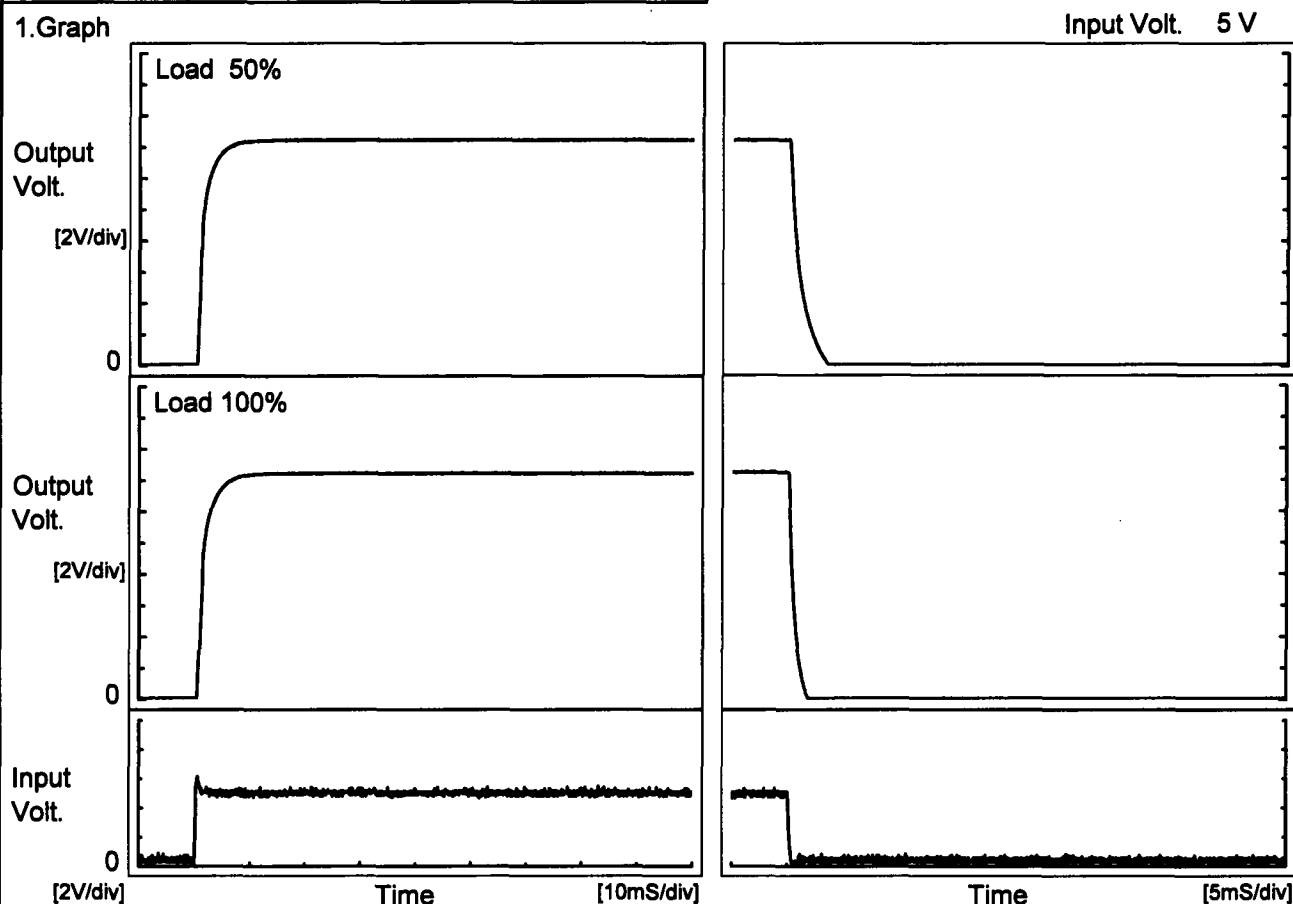
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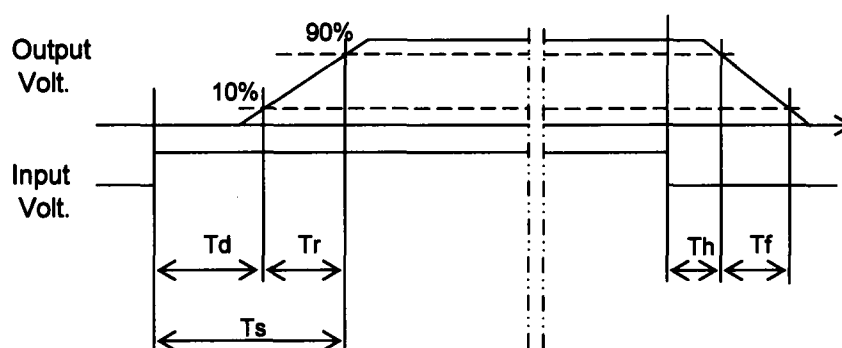
Model	SUW100515/SUCW100515	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V0.35A		

1. Graph



2. Values

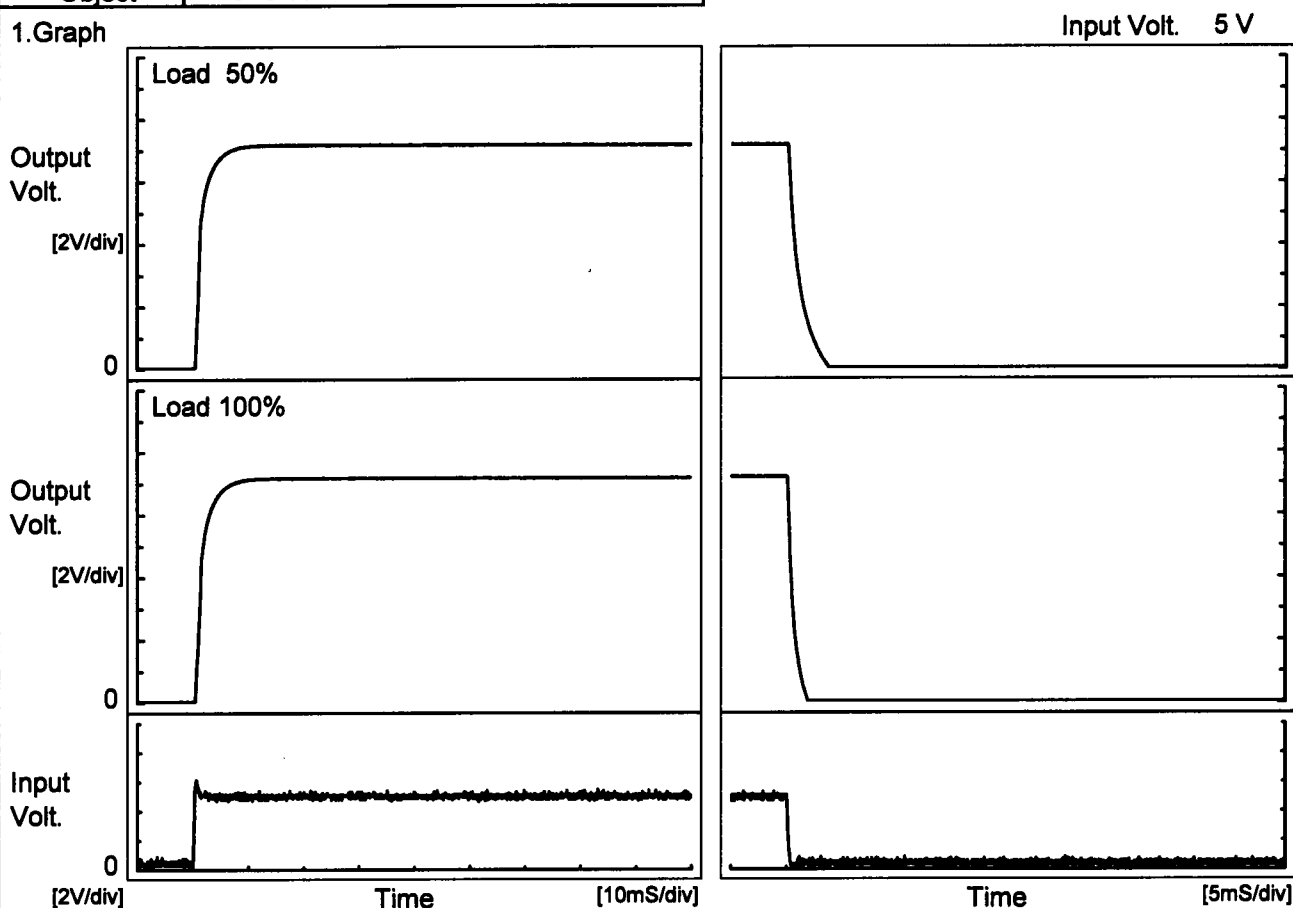
		[mS]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		0.6	4.4	5.0	0.2	2.2
100 %		0.6	4.6	5.2	0.2	1.1



COSEL

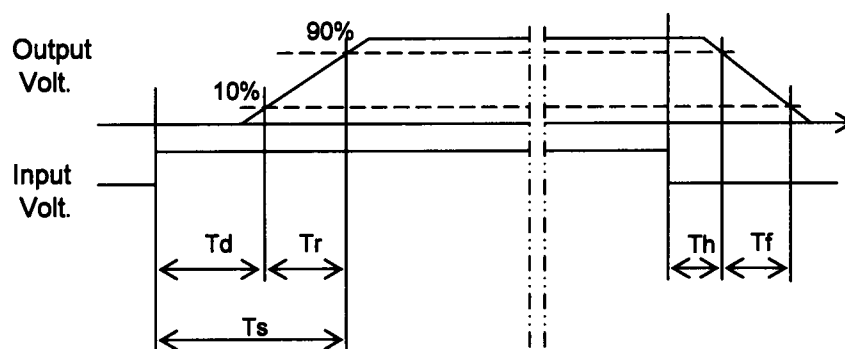
Model	SUW100515/SUCW100515	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-15V0.35A		

1.Graph



2.Values

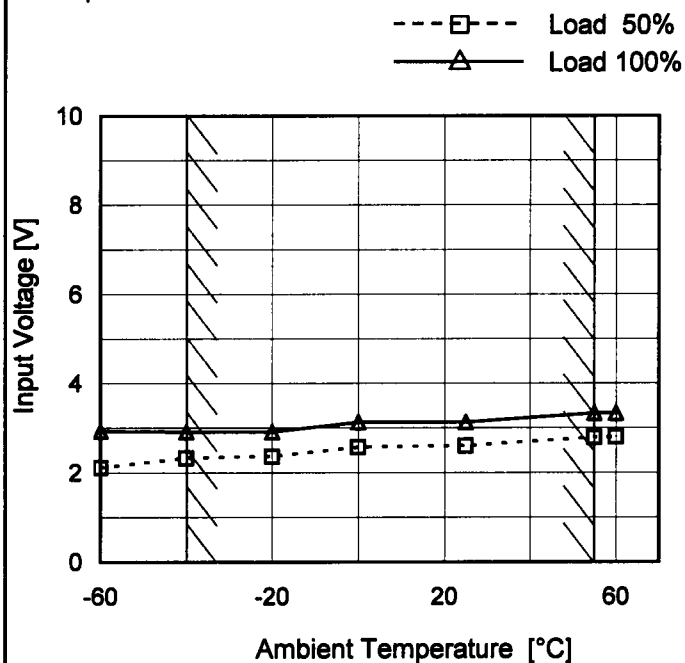
		[mS]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		0.6	4.6	5.2	0.2	2.4
100 %		0.6	4.8	5.4	0.2	1.2



COSEL

Model	SUW100515/SUCW100515
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.35A

1. Graph



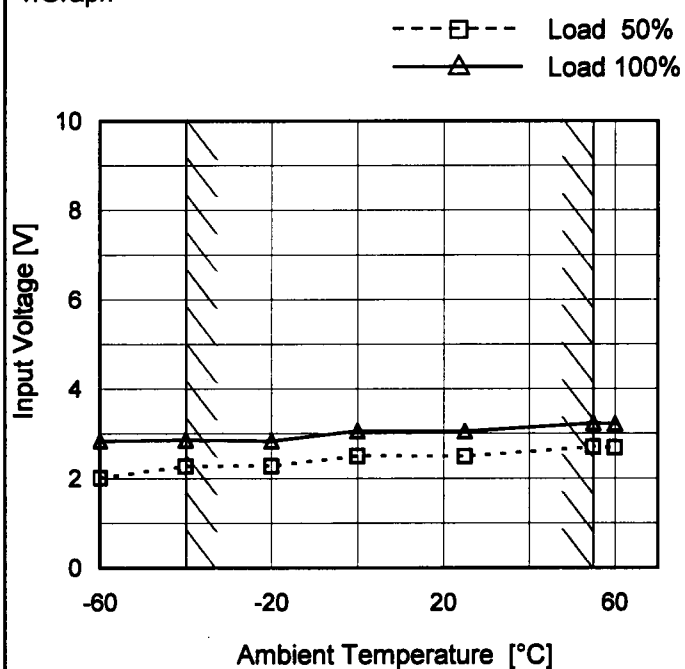
Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.2	3.0
-40	2.4	3.0
-20	2.4	3.0
0	2.6	3.2
25	2.6	3.2
55	2.8	3.4
60	2.8	3.4
—	—	—
—	—	—
—	—	—
—	—	—

Object	-15V0.35A
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1. Graph



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.1	2.9
-40	2.3	2.9
-20	2.3	2.9
0	2.5	3.1
25	2.5	3.1
55	2.7	3.3
60	2.7	3.3
—	—	—
—	—	—
—	—	—
—	—	—

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

Model		SUW100515/SUCW100515		Temperature 25°C	
Item		Overcurrent Protection		Testing Circuitry Figure A	
Object		+15V0.35A			
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>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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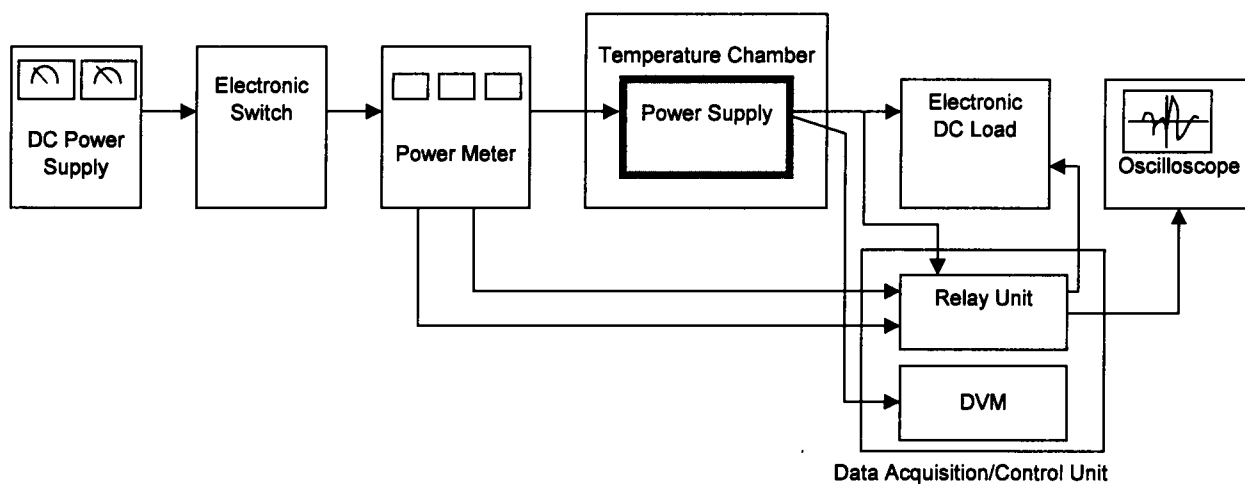


Figure A

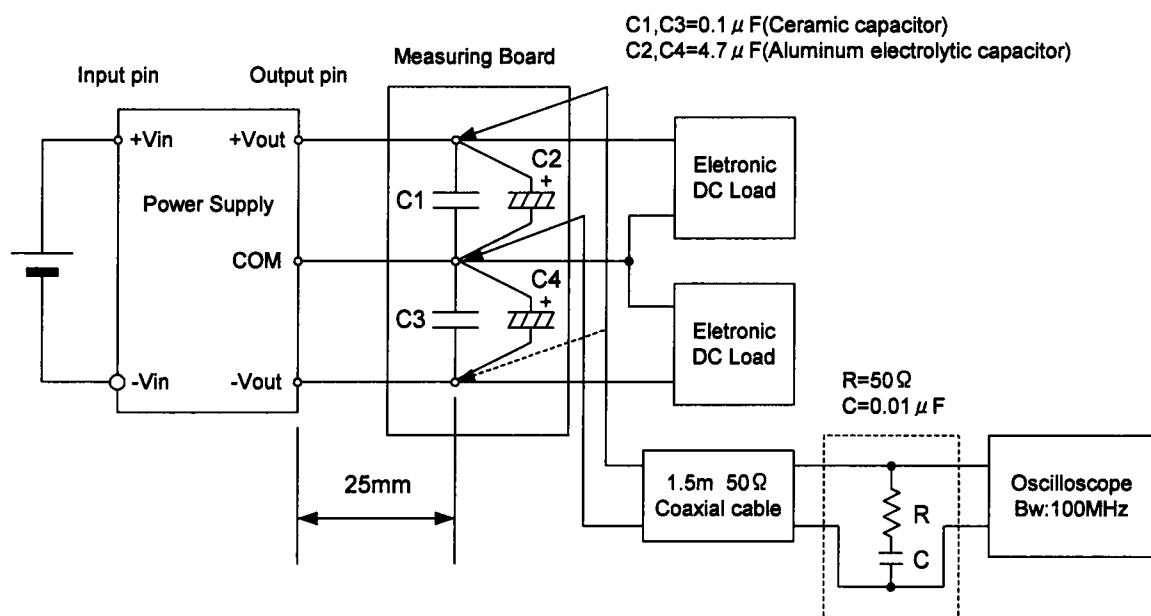


Figure B(Ripple and Ripple noise Characteristic)