



TEST DATA OF SUCW31215

Regulated DC Power Supply
Mar 17, 2005

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

Prepared by : Hayato Nakatsubo
Hayato Nakatsubo Design Engineer

COSEL CO.,LTD.

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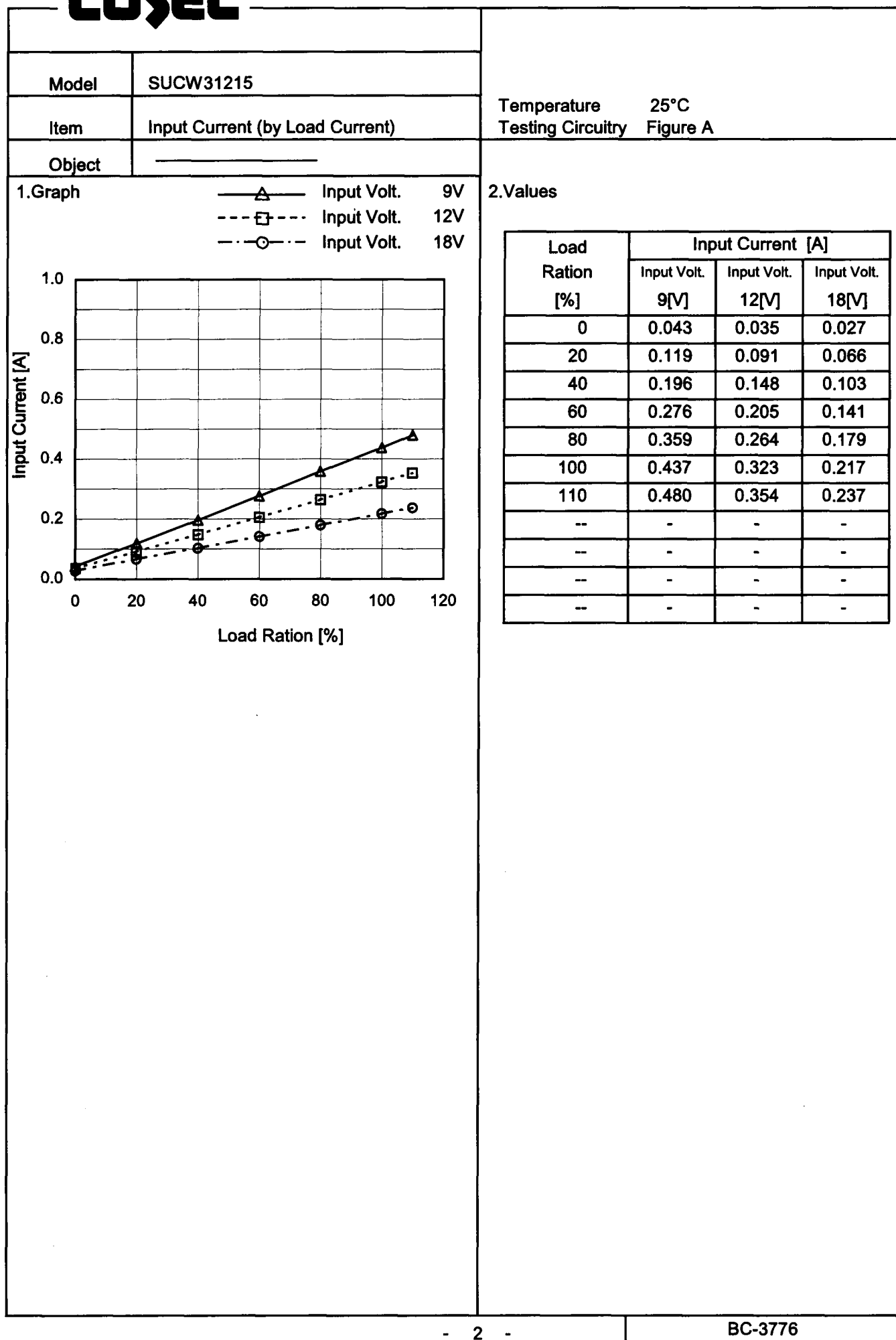
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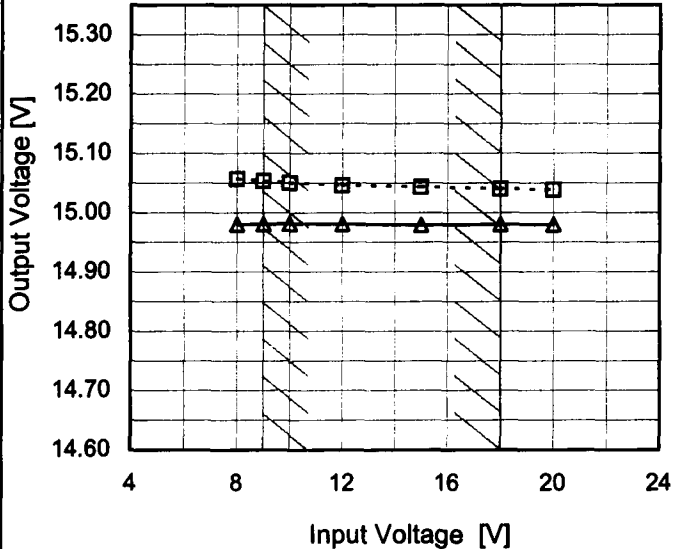
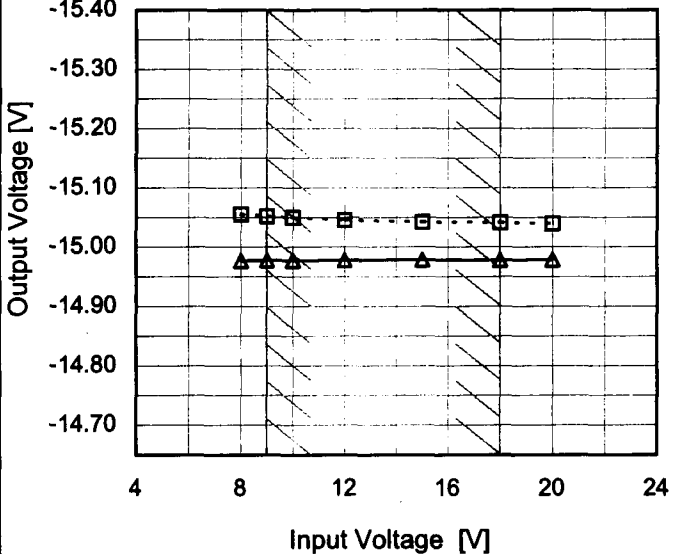
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1.Graph		2.Values	

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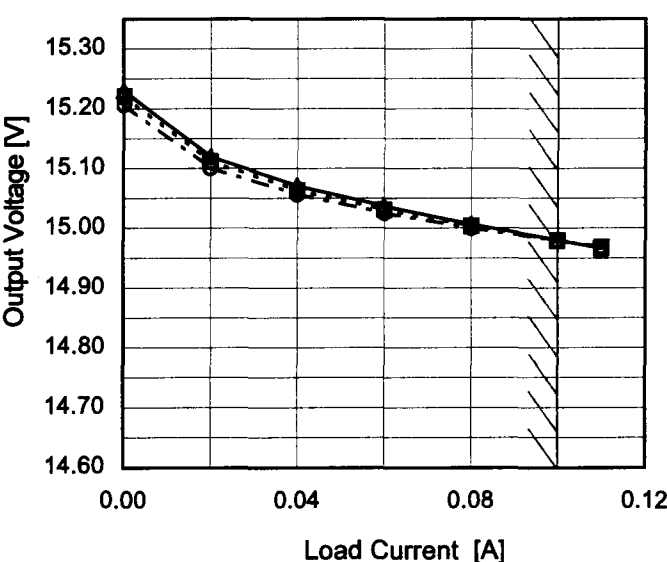
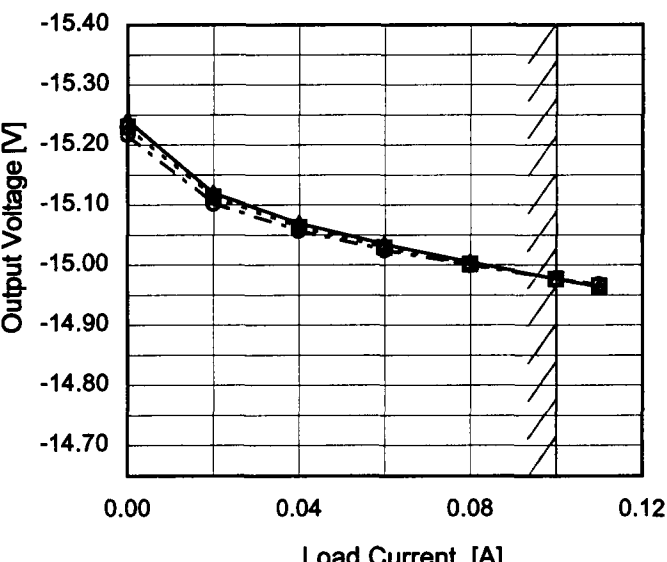
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<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>8</td><td>15.057</td><td>14.981</td></tr><tr><td>9</td><td>15.054</td><td>14.981</td></tr><tr><td>10</td><td>15.051</td><td>14.981</td></tr><tr><td>12</td><td>15.046</td><td>14.981</td></tr><tr><td>15</td><td>15.043</td><td>14.980</td></tr><tr><td>18</td><td>15.040</td><td>14.980</td></tr><tr><td>20</td><td>15.039</td><td>14.980</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	15.057	14.981	9	15.054	14.981	10	15.051	14.981	12	15.046	14.981	15	15.043	14.980	18	15.040	14.980	20	15.039	14.980	--	-	-	--	-	-
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Model		SUCW31215																																																				
Item		Load Regulation																																																				
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<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> 		<table><tr><th rowspan="2">Load Current [A]</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>0.00</td><td>15.230</td><td>15.222</td><td>15.207</td></tr><tr><td>0.02</td><td>15.120</td><td>15.112</td><td>15.101</td></tr><tr><td>0.04</td><td>15.071</td><td>15.063</td><td>15.057</td></tr><tr><td>0.06</td><td>15.037</td><td>15.031</td><td>15.025</td></tr><tr><td>0.08</td><td>15.007</td><td>15.004</td><td>15.000</td></tr><tr><td>0.10</td><td>14.980</td><td>14.980</td><td>14.979</td></tr><tr><td>0.11</td><td>14.967</td><td>14.969</td><td>14.969</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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.00	15.230	15.222	15.207	0.02	15.120	15.112	15.101	0.04	15.071	15.063	15.057	0.06	15.037	15.031	15.025	0.08	15.007	15.004	15.000	0.10	14.980	14.980	14.979	0.11	14.967	14.969	14.969	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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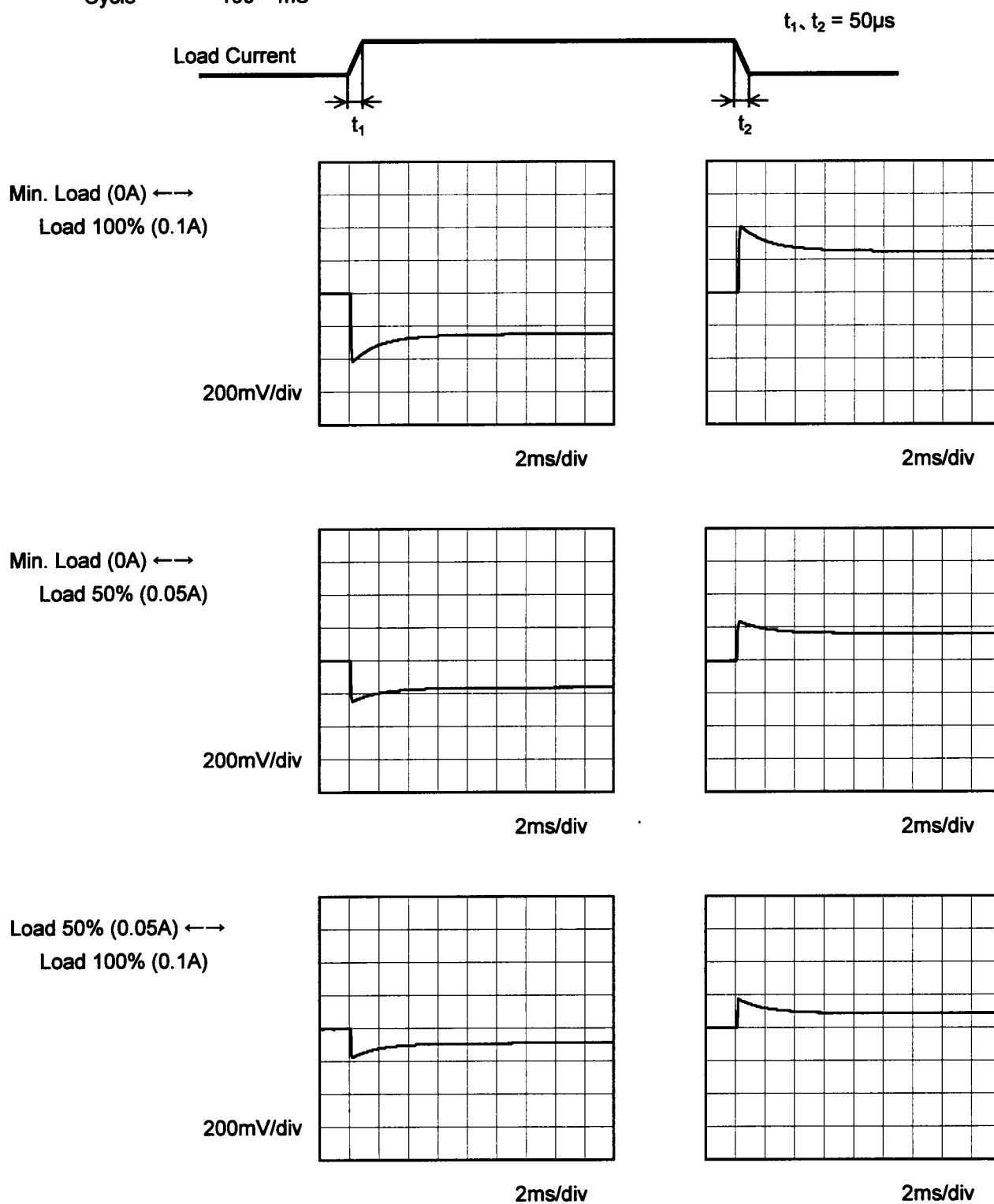
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COSEL

Model	SUCW31215	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V0.1A		

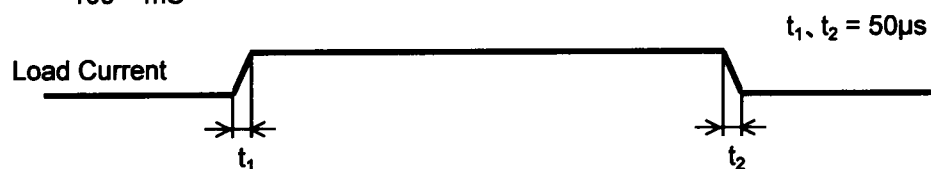
Input Volt. 12 V
Cycle 100 mS



COSEL

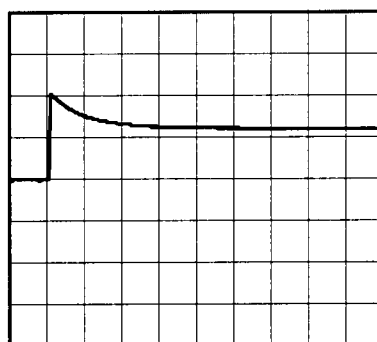
Model	SUCW31215	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-15V0.1A		

Input Volt. 12 V
Cycle 100 mS

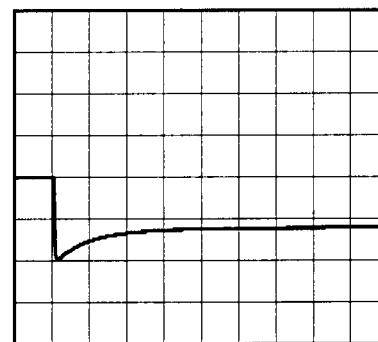


Min. Load (0A) \longleftrightarrow
Load 100% (0.1A)

200mV/div



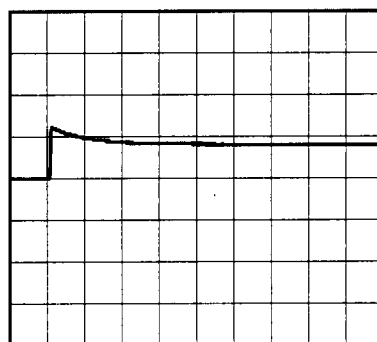
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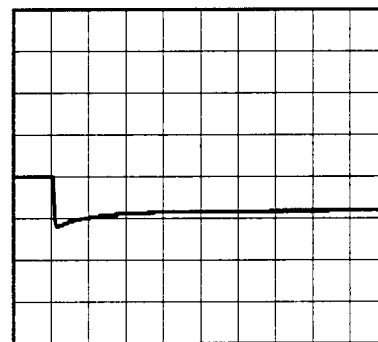
2ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.05A)

200mV/div



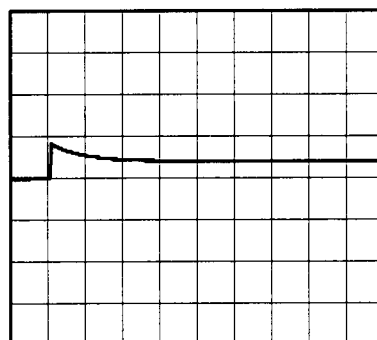
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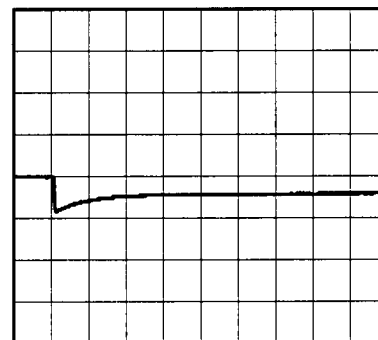
2ms/div

Load 50% (0.05A) \longleftrightarrow
Load 100% (0.1A)

200mV/div



2ms/div



2ms/div

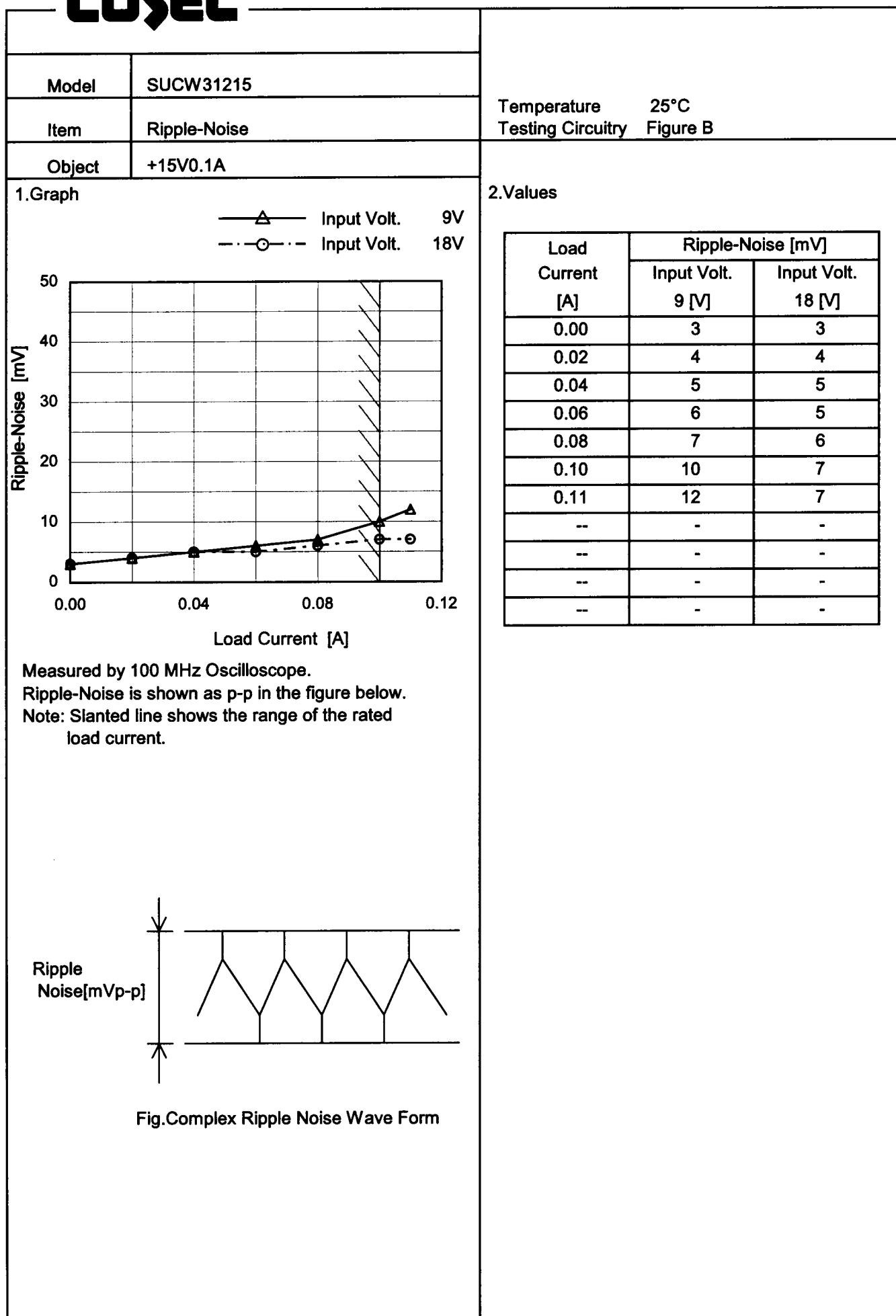
COSEL

Model		SUCW31215		Temperature Testing Circuitry	25°C Figure B
Item		Ripple Voltage (by Load Current)			
Object		+15V0.1A			
1.Graph					
<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>Input Volt. 9V</div><div>Input Volt. 18V</div></div></div> <div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div></div> <div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> 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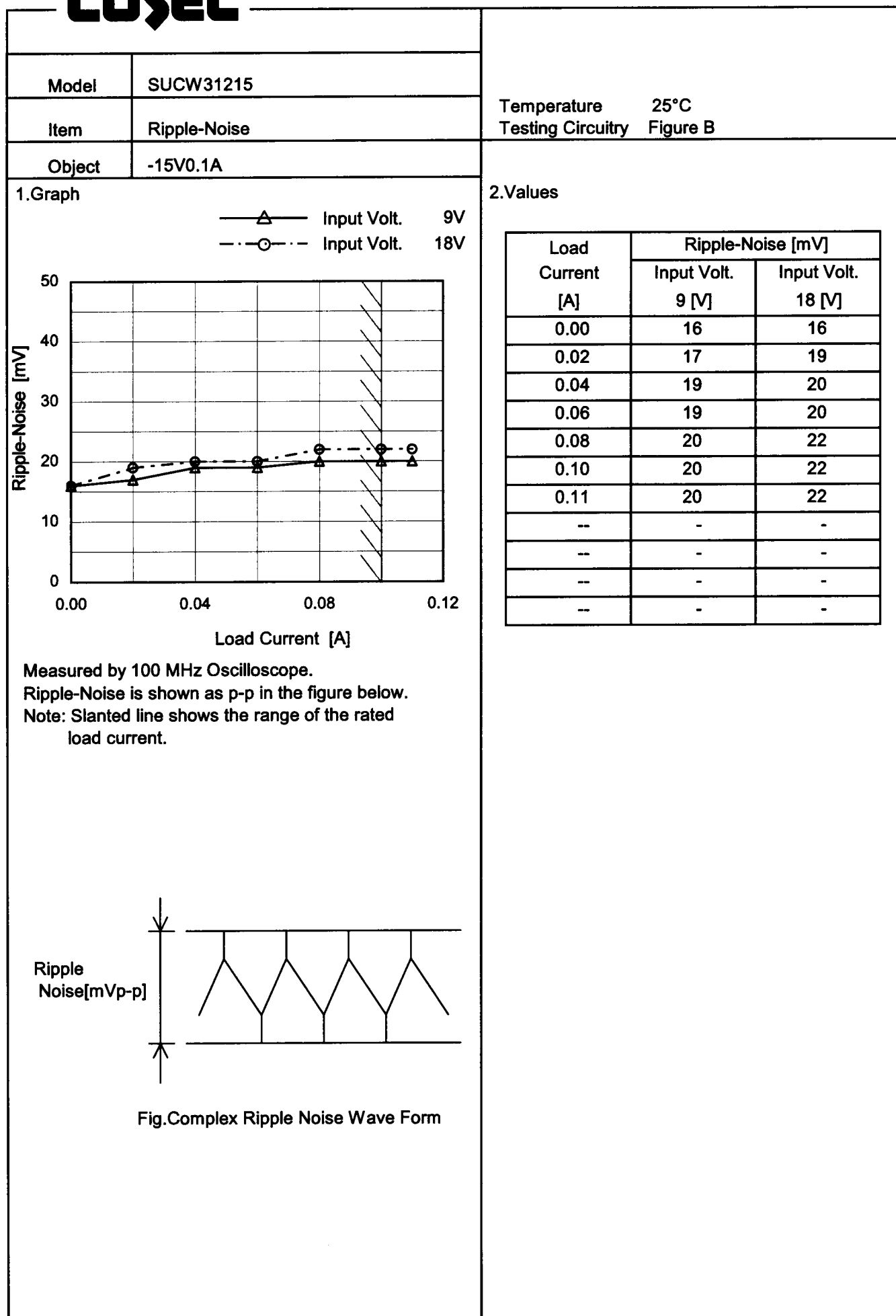
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Model		SUCW31215	Temperature 25°C Testing Circuitry Figure B
Item		Ripple Voltage (by Load Current)	
Object		-15V0.1A	
1.Graph			2.Values
<div><div><div><div></div><div>—△—</div><div>Input Volt. 9V</div></div><div><div></div><div>-·-○-·-</div><div>Input Volt. 18V</div></div></div><div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div></div>			
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.			
<div><div><div></div><div>Ripple [mVp-p]</div></div><div></div><div><div></div><div>Fig.Complex Ripple Wave Form</div></div></div>			

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Model		SUCW31215																																																				
Item		Ambient Temperature Drift																																																				
Object		+15V0.1A																																																				
1.Graph		<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> <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. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>-60</td><td>14.912</td><td>14.913</td><td>14.913</td></tr><tr><td>-40</td><td>14.939</td><td>14.940</td><td>14.939</td></tr><tr><td>-20</td><td>14.960</td><td>14.960</td><td>14.959</td></tr><tr><td>0</td><td>14.974</td><td>14.973</td><td>14.972</td></tr><tr><td>25</td><td>14.982</td><td>14.981</td><td>14.980</td></tr><tr><td>55</td><td>14.980</td><td>14.979</td><td>14.978</td></tr><tr><td>60</td><td>14.979</td><td>14.978</td><td>14.976</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	14.912	14.913	14.913	-40	14.939	14.940	14.939	-20	14.960	14.960	14.959	0	14.974	14.973	14.972	25	14.982	14.981	14.980	55	14.980	14.979	14.978	60	14.979	14.978	14.976	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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1.Graph		<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> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																				
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Note: Slanted line shows the range of the rated ambient temperature.																																																						

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Model		SUCW31215	Testing Circuitry Figure A			
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 : 9 - 18V
Load Current (AVR 1) : 0 - 0.1A (AVR 2): 0 - 0.1A

* Other Output : Rated Load

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

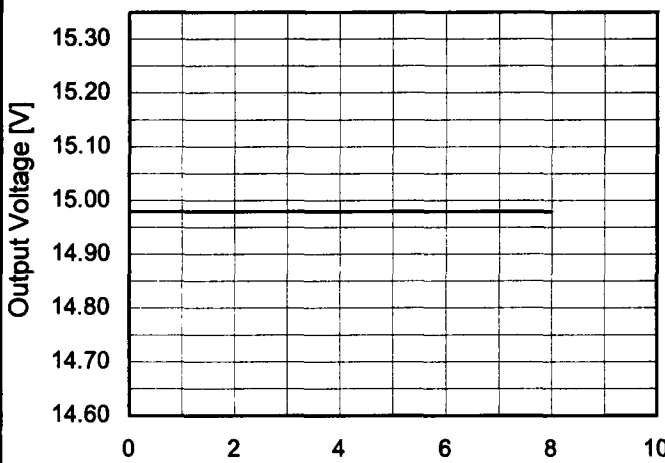
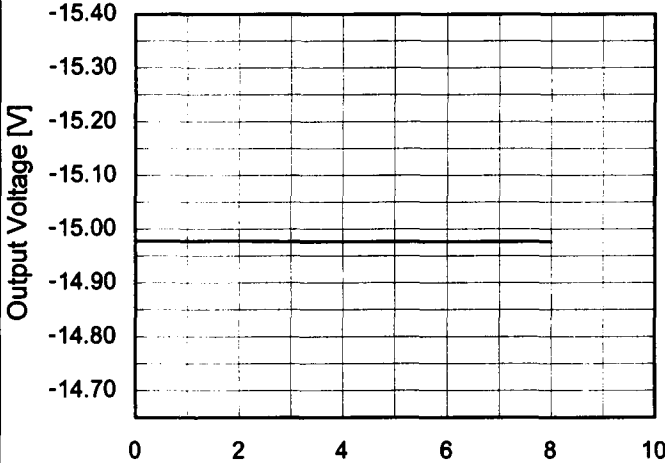
* Output Voltage Accuracy (Ration) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

Object		+15V0.1A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	9	0	15.234	±148	±1.0
Minimum Voltage	-40	9	0.1	14.939		

Object		-15V0.1A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	9	0	-15.245	±155	±1.0
Minimum Voltage	-40	9	0.1	-14.935		

COSEL

Model	SUCW31215																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+15V0.1A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 12V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>14.981</td></tr><tr><td>0.5</td><td>14.980</td></tr><tr><td>1.0</td><td>14.980</td></tr><tr><td>2.0</td><td>14.980</td></tr><tr><td>3.0</td><td>14.980</td></tr><tr><td>4.0</td><td>14.980</td></tr><tr><td>5.0</td><td>14.980</td></tr><tr><td>6.0</td><td>14.980</td></tr><tr><td>7.0</td><td>14.980</td></tr><tr><td>8.0</td><td>14.980</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	14.981	0.5	14.980	1.0	14.980	2.0	14.980	3.0	14.980	4.0	14.980	5.0	14.980	6.0	14.980	7.0	14.980	8.0	14.980
Time since start [H]	Output Voltage [V]																								
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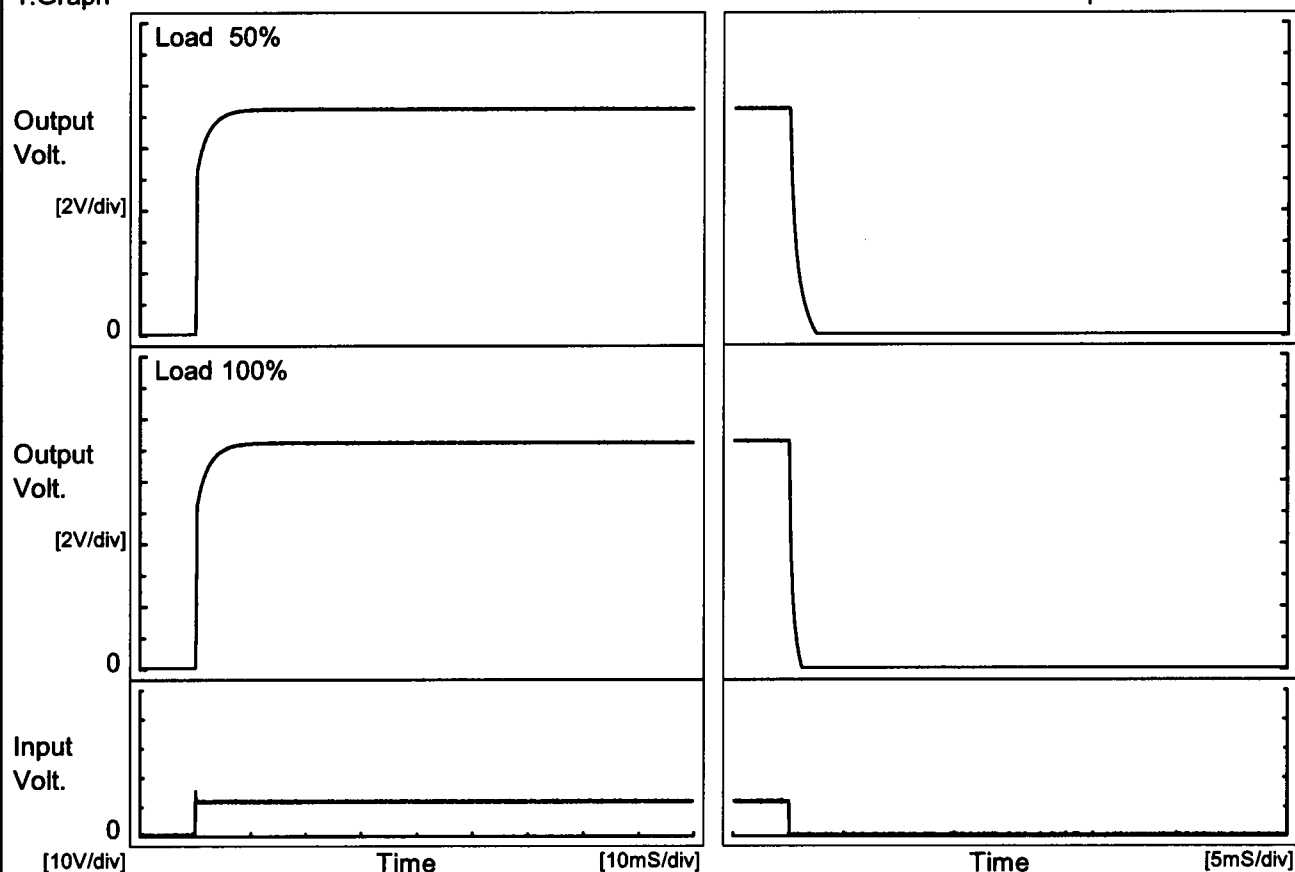
BC-3776

COSEL

Model	SUCW31215	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V0.1A		

1.Graph

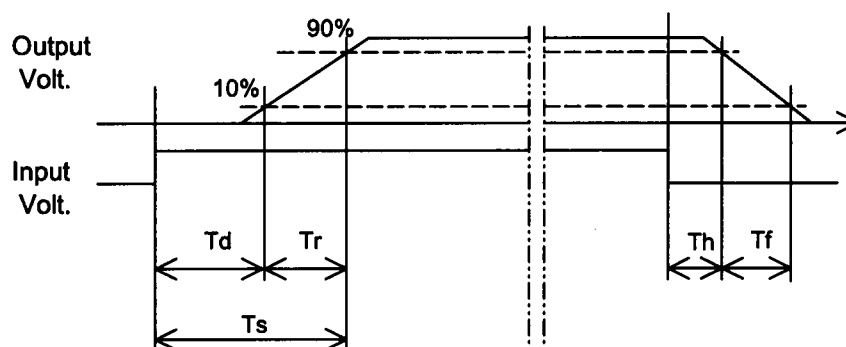
Input Volt. 12 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.4	3.5	0.1	1.5
100 %	0.1	3.5	3.6	0.1	0.7

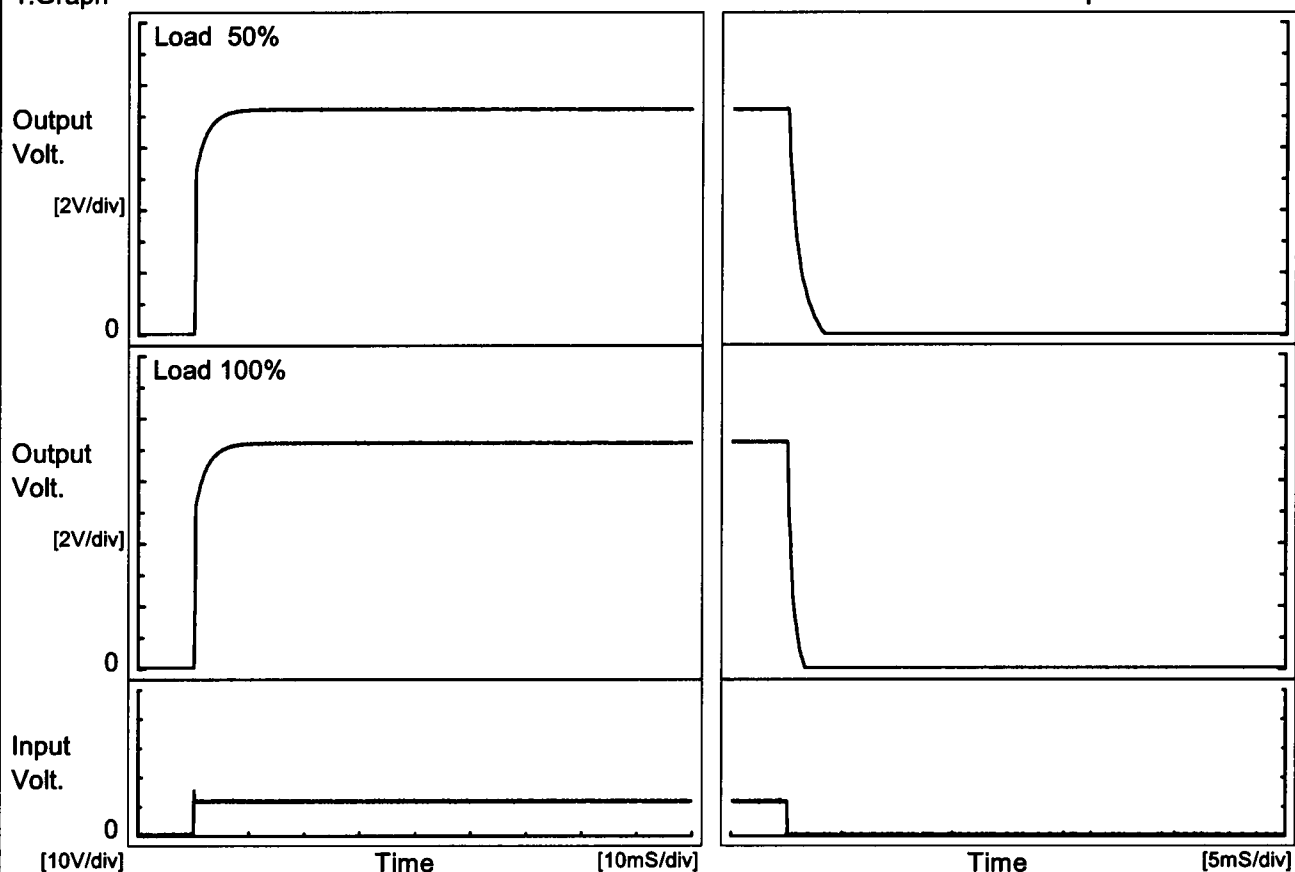


COSEL

Model	SUCW31215	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-15V0.1A		

1.Graph

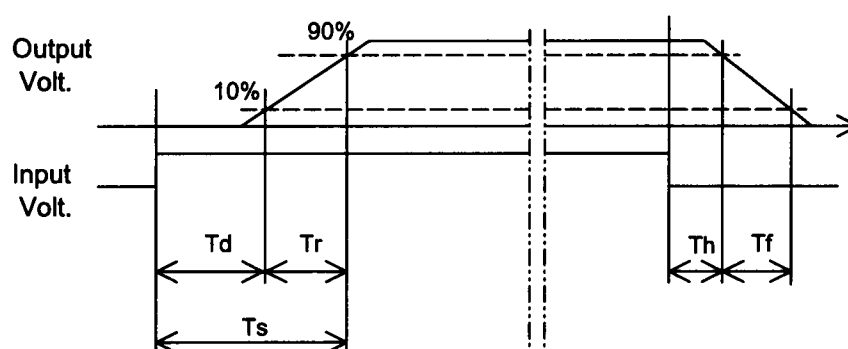
Input Volt. 12 V



2.Values

[mS]

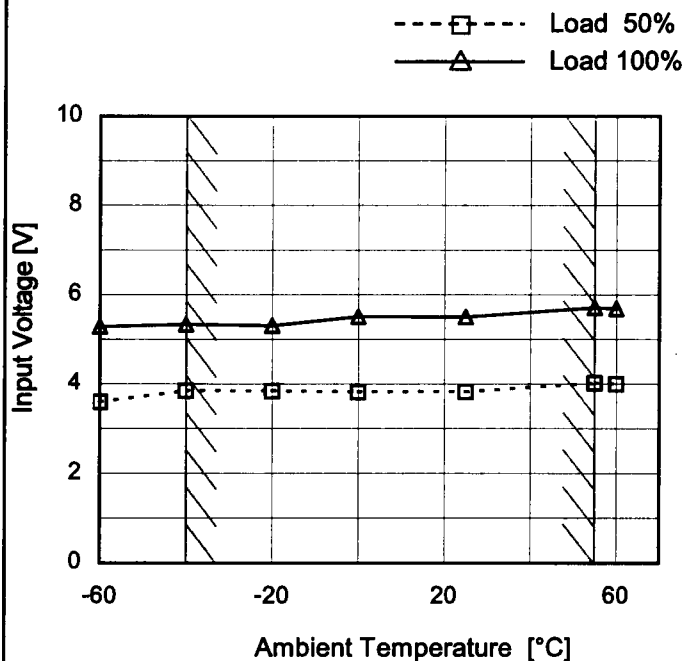
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.5	3.6	0.1	2.1
100 %	0.1	3.5	3.6	0.1	1.1



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Model	SUCW31215
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.1A

1.Graph



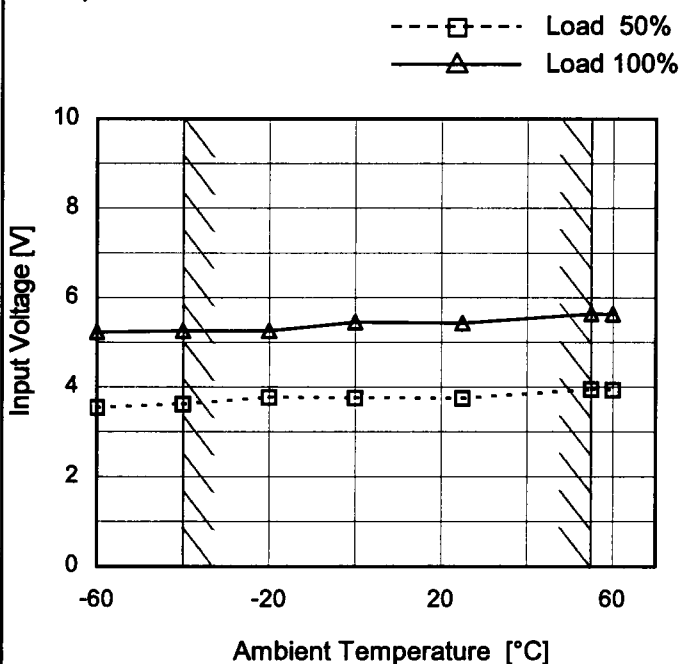
Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.6	5.3
-40	3.9	5.4
-20	3.9	5.4
0	3.9	5.6
25	3.9	5.5
55	4.1	5.8
60	4.0	5.7
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.1A
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1.Graph

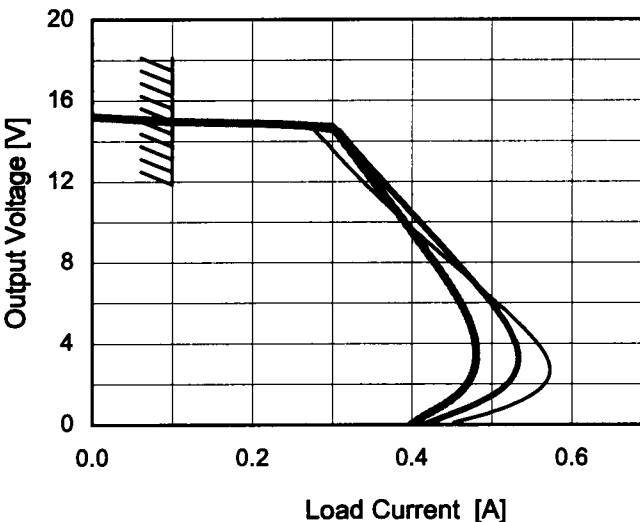
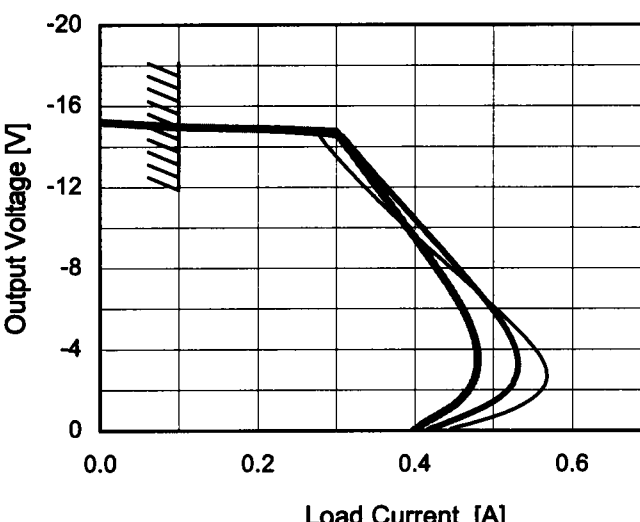


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.6	5.3
-40	3.7	5.3
-20	3.8	5.3
0	3.8	5.5
25	3.8	5.5
55	4.0	5.7
60	4.0	5.7
--	-	-
--	-	-
--	-	-
--	-	-

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

COSEL

Model		SUCW31215		Temperature 25°C																																																								
Item		Overcurrent Protection		Testing Circuitry Figure A																																																								
Object		+15V0.1A		2.Values																																																								
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Object		-15V0.1A		2.Values																																																								
1.Graph		<div><div><div></div><div></div><div></div></div><div>Input Volt. 9V Input Volt. 12V Input Volt. 18V</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. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>15.0</td><td>0.10</td><td>0.10</td><td>0.10</td></tr><tr><td>14.3</td><td>0.26</td><td>0.31</td><td>0.31</td></tr><tr><td>13.5</td><td>0.30</td><td>0.33</td><td>0.32</td></tr><tr><td>12.0</td><td>0.34</td><td>0.37</td><td>0.35</td></tr><tr><td>10.5</td><td>0.38</td><td>0.40</td><td>0.38</td></tr><tr><td>9.0</td><td>0.42</td><td>0.43</td><td>0.41</td></tr><tr><td>7.5</td><td>0.46</td><td>0.47</td><td>0.44</td></tr><tr><td>6.0</td><td>0.51</td><td>0.50</td><td>0.46</td></tr><tr><td>4.5</td><td>0.55</td><td>0.52</td><td>0.48</td></tr><tr><td>3.0</td><td>0.57</td><td>0.53</td><td>0.48</td></tr><tr><td>1.5</td><td>0.55</td><td>0.50</td><td>0.46</td></tr><tr><td>0.0</td><td>0.45</td><td>0.42</td><td>0.40</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	15.0	0.10	0.10	0.10	14.3	0.26	0.31	0.31	13.5	0.30	0.33	0.32	12.0	0.34	0.37	0.35	10.5	0.38	0.40	0.38	9.0	0.42	0.43	0.41	7.5	0.46	0.47	0.44	6.0	0.51	0.50	0.46	4.5	0.55	0.52	0.48	3.0	0.57	0.53	0.48	1.5	0.55	0.50	0.46	0.0	0.45	0.42	0.40
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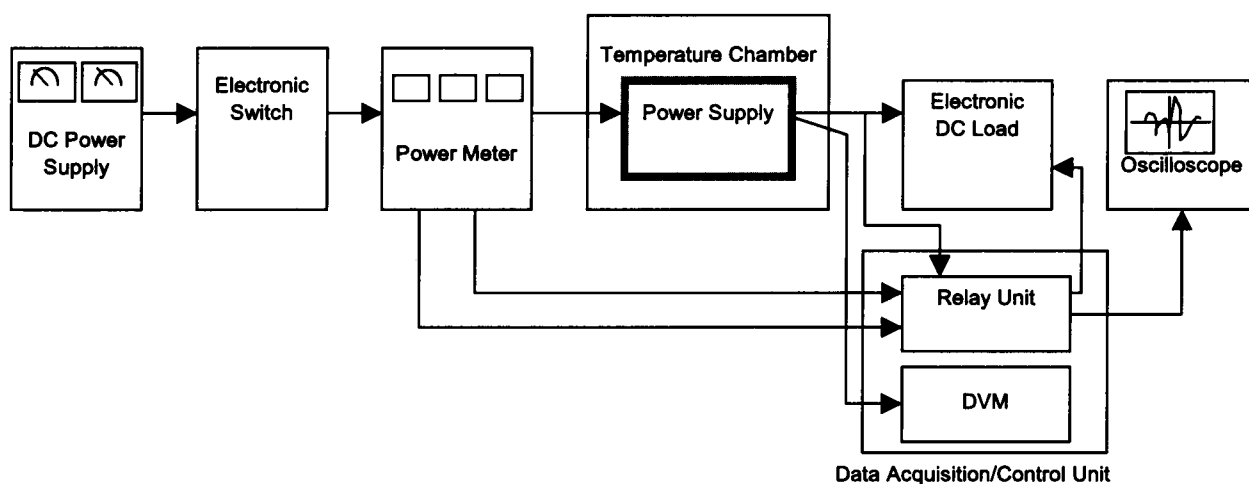


Figure A

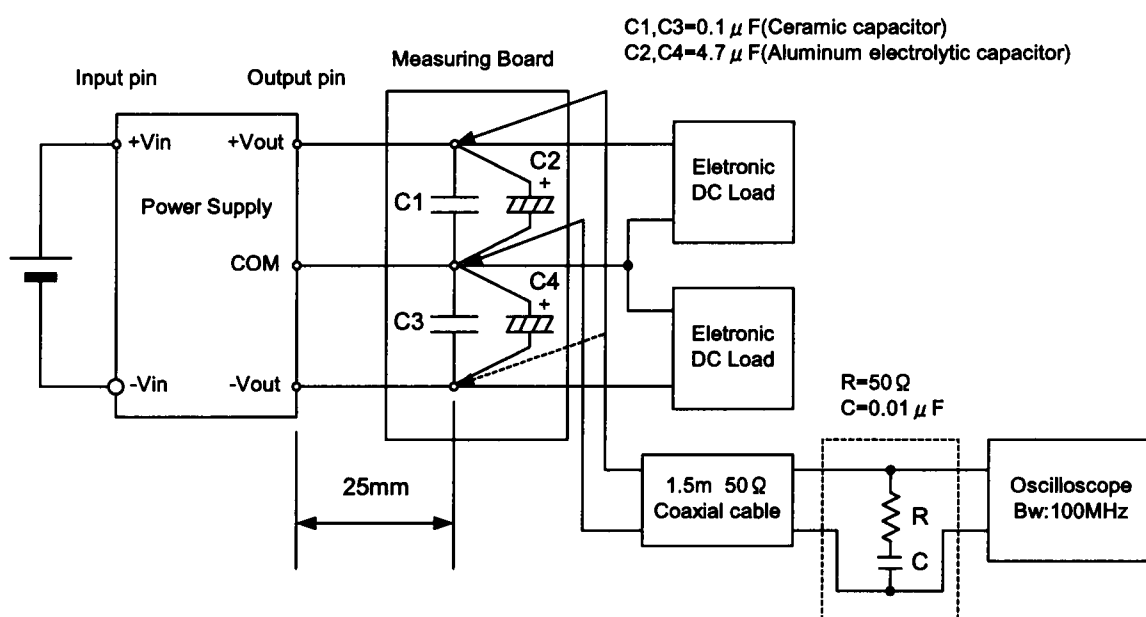


Figure B (Ripple and Ripple noise Characteristic)