

# TEST DATA OF SUTW60515

Regulated DC Power Supply  
March 16, 2009

Approved by : Kazunari Asano  
Kazunari Asano Design Manager

Prepared by : Sho Saito  
Sho Saito Design Engineer

**COSEL CO.,LTD.**

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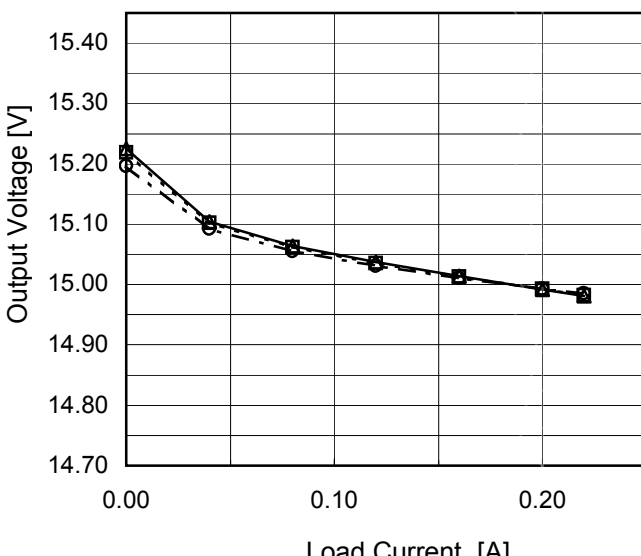
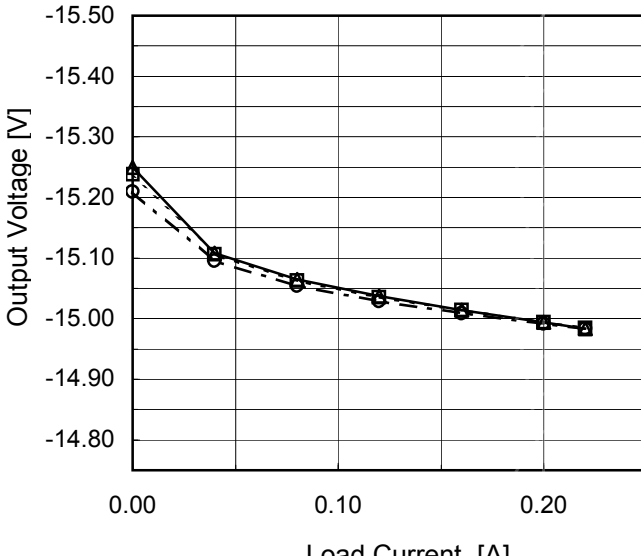
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# COSEL

Model	SUTW60515																																																					
Item	Load Regulation	Temperature	25°C																																																			
Object	+15V0.2A	Testing Circuitry	Figure A																																																			
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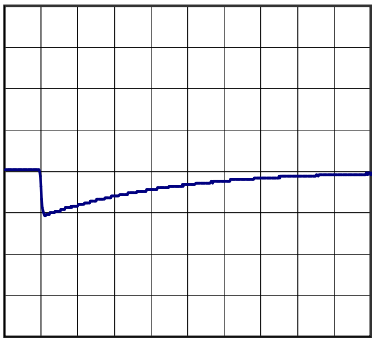
Model		SUTW60515	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		+15V0.2A	

Input Volt. 48 V  
Cycle 100 mS



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

500mV/div



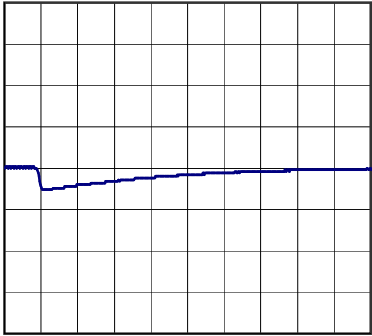
500µs/div



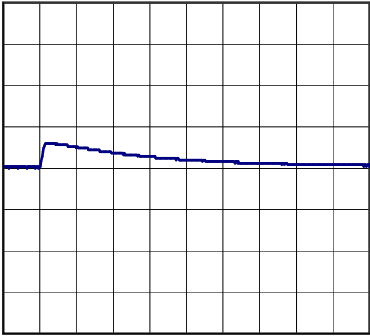
500µs/div

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

500mV/div



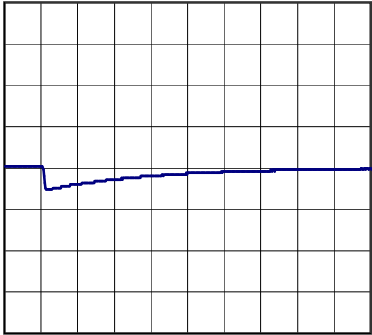
500µs/div



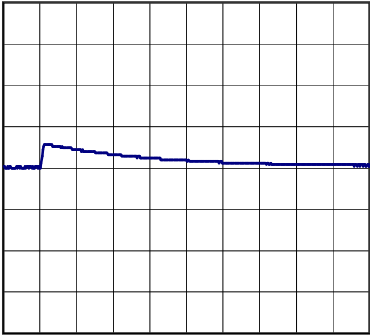
500µs/div

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

500mV/div



500µs/div

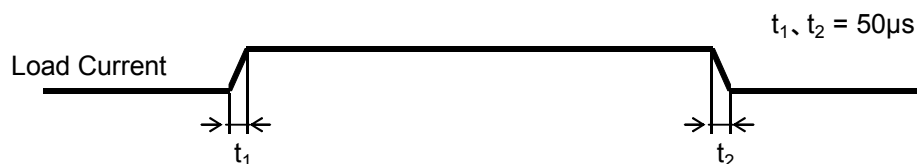


500µs/div

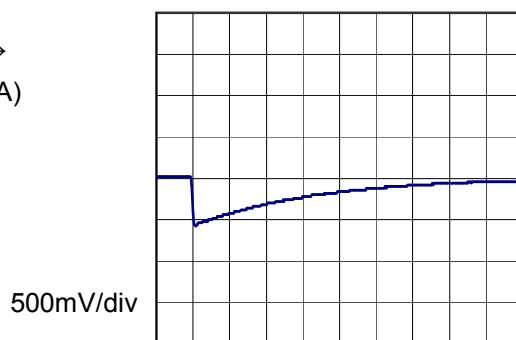


Model	SUTW60515	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	-15V0.2A	

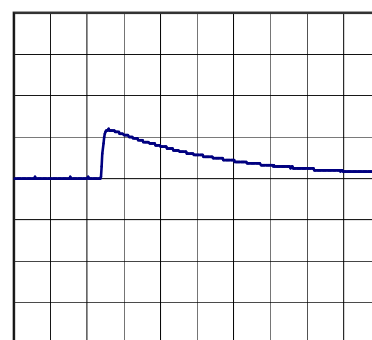
Input Volt. 48 V  
Cycle 100 mS



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

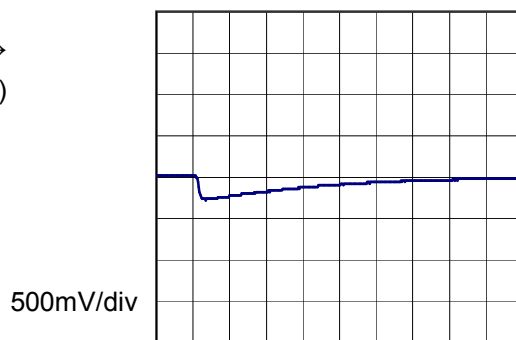


500µs/div



500µs/div

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

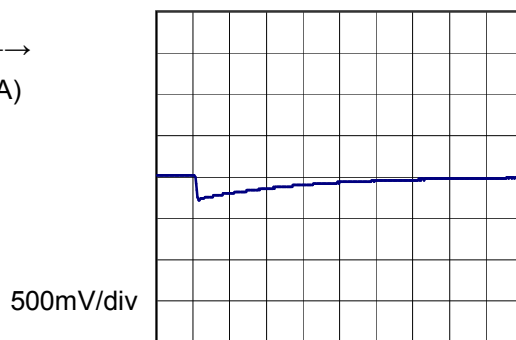


500µs/div



500µs/div

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



500µs/div



500µs/div

Model	SUTW60515																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure B																																						
Object	+15V0.2A																																								
1.Graph		2.Values																																							
<div><div><div><div></div><div>Input Volt.</div><div>9V</div></div><div><div></div><div>Input Volt.</div><div>18V</div></div></div><div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div></div>		<table><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><tr><td>0.00</td><td>4</td><td>3</td></tr><tr><td>0.04</td><td>4</td><td>3</td></tr><tr><td>0.08</td><td>5</td><td>3</td></tr><tr><td>0.12</td><td>5</td><td>4</td></tr><tr><td>0.16</td><td>8</td><td>6</td></tr><tr><td>0.20</td><td>10</td><td>7</td></tr><tr><td>0.22</td><td>13</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 Voltage [mV]		Input Volt. 9 [V]	Input Volt. 18 [V]	0.00	4	3	0.04	4	3	0.08	5	3	0.12	5	4	0.16	8	6	0.20	10	7	0.22	13	8	--	-	-	--	-	-	--	-	-	--	-	-
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Model	SUTW60515																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
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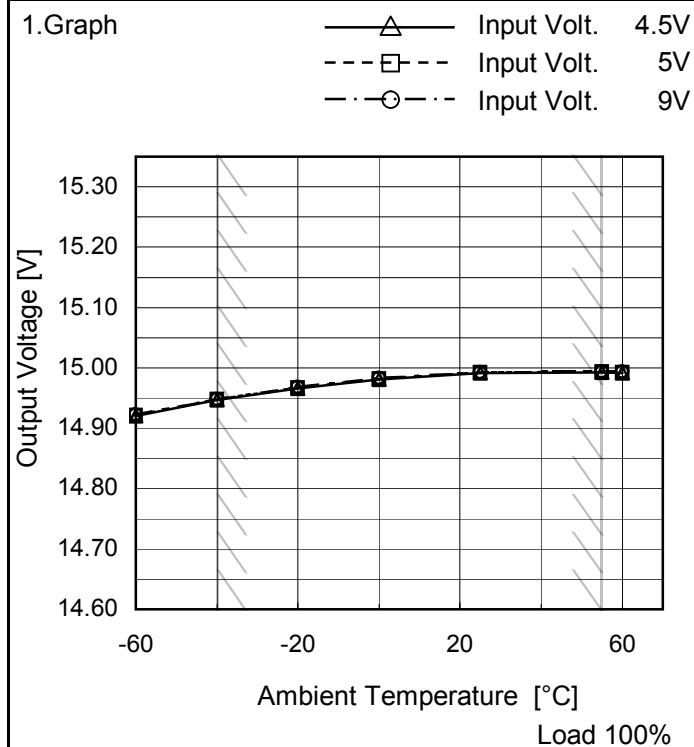
Model	SUTW60515		
Item	Ripple-Noise	Temperature	25°C
Object	+15V0.2A	Testing Circuitry	Figure B
1.Graph		2.Values	
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <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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Model	SUTW60515																																								
Item	Ripple-Noise	Temperature	25°C																																						
Object	-15V0.2A	Testing Circuitry	Figure B																																						
1.Graph		2.Values																																							
<div><div><div><div></div><div>Input Volt.</div><div>9V</div></div><div><div></div><div>Input Volt.</div><div>18V</div></div></div><div><p>Ripple-Noise [mV]</p><p>Load Current [A]</p></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 9 [V]</th><th>Input Volt. 18 [V]</th></tr><tr><td>0.00</td><td>4</td><td>4</td></tr><tr><td>0.04</td><td>4</td><td>4</td></tr><tr><td>0.08</td><td>4</td><td>4</td></tr><tr><td>0.12</td><td>6</td><td>5</td></tr><tr><td>0.16</td><td>7</td><td>5</td></tr><tr><td>0.20</td><td>10</td><td>6</td></tr><tr><td>0.22</td><td>12</td><td>7</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. 9 [V]	Input Volt. 18 [V]	0.00	4	4	0.04	4	4	0.08	4	4	0.12	6	5	0.16	7	5	0.20	10	6	0.22	12	7	--	-	-	--	-	-	--	-	-	--	-	-
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<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><div>Ripple Noise[mVp-p]</div></div><div></div></div>																																									
Fig.Complex Ripple Noise Wave Form																																									

Model	SUTW60515																																								
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry    Figure B																																							
Object	+15V0.2A																																								
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Model	SUTW60515
Item	Ambient Temperature Drift
Object	+15V0.2A

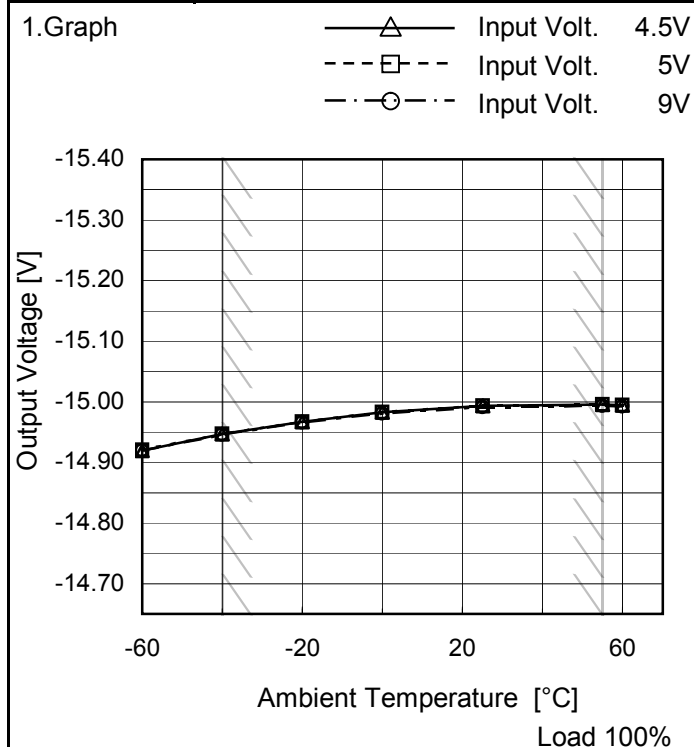


Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	14.920	14.921	14.922
-40	14.947	14.948	14.948
-20	14.966	14.967	14.968
0	14.981	14.982	14.983
25	14.991	14.992	14.993
55	14.993	14.993	14.994
60	14.992	14.993	14.993
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.2A
--------	----------



2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	-14.920	-14.920	-14.919
-40	-14.946	-14.947	-14.946
-20	-14.967	-14.967	-14.966
0	-14.982	-14.982	-14.981
25	-14.993	-14.993	-14.991
55	-14.995	-14.995	-14.993
60	-14.995	-14.995	-14.992
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model		SUTW60515	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 : 4.5 - 9V

Load Current (AVR 1) : 0 - 0.2A (AVR 2) : 0 - 0.2A

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

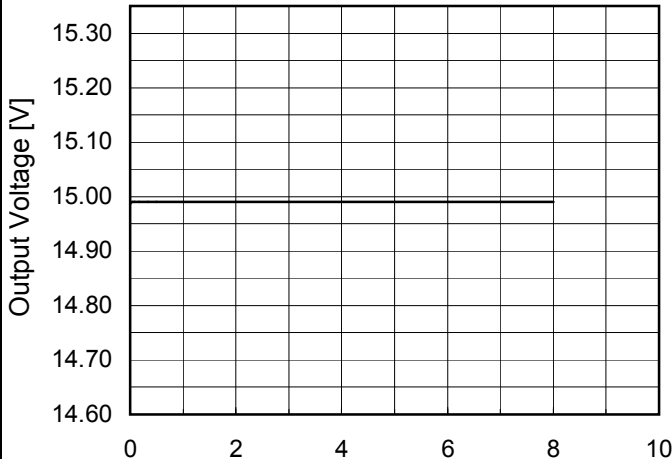
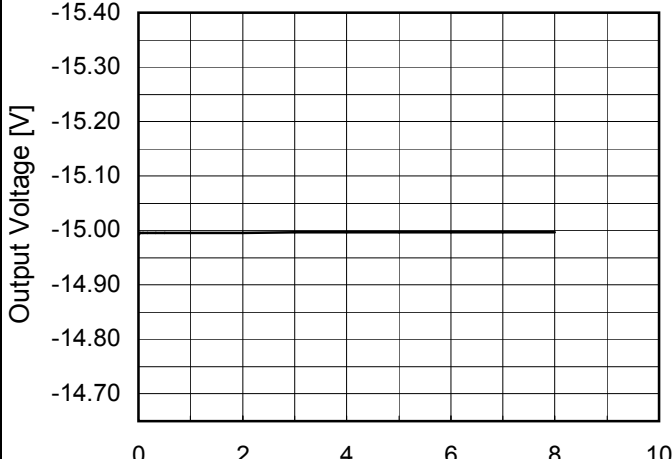
\* Output Voltage Accuracy (Ration) =  $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

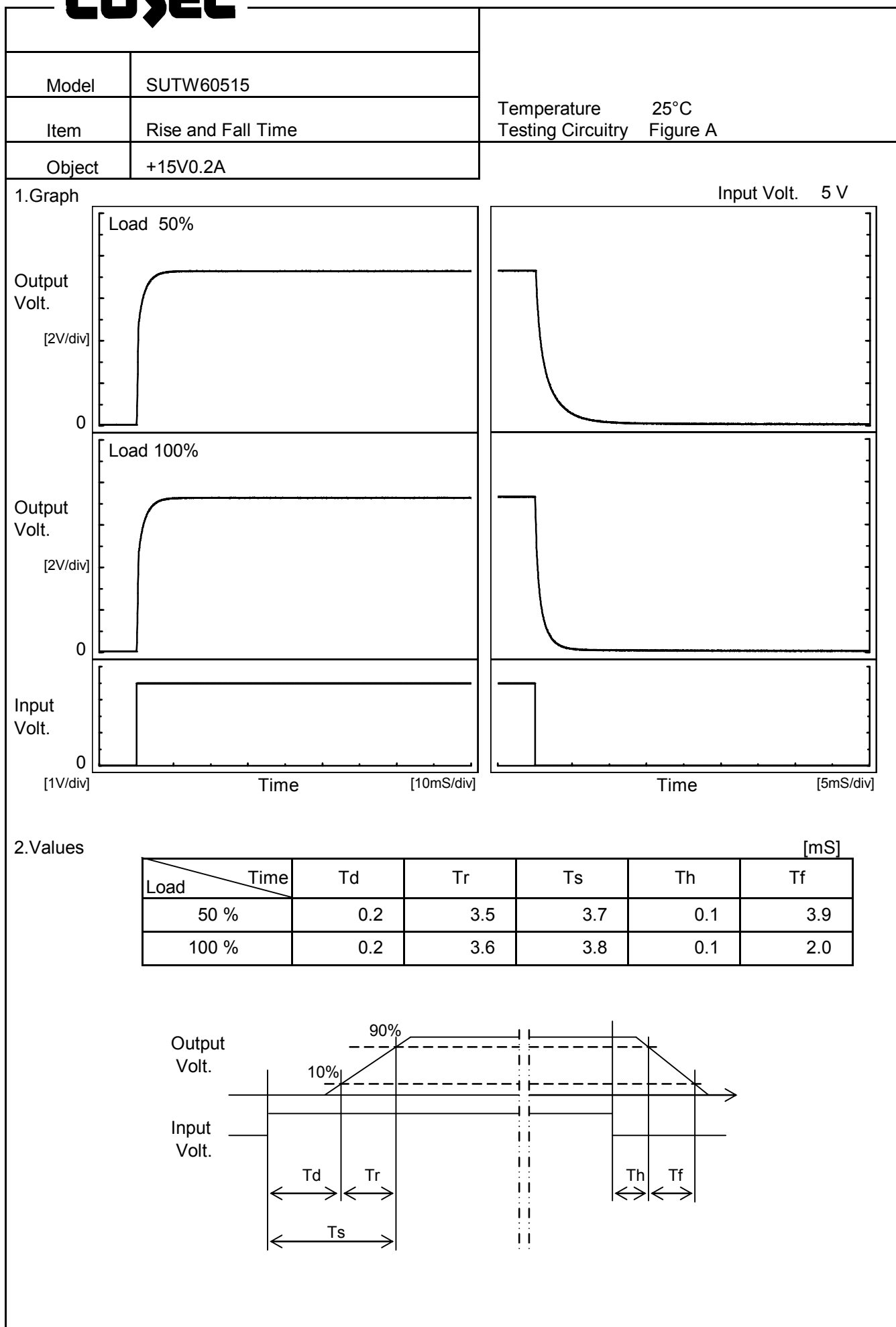
## 2. Values

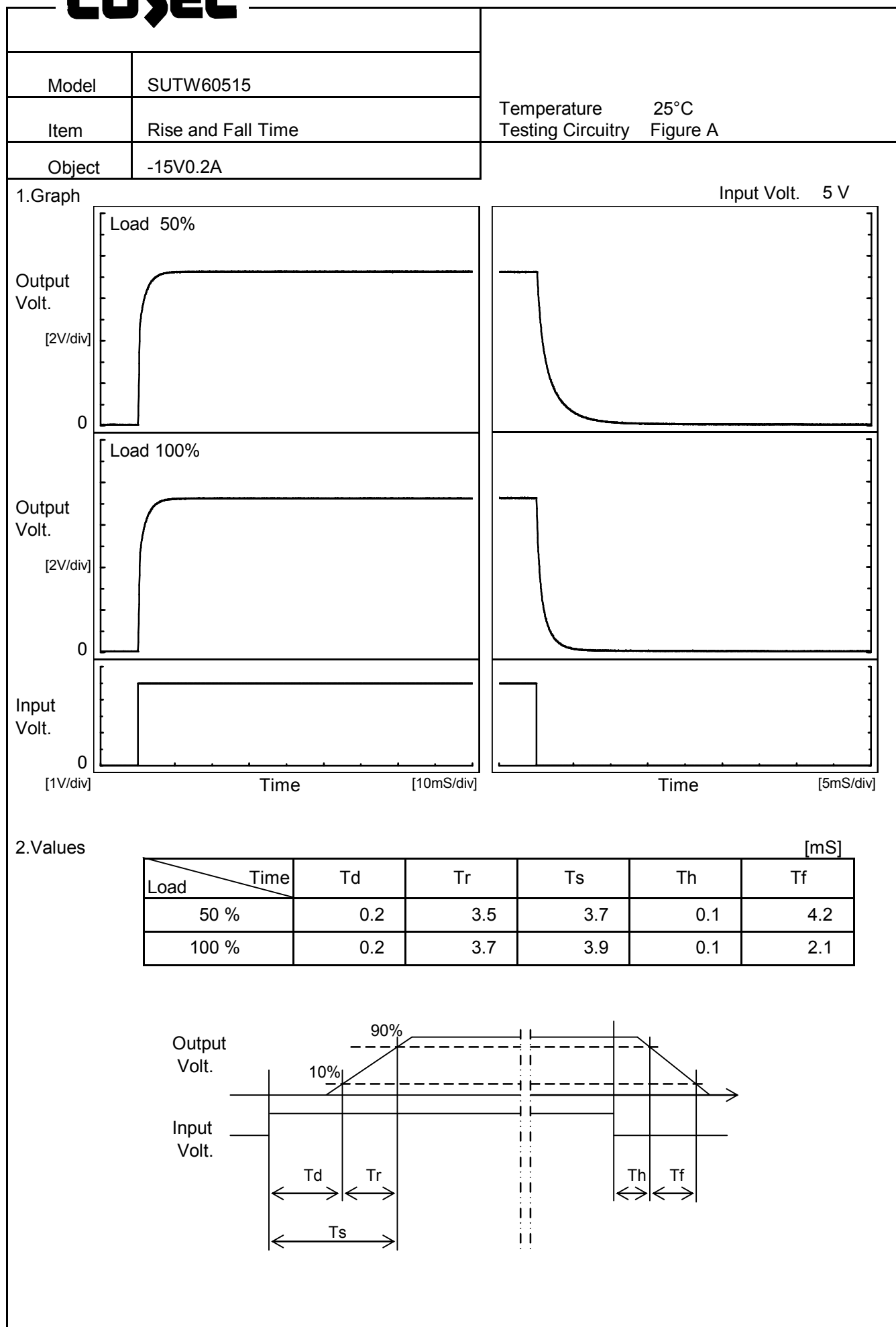
Object		+15V0.2A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	4.5	0	15.231	±254	±1.7
Minimum Voltage	-40	4.5	0.2	14.724		

Object		-15V0.2A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	4.5	0	-15.255	±253	±1.7
Minimum Voltage	-40	4.5	0.2	-14.750		



Model	SUTW60515																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+15V0.2A																								
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 5V</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>14.986</td></tr><tr><td>0.5</td><td>14.990</td></tr><tr><td>1.0</td><td>14.990</td></tr><tr><td>2.0</td><td>14.990</td></tr><tr><td>3.0</td><td>14.990</td></tr><tr><td>4.0</td><td>14.990</td></tr><tr><td>5.0</td><td>14.990</td></tr><tr><td>6.0</td><td>14.990</td></tr><tr><td>7.0</td><td>14.990</td></tr><tr><td>8.0</td><td>14.990</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	14.986	0.5	14.990	1.0	14.990	2.0	14.990	3.0	14.990	4.0	14.990	5.0	14.990	6.0	14.990	7.0	14.990	8.0	14.990
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Model	SUTW60515	Testing Circuitry    Figure A																									
Item	Minimum Input Voltage for Regulated Output Voltage																										
Object	+15V0.2A																										
1.Graph		2.Values																									
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <p>The graph plots Input Voltage [V] on the y-axis (0.0 to 5.0) against Ambient Temperature [°C] on the x-axis (-60 to 60). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). The Load 100% series starts at approximately 2.7V at -60°C, dips slightly to 2.6V at -20°C, and then rises to 3.0V at 60°C. The Load 50% series starts at 2.0V at -60°C, rises slightly to 2.2V at -20°C, and then remains relatively flat around 2.1V to 2.2V up to 60°C. Two vertical slanted lines are drawn at approximately -40°C and 55°C, indicating the range of the rated ambient temperature.</p> <table border="1"><thead><tr><th>Ambient Temperature [°C]</th><th>Load 50% [V]</th><th>Load 100% [V]</th></tr></thead><tbody><tr><td>-60</td><td>2.0</td><td>2.7</td></tr><tr><td>-40</td><td>2.1</td><td>2.7</td></tr><tr><td>-20</td><td>2.2</td><td>2.6</td></tr><tr><td>0</td><td>2.1</td><td>2.7</td></tr><tr><td>20</td><td>2.2</td><td>2.8</td></tr><tr><td>40</td><td>2.1</td><td>2.9</td></tr><tr><td>60</td><td>2.2</td><td>3.0</td></tr></tbody></table>		Ambient Temperature [°C]	Load 50% [V]	Load 100% [V]	-60	2.0	2.7	-40	2.1	2.7	-20	2.2	2.6	0	2.1	2.7	20	2.2	2.8	40	2.1	2.9	60	2.2	3.0		
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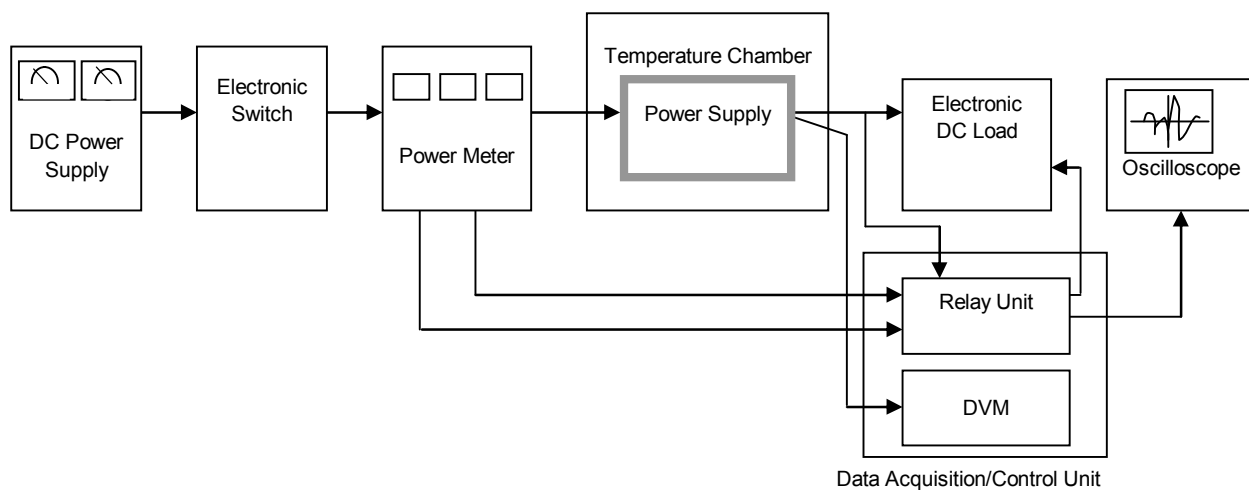


Figure A

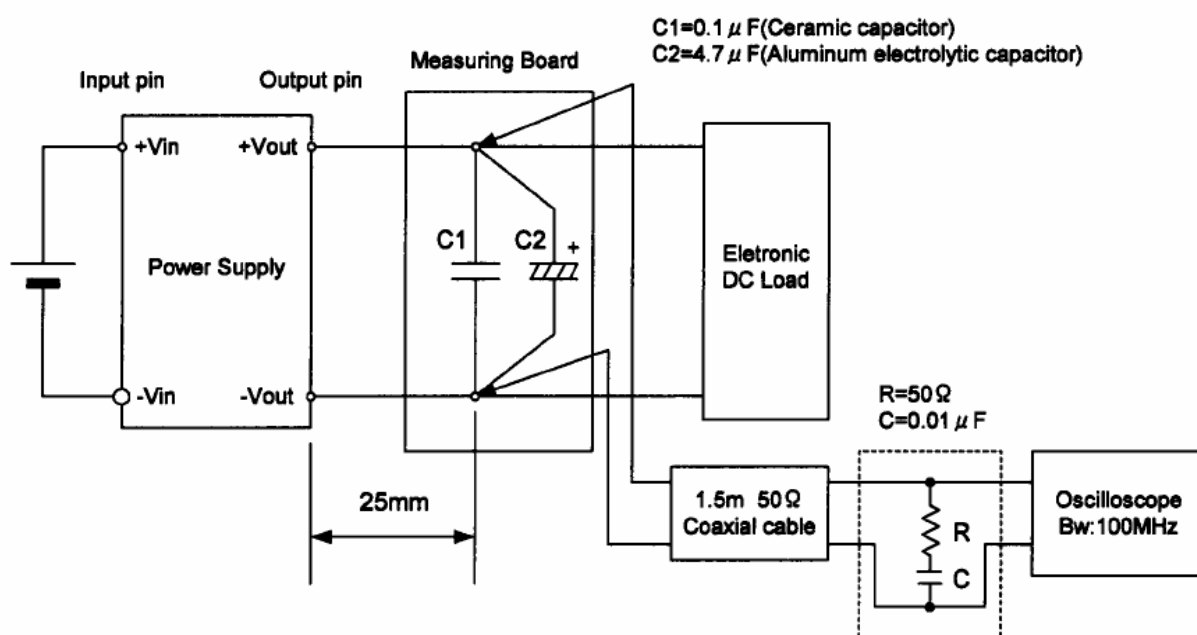


Figure B (Ripple and Ripple noise Characteristic)