

# TEST DATA OF SUTS60505

Regulated DC Power Supply  
March 5, 2009

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Prepared by : Sho Saito Design Engineer

**COSEL CO.,LTD.**

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Model	SUTS60505		
Item	Input Current (by Input Voltage)	Temperature	25°C
Object		Testing Circuitry	Figure A
1.Graph		2.Values	
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Note: Slanted line shows the range of the rated load current.																																																						

Model	SUTS60505																																
Item	Efficiency (by Input Voltage)	Temperature	25°C																														
		Testing Circuitry	Figure A																														
Object																																	
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<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Load 50% [%]</th><th>Load 100% [%]</th></tr></thead><tbody><tr><td>4.0</td><td>75.8</td><td>75.8</td></tr><tr><td>4.5</td><td>76.0</td><td>77.5</td></tr><tr><td>5.0</td><td>75.9</td><td>78.4</td></tr><tr><td>6.0</td><td>75.4</td><td>79.0</td></tr><tr><td>7.0</td><td>74.1</td><td>79.2</td></tr><tr><td>8.0</td><td>72.4</td><td>78.8</td></tr><tr><td>9.0</td><td>70.5</td><td>78.0</td></tr><tr><td>9.5</td><td>69.6</td><td>77.3</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Load 50% [%]	Load 100% [%]	4.0	75.8	75.8	4.5	76.0	77.5	5.0	75.9	78.4	6.0	75.4	79.0	7.0	74.1	79.2	8.0	72.4	78.8	9.0	70.5	78.0	9.5	69.6	77.3	--	-	-		
Input Voltage [V]	Load 50% [%]	Load 100% [%]																															
4.0	75.8	75.8																															
4.5	76.0	77.5																															
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<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> <p>Efficiency [%]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</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>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.2</td><td>65.5</td><td>64.6</td><td>53.9</td></tr><tr><td>0.4</td><td>74.3</td><td>74.0</td><td>67.2</td></tr><tr><td>0.6</td><td>76.9</td><td>77.1</td><td>73.0</td></tr><tr><td>0.8</td><td>77.6</td><td>78.2</td><td>76.0</td></tr><tr><td>1.0</td><td>77.5</td><td>78.4</td><td>78.0</td></tr><tr><td>1.1</td><td>77.3</td><td>78.2</td><td>78.4</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]	Efficiency [%]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	0.0	-	-	-	0.2	65.5	64.6	53.9	0.4	74.3	74.0	67.2	0.6	76.9	77.1	73.0	0.8	77.6	78.2	76.0	1.0	77.5	78.4	78.0	1.1	77.3	78.2	78.4	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																					
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Model	SUTS60505																																		
Item	Line Regulation	Temperature	25°C																																
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Input Voltage [V]	Output Voltage [V]																																		
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Load Current [A]	Output Voltage [V]																																																					
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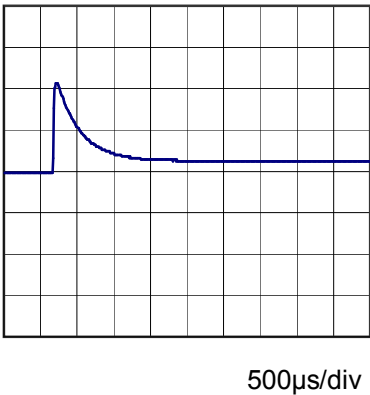
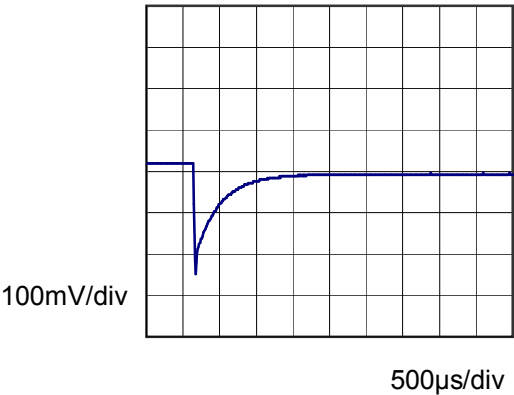


Model		SUTS60505	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		+5V1A	

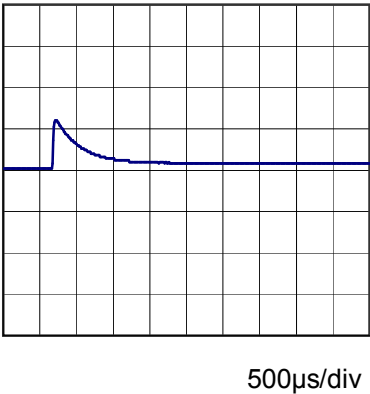
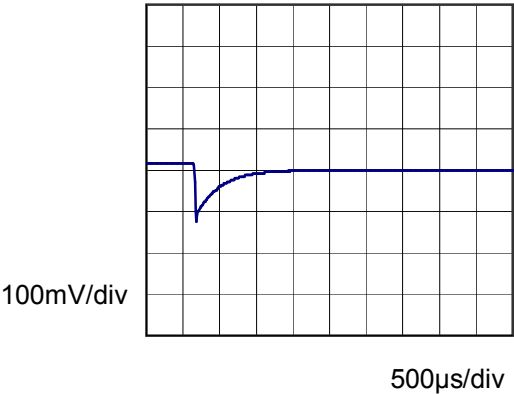
Input Volt. 5 V  
Cycle 100 mS



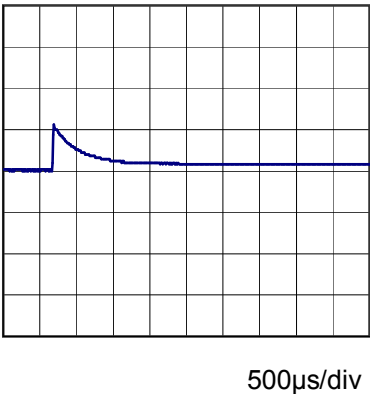
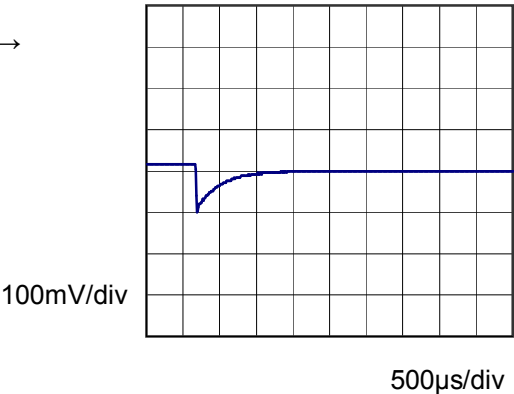
Min. Load (0A)  $\longleftrightarrow$   
Load 100% (1A)



Min. Load (0A)  $\longleftrightarrow$   
Load 50% (0.5A)



Load 50% (0.5A)  $\longleftrightarrow$   
Load 100% (1A)




Model	SUTS60505																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure B																																						
Object	+5V1A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 4.5V</div></div><div><div>-·-○-·-</div><div>Input Volt. 9V</div></div></div> <p>Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>		<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>0.0</td><td>2</td><td>2</td></tr><tr><td>0.2</td><td>4</td><td>3</td></tr><tr><td>0.4</td><td>5</td><td>4</td></tr><tr><td>0.6</td><td>5</td><td>5</td></tr><tr><td>0.8</td><td>7</td><td>5</td></tr><tr><td>1.0</td><td>11</td><td>6</td></tr><tr><td>1.1</td><td>13</td><td>6</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]	0.0	2	2	0.2	4	3	0.4	5	4	0.6	5	5	0.8	7	5	1.0	11	6	1.1	13	6	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 4.5 [V]	Input Volt. 9 [V]																																							
0.0	2	2																																							
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

Model	SUTS60505																																								
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Object	+5V1A																																								
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Load Current [A]	Ripple-Noise [mV]																																								
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<p>Fig.Complex Ripple Noise Wave Form</p>																																									

Model	SUTS60505																																								
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry    Figure B																																							
Object	+5V1A																																								
1.Graph		2.Values																																							
<div><div>---□---    Load 50%</div><div>—△—    Load 100%</div></div> <p>Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>-60</td><td>8</td><td>13</td></tr><tr><td>-40</td><td>8</td><td>13</td></tr><tr><td>-20</td><td>6</td><td>10</td></tr><tr><td>0</td><td>6</td><td>10</td></tr><tr><td>25</td><td>4</td><td>8</td></tr><tr><td>55</td><td>3</td><td>6</td></tr><tr><td>60</td><td>3</td><td>6</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>		Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	8	13	-40	8	13	-20	6	10	0	6	10	25	4	8	55	3	6	60	3	6	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
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Model	SUTS60505																																																						
Item	Ambient Temperature Drift	Testing Circuitry    Figure A																																																					
Object	+5V1A																																																						
1.Graph		2.Values																																																					
<div><div>—△—    Input Volt.    4.5V</div><div>---□---    Input Volt.    5V</div><div>-·-○-·-    Input Volt.    9V</div></div> <div><p>Output Voltage [V]</p><p>Ambient Temperature [°C]</p><p>Load 100%</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>5.035</td><td>5.039</td><td>5.041</td></tr><tr><td>-40</td><td>5.047</td><td>5.051</td><td>5.052</td></tr><tr><td>-20</td><td>5.057</td><td>5.060</td><td>5.062</td></tr><tr><td>0</td><td>5.066</td><td>5.068</td><td>5.069</td></tr><tr><td>25</td><td>5.073</td><td>5.075</td><td>5.076</td></tr><tr><td>55</td><td>5.078</td><td>5.079</td><td>5.080</td></tr><tr><td>60</td><td>5.078</td><td>5.080</td><td>5.080</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	5.035	5.039	5.041	-40	5.047	5.051	5.052	-20	5.057	5.060	5.062	0	5.066	5.068	5.069	25	5.073	5.075	5.076	55	5.078	5.079	5.080	60	5.078	5.080	5.080	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated ambient temperature.																																																							



		
Model	SUTS60505	
Item	Output Voltage Accuracy	
Object	+5V1A	

### 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 - 1A

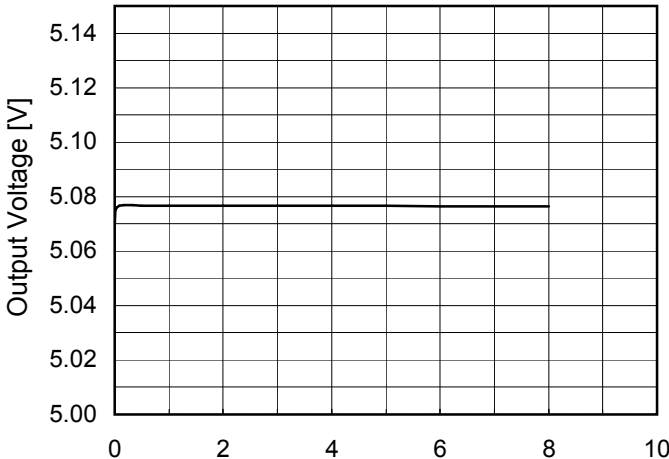
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

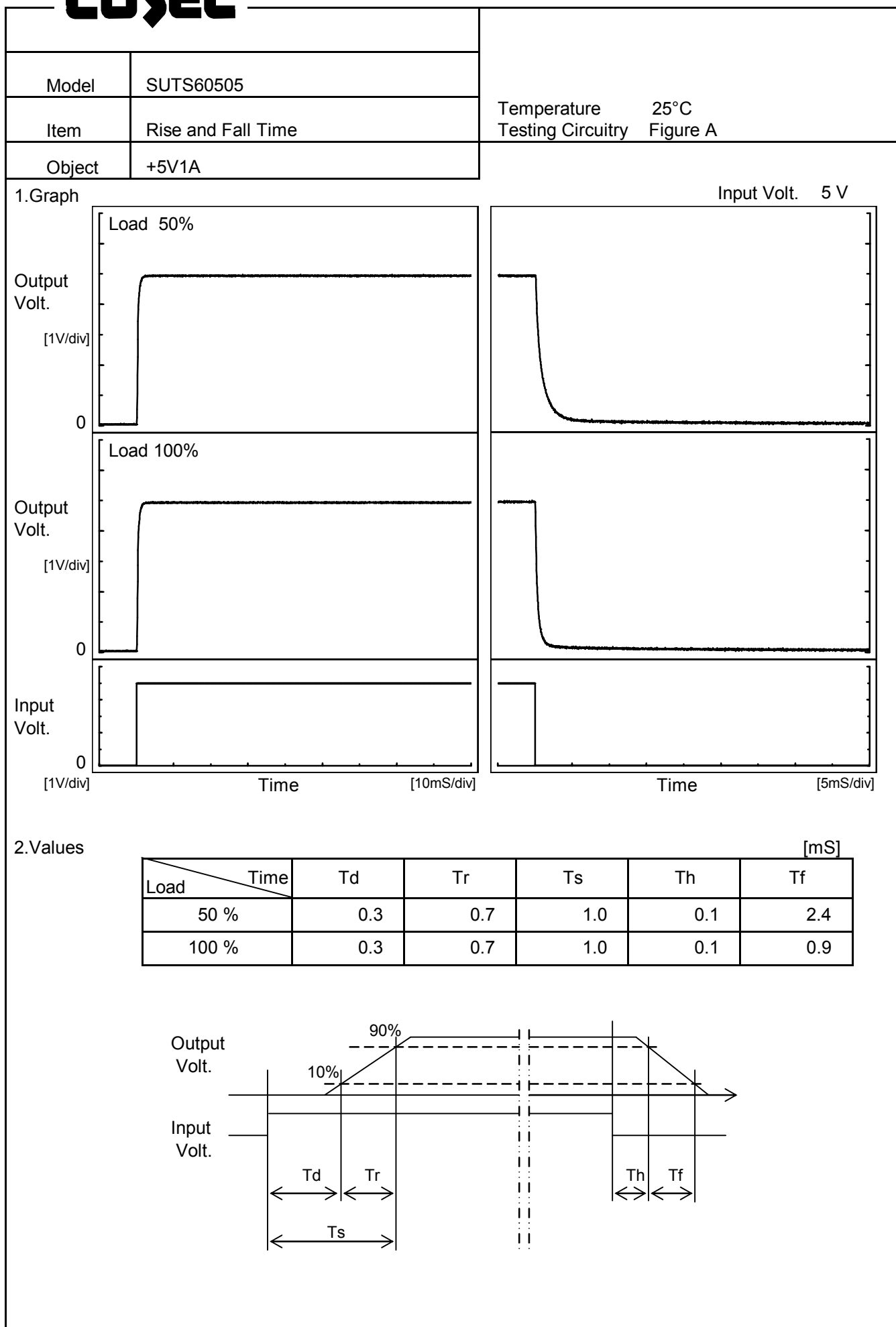
### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	55	4.5	0	5.089	±21	±0.4
Minimum Voltage	-40	4.5	1	5.047		



Model	SUTS60505																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+5V1A																								
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>5.070</td></tr><tr><td>0.5</td><td>5.077</td></tr><tr><td>1.0</td><td>5.077</td></tr><tr><td>2.0</td><td>5.077</td></tr><tr><td>3.0</td><td>5.077</td></tr><tr><td>4.0</td><td>5.077</td></tr><tr><td>5.0</td><td>5.077</td></tr><tr><td>6.0</td><td>5.077</td></tr><tr><td>7.0</td><td>5.077</td></tr><tr><td>8.0</td><td>5.076</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.070	0.5	5.077	1.0	5.077	2.0	5.077	3.0	5.077	4.0	5.077	5.0	5.077	6.0	5.077	7.0	5.077	8.0	5.076
Time since start [H]	Output Voltage [V]																								
0.0	5.070																								
0.5	5.077																								
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6.0	5.077																								
7.0	5.077																								
8.0	5.076																								





		Testing Circuitry    Figure A																																						
Model	SUTS60505																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+5V1A																																							
1.Graph		2.Values																																						
<div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><p>Input Voltage [V]</p><p>Ambient Temperature [°C]</p></div>																																								
Note: Slanted line shows the range of the rated ambient temperature.																																								
		<table><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><tr><td>-60</td><td>2.5</td><td>3.0</td></tr><tr><td>-40</td><td>2.4</td><td>3.0</td></tr><tr><td>-20</td><td>2.4</td><td>3.1</td></tr><tr><td>0</td><td>2.5</td><td>3.1</td></tr><tr><td>25</td><td>2.7</td><td>3.3</td></tr><tr><td>55</td><td>2.7</td><td>3.5</td></tr><tr><td>60</td><td>2.8</td><td>3.5</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>	Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-60	2.5	3.0	-40	2.4	3.0	-20	2.4	3.1	0	2.5	3.1	25	2.7	3.3	55	2.7	3.5	60	2.8	3.5	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	Input Voltage [V]																																							
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Model	SUTS60505																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+5V1A	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>5.00</td><td>1.00</td><td>1.00</td><td>1.00</td></tr><tr><td>4.75</td><td>1.24</td><td>1.30</td><td>1.27</td></tr><tr><td>4.50</td><td>1.26</td><td>1.32</td><td>1.28</td></tr><tr><td>4.00</td><td>1.31</td><td>1.36</td><td>1.30</td></tr><tr><td>3.50</td><td>1.36</td><td>1.41</td><td>1.31</td></tr><tr><td>3.00</td><td>1.43</td><td>1.47</td><td>1.35</td></tr><tr><td>2.50</td><td>1.48</td><td>1.52</td><td>1.38</td></tr><tr><td>2.00</td><td>1.52</td><td>1.56</td><td>1.40</td></tr><tr><td>1.50</td><td>1.55</td><td>1.57</td><td>1.41</td></tr><tr><td>1.00</td><td>1.52</td><td>1.53</td><td>1.38</td></tr><tr><td>0.50</td><td>1.42</td><td>1.41</td><td>1.31</td></tr><tr><td>0.00</td><td>1.14</td><td>1.16</td><td>1.11</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	5.00	1.00	1.00	1.00	4.75	1.24	1.30	1.27	4.50	1.26	1.32	1.28	4.00	1.31	1.36	1.30	3.50	1.36	1.41	1.31	3.00	1.43	1.47	1.35	2.50	1.48	1.52	1.38	2.00	1.52	1.56	1.40	1.50	1.55	1.57	1.41	1.00	1.52	1.53	1.38	0.50	1.42	1.41	1.31	0.00	1.14	1.16	1.11
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Figure A

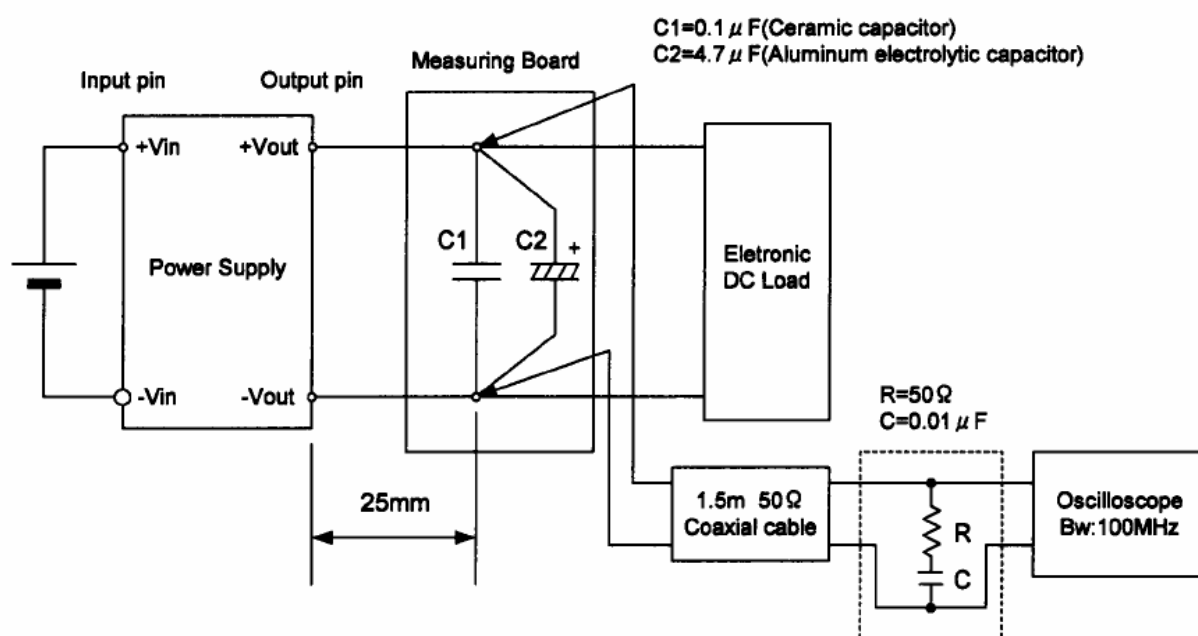


Figure B (Ripple and Ripple noise Characteristic)