

# TEST DATA OF SUTS62415

Regulated DC Power Supply  
March 13, 2009

Approved by : Kazunari Asano  
Kazunari Asano Design Manager

Prepared by : Sho Saito  
Sho Saito Design Engineer

**COSEL CO.,LTD.**

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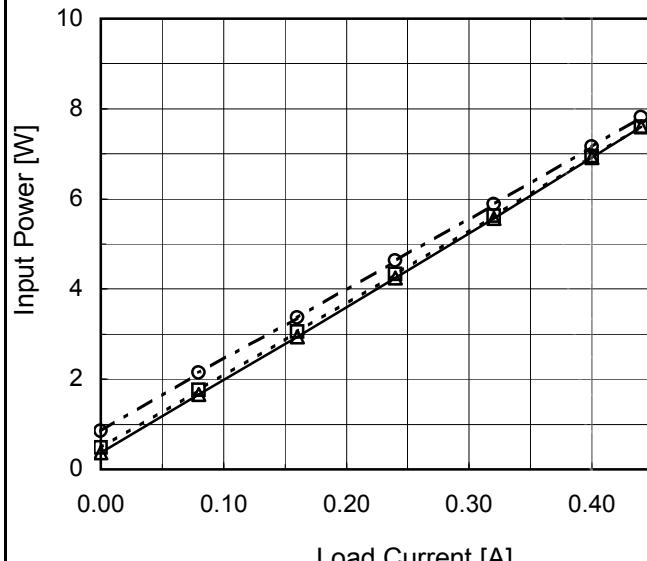
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1.Graph	<p style="text-align: center;"> <span style="color: black;">△</span> Load 100%  <span style="color: black;">□</span> Load 50%  <span style="color: black;">○</span> Load 0%     </p> <p>The graph plots Input Current [A] on the y-axis (0.00 to 0.50) against Input Voltage [V] on the x-axis (0 to 50). Three data series are shown: Load 100% (triangles), Load 50% (squares), and Load 0% (circles). A slanted line is drawn through the origin, representing the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Load 0% [A]</th> <th>Load 50% [A]</th> <th>Load 100% [A]</th> </tr> </thead> <tbody> <tr><td>14.0</td><td>0.001</td><td>-</td><td>0.45</td></tr> <tr><td>15.2</td><td>-</td><td>0.022</td><td>0.38</td></tr> <tr><td>16.0</td><td>-</td><td>0.022</td><td>0.32</td></tr> <tr><td>17.0</td><td>-</td><td>0.022</td><td>0.25</td></tr> <tr><td>18.0</td><td>-</td><td>0.021</td><td>0.20</td></tr> <tr><td>20.0</td><td>-</td><td>0.020</td><td>0.15</td></tr> <tr><td>24.0</td><td>-</td><td>0.020</td><td>0.10</td></tr> <tr><td>28.0</td><td>-</td><td>0.022</td><td>0.08</td></tr> <tr><td>32.0</td><td>-</td><td>0.023</td><td>0.06</td></tr> <tr><td>36.0</td><td>-</td><td>0.024</td><td>0.05</td></tr> <tr><td>37.6</td><td>-</td><td>0.024</td><td>0.045</td></tr> <tr><td>40.0</td><td>-</td><td>0.024</td><td>0.04</td></tr> </tbody> </table>	Input Voltage [V]	Load 0% [A]	Load 50% [A]	Load 100% [A]	14.0	0.001	-	0.45	15.2	-	0.022	0.38	16.0	-	0.022	0.32	17.0	-	0.022	0.25	18.0	-	0.021	0.20	20.0	-	0.020	0.15	24.0	-	0.020	0.10	28.0	-	0.022	0.08	32.0	-	0.023	0.06	36.0	-	0.024	0.05	37.6	-	0.024	0.045	40.0	-	0.024	0.04																														
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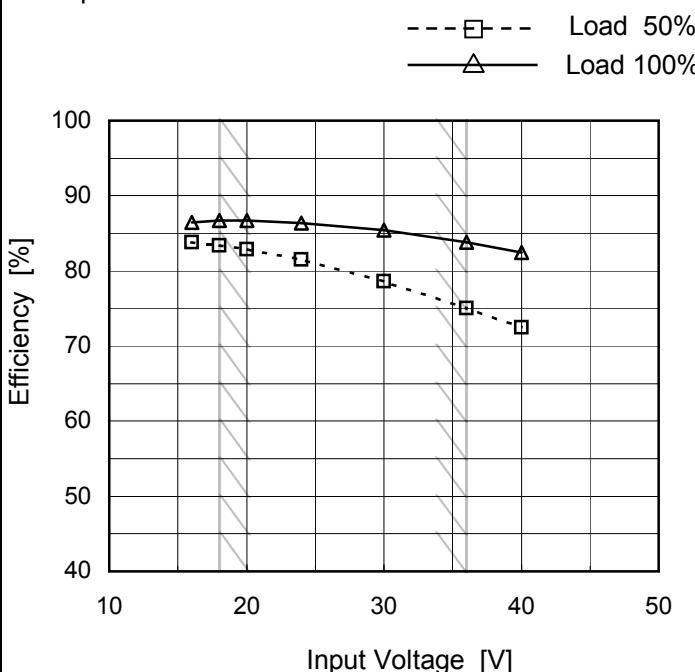
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Model	SUTS62415	Temperature	25°C
Item	Efficiency (by Input Voltage)	Testing Circuitry	Figure A
Object	—		

## 1. Graph



## 2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	83.8	86.5
18	83.4	86.7
20	82.9	86.7
24	81.5	86.4
30	78.6	85.4
36	75.0	83.8
40	72.5	82.4
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Note: Slanted line shows the range of the rated input voltage.

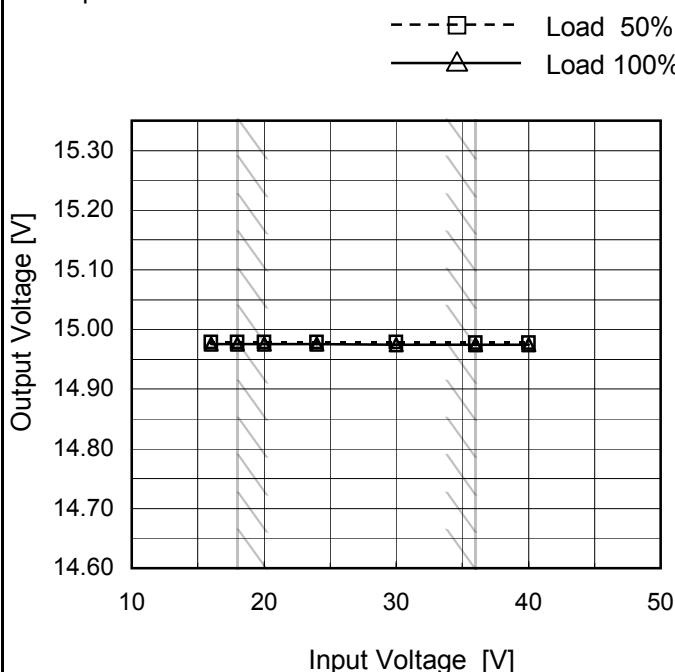
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Note: Slanted line shows the range of the rated load current.

Model	SUTS62415
Item	Line Regulation
Object	+15V0.4A

Temperature 25°C  
Testing Circuitry Figure A

## 1.Graph



## 2.Values

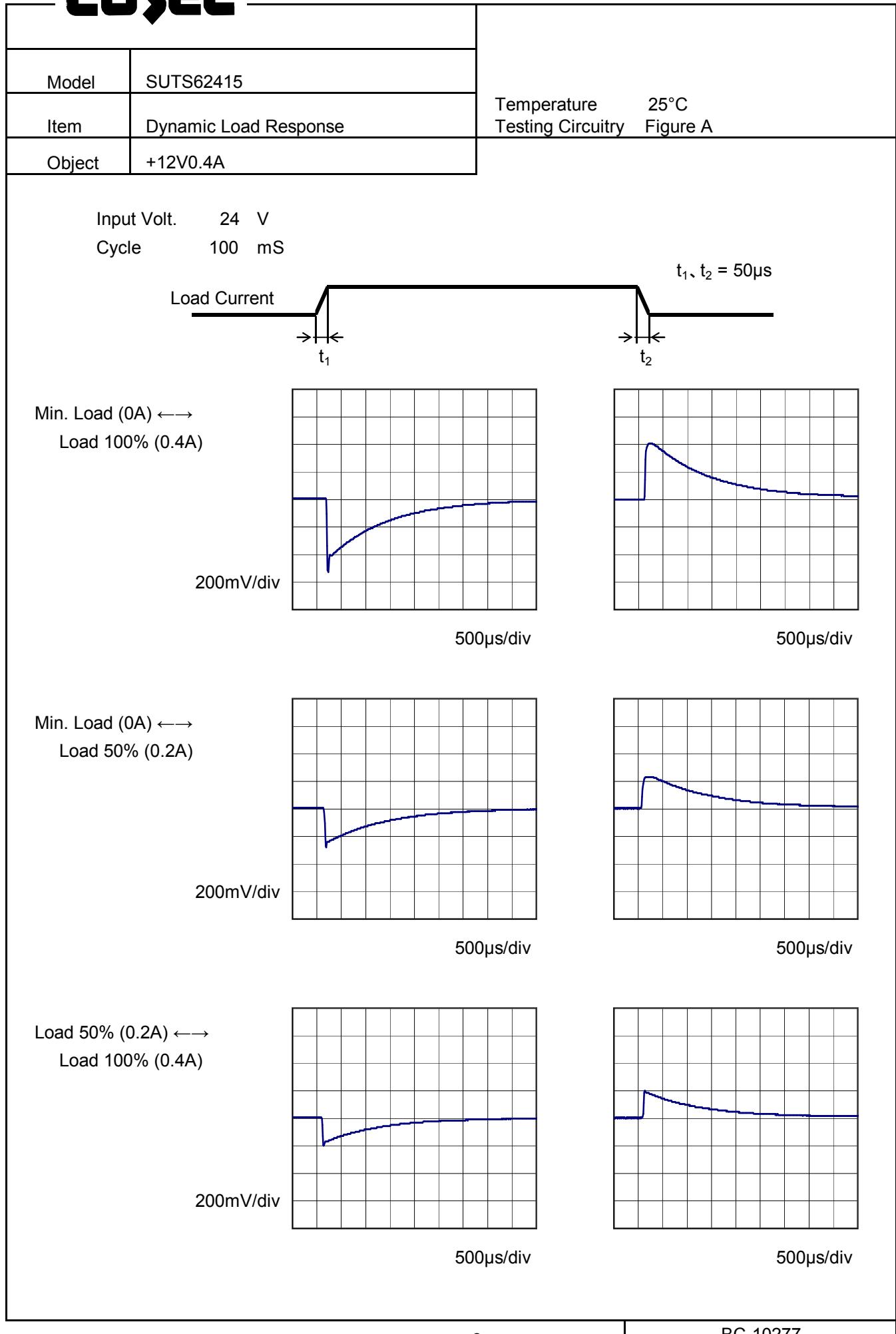
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	14.979	14.976
18	14.979	14.976
20	14.979	14.976
24	14.978	14.976
30	14.978	14.975
36	14.978	14.975
40	14.978	14.974
--	-	-
--	-	-

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

Model	SUTS62415	Temperature Testing Circuitry      25°C Figure A																																																								
Item	Load Regulation																																																									
Object	+15V0.4A																																																									
1.Graph	<p style="text-align: center;"> <span style="color: black;">—△—</span> Input Volt. 18V  <span style="color: gray;">---□---</span> Input Volt. 24V  <span style="color: gray;">---○---</span> Input Volt. 36V         </p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (18V)</th> <th>Output Voltage [V] (24V)</th> <th>Output Voltage [V] (36V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>14.982</td><td>14.982</td><td>14.983</td></tr> <tr><td>0.08</td><td>14.981</td><td>14.981</td><td>14.980</td></tr> <tr><td>0.16</td><td>14.980</td><td>14.979</td><td>14.979</td></tr> <tr><td>0.24</td><td>14.979</td><td>14.978</td><td>14.977</td></tr> <tr><td>0.32</td><td>14.977</td><td>14.977</td><td>14.976</td></tr> <tr><td>0.40</td><td>14.975</td><td>14.976</td><td>14.975</td></tr> <tr><td>0.44</td><td>14.975</td><td>14.975</td><td>14.974</td></tr> </tbody> </table>	Load Current [A]	Output Voltage [V] (18V)	Output Voltage [V] (24V)	Output Voltage [V] (36V)	0.00	14.982	14.982	14.983	0.08	14.981	14.981	14.980	0.16	14.980	14.979	14.979	0.24	14.979	14.978	14.977	0.32	14.977	14.977	14.976	0.40	14.975	14.976	14.975	0.44	14.975	14.975	14.974																									
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Note: Slanted line shows the range of the rated load current.

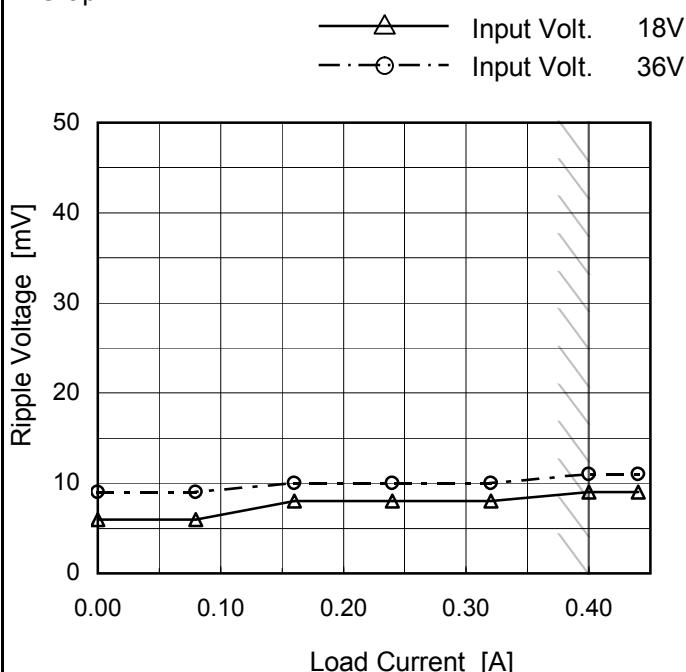
**COSEL**



Model	SUTS62415
Item	Ripple Voltage (by Load Current)
Object	+15V0.4A

Temperature 25°C  
Testing Circuitry Figure B

## 1.Graph



## 2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.00	6	9
0.08	6	9
0.16	8	10
0.24	8	10
0.32	8	10
0.40	9	11
0.44	9	11
--	-	-
--	-	-
--	-	-
--	-	-

Ripple Voltage is shown as p-p in the figure below.

Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

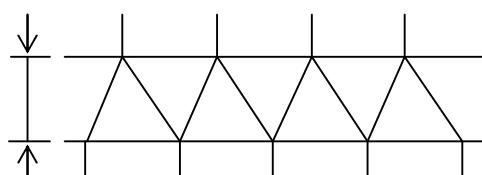
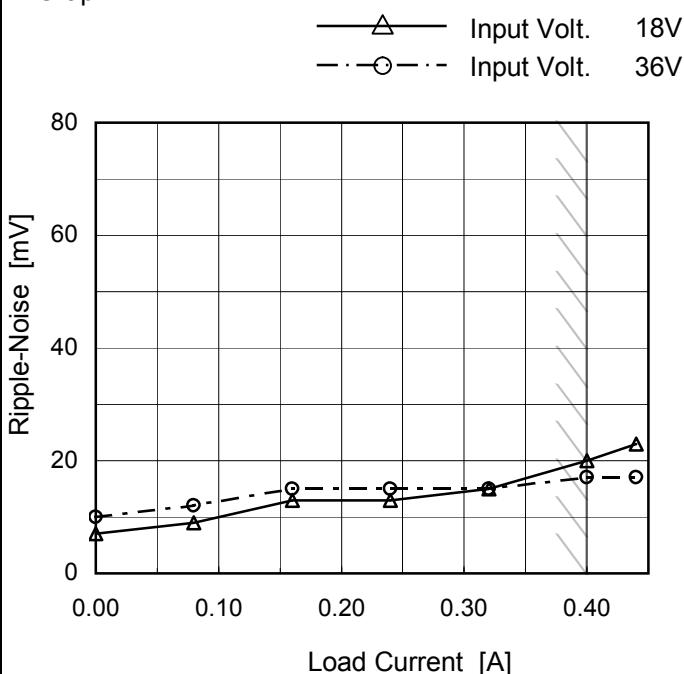


Fig.Complex Ripple Wave Form

Model	SUTS62415
Item	Ripple-Noise
Object	+15V0.4A

Temperature 25°C  
Testing Circuitry Figure B

## 1. Graph



## 2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.00	7	10
0.08	9	12
0.16	13	15
0.24	13	15
0.32	15	15
0.40	20	17
0.44	23	17
--	-	-
--	-	-
--	-	-
--	-	-

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.

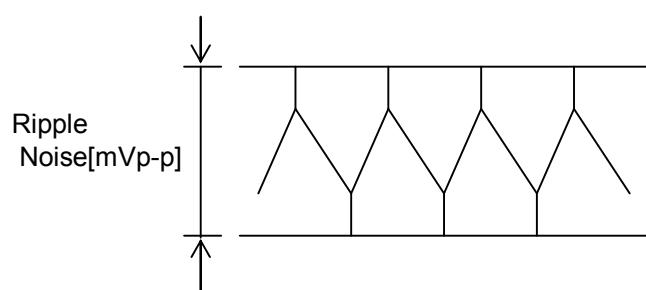
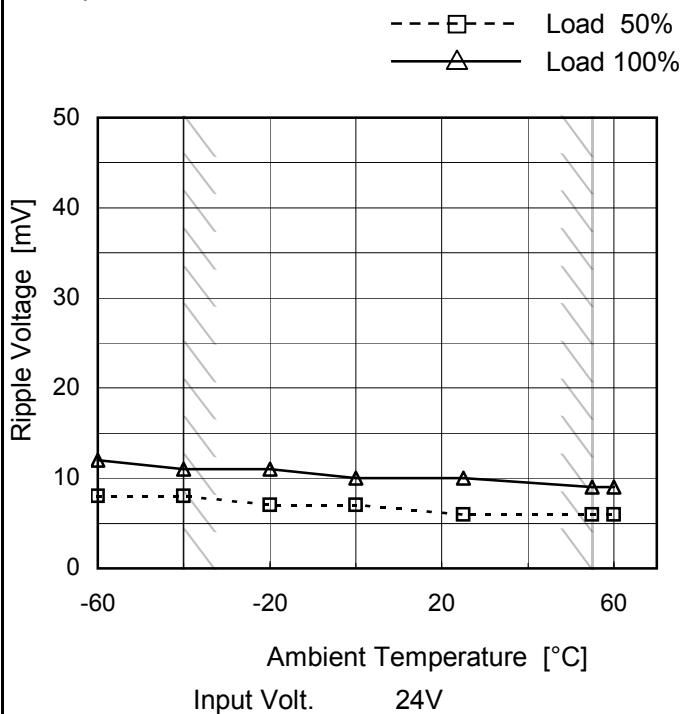


Fig.Complex Ripple Noise Wave Form

Model	SUTS62415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.4A

## 1. Graph



Measured by 100 MHz Oscilloscope.

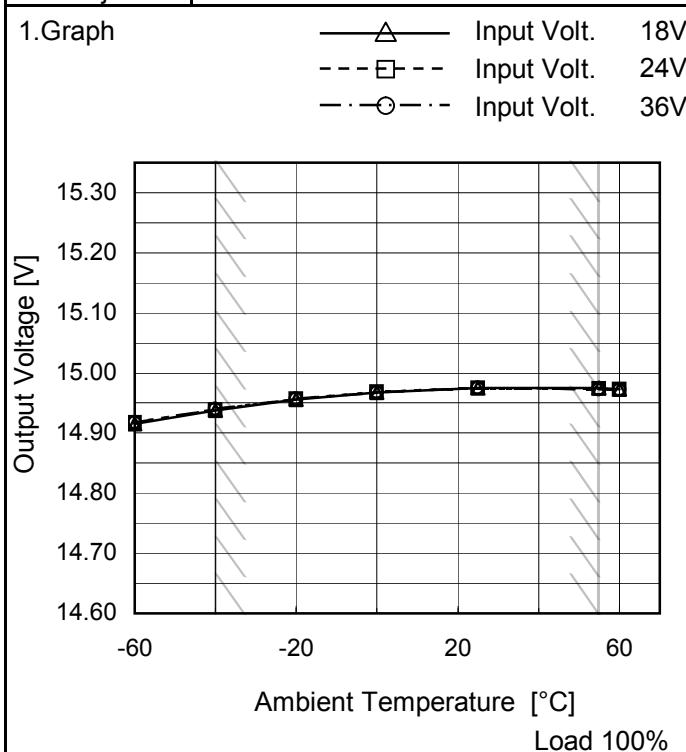
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure B

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	8	12
-40	8	11
-20	7	11
0	7	10
25	6	10
55	6	9
60	6	9
--	-	-
--	-	-
--	-	-
--	-	-

Model	SUTS62415
Item	Ambient Temperature Drift
Object	+15V0.4A



Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.915	14.918	14.917
-40	14.938	14.939	14.939
-20	14.956	14.957	14.957
0	14.968	14.968	14.968
25	14.975	14.975	14.975
55	14.975	14.974	14.973
60	14.973	14.972	14.971
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model	SUTS62415	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+15V0.4A	

### 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 : 18 - 36V

Load Current : 0 - 0.4A

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

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

### 2. Values

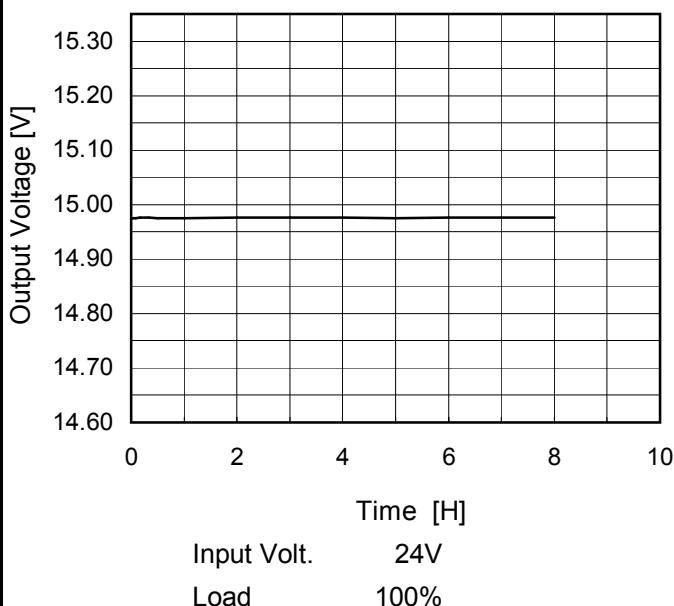
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	36	0	14.983	±23	±0.2
Minimum Voltage	-40	18	0.4	14.938		

**COSEL**

Model	SUTS62415
Item	Time Lapse Drift
Object	+15V0.4A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph



2. Values

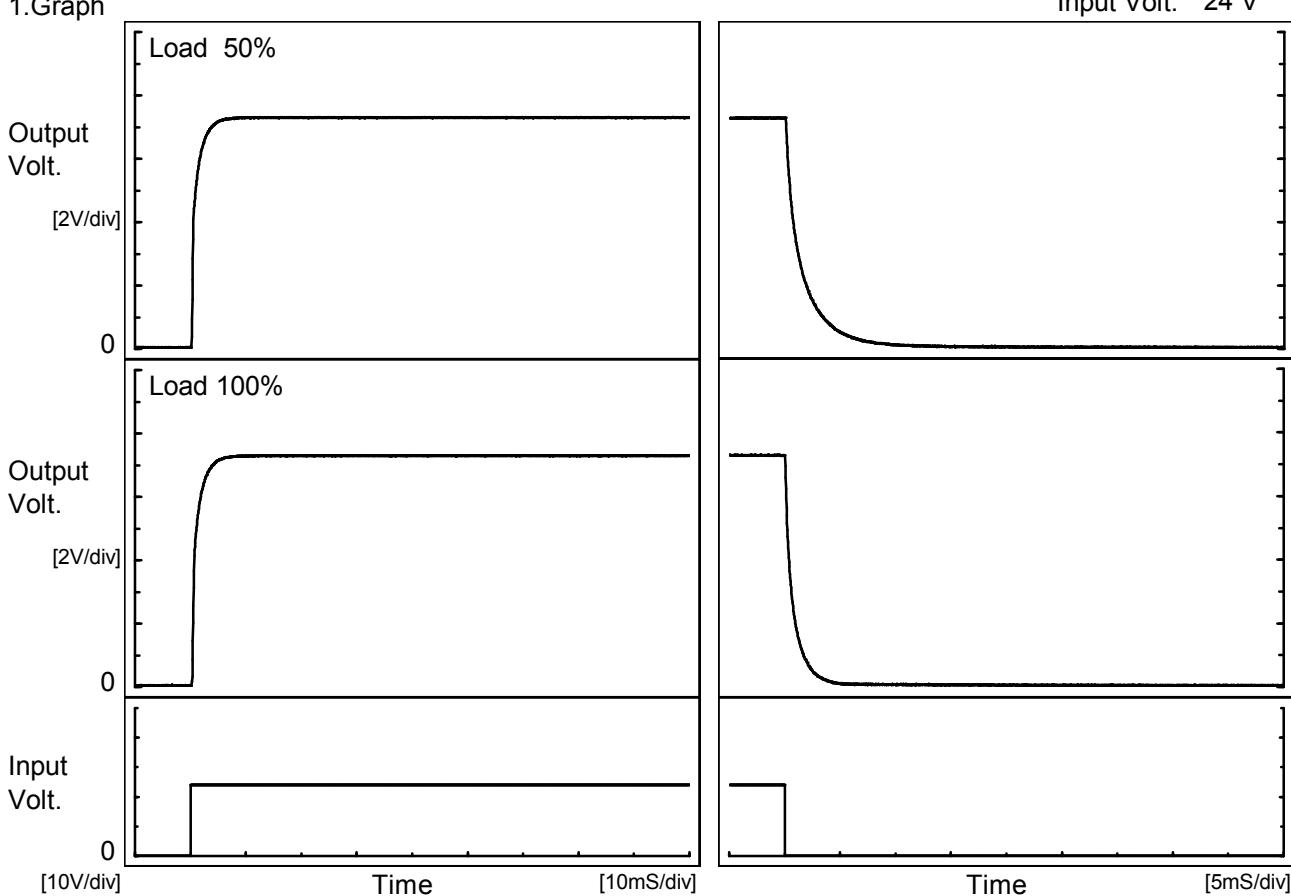
Time since start [H]	Output Voltage [V]
0.0	14.974
0.5	14.975
1.0	14.976
2.0	14.976
3.0	14.976
4.0	14.976
5.0	14.976
6.0	14.976
7.0	14.976
8.0	14.976

**COSEL**

Model	SUTS62415
Item	Rise and Fall Time
Object	+15V0.4A

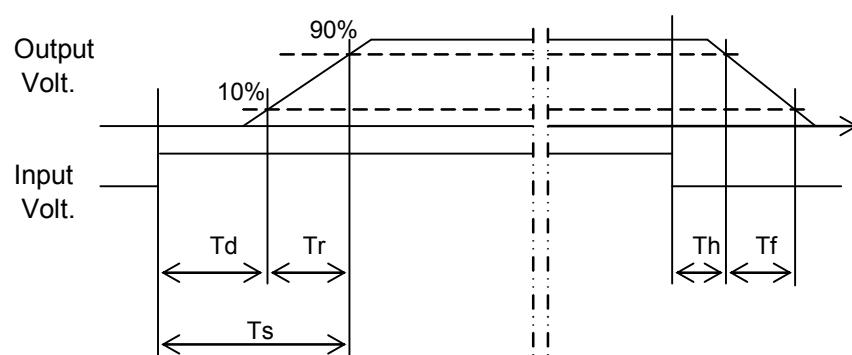
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

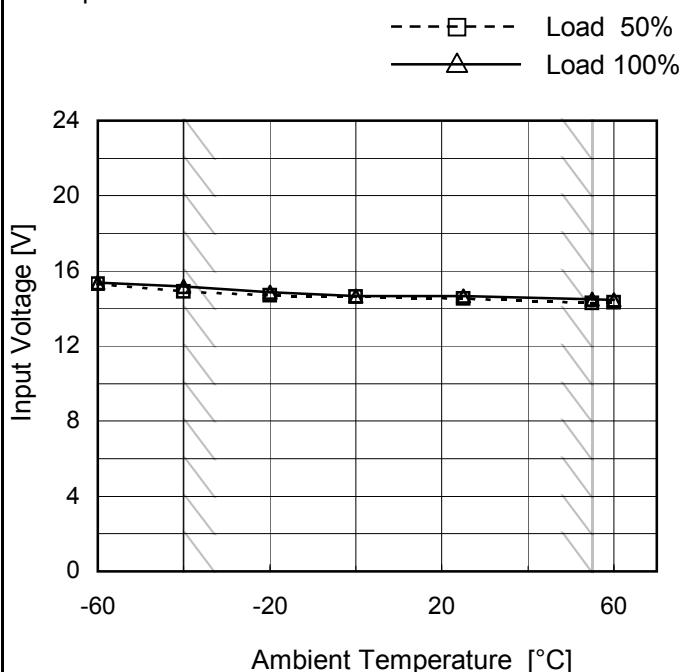
Load	Time	Td	Tr	Ts	Th	Tf	[mS]
50 %		0.3	2.8	3.1	0.1	3.9	
100 %		0.4	2.8	3.2	0.1	1.9	



Model	SUTS62415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.4A

## Testing Circuitry Figure A

## 1.Graph



## 2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.4	15.4
-40	14.9	15.2
-20	14.8	14.9
0	14.7	14.7
25	14.6	14.7
55	14.3	14.5
60	14.4	14.5
--	-	-
--	-	-
--	-	-
--	-	-

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

Model	SUTS62415	Temperature Testing Circuitry 25°C Figure A																																																							
Item	Overcurrent Protection																																																								
Object	+15V0.4A																																																								
1.Graph		2.Values																																																							
<p>Input Volt. 18V            Input Volt. 24V            Input Volt. 36V</p> <p>Output Voltage [V]</p> <p>Load Current [A]</p>		<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>15.0</td><td>0.40</td><td>0.40</td><td>0.40</td></tr> <tr><td>14.3</td><td>0.58</td><td>0.62</td><td>0.62</td></tr> <tr><td>13.5</td><td>0.59</td><td>0.62</td><td>0.63</td></tr> <tr><td>12.0</td><td>0.62</td><td>0.64</td><td>0.64</td></tr> <tr><td>10.5</td><td>0.66</td><td>0.68</td><td>0.66</td></tr> <tr><td>9.0</td><td>0.69</td><td>0.71</td><td>0.67</td></tr> <tr><td>7.5</td><td>0.72</td><td>0.72</td><td>0.69</td></tr> <tr><td>6.0</td><td>0.74</td><td>0.74</td><td>0.70</td></tr> <tr><td>4.5</td><td>0.75</td><td>0.74</td><td>0.70</td></tr> <tr><td>3.0</td><td>0.74</td><td>0.71</td><td>0.68</td></tr> <tr><td>1.5</td><td>0.68</td><td>0.65</td><td>0.63</td></tr> <tr><td>0.0</td><td>1.01</td><td>0.98</td><td>0.98</td></tr> </tbody> </table>	Output Voltage [V]	Load Current [A]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	15.0	0.40	0.40	0.40	14.3	0.58	0.62	0.62	13.5	0.59	0.62	0.63	12.0	0.62	0.64	0.64	10.5	0.66	0.68	0.66	9.0	0.69	0.71	0.67	7.5	0.72	0.72	0.69	6.0	0.74	0.74	0.70	4.5	0.75	0.74	0.70	3.0	0.74	0.71	0.68	1.5	0.68	0.65	0.63	0.0	1.01	0.98	0.98
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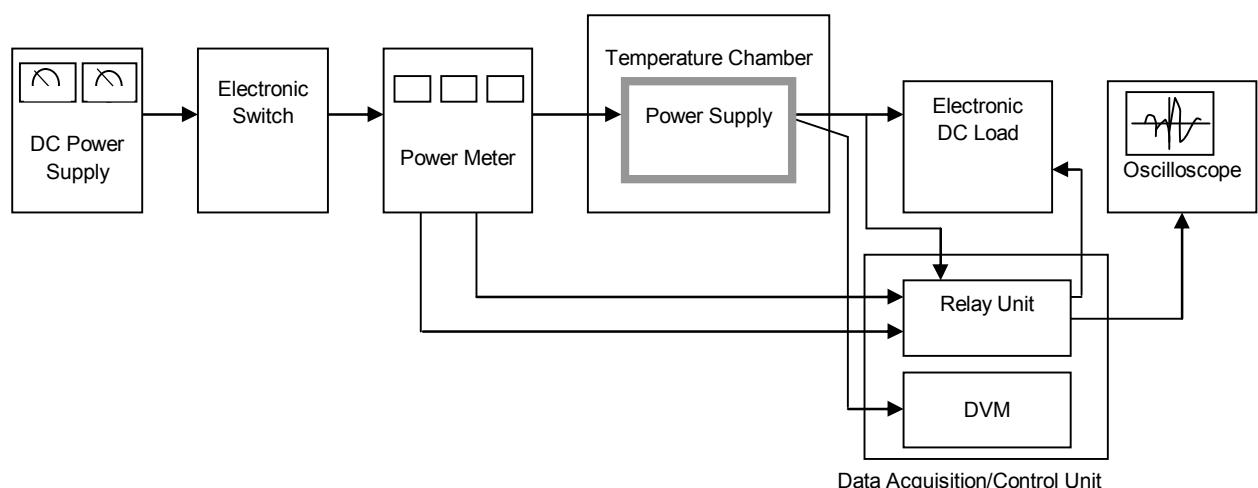


Figure A

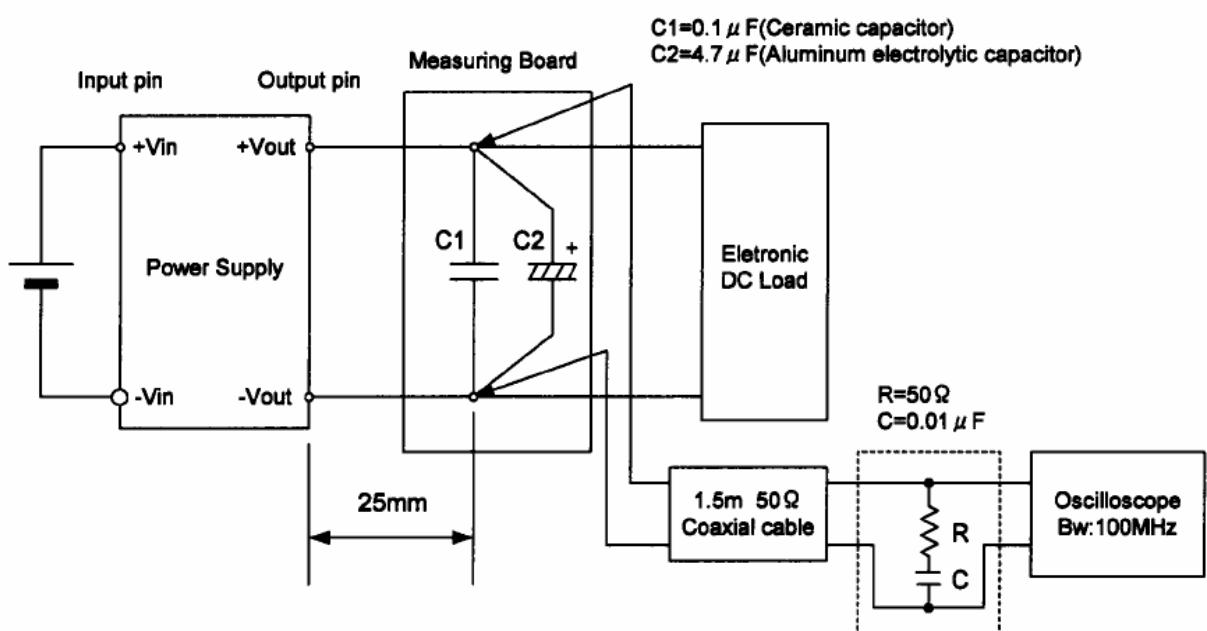


Figure B (Ripple and Ripple noise Characteristic)