

TEST DATA OF SUS62415 SU CS62415

Regulated DC Power Supply
Feb 17, 2005

Approved by :

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Tetsuo Sugimori

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Prepared by :

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Yoshikazu Mizuno

Design Engineer

COSEL CO.,LTD.



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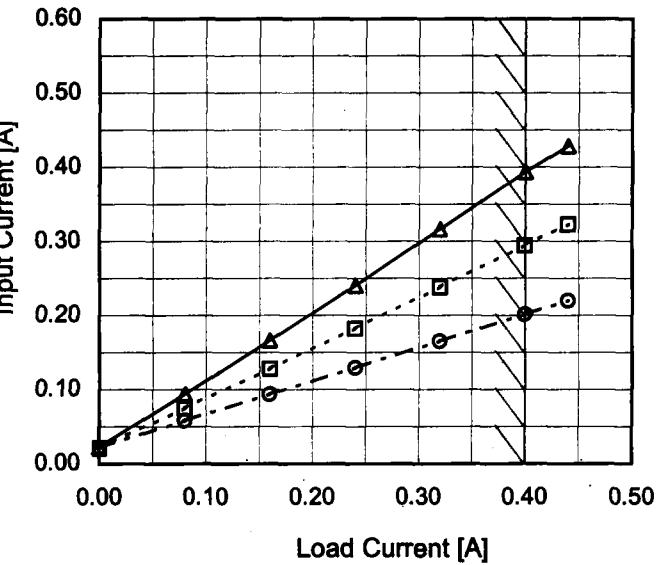
(Final Page 18)

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Model	SUS62415/SUCS62415	Temperature Testing Circuitry Figure A																																																																							
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1. Graph		2. Values																																																																							
<p>The graph plots Input Current [A] on the y-axis (0.00 to 0.60) against Input Voltage [V] on the x-axis (0 to 40). Three curves are shown: Load 100% (triangles), Load 50% (squares), and Load 0% (circles). All curves show a sharp increase in current from 0V to approximately 15V, followed by a more gradual increase. A slanted line is drawn through the origin, representing the rated input voltage range.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Load 0%</th> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>4.0</td><td>0.001</td><td>0.001</td><td>0.001</td></tr> <tr><td>8.0</td><td>0.001</td><td>0.001</td><td>0.001</td></tr> <tr><td>12.0</td><td>0.001</td><td>0.001</td><td>0.001</td></tr> <tr><td>15.2</td><td>0.025</td><td>0.240</td><td>0.466</td></tr> <tr><td>16.0</td><td>0.024</td><td>0.226</td><td>0.444</td></tr> <tr><td>18.0</td><td>0.023</td><td>0.202</td><td>0.390</td></tr> <tr><td>20.0</td><td>0.022</td><td>0.182</td><td>0.349</td></tr> <tr><td>24.0</td><td>0.021</td><td>0.154</td><td>0.294</td></tr> <tr><td>28.0</td><td>0.021</td><td>0.135</td><td>0.252</td></tr> <tr><td>32.0</td><td>0.021</td><td>0.121</td><td>0.223</td></tr> <tr><td>36.0</td><td>0.021</td><td>0.110</td><td>0.200</td></tr> <tr><td>40.0</td><td>0.022</td><td>0.102</td><td>0.183</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> </tbody> </table>	Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0.0	0.000	0.000	0.000	4.0	0.001	0.001	0.001	8.0	0.001	0.001	0.001	12.0	0.001	0.001	0.001	15.2	0.025	0.240	0.466	16.0	0.024	0.226	0.444	18.0	0.023	0.202	0.390	20.0	0.022	0.182	0.349	24.0	0.021	0.154	0.294	28.0	0.021	0.135	0.252	32.0	0.021	0.121	0.223	36.0	0.021	0.110	0.200	40.0	0.022	0.102	0.183	—	-	-	-	--	-	-	-	--	-	-	-
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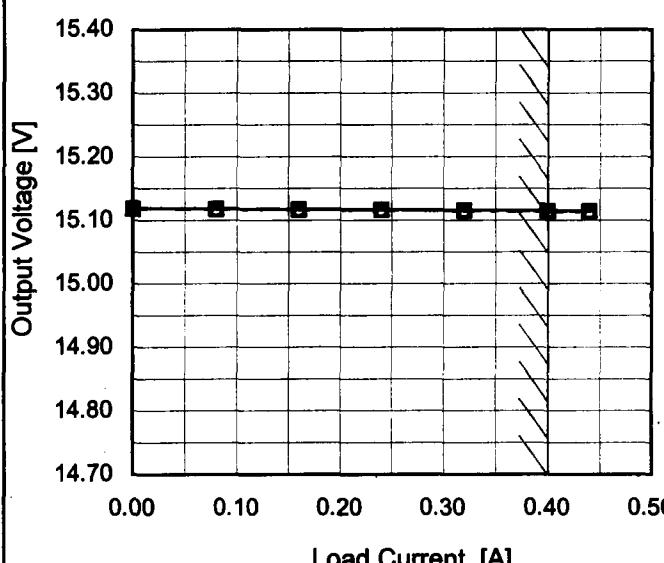
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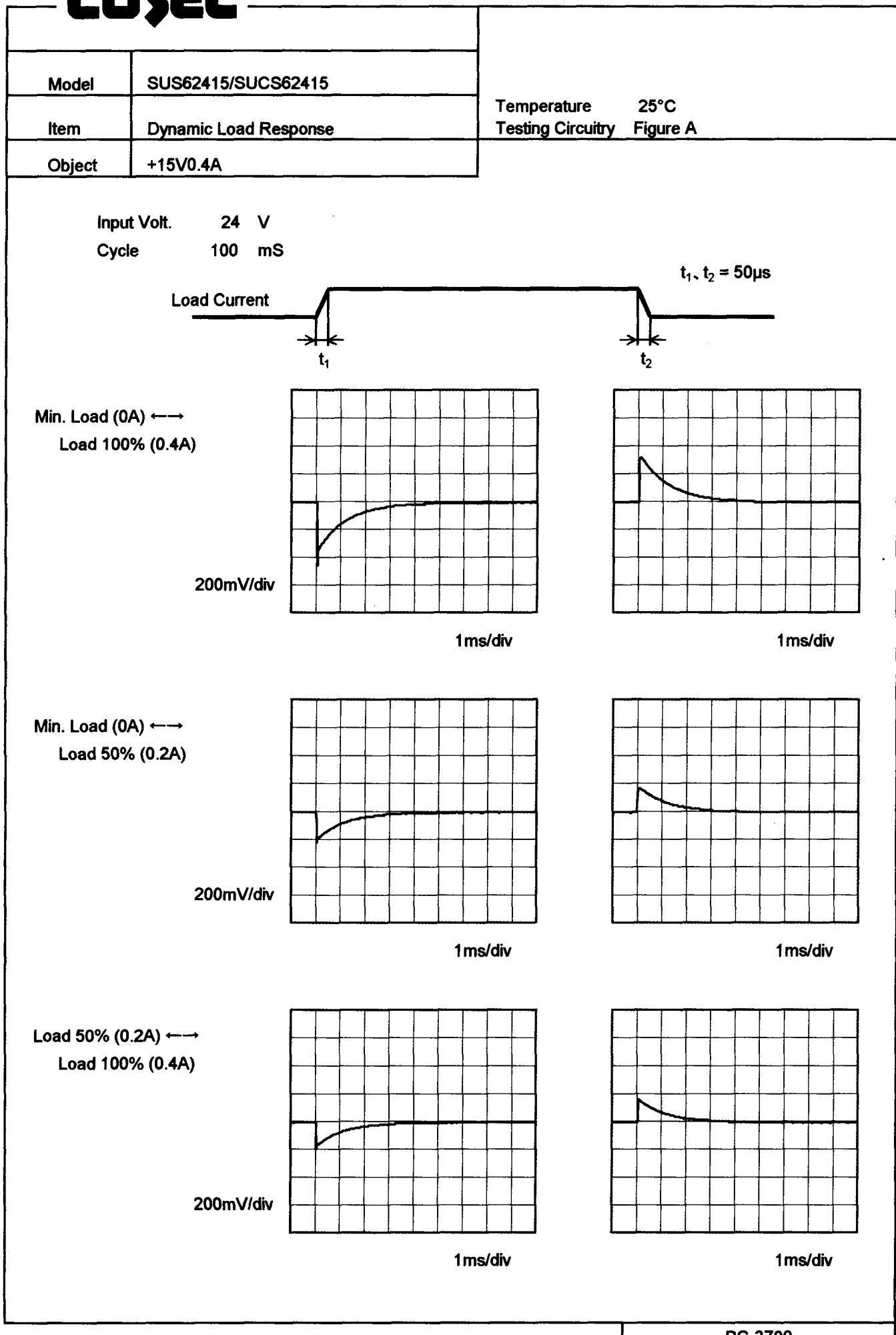
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Model	SUS62415/SUCS62415		Temperature Testing Circuitry 25°C Figure B																																						
Item	Ripple Voltage (by Load Current)																																								
Object	+15V0.4A																																								
1. Graph																																									
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The graph shows two curves: one for Input Volt. 18V (solid line with triangle markers) and one for Input Volt. 36V (dashed line with circle markers). The x-axis represents Load Current [A] from 0.00 to 0.50. The y-axis represents Ripple Voltage [mV] from 0 to 50. Both curves show a slight increase in ripple voltage as load current increases. A slanted line is drawn across the graph, starting from approximately (0.05, 4) and ending at (0.45, 7), indicating the range of rated load current.</p>																																									
2. Values																																									
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 18 [V]</th> <th>Input Volt. 36 [V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>4</td><td>6</td></tr> <tr><td>0.08</td><td>4</td><td>6</td></tr> <tr><td>0.16</td><td>6</td><td>6</td></tr> <tr><td>0.24</td><td>6</td><td>7</td></tr> <tr><td>0.32</td><td>6</td><td>7</td></tr> <tr><td>0.40</td><td>7</td><td>7</td></tr> <tr><td>0.44</td><td>7</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> </tbody> </table>				Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0.00	4	6	0.08	4	6	0.16	6	6	0.24	6	7	0.32	6	7	0.40	7	7	0.44	7	7	-	-	-	-	-	-	-	-	-	-	-	-
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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.																																									
<p>Ripple [mVp-p] - Fig.Complex Ripple Wave Form</p> <p>The oscilloscope trace shows a complex ripple wave form with multiple frequency components. The vertical axis is labeled "Ripple [mVp-p]" and the horizontal axis represents time. The waveform is periodic and exhibits several distinct harmonics.</p>																																									

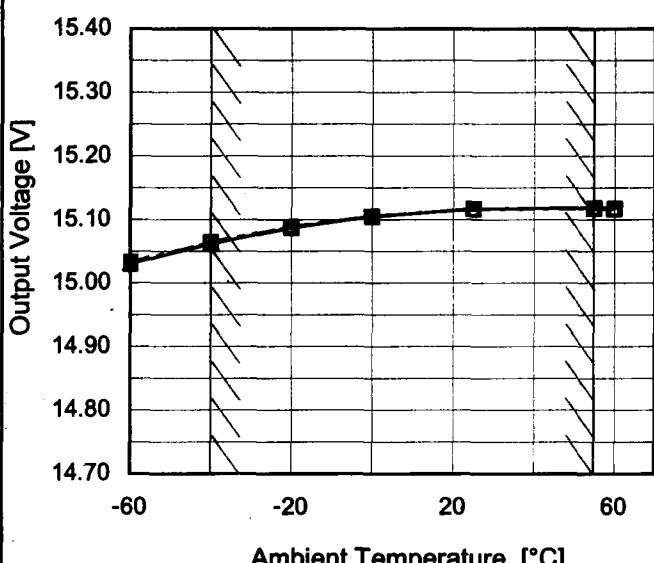
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Model	SUS62415/SUCS62415	Temperature Testing Circuitry 25°C Figure B																							
Item	Ripple-Noise																								
Object	+15V0.4A																								
1. Graph		2. Values																							
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 50 mV, and the X-axis ranges from 0.00 to 0.50 A. Two curves are plotted: one for Input Volt. 18V (solid line with triangle markers) and one for Input Volt. 36V (dashed line with circle markers). Both curves show an increase in Ripple-Noise as Load Current increases. A slanted line indicates the range of the rated load current.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple-Noise [mV] (18V)</th> <th>Ripple-Noise [mV] (36V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>8</td><td>10</td></tr> <tr><td>0.08</td><td>10</td><td>12</td></tr> <tr><td>0.16</td><td>13</td><td>15</td></tr> <tr><td>0.24</td><td>16</td><td>16</td></tr> <tr><td>0.32</td><td>17</td><td>17</td></tr> <tr><td>0.40</td><td>19</td><td>17</td></tr> <tr><td>0.44</td><td>22</td><td>18</td></tr> </tbody> </table>		Load Current [A]	Ripple-Noise [mV] (18V)	Ripple-Noise [mV] (36V)	0.00	8	10	0.08	10	12	0.16	13	15	0.24	16	16	0.32	17	17	0.40	19	17	0.44	22	18
Load Current [A]	Ripple-Noise [mV] (18V)	Ripple-Noise [mV] (36V)																							
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<p>Model SUS62415/SUCS62415</p> <p>Item Ripple Voltage (by Ambient Temp.)</p> <p>Object +15V0.4A</p>	Testing Circuitry Figure B																																						
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Model SUS62415/SUCA62415																																																				
Item Ambient Temperature Drift	Testing Circuitry Figure A																																																			
Object +15V0.4A																																																				
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<p>Ambient Temperature [°C]</p> <p>Load 100%</p>	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</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>-60</td> <td>15.031</td> <td>15.033</td> <td>15.032</td> </tr> <tr> <td>-40</td> <td>15.062</td> <td>15.064</td> <td>15.064</td> </tr> <tr> <td>-20</td> <td>15.087</td> <td>15.088</td> <td>15.088</td> </tr> <tr> <td>0</td> <td>15.105</td> <td>15.105</td> <td>15.105</td> </tr> <tr> <td>25</td> <td>15.117</td> <td>15.117</td> <td>15.116</td> </tr> <tr> <td>55</td> <td>15.119</td> <td>15.118</td> <td>15.117</td> </tr> <tr> <td>60</td> <td>15.118</td> <td>15.117</td> <td>15.116</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	-60	15.031	15.033	15.032	-40	15.062	15.064	15.064	-20	15.087	15.088	15.088	0	15.105	15.105	15.105	25	15.117	15.117	15.116	55	15.119	15.118	15.117	60	15.118	15.117	15.116	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated ambient temperature.



Model	SUS62415/SUCS62415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
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	55	36	0	15.123	±31	±0.2
Minimum Voltage	-40	24	0	15.062		

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Model	SUS62415/SUCA62415	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+15V 0.4A																								
1.Graph			2.Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 24V Load 100%</p>			<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15.117</td></tr> <tr><td>0.5</td><td>15.115</td></tr> <tr><td>1.0</td><td>15.115</td></tr> <tr><td>2.0</td><td>15.115</td></tr> <tr><td>3.0</td><td>15.115</td></tr> <tr><td>4.0</td><td>15.115</td></tr> <tr><td>5.0</td><td>15.115</td></tr> <tr><td>6.0</td><td>15.115</td></tr> <tr><td>7.0</td><td>15.115</td></tr> <tr><td>8.0</td><td>15.115</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	15.117	0.5	15.115	1.0	15.115	2.0	15.115	3.0	15.115	4.0	15.115	5.0	15.115	6.0	15.115	7.0	15.115	8.0	15.115
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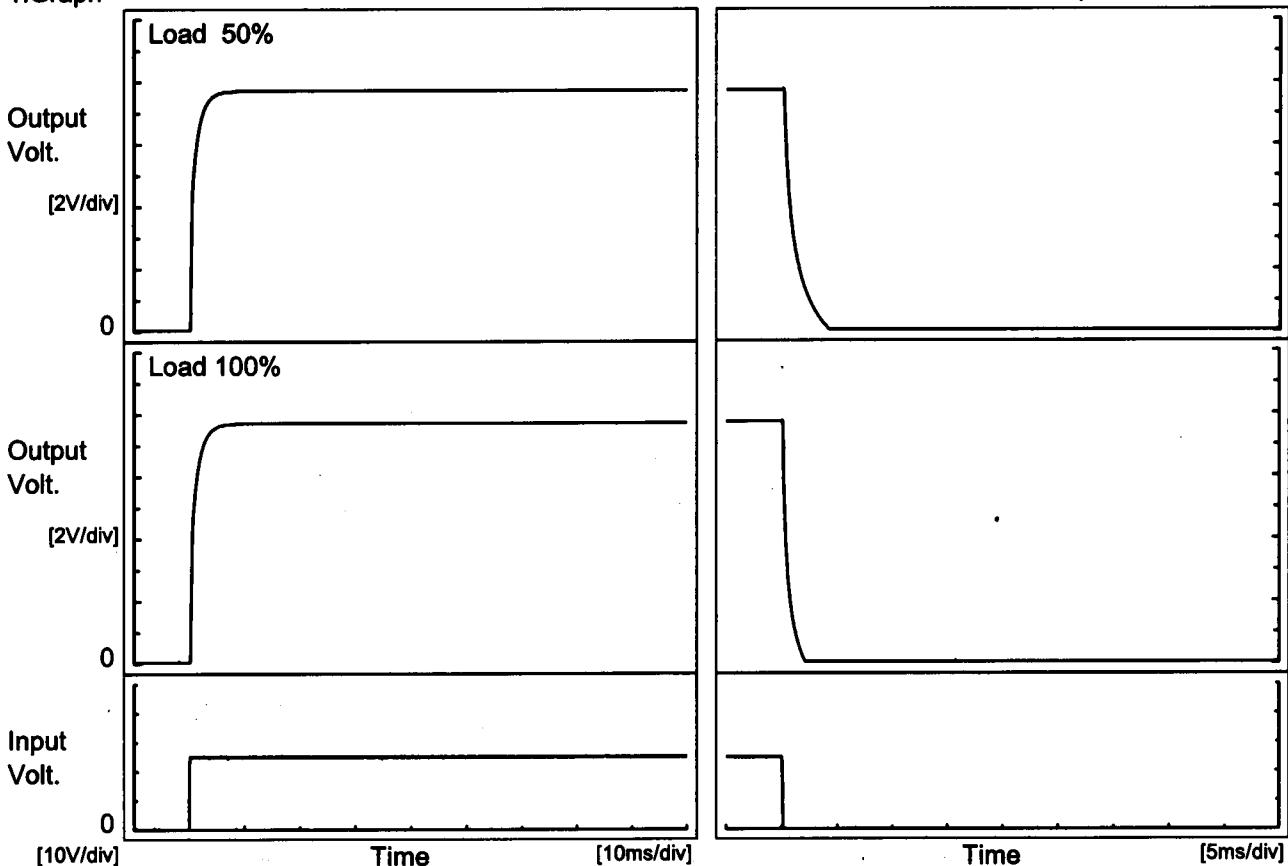
Model SUS62415/SUCS62415

Item Rise and Fall Time

Object +15V0.4A

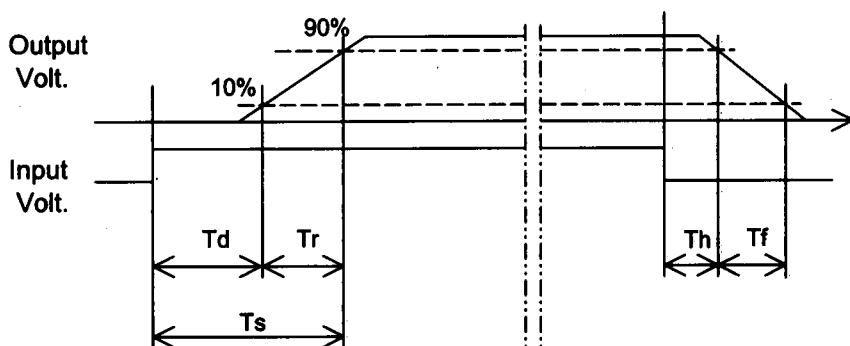
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		0.3	2.0	2.3	0.2	2.5	
100 %		0.3	2.0	2.3	0.1	1.3	



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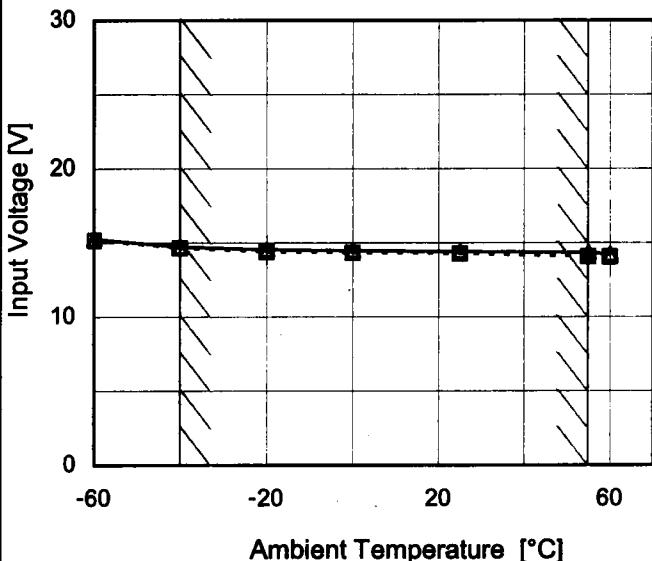
Model SUS62415/SUCCS62415

Item Minimum Input Voltage
for Regulated Output Voltage

Object +15V0.4A

1. Graph

---□--- Load 50%
—△— Load 100%



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

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.2	15.3
-40	14.7	14.8
-20	14.4	14.6
0	14.4	14.5
25	14.3	14.5
55	14.1	14.4
60	14.1	14.3
-	-	-
-	-	-
-	-	-
-	-	-

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Model	SUS62415/SUCCS62415
Item	Overcurrent Protection
Object	+15V0.4A

1. Graph

Output Voltage [V]

Load Current [A]

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

Temperature 25°C
Testing Circuitry Figure A

2. Values

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	0.62	0.67	0.67
13.5	0.63	0.67	0.67
12.0	0.68	0.71	0.68
10.5	0.71	0.73	0.71
9.0	0.74	0.76	0.72
7.5	0.77	0.77	0.73
6.0	0.79	0.78	0.74
4.5	0.80	0.78	0.74
3.0	0.78	0.75	0.72
1.5	0.72	0.69	0.66
0.0	1.02	1.01	0.97

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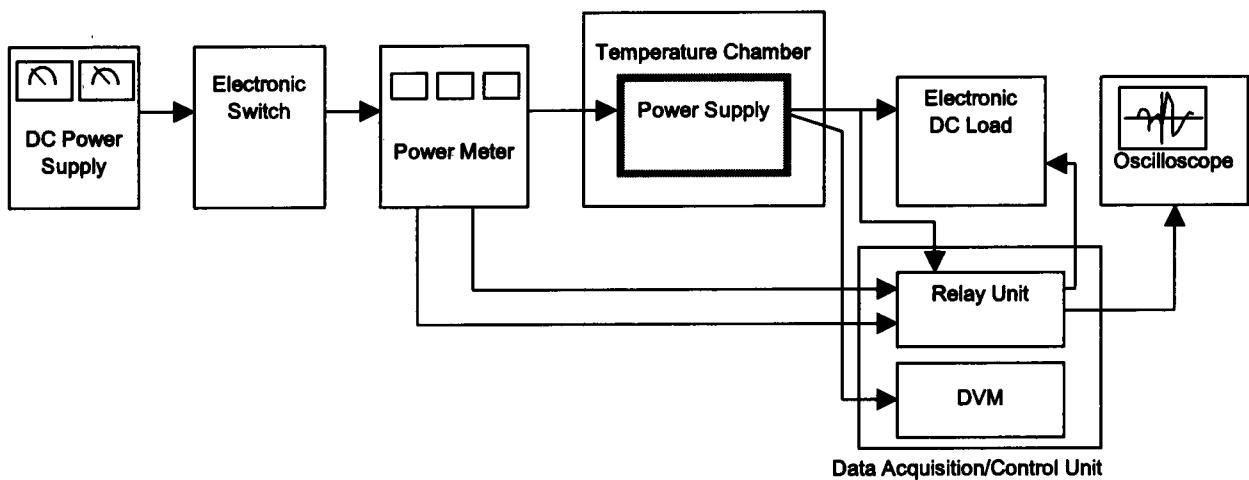


Figure A

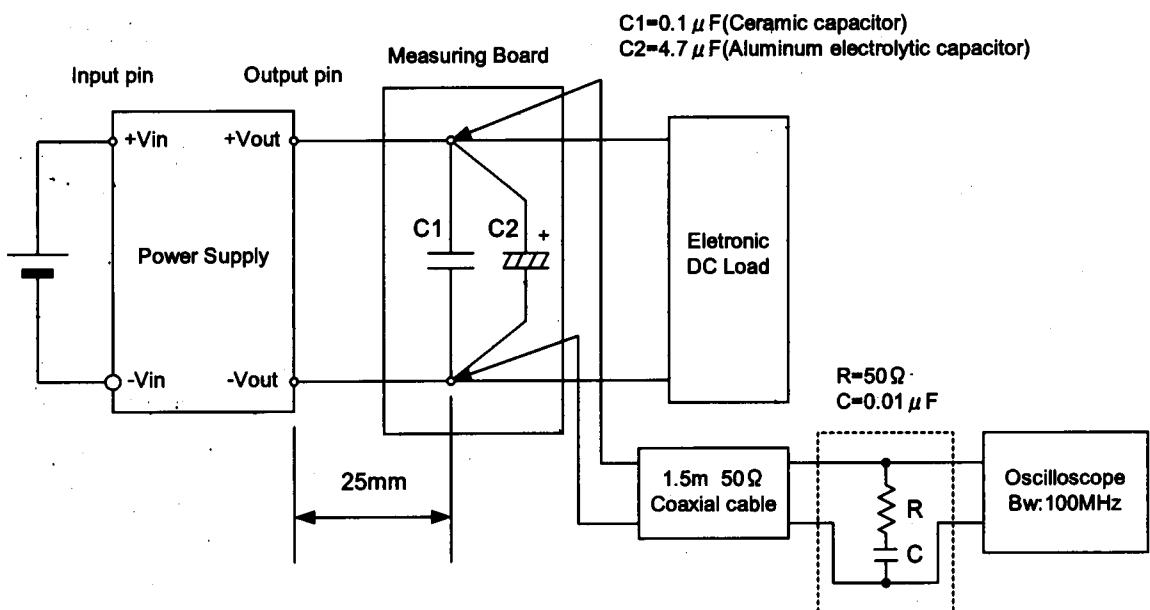


Figure B (Ripple and Ripple noise Characteristic)