



TEST DATA OF SUW102415 SUCW102415

Regulated DC Power Supply
Mar 28, 2005

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Yoshimichi Hirokawa Design Engineer

COSEL CO.,LTD.

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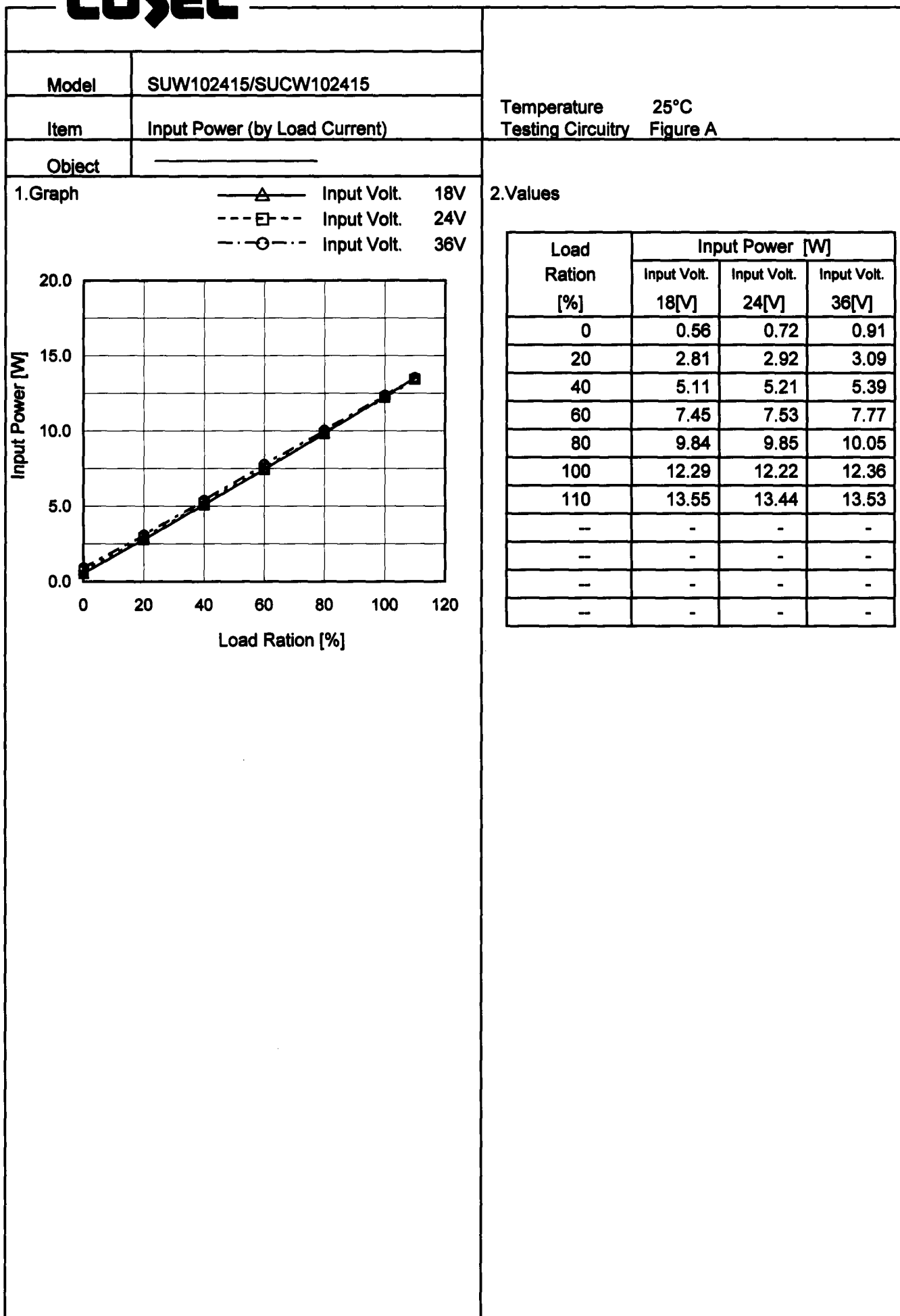
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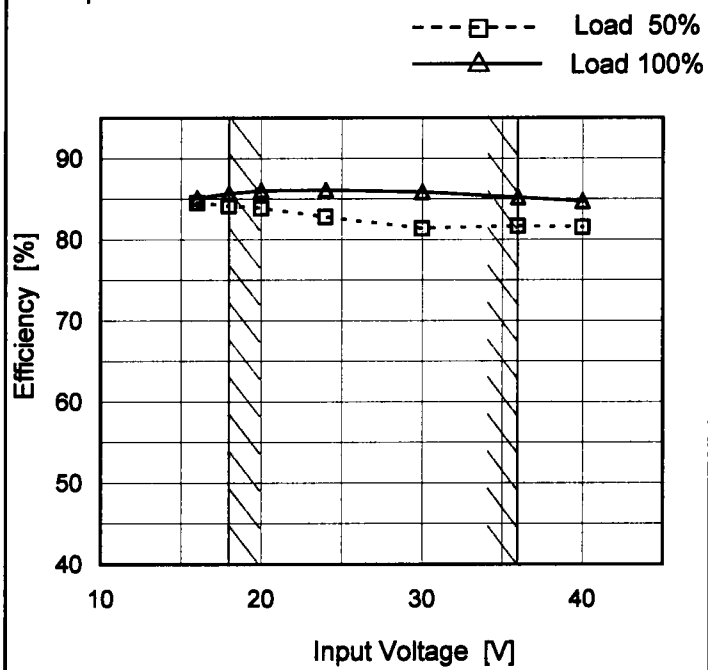
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Model SUW102415/SUCW102415

Item Efficiency (by Input Voltage)

Object
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	84.5	85.1
18	84.1	85.7
20	83.9	86.0
24	82.8	86.1
30	81.4	85.9
36	81.7	85.2
40	81.5	84.7
--	-	-
--	-	-

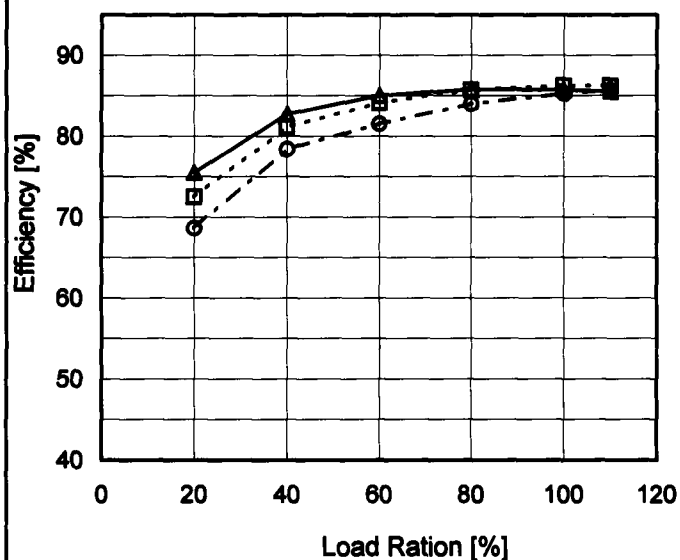
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Temperature 25°C
Testing Circuitry Figure A

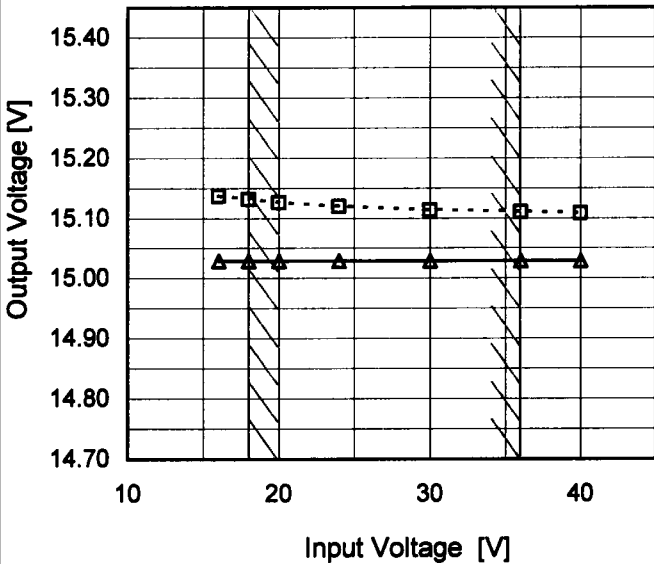
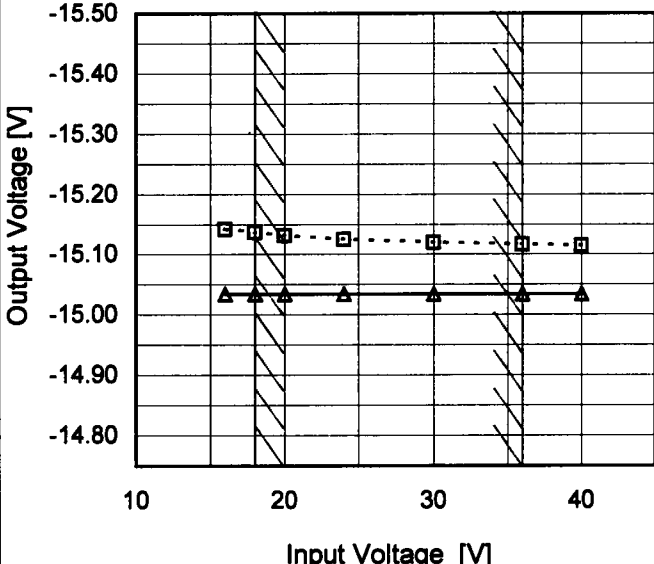
1. Graph

—△— Input Volt. 18V
 ---□--- Input Volt. 24V
 -·-○-·- Input Volt. 36V



2. Values

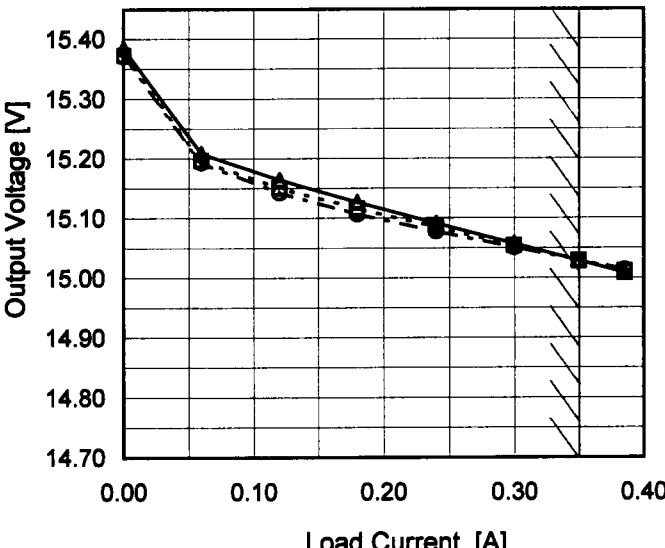
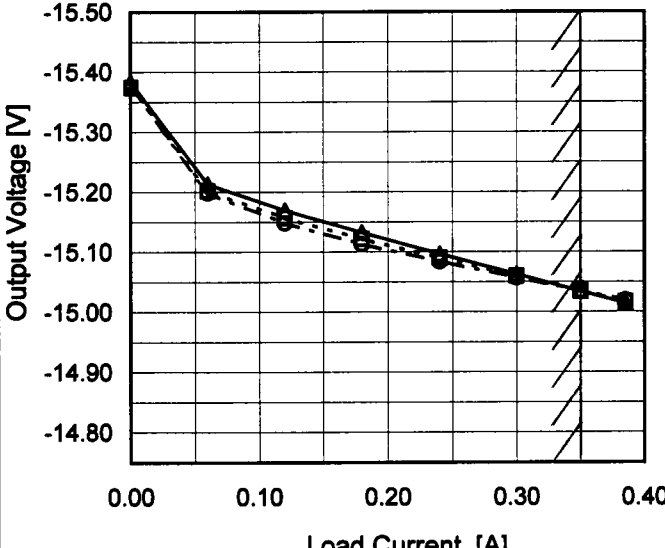
Load Ration [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	75.5	72.5	68.6
40	82.7	81.1	78.4
60	85.0	84.1	81.5
80	85.8	85.7	84.0
100	85.7	86.2	85.3
110	85.5	86.2	85.7
--	-	-	-
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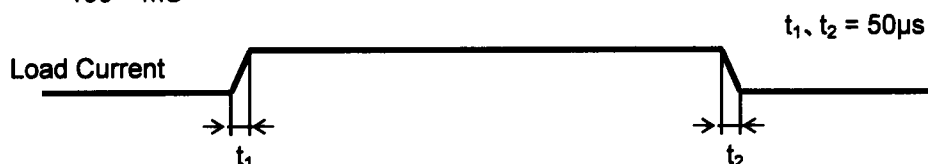
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Item	Load Regulation																																																						
Object	+15V0.35A																																																						
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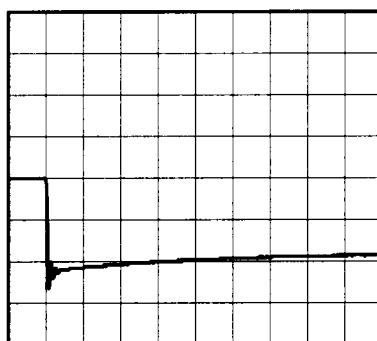
Model	SUW102415/SUCW102415	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V0.35A		

Input Volt. 24 V
Cycle 100 mS

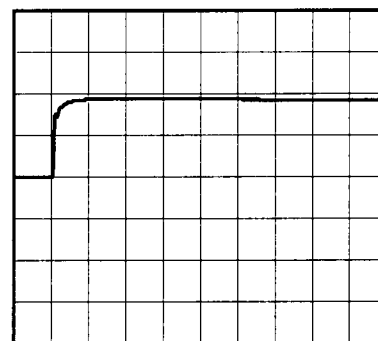


Min. Load (0A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



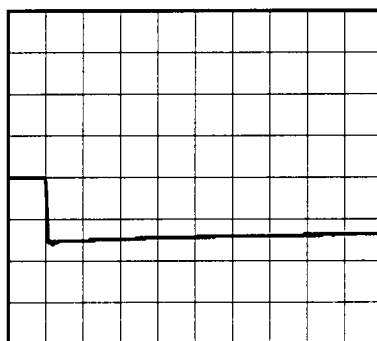
500µs/div



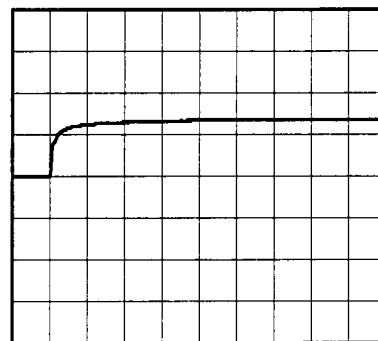
500µs/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.175A)

200mV/div



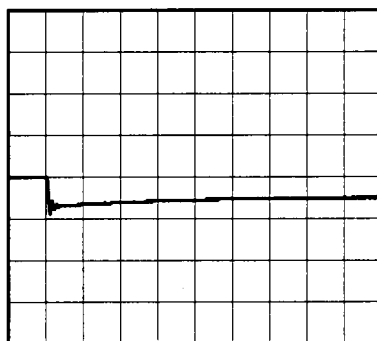
500µs/div



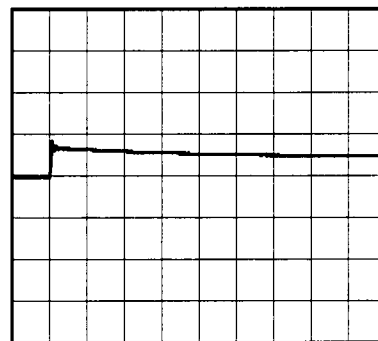
500µs/div

Load 50% (0.175A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



500µs/div

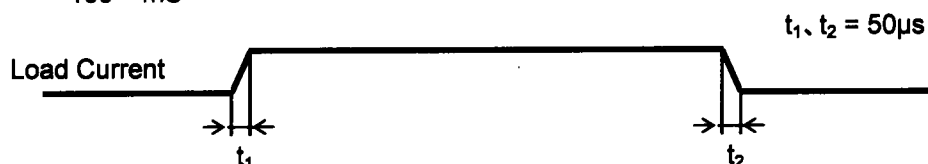


500µs/div

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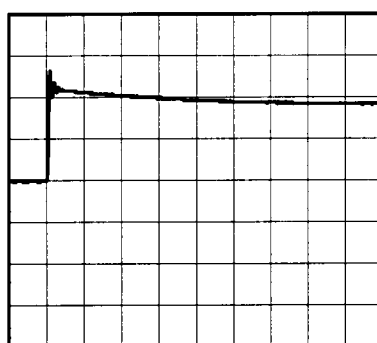
Model	SUW102415/SUCW102415	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-15V0.35A		

Input Volt. 24 V
Cycle 100 mS

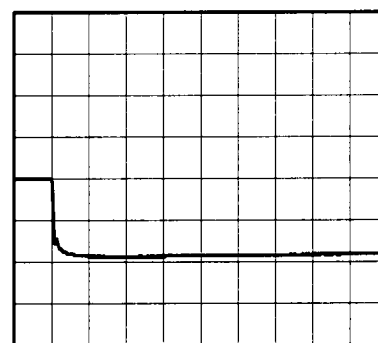


Min. Load (0A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



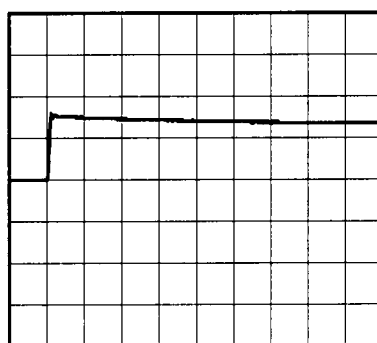
500µs/div



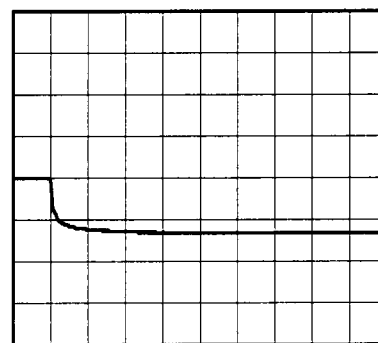
500µs/div

Min. Load (0A) \longleftrightarrow
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200mV/div



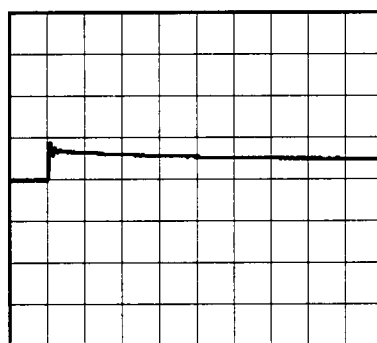
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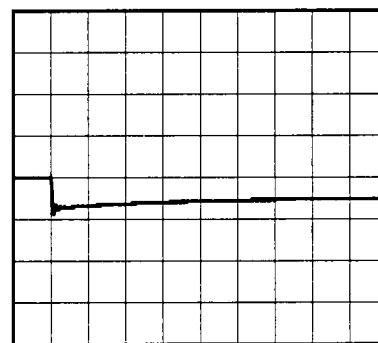
500µs/div

Load 50% (0.175A) \longleftrightarrow
Load 100% (0.35A)

200mV/div



500µs/div



500µs/div

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Model	SUW102415/SUCW102415																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure B																																						
Object	+15V0.35A																																								
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 18V</div><div>- - -○- - - Input Volt. 36V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>		<table><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><tr><td>0.000</td><td>2</td><td>2</td></tr><tr><td>0.070</td><td>3</td><td>3</td></tr><tr><td>0.140</td><td>3</td><td>3</td></tr><tr><td>0.210</td><td>3</td><td>3</td></tr><tr><td>0.280</td><td>4</td><td>4</td></tr><tr><td>0.350</td><td>5</td><td>4</td></tr><tr><td>0.385</td><td>6</td><td>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>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0.000	2	2	0.070	3	3	0.140	3	3	0.210	3	3	0.280	4	4	0.350	5	4	0.385	6	5	—	-	-	—	-	-	—	-	-	—	-	-
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<div><div>Ripple [mVp-p]</div><div>Fig.Complex Ripple Wave Form</div></div>																																									

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Model	SUW102415/SUCW102415																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
Object	-15V0.35A	Testing Circuitry	Figure B																																						
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<div><div><div><div><div></div><div>80</div></div><div><div></div><div>60</div></div><div><div></div><div>40</div></div><div><div></div><div>20</div></div><div><div></div><div>0</div></div></div><div><div></div><div>0.00</div></div><div><div></div><div>0.10</div></div><div><div></div><div>0.20</div></div><div><div></div><div>0.30</div></div><div><div></div><div>0.40</div></div></div><div><div></div><div>Ripple Voltage [mV]</div></div><div><div></div><div>Load Current [A]</div></div></div> <div><div><div>—△—</div><div>Input Volt. 18V</div></div><div><div>---○---</div><div>Input Volt. 36V</div></div></div>		<table><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><tr><td>0.000</td><td>2</td><td>2</td></tr><tr><td>0.070</td><td>3</td><td>3</td></tr><tr><td>0.140</td><td>4</td><td>4</td></tr><tr><td>0.210</td><td>4</td><td>4</td></tr><tr><td>0.280</td><td>5</td><td>4</td></tr><tr><td>0.350</td><td>5</td><td>5</td></tr><tr><td>0.385</td><td>6</td><td>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>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0.000	2	2	0.070	3	3	0.140	4	4	0.210	4	4	0.280	5	4	0.350	5	5	0.385	6	5	—	-	-	—	-	-	—	-	-	—	-	-
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Model		SUW102415/SUCW102415																																							
Item		Ripple-Noise																																							
Object		+15V0.35A																																							
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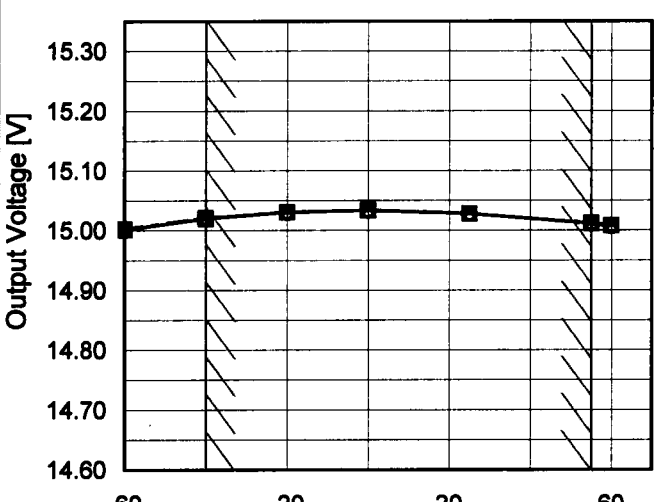
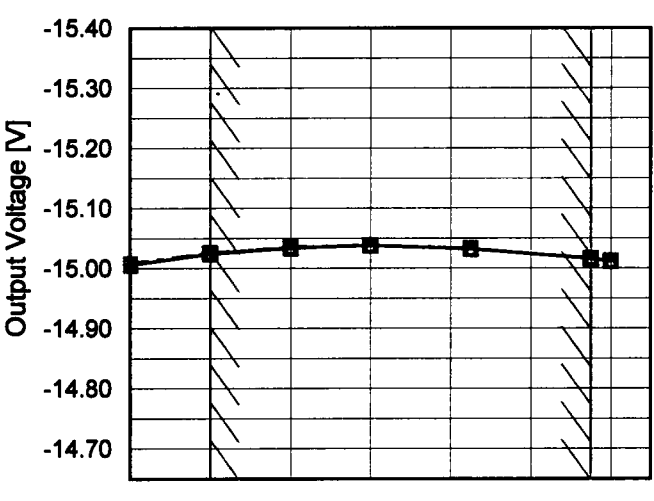
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Model		SUW102415/SUCW102415		Temperature 25°C Testing Circuitry Figure B
Item		Ripple-Noise		
Object		-15V0.35A		
1.Graph				
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <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		SUW102415/SUCW102415																																							
Item		Ripple Voltage (by Ambient Temp.)																																							
Object		+15V0.35A																																							
1.Graph																																									
<div><div><div><div><div></div><div></div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>Load 50%</div><div>Load 100%</div></div> <div><div><div><div><div></div><div></div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>Ripple Voltage [mV]</div><div><div><div><div></div><div></div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>80</div><div>60</div><div>40</div><div>20</div><div>0</div></div> <div><div><div><div></div><div></div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div>-60</div> <div>-40</div> <div>-20</div> <div>0</div> <div>20</div> <div>40</div> <div>60</div> <div>Ambient Temperature [°C]</div> <div>Input Volt. 24V</div>																																									
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Ambient Temperature [°C]	Ripple Voltage [mV]																																								
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Measured by 100 MHz Oscilloscope.																																									
Note: Slanted line shows the range of the rated ambient temperature.																																									

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Model		SUW102415/SUCW102415																																																				
Item		Ambient Temperature Drift																																																				
Object		+15V0.35A																																																				
1.Graph		<div><div>—△—</div>Input Volt. 18V</div> <div><div>---□---</div>Input Volt. 24V</div> <div><div>---○---</div>Input Volt. 36V</div>																																																				
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		<table><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><tr><td>-60</td><td>15.002</td><td>15.003</td><td>15.003</td></tr><tr><td>-40</td><td>15.020</td><td>15.021</td><td>15.021</td></tr><tr><td>-20</td><td>15.031</td><td>15.031</td><td>15.030</td></tr><tr><td>0</td><td>15.034</td><td>15.034</td><td>15.033</td></tr><tr><td>25</td><td>15.028</td><td>15.028</td><td>15.028</td></tr><tr><td>55</td><td>15.012</td><td>15.012</td><td>15.011</td></tr><tr><td>60</td><td>15.008</td><td>15.008</td><td>15.007</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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	-60	15.002	15.003	15.003	-40	15.020	15.021	15.021	-20	15.031	15.031	15.030	0	15.034	15.034	15.033	25	15.028	15.028	15.028	55	15.012	15.012	15.011	60	15.008	15.008	15.007	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]																																																			
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25	15.028	15.028	15.028																																																			
55	15.012	15.012	15.011																																																			
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1.Graph		<div><div>—△—</div>Input Volt. 18V</div> <div><div>---□---</div>Input Volt. 24V</div> <div><div>---○---</div>Input Volt. 36V</div>																																																				
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		<table><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><tr><td>-60</td><td>-15.006</td><td>-15.007</td><td>-15.008</td></tr><tr><td>-40</td><td>-15.024</td><td>-15.025</td><td>-15.025</td></tr><tr><td>-20</td><td>-15.034</td><td>-15.035</td><td>-15.035</td></tr><tr><td>0</td><td>-15.038</td><td>-15.038</td><td>-15.038</td></tr><tr><td>25</td><td>-15.032</td><td>-15.033</td><td>-15.032</td></tr><tr><td>55</td><td>-15.016</td><td>-15.016</td><td>-15.016</td></tr><tr><td>60</td><td>-15.012</td><td>-15.012</td><td>-15.012</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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	-60	-15.006	-15.007	-15.008	-40	-15.024	-15.025	-15.025	-20	-15.034	-15.035	-15.035	0	-15.038	-15.038	-15.038	25	-15.032	-15.033	-15.032	55	-15.016	-15.016	-15.016	60	-15.012	-15.012	-15.012	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated ambient temperature.																																																						

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		Testing Circuitry Figure A
Model	SUW102415/SUCW102415	
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 : 18 - 36V

Load Current (AVR 1) : 0 - 0.35A (AVR 2) : 0 - 0.35A

* Other Output : Rated Load

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

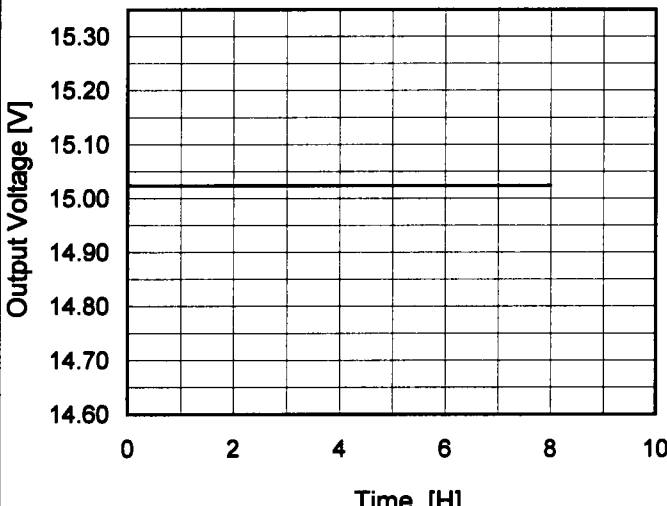
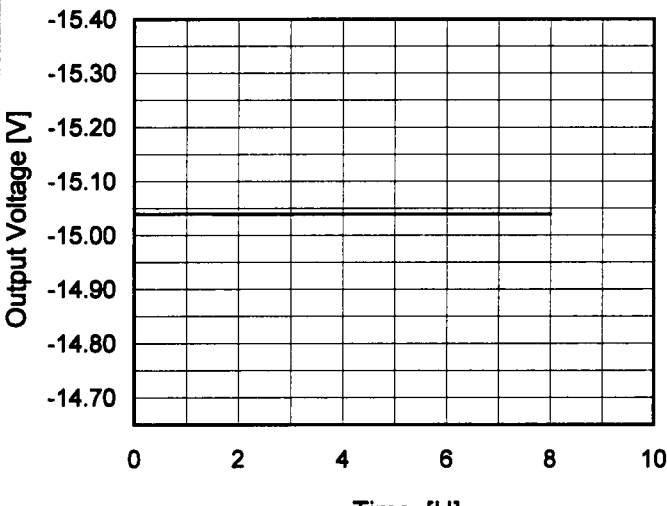
* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

Object		+15V0.35A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	15.388	±189	±1.3
Minimum Voltage	55	36	0.35	15.011		

Object		-15V0.35A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	-15.389	±187	±1.2
Minimum Voltage	55	36	0.35	-15.016		

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Model	SUW102415/SUCW102415																								
Item	Time Lapse Drift																								
Object	+15V0.35A																								
1.Graph		2.Values																							
<div><p>Input Volt. 24V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>15.029</td></tr><tr><td>0.5</td><td>15.024</td></tr><tr><td>1.0</td><td>15.024</td></tr><tr><td>2.0</td><td>15.024</td></tr><tr><td>3.0</td><td>15.024</td></tr><tr><td>4.0</td><td>15.024</td></tr><tr><td>5.0</td><td>15.024</td></tr><tr><td>6.0</td><td>15.024</td></tr><tr><td>7.0</td><td>15.024</td></tr><tr><td>8.0</td><td>15.024</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	15.029	0.5	15.024	1.0	15.024	2.0	15.024	3.0	15.024	4.0	15.024	5.0	15.024	6.0	15.024	7.0	15.024	8.0	15.024
Time since start [H]	Output Voltage [V]																								
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Object	-15V0.35A																								
1.Graph		2.Values																							
<div><p>Input Volt. 24V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>-15.042</td></tr><tr><td>0.5</td><td>-15.039</td></tr><tr><td>1.0</td><td>-15.040</td></tr><tr><td>2.0</td><td>-15.040</td></tr><tr><td>3.0</td><td>-15.040</td></tr><tr><td>4.0</td><td>-15.040</td></tr><tr><td>5.0</td><td>-15.039</td></tr><tr><td>6.0</td><td>-15.040</td></tr><tr><td>7.0</td><td>-15.039</td></tr><tr><td>8.0</td><td>-15.039</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	-15.042	0.5	-15.039	1.0	-15.040	2.0	-15.040	3.0	-15.040	4.0	-15.040	5.0	-15.039	6.0	-15.040	7.0	-15.039	8.0	-15.039
Time since start [H]	Output Voltage [V]																								
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0.5	-15.039																								
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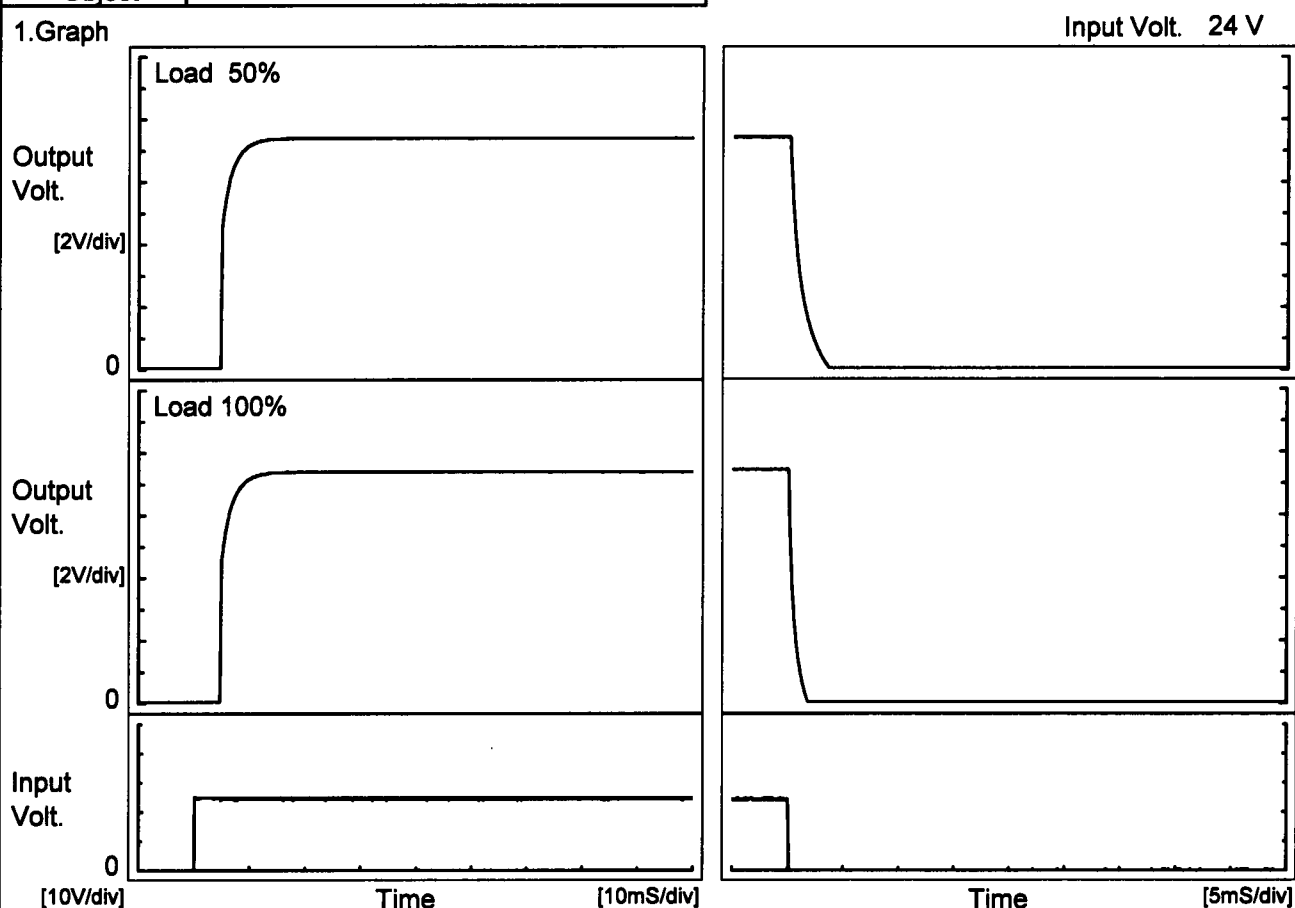
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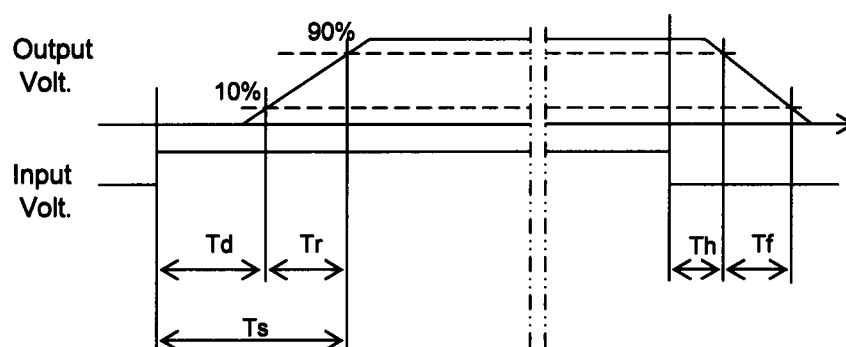
Model	SUW102415/SUCW102415	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V0.35A		

1. Graph



2. Values

		[mS]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		4.7	3.2	7.9	0.2	2.3
100 %		4.6	3.4	8.0	0.1	1.1

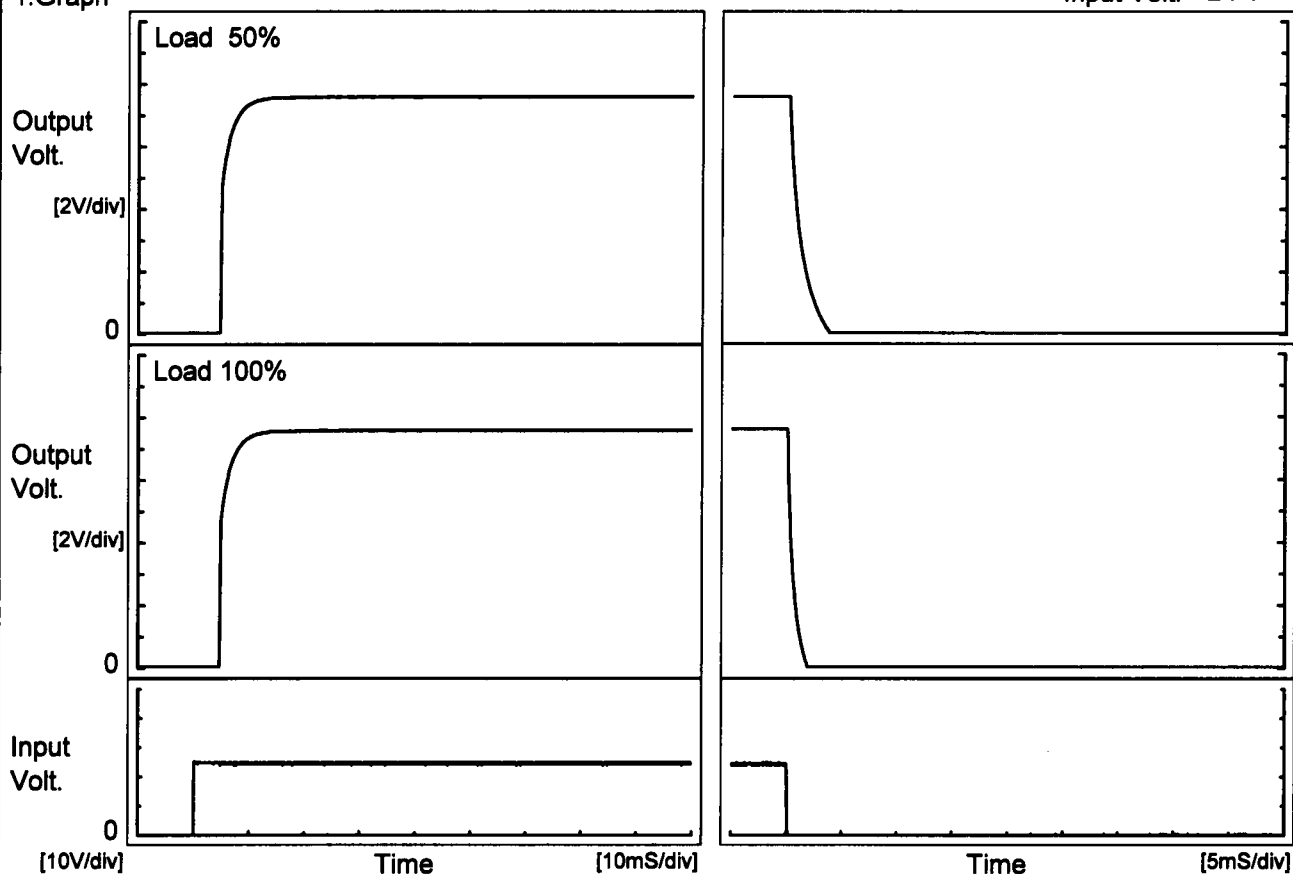


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Model	SUW102415/SUCW102415	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-15V0.35A		

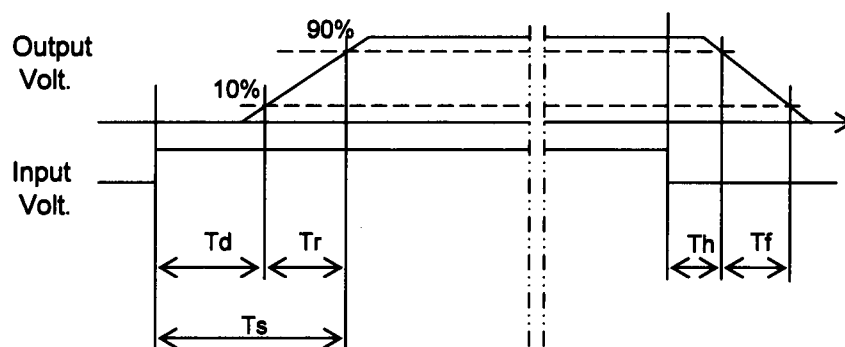
1. Graph

Input Volt. 24 V

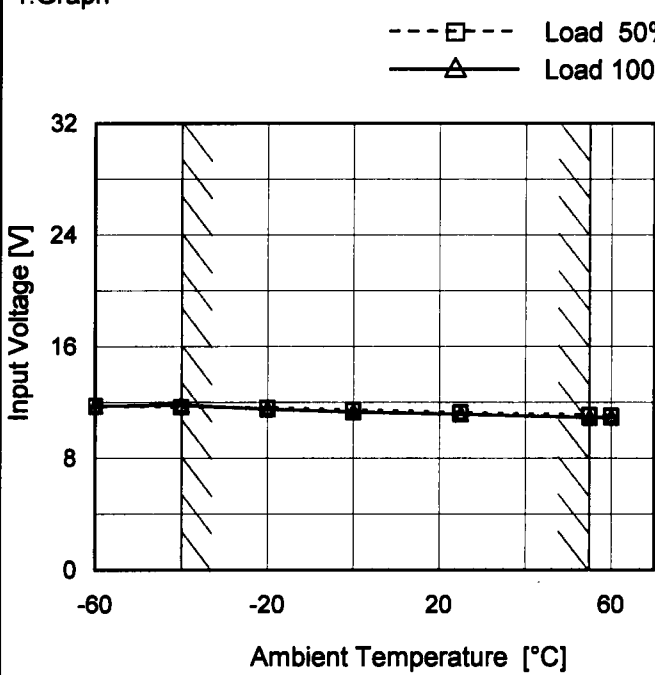


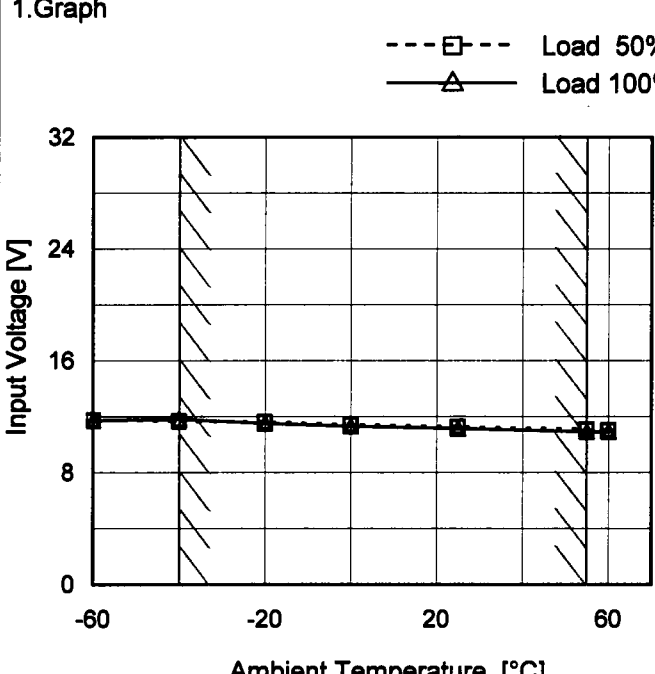
2. Values

		[mS]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		4.7	2.7	7.4	0.2	2.4
100 %		4.6	2.8	7.4	0.1	1.2



COSEL

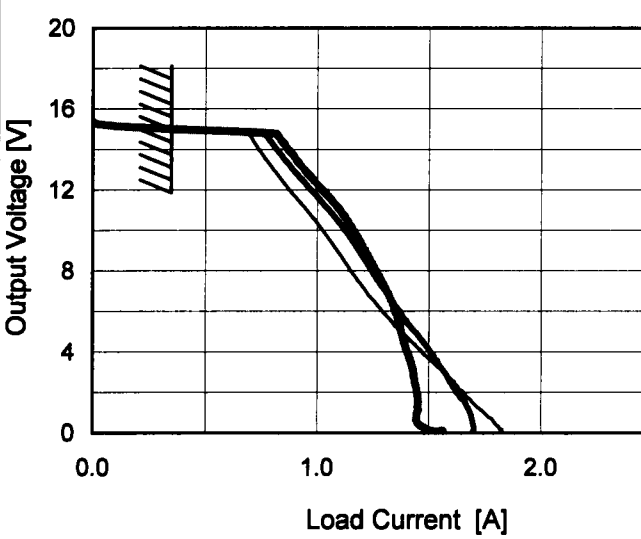
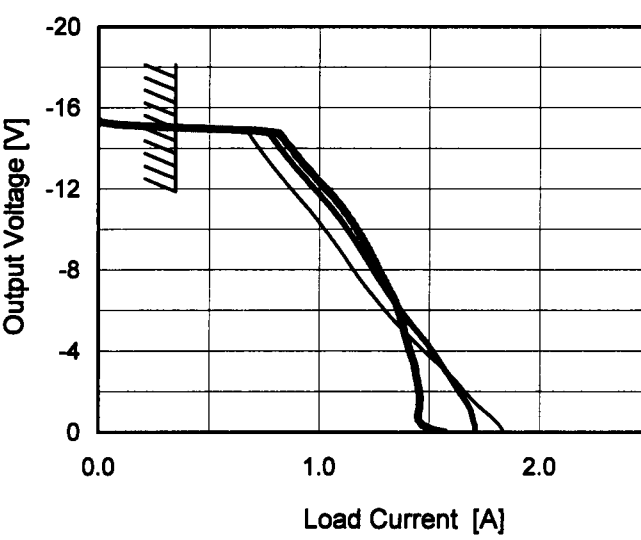
Model		SUW102415/SUCW102415	
Item		Minimum Input Voltage for Regulated Output Voltage	
Object		+15V0.35A	
1.Graph			
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> 			
2.Values			
Ambient Temperature [°C]		Input Voltage [V]	
		Load 50%	Load 100%
-60		11.8	11.8
-40		11.7	11.9
-20		11.7	11.6
0		11.5	11.4
25		11.3	11.2
55		11.1	11.0
60		11.1	11.0
--		-	-
--		-	-
--		-	-
--		-	-

Object		-15V0.35A	
1.Graph			
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> 			
2.Values			
Ambient Temperature [°C]		Input Voltage [V]	
		Load 50%	Load 100%
-60		11.8	11.8
-40		11.7	11.9
-20		11.7	11.6
0		11.5	11.4
25		11.3	11.2
55		11.1	11.0
60		11.1	11.0
--		-	-
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Note: Slanted line shows the range of the rated ambient temperature.

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Model		SUW102415/SUCW102415																																																								
Item		Overcurrent Protection																																																								
Object		+15V0.35A																																																								
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Note: Slanted line shows the range of the rated load current.																																																										

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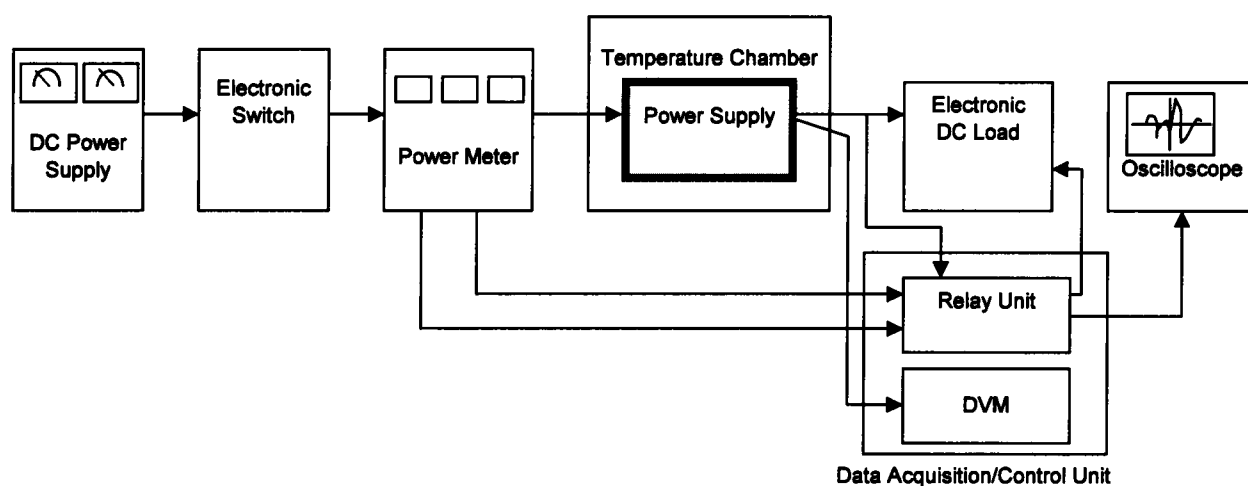


Figure A

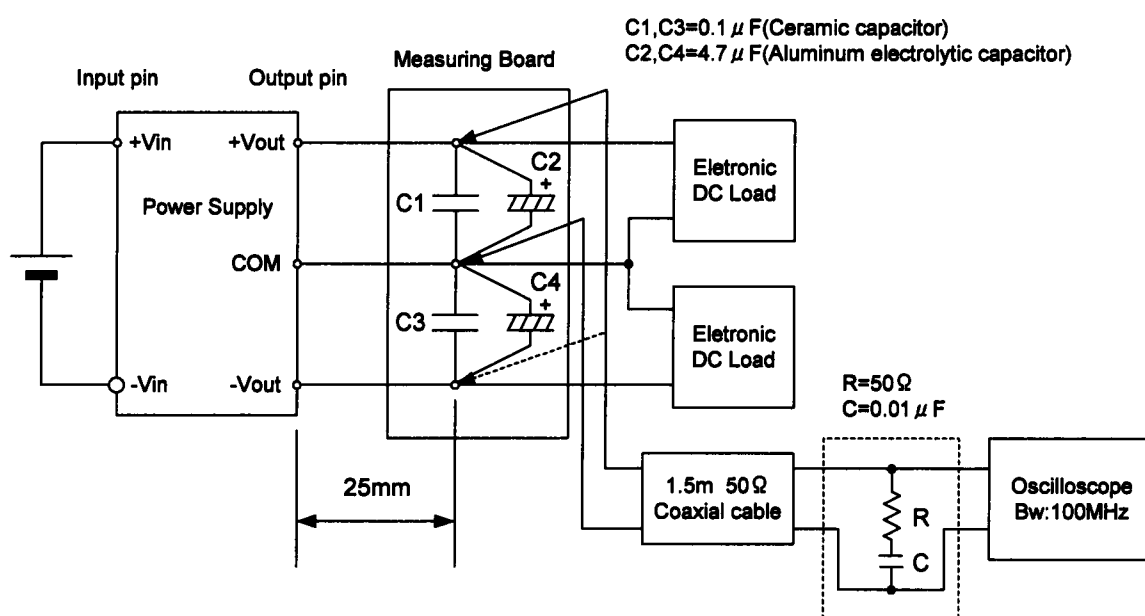


Figure B (Ripple and Ripple noise Characteristic)