



# TEST DATA OF SFS204805

Regulated DC Power Supply  
Sep 6, 2004

Approved by : Isao Yasuda  
Isao Yasuda Design Manager

Prepared by : Kazuhiro Horii  
Kazuhiro Horii Design Engineer

**COSEL CO.,LTD.**

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<p>The graph plots Input Current [A] on the y-axis (0.0 to 1.0) against Load Current [A] on the x-axis (0.0 to 4.0). Three data series are shown: 36V (solid line with triangles), 48V (dashed line with squares), and 76V (dash-dot line with circles). A vertical slanted line is drawn at approximately 4.0A on the x-axis, indicating the rated load current range.</p>				<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Input Volt. 36[V]</th> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.027</td><td>0.020</td><td>0.019</td></tr> <tr><td>0.8</td><td>0.140</td><td>0.106</td><td>0.073</td></tr> <tr><td>1.6</td><td>0.256</td><td>0.193</td><td>0.128</td></tr> <tr><td>2.4</td><td>0.374</td><td>0.281</td><td>0.184</td></tr> <tr><td>3.2</td><td>0.495</td><td>0.370</td><td>0.240</td></tr> <tr><td>4.0</td><td>0.618</td><td>0.461</td><td>0.296</td></tr> <tr><td>4.4</td><td>0.681</td><td>0.506</td><td>0.324</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> </tbody> </table>				Load Current [A]	Input Current [A]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	0.027	0.020	0.019	0.8	0.140	0.106	0.073	1.6	0.256	0.193	0.128	2.4	0.374	0.281	0.184	3.2	0.495	0.370	0.240	4.0	0.618	0.461	0.296	4.4	0.681	0.506	0.324	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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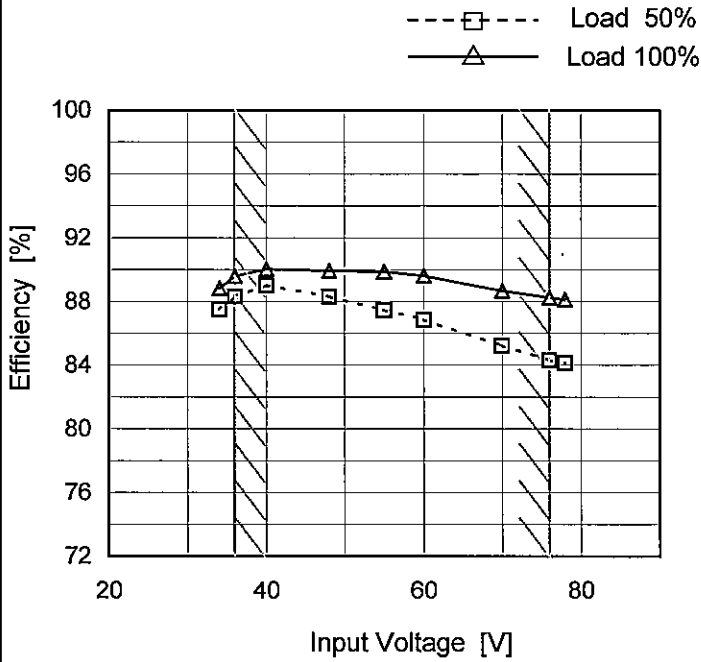
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Model	SFS204805
Item	Efficiency (by Input Voltage)
Object	

Temperature 25°C  
Testing Circuitry Figure A

1. Graph



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

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
34	87.5	88.8
36	88.3	89.6
40	89.0	90.0
48	88.3	90.0
55	87.5	89.9
60	86.9	89.6
70	85.2	88.7
76	84.3	88.3
78	84.2	88.1

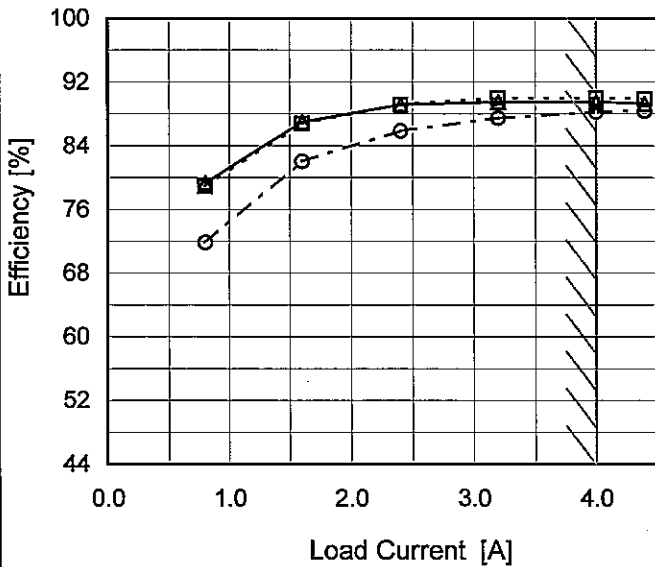


Model	SFS204805
Item	Efficiency (by Load Current)
Object	_____

Temperature 25°C  
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 36V  
- - -□- - - Input Volt. 48V  
- · -○- · - Input Volt. 76V



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

2. Values

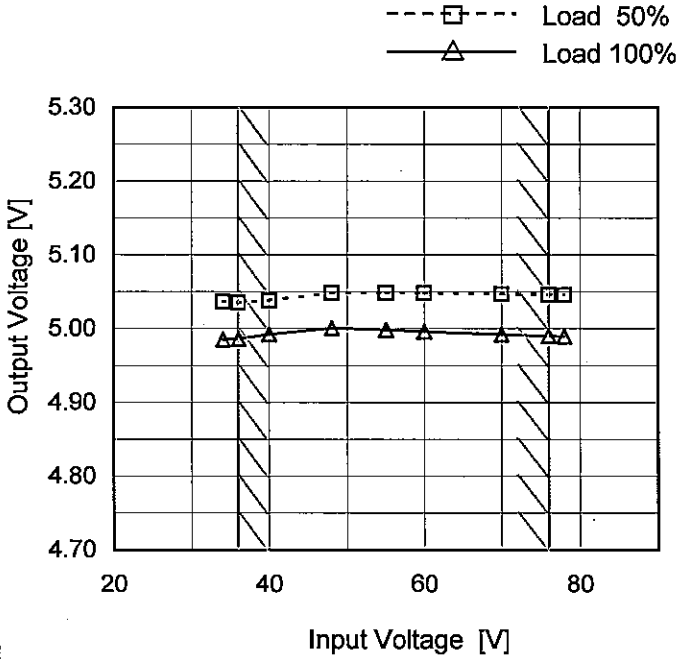
Load Current [A]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	-	-	-
0.8	79.4	78.9	71.9
1.6	87.0	86.8	82.1
2.4	89.2	89.2	85.9
3.2	89.5	90.0	87.5
4.0	89.6	90.0	88.3
4.4	89.3	89.9	88.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-



Model	SFS204805
Item	Line Regulation
Object	+5V4A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph



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

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
34	5.037	4.985
36	5.036	4.986
40	5.038	4.993
48	5.049	5.001
55	5.049	4.999
60	5.049	4.996
70	5.047	4.992
76	5.046	4.990
78	5.046	4.990



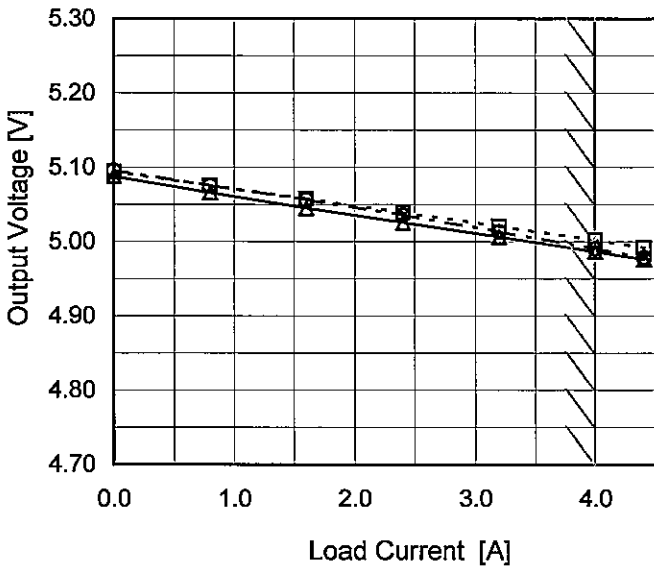


Model	SFS204805
Item	Load Regulation
Object	+5V4A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 36V  
- - - □ - - - Input Volt. 48V  
- - - ○ - - - Input Volt. 76V



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

2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	5.088	5.094	5.096
0.8	5.066	5.075	5.075
1.6	5.045	5.058	5.056
2.4	5.026	5.039	5.036
3.2	5.007	5.021	5.013
4.0	4.987	5.002	4.991
4.4	4.976	4.992	4.979
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--	-	-	-
--	-	-	-
--	-	-	-



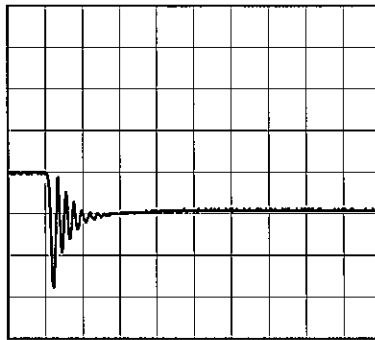
Model	SFS204805	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+5V4A		

Input Volt. 48 V  
Cycle 1000 mS

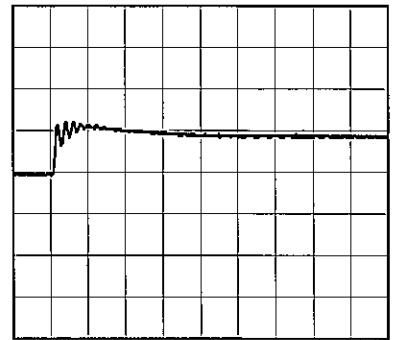
Load Current 4A / 200 μs

Min. Load (0A) ←→  
Load 100% (4A)

100mV/div



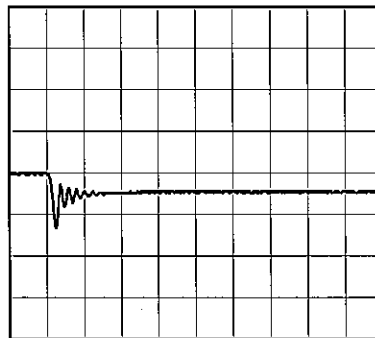
200 μs/div



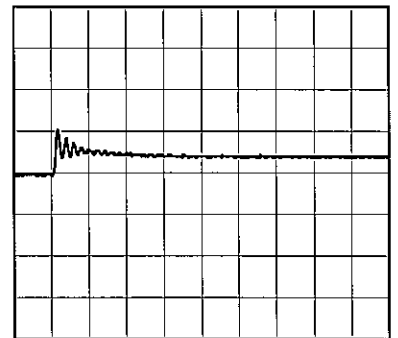
200 μs/div

Min. Load (0A) ←→  
Load 50% (2A)

100mV/div



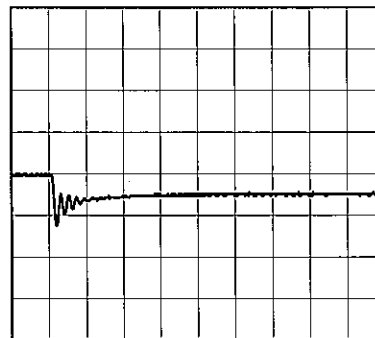
200 μs/div



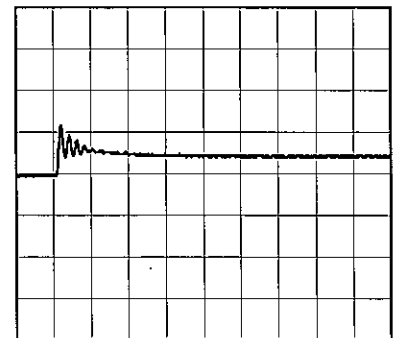
200 μs/div

Load 50% (2A) ←→  
Load 100% (4A)

100mV/div



200 μs/div



200 μs/div



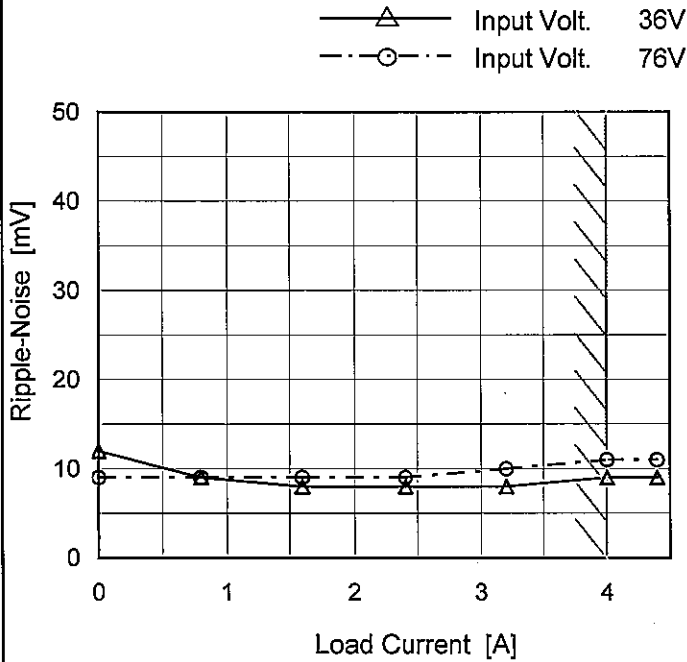
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Load Current [A]	Ripple Voltage [mV]																																										
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<p>Measured by 100MHz Ossilloscope.                      Ripple Voltage is shown as p-p in the figure below.                      Note: Slanted line shows the range of the rated load current.</p>																																											
<p>Ripple [mVp-p]</p> <p>Fig. Complex Ripple Wave Form</p>																																											



Model	SFS204805
Item	Ripple-Noise
Object	+5V4A

Temperature 25°C  
Testing Circuitry Figure C

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.0	12	9
0.8	9	9
1.6	8	9
2.4	8	9
3.2	8	10
4.0	9	11
4.4	9	11
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 100MHz Oscilloscope.  
Ripple-Noise is shown as p-p in the figure below.  
Note: Slanted line shows the range of the rated load current.

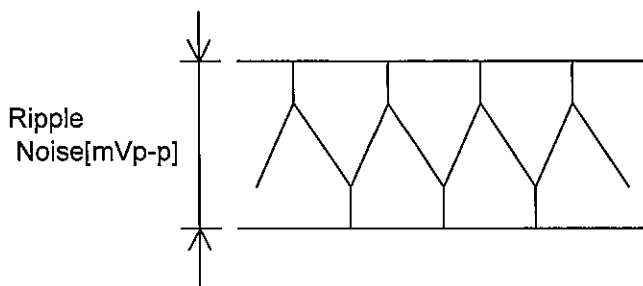


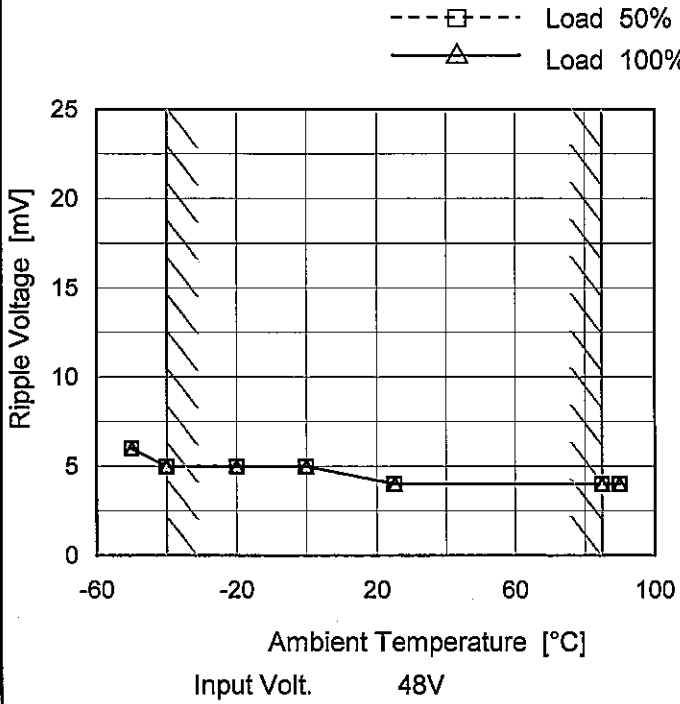
Fig. Complex Ripple Noise Wave Form



Model	SFS204805
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V4A

Testing Circuitry Figure C

1. Graph



2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	6	6
-40	5	5
-20	5	5
0	5	5
25	4	4
85	4	4
90	4	4
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 100MHz Oscilloscope.  
 Note: Slanted line shows the range of the rated ambient temperature.



Model		SFS204805		Testing Circuitry Figure A																																																				
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Object		+5V4A																																																						
1.Graph		—△— Input Volt. 36V - - - □ - - - Input Volt. 48V - · - ○ - · - - Input Volt. 76V		2.Values																																																				
<p>Output Voltage [V]</p> <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. 36[V]</th> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr><td>-45</td><td>4.973</td><td>4.992</td><td>4.979</td></tr> <tr><td>-40</td><td>4.973</td><td>4.993</td><td>4.981</td></tr> <tr><td>-20</td><td>4.977</td><td>4.997</td><td>4.986</td></tr> <tr><td>0</td><td>4.983</td><td>5.003</td><td>4.992</td></tr> <tr><td>25</td><td>4.990</td><td>5.005</td><td>4.994</td></tr> <tr><td>50</td><td>4.991</td><td>5.004</td><td>4.991</td></tr> <tr><td>85</td><td>4.989</td><td>4.999</td><td>4.973</td></tr> <tr><td>90</td><td>4.989</td><td>4.996</td><td>4.971</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>				Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-45	4.973	4.992	4.979	-40	4.973	4.993	4.981	-20	4.977	4.997	4.986	0	4.983	5.003	4.992	25	4.990	5.005	4.994	50	4.991	5.004	4.991	85	4.989	4.999	4.973	90	4.989	4.996	4.971	--	-	-	-	--	-	-	-	--	-	-	-
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<b>COSEL</b>		
Model	SFS204805	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+5V4A	

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 - 85°C

Input Voltage : 36 - 76V

Load Current : 0 - 4A

\* 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

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	85	36	0	5.126	±77	±1.5
Minimum Voltage	85	76	4	4.973		



<b>COSEL</b>																									
Model	SFS204805	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+5V4A																								
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt.     48V Load             100%</p>		<p>2.Values</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>5.004</td></tr> <tr><td>0.5</td><td>5.001</td></tr> <tr><td>1.0</td><td>5.001</td></tr> <tr><td>2.0</td><td>5.001</td></tr> <tr><td>3.0</td><td>5.001</td></tr> <tr><td>4.0</td><td>5.001</td></tr> <tr><td>5.0</td><td>5.001</td></tr> <tr><td>6.0</td><td>5.001</td></tr> <tr><td>7.0</td><td>5.001</td></tr> <tr><td>8.0</td><td>5.001</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	5.004	0.5	5.001	1.0	5.001	2.0	5.001	3.0	5.001	4.0	5.001	5.0	5.001	6.0	5.001	7.0	5.001	8.0	5.001
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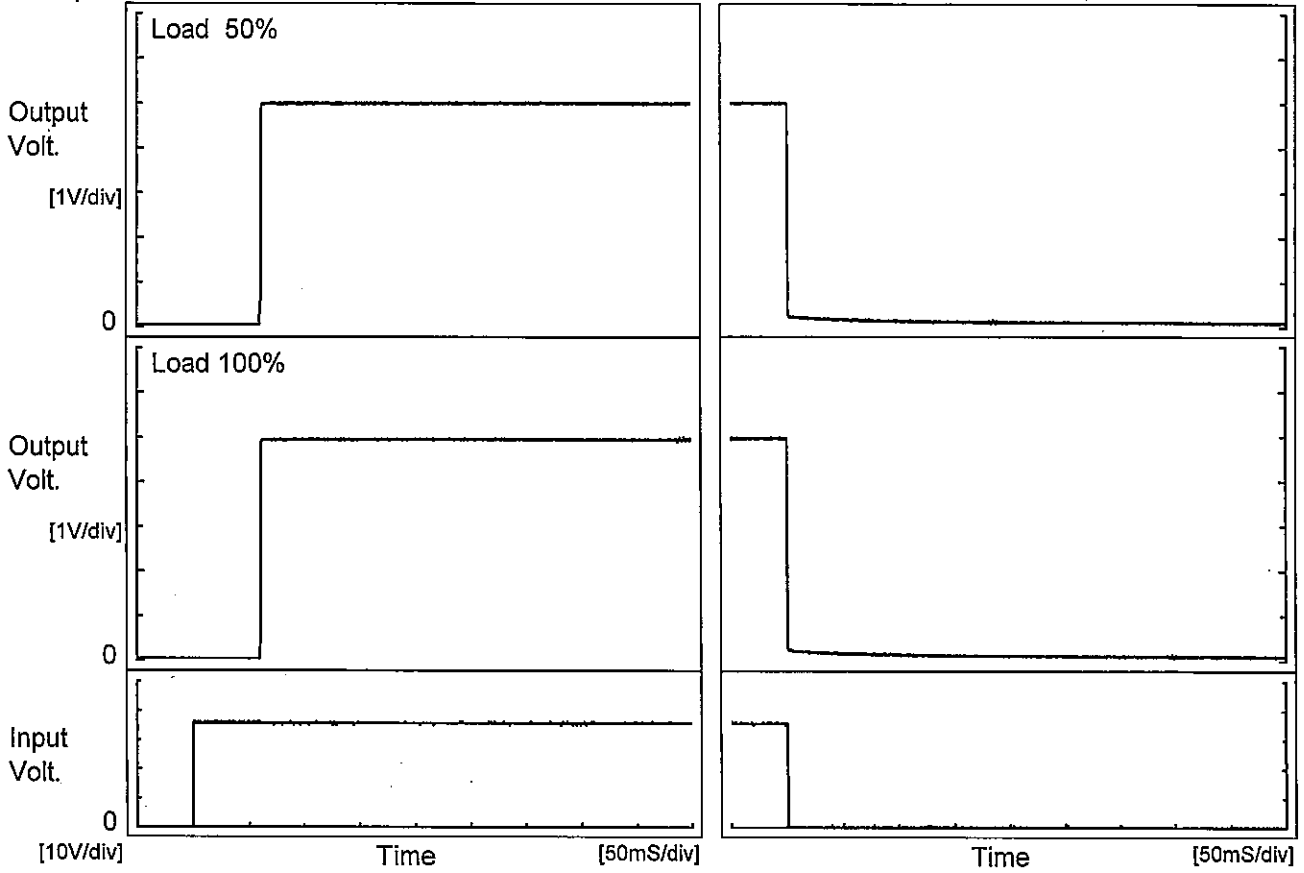




Model	SFS204805	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V4A		

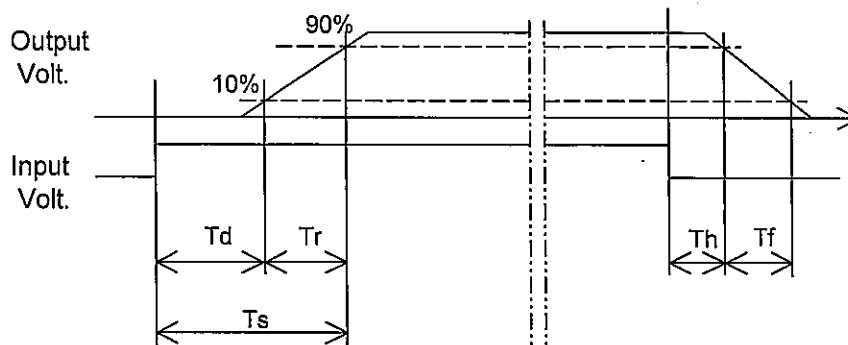
1. Graph

Input Volt. 36 V



2. Values

Load	Time	Td	Tr	Ts	Th	Tf
50 %		60.5	0.3	60.8	0.3	0.5
100 %		60.5	0.4	60.9	0.3	0.5





Model		SFS204805	Testing Circuitry Figure A																																						
Item		Minimum Input Voltage for Regulated Output Voltage																																							
Object		+5V4A																																							
1.Graph		<p>---□--- Load 50% —△— Load 100%</p>	2.Values																																						
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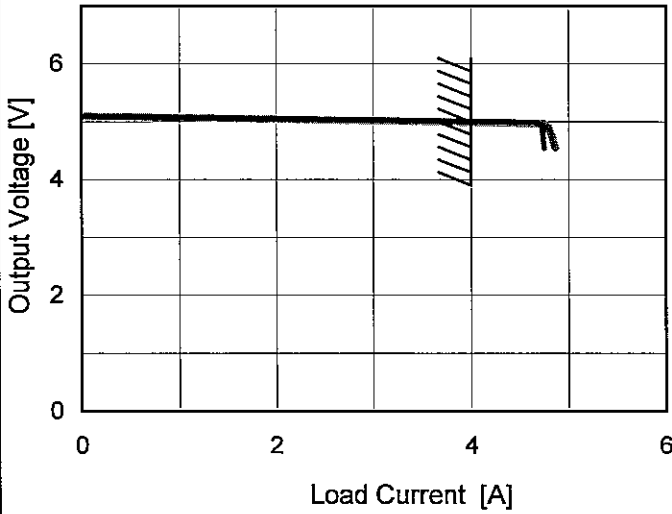


Model	SFS204805
Item	Overcurrent Protection
Object	+5V4A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph

\_\_\_\_\_ Input Volt. 36V  
 \_\_\_\_\_ Input Volt. 48V  
 \_\_\_\_\_ Input Volt. 76V



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

When the output voltage fell to less than 4.5V, the unit shuts off the output by operating low voltage protection.

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
5.00	4.04	4.18	4.05
4.75	4.76	4.74	4.84
4.50	4.76	4.75	4.88
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
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Model		SFS204805	Testing Circuitry Figure A																																																					
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<p style="text-align: center;">Load 0%</p>		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 48[V]</th> <th>Input Volt.</th> <th>Input Volt.</th> </tr> </thead> <tbody> <tr> <td>-40</td> <td>6.68</td> <td>-</td> <td>-</td> </tr> <tr> <td>25</td> <td>6.58</td> <td>-</td> <td>-</td> </tr> <tr> <td>85</td> <td>6.47</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> <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> <tr> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>				Ambient Temperature [°C]	Operating Point [V]			Input Volt. 48[V]	Input Volt.	Input Volt.	-40	6.68	-	-	25	6.58	-	-	85	6.47	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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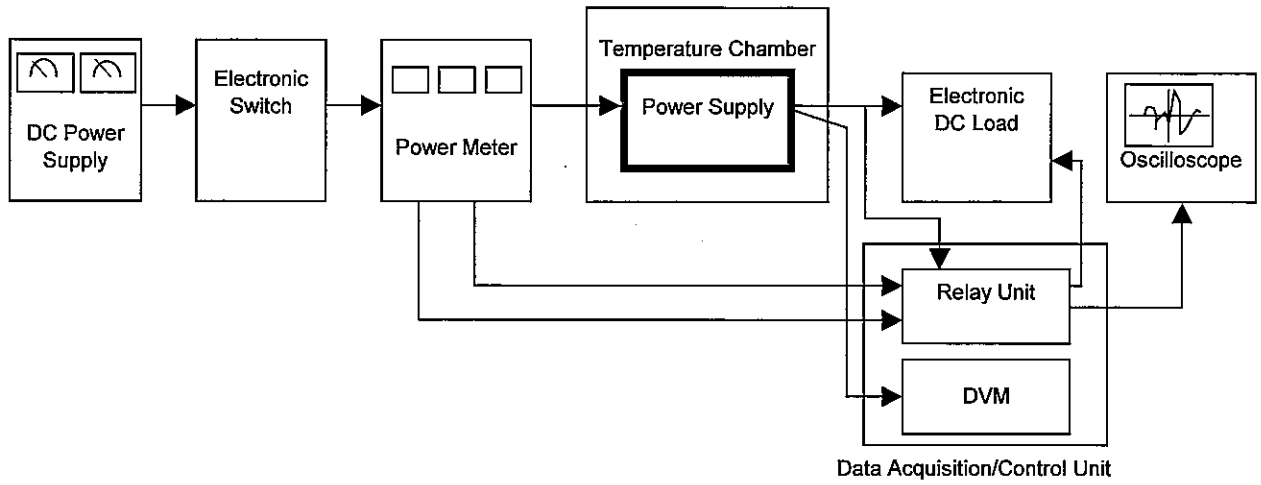


Figure A

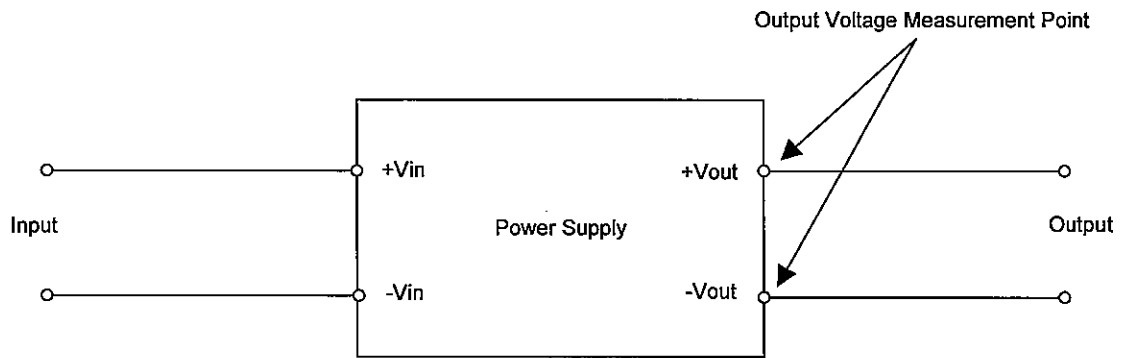


Figure B (General Electric Characteristic)

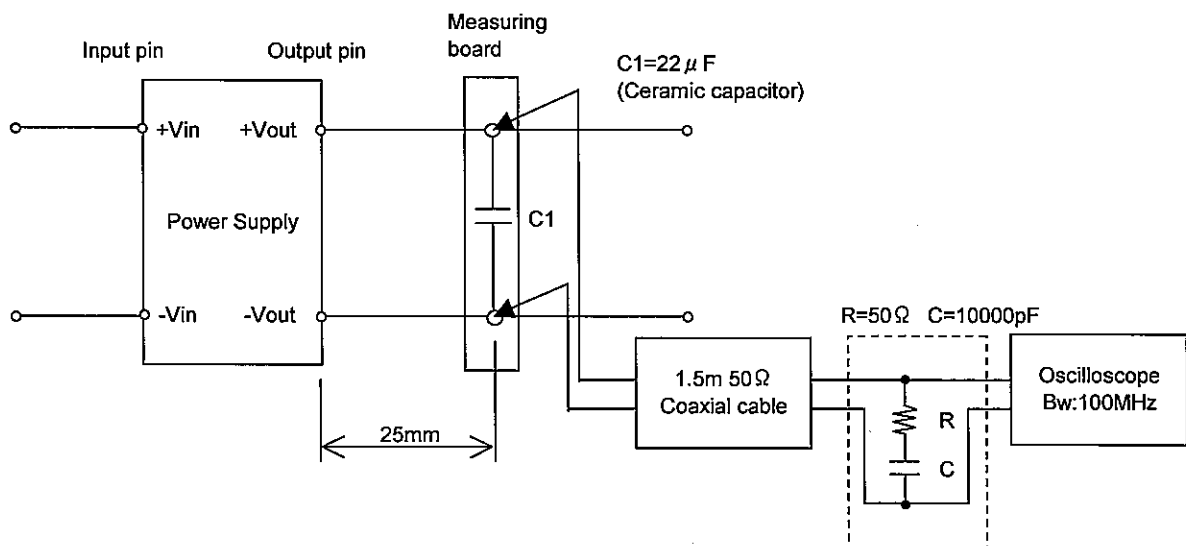


Figure C (Ripple and Ripple noise Characteristic)