



TEST DATA OF SFS302412/SFCS302412

Regulated DC Power Supply
May.29. 2007

Approved by : Toshiyuki Tsuri Design Manager
Toshiyuki Tsuri

Prepared by : K. Shibutani Design Engineer
Kenichi Shibutani

COSEL CO.,LTD.

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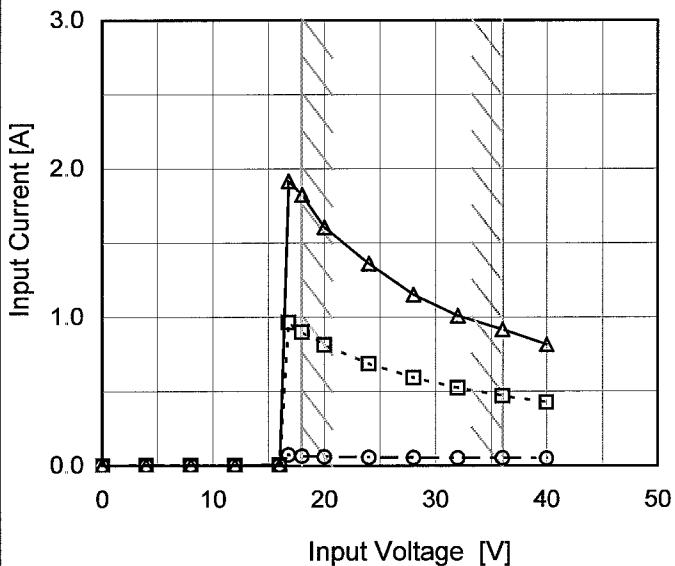
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Model	SFS302412/SFCS302412
Item	Input Current (by Input Voltage)
Object	_____

1. Graph

—△— Load 100%
 - - -□-- Load 50%
 - -○--- Load 0%



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

Temperature 25°C
 Testing Circuitry Figure A

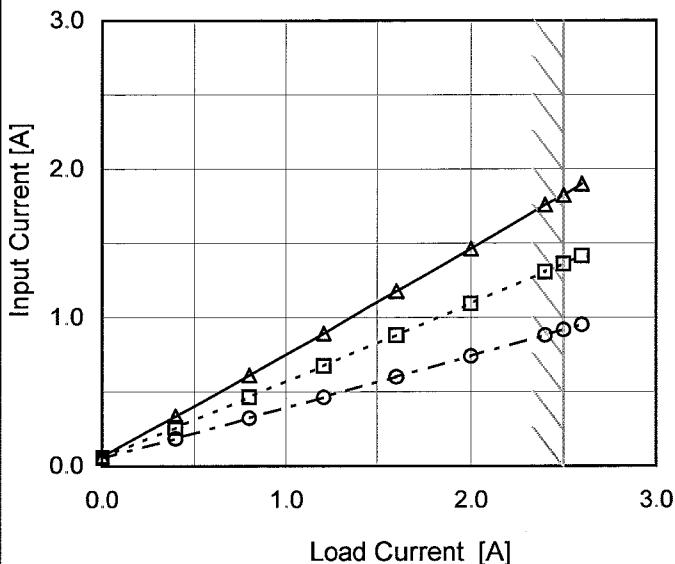
2. Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
4	0.002	0.002	0.002
8	0.002	0.002	0.002
12	0.003	0.003	0.003
16	0.004	0.004	0.004
17	0.073	0.966	1.918
18	0.065	0.900	1.826
20	0.060	0.815	1.608
24	0.057	0.687	1.362
28	0.054	0.593	1.153
32	0.052	0.523	1.010
36	0.051	0.469	0.918
40	0.050	0.426	0.817
--	-	-	-
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Model	SFS302412/SFCS302412
Item	Input Current (by Load Current)
Object	_____

1. Graph

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



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

Temperature 25°C
 Testing Circuitry Figure A

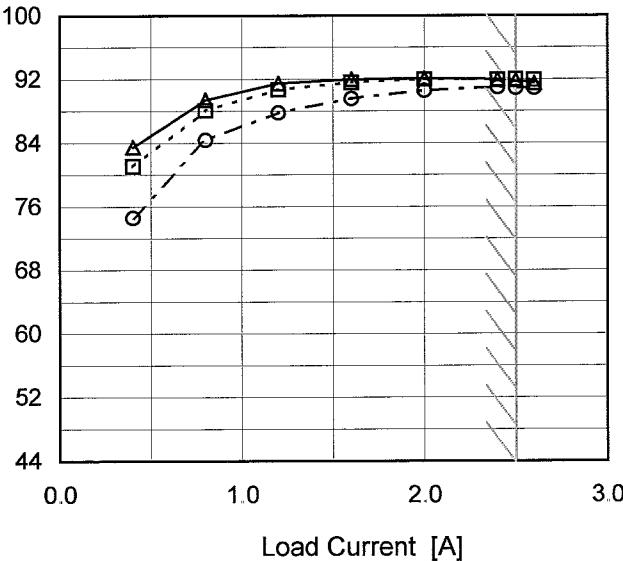
2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	0.065	0.057	0.051
0.4	0.336	0.259	0.186
0.8	0.612	0.465	0.323
1.2	0.894	0.674	0.463
1.6	1.178	0.882	0.602
2.0	1.465	1.094	0.741
2.4	1.760	1.308	0.882
2.5	1.826	1.362	0.918
2.6	1.900	1.415	0.953
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Model	SFS302412/SFCS302412	Temperature Testing Circuitry 25°C Figure A																																																			
Item	Input Power (by Load Current)																																																				
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1.Graph	<p>—△— Input Volt. 18V - - -□- - Input Volt. 24V - - ○ - - Input Volt. 36V</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>18V [W]</th> <th>24V [W]</th> <th>36V [W]</th> </tr> </thead> <tbody> <tr><td>0.4</td><td>6.09</td><td>6.27</td><td>6.79</td></tr> <tr><td>0.8</td><td>11.07</td><td>11.25</td><td>11.72</td></tr> <tr><td>1.2</td><td>16.08</td><td>16.28</td><td>16.75</td></tr> <tr><td>1.6</td><td>21.14</td><td>21.30</td><td>21.77</td></tr> <tr><td>2.0</td><td>26.23</td><td>26.36</td><td>26.74</td></tr> <tr><td>2.4</td><td>31.39</td><td>31.52</td><td>31.82</td></tr> <tr><td>2.5</td><td>32.80</td><td>32.76</td><td>33.20</td></tr> <tr><td>2.6</td><td>34.10</td><td>34.06</td><td>34.40</td></tr> </tbody> </table>	Load Current [A]	18V [W]	24V [W]	36V [W]	0.4	6.09	6.27	6.79	0.8	11.07	11.25	11.72	1.2	16.08	16.28	16.75	1.6	21.14	21.30	21.77	2.0	26.23	26.36	26.74	2.4	31.39	31.52	31.82	2.5	32.80	32.76	33.20	2.6	34.10	34.06	34.40																
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Note: Slanted line shows the range of the rated load current.

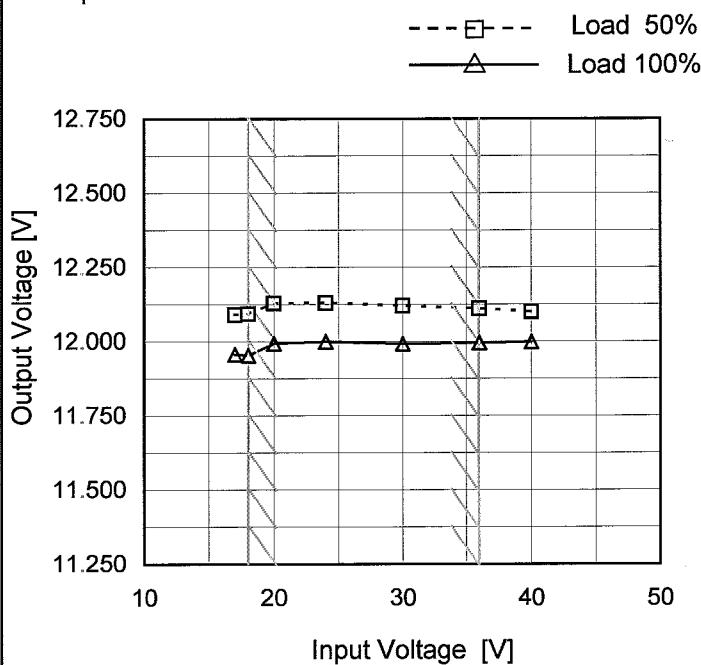
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<p>The graph plots Efficiency [%] on the y-axis (44 to 100) against Input Voltage [V] on the x-axis (10 to 50). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show efficiency remaining high (above 90%) across the input voltage range. A slanted line on the graph indicates the rated input voltage range.</p>																																		
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Model	SFS302412/SFCS302412
Item	Line Regulation
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



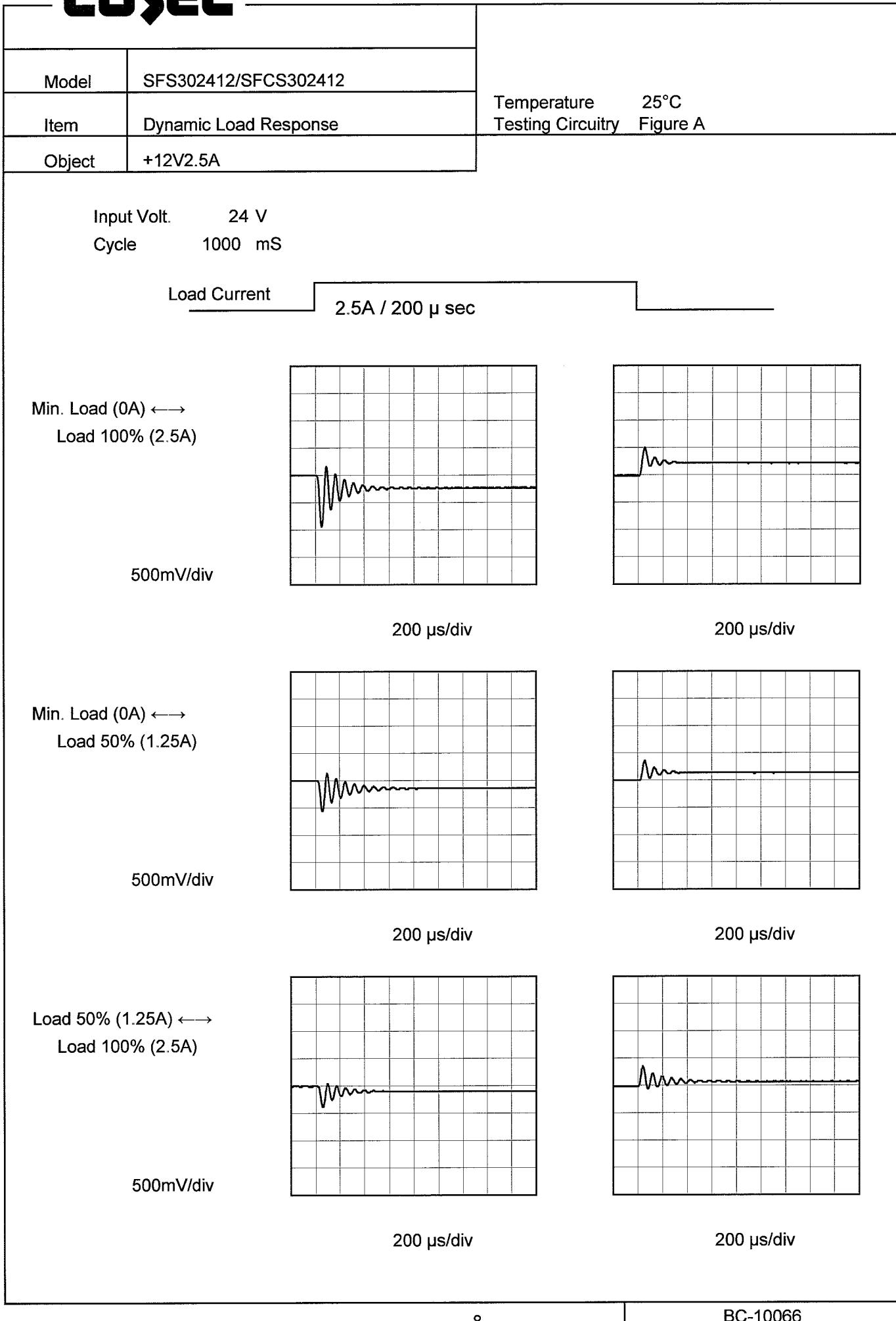
2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.090	11.957
18	12.094	11.954
20	12.129	11.993
24	12.130	12.000
30	12.121	11.992
36	12.111	11.996
40	12.100	11.999
--	-	-
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Note: Slanted line shows the range of the rated input voltage.

Model	SFS302412/SFCS302412																																																					
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1. Graph <div style="display: flex; justify-content: space-between;"> Input Volt. 18V Input Volt. 24V Input Volt. 36V </div> <p>Output Voltage [V]</p> <p>Load Current [A]</p>																																																						
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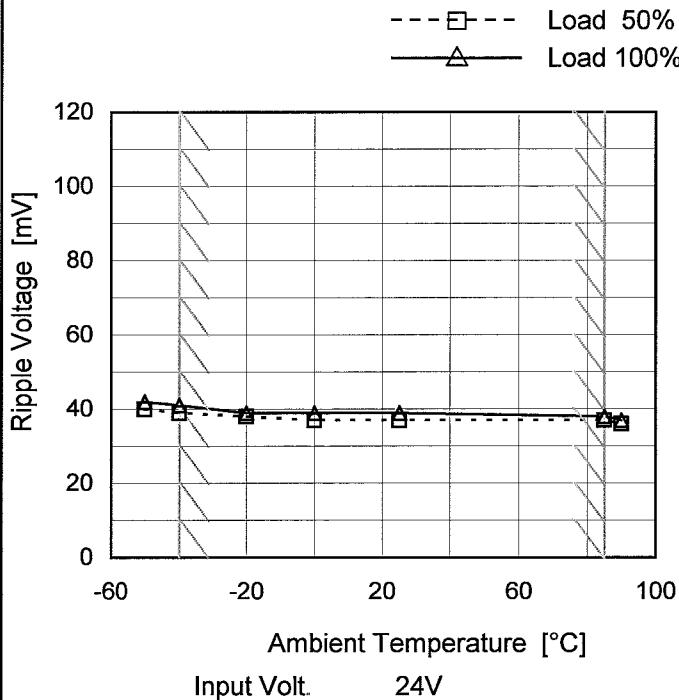


Model	SFS302412/SFCS302412																																						
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure C																																					
Object	+12V2.5A																																						
1.Graph																																							
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 120 mV, and the X-axis ranges from 0 to 3 A. Two sets of data points are plotted: Input Volt. 18V (solid triangles) and Input Volt. 36V (dashed circles). A slanted line indicates the rated load current range.</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (18V)</th> <th>Ripple Voltage [mV] (36V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>27</td><td>46</td></tr> <tr><td>0.6</td><td>27</td><td>46</td></tr> <tr><td>1.2</td><td>27</td><td>46</td></tr> <tr><td>1.8</td><td>27</td><td>46</td></tr> <tr><td>2.4</td><td>27</td><td>46</td></tr> <tr><td>3.0</td><td>27</td><td>47</td></tr> <tr><td>3.3</td><td>27</td><td>49</td></tr> </tbody> </table>		Load Current [A]	Ripple Voltage [mV] (18V)	Ripple Voltage [mV] (36V)	0.0	27	46	0.6	27	46	1.2	27	46	1.8	27	46	2.4	27	46	3.0	27	47	3.3	27	49														
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<p>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> <p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																							

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Item	Ripple-Noise	Temperature 25°C Testing Circuitry Figure C																																					
Object	+12V2.5A																																						
1. Graph																																							
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 150 mV, and the X-axis ranges from 0 to 3 A. Two horizontal lines represent Input Volt. 18V (at ~28 mV) and Input Volt. 36V (at ~47 mV). A slanted line connects the points (0, 28) and (2.5, 47), representing the rated load current range.</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>0.0</td><td>28</td><td>47</td></tr> <tr><td>0.6</td><td>28</td><td>47</td></tr> <tr><td>1.2</td><td>28</td><td>47</td></tr> <tr><td>1.8</td><td>28</td><td>47</td></tr> <tr><td>2.4</td><td>28</td><td>48</td></tr> <tr><td>3.0</td><td>28</td><td>49</td></tr> <tr><td>3.3</td><td>28</td><td>50</td></tr> </tbody> </table>		Load Current [A]	Ripple-Noise [mV] (18V)	Ripple-Noise [mV] (36V)	0.0	28	47	0.6	28	47	1.2	28	47	1.8	28	47	2.4	28	48	3.0	28	49	3.3	28	50														
Load Current [A]	Ripple-Noise [mV] (18V)	Ripple-Noise [mV] (36V)																																					
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<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 18 [V]</th> <th>Input Volt. 36 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>28</td><td>47</td></tr> <tr><td>0.6</td><td>28</td><td>47</td></tr> <tr><td>1.2</td><td>28</td><td>47</td></tr> <tr><td>1.8</td><td>28</td><td>47</td></tr> <tr><td>2.4</td><td>28</td><td>48</td></tr> <tr><td>3.0</td><td>28</td><td>49</td></tr> <tr><td>3.3</td><td>28</td><td>50</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-Noise [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0.0	28	47	0.6	28	47	1.2	28	47	1.8	28	47	2.4	28	48	3.0	28	49	3.3	28	50	--	-	-	--	-	-	--	-	-	--	-	-
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--	-	-																																					
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<p>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.</p> <p>Fig.Complex Ripple Noise Wave Form</p>																																							

Model	SFS302412/SFCS302412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V2.5A

1. Graph



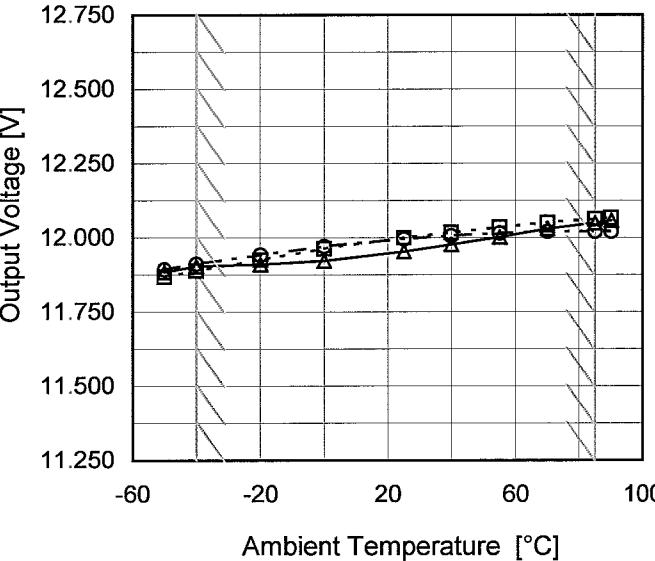
Measured by 100 MHz Oscilloscope.

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

Testing Circuitry Figure C

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	40	42
-40	39	41
-20	38	39
0	37	39
25	37	39
85	37	38
90	36	37
--	-	-
--	-	-
--	-	-
--	-	-

Model	SFS302412/SFCS302412	Testing Circuitry Figure A		
Item	Ambient Temperature Drift			
Object	+12V2.5A			
1.Graph	<p style="text-align: center;"> △ Input Volt. 18V □ Input Volt. 24V ○ Input Volt. 36V </p>  <p style="text-align: center;">Output Voltage [V]</p> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Load 100%</p>	2.Values		
Note:	Slanted line shows the range of the rated ambient temperature.			

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-50	11.885	11.868	11.893
-40	11.904	11.889	11.912
-20	11.911	11.926	11.942
0	11.922	11.963	11.971
25	11.954	12.000	11.996
40	11.977	12.017	12.006
55	12.002	12.034	12.015
70	12.030	12.051	12.021
85	12.050	12.063	12.021
90	12.058	12.067	12.020
--	-	-	-



Model	SFS302412/SFCS302412
Item	Output Voltage Accuracy
Object	+12V2.5A

Testing Circuitry Figure A

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 : 18 - 36V

Load Current : 0 - 2.5A

* 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	85	18	0	12.330	± 221	± 1.8
Minimum Voltage	-40	24	2.5	11.889		



Model	SFS302412/SFCS302412	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+12V2.5A																								
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>11.988</td></tr> <tr><td>0.5</td><td>12.005</td></tr> <tr><td>1.0</td><td>12.005</td></tr> <tr><td>2.0</td><td>12.005</td></tr> <tr><td>3.0</td><td>12.005</td></tr> <tr><td>4.0</td><td>12.005</td></tr> <tr><td>5.0</td><td>12.005</td></tr> <tr><td>6.0</td><td>12.005</td></tr> <tr><td>7.0</td><td>12.005</td></tr> <tr><td>8.0</td><td>12.005</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	11.988	0.5	12.005	1.0	12.005	2.0	12.005	3.0	12.005	4.0	12.005	5.0	12.005	6.0	12.005	7.0	12.005	8.0	12.005
Time since start [H]	Output Voltage [V]																								
0.0	11.988																								
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8.0	12.005																								

COSSEL

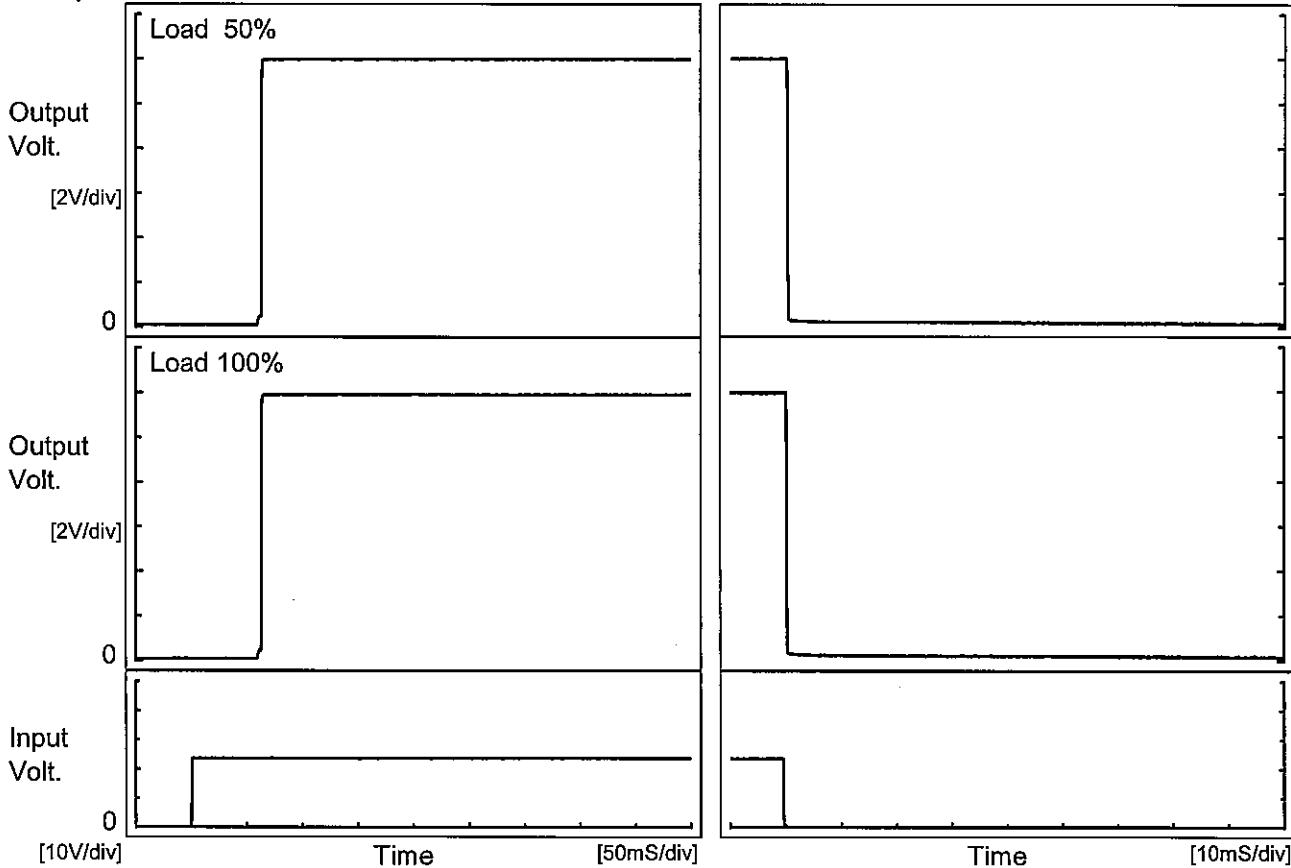
Model SFS302412/SFCS302412

Item Rise and Fall Time

Object +12V2.5A

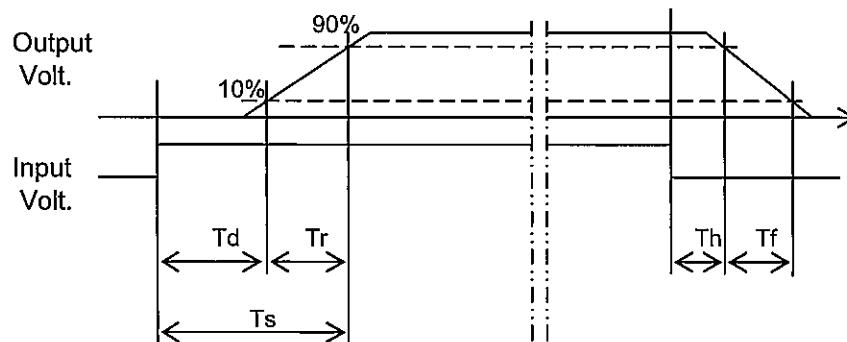
Temperature 25°C
Testing Circuitry Figure A

1. Graph



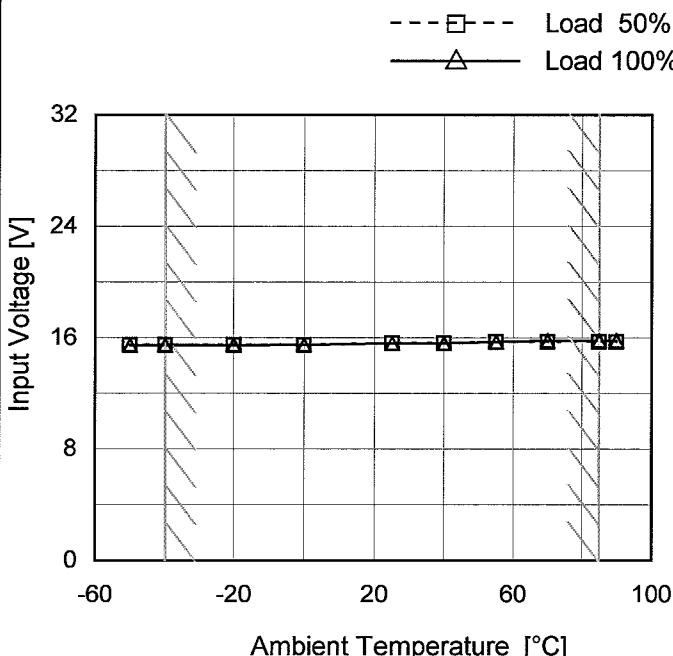
2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[mS]
50 %		61.8	0.6	62.4	0.1	0.6	
100 %		61.8	0.6	62.4	0.1	0.4	



Model	SFS302412/SFCS302412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V2.5A

1. Graph



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

Testing Circuitry Figure A

2. Values

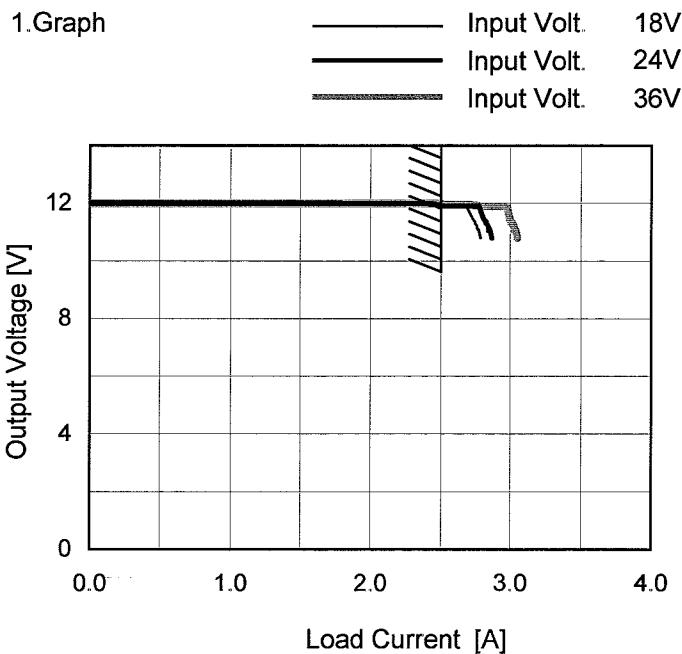
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	15.5	15.5
-40	15.5	15.5
-20	15.5	15.5
0	15.5	15.5
25	15.6	15.6
40	15.6	15.6
55	15.7	15.7
70	15.7	15.8
85	15.7	15.8
90	15.7	15.8
--	-	-

COSEL

Model SFS302412/SFCS302412

Item Overcurrent Protection

Object +12V2.5A



When the output voltage fell to less than 10.8V, the unit shuts off the output by operating low voltage protection.

Temperature 25°C
Testing Circuitry Figure A

2. Values

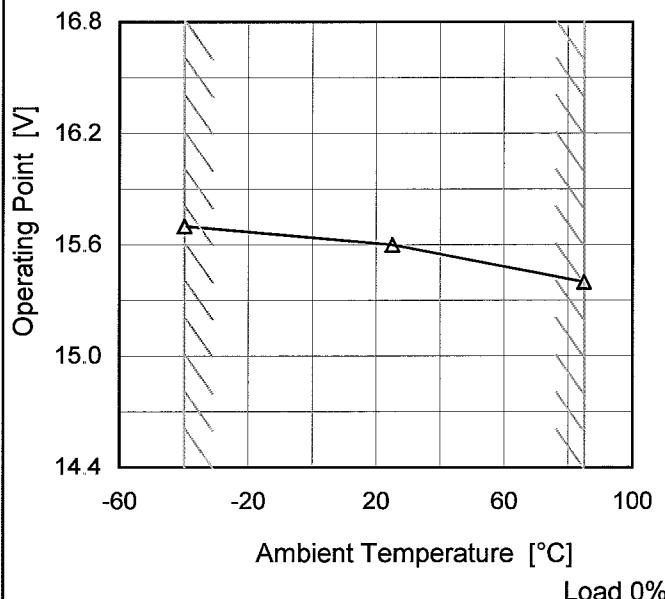
Output Voltage [V]	Load Current [A]		
	18[V]	24[V]	36[V]
12.0	2.54	2.55	2.51
11.4	2.77	2.85	3.01
10.8	2.79	2.87	3.05
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	SFS302412/SFCS302412
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Item	Overvoltage Protection
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Object	+12V2.5A
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1. Graph —△— Input Volt. 24V



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 24[V]	Input Volt.	Input Volt.
-40	15.7	-	-
25	15.6	-	-
85	15.4	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

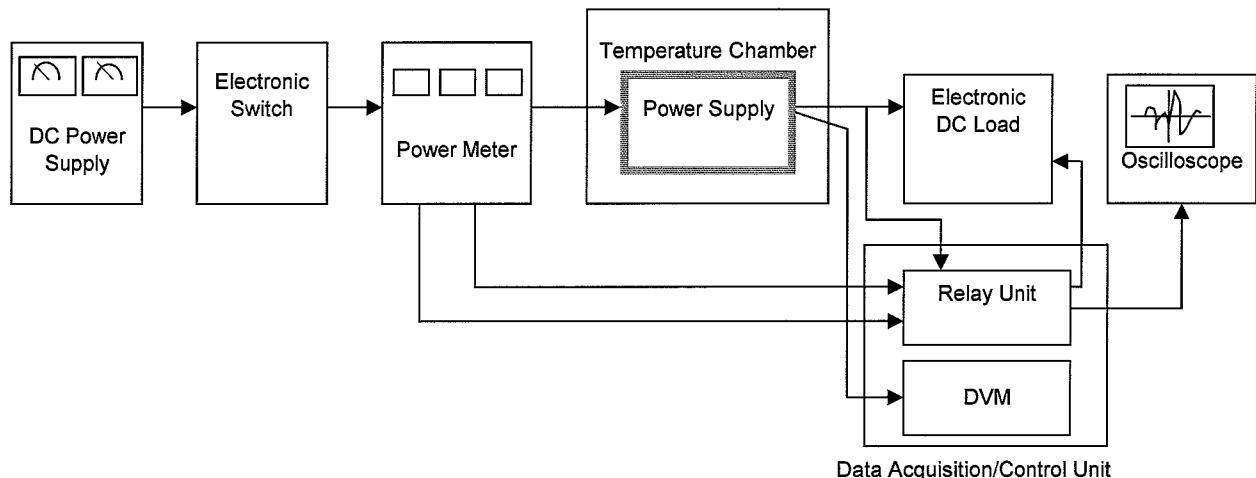


Figure A

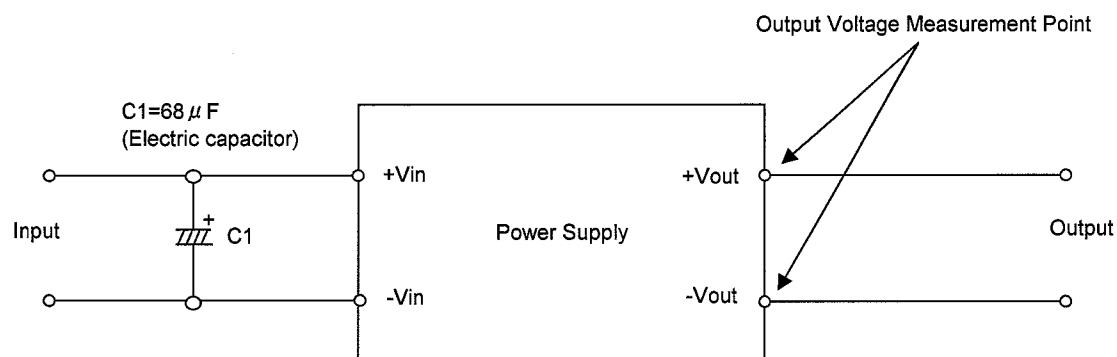


Figure B (General Electric Characteristic)

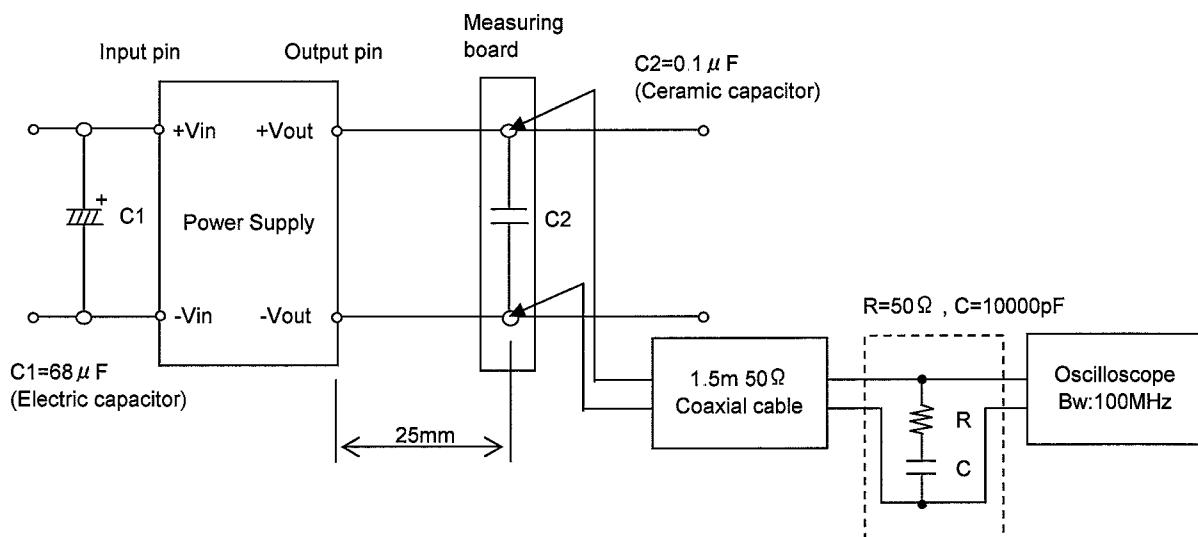


Figure C (Ripple and Ripple noise Characteristic)