



TEST DATA OF SFS30243R3/SFCS30243R3

Regulated DC Power Supply
Jul 20,2006

Approved by : I. Yasuda Isao Yasuda Design Manager

Prepared by : K. Shibutani Kenichi Shibutani Design Engineer

COSEL CO.,LTD.



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Model	SFS30243R3/SFCS30243R3	Temperature	25°C																																																																																																																																											
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<p>Graph showing Input Current [A] vs Input Voltage [V]. The Y-axis ranges from 0.0 to 2.5 A, and the X-axis ranges from 0 to 50 V. Three curves are plotted: Load 100% (triangles), Load 50% (squares), and Load 0% (circles). A vertical dashed line at approximately 17V indicates 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>0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>4</td><td>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>8</td><td>0.002</td><td>0.002</td><td>0.002</td></tr> <tr><td>12</td><td>0.002</td><td>0.002</td><td>0.002</td></tr> <tr><td>16</td><td>0.002</td><td>0.002</td><td>0.002</td></tr> <tr><td>17</td><td>-</td><td>-</td><td>1.931</td></tr> <tr><td>18</td><td>0.046</td><td>0.904</td><td>1.822</td></tr> <tr><td>20</td><td>0.039</td><td>0.819</td><td>1.620</td></tr> <tr><td>24</td><td>0.037</td><td>0.684</td><td>1.358</td></tr> <tr><td>28</td><td>0.035</td><td>0.589</td><td>1.148</td></tr> <tr><td>32</td><td>0.034</td><td>0.520</td><td>1.006</td></tr> <tr><td>36</td><td>0.034</td><td>0.464</td><td>0.904</td></tr> <tr><td>40</td><td>0.033</td><td>0.421</td><td>0.808</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]	Load 0% [A]	Load 50% [A]	Load 100% [A]	0	0.000	0.000	0.000	4	0.003	0.003	0.003	8	0.002	0.002	0.002	12	0.002	0.002	0.002	16	0.002	0.002	0.002	17	-	-	1.931	18	0.046	0.904	1.822	20	0.039	0.819	1.620	24	0.037	0.684	1.358	28	0.035	0.589	1.148	32	0.034	0.520	1.006	36	0.034	0.464	0.904	40	0.033	0.421	0.808	--	-	-	-	--	-	-	-	--	-	-	-	<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</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>4</td><td>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>8</td><td>0.002</td><td>0.002</td><td>0.002</td></tr> <tr><td>12</td><td>0.002</td><td>0.002</td><td>0.002</td></tr> <tr><td>16</td><td>0.002</td><td>0.002</td><td>0.002</td></tr> <tr><td>17</td><td>0.050</td><td>0.971</td><td>1.931</td></tr> <tr><td>18</td><td>0.046</td><td>0.904</td><td>1.822</td></tr> <tr><td>20</td><td>0.039</td><td>0.819</td><td>1.620</td></tr> <tr><td>24</td><td>0.037</td><td>0.684</td><td>1.358</td></tr> <tr><td>28</td><td>0.035</td><td>0.589</td><td>1.148</td></tr> <tr><td>32</td><td>0.034</td><td>0.520</td><td>1.006</td></tr> <tr><td>36</td><td>0.034</td><td>0.464</td><td>0.904</td></tr> <tr><td>40</td><td>0.033</td><td>0.421</td><td>0.808</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	0.000	0.000	0.000	4	0.003	0.003	0.003	8	0.002	0.002	0.002	12	0.002	0.002	0.002	16	0.002	0.002	0.002	17	0.050	0.971	1.931	18	0.046	0.904	1.822	20	0.039	0.819	1.620	24	0.037	0.684	1.358	28	0.035	0.589	1.148	32	0.034	0.520	1.006	36	0.034	0.464	0.904	40	0.033	0.421	0.808	--	-	-	-	--	-	-	-	--	-	-	-		
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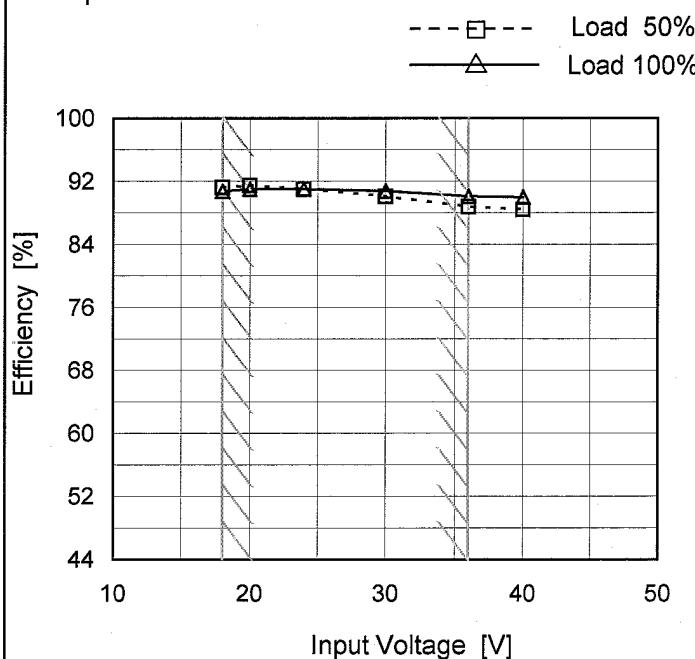
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<p>The graph plots Input Power [W] on the Y-axis (0 to 50) against Load Current [A] on the X-axis (0 to 10). Three curves are shown for Input Voltages of 18V, 24V, and 36V. The 18V curve starts at (0,0) and ends at approximately (9.2, 33.32). The 24V curve starts at (0,0) and ends at approximately (9.0, 32.59). The 36V curve starts at (0,0) and ends at approximately (7.5, 27.08). A slanted line is drawn through the data points, representing the rated load current range.</p>																																																					
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Model	SFS30243R3/SFCS30243R3
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%
17	91.3	90.6
18	91.8	91.0
20	91.7	91.3
24	91.2	91.3
30	90.4	91.0
36	89.3	90.7
40	88.5	90.3
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<p>—△— Input Volt. 18V - - □ - - Input Volt. 24V - - ○ - - Input Volt. 36V</p> <p>The graph shows efficiency increasing from approximately 75% at 1A to 92% at 6A, then remaining relatively constant up to 10A. A slanted line is drawn through the 6A point, indicating the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Efficiency [18V] %</th> <th>Efficiency [24V] %</th> <th>Efficiency [36V] %</th> </tr> </thead> <tbody> <tr><td>1.5</td><td>85.1</td><td>84.0</td><td>79.2</td></tr> <tr><td>3.0</td><td>90.3</td><td>89.6</td><td>86.8</td></tr> <tr><td>4.5</td><td>91.8</td><td>91.2</td><td>89.3</td></tr> <tr><td>6.0</td><td>91.9</td><td>91.6</td><td>90.3</td></tr> <tr><td>7.5</td><td>91.5</td><td>91.7</td><td>90.7</td></tr> <tr><td>9.0</td><td>91.0</td><td>91.3</td><td>90.7</td></tr> <tr><td>9.2</td><td>90.9</td><td>91.3</td><td>90.6</td></tr> </tbody> </table>		Load Current [A]	Efficiency [18V] %	Efficiency [24V] %	Efficiency [36V] %	1.5	85.1	84.0	79.2	3.0	90.3	89.6	86.8	4.5	91.8	91.2	89.3	6.0	91.9	91.6	90.3	7.5	91.5	91.7	90.7	9.0	91.0	91.3	90.7	9.2	90.9	91.3	90.6																				
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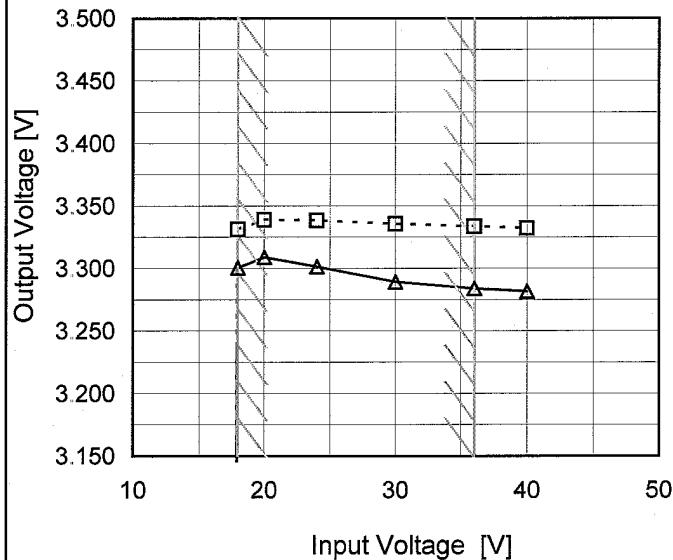
Model	SFS30243R3/SFCS30243R3
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Item	Line Regulation
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Object	+3.3V9A
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1. Graph

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



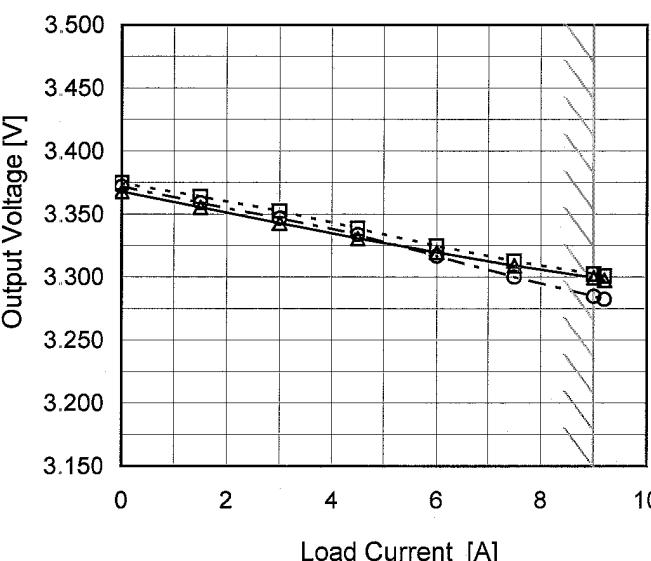
Note: Slanted line shows the range of the rated input voltage.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	3.327	3.294
18	3.332	3.301
20	3.340	3.308
24	3.338	3.300
30	3.336	3.289
36	3.334	3.284
40	3.332	3.281
--	-	-
--	-	-

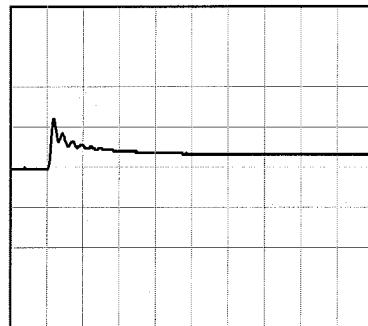
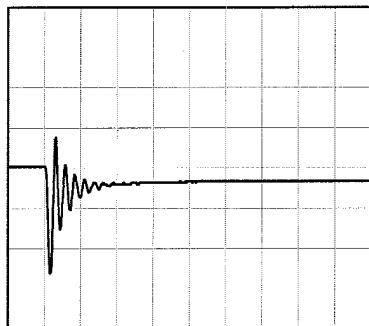
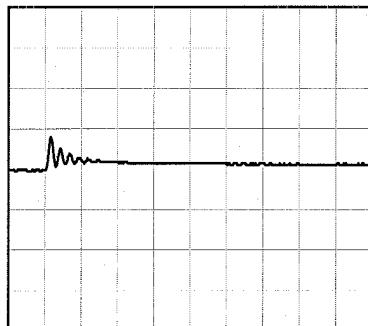
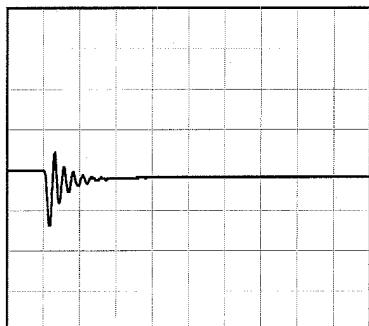
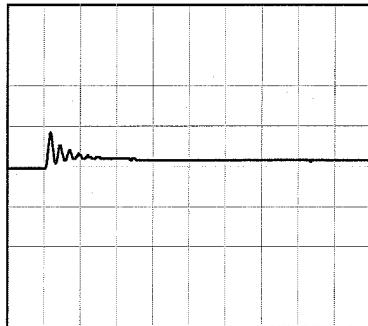
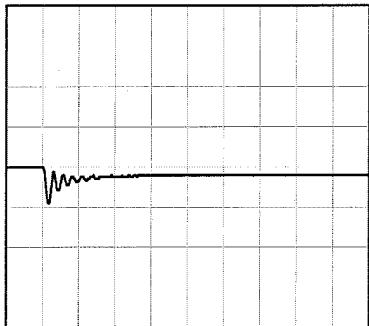
COSEL

Model	SFS30243R3/SFCS30243R3	Temperature	25°C
Item	Load Regulation	Testing Circuitry	Figure A
Object	+3.3V9A		
1. Graph	<p>—△— Input Volt. 18V - - -□--- Input Volt. 24V - - ○--- Input Volt. 36V</p>  <p>Output Voltage [V]</p> <p>Load Current [A]</p>	2. Values	
Load Current [A]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	3.369	3.375	3.371
1.5	3.356	3.364	3.359
3.0	3.344	3.352	3.346
4.5	3.332	3.338	3.333
6.0	3.320	3.324	3.316
7.5	3.310	3.311	3.299
9.0	3.300	3.300	3.284
9.2	3.298	3.298	3.281
--	-	-	-
--	-	-	-
--	-	-	-

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

COSEL

Model	SFS30243R3/SFCS30243R3
Item	Dynamic Load Response
Object	+3.3V9A

Temperature 25°C
Testing Circuitry Figure AInput Volt. 24 V
Cycle 1000 mSMin. Load (0A) ↔
Load 100% (9A)Min. Load (0A) ↔
Load 50% (4.5A)Load 50% (4.5A) ↔
Load 100% (9A)

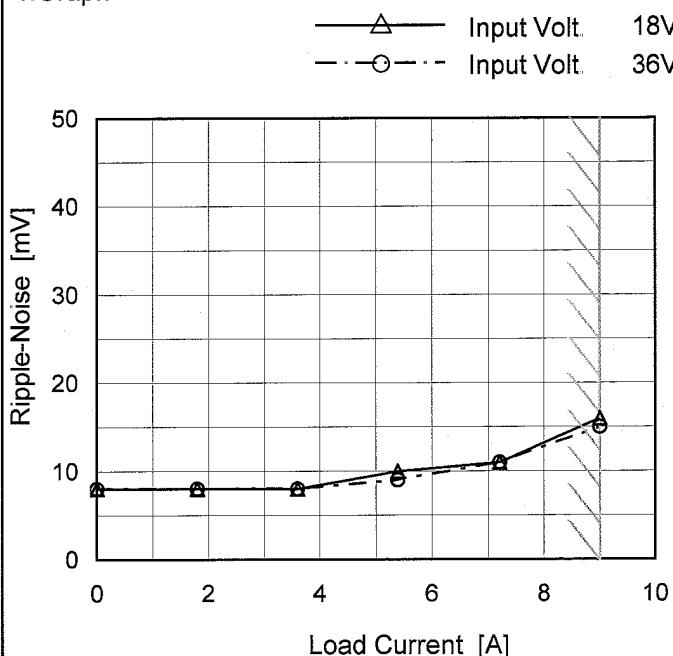
COSEL

Model	SFS30243R3/SFCS30243R3																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure C																																						
Object	+3.3V9A																																							
1. Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 25 mV, and the X-axis ranges from 0 to 10 A. Data points are plotted at 0, 2, 4, 6, 8, and 9.0 A. A slanted line indicates the range of rated load current.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (Input Volt. 18V)</th> <th>Ripple Voltage [mV] (Input Volt. 36V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>1</td><td>2</td></tr> <tr><td>1.8</td><td>1</td><td>2</td></tr> <tr><td>3.6</td><td>1</td><td>2</td></tr> <tr><td>5.4</td><td>1</td><td>2</td></tr> <tr><td>7.2</td><td>1</td><td>2</td></tr> <tr><td>9.0</td><td>1</td><td>2</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> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV] (Input Volt. 18V)	Ripple Voltage [mV] (Input Volt. 36V)	0.0	1	2	1.8	1	2	3.6	1	2	5.4	1	2	7.2	1	2	9.0	1	2	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-		
Load Current [A]	Ripple Voltage [mV] (Input Volt. 18V)	Ripple Voltage [mV] (Input Volt. 36V)																																						
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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>																																								

COSEL

Model	SFS30243R3/SFCS30243R3
Item	Ripple-Noise
Object	+3.3V9A

1. Graph



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.

Temperature 25°C
Testing Circuitry Figure C

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	8	8
1.8	8	8
3.6	8	8
5.4	10	9
7.2	11	11
9.0	16	15
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

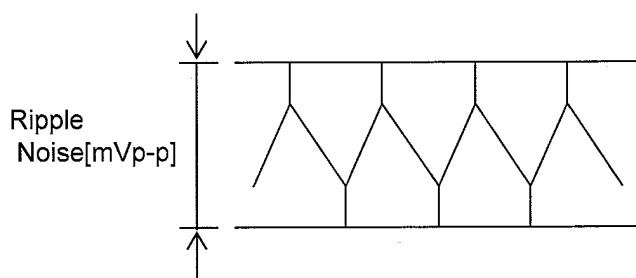


Fig.Complex Ripple Noise Wave Form

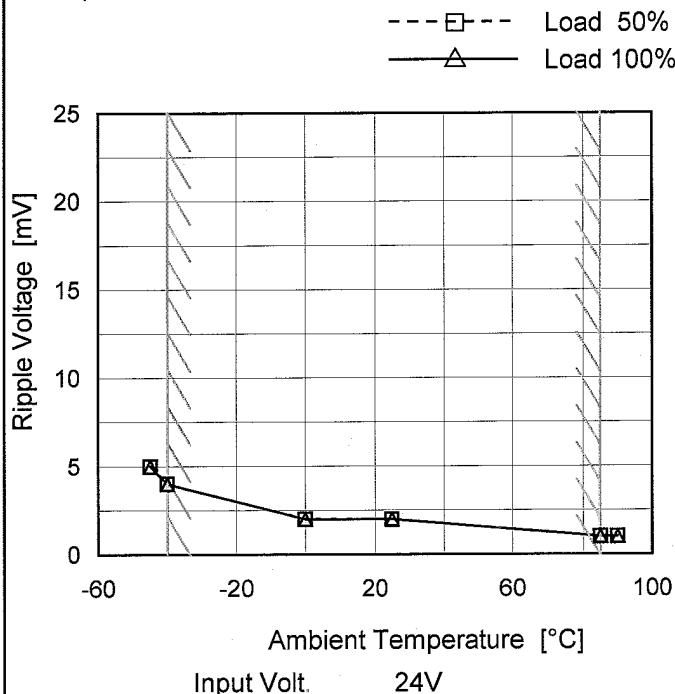
COSEL

Model	SFS30243R3/SFCS30243R3
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Item	Ripple Voltage (by Ambient Temp.)
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Object	+3.3V9A
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1. Graph



Measured by 100 MHz Oscilloscope.

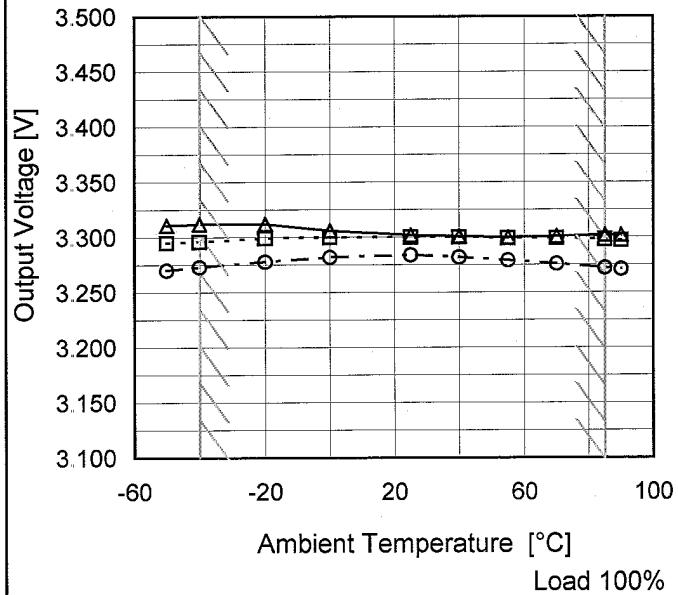
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure C

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-45	5	5
-40	4	4
0	2	2
25	2	2
85	1	1
90	1	1
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SFS30243R3/SFCS30243R3																																																					
Item	Ambient Temperature Drift																																																					
Object	+3.3V9A																																																					
1.Graph	—△— Input Volt. 18V - - □--- Input Volt. 24V - - ○--- Input Volt. 36V																																																					
	 <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																					
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Testing Circuitry	Figure A																																																					
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Model	SFS30243R3/SFCS30243R3	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+3.3V9A	

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 - 9A

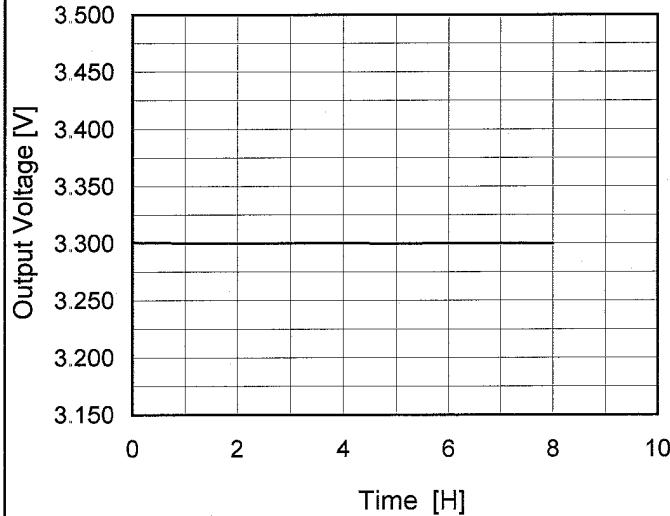
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	85	18	0	3.384	± 56	± 1.7
Minimum Voltage	85	36	9	3.272		

COSEL

Model	SFS30243R3/SFCS30243R3	Temperature 25°C Testing Circuitry Figure A																						
Item	Time Lapse Drift																							
Object	+3.3V9A																							
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>3.302</td></tr> <tr><td>0.5</td><td>3.301</td></tr> <tr><td>1.0</td><td>3.300</td></tr> <tr><td>2.0</td><td>3.300</td></tr> <tr><td>3.0</td><td>3.300</td></tr> <tr><td>4.0</td><td>3.300</td></tr> <tr><td>5.0</td><td>3.300</td></tr> <tr><td>6.0</td><td>3.300</td></tr> <tr><td>7.0</td><td>3.300</td></tr> <tr><td>8.0</td><td>3.300</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	3.302	0.5	3.301	1.0	3.300	2.0	3.300	3.0	3.300	4.0	3.300	5.0	3.300	6.0	3.300	7.0	3.300	8.0	3.300
Time since start [H]	Output Voltage [V]																							
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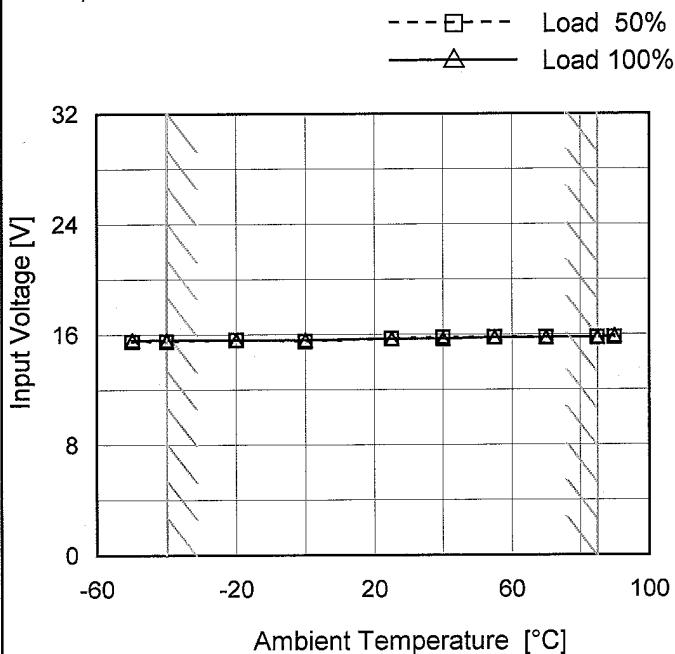
COSEL

Model	SFS30243R3/SFCS30243R3	Temperature Testing Circuitry	25°C Figure A																					
Item	Rise and Fall Time																							
Object	+3.3V9A																							
1.Graph			Input Volt. 24 V																					
2.Values			[mS]																					
<table border="1"> <thead> <tr> <th>Load</th> <th>Time</th> <th>Td</th> <th>Tr</th> <th>Ts</th> <th>Th</th> <th>Tf</th> </tr> </thead> <tbody> <tr> <td>50 %</td> <td></td> <td>57.8</td> <td>0.6</td> <td>58.4</td> <td>0.1</td> <td>0.1</td> </tr> <tr> <td>100 %</td> <td></td> <td>57.3</td> <td>0.6</td> <td>57.9</td> <td>0.1</td> <td>0.1</td> </tr> </tbody> </table>				Load	Time	Td	Tr	Ts	Th	Tf	50 %		57.8	0.6	58.4	0.1	0.1	100 %		57.3	0.6	57.9	0.1	0.1
Load	Time	Td	Tr	Ts	Th	Tf																		
50 %		57.8	0.6	58.4	0.1	0.1																		
100 %		57.3	0.6	57.9	0.1	0.1																		

COSEL

Model	SFS30243R3/SFCS30243R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V9A

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	15.6
-40	15.5	15.6
-20	15.6	15.6
0	15.5	15.6
25	15.7	15.7
40	15.8	15.7
55	15.8	15.8
70	15.8	15.8
85	15.8	15.8
90	15.8	15.9
--	-	-



Model	SFS30243R3/SFCS30243R3	Temperature	25°C																																																																			
Item	Overcurrent Protection	Testing Circuitry	Figure A																																																																			
Object	+3.3V9A																																																																					
1. Graph		2. Values																																																																				
<p>Input Volt. 18V Input Volt. 24V Input Volt. 36V</p> <table border="1"> <caption>Estimated data points from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (18V Input)</th> <th>Output Voltage [V] (24V Input)</th> <th>Output Voltage [V] (36V Input)</th> </tr> </thead> <tbody> <tr><td>0</td><td>3.30</td><td>3.30</td><td>3.30</td></tr> <tr><td>4</td><td>3.30</td><td>3.30</td><td>3.30</td></tr> <tr><td>8</td><td>2.97</td><td>2.97</td><td>2.97</td></tr> <tr><td>12</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Output Voltage [V] (18V Input)	Output Voltage [V] (24V Input)	Output Voltage [V] (36V Input)	0	3.30	3.30	3.30	4	3.30	3.30	3.30	8	2.97	2.97	2.97	12	-	-	-																																																	
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Output Voltage [V]	Load Current [A]																																																																					
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3.14	9.84	9.84	9.96																																																																			
2.97	9.80	9.83	9.99																																																																			
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Model	SFS30243R3/SFCS30243R3	Testing Circuitry Figure A																																																																									
Item	Overvoltage Protection																																																																										
Object	+3.3V9A																																																																										
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<p>Note: Slanted line shows the range of the rated ambient temperature.</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. 24[V]</th> <th>Input Volt.</th> <th>Input Volt.</th> </tr> </thead> <tbody> <tr><td>-40</td><td>4.51</td><td>-</td><td>-</td></tr> <tr><td>25</td><td>4.47</td><td>-</td><td>-</td></tr> <tr><td>85</td><td>4.43</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. 24[V]	Input Volt.	Input Volt.	-40	4.51	-	-	25	4.47	-	-	85	4.43	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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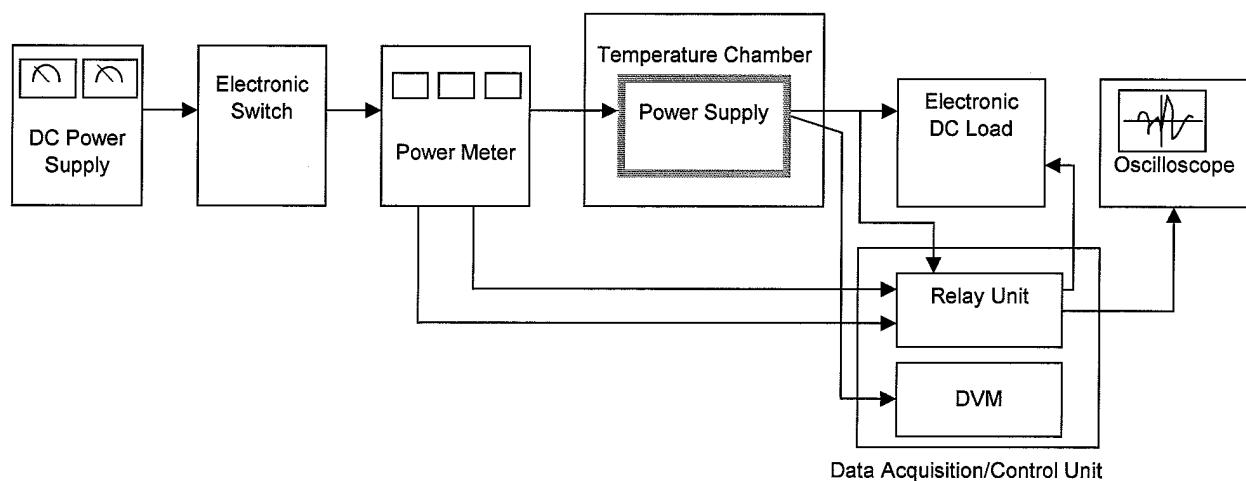


Figure A

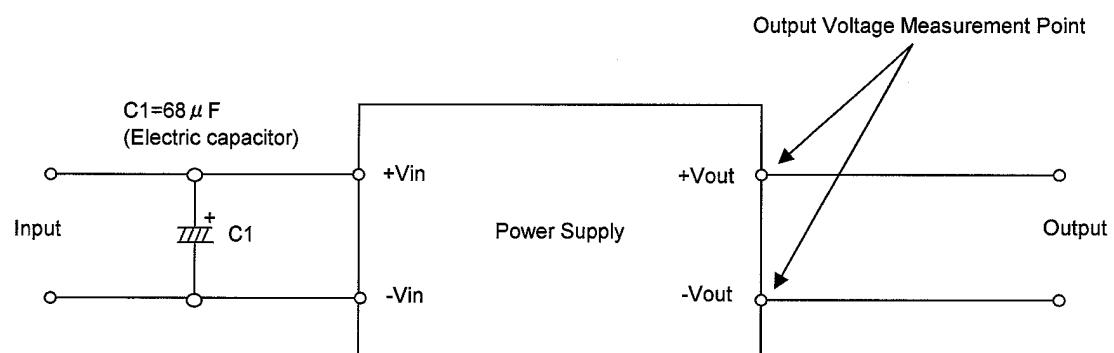


Figure B (General Electric Characteristic)

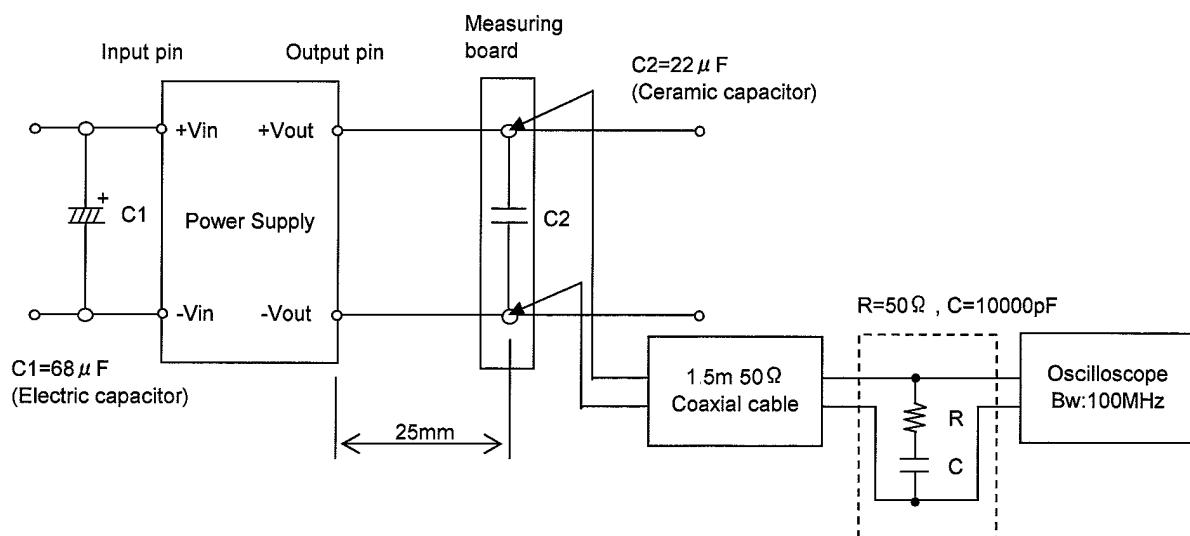


Figure C (Ripple and Ripple noise Characteristic)