

TEST DATA OF SFS10481R5

Regulated DC Power Supply
Jul.9. 2004

Approved by : Isao Yasuda
Isao Yasuda Design Manager

Prepared by : Tatsuya Mano
Tatsuya Mano Design Engineer

COSEL CO.,LTD.

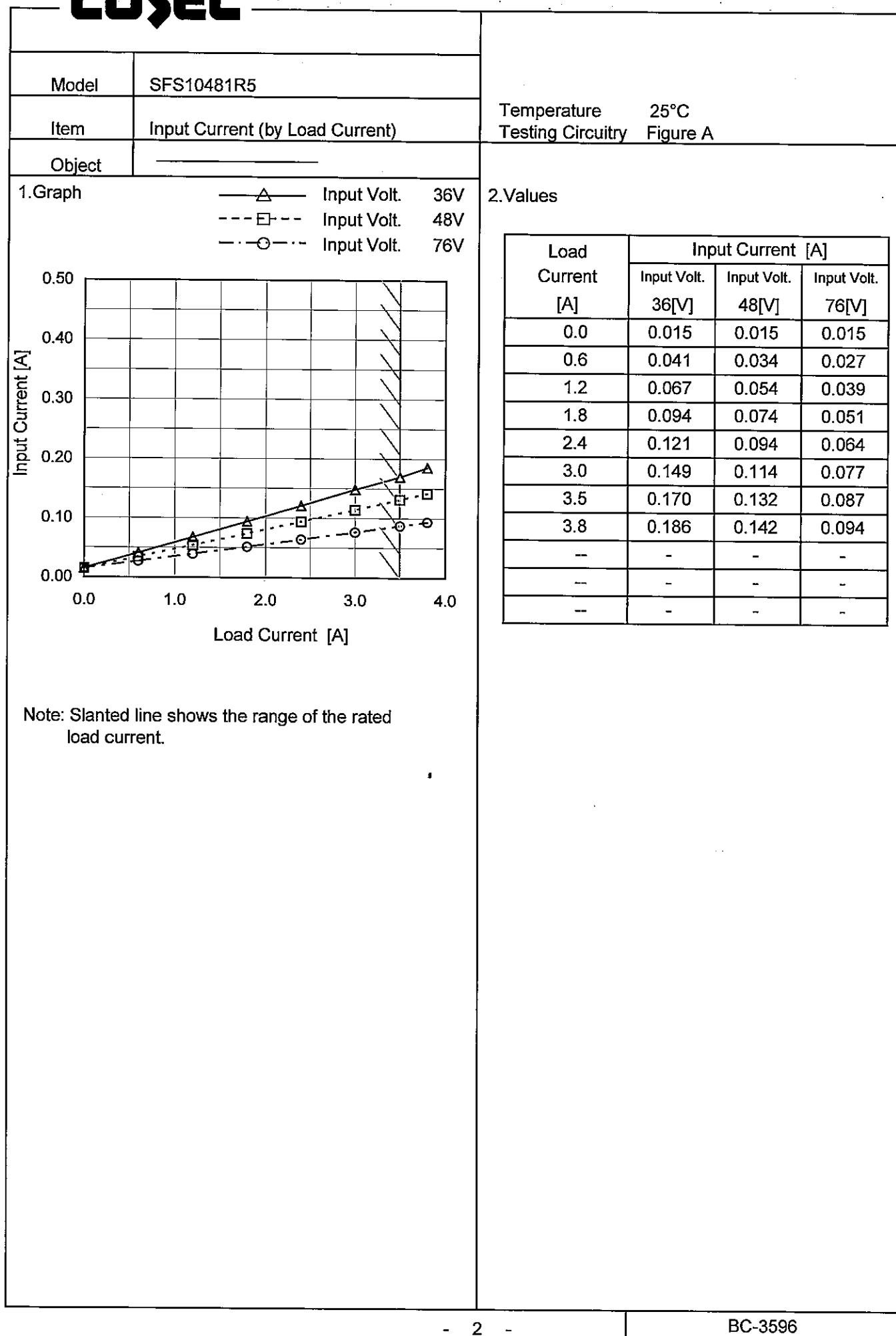
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Model	SFS10481R5																																																																									
Item	Input Current (by Input Voltage)	Temperature	25°C																																																																							
Object		Testing Circuitry	Figure A																																																																							
1.Graph		2.Values																																																																								
<div><div><div>—△—</div><div>---□---</div><div>-○-</div></div><div>Load 100%</div><div>Load 50%</div><div>Load 0%</div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><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><tr><td>0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>8</td><td>0.001</td><td>0.001</td><td>0.001</td></tr><tr><td>16</td><td>0.001</td><td>0.001</td><td>0.001</td></tr><tr><td>24</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>33</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>33</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>35</td><td>0.016</td><td>0.094</td><td>0.174</td></tr><tr><td>36</td><td>0.015</td><td>0.092</td><td>0.170</td></tr><tr><td>40</td><td>0.015</td><td>0.084</td><td>0.155</td></tr><tr><td>48</td><td>0.015</td><td>0.072</td><td>0.132</td></tr><tr><td>60</td><td>0.015</td><td>0.060</td><td>0.107</td></tr><tr><td>70</td><td>0.015</td><td>0.053</td><td>0.093</td></tr><tr><td>76</td><td>0.015</td><td>0.050</td><td>0.087</td></tr><tr><td>80</td><td>0.015</td><td>0.048</td><td>0.083</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0	0.000	0.000	0.000	8	0.001	0.001	0.001	16	0.001	0.001	0.001	24	0.002	0.002	0.002	33	0.002	0.002	0.002	33	0.002	0.002	0.002	35	0.016	0.094	0.174	36	0.015	0.092	0.170	40	0.015	0.084	0.155	48	0.015	0.072	0.132	60	0.015	0.060	0.107	70	0.015	0.053	0.093	76	0.015	0.050	0.087	80	0.015	0.048	0.083	--	-	-	-	-	-	-	-
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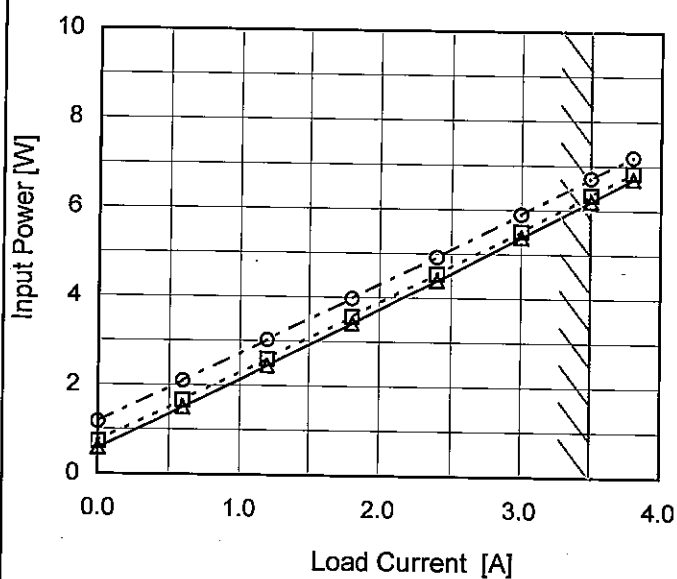
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Model	SFS10481R5
Item	Input Power (by Load Current)
Object	

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]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	0.58	0.73	1.17
0.6	1.50	1.66	2.10
1.2	2.45	2.60	3.03
1.8	3.41	3.56	3.98
2.4	4.39	4.54	4.92
3.0	5.38	5.51	5.90
3.5	6.20	6.34	6.72
3.8	6.71	6.84	7.20
--	-	-	-
--	-	-	-
--	-	-	-

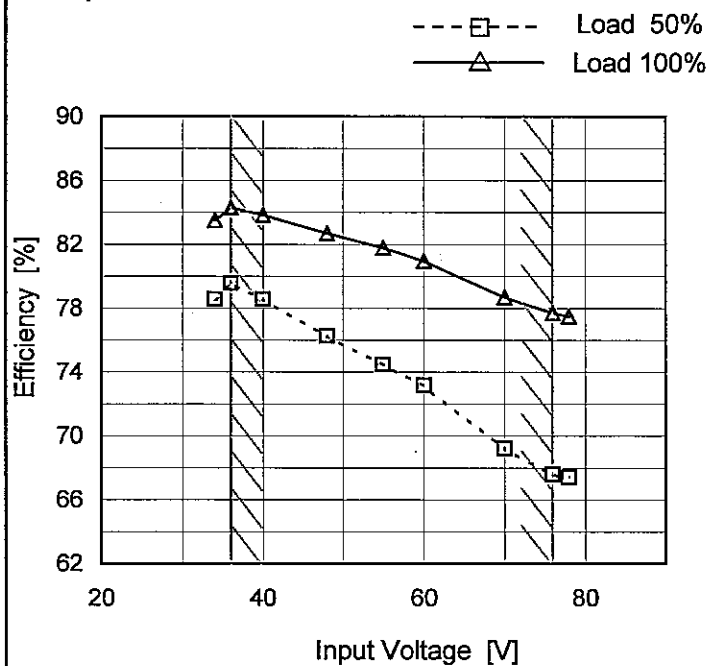
Model SFS10481R5

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	78.5	83.5
36	79.6	84.3
40	78.6	83.8
48	76.3	82.7
55	74.5	81.8
60	73.2	81.0
70	69.2	78.7
76	67.6	77.7
78	67.4	77.5

Model		SFS10481R5	Temperature		25°C																																															
Item		Efficiency (by Load Current)	Testing Circuitry		Figure A																																															
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<div><div><div>Efficiency [%]</div><div><div>Load Current [A]</div></div><table><thead><tr><th>Load Current [A]</th><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>-</td><td>-</td><td>-</td></tr><tr><td>0.6</td><td>61.0</td><td>55.1</td><td>43.4</td></tr><tr><td>1.2</td><td>74.2</td><td>70.0</td><td>59.8</td></tr><tr><td>1.8</td><td>79.7</td><td>76.5</td><td>68.1</td></tr><tr><td>2.4</td><td>82.2</td><td>79.7</td><td>73.1</td></tr><tr><td>3.0</td><td>83.5</td><td>81.8</td><td>76.0</td></tr><tr><td>3.5</td><td>84.3</td><td>82.7</td><td>77.7</td></tr><tr><td>3.8</td><td>84.3</td><td>83.0</td><td>78.4</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></div></div>		Load Current [A]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	-	-	-	0.6	61.0	55.1	43.4	1.2	74.2	70.0	59.8	1.8	79.7	76.5	68.1	2.4	82.2	79.7	73.1	3.0	83.5	81.8	76.0	3.5	84.3	82.7	77.7	3.8	84.3	83.0	78.4	—	-	-	-	--	-	-	-	—	-	-	-			
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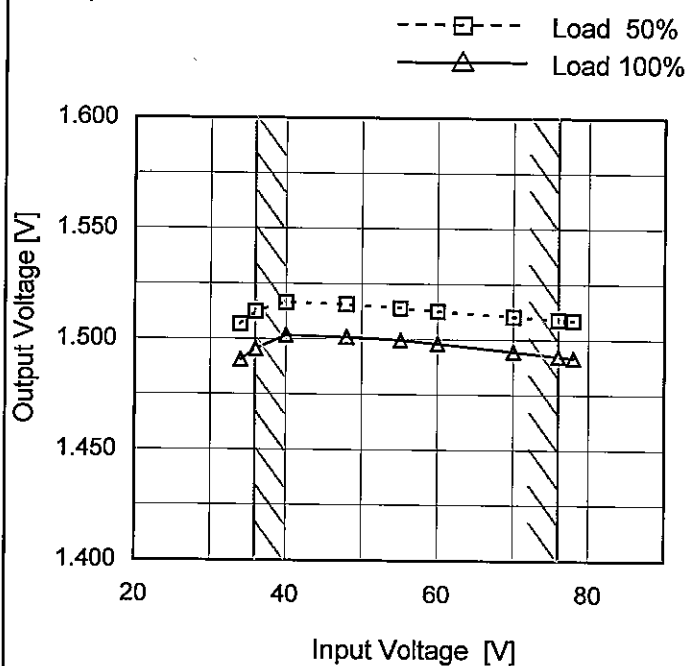
Model SFS10481R5

Item Line Regulation

Object +1.5V3.5A

Temperature 25°C
Testing Circuitry Figure A

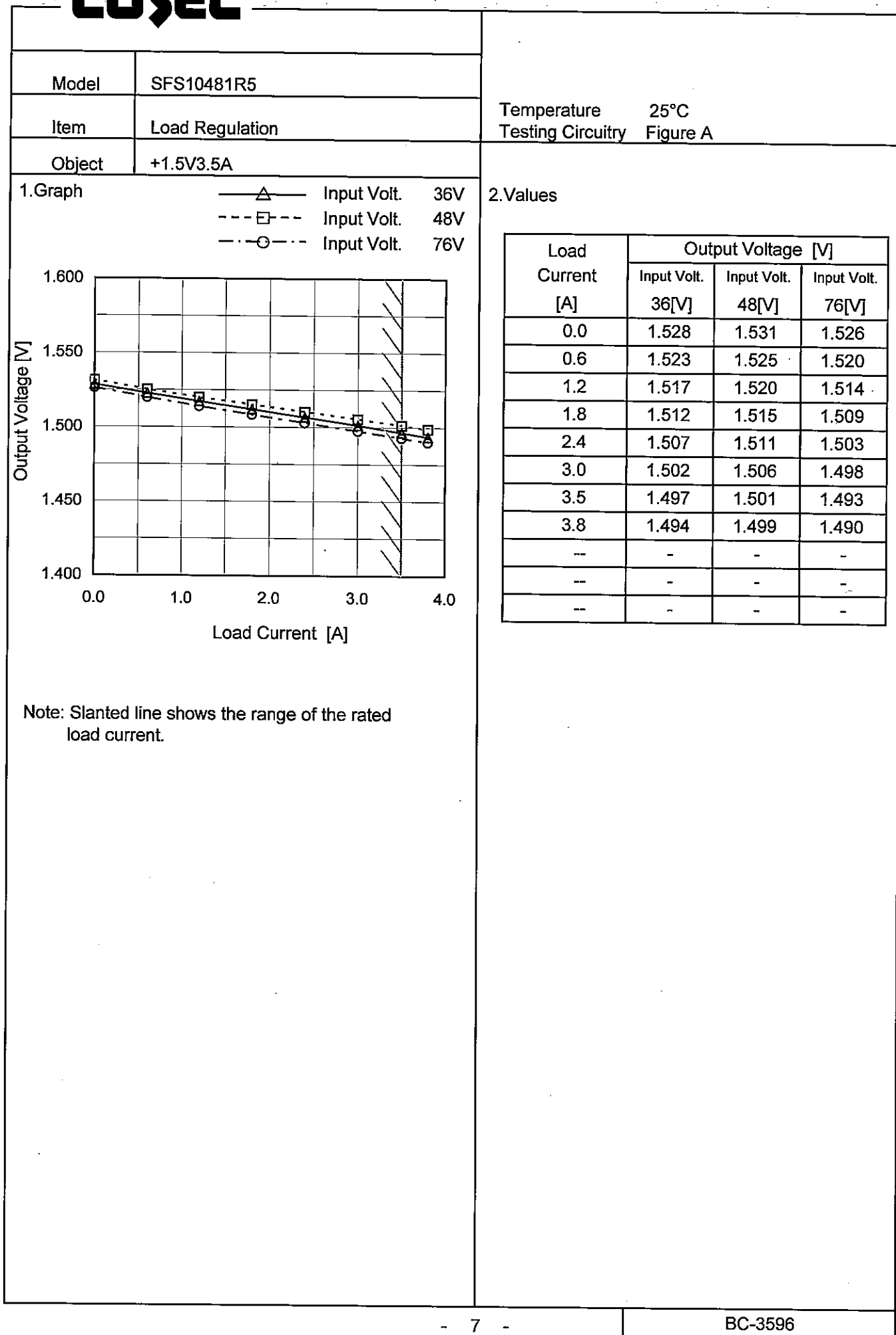
1. Graph



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

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
34	1.507	1.491
36	1.512	1.496
40	1.516	1.502
48	1.516	1.501
55	1.514	1.500
60	1.513	1.498
70	1.510	1.495
76	1.509	1.492
78	1.509	1.492

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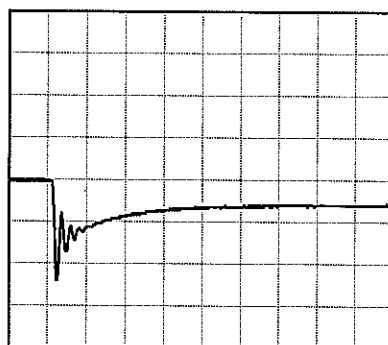
Model	SFS10481R5	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+1.5V3.5A		

Input Volt. 48 V
Cycle 1000 ms

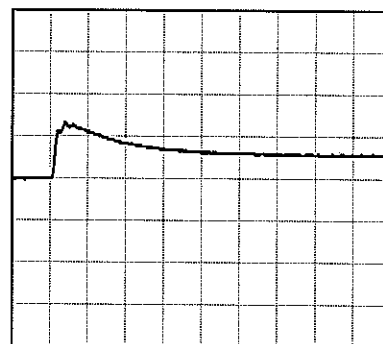
Load Current 3.5A/200 μ sec

Min. Load (0A) \longleftrightarrow
Load 100% (3.5A)

50 mV/div



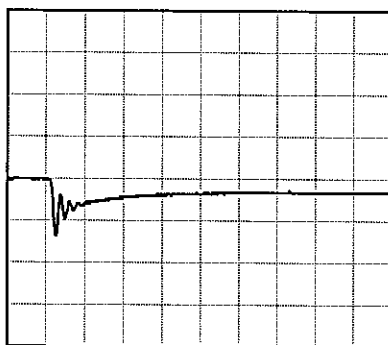
200 μ s/div



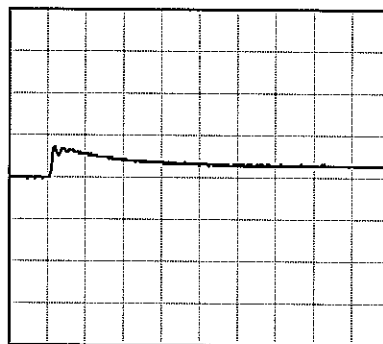
200 μ s/div

Min. Load (0A) \longleftrightarrow
Load 50% (1.75A)

50 mV/div



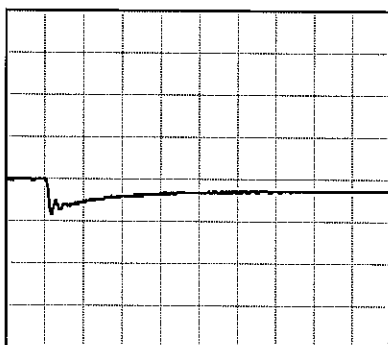
200 μ s/div



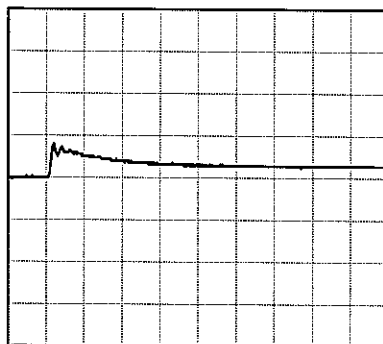
200 μ s/div

Load 50% (1.75A) \longleftrightarrow
Load 100% (3.5A)

50 mV/div



200 μ s/div



200 μ s/div

Model	SFS10481R5																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
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Object	+1.5V3.5A																																								
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

Model	SFS10481R5																																								
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Model		SFS10481R5	Testing Circuitry Figure C
Item		Ripple Voltage (by Ambient Temp.)	
Object		+1.5V3.5A	
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><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><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><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><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><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></d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COSEL

Model SFS10481R5

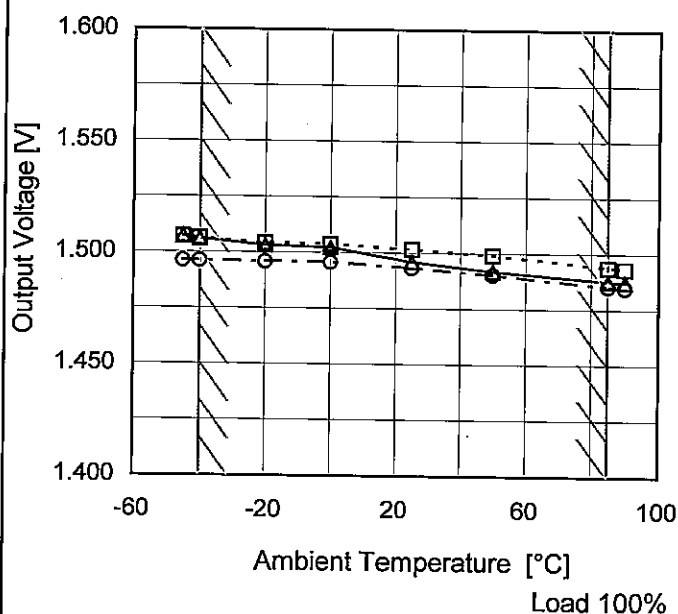
Item Ambient Temperature Drift

Object +1.5V3.5A

Testing Circuitry Figure A

1. Graph

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



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

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-45	1.507	1.507	1.496
-40	1.506	1.506	1.496
-20	1.503	1.504	1.496
0	1.502	1.504	1.496
25	1.496	1.502	1.493
50	1.492	1.499	1.490
85	1.488	1.494	1.485
90	1.487	1.493	1.485
--	-	-	-
--	-	-	-
--	-	-	-

		Testing Circuitry Figure A
Model	SFS10481R5	
Item	Output Voltage Accuracy	
Object	+1.5V3.5A	

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 - 3.5A

* 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	48	0	1.538	±27	±1.8
Minimum Voltage	85	76	3.5	1.485		

COSEL

Model	SFS10481R5	Temperature 25°C Testing Circuitry Figure A																							
Item	Time Lapse Drift																								
Object	+1.5V3.5A																								
1.Graph		2.Values																							
<div><div><div><div>1.600</div><div>1.550</div><div>1.500</div><div>1.450</div><div>1.400</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div></div><div><div>Output Voltage [V]</div><div>Time [H]</div></div><div><div>Input Volt. 48V</div><div>Load 100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>1.502</td></tr><tr><td>0.5</td><td>1.501</td></tr><tr><td>1.0</td><td>1.500</td></tr><tr><td>2.0</td><td>1.500</td></tr><tr><td>3.0</td><td>1.500</td></tr><tr><td>4.0</td><td>1.500</td></tr><tr><td>5.0</td><td>1.500</td></tr><tr><td>6.0</td><td>1.500</td></tr><tr><td>7.0</td><td>1.500</td></tr><tr><td>8.0</td><td>1.500</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	1.502	0.5	1.501	1.0	1.500	2.0	1.500	3.0	1.500	4.0	1.500	5.0	1.500	6.0	1.500	7.0	1.500	8.0	1.500
Time since start [H]	Output Voltage [V]																								
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- 14 -

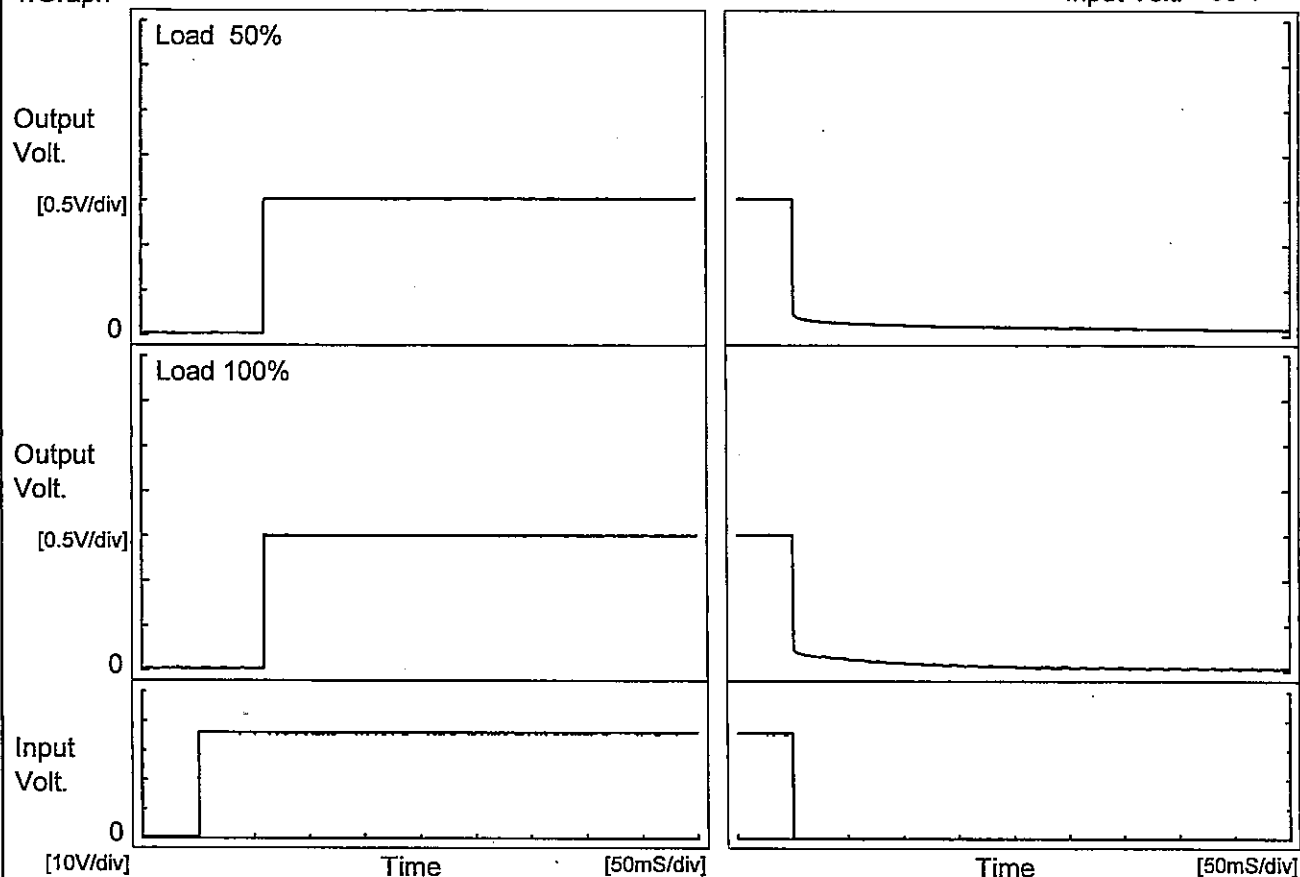
BC-3596

COSEL

Model	SFS10481R5	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+1.5V3.5A		

1. Graph

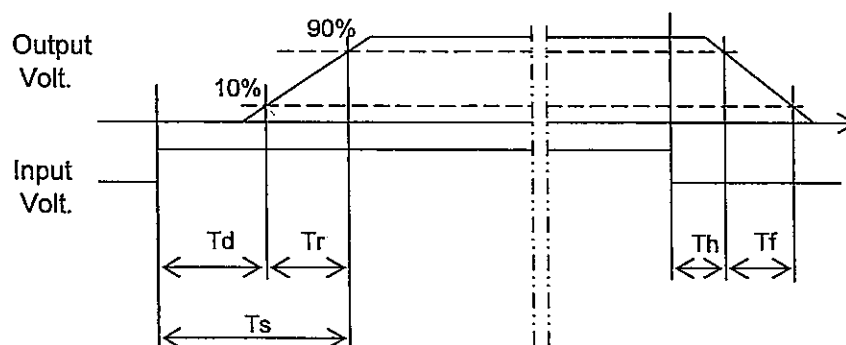
Input Volt. 36 V



2. Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	58.8	0.4	59.2	0.3	17.3
100 %	59.0	0.5	59.5	0.3	17.8



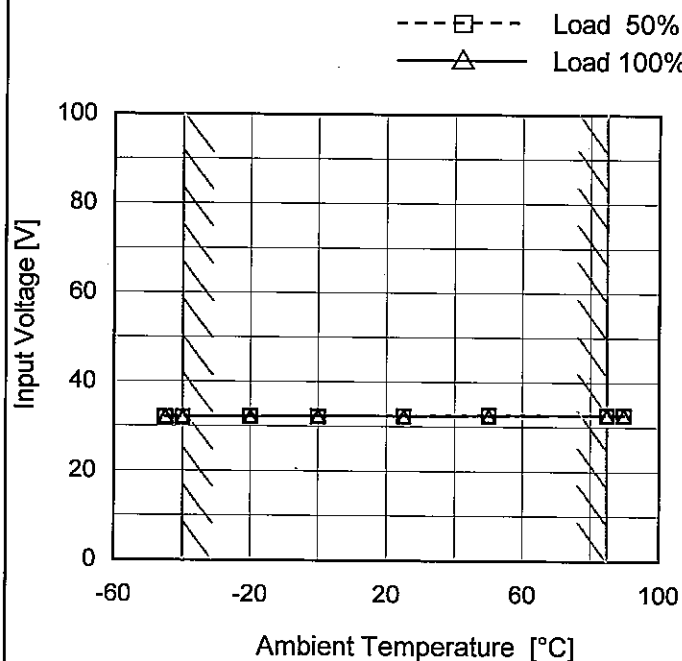
Model SFS10481R5

Item Minimum Input Voltage
for Regulated Output Voltage

Object +1.5V3.5A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-45	32.1	32.2
-40	32.1	32.3
-20	32.3	32.2
0	32.3	32.4
25	32.5	32.4
50	32.6	32.6
85	32.7	32.8
90	32.8	32.8
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--	-	-

COSEL

Model SFS10481R5

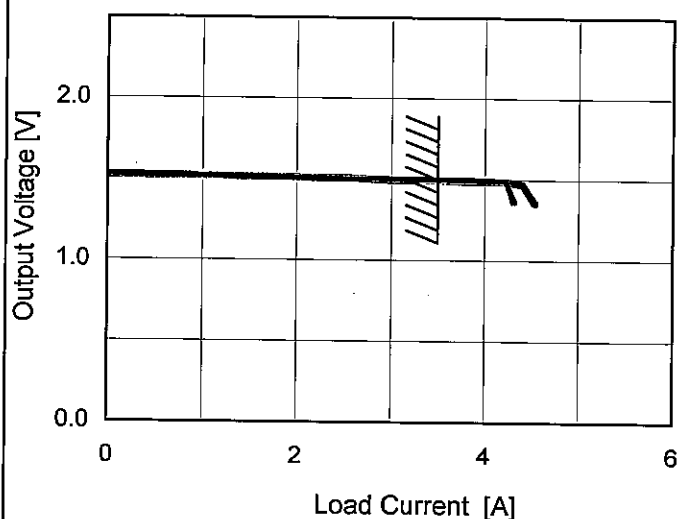
Item Overcurrent Protection

Object +1.5V3.5A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

_____ Input Volt. 36V
 _____ Input Volt. 48V
 _____ Input Volt. 76V

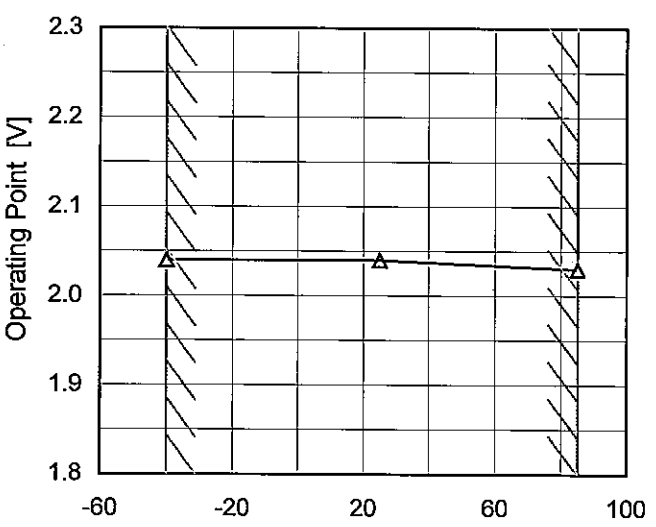


Note: Slanted line shows the range of the rated load current.

When the output voltage fell to less than 1.35V, 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]
1.50	3.53	3.59	3.52
1.43	4.25	4.27	4.46
1.35	4.29	4.33	4.54
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
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Model	SFS10481R5																																																					
Item	Overvoltage Protection	Testing Circuitry Figure A																																																				
Object	+1.5V3.5A																																																					
1.Graph		2.Values																																																				
<div><div>—△— Input Volt. 48V</div><div><p>Operating Point [V]</p><p>Ambient Temperature [°C]</p><p>Load 0%</p><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div></div>		<table><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><tr><td>-40</td><td>2.04</td><td>-</td><td>-</td></tr><tr><td>25</td><td>2.04</td><td>-</td><td>-</td></tr><tr><td>85</td><td>2.03</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></table>		Ambient Temperature [°C]	Operating Point [V]			Input Volt. 48[V]	Input Volt.	Input Volt.	-40	2.04	-	-	25	2.04	-	-	85	2.03	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Operating Point [V]																																																					
	Input Volt. 48[V]	Input Volt.	Input Volt.																																																			
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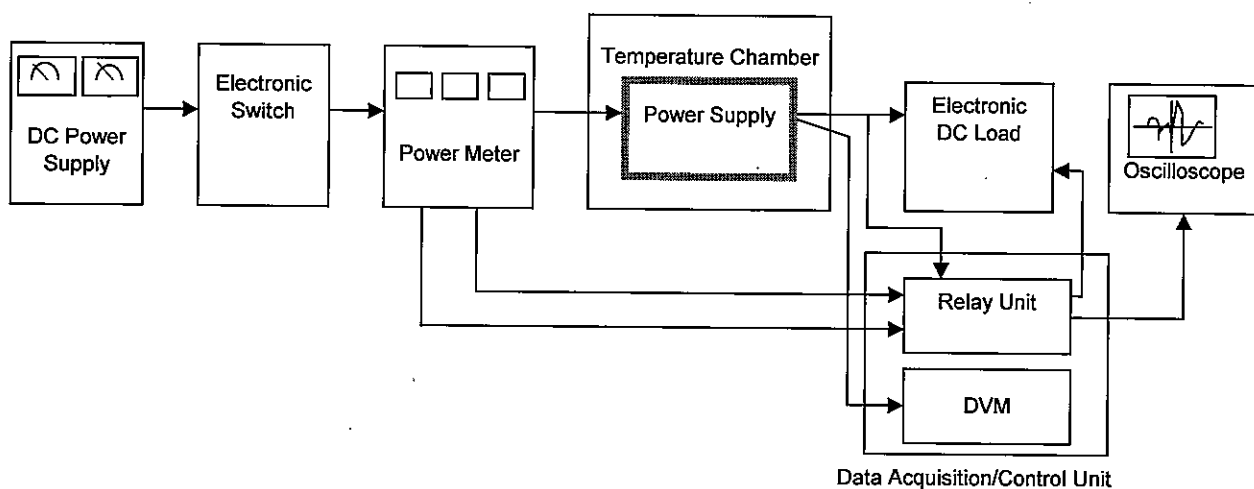


Figure A

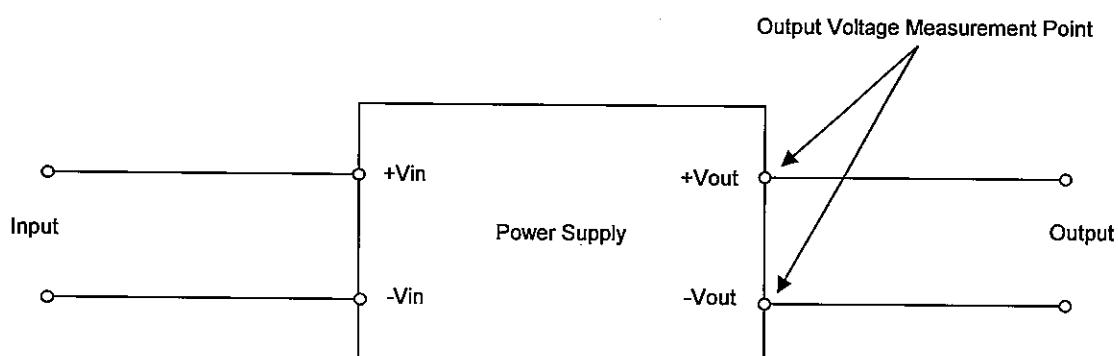


Figure B (General Electric Characteristic)

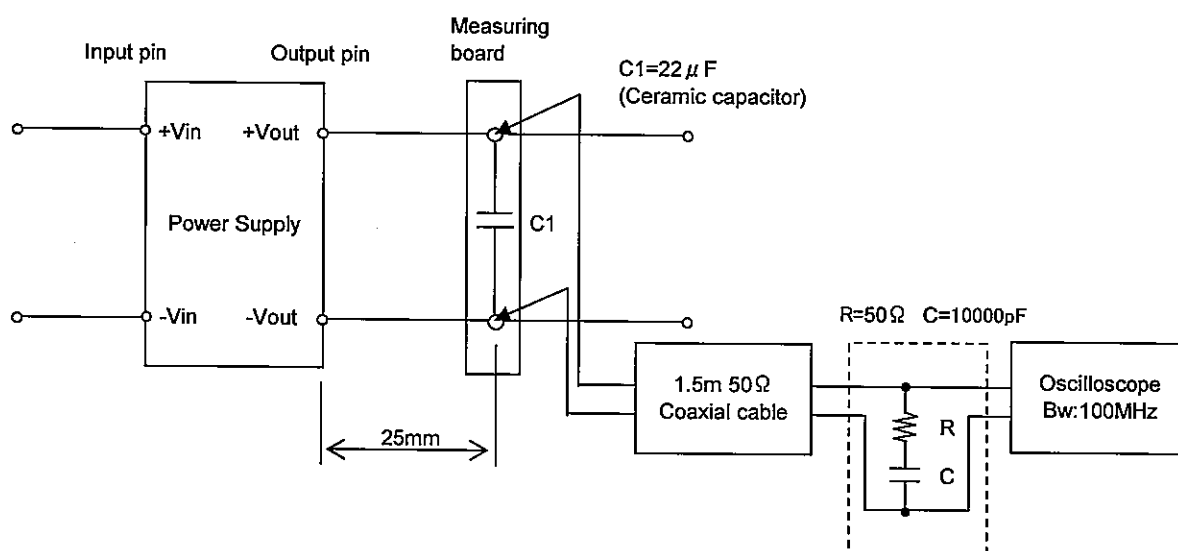


Figure C (Ripple and Ripple noise Characteristic)