



# TEST DATA OF SFS15481R2

Regulated DC Power Supply  
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Toshiyuki Tsuru Design Engineer

**COSEL CO.,LTD.**

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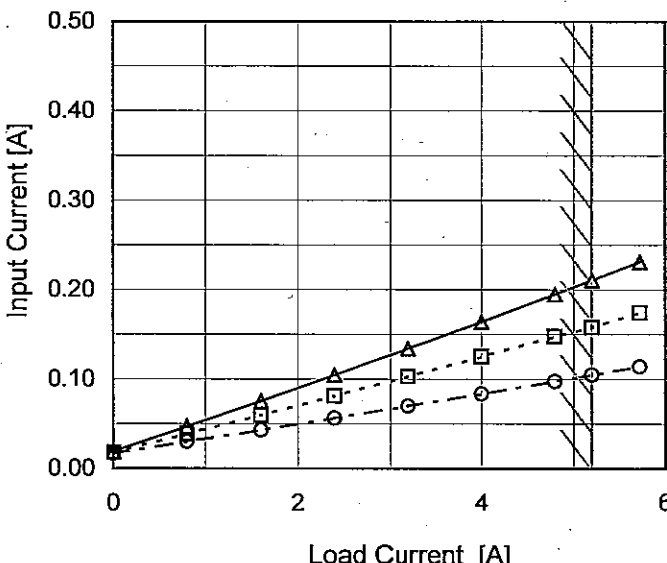
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Item		Input Current (by Input Voltage)																																																																								
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1.Graph		<div><div><div>—△—</div><div>Load 100%</div></div><div><div>---□---</div><div>Load 50%</div></div><div><div>---○---</div><div>Load 0%</div></div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>																																																																								
2.Values		<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>0.002</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>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>35</td><td>0.020</td><td>0.114</td><td>0.215</td></tr><tr><td>36</td><td>0.019</td><td>0.111</td><td>0.210</td></tr><tr><td>40</td><td>0.019</td><td>0.101</td><td>0.190</td></tr><tr><td>48</td><td>0.018</td><td>0.086</td><td>0.159</td></tr><tr><td>60</td><td>0.018</td><td>0.072</td><td>0.129</td></tr><tr><td>70</td><td>0.017</td><td>0.064</td><td>0.112</td></tr><tr><td>76</td><td>0.017</td><td>0.060</td><td>0.104</td></tr><tr><td>80</td><td>0.017</td><td>0.057</td><td>0.100</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>		Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0	0.000	0.000	0.000	8	0.002	0.002	0.002	16	0.002	0.002	0.002	24	0.002	0.002	0.002	33	0.002	0.002	0.002	35	0.020	0.114	0.215	36	0.019	0.111	0.210	40	0.019	0.101	0.190	48	0.018	0.086	0.159	60	0.018	0.072	0.129	70	0.017	0.064	0.112	76	0.017	0.060	0.104	80	0.017	0.057	0.100	--	-	-	-	--	-	-	-	--	-	-	-
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Model		SFS15481R2	
Item		Input Current (by Load Current)	
Object		_____	
1. Graph		<div><div>—△— Input Volt. 36V</div><div>---□--- Input Volt. 48V</div><div>---○--- Input Volt. 76V</div></div> <div></div>	
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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	0.019	0.018	0.017
0.80	0.047	0.039	0.030
1.60	0.076	0.060	0.043
2.40	0.105	0.081	0.057
3.20	0.134	0.103	0.070
4.00	0.164	0.125	0.084
4.80	0.195	0.148	0.098
5.20	0.211	0.158	0.105
5.72	0.231	0.175	0.114
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Model		SFS15481R2		Temperature		25°C																																																				
Item		Input Power (by Load Current)		Testing Circuitry		Figure A																																																				
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<div><div>Input Power [W]</div><div><div>Load Current [A]</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>0.00</td><td>0.69</td><td>0.86</td><td>1.29</td></tr><tr><td>0.80</td><td>1.69</td><td>1.85</td><td>2.28</td></tr><tr><td>1.60</td><td>2.71</td><td>2.87</td><td>3.27</td></tr><tr><td>2.40</td><td>3.75</td><td>3.90</td><td>4.29</td></tr><tr><td>3.20</td><td>4.82</td><td>4.95</td><td>5.32</td></tr><tr><td>4.00</td><td>5.91</td><td>6.02</td><td>6.36</td></tr><tr><td>4.80</td><td>7.02</td><td>7.11</td><td>7.42</td></tr><tr><td>5.20</td><td>7.55</td><td>7.61</td><td>7.96</td></tr><tr><td>5.72</td><td>8.28</td><td>8.33</td><td>8.66</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>						Load Current [A]	Input Power [W]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.00	0.69	0.86	1.29	0.80	1.69	1.85	2.28	1.60	2.71	2.87	3.27	2.40	3.75	3.90	4.29	3.20	4.82	4.95	5.32	4.00	5.91	6.02	6.36	4.80	7.02	7.11	7.42	5.20	7.55	7.61	7.96	5.72	8.28	8.33	8.66	--	-	-	-	--	-	-	-
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Item		Efficiency (by Input Voltage)	
Object			
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# COSEL

Model		SFS15481R2	
Item		Efficiency (by Load Current)	
Object			

1.Graph

—△—

Input Volt.

36V

---□---

Input Volt.

48V

---○---

Input Volt.

76V

Efficiency [%]

Load Current [A]

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]
0.00	-	-	-
0.80	58.7	53.6	43.4
1.60	72.4	68.5	59.8
2.40	77.9	75.1	68.1
3.20	80.5	78.5	73.0
4.00	81.7	80.4	76.0
4.80	82.3	81.6	77.8
5.20	82.3	82.0	78.5
5.72	82.2	82.1	79.1
--	-	-	-
--	-	-	-

**COSEL**

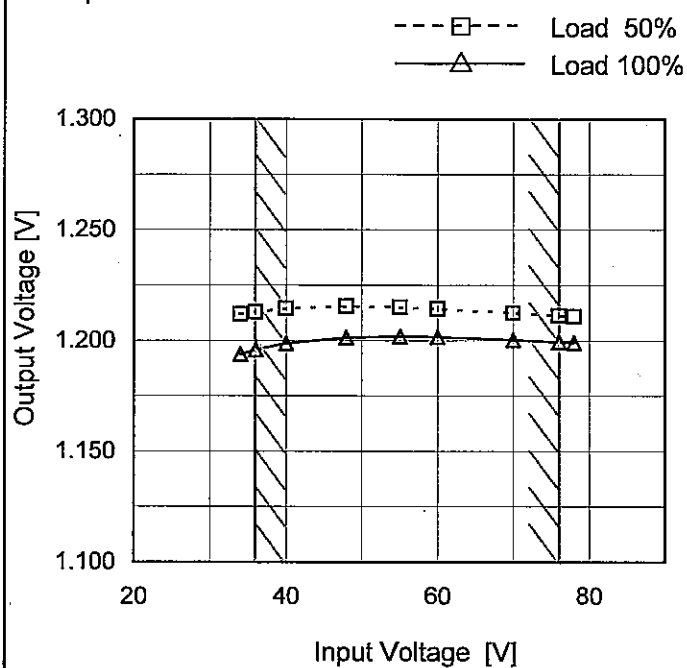
Model SFS15481R2

Item Line Regulation

Object +1.2V5.2A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
34	1.212	1.194
36	1.213	1.196
40	1.215	1.199
48	1.216	1.201
55	1.215	1.202
60	1.214	1.202
70	1.213	1.200
76	1.211	1.199
78	1.211	1.199



# COSEL

Model	SFS15481R2																																																					
Item	Load Regulation	Temperature	25°C																																																			
Object	+1.2V5.2A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>36V</div></div><div><div>---□---</div><div>Input Volt.</div><div>48V</div></div><div><div>---○---</div><div>Input Volt.</div><div>76V</div></div></div> <p>Output Voltage [V]</p> <p>Load Current [A]</p>		<table><tr><th rowspan="2">Load Current [A]</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><tr><td>0.00</td><td>1.226</td><td>1.226</td><td>1.221</td></tr><tr><td>0.80</td><td>1.222</td><td>1.223</td><td>1.218</td></tr><tr><td>1.60</td><td>1.218</td><td>1.219</td><td>1.215</td></tr><tr><td>2.40</td><td>1.213</td><td>1.216</td><td>1.212</td></tr><tr><td>3.20</td><td>1.209</td><td>1.212</td><td>1.209</td></tr><tr><td>4.00</td><td>1.204</td><td>1.208</td><td>1.206</td></tr><tr><td>4.80</td><td>1.199</td><td>1.204</td><td>1.202</td></tr><tr><td>5.20</td><td>1.196</td><td>1.202</td><td>1.200</td></tr><tr><td>5.72</td><td>1.192</td><td>1.199</td><td>1.197</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.00	1.226	1.226	1.221	0.80	1.222	1.223	1.218	1.60	1.218	1.219	1.215	2.40	1.213	1.216	1.212	3.20	1.209	1.212	1.209	4.00	1.204	1.208	1.206	4.80	1.199	1.204	1.202	5.20	1.196	1.202	1.200	5.72	1.192	1.199	1.197	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.																																																						

# COSEL

Model	SFS15481R2	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+1.2V5.2A	

Input Volt. 48 V

Cycle 1000 mS

Load Current

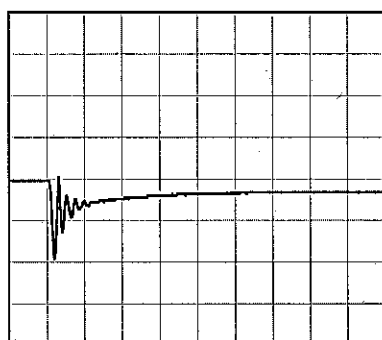


5.2A / 200 μs

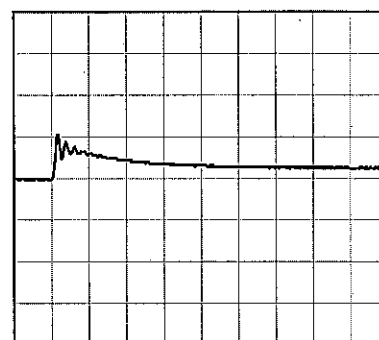
Min. Load (0A) ←→

Load 100% (5.2A)

100mV/div



200 μs/div

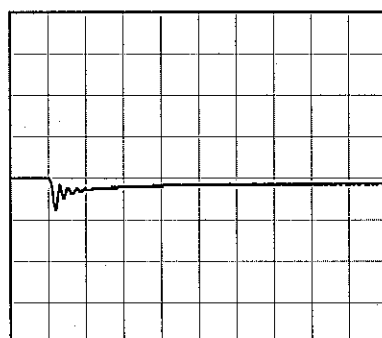


200 μs/div

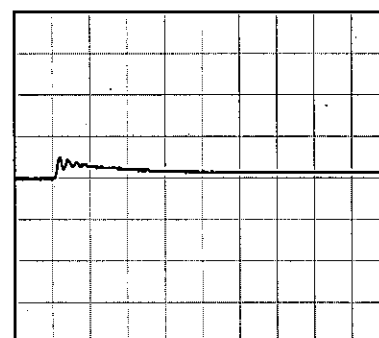
Min. Load (0A) ←→

Load 50% (2.6A)

100mV/div



200 μs/div

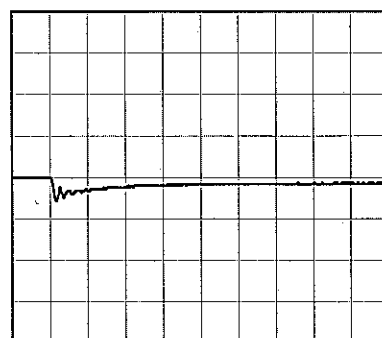


200 μs/div

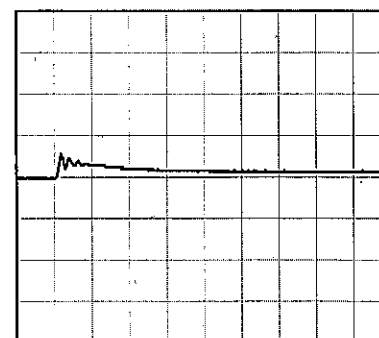
Load 50% (2.6A) ←→

Load 100% (5.2A)

100mV/div



200 μs/div



200 μs/div

# COSEL

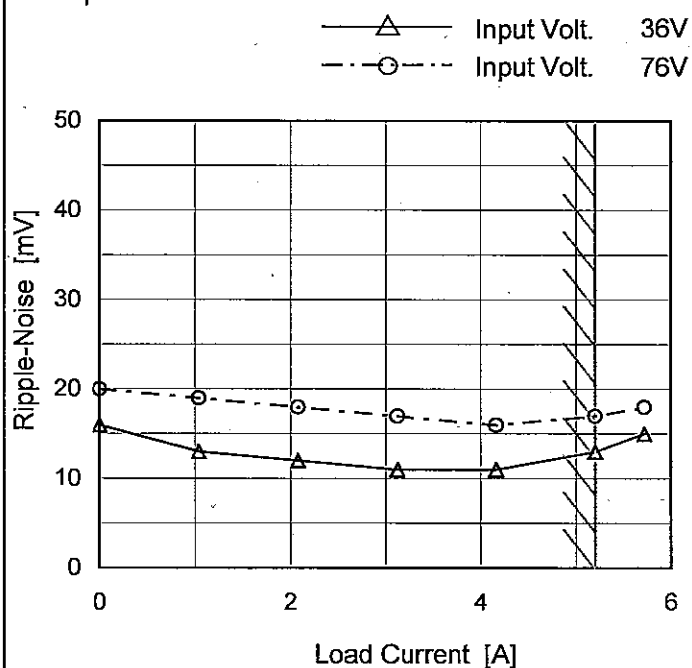
Model	SFS15481R2																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure C																																						
Object	+1.2V5.2A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>36V</div></div><div><div>---○---</div><div>Input Volt.</div><div>76V</div></div></div> <div>Ripple Voltage [mV]</div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 36 [V]</th><th>Input Volt. 76 [V]</th></tr><tr><td>0.00</td><td>1</td><td>1</td></tr><tr><td>1.04</td><td>1</td><td>1</td></tr><tr><td>2.08</td><td>1</td><td>1</td></tr><tr><td>3.12</td><td>1</td><td>1</td></tr><tr><td>4.16</td><td>1</td><td>1</td></tr><tr><td>5.20</td><td>1</td><td>1</td></tr><tr><td>5.72</td><td>1</td><td>1</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. 36 [V]	Input Volt. 76 [V]	0.00	1	1	1.04	1	1	2.08	1	1	3.12	1	1	4.16	1	1	5.20	1	1	5.72	1	1	—	-	-	—	-	-	—	-	-	—	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 36 [V]	Input Volt. 76 [V]																																							
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1.04	1	1																																							
2.08	1	1																																							
3.12	1	1																																							
4.16	1	1																																							
5.20	1	1																																							
5.72	1	1																																							
—	-	-																																							
—	-	-																																							
—	-	-																																							
—	-	-																																							
<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>																																									
<div>Ripple [mVp-p]</div> <div>Fig.Complex Ripple Wave Form</div>																																									

**COSEL**

Model	SFS15481R2
Item	Ripple-Noise
Object	+1.2V5.2A

Temperature 25°C  
Testing Circuitry Figure C

## 1.Graph



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.

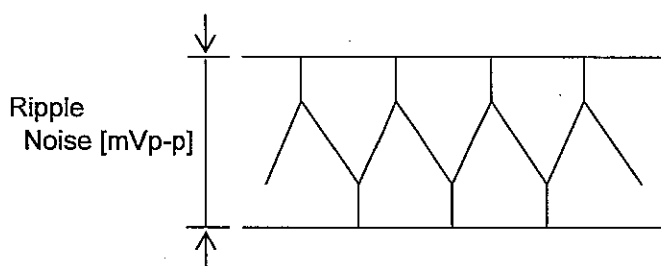


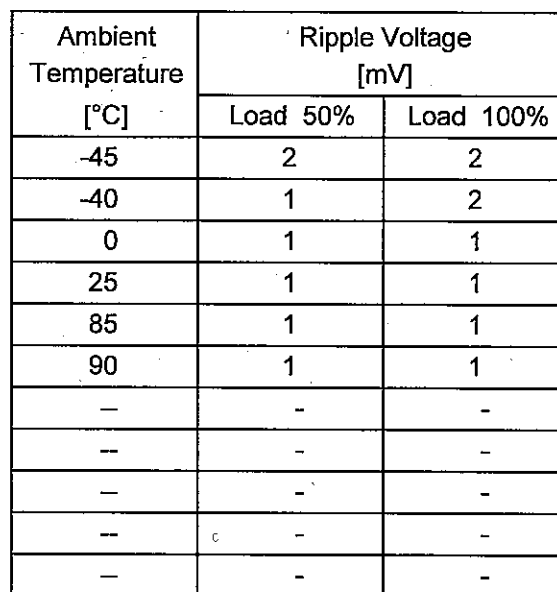
Fig.Complex Ripple Wave Form

## 2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	16	20
1.04	13	19
2.08	12	18
3.12	11	17
4.16	11	16
5.20	13	17
5.72	15	18
--	-	-
--	-	-
--	-	-
--	-	-

Testing Circuitry Figure C

## 2.Values



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

# COSEL

Model		SFS15481R2																																																				
Item		Ambient Temperature Drift																																																				
Object		+1.2V5.2A																																																				
1.Graph		<div><div><div>—△—</div><div>Input Volt. 36V</div></div><div><div>---□---</div><div>Input Volt. 48V</div></div><div><div>---○---</div><div>Input Volt. 76V</div></div></div> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																				
2.Values		<table><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><tr><td>-45</td><td>1.212</td><td>1.216</td><td>1.212</td></tr><tr><td>-40</td><td>1.211</td><td>1.216</td><td>1.211</td></tr><tr><td>-20</td><td>1.207</td><td>1.212</td><td>1.208</td></tr><tr><td>0</td><td>1.202</td><td>1.208</td><td>1.205</td></tr><tr><td>25</td><td>1.197</td><td>1.203</td><td>1.201</td></tr><tr><td>50</td><td>1.191</td><td>1.197</td><td>1.196</td></tr><tr><td>85</td><td>1.181</td><td>1.186</td><td>1.185</td></tr><tr><td>90</td><td>1.180</td><td>1.185</td><td>1.184</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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-45	1.212	1.216	1.212	-40	1.211	1.216	1.211	-20	1.207	1.212	1.208	0	1.202	1.208	1.205	25	1.197	1.203	1.201	50	1.191	1.197	1.196	85	1.181	1.186	1.185	90	1.180	1.185	1.184	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																			
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-20	1.207	1.212	1.208																																																			
0	1.202	1.208	1.205																																																			
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50	1.191	1.197	1.196																																																			
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--	-	-	-																																																			
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Note: Slanted line shows the range of the rated ambient temperature.																																																						

**COSEL**

		Testing Circuitry Figure A
Model	SFS15481R2	
Item	Output Voltage Accuracy	
Object	+1.2V5.2A	

### 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 - 5.2A

\* 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

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	48	0	1.228	±24	±2.0
Minimum Voltage	85	36	5.2	1.181		

# COSEL

Model		SFS15481R2	Temperature25°C Testing CircuitryFigure A																						
Item		Time Lapse Drift																							
Object		+1.2V5.2A																							
1.Graph			2.Values																						
<div><div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>1.300</div><div></div><div>1.250</div><div></div><div>1.200</div><div></div><div>1.150</div><div></div><div>1.100</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>Time [H]</div><div>Input Volt.48V</div><div>Load100%</div></div></div></div>			<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>1.203</td></tr><tr><td>0.5</td><td>1.201</td></tr><tr><td>1.0</td><td>1.201</td></tr><tr><td>2.0</td><td>1.201</td></tr><tr><td>3.0</td><td>1.201</td></tr><tr><td>4.0</td><td>1.201</td></tr><tr><td>5.0</td><td>1.201</td></tr><tr><td>6.0</td><td>1.201</td></tr><tr><td>7.0</td><td>1.201</td></tr><tr><td>8.0</td><td>1.201</td></tr></table>	Time since start [H]	Output Voltage [V]	0.0	1.203	0.5	1.201	1.0	1.201	2.0	1.201	3.0	1.201	4.0	1.201	5.0	1.201	6.0	1.201	7.0	1.201	8.0	1.201
Time since start [H]	Output Voltage [V]																								
0.0	1.203																								
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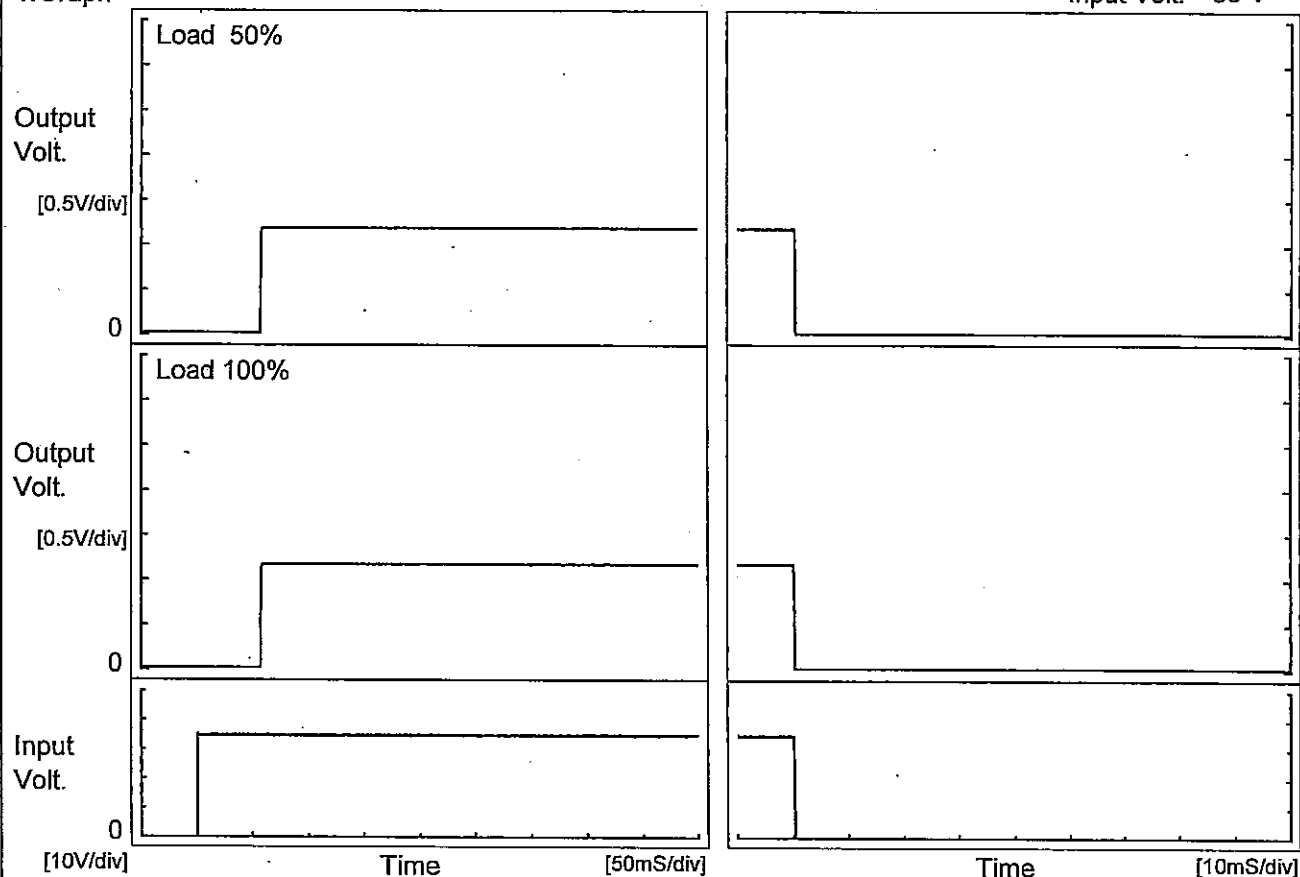


# COSEL

Model	SFS15481R2	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+1.2V5.2A		

## 1. Graph

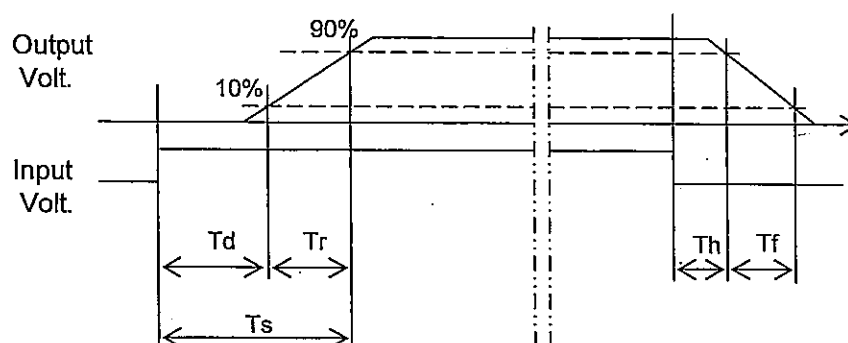
Input Volt. 36 V



## 2. Values

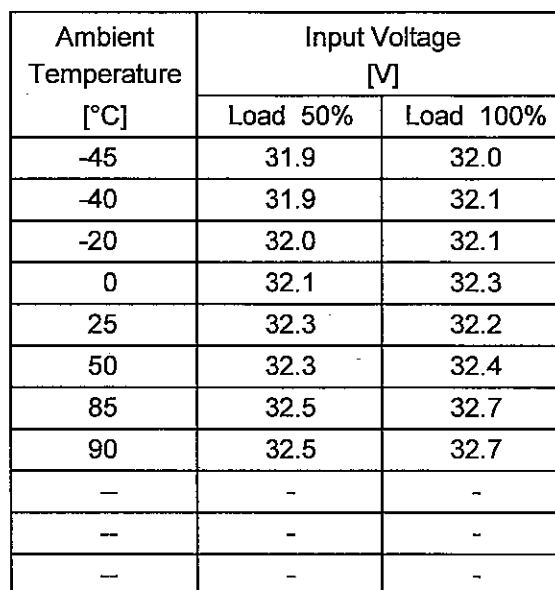
[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	57.5	0.8	58.3	0.2	0.2
100 %	57.3	0.8	58.1	0.1	0.2



Testing Circuitry Figure A

## 2.Values



- 16 -

# COSEL

Model		SFS15481R2		Temperature 25°C																																																												
Item		Overcurrent Protection		Testing Circuitry Figure A																																																												
Object		+1.2V5.2A																																																														
1.Graph				2.Values																																																												
<div><div><div></div><div>Input Volt.</div><div>36V</div></div><div><div></div><div>Input Volt.</div><div>48V</div></div><div><div></div><div>Input Volt.</div><div>76V</div></div></div> <p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>When the output voltage fell to less than 1.08V ,the unit shuts off the output by operating low voltage protection.</p>				<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>1.20</td><td>5.21</td><td>5.38</td><td>5.38</td></tr><tr><td>1.14</td><td>5.98</td><td>5.99</td><td>6.12</td></tr><tr><td>1.08</td><td>6.02</td><td>6.05</td><td>6.19</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><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	1.20	5.21	5.38	5.38	1.14	5.98	5.99	6.12	1.08	6.02	6.05	6.19	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model		SFS15481R2
Item		Overvoltage Protection
Object		+1.2V5.2A

1.Graph

—△— Input Volt. 48V

Operating Point [V]

Ambient Temperature [°C]	Operating Point [V]
-40	1.65
25	1.64
85	1.62

Ambient Temperature [°C]

Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 48[V]	Input Volt.	Input Volt.
-40	1.65	-	-
25	1.64	-	-
85	1.62	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

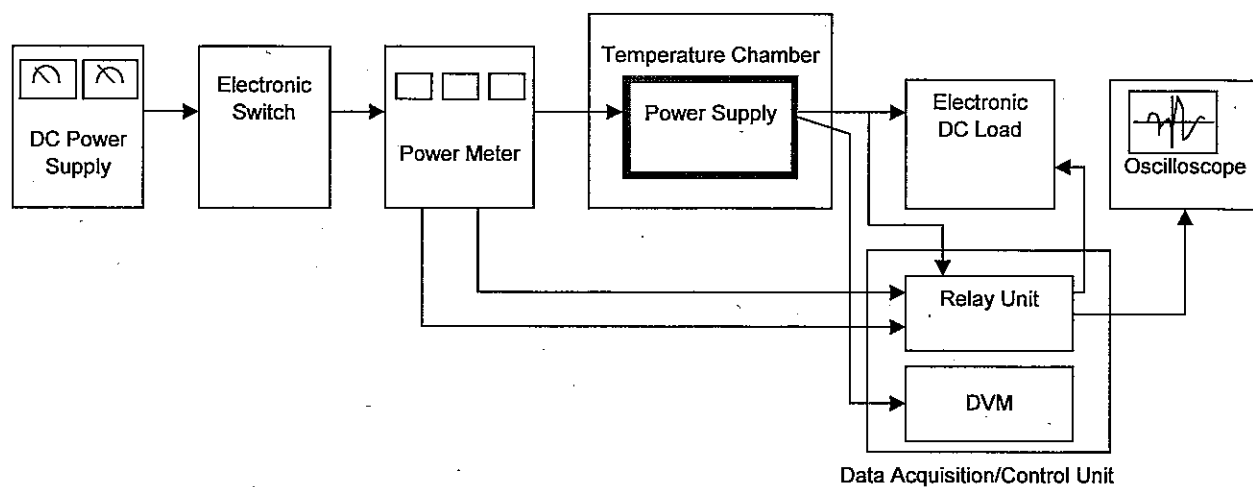


Figure A

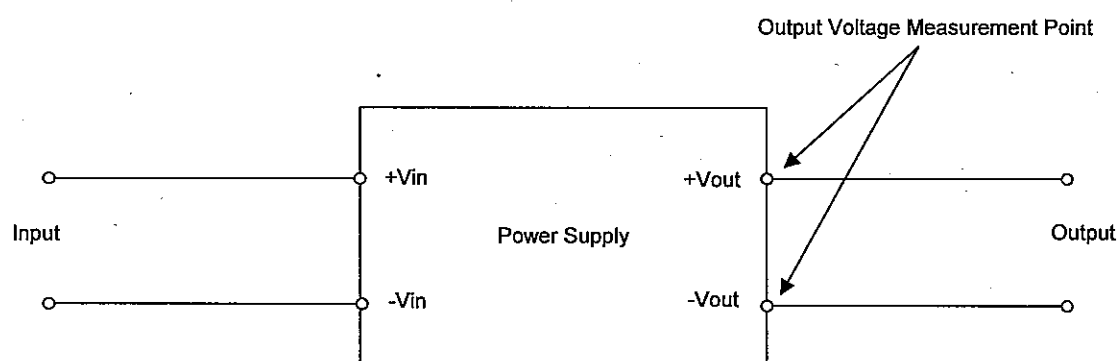


Figure B (General Electric Characteristic)

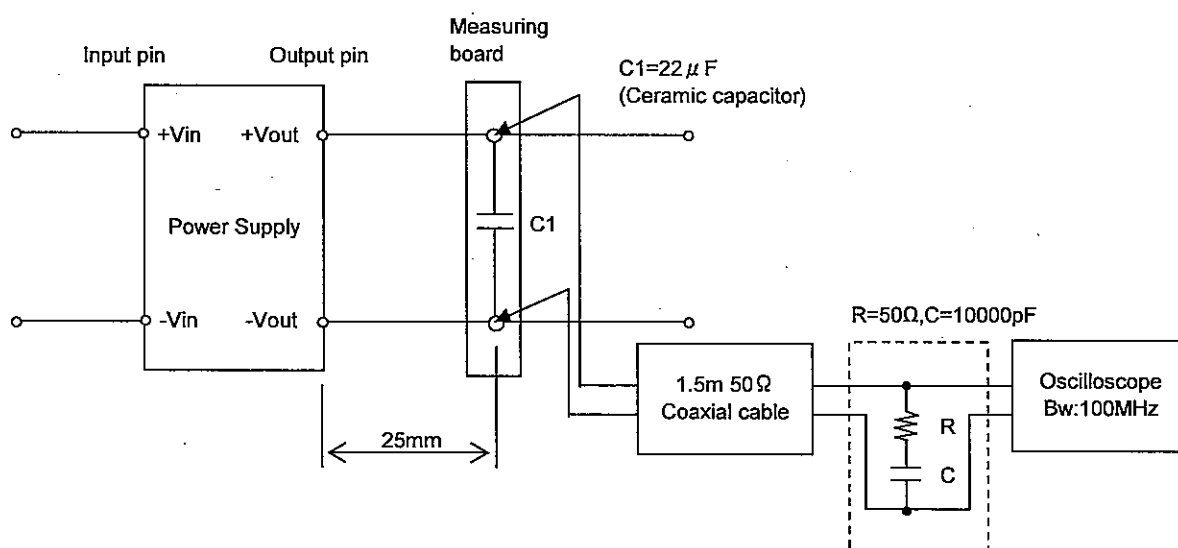


Figure C (Ripple and Ripple noise Characteristic)