

# TEST DATA OF BRFS30

Regulated DC Power Supply  
2013/05/16

Approved by : Yoshimichi Hirokawa  
Yoshimichi Hirokawa Design Manager

Prepared by : Masahiro Kondo  
Masahiro Kondo Design Engineer

**COSEL CO.,LTD.**



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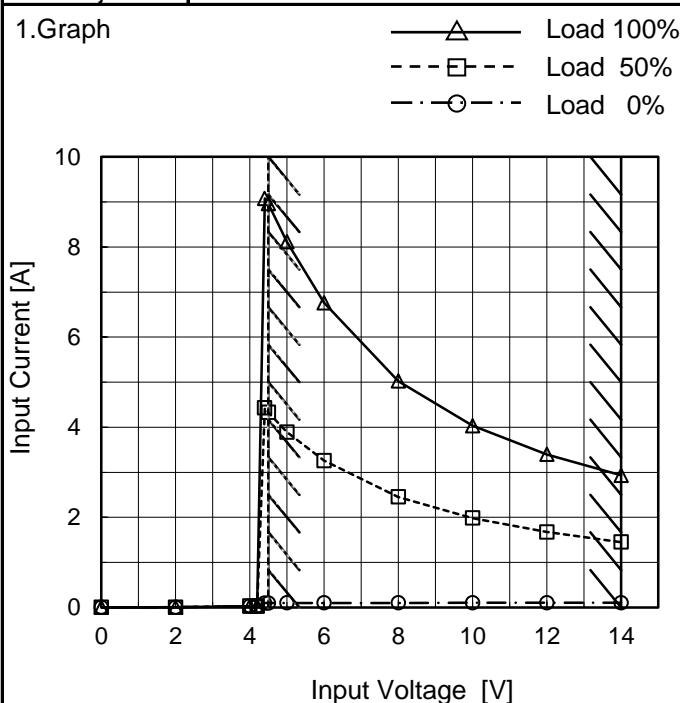
(Final Page 18)

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Model	BRFS30
Item	Input Current (by Input Voltage)
Object	_____

Temperature 25°C  
Testing Circuitry Figure A

## 1.Graph

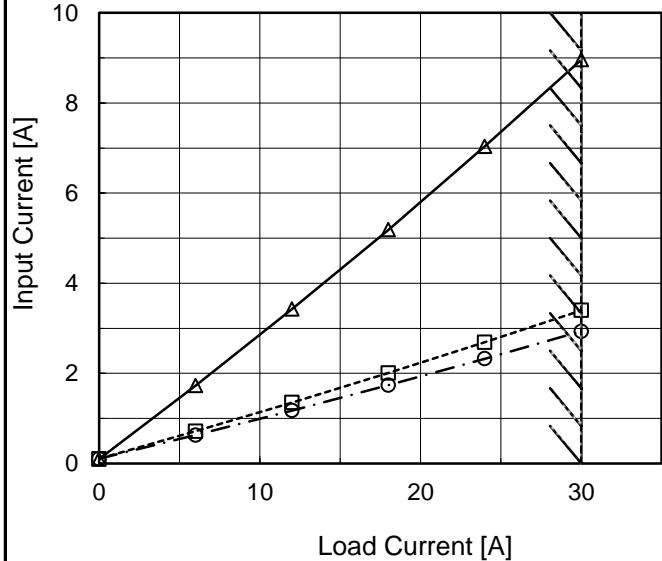


Note: Slanted line shows the range of the rated input voltage.

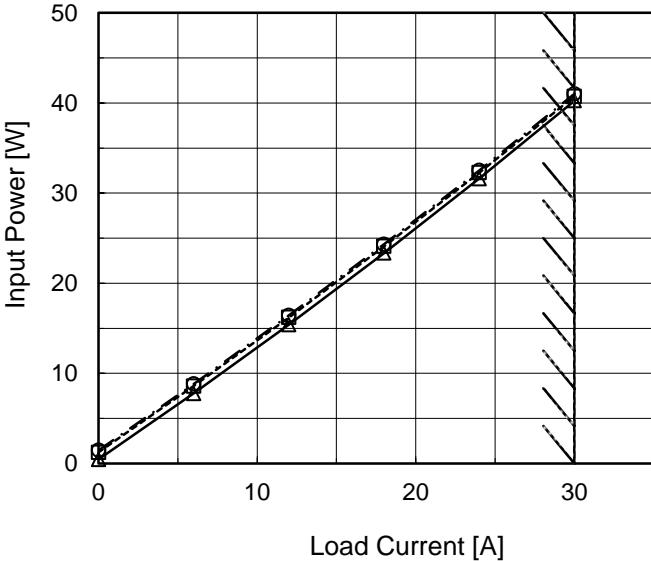
## 2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
2.0	0.004	0.004	0.004
4.0	0.028	0.028	0.028
4.2	0.029	0.028	0.028
4.5	0.098	4.426	9.076
5.0	0.100	3.889	8.115
6.0	0.100	3.259	6.761
8.0	0.101	2.453	5.022
10.0	0.102	1.983	4.032
12.0	0.103	1.673	3.396
14.0	0.104	1.451	2.932
--	-	-	-
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Model	BRFS30																																																					
Item	Input Current (by Load Current)																																																					
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1.Graph	—△— Input Volt. 4.5V - -□--- Input Volt. 12V - -○--- Input Volt. 14V																																																					
 <p>The graph shows the relationship between Input Current [A] on the Y-axis (0 to 10) and Load Current [A] on the X-axis (0 to 30). Three curves are plotted for different input voltages: 4.5V (solid line with triangle markers), 12V (dashed line with square markers), and 14V (dotted line with circle markers). All curves show a positive linear relationship. A slanted line is drawn across the graph, representing the rated load current range.</p>																																																						
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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 30). Three curves are shown for different input voltages: 4.5V (solid line with triangle markers), 12V (dashed line with square markers), and 14V (dash-dot line with circle markers). All curves show a linear increase in power with load current. A slanted line is drawn across the graph, starting from approximately (0, 2) and ending at (30, 42), indicating the range of the rated load current.</p>																																																						
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Model	BRFS30	Temperature	25°C																																
Item	Efficiency (by Input Voltage)	Testing Circuitry	Figure A																																
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1.Graph																																			
<p>Efficiency [%]</p> <p>Input Voltage [V]</p> <p>Legend:</p> <ul style="list-style-type: none"> <li>--□-- Load 50%</li> <li>—△— Load 100%</li> </ul>																																			
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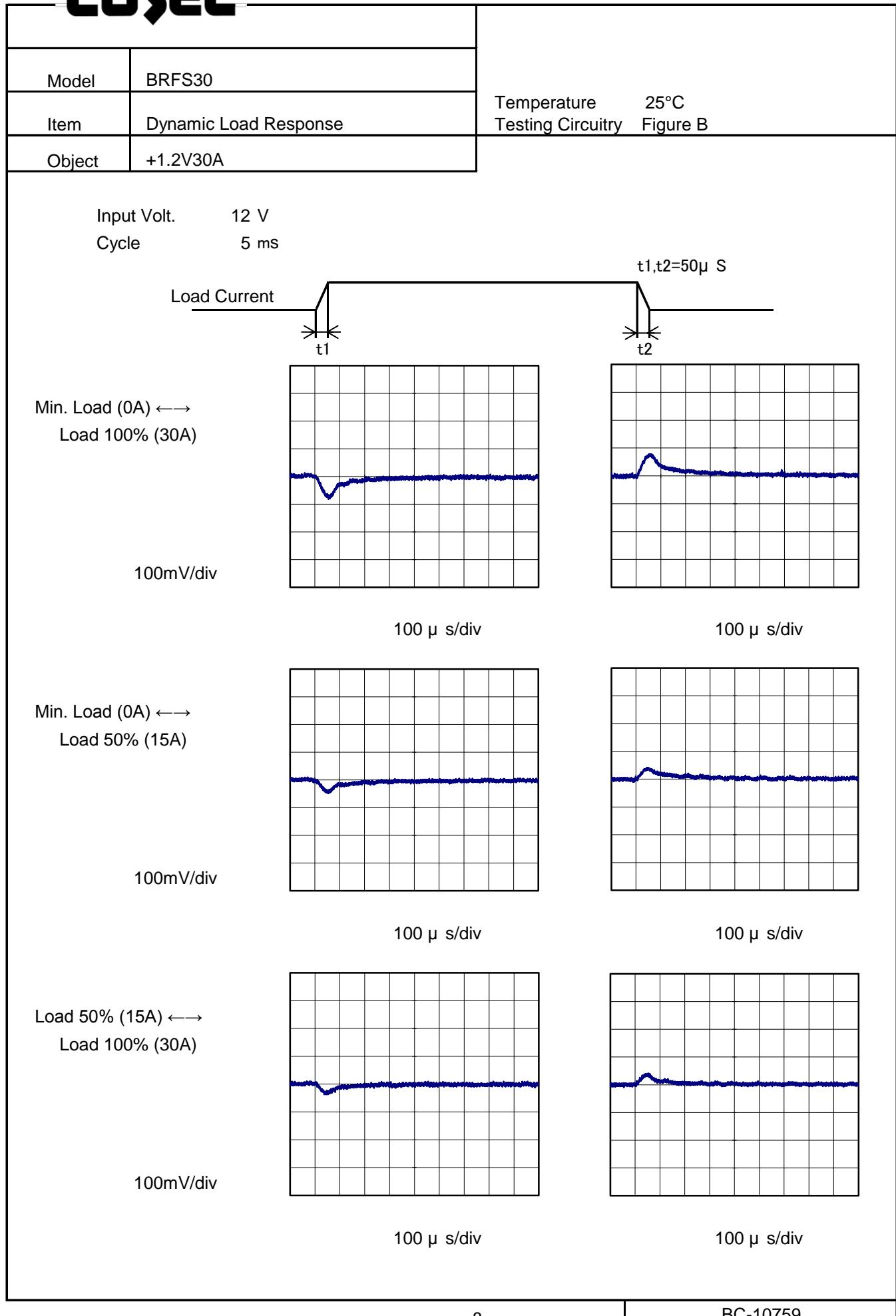
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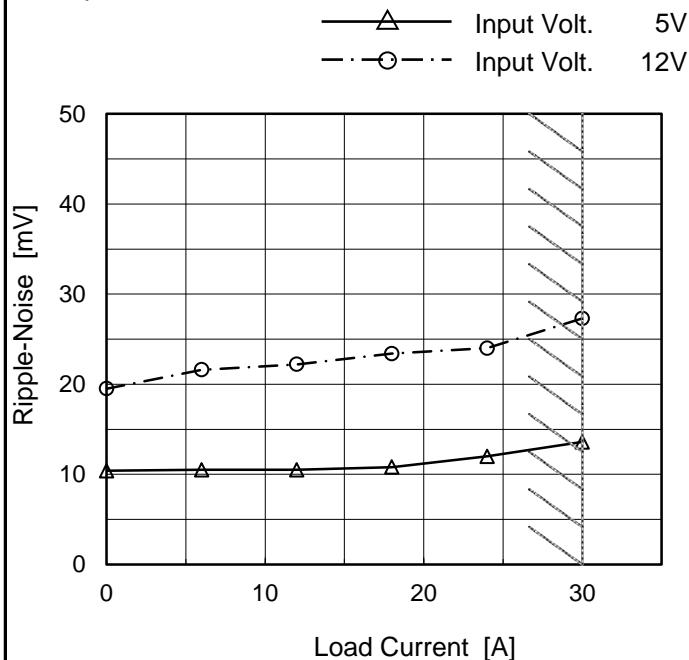
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<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 25 mV, and the X-axis ranges from 0 to 30 A. Two curves are plotted: one for Input Volt. 5V (solid line with open triangle markers) and one for Input Volt. 12V (dashed line with open circle markers). Both curves show a slight increase in ripple voltage as load current increases. A slanted line indicates the rated load current range.</p>		2.Values																																						
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<p>Measured by 20 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>Diagram illustrating a Complex Ripple Wave Form. The waveform consists of a series of sharp, triangular pulses superimposed on a constant DC level. The vertical axis is labeled "Ripple [mVp-p]" with arrows indicating the measurement range.</p>																																								
<p>Fig.Complex Ripple Wave Form</p>																																								

**COSEL**

Model	BRFS30
Item	Ripple-Noise
Object	+1.2V30A

Temperature 25°C  
Testing Circuitry Figure C

## 1.Graph



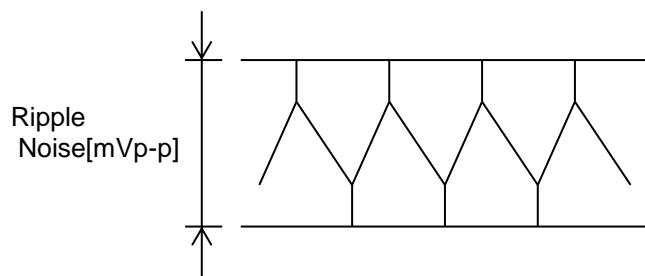
## 2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 5 [V]	Input Volt. 12 [V]
0	10	20
6	11	22
12	11	22
18	11	23
24	12	24
30	14	27
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 20 MHz Oscilloscope.

Ripple-Noise is shown as p-p in the figure below.

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

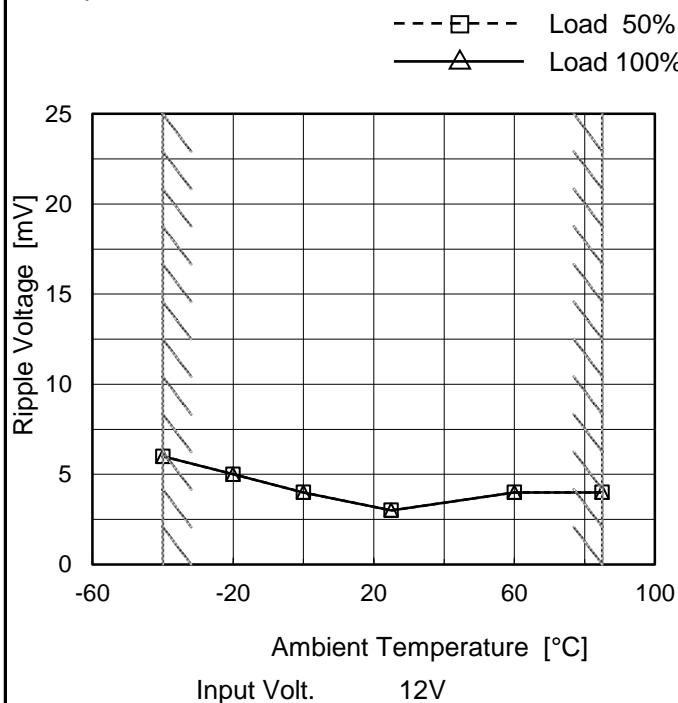


**COSEL**

Model	BRFS30
Item	Ripple Voltage (by Ambient Temp.)
Object	+1.2V30A

Testing Circuitry Figure C

## 1. Graph



## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	6.0	6.0
-20	5.0	5.0
0	4.0	4.0
25	3.0	3.0
60	4.0	4.0
85	4.0	4.0
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 20 MHz Oscilloscope.

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

Ripple [mVp-p]

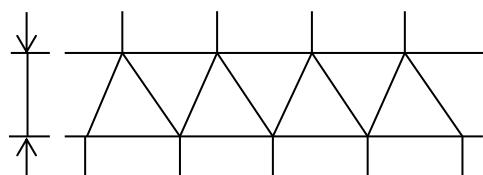


Fig.Complex Ripple Wave Form

Model	BRFS30																																																					
Item	Ambient Temperature Drift																																																					
Object	+1.2V30A																																																					
1.Graph	<p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p> <ul style="list-style-type: none"> <li>—△— Input Volt. 4.5V</li> <li>- - □ - - Input Volt. 12V</li> <li>- - ○ - - Input Volt. 14V</li> </ul>																																																					
Testing Circuitry	Figure A																																																					
2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 4.5[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 14[V]</th> </tr> </thead> <tbody> <tr> <td>-40</td><td>1.197</td><td>1.197</td><td>1.197</td></tr> <tr> <td>-20</td><td>1.197</td><td>1.197</td><td>1.196</td></tr> <tr> <td>0</td><td>1.196</td><td>1.196</td><td>1.196</td></tr> <tr> <td>25</td><td>1.195</td><td>1.195</td><td>1.195</td></tr> <tr> <td>60</td><td>1.195</td><td>1.195</td><td>1.195</td></tr> <tr> <td>85</td><td>1.195</td><td>1.195</td><td>1.195</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]	Output Voltage [V]			Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]	-40	1.197	1.197	1.197	-20	1.197	1.197	1.196	0	1.196	1.196	1.196	25	1.195	1.195	1.195	60	1.195	1.195	1.195	85	1.195	1.195	1.195	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note:	Slanted line shows the range of the rated ambient temperature.																																																					



Model	BRFS30	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+1.2V30A	

### 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 : 4.5 - 14V

Load Current : 0 - 30A

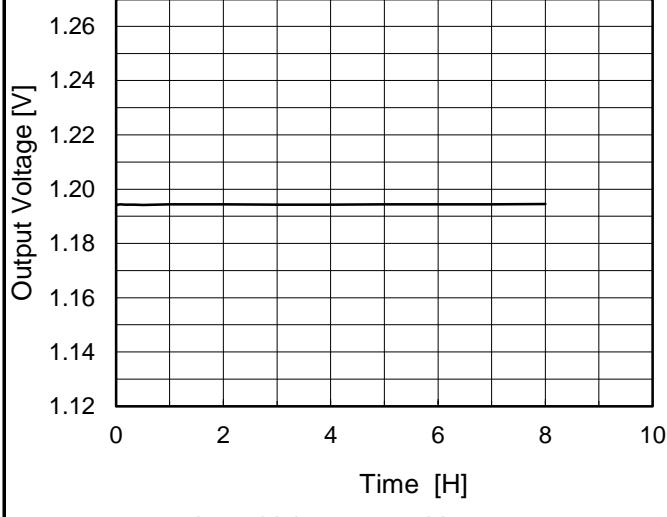
\* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	14	0	1.199	±2	±0.2
Minimum Voltage	85	12	30	1.195		

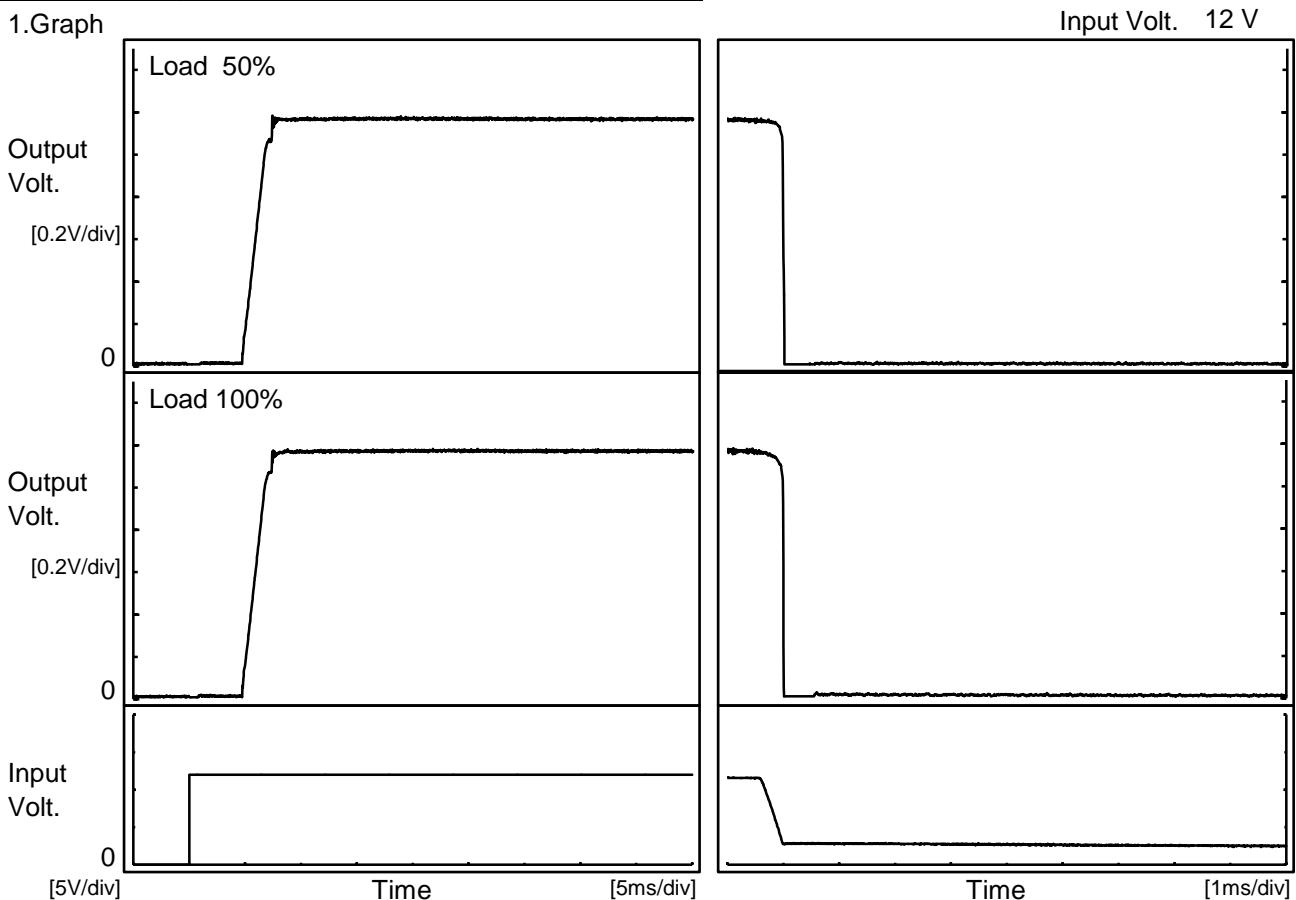
**COSEL**

Model	BRFS30	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+1.2V30A																								
1. Graph			2. Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 12V 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>1.194</td></tr> <tr><td>0.5</td><td>1.194</td></tr> <tr><td>1.0</td><td>1.194</td></tr> <tr><td>2.0</td><td>1.194</td></tr> <tr><td>3.0</td><td>1.194</td></tr> <tr><td>4.0</td><td>1.194</td></tr> <tr><td>5.0</td><td>1.194</td></tr> <tr><td>6.0</td><td>1.194</td></tr> <tr><td>7.0</td><td>1.194</td></tr> <tr><td>8.0</td><td>1.194</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	1.194	0.5	1.194	1.0	1.194	2.0	1.194	3.0	1.194	4.0	1.194	5.0	1.194	6.0	1.194	7.0	1.194	8.0	1.194
Time since start [H]	Output Voltage [V]																								
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**COSEL**

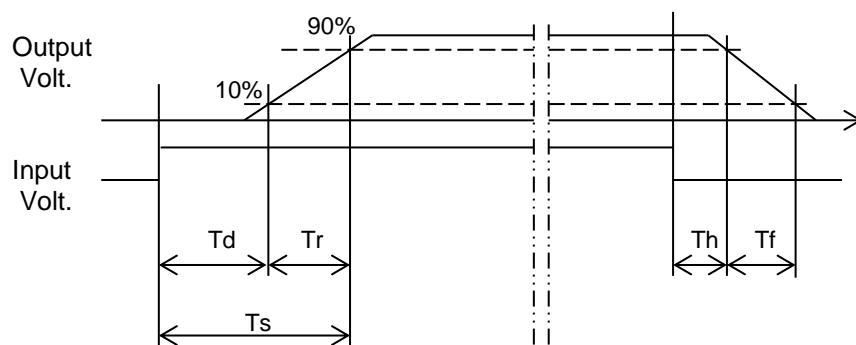
Model	BRFS30	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+1.2V30A		

## 1. Graph



## 2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		4.9	2.5	7.4	0.0	0.2	
100 %		4.9	2.5	7.4	0.0	0.2	

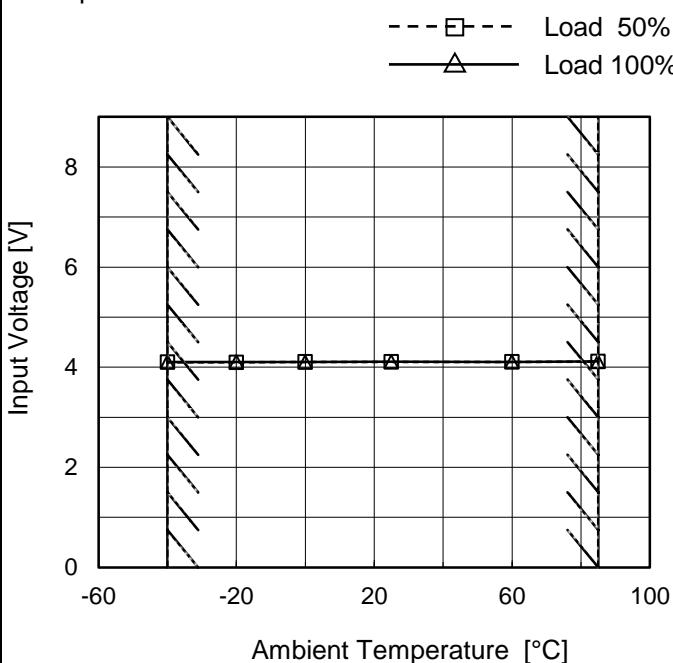


**COSEL**

Model	BRFS30
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+1.2V30A

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%
-40	4.10	4.11
-20	4.10	4.11
0	4.11	4.11
25	4.11	4.11
60	4.11	4.11
85	4.12	4.12
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

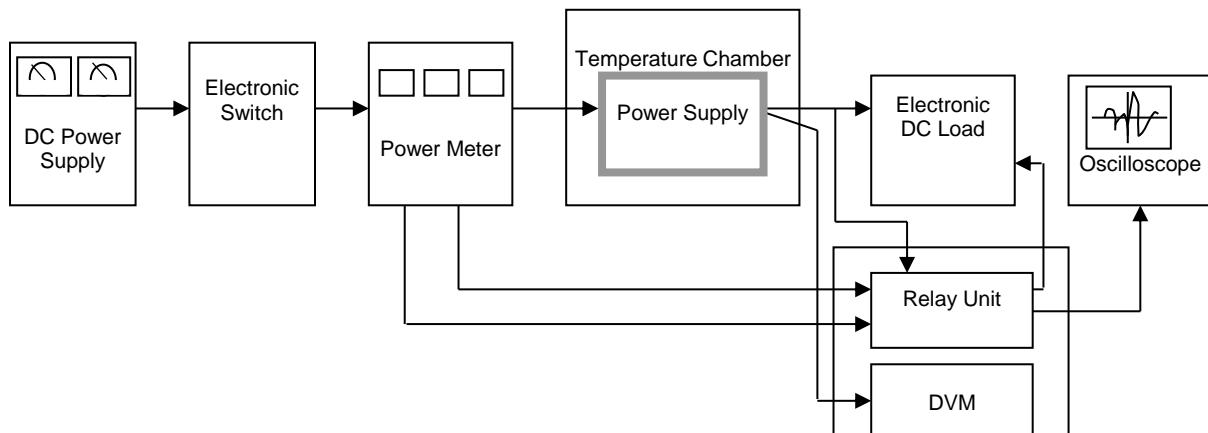


Model	BRFS30	Temperature	25°C																																																																							
Item	Overcurrent Protection	Testing Circuitry	Figure A																																																																							
Object	+1.2V30A																																																																									
1.Graph	<p>—△— Input Volt. 4.5V            —□— Input Volt. 12V            —○— Input Volt. 14V</p>																																																																									
	<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 4.5[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 14[V]</th> </tr> </thead> <tbody> <tr><td>1.2</td><td>34.93</td><td>34.89</td><td>35.36</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]	1.2	34.93	34.89	35.36	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.

Intermittent operation occurs when overcurrent protection is activated.

COSEL



Data Acquisition/Control Unit

Figure A

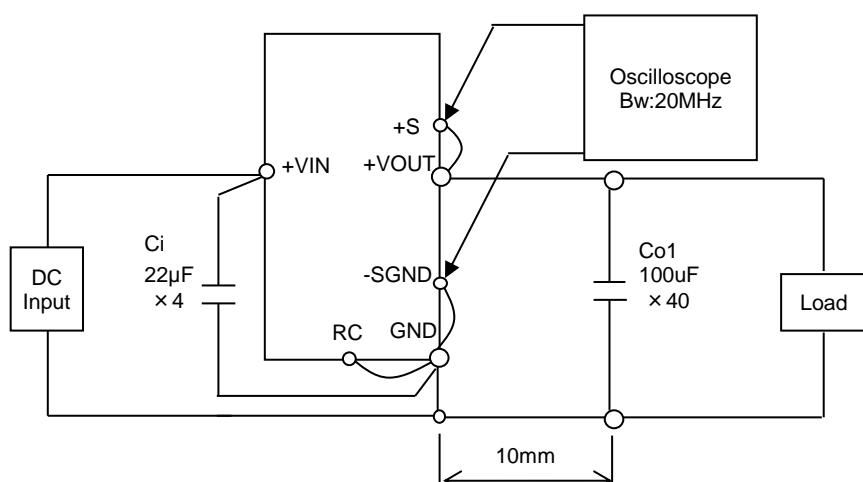


Figure B

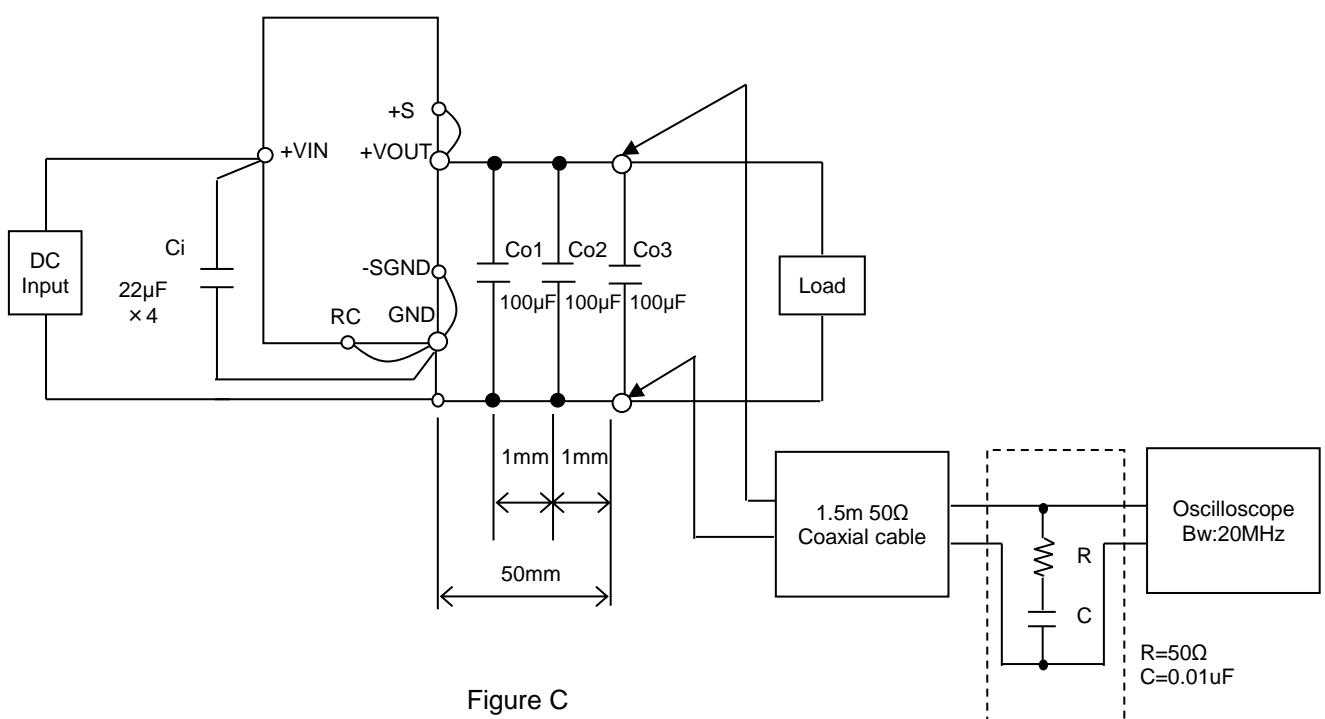


Figure C