



TEST DATA OF CES48018-30

Regulated DC Power Supply
Jul.18. 2003

Approved by :

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Kazuyoshi Shimano

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Prepared by :

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Design Engineer

COSEL CO.,LTD.



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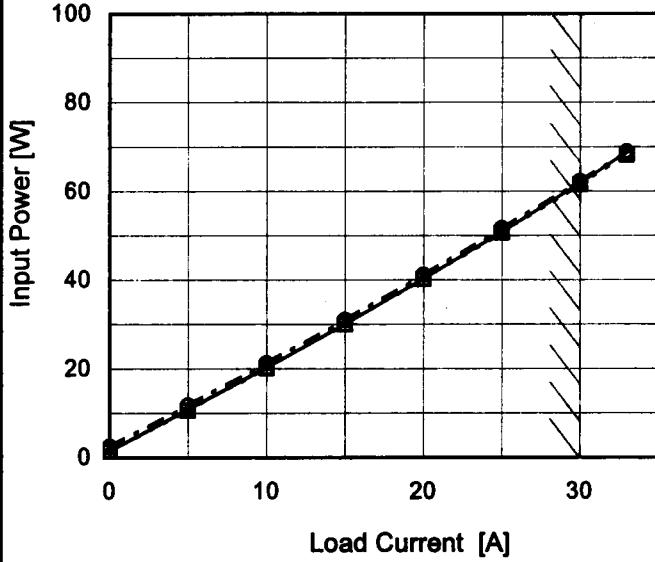
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<p>The graph plots Input Current [A] on the y-axis (0.0 to 5.0) against Input Voltage [V] on the x-axis (0 to 80). Three data series are shown: Load 100% (solid triangles), Load 50% (dashed squares), and Load 0% (dotted circles). All series show a sharp increase in current between 30V and 40V, peaking around 1.8A at 35V. Above 40V, the current decreases as load increases. A slanted line from approximately (30, 0) to (75, 5) marks the rated input voltage range.</p>		<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>8</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>16</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>24</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>33</td><td>0.054</td><td>0.928</td><td>1.904</td></tr> <tr><td>34</td><td>0.050</td><td>0.901</td><td>1.881</td></tr> <tr><td>36</td><td>0.041</td><td>0.838</td><td>1.706</td></tr> <tr><td>40</td><td>0.032</td><td>0.747</td><td>1.524</td></tr> <tr><td>48</td><td>0.030</td><td>0.628</td><td>1.279</td></tr> <tr><td>60</td><td>0.032</td><td>0.509</td><td>1.035</td></tr> <tr><td>70</td><td>0.033</td><td>0.442</td><td>0.891</td></tr> <tr><td>76</td><td>0.034</td><td>0.410</td><td>0.825</td></tr> <tr><td>80</td><td>0.034</td><td>0.392</td><td>0.788</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	8	0.000	0.000	0.000	16	0.000	0.000	0.000	24	0.000	0.000	0.000	33	0.054	0.928	1.904	34	0.050	0.901	1.881	36	0.041	0.838	1.706	40	0.032	0.747	1.524	48	0.030	0.628	1.279	60	0.032	0.509	1.035	70	0.033	0.442	0.891	76	0.034	0.410	0.825	80	0.034	0.392	0.788	--	-	-	-	--	-	-	-	--	-	-	-
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<p>Detailed description: The graph plots Efficiency [%] on the y-axis (72 to 100) against Input Voltage [V] on the x-axis (20 to 80). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show a slight downward trend as input voltage increases. A slanted line is drawn across the graph, intersecting both data series, representing the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>33</td><td>89.1</td><td>85.9</td></tr> <tr><td>36</td><td>89.4</td><td>87.0</td></tr> <tr><td>40</td><td>89.8</td><td>87.4</td></tr> <tr><td>48</td><td>89.3</td><td>87.2</td></tr> <tr><td>55</td><td>88.8</td><td>87.1</td></tr> <tr><td>60</td><td>88.2</td><td>86.9</td></tr> <tr><td>70</td><td>87.2</td><td>86.5</td></tr> <tr><td>76</td><td>86.4</td><td>86.2</td></tr> <tr><td>80</td><td>85.9</td><td>86.0</td></tr> </tbody> </table>				Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	33	89.1	85.9	36	89.4	87.0	40	89.8	87.4	48	89.3	87.2	55	88.8	87.1	60	88.2	86.9	70	87.2	86.5	76	86.4	86.2	80	85.9	86.0		
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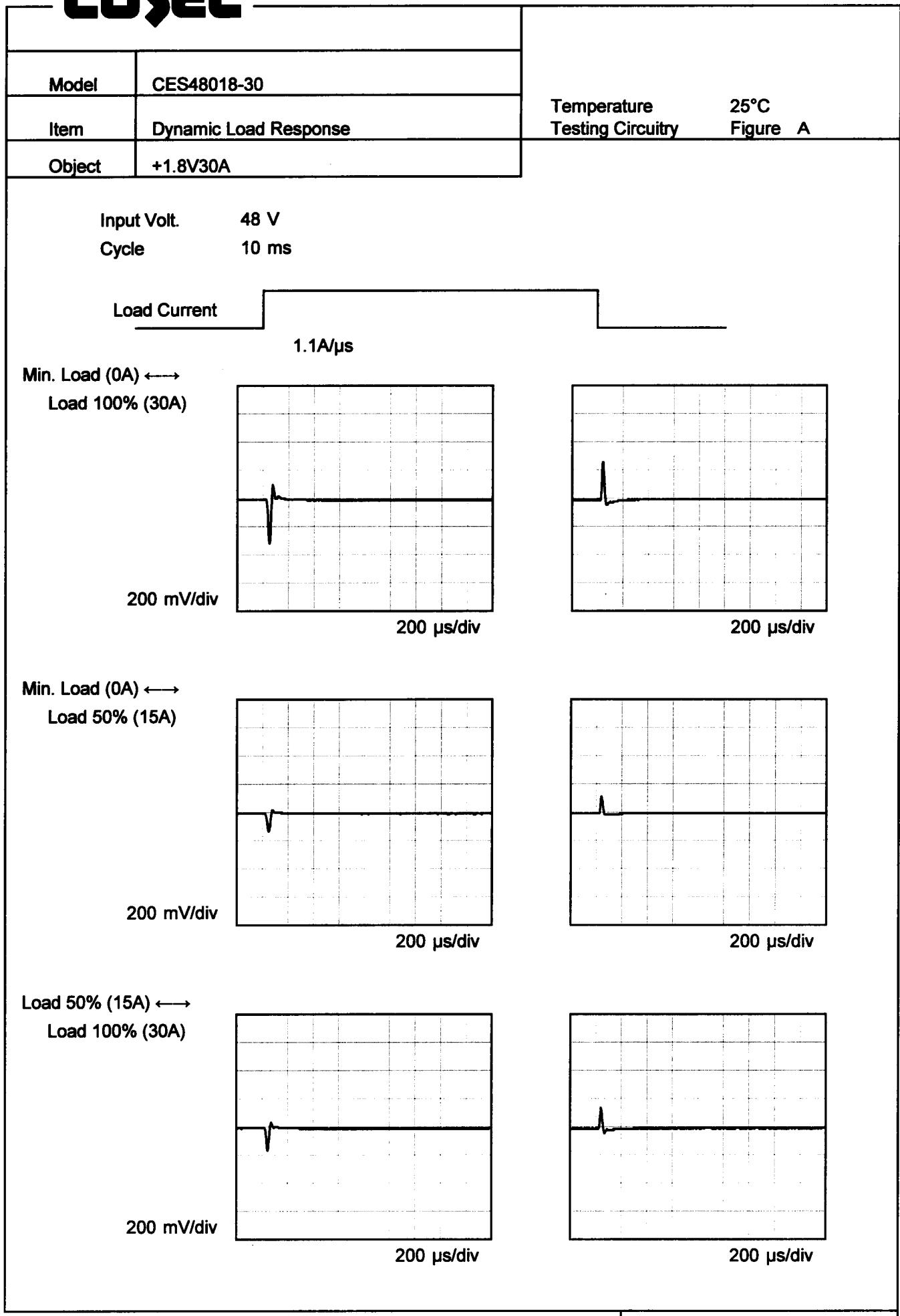
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Note: Slanted line shows the range of the rated input voltage.

COSEL

Model	CES48018-30	Temperature	25°C																																																			
Item	Load Regulation	Testing Circuitry	Figure A																																																			
Object	+1.8V30A																																																					
1.Graph	<p>—▲— Input Volt. 36V - - -□- - Input Volt. 48V - - ○- - Input Volt. 76V</p>																																																					
2.Values	<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>0</td><td>1.793</td><td>1.793</td><td>1.794</td></tr> <tr> <td>5</td><td>1.793</td><td>1.794</td><td>1.794</td></tr> <tr> <td>10</td><td>1.793</td><td>1.794</td><td>1.794</td></tr> <tr> <td>15</td><td>1.793</td><td>1.794</td><td>1.794</td></tr> <tr> <td>20</td><td>1.794</td><td>1.794</td><td>1.794</td></tr> <tr> <td>25</td><td>1.794</td><td>1.794</td><td>1.794</td></tr> <tr> <td>30</td><td>1.794</td><td>1.794</td><td>1.794</td></tr> <tr> <td>33</td><td>1.794</td><td>1.794</td><td>1.794</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>			Load Current [A]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0	1.793	1.793	1.794	5	1.793	1.794	1.794	10	1.793	1.794	1.794	15	1.793	1.794	1.794	20	1.794	1.794	1.794	25	1.794	1.794	1.794	30	1.794	1.794	1.794	33	1.794	1.794	1.794	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.

COSEL

COSEL

Model	CES48018-30																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+1.8V30A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 100 mV, and the X-axis ranges from 0 to 30 A. Two curves are shown: Input Volt. 36V (solid line with triangle markers) and Input Volt. 76V (dashed line with circle markers). Both curves remain flat at approximately 5 mV until a load current of about 25A, after which they rise sharply to between 40mV and 90mV. A slanted line indicates the rated load current range from 0 to 30A.</p>																																								
2.Values																																								
<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>0</td> <td>5</td> <td>5</td> </tr> <tr> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>10</td> <td>5</td> <td>5</td> </tr> <tr> <td>15</td> <td>5</td> <td>5</td> </tr> <tr> <td>20</td> <td>5</td> <td>5</td> </tr> <tr> <td>25</td> <td>5</td> <td>5</td> </tr> <tr> <td>30</td> <td>5</td> <td>5</td> </tr> <tr> <td>33</td> <td>5</td> <td>5</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. 36 [V]	Input Volt. 76 [V]	0	5	5	5	5	5	10	5	5	15	5	5	20	5	5	25	5	5	30	5	5	33	5	5	-	-	-	-	-	-	-	-	-
Load Current [A]	Ripple Voltage [mV]																																							
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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>																																								

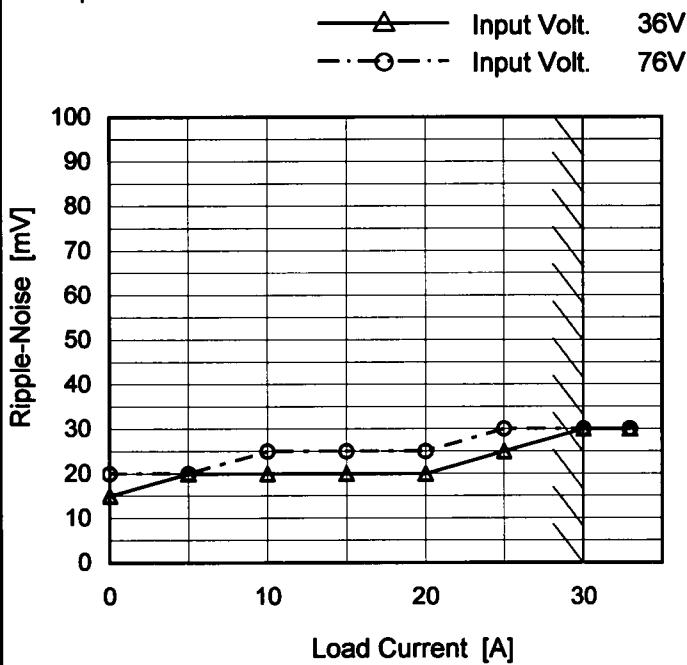
COSEL

Model CES48018-30

Item Ripple-Noise

Object +1.8V30A

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.

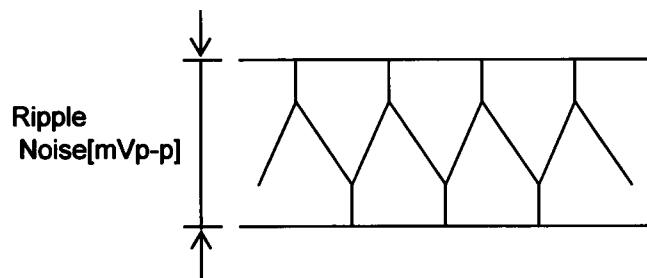


Fig.Complex Ripple Noise Wave Form

Temperature 25°C
Testing Circuitry Figure B

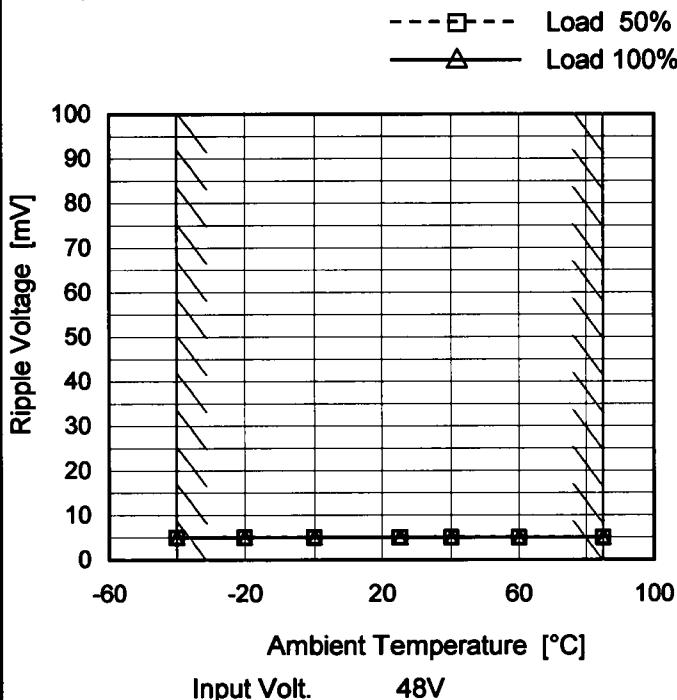
2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	15	20
5	20	20
10	20	25
15	20	25
20	20	25
25	25	30
30	30	30
33	30	30
--	-	-
--	-	-
--	-	-

COSEL

Model	CES48018-30
Item	Ripple Voltage (by Ambient Temp.)
Object	+1.8V30A

1. Graph



Measured by 100 MHz Oscilloscope.

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

Testing Circuitry Figure B

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	5	5
-20	5	5
0	5	5
25	5	5
40	5	5
60	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

<p>Model CES48018-30</p> <p>Item Ambient Temperature Drift</p> <p>Object +1.8V30A</p>	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. 36[V]</th> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr> <td>-40</td><td>1.797</td><td>1.797</td><td>1.797</td></tr> <tr> <td>-20</td><td>1.796</td><td>1.796</td><td>1.796</td></tr> <tr> <td>0</td><td>1.795</td><td>1.795</td><td>1.795</td></tr> <tr> <td>25</td><td>1.794</td><td>1.794</td><td>1.794</td></tr> <tr> <td>40</td><td>1.793</td><td>1.792</td><td>1.792</td></tr> <tr> <td>60</td><td>1.791</td><td>1.791</td><td>1.791</td></tr> <tr> <td>85</td><td>1.788</td><td>1.788</td><td>1.788</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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-40	1.797	1.797	1.797	-20	1.796	1.796	1.796	0	1.795	1.795	1.795	25	1.794	1.794	1.794	40	1.793	1.792	1.792	60	1.791	1.791	1.791	85	1.788	1.788	1.788	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-
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<p>1.Graph</p> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																					
<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																																					



Model	CES48018-30	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+1.8V30A	

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 - 30A

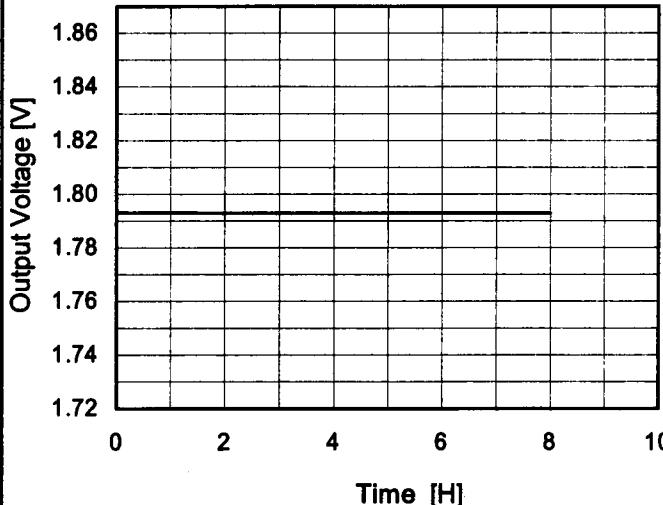
* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	76	0	1.797	±5	±0.3
Minimum Voltage	85	76	30	1.788		

COSEL

Model	CES48018-30	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+1.8V30A																								
1.Graph			2.Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 48V 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>1.794</td></tr> <tr><td>0.5</td><td>1.793</td></tr> <tr><td>1.0</td><td>1.793</td></tr> <tr><td>2.0</td><td>1.793</td></tr> <tr><td>3.0</td><td>1.793</td></tr> <tr><td>4.0</td><td>1.793</td></tr> <tr><td>5.0</td><td>1.793</td></tr> <tr><td>6.0</td><td>1.793</td></tr> <tr><td>7.0</td><td>1.793</td></tr> <tr><td>8.0</td><td>1.793</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	1.794	0.5	1.793	1.0	1.793	2.0	1.793	3.0	1.793	4.0	1.793	5.0	1.793	6.0	1.793	7.0	1.793	8.0	1.793
Time since start [H]	Output Voltage [V]																								
0.0	1.794																								
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COSEL

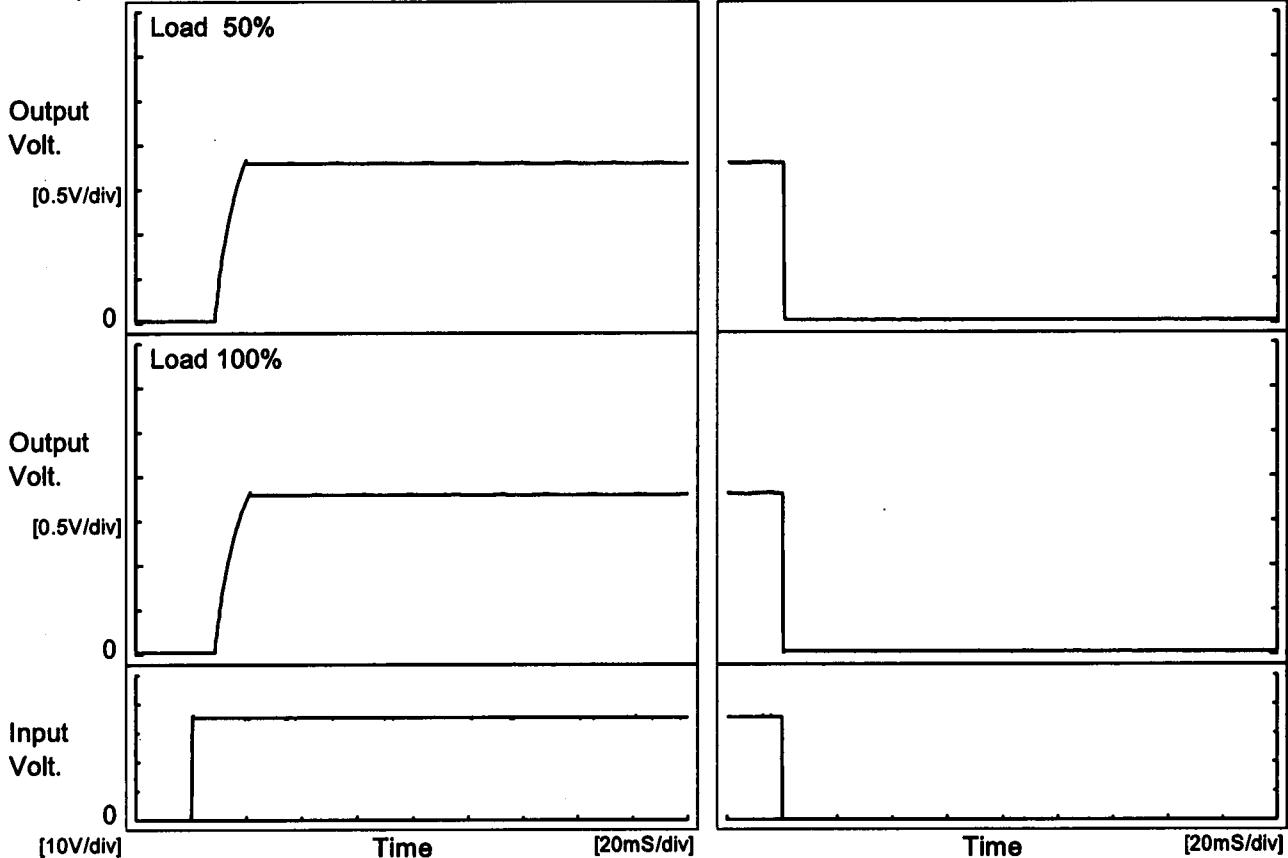
Model CES48018-30

Item Rise and Fall Time

Object +1.8V30A

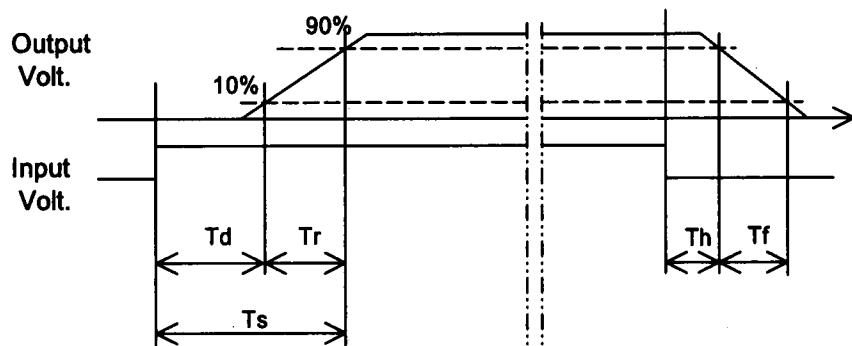
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

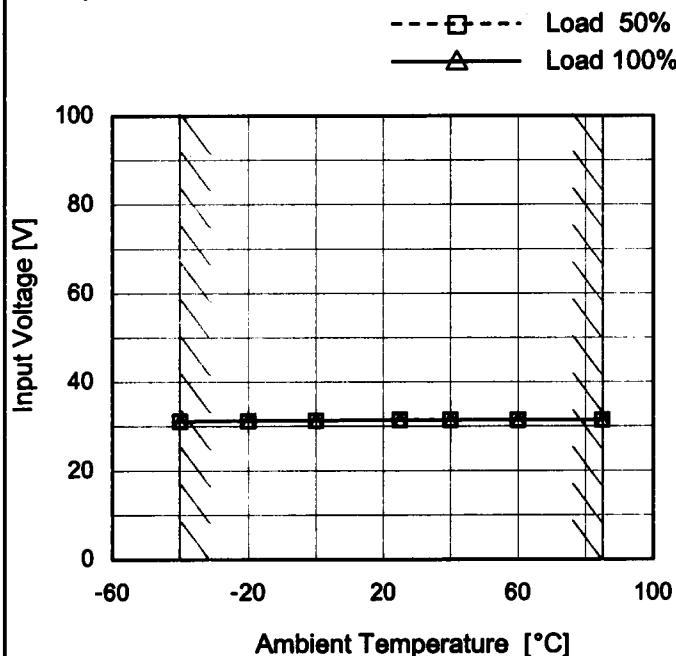
Load	Time	Td	Tr	Ts	Th	Tf	[mS]
50 %		9.3	8.5	17.8	0.2	0.3	
100 %		9.3	9.6	18.9	0.2	0.2	



COSEL

Model	CES48018-30
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+1.8V30A

1.Graph



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

Testing Circuitry Figure A

2.Values

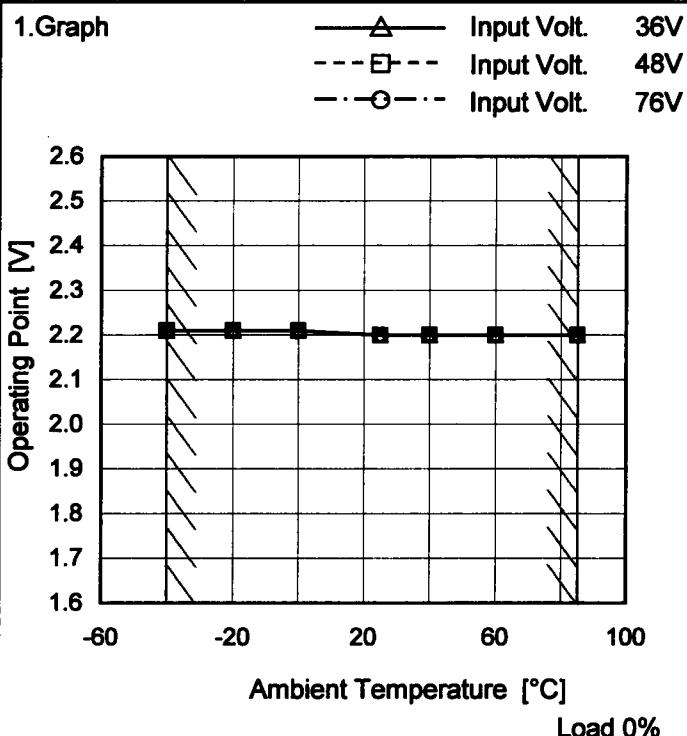
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	31.2	31.2
-20	31.3	31.3
0	31.3	31.3
25	31.5	31.5
40	31.5	31.5
60	31.5	31.5
85	31.5	31.5
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	CES48018-30	Temperature Testing Circuitry	25°C Figure A																																																								
Item	Overcurrent Protection																																																										
Object	+1.8V30A																																																										
1.Graph	<p>Input Volt. 36V Input Volt. 48V Input Volt. 76V</p> <p>Output Voltage [V]</p> <p>Load Current [A]</p>	2.Values																																																									
<p>Note: Slanted line shows the range of the rated load current.</p>																																																											
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Output Voltage [V]	Load Current [A]																																																										
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0.00	0.00	0.00	0.00																																																								

COSEL

Model	CES48018-30
Item	Overvoltage Protection
Object	+1.8V30A



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Operating Point [V]		
	36[V]	48[V]	76[V]
-40	2.21	2.21	2.21
-20	2.21	2.21	2.21
0	2.21	2.21	2.21
25	2.20	2.20	2.20
40	2.20	2.20	2.20
60	2.20	2.20	2.20
85	2.20	2.20	2.20
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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

COSEL

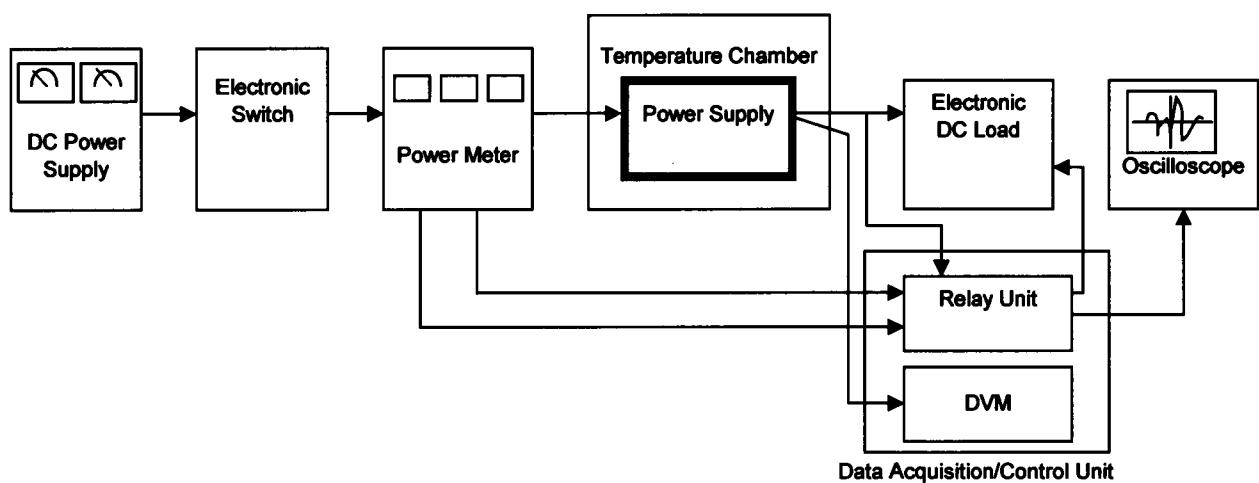


Figure A

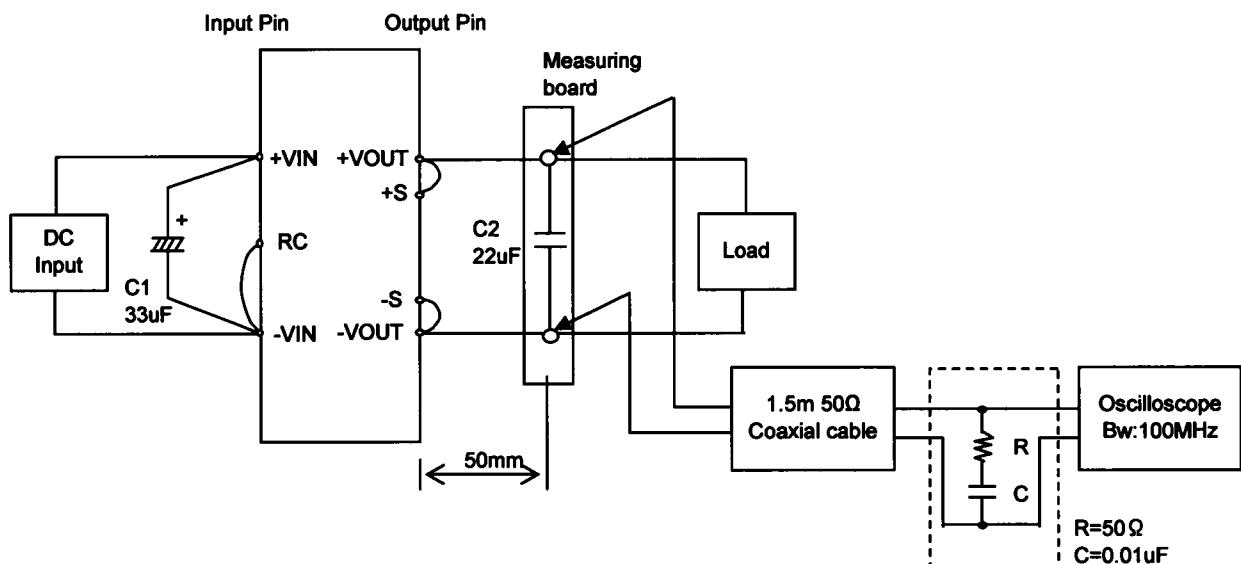


Figure B