



TEST DATA OF CES48060-17

Regulated DC Power Supply
Nov 27, 2006

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COSEL CO.,LTD.

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Model		CES48060-17																																																																																																																																																												
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Model

CES48060-17

Item

Input Current (by Load Current)

Object

Temperature

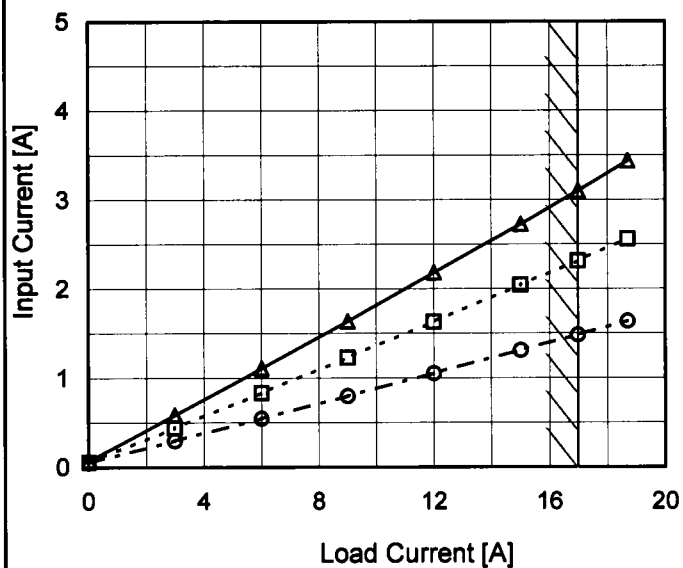
25°C

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 Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	0.072	0.057	0.052
3.0	0.587	0.441	0.297
6.0	1.110	0.832	0.547
9.0	1.639	1.228	0.798
12.0	2.184	1.630	1.052
15.0	2.727	2.044	1.310
17.0	3.099	2.314	1.483
18.7	3.437	2.561	1.638
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<div><div><div>Input Power [W]</div><div>200</div><div>150</div><div>100</div><div>50</div><div>0</div></div><div><div>0</div><div>4</div><div>8</div><div>12</div><div>16</div><div>20</div></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>0.0</td><td>2.6</td><td>2.7</td><td>4.0</td></tr><tr><td>3.0</td><td>20.9</td><td>21.0</td><td>22.4</td></tr><tr><td>6.0</td><td>39.8</td><td>39.7</td><td>41.4</td></tr><tr><td>9.0</td><td>58.8</td><td>58.7</td><td>60.3</td></tr><tr><td>12.0</td><td>78.1</td><td>78.0</td><td>79.6</td></tr><tr><td>15.0</td><td>97.5</td><td>97.5</td><td>99.3</td></tr><tr><td>17.0</td><td>111.1</td><td>110.7</td><td>112.3</td></tr><tr><td>18.7</td><td>122.8</td><td>122.1</td><td>123.6</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>		Load Current [A]	Input Power [W]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	2.6	2.7	4.0	3.0	20.9	21.0	22.4	6.0	39.8	39.7	41.4	9.0	58.8	58.7	60.3	12.0	78.1	78.0	79.6	15.0	97.5	97.5	99.3	17.0	111.1	110.7	112.3	18.7	122.8	122.1	123.6	--	-	-	-	--	-	-	-	--	-	-	-
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Model

CES48060-17

Item

Efficiency (by Input Voltage)

Object

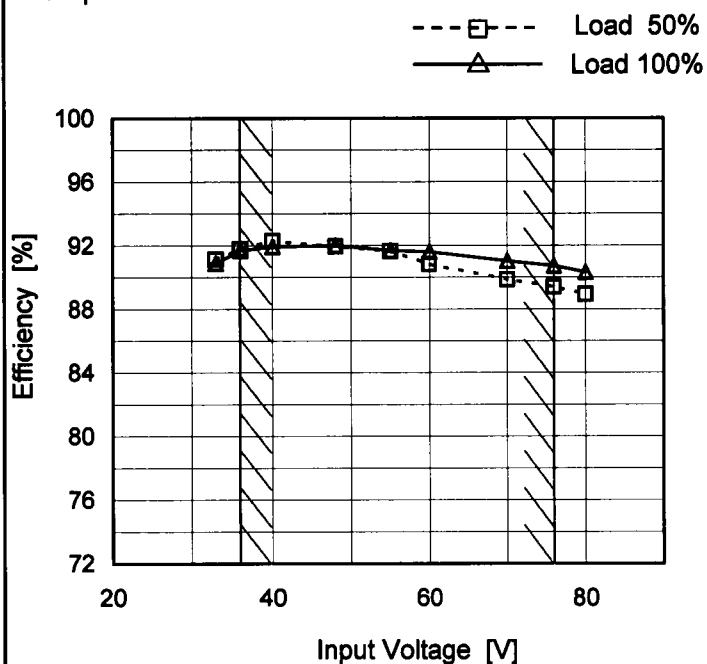
Temperature

25°C

Testing Circuitry

Figure A

1. Graph



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

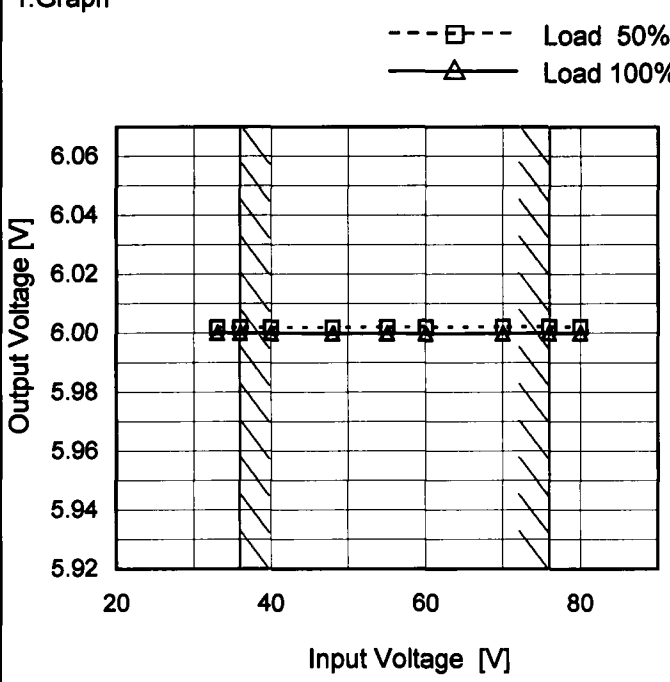
2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	91.2	90.9
36	91.8	91.7
40	92.3	91.9
48	92.0	92.0
55	91.6	91.7
60	90.8	91.6
70	89.9	91.0
76	89.4	90.7
80	88.9	90.3

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Model		CES48060-17		Temperature 25°C																																																				
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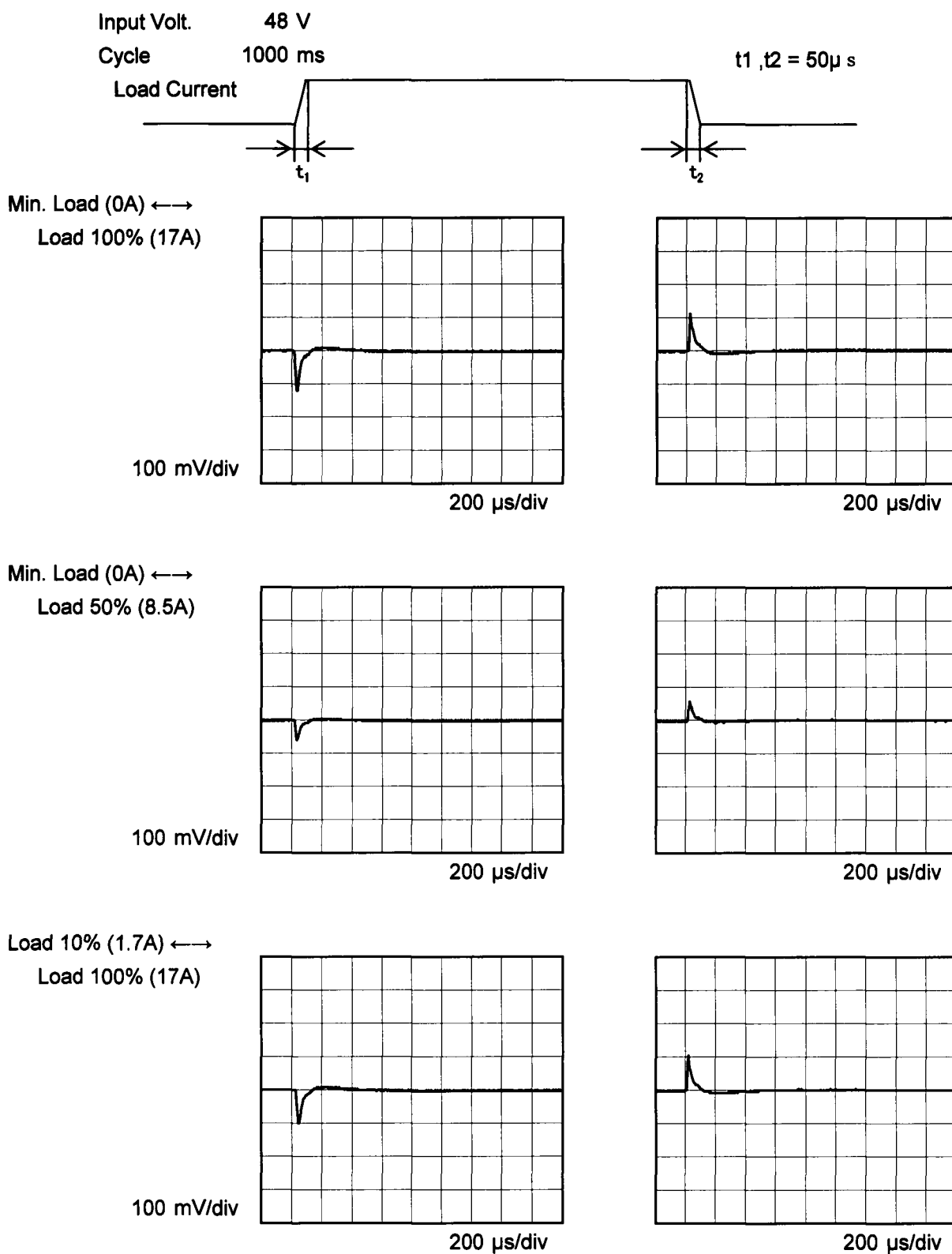
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<div><div><div>—△—</div><div>Input Volt.</div><div>36V</div></div><div><div>---□---</div><div>Input Volt.</div><div>48V</div></div><div><div>---○---</div><div>Input Volt.</div><div>76V</div></div></div> <div>Output Voltage [V]</div> <div>Load Current [A]</div>		<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>0.0</td><td>6.003</td><td>6.004</td><td>6.004</td></tr><tr><td>3.0</td><td>6.003</td><td>6.003</td><td>6.003</td></tr><tr><td>6.0</td><td>6.002</td><td>6.002</td><td>6.002</td></tr><tr><td>9.0</td><td>6.001</td><td>6.002</td><td>6.002</td></tr><tr><td>12.0</td><td>6.001</td><td>6.001</td><td>6.001</td></tr><tr><td>15.0</td><td>6.000</td><td>6.000</td><td>6.001</td></tr><tr><td>17.0</td><td>6.000</td><td>6.000</td><td>6.000</td></tr><tr><td>18.7</td><td>6.000</td><td>6.000</td><td>6.000</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>		Load Current [A]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	6.003	6.004	6.004	3.0	6.003	6.003	6.003	6.0	6.002	6.002	6.002	9.0	6.001	6.002	6.002	12.0	6.001	6.001	6.001	15.0	6.000	6.000	6.001	17.0	6.000	6.000	6.000	18.7	6.000	6.000	6.000	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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Note: Slanted line shows the range of the rated load current.																																																						

COSEL

Model	CES48060-17
Item	Dynamic Load Response
Object	+6V17A

Temperature 25°C
Testing Circuitry Figure A



COSEL

Model		CES48060-17		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+6V17A																																									
1.Graph				2.Values																																							
<div><div><div>—△— Input Volt. 36V</div><div>- -○- - Input Volt. 76V</div></div><div><div><div>Ripple Voltage [mV]</div><div>0 10 20 30 40 50</div><div>0 4 8 12 16 20</div><div>Load Current [A]</div></div></div></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>0.0</td><td>5</td><td>5</td></tr><tr><td>3.0</td><td>5</td><td>5</td></tr><tr><td>6.0</td><td>5</td><td>5</td></tr><tr><td>9.0</td><td>5</td><td>5</td></tr><tr><td>12.0</td><td>5</td><td>5</td></tr><tr><td>15.0</td><td>5</td><td>5</td></tr><tr><td>17.0</td><td>5</td><td>5</td></tr><tr><td>18.7</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></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 36 [V]	Input Volt. 76 [V]	0.0	5	5	3.0	5	5	6.0	5	5	9.0	5	5	12.0	5	5	15.0	5	5	17.0	5	5	18.7	5	5	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 36 [V]	Input Volt. 76 [V]																																									
0.0	5	5																																									
3.0	5	5																																									
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<div>Measured by 20 MHz Oscilloscope.</div> <div>Ripple Voltage is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																											
<div><div>Ripple [mVp-p]</div><div></div><div>Fig.Complex Ripple Wave Form</div></div>																																											

COSEL

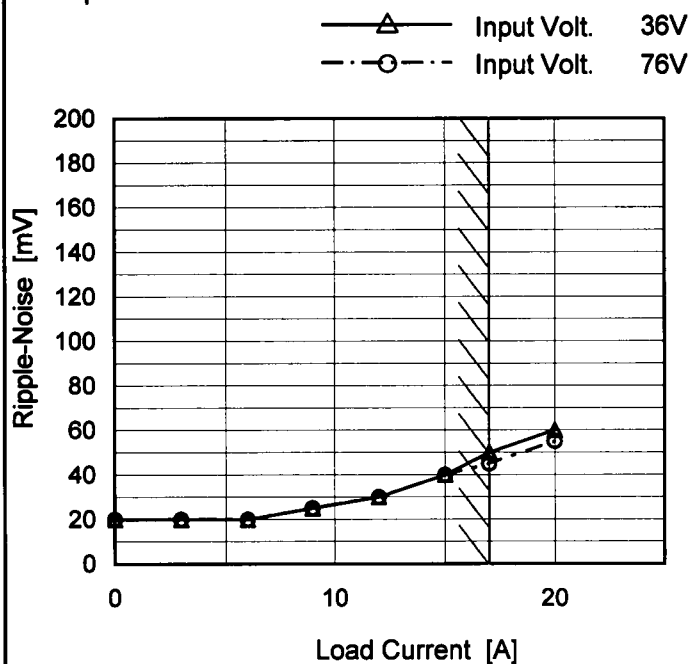
Model CES48060-17

Item Ripple-Noise

Object +6V17A

Temperature 25°C
Testing Circuitry Figure B

1. Graph



Measured by 500 MHz Oscilloscope.
 Ripple-Noise is shown as p-p in the figure below.
 Note: Slanted line shows the range of the rated load current.

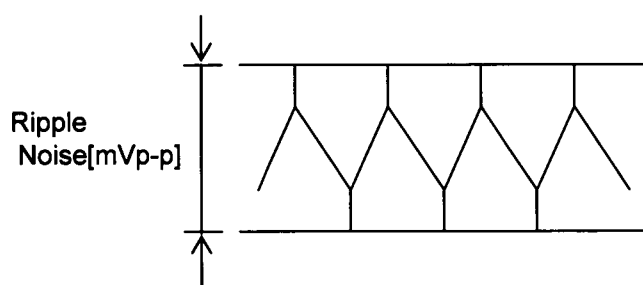


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	20	20
3	20	20
6	20	20
9	25	25
12	30	30
15	40	40
17	50	45
20	60	55
--	-	-
--	-	-
--	-	-

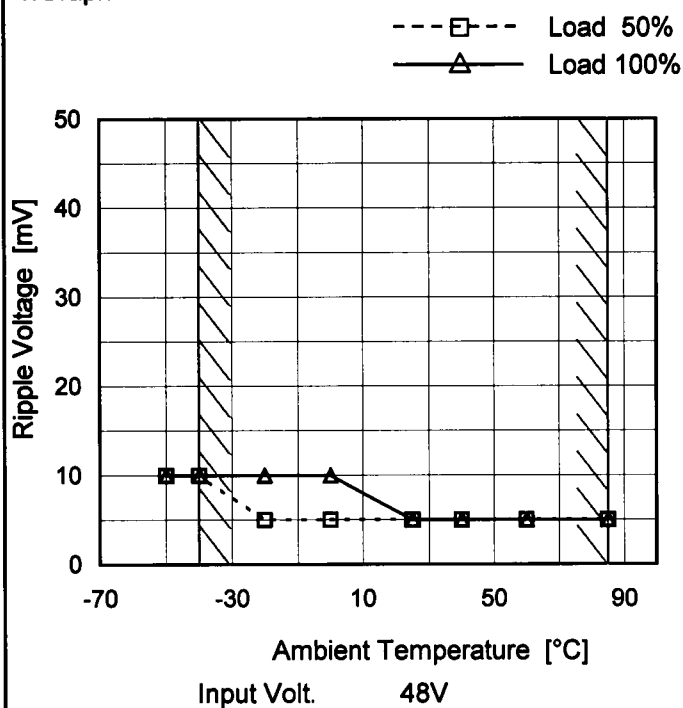
COSEL

Model CES48060-17

Item Ripple Voltage (by Ambient Temp.)

Object +6V17A

Testing Circuitry Figure B

1. Graph


Measured by 20 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	10	10
-40	10	10
-20	5	10
0	5	10
25	5	5
40	5	5
60	5	5
85	5	5
--	-	-
--	-	-
--	-	-

COSEL

Model

CES48060-17

Item

Ambient Temperature Drift

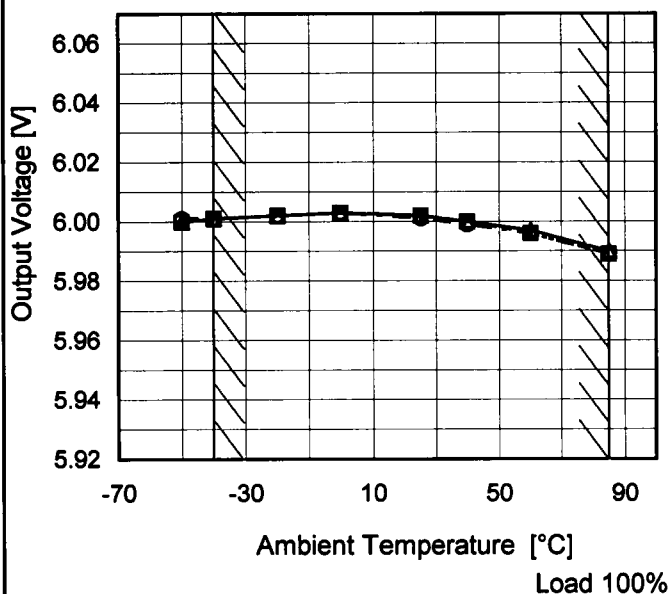
Object

+6V17A

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]
-50	6.000	6.000	6.001
-40	6.001	6.001	6.001
-20	6.002	6.002	6.002
0	6.003	6.003	6.003
25	6.002	6.002	6.001
40	6.000	6.000	5.999
60	5.997	5.996	5.996
85	5.990	5.989	5.989
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

		Testing Circuitry Figure A
Model	CES48060-17	
Item	Output Voltage Accuracy	
Object	+6V17A	

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 - 17A

* 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	0	36	0	6.006	±9	±0.2
Minimum Voltage	85	76	17	5.989		

COSEL

Model

CES48060-17

Item

Time Lapse Drift

Object

+6V17A

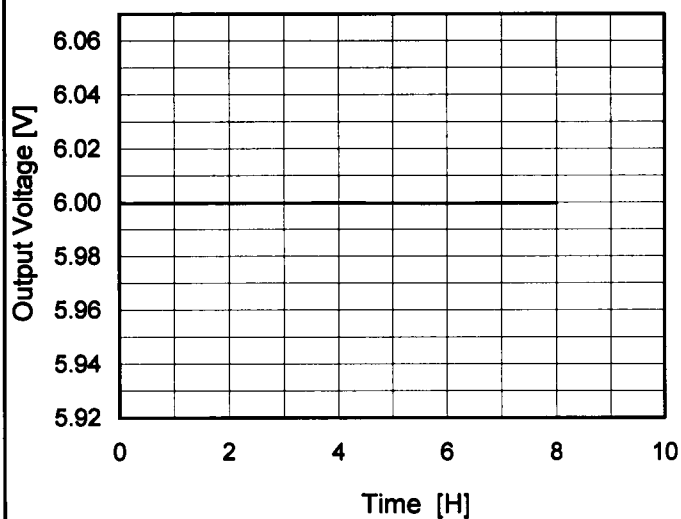
Temperature

25°C

Testing Circuitry

Figure A

1. Graph



Input Volt.

48V

Load

100%

2. Values

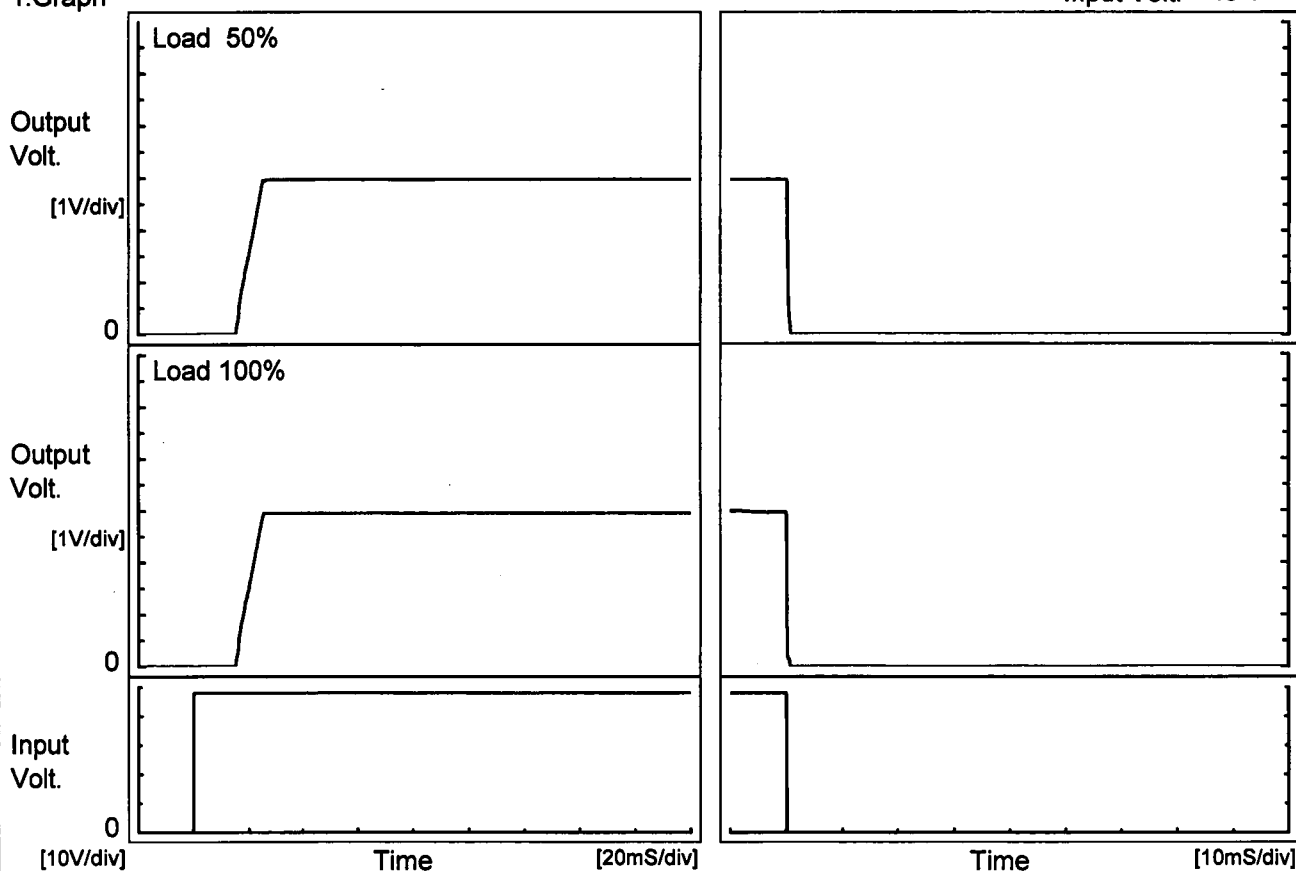
Time since start [H]	Output Voltage [V]
0.0	6.001
0.5	6.000
1.0	6.000
2.0	6.000
3.0	6.000
4.0	6.000
5.0	6.000
6.0	6.000
7.0	6.000
8.0	6.000

COSEL

Model	CES48060-17	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+6V17A		

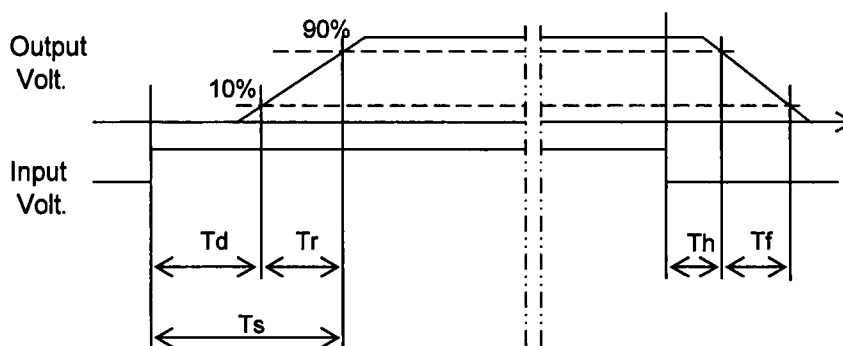
1. Graph

Input Volt. 48 V



2. Values

		[mS]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		16.1	8.1	24.2	0.1	0.3
100 %		16.0	8.4	24.4	0.1	0.2



COSEL

Model

CES48060-17

Item

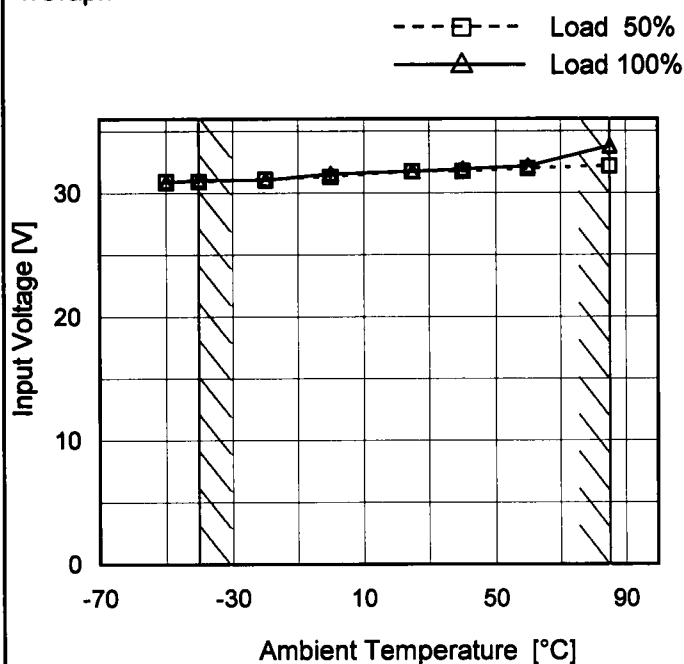
Minimum Input Voltage
for Regulated Output Voltage

Object

+6V17A

Testing Circuitry Figure A

1. Graph



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

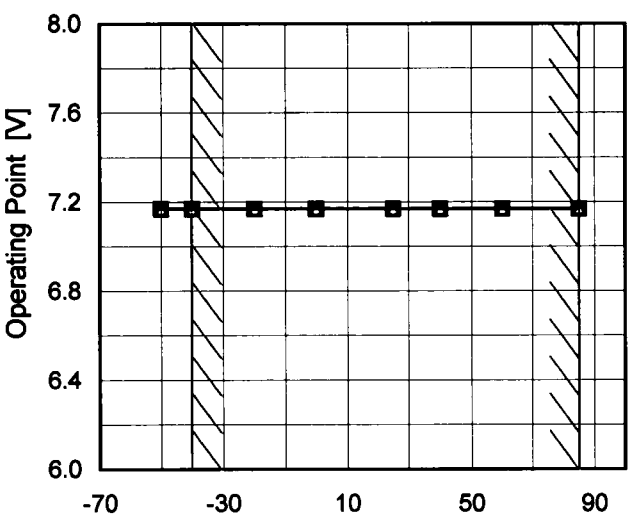
2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	31.0	30.9
-40	31.0	31.1
-20	31.2	31.1
0	31.4	31.6
25	31.8	31.8
40	31.8	32.0
60	32.0	32.2
85	32.2	33.8
--	-	-
--	-	-
--	-	-

COSEL

Model	CES48060-17																																																													
Item	Overcurrent Protection	Temperature	25°C																																																											
Object	+6V17A	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> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 3.8V to 0V.</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>6.0</td><td>21.38</td><td>20.97</td><td>20.95</td></tr><tr><td>5.7</td><td>21.44</td><td>20.91</td><td>20.94</td></tr><tr><td>5.4</td><td>21.10</td><td>20.78</td><td>20.86</td></tr><tr><td>4.8</td><td>20.65</td><td>20.62</td><td>20.83</td></tr><tr><td>4.2</td><td>20.42</td><td>20.56</td><td>20.93</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]	6.0	21.38	20.97	20.95	5.7	21.44	20.91	20.94	5.4	21.10	20.78	20.86	4.8	20.65	20.62	20.83	4.2	20.42	20.56	20.93	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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COSEL

Model		CES48060-17																																																				
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Ambient Temperature [°C]	Operating Point [V]																																																					
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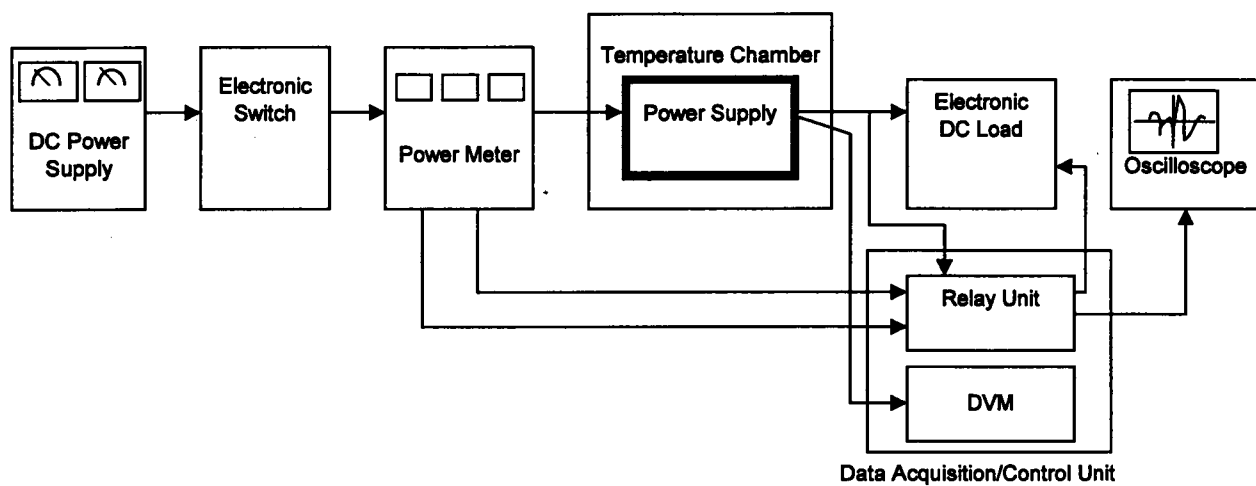


Figure A

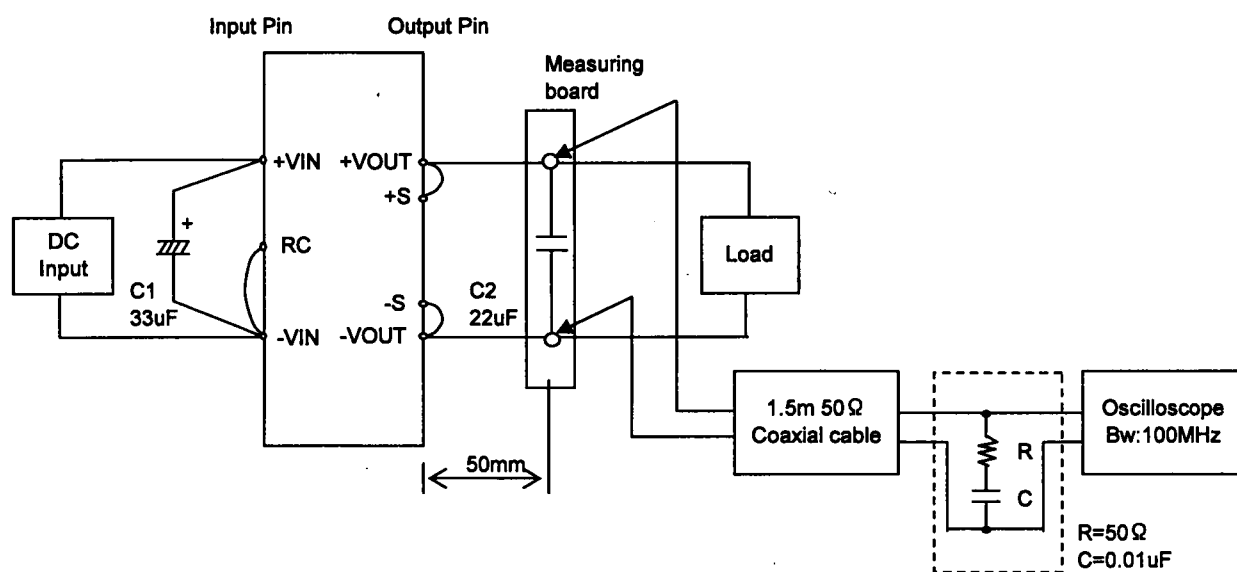


Figure B