



TEST DATA OF CHS2004805

Regulated DC Power Supply
September 29, 2011

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COSEL CO.,LTD.

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

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Model	CHS2004805
Item	Input Current (by Load Current)
Object	

1. Graph

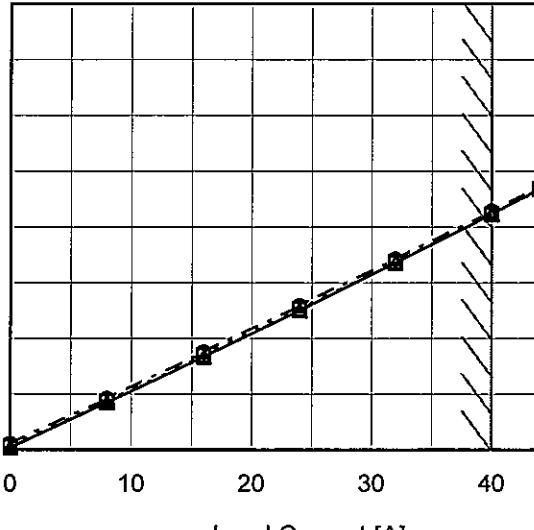
Load Current [A]	Input Volt. 36V [A]	Input Volt. 48V [A]	Input Volt. 76V [A]
0	0.055	0.060	0.070
8	1.186	0.908	0.608
16	2.332	1.764	1.156
24	3.492	2.634	1.704
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40	5.880	4.398	2.818
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Note: Slanted line shows the range of the rated load current.

Temperature	25°C
Testing Circuitry	Figure A

2. Values

Load Current [A]	Input Current [A]		
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Note: Slanted line shows the range of the rated load current.

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Model	CHS2004805	Temperature	25°C																														
Item	Efficiency (by Input Voltage)	Testing Circuitry	Figure A																														
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<p>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 decrease in efficiency as input voltage increases. A vertical slanted line indicates 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>34</td><td>95.8</td><td>94.1</td></tr> <tr><td>36</td><td>95.7</td><td>94.2</td></tr> <tr><td>40</td><td>95.6</td><td>94.4</td></tr> <tr><td>48</td><td>95.0</td><td>94.4</td></tr> <tr><td>55</td><td>94.4</td><td>94.3</td></tr> <tr><td>60</td><td>94.0</td><td>94.1</td></tr> <tr><td>70</td><td>92.9</td><td>93.5</td></tr> <tr><td>76</td><td>92.3</td><td>93.1</td></tr> <tr><td>80</td><td>91.9</td><td>93.0</td></tr> </tbody> </table>				Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	34	95.8	94.1	36	95.7	94.2	40	95.6	94.4	48	95.0	94.4	55	94.4	94.3	60	94.0	94.1	70	92.9	93.5	76	92.3	93.1	80	91.9	93.0
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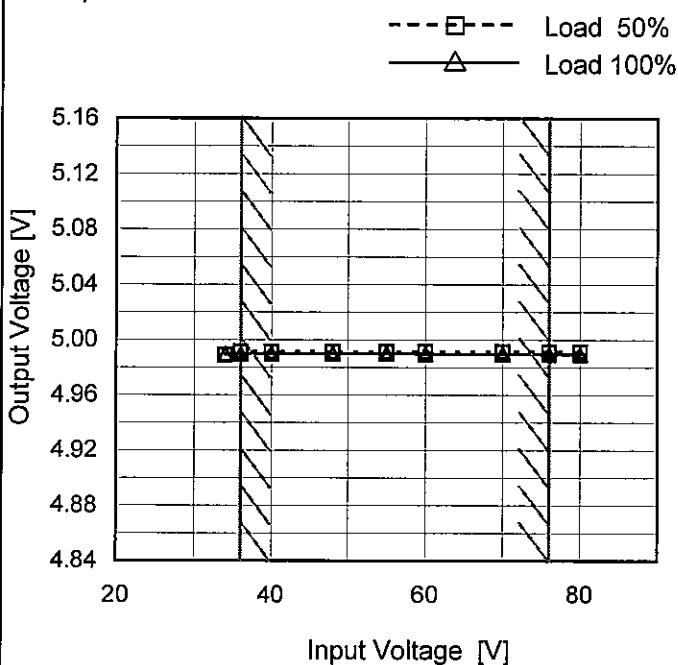
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Model	CHS2004805
Item	Line Regulation
Object	+5V40A

1. Graph



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

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
34	4.989	4.989
36	4.991	4.990
40	4.991	4.990
48	4.991	4.990
55	4.991	4.990
60	4.991	4.990
70	4.991	4.990
76	4.991	4.990
80	4.991	4.989

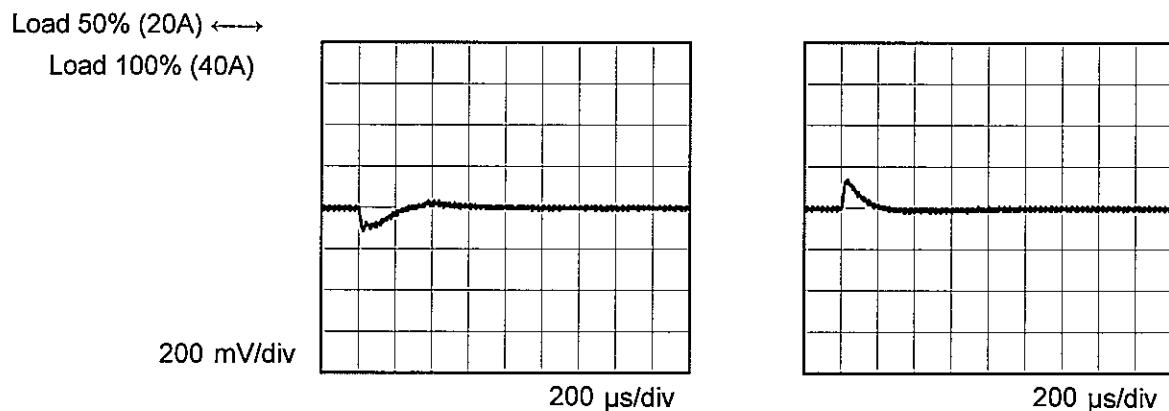
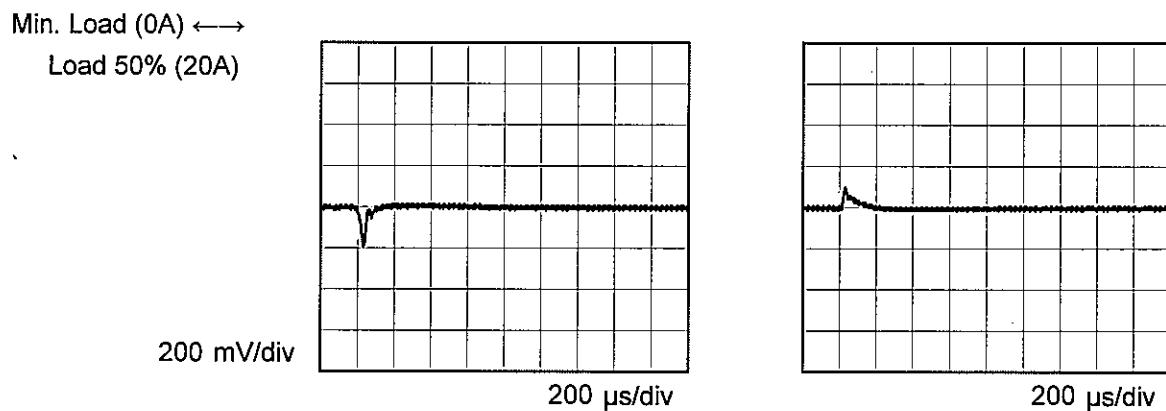
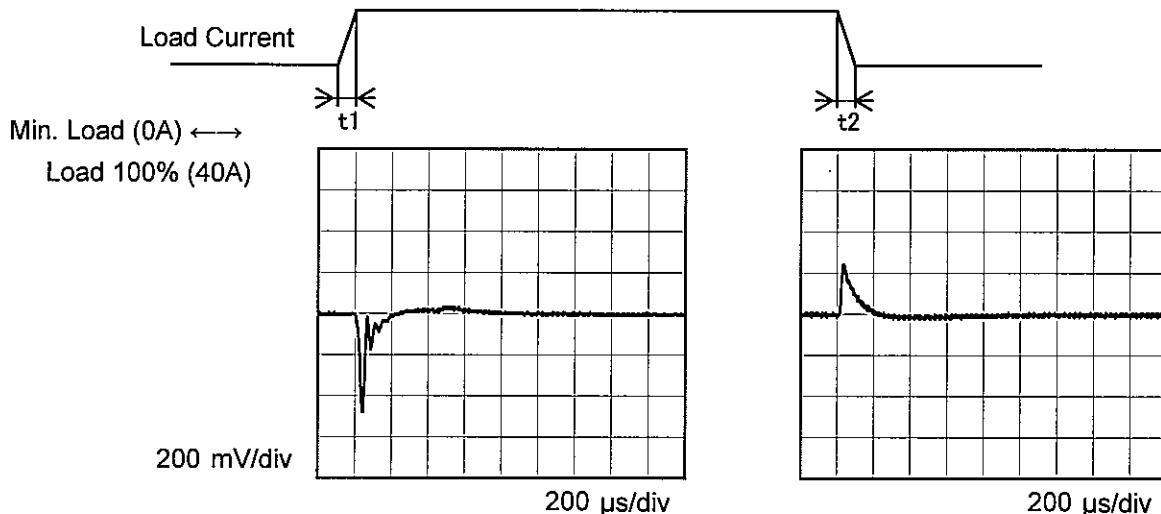
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<p style="text-align: center;"> —△— Input Volt. 36V ---□--- Input Volt. 48V ---○--- Input Volt. 76V </p> <p>The graph plots Output Voltage [V] on the Y-axis (4.84 to 5.16) against Load Current [A] on the X-axis (0 to 40). Three data series are shown for input voltages of 36V, 48V, and 76V. All series show a constant output voltage of approximately 5.00V up to a load current of about 35A, after which the output voltage drops sharply. A slanted line on the graph indicates the range of the rated load current.</p>																																																						
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<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>4.988</td><td>4.991</td><td>4.991</td></tr> <tr><td>8</td><td>4.989</td><td>4.991</td><td>4.991</td></tr> <tr><td>16</td><td>4.990</td><td>4.991</td><td>4.991</td></tr> <tr><td>24</td><td>4.990</td><td>4.991</td><td>4.991</td></tr> <tr><td>32</td><td>4.990</td><td>4.991</td><td>4.991</td></tr> <tr><td>40</td><td>4.990</td><td>4.990</td><td>4.990</td></tr> <tr><td>44</td><td>4.990</td><td>4.990</td><td>4.990</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>				Load Current [A]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0	4.988	4.991	4.991	8	4.989	4.991	4.991	16	4.990	4.991	4.991	24	4.990	4.991	4.991	32	4.990	4.991	4.991	40	4.990	4.990	4.990	44	4.990	4.990	4.990	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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<p>Note: Slanted line shows the range of the rated load current.</p>																																																						

COSEL

Model	CHS2004805	Temperature Testing Circuitry 25°C Figure A
Item	Dynamic Load Response	
Object	+5V40A	

Input Volt. 48 V
Cycle 5 ms



COSEL

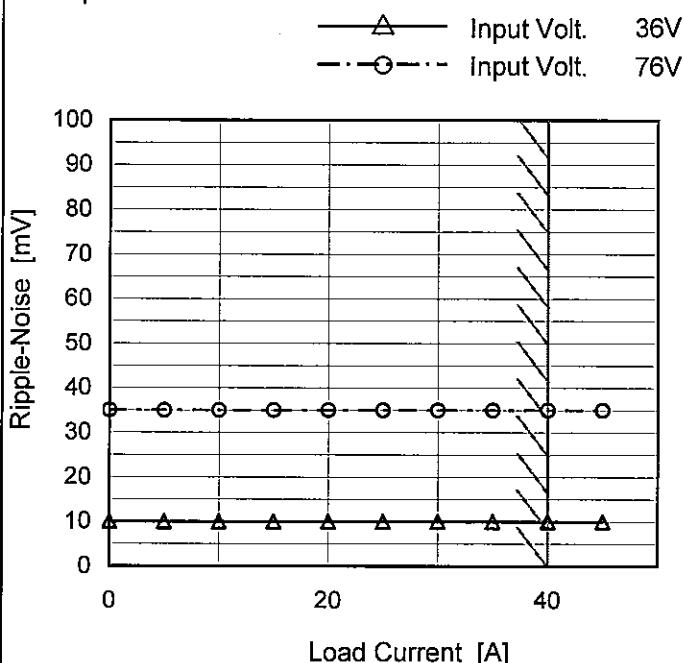
Model	CHS2004805																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+5V40A																																							
1.Graph																																								
		2.Values																																						
<p>—△— Input Volt. 36V - -○- - Input Volt. 76V</p>																																								
<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>10</td><td>30</td></tr> <tr><td>5</td><td>10</td><td>30</td></tr> <tr><td>10</td><td>10</td><td>30</td></tr> <tr><td>15</td><td>10</td><td>30</td></tr> <tr><td>20</td><td>10</td><td>30</td></tr> <tr><td>25</td><td>10</td><td>30</td></tr> <tr><td>30</td><td>10</td><td>30</td></tr> <tr><td>35</td><td>10</td><td>30</td></tr> <tr><td>40</td><td>10</td><td>30</td></tr> <tr><td>45</td><td>10</td><td>30</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	10	30	5	10	30	10	10	30	15	10	30	20	10	30	25	10	30	30	10	30	35	10	30	40	10	30	45	10	30	--	-	-
Load Current [A]	Ripple Voltage [mV]																																							
	Input Volt. 36[V]	Input Volt. 76[V]																																						
0	10	30																																						
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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	CHS2004805
Item	Ripple-Noise
Object	+5V40A

Temperature 25°C
 Testing Circuitry Figure B

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.

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36[V]	Input Volt. 76 [V]
0	10	35
5	10	35
10	10	35
15	10	35
20	10	35
25	10	35
30	10	35
35	10	35
40	10	35
45	10	35
--	-	-

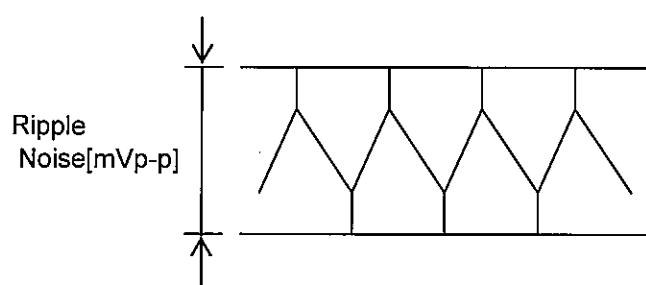


Fig.Complex Ripple Noise Wave Form

COSEL

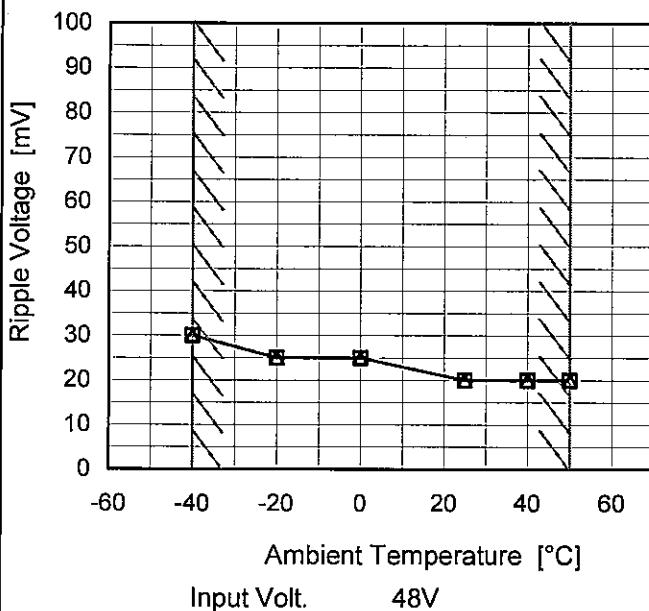
Model CHS2004805

Item Ripple Voltage (by Ambient Temp.)

Object +5V40A

1. Graph

---□--- Load 50%
—△— Load 100%



Input Volt. 48V

Measured by 100 MHz Oscilloscope.

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

Ripple [mVp-p]

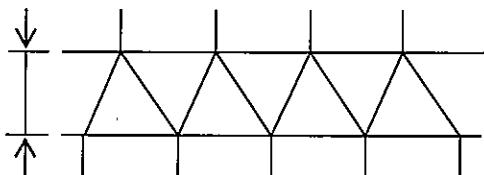


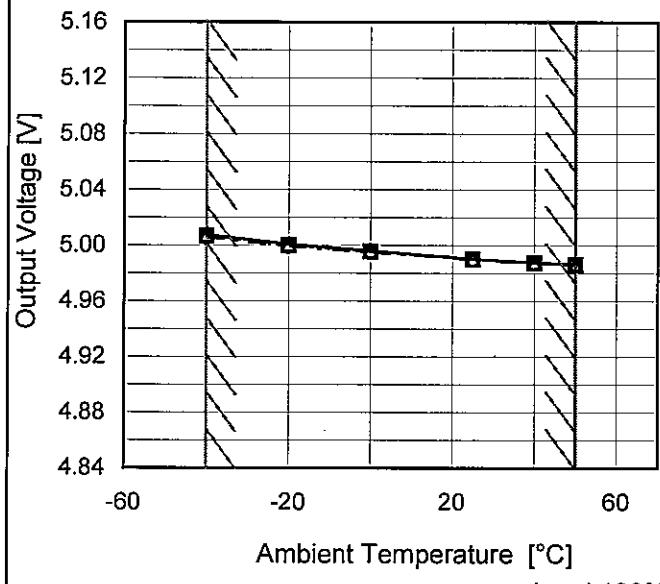
Fig. Complex Ripple Wave Form

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	30	30
-20	25	25
0	25	25
25	20	20
40	20	20
50	20	20
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	CHS2004805	Testing Circuitry Figure A		
Item	Ambient Temperature Drift			
Object	+5V40A	2.Values		
1.Graph	<p>—△— Input Volt. 36V - - □ - - Input Volt. 48V - - ○ - - Input Volt. 76V</p>  <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>	2.Values		
		Ambient Temperature [°C]	Output Voltage [V]	
		[°C]	Input Volt. 36[V]	Input Volt. 48[V]
		-40	5.007	5.007
		-20	5.001	5.000
		0	4.996	4.996
		25	4.990	4.990
		40	4.988	4.987
		50	4.986	4.986
		--	-	-
		--	-	-
		--	-	-
		--	-	-
		--	-	-

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



Model	CHS2004805	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+5V40A	

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 - 50°C

Input Voltage : 36 - 76V

Load Current : 0 - 40A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

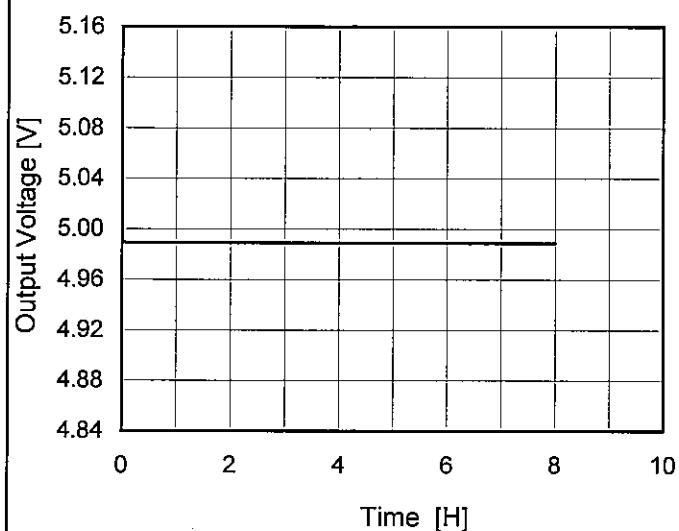
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	76	0	5.009	±12	±0.2
Minimum Voltage	50	36	0	4.985		

COSEL

Model	CHS2004805
Item	Time Lapse Drift
Object	+5V40A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

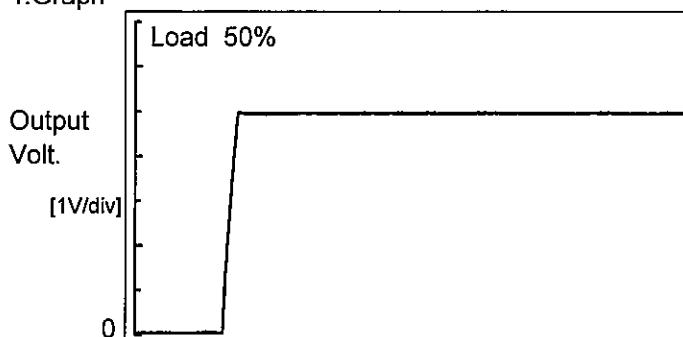
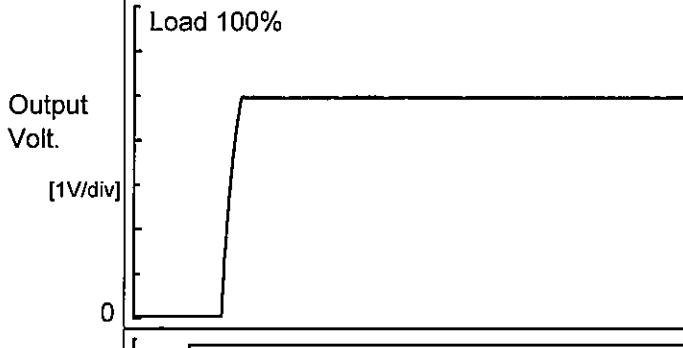
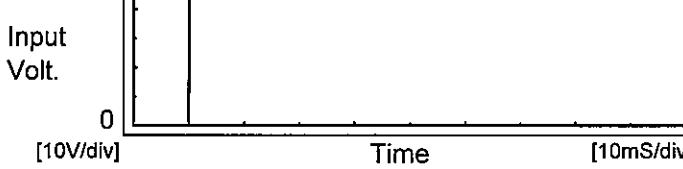
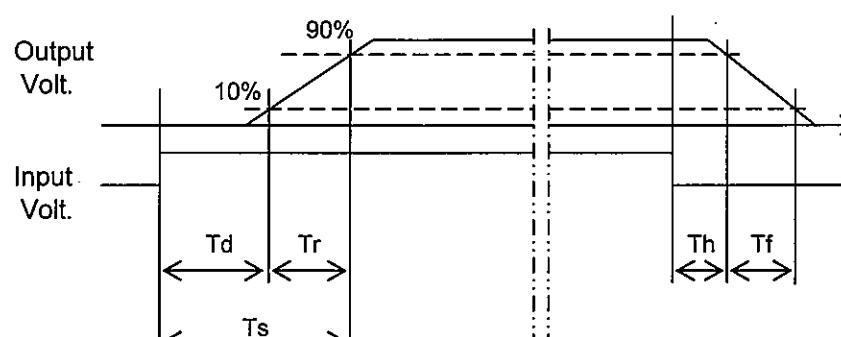


Input Volt. 48V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	4.990
0.5	4.989
1.0	4.989
2.0	4.989
3.0	4.989
4.0	4.989
5.0	4.989
6.0	4.989
7.0	4.989
8.0	4.989

COSSEL

Model	CHS2004805	Temperature	25°C				
Item	Rise and Fall Time	Testing Circuitry	Figure A				
Object	+5V40A						
1. Graph			Input Volt. 48 V				
							
							
							
			Time [10mS/div]				
			Time [10mS/div]				
2. Values [mS]							
Load		Time	Td	Tr	Ts	Th	Tf
50 %			6.1	2.2	8.3	0.8	0.3
100 %			6.0	2.8	8.8	0.4	0.1
							

Model	CHS2004805	Testing Circuitry Figure A																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																								
Object	+5V40A																																								
1.Graph																																									
<p>Input Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Legend:</p> <ul style="list-style-type: none"> Load 50% (dashed line) Load 100% (solid line) 		2.Values																																							
		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>-40</td><td>32.5</td><td>32.7</td> </tr> <tr> <td>-20</td><td>32.7</td><td>32.7</td> </tr> <tr> <td>0</td><td>32.7</td><td>32.7</td> </tr> <tr> <td>25</td><td>32.7</td><td>32.7</td> </tr> <tr> <td>40</td><td>32.7</td><td>32.7</td> </tr> <tr> <td>50</td><td>32.7</td><td>32.6</td> </tr> <tr> <td>--</td><td>-</td><td>-</td> </tr> </tbody> </table>		Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-40	32.5	32.7	-20	32.7	32.7	0	32.7	32.7	25	32.7	32.7	40	32.7	32.7	50	32.7	32.6	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.																																									

COSEL

Model	CHS2004805
Item	Overcurrent Protection
Object	+5V40A
1. Graph	
<p style="text-align: center;"> ————— Input Volt. 36V ————— Input Volt. 48V ————— Input Volt. 76V </p>	
<p>Note: Slanted line shows the range of the rated load current.</p>	

 Temperature 25°C
 Testing Circuitry Figure A

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
5.00	40.77	40.75	40.74
4.75	48.04	48.28	48.70
4.50	48.11	48.26	48.91
4.00	48.21	48.40	49.17
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

COSEL

Model	CHS2004805	Testing Circuitry Figure A																																							
Item	Otvoltage Protection																																								
Object	+5V40A																																								
1. Graph			2.Values																																						
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend: Input Volt. 48V (solid line with triangle), Input Volt. 76V (dashed line with square)</p>			<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr> <td>-40</td><td>6.84</td><td>6.71</td> </tr> <tr> <td>-20</td><td>6.86</td><td>6.69</td> </tr> <tr> <td>0</td><td>6.86</td><td>6.71</td> </tr> <tr> <td>25</td><td>6.84</td><td>6.69</td> </tr> <tr> <td>40</td><td>6.83</td><td>6.68</td> </tr> <tr> <td>50</td><td>6.83</td><td>6.68</td> </tr> <tr> <td>--</td><td>-</td><td>-</td> </tr> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 48[V]	Input Volt. 76[V]	-40	6.84	6.71	-20	6.86	6.69	0	6.86	6.71	25	6.84	6.69	40	6.83	6.68	50	6.83	6.68	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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COSEL

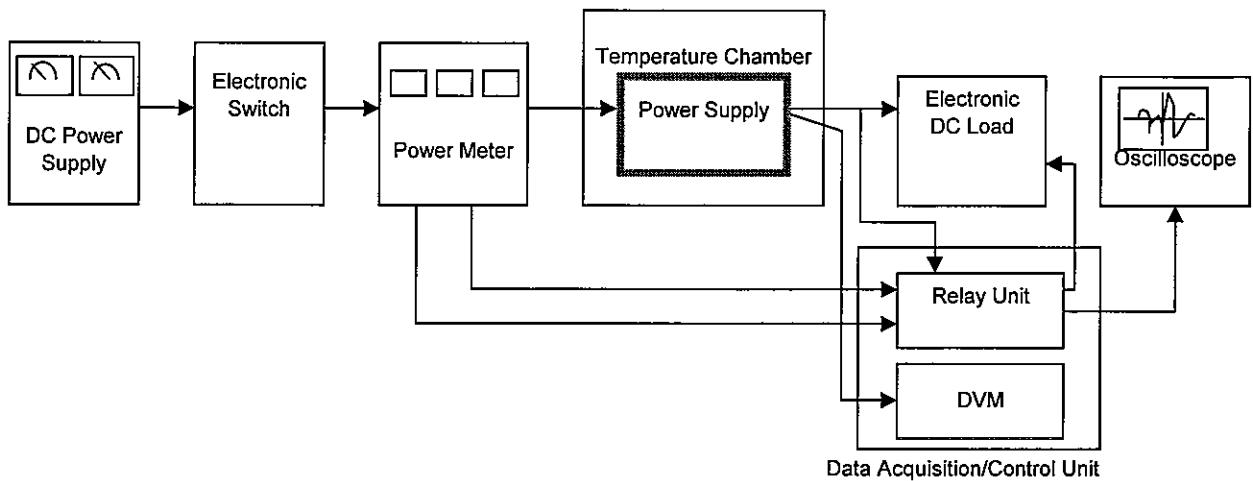


Figure A

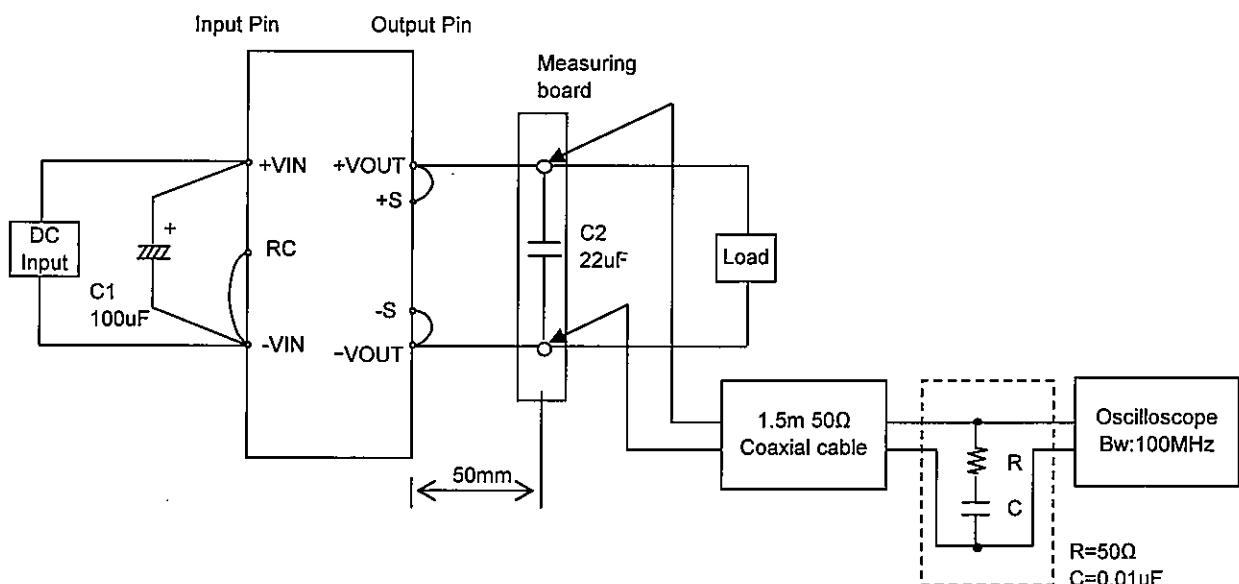


Figure B