



# TEST DATA OF CHS3004832

Regulated DC Power Supply  
September 26, 2019

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Yukihiro Takehashi Design Manager

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**COSEL CO.,LTD.**

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1.Graph				2.Values	
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Model		CHS3004832		Temperature 25°C Testing Circuitry Figure A																																																				
Item		Load Regulation																																																						
Object		+32V9.4A																																																						
1.Graph		<div><div><div>—△—</div><div>---□---</div><div>---○---</div></div><div><div>Input Volt. 36V</div><div>Input Volt. 48V</div><div>Input Volt. 76V</div></div></div> <div><div><div>Output Voltage [V]</div><div><div>32.40</div><div>32.30</div><div>32.20</div><div>32.10</div><div>32.00</div><div>31.90</div><div>31.80</div><div>31.70</div></div><div><div>0</div><div>4</div><div>8</div><div>12</div></div><div>Load Current [A]</div></div></div> <td colspan="2">2.Values</td>		2.Values																																																				
		<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>32.083</td><td>32.084</td><td>32.085</td></tr><tr><td>1.50</td><td>32.081</td><td>32.081</td><td>32.083</td></tr><tr><td>3.00</td><td>32.080</td><td>32.081</td><td>32.084</td></tr><tr><td>4.50</td><td>32.081</td><td>32.082</td><td>32.085</td></tr><tr><td>6.00</td><td>32.082</td><td>32.084</td><td>32.086</td></tr><tr><td>7.50</td><td>32.085</td><td>32.085</td><td>32.088</td></tr><tr><td>9.00</td><td>32.086</td><td>32.087</td><td>32.089</td></tr><tr><td>9.40</td><td>32.088</td><td>32.089</td><td>32.090</td></tr><tr><td>10.34</td><td>32.089</td><td>32.090</td><td>32.090</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	32.083	32.084	32.085	1.50	32.081	32.081	32.083	3.00	32.080	32.081	32.084	4.50	32.081	32.082	32.085	6.00	32.082	32.084	32.086	7.50	32.085	32.085	32.088	9.00	32.086	32.087	32.089	9.40	32.088	32.089	32.090	10.34	32.089	32.090	32.090	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																							
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Note: Slanted line shows the range of the rated load current.																																																								

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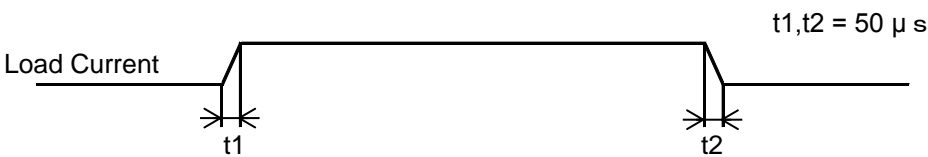
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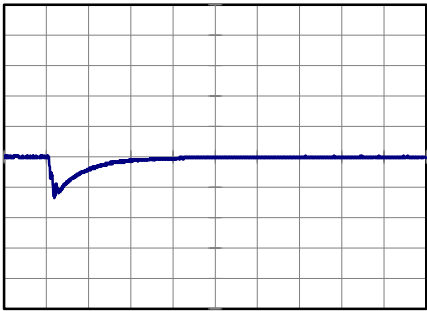
Model	CHS3004832	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+32V9.4A	

Input Volt. 48 V  
Cycle 10 ms

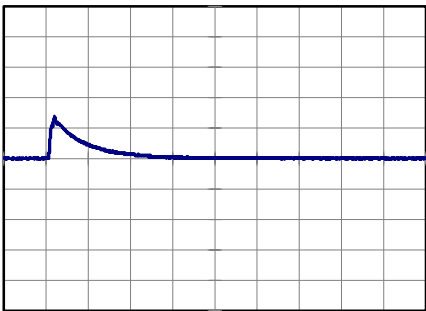


Min.Load (0A) $\longleftrightarrow$   
Load 100% (9.4A)

1 V/div



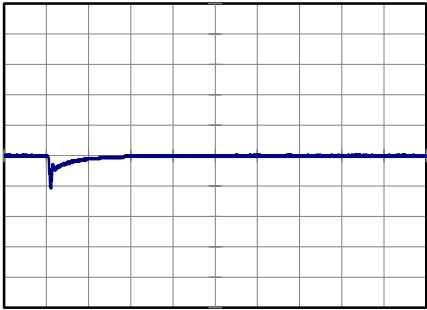
400 us/div



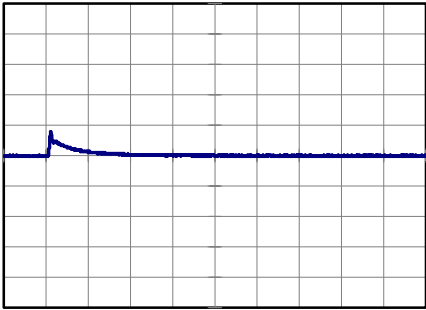
400 us/div

Min.Load (0A) $\longleftrightarrow$   
Load 50% (4.7A)

1 V/div



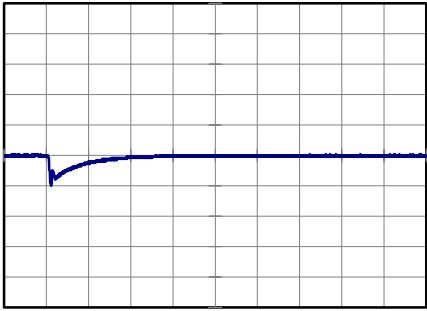
400 us/div



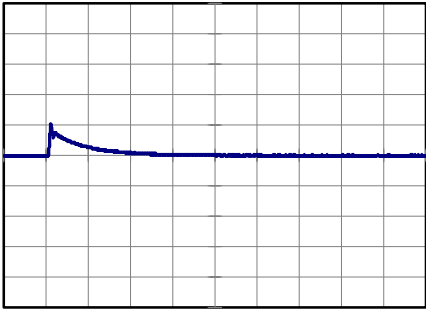
400 us/div

Load 50% (4.7A) $\longleftrightarrow$   
Load 100% (9.4A)

1 V/div



400 us/div



400 us/div

Model		CHS3004832		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure B																																							
Object		+32V9.4A																																									
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> <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>Fig.Complex Ripple Wave Form</p>				<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>0.000</td><td>70</td><td>185</td></tr><tr><td>2.350</td><td>70</td><td>185</td></tr><tr><td>4.700</td><td>65</td><td>180</td></tr><tr><td>7.050</td><td>60</td><td>170</td></tr><tr><td>9.400</td><td>70</td><td>170</td></tr><tr><td>10.340</td><td>80</td><td>175</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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 36 [V]	Input Volt. 76 [V]	0.000	70	185	2.350	70	185	4.700	65	180	7.050	60	170	9.400	70	170	10.340	80	175	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 36 [V]	Input Volt. 76 [V]																																									
0.000	70	185																																									
2.350	70	185																																									
4.700	65	180																																									
7.050	60	170																																									
9.400	70	170																																									
10.340	80	175																																									
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Model		CHS3004832		Temperature 25°C																																							
Item		Ripple-Noise		Testing Circuitry Figure B																																							
Object		+32V9.4A																																									
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> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 36 [V]</th><th>Input Volt. 76 [V]</th></tr><tr><td>0.000</td><td>85</td><td>190</td></tr><tr><td>2.350</td><td>85</td><td>190</td></tr><tr><td>4.700</td><td>85</td><td>190</td></tr><tr><td>7.050</td><td>80</td><td>185</td></tr><tr><td>9.400</td><td>85</td><td>185</td></tr><tr><td>10.340</td><td>90</td><td>190</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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 36 [V]	Input Volt. 76 [V]	0.000	85	190	2.350	85	190	4.700	85	190	7.050	80	185	9.400	85	185	10.340	90	190	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																										
	Input Volt. 36 [V]	Input Volt. 76 [V]																																									
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9.400	85	185																																									
10.340	90	190																																									
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<p>Measured by 100 MHz Oscilloscope.</p> <p>Ripple-Noise is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Ripple Noise[mVp-p]</p> <p>Fig.Complex Ripple Noise Wave Form</p>																																											

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Model		CHS3004832																																																				
Item		Ambient Temperature Drift																																																				
Object		+32V9.4A																																																				
1.Graph		2.Values																																																				
<div><div><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>Ambient Temperature [°C]</div><div>Load 100%</div></div><div>Note: Slanted line shows the range of the rated ambient temperature.</div></div>		<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>-40</td><td>31.965</td><td>31.975</td><td>31.988</td></tr><tr><td>-20</td><td>32.018</td><td>32.026</td><td>32.037</td></tr><tr><td>0</td><td>32.055</td><td>32.061</td><td>32.068</td></tr><tr><td>25</td><td>32.088</td><td>32.089</td><td>32.090</td></tr><tr><td>40</td><td>32.089</td><td>32.090</td><td>32.088</td></tr><tr><td>55</td><td>32.091</td><td>32.089</td><td>32.085</td></tr><tr><td>60</td><td>32.090</td><td>32.088</td><td>32.083</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>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-40	31.965	31.975	31.988	-20	32.018	32.026	32.037	0	32.055	32.061	32.068	25	32.088	32.089	32.090	40	32.089	32.090	32.088	55	32.091	32.089	32.085	60	32.090	32.088	32.083	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model		CHS3004832	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+32V9.4A	

### 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 - 55°C

Input Voltage : 36 - 76V

Load Current : 0 - 9.4A

\* 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	55	36	9.4	32.091	±72	±0.2
Minimum Voltage	-40	48	0	31.948		



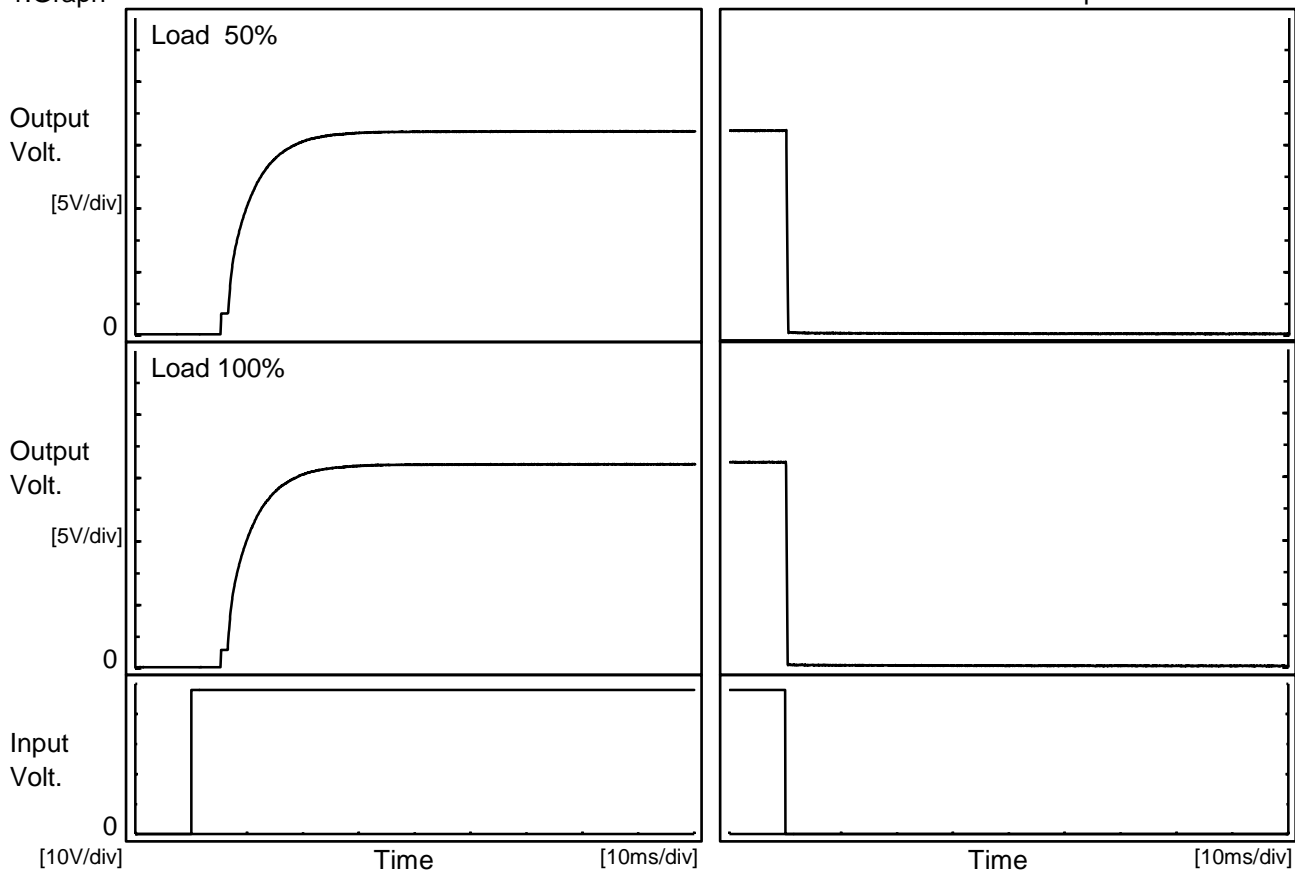
COSEL																									
Model	CHS3004832																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+32V9.4A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 48V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>32.089</td></tr><tr><td>0.5</td><td>32.091</td></tr><tr><td>1.0</td><td>32.091</td></tr><tr><td>2.0</td><td>32.091</td></tr><tr><td>3.0</td><td>32.091</td></tr><tr><td>4.0</td><td>32.091</td></tr><tr><td>5.0</td><td>32.092</td></tr><tr><td>6.0</td><td>32.092</td></tr><tr><td>7.0</td><td>32.092</td></tr><tr><td>8.0</td><td>32.091</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	32.089	0.5	32.091	1.0	32.091	2.0	32.091	3.0	32.091	4.0	32.091	5.0	32.092	6.0	32.092	7.0	32.092	8.0	32.091
Time since start [H]	Output Voltage [V]																								
0.0	32.089																								
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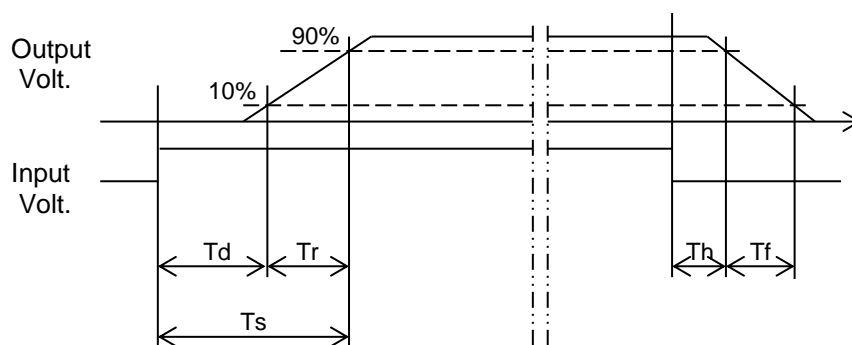
Model	CHS3004832	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+32V9.4A		

# 1.Graph



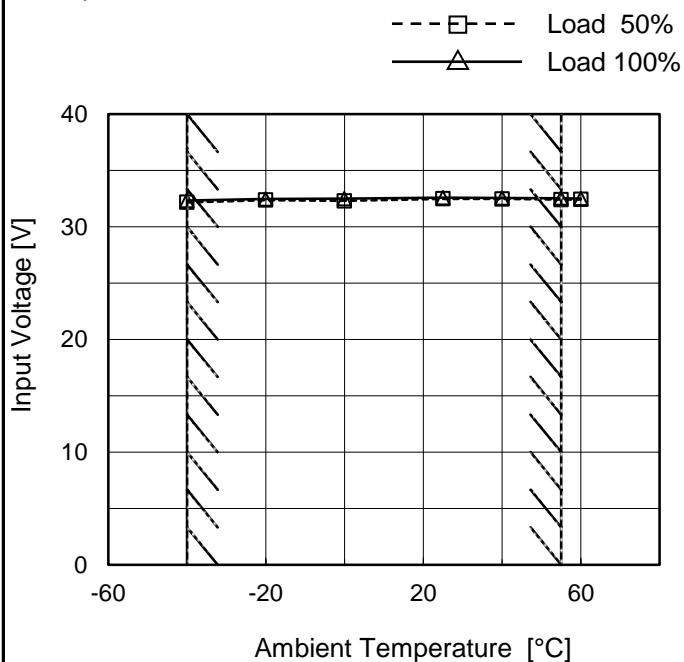
# 2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	5.4	11.2	16.6	0.2	0.2
100 %	5.4	11.1	16.5	0.2	0.2



Model	CHS3004832
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+32V9.4A

## 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	32.2	32.4
-20	32.4	32.5
0	32.3	32.5
25	32.5	32.6
40	32.5	32.6
55	32.5	32.6
60	32.5	32.6
--	-	-
--	-	-
--	-	-
--	-	-



Model		CHS3004832	
Item		Overcurrent Protection	
Object		+32V9.4A	
1.Graph		2.Values	

Input Volt. 36V

Input Volt. 48V

Input Volt. 76V

Output Voltage [V]

</

Model		CHS3004832
Item		Overvoltage Protection
Object		+32V9.4A

1.Graph

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□---

Input Volt.

48V

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○---

Input Volt.

76V

Ambient Temperature [°C]	Input Volt. 48[V]	Input Volt. 76[V]
-40	39.72	39.32
-20	39.76	39.39
0	39.74	39.41
25	39.72	39.46
55	39.69	39.37
60	39.68	39.35
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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. 76[V]
-40	39.72	39.32
-20	39.76	39.39
0	39.74	39.41
25	39.72	39.46
55	39.69	39.37
60	39.68	39.35
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

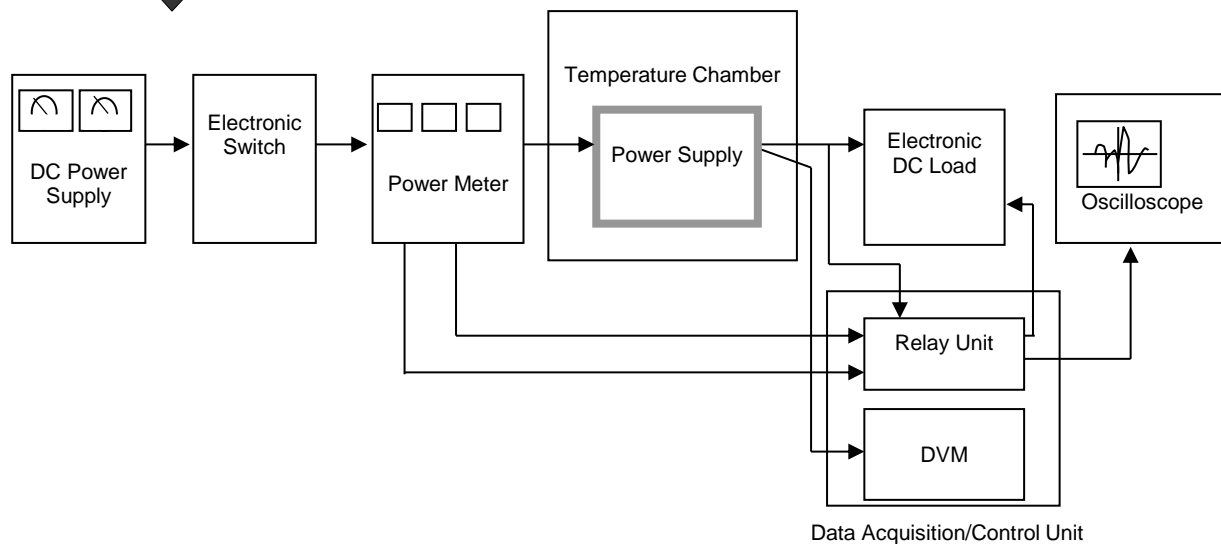


Figure A

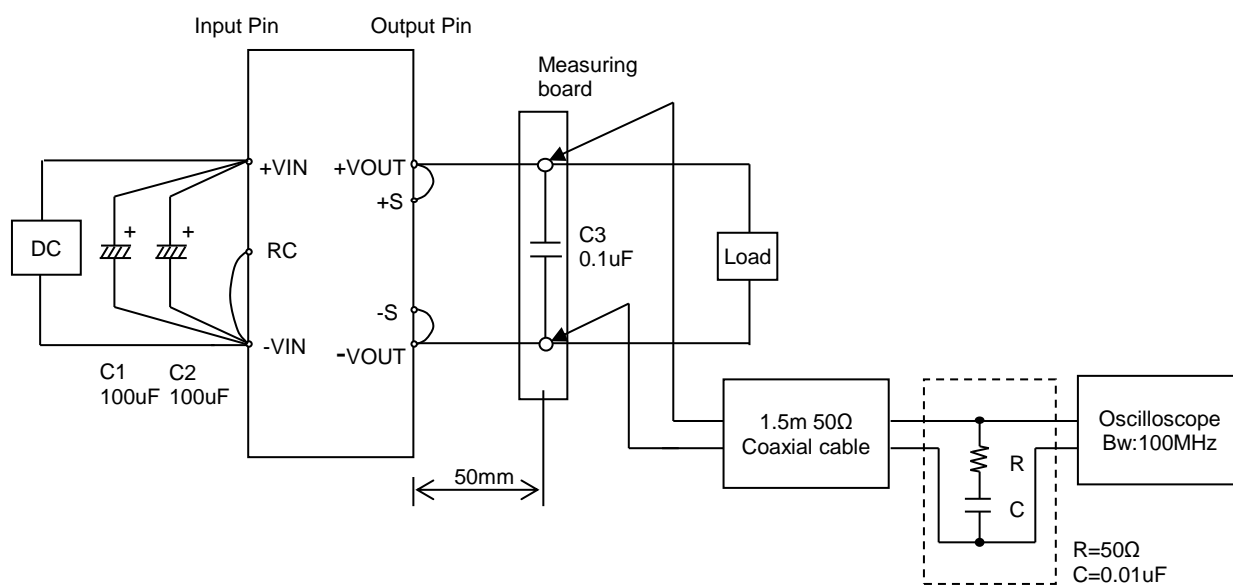


Figure B