

# TEST DATA OF DHS100A05

Regulated DC Power Supply  
April 8, 2010

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Tatsuya Mano Design Manager

Prepared by : Tetsuro Hirata  
Tetsuro Hirata Design Engineer

**COSEL CO.,LTD.**



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(Final Page 19)

Model	DHS100A05
Item	Input Current (by Input Voltage)
Object	

1.Graph

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
40	0.001	0.001	0.001
45	0.002	0.002	0.002
50	0.034	1.208	2.417
55	0.035	1.090	2.177
60	0.031	0.998	2.005
66	0.031	0.909	1.803
80	0.030	0.760	1.491
95	0.030	0.636	1.248
110	0.030	0.536	1.071
125	0.030	0.476	0.949
140	0.030	0.429	0.849
160	0.030	0.380	0.744
170	0.030	0.361	0.701
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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

Temperature 25°C  
Testing Circuitry Figure A

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Model	DHS100A05	Temperature Testing Circuitry	25°C Figure A																																															
Item	Input Current (by Load Current)																																																	
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1.Graph		2.Values																																																
<p>—△— Input Volt. 60V        - - -□- Input Volt. 110V        - - -○- Input Volt. 160V</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 60[V]</th> <th>Input Volt. 110[V]</th> <th>Input Volt. 160[V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>0.031</td><td>0.030</td><td>0.030</td></tr> <tr><td>4</td><td>0.430</td><td>0.225</td><td>0.166</td></tr> <tr><td>8</td><td>0.804</td><td>0.431</td><td>0.308</td></tr> <tr><td>12</td><td>1.192</td><td>0.641</td><td>0.452</td></tr> <tr><td>16</td><td>1.596</td><td>0.858</td><td>0.600</td></tr> <tr><td>20</td><td>2.005</td><td>1.071</td><td>0.744</td></tr> <tr><td>22</td><td>2.236</td><td>1.196</td><td>0.829</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]	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]	0	0.031	0.030	0.030	4	0.430	0.225	0.166	8	0.804	0.431	0.308	12	1.192	0.641	0.452	16	1.596	0.858	0.600	20	2.005	1.071	0.744	22	2.236	1.196	0.829	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model	DHS100A05	Temperature Testing Circuitry	25°C Figure A																																																				
Item	Input Power (by Load Current)																																																						
Object	—																																																						
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Model	DHS100A05	Temperature Testing Circuitry Object	25°C
Item	Efficiency (by Input Voltage)		Figure A
Object	_____		

**1. Graph**

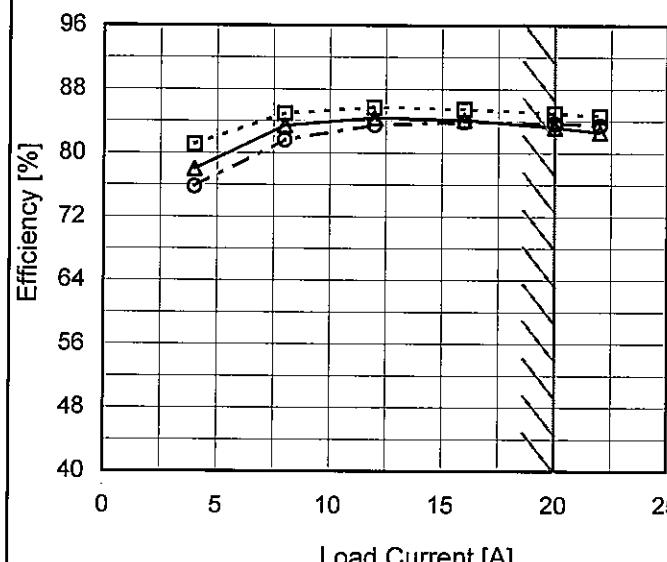
Legend: ---□--- Load 50%  
—△— Load 100%

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
60	84.0	83.2
66	83.9	83.1
80	83.0	83.0
95	83.4	83.4
110	85.5	85.0
125	84.7	84.5
140	83.9	84.2
160	82.8	83.7
170	82.2	83.4

**2. Values**

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

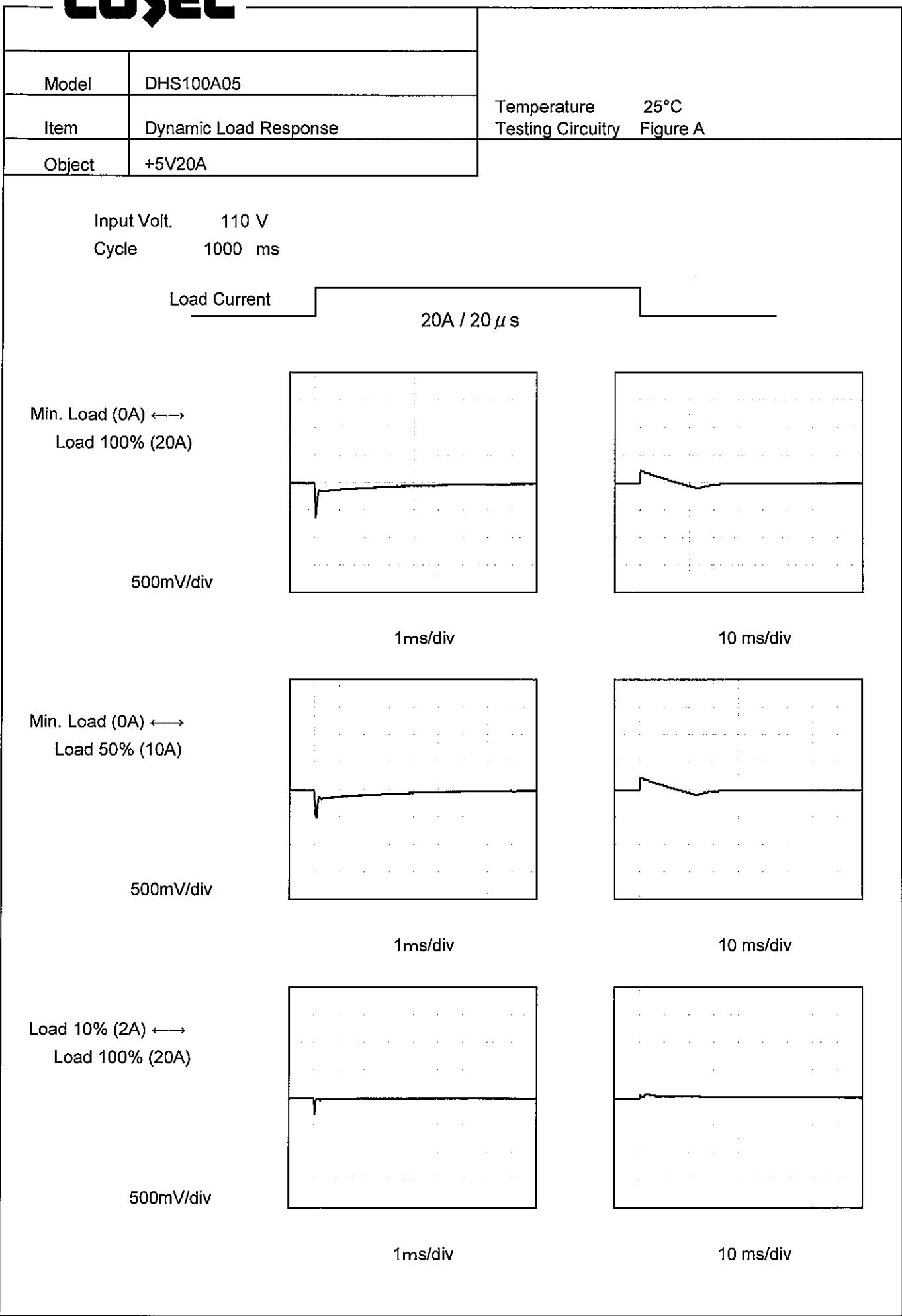
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Model	DHS100A05	Temperature	25°C																																																			
Item	Efficiency (by Load Current)	Testing Circuitry	Figure A																																																			
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Model	DHS100A05	Temperature	25°C																																
Item	Line Regulation	Testing Circuitry	Figure A																																
Object	+5V20A																																		
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Object	+5V20A																																																					
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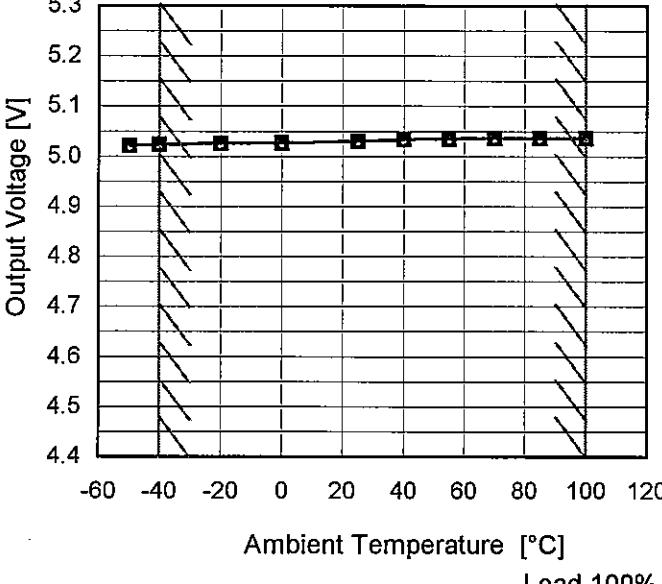
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Model	DHS100A05	Temperature Testing Circuitry 25°C Figure B																																			
Item	Ripple Voltage (by Load Current)																																				
Object	+5V20A																																				
1.Graph		2.Values																																			
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 300 mV, and the X-axis ranges from 0 to 25 A. Two sets of data points are shown: solid triangles for 60V and dashed circles for 160V. A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (60V)</th> <th>Ripple Voltage [mV] (160V)</th> </tr> </thead> <tbody> <tr><td>0</td><td>5</td><td>5</td></tr> <tr><td>4</td><td>15</td><td>20</td></tr> <tr><td>8</td><td>15</td><td>20</td></tr> <tr><td>12</td><td>15</td><td>20</td></tr> <tr><td>16</td><td>15</td><td>20</td></tr> <tr><td>20</td><td>15</td><td>25</td></tr> <tr><td>22</td><td>15</td><td>25</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> </tbody> </table>		Load Current [A]	Ripple Voltage [mV] (60V)	Ripple Voltage [mV] (160V)	0	5	5	4	15	20	8	15	20	12	15	20	16	15	20	20	15	25	22	15	25	--	-	-	--	-	-	--	-	-	--	-	-
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<p>Measured by 500 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>																																					

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4	20	25																																								
8	20	30																																								
12	20	30																																								
16	20	30																																								
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22	20	30																																								
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<p>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.</p>																																										
<p>Fig.Complex Ripple Noise Wave Form</p>																																										

Model	DHS100A05	Testing Circuitry    Figure B																																						
Item	Ripple Voltage (by Ambient Temp.)																																							
Object	+5V20A																																							
1.Graph		2.Values																																						
<p>Input Volt. 110V</p>		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-50</td><td>35</td><td>35</td></tr> <tr><td>-40</td><td>25</td><td>25</td></tr> <tr><td>-20</td><td>20</td><td>25</td></tr> <tr><td>0</td><td>20</td><td>25</td></tr> <tr><td>25</td><td>20</td><td>20</td></tr> <tr><td>40</td><td>20</td><td>20</td></tr> <tr><td>55</td><td>20</td><td>20</td></tr> <tr><td>70</td><td>20</td><td>20</td></tr> <tr><td>85</td><td>15</td><td>20</td></tr> <tr><td>100</td><td>15</td><td>20</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-50	35	35	-40	25	25	-20	20	25	0	20	25	25	20	20	40	20	20	55	20	20	70	20	20	85	15	20	100	15	20	--	-	-
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Model	DHS100A05	Testing Circuitry Figure A																																																					
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Object	+5V20A	2.Values																																																					
1.Graph	<p>—△— Input Volt. 60V        - - -□- Input Volt. 110V        - - -○- Input Volt. 160V</p>  <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 60[V]</th> <th>Input Volt. 110[V]</th> <th>Input Volt. 160[V]</th> </tr> </thead> <tbody> <tr> <td>-50</td> <td>5.021</td> <td>5.021</td> <td>5.021</td> </tr> <tr> <td>-40</td> <td>5.024</td> <td>5.024</td> <td>5.023</td> </tr> <tr> <td>-20</td> <td>5.026</td> <td>5.026</td> <td>5.025</td> </tr> <tr> <td>0</td> <td>5.026</td> <td>5.026</td> <td>5.026</td> </tr> <tr> <td>25</td> <td>5.030</td> <td>5.030</td> <td>5.030</td> </tr> <tr> <td>40</td> <td>5.034</td> <td>5.034</td> <td>5.034</td> </tr> <tr> <td>55</td> <td>5.036</td> <td>5.036</td> <td>5.036</td> </tr> <tr> <td>70</td> <td>5.037</td> <td>5.037</td> <td>5.037</td> </tr> <tr> <td>85</td> <td>5.036</td> <td>5.037</td> <td>5.037</td> </tr> <tr> <td>100</td> <td>5.036</td> <td>5.037</td> <td>5.037</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>			Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]	-50	5.021	5.021	5.021	-40	5.024	5.024	5.023	-20	5.026	5.026	5.025	0	5.026	5.026	5.026	25	5.030	5.030	5.030	40	5.034	5.034	5.034	55	5.036	5.036	5.036	70	5.037	5.037	5.037	85	5.036	5.037	5.037	100	5.036	5.037	5.037	--	-	-	-
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Note: Slanted line shows the range of the rated ambient temperature.



Model	DHS100A05	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+5V20A	

### 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 - 100°C

Input Voltage : 60 - 160V

Load Current : 0 - 20A

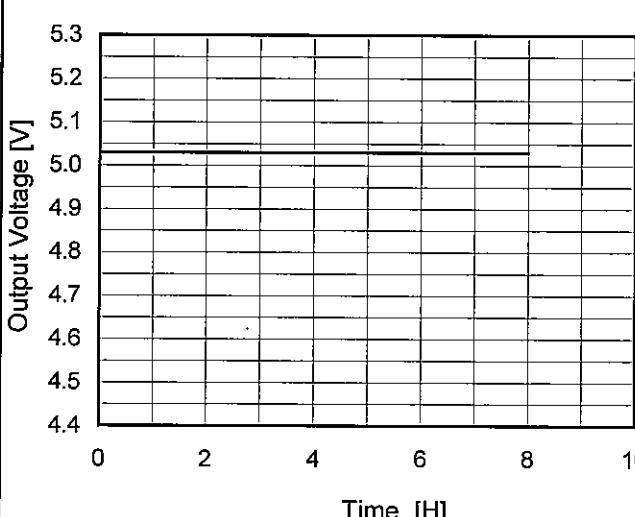
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	70	60	0	5.040		
Minimum Voltage	-40	160	20	5.023	±9	±0.2

**COSEL**

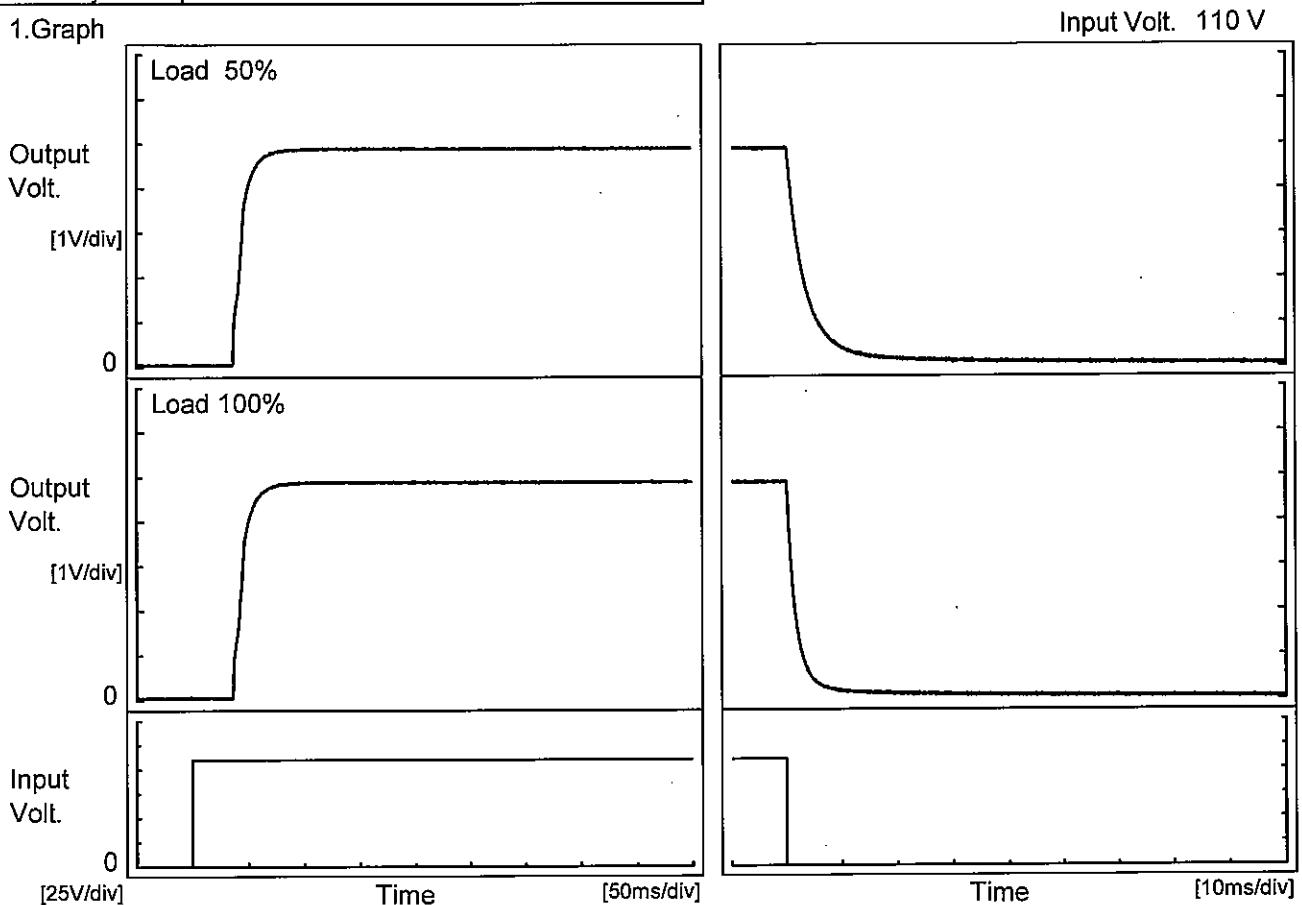
Model	DHS100A05	Temperature 25°C Testing Circuitry Figure A																						
Item	Time Lapse Drift																							
Object	+5V20A																							
1. Graph		2. Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 110V Load 100%</p>		<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.030</td></tr> <tr><td>0.5</td><td>5.030</td></tr> <tr><td>1.0</td><td>5.030</td></tr> <tr><td>2.0</td><td>5.030</td></tr> <tr><td>3.0</td><td>5.030</td></tr> <tr><td>4.0</td><td>5.030</td></tr> <tr><td>5.0</td><td>5.030</td></tr> <tr><td>6.0</td><td>5.030</td></tr> <tr><td>7.0</td><td>5.030</td></tr> <tr><td>8.0</td><td>5.030</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	5.030	0.5	5.030	1.0	5.030	2.0	5.030	3.0	5.030	4.0	5.030	5.0	5.030	6.0	5.030	7.0	5.030	8.0	5.030
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6.0	5.030																							
7.0	5.030																							
8.0	5.030																							

**COSEL**

Model	DHS100A05
Item	Rise and Fall Time
Object	+5V20A

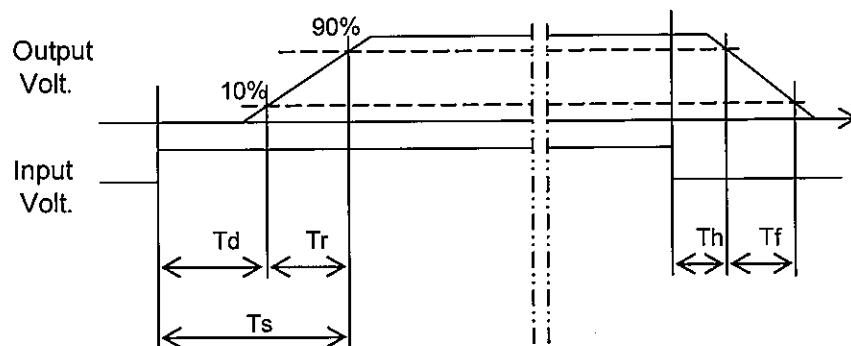
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



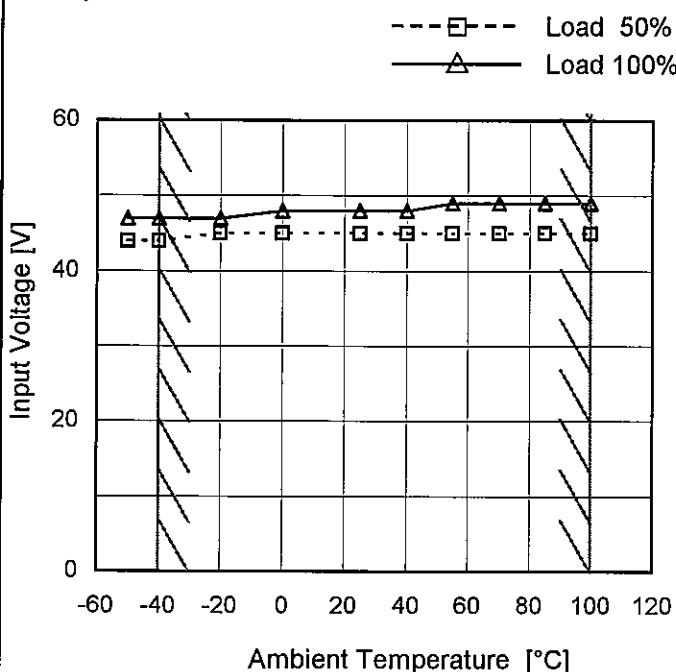
## 2. Values

Load	Time	Td	Tr	Ts	Th	Tf
50 %		36.8	21.8	58.6	0.3	9.1
100 %		36.8	22.0	58.8	0.2	4.4



Model	DHS100A05
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V20A

## 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%
-50	44	47
-40	44	47
-20	45	47
0	45	48
25	45	48
40	45	48
55	45	49
70	45	49
85	45	49
100	45	49
--	-	-

**COSEL**

Model	DHS100A05
Item	Overcurrent Protection
Object	+5V20A
1.Graph	
<p>The graph plots Output Voltage [V] on the Y-axis (0 to 8) against Load Current [A] on the X-axis (0 to 30). Three curves represent different input voltages: 60V (top), 110V (middle), and 160V (bottom). All curves show a sharp drop in output voltage as load current increases beyond a certain point. A slanted line is drawn across the graph, starting from approximately (18A, 5.5V) and ending at (25A, 3.5V), indicating the range of the rated load current where intermittent operation occurs.</p>	
<p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 3.5V to 0V.</p>	

Temperature	25°C
Testing Circuitry	Figure A

## 2.Values

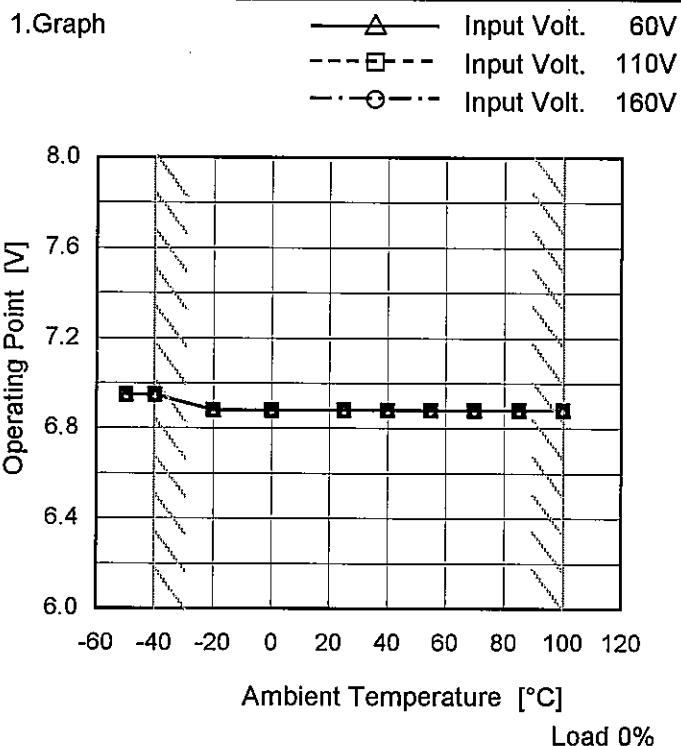
Output Voltage [V]	Load Current [A]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
5.00	20.01	20.04	20.06
4.75	24.54	25.20	25.85
4.50	24.65	25.39	25.91
4.00	24.81	25.76	26.48
3.50	25.00	25.82	26.14
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

**COSEL**

Model DHS100A05

Item Overvoltage Protection

Object +5V20A



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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
-50	6.95	6.95	6.95
-40	6.95	6.95	6.95
-20	6.88	6.88	6.88
0	6.88	6.88	6.88
25	6.88	6.88	6.88
40	6.88	6.88	6.88
55	6.88	6.88	6.88
70	6.88	6.88	6.88
85	6.88	6.88	6.88
100	6.88	6.88	6.88
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COSEL

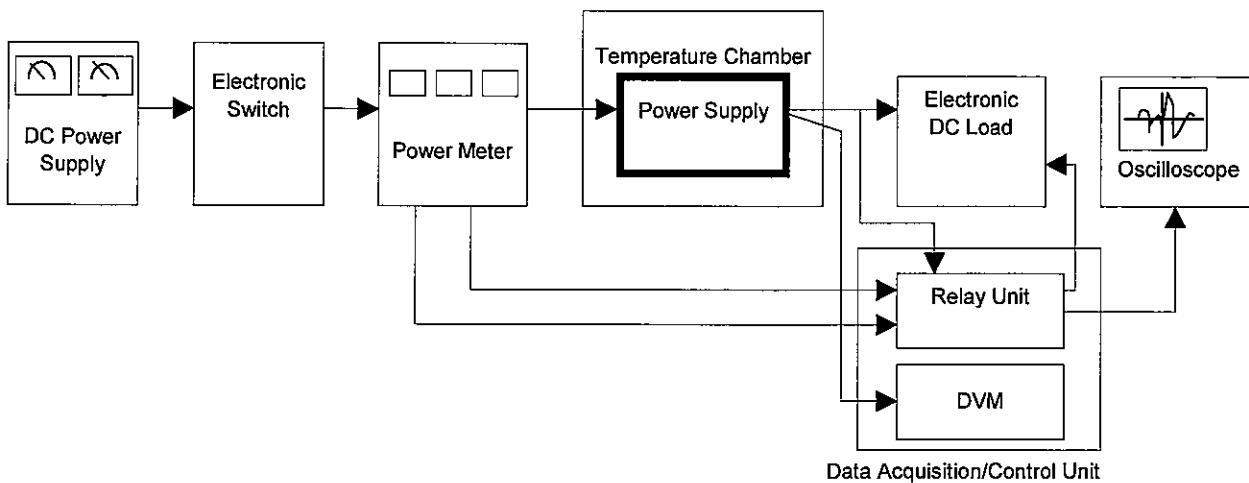
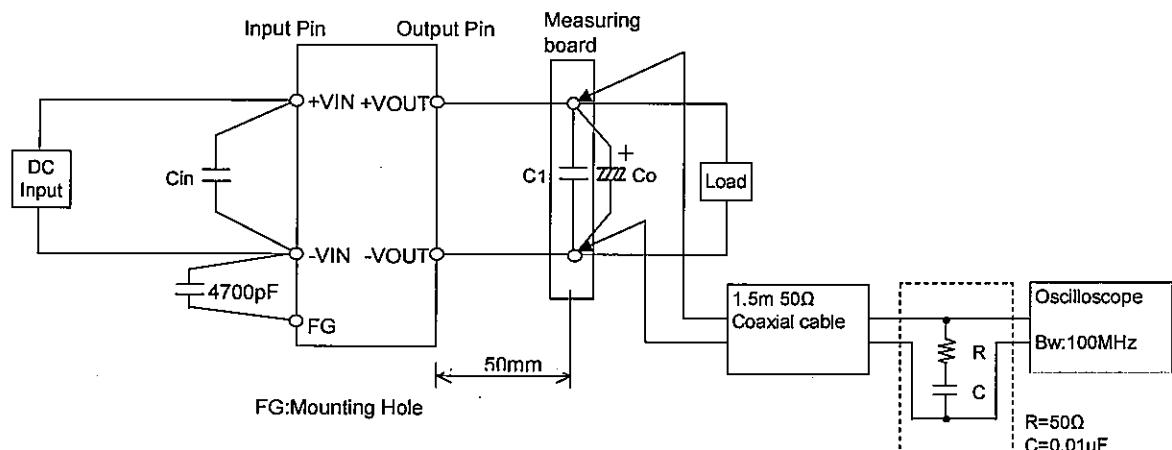


Figure A



C1 : DHS100A24 4.7 $\mu\text{F}$   
 Others 10 $\mu\text{F}$   
 Co : DHS100A05 2200 $\mu\text{F}$   
 DHS100A12 470 $\mu\text{F}$   
 DHS100A15 470 $\mu\text{F}$   
 DHS100A24 220 $\mu\text{F}$

Figure B