



TEST DATA OF DHS250B03

Regulated DC Power Supply
November 18, 2009

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Tatsuya Mano Design Manager

Prepared by : Noriaki Nakase
Noriaki Nakase Design Engineer

COSEL CO.,LTD.

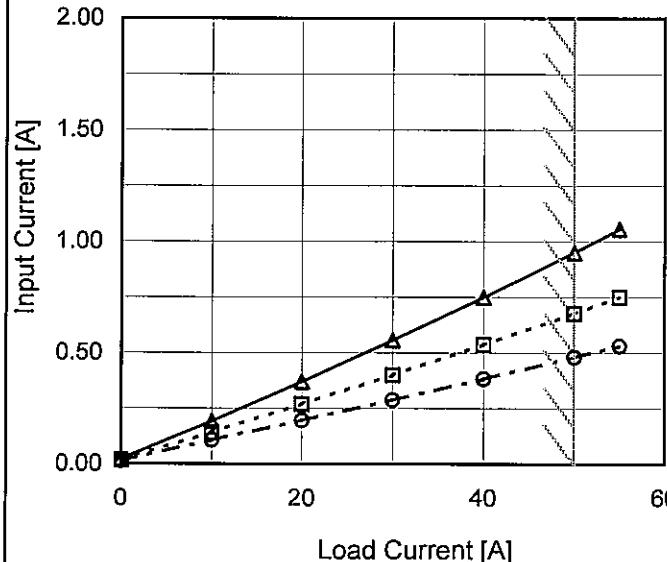
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Model	DHS250B03	Temperature Testing Circuitry 25°C Figure A																																																																																	
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Item	Input Current (by Load Current)
Object	_____
1.Graph	<p>—△— Input Volt. 200V - - -□--- Input Volt. 280V - - -○--- Input Volt. 400V</p>  <p>Note: Slanted line shows the range of the rated load current.</p>

Temperature 25°C
 Testing Circuitry Figure A

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	0.021	0.018	0.014
10	0.191	0.141	0.106
20	0.370	0.268	0.195
30	0.556	0.400	0.287
40	0.749	0.536	0.382
50	0.950	0.677	0.480
55	1.054	0.750	0.530
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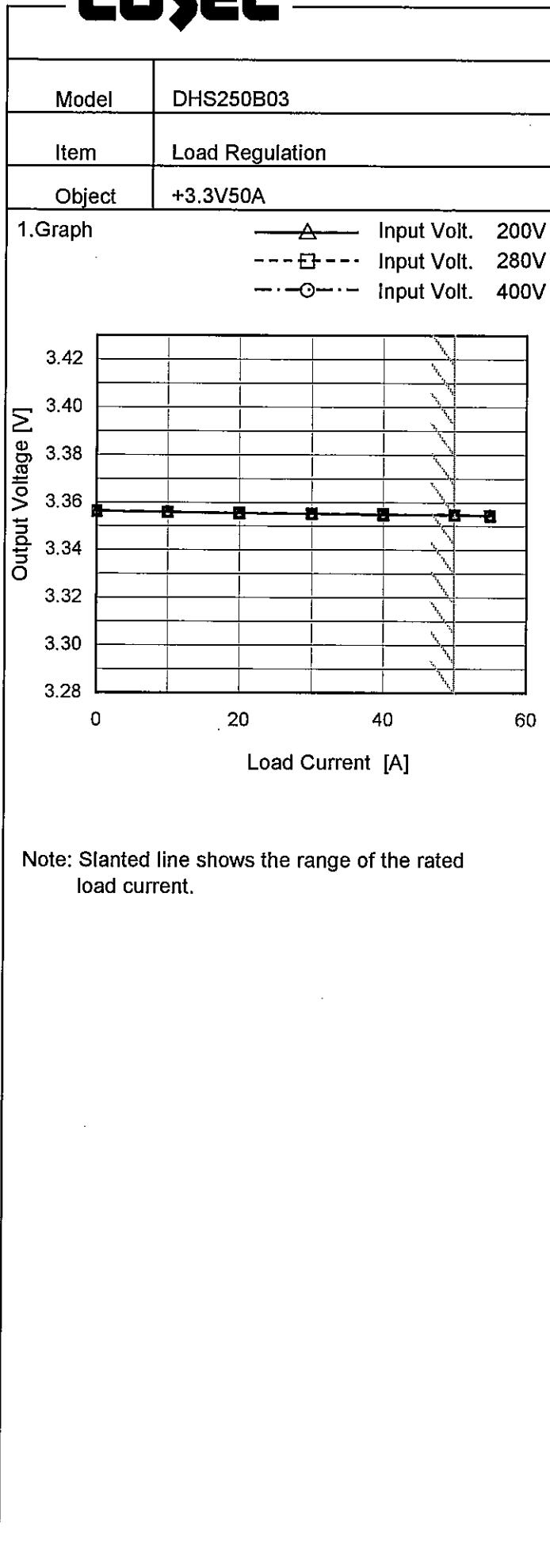
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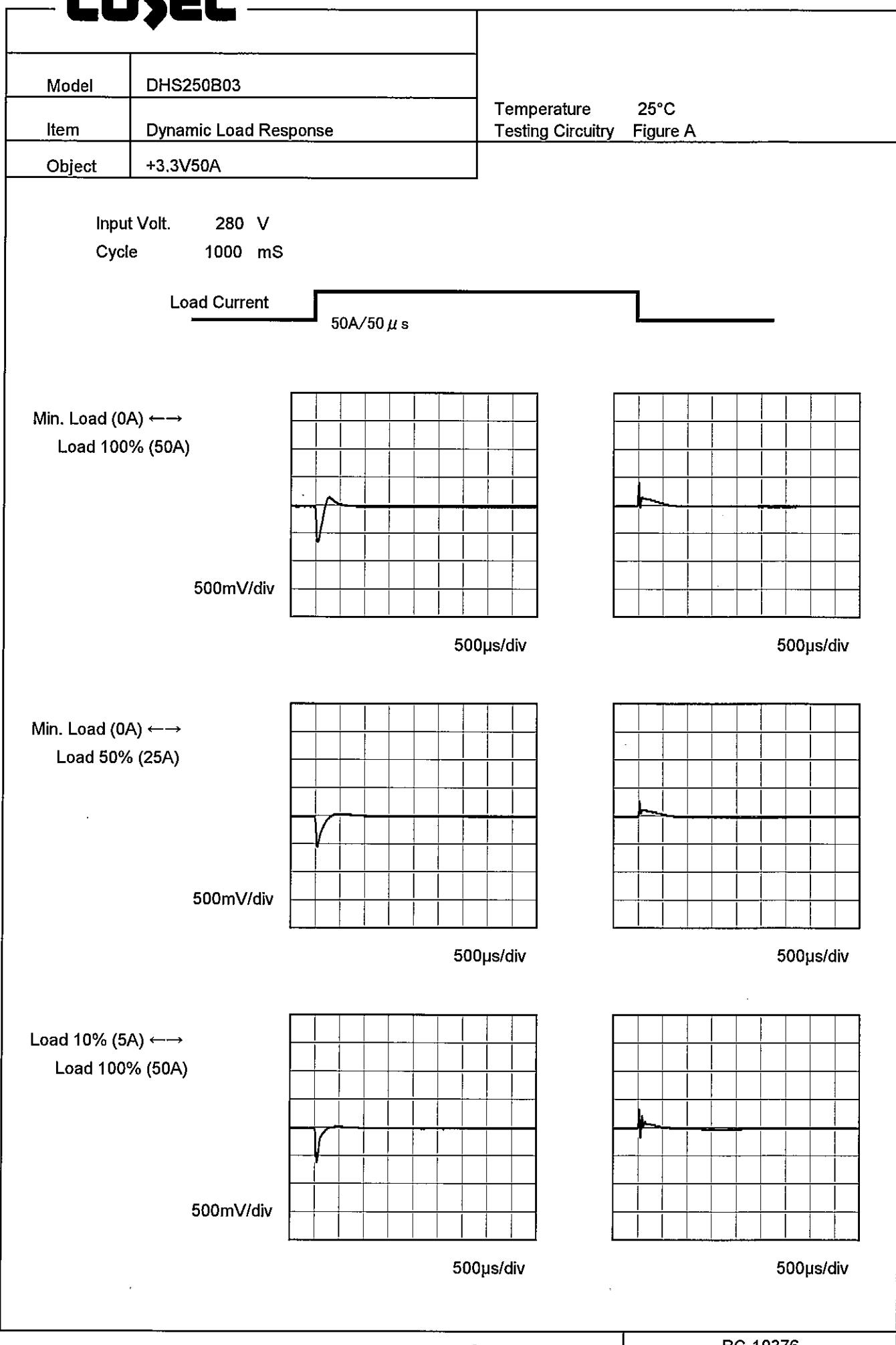
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Temperature 25°C
Testing Circuitry Figure A

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0	3.356	3.356	3.357
10	3.356	3.356	3.356
20	3.356	3.356	3.356
30	3.355	3.355	3.355
40	3.355	3.355	3.355
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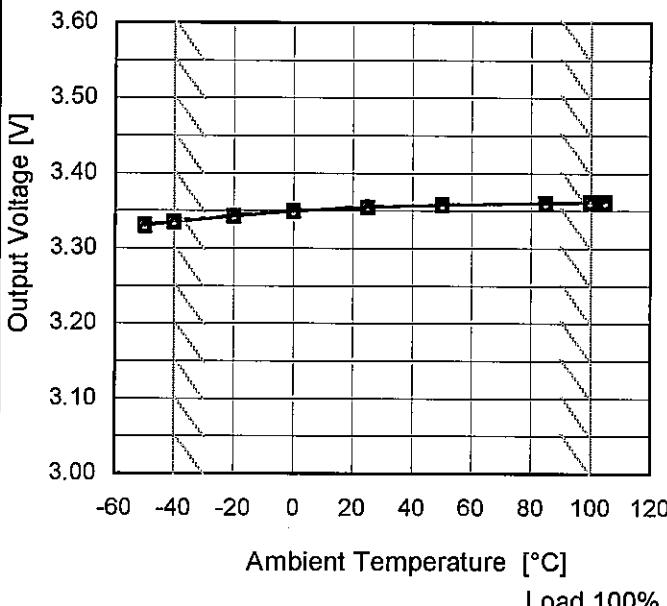
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Load Current [A]	Ripple Voltage [mV]																																							
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<p>Measured by 100 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																								
<p>Ripple [mVp-p]</p>																																								
<p>Fig.Complex Ripple Wave Form</p>																																								

Model	DHS250B03	Temperature	25°C																																						
Item	Ripple-Noise	Testing Circuitry	Figure B																																						
Object	+3.3V50A																																								
1.Graph			2.Values																																						
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 100 mV, and the X-axis ranges from 0 to 60 A. Two curves are shown: Input Volt. 200V (solid line with triangles) and Input Volt. 400V (dashed line with circles). Both curves remain flat until approximately 50A, then drop sharply. A slanted line indicates the rated load current range.</p>			<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 200 [V]</th> <th>Input Volt. 400 [V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>10</td><td>15</td></tr> <tr><td>10</td><td>10</td><td>15</td></tr> <tr><td>20</td><td>10</td><td>15</td></tr> <tr><td>30</td><td>10</td><td>15</td></tr> <tr><td>40</td><td>10</td><td>15</td></tr> <tr><td>50</td><td>10</td><td>15</td></tr> <tr><td>55</td><td>10</td><td>15</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-Noise [mV]		Input Volt. 200 [V]	Input Volt. 400 [V]	0	10	15	10	10	15	20	10	15	30	10	15	40	10	15	50	10	15	55	10	15	--	-	-	--	-	-	--	-	-	--	-	-
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<p>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.</p>			<p>Diagram of a complex ripple noise wave form. It shows a series of sharp, triangular pulses with a period T. The amplitude of each pulse is labeled as Ripple Noise[mVp-p].</p>																																						
<p>Fig.Complex Ripple Noise Wave Form</p>																																									

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<p>Model DHS250B03</p> <p>Item Ripple Voltage (by Ambient Temp.)</p> <p>Object +3.3V50A</p>	Testing Circuitry Figure B																																						
	1.Graph	2.Values																																					
	<p style="text-align: center;">---□--- Load 50% —△— Load 100%</p> <p>Ripple Voltage [mV]</p> <p>Ambient Temperature [°C]</p> <p>Input Volt. 280V</p>																																						
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Ambient Temperature [°C]	Ripple Voltage [mV]																																						
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<p>Model DHS250B03</p> <p>Item Ambient Temperature Drift</p> <p>Object +3.3V50A</p>	Testing Circuitry Figure A																																																					
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		—○— Input Volt. 400V	2.Values																																																			
	 <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. 200[V]</th> <th>Input Volt. 280[V]</th> <th>Input Volt. 400[V]</th> </tr> </thead> <tbody> <tr> <td>-50</td><td>3.330</td><td>3.330</td><td>3.331</td></tr> <tr> <td>-40</td><td>3.335</td><td>3.335</td><td>3.335</td></tr> <tr> <td>-20</td><td>3.343</td><td>3.343</td><td>3.343</td></tr> <tr> <td>0</td><td>3.349</td><td>3.349</td><td>3.350</td></tr> <tr> <td>25</td><td>3.355</td><td>3.355</td><td>3.355</td></tr> <tr> <td>50</td><td>3.358</td><td>3.358</td><td>3.358</td></tr> <tr> <td>85</td><td>3.360</td><td>3.360</td><td>3.360</td></tr> <tr> <td>100</td><td>3.362</td><td>3.362</td><td>3.362</td></tr> <tr> <td>105</td><td>3.362</td><td>3.362</td><td>3.362</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. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	-50	3.330	3.330	3.331	-40	3.335	3.335	3.335	-20	3.343	3.343	3.343	0	3.349	3.349	3.350	25	3.355	3.355	3.355	50	3.358	3.358	3.358	85	3.360	3.360	3.360	100	3.362	3.362	3.362	105	3.362	3.362	3.362	--	-	-	-	--	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
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100	3.362	3.362	3.362																																																			
105	3.362	3.362	3.362																																																			
--	-	-	-																																																			
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Note: Slanted line shows the range of the rated ambient temperature.



Model	DHS250B03	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+3.3V50A	

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 : 200 - 400V

Load Current : 0 - 50A

* 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	100	200	0	3.364	±15	±0.5
Minimum Voltage	-40	200	50	3.335		

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Model	DHS250B03	Temperature Testing Circuitry 25°C Figure A																						
Item	Time Lapse Drift																							
Object	+3.3V50A																							
1.Graph		2.Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 280V</p> <p>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>3.353</td></tr> <tr><td>0.5</td><td>3.355</td></tr> <tr><td>1.0</td><td>3.355</td></tr> <tr><td>2.0</td><td>3.355</td></tr> <tr><td>3.0</td><td>3.355</td></tr> <tr><td>4.0</td><td>3.355</td></tr> <tr><td>5.0</td><td>3.355</td></tr> <tr><td>6.0</td><td>3.355</td></tr> <tr><td>7.0</td><td>3.355</td></tr> <tr><td>8.0</td><td>3.355</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	3.353	0.5	3.355	1.0	3.355	2.0	3.355	3.0	3.355	4.0	3.355	5.0	3.355	6.0	3.355	7.0	3.355	8.0	3.355
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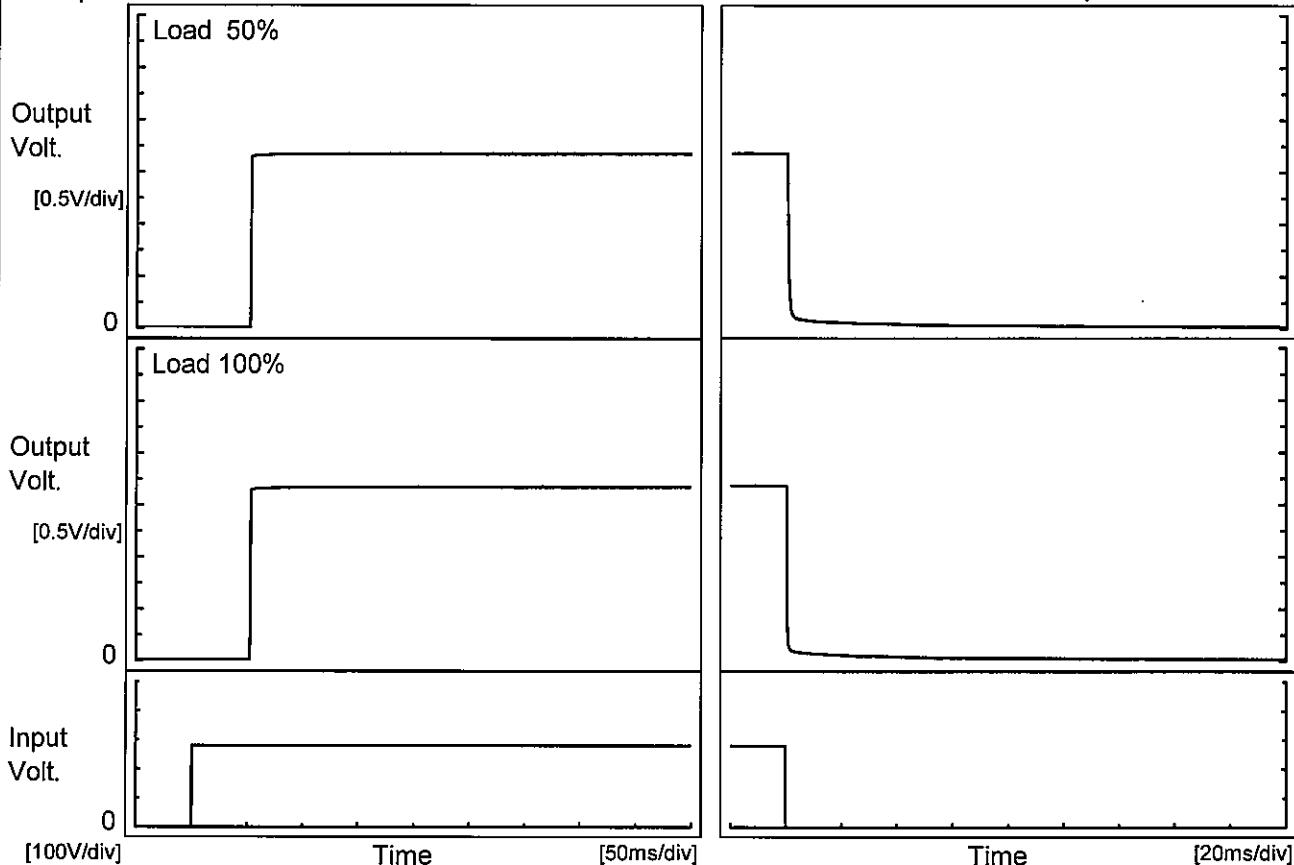
Model DHS250B03

Item Rise and Fall Time

Object +3.3V50A

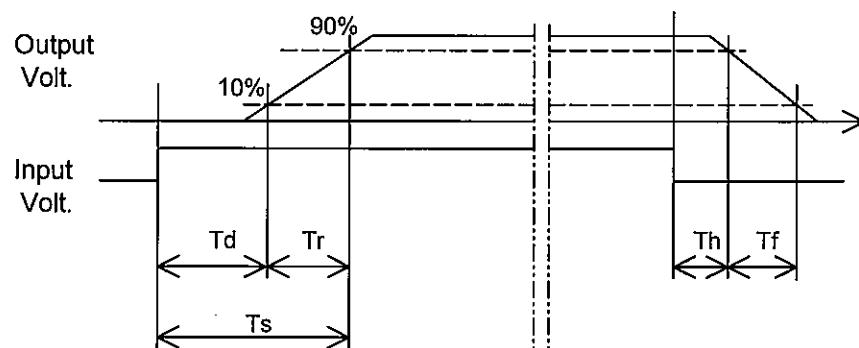
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		52.5	0.5	53.0	0.3	1.2	
100 %		52.5	0.8	53.3	0.3	0.5	





Model	DHS250B03																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+3.3V50A																																							
1.Graph																																								
<p>Input Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>---□--- Load 50%</p> <p>—△— Load 100%</p>																																								
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Ambient Temperature [°C]	Input Voltage [V]																																							
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Note: Slanted line shows the range of the rated ambient temperature.																																								

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Model	DHS250B03	Temperature	25°C																																																												
Item	Overcurrent Protection	Testing Circuitry	Figure A																																																												
Object	+3.3V50A																																																														
1.Graph	<p>Input Volt. 200V Input Volt. 280V Input Volt. 400V</p>																																																														
<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>			2.Values																																																												
<p>Intermittent operation occurs when the output voltage is from 2V to 0V.</p>			<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 200[V]</th> <th>Input Volt. 280[V]</th> <th>Input Volt. 400[V]</th> </tr> </thead> <tbody> <tr><td>3.30</td><td>51.00</td><td>51.00</td><td>51.01</td></tr> <tr><td>3.14</td><td>59.67</td><td>61.68</td><td>63.02</td></tr> <tr><td>2.97</td><td>60.12</td><td>62.15</td><td>63.28</td></tr> <tr><td>2.64</td><td>61.42</td><td>63.22</td><td>64.47</td></tr> <tr><td>2.31</td><td>62.71</td><td>64.76</td><td>65.51</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> </tbody> </table>	Output Voltage [V]	Load Current [A]			Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	3.30	51.00	51.00	51.01	3.14	59.67	61.68	63.02	2.97	60.12	62.15	63.28	2.64	61.42	63.22	64.47	2.31	62.71	64.76	65.51	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	
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Model	DHS250B03
Item	Overvoltage Protection
Object	+3.3V50A
1.Graph	
<p style="text-align: center;"> —△— Input Volt. 200V ---□--- Input Volt. 280V ---○--- Input Volt. 400V </p> <p style="text-align: center;">Operating Point [V]</p> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Load 0%</p>	
<p>Note: Slanted line shows the range of the rated ambient temperature.</p>	

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
-50	4.48	4.48	4.48
-40	4.50	4.50	4.50
-20	4.50	4.50	4.50
0	4.50	4.50	4.50
25	4.50	4.50	4.50
50	4.51	4.51	4.51
85	4.51	4.51	4.51
100	4.51	4.51	4.51
105	4.51	4.51	4.51
--	-	-	-
--	-	-	-

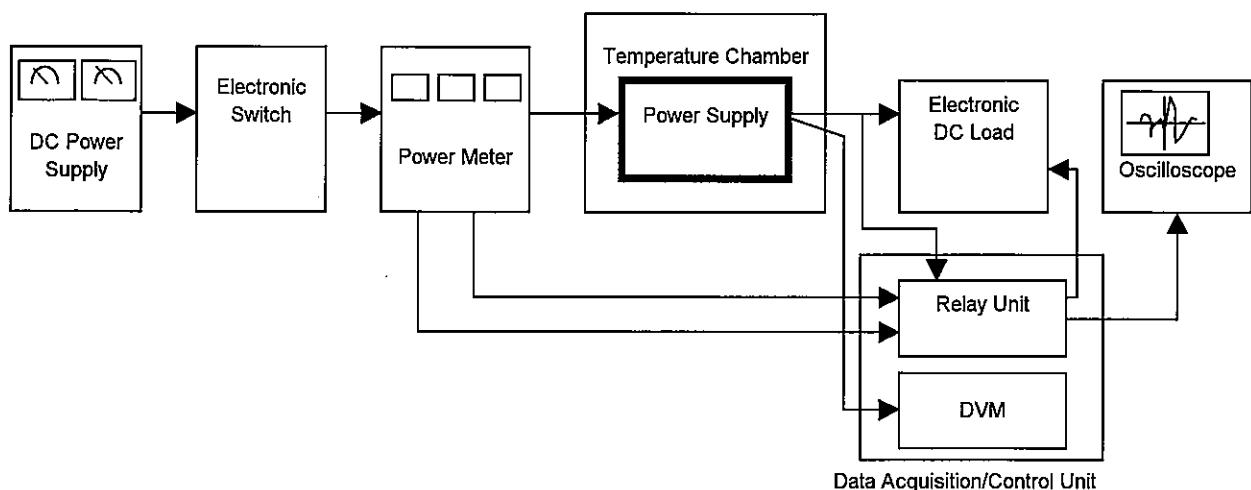
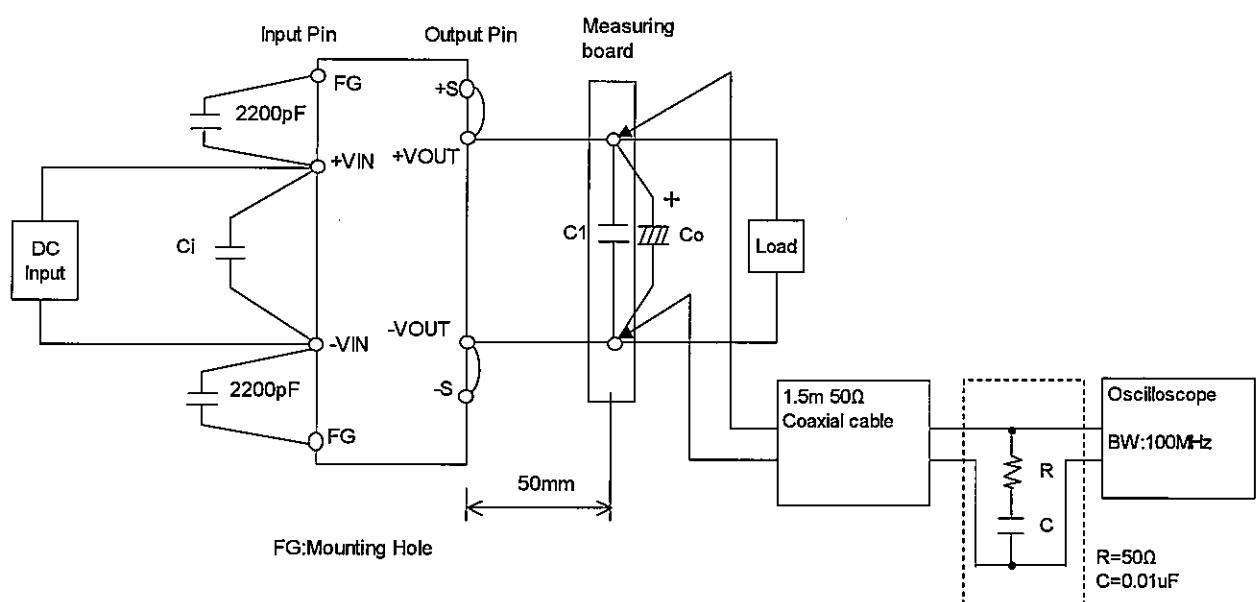


Figure A



C1	Co	
DHS250B24	DHS250B03	2200μF
DHS250B28	DHS250B05	2200μF
DHS250B48	DHS250B07	2200μF
Others	DHS250B12	1000μF

C1	Co	
DHS250B24	DHS250B03	2200μF
DHS250B28	DHS250B05	2200μF
DHS250B48	DHS250B07	2200μF
Others	DHS250B12	1000μF

Figure B