

TEST DATA OF SNDHS50B28

Regulated DC Power Supply
June 30, 2011

Approved by : Takahiro Yoneda
Takahiro Yoneda Design Manager

Prepared by : Tadashi Arai
Tadashi Arai Design Engineer

COSEL CO.,LTD.

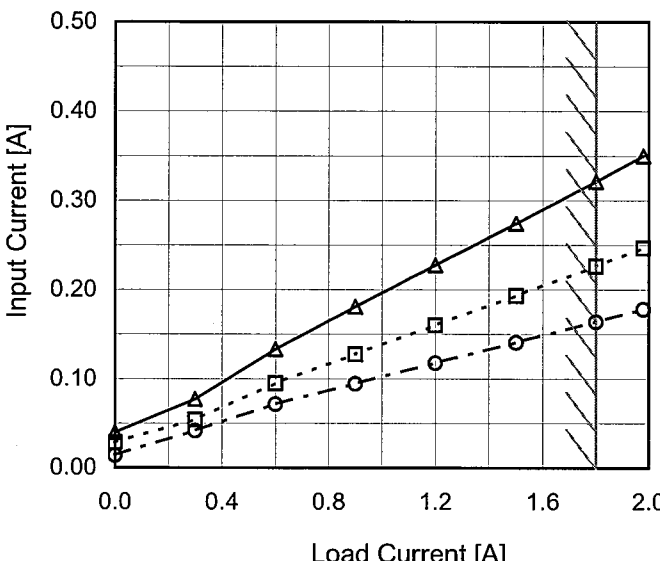
CONTENTS

1.Input Current (by Input Voltage)	1
2.Input Current (by Load Current)	2
3.Input Power (by Load Current)	3
4.Efficiency (by Input Voltage)	4
5.Efficiency (by Load Current)	5
6.Line Regulation	6
7.Load Regulation	7
8.Dynamic Load Response	8
9.Ripple Voltage (by Load Current)	9
10.Ripple-Noise	10
11.Ripple Voltage (by Ambient Temperature)	11
12.Ambient Temperature Drift	12
13.Output Voltage Accuracy	13
14.Time Lapse Drift	14
15.Rise and Fall Time	15
16.Minimum Input Voltage for Regulated Output Voltage	16
17.Overcurrent Protection	17
18.Overvoltage Protection	18
19.Figure of Testing Circuitry	19

(Final Page 19)

Model	SNDHS50B28																																																																																	
Item	Input Current (by Input Voltage)		Temperature 25°C Testing Circuitry Figure A																																																																															
Object	_____																																																																																	
1.Graph		2.Values																																																																																
<div><div><div>—△—</div><div>Load 100%</div></div><div><div>---□---</div><div>Load 50%</div></div><div><div>-○-</div><div>Load 0%</div></div></div> <div><p>Note: Slanted line shows the range of the rated input voltage.</p></div> <div><table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Load 0%</th><th>Load 50%</th><th>Load 100%</th></tr><tr><td>0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>50</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>150</td><td>0.002</td><td>0.000</td><td>0.002</td></tr><tr><td>170</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>180</td><td>0.042</td><td>0.196</td><td>0.319</td></tr><tr><td>190</td><td>0.042</td><td>0.188</td><td>0.336</td></tr><tr><td>195</td><td>0.042</td><td>0.182</td><td>0.326</td></tr><tr><td>200</td><td>0.040</td><td>0.177</td><td>0.316</td></tr><tr><td>250</td><td>0.034</td><td>0.139</td><td>0.249</td></tr><tr><td>280</td><td>0.029</td><td>0.125</td><td>0.223</td></tr><tr><td>300</td><td>0.025</td><td>0.117</td><td>0.209</td></tr><tr><td>350</td><td>0.016</td><td>0.103</td><td>0.182</td></tr><tr><td>400</td><td>0.014</td><td>0.093</td><td>0.162</td></tr><tr><td>420</td><td>0.014</td><td>0.089</td><td>0.155</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></div>				Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0	0.000	0.000	0.000	50	0.000	0.000	0.000	100	0.000	0.000	0.000	150	0.002	0.000	0.002	170	0.003	0.003	0.003	180	0.042	0.196	0.319	190	0.042	0.188	0.336	195	0.042	0.182	0.326	200	0.040	0.177	0.316	250	0.034	0.139	0.249	280	0.029	0.125	0.223	300	0.025	0.117	0.209	350	0.016	0.103	0.182	400	0.014	0.093	0.162	420	0.014	0.089	0.155	--	-	-	-	--	-	-	-	--	-	-	-
Input Voltage [V]	Input Current [A]																																																																																	
	Load 0%	Load 50%	Load 100%																																																																															
0	0.000	0.000	0.000																																																																															
50	0.000	0.000	0.000																																																																															
100	0.000	0.000	0.000																																																																															
150	0.002	0.000	0.002																																																																															
170	0.003	0.003	0.003																																																																															
180	0.042	0.196	0.319																																																																															
190	0.042	0.188	0.336																																																																															
195	0.042	0.182	0.326																																																																															
200	0.040	0.177	0.316																																																																															
250	0.034	0.139	0.249																																																																															
280	0.029	0.125	0.223																																																																															
300	0.025	0.117	0.209																																																																															
350	0.016	0.103	0.182																																																																															
400	0.014	0.093	0.162																																																																															
420	0.014	0.089	0.155																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															
		BC-10584																																																																																

COSEL

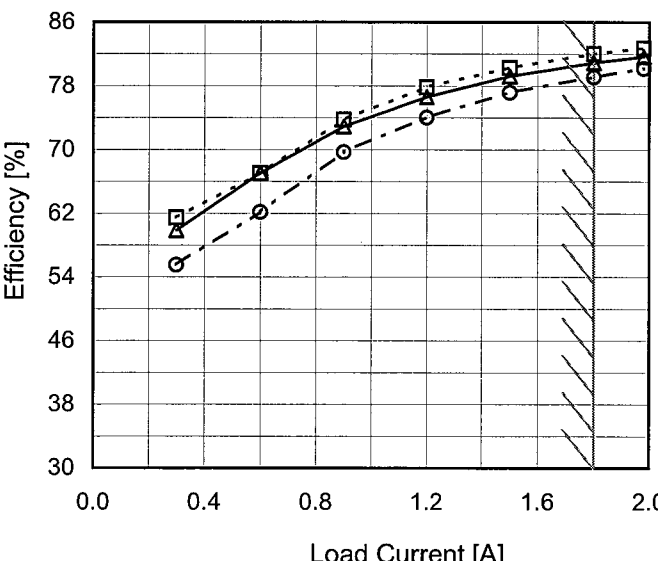
Model		SNDHS50B28		Temperature 25°C																																																				
Item		Input Current (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<div><div>—△—</div>Input Volt. 200V</div> <div><div>---□---</div>Input Volt. 280V</div> <div><div>-·-○-·-</div>Input Volt. 400V</div>  <p>Note: Slanted line shows the range of the rated load current.</p>		2.Values																																																				
				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 200[V]</th><th>Input Volt. 280[V]</th><th>Input Volt. 400[V]</th></tr><tr><td>0.00</td><td>0.040</td><td>0.028</td><td>0.014</td></tr><tr><td>0.30</td><td>0.077</td><td>0.054</td><td>0.042</td></tr><tr><td>0.60</td><td>0.133</td><td>0.095</td><td>0.071</td></tr><tr><td>0.90</td><td>0.181</td><td>0.128</td><td>0.095</td></tr><tr><td>1.20</td><td>0.228</td><td>0.160</td><td>0.118</td></tr><tr><td>1.50</td><td>0.275</td><td>0.193</td><td>0.141</td></tr><tr><td>1.80</td><td>0.322</td><td>0.226</td><td>0.164</td></tr><tr><td>1.98</td><td>0.350</td><td>0.247</td><td>0.178</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 Current [A]			Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	0.040	0.028	0.014	0.30	0.077	0.054	0.042	0.60	0.133	0.095	0.071	0.90	0.181	0.128	0.095	1.20	0.228	0.160	0.118	1.50	0.275	0.193	0.141	1.80	0.322	0.226	0.164	1.98	0.350	0.247	0.178	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Input Current [A]																																																							
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																					
0.00	0.040	0.028	0.014																																																					
0.30	0.077	0.054	0.042																																																					
0.60	0.133	0.095	0.071																																																					
0.90	0.181	0.128	0.095																																																					
1.20	0.228	0.160	0.118																																																					
1.50	0.275	0.193	0.141																																																					
1.80	0.322	0.226	0.164																																																					
1.98	0.350	0.247	0.178																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					



Model		SNDHS50B28																																																				
Item		Input Power (by Load Current)																																																				
Object																																																						
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>200V</div></div><div><div>---□---</div><div>Input Volt.</div><div>280V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>400V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 200[V]</th><th>Input Volt. 280[V]</th><th>Input Volt. 400[V]</th></tr><tr><td>0.00</td><td>8.00</td><td>7.90</td><td>5.60</td></tr><tr><td>0.30</td><td>15.50</td><td>15.10</td><td>16.70</td></tr><tr><td>0.60</td><td>26.60</td><td>26.60</td><td>28.70</td></tr><tr><td>0.90</td><td>36.20</td><td>35.80</td><td>37.90</td></tr><tr><td>1.20</td><td>45.60</td><td>44.90</td><td>47.20</td></tr><tr><td>1.50</td><td>54.90</td><td>54.20</td><td>56.40</td></tr><tr><td>1.80</td><td>64.30</td><td>63.50</td><td>65.80</td></tr><tr><td>1.98</td><td>70.00</td><td>69.10</td><td>71.30</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. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	8.00	7.90	5.60	0.30	15.50	15.10	16.70	0.60	26.60	26.60	28.70	0.90	36.20	35.80	37.90	1.20	45.60	44.90	47.20	1.50	54.90	54.20	56.40	1.80	64.30	63.50	65.80	1.98	70.00	69.10	71.30	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Input Power [W]																																																					
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																			
0.00	8.00	7.90	5.60																																																			
0.30	15.50	15.10	16.70																																																			
0.60	26.60	26.60	28.70																																																			
0.90	36.20	35.80	37.90																																																			
1.20	45.60	44.90	47.20																																																			
1.50	54.90	54.20	56.40																																																			
1.80	64.30	63.50	65.80																																																			
1.98	70.00	69.10	71.30																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			

Model		SNDHS50B28																																	
Item		Efficiency (by Input Voltage)																																	
Object																																			
1.Graph		2.Values																																	
<div><div><div><div><div></div><div></div><div></div></div><div></div><div></div></div><div><div><div></div><div></div><div></div></div><div></div><div></div></div></div><div>Load 50%</div><div>Load 100%</div></div> <table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Efficiency [%]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>195</td><td>72.4</td><td>80.6</td></tr><tr><td>200</td><td>72.9</td><td>81.0</td></tr><tr><td>240</td><td>74.1</td><td>82.2</td></tr><tr><td>280</td><td>73.7</td><td>82.0</td></tr><tr><td>320</td><td>72.7</td><td>81.4</td></tr><tr><td>360</td><td>71.3</td><td>80.3</td></tr><tr><td>400</td><td>69.6</td><td>79.2</td></tr><tr><td>420</td><td>68.6</td><td>78.6</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>		Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	195	72.4	80.6	200	72.9	81.0	240	74.1	82.2	280	73.7	82.0	320	72.7	81.4	360	71.3	80.3	400	69.6	79.2	420	68.6	78.6	--	-	-		
Input Voltage [V]	Efficiency [%]																																		
	Load 50%	Load 100%																																	
195	72.4	80.6																																	
200	72.9	81.0																																	
240	74.1	82.2																																	
280	73.7	82.0																																	
320	72.7	81.4																																	
360	71.3	80.3																																	
400	69.6	79.2																																	
420	68.6	78.6																																	
--	-	-																																	
		BC-10584																																	

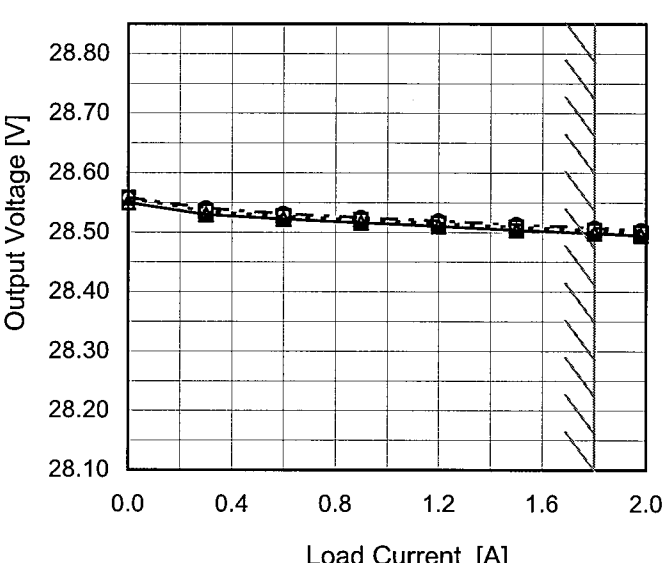
COSEL

Model		SNDHS50B28		Temperature 25°C																																																				
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<div><div>—△—</div>Input Volt. 200V</div> <div><div>- - □ - -</div>Input Volt. 280V</div> <div><div>- · ○ - ·</div>Input Volt. 400V</div>  <p>Efficiency [%]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		2.Values																																																				
		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 200[V]</th><th>Input Volt. 280[V]</th><th>Input Volt. 400[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.30</td><td>59.9</td><td>61.5</td><td>55.5</td></tr><tr><td>0.60</td><td>67.1</td><td>67.1</td><td>62.2</td></tr><tr><td>0.90</td><td>72.9</td><td>73.8</td><td>69.7</td></tr><tr><td>1.20</td><td>76.6</td><td>77.8</td><td>74.1</td></tr><tr><td>1.50</td><td>79.3</td><td>80.3</td><td>77.2</td></tr><tr><td>1.80</td><td>80.9</td><td>82.0</td><td>79.1</td></tr><tr><td>1.98</td><td>81.7</td><td>82.7</td><td>80.2</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]	Efficiency [%]			Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	-	-	-	0.30	59.9	61.5	55.5	0.60	67.1	67.1	62.2	0.90	72.9	73.8	69.7	1.20	76.6	77.8	74.1	1.50	79.3	80.3	77.2	1.80	80.9	82.0	79.1	1.98	81.7	82.7	80.2	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																					
0.00	-	-	-																																																					
0.30	59.9	61.5	55.5																																																					
0.60	67.1	67.1	62.2																																																					
0.90	72.9	73.8	69.7																																																					
1.20	76.6	77.8	74.1																																																					
1.50	79.3	80.3	77.2																																																					
1.80	80.9	82.0	79.1																																																					
1.98	81.7	82.7	80.2																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					

- 5 -

BC-10584

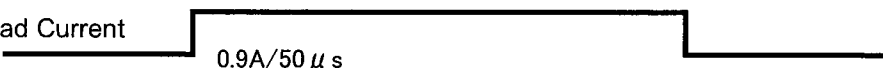
Model	SNDHS50B28																																		
Item	Line Regulation	Temperature	25°C																																
		Testing Circuitry	Figure A																																
Object	+28V1.8A																																		
1.Graph		2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>195</td><td>28.512</td><td>28.499</td></tr><tr><td>200</td><td>28.513</td><td>28.501</td></tr><tr><td>240</td><td>28.514</td><td>28.502</td></tr><tr><td>280</td><td>28.517</td><td>28.505</td></tr><tr><td>320</td><td>28.518</td><td>28.507</td></tr><tr><td>360</td><td>28.519</td><td>28.508</td></tr><tr><td>400</td><td>28.521</td><td>28.509</td></tr><tr><td>420</td><td>28.521</td><td>28.510</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	195	28.512	28.499	200	28.513	28.501	240	28.514	28.502	280	28.517	28.505	320	28.518	28.507	360	28.519	28.508	400	28.521	28.509	420	28.521	28.510	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
195	28.512	28.499																																	
200	28.513	28.501																																	
240	28.514	28.502																																	
280	28.517	28.505																																	
320	28.518	28.507																																	
360	28.519	28.508																																	
400	28.521	28.509																																	
420	28.521	28.510																																	
--	-	-																																	

Model		SNDHS50B28																																																				
Item		Load Regulation																																																				
Object		+28V1.8A																																																				
1.Graph		2.Values																																																				
<div><div><div><div><div>—△—</div><div>Input Volt.</div><div>200V</div></div><div><div>---□---</div><div>Input Volt.</div><div>280V</div></div><div><div>---○---</div><div>Input Volt.</div><div>400V</div></div></div><div></div></div></div>		<table><tr><th rowspan="2">Load Current [A]</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><tr><td>0.00</td><td>28.550</td><td>28.558</td><td>28.558</td></tr><tr><td>0.30</td><td>28.530</td><td>28.535</td><td>28.540</td></tr><tr><td>0.60</td><td>28.522</td><td>28.527</td><td>28.531</td></tr><tr><td>0.90</td><td>28.517</td><td>28.521</td><td>28.525</td></tr><tr><td>1.20</td><td>28.511</td><td>28.515</td><td>28.519</td></tr><tr><td>1.50</td><td>28.504</td><td>28.509</td><td>28.513</td></tr><tr><td>1.80</td><td>28.499</td><td>28.503</td><td>28.507</td></tr><tr><td>1.98</td><td>28.495</td><td>28.499</td><td>28.504</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. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	28.550	28.558	28.558	0.30	28.530	28.535	28.540	0.60	28.522	28.527	28.531	0.90	28.517	28.521	28.525	1.20	28.511	28.515	28.519	1.50	28.504	28.509	28.513	1.80	28.499	28.503	28.507	1.98	28.495	28.499	28.504	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																			
0.00	28.550	28.558	28.558																																																			
0.30	28.530	28.535	28.540																																																			
0.60	28.522	28.527	28.531																																																			
0.90	28.517	28.521	28.525																																																			
1.20	28.511	28.515	28.519																																																			
1.50	28.504	28.509	28.513																																																			
1.80	28.499	28.503	28.507																																																			
1.98	28.495	28.499	28.504																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
Note: Slanted line shows the range of the rated load current.																																																						

COSEL

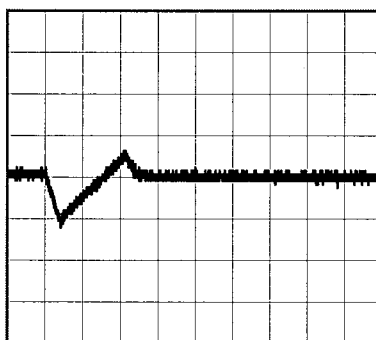
Model	SNDHS50B28	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+28V1.8A	

Input Volt. 280 V
Cycle 1000 ms

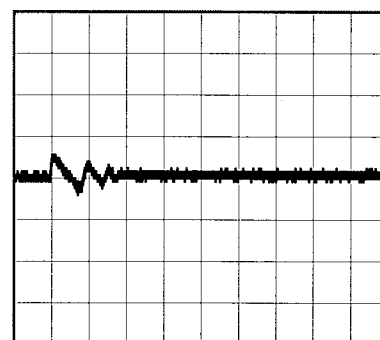
Load Current  0.9A/50 μ s

Min. Load (0A) \longleftrightarrow
Load 100% (0.9A)

0.5 V/div



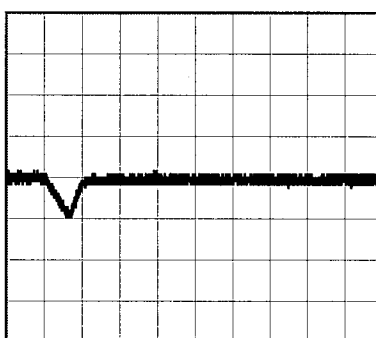
1ms/div



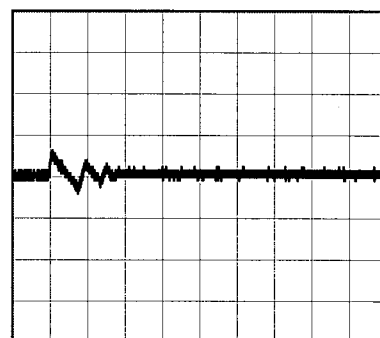
20ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.45A)

0.5 V/div



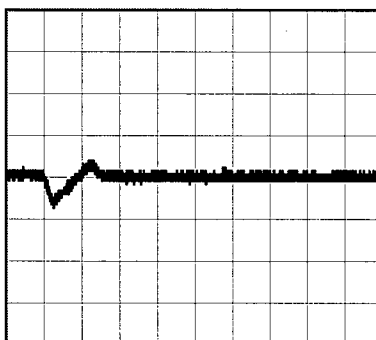
1ms/div



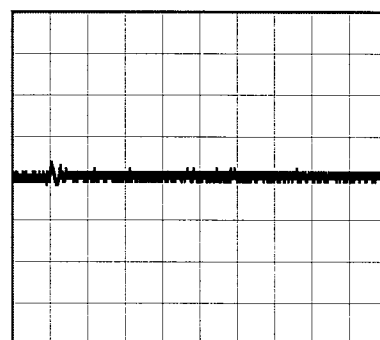
20ms/div

Load 10% (0.09A) \longleftrightarrow
Load 100% (0.9A)

0.5 V/div



1ms/div



20ms/div

Model		SNDHS50B28		Temperature Testing Circuitry	25°C Figure B																																						
Item		Ripple Voltage (by Load Current)																																									
Object		+28V1.8A																																									
1.Graph				2.Values																																							
<div><div><div>—△— Input Volt. 200V</div><div>- -○- - Input Volt. 400V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 200 [V]</th><th>Input Volt. 400 [V]</th></tr><tr><td>0.00</td><td>10</td><td>10</td></tr><tr><td>0.30</td><td>25</td><td>40</td></tr><tr><td>0.60</td><td>25</td><td>40</td></tr><tr><td>0.90</td><td>25</td><td>40</td></tr><tr><td>1.20</td><td>25</td><td>40</td></tr><tr><td>1.50</td><td>25</td><td>40</td></tr><tr><td>1.80</td><td>25</td><td>40</td></tr><tr><td>1.98</td><td>30</td><td>40</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. 200 [V]	Input Volt. 400 [V]	0.00	10	10	0.30	25	40	0.60	25	40	0.90	25	40	1.20	25	40	1.50	25	40	1.80	25	40	1.98	30	40	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 200 [V]	Input Volt. 400 [V]																																									
0.00	10	10																																									
0.30	25	40																																									
0.60	25	40																																									
0.90	25	40																																									
1.20	25	40																																									
1.50	25	40																																									
1.80	25	40																																									
1.98	30	40																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
<div>Measured by 100 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>Fig.Complex Ripple Wave Form</div></div>																																											

- 9 -

BC-10584

Model	SNDHS50B28		
Item	Ripple-Noise	Temperature	25°C
Object	+28V1.8A	Testing Circuitry	Figure B
1.Graph		2.Values	
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></</div></div>			

Model		SNDHS50B28	
Item		Ripple Voltage (by Ambient Temp.)	
Object		+28V1.8A	
1.Graph		2.Values	

<

BC-10584



		Testing Circuitry Figure A
Model	SNDHS50B28	
Item	Output Voltage Accuracy	
Object	+28V1.8A	

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 : -20 - 95°C

Input Voltage : 200 - 400V

Load Current : 0 - 1.8A

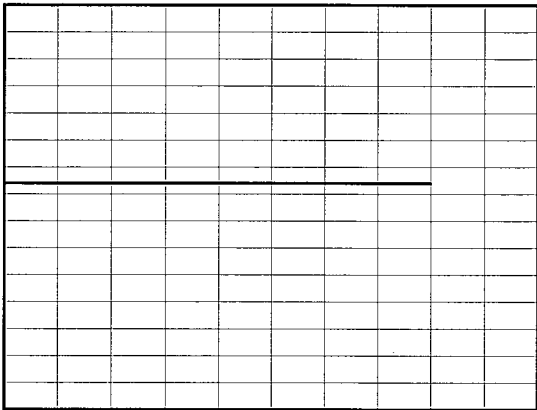
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* 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	85	400	0	28.552	±50	±0.2
Minimum Voltage	-20	200	1.8	28.453		

COSEL

Model	SNDHS50B28																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+28V1.8A																								
1.Graph		2.Values																							
<div><div><div>28.70</div><div>28.60</div><div>28.50</div><div>28.40</div><div>28.30</div><div>28.20</div><div>28.10</div><div>28.00</div></div><div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div></div> <div><div>Time [H]</div><div>Input Volt. 280V</div><div>Load 100%</div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>28.420</td></tr><tr><td>0.5</td><td>28.420</td></tr><tr><td>1.0</td><td>28.420</td></tr><tr><td>2.0</td><td>28.420</td></tr><tr><td>3.0</td><td>28.420</td></tr><tr><td>4.0</td><td>28.420</td></tr><tr><td>5.0</td><td>28.420</td></tr><tr><td>6.0</td><td>28.420</td></tr><tr><td>7.0</td><td>28.420</td></tr><tr><td>8.0</td><td>28.420</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	28.420	0.5	28.420	1.0	28.420	2.0	28.420	3.0	28.420	4.0	28.420	5.0	28.420	6.0	28.420	7.0	28.420	8.0	28.420
Time since start [H]	Output Voltage [V]																								
0.0	28.420																								
0.5	28.420																								
1.0	28.420																								
2.0	28.420																								
3.0	28.420																								
4.0	28.420																								
5.0	28.420																								
6.0	28.420																								
7.0	28.420																								
8.0	28.420																								

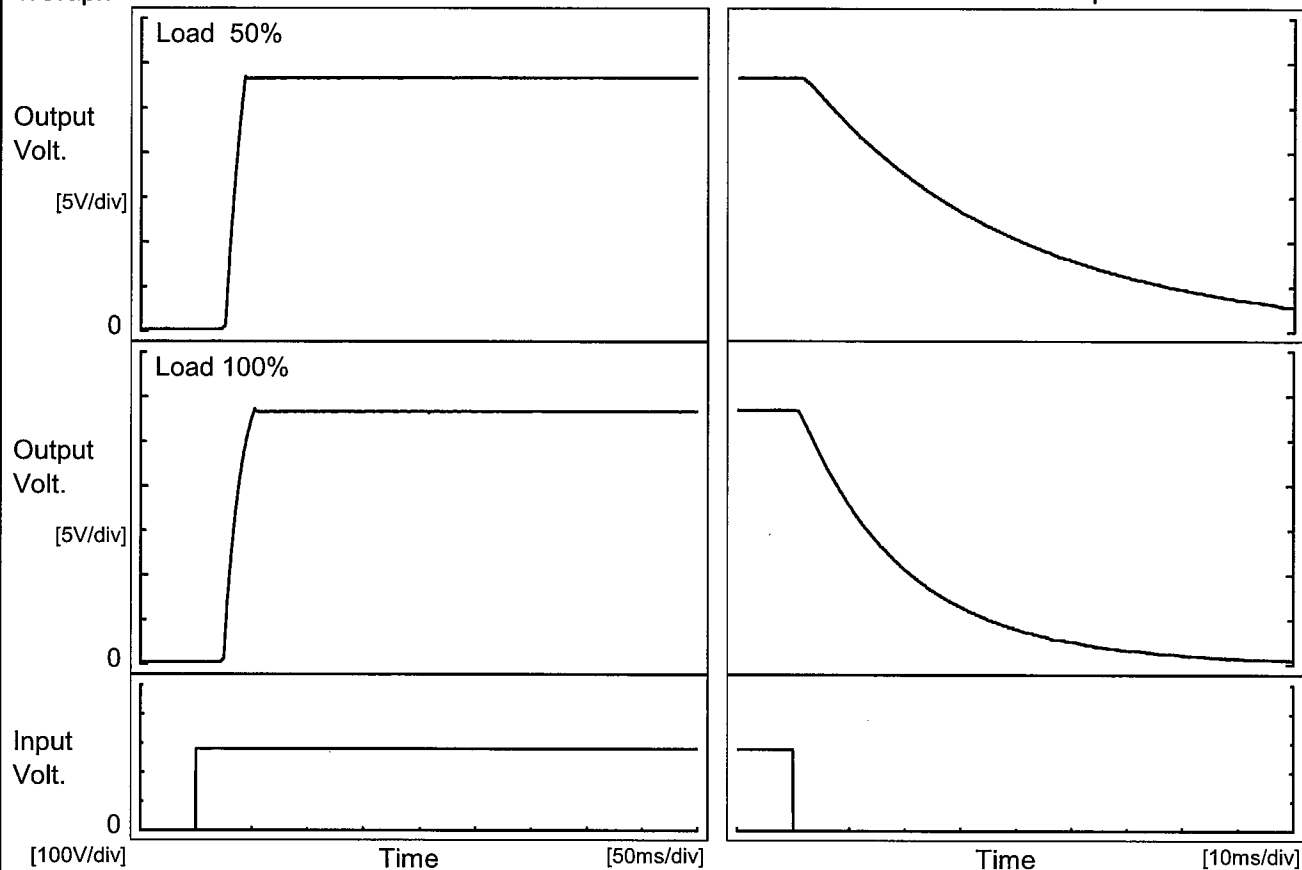
- 14 -

BC-10584

COSEL

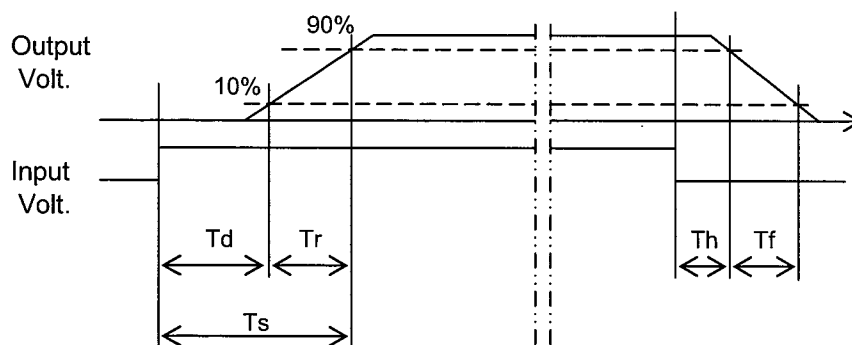
Model	SNDHS50B28	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+28V1.8A		

1.Graph



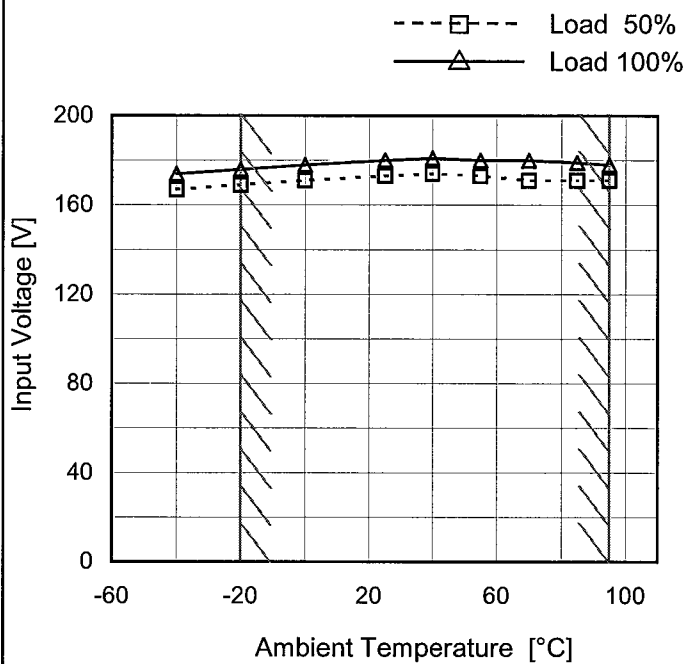
2.Values

		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		27.5	13.5	41.0	6.2	80.7
100 %		26.3	19.3	45.6	3.3	42.7



Model	SNDHS50B28
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+28V1.8A

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	167	174
-20	169	176
0	171	178
25	173	180
40	174	181
55	173	180
70	171	180
85	171	179
95	171	178
--	-	-
--	-	-

Model	SNDHS50B28																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+28V1.8A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div><div></div><div></div></div><div><div>Input Volt. 200V</div><div>Input Volt. 280V</div><div>Input Volt. 400V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 14V to 0V.</p>		<table><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><tr><td>26.6</td><td>2.24</td><td>2.33</td><td>2.45</td></tr><tr><td>25.2</td><td>2.28</td><td>2.35</td><td>2.46</td></tr><tr><td>22.4</td><td>2.33</td><td>2.42</td><td>2.54</td></tr><tr><td>19.6</td><td>2.37</td><td>2.43</td><td>2.54</td></tr><tr><td>16.8</td><td>2.40</td><td>2.46</td><td>2.52</td></tr><tr><td>14.0</td><td>2.41</td><td>2.45</td><td>2.51</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></table>		Output Voltage [V]	Load Current [A]			Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	26.6	2.24	2.33	2.45	25.2	2.28	2.35	2.46	22.4	2.33	2.42	2.54	19.6	2.37	2.43	2.54	16.8	2.40	2.46	2.52	14.0	2.41	2.45	2.51	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Output Voltage [V]	Load Current [A]																																																									
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																							
26.6	2.24	2.33	2.45																																																							
25.2	2.28	2.35	2.46																																																							
22.4	2.33	2.42	2.54																																																							
19.6	2.37	2.43	2.54																																																							
16.8	2.40	2.46	2.52																																																							
14.0	2.41	2.45	2.51																																																							
--	-	-	-																																																							
--	-	-	-																																																							
--	-	-	-																																																							
--	-	-	-																																																							
--	-	-	-																																																							
--	-	-	-																																																							

Model	SNDHS50B28																																								
Item	Overvoltage Protection	Testing Circuitry Figure A																																							
Object	+28V1.8A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 200V</div></div><div><div>---□---</div><div>Input Volt. 400V</div></div></div> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Operating Point [V]</th></tr><tr><th>Input Volt. 200[V]</th><th>Input Volt. 400[V]</th></tr><tr><td>-40</td><td>34.87</td><td>34.87</td></tr><tr><td>-20</td><td>35.39</td><td>35.39</td></tr><tr><td>0</td><td>35.86</td><td>35.86</td></tr><tr><td>25</td><td>36.56</td><td>36.56</td></tr><tr><td>40</td><td>36.97</td><td>36.97</td></tr><tr><td>55</td><td>37.27</td><td>37.27</td></tr><tr><td>70</td><td>37.67</td><td>37.68</td></tr><tr><td>85</td><td>38.09</td><td>37.97</td></tr><tr><td>95</td><td>38.26</td><td>38.26</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 200[V]	Input Volt. 400[V]	-40	34.87	34.87	-20	35.39	35.39	0	35.86	35.86	25	36.56	36.56	40	36.97	36.97	55	37.27	37.27	70	37.67	37.68	85	38.09	37.97	95	38.26	38.26	--	-	-	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
	Input Volt. 200[V]	Input Volt. 400[V]																																							
-40	34.87	34.87																																							
-20	35.39	35.39																																							
0	35.86	35.86																																							
25	36.56	36.56																																							
40	36.97	36.97																																							
55	37.27	37.27																																							
70	37.67	37.68																																							
85	38.09	37.97																																							
95	38.26	38.26																																							
--	-	-																																							
--	-	-																																							

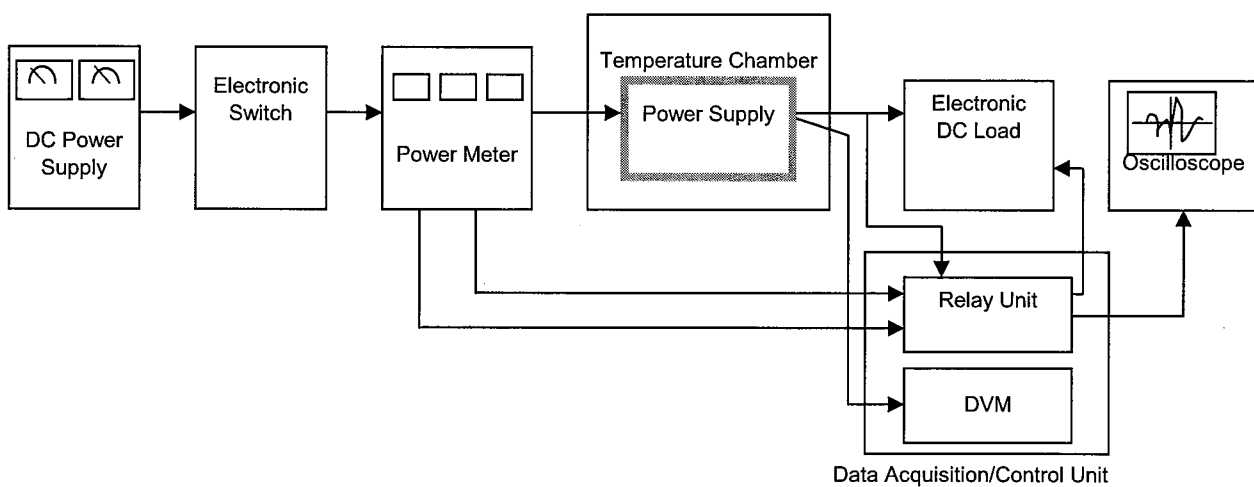


Figure A

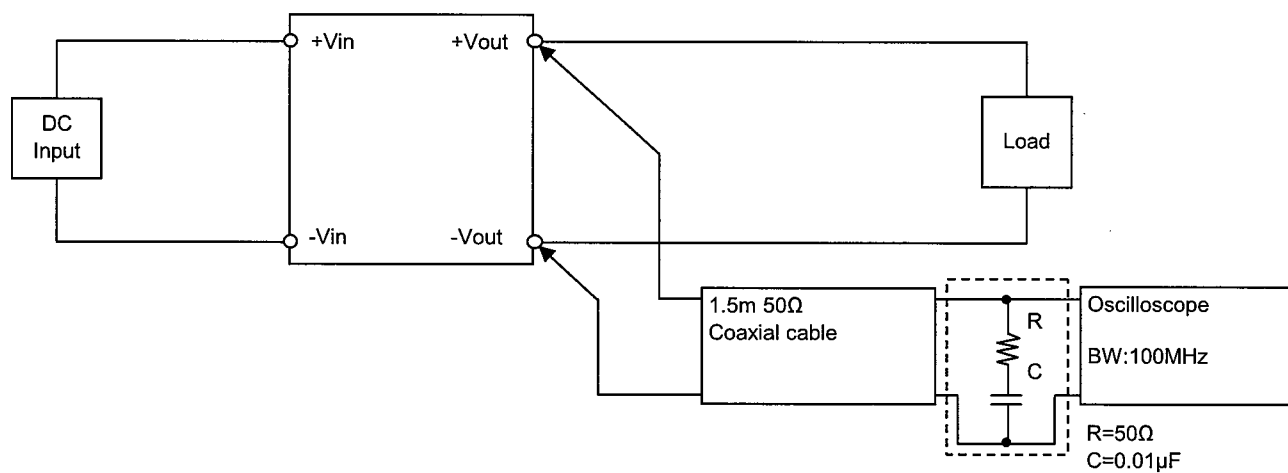


Figure B (Ripple and Ripple noise Characteristic)