

TEST DATA OF SNDHS50B12

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		SNDHS50B12																																																																																
Item		Input Current (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></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>0.002</td><td>0.000</td></tr><tr><td>170</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>180</td><td>0.034</td><td>0.186</td><td>0.329</td></tr><tr><td>185</td><td>0.033</td><td>0.180</td><td>0.334</td></tr><tr><td>200</td><td>0.030</td><td>0.165</td><td>0.307</td></tr><tr><td>250</td><td>0.020</td><td>0.132</td><td>0.244</td></tr><tr><td>280</td><td>0.016</td><td>0.119</td><td>0.219</td></tr><tr><td>300</td><td>0.015</td><td>0.112</td><td>0.205</td></tr><tr><td>350</td><td>0.014</td><td>0.099</td><td>0.178</td></tr><tr><td>400</td><td>0.013</td><td>0.089</td><td>0.160</td></tr><tr><td>420</td><td>0.012</td><td>0.086</td><td>0.153</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>		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	0.002	0.000	170	0.003	0.003	0.003	180	0.034	0.186	0.329	185	0.033	0.180	0.334	200	0.030	0.165	0.307	250	0.020	0.132	0.244	280	0.016	0.119	0.219	300	0.015	0.112	0.205	350	0.014	0.099	0.178	400	0.013	0.089	0.160	420	0.012	0.086	0.153	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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	0.002	0.000																																																																															
170	0.003	0.003	0.003																																																																															
180	0.034	0.186	0.329																																																																															
185	0.033	0.180	0.334																																																																															
200	0.030	0.165	0.307																																																																															
250	0.020	0.132	0.244																																																																															
280	0.016	0.119	0.219																																																																															
300	0.015	0.112	0.205																																																																															
350	0.014	0.099	0.178																																																																															
400	0.013	0.089	0.160																																																																															
420	0.012	0.086	0.153																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															
--	-	-	-																																																																															

1

BC-10581

Model		SNDHS50B12	
Item		Input Current (by Load Current)	
Object		_____	

1.Graph

—△—

Input Volt.

200V

---□---

Input Volt.

280V

-○-

Input Volt.

400V

Input Current [A]

0.50

0.40

0.30

0.20

0.10

0.00

0.0

1.0

2.0

3.0

4.0

5.0

Load Current [A]

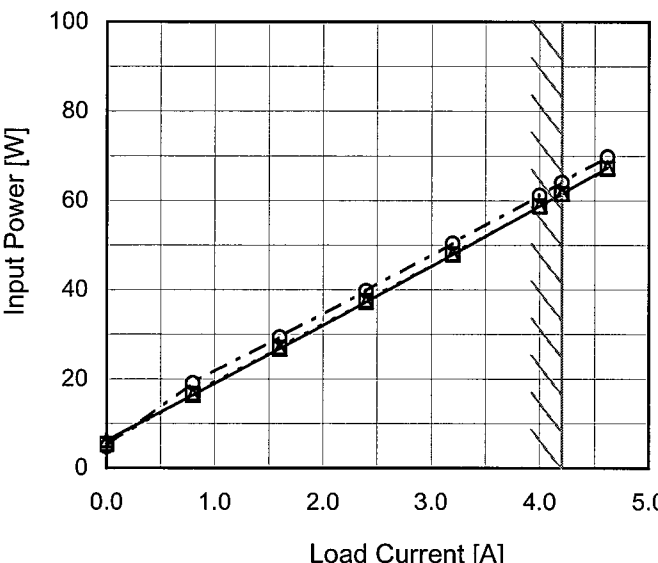
Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0.00	0.031	0.019	0.012
0.80	0.082	0.060	0.048
1.60	0.134	0.097	0.073
2.40	0.186	0.134	0.099
3.20	0.240	0.171	0.126
4.00	0.294	0.210	0.153
4.20	0.308	0.220	0.160
4.62	0.338	0.240	0.174
--	-	-	-
--	-	-	-
--	-	-	-

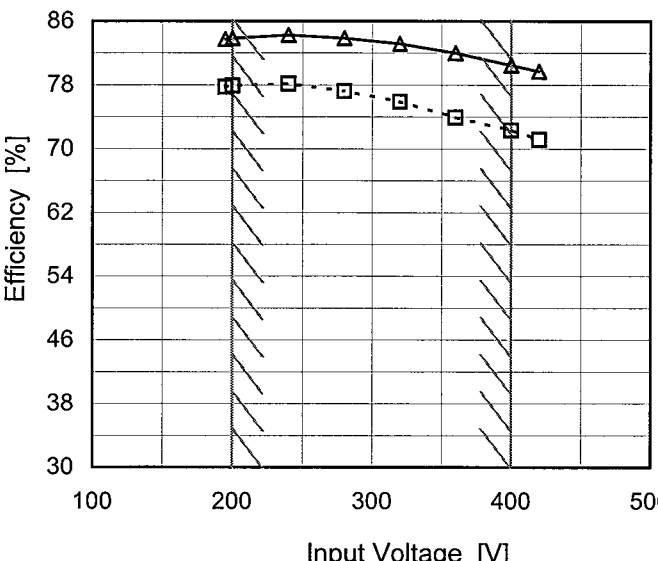
- 2 -

BC-10581

Model		SNDHS50B12		Temperature 25°C																																																				
Item		Input Power (by Load Current)		Testing Circuitry Figure A																																																				
Object		_____																																																						
1.Graph		<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>		2.Values																																																				
		<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>6.20</td><td>5.30</td><td>4.80</td></tr><tr><td>0.80</td><td>16.40</td><td>16.70</td><td>19.10</td></tr><tr><td>1.60</td><td>26.80</td><td>27.00</td><td>29.40</td></tr><tr><td>2.40</td><td>37.30</td><td>37.50</td><td>39.80</td></tr><tr><td>3.20</td><td>47.90</td><td>48.00</td><td>50.40</td></tr><tr><td>4.00</td><td>58.80</td><td>58.80</td><td>61.20</td></tr><tr><td>4.20</td><td>61.60</td><td>61.50</td><td>64.10</td></tr><tr><td>4.62</td><td>67.40</td><td>67.20</td><td>69.80</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	6.20	5.30	4.80	0.80	16.40	16.70	19.10	1.60	26.80	27.00	29.40	2.40	37.30	37.50	39.80	3.20	47.90	48.00	50.40	4.00	58.80	58.80	61.20	4.20	61.60	61.50	64.10	4.62	67.40	67.20	69.80	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Input Power [W]																																																							
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																					
0.00	6.20	5.30	4.80																																																					
0.80	16.40	16.70	19.10																																																					
1.60	26.80	27.00	29.40																																																					
2.40	37.30	37.50	39.80																																																					
3.20	47.90	48.00	50.40																																																					
4.00	58.80	58.80	61.20																																																					
4.20	61.60	61.50	64.10																																																					
4.62	67.40	67.20	69.80																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					

- 3 -

BC-10581

Model		SNDHS50B12		Temperature Testing Circuitry	25°C Figure A																																
Item		Efficiency (by Input Voltage)																																			
Object		_____																																			
1.Graph				2.Values																																	
<div><div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div><p>Efficiency [%]</p><p>Input Voltage [V]</p><p>Note: Slanted line shows the range of the rated input voltage.</p></div>				<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Efficiency [%]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>195</td><td>77.7</td><td>83.7</td></tr><tr><td>200</td><td>77.9</td><td>83.9</td></tr><tr><td>240</td><td>78.2</td><td>84.3</td></tr><tr><td>280</td><td>77.2</td><td>83.9</td></tr><tr><td>320</td><td>75.9</td><td>83.2</td></tr><tr><td>360</td><td>73.9</td><td>82.0</td></tr><tr><td>400</td><td>72.3</td><td>80.5</td></tr><tr><td>420</td><td>71.1</td><td>79.7</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	195	77.7	83.7	200	77.9	83.9	240	78.2	84.3	280	77.2	83.9	320	75.9	83.2	360	73.9	82.0	400	72.3	80.5	420	71.1	79.7	--	-	-
Input Voltage [V]	Efficiency [%]																																				
	Load 50%	Load 100%																																			
195	77.7	83.7																																			
200	77.9	83.9																																			
240	78.2	84.3																																			
280	77.2	83.9																																			
320	75.9	83.2																																			
360	73.9	82.0																																			
400	72.3	80.5																																			
420	71.1	79.7																																			
--	-	-																																			

Model		SNDHS50B12		Temperature 25°C																																																				
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<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> <table><thead><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></thead><tbody><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.80</td><td>61.4</td><td>60.3</td><td>52.8</td></tr><tr><td>1.60</td><td>74.1</td><td>73.6</td><td>67.6</td></tr><tr><td>2.40</td><td>79.5</td><td>79.1</td><td>74.5</td></tr><tr><td>3.20</td><td>82.3</td><td>82.1</td><td>78.2</td></tr><tr><td>4.00</td><td>83.7</td><td>83.7</td><td>80.4</td></tr><tr><td>4.20</td><td>83.8</td><td>84.0</td><td>80.6</td></tr><tr><td>4.62</td><td>84.2</td><td>84.5</td><td>81.4</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]	Efficiency [%]			Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	-	-	-	0.80	61.4	60.3	52.8	1.60	74.1	73.6	67.6	2.40	79.5	79.1	74.5	3.20	82.3	82.1	78.2	4.00	83.7	83.7	80.4	4.20	83.8	84.0	80.6	4.62	84.2	84.5	81.4	--	-	-	-	--	-	-	-	--	-	-	-	2.Values	
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																					
0.00	-	-	-																																																					
0.80	61.4	60.3	52.8																																																					
1.60	74.1	73.6	67.6																																																					
2.40	79.5	79.1	74.5																																																					
3.20	82.3	82.1	78.2																																																					
4.00	83.7	83.7	80.4																																																					
4.20	83.8	84.0	80.6																																																					
4.62	84.2	84.5	81.4																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
		<table><thead><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></thead><tbody><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.80</td><td>61.4</td><td>60.3</td><td>52.8</td></tr><tr><td>1.60</td><td>74.1</td><td>73.6</td><td>67.6</td></tr><tr><td>2.40</td><td>79.5</td><td>79.1</td><td>74.5</td></tr><tr><td>3.20</td><td>82.3</td><td>82.1</td><td>78.2</td></tr><tr><td>4.00</td><td>83.7</td><td>83.7</td><td>80.4</td></tr><tr><td>4.20</td><td>83.8</td><td>84.0</td><td>80.6</td></tr><tr><td>4.62</td><td>84.2</td><td>84.5</td><td>81.4</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]	Efficiency [%]			Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	-	-	-	0.80	61.4	60.3	52.8	1.60	74.1	73.6	67.6	2.40	79.5	79.1	74.5	3.20	82.3	82.1	78.2	4.00	83.7	83.7	80.4	4.20	83.8	84.0	80.6	4.62	84.2	84.5	81.4	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																					
0.00	-	-	-																																																					
0.80	61.4	60.3	52.8																																																					
1.60	74.1	73.6	67.6																																																					
2.40	79.5	79.1	74.5																																																					
3.20	82.3	82.1	78.2																																																					
4.00	83.7	83.7	80.4																																																					
4.20	83.8	84.0	80.6																																																					
4.62	84.2	84.5	81.4																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								

Model	SNDHS50B12																																
Item	Line Regulation	Temperature	25°C																														
Object	+12V4.2A	Testing Circuitry	Figure A																														
1.Graph		2.Values																															
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] Load 50%</th><th>Output Voltage [V] Load 100%</th></tr></thead><tbody><tr><td>195</td><td>12.254</td><td>12.247</td></tr><tr><td>200</td><td>12.254</td><td>12.247</td></tr><tr><td>240</td><td>12.254</td><td>12.247</td></tr><tr><td>280</td><td>12.254</td><td>12.248</td></tr><tr><td>320</td><td>12.254</td><td>12.248</td></tr><tr><td>360</td><td>12.255</td><td>12.248</td></tr><tr><td>400</td><td>12.255</td><td>12.249</td></tr><tr><td>420</td><td>12.256</td><td>12.249</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]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	195	12.254	12.247	200	12.254	12.247	240	12.254	12.247	280	12.254	12.248	320	12.254	12.248	360	12.255	12.248	400	12.255	12.249	420	12.256	12.249	--	-	-		
Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%																															
195	12.254	12.247																															
200	12.254	12.247																															
240	12.254	12.247																															
280	12.254	12.248																															
320	12.254	12.248																															
360	12.255	12.248																															
400	12.255	12.249																															
420	12.256	12.249																															
--	-	-																															


COSEL

Model		SNDHS50B12		Temperature		25°C																																																	
Item		Load Regulation		Testing Circuitry		Figure A																																																	
Object		+12V4.2A																																																					
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>Input Volt. 200V</div></div><div><div>---□---</div><div>Input Volt. 280V</div></div><div><div>-·-○-·-</div><div>Input Volt. 400V</div></div></div><div><table><thead><tr><th>Load Current [A]</th><th>Input Volt. 200[V]</th><th>Input Volt. 280[V]</th><th>Input Volt. 400[V]</th></tr></thead><tbody><tr><td>0.00</td><td>12.263</td><td>12.263</td><td>12.264</td></tr><tr><td>0.80</td><td>12.256</td><td>12.256</td><td>12.257</td></tr><tr><td>1.60</td><td>12.253</td><td>12.254</td><td>12.255</td></tr><tr><td>2.40</td><td>12.251</td><td>12.251</td><td>12.252</td></tr><tr><td>3.20</td><td>12.248</td><td>12.249</td><td>12.250</td></tr><tr><td>4.00</td><td>12.246</td><td>12.246</td><td>12.248</td></tr><tr><td>4.20</td><td>12.245</td><td>12.246</td><td>12.247</td></tr><tr><td>4.62</td><td>12.244</td><td>12.245</td><td>12.246</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></div><div>Note: Slanted line shows the range of the rated load current.</div></div>				Load Current [A]	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]	0.00	12.263	12.263	12.264	0.80	12.256	12.256	12.257	1.60	12.253	12.254	12.255	2.40	12.251	12.251	12.252	3.20	12.248	12.249	12.250	4.00	12.246	12.246	12.248	4.20	12.245	12.246	12.247	4.62	12.244	12.245	12.246	--	-	-	-	--	-	-	-	--	-	-	-				
Load Current [A]	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]																																																				
0.00	12.263	12.263	12.264																																																				
0.80	12.256	12.256	12.257																																																				
1.60	12.253	12.254	12.255																																																				
2.40	12.251	12.251	12.252																																																				
3.20	12.248	12.249	12.250																																																				
4.00	12.246	12.246	12.248																																																				
4.20	12.245	12.246	12.247																																																				
4.62	12.244	12.245	12.246																																																				
--	-	-	-																																																				
--	-	-	-																																																				
--	-	-	-																																																				
				BC-10581																																																			

COSEL

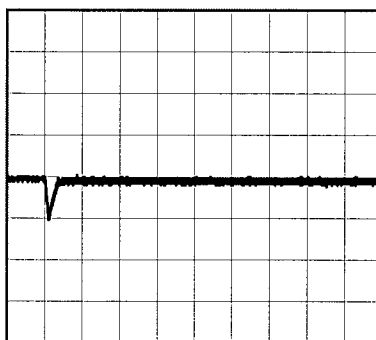
Model	SNDHS50B12	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+12V4.2A	

Input Volt. 280 V
Cycle 1000 ms

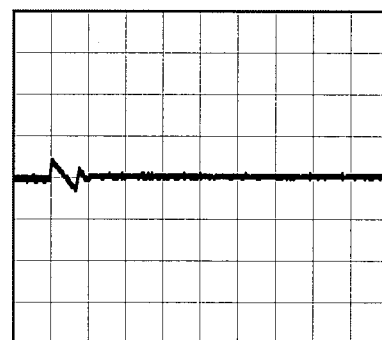
Load Current  4.2A/50 μ s

Min. Load (0A) \longleftrightarrow
Load 100% (4.2A)

0.5 V/div



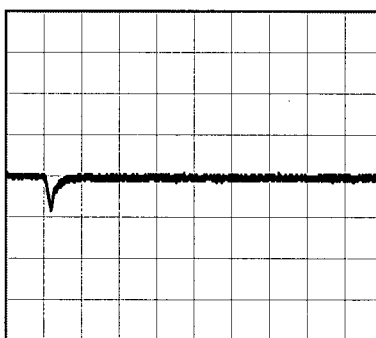
1ms/div



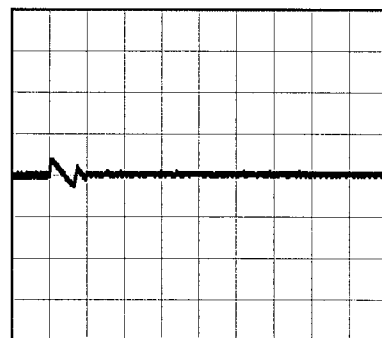
10ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (2.1A)

0.5 V/div



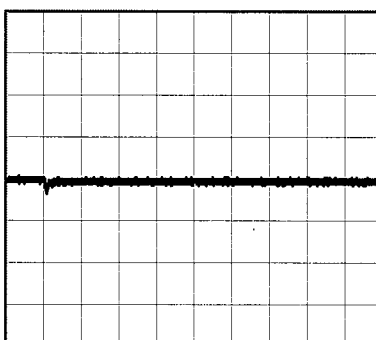
1ms/div



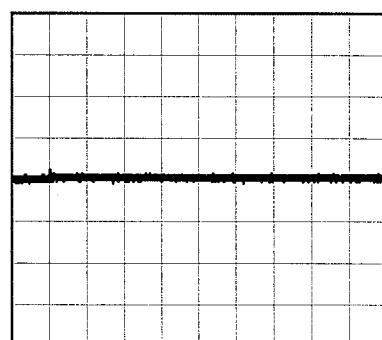
10ms/div

Load 10% (0.42A) \longleftrightarrow
Load 100% (4.2A)

0.5 V/div

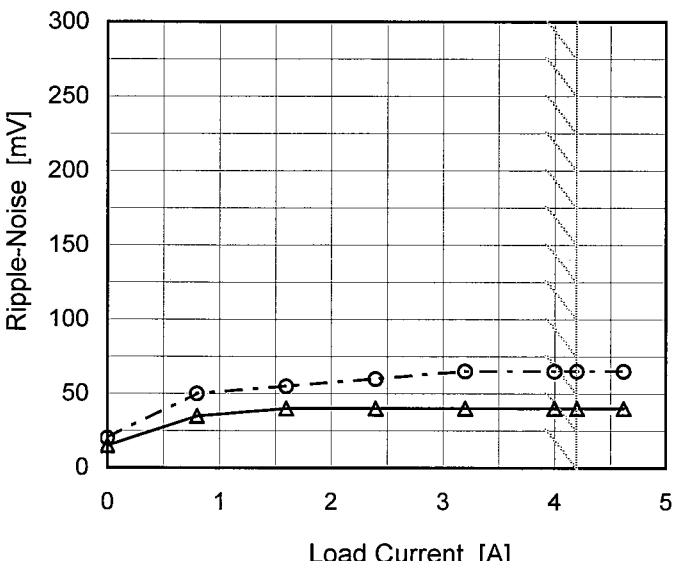
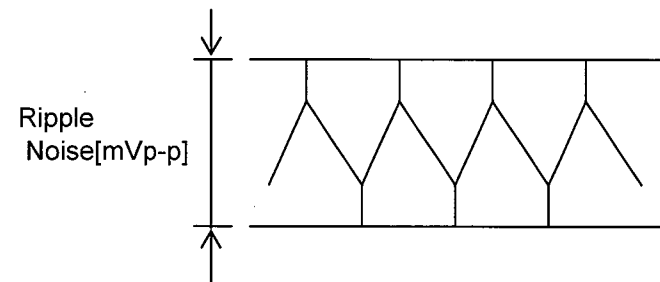


1ms/div



10ms/div

Model	SNDHS50B12																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
Object	+12V4.2A	Testing Circuitry	Figure B																																						
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 200V</div></div><div><div>-·-○-·-</div><div>Input Volt. 400V</div></div></div> <table><thead><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></thead><tbody><tr><td>0.00</td><td>5</td><td>5</td></tr><tr><td>0.80</td><td>30</td><td>40</td></tr><tr><td>1.60</td><td>35</td><td>40</td></tr><tr><td>2.40</td><td>35</td><td>40</td></tr><tr><td>3.20</td><td>35</td><td>40</td></tr><tr><td>4.00</td><td>35</td><td>40</td></tr><tr><td>4.20</td><td>35</td><td>40</td></tr><tr><td>4.62</td><td>35</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></tbody></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 200 [V]	Input Volt. 400 [V]	0.00	5	5	0.80	30	40	1.60	35	40	2.40	35	40	3.20	35	40	4.00	35	40	4.20	35	40	4.62	35	40	--	-	-	--	-	-	--	-	-		
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 200 [V]	Input Volt. 400 [V]																																							
0.00	5	5																																							
0.80	30	40																																							
1.60	35	40																																							
2.40	35	40																																							
3.20	35	40																																							
4.00	35	40																																							
4.20	35	40																																							
4.62	35	40																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
<p>Measured by 100 MHz Oscilloscope.</p> <p>Ripple Voltage 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 [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

Model	SNDHS50B12																																								
Item	Ripple-Noise	Temperature	25°C																																						
Object	+12V4.2A	Testing Circuitry	Figure B																																						
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>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>		<table><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><tr><td>0.00</td><td>15</td><td>20</td></tr><tr><td>0.80</td><td>35</td><td>50</td></tr><tr><td>1.60</td><td>40</td><td>55</td></tr><tr><td>2.40</td><td>40</td><td>60</td></tr><tr><td>3.20</td><td>40</td><td>65</td></tr><tr><td>4.00</td><td>40</td><td>65</td></tr><tr><td>4.20</td><td>40</td><td>65</td></tr><tr><td>4.62</td><td>40</td><td>65</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. 200 [V]	Input Volt. 400 [V]	0.00	15	20	0.80	35	50	1.60	40	55	2.40	40	60	3.20	40	65	4.00	40	65	4.20	40	65	4.62	40	65	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 200 [V]	Input Volt. 400 [V]																																							
0.00	15	20																																							
0.80	35	50																																							
1.60	40	55																																							
2.40	40	60																																							
3.20	40	65																																							
4.00	40	65																																							
4.20	40	65																																							
4.62	40	65																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
 <p>Fig.Complex Ripple Noise Wave Form</p>																																									

- 10 -


BC-10581

Model	SNDHS50B12																																								
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure B																																							
Object	+12V4.2A																																								
1.Graph		2.Values																																							
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div> <p>Ripple Voltage [mV]</p> <p>Ambient Temperature [°C]</p> <p>Input Volt. 280V</p>		<table><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><tr><td>-40</td><td>45</td><td>50</td></tr><tr><td>-20</td><td>45</td><td>45</td></tr><tr><td>0</td><td>40</td><td>45</td></tr><tr><td>25</td><td>35</td><td>35</td></tr><tr><td>40</td><td>40</td><td>40</td></tr><tr><td>55</td><td>40</td><td>40</td></tr><tr><td>70</td><td>40</td><td>45</td></tr><tr><td>85</td><td>45</td><td>50</td></tr><tr><td>95</td><td>50</td><td>50</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-40	45	50	-20	45	45	0	40	45	25	35	35	40	40	40	55	40	40	70	40	45	85	45	50	95	50	50	--	-	-	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
	Load 50%	Load 100%																																							
-40	45	50																																							
-20	45	45																																							
0	40	45																																							
25	35	35																																							
40	40	40																																							
55	40	40																																							
70	40	45																																							
85	45	50																																							
95	50	50																																							
--	-	-																																							
--	-	-																																							
Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.																																									

- 11 -

BC-10581



			
Model	SNDHS50B12		
Item	Output Voltage Accuracy		Testing Circuitry Figure A
Object	+12V4.2A		

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

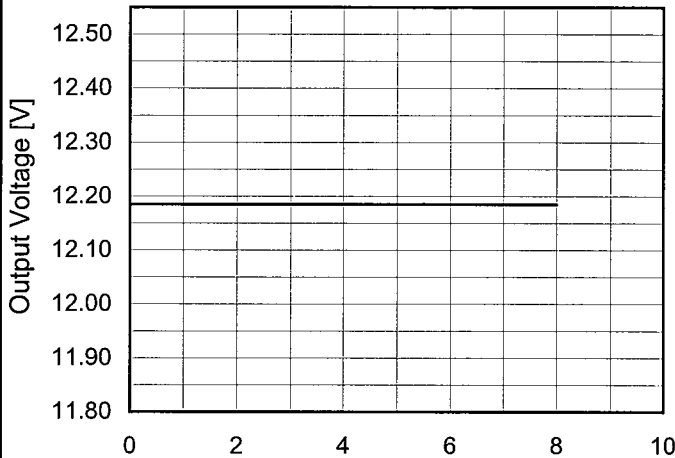
Load Current : 0 - 4.2A

* 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	200	0	12.269	±30	±0.3
Minimum Voltage	-20	200	4.2	12.209		

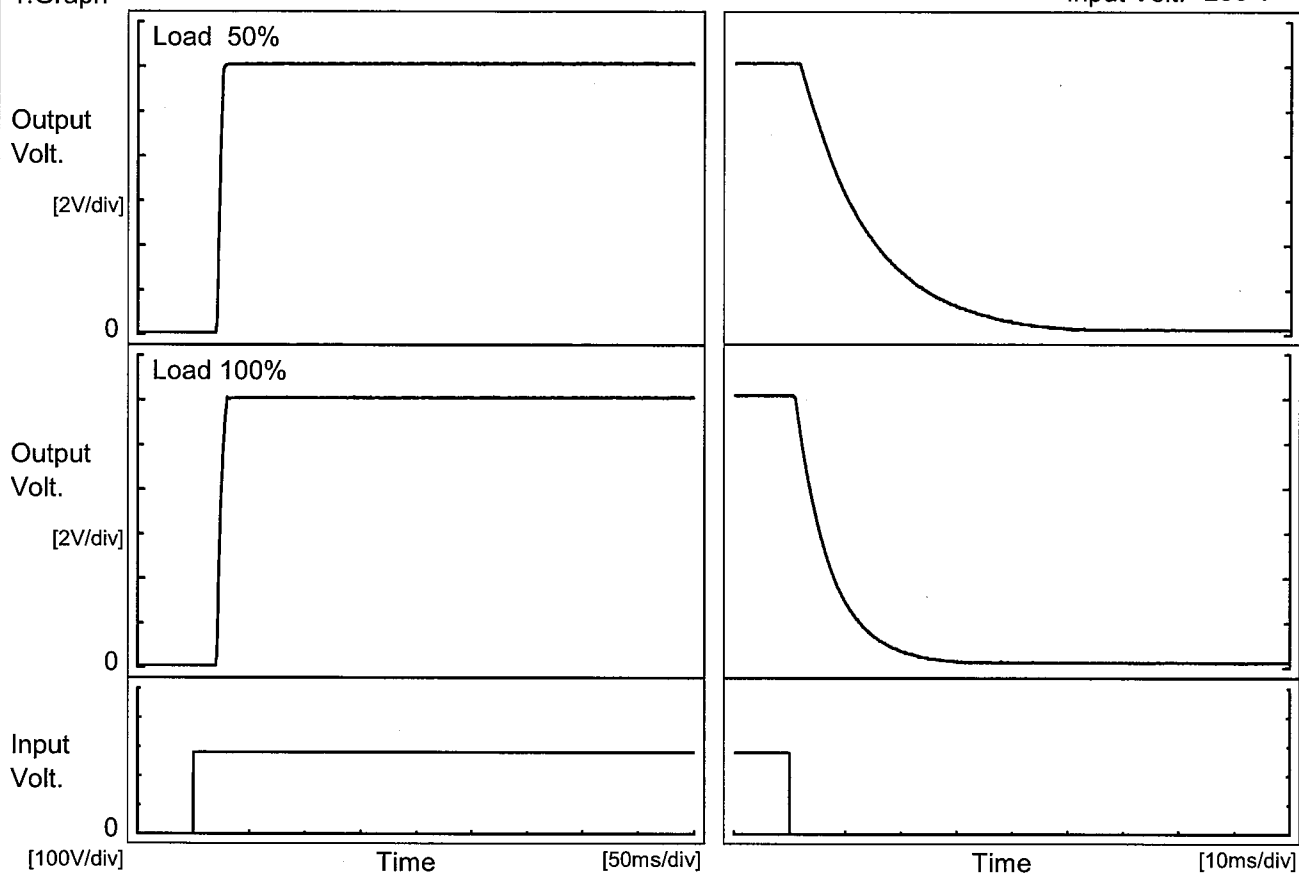
Model	SNDHS50B12																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+12V4.2A																								
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 280V</p><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>12.185</td></tr><tr><td>0.5</td><td>12.185</td></tr><tr><td>1.0</td><td>12.185</td></tr><tr><td>2.0</td><td>12.185</td></tr><tr><td>3.0</td><td>12.185</td></tr><tr><td>4.0</td><td>12.185</td></tr><tr><td>5.0</td><td>12.185</td></tr><tr><td>6.0</td><td>12.185</td></tr><tr><td>7.0</td><td>12.185</td></tr><tr><td>8.0</td><td>12.185</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.185	0.5	12.185	1.0	12.185	2.0	12.185	3.0	12.185	4.0	12.185	5.0	12.185	6.0	12.185	7.0	12.185	8.0	12.185
Time since start [H]	Output Voltage [V]																								
0.0	12.185																								
0.5	12.185																								
1.0	12.185																								
2.0	12.185																								
3.0	12.185																								
4.0	12.185																								
5.0	12.185																								
6.0	12.185																								
7.0	12.185																								
8.0	12.185																								

COSEL

Model	SNDHS50B12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V4.2A		

1.Graph

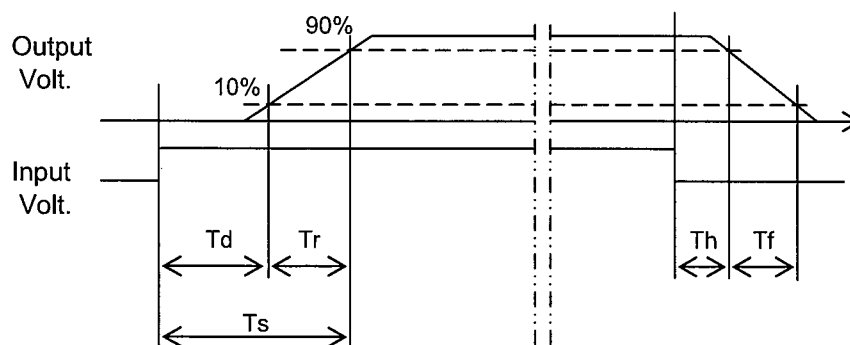
Input Volt. 280 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	21.5	4.3	25.8	3.2	27.1
100 %	21.5	6.5	28.0	1.7	14.3



1. Graph

The graph plots Input Voltage [V] on the Y-axis (0 to 200) against Ambient Temperature [°C] on the X-axis (-60 to 100). 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 increase in input voltage with temperature. A slanted line indicates the range of the rated ambient temperature, approximately from -20°C to 100°C.

Ambient Temperature [°C]	Input Voltage [V] (Load 50%)	Input Voltage [V] (Load 100%)
-40	162	168
-20	163	170
0	164	172
20	165	174
40	166	176
60	167	178
80	168	180
100	169	182

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	163	168
-20	164	170
0	165	172
25	167	174
40	168	175
55	168	176
70	168	177
85	168	176
95	167	176
--	-	-
--	-	-

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

BC-10581

Model	SNDHS50B12	Testing Circuitry Figure A																																							
Item	Overvoltage Protection																																								
Object	+12V4.2A																																								
1.Graph		2.Values																																							
<div><div><div><div><div></div><div>△</div></div><div>Input Volt. 200V</div></div><div><div><div></div><div>□</div></div><div>Input Volt. 400V</div></div></div><div>Ambient Temperature [°C]</div><div>Load 0%</div></div>		<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>15.05</td><td>15.05</td></tr><tr><td>-20</td><td>15.04</td><td>15.05</td></tr><tr><td>0</td><td>15.16</td><td>15.16</td></tr><tr><td>25</td><td>15.16</td><td>15.16</td></tr><tr><td>40</td><td>15.16</td><td>15.16</td></tr><tr><td>55</td><td>15.16</td><td>15.16</td></tr><tr><td>70</td><td>15.28</td><td>15.28</td></tr><tr><td>85</td><td>15.28</td><td>15.28</td></tr><tr><td>95</td><td>15.33</td><td>15.28</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	15.05	15.05	-20	15.04	15.05	0	15.16	15.16	25	15.16	15.16	40	15.16	15.16	55	15.16	15.16	70	15.28	15.28	85	15.28	15.28	95	15.33	15.28	--	-	-	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
	Input Volt. 200[V]	Input Volt. 400[V]																																							
-40	15.05	15.05																																							
-20	15.04	15.05																																							
0	15.16	15.16																																							
25	15.16	15.16																																							
40	15.16	15.16																																							
55	15.16	15.16																																							
70	15.28	15.28																																							
85	15.28	15.28																																							
95	15.33	15.28																																							
--	-	-																																							
--	-	-																																							
Note: Slanted line shows the range of the rated ambient temperature.																																									

- 18 -

BC-10581

COSEL

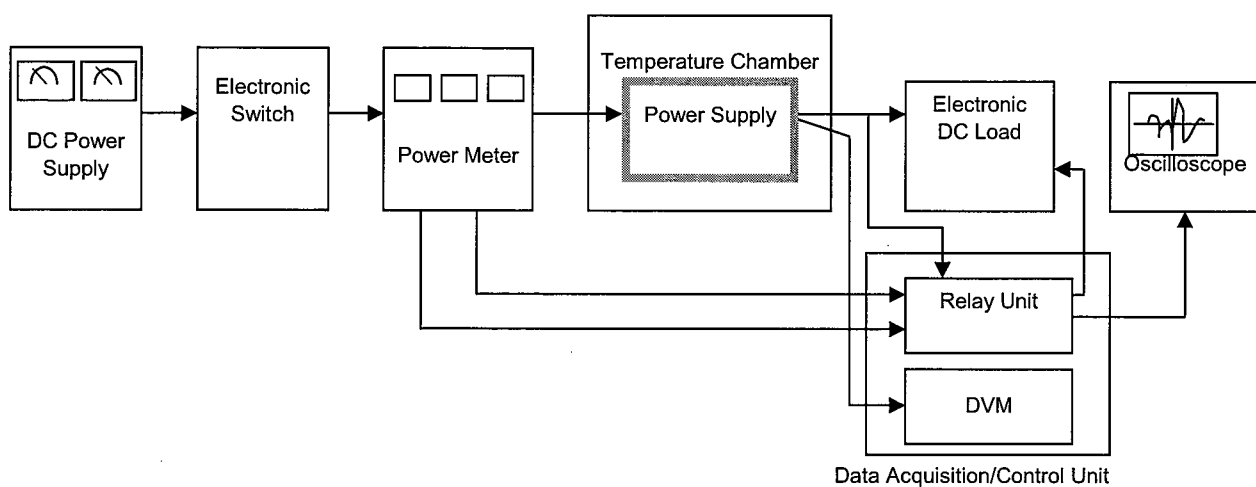


Figure A

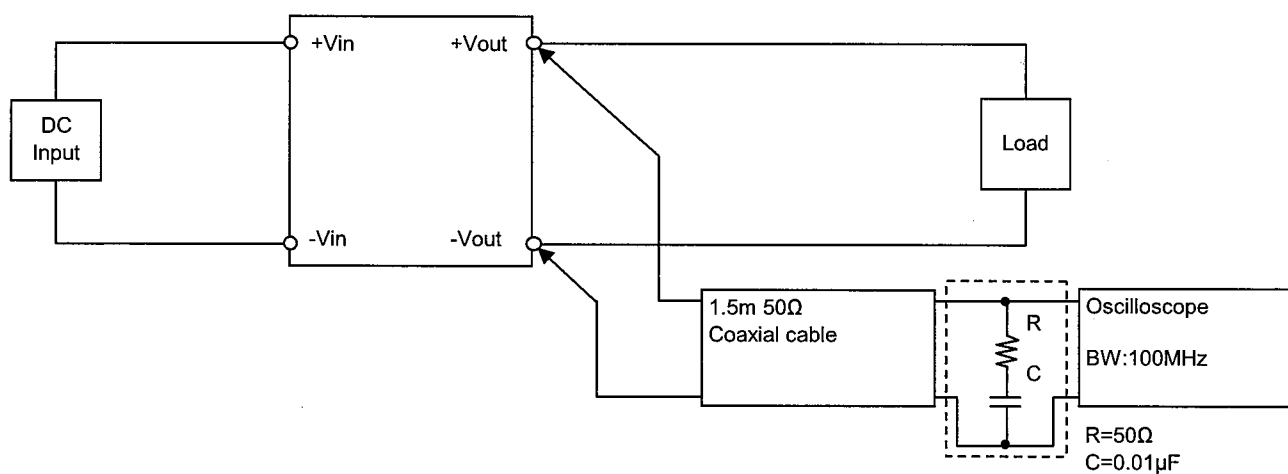


Figure B (Ripple and Ripple noise Characteristic)