

# TEST DATA OF SNDBS400B18

Regulated DC Power Supply  
July 6, 2012

Approved by : Takahiro Yoneda  
Takahiro Yoneda                                  Design Manager

Prepared by : Satoshi Kinoshita  
Satoshi Kinoshita                                  Design Engineer

**COSEL CO.,LTD.**

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Model	SNDBS400B18																																																																																	
Item	Input Current (by Input Voltage)																																																																																	
Object	_____																																																																																	
1.Graph	<p>The graph plots Input Current [A] on the y-axis (0.0 to 5.0) against Input Voltage [V] on the x-axis (0 to 500). Three curves are shown: Load 100% (triangles), Load 50% (squares), and Load 0% (circles). A slanted line indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Load 0% [A]</th> <th>Load 50% [A]</th> <th>Load 100% [A]</th> </tr> </thead> <tbody> <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>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>150</td><td>0.004</td><td>0.004</td><td>0.004</td></tr> <tr><td>165</td><td>0.028</td><td>1.381</td><td>2.824</td></tr> <tr><td>170</td><td>0.027</td><td>1.330</td><td>2.730</td></tr> <tr><td>180</td><td>0.027</td><td>1.244</td><td>2.544</td></tr> <tr><td>200</td><td>0.026</td><td>1.106</td><td>2.260</td></tr> <tr><td>250</td><td>0.024</td><td>0.880</td><td>1.782</td></tr> <tr><td>280</td><td>0.024</td><td>0.790</td><td>1.593</td></tr> <tr><td>300</td><td>0.024</td><td>0.740</td><td>1.487</td></tr> <tr><td>350</td><td>0.023</td><td>0.641</td><td>1.282</td></tr> <tr><td>400</td><td>0.023</td><td>0.568</td><td>1.130</td></tr> <tr><td>420</td><td>0.023</td><td>0.543</td><td>1.079</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>	Input Voltage [V]	Load 0% [A]	Load 50% [A]	Load 100% [A]	0	0.000	0.000	0.000	50	0.000	0.000	0.000	100	0.003	0.003	0.003	150	0.004	0.004	0.004	165	0.028	1.381	2.824	170	0.027	1.330	2.730	180	0.027	1.244	2.544	200	0.026	1.106	2.260	250	0.024	0.880	1.782	280	0.024	0.790	1.593	300	0.024	0.740	1.487	350	0.023	0.641	1.282	400	0.023	0.568	1.130	420	0.023	0.543	1.079	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-					
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Note: Slanted line shows the range of the rated input voltage.

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Model	SNDBS400B18		
Item	Input Current (by Load Current)	Temperature Testing Circuitry	25°C Figure A
Object	—	—	—
1.Graph	—△— Input Volt. 200V ---□--- Input Volt. 280V ---○--- Input Volt. 400V	2.Values	
<p>Note: Slanted line shows the range of the rated load current.</p>			
Load Current [A]	Input Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0.0	0.026	0.024	0.023
4.0	0.427	0.304	0.221
8.0	0.812	0.581	0.421
12.0	1.208	0.862	0.618
16.0	1.616	1.148	0.819
20.0	2.040	1.441	1.024
22.0	2.260	1.593	1.130
24.2	2.502	1.760	1.246
--	-	-	-
--	-	-	-
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1.Graph																																																						
<p>The graph plots Input Power [W] on the Y-axis (0 to 1000) against Load Current [A] on the X-axis (0 to 30). Three curves are shown for Input Volt. 200V (solid line with triangles), Input Volt. 280V (dashed line with squares), and Input Volt. 400V (dash-dot line with circles). A vertical slanted line is drawn from approximately 21.5A to 24.2A on the X-axis, representing the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 200[V] [W]</th> <th>Input Volt. 280[V] [W]</th> <th>Input Volt. 400[V] [W]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.2</td><td>6.7</td><td>9.4</td></tr> <tr><td>4.0</td><td>85.4</td><td>85.2</td><td>88.6</td></tr> <tr><td>8.0</td><td>162.2</td><td>162.7</td><td>168.5</td></tr> <tr><td>12.0</td><td>241.4</td><td>241.2</td><td>247.4</td></tr> <tr><td>16.0</td><td>323.0</td><td>321.4</td><td>327.6</td></tr> <tr><td>20.0</td><td>408.0</td><td>403.6</td><td>410.0</td></tr> <tr><td>22.0</td><td>452.0</td><td>445.9</td><td>452.0</td></tr> <tr><td>24.2</td><td>500.0</td><td>492.7</td><td>499.0</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Input Volt. 200[V] [W]	Input Volt. 280[V] [W]	Input Volt. 400[V] [W]	0.0	5.2	6.7	9.4	4.0	85.4	85.2	88.6	8.0	162.2	162.7	168.5	12.0	241.4	241.2	247.4	16.0	323.0	321.4	327.6	20.0	408.0	403.6	410.0	22.0	452.0	445.9	452.0	24.2	500.0	492.7	499.0	--	-	-	-	--	-	-	-	--	-	-	-	Temperature 25°C Testing Circuitry Figure A					
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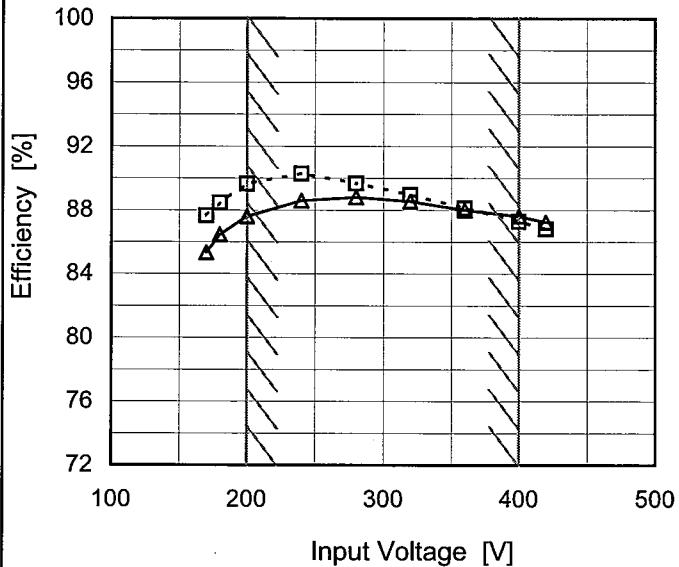
Model SNDBS400B18

Item Efficiency (by Input Voltage)

Object

## 1. Graph

--- □ --- Load 50%  
 —△— Load 100%


 Temperature 25°C  
 Testing Circuitry Figure A

## 2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
170	87.6	85.3
180	88.5	86.5
200	89.6	87.6
240	90.3	88.6
280	89.7	88.8
320	89.0	88.6
360	88.1	88.0
400	87.3	87.6
420	86.8	87.2

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

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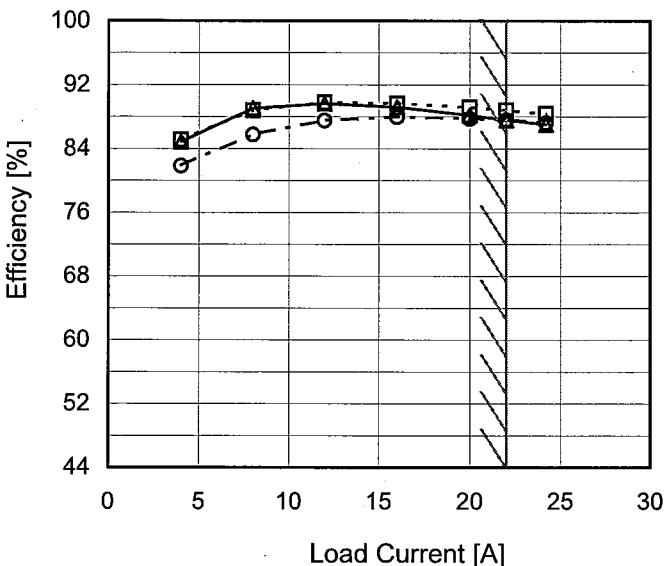
Model SNDBS400B18

Item Efficiency (by Load Current)

Object \_\_\_\_\_

## 1. Graph

—△— Input Volt. 200V  
 - - □ - - Input Volt. 280V  
 - - ○ - - Input Volt. 400V



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

 Temperature 25°C  
 Testing Circuitry Figure A

## 2. Values

Load Current [A]	Efficiency [%]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
0.0	-	-	-
4.0	84.9	85.1	81.9
8.0	89.0	88.8	85.7
12.0	89.7	89.8	87.5
16.0	89.2	89.7	88.0
20.0	88.2	89.2	87.8
22.0	87.6	88.8	87.6
24.2	87.1	88.4	87.3
--	-	-	-
--	-	-	-
--	-	-	-

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Model	SNDBS400B18																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+18V22A																																	
1.Graph																																		
<p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Legend: ---□--- Load 50% —△— Load 100%</p>																																		
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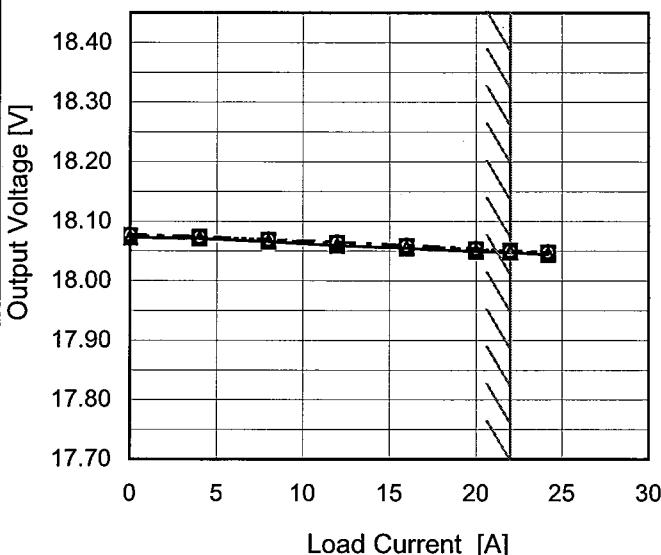
Model SNDBS400B18

Item Load Regulation

Object +18V22A

## 1. Graph

—△— Input Volt. 200V  
 - - □ - - Input Volt. 280V  
 - - ○ - - Input Volt. 400V

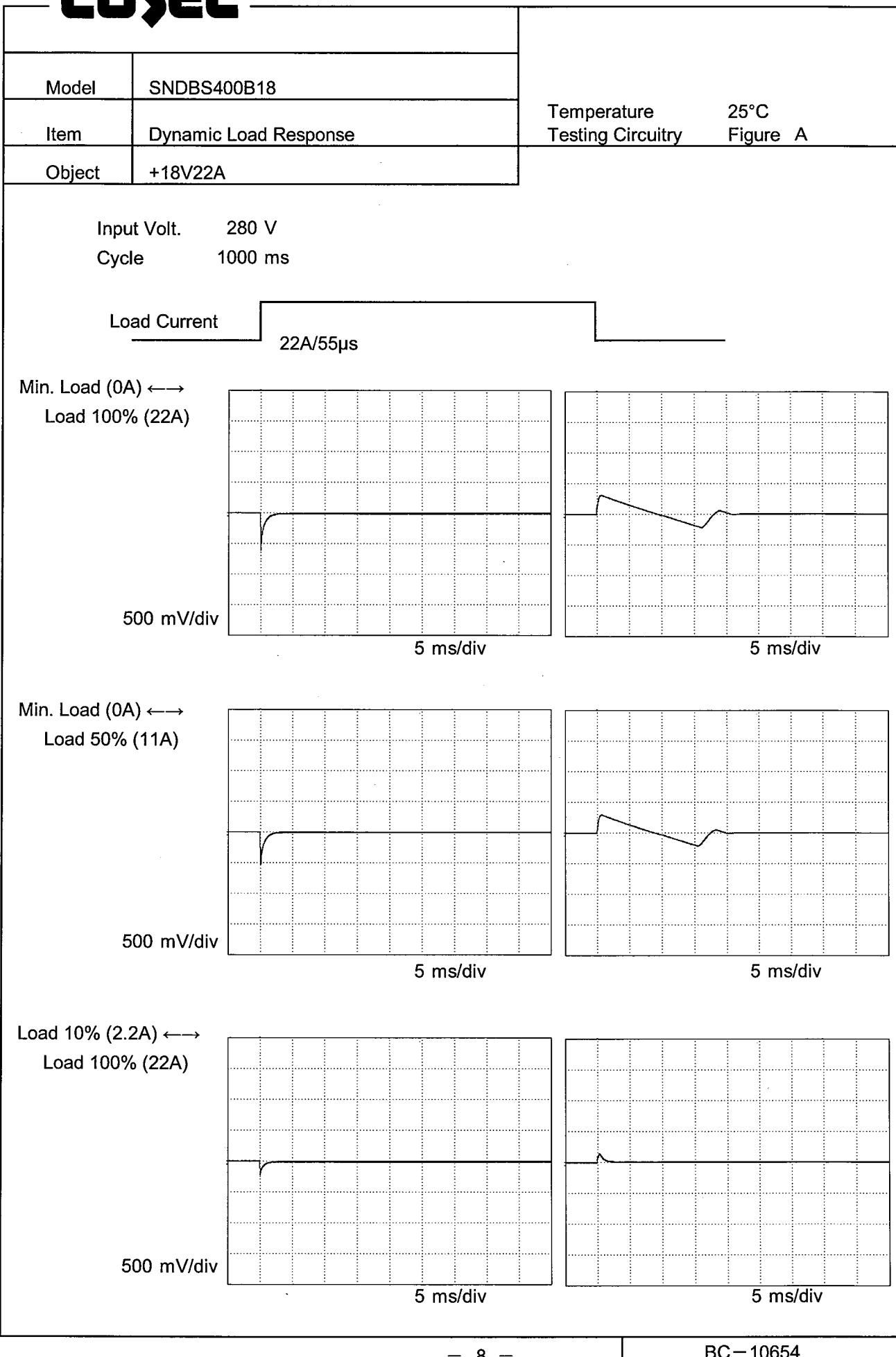


Note: Slanted line shows the range of the rated load current.

 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]
0.0	18.073	18.076	18.077
4.0	18.071	18.074	18.074
8.0	18.066	18.068	18.069
12.0	18.060	18.063	18.065
16.0	18.055	18.058	18.060
20.0	18.050	18.053	18.054
22.0	18.048	18.050	18.050
24.2	18.044	18.047	18.049
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--	-	-	-

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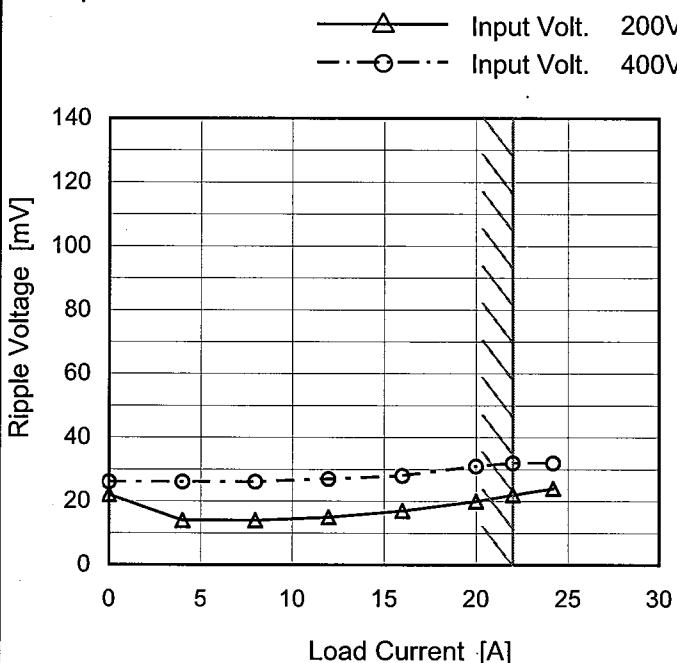
# COSEL

Model SNDBS400B18

Item Ripple Voltage (by Load Current)

Object +18V22A

1. Graph



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.

Temperature 25°C  
Testing Circuitry Figure B

2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 200 [V]	Input Volt. 400 [V]
0.0	22	26
4.0	14	26
8.0	14	26
12.0	15	27
16.0	17	28
20.0	20	31
22.0	22	32
24.2	24	32
--	-	-
--	-	-
--	-	-

Ripple [mVp-p]

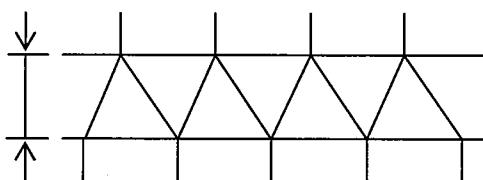
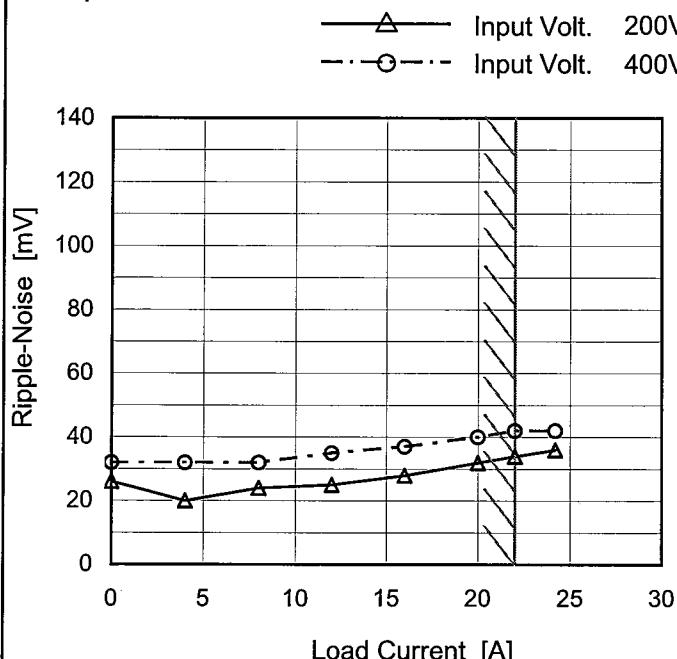


Fig.Complex Ripple Wave Form

**COSEL**

Model	SNDBS400B18
Item	Ripple-Noise
Object	+18V22A

## 1.Graph



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.

Temperature 25°C  
Testing Circuitry Figure B

## 2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 200 [V]	Input Volt. 400 [V]
0.0	26	32
4.0	20	32
8.0	24	32
12.0	25	35
16.0	28	37
20.0	32	40
22.0	34	42
24.2	36	42
--	-	-
--	-	-
--	-	-

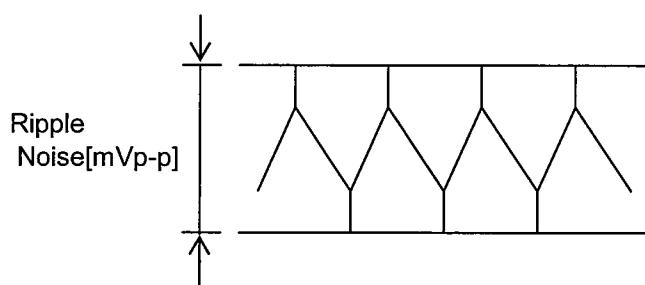


Fig.Complex Ripple Noise Wave Form

**COSEL**

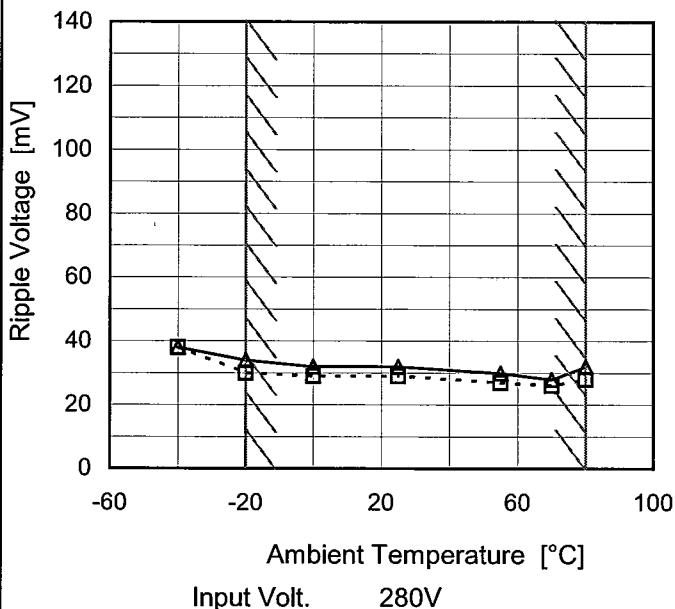
Model SNDBS400B18

Item Ripple Voltage (by Ambient Temp.)

Object +18V22A

## 1. Graph

---□--- Load 50%  
 —△— Load 100%



Measured by 100 MHz Oscilloscope.

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

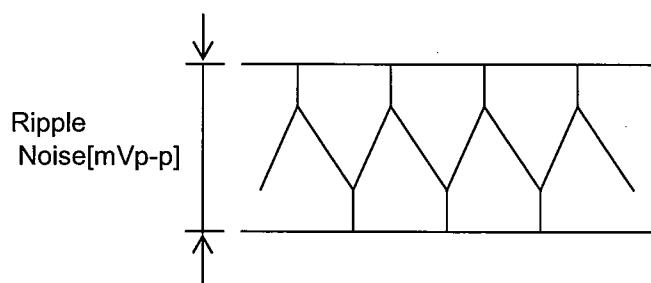
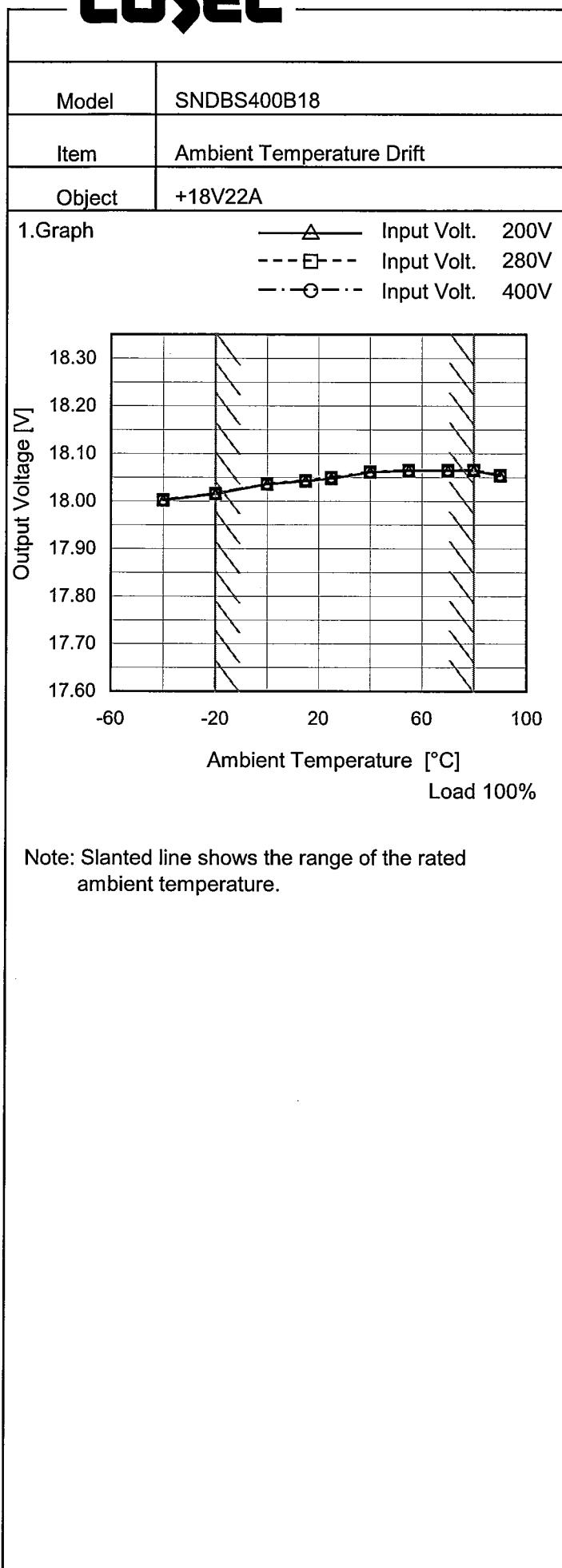


Fig. Complex Ripple Noise Wave Form

Testing Circuitry Figure B

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	38	38
-20	30	34
0	29	32
25	29	32
55	27	30
70	26	28
80	28	32
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**


Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
-40	18.002	18.003	18.003
-20	18.015	18.016	18.016
0	18.036	18.036	18.036
15	18.042	18.043	18.043
25	18.048	18.050	18.050
40	18.061	18.062	18.062
55	18.064	18.065	18.065
70	18.064	18.065	18.065
80	18.065	18.066	18.066
90	18.054	18.055	18.055
--	-	-	-



Model	SNDBS400B18	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+18V22A	

### 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 - 80°C

Input Voltage : 200 - 400V

Load Current : 0 - 22A

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

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

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	80	400	0	18.096	±41	±0.2
Minimum Voltage	-20	200	22	18.015		

**COSEL**

Model	SNDBS400B18
Item	Time Lapse Drift
Object	+18V22A

1.Graph

Time since start [H]	Output Voltage [V]
0.0	18.039
0.5	18.050
1.0	18.050
2.0	18.051
3.0	18.051
4.0	18.050
5.0	18.051
6.0	18.051
7.0	18.051
8.0	18.052

Input Volt. 280V  
Load 100%

Temperature 25°C  
Testing Circuitry Figure A

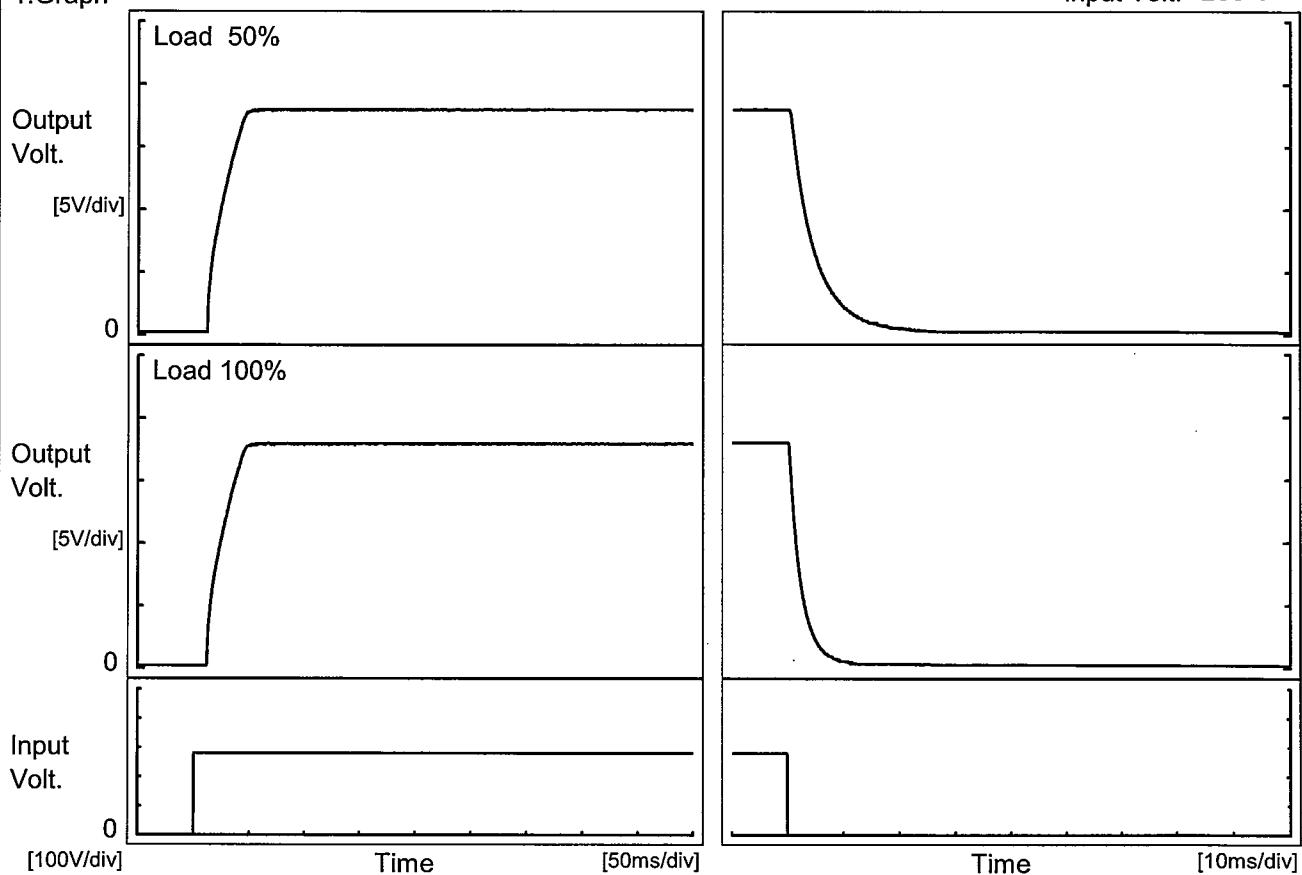
2.Values

Time since start [H]	Output Voltage [V]
0.0	18.039
0.5	18.050
1.0	18.050
2.0	18.051
3.0	18.051
4.0	18.050
5.0	18.051
6.0	18.051
7.0	18.051
8.0	18.052

**COSEL**

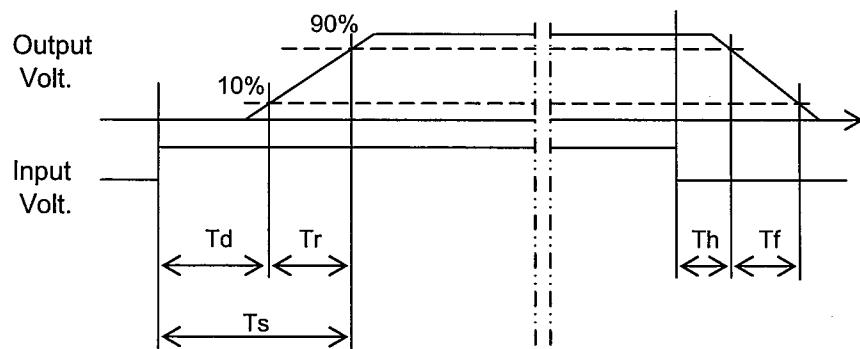
Model	SNDBS400B18	Temperature Testing Circuitry	25°C
Item	Rise and Fall Time		Figure A
Object	+18V22A		

## 1. Graph



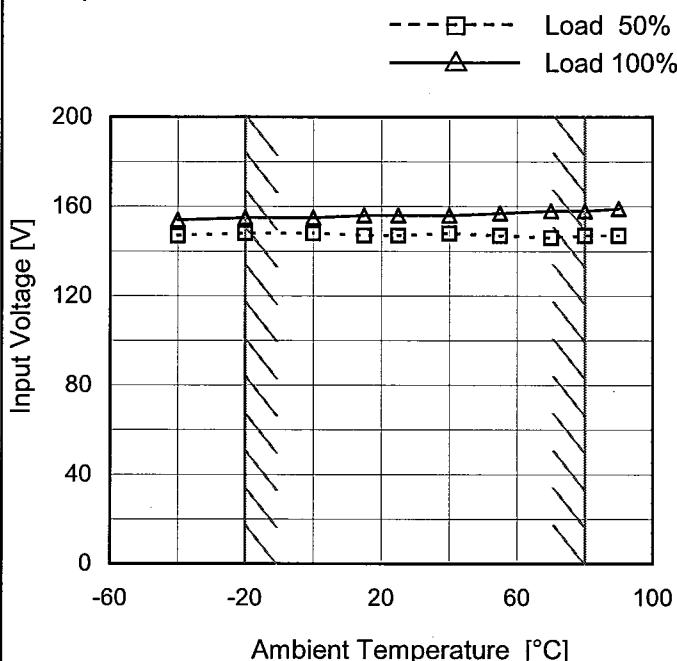
## 2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		12.3	29.5	41.8	0.8	9.8	
100 %		12.5	29.3	41.8	0.4	4.9	



Model	SNDBS400B18
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+18V22A

## 1. Graph



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

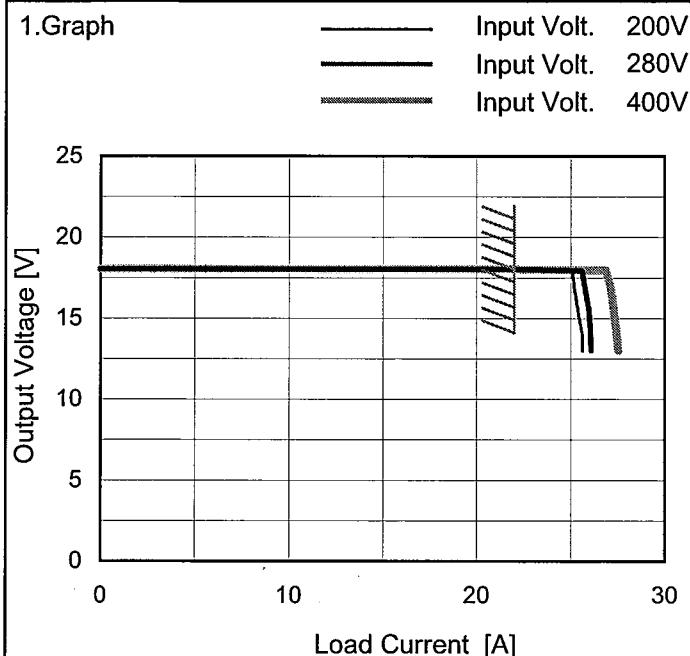
Testing Circuitry Figure A

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	147	154
-20	148	155
0	148	155
15	147	156
25	147	156
40	148	156
55	147	157
70	146	158
80	147	158
90	147	159
--	-	-

# COSEL

Model	SNDBS400B18
Item	Overcurrent Protection
Object	+18V22A



Temperature 25°C  
Testing Circuitry Figure A

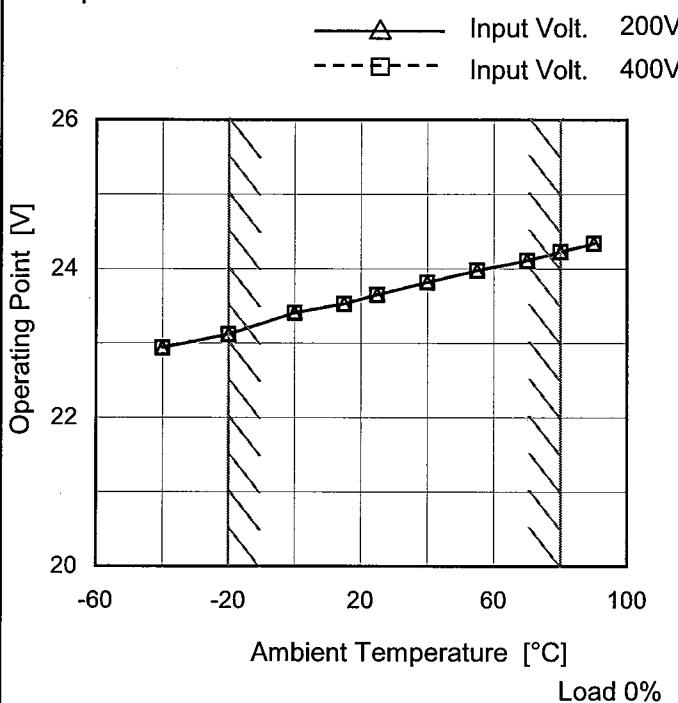
## 2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 200[V]	Input Volt. 280[V]	Input Volt. 400[V]
17	25.18	25.73	27.09
16	25.28	22.12	22.24
14	25.53	26.02	27.39
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Intermittent operation occurs when the output voltage is from 13V to 0V.

Model	SNDBS400B18
Item	Ovv Protection
Object	+18V22A

## 1. Graph



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

## Testing Circuitry Figure A

## 2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 200[V]	Input Volt. 400[V]
-40	22.94	22.94
-20	23.12	23.12
0	23.41	23.41
15	23.53	23.53
25	23.65	23.65
40	23.82	23.82
55	23.98	23.98
70	24.11	24.11
80	24.23	24.23
90	24.34	24.34
--	-	-

COSEL

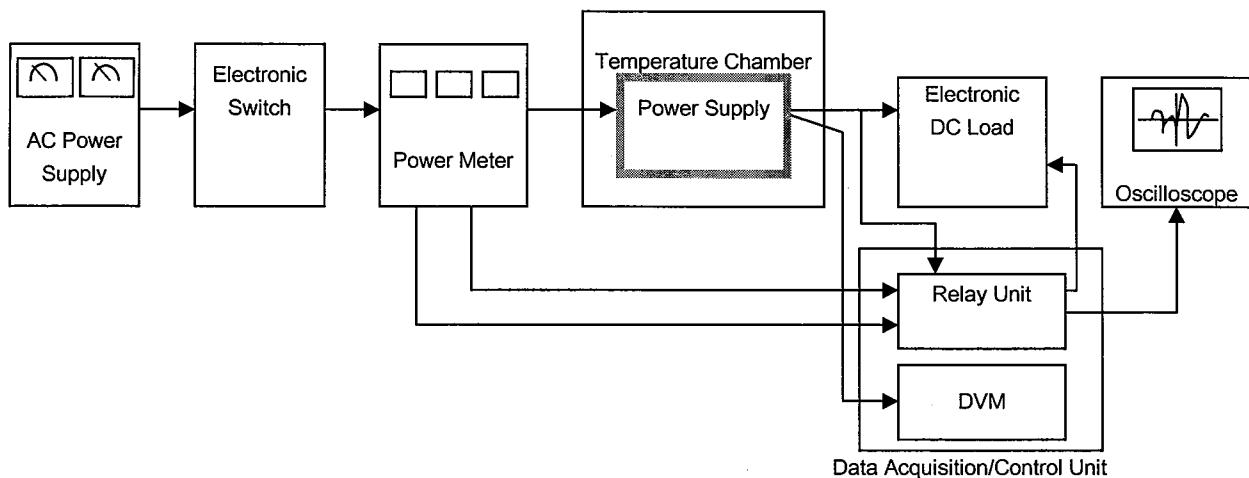


Figure A

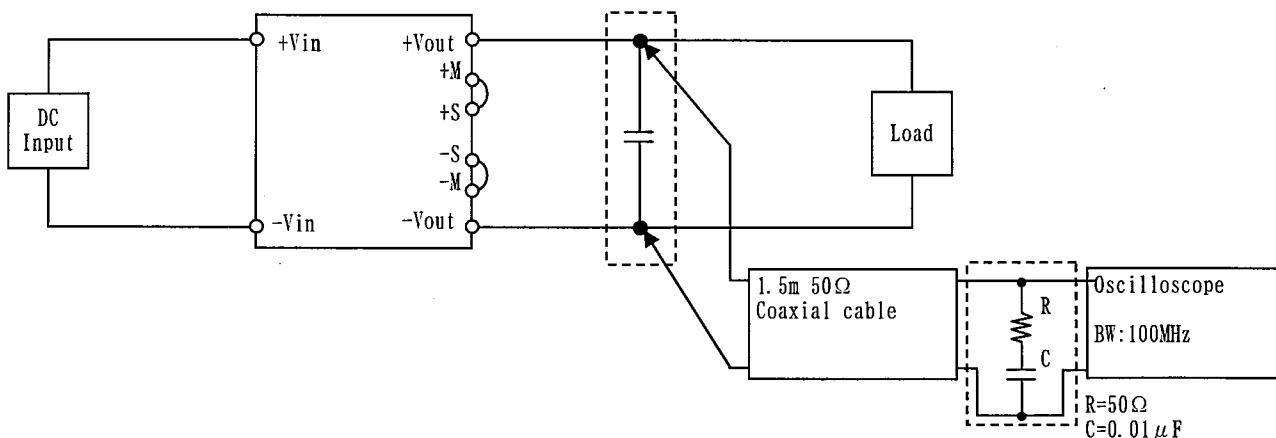


Figure B ( Ripple and Ripple noise Characteristic )