

TEST DATA OF BRDS40

Regulated DC Power Supply
October 9, 2015

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COSEL CO.,LTD.



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(Final Page 18)

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Model BRDS40

Item Input Current (by Input Voltage)

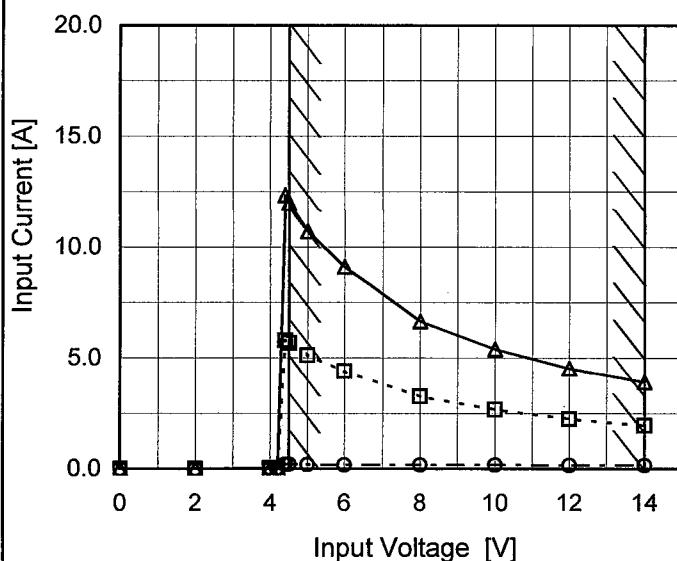
Object +1.2V40A

1. Graph

Load 100% ▲

Load 50% □

Load 0% ○



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

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
2.0	0.003	0.003	0.002
4.0	0.034	0.034	0.034
4.2	0.034	0.035	0.034
4.4	0.197	5.800	12.350
4.5	0.196	5.672	11.988
5.0	0.192	5.112	10.697
6.0	0.180	4.397	9.098
8.0	0.169	3.253	6.650
10.0	0.168	2.666	5.394
12.0	0.163	2.246	4.521
14.0	0.158	1.949	3.914
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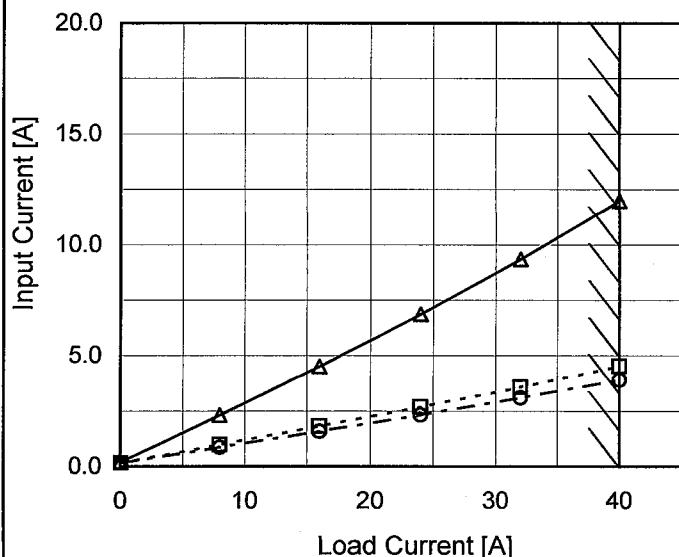
Model BRDS40

Item Input Current (by Load Current)

Object +1.2V40A

1. Graph

—△— Input Volt. 4.5V
 - - -□--- Input Volt. 12V
 - - -○--- Input Volt. 14V



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

Temperature 25°C
 Testing Circuitry Figure A

2. Values

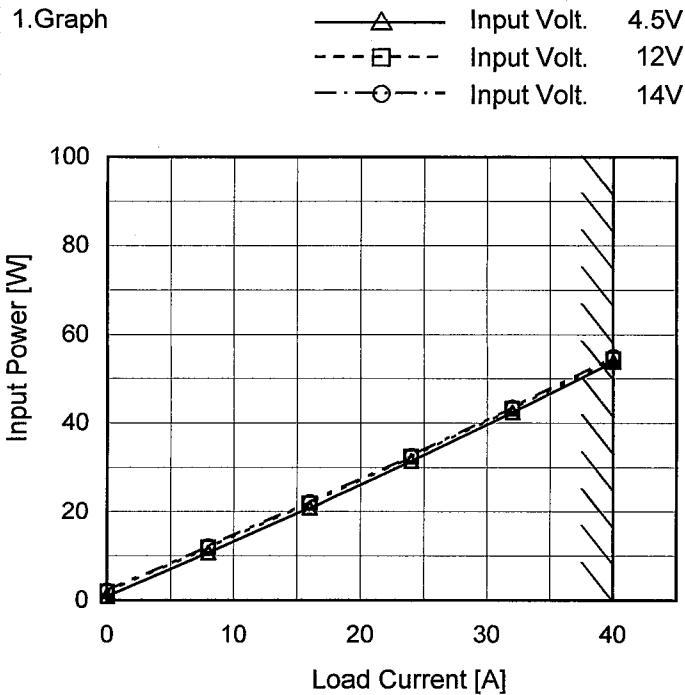
Load Current [A]	Input Current [A]		
	Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]
0	0.196	0.163	0.158
8	2.311	0.983	0.865
16	4.515	1.817	1.581
24	6.864	2.684	2.323
32	9.345	3.582	3.097
40	11.988	4.521	3.914
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model BRDS40

Item Input Power (by Load Current)

Object +1.2V40A



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

 Temperature 25°C
 Testing Circuitry Figure A

2. Values

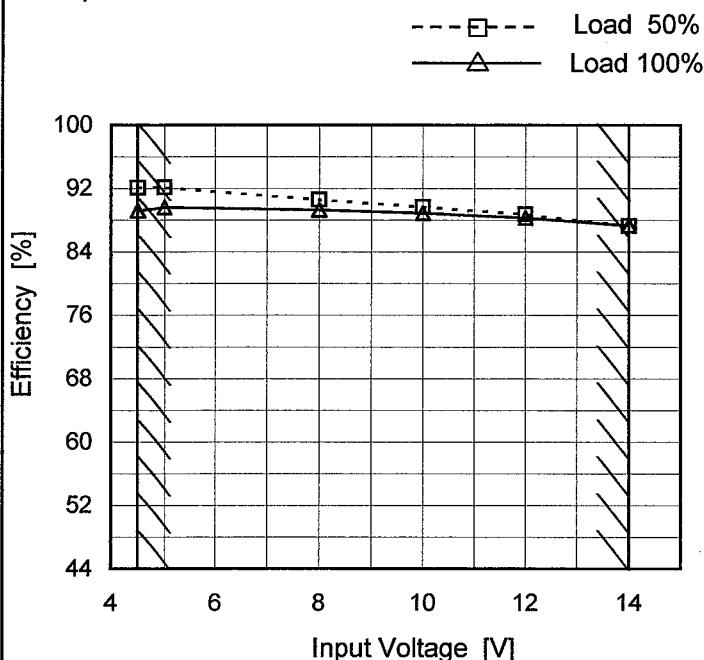
Load Current [A]	Input Power [W]		
	Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]
0	0.92	1.97	2.23
8	10.77	11.89	12.19
16	20.87	21.95	22.27
24	31.44	32.38	32.68
32	42.39	43.15	43.53
40	53.80	54.39	54.96
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	BRDS40
Item	Efficiency (by Input Voltage)
Object	+1.2V40A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.5	92.1	89.2
5.0	92.1	89.6
8.0	90.6	89.3
10.0	89.7	88.9
12.0	88.7	88.3
14.0	87.3	87.3
--	-	-
--	-	-
--	-	-

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

COSEL

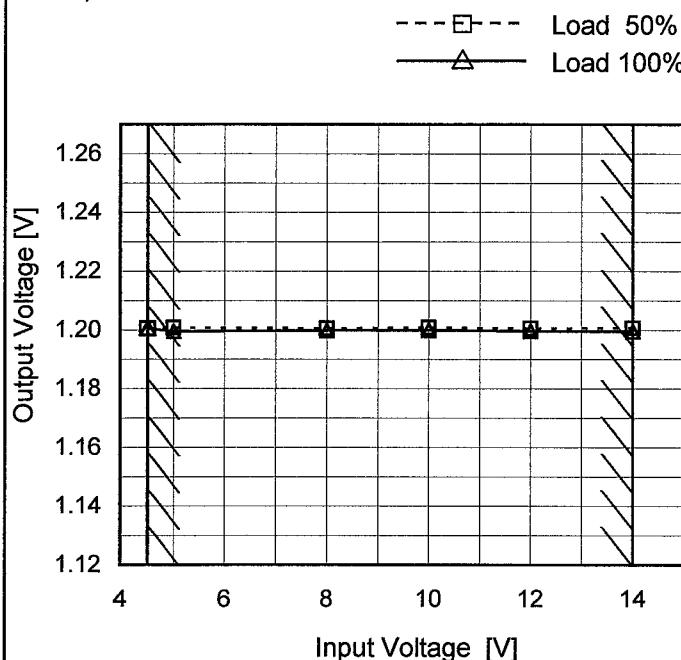
Model	BRDS40	Temperature	25°C																																																			
Item	Efficiency (by Load Current)	Testing Circuitry	Figure A																																																			
Object	+1.2V40A																																																					
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<p>—△— Input Volt. 4.5V - - -□--- Input Volt. 12V - - ○--- Input Volt. 14V</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Efficiency [4.5V] [%]</th> <th>Efficiency [12V] [%]</th> <th>Efficiency [14V] [%]</th> </tr> </thead> <tbody> <tr><td>0</td><td>90.3</td><td>81.8</td><td>79.7</td></tr> <tr><td>8</td><td>92.3</td><td>87.7</td><td>86.4</td></tr> <tr><td>16</td><td>91.8</td><td>89.1</td><td>88.2</td></tr> <tr><td>24</td><td>90.7</td><td>89.1</td><td>88.3</td></tr> <tr><td>32</td><td>89.2</td><td>88.3</td><td>87.3</td></tr> <tr><td>40</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				Load Current [A]	Efficiency [4.5V] [%]	Efficiency [12V] [%]	Efficiency [14V] [%]	0	90.3	81.8	79.7	8	92.3	87.7	86.4	16	91.8	89.1	88.2	24	90.7	89.1	88.3	32	89.2	88.3	87.3	40	-	-	-																							
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<p>Note: Slanted line shows the range of the rated load current.</p>																																																						

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Model	BRDS40
Item	Line Regulation
Object	+1.2V40A

Temperature 25°C
 Testing Circuitry Figure A

1.Graph



2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.5	1.201	1.201
5.0	1.201	1.200
8.0	1.201	1.200
10.0	1.201	1.200
12.0	1.201	1.200
14.0	1.201	1.200
--	-	-
--	-	-
--	-	-

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

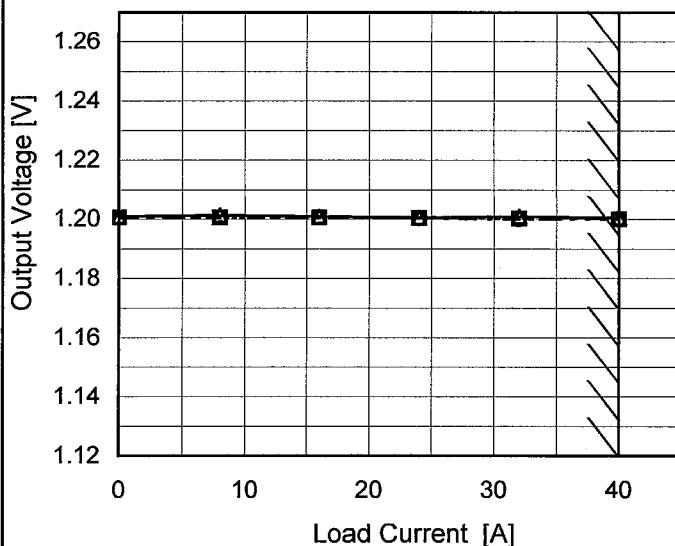
COSEL

Model BRDS40

Item Load Regulation

Object +1.2V40A

1. Graph
- △— Input Volt. 4.5V
 - - □ - - Input Volt. 12V
 - - ○ - - Input Volt. 14V

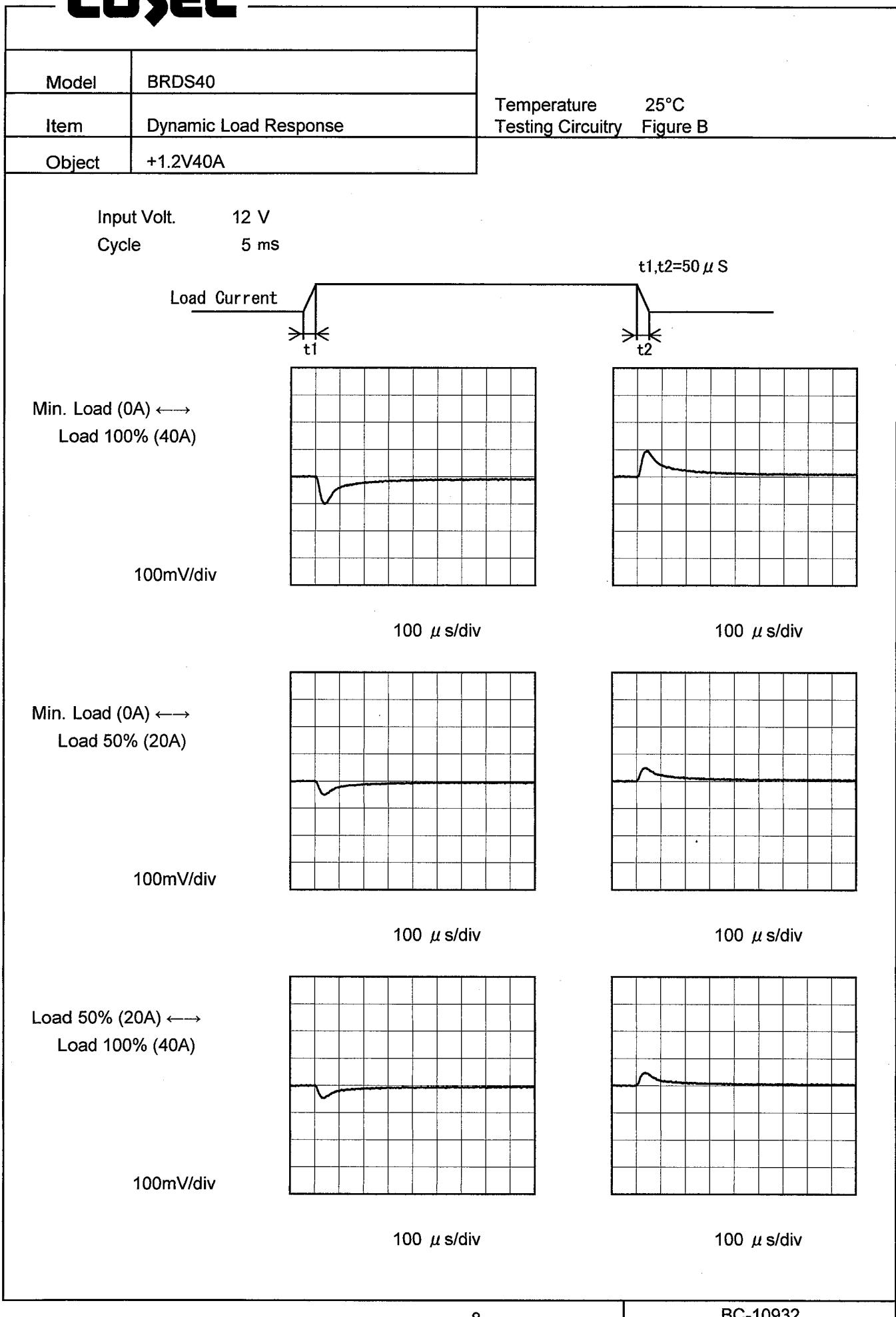


Note: Slanted line shows the range of the rated load current.

 Temperature 25°C
 Testing Circuitry Figure A

2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]
0	1.201	1.201	1.201
8	1.201	1.201	1.201
16	1.201	1.201	1.201
24	1.201	1.200	1.200
32	1.201	1.200	1.200
40	1.201	1.200	1.200
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSSEL

COSEL

Model	BRDS40																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure C																																						
Object	+1.2V40A																																							
1. Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 25 mV, and the X-axis ranges from 0 to 50 A. Two sets of data points are plotted: Input Volt. 12V (open circles) and Input Volt. 5V (open triangles). A slanted line indicates the range of rated load current (around 30A).</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (12V)</th> <th>Ripple Voltage [mV] (5V)</th> </tr> </thead> <tbody> <tr><td>0</td><td>4.0</td><td>4.0</td></tr> <tr><td>8</td><td>4.0</td><td>4.0</td></tr> <tr><td>16</td><td>4.0</td><td>4.0</td></tr> <tr><td>24</td><td>4.0</td><td>4.0</td></tr> <tr><td>32</td><td>4.0</td><td>4.0</td></tr> <tr><td>40</td><td>4.0</td><td>4.0</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV] (12V)	Ripple Voltage [mV] (5V)	0	4.0	4.0	8	4.0	4.0	16	4.0	4.0	24	4.0	4.0	32	4.0	4.0	40	4.0	4.0																	
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<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 5 [V]</th> <th>Input Volt. 12 [V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>5.0</td><td>4.0</td></tr> <tr><td>8</td><td>4.0</td><td>5.0</td></tr> <tr><td>16</td><td>4.0</td><td>5.0</td></tr> <tr><td>24</td><td>4.0</td><td>5.0</td></tr> <tr><td>32</td><td>4.0</td><td>5.0</td></tr> <tr><td>40</td><td>4.0</td><td>5.0</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV]		Input Volt. 5 [V]	Input Volt. 12 [V]	0	5.0	4.0	8	4.0	5.0	16	4.0	5.0	24	4.0	5.0	32	4.0	5.0	40	4.0	5.0	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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<p>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																								
<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								

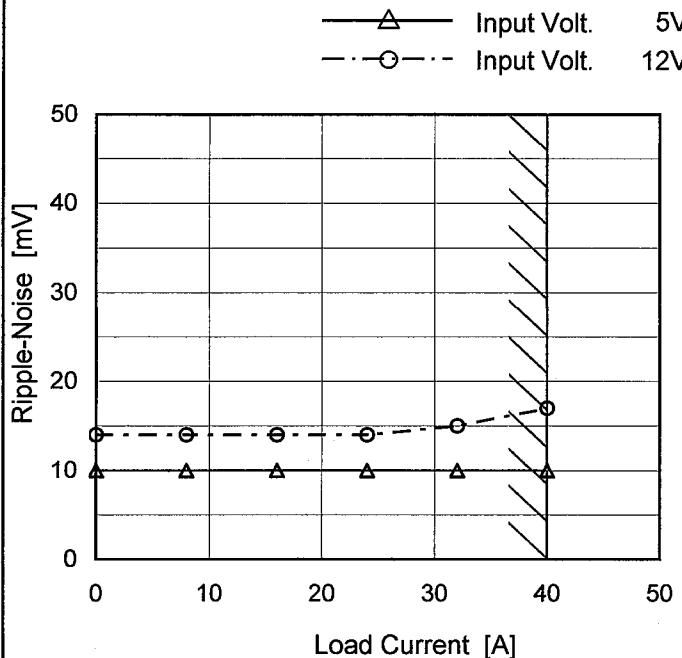
COSEL

Model BRDS40

Item Ripple-Noise

Object +1.2V40A

1. Graph



Measured by 20 MHz Oscilloscope.

Ripple-Noise is shown as p-p in the figure below.

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

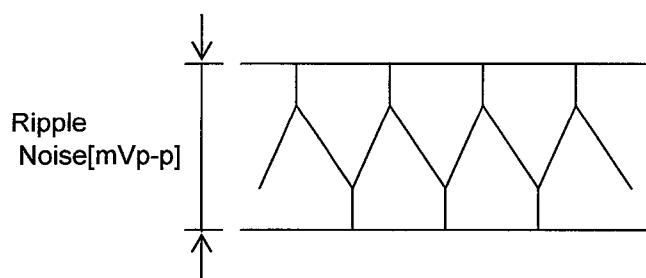


Fig.Complex Ripple Noise Wave Form

Temperature 25°C
Testing Circuitry Figure C

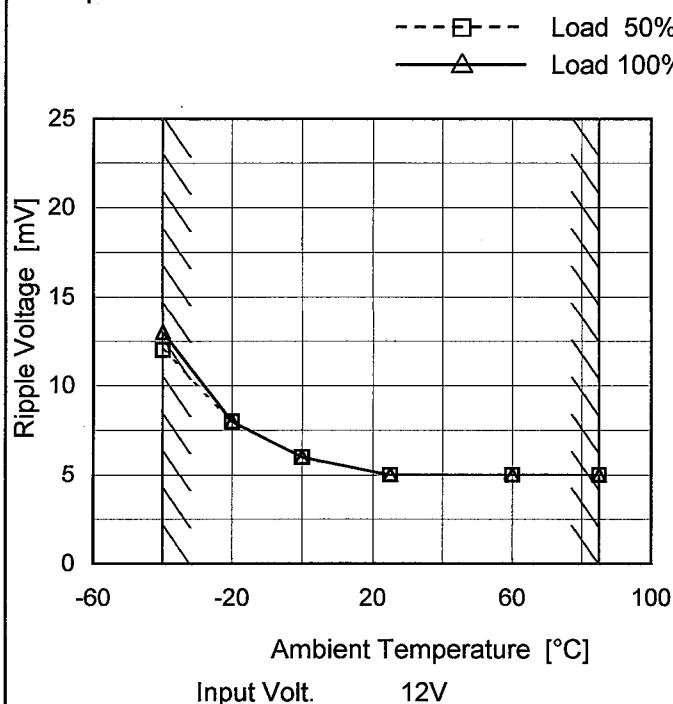
2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 5 [V]	Input Volt. 12 [V]
0	10	14
8	10	14
16	10	14
24	10	14
32	10	15
40	10	17
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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Model	BRDS40
Item	Ripple Voltage (by Ambient Temp.)
Object	+1.2V40A

1. Graph



Measured by 20 MHz Oscilloscope.

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

Testing Circuitry Figure C

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	12.0	13.0
-20	8.0	8.0
0	6.0	6.0
25	5.0	5.0
60	5.0	5.0
85	5.0	5.0
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Ripple [mVp-p]

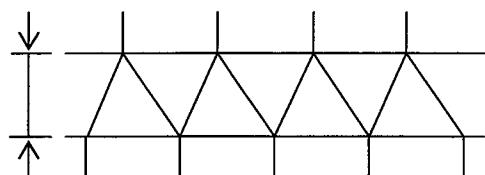
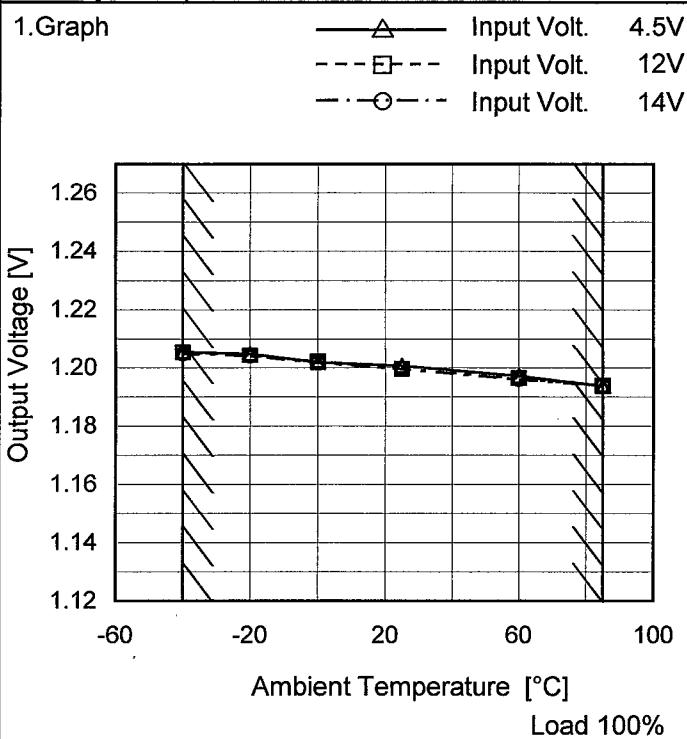


Fig.Complex Ripple Wave Form

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Model	BRDS40
Item	Ambient Temperature Drift
Object	+1.2V40A



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]
-40	1.205	1.205	1.205
-20	1.205	1.204	1.204
0	1.202	1.202	1.202
25	1.201	1.200	1.200
60	1.197	1.196	1.196
85	1.194	1.194	1.194
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model	BRDS40	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+1.2V40A	

1. Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature : -40 - 85°C

Input Voltage : 4.5 - 14V

Load Current : 0 - 40A

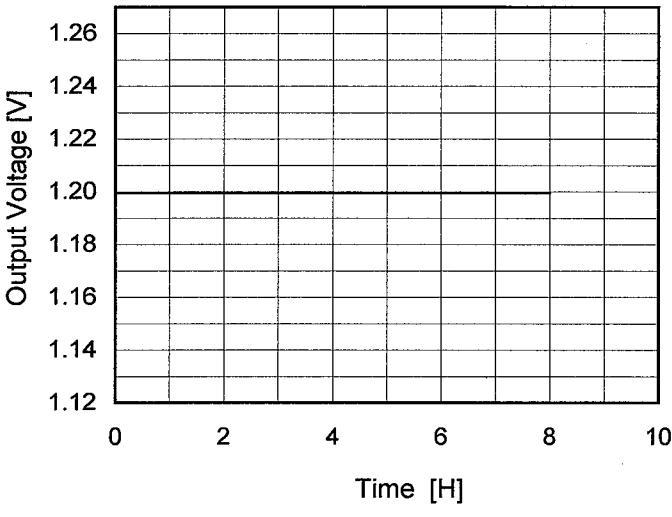
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	-40	14	0	1.205	± 6	± 0.5
Minimum Voltage	85	4.5	0	1.194		

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Model	BRDS40	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+1.2V40A																								
1. Graph			2. Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 12V Load 100%</p>			<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>1.200</td></tr> <tr><td>0.5</td><td>1.200</td></tr> <tr><td>1.0</td><td>1.200</td></tr> <tr><td>2.0</td><td>1.200</td></tr> <tr><td>3.0</td><td>1.200</td></tr> <tr><td>4.0</td><td>1.200</td></tr> <tr><td>5.0</td><td>1.200</td></tr> <tr><td>6.0</td><td>1.200</td></tr> <tr><td>7.0</td><td>1.200</td></tr> <tr><td>8.0</td><td>1.200</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	1.200	0.5	1.200	1.0	1.200	2.0	1.200	3.0	1.200	4.0	1.200	5.0	1.200	6.0	1.200	7.0	1.200	8.0	1.200
Time since start [H]	Output Voltage [V]																								
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COSEL

Model BRDS40

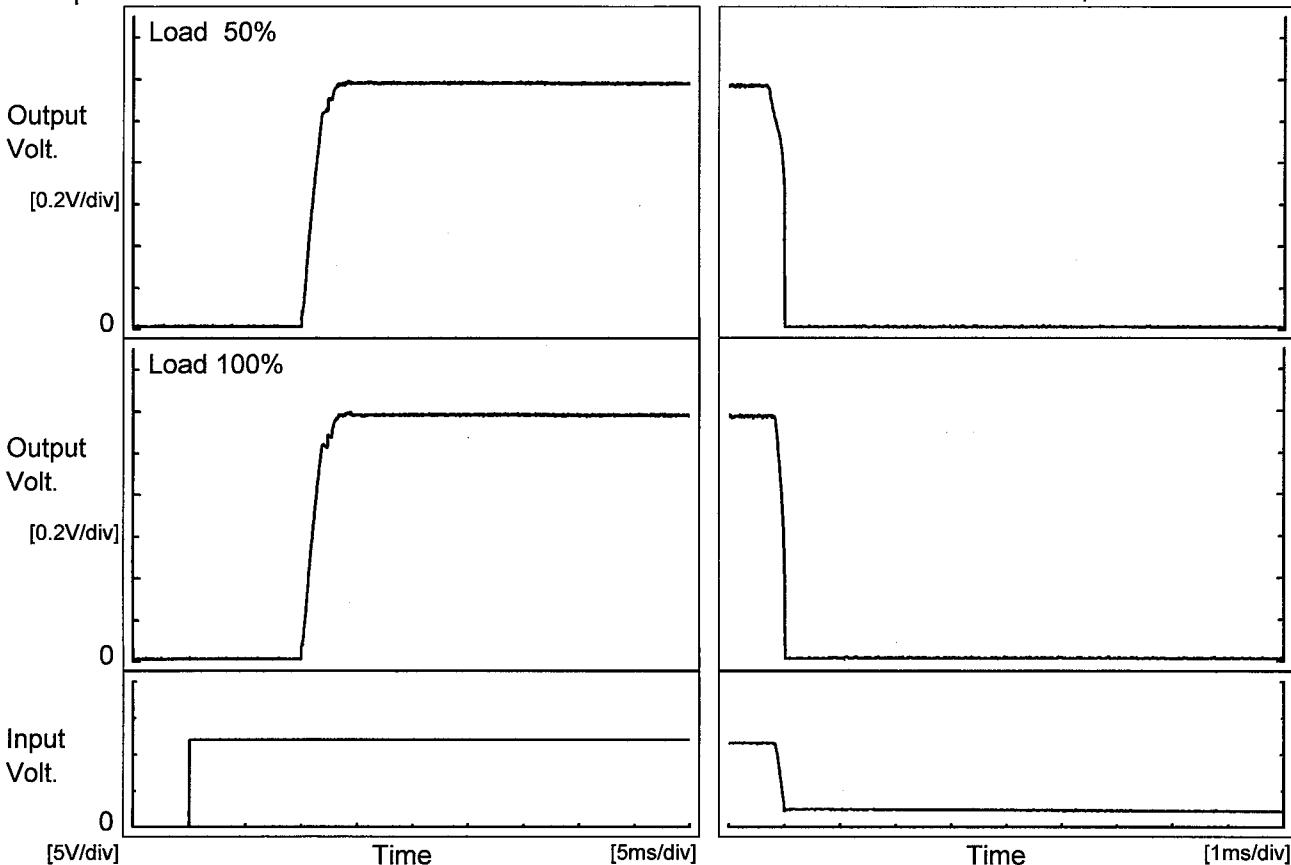
Item Rise and Fall Time

Object +1.2V40A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

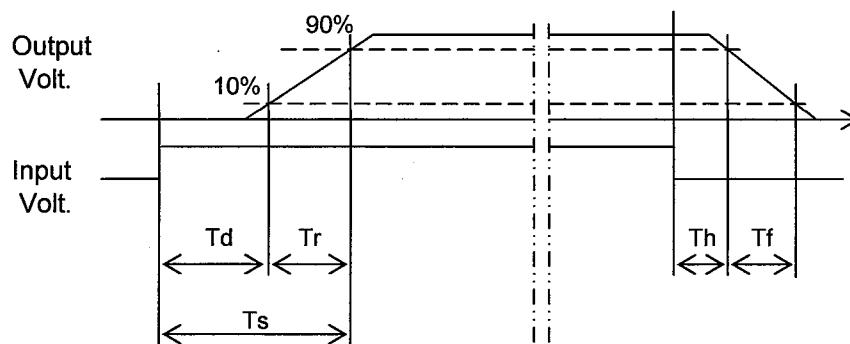
Input Volt. 12 V



2. Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	10.2	2.2	12.4	0.2	0.2
100 %	10.2	2.2	12.4	0.2	0.2

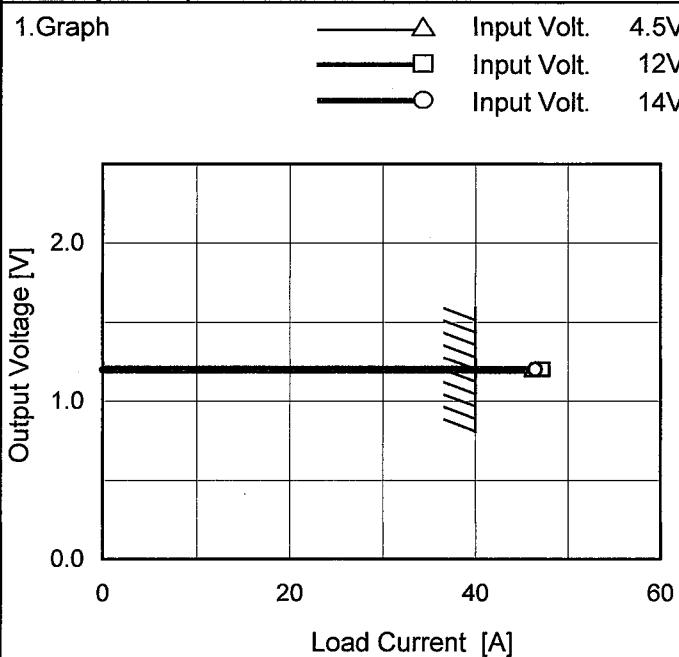


COSEL

Model	BRDS40	Testing Circuitry Figure A																																						
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+1.2V40A																																							
1. Graph																																								
<p>Input Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>--- □ --- Load 50%</p> <p>— △ — Load 100%</p>																																								
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<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>-40</td><td>4.00</td><td>4.01</td> </tr> <tr> <td>-20</td><td>4.00</td><td>3.97</td> </tr> <tr> <td>0</td><td>3.92</td><td>3.80</td> </tr> <tr> <td>25</td><td>3.80</td><td>3.84</td> </tr> <tr> <td>60</td><td>3.82</td><td>3.89</td> </tr> <tr> <td>85</td><td>3.82</td><td>3.90</td> </tr> <tr> <td>--</td><td>-</td><td>-</td> </tr> </tbody> </table>			Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-40	4.00	4.01	-20	4.00	3.97	0	3.92	3.80	25	3.80	3.84	60	3.82	3.89	85	3.82	3.90	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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COSEL

Model	BRDS40
Item	Overcurrent Protection
Object	+1.2V40A



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

Intermittent operation occurs when overcurrent protection is activated.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 4.5[V]	Input Volt. 12[V]	Input Volt. 14[V]
1.20	46.02	46.42	46.41
1.14	-	-	-
1.08	-	-	-
0.96	-	-	-
0.84	-	-	-
0.72	-	-	-
0.60	-	-	-
0.48	-	-	-
0.36	-	-	-
0.24	-	-	-
0.12	-	-	-
0.00	-	-	-

COSEL

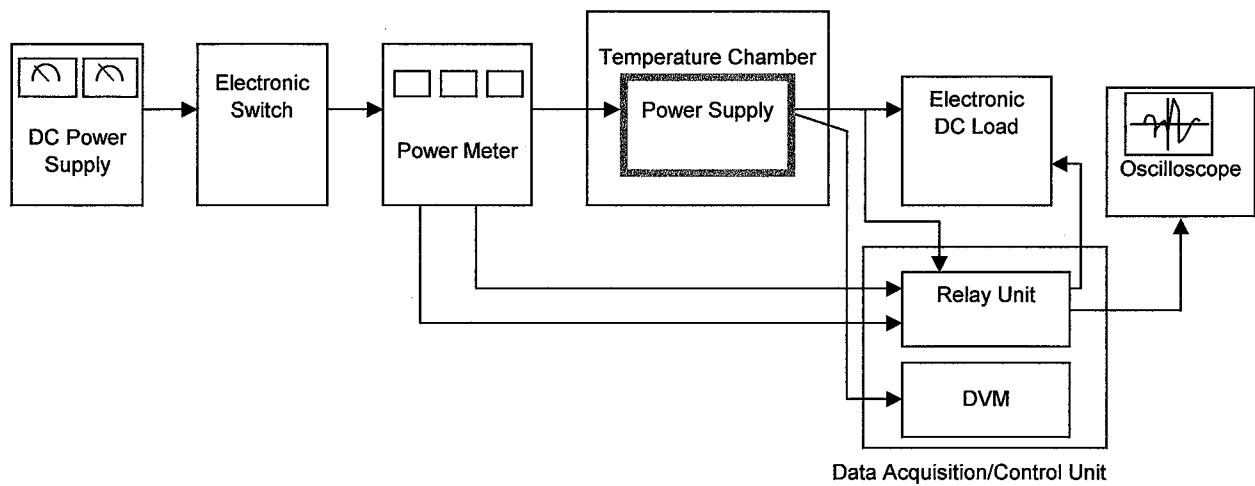


Figure A

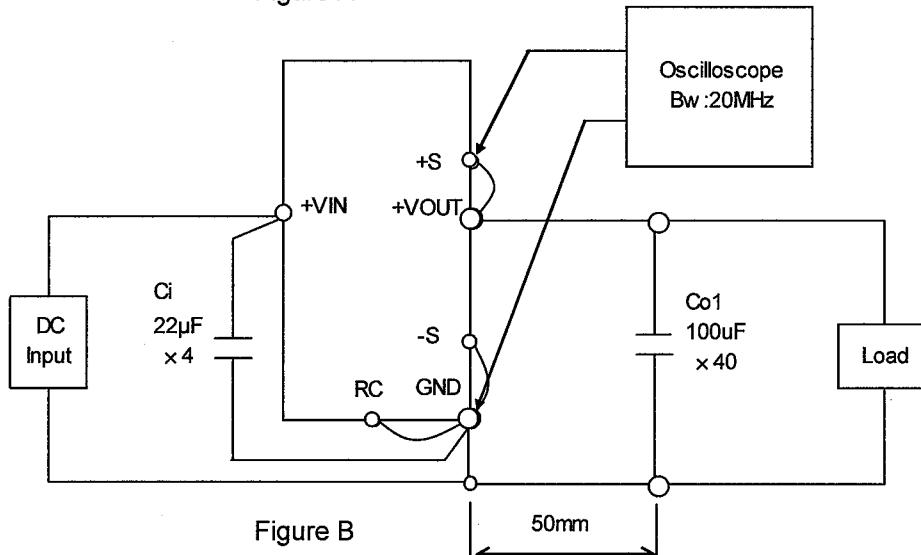


Figure B

