COSEL

TEST DATA OF BRNS20

Regulated DC Power Supply
July 29, 2013

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Model	BRNS20
Item	Input Current (by Input Voltage)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——△—— Load 100%
- - -□- - - Load 50%
—·—○—·— Load 0%

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

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
1.0	0.000	0.000	0.000
2.0	0.000	0.000	0.000
2.5	0.000	0.000	0.000
2.7	0.000	0.000	0.000
2.9	0.064	4.704	9.785
3.3	0.063	4.059	8.397
4.0	0.060	3.306	6.930
4.5	0.062	2.915	6.064
5.0	0.064	2.619	5.367
5.2	0.065	2.520	5.204
6.0	0.064	2.191	4.501
7.0	0.063	1.888	3.859
8.0	0.063	1.661	3.380
10.0	0.063	1.349	2.724
12.0	0.063	1.143	2.290
14.4	0.063	0.973	1.934
--	-	-	-

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Model	BRNS20
Item	Input Current (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

———△——— Input Volt. 3.3V
- - -◻- - - Input Volt. 5V
—·—○—·· Input Volt. 12V

Input Current [A] (y-axis)
Load Current [A] (x-axis)

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 3.3[V]	Input Volt. 5[V]	Input Volt. 12[V]
0	0.063	0.064	0.063
4	1.572	1.054	0.492
8	3.176	2.078	0.922
12	4.843	3.138	1.364
16	6.577	4.232	1.820
20	8.397	5.367	2.290
---	-	-	-
---	-	-	-
---	-	-	-
---	-	-	-
---	-	-	-

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

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Model	BRNS20
Item	Input Power (by Load Current)
Object	————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
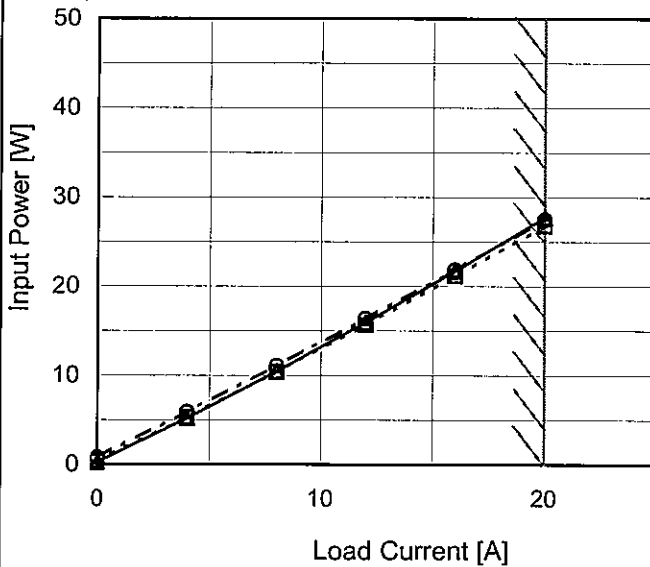
—△— Input Volt. 3.3V
- - -☐- - - Input Volt. 5V
—··-○—·· Input Volt. 12V

Load Current [A]

2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 3.3[V]	Input Volt. 5[V]	Input Volt. 12[V]
0	0.21	0.32	0.75
4	5.19	5.27	5.91
8	10.46	10.38	11.06
12	15.96	15.67	16.36
16	21.70	21.14	21.83
20	27.71	26.79	27.48
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	BRNS20
Item	Efficiency (by Input Voltage)
Object	———————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

--⊟-- Load 50%
—△— Load 100%

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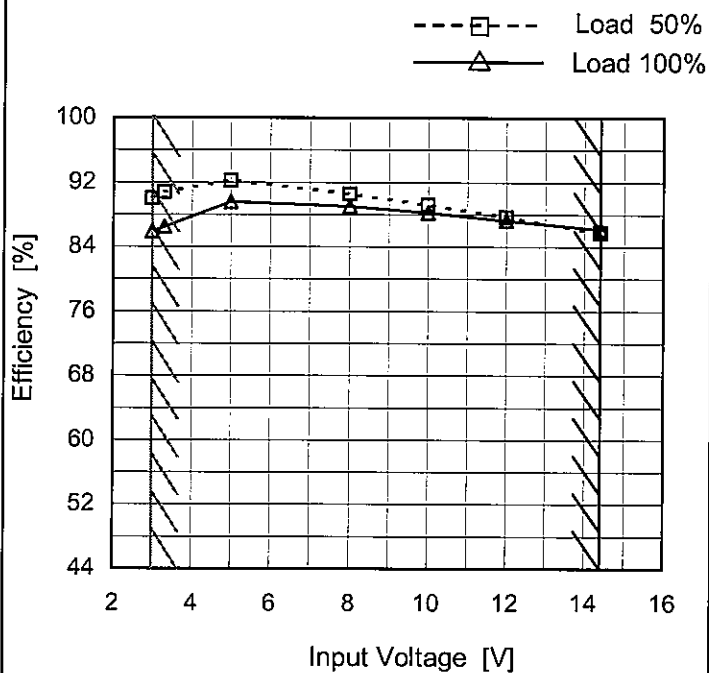
2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
3.0	90.0	85.9
3.3	90.8	86.5
5.0	92.2	89.6
8.0	90.6	89.1
10.0	89.2	88.3
12.0	87.6	87.3
14.4	85.8	86.2
--	-	-
--	-	-

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Model	BRNS20
Item	Efficiency (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——△—— Input Volt. 3.3V
- - -Ð- - - Input Volt. 5V
—·—O—·· Input Volt. 12V

Efficiency [%]

Load Current [A]

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 3.3[V]	Input Volt. 5[V]	Input Volt. 12[V]
0	-	-	-
4	92.2	90.7	81.0
8	91.5	92.3	86.7
12	90.1	91.8	87.9
16	88.4	90.8	87.9
20	86.5	89.6	87.3
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	BRNS20
Item	Line Regulation
Object	+1.2V20A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
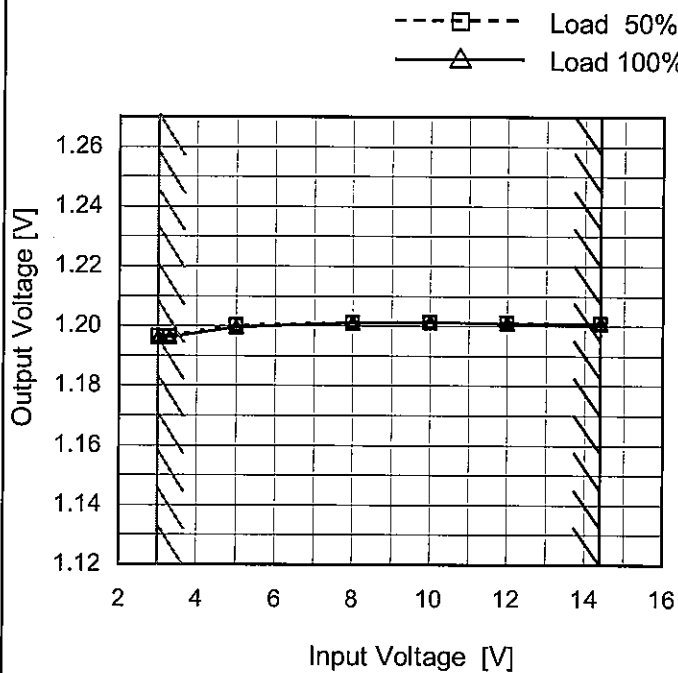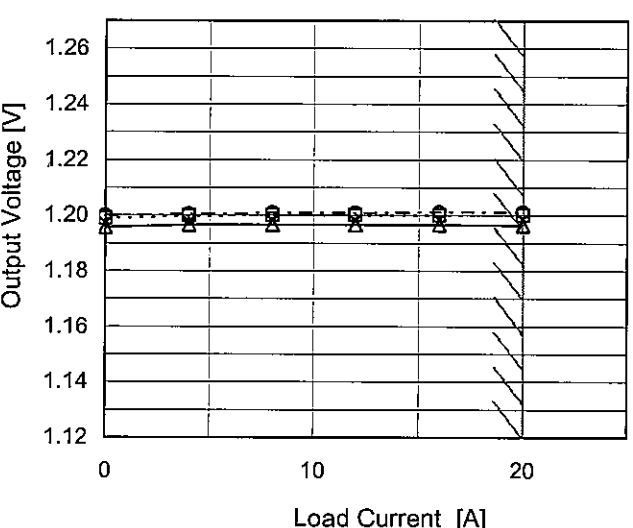
--- ⊟ --- Load 50%
——△—— Load 100%

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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
3.0	1.197	1.196
3.3	1.197	1.196
5.0	1.200	1.200
8.0	1.201	1.201
10.0	1.201	1.201
12.0	1.201	1.201
14.4	1.201	1.201
--	-	-
--	-	-

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Model	BRNS20
Item	Load Regulation
Object	+1.2V20A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

— △ — Input Volt. 3.3V
- - - □ - - - Input Volt. 5V
— · —○— · — Input Volt. 12V

Output Voltage [V] vs Load Current [A]

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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 3.3[V]	Input Volt. 5[V]	Input Volt. 12[V]
0	1.196	1.199	1.200
4	1.197	1.200	1.201
8	1.197	1.200	1.201
12	1.197	1.200	1.201
16	1.197	1.200	1.201
20	1.196	1.200	1.201
--	-	-	-
---	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	BRNS20
Item	Dynamic Load Response
Object	+1.2V20A

Temperature　　　25°C
Testing Circuitry　Figure B

Input Volt.　　12 V
Cycle　　　　5 ms

t1,t2=50 μ S

Load Current

t1　　　　　　　　t2

Min. Load (0A) ←→
Load 100% (20A)

200mV/div
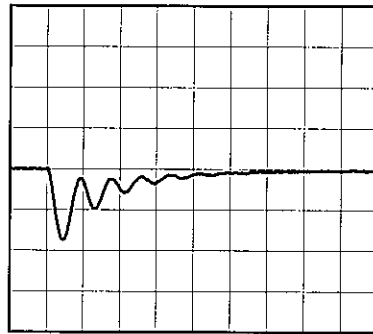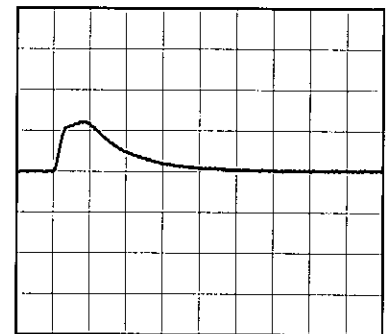
100 μ s/div　　　　　　　100 μ s/div

Min. Load (0A) ←→
Load 50% (10A)

200mV/div
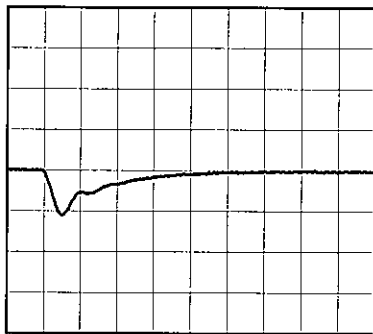
100 μ s/div　　　　　　　100 μ s/div

Load 50% (10A) ←→
Load 100% (20A)

200mV/div

100 μ s/div　　　　　　　100 μ s/div

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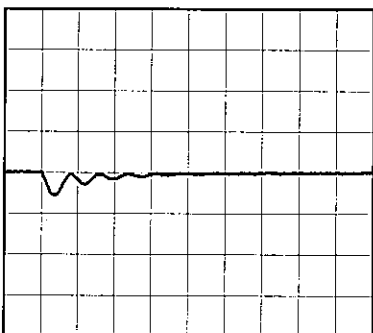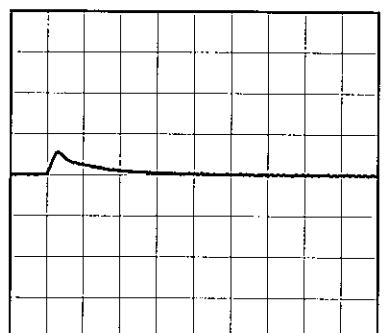
Model	BRNS20
Item	Ripple Voltage (by Load Current)
Object	+1.2V20A

Temperature   25°C
Testing Circuitry   Figure C

1.Graph

——△—— Input Volt.   3.3V
—·—○—·· Input Volt.   12V

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.
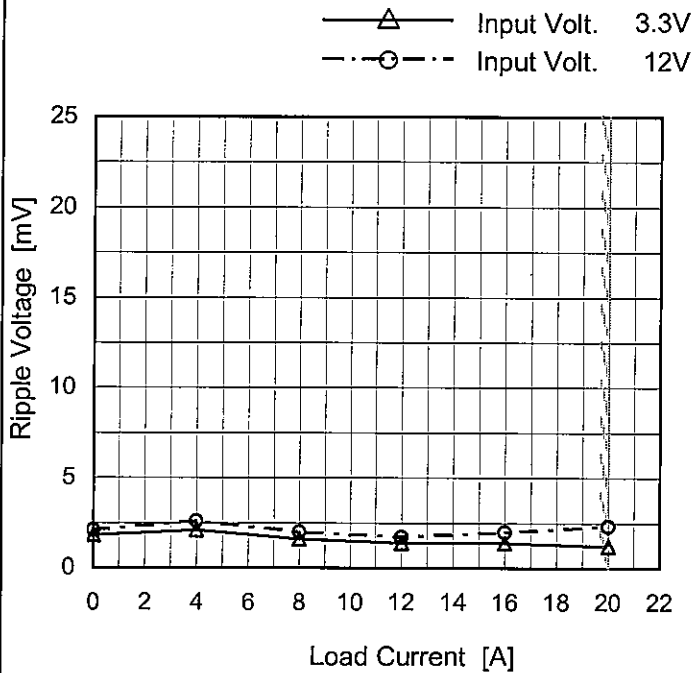
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 3.3 [V]	Input Volt. 12 [V]
0	1.8	2.1
4	2.1	2.6
8	1.6	2.0
12	1.4	1.7
16	1.4	2.0
20	1.2	2.3
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Ripple [mVp-p]

Fig.Complex Ripple Wave Form

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Model	BRNS20
Item	Ripple-Noise
Object	+1.2V20A

Temperature   25°C
Testing Circuitry   Figure C

1.Graph

— △ — Input Volt. 3.3V
— ·○· — Input Volt. 12V

Load Current [A]

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.

2.Values

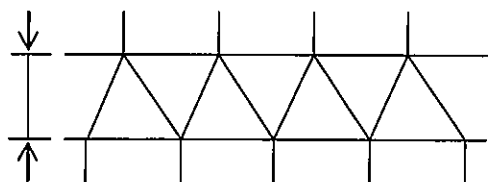| Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 3.3 [V]	Input Volt. 12 [V]
0	9.2	10.4
4	11.9	12.3
8	11.9	13.9
12	12.3	14.5
16	12.3	14.9
20	12.7	14.9
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Ripple
Noise[mVp-p]

Fig.Complex Ripple Noise Wave Form

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Model	BRNS20
Item	Ripple Voltage (by Ambient Temp.)
Object	+1.2V20A

Testing Circuitry   Figure C

1.Graph

--- ▣ --- Load 50%
——— △ ——— Load 100%

Ambient Temperature [°C]

Input Volt.   12V
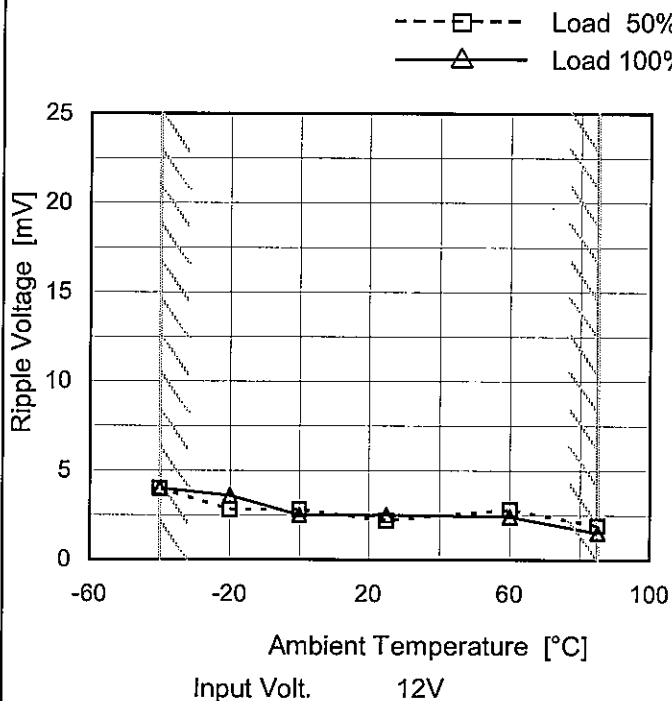
Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
       ambient temperature.
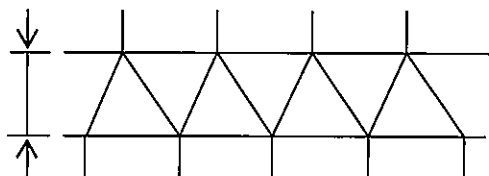
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	4.0	4.0
-20	2.8	3.6
0	2.8	2.5
25	2.2	2.5
60	2.8	2.4
85	1.9	1.5
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Ripple [mVp-p]

Fig.Complex Ripple Wave Form

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参考資料

Model	BRNS20
Item	Ambient Temperature Drift
Object	+1.2V20A

Testing Circuitry   Figure A

1.Graph

——△——	Input Volt.	3.3V
- - -☐- - -	Input Volt.	5V
—··—○—··—	Input Volt.	12V

Output Voltage [V] vs Ambient Temperature [°C], Load 100%

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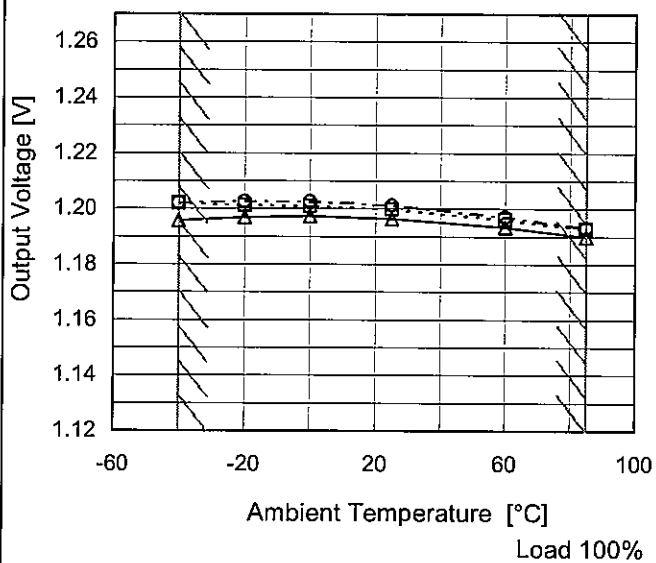
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 3.3[V]	Input Volt. 5[V]	Input Volt. 12[V]
-40	1.196	1.202	1.202
-20	1.197	1.201	1.203
0	1.197	1.201	1.203
25	1.196	1.200	1.201
60	1.193	1.196	1.197
85	1.190	1.193	1.193
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	BRNS20
Item	Output Voltage Accuracy
Object	+1.2V20A

Testing Circuitry   Figure A

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 : 3 - 14.4V

Load Current   : 0 - 20A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	12	20	1.203	±7	±0.6
Minimum Voltage	85	3.3	0	1.190		

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Model	BRNS20
Item	Time Lapse Drift
Object	+1.2V20A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Input Volt.   12V
Load   100%
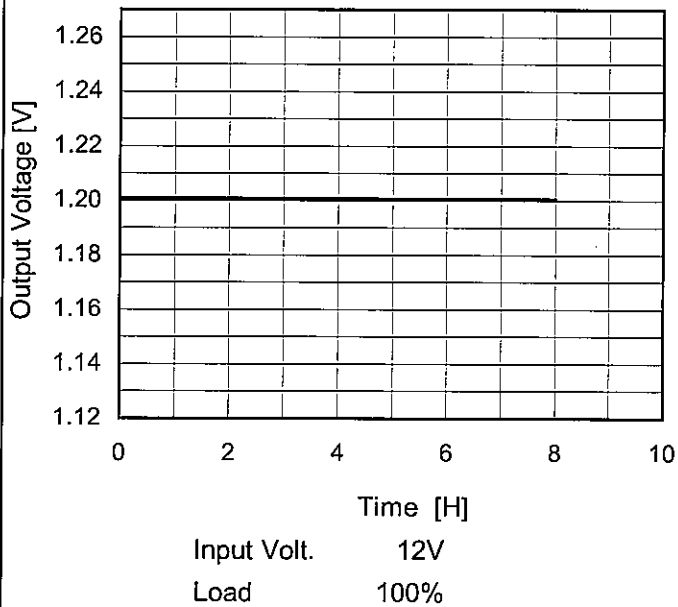
2.Values

Time since start [H]	Output Voltage [V]
0.0	1.201
0.5	1.201
1.0	1.201
2.0	1.201
3.0	1.201
4.0	1.201
5.0	1.201
6.0	1.201
7.0	1.201
8.0	1.201

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Model	BRNS20
Item	Rise and Fall Time
Object	+1.2V20A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

Input Volt.　12 V

Load 50%

Output
Volt.

[0.2V/div]

0

Load 100%

Output
Volt.

[0.2V/div]

0

Input
Volt.

0

[5V/div]　　　　　Time　　　　[5ms/div]

Time　　　　[1ms/div]
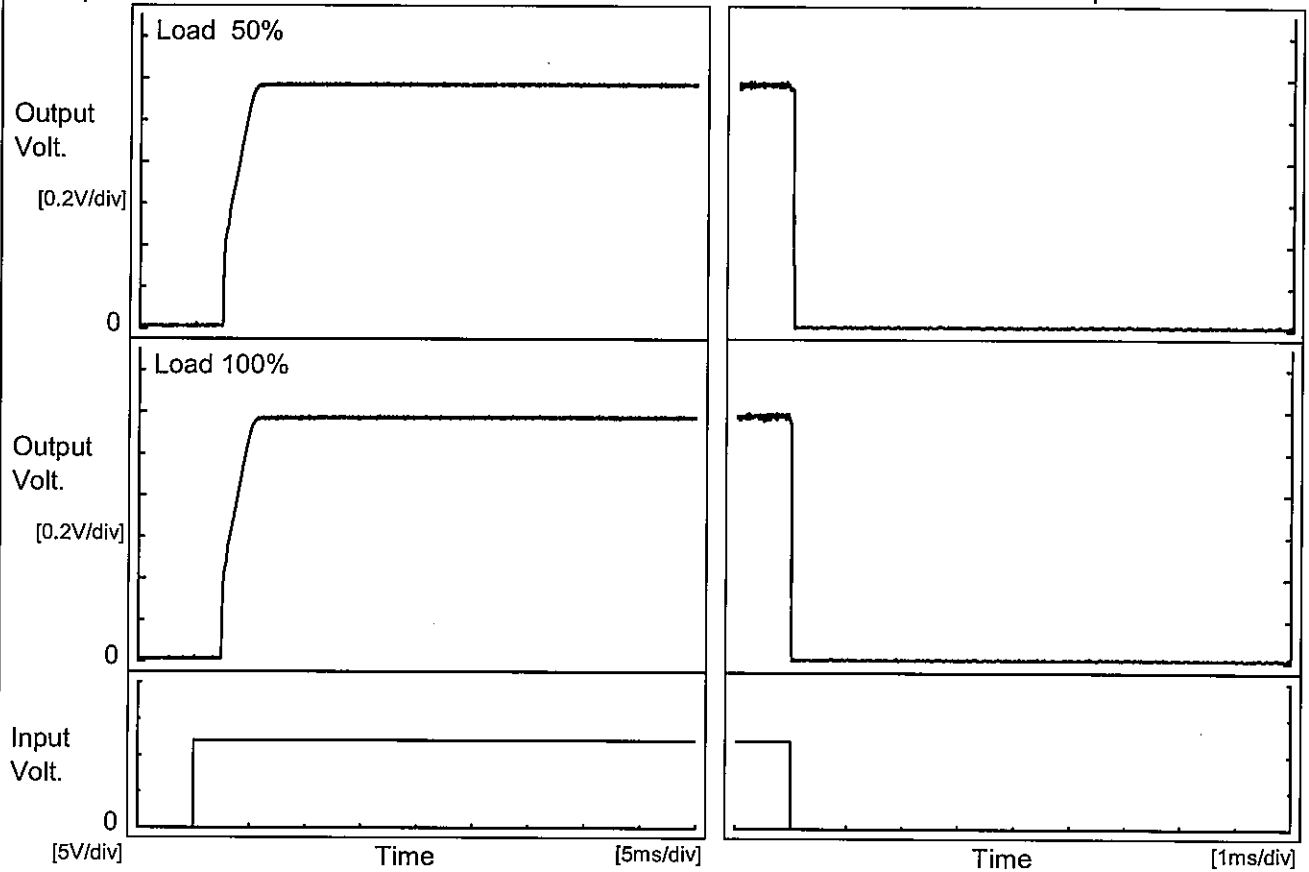
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.5	2.5	5.0	0.0	0.0
100 %	2.5	2.5	5.0	0.0	0.0

Output
Volt.

90%

10%

Input
Volt.

Td　Tr

Ts

Th　Tf

- 15 -

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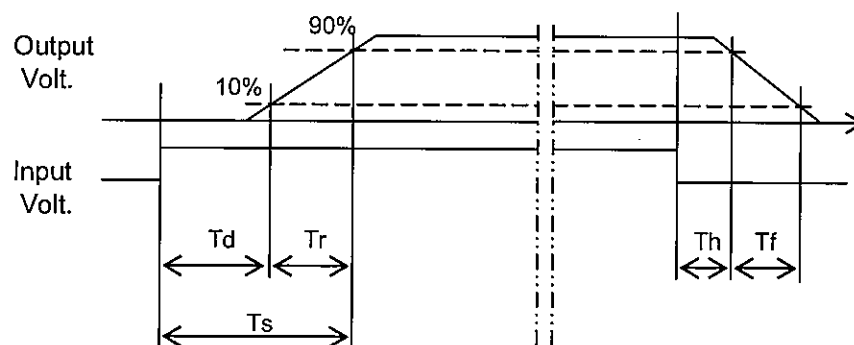
Model	BRNS20
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+1.2V20A

Testing Circuitry   Figure A
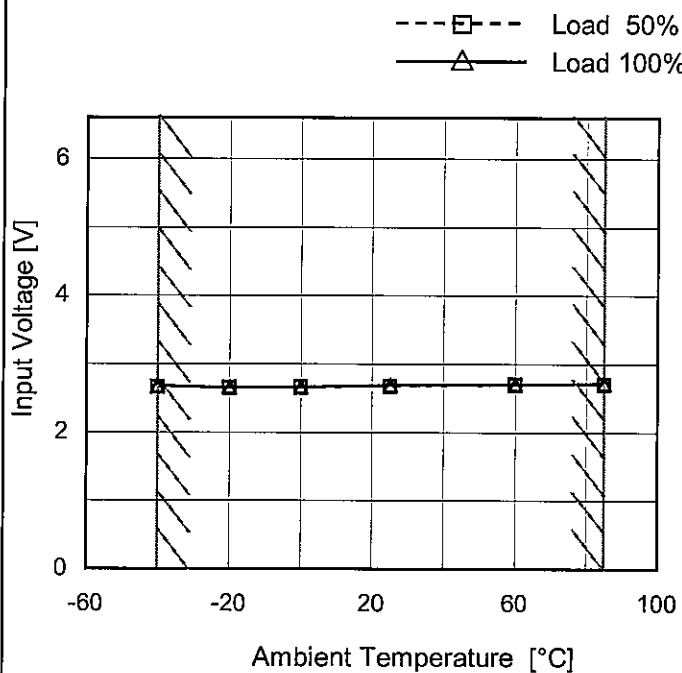
1.Graph

--- ⊟ --- Load 50%
——△—— Load 100%

Ambient Temperature [°C]

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

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	2.67	2.68
-20	2.66	2.66
0	2.66	2.67
25	2.68	2.69
60	2.70	2.70
85	2.71	2.72
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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Model	BRNS20
Item	Overcurrent Protection
Object	+1.2V20A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——△	Input Volt.	3.3V
——□	Input Volt.	5V
——○	Input Volt.	12V

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

Intermittent operation occurs when overcurrent protection is activated.

2.Values

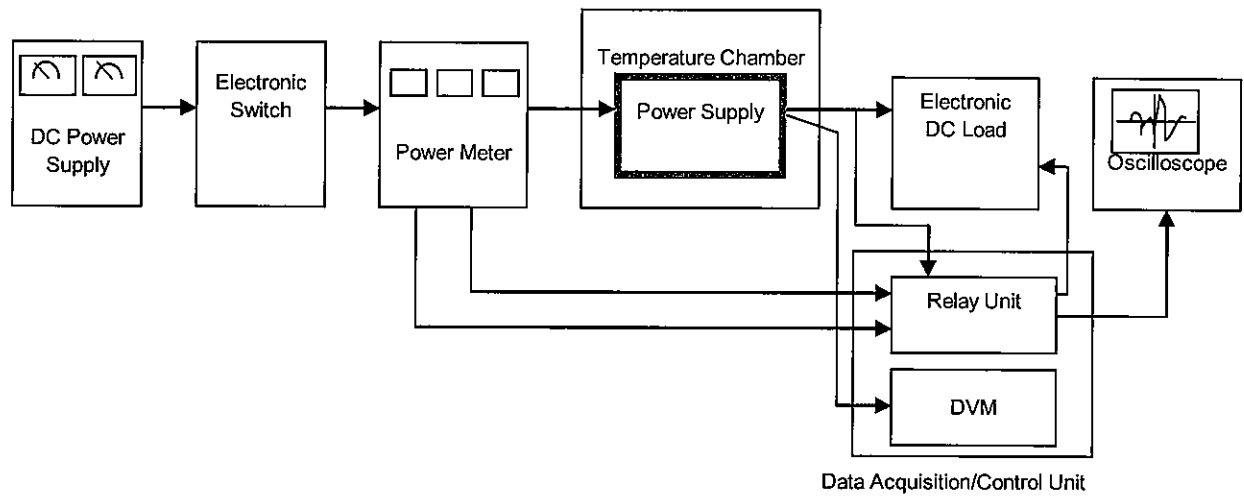| Output Voltage [V]	Load Current [A]		
	Input Volt. 3.3[V]	Input Volt. 5[V]	Input Volt. 12[V]
1.20	30.38	30.92	28.76
1.14	-	-	-
1.08	-	-	-
0.96	-	-	-
0.84	-	-	-
0.72	-	-	-
0.60	-	-	-
0.48	-	-	-
0.36	-	-	-
0.24	-	-	-
0.12	-	-	-
0.00	-	-	-

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Figure A

Figure B

Figure C

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