COSEL

参考資料

TEST DATA OF CBS3502428

Regulated DC Power Supply
Dec.14. 2004

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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)

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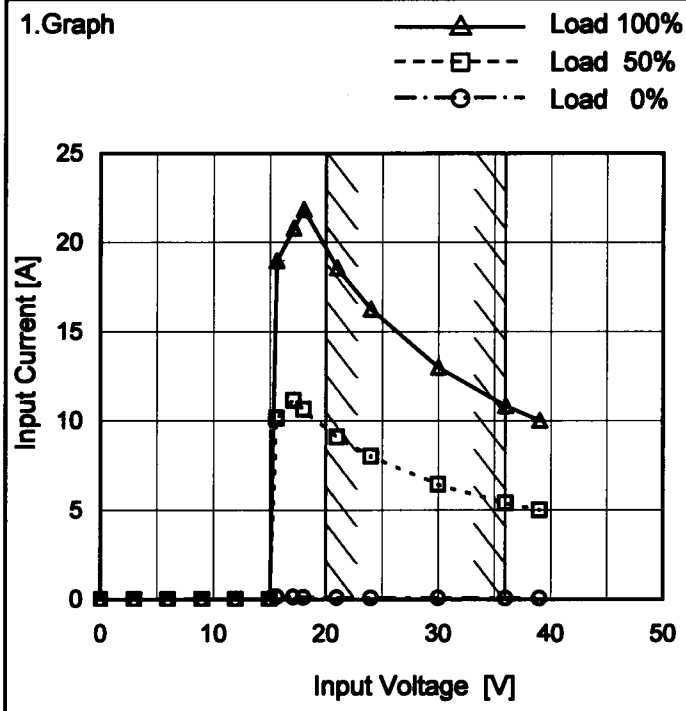
Model	CBS3502428
Item	Input Current (by Input Voltage)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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	0.000	0.000	0.000
3.0	0.000	0.000	0.000
6.0	0.000	0.000	0.000
9.0	0.017	0.015	0.016
12.0	0.014	0.015	0.013
15.0	0.015	0.012	0.013
15.6	0.167	10.174	18.986
17.1	0.149	11.175	20.811
18.0	0.122	10.676	21.849
21.0	0.113	9.110	18.580
24.0	0.096	8.019	16.268
30.0	0.084	6.447	13.005
36.0	0.074	5.406	10.846
39.0	0.074	5.004	10.025
–	-	-	-
–	-	-	-

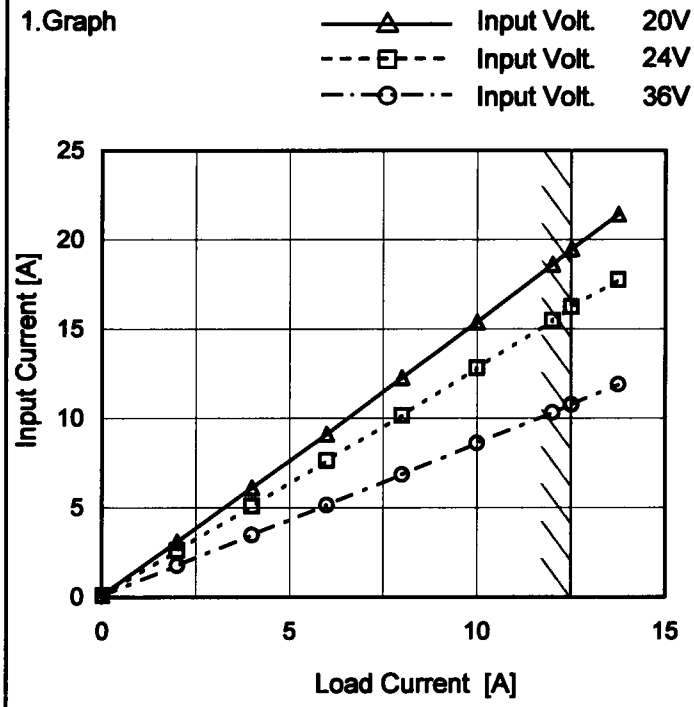
BC-3608

COSEL

Model	CBS3502428
Item	Input Current (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	0.115	0.094	0.073
2.00	3.100	2.616	1.784
4.00	6.116	5.096	3.482
6.00	9.124	7.653	5.153
8.00	12.289	10.173	6.868
10.00	15.385	12.830	8.613
12.00	18.624	15.475	10.320
12.50	19.484	16.245	10.776
13.75	21.422	17.761	11.903
—	-	-	-
—	-	-	-

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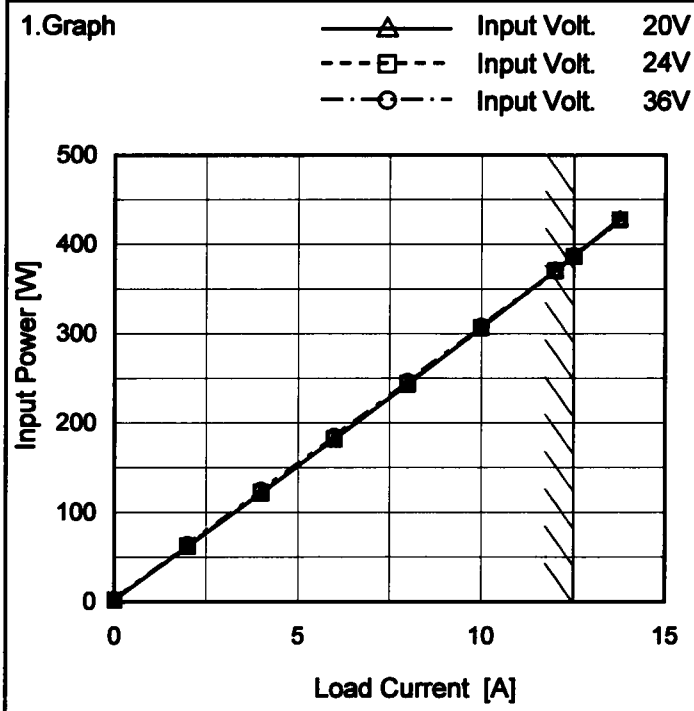
Model	CBS3502428
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

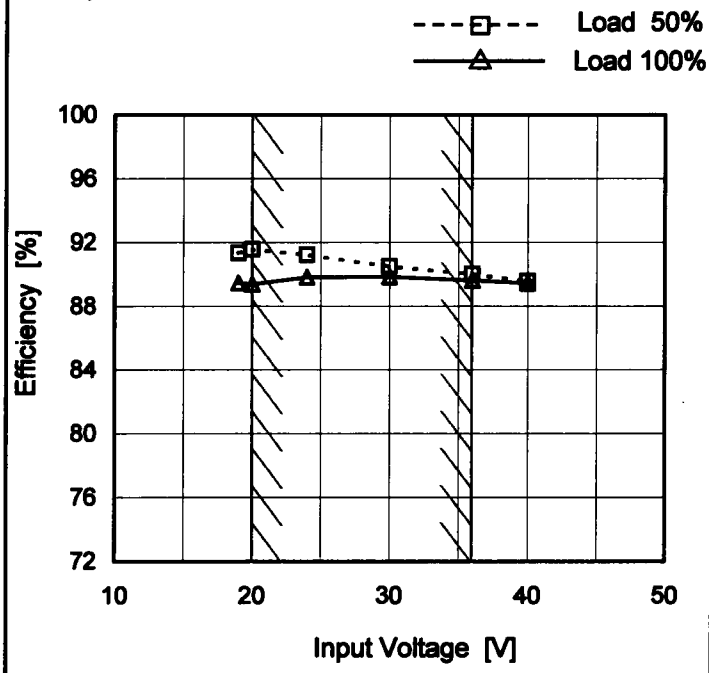
Load Current [A]	Input Power [W]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	2.3	2.3	2.6
2.00	62.1	62.4	64.1
4.00	121.6	122.4	124.9
6.00	182.1	182.7	185.5
8.00	243.7	244.4	246.7
10.00	306.6	306.7	308.7
12.00	371.0	370.4	371.2
12.50	387.2	386.6	387.6
13.75	428.7	427.3	427.5
—	-	-	-
—	-	-	-

COSEL

Model	CBS3502428
Item	Efficiency (by Input Voltage)
Object	———————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

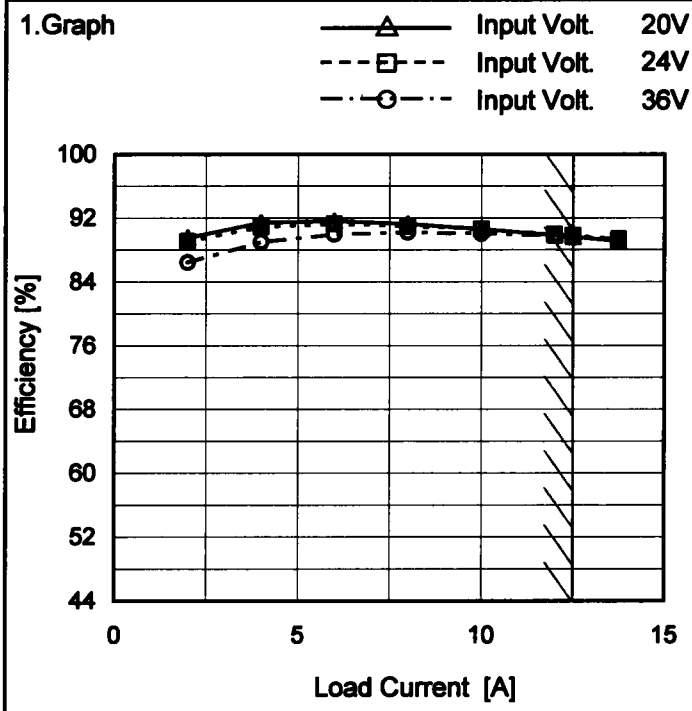
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
19	91.4	89.5
20	91.6	89.4
24	91.2	89.8
30	90.5	89.8
36	90.0	89.6
40	89.6	89.4
—	-	-
—	-	-
—	-	-

COSEL

Model	CBS3502428
Item	Efficiency (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	-	-	-
2.00	89.5	89.1	86.4
4.00	91.4	90.9	89.0
6.00	91.6	91.3	90.0
8.00	91.3	91.0	90.2
10.00	90.6	90.6	90.1
12.00	89.9	90.0	89.8
12.50	89.7	89.8	89.6
13.75	89.1	89.4	89.4
—	-	-	-
—	-	-	-

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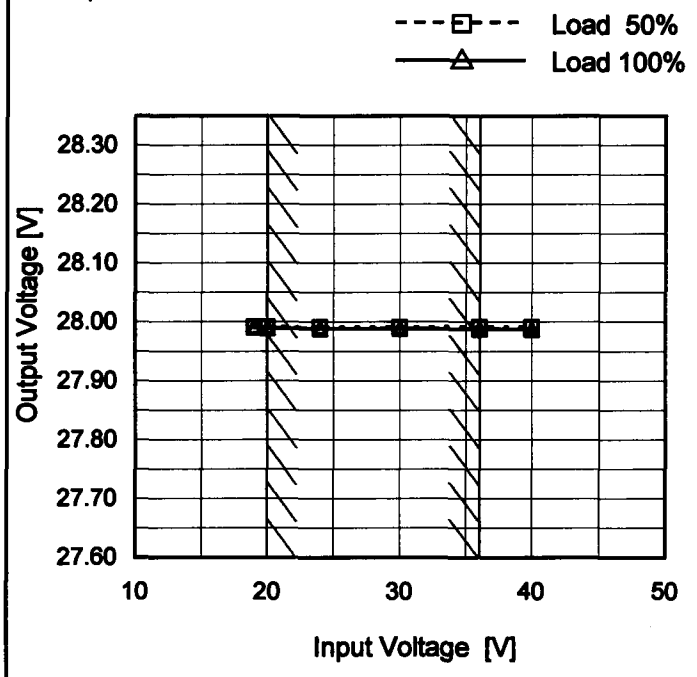
Model	CBS3502428
Item	Line Regulation
Object	+28V12.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

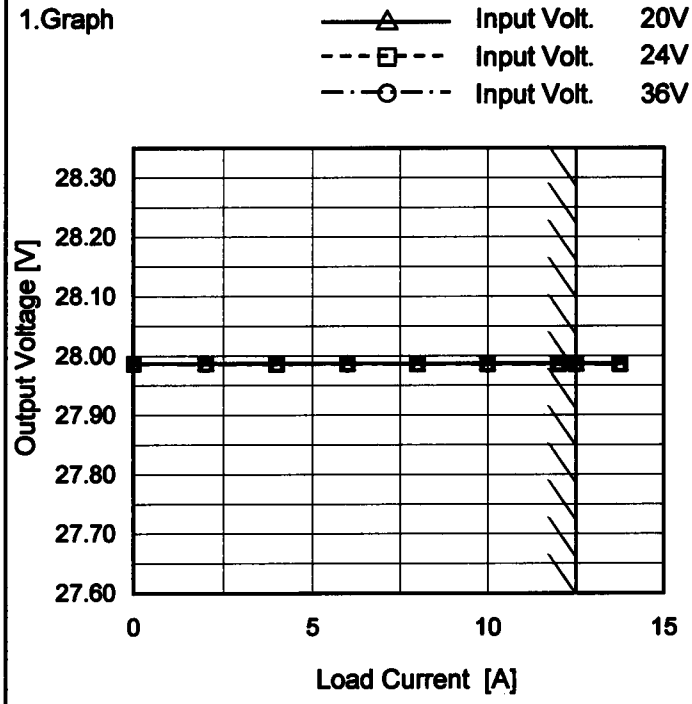
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
19	27.992	27.991
20	27.992	27.990
24	27.991	27.989
30	27.991	27.989
36	27.991	27.989
40	27.991	27.988
—	-	-
—	-	-
—	-	-

COSEL

Model	CBS3502428
Item	Load Regulation
Object	+28V12.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	27.988	27.987	27.986
2.00	27.987	27.987	27.986
4.00	27.987	27.986	27.986
6.00	27.987	27.987	27.986
8.00	27.987	27.987	27.986
10.00	27.987	27.986	27.986
12.00	27.987	27.986	27.986
12.50	27.987	27.986	27.986
13.75	27.987	27.986	27.985
—	-	-	-
—	-	-	-

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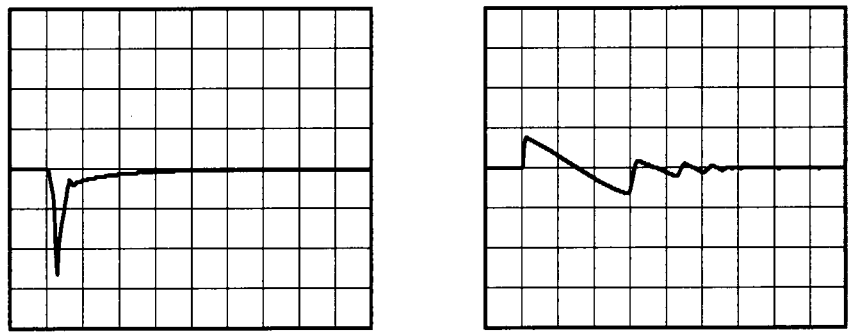
Model	CBS3502428		
Item	Dynamic Load Response	Temperature	25℃
		Testing Circuitry	Figure A
Object	+28V12.5A		

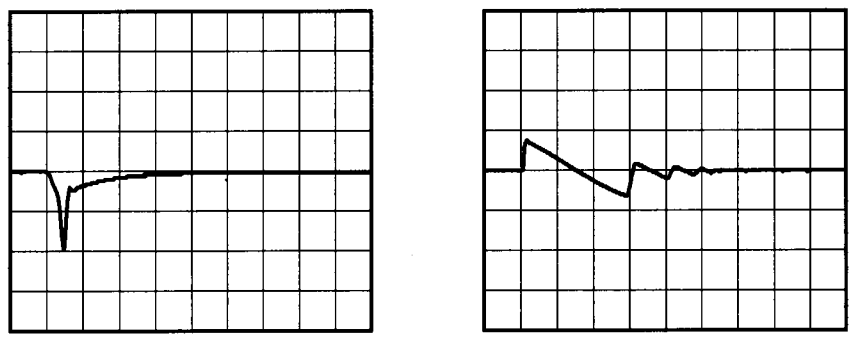
Input Volt. 24 V
Cycle 1000 ms

Load Current

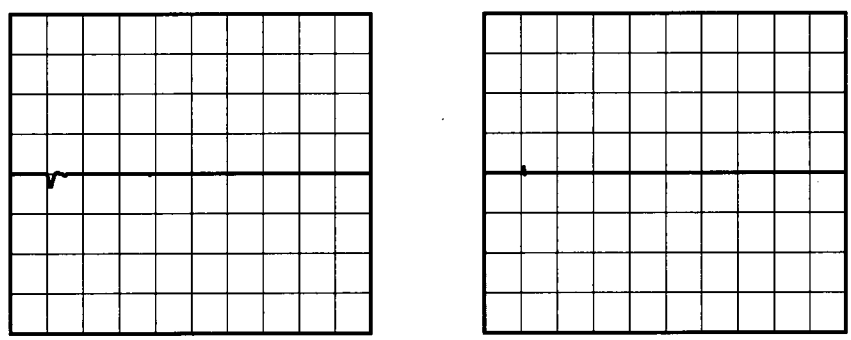
Min. Load (0A) ⟷
Load 100% (12.5A)



Min. Load (0A) ⟷
Load 50% (6.25A)



Load 10% (1.25A) ⟷
Load 100% (12.5A)

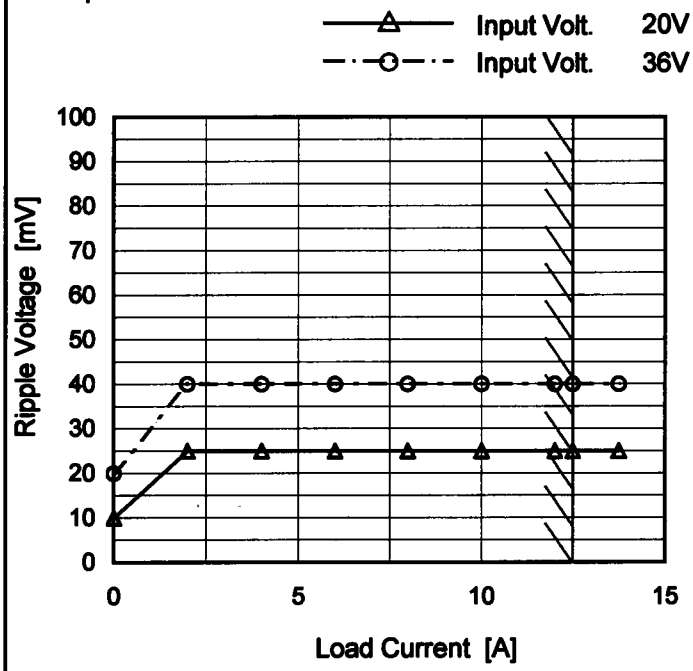


COSEL

Model	CBS3502428
Item	Ripple Voltage (by Load Current)
Object	+28V12.5A

Temperature 25°C
Testing Circuitry Figure A

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.

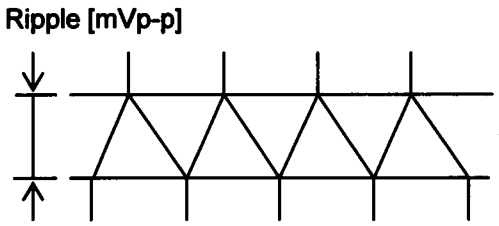


Fig.Complex Ripple Wave Form

2.Values

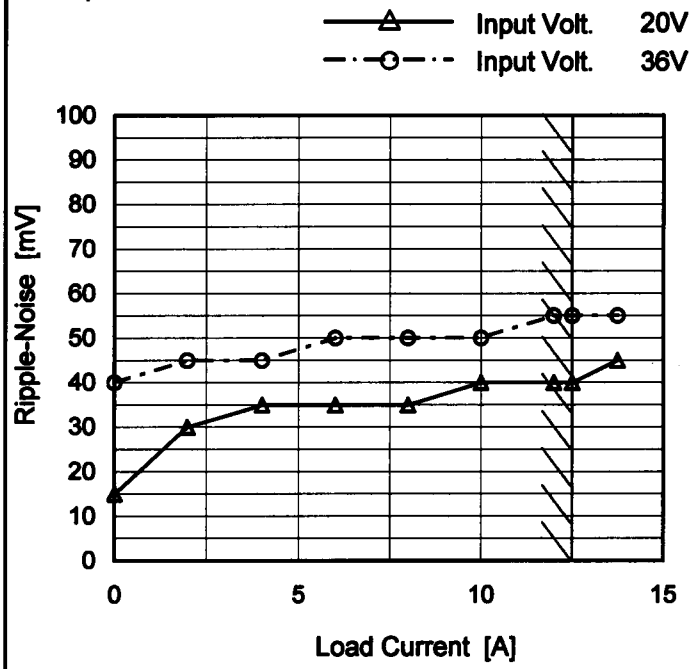
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 20 [V]	Input Volt. 36 [V]
0.00	10	20
2.00	25	40
4.00	25	40
6.00	25	40
8.00	25	40
10.00	25	40
12.00	25	40
12.50	25	40
13.75	25	40
–	-	-
–	-	-

COSEL

Model	CBS3502428
Item	Ripple-Noise
Object	+28V12.5A

Temperature 25°C
Testing Circuitry Figure A

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.

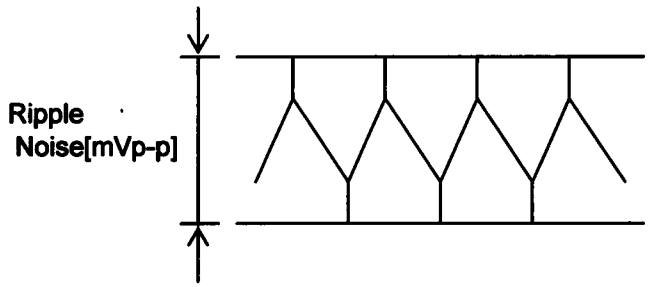


Fig.Complex Ripple Noise Wave Form

2.Values

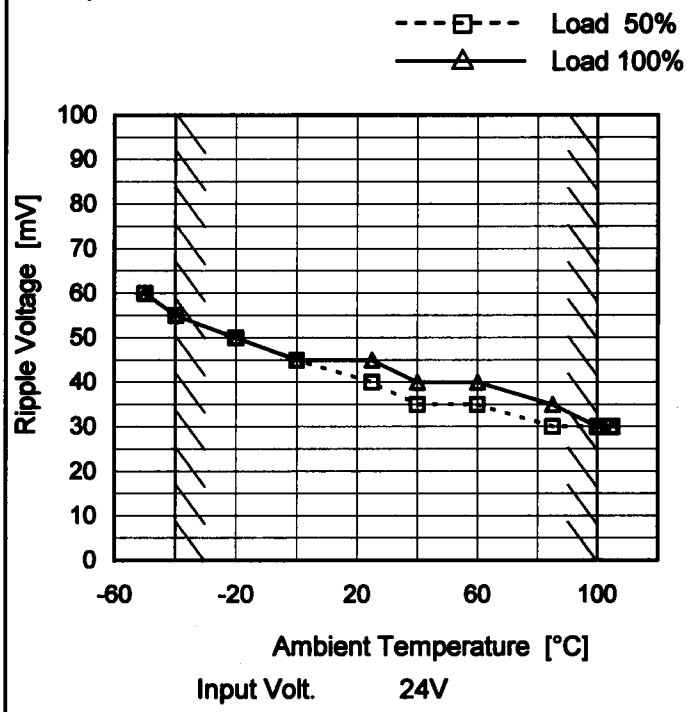
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 20 [V]	Input Volt. 36 [V]
0.00	15	40
2.00	30	45
4.00	35	45
6.00	35	50
8.00	35	50
10.00	40	50
12.00	40	55
12.50	40	55
13.75	45	55
--	-	-
--	-	-

COSEL

Model	CBS3502428
Item	Ripple Voltage (by Ambient Temp.)
Object	+28V12.5A

Testing Circuitry Figure A

1.Graph



Input Volt. 24V

Measured by 100 MHz Oscilloscope.

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

2.Values

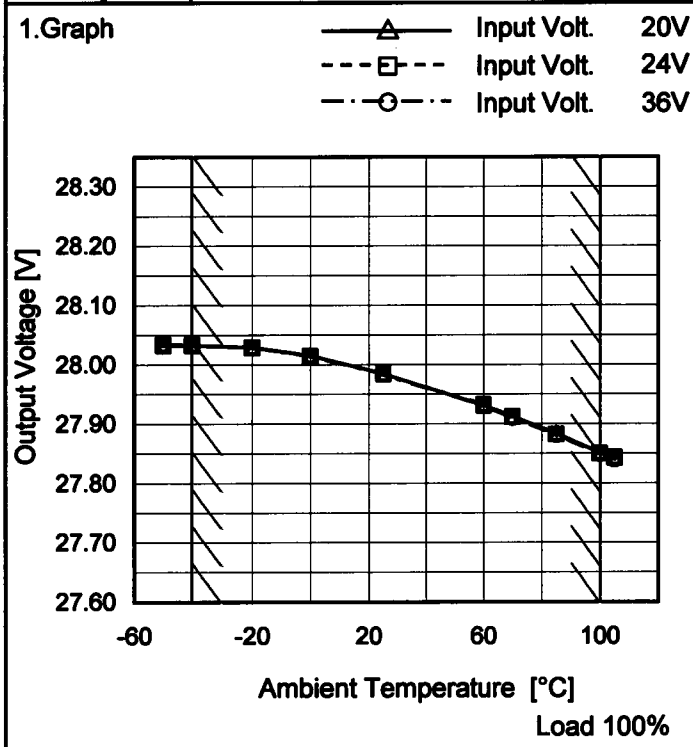
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	60	60
-40	55	55
-20	50	50
0	45	45
25	40	45
40	35	40
60	35	40
85	30	35
100	30	30
105	30	30
–	-	-

COSEL

Model	CBS3502428
Item	Ambient Temperature Drift
Object	+28V12.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
-50	28.033	28.034	28.034
-40	28.033	28.033	28.033
-20	28.029	28.029	28.029
0	28.015	28.015	28.015
25	27.985	27.984	27.984
60	27.932	27.932	27.930
70	27.912	27.912	27.910
85	27.884	27.883	27.881
100	27.851	27.850	27.849
105	27.843	27.843	27.840
—	-	-	-

COSEL

Model	CBS3502428	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+28V12.5A	

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 - 100°C
Input Voltage : 20 - 36V
Load Current : 0 - 12.5A

* 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

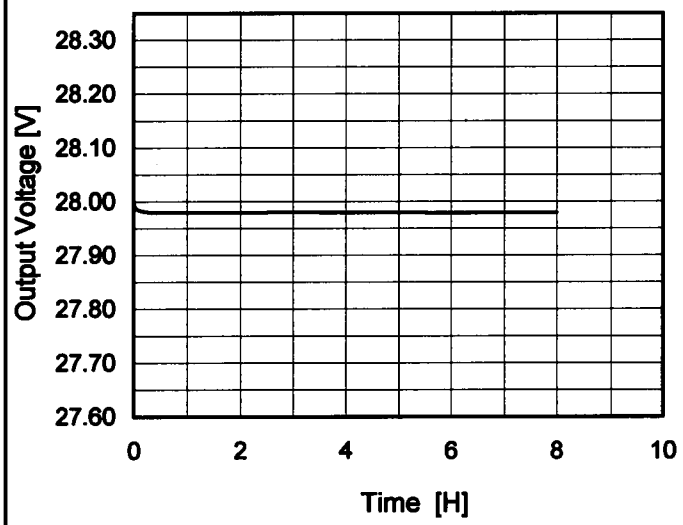
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	24	0	28.034	±93	±0.3
Minimum Voltage	100	36	12.5	27.848		

COSEL

Model	CBS3502428
Item	Time Lapse Drift
Object	+28V12.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 24V
Load 100%

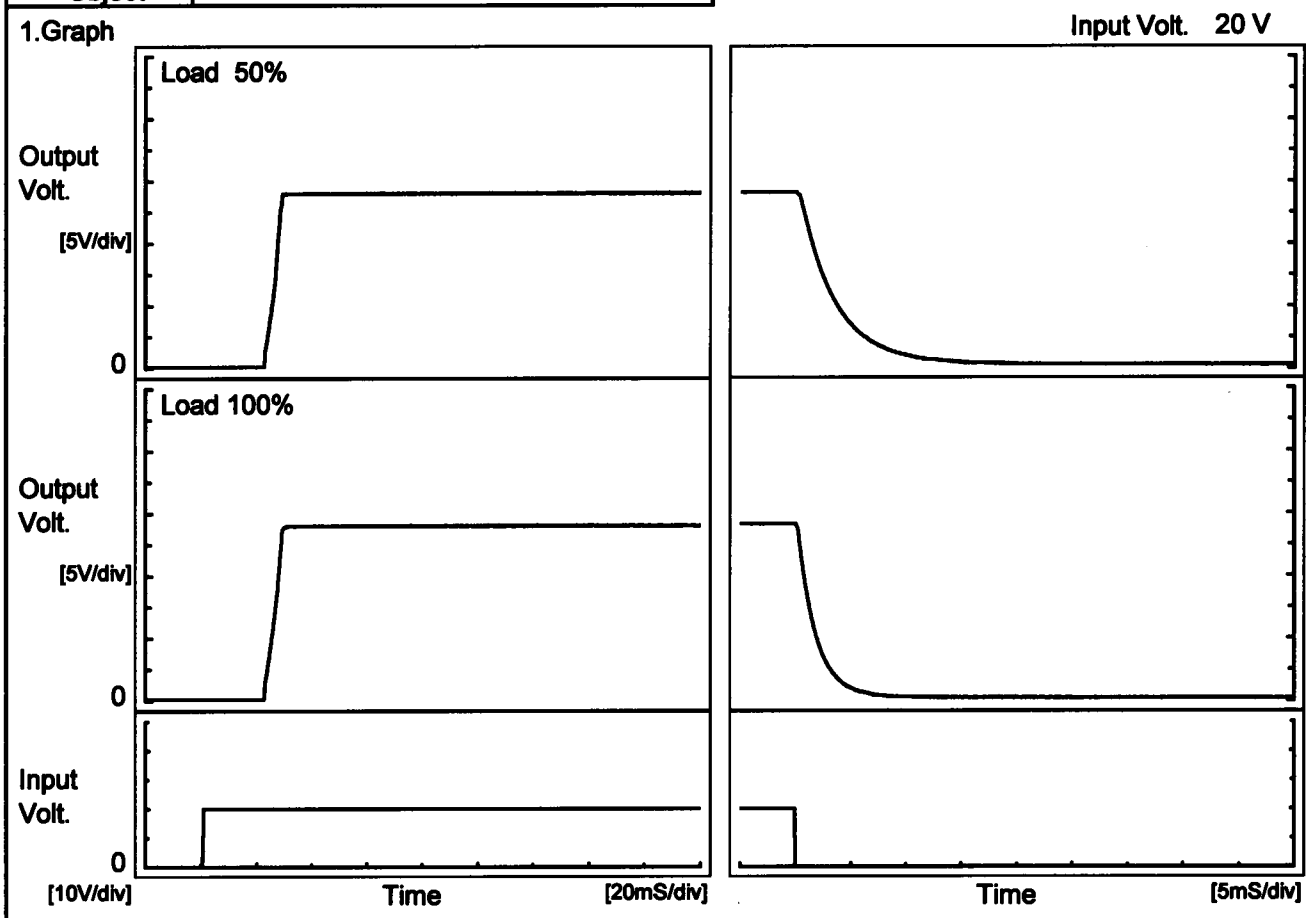
2.Values

Time since start [H]	Output Voltage [V]
0.0	27.999
0.5	27.980
1.0	27.980
2.0	27.980
3.0	27.980
4.0	27.980
5.0	27.980
6.0	27.979
7.0	27.980
8.0	27.980

COSEL

Model	CBS3502428		
Item	Rise and Fall Time	Temperature	25°C
		Testing Circuitry	Figure A
Object	+28V12.5A		

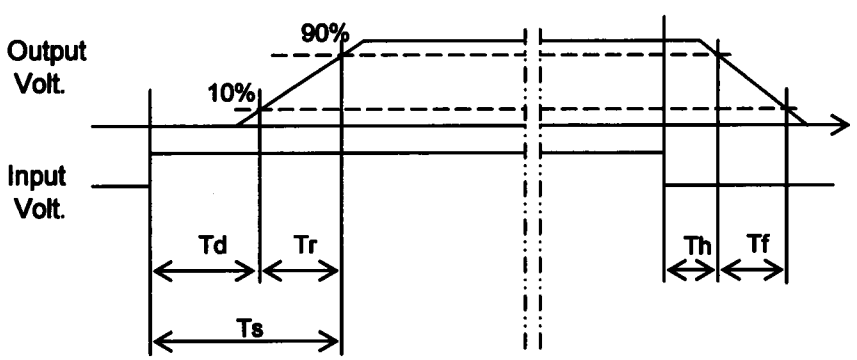
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	23.1	5.5	28.6	0.7	7.6
100 %	23.1	5.8	28.9	0.4	3.8

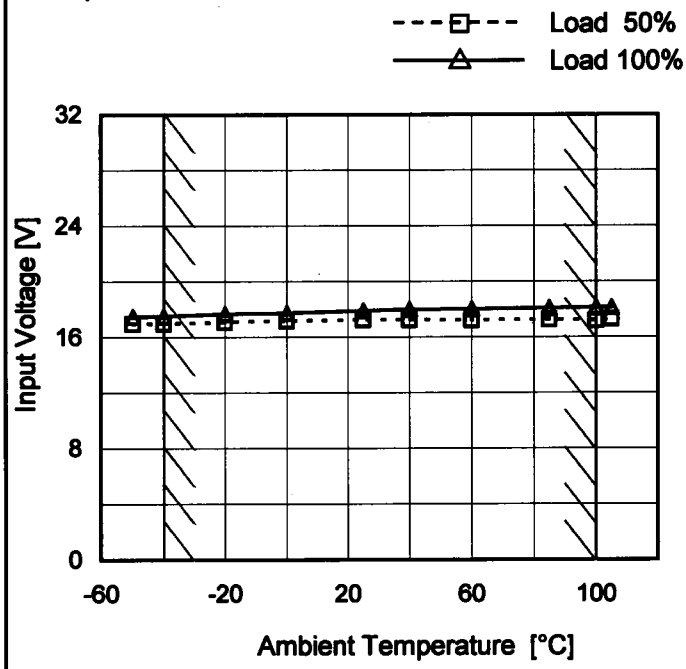


COSEL

Model	CBS3502428
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+28V12.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

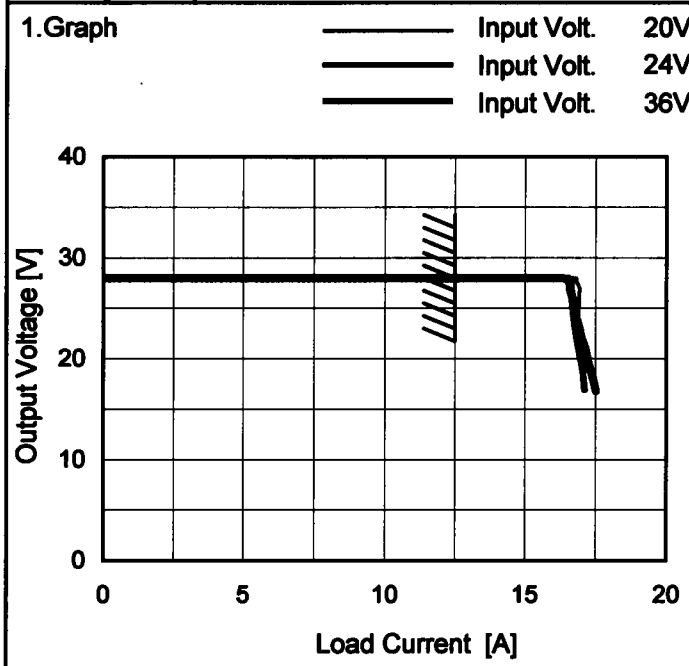
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	17.0	17.5
-40	17.0	17.6
-20	17.1	17.7
0	17.2	17.8
25	17.3	17.9
40	17.3	18.0
60	17.3	18.1
85	17.3	18.1
100	17.2	18.2
105	17.3	18.2
--	-	-

COSEL

Model	CBS3502428
Item	Overcurrent Protection
Object	+28V12.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Intermittent opertion occurs when the output voltage is from 16.8V to 0V.

2.Values

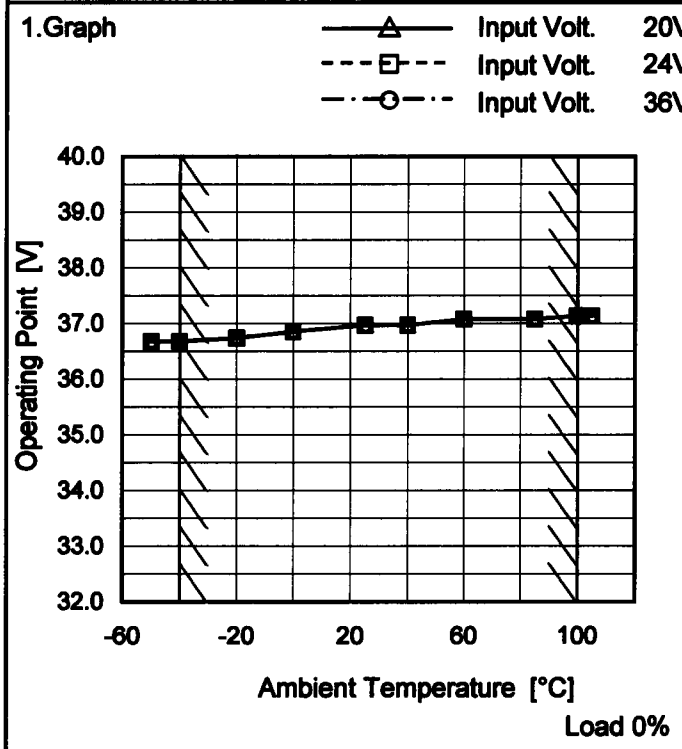
Output Voltage [V]	Load Current [A]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
28.0	13.08	12.59	12.58
26.6	16.92	16.64	16.63
25.2	16.90	16.67	16.73
22.4	16.88	16.80	16.98
19.6	16.96	16.98	17.26
16.8	17.07	17.13	17.51
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	CBS3502428
Item	Overvoltage Protection
Object	+28V12.5A

Testing Circuitry Figure A

1.Graph



Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 20[V]	Input Volt. 24[V]	Input Volt. 36[V]
-50	36.68	36.68	36.68
-40	36.68	36.68	36.68
-20	36.74	36.74	36.74
0	36.86	36.85	36.85
25	36.97	36.97	36.97
40	36.97	36.97	36.97
60	37.08	37.08	37.08
85	37.08	37.08	37.08
100	37.14	37.14	37.14
105	37.14	37.14	37.14
--	-	-	-

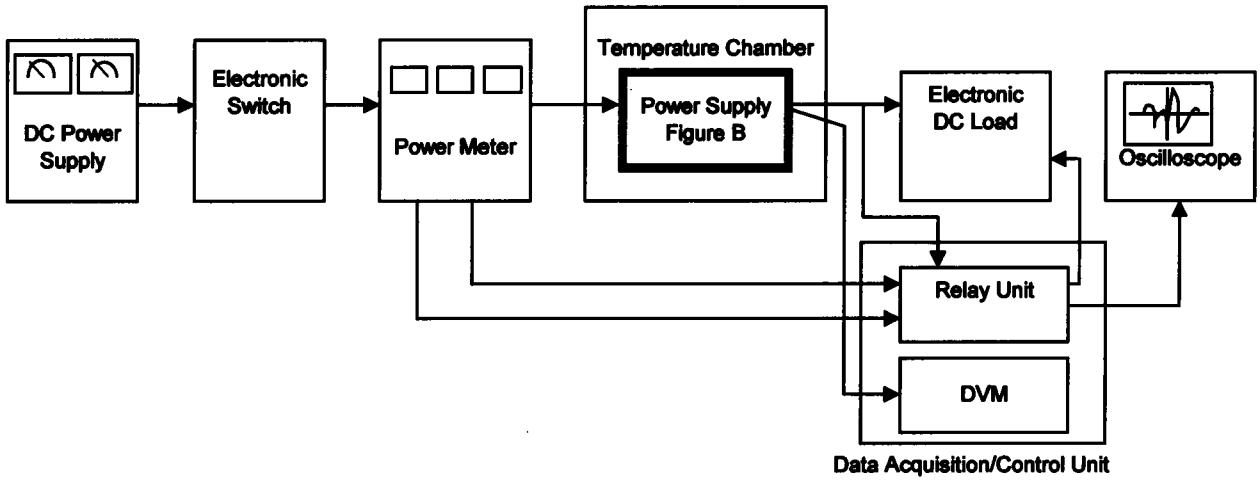
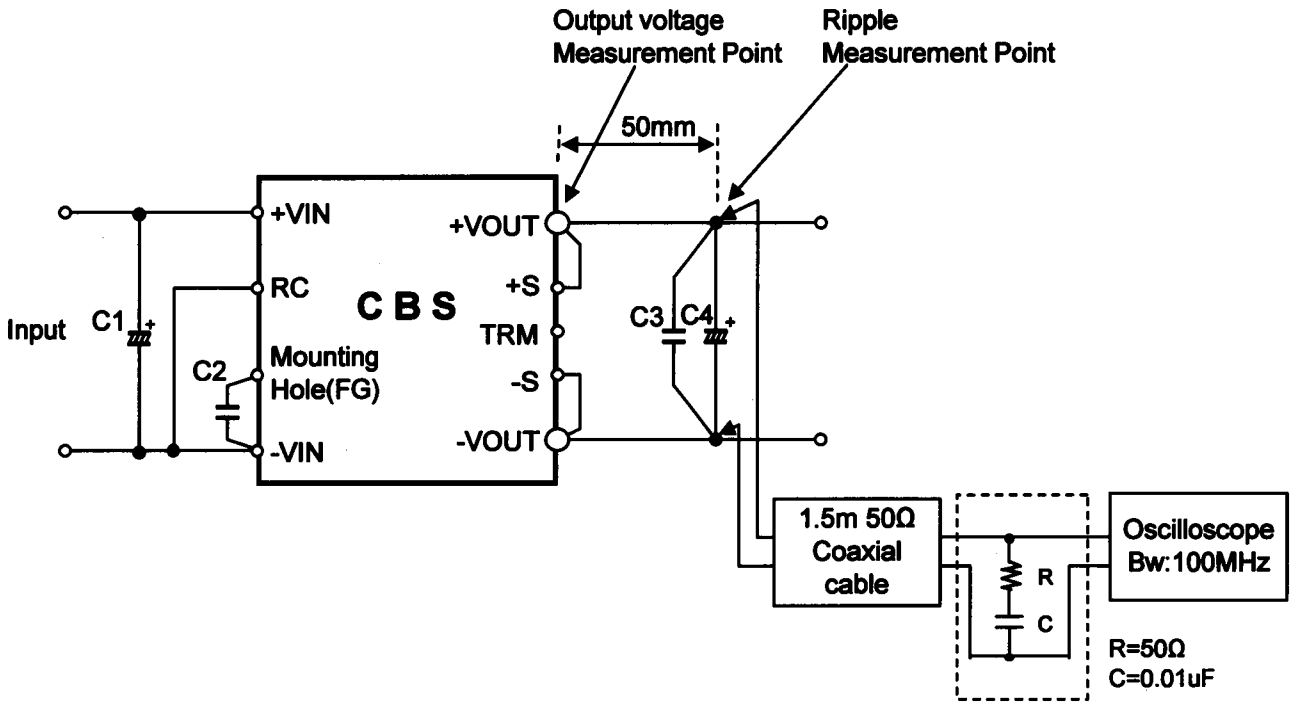


Figure A



C1 : 50V 220μF ×2
C2 : 4700pF
C3 : 50V 0.1μF
C4 : 35V 220μF ×3 (-40℃≦T_B≦-20℃)
35V 220μF (-20℃<T_B≦100℃)
TB : Base Plate Temp.

Figure B