参考資料

COSEL

TEST DATA OF CBS2004805

(48V INPUT)

Regulated DC Power Supply

Feb. 27, 2001

Approved by : Takayuki Fukuda

Takayuki Fukuda Design Manager

Prepared by : Atsushi Yoshiyama

Atsushi Yoshiyama Design Engineer

コーセル株式会社

COSEL CO.,LTD.

COSEL

CONTENTS

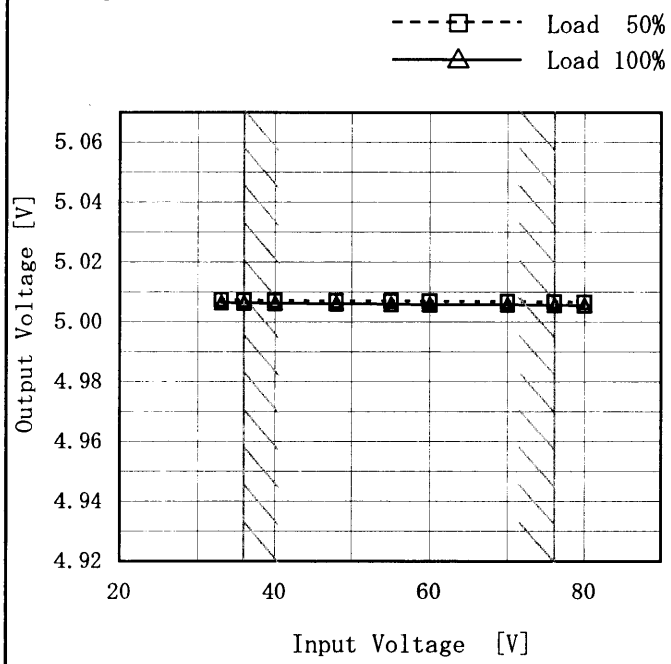
(Final Page 21)

COSEL

Model	CBS2004805
Item	Line Regulation 静的入力変動
Object	+5V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格入力電圧範囲を示す。

2. Values

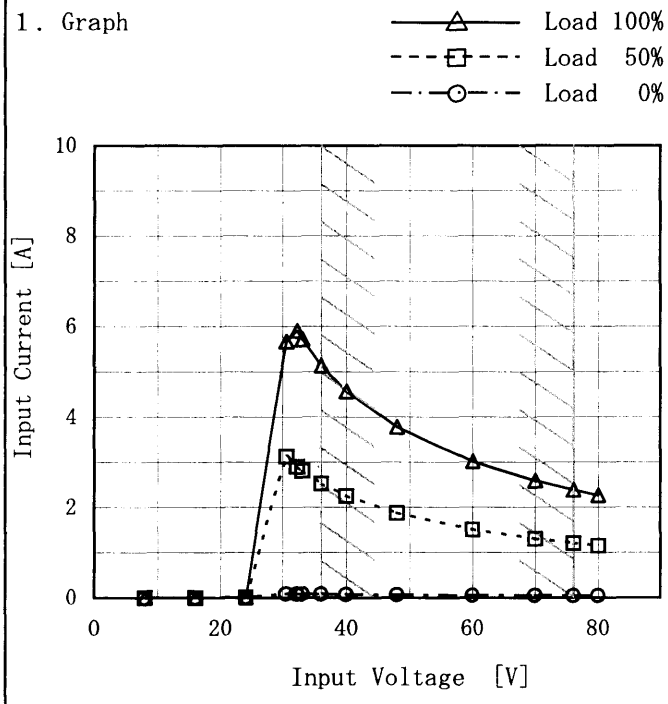
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
33	5.007	5.007
36	5.007	5.006
40	5.007	5.006
48	5.007	5.006
55	5.007	5.006
60	5.007	5.006
70	5.007	5.006
76	5.007	5.006
80	5.007	5.006

COSEL

Model	CBS2004805
Item	Input Current (by Input Voltage) 入力電流（入力電圧特性）
Object	————————

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

（注）斜線は定格入力電圧範囲を示す。

2. Values

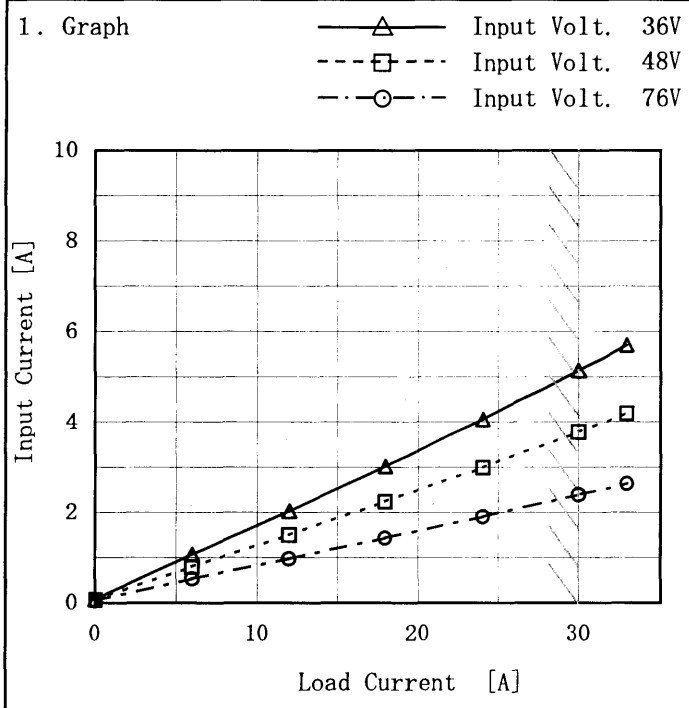
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
8.0	0.000	0.000	0.000
16.0	0.000	0.000	0.000
24.0	0.008	0.008	0.008
30.6	0.086	3.126	5.670
32.2	0.083	2.902	5.910
33.0	0.082	2.808	5.720
36.0	0.077	2.524	5.140
40.0	0.072	2.252	4.570
48.0	0.065	1.874	3.780
60.0	0.051	1.506	3.016
70.0	0.047	1.299	2.588
76.0	0.046	1.202	2.386
80.0	0.045	1.146	2.268
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	CBS2004805
Item	Input Current (by Load Current) 入力電流（負荷特性）
Object	――――――

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

（注）斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.077	0.063	0.044
6	1.073	0.794	0.529
12	2.028	1.501	0.972
18	3.018	2.236	1.428
24	4.053	2.994	1.901
30	5.140	3.782	2.386
33	5.700	4.186	2.634
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

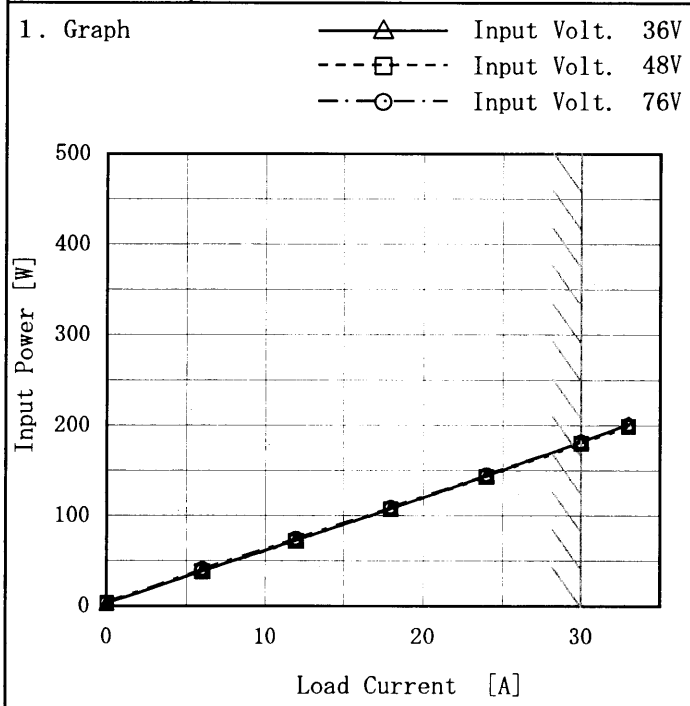
BC－3334

COSEL

Model	CBS2004805
Item	Input Power (by Load Current) 入力電力（負荷特性）
Object	――――――

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	2.8	3.0	3.5
6	38.6	38.0	40.4
12	72.8	71.9	74.2
18	107.8	107.0	108.6
24	144.1	142.8	144.9
30	182.0	179.9	181.5
33	201.5	198.8	200.3
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

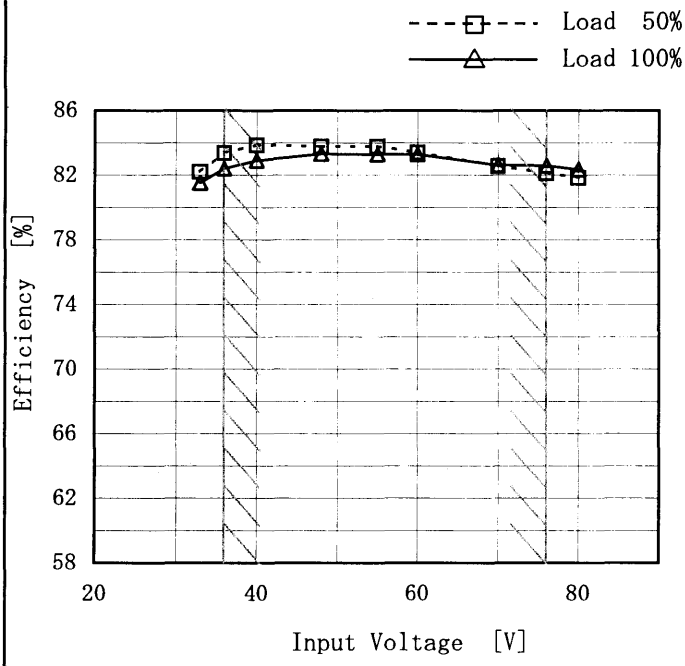
BC－3334

COSEL

Model	CBS2004805
Item	Efficiency (by Input Voltage) 効率 (入力電圧特性)
Object	————————

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格入力電圧範囲を示す。

2. Values

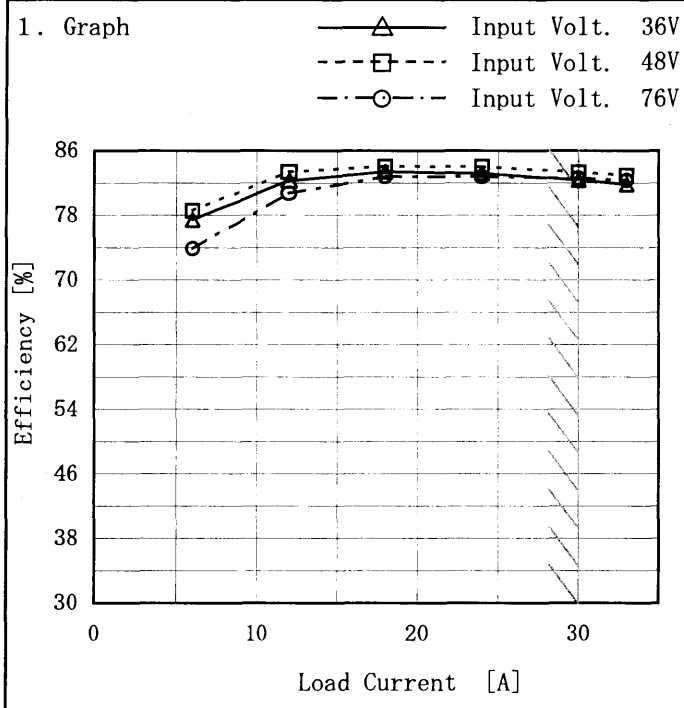
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	82.2	81.5
36	83.4	82.4
40	83.9	82.9
48	83.8	83.3
55	83.8	83.3
60	83.4	83.3
70	82.6	82.6
76	82.1	82.6
80	81.8	82.4

COSEL

Model	CBS2004805
Item	Efficiency (by Load Current) 効率 (負荷特性)
Object	————————

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格負荷電流範囲を示す。

2. Values

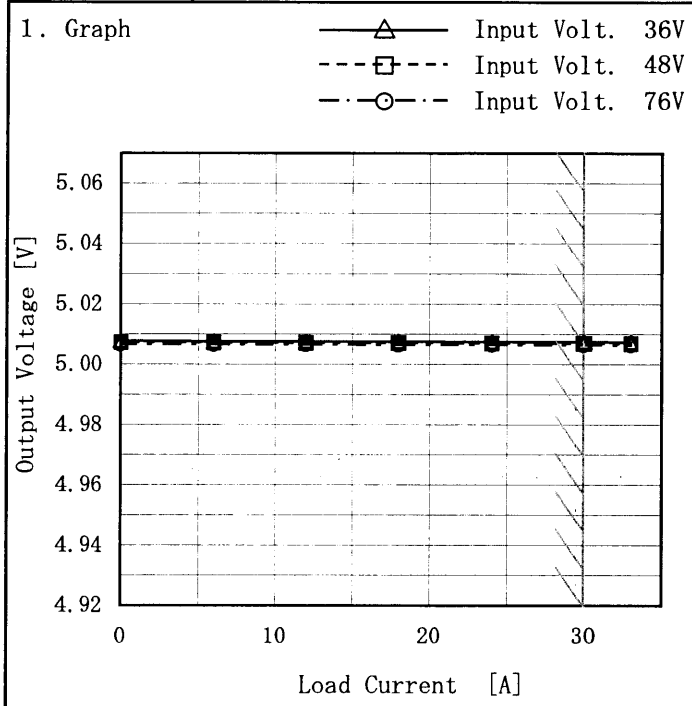
Load Current [A]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	–	–	–
6	77.5	78.5	73.9
12	82.3	83.3	80.7
18	83.4	84.0	82.8
24	83.2	84.0	82.8
30	82.4	83.3	82.6
33	81.8	82.9	82.3
--	–	–	–
--	–	–	–
--	–	–	–
--	–	–	–

COSEL

Model	CBS2004805
Item	Load Regulation 静的負荷変動
Object	+5V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格負荷電流範囲を示す。

2. Values

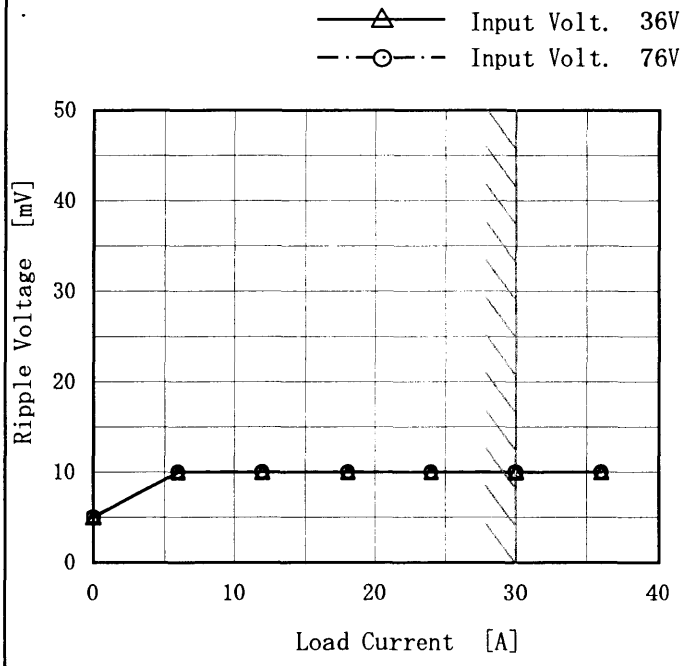
Load Current [A]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	5.008	5.007	5.007
6	5.008	5.007	5.007
12	5.008	5.007	5.007
18	5.008	5.007	5.007
24	5.008	5.007	5.007
30	5.008	5.007	5.007
33	5.007	5.007	5.006
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	CBS2004805
Item	Ripple Voltage (by Load Current) リップル電圧（負荷特性）
Object	+5V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

リップル電圧は、下図ｐ－ｐ値で示される。
（注）斜線は定格負荷電流範囲を示す。

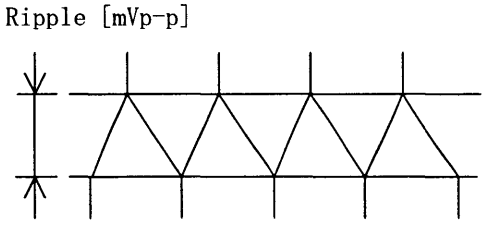


Fig. Complex Ripple Wave Form
図　リップル波形図

2. Values

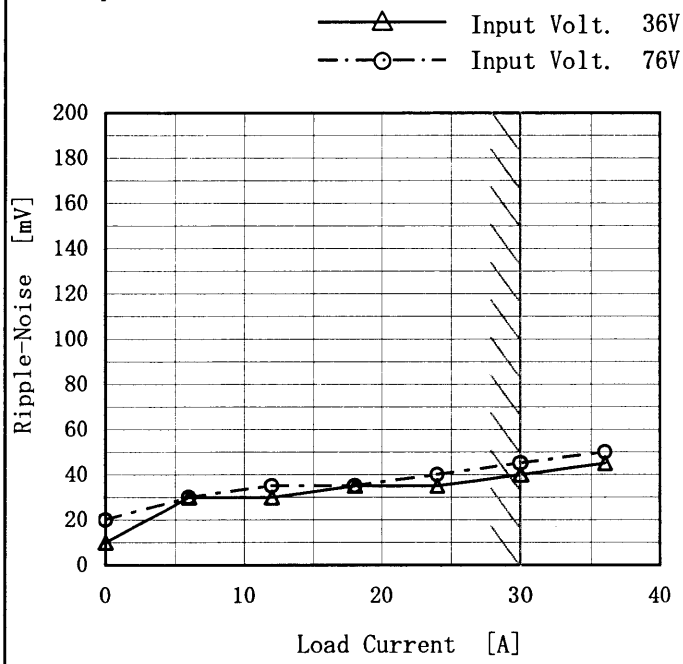
Load Current [A]	Ripple Output Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	5	5
6	10	10
12	10	10
18	10	10
24	10	10
30	10	10
36	10	10
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	CBS2004805
Item	Ripple-Noise リップルノイズ
Object	+5V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

リップルノイズは、下図ｐ－ｐ値で示される。
（注）斜線は定格負荷電流範囲を示す。

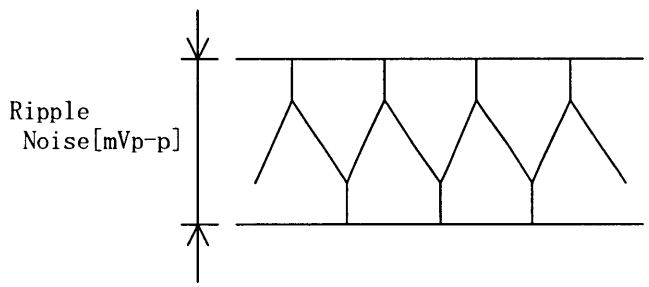


Fig. Complex Ripple Noise Wave Form
図　リップルノイズ波形

2. Values

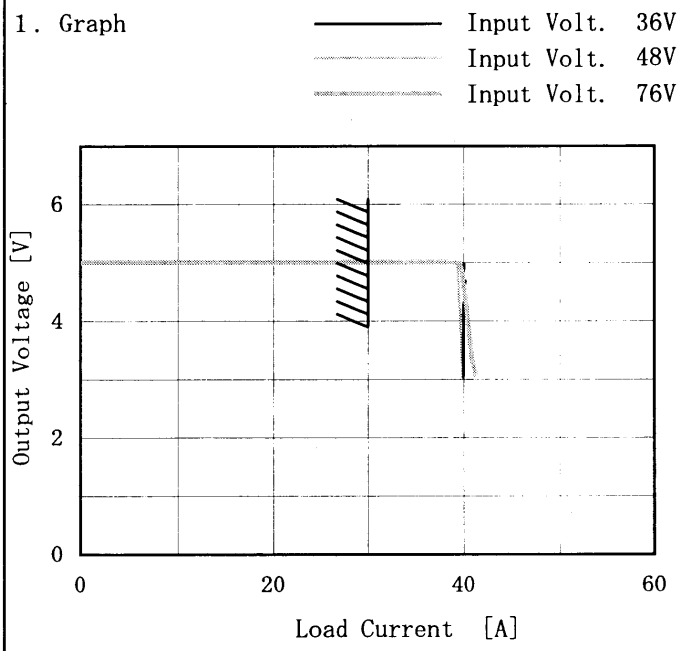
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	10	20
6	30	30
12	30	35
18	35	35
24	35	40
30	40	45
36	45	50
--	—	—
--	—	—
--	—	—
--	—	—

COSEL

Model	CBS2004805
Item	Overcurrent Protection 過電流保護
Object	+5V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current.
(注) 斜線は定格負荷電流範囲を示す。

Intermittent operation occurs when the output voltage is from 3V to 0V.
3V～0V間は、間欠モードとなる。

2. Values

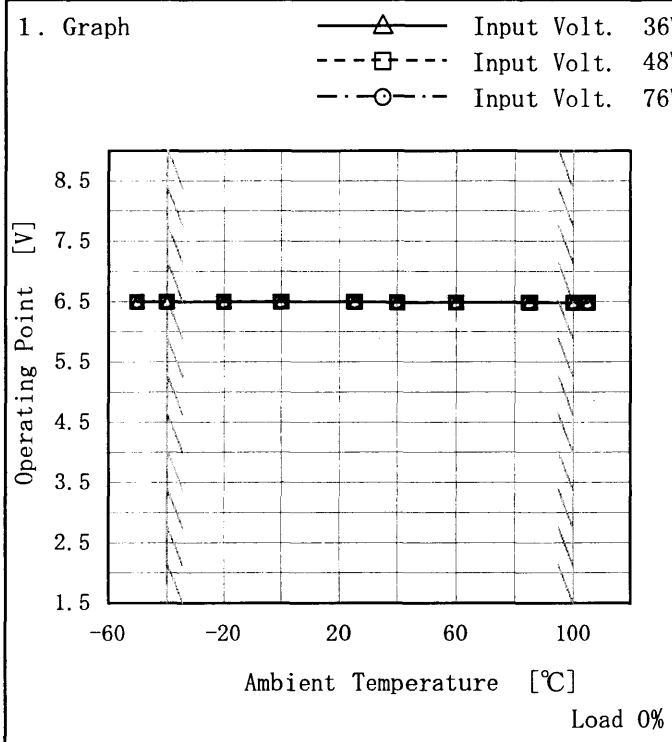
Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
5.00	31.29	31.28	31.28
4.75	39.94	39.41	39.86
4.50	40.07	39.48	40.09
4.00	39.96	39.62	40.45
3.50	39.96	39.76	40.76
3.00	39.95	39.93	41.18
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	CBS2004805
Item	Overvoltage Protection 過電圧保護
Object	+5V30A

Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格周囲温度範囲を示す。

2. Values

Ambient Temperature [℃]	Operating Point [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-50	6.46	6.46	6.46
-40	6.46	6.46	6.46
-20	6.46	6.46	6.46
0	6.46	6.46	6.46
25	6.46	6.46	6.46
40	6.45	6.45	6.45
60	6.45	6.45	6.45
85	6.45	6.45	6.45
100	6.44	6.44	6.44
105	6.44	6.44	6.44
--	-	-	-

COSEL

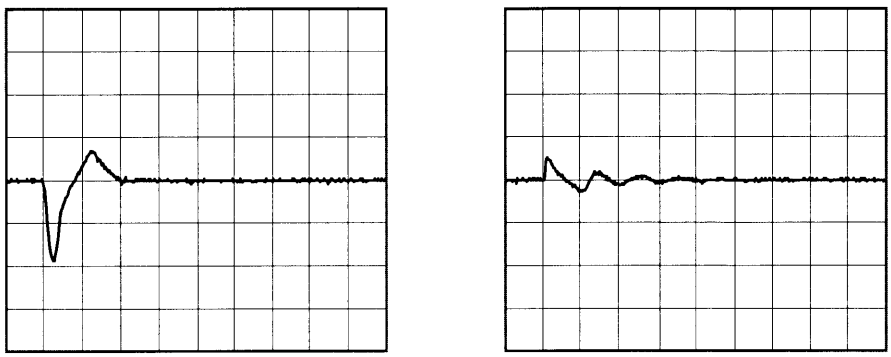
Model	CBS2004805		
Item	Dynamic Load Response 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+5V30A		

Input Volt. 48 V

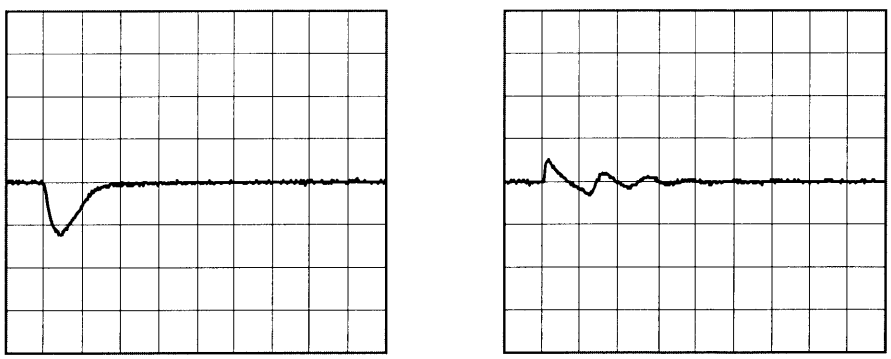
Cycle 1000 ms

Load Current

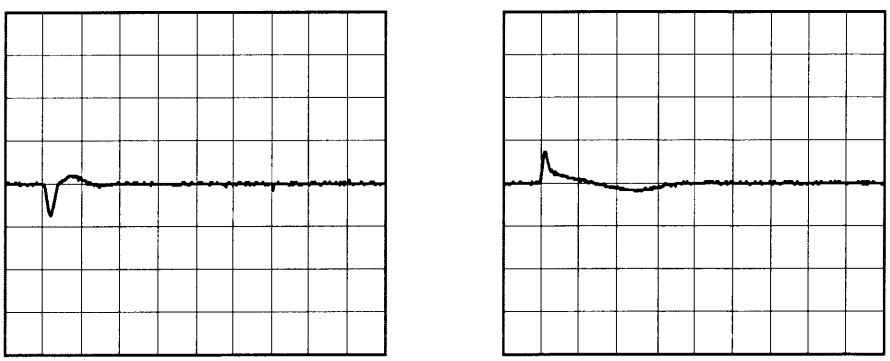
Min. Load (0A) ←→
Load 100% (30A)



Min. Load (0A) ←→
Load 50% (15A)



Load 10% (3A) ←→
Load 100% (30A)

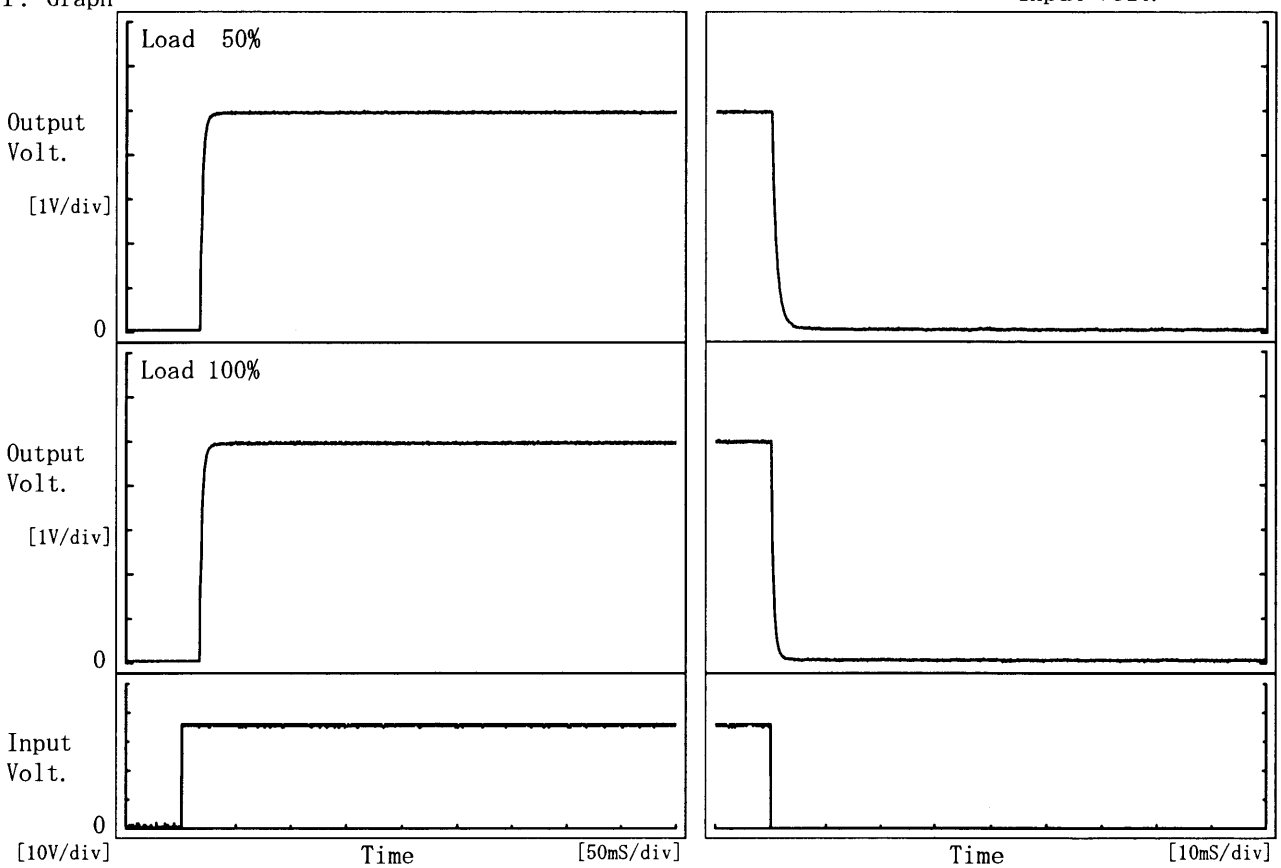


COSEL

Model	CBS2004805		
Item	Rise and Fall Time 立上り、立下り時間	Temperature Testing Circuitry	25℃ Figure A
Object	+5V30A		

1. Graph

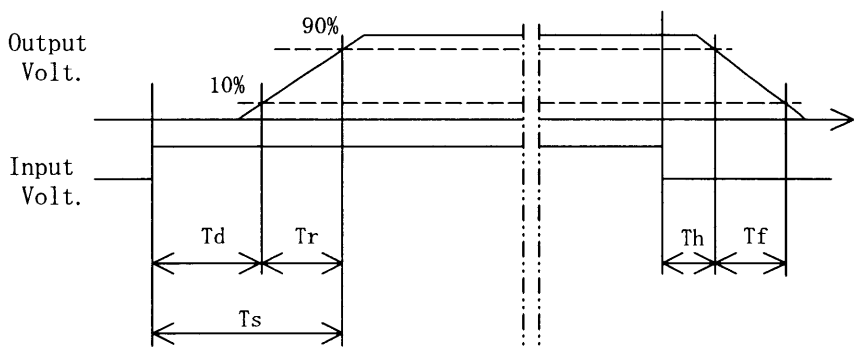
Input Volt. 36 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	16.3	5.5	21.8	0.1	2.1
100 %	16.3	5.5	21.8	0.1	1.1

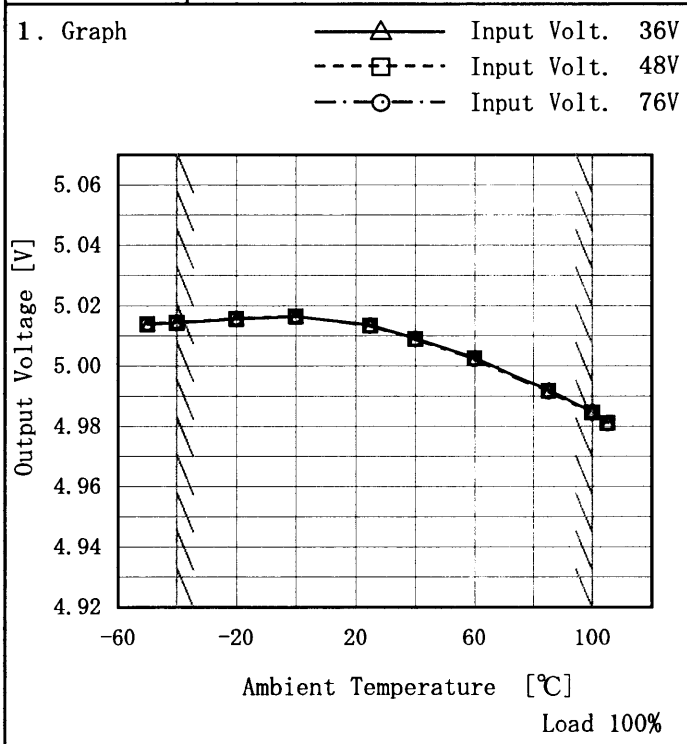


COSEL

Model	CBS2004805
Item	Ambient Temperature Drift 周囲温度変動
Object	+5V30A

Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格周囲温度範囲を示す。

2. Values

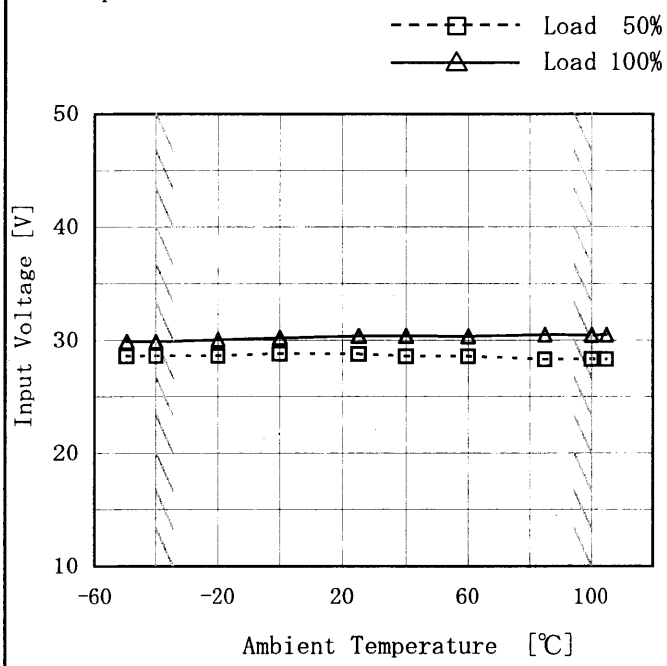
Ambient Temperature [℃]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-50	5.014	5.014	5.014
-40	5.014	5.014	5.015
-20	5.016	5.016	5.016
0	5.017	5.017	5.017
25	5.014	5.013	5.013
40	5.009	5.009	5.009
60	5.003	5.003	5.002
85	4.992	4.992	4.991
100	4.985	4.985	4.984
105	4.981	4.981	4.981
--	-	-	-

COSEL

Model	CBS2004805
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+5V30A

Testing Circuitry Figure A

1. Graph



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

(注) 斜線は定格周囲温度範囲を示す。

2. Values

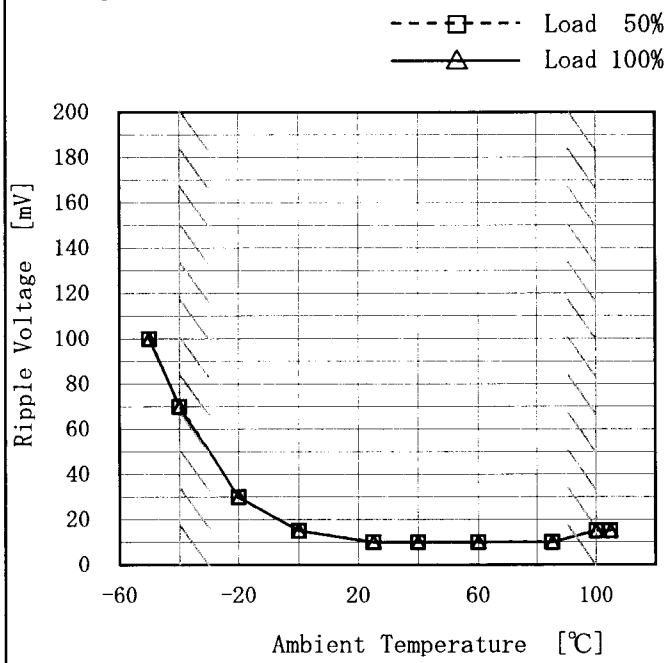
Ambient Temperature [℃]	Input Voltage [V]	
	Load 50%	Load 100%
-50	28.6	29.9
-40	28.6	29.9
-20	28.6	30.0
0	28.8	30.2
25	28.8	30.4
40	28.6	30.4
60	28.6	30.4
85	28.3	30.5
100	28.3	30.5
105	28.3	30.5
--	-	-

COSEL

Model	CBS2004805
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	+5V30A

Testing Circuitry Figure A

1. Graph



Input Volt. 48V

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

(注) 斜線は定格周囲温度範囲を示す。

2. Values

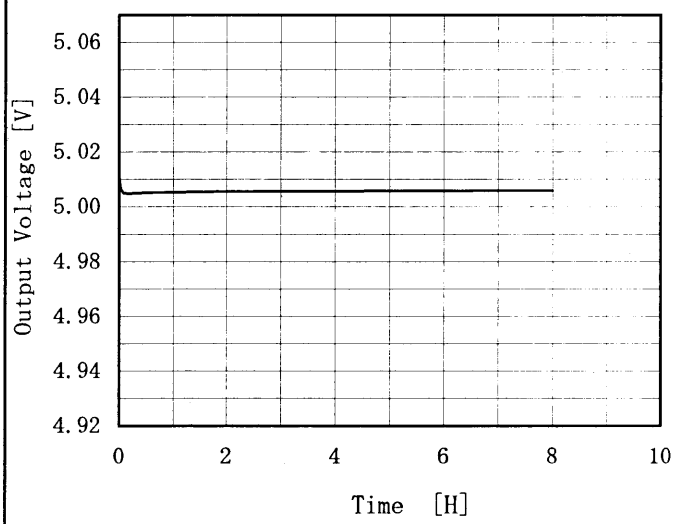
Ambient Temperature [℃]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	100	100
-40	70	70
-20	30	30
0	15	15
25	10	10
40	10	10
60	10	10
85	10	10
100	15	15
105	15	15
—	—	—

COSEL

Model	CBS2004805
Item	Time Lapse Drift 経時ドリフト
Object	+5V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Input Volt. 48V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	5.012
0.5	5.005
1.0	5.005
2.0	5.006
3.0	5.006
4.0	5.006
5.0	5.006
6.0	5.006
7.0	5.006
8.0	5.006

COSEL

Model	CBS2004805
Item	Output Voltage Accuracy 定電圧精度
Object	+5V30A

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 ～ 100℃
Input Voltage : 36 ～ 76V
Load Current : 0 ～ 30A

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

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

1. 定電圧精度

周囲温度、入力電圧、負荷電流を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

周囲温度 : -40 ～ 100℃
入力電圧 : 36 ～ 76V
負荷電流 : 0 ～ 30A

* 定電圧精度(変動値) ＝ ±(出力電圧の最高値－出力電圧の最低値)／2

$$\text{* 定電圧精度(変動率)} = \frac{\text{変動値}}{\text{定格出力電圧}} \times 100$$

2. Values

Item	Temperature [℃]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	36	0	5.015	±17	±0.3
Minimum Voltage	100	76	30	4.982		

COSEL

Model	CBS2004805	
Item	Condense 結露特性	Testing Circuitry Figure A
Object	+5V30A	

1. Condensation test

Testing procedure is as follows.

① Keeping and cooling the unit in a tank at -10℃ for an hour with the input off.

② Taking it out of the tank and dewing itself in a room where the temperature is 25℃ and the humidity is 40%RH.

③ Testing electrical characteristics of the unit to confirm there be no fault.

1. 結露特性試験

入力を切った状態で、恒温槽で－１０℃に冷却しておき、約１時間後に恒温槽から取り出し、室温２５℃、湿度４０%RHの状態におき結露させ、その電気的特性の測定を行い異常のないことを確認する。

2. Values

Item	Data	Testing Conditions
Output Voltage [V]	5.021	Input Volt.:48V, Load Current.:30A
Line Regulation [mV]	1	Input Volt.:36～76V, Load Current.:30A
Load Regulation [mV]	1	Input Volt.:48V, Load Current.:0～30A

COSEL

Model	CBS2004805		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25℃ Figure B
Object	+5V30A		

1. Conditions

・Input Voltage : 48 V
・Pulse Voltage : 2000 V
・Pulse Cycle : 16.7 mS
・Pulse Input Duration : 1 min. or more
・Load : 100 %

2. Results

Pulse Width [nS]	MODE	POLARITY	No protection failure should occur 保護回路の誤動作がない	DC-like Regulation of Output Voltage 出力電圧の直流的変動
50	COMMON	+	OK	no fluctuation
		−	OK	no fluctuation
	NORMAL	+	OK	no fluctuation
		−	OK	no fluctuation
1000	COMMON	+	OK	no fluctuation
		−	OK	no fluctuation
	NORMAL	+	OK	no fluctuation
		−	OK	no fluctuation

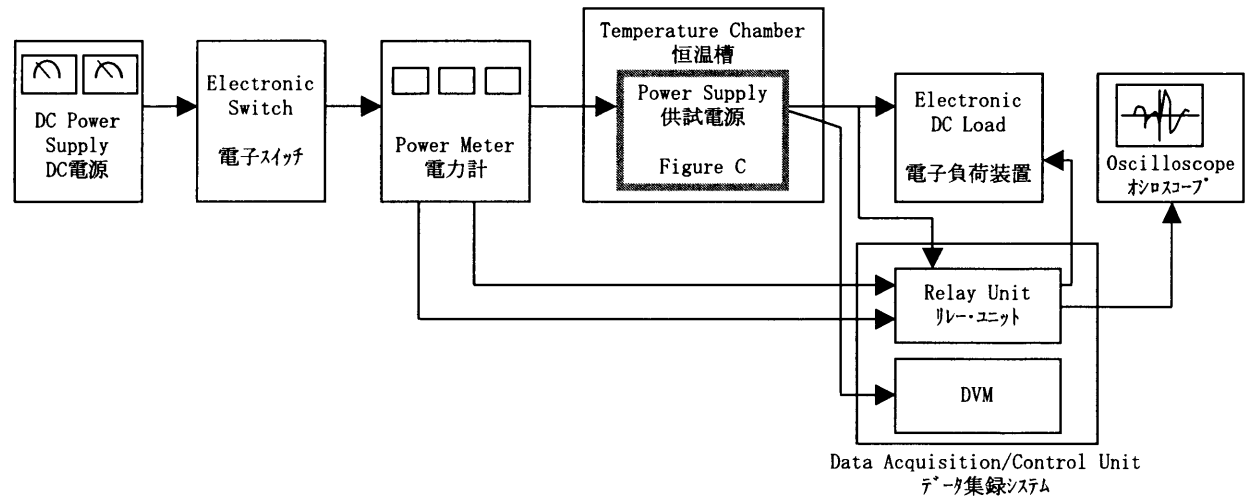


Figure A

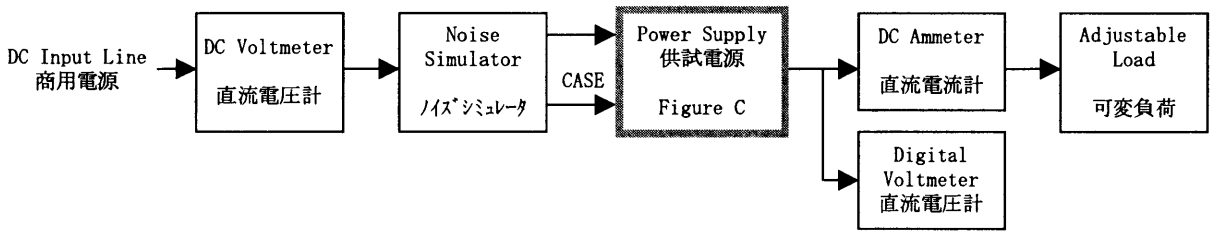


Figure B

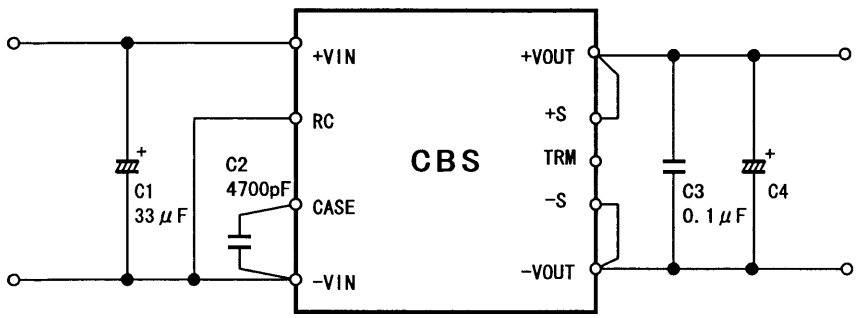


Figure C

C1 : 100V 33μF
C2 : 4700pF
C3 : 50V 0.1μF

($-40℃ \leqq T_B \leqq -20℃$)
C4 : CBS2004803, 05　10V 2200μF ×2
CBS2004812, 15　25V 1000μF ×2
CBS2004824, 28　35V 470μF ×2

($-20℃ < T_B \leqq 100℃$)
C4 : CBS2004803, 05　10V 2200μF
CBS2004812, 15　25V 1000μF
CBS2004824, 28　35V 470μF

T_B:Base Plate Temp.