参考資料

COSEL

TEST DATA OF CDS4004812

(48V INPUT)

Regulated DC Power Supply

Apr. 2, 2002

Approved by : Kazuyoshi Shimano

Kazuyoshi Shimano Design Manager

Prepared by : Hitoshi Nakayama

Hitoshi Nakayama Design Engineer

コーセル株式会社

COSEL CO.,LTD.

COSEL

CONTENTS

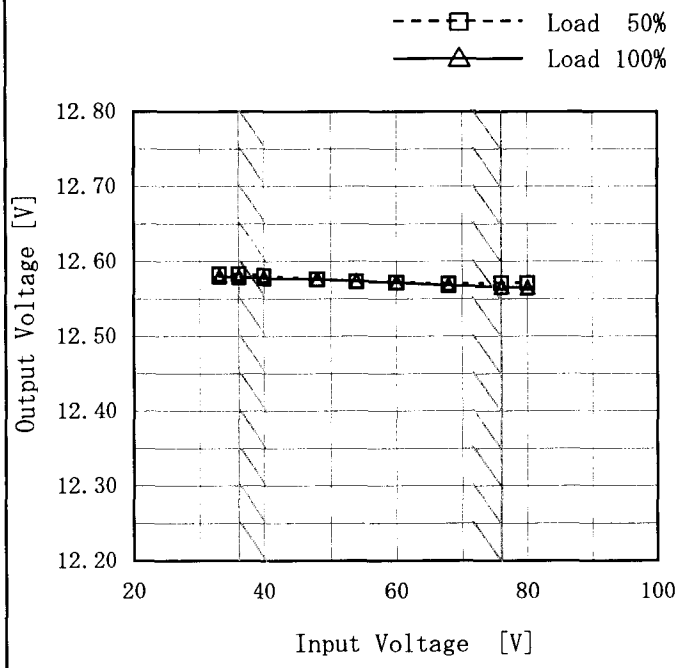
(Final Page 21)

COSEL

Model	CDS4004812
Item	Line Regulation 静的入力変動
Object	+12.5V40A

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	12.583	12.580
36	12.583	12.579
40	12.581	12.578
48	12.576	12.576
54	12.573	12.574
60	12.572	12.572
68	12.570	12.568
76	12.571	12.566
80	12.571	12.565

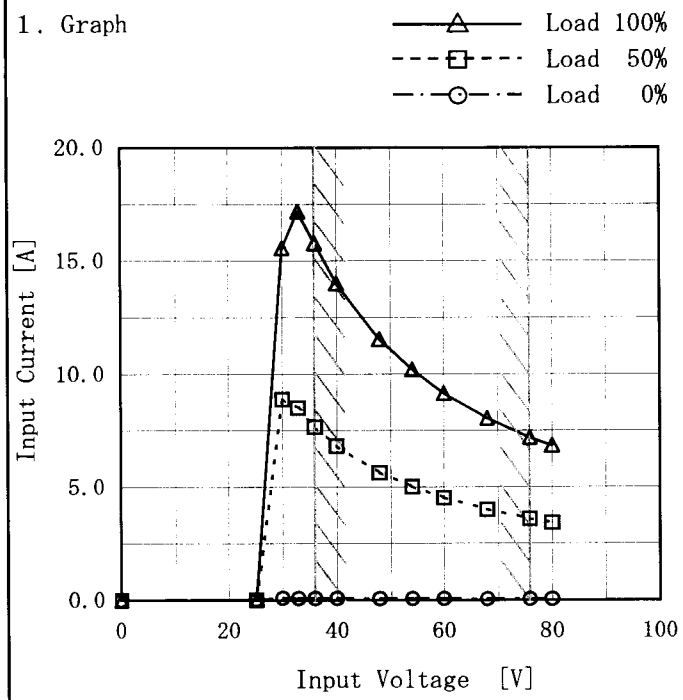
BC－3418

COSEL

Model	CDS4004812
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

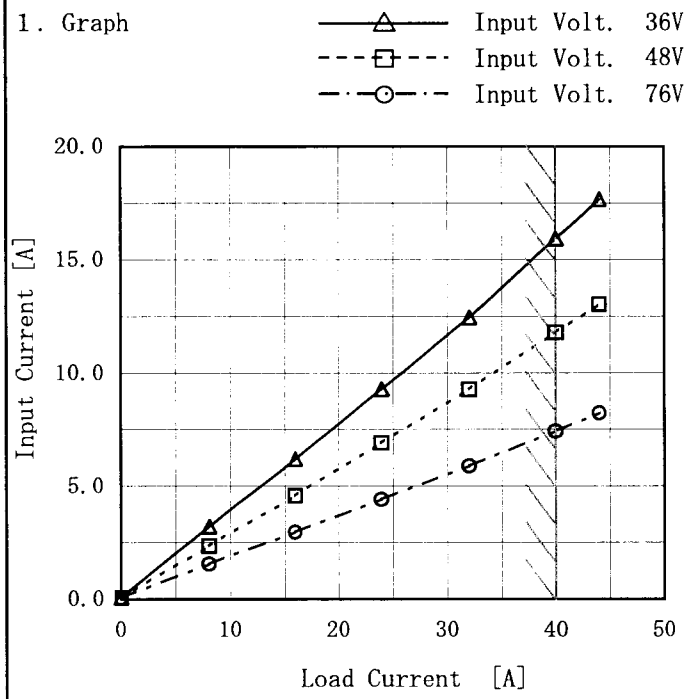
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
25	0.013	0.014	0.013
30	0.082	8.879	15.565
33	0.077	8.499	17.184
36	0.072	7.657	15.777
40	0.064	6.816	14.003
48	0.059	5.633	11.535
54	0.056	5.013	10.205
60	0.051	4.516	9.152
68	0.049	3.997	8.052
76	0.048	3.595	7.198
80	0.049	3.424	6.839
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	CDS4004812
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

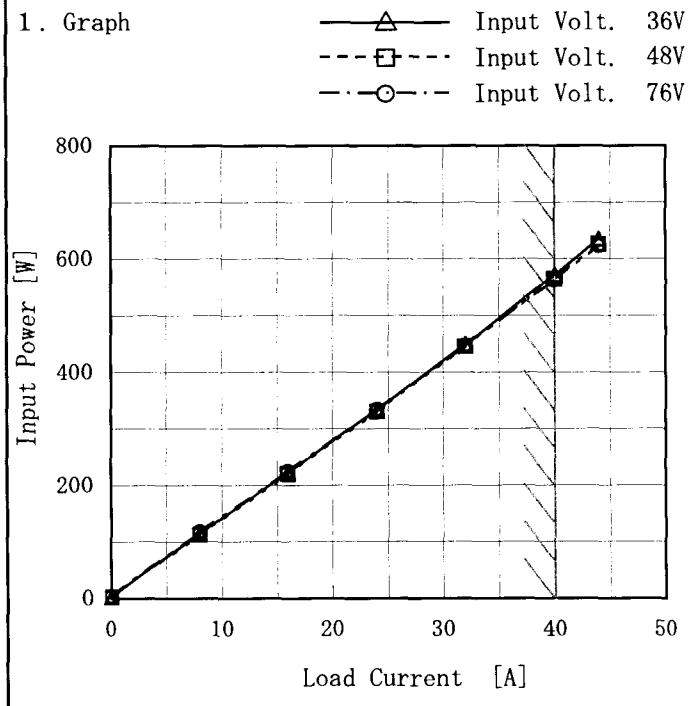
Load Current [A]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.072	0.060	0.049
8	3.216	2.351	1.545
16	6.196	4.581	2.956
24	9.292	6.911	4.402
32	12.459	9.275	5.878
40	15.934	11.800	7.423
44	17.660	13.028	8.217
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	CDS4004812
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

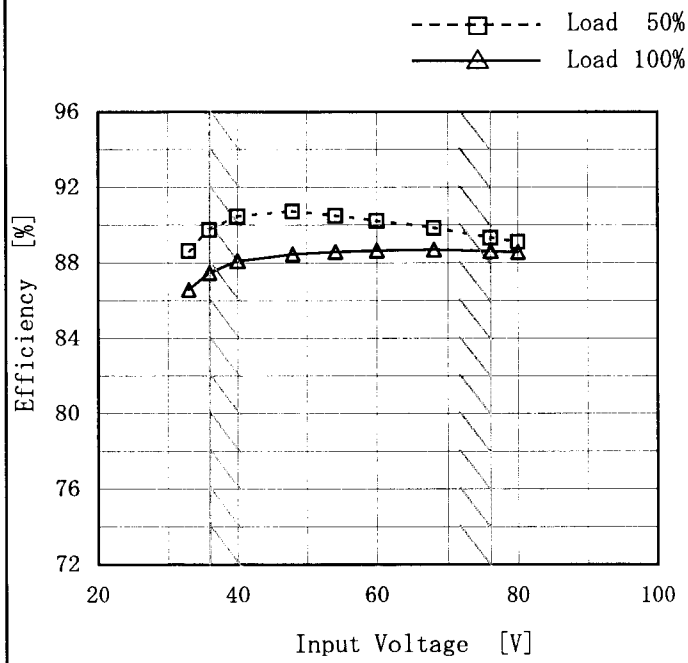
Load Current [A]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	2.6	2.9	3.7
8	115.2	112.6	117.4
16	222.7	219.8	224.4
24	334.0	330.6	333.9
32	449.3	445.2	446.4
40	571.2	564.5	563.1
44	635.0	626.1	622.9
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	CDS4004812
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

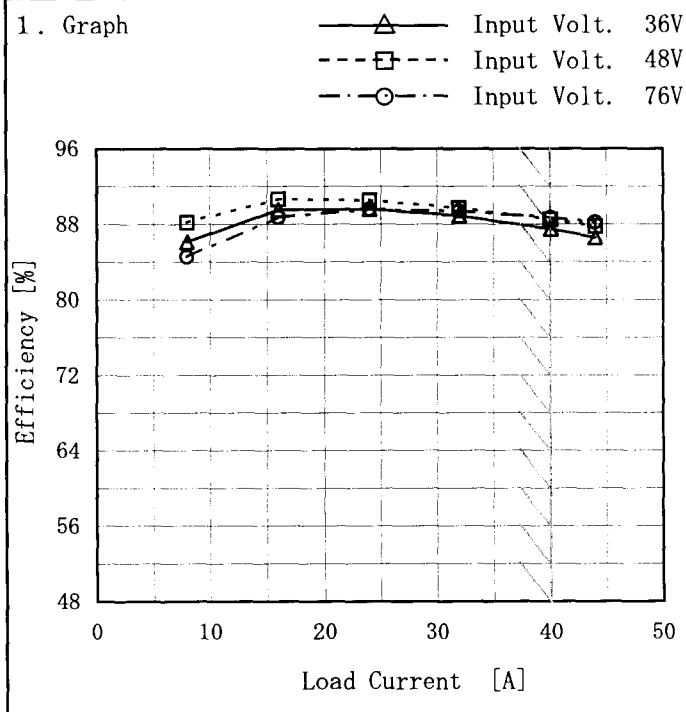
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	88.6	86.6
36	89.8	87.5
40	90.5	88.1
48	90.7	88.5
54	90.5	88.6
60	90.2	88.6
68	89.9	88.7
76	89.3	88.6
80	89.1	88.6

COSEL

Model	CDS4004812
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

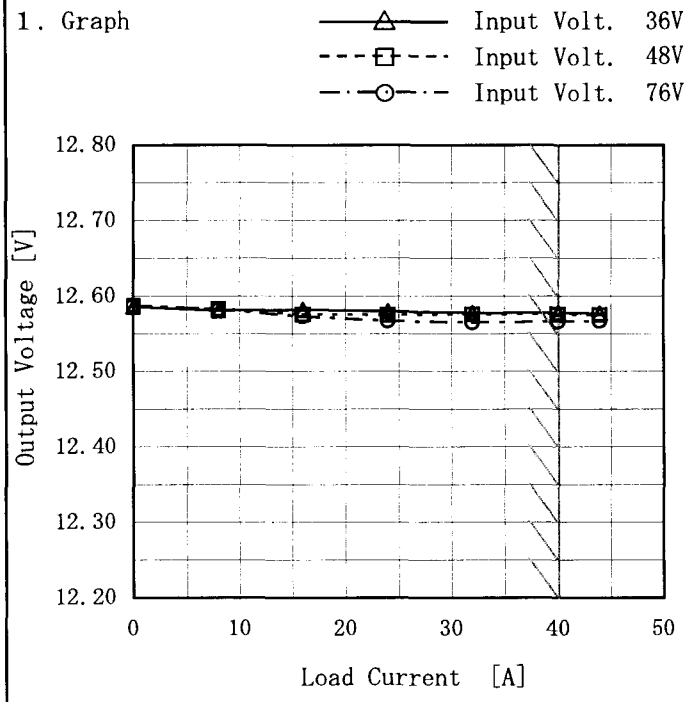
Load Current [A]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	—	—	—
8	86.1	88.2	84.5
16	89.5	90.7	88.8
24	89.6	90.5	89.6
32	88.9	89.7	89.4
40	87.5	88.5	88.7
44	86.6	87.8	88.2
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	CDS4004812
Item	Load Regulation 静的負荷変動
Object	+12.5V40A

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

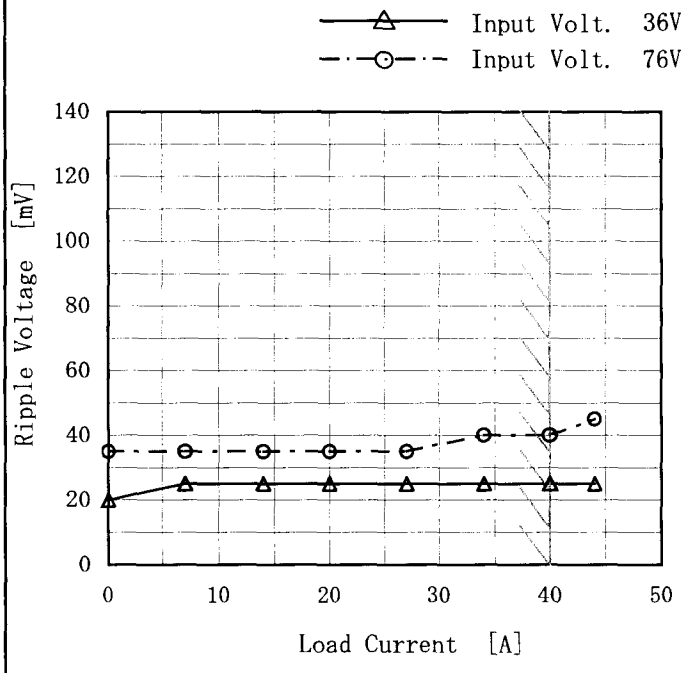
Load Current [A]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	12.586	12.587	12.587
8	12.581	12.583	12.582
16	12.582	12.576	12.573
24	12.580	12.575	12.567
32	12.578	12.576	12.565
40	12.578	12.576	12.566
44	12.577	12.575	12.567
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	CDS4004812
Item	Ripple Voltage (by Load Current) リップル電圧（負荷特性）
Object	+12.5V40A

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。

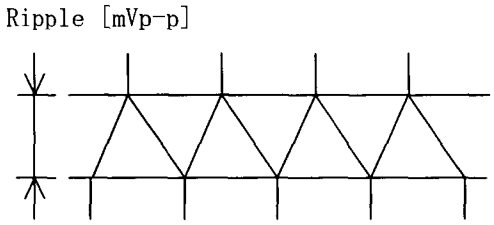


Fig. Complex Ripple Wave Form
図　リップル波形詳細図

2. Values

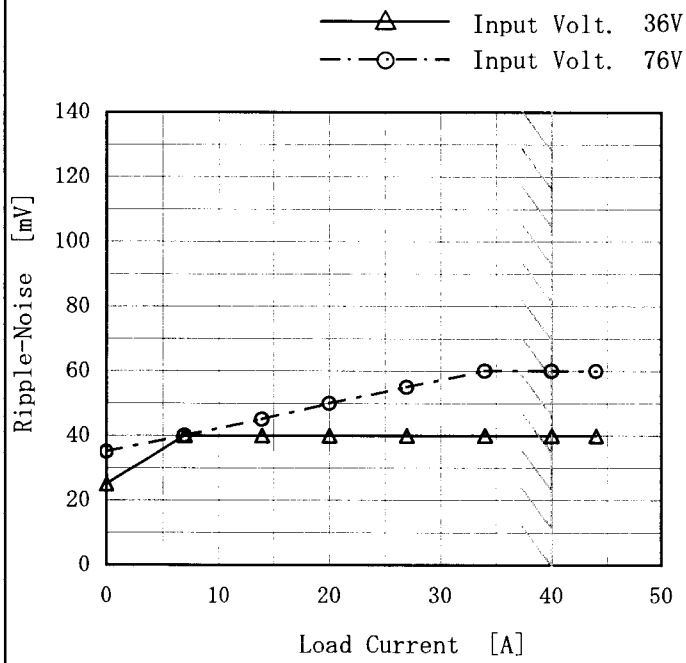
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	20	35
7	25	35
14	25	35
20	25	35
27	25	35
34	25	40
40	25	40
44	25	45
—	—	—
—	—	—
—	—	—

COSEL

Model	CDS4004812
Item	Ripple-Noise リップルノイズ
Object	+12.5V40A

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。

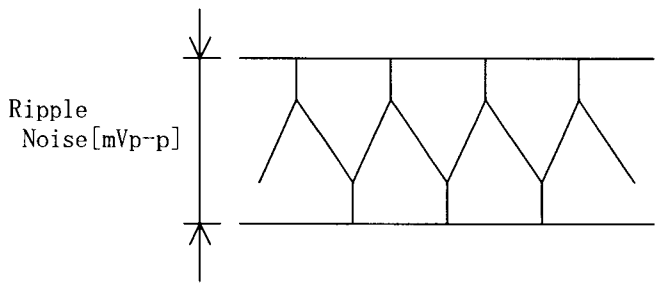


Fig. Complex Ripple Noise Wave Form
図　リップルノイズ波形

2. Values

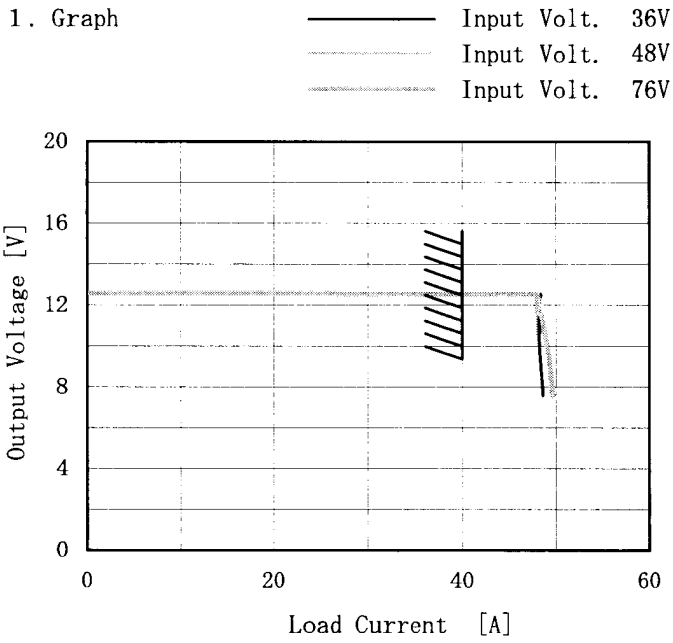
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	25	35
7	40	40
14	40	45
20	40	50
27	40	55
34	40	60
40	40	60
44	40	60
—	—	—
—	—	—
—	—	—

COSEL

Model	CDS4004812
Item	Overcurrent Protection 過電流保護
Object	+12.5V40A

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 7.5V to 0V.
7.5V～0V間は、間欠モードとなる。

2. Values

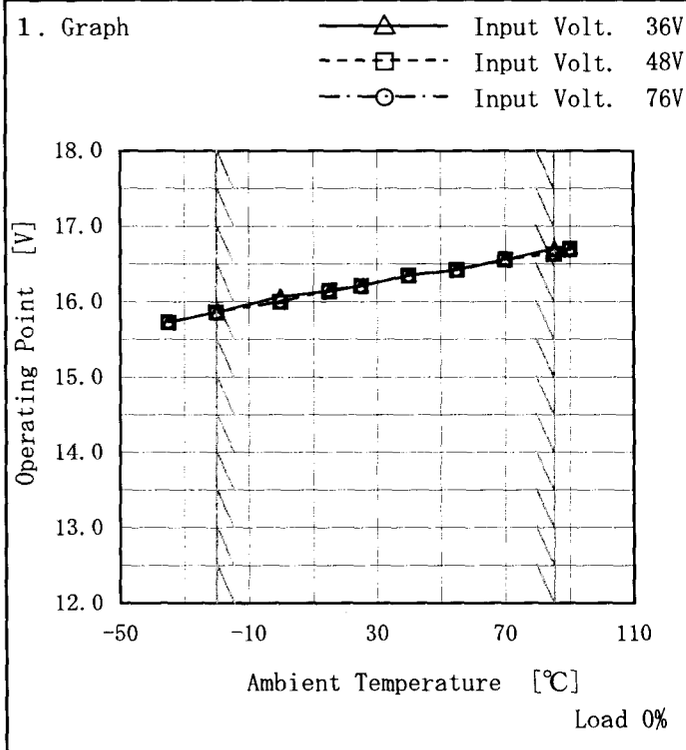
Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
12.500	48.44	47.92	48.19
11.875	48.40	47.99	48.35
11.250	48.32	48.08	48.60
10.000	48.32	48.25	49.11
8.750	48.49	48.48	49.43
7.500	48.68	48.61	49.77
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	CDS4004812
Item	Overvoltage Protection 過電圧保護
Object	+12.5V40A

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]
-35	15.73	15.73	15.73
-20	15.86	15.86	15.86
0	16.07	16.00	16.00
15	16.14	16.15	16.15
25	16.21	16.21	16.21
40	16.35	16.35	16.35
55	16.42	16.42	16.42
70	16.56	16.56	16.56
85	16.70	16.63	16.63
90	16.69	16.70	16.70
--	—	—	—

COSEL

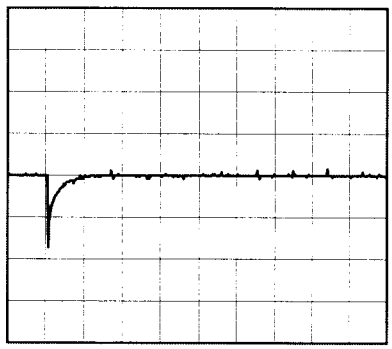
Model	CDS4004812		
Item	Dynamic Load Response 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+12.5V40A		

Input Volt. 48 V

Cycle 1000 ms

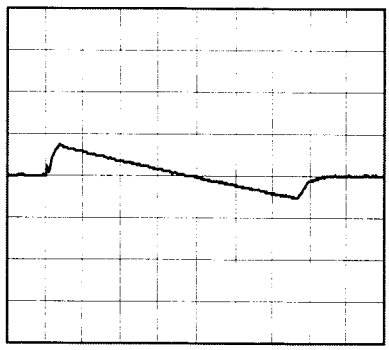
Load Current

Min. Load (0A) ⟷
Load 100% (40A)



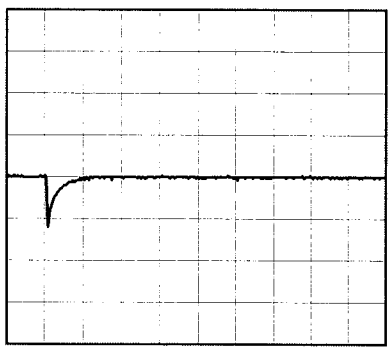
500 mV/div

2 ms/div



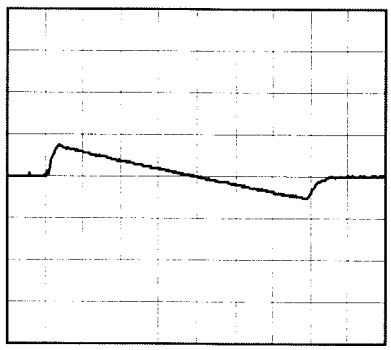
2 ms/div

Min. Load (0A) ⟷
Load 50% (20A)



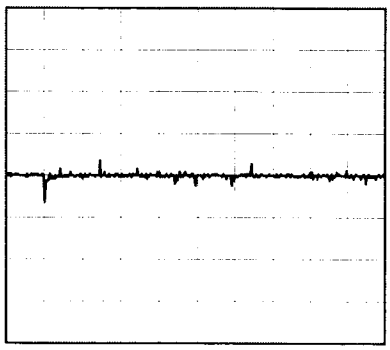
500 mV/div

2 ms/div



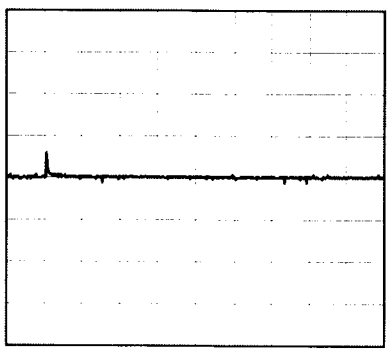
2 ms/div

Load 10% (4A) ⟷
Load 100% (40A)



500 mV/div

2 ms/div

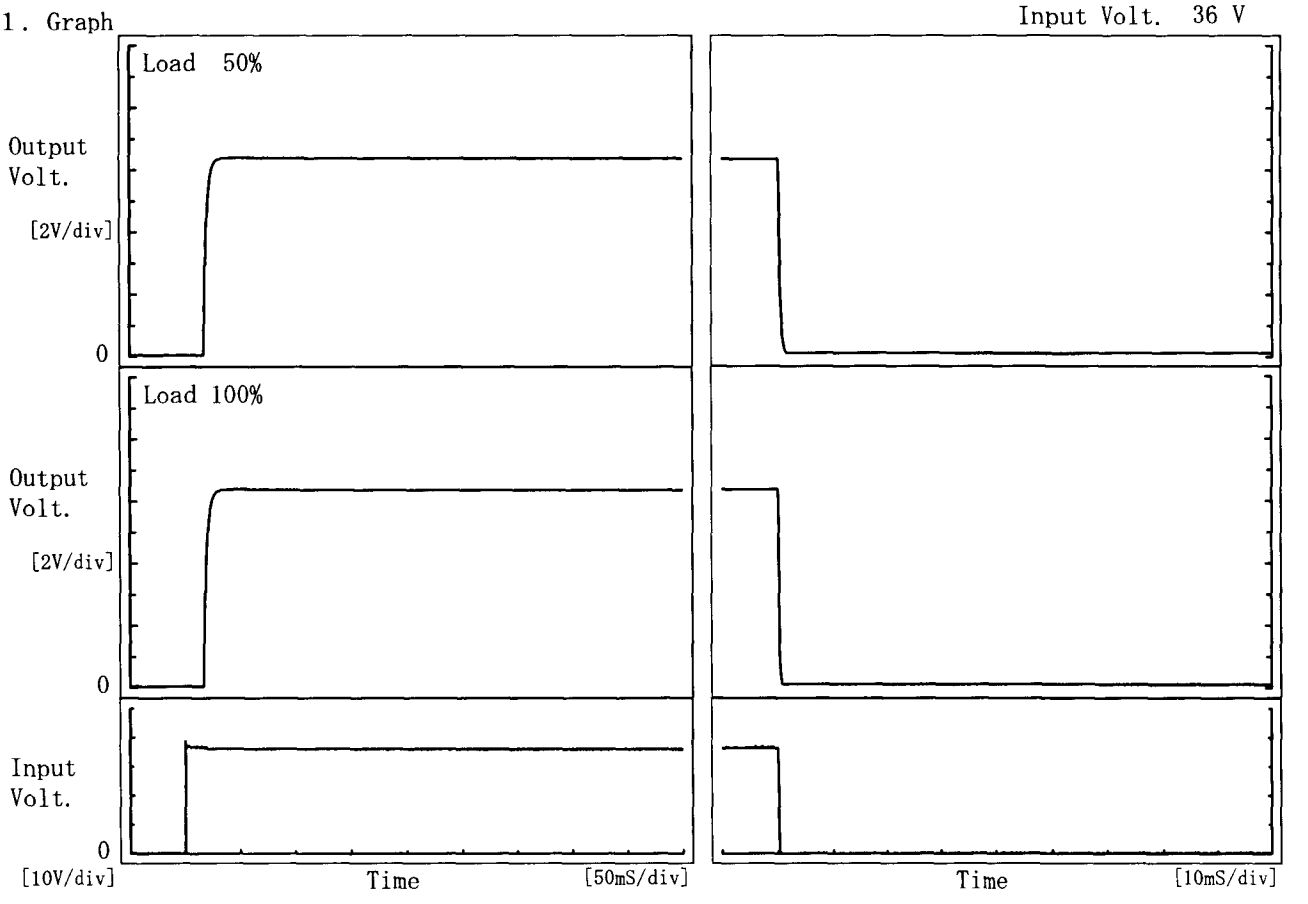


2 ms/div

COSEL

Model	CDS4004812		
Item	Rise and Fall Time 立上り、立下り時間	Temperature Testing Circuitry	25℃ Figure A
Object	+12.5V40A		

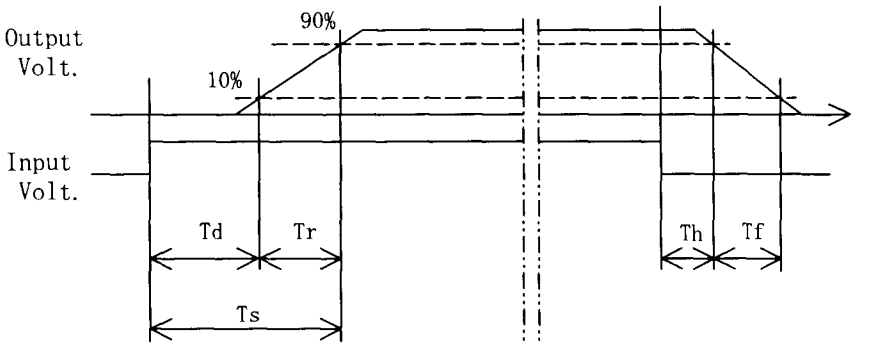
1. Graph



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	16.8	5.5	22.3	0.1	0.7
100 %	16.8	5.8	22.5	0.1	0.4

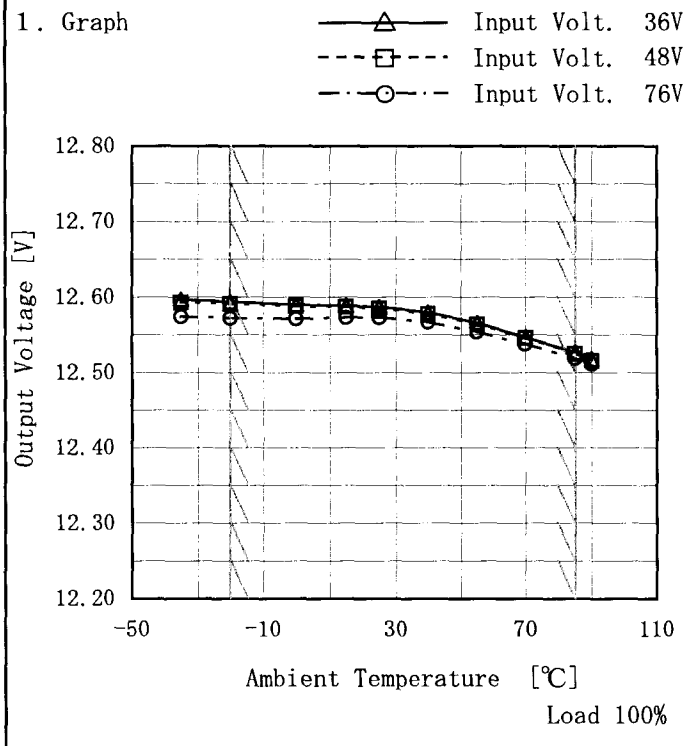


COSEL

Model	CDS4004812
Item	Ambient Temperature Drift 周囲温度変動
Object	+12.5V40A

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

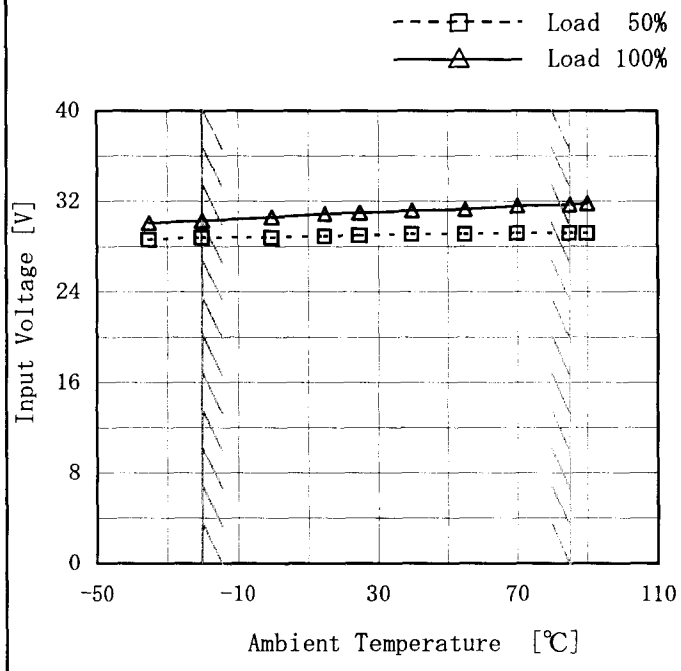
Ambient Temperature [℃]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-35	12.597	12.593	12.574
-20	12.594	12.591	12.572
0	12.590	12.588	12.571
15	12.589	12.587	12.573
25	12.587	12.585	12.573
40	12.580	12.578	12.567
55	12.566	12.564	12.554
70	12.547	12.546	12.538
85	12.527	12.525	12.519
90	12.518	12.516	12.511
--	—	—	—

COSEL

Model	CDS4004812
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+12.5V40A

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

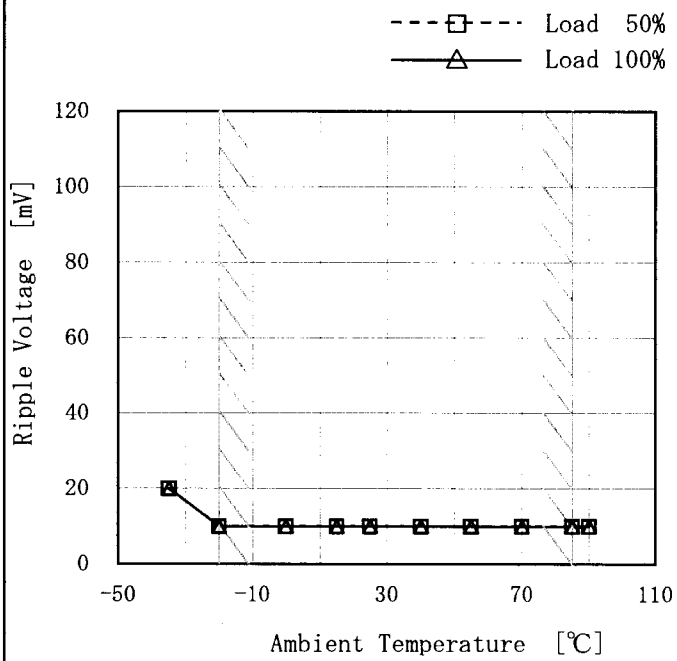
Ambient Temperature [℃]	Input Voltage [V]	
	Load 50%	Load 100%
-35	28.6	30.1
-20	28.8	30.3
0	28.8	30.6
15	28.9	30.9
25	29.0	31.0
40	29.1	31.2
55	29.1	31.3
70	29.2	31.6
85	29.2	31.7
90	29.2	31.8
—	—	—

COSEL

Model	CDS4004812
Item	Ripple Voltage (by Ambient Temp.) リップル電圧（周囲温度特性）
Object	+12.5V40A

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

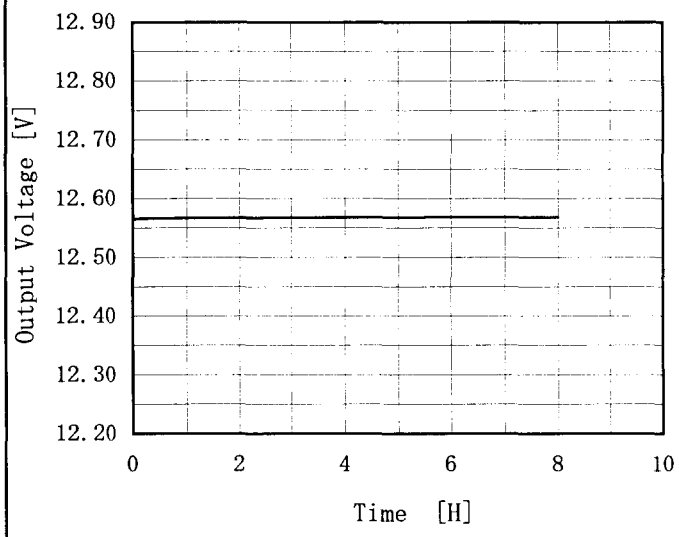
Ambient Temperature [℃]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-35	20	20
-20	10	10
0	10	10
15	10	10
25	10	10
40	10	10
55	10	10
70	10	10
85	10	10
90	10	10
—	—	—

COSEL

Model	CDS4004812
Item	Time Lapse Drift 経時ドリフト
Object	+12.5V40A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Input Volt. 48V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	12.577
0.5	12.566
1.0	12.567
2.0	12.568
3.0	12.568
4.0	12.568
5.0	12.568
6.0	12.569
7.0	12.569
8.0	12.569

COSEL

Model	CDS4004812
Item	Output Voltage Accuracy 定電圧精度
Object	+12.5V40A

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 : -20 ～ 85℃

Input Voltage : 36 ～ 76V

Load Current : 0 ～ 40A

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

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

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 : -20 ～ 85℃

入力電圧 : 36 ～ 76V

負荷電流 : 0 ～ 40A

＊ 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	-20	36	0	12.602	±42	±0.3
Minimum Voltage	85	76	40	12.519		

COSEL

Model	CDS4004812	
Item	Condense 結露特性	Testing Circuitry Figure A
Object	+12.5V40A	

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]	12.566	Input Volt.:48V, Load Current.:40A
Line Regulation [mV]	13	Input Volt.:36～76V, Load Current.:40A
Load Regulation [mV]	13	Input Volt.:48V, Load Current.:0～40A

COSEL

Model	CDS4004812		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25℃ Figure B
Object	+12.5V40A		

1. Conditions

- Input Voltage : 48 V
- Pulse Voltage : 2000 V
- Pulse Cycle : 10 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

COSEL

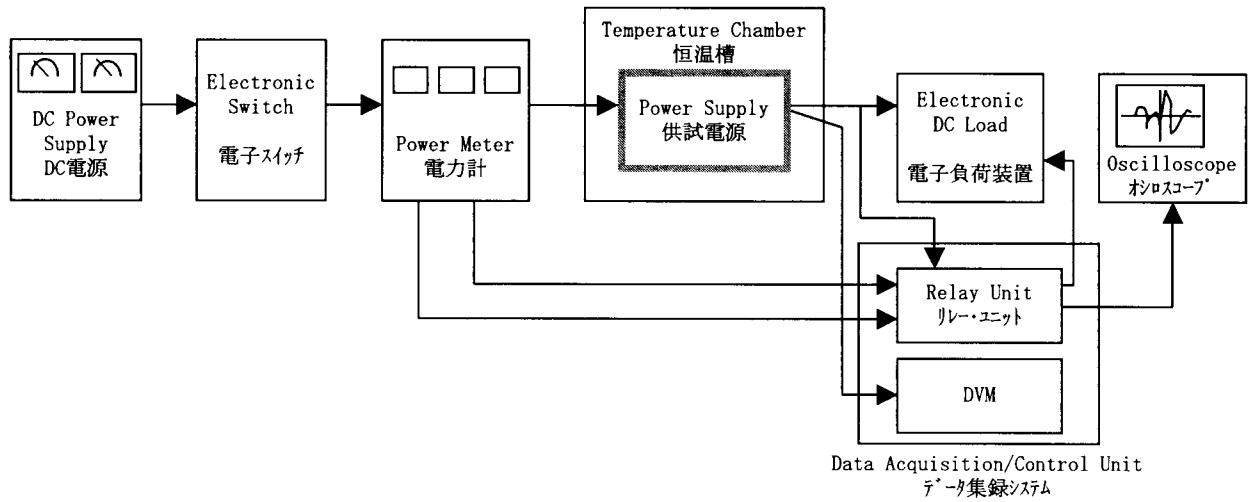


Figure A

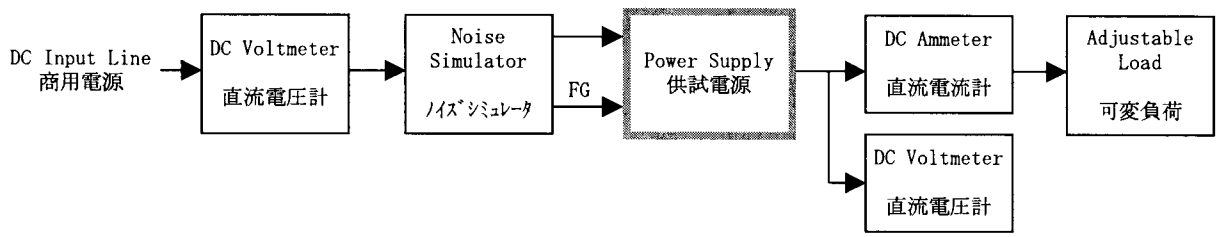


Figure B

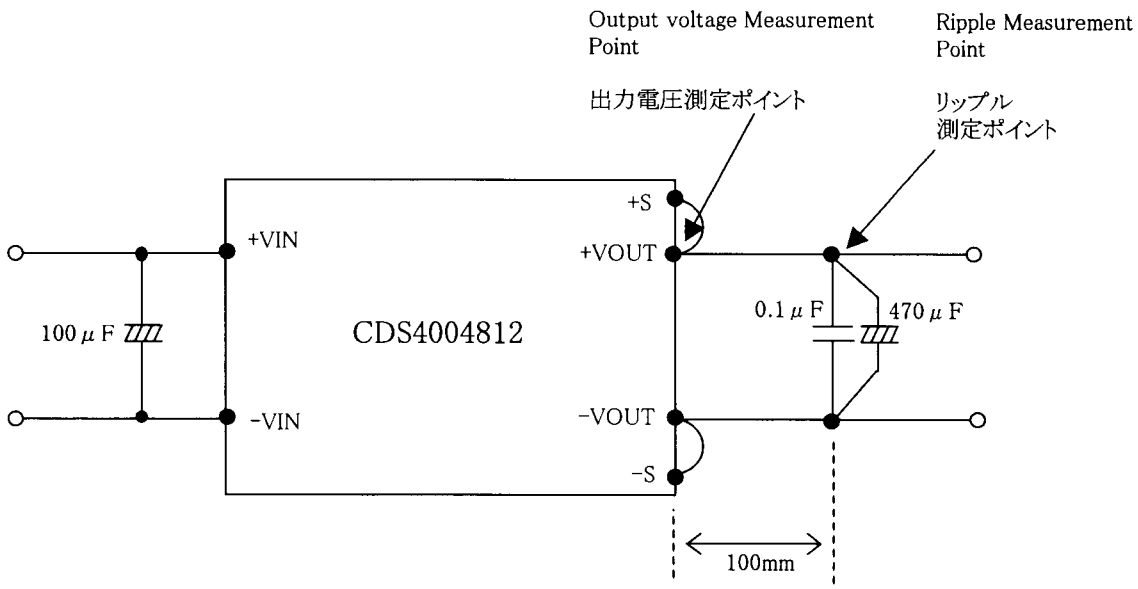


Figure C (General Electric Characteristic)
一般電気特性