参考資料

COSEL

TEST DATA OF ZUS1R51212

(12.0V INPUT)

Regulated DC Power Supply

Date : June 14. 1996

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COSEL CO., LTD.

参考資料

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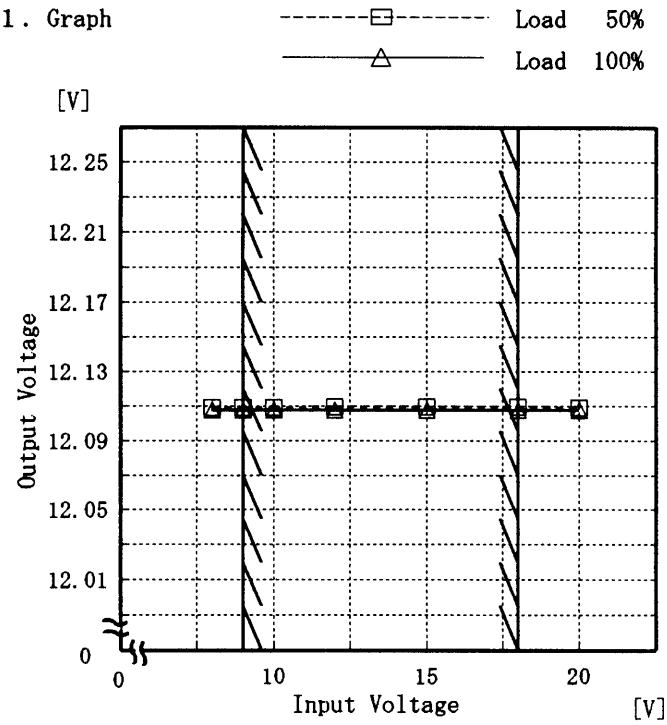
Model	ZUS1R51212
Item	Line Regulation 静的入力変動
Object	+12V0.13A

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]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]
8.0	12.109	12.108
9.0	12.109	12.108
10.0	12.109	12.108
12.0	12.109	12.108
15.0	12.109	12.108
18.0	12.109	12.107
20.0	12.109	12.107
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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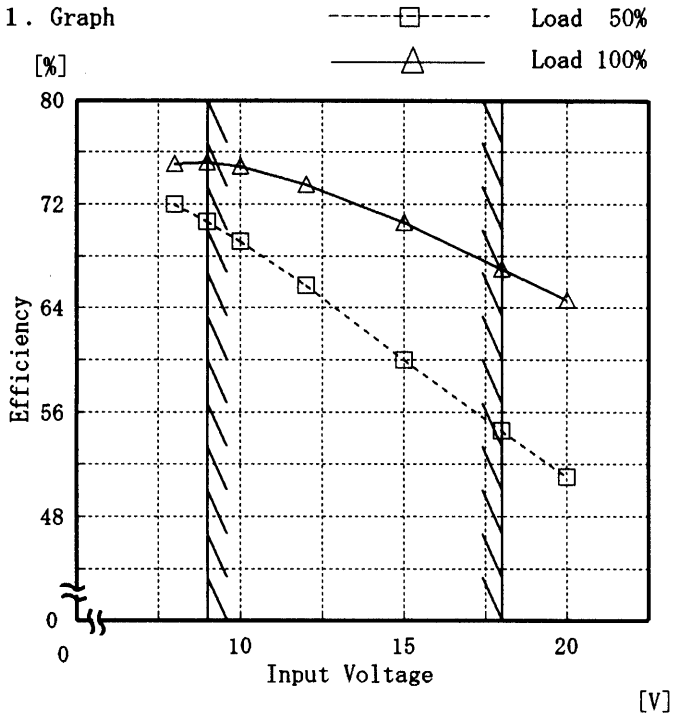
Model	ZUS1R51212
Item	Efficiency 効率
Object	――――――――――――

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

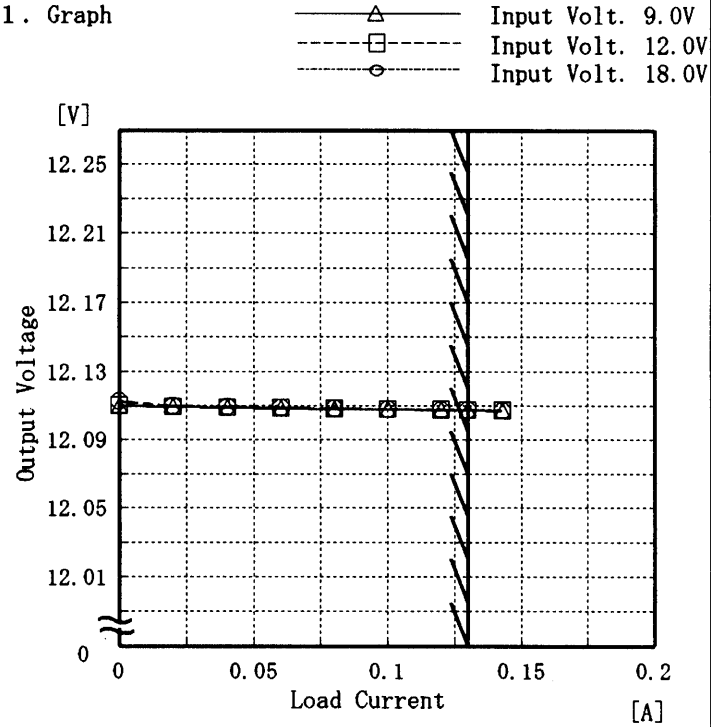
Input Voltage [V]	Load 50% Efficiency [%]	Load 100% Efficiency [%]
8.0	72.0	75.1
9.0	70.6	75.2
10.0	69.1	74.9
12.0	65.7	73.5
15.0	60.0	70.6
18.0	54.6	67.0
20.0	51.0	64.6
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	ZUS1R51212
Item	Load Regulation 静的負荷変動
Object	+12V0.13A

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 Volt. 9.0[V] Output Volt. [V]	Input Volt. 12.0[V] Output Volt. [V]	Input Volt. 18.0[V] Output Volt. [V]
0.00	12.110	12.111	12.113
0.02	12.110	12.110	12.110
0.04	12.109	12.109	12.109
0.06	12.109	12.109	12.109
0.08	12.108	12.109	12.109
0.10	12.108	12.108	12.108
0.12	12.108	12.108	12.108
0.13	12.108	12.108	12.108
0.14	12.107	12.108	12.107
—	—	—	—

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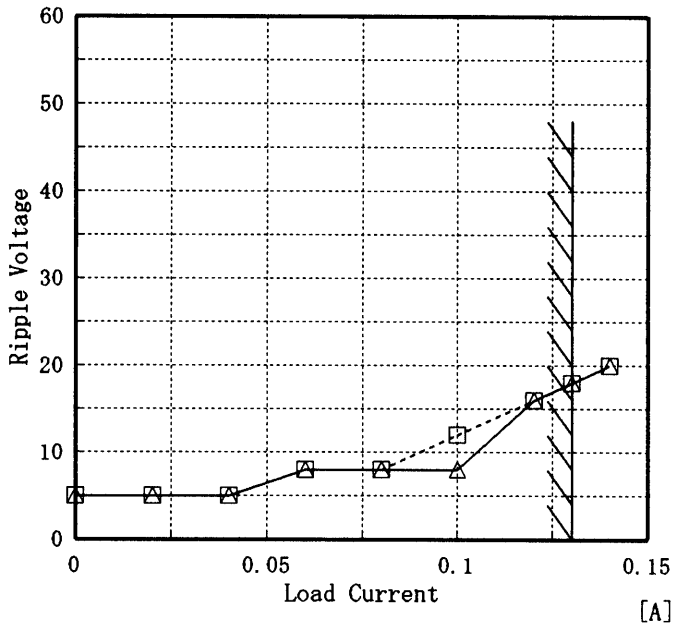
Model	ZUS1R51212
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+12V 0.13A

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。

T1: Due to AC Input Line
入力商用周期
T2: Due to Switching
ｽｲｯﾁﾝｸﾞ周期

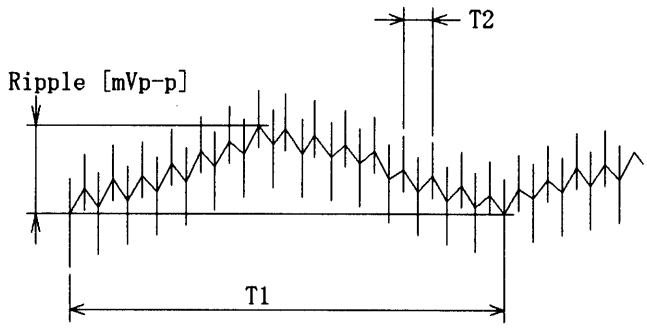


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

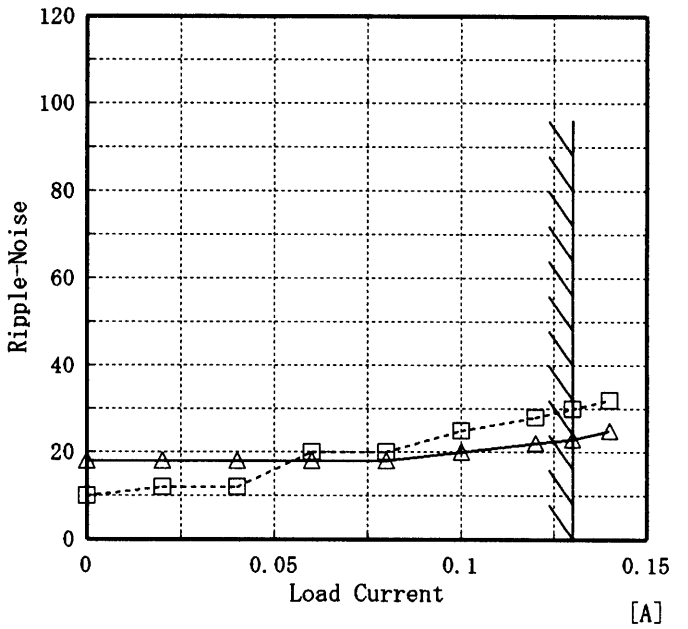
Load Current [A]	Input Volt. 9.0 [V] Ripple Output Volt. [mV]	Input Volt. 18.0 [V] Ripple Output Volt. [mV]
0.00	5	5
0.02	5	5
0.04	5	5
0.06	8	8
0.08	8	8
0.10	12	8
0.12	16	16
0.13	18	18
0.14	20	20
—	—	—
—	—	—

COSEL

Model	ZUS1R51212
Item	Ripple-Noise リップルノイズ
Object	+12V0.13A

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。

T1: Due to AC Input Line
入力商用周期
T2: Due to Switching
ｽｲｯﾁﾝｸﾞ周期

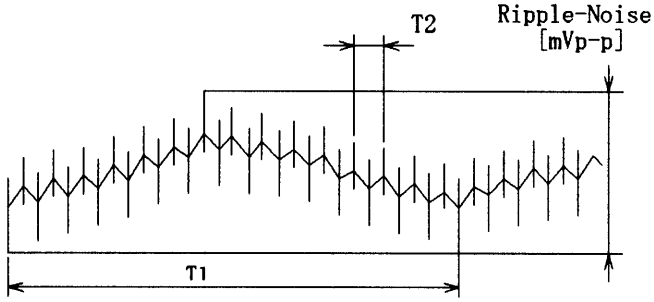


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

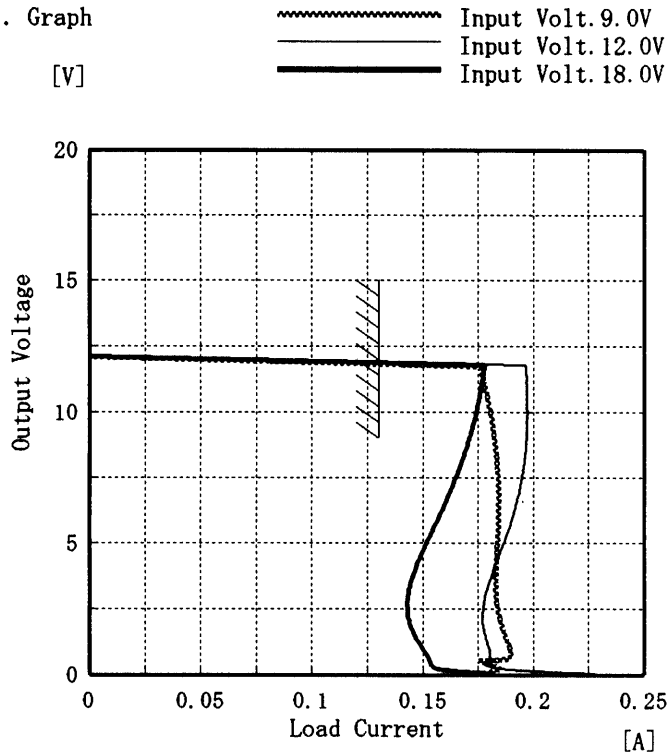
Load current [A]	Input Volt. 9.0 [V] Ripple-Noise [mV]	Input Volt. 18.0 [V] Ripple-Noise [mV]
0.00	10	18
0.02	12	18
0.04	12	18
0.06	20	18
0.08	20	18
0.10	25	20
0.12	28	22
0.13	30	23
0.14	32	25
—	—	—
—	—	—

COSEL

Model	ZUS1R51212
Item	Overcurrent Protection 過電流保護
Object	+12V0.13A

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

Output Voltage [V]	Input Volt. 9.0[V] Load Current [A]	Input Volt. 12.0[V] Load Current [A]	Input Volt. 18.0[V] Load Current [A]
12.00	0.18	0.20	0.18
11.40	0.18	0.20	0.18
10.80	0.18	0.20	0.18
9.60	0.18	0.20	0.17
8.40	0.18	0.20	0.17
7.20	0.18	0.19	0.16
6.00	0.18	0.19	0.16
4.80	0.18	0.19	0.15
3.60	0.18	0.18	0.15
2.40	0.18	0.18	0.14
1.20	0.19	0.18	0.15
0.00	0.17	0.23	0.18

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Model	ZUS1R51212		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+12V0.13A		

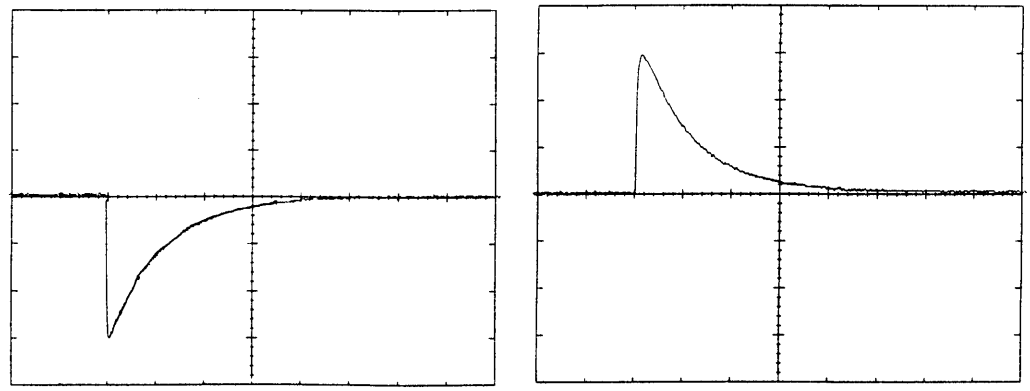
Input Volt. 12.0 V

Cycle 100 mS

Load Current

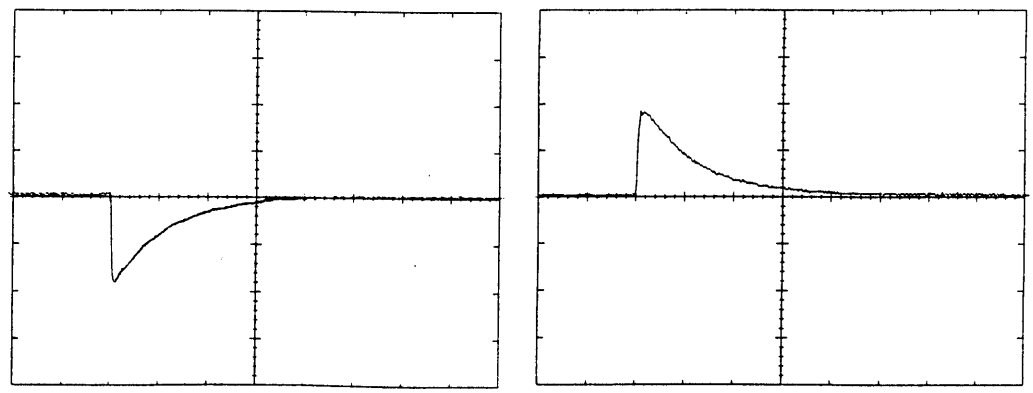
Min. Load ⟷
Load 100 %

200 mV/div



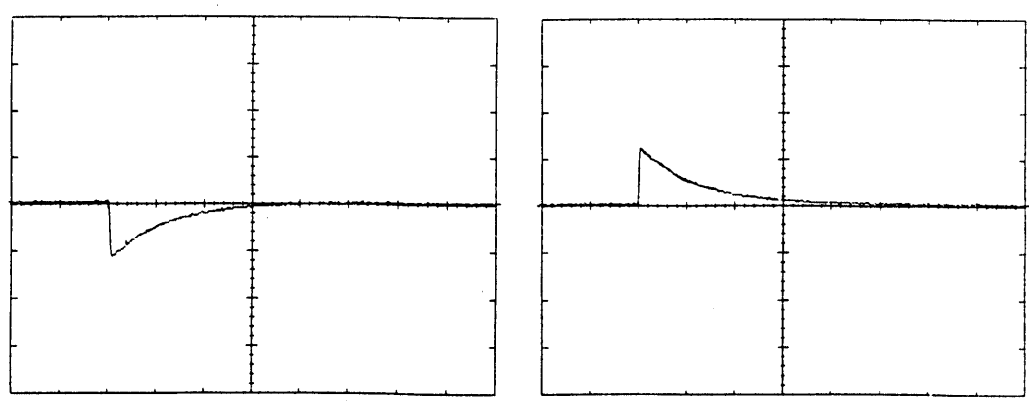
Min. Load ⟷
Load 50 %

200 mV/div



Load 50%⟷
Load 100 %

200 mV/div



1 mS/div

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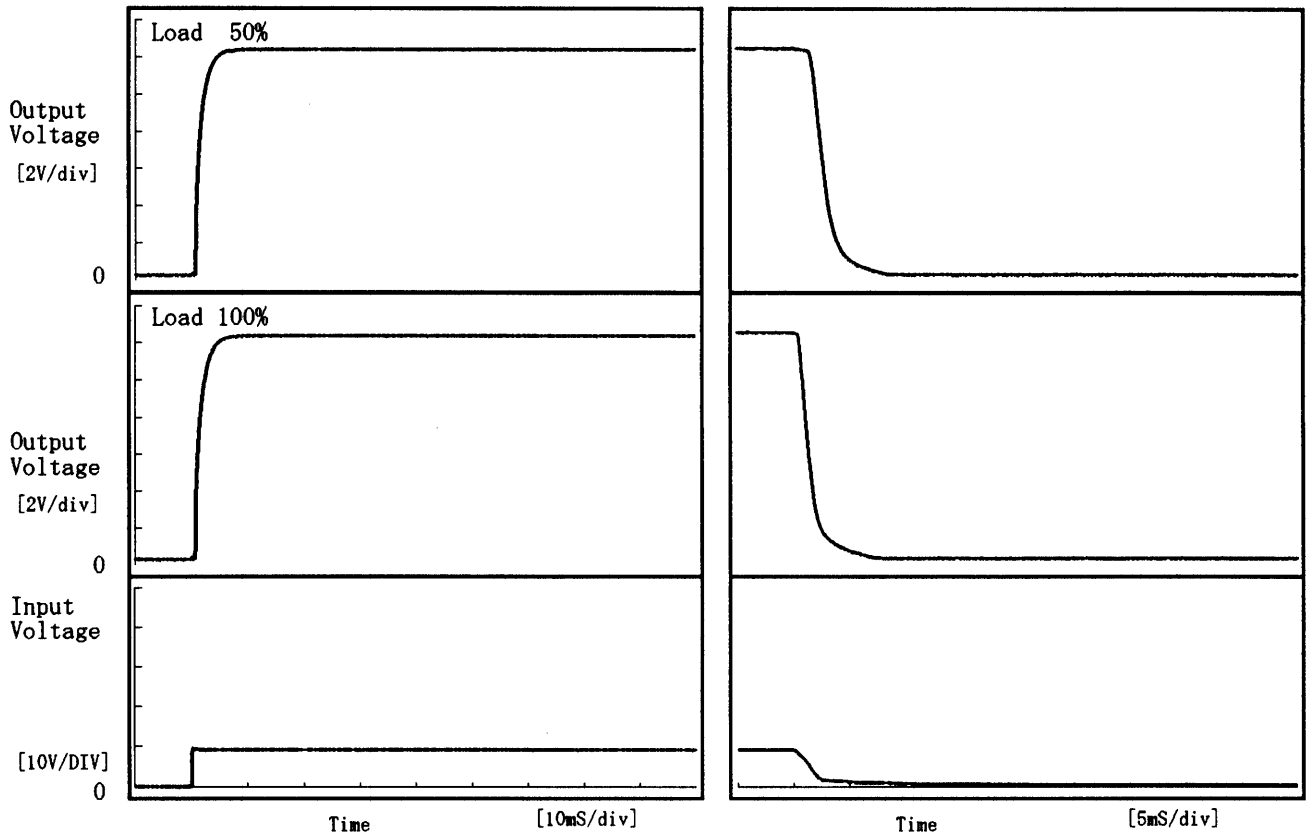
Model	ZUS1R51212		
Item	Rise and Fall Time 立上り、立下り時間	Temperature Testing Circuitry	25℃ Figure A
Object	+12V0.13A		

1. Graph

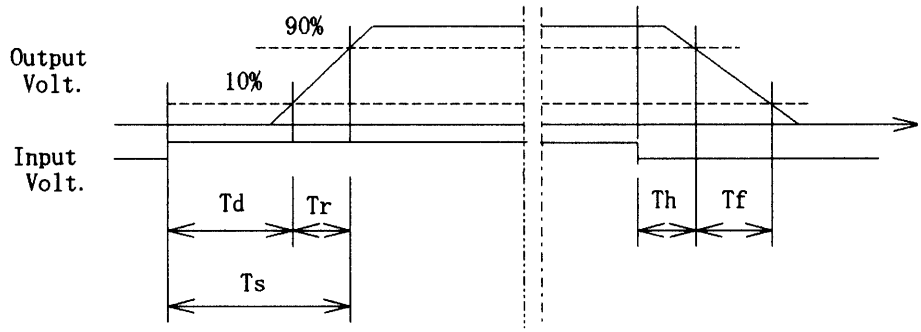
Input Volt. 9.0 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	0.65	2.40	3.05	1.85	2.70
100 %	0.65	2.50	3.15	0.75	2.35



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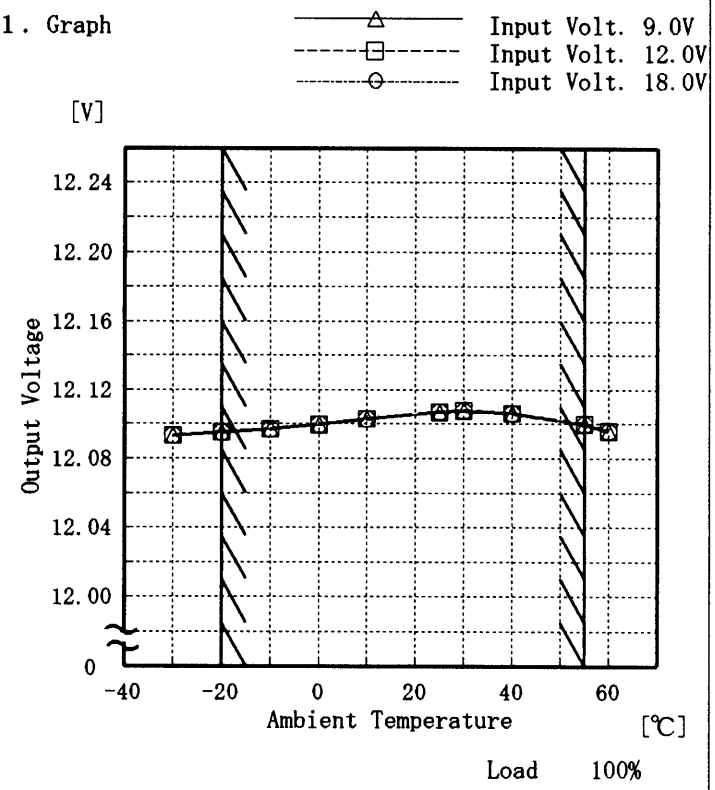
Model	ZUS1R51212
Item	Ambient Temperature Drift 周囲温度変動
Object	+12V0.13A

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

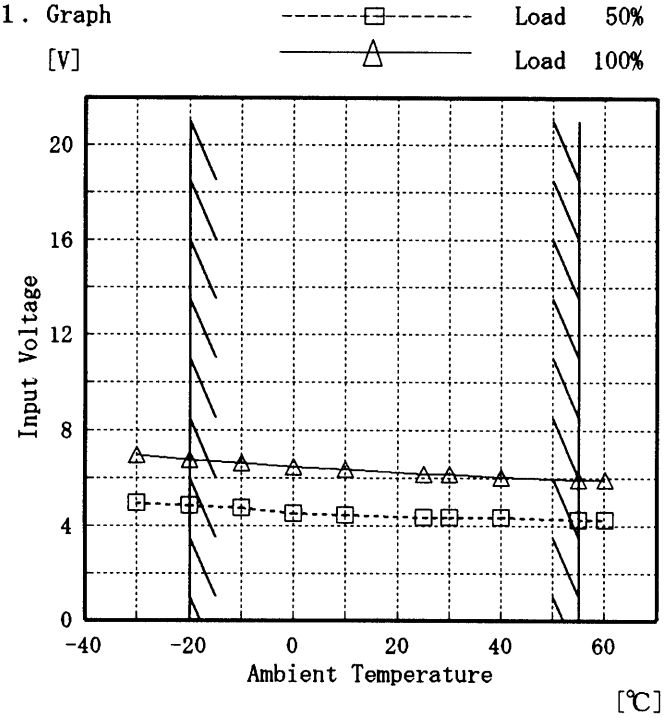
Temperature [℃]	Input Volt. 9.0[V] Output Volt. [V]	Input Volt. 12.0[V] Output Volt. [V]	Input Volt. 18.0[V] Output Volt. [V]
-30	12.093	12.093	12.093
-20	12.095	12.095	12.095
-10	12.097	12.097	12.097
0	12.099	12.100	12.100
10	12.103	12.103	12.103
25	12.107	12.107	12.107
30	12.108	12.108	12.108
40	12.106	12.106	12.106
55	12.100	12.100	12.100
60	12.096	12.096	12.096
—	—	—	—

COSEL

Model	ZUS1R51212
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+12V0.13A

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

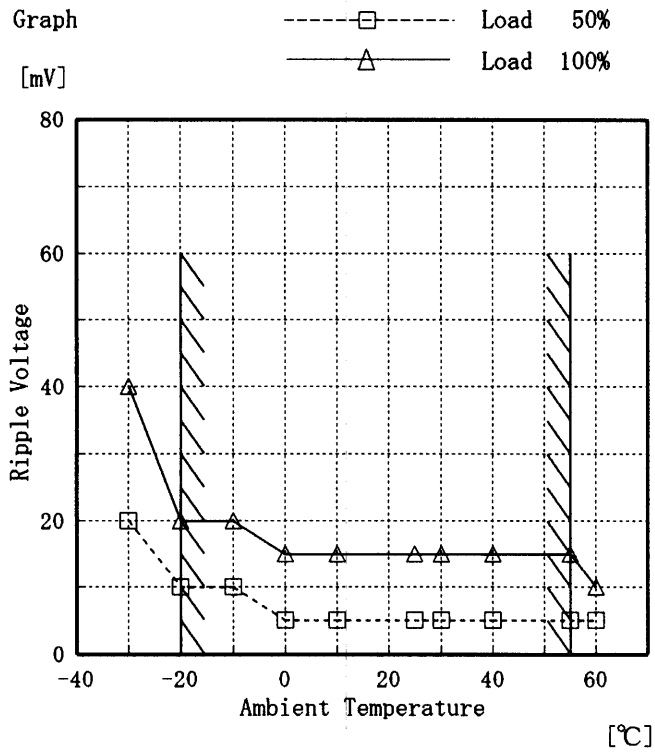
Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	5.0	7.0
-20	4.9	6.8
-10	4.8	6.7
0	4.6	6.5
10	4.5	6.4
25	4.4	6.2
30	4.4	6.2
40	4.4	6.1
55	4.3	5.9
60	4.3	5.9
—	—	—

COSEL

Model	ZUS1R51212
Item	Ripple Voltage (by Ambient Temp.) リップル電圧（周囲温度特性）
Object	+12V0.13A

Testing Circuitry　Figure A

1. Graph



Input Volt.　9.0 V

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

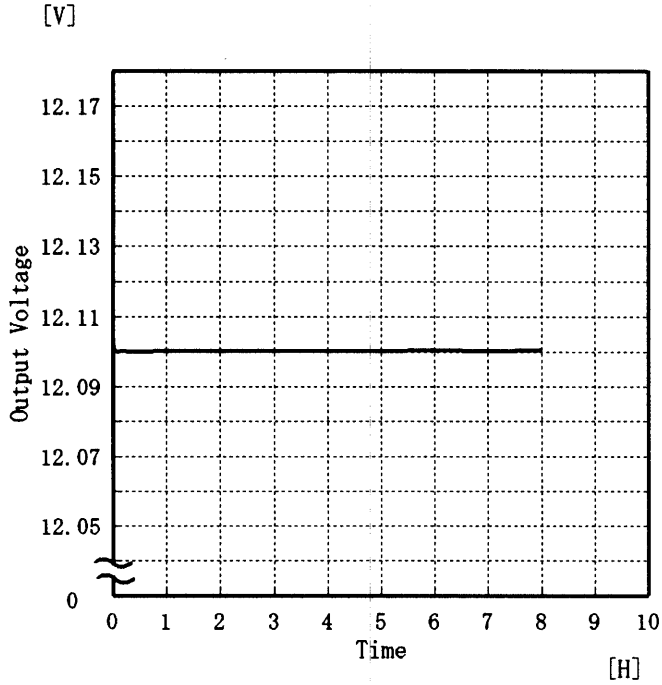
Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-30	20	40
-20	10	20
-10	10	20
0	5	15
10	5	15
25	5	15
30	5	15
40	5	15
55	5	15
60	5	10
—	—	—

COSEL

Model	ZUS1R51212
Item	Time Lapse Drift 経時ドリフト
Object	+12V0.13A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 12V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	12.103
0.5	12.100
1.0	12.100
2.0	12.100
3.0	12.100
4.0	12.100
5.0	12.100
6.0	12.101
7.0	12.101
8.0	12.101

COSEL

Model	ZUS1R51212	
Item	Output Voltage Accuracy 定電圧精度	Testing Circuitry Figure A
Object	+12V0.13A	

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 : -20～55 ℃
Input Voltage : 9.0～18.0 V
Load Current : 0.00～0.13 A

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

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

定電圧精度

周囲温度、入力電圧、負荷を下記仕様内で、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 -20～55 ℃
入力電圧 9.0～18.0 V
負荷電流 0.00～0.13 A

* 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

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

Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	25	18.0	0.00	12.113	±9	±0.1
Minimum Voltage	-20	9.0	0.13	12.095		

COSEL

Model	ZUS1R51212
Item	Condensation 結露特性
Object	+12V 0.13A

Testing Circuitry Figure A

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 24℃ and the humidity is 40%RH.

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

④ Repeating ①,② and ③ three times.

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２４℃、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３度行い、異常のないことを確認する。

2．Values

	Times	Output Voltage [V]	Ripple Voltage [mV]	Ripple Noise [mV]
Load 50 %	1	12.221	10	20
	2	12.223	10	20
	3	12.223	10	20
Load 100 %	1	12.219	20	25
	2	12.222	20	25
	3	12.220	20	25

Input Volt. 12.0 V

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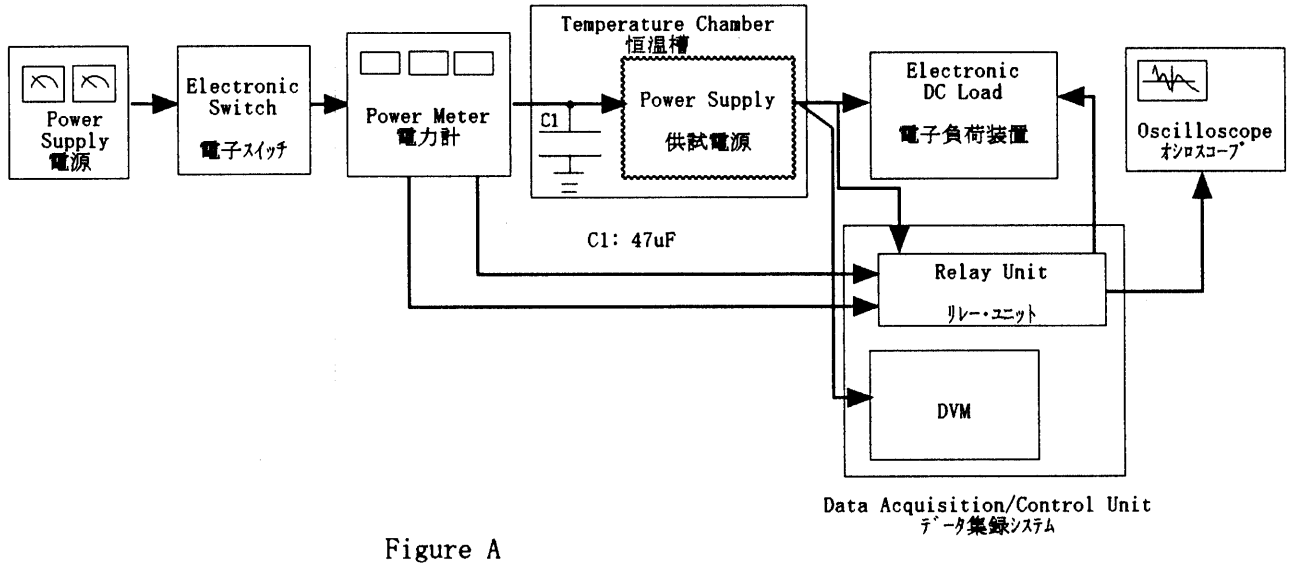

Figure A