



# TEST DATA OF ZUS102412

(24.0V INPUT)

Regulated DC Power Supply

Date : Sep 21. 1996

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Design Manager

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Design Engineer

コーセル株式会社  
COSEL CO., LTD.

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(Final Page 15 )

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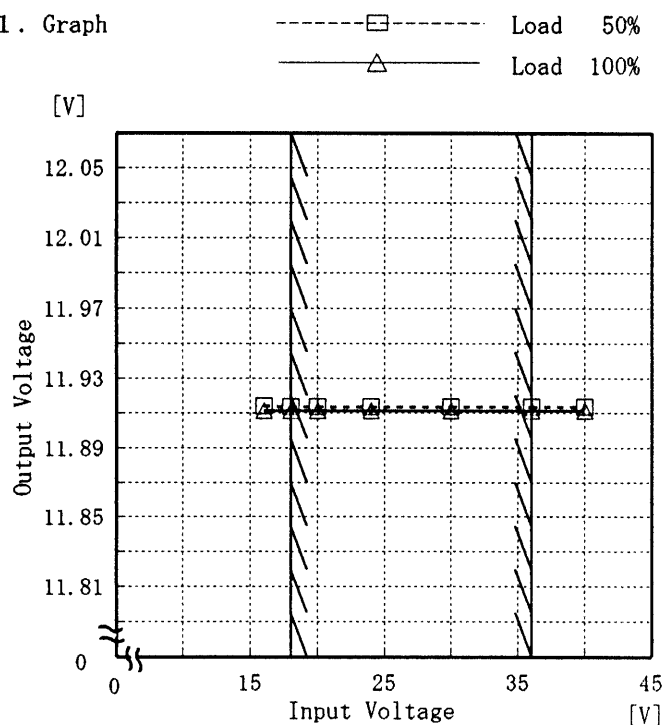
Model ZUS102412

Item Line Regulation 静的入力変動

Object +12V0.900A

Temperature 25°C  
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%	Load 100%
	Output Volt. [V]	Output Volt. [V]
16.0	11.914	11.911
18.0	11.914	11.911
20.0	11.914	11.911
24.0	11.914	11.911
30.0	11.913	11.911
36.0	11.913	11.911
40.0	11.913	11.911
—	—	—
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Model		ZUS102412	Temperature 25℃ Testing Circuitry Figure A																																																																																					
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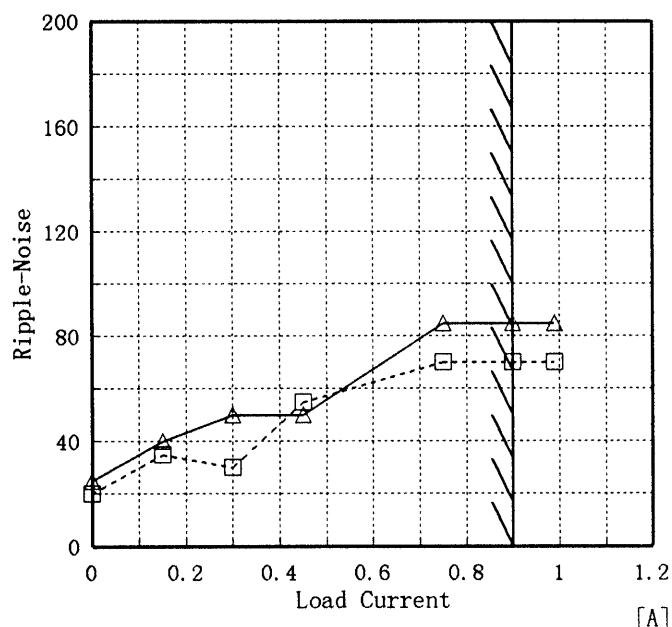
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<p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>リップル電圧は、下図 p-p 値で示される。</p> <p>(注)斜線は定格負荷電流範囲を示す。</p> <div><div>T1: Due to AC Input Line 入力商用周期</div><div>T2: Due to Switching スイッチング周期</div><div></div></div>																																										
<p>Fig. Complex Ripple Wave Form</p> <p>図 リップル波形詳細図</p>																																										

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Model	ZUS102412
Item	Ripple-Noise リップルノイズ
Object	+12V0.900A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph  
[mV]



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。

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T1: Due to AC Input Line  
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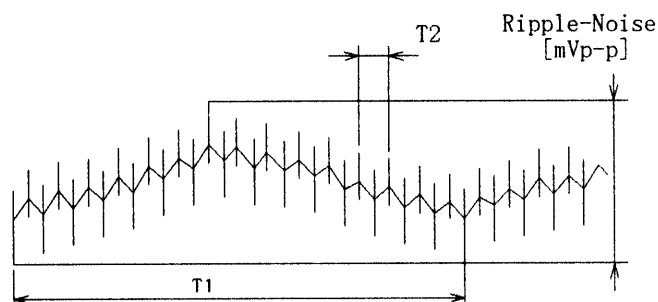


Fig. Complex Ripple Wave Form

図 リップル波形詳細図

2. Values

Load current [A]	Input Volt. 18.0 [V]	Input Volt. 36.0 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	20	25
0.15	35	40
0.30	30	50
0.45	55	50
0.75	70	85
0.90	70	85
0.99	70	85
—	—	—
—	—	—
—	—	—
—	—	—

**COSEL**

Model ZUS102412		Temperature 25°C																																																					
Item Overcurrent Protection 過電流保護		Testing Circuitry Figure A																																																					
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1. Graph <div> <div> <div>~~~~~</div> <div>-----</div> <div>————</div> </div> <div> <div>Input Volt. 18.0V</div> <div>Input Volt. 24.0V</div> <div>Input Volt. 36.0V</div> </div> </div> <div> <div>[V]</div> <div>Output Voltage [V]</div> <div>Load Current [A]</div> </div>		2. Values <table border="1"> <thead> <tr> <th>Output Voltage [V]</th><th>Input Volt. 18.0[V] Load Current [A]</th><th>Input Volt. 24.0[V] Load Current [A]</th><th>Input Volt. 36.0[V] Load Current [A]</th></tr> </thead> <tbody> <tr><td>12.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>11.40</td><td>1.17</td><td>1.21</td><td>1.18</td></tr> <tr><td>10.80</td><td>1.20</td><td>1.25</td><td>1.22</td></tr> <tr><td>9.60</td><td>1.28</td><td>1.32</td><td>1.30</td></tr> <tr><td>8.40</td><td>1.35</td><td>1.41</td><td>1.39</td></tr> <tr><td>7.20</td><td>1.40</td><td>1.44</td><td>1.42</td></tr> <tr><td>6.00</td><td>1.43</td><td>1.45</td><td>1.41</td></tr> <tr><td>4.80</td><td>1.38</td><td>1.38</td><td>1.31</td></tr> <tr><td>3.60</td><td>1.29</td><td>1.26</td><td>1.16</td></tr> <tr><td>2.40</td><td>1.27</td><td>1.23</td><td>1.11</td></tr> <tr><td>1.20</td><td>1.25</td><td>1.20</td><td>1.05</td></tr> <tr><td>0.00</td><td>1.28</td><td>1.16</td><td>1.32</td></tr> </tbody> </table>		Output Voltage [V]	Input Volt. 18.0[V] Load Current [A]	Input Volt. 24.0[V] Load Current [A]	Input Volt. 36.0[V] Load Current [A]	12.00	0.00	0.00	0.00	11.40	1.17	1.21	1.18	10.80	1.20	1.25	1.22	9.60	1.28	1.32	1.30	8.40	1.35	1.41	1.39	7.20	1.40	1.44	1.42	6.00	1.43	1.45	1.41	4.80	1.38	1.38	1.31	3.60	1.29	1.26	1.16	2.40	1.27	1.23	1.11	1.20	1.25	1.20	1.05	0.00	1.28	1.16	1.32
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# COSEL

Model	ZUS102412	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	+12V0.900A		

Input Volt. 24 V

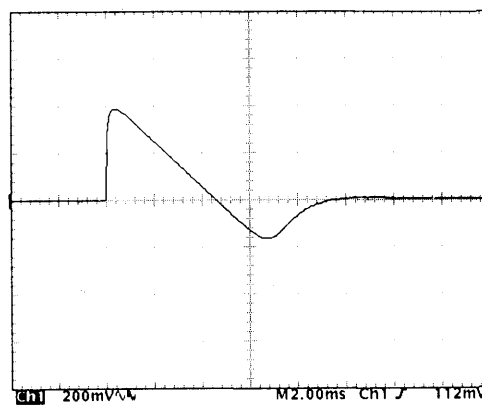
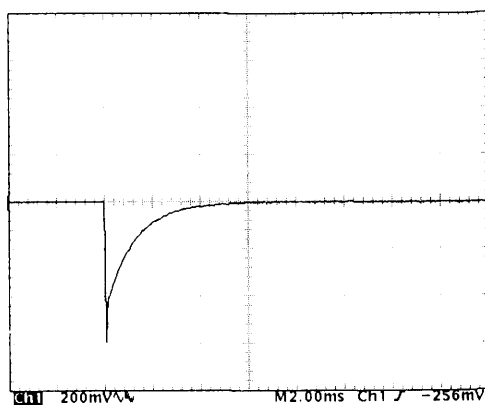
Cycle 100 mS

Load Current

Min. Load ↔

Load 100 %

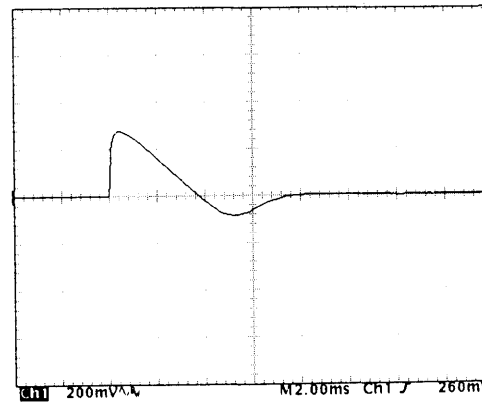
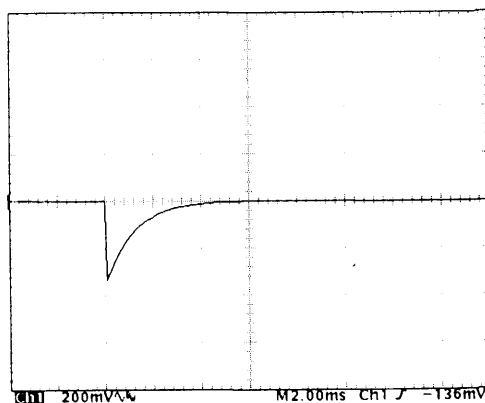
200 mV/div



Min. Load ↔

Load 50 %

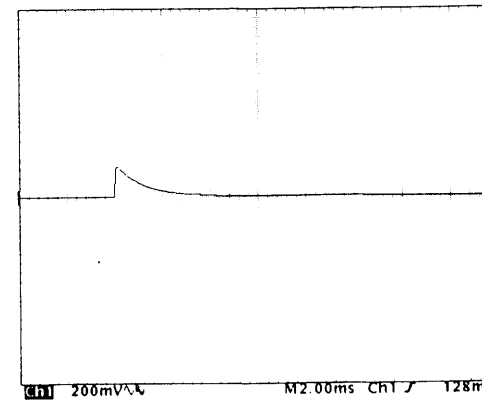
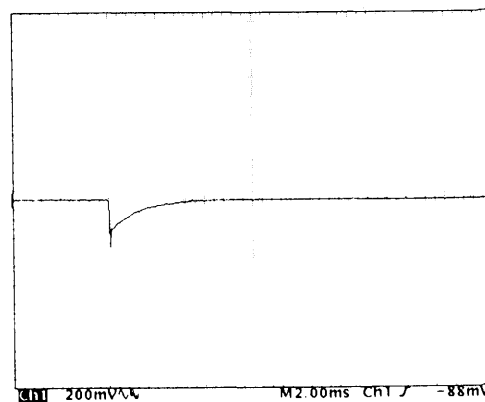
200 mV/div



Load 50% ↔

Load 100 %

200 mV/div



2 mS/div

**COSEL**

Model ZUS102412

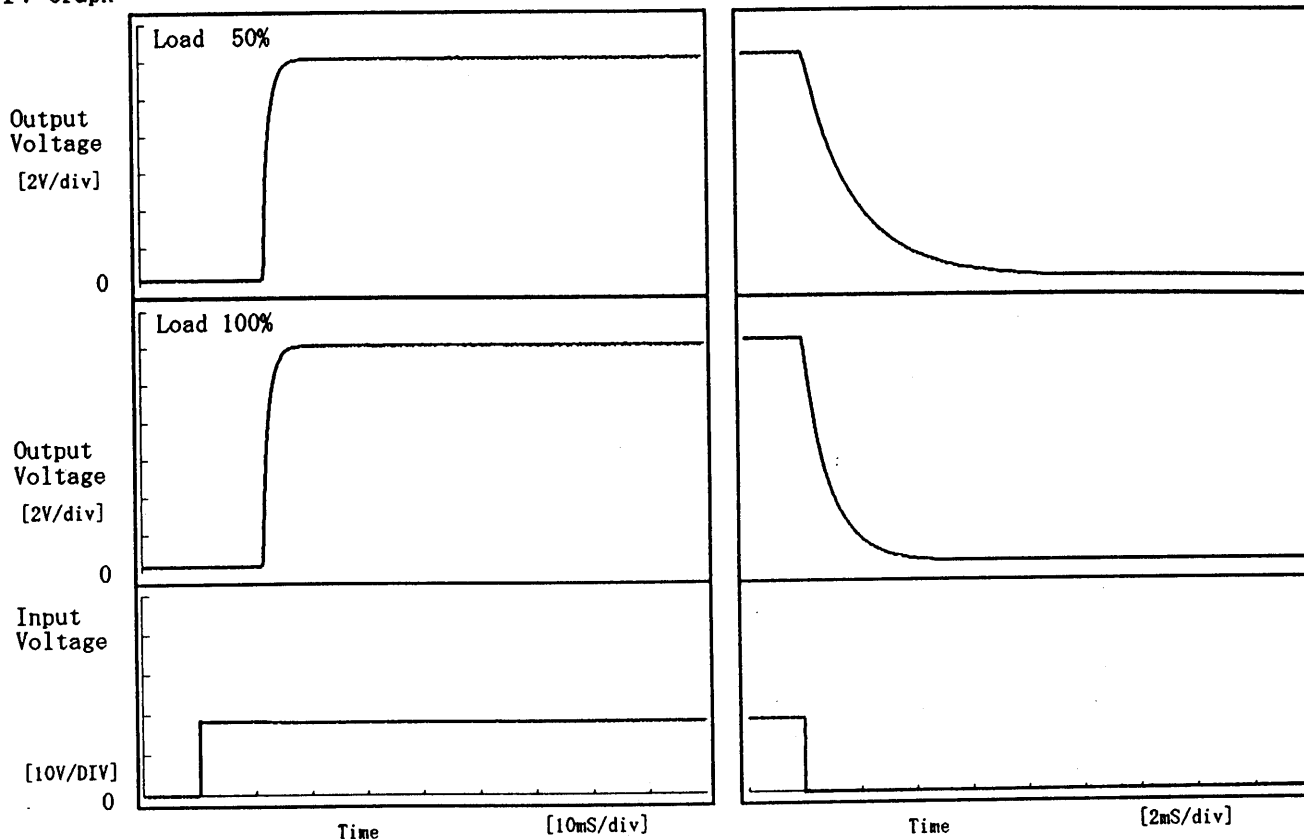
Item Rise and Fall Time 立上り、立下り時間

Temperature 25°C  
Testing Circuitry Figure A

Object +12V0.900A

## 1. Graph

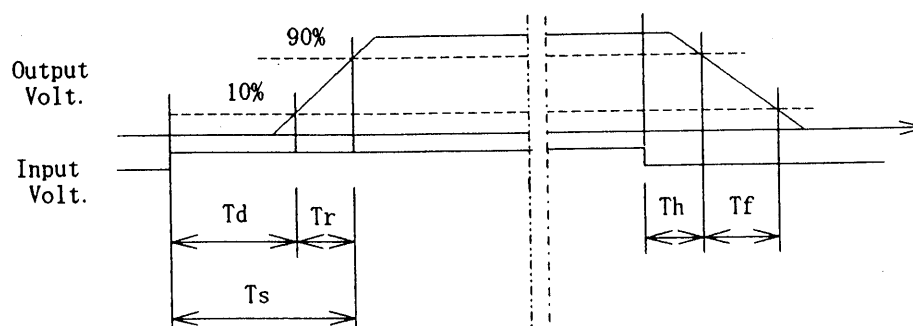
Input Volt. 18.0 V



## 2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	11.55	2.75	14.30	0.31	3.95
100 %	11.90	2.70	14.60	0.15	2.03



**COSEL**

Model		ZUS102412	Testing Circuitry    Figure A	
Item		Ambient Temperature Drift 周囲温度変動		
Object		+12V0.900A		

1. Graph

—△—

---□---

---○---

Input Volt. 18.0V

Input Volt. 24.0V

Input Volt. 36.0V

[V]

Output Voltage

12.04

12.00

11.96

11.92

11.88

11.84

11.80

0

-40

-20

0

20

40

60

Ambient Temperature                      [°C]

Load      100%

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 [°C]	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-30	11.893	11.893	11.894
-20	11.897	11.897	11.897
-10	11.900	11.900	11.901
0	11.903	11.903	11.903
10	11.905	11.906	11.906
25	11.910	11.910	11.910
30	11.912	11.912	11.912
40	11.912	11.911	11.910
55	11.905	11.904	11.904
60	11.901	11.900	11.899
—	—	—	—

# COSEL

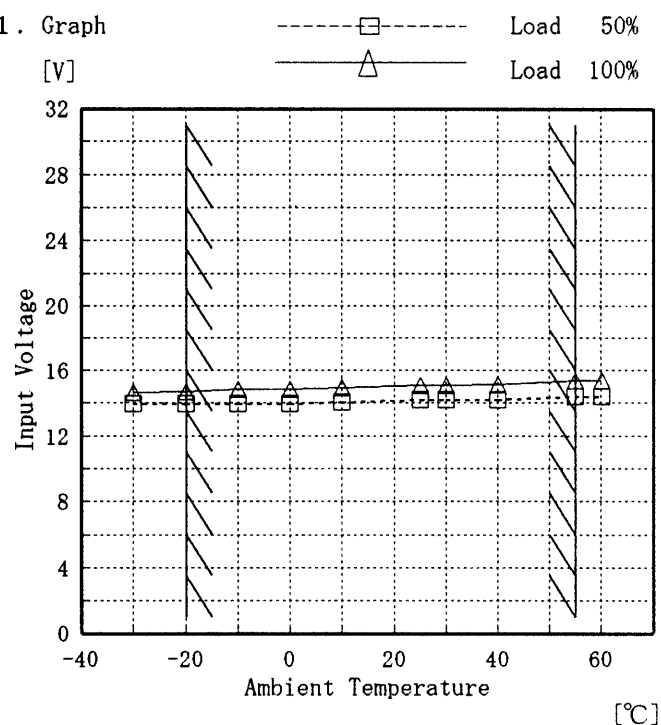
Model ZUS102412

Item Minimum Input Voltage for Regulated Output Voltage  
最低レギュレーション電圧

Object +12V0.900A

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. [°C]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	14.0	14.7
-20	14.0	14.7
-10	14.0	14.9
0	14.0	14.9
10	14.1	14.9
25	14.2	15.1
30	14.2	15.1
40	14.2	15.2
55	14.4	15.4
60	14.4	15.4
—	—	—

# COSEL

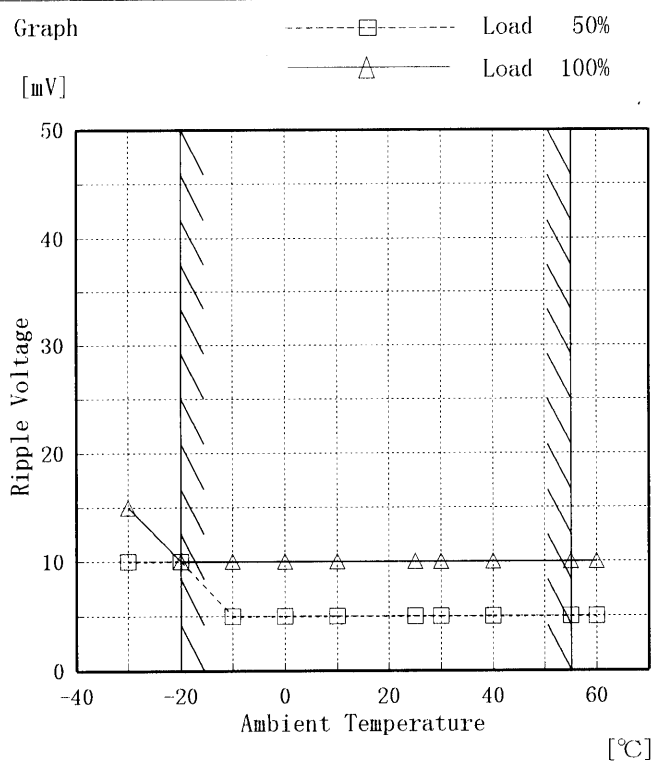
Model ZUS102412

Item Ripple Voltage (by Ambient Temp.)  
リップル電圧 (周囲温度特性)

Object +12V 0.900A

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

**COSEL**

Model

ZUS102412

Item

Time Lapse Drift 経時ドリフト

Temperature

25 °C

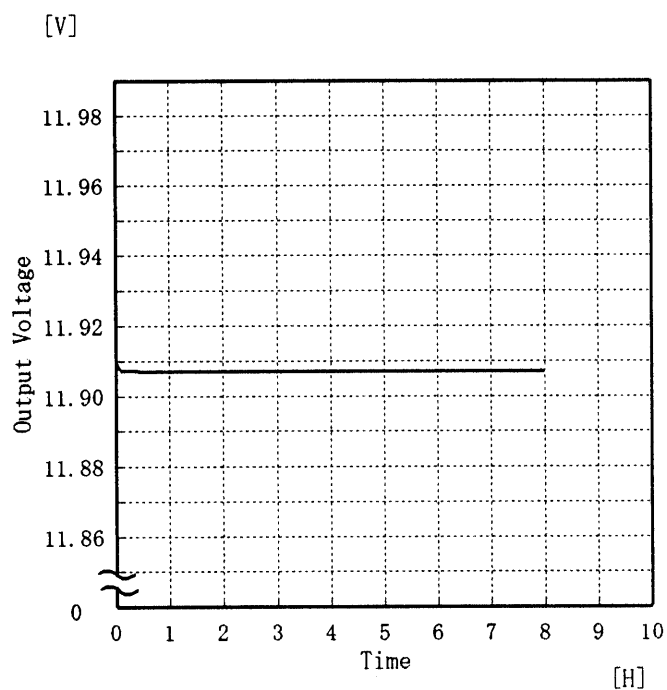
Testing Circuitry

Figure A

Object

+12V0.900A

## 1. Graph



Input Volt. 24V

Load 100%

## 2. Values

Time since start [H]	Output Voltage [V]
0.0	11.909
0.5	11.907
1.0	11.907
2.0	11.907
3.0	11.907
4.0	11.907
5.0	11.907
6.0	11.907
7.0	11.907
8.0	11.907

**COSEL**

Model		ZUS102412	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+12V0.900A	

## 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 °C

Input Voltage : 18.0~36.0 V

Load Current : 0.000~0.900 A

\* Output Voltage Accuracy =  $\pm (\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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 °C

入力電圧 18.0~36.0 V

負荷電流 0.000~0.900 A

\* 定電圧精度(変動値) =  $\pm (\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

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

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	25	36.0	0.000	11.917	±10	±0.1
Minimum Voltage	-20	18.0	0.900	11.898		

# COSEL

COSEL

Model	ZUS102412
Item	Condensation 結露特性
Object	+12V0.900A

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 25℃ 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	12.050	5	40
	2	12.051	5	40
	3	12.053	5	40
Load 100 %	1	12.046	10	55
	2	12.046	10	55
	3	12.050	10	55

Input Volt. 24.0 V



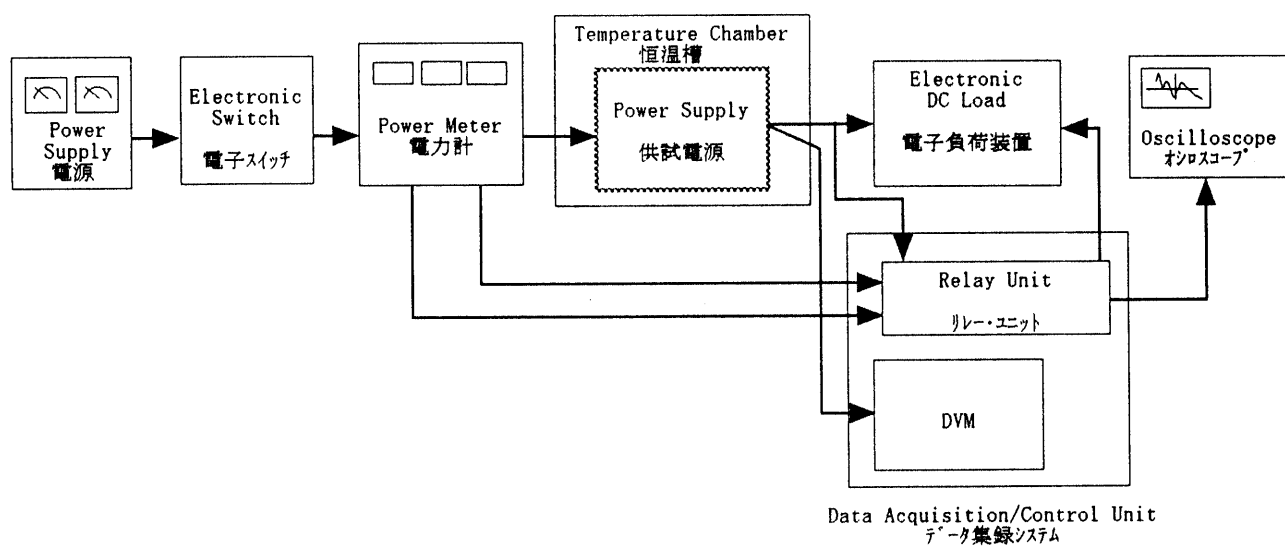
**COSEL**

Figure A