



# TEST DATA OF ZUS61212

(12.0V INPUT)

Regulated DC Power Supply

Date : Sep. 23. 1996

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Design Manager

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COSEL CO., LTD.

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Model		ZUS61212	Temperature		25℃																																							
Item		Line Regulation  静的入力変動	Testing Circuitry		Figure A																																							
Object		+12V0.5A																																										
1. Graph			2. Values																																									
<div>-----□----- Load 50%</div> <div>-----△----- Load 100%</div> <div><p>[V]</p><p>Output Voltage</p><p>Input Voltage [V]</p></div> <div>Note: Slanted line shows the range of the rated input voltage.</div> <div>(注)斜線は定格入力電圧範囲を示す。</div>			<table><tr><th>Input Voltage [V]</th><th>Load 50% Output Volt. [V]</th><th>Load 100% Output Volt. [V]</th></tr><tr><td>8.0</td><td>12.122</td><td>12.120</td></tr><tr><td>9.0</td><td>12.122</td><td>12.119</td></tr><tr><td>10.0</td><td>12.122</td><td>12.120</td></tr><tr><td>12.0</td><td>12.122</td><td>12.120</td></tr><tr><td>15.0</td><td>12.122</td><td>12.120</td></tr><tr><td>18.0</td><td>12.122</td><td>12.120</td></tr><tr><td>20.0</td><td>12.122</td><td>12.120</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr></table>			Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]	8.0	12.122	12.120	9.0	12.122	12.119	10.0	12.122	12.120	12.0	12.122	12.120	15.0	12.122	12.120	18.0	12.122	12.120	20.0	12.122	12.120	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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Model

ZUS61212

Item

Efficiency 効率

Temperature

25°C

Testing Circuitry

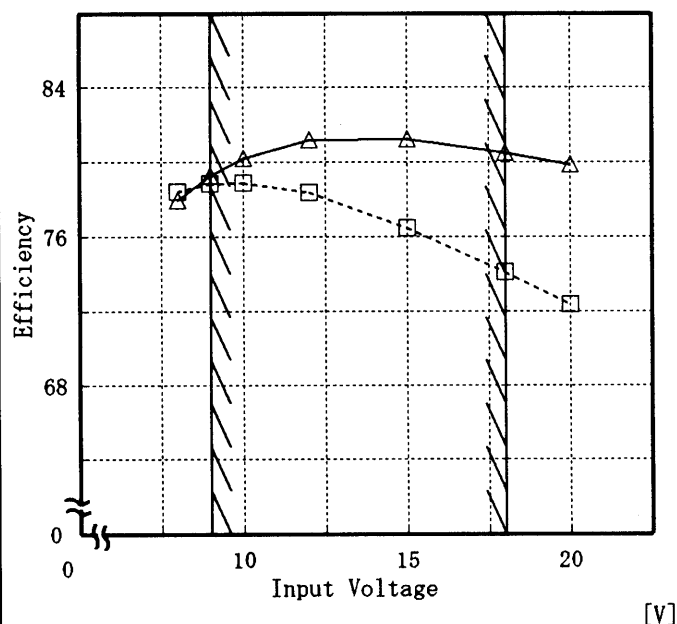
Figure A

Object

## 1. Graph

[%]

-----□----- Load 50%  
 -----△----- Load 100%



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。

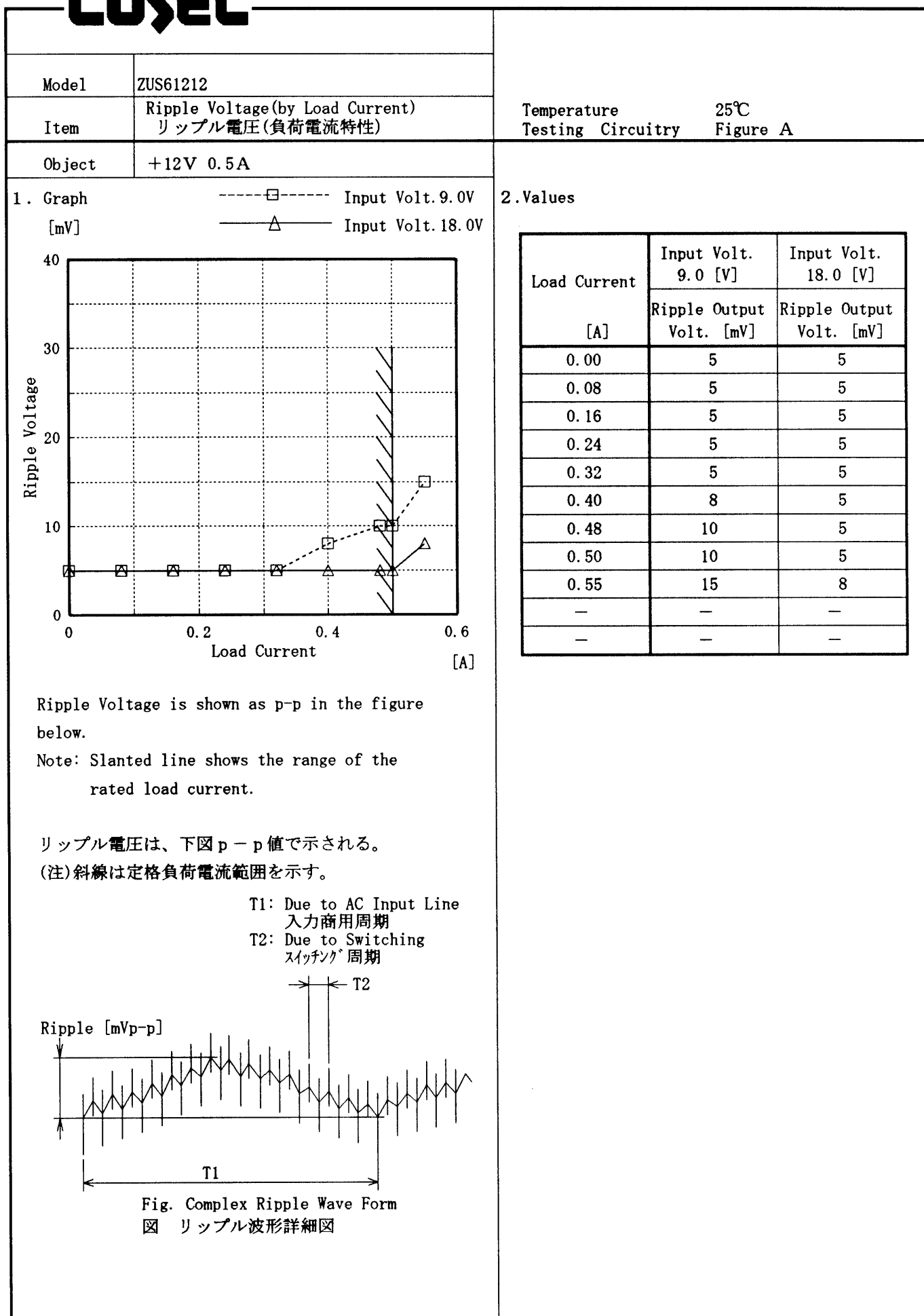
## 2. Values

Input Voltage [V]	Load 50%	Load 100%
	Efficiency [%]	Efficiency [%]
8.0	78.4	78.0
9.0	78.9	79.3
10.0	78.9	80.2
12.0	78.4	81.2
15.0	76.5	81.2
18.0	74.1	80.5
20.0	72.4	79.9
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

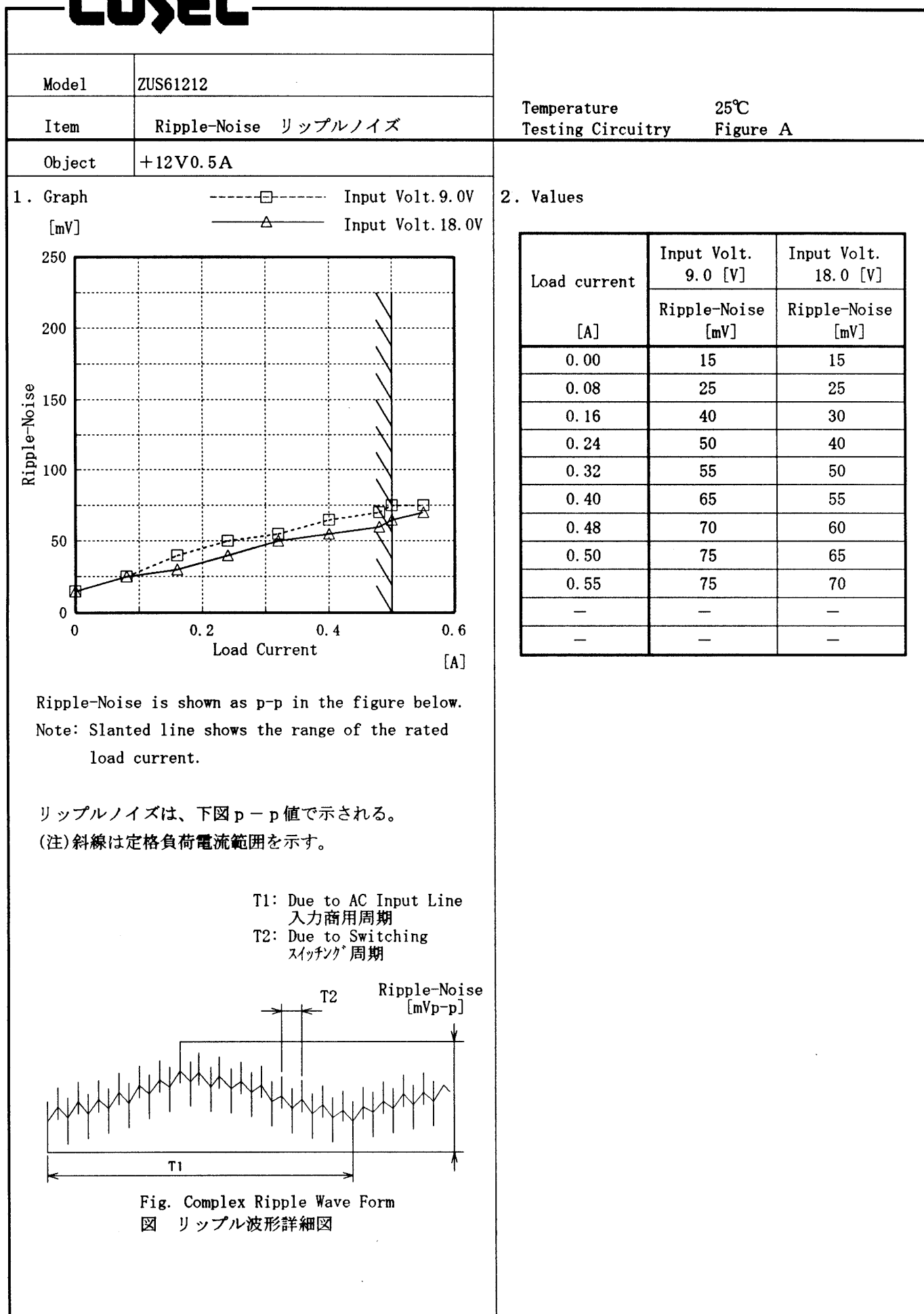
# COSEL

Model		ZUS61212		Temperature		25℃																																																				
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<div><div><div>—△—</div><div>---□---</div><div>---○---</div></div><div><div>Input Volt. 9.0V</div><div>Input Volt. 12.0V</div><div>Input Volt. 18.0V</div></div></div> <div><div>[V]</div><div>Output Voltage</div><div>Load Current</div><div>[A]</div></div> <div>Note: Slanted line shows the range of the rated load current.</div> <div>(注)斜線は定格負荷電流範囲を示す。</div>				<table><tr><th rowspan="2">Load Current</th><th>Input Volt.</th><th>Input Volt.</th><th>Input Volt.</th></tr><tr><th>9.0[V]</th><th>12.0[V]</th><th>18.0[V]</th></tr><tr><th>[A]</th><th>Output Volt. [V]</th><th>Output Volt. [V]</th><th>Output Volt. [V]</th></tr><tr><td>0.00</td><td>12.124</td><td>12.124</td><td>12.124</td></tr><tr><td>0.08</td><td>12.123</td><td>12.123</td><td>12.123</td></tr><tr><td>0.16</td><td>12.122</td><td>12.122</td><td>12.122</td></tr><tr><td>0.24</td><td>12.122</td><td>12.122</td><td>12.122</td></tr><tr><td>0.32</td><td>12.121</td><td>12.121</td><td>12.121</td></tr><tr><td>0.40</td><td>12.121</td><td>12.121</td><td>12.121</td></tr><tr><td>0.48</td><td>12.121</td><td>12.121</td><td>12.120</td></tr><tr><td>0.50</td><td>12.121</td><td>12.121</td><td>12.120</td></tr><tr><td>0.55</td><td>12.120</td><td>12.120</td><td>12.120</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current	Input Volt.	Input Volt.	Input Volt.	9.0[V]	12.0[V]	18.0[V]	[A]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]	0.00	12.124	12.124	12.124	0.08	12.123	12.123	12.123	0.16	12.122	12.122	12.122	0.24	12.122	12.122	12.122	0.32	12.121	12.121	12.121	0.40	12.121	12.121	12.121	0.48	12.121	12.121	12.120	0.50	12.121	12.121	12.120	0.55	12.120	12.120	12.120	—	—	—	—
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# COSEL



# COSEL



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Model		ZUS61212	Temperature 25℃ Testing Circuitry Figure A	
Item		Overcurrent Protection 過電流保護		
Object		+12V0.5A		

1. Graph

~~~~~

———

————

Input Volt. 9.0V  
Input Volt. 12.0V  
Input Volt. 18.0V

[V]

20

15

10

5

0

0

0.2

0.4

0.6

0.8

1

Output Voltage

Load Current

[V]

[A]

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] | Input Volt. 12.0[V] | Input Volt. 18.0[V] |
|--------------------|--------------------|---------------------|---------------------|
|                    | Load Current [A]   | Load Current [A]    | Load Current [A]    |
| 12.00              | 0.81               | 0.89                | 0.80                |
| 11.40              | 0.82               | 0.89                | 0.80                |
| 10.80              | 0.83               | 0.89                | 0.80                |
| 9.60               | 0.85               | 0.90                | 0.79                |
| 8.40               | 0.87               | 0.91                | 0.78                |
| 7.20               | 0.88               | 0.90                | 0.76                |
| 6.00               | 0.89               | 0.89                | 0.73                |
| 4.80               | 0.88               | 0.86                | 0.69                |
| 3.60               | 0.85               | 0.81                | 0.64                |
| 2.40               | 0.83               | 0.78                | 0.59                |
| 1.20               | 0.82               | 0.75                | 0.58                |
| 0.00               | 0.90               | 0.86                | 0.67                |

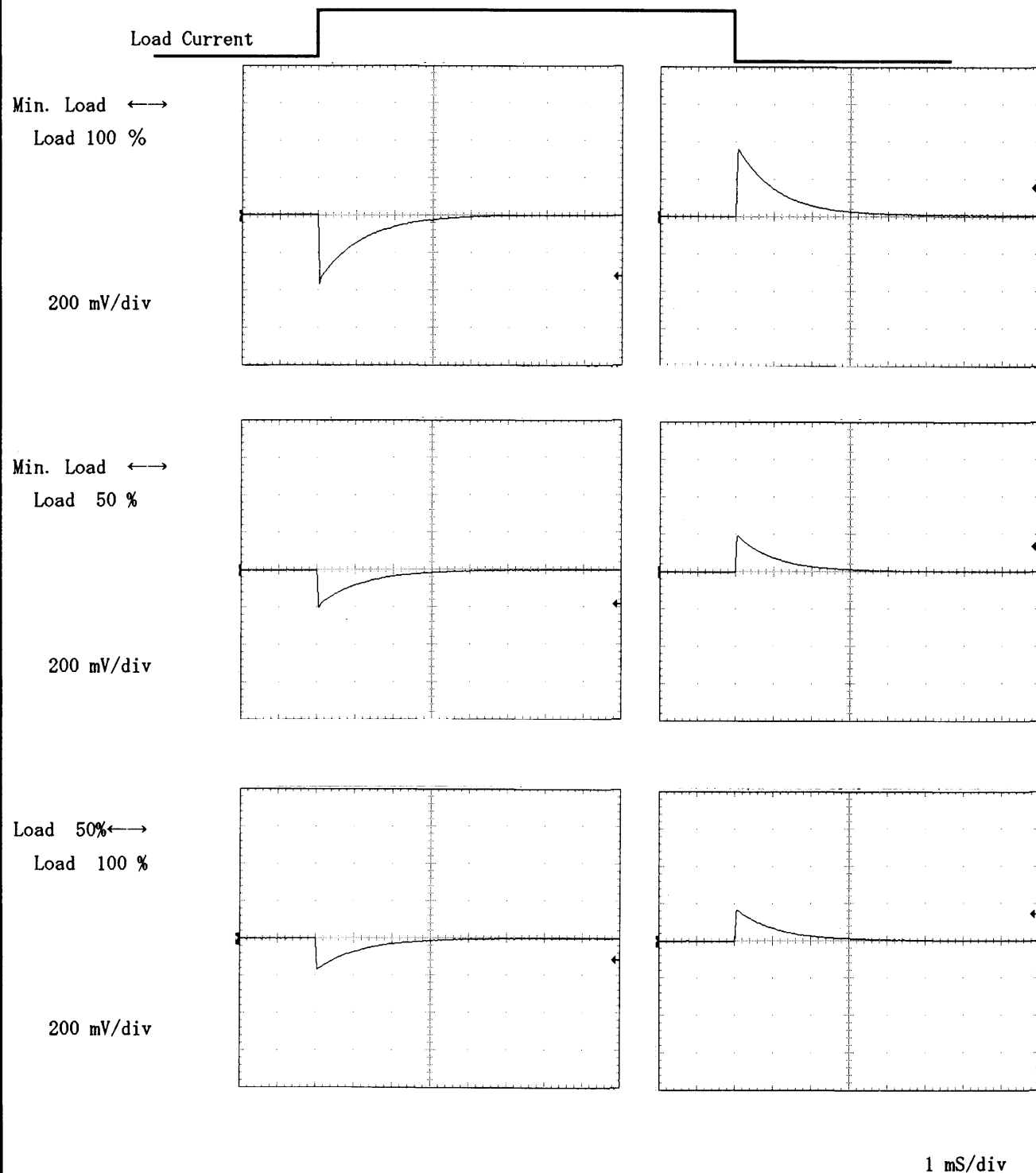


# COSEL

|        |                                 |                                  |                 |
|--------|---------------------------------|----------------------------------|-----------------|
| Model  | ZUS61212                        | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Item   | Dynamic Load Responce<br>動的負荷変動 |                                  |                 |
| Object | +12V0.5A                        |                                  |                 |

Input Volt. 12.0 V

Cycle 100 mS

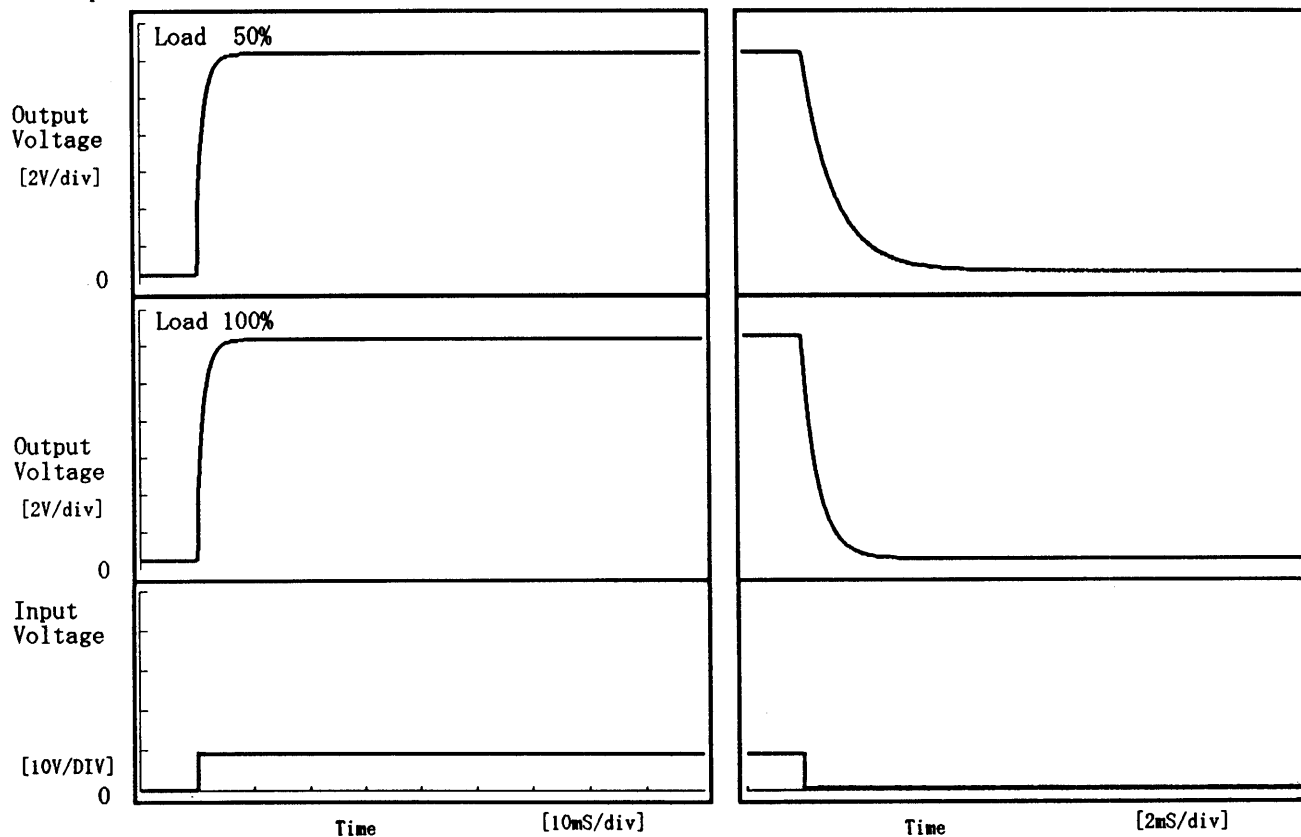


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|        |                              |                   |          |
|--------|------------------------------|-------------------|----------|
| Model  | ZUS61212                     | Temperature       | 25°C     |
| Item   | Rise and Fall Time 立上り、立下り時間 | Testing Circuitry | Figure A |
| Object | +12V0.5A                     |                   |          |

## 1. Graph

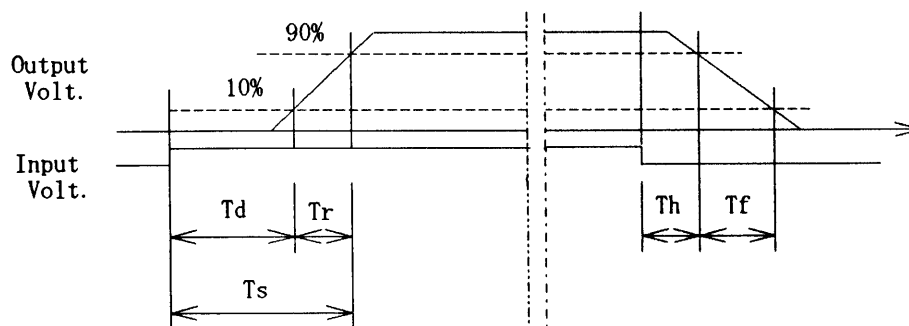
Input Volt. 9.0 V



## 2. Values

[mS]

| Load \ Time | T d  | T r  | T s  | T h  | T f  |
|-------------|------|------|------|------|------|
| 50 %        | 0.05 | 2.45 | 2.50 | 0.23 | 2.95 |
| 100 %       | 0.05 | 2.50 | 2.55 | 0.12 | 1.40 |



# COSEL

Model ZUS61212

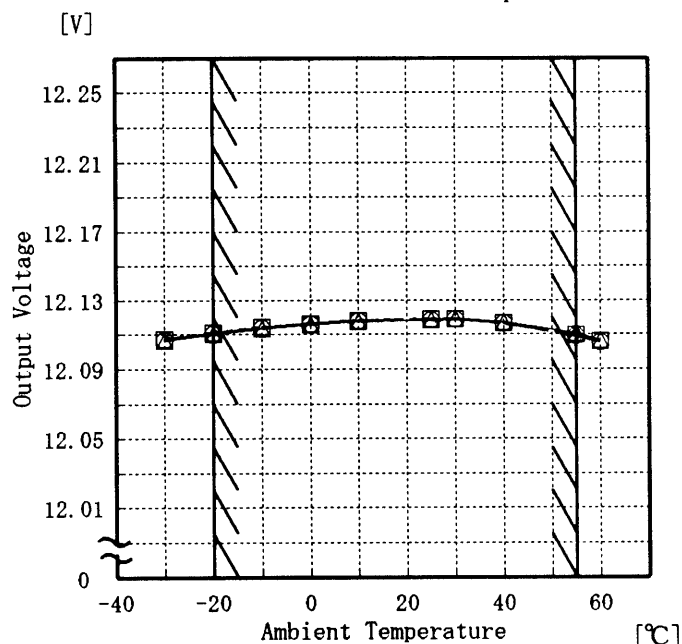
Item Ambient Temperature Drift  
周囲温度変動

Object +12V0.5A

Testing Circuitry Figure A

## 1. Graph

—△— Input Volt. 9.0V  
 - - - □ - - - Input Volt. 12.0V  
 - - - ○ - - - Input Volt. 18.0V



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<br>[°C] | Input Volt.<br>9.0[V] | Input Volt.<br>12.0[V] | Input Volt.<br>18.0[V] |
|---------------------|-----------------------|------------------------|------------------------|
|                     | Output<br>Volt. [V]   | Output<br>Volt. [V]    | Output<br>Volt. [V]    |
| -30                 | 12.106                | 12.107                 | 12.107                 |
| -20                 | 12.110                | 12.111                 | 12.111                 |
| -10                 | 12.114                | 12.114                 | 12.114                 |
| 0                   | 12.116                | 12.116                 | 12.116                 |
| 10                  | 12.118                | 12.118                 | 12.118                 |
| 25                  | 12.119                | 12.119                 | 12.119                 |
| 30                  | 12.119                | 12.119                 | 12.119                 |
| 40                  | 12.117                | 12.117                 | 12.117                 |
| 55                  | 12.110                | 12.110                 | 12.109                 |
| 60                  | 12.107                | 12.106                 | 12.106                 |
| —                   | —                     | —                      | —                      |

**COSEL**

Model ZUS61212

Item

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

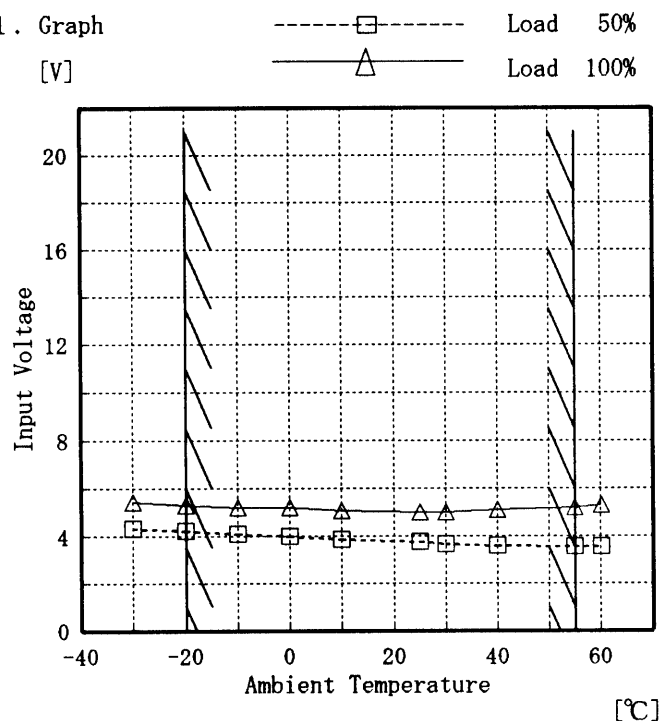
Object

+12V0.5A

Testing Circuitry Figure A

## 1. Graph

[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.<br>[°C] | Load 50%           | Load 100%          |
|-----------------------|--------------------|--------------------|
|                       | Input Volt.<br>[V] | Input Volt.<br>[V] |
| -30                   | 4.3                | 5.4                |
| -20                   | 4.2                | 5.3                |
| -10                   | 4.1                | 5.2                |
| 0                     | 4.0                | 5.2                |
| 10                    | 3.9                | 5.1                |
| 25                    | 3.8                | 5.0                |
| 30                    | 3.7                | 5.0                |
| 40                    | 3.6                | 5.1                |
| 55                    | 3.6                | 5.2                |
| 60                    | 3.6                | 5.3                |
| —                     | —                  | —                  |

**COSEL**

Model

ZUS61212

Item

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

Object

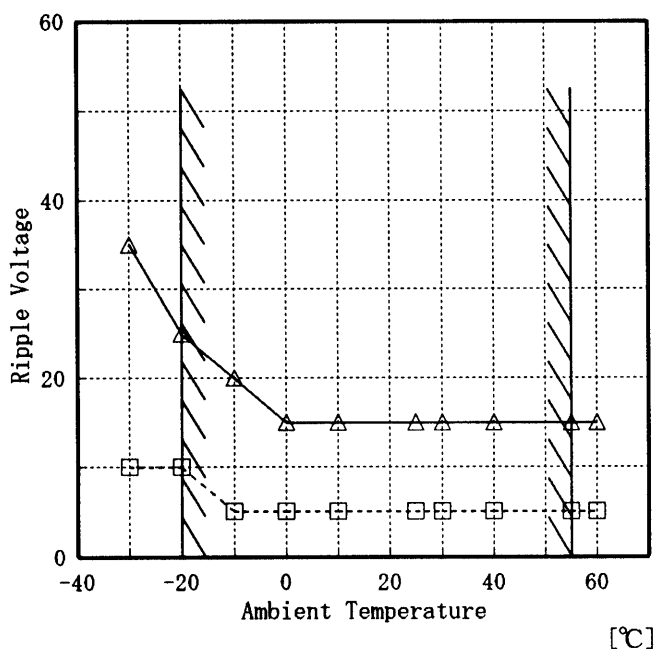
+12V0.5A

Testing Circuitry

Figure A

## 1. Graph

[mV]



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.<br>[°C] | Load 50%                    | Load 100%                   |
|-----------------------|-----------------------------|-----------------------------|
|                       | Ripple Output<br>Volt. [mV] | Ripple Output<br>Volt. [mV] |
| -30                   | 10                          | 35                          |
| -20                   | 10                          | 25                          |
| -10                   | 5                           | 20                          |
| 0                     | 5                           | 15                          |
| 10                    | 5                           | 15                          |
| 25                    | 5                           | 15                          |
| 30                    | 5                           | 15                          |
| 40                    | 5                           | 15                          |
| 55                    | 5                           | 15                          |
| 60                    | 5                           | 15                          |
| —                     | —                           | —                           |

**COSEL**

Model

ZUS61212

Item

Time Lapse Drift 経時ドリフト

Temperature

25 ℃

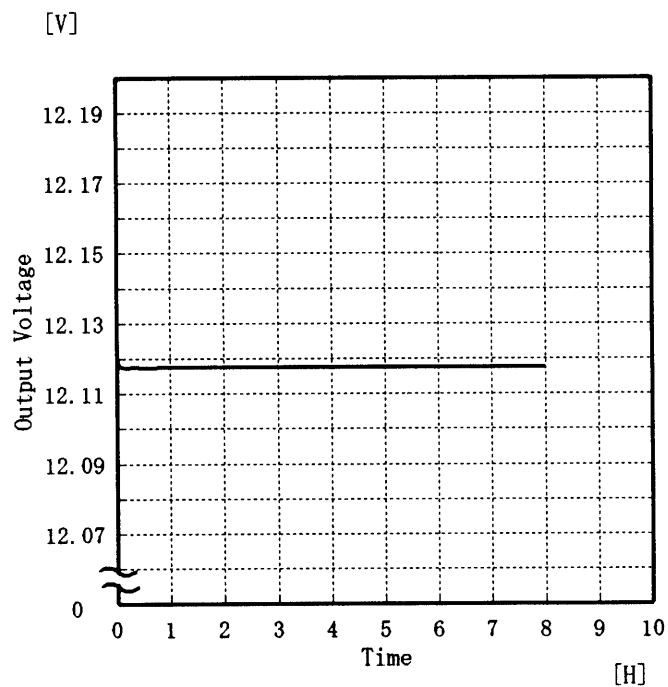
Testing Circuitry

Figure A

Object

+12V0.5A

## 1. Graph



## 2. Values

| Time since<br>start<br>[H] | Output<br>Voltage<br>[V] |
|----------------------------|--------------------------|
| 0.0                        | 12.121                   |
| 0.5                        | 12.118                   |
| 1.0                        | 12.118                   |
| 2.0                        | 12.118                   |
| 3.0                        | 12.118                   |
| 4.0                        | 12.118                   |
| 5.0                        | 12.118                   |
| 6.0                        | 12.118                   |
| 7.0                        | 12.118                   |
| 8.0                        | 12.118                   |

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|        |                               |                            |
|--------|-------------------------------|----------------------------|
| Model  | ZUS61212                      | Testing Circuitry Figure A |
| Item   | Output Voltage Accuracy 定電圧精度 |                            |
| Object | +12V0.5A                      |                            |

## 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 : 9.0~18.0 V

Load Current : 0.0~0.5 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 : 9.0~18.0 V

負荷電流 : 0.0~0.5 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               | 18.0              | 0.0                | 12.124             | ±8                           | ±0.1                                |
| Minimum Voltage | 55               | 9.0               | 0.5                | 12.108             |                              |                                     |

**COSEL**

|        |                   |                                 |
|--------|-------------------|---------------------------------|
| Model  | ZUS61212          | Testing Circuitry      Figure A |
| Item   | Condensation 結露特性 |                                 |
| Object | +12V 0.5A         |                                 |

## 1. Condensation test

Testing procedure is as follows.

- ① Keeping and cooling the unit in a tank at  $-10^{\circ}\text{C}$  for an hour with the input off.
- ② Taking it out of the tank and dewing itself in a room where the temperature is  $26^{\circ}\text{C}$  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 $-10^{\circ}\text{C}$ に冷却しておき、約1時間後に恒温槽から取り出し、室温 $26^{\circ}\text{C}$ 、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<br>[V] | Ripple Voltage<br>[mV] | Ripple Noise<br>[mV] |
|------------------|-------|-----------------------|------------------------|----------------------|
| Load<br>50<br>%  | 1     | 12.094                | 5                      | 50                   |
|                  | 2     | 12.097                | 5                      | 40                   |
|                  | 3     | 12.093                | 5                      | 45                   |
| Load<br>100<br>% | 1     | 12.091                | 15                     | 75                   |
|                  | 2     | 12.093                | 15                     | 70                   |
|                  | 3     | 12.091                | 15                     | 75                   |

Input Volt. 12.0 V



