



TEST DATA OF ZUS61215

(12.0V INPUT)

Regulated DC Power Supply

Date : Sep. 23. 1996

Approved by : T. Sugimori
Design Manager

Prepared by : H. Ise
Design Engineer

コーセル株式会社
COSEL CO., LTD.

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COSEL

Model

ZUS61215

Item

Line Regulation 静的入力変動

Object

+15V0.4A

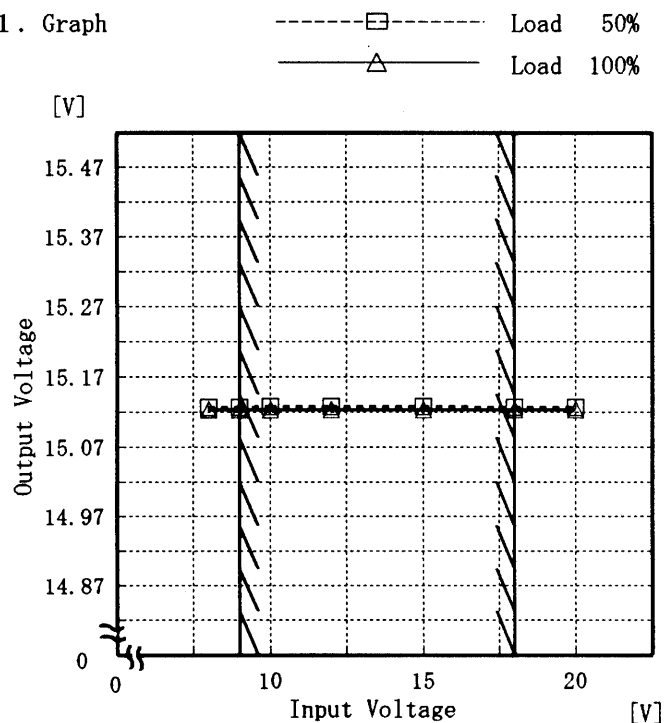
Temperature

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%	Load 100%
	Output Volt. [V]	Output Volt. [V]
8.0	15.126	15.123
9.0	15.127	15.123
10.0	15.127	15.123
12.0	15.127	15.123
15.0	15.127	15.123
18.0	15.127	15.123
20.0	15.126	15.123
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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Model

ZUS61215

Item

Efficiency 効率

Temperature

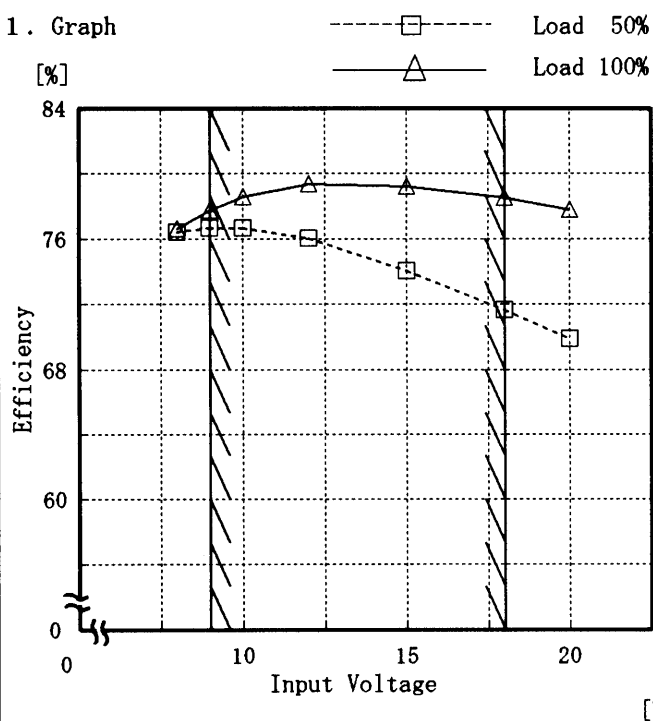
25°C

Testing Circuitry

Figure A

Object

1. Graph



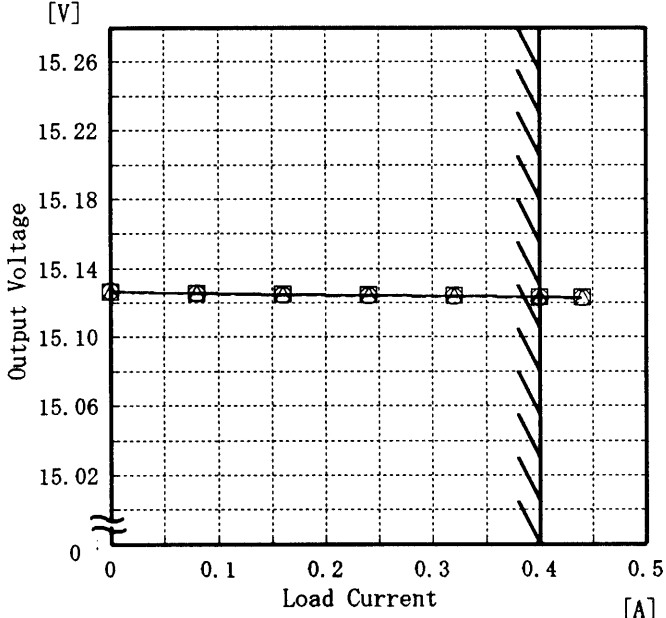
Note: Slanted line shows the range of the rated input voltage.

(注) 斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Load 50%	Load 100%
	Efficiency [%]	Efficiency [%]
8.0	76.4	76.6
9.0	76.7	77.7
10.0	76.6	78.6
12.0	76.0	79.3
15.0	74.0	79.2
18.0	71.6	78.5
20.0	69.9	77.8
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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Model ZUS61215		Temperature 25°C																																																
Item	Load Regulation 静的負荷変動	Testing Circuitry Figure A																																																
Object	+15V0.4A																																																	
<p>1. Graph</p> <p> △ Input Volt. 9.0V □ Input Volt. 12.0V ○ Input Volt. 18.0V </p>  <p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th><th>Input Volt. 9.0[V]</th><th>Input Volt. 12.0[V]</th><th>Input Volt. 18.0[V]</th></tr> <tr> <th>Output Volt. [V]</th><th>Output Volt. [V]</th><th>Output Volt. [V]</th></tr> </thead> <tbody> <tr><td>0.00</td><td>15.127</td><td>15.126</td><td>15.127</td></tr> <tr><td>0.08</td><td>15.126</td><td>15.126</td><td>15.126</td></tr> <tr><td>0.16</td><td>15.125</td><td>15.125</td><td>15.125</td></tr> <tr><td>0.24</td><td>15.125</td><td>15.125</td><td>15.124</td></tr> <tr><td>0.32</td><td>15.124</td><td>15.124</td><td>15.124</td></tr> <tr><td>0.40</td><td>15.124</td><td>15.123</td><td>15.123</td></tr> <tr><td>0.44</td><td>15.123</td><td>15.123</td><td>15.123</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>		Load Current [A]	Input Volt. 9.0[V]	Input Volt. 12.0[V]	Input Volt. 18.0[V]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]	0.00	15.127	15.126	15.127	0.08	15.126	15.126	15.126	0.16	15.125	15.125	15.125	0.24	15.125	15.125	15.124	0.32	15.124	15.124	15.124	0.40	15.124	15.123	15.123	0.44	15.123	15.123	15.123	—	—	—	—	—	—	—	—	—	—	—	—
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0.40	15.124	15.123	15.123																																															
0.44	15.123	15.123	15.123																																															
—	—	—	—																																															
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COSEL

Model		ZUS61215	
Item		Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)	
Object		+15V 0.4A	

1. Graph

-----□-----

Input Volt. 9.0V

-----△-----

Input Volt. 18.0V

50

40

30

20

10

0

Ripple Voltage

[mV]

0

0.1

0.2

0.3

0.4

0.5

Load Current

[A]

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
スイッチング周期

→

←

T2

↑

↓

T1

Ripple [mVp-p]

↑

↓

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]	Input Volt. 18.0 [V]
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
0.00	5	5
0.08	5	5
0.16	5	5
0.24	5	5
0.32	8	5
0.40	10	5
0.44	15	8
—	—	—
—	—	—
—	—	—
—	—	—

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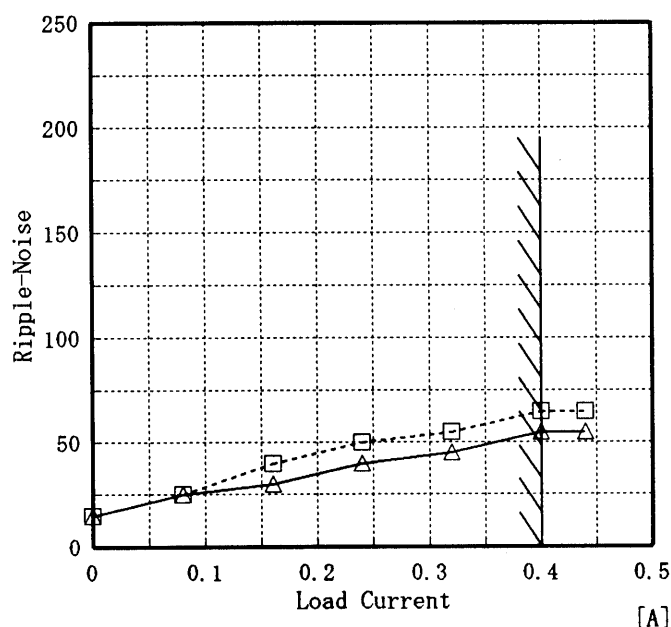
Model ZUS61215

Item Ripple-Noise リップルノイズ

Object +15V0.4A

Temperature
Testing Circuitry25°C
Figure A

1. Graph
- Input Volt. 9.0V
 [mV] ————△——— Input Volt. 18.0V



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
 スイッチング周期

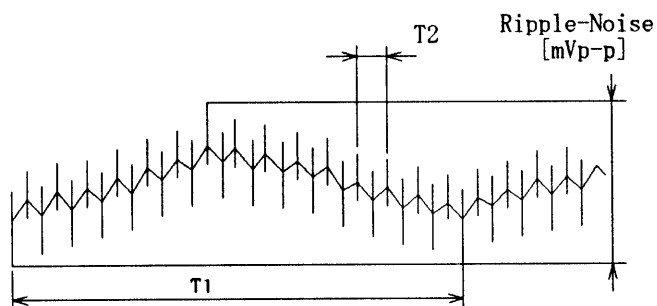


Fig. Complex Ripple Wave Form
 図 リップル波形詳細図

2. Values

Load current [A]	Input Volt. 9.0 [V]	Input Volt. 18.0 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	15	15
0.08	25	25
0.16	40	30
0.24	50	40
0.32	55	45
0.40	65	55
0.44	65	55
—	—	—
—	—	—
—	—	—
—	—	—

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Model		ZUS61215	Temperature25℃ Testing Circuitry Figure A
Item		Overcurrent Protection 過電流保護	
Object		+15V0.4A	

1. Graph

[V]

Output Voltage [V]

Load Current [A]

~~~~~

-----

=====

Input Volt. 9.0V

Input Volt. 12.0V

Input Volt. 18.0V

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 Curr-ent [A]  | Load Curr-ent [A]   | Load Curr-ent [A]   |
| 15.00              | 0.58               | 0.64                | 0.59                |
| 14.25              | 0.59               | 0.65                | 0.59                |
| 13.50              | 0.60               | 0.65                | 0.59                |
| 12.00              | 0.62               | 0.66                | 0.59                |
| 10.50              | 0.63               | 0.66                | 0.58                |
| 9.00               | 0.64               | 0.66                | 0.57                |
| 7.50               | 0.65               | 0.66                | 0.55                |
| 6.00               | 0.64               | 0.64                | 0.53                |
| 4.50               | 0.63               | 0.61                | 0.49                |
| 3.00               | 0.61               | 0.58                | 0.46                |
| 1.50               | 0.60               | 0.56                | 0.45                |
| 0.00               | 0.55               | 0.52                | 0.44                |



# COSEL

|        |                                 |                   |          |
|--------|---------------------------------|-------------------|----------|
| Model  | ZUS61215                        | Temperature       | 25°C     |
| Item   | Dynamic Load Responce<br>動的負荷変動 | Testing Circuitry | Figure A |
| Object | +15V0.4A                        |                   |          |

Input Volt. 12.0 V

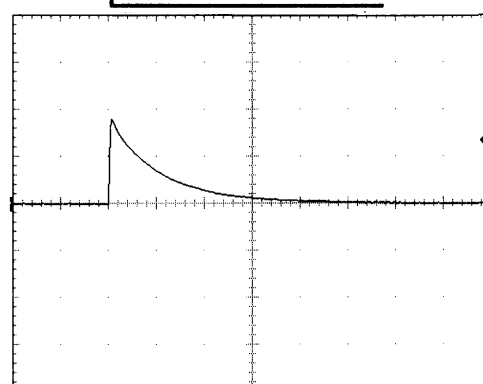
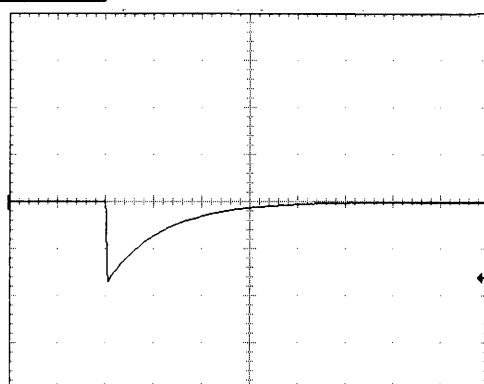
Cycle 100 mS

Load Current

Min. Load ↔

Load 100 %

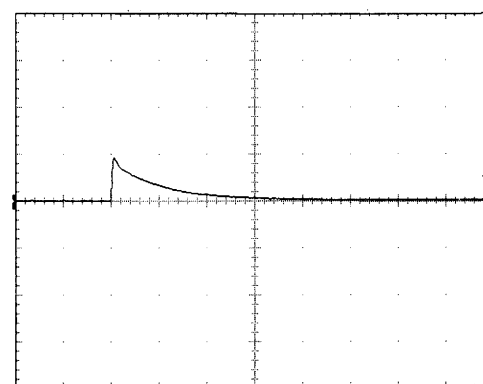
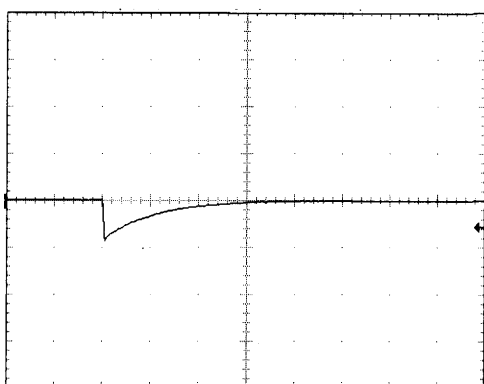
200 mV/div



Min. Load ↔

Load 50 %

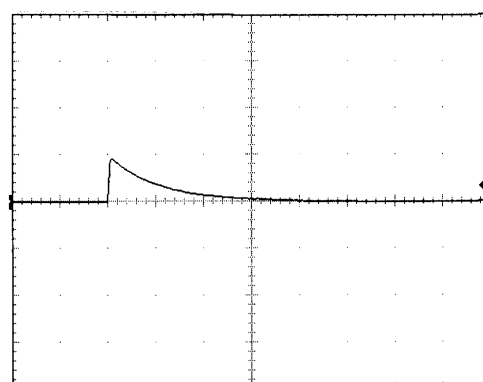
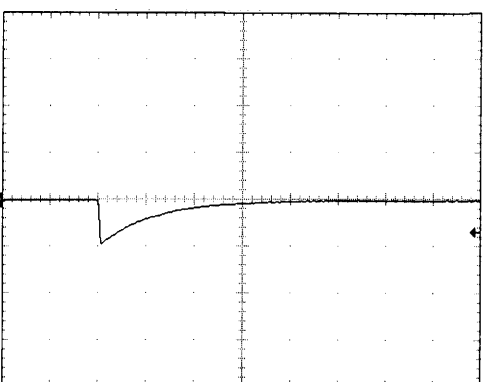
200 mV/div



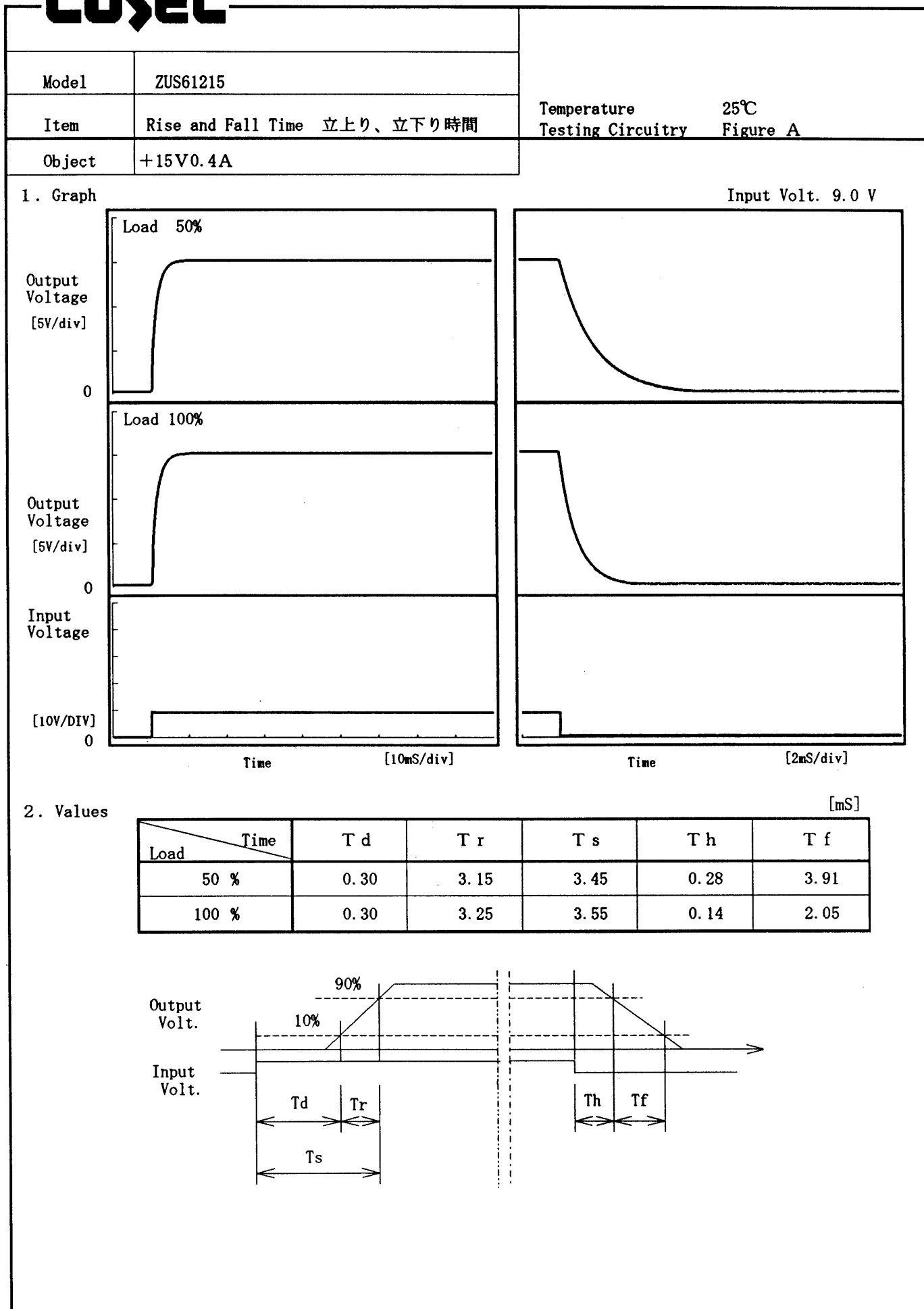
Load 50% ↔

Load 100 %

200 mV/div



1 mS/div

**COSEL**

# COSEL

Model

ZUS61215

Item

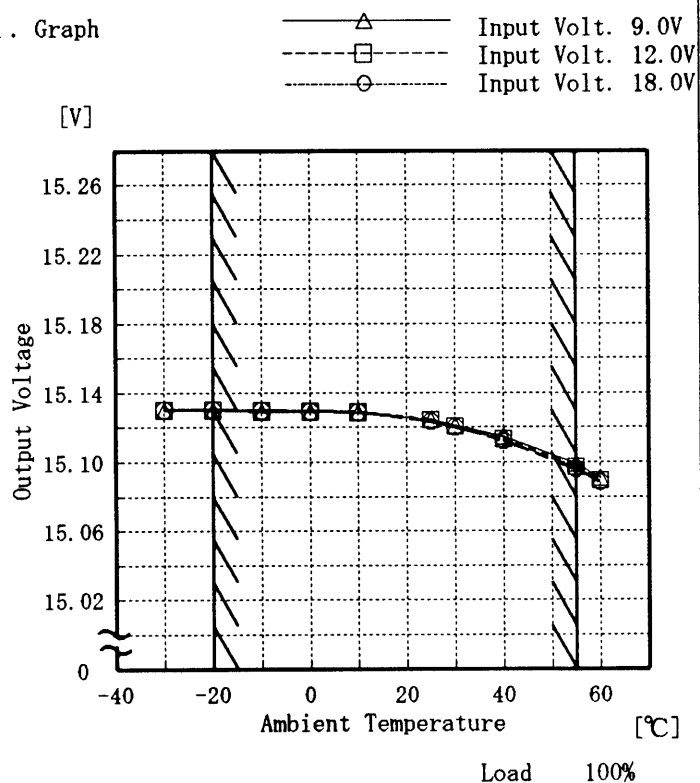
Ambient Temperature Drift  
周囲温度変動

Object

+15V0.4A

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.<br>9.0[V] | Input Volt.<br>12.0[V] | Input Volt.<br>18.0[V] |
|-------------|-----------------------|------------------------|------------------------|
| [°C]        | Output<br>Volt. [V]   | Output<br>Volt. [V]    | Output<br>Volt. [V]    |
| -30         | 15.130                | 15.130                 | 15.130                 |
| -20         | 15.130                | 15.130                 | 15.130                 |
| -10         | 15.129                | 15.130                 | 15.130                 |
| 0           | 15.129                | 15.130                 | 15.129                 |
| 10          | 15.128                | 15.129                 | 15.129                 |
| 25          | 15.124                | 15.124                 | 15.124                 |
| 30          | 15.121                | 15.121                 | 15.120                 |
| 40          | 15.115                | 15.113                 | 15.112                 |
| 55          | 15.099                | 15.097                 | 15.096                 |
| 60          | 15.091                | 15.089                 | 15.088                 |
| —           | —                     | —                      | —                      |

# COSEL

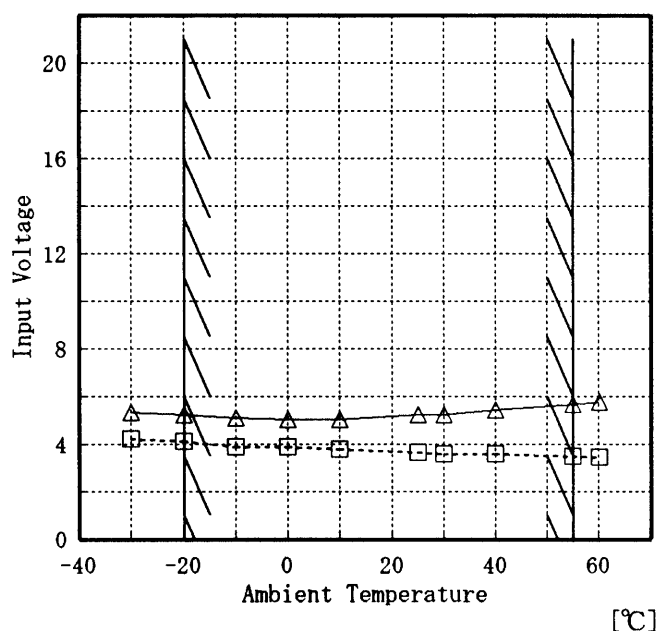
Model ZUS61215

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

Object +15V0.4A

Testing Circuitry Figure A

1. Graph
- [V]
- Load 50%
- △----- 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

| Ambient Temp.<br>[°C] | Load 50%<br>Input Volt.<br>[V] | Load 100%<br>Input Volt.<br>[V] |
|-----------------------|--------------------------------|---------------------------------|
| -30                   | 4.2                            | 5.3                             |
| -20                   | 4.1                            | 5.2                             |
| -10                   | 3.9                            | 5.1                             |
| 0                     | 3.9                            | 5.0                             |
| 10                    | 3.8                            | 5.0                             |
| 25                    | 3.7                            | 5.2                             |
| 30                    | 3.6                            | 5.2                             |
| 40                    | 3.6                            | 5.5                             |
| 55                    | 3.5                            | 5.7                             |
| 60                    | 3.5                            | 5.8                             |
| —                     | —                              | —                               |

**COSEL**

Model

ZUS61215

Item

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

Object

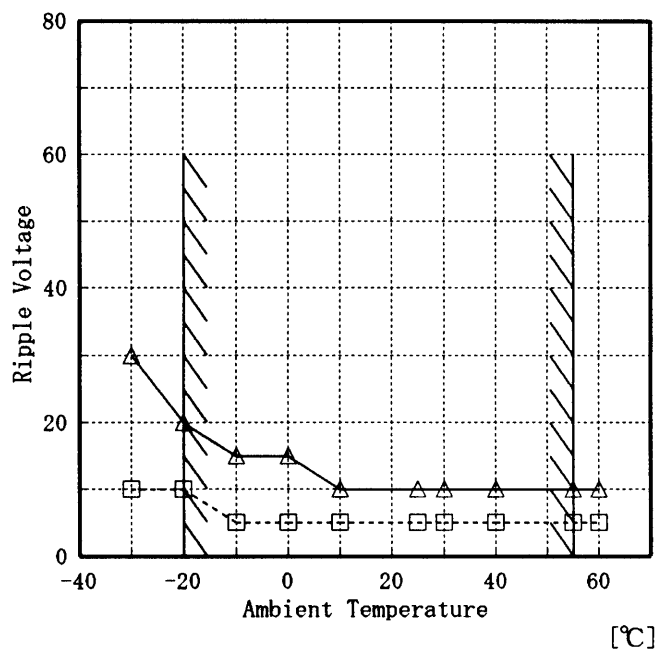
+15V0.4A

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                          | 30                          |
| -20                   | 10                          | 20                          |
| -10                   | 5                           | 15                          |
| 0                     | 5                           | 15                          |
| 10                    | 5                           | 10                          |
| 25                    | 5                           | 10                          |
| 30                    | 5                           | 10                          |
| 40                    | 5                           | 10                          |
| 55                    | 5                           | 10                          |
| 60                    | 5                           | 10                          |
| —                     | —                           | —                           |

**COSEL**

Model

ZUS61215

Item

Time Lapse Drift 経時ドリフト

Object

+15V0.4A

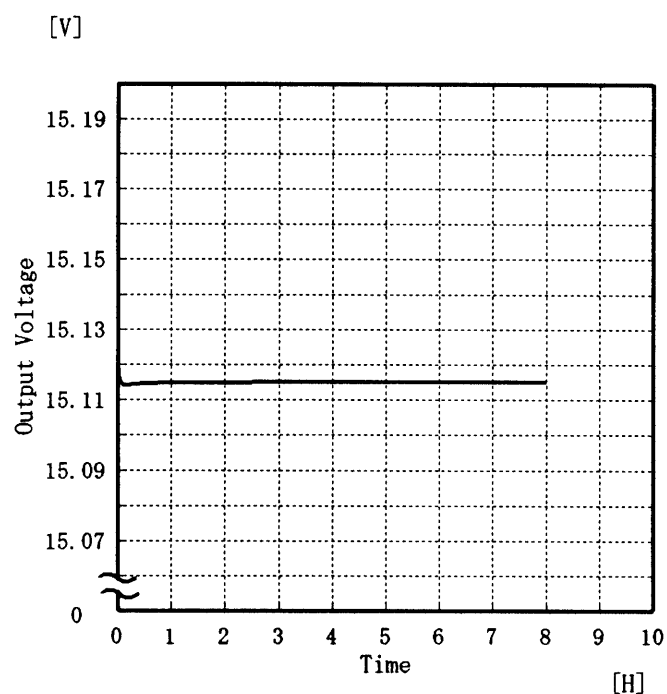
Temperature

25 ℃

Testing Circuitry

Figure A

## 1. Graph



Input Volt. 12V

Load 100%

## 2. Values

| Time since start [H] | Output Voltage [V] |
|----------------------|--------------------|
| 0.0                  | 15.121             |
| 0.5                  | 15.115             |
| 1.0                  | 15.115             |
| 2.0                  | 15.115             |
| 3.0                  | 15.115             |
| 4.0                  | 15.115             |
| 5.0                  | 15.115             |
| 6.0                  | 15.115             |
| 7.0                  | 15.115             |
| 8.0                  | 15.115             |

# COSEL

|        |  |                               |                            |
|--------|--|-------------------------------|----------------------------|
| Model  |  | ZUS61215                      | Testing Circuitry Figure A |
| Item   |  | Output Voltage Accuracy 定電圧精度 |                            |
| Object |  | +15V0.4A                      |                            |

## 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 : 0.0~0.4 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 : 0.0~0.4 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<br>[°C] | Input<br>Voltage [V] | Output<br>Current [A] | Output<br>Voltage [V] | Output Voltage<br>Accuracy [mV] | Output Voltage<br>Accuracy(Ration) [%] |
|-----------------|---------------------|----------------------|-----------------------|-----------------------|---------------------------------|----------------------------------------|
| Maximum Voltage | -20                 | 18.0                 | 0.0                   | 15.136                | ±22                             | ±0.2                                   |
| Minimum Voltage | 55                  | 9.0                  | 0.4                   | 15.093                |                                 |                                        |

**COSEL**

LOVEL

|        |                   |
|--------|-------------------|
| Model  | ZUS61215          |
| Item   | Condensation 結露特性 |
| Object | +15V 0.4A         |

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 26℃ 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26℃、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     | 15.123                | 5                      | 45                   |
|                  | 2     | 15.122                | 5                      | 40                   |
|                  | 3     | 15.124                | 5                      | 45                   |
| Load<br>100<br>% | 1     | 15.122                | 10                     | 70                   |
|                  | 2     | 15.122                | 10                     | 60                   |
|                  | 3     | 15.123                | 10                     | 60                   |

Input Volt. 12.0 V

-14-

BC-2048



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