



# TEST DATA OF ZUS104815

(48.0V INPUT)

Regulated DC Power Supply

Date : Sep 21. 1996

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COSEL CO., LTD.

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Model		ZUS104815																																									
Item		Line Regulation 静的入力変動	Temperature	25℃																																							
Object		+15V0.700A	Testing Circuitry	Figure A																																							
1. Graph		-----□----- Load 50% -----△----- Load 100%																																									
<p>[V]</p> <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>(注)斜線は定格入力電圧範囲を示す。</p>		2. Values																																									
		<table><tr><th>Input Voltage [V]</th><th>Load 50% Output Volt. [V]</th><th>Load 100% Output Volt. [V]</th></tr><tr><td>33.0</td><td>15.262</td><td>15.259</td></tr><tr><td>36.0</td><td>15.263</td><td>15.259</td></tr><tr><td>42.0</td><td>15.262</td><td>15.259</td></tr><tr><td>48.0</td><td>15.262</td><td>15.258</td></tr><tr><td>54.0</td><td>15.261</td><td>15.258</td></tr><tr><td>60.0</td><td>15.261</td><td>15.257</td></tr><tr><td>66.0</td><td>15.262</td><td>15.257</td></tr><tr><td>72.0</td><td>15.261</td><td>15.256</td></tr><tr><td>75.0</td><td>15.261</td><td>15.256</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]	33.0	15.262	15.259	36.0	15.263	15.259	42.0	15.262	15.259	48.0	15.262	15.258	54.0	15.261	15.258	60.0	15.261	15.257	66.0	15.262	15.257	72.0	15.261	15.256	75.0	15.261	15.256	—	—	—	—	—	—	—	—	—
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Model		ZUS104815	Temperature 25℃	
Item		Efficiency 効率	Testing Circuitry Figure A	
Object				

1. Graph

-----□----- Load 50%

-----△----- Load 100%

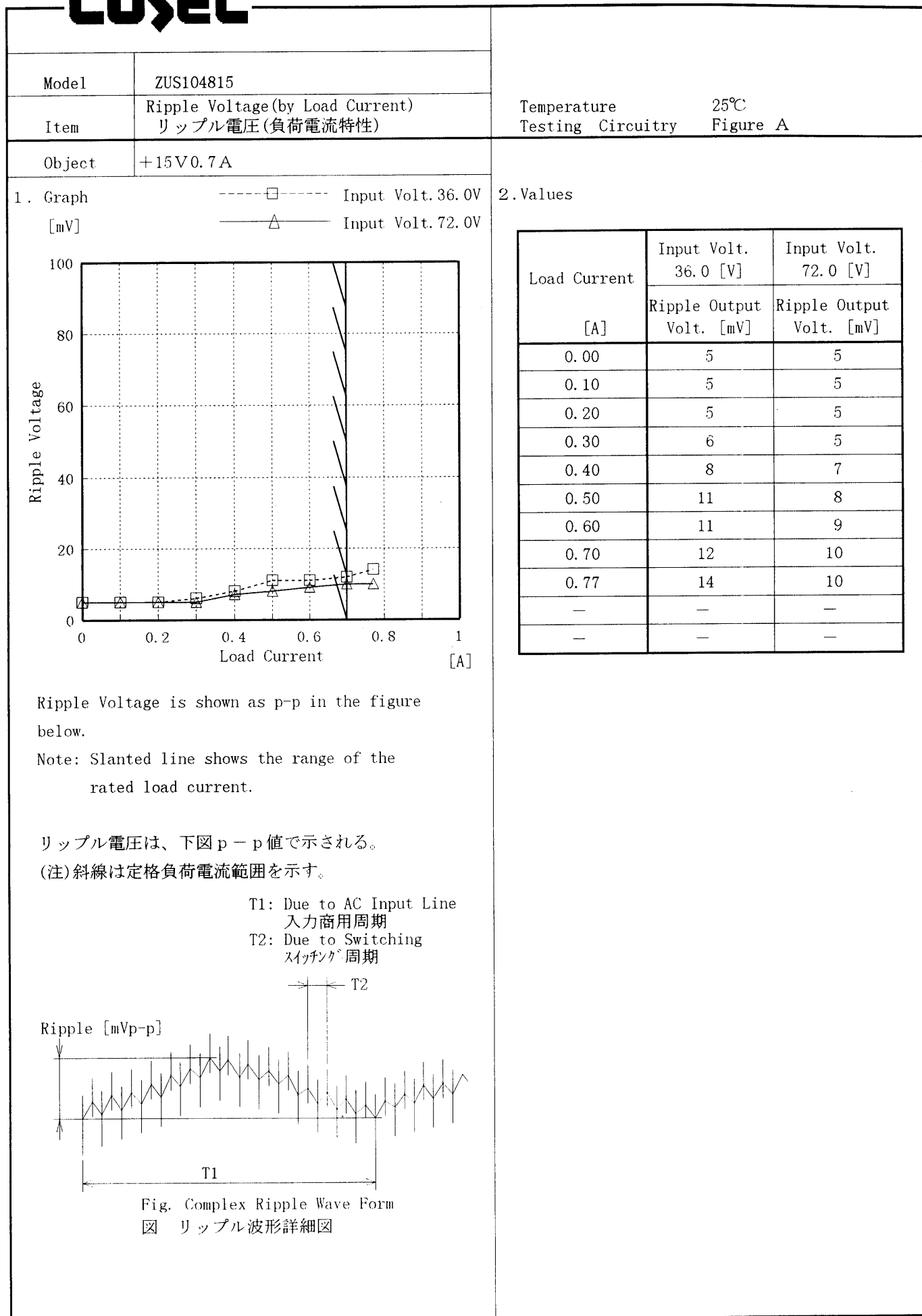
Efficiency [%]

</

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Model		ZUS104815		Temperature		25℃																																																
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<div><div><div>△</div><div>Input Volt. 36.0V</div></div><div><div>□</div><div>Input Volt. 48.0V</div></div><div><div>○</div><div>Input Volt. 72.0V</div></div></div> <div><div><div>Output Voltage [V]</div><div><div>Load Current [A]</div></div></div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th>Input Volt. 36.0[V]</th><th>Input Volt. 48.0[V]</th><th>Input Volt. 72.0[V]</th></tr><tr><th>Output Volt. [V]</th><th>Output Volt. [V]</th><th>Output Volt. [V]</th></tr><tr><td>0.00</td><td>15.266</td><td>15.266</td><td>15.266</td></tr><tr><td>0.10</td><td>15.264</td><td>15.263</td><td>15.263</td></tr><tr><td>0.20</td><td>15.263</td><td>15.262</td><td>15.262</td></tr><tr><td>0.30</td><td>15.262</td><td>15.262</td><td>15.260</td></tr><tr><td>0.40</td><td>15.261</td><td>15.261</td><td>15.259</td></tr><tr><td>0.50</td><td>15.260</td><td>15.259</td><td>15.259</td></tr><tr><td>0.60</td><td>15.259</td><td>15.258</td><td>15.257</td></tr><tr><td>0.70</td><td>15.258</td><td>15.257</td><td>15.256</td></tr><tr><td>0.77</td><td>15.257</td><td>15.257</td><td>15.255</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current [A]	Input Volt. 36.0[V]	Input Volt. 48.0[V]	Input Volt. 72.0[V]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]	0.00	15.266	15.266	15.266	0.10	15.264	15.263	15.263	0.20	15.263	15.262	15.262	0.30	15.262	15.262	15.260	0.40	15.261	15.261	15.259	0.50	15.260	15.259	15.259	0.60	15.259	15.258	15.257	0.70	15.258	15.257	15.256	0.77	15.257	15.257	15.255	—	—	—	—
Load Current [A]	Input Volt. 36.0[V]	Input Volt. 48.0[V]	Input Volt. 72.0[V]																																																			
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(注)斜線は定格負荷電流範囲を示す。																																																						

# COSEL

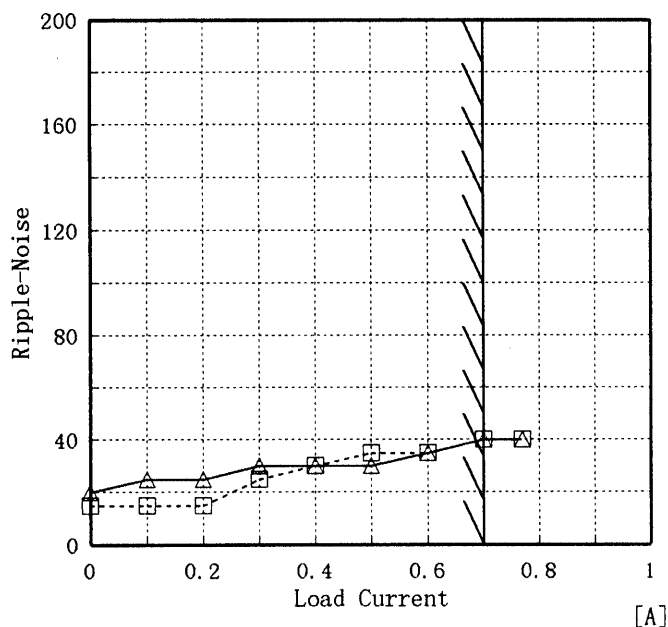


# COSEL

Model	ZUS104815
Item	Ripple-Noise リップルノイズ
Object	+15V0.700A

Temperature 25°C  
Testing Circuitry Figure A

1. Graph  
[mV]      -----□----- Input Volt. 36.0V  
                      ——△—— Input Volt. 72.0V



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

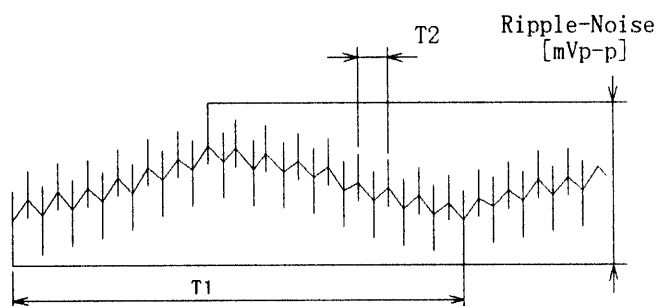


Fig. Complex Ripple Wave Form

図 リップル波形詳細図

2. Values

Load current [A]	Input Volt. 36.0 [V]	Input Volt. 72.0 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	15	20
0.10	15	25
0.20	15	25
0.30	25	30
0.40	30	30
0.50	35	30
0.60	35	35
0.70	40	40
0.77	40	40
—	—	—
—	—	—

**COSEL**

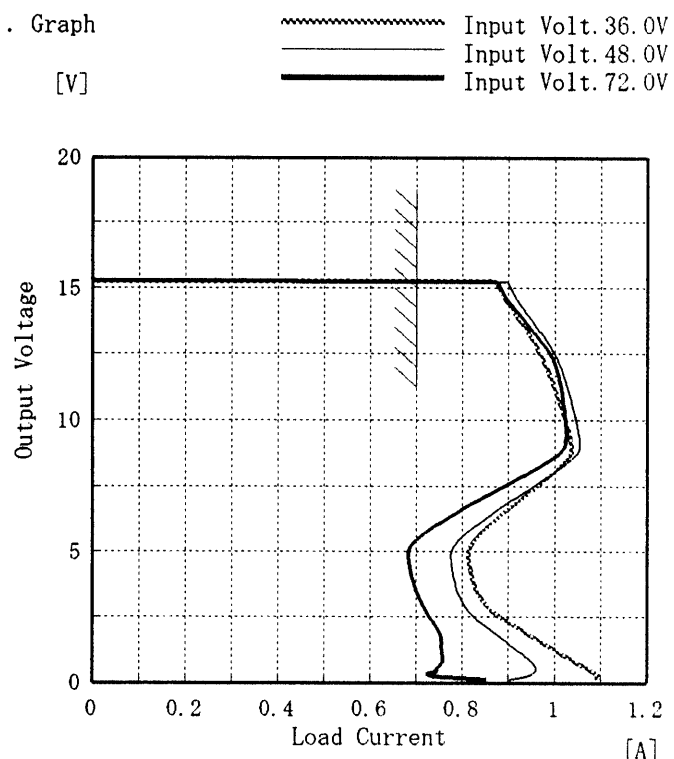
Model ZUS104815

Item Overcurrent Protection  
過電流保護

Object +15V 0.700A

Temperature 25°C  
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. 36.0[V]	Input Volt. 48.0[V]	Input Volt. 72.0[V]
	Load Current [A]	Load Current [A]	Load Current [A]
15.00	0.00	0.00	0.00
14.25	0.90	0.93	0.91
13.50	0.93	0.96	0.94
12.00	0.98	1.01	1.00
10.50	1.01	1.04	1.02
9.00	1.04	1.05	1.02
7.50	0.97	0.96	0.90
6.00	0.86	0.83	0.75
4.50	0.81	0.78	0.68
3.00	0.85	0.80	0.71
1.50	0.97	0.90	0.75
0.00	1.09	0.90	0.85



# COSEL

Model	ZUS104815
Item	Dynamic Load Response 動的負荷変動
Object	+15V0.700A

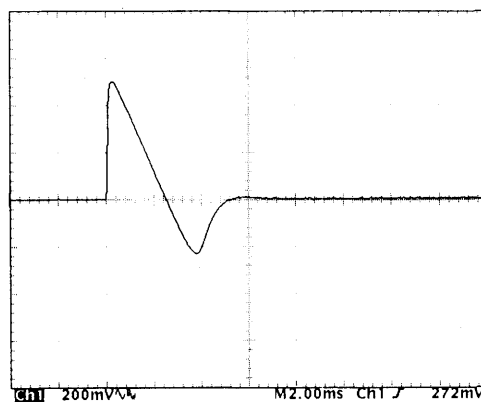
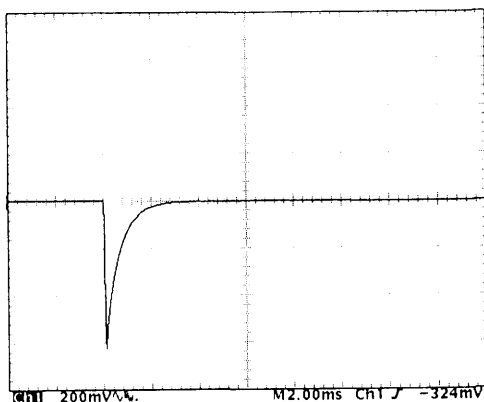
Temperature 25°C  
Testing Circuitry Figure A

Input Volt. 48 V  
Cycle 100 mS

Load Current

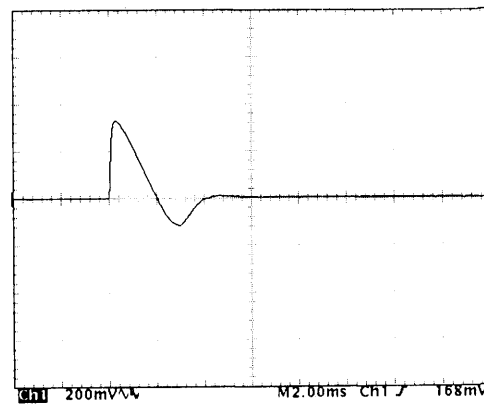
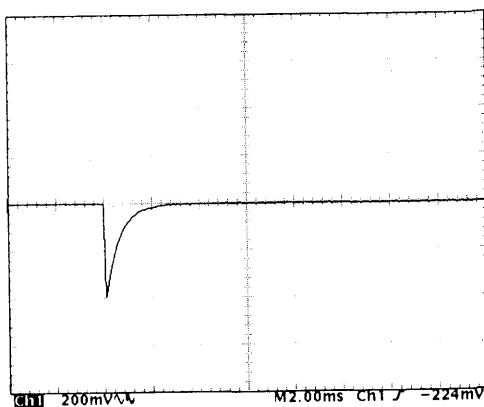
Min. Load  $\longleftrightarrow$   
Load 100 %

200 mV/div



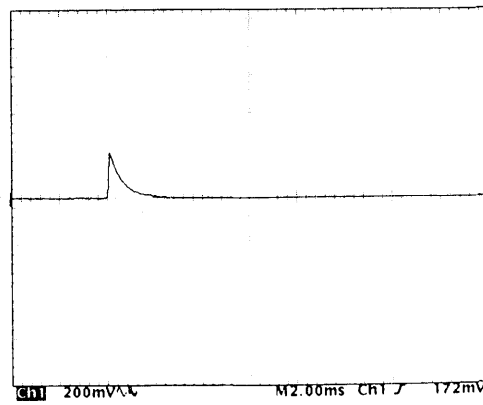
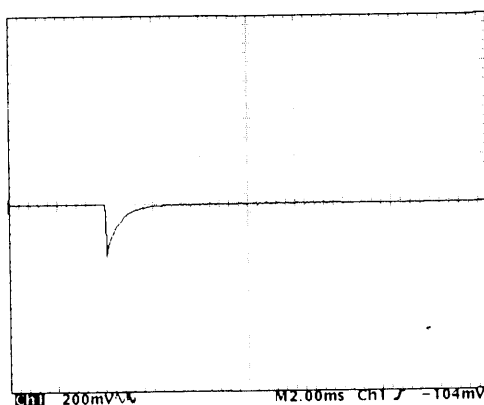
Min. Load  $\longleftrightarrow$   
Load 50 %

200 mV/div



Load 50%  $\longleftrightarrow$   
Load 100 %

200 mV/div



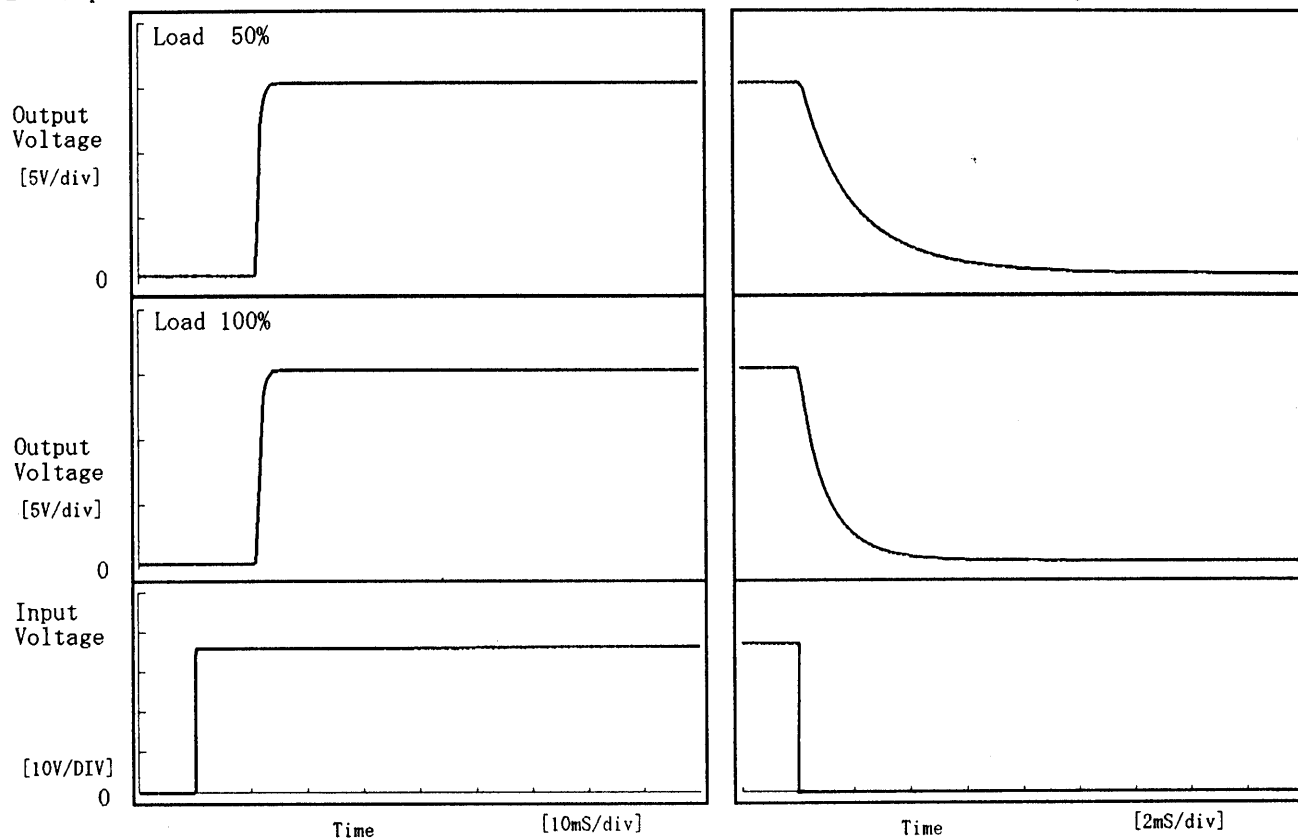
2 mS/div

**COSEL**

Model	ZUS104815	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+15V0.700A		

## 1. Graph

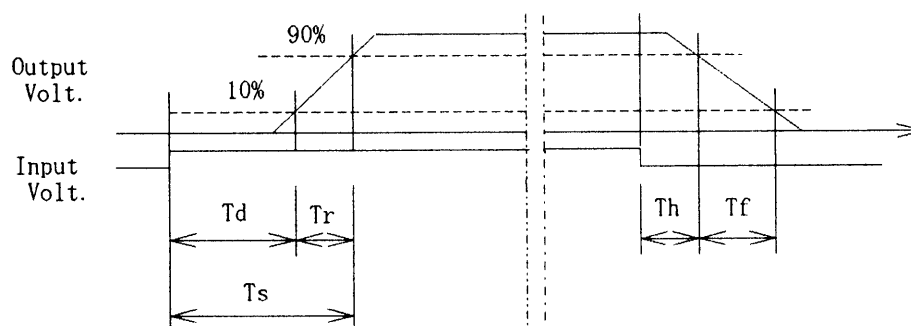
Input Volt. 36.0 V



## 2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	10.85	1.40	12.25	0.40	5.21
100 %	10.90	1.55	12.45	0.20	2.47



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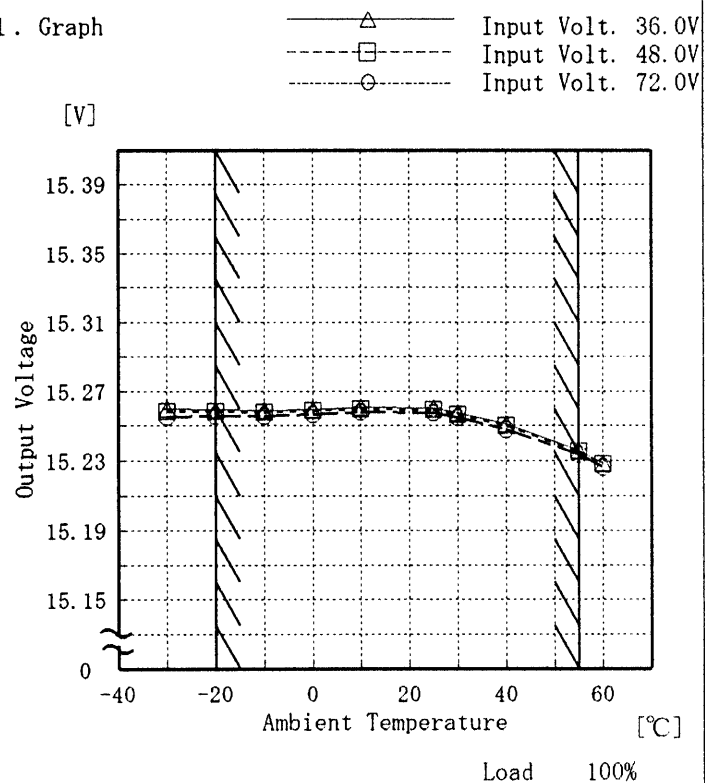
Model ZUS104815

Item Ambient Temperature Drift  
周囲温度変動

Object +15V0.700A

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 [°C]	Input Volt. 36.0[V]	Input Volt. 48.0[V]	Input Volt. 72.0[V]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-30	15.260	15.258	15.255
-20	15.259	15.258	15.256
-10	15.259	15.258	15.256
0	15.260	15.259	15.257
10	15.261	15.260	15.258
25	15.260	15.260	15.258
30	15.257	15.257	15.255
40	15.251	15.250	15.248
55	15.236	15.235	15.234
60	15.229	15.228	15.226
—	—	—	—

**COSEL**

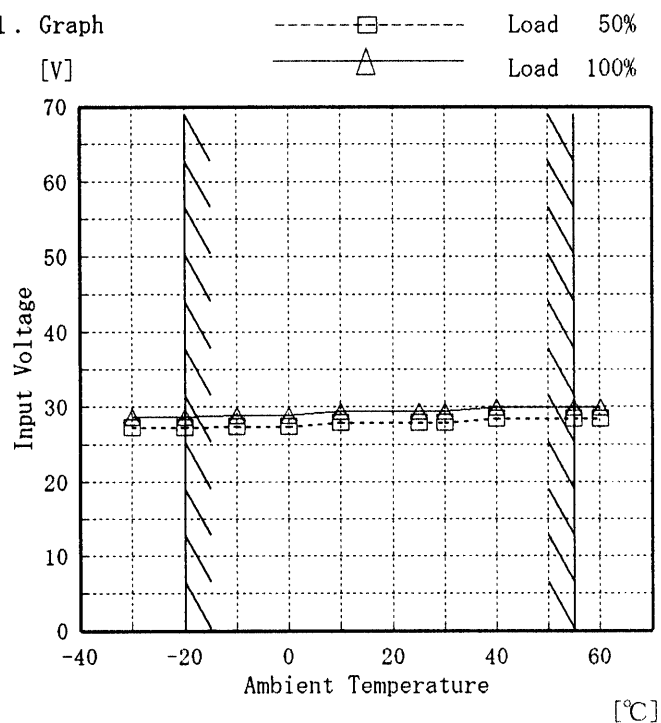
Model ZUS104815

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

Object +15V0.700A

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	27.3	28.7
-20	27.3	28.7
-10	27.4	28.9
0	27.4	28.9
10	27.9	29.4
25	27.9	29.4
30	27.9	29.4
40	28.4	29.9
55	28.4	29.9
60	28.4	29.9
—	—	—

**COSEL**

Model

ZUS104815

Item

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

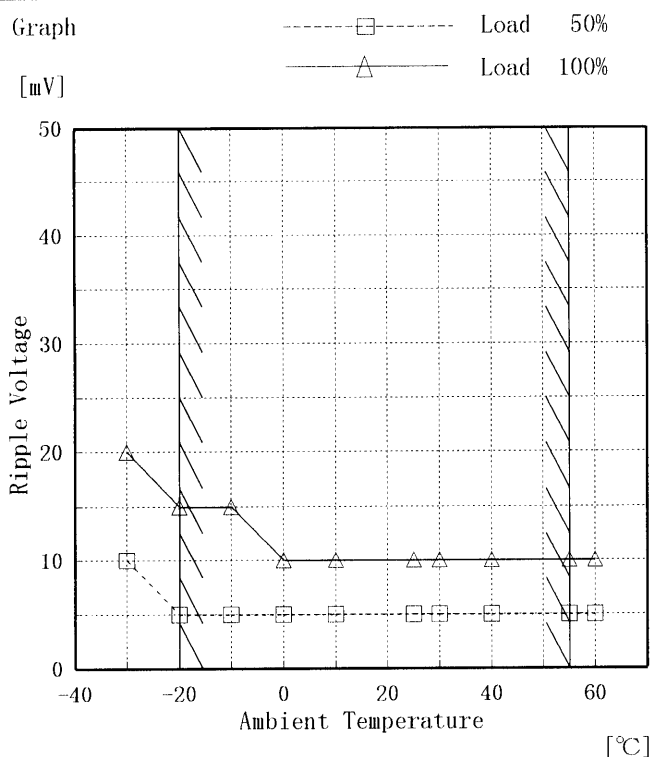
Object

+15V0.700A

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

**COSEL**

Model

ZUS104815

Item

Time Lapse Drift 経時ドリフト

Temperature

25 °C

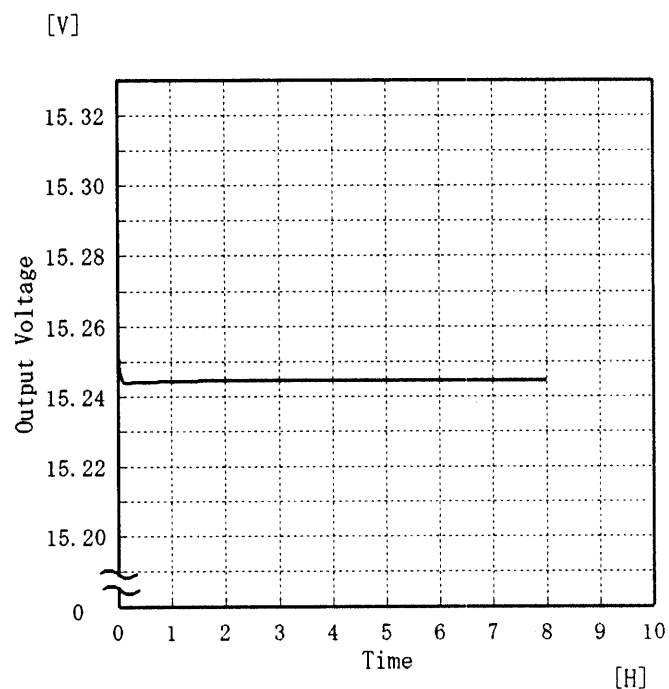
Testing Circuitry

Figure A

Object

+15V0.700A

## 1. Graph



Input Volt. 48V

Load 100%

## 2. Values

Time since start [H]	Output Voltage [V]
0.0	15.252
0.5	15.244
1.0	15.245
2.0	15.245
3.0	15.245
4.0	15.245
5.0	15.245
6.0	15.245
7.0	15.245
8.0	15.245

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Model		ZUS104815	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+15V0.700A	

## 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 : 36.0~72.0 V

Load Current : 0.000~0.700 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 : 36.0~72.0 V

負荷電流 : 0.000~0.700 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	15.269	±20	±0.2
Minimum Voltage	55	72.0	0.700	15.229		

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Model	ZUS104815	Testing Circuitry      Figure A
Item	Condensation 結露特性	
Object	+15V0.700A	

## 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  $25^{\circ}\text{C}$  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 $25^{\circ}\text{C}$ 、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 [V]	Ripple Voltage [mV]	Ripple Noise [mV]
Load 50 %	1	15.248	10	30
	2	15.246	10	30
	3	15.250	10	30
Load 100 %	1	15.244	15	40
	2	15.246	15	40
	3	15.246	15	40

Input Volt. 48.0 V



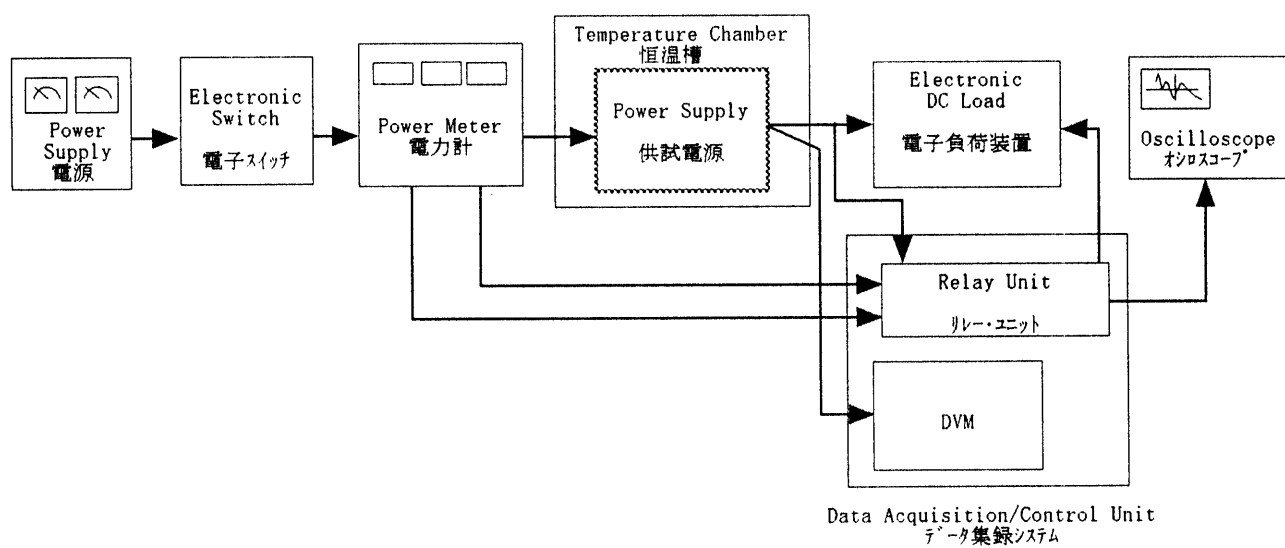
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Figure A