



TEST DATA OF ZUS64805

(48.0V INPUT)

Regulated DC Power Supply

Date : Sep. 23. 1996

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Design Manager

Prepared by : H. Ise
Design Engineer

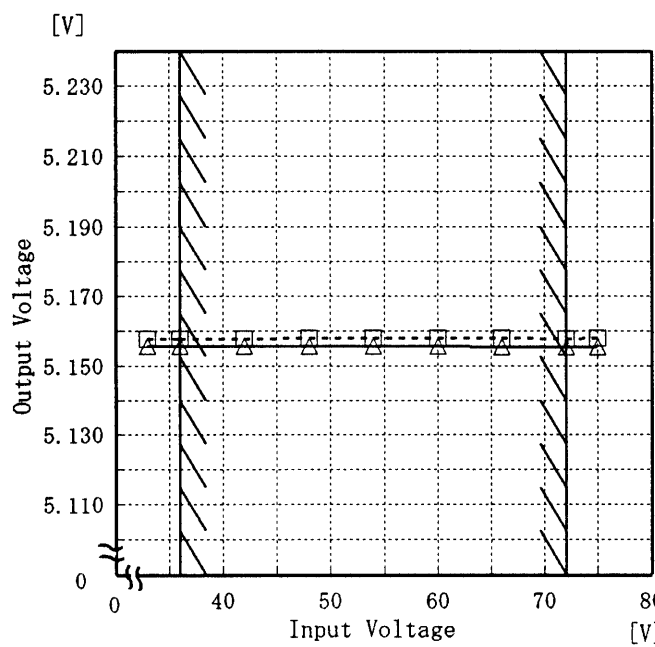
コーセル株式会社
COSEL CO., LTD.

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Model		ZUS64805	Temperature Testing Circuitry	25℃ Figure A																																									
Item		Line Regulation 静的入力変動																																											
Object		+5V1.2A																																											
1. Graph		<div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div> <div><div>Output Voltage [V]</div><div></div><div>Input Voltage [V]</div></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>	2. Values	<table><tr><th rowspan="2">Input Voltage [V]</th><th>Load 50%</th><th>Load 100%</th></tr><tr><th>Output Volt. [V]</th><th>Output Volt. [V]</th></tr><tr><td>33.0</td><td>5.158</td><td>5.156</td></tr><tr><td>36.0</td><td>5.158</td><td>5.156</td></tr><tr><td>42.0</td><td>5.158</td><td>5.156</td></tr><tr><td>48.0</td><td>5.158</td><td>5.156</td></tr><tr><td>54.0</td><td>5.158</td><td>5.156</td></tr><tr><td>60.0</td><td>5.158</td><td>5.155</td></tr><tr><td>66.0</td><td>5.158</td><td>5.155</td></tr><tr><td>72.0</td><td>5.158</td><td>5.155</td></tr><tr><td>75.0</td><td>5.158</td><td>5.155</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%	Load 100%	Output Volt. [V]	Output Volt. [V]	33.0	5.158	5.156	36.0	5.158	5.156	42.0	5.158	5.156	48.0	5.158	5.156	54.0	5.158	5.156	60.0	5.158	5.155	66.0	5.158	5.155	72.0	5.158	5.155	75.0	5.158	5.155	—	—	—	—	—	—	—	—	—
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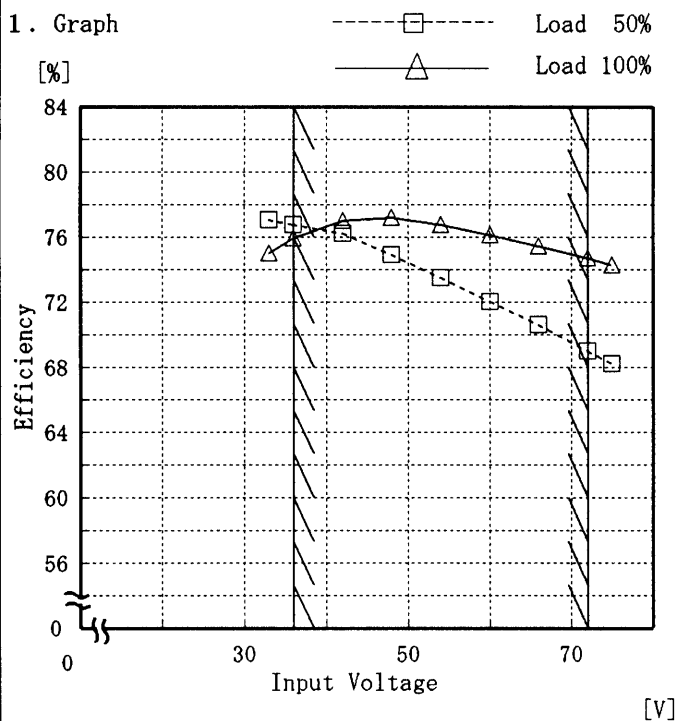
Model ZUS64805

Item Efficiency 効率

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph

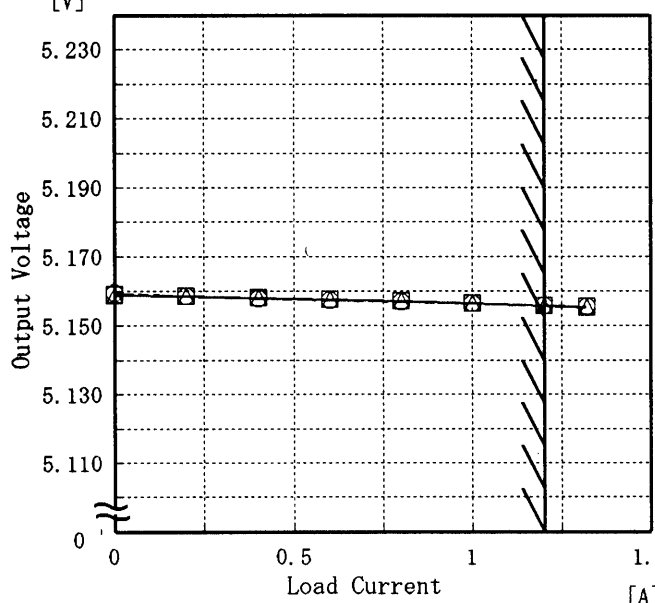


(注) 斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Load 50%	Load 100%
	Efficiency [%]	Efficiency [%]
33.0	77.0	75.0
36.0	76.8	75.9
42.0	76.2	77.0
48.0	74.9	77.2
54.0	73.5	76.8
60.0	72.1	76.1
66.0	70.6	75.5
72.0	69.0	74.7
75.0	68.2	74.3
—	—	—
—	—	—
—	—	—

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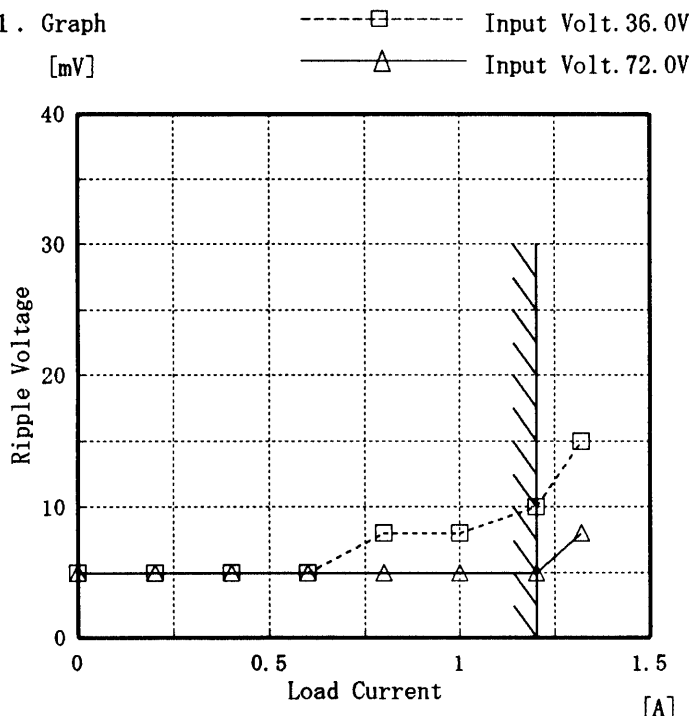
Model		ZUS64805	Temperature		25℃																																														
Item		Load Regulation 静的負荷変動	Testing Circuitry		Figure A																																														
Object		+5V1.2A																																																	
1. Graph		<div><div>—△—</div>Input Volt. 36.0V</div> <div><div>- - -□-</div>Input Volt. 48.0V</div> <div><div>- - -○-</div>Input Volt. 72.0V</div>	2. Values																																																
<div><div><div>[V]</div><div>5.230</div><div>5.210</div><div>5.190</div><div>5.170</div><div>5.150</div><div>5.130</div><div>5.110</div><div>0</div></div><div><div>Output Voltage</div></div></div>  <div><div>0</div><div>0.5</div><div>1</div><div>1.5</div></div> <div><div>Load Current</div><div>[A]</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>5.159</td><td>5.159</td><td>5.160</td></tr><tr><td>0.20</td><td>5.159</td><td>5.159</td><td>5.159</td></tr><tr><td>0.40</td><td>5.158</td><td>5.158</td><td>5.158</td></tr><tr><td>0.60</td><td>5.158</td><td>5.158</td><td>5.158</td></tr><tr><td>0.80</td><td>5.157</td><td>5.157</td><td>5.157</td></tr><tr><td>1.00</td><td>5.157</td><td>5.157</td><td>5.157</td></tr><tr><td>1.20</td><td>5.156</td><td>5.156</td><td>5.156</td></tr><tr><td>1.20</td><td>5.156</td><td>5.156</td><td>5.156</td></tr><tr><td>1.32</td><td>5.155</td><td>5.156</td><td>5.156</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	5.159	5.159	5.160	0.20	5.159	5.159	5.159	0.40	5.158	5.158	5.158	0.60	5.158	5.158	5.158	0.80	5.157	5.157	5.157	1.00	5.157	5.157	5.157	1.20	5.156	5.156	5.156	1.20	5.156	5.156	5.156	1.32	5.155	5.156	5.156	—	—	—	—
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<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>																																																			

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Model	ZUS64805
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+5V 1.2A

Temperature 25°C
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

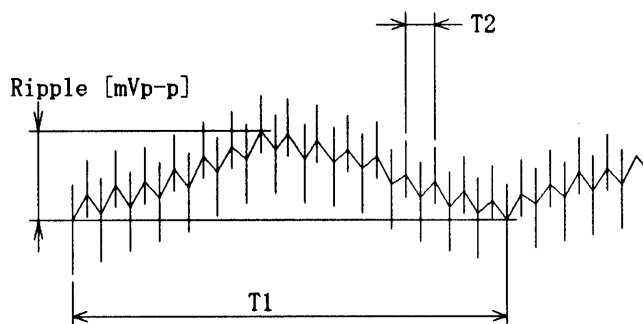


Fig. Complex Ripple Wave Form

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 Output Volt. [mV]	Ripple Output Volt. [mV]
0.00	5	5
0.20	5	5
0.40	5	5
0.60	5	5
0.80	8	5
1.00	8	5
1.20	10	5
1.3	15	8
—	—	—
—	—	—
—	—	—

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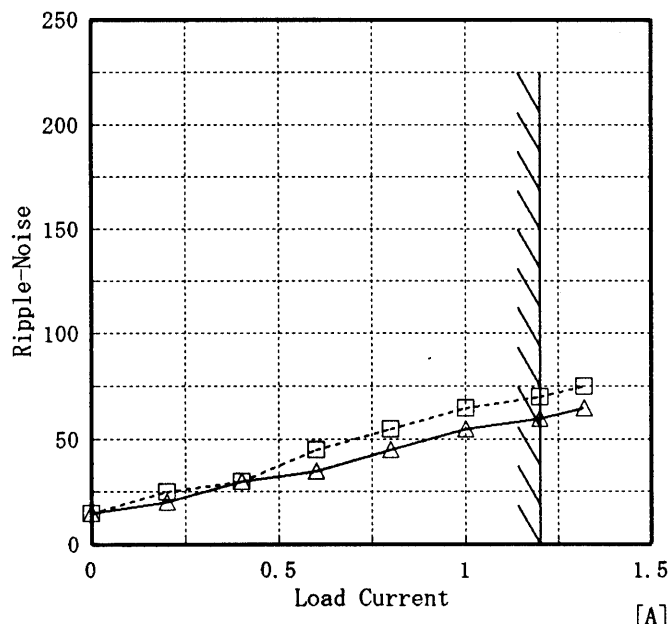
Model ZUS64805

Item Ripple-Noise リップルノイズ

Object +5V1.2A

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。
(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

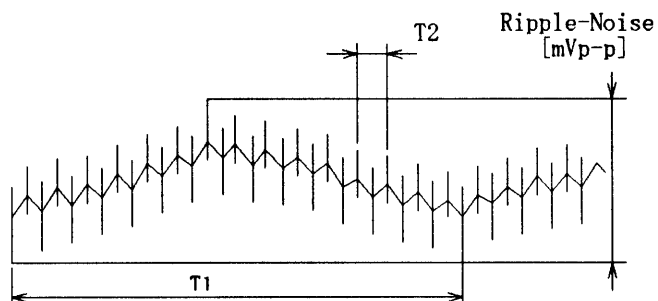


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

Load current [A]	Input Volt. 36.0 [V]	Input Volt. 72.0 [V]
	Ripple-Noise [mV]	Ripple-Noise [mV]
0.00	15	15
0.20	25	20
0.40	30	30
0.60	45	35
0.80	55	45
1.00	65	55
1.20	70	60
1.32	75	65
—	—	—
—	—	—
—	—	—

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Model		ZUS64805	Temperature25℃ Testing Circuitry Figure A	
Item		Overcurrent Protection 過電流保護		
Object		+5V1.2A		

1. Graph

~~~~~

\_\_\_\_\_

—————

Input Volt. 36.0V  
Input Volt. 48.0V  
Input Volt. 72.0V

[V]

8

6

4

2

0

0

0.5

1

1.5

2

2.5

Output Voltage

Load Current

0

0.5

1

1.5

2

2.5

[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. 36.0[V] | Input Volt. 48.0[V] | Input Volt. 72.0[V] |
|--------------------|---------------------|---------------------|---------------------|
|                    | Load Current [A]    | Load Current [A]    | Load Current [A]    |
| 5.00               | 1.63                | 1.82                | 1.78                |
| 4.75               | 1.66                | 1.84                | 1.79                |
| 4.50               | 1.69                | 1.86                | 1.79                |
| 4.00               | 1.75                | 1.90                | 1.80                |
| 3.50               | 1.80                | 1.94                | 1.80                |
| 3.00               | 1.85                | 1.96                | 1.79                |
| 2.50               | 1.89                | 1.97                | 1.77                |
| 2.00               | 1.92                | 1.97                | 1.73                |
| 1.50               | 1.94                | 1.94                | 1.68                |
| 1.00               | 1.94                | 1.90                | 1.62                |
| 0.50               | 1.94                | 1.86                | 1.58                |
| 0.00               | 1.87                | 1.81                | 1.59                |

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。



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|        |                                 |                   |          |
|--------|---------------------------------|-------------------|----------|
| Model  | ZUS64805                        | Temperature       | 25°C     |
| Item   | Dynamic Load Responce<br>動的負荷変動 | Testing Circuitry | Figure A |
| Object | +5V 1.2A                        |                   |          |

Input Volt. 48.0 V

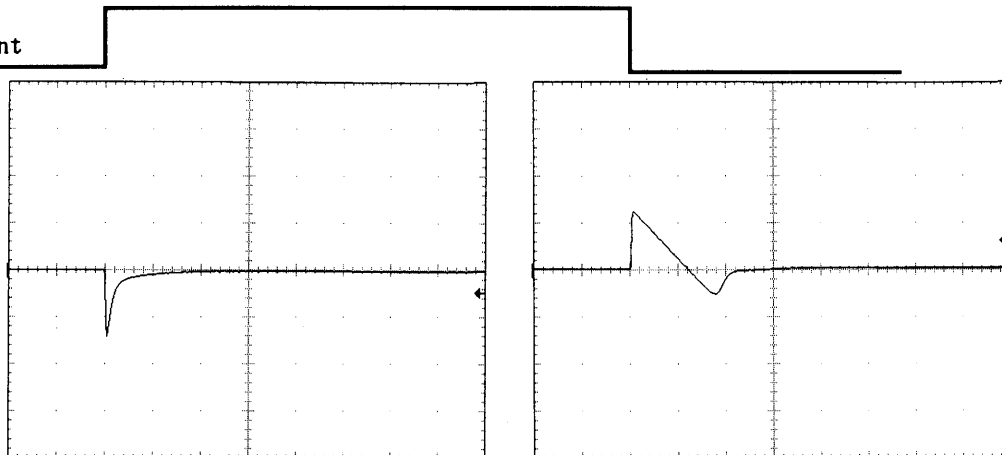
Cycle 100 mS

Load Current

Min. Load ↔

Load 100 %

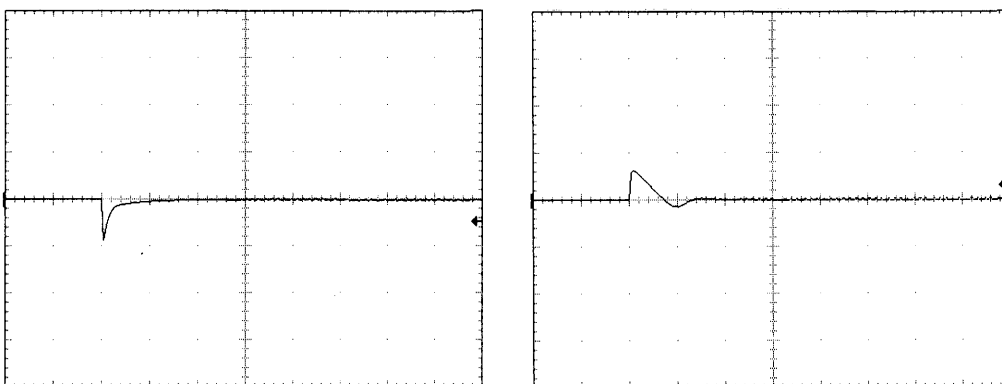
200 mV/div



Min. Load ↔

Load 50 %

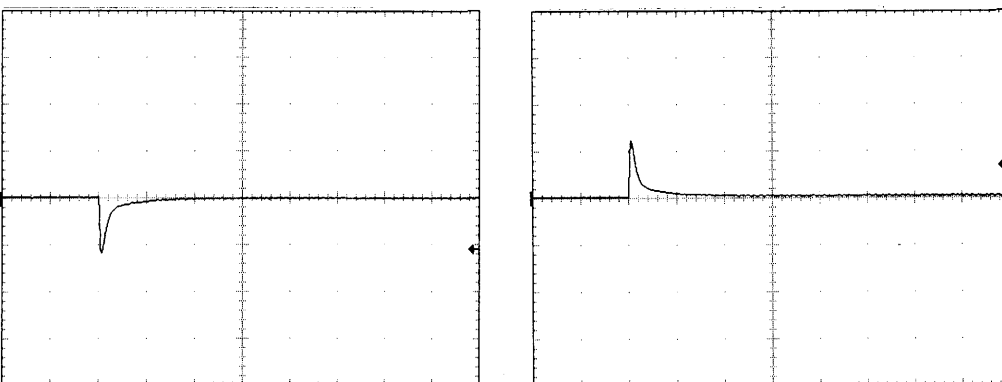
200 mV/div



Load 50% ↔

Load 100 %

100 mV/div



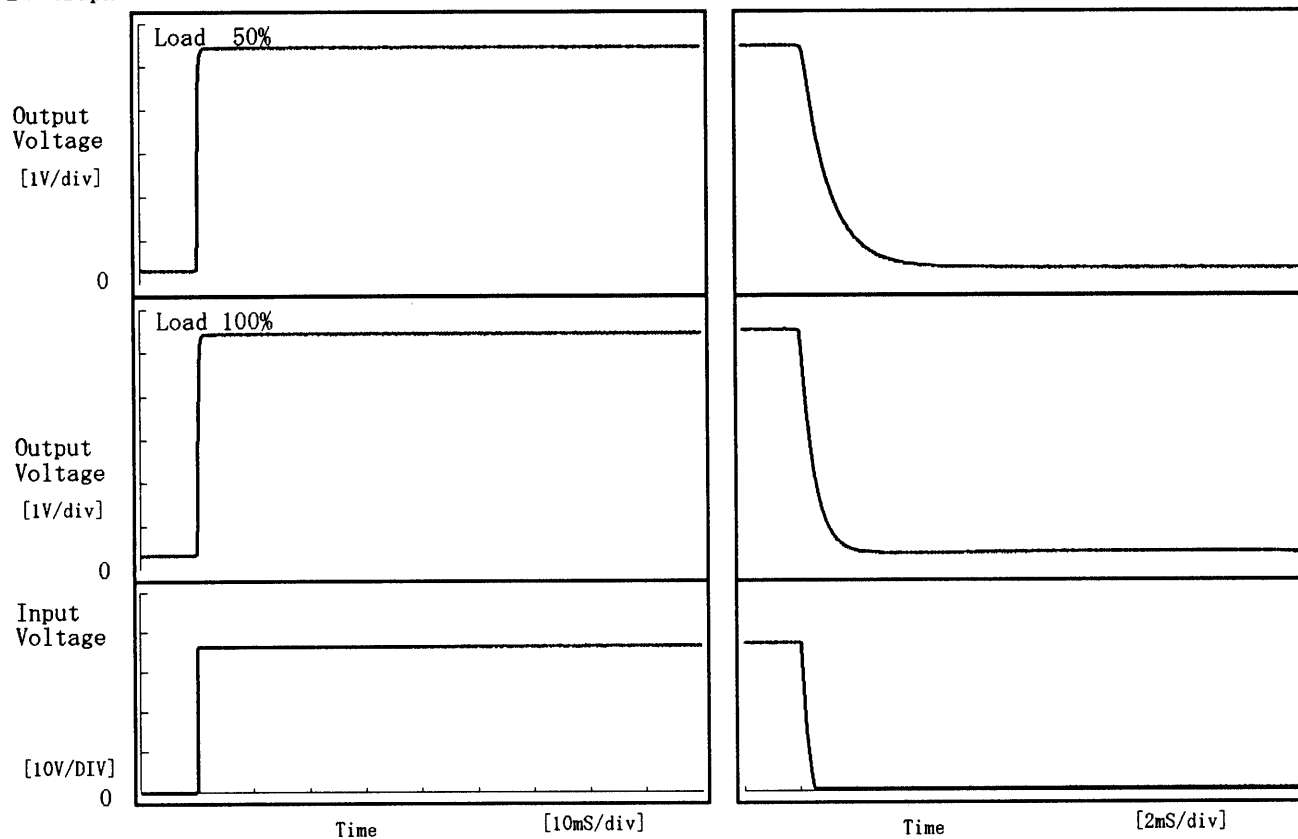
1 mS/div

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|        |                              |                   |          |
|--------|------------------------------|-------------------|----------|
| Model  | ZUS64805                     | Temperature       | 25°C     |
| Item   | Rise and Fall Time 立上り、立下り時間 | Testing Circuitry | Figure A |
| Object | +5V1.2A                      |                   |          |

## 1. Graph

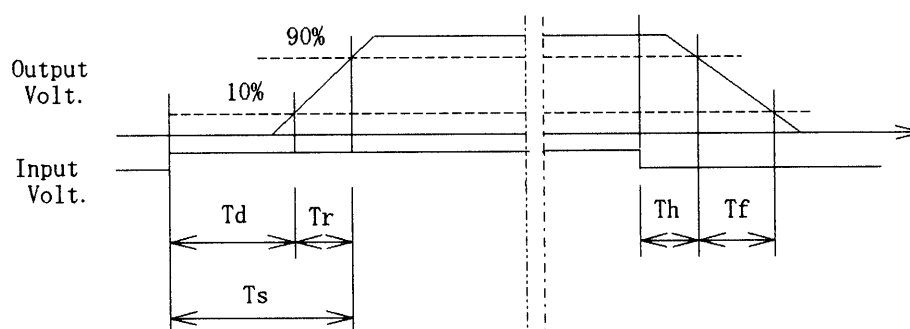
Input Volt. 36.0 V



## 2. Values

[mS]

| Load \ Time | T d  | T r  | T s  | T h  | T f  |
|-------------|------|------|------|------|------|
| 50 %        | 0.05 | 0.40 | 0.45 | 0.32 | 2.17 |
| 100 %       | 0.05 | 0.45 | 0.50 | 0.14 | 1.10 |



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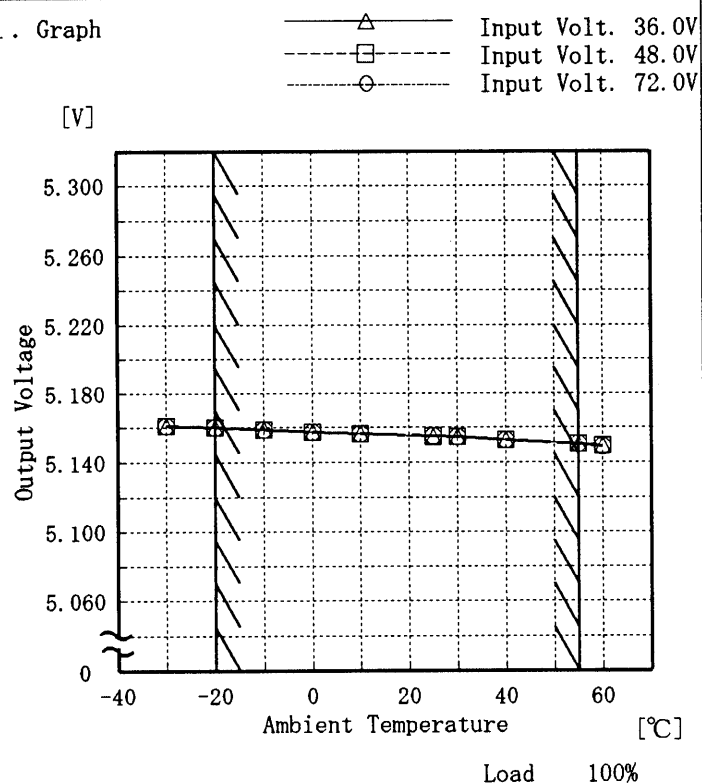
Model ZUS64805

Item Ambient Temperature Drift  
周囲温度変動

Object +5V1.2A

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<br>[°C] | Input Volt.<br>36.0[V] | Input Volt.<br>48.0[V] | Input Volt.<br>72.0[V] |
|---------------------|------------------------|------------------------|------------------------|
|                     | Output<br>Volt. [V]    | Output<br>Volt. [V]    | Output<br>Volt. [V]    |
| -30                 | 5.161                  | 5.161                  | 5.161                  |
| -20                 | 5.160                  | 5.160                  | 5.160                  |
| -10                 | 5.159                  | 5.159                  | 5.159                  |
| 0                   | 5.157                  | 5.158                  | 5.157                  |
| 10                  | 5.156                  | 5.156                  | 5.156                  |
| 25                  | 5.155                  | 5.155                  | 5.155                  |
| 30                  | 5.155                  | 5.155                  | 5.155                  |
| 40                  | 5.153                  | 5.153                  | 5.153                  |
| 55                  | 5.150                  | 5.150                  | 5.150                  |
| 60                  | 5.149                  | 5.150                  | 5.149                  |
| —                   | —                      | —                      | —                      |

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Model ZUS64805

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

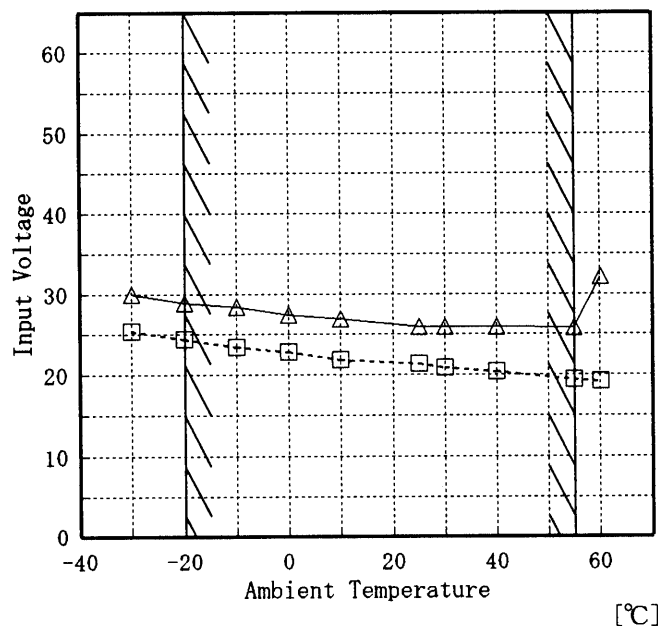
Object +5V1.2A

Testing Circuitry Figure A

## 1. Graph

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

[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                   | 25.4               | 29.9               |
| -20                   | 24.4               | 28.9               |
| -10                   | 23.4               | 28.4               |
| 0                     | 22.9               | 27.4               |
| 10                    | 21.9               | 26.9               |
| 25                    | 21.4               | 25.9               |
| 30                    | 20.9               | 25.9               |
| 40                    | 20.4               | 25.9               |
| 55                    | 19.4               | 25.8               |
| 60                    | 19.3               | 32.1               |
| —                     | —                  | —                  |

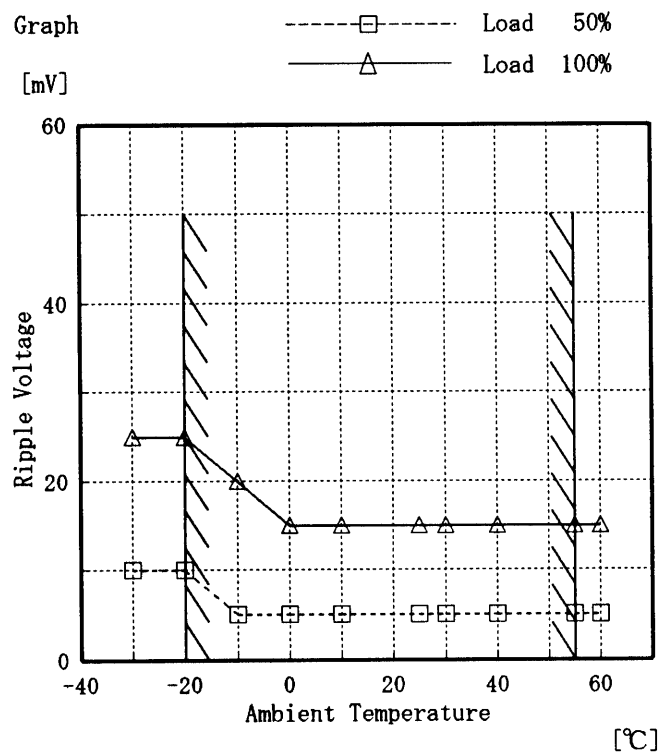
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Model ZUS64805

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

Object +5V1.2A

## 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。

## Testing Circuitry Figure A

## 2. Values

| Ambient Temp.<br>[°C] | Load 50%                    | Load 100%                   |
|-----------------------|-----------------------------|-----------------------------|
|                       | Ripple Output<br>Volt. [mV] | Ripple Output<br>Volt. [mV] |
| -30                   | 10                          | 25                          |
| -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                          |
| —                     | —                           | —                           |

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Model

ZUS64805

Item

Time Lapse Drift 経時ドリフト

Object

+5V1.2A

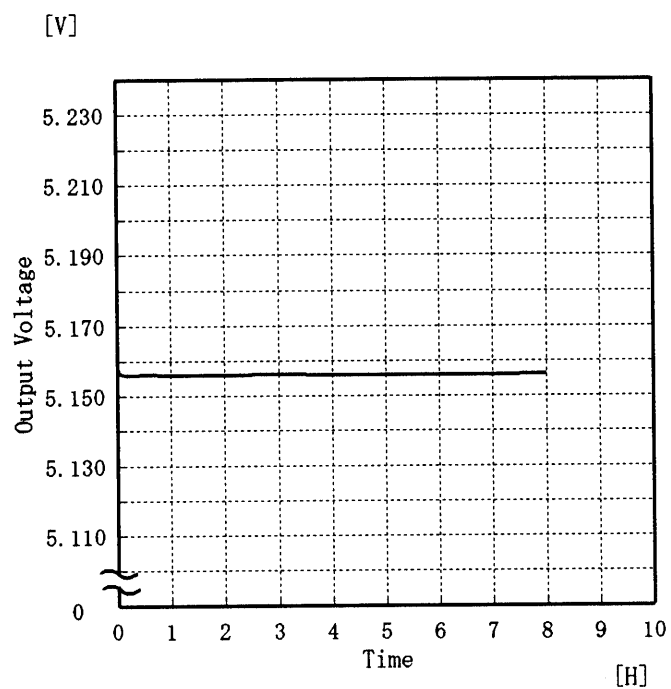
Temperature

25 °C

Testing Circuitry

Figure A

## 1. Graph



## 2. Values

| Time since<br>start<br>[H] | Output<br>Voltage<br>[V] |
|----------------------------|--------------------------|
| 0.0                        | 5.159                    |
| 0.5                        | 5.156                    |
| 1.0                        | 5.156                    |
| 2.0                        | 5.156                    |
| 3.0                        | 5.156                    |
| 4.0                        | 5.156                    |
| 5.0                        | 5.156                    |
| 6.0                        | 5.156                    |
| 7.0                        | 5.156                    |
| 8.0                        | 5.156                    |

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|        |                               |                            |
|--------|-------------------------------|----------------------------|
| Model  | ZUS64805                      | Testing Circuitry Figure A |
| Item   | Output Voltage Accuracy 定電圧精度 |                            |
| Object | +5V1.2A                       |                            |

## 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 : 0.0~1.2 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 : 0.0~1.2 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 | -20              | 72.0              | 0.0                | 5.164              | ±7                           | ±0.2                                |
| Minimum Voltage | 55               | 72.0              | 1.2                | 5.150              |                              |                                     |

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|        |                   |                                 |
|--------|-------------------|---------------------------------|
| Model  | ZUS64805          | Testing Circuitry      Figure A |
| Item   | Condensation 結露特性 |                                 |
| Object | +5V 1.2A          |                                 |

## 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     | 5.160                 | 5                      | 40                   |
|                  | 2     | 5.157                 | 5                      | 45                   |
|                  | 3     | 5.158                 | 5                      | 45                   |
| Load<br>100<br>% | 1     | 5.157                 | 15                     | 55                   |
|                  | 2     | 5.154                 | 10                     | 65                   |
|                  | 3     | 5.156                 | 10                     | 65                   |

Input Volt. 48.0 V



**COSEL**

