



TEST DATA OF ZUS104812

(48.0V INPUT)

Regulated DC Power Supply

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Approved by : T. Sugimori
Design Manager

Prepared by : M. Takashima
Design Engineer

コーセル株式会社
COSEL CO., LTD.

CONTENTS

1. Line Regulation	1
静的入力変動	
2. Efficiency	2
効率	
3. Load Regulation	3
静的負荷変動	
4. Ripple Voltage (by Load Current)	4
リップル電圧(負荷電流特性)	
5. Ripple-Noise	5
リップルノイズ	
6. Overcurrent Protection	6
過電流保護	
7. Dynamic Load Responce	7
動的負荷変動	
8. Rise and Fall Time	8
立上り、立下がり時間	
9. Ambient Temperature Drift	9
周囲温度変動	
10. Minimum Input Voltage for Regulated Output Voltage . . .	10
最低レギュレーション電圧	
11. Ripple Voltage (by Ambient Temperature)	11
リップル電圧(周囲温度特性)	
12. Time Lapse Drift	12
経時ドリフト	
13. Output Voltage Accuracy	13
定電圧精度	
14. Condensation	14
結露特性	
15. Figure of Testing Circuitry	15
測定回路図	

(Final Page 15)

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Model		ZUS104812	Temperature Testing Circuitry	25℃ Figure A																																					
Item		Line Regulation 静的入力変動																																							
Object		+12V0.900A																																							
1. Graph		<div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div> <div><div><div>Output Voltage [V]</div><div><div>12.21</div><div>12.17</div><div>12.13</div><div>12.09</div><div>12.05</div><div>12.01</div><div>11.97</div><div>0</div></div><div><div>0</div><div>40</div><div>50</div><div>60</div><div>70</div><div>80</div></div><div>Input Voltage [V]</div></div></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></div>	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>12.073</td><td>12.070</td></tr><tr><td>36.0</td><td>12.073</td><td>12.070</td></tr><tr><td>42.0</td><td>12.072</td><td>12.070</td></tr><tr><td>48.0</td><td>12.073</td><td>12.070</td></tr><tr><td>54.0</td><td>12.072</td><td>12.070</td></tr><tr><td>60.0</td><td>12.072</td><td>12.070</td></tr><tr><td>66.0</td><td>12.072</td><td>12.070</td></tr><tr><td>72.0</td><td>12.072</td><td>12.070</td></tr><tr><td>75.0</td><td>12.072</td><td>12.070</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	12.073	12.070	36.0	12.073	12.070	42.0	12.072	12.070	48.0	12.073	12.070	54.0	12.072	12.070	60.0	12.072	12.070	66.0	12.072	12.070	72.0	12.072	12.070	75.0	12.072	12.070	—	—	—	—	—	—	—	—	—
Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]																																							
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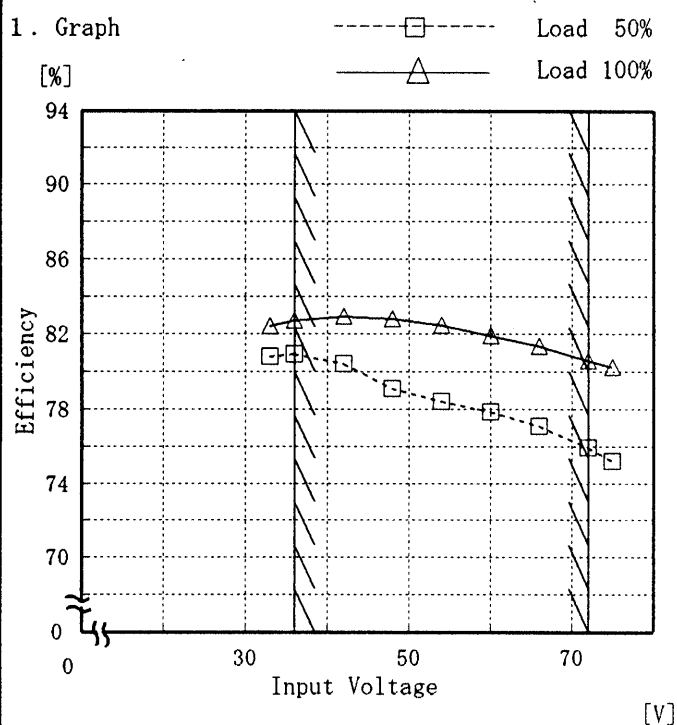
Model ZUS104812

Item Efficiency 効率

Object

 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%
	Efficiency [%]	Efficiency [%]
33.0	80.8	82.4
36.0	80.9	82.7
42.0	80.4	82.9
48.0	79.1	82.8
54.0	78.4	82.5
60.0	77.9	81.9
66.0	77.1	81.4
72.0	75.9	80.6
75.0	75.2	80.2
—	—	—
—	—	—
—	—	—

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Model		ZUS104812		Temperature		25℃																																																
Item		Load Regulation 静的負荷変動		Testing Circuitry		Figure A																																																
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1. Graph				2. Values																																																		
<div><div><div>△</div><div>□</div><div>○</div></div><div>Input Volt. 36.0V Input Volt. 48.0V Input Volt. 72.0V</div></div> <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>				<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>12.075</td><td>12.075</td><td>12.075</td></tr><tr><td>0.15</td><td>12.074</td><td>12.074</td><td>12.074</td></tr><tr><td>0.30</td><td>12.073</td><td>12.073</td><td>12.073</td></tr><tr><td>0.45</td><td>12.072</td><td>12.072</td><td>12.072</td></tr><tr><td>0.60</td><td>12.072</td><td>12.072</td><td>12.072</td></tr><tr><td>0.75</td><td>12.071</td><td>12.071</td><td>12.071</td></tr><tr><td>0.90</td><td>12.071</td><td>12.070</td><td>12.070</td></tr><tr><td>0.99</td><td>12.070</td><td>12.070</td><td>12.070</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</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	12.075	12.075	12.075	0.15	12.074	12.074	12.074	0.30	12.073	12.073	12.073	0.45	12.072	12.072	12.072	0.60	12.072	12.072	12.072	0.75	12.071	12.071	12.071	0.90	12.071	12.070	12.070	0.99	12.070	12.070	12.070	—	—	—	—	—	—	—	—
Load Current [A]	Input Volt. 36.0[V]	Input Volt. 48.0[V]	Input Volt. 72.0[V]																																																			
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Model	ZUS104812
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+12V0.9A

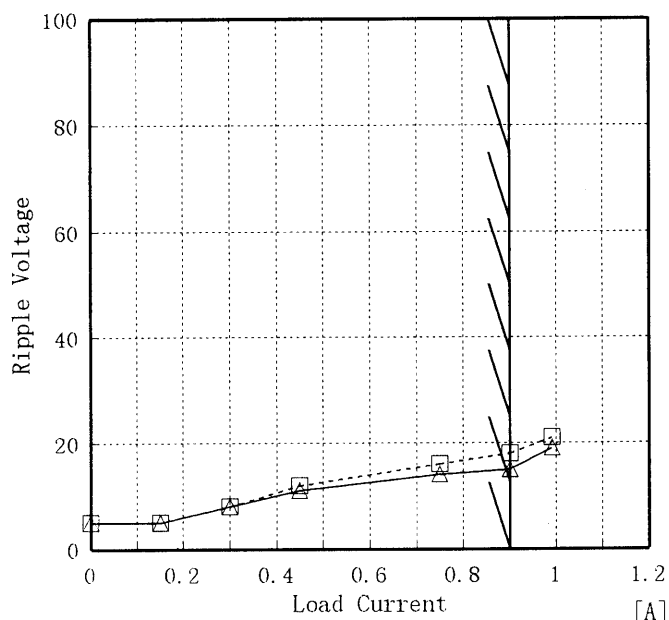
Temperature	25°C
Testing Circuitry	Figure A

1. Graph

[mV]

-----□----- Input Volt. 36.0V

—△— Input Volt. 72.0V



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

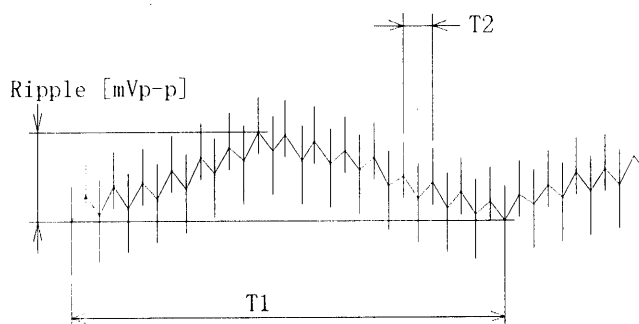


Fig. Complex Ripple Wave Form

図 リップル波形詳細図

2. Values

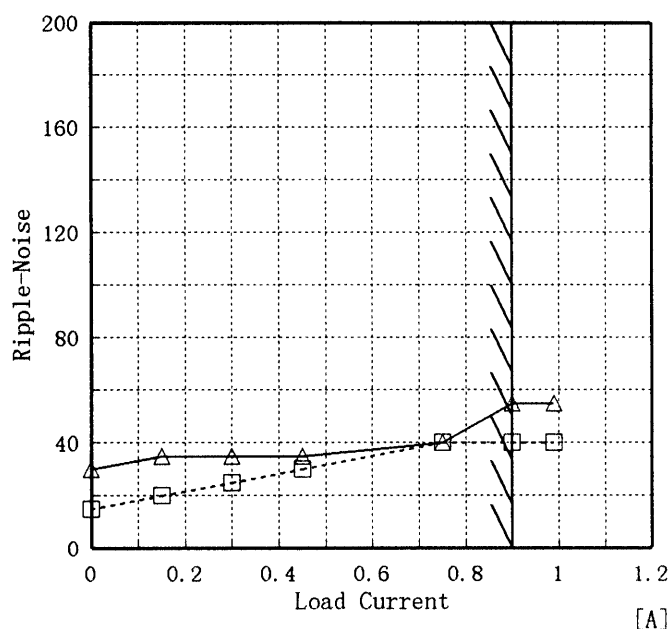
Load Current [A]	Input Volt. 36.0 [V]	Input Volt. 72.0 [V]
	Ripple Output Volt. [mV]	Ripple Output Volt. [mV]
0.00	5	5
0.15	5	5
0.30	8	8
0.45	12	11
0.75	16	14
0.90	18	15
0.99	21	19
—	—	—
—	—	—
—	—	—
—	—	—

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Model	ZUS104812
Item	Ripple-Noise リップルノイズ
Object	+12V0.900A

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

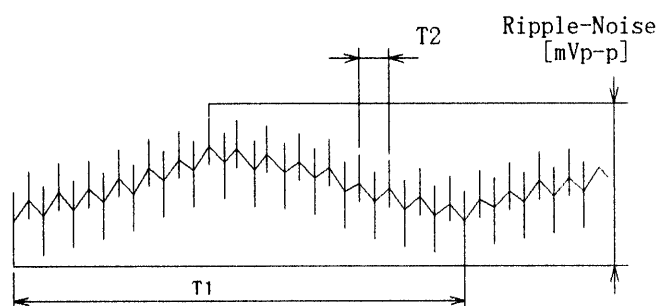


Fig. Complex Ripple Wave Form

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	30
0.15	20	35
0.30	25	35
0.45	30	35
0.75	40	40
0.90	40	55
0.99	40	55
—	—	—
—	—	—
—	—	—
—	—	—

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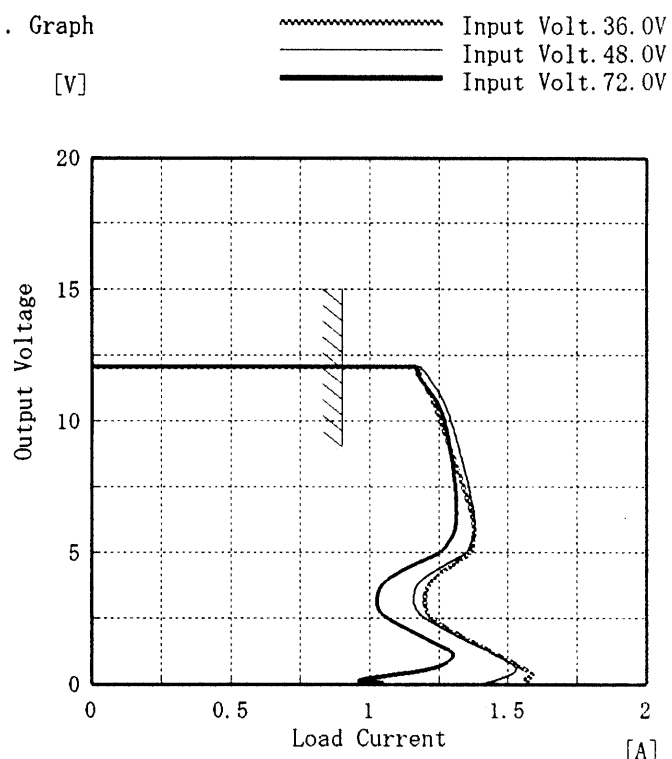
Model ZUS104812

Item Overcurrent Protection
過電流保護

Object +12V0.900A

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]
12.00	0.00	0.00	0.00
11.40	1.19	1.23	1.20
10.80	1.22	1.26	1.24
9.60	1.27	1.30	1.28
8.40	1.30	1.33	1.30
7.20	1.35	1.36	1.31
6.00	1.38	1.38	1.31
4.80	1.34	1.32	1.22
3.60	1.20	1.16	1.04
2.40	1.23	1.21	1.07
1.20	1.43	1.43	1.29
0.00	1.57	1.42	1.05

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Model	ZUS104812	Temperature	25°C
Item	Dynamic Load Response 動的負荷変動	Testing Circuitry	Figure A
Object	+12V0.900A		

Input Volt. 48 V

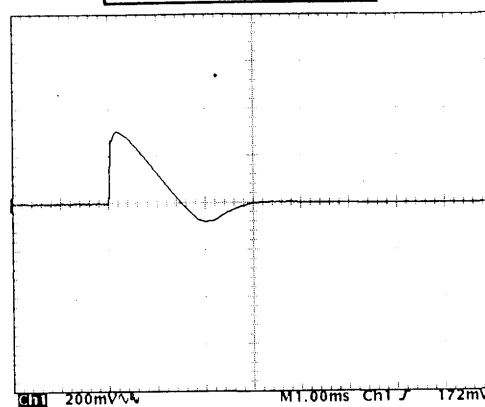
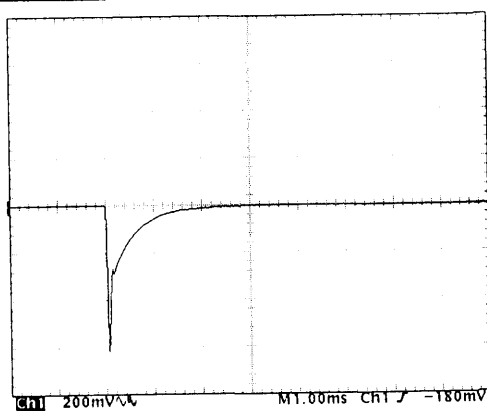
Cycle 100 mS

Load Current

Min. Load ↔

Load 100 %

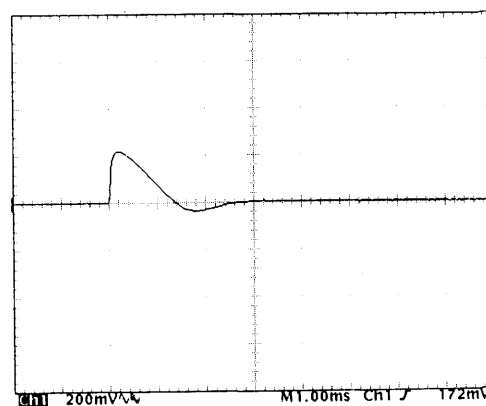
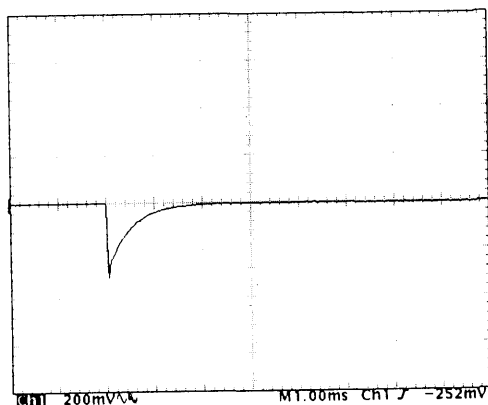
200 mV/div



Min. Load ↔

Load 50 %

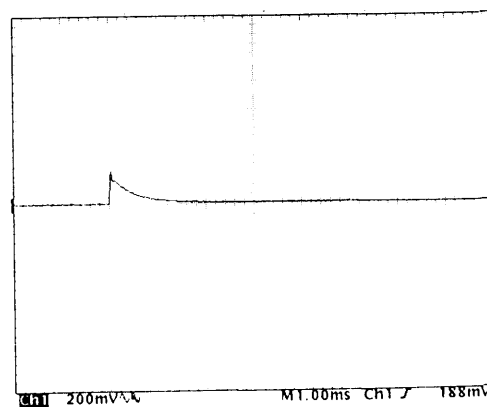
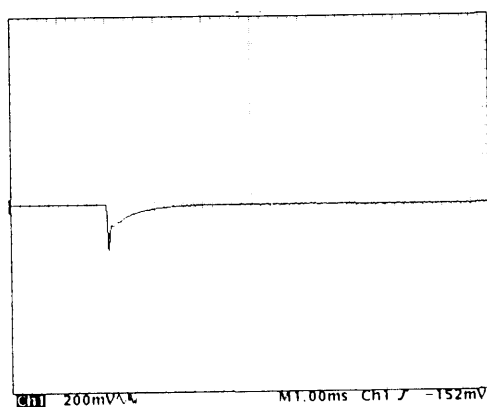
200 mV/div



Load 50% ↔

Load 100 %

200 mV/div



1 mS/div

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Model ZUS104812

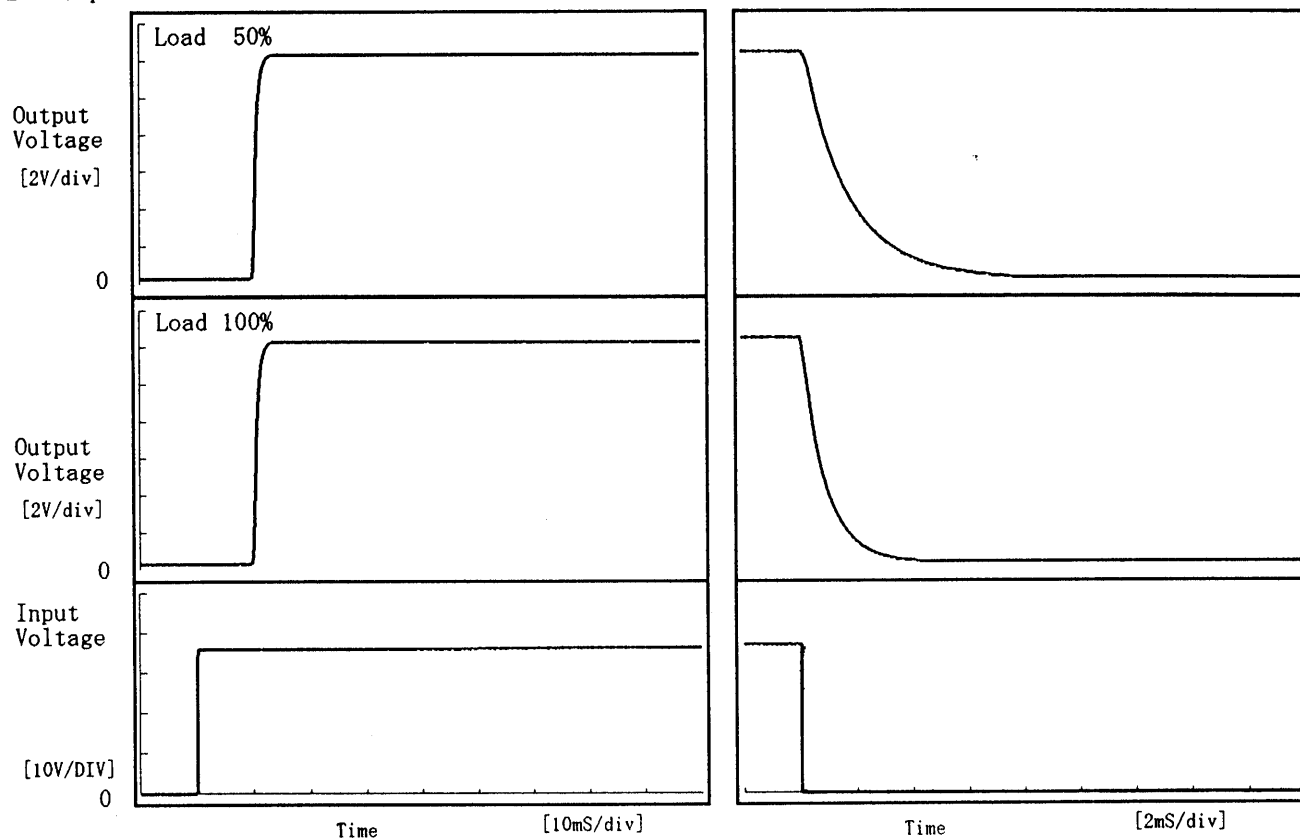
Item Rise and Fall Time 立上り、立下り時間

Object +12V0.900A

Temperature 25℃
Testing Circuitry Figure A

1. Graph

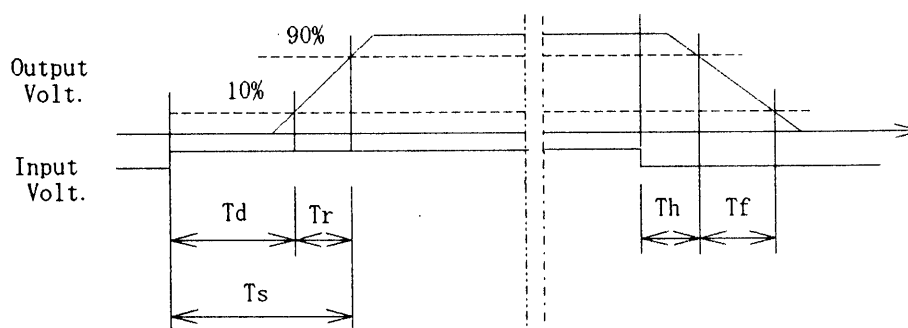
Input Volt. 36.0 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	10.00	1.40	11.40	0.40	3.47
100 %	10.00	1.45	11.45	0.19	1.82



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Model ZUS104812

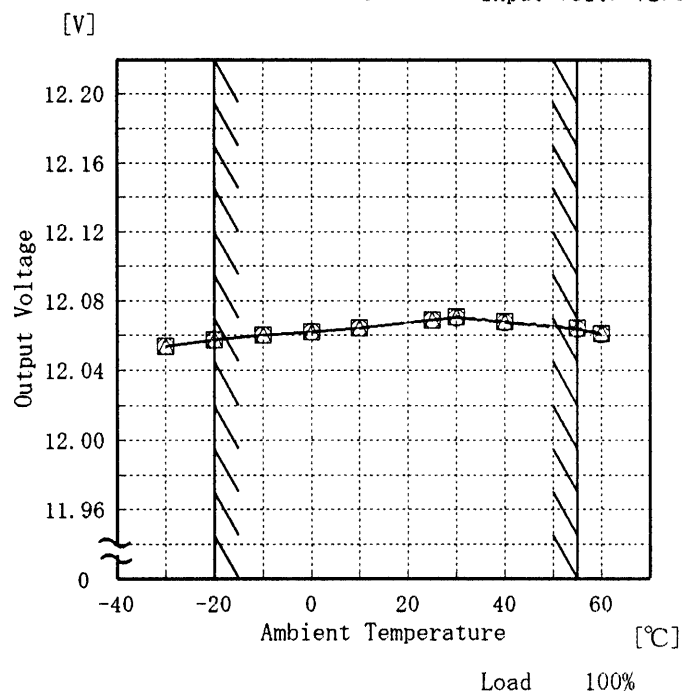
Item Ambient Temperature Drift
周囲温度変動

Object +12V0.900A

Testing Circuitry Figure A

1. Graph

—△— Input Volt. 36.0V
 - - - □ - - - Input Volt. 48.0V
 - - - ○ - - - Input Volt. 72.0V



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	Input Volt. 36.0[V]	Input Volt. 48.0[V]	Input Volt. 72.0[V]
[°C]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-30	12.054	12.054	12.054
-20	12.057	12.057	12.057
-10	12.060	12.060	12.060
0	12.062	12.062	12.062
10	12.064	12.064	12.064
25	12.069	12.069	12.069
30	12.071	12.071	12.070
40	12.068	12.068	12.068
55	12.064	12.064	12.064
60	12.061	12.061	12.061
—	—	—	—

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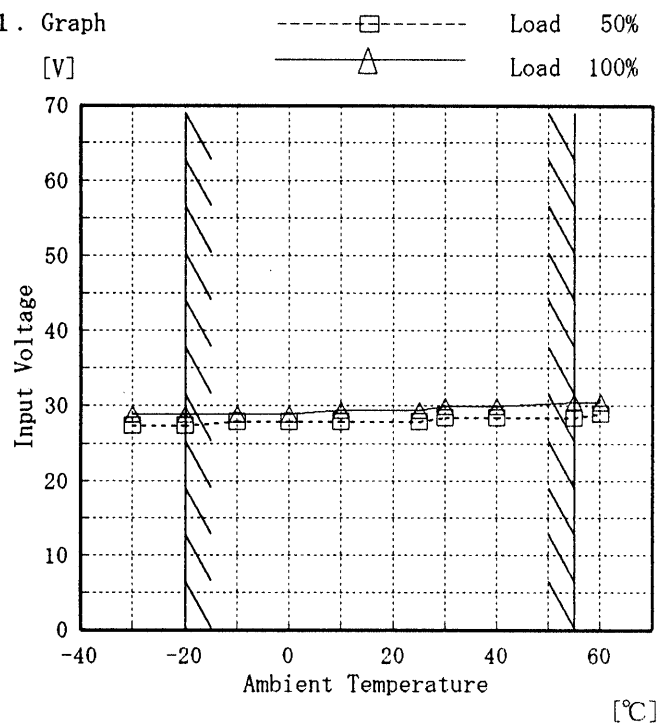
Model ZUS104812

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	27.4	28.9
-20	27.4	28.9
-10	27.9	28.9
0	27.9	28.9
10	27.9	29.4
25	27.9	29.4
30	28.4	29.9
40	28.4	29.9
55	28.4	30.4
60	28.9	30.4
—	—	—

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Model		ZUS104812	Testing Circuitry	Figure A																																				
Item		Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)																																						
Object		+ 1 2 V 0 . 9 0 0 A																																						
1. Graph		<div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div> <div><p>[mV]</p><p>Input Volt. 36.0 V</p><p>Note: Slanted line shows the range of the rated ambient temperature.</p><p>(注)斜線は定格周囲温度範囲を示す。</p></div>	2. Values																																					
		<table><tr><th>Ambient Temp. [°C]</th><th>Load 50% Ripple Output Volt. [mV]</th><th>Load 100% Ripple Output Volt. [mV]</th></tr><tr><td>-30</td><td>15</td><td>25</td></tr><tr><td>-20</td><td>10</td><td>20</td></tr><tr><td>-10</td><td>10</td><td>15</td></tr><tr><td>0</td><td>10</td><td>15</td></tr><tr><td>10</td><td>10</td><td>15</td></tr><tr><td>25</td><td>10</td><td>15</td></tr><tr><td>30</td><td>10</td><td>15</td></tr><tr><td>40</td><td>10</td><td>15</td></tr><tr><td>55</td><td>10</td><td>15</td></tr><tr><td>60</td><td>10</td><td>15</td></tr><tr><td>—</td><td>—</td><td>—</td></tr></table>	Ambient Temp. [°C]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]	-30	15	25	-20	10	20	-10	10	15	0	10	15	10	10	15	25	10	15	30	10	15	40	10	15	55	10	15	60	10	15	—	—	—		
Ambient Temp. [°C]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]																																						
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0	10	15																																						
10	10	15																																						
25	10	15																																						
30	10	15																																						
40	10	15																																						
55	10	15																																						
60	10	15																																						
—	—	—																																						

COSEL

Model

ZUS104812

Item

Time Lapse Drift 経時ドリフト

Temperature

25 °C

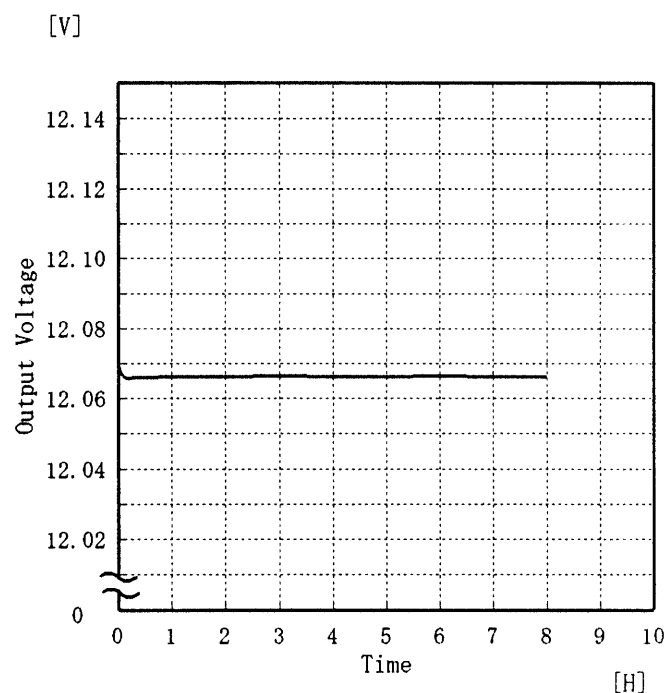
Testing Circuitry

Figure A

Object

+12V0.900A

1. Graph



2. Values

Time since start [H]	Output Voltage [V]
0.0	12.070
0.5	12.066
1.0	12.066
2.0	12.066
3.0	12.067
4.0	12.066
5.0	12.066
6.0	12.067
7.0	12.066
8.0	12.066

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Model		ZUS104812	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 : 36.0~72.0 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 : 36.0~72.0 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	12.075	±9	±0.1
Minimum Voltage	-20	48.0	0.900	12.058		

COSEL

LUCEL

Model	ZUS104812
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	12.064	15	35
	2	12.060	15	35
	3	12.061	15	35
Load 100 %	1	12.058	20	45
	2	12.057	20	45
	3	12.058	20	45

Input Volt. 48.0 V

COSEL

