



TEST DATA OF ZUS101212

(12.0V INPUT)

Regulated DC Power Supply

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COSEL CO., LTD.

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Model		ZUS101212	
Item		Line Regulation 静的入力変動	
Object		+12V0.900A	

1. Graph

-----□----- Load 50%

-----△----- Load 100%

[V]

12.25

12.21

12.17

12.13

12.09

12.05

12.01

0

0

10

15

20

Input Voltage

[V]

Output Voltage

[V]

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	12.109	12.107
9.0	12.109	12.107
10.0	12.109	12.107
12.0	12.109	12.107
15.0	12.109	12.107
18.0	12.109	12.107
20.0	12.109	12.107
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

Temperature

25℃

Testing Circuitry

Figure A

COSEL

Model

ZUS101212

Item

Efficiency 効率

Object

1. Graph

---□---

Load 50%

—△—

Load 100%

[%]

90

82

74

66

58

50

42

0

Efficiency

0

10

15

20

Input Voltage

[V]

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	82.2	81.7
9.0	82.4	82.4
10.0	82.8	82.8
12.0	82.0	83.4
15.0	82.0	83.4
18.0	81.0	83.2
20.0	80.7	82.7
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model		ZUS101212	Temperature25℃																																																		
Item		Load Regulation 静的負荷変動	Testing CircuitryFigure A																																																		
Object		+12V0.900A																																																			
1. Graph		<div><div><div>—△—</div><div>Input Volt. 9.0V</div></div><div><div>- - -□- - -</div><div>Input Volt. 12.0V</div></div><div><div>- - -○- - -</div><div>Input Volt. 18.0V</div></div></div> <div><div>Output Voltage [V]</div><div><div>12.25</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>0</div></div></div> <div><div>Load Current [A]</div><div><div>0</div><div>0.2</div><div>0.4</div><div>0.6</div><div>0.8</div><div>1</div><div>1.2</div></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>	2. Values		<table><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><tr><td>0.00</td><td>12.113</td><td>12.113</td><td>12.114</td></tr><tr><td>0.15</td><td>12.112</td><td>12.112</td><td>12.112</td></tr><tr><td>0.30</td><td>12.111</td><td>12.111</td><td>12.111</td></tr><tr><td>0.45</td><td>12.110</td><td>12.110</td><td>12.110</td></tr><tr><td>0.60</td><td>12.109</td><td>12.109</td><td>12.109</td></tr><tr><td>0.75</td><td>12.108</td><td>12.108</td><td>12.108</td></tr><tr><td>0.90</td><td>12.108</td><td>12.108</td><td>12.108</td></tr><tr><td>0.99</td><td>12.107</td><td>12.107</td><td>12.107</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. 9.0[V]	Input Volt. 12.0[V]	Input Volt. 18.0[V]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]	0.00	12.113	12.113	12.114	0.15	12.112	12.112	12.112	0.30	12.111	12.111	12.111	0.45	12.110	12.110	12.110	0.60	12.109	12.109	12.109	0.75	12.108	12.108	12.108	0.90	12.108	12.108	12.108	0.99	12.107	12.107	12.107	—	—	—	—	—	—	—	—
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	12.113	12.113	12.114																																																		
0.15	12.112	12.112	12.112																																																		
0.30	12.111	12.111	12.111																																																		
0.45	12.110	12.110	12.110																																																		
0.60	12.109	12.109	12.109																																																		
0.75	12.108	12.108	12.108																																																		
0.90	12.108	12.108	12.108																																																		
0.99	12.107	12.107	12.107																																																		
—	—	—	—																																																		
—	—	—	—																																																		

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Model		ZUS101212	
Item		Ripple Voltage (by Load Current) リップル電圧 (負荷電流特性)	
Object		+12V 0.9A	

1. Graph

-----□----- Input Volt. 9.0V

-----△----- Input Volt. 18.0V

[mV]

100

80

60

40

20

0

0

0.2

0.4

0.6

0.8

1

1.2

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
0.15	5	5
0.30	7	8
0.45	11	11
0.75	15	14
0.90	14	13
0.99	18	14
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	ZUS101212	Temperature	25°C
Item	Ripple-Noise リップルノイズ	Testing Circuitry	Figure A
Object	+12V0.900A		

1. Graph

[mV]

-----□----- Input Volt. 9.0V

-----△----- Input Volt. 18.0V

Ripple-Noise

Load Current [A]

2. Values

Load current [A]	Input Volt. 9.0 [V] Ripple-Noise [mV]	Input Volt. 18.0 [V] Ripple-Noise [mV]
0.00	30	40
0.15	30	40
0.30	40	50
0.45	40	60
0.75	65	70
0.90	65	75
0.99	65	75
—	—	—
—	—	—
—	—	—
—	—	—

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

Ripple-Noise [mVp-p]

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

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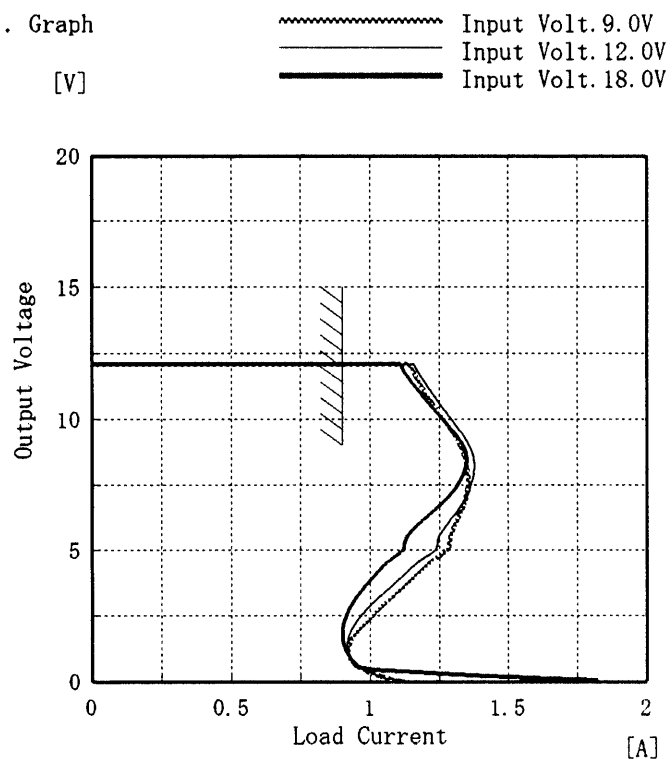
Model ZUS101212

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. 9.0[V]	Input Volt. 12.0[V]	Input Volt. 18.0[V]
	Load Current [A]	Load Current [A]	Load Current [A]
12.00	0.00	0.00	0.00
11.40	1.18	1.20	1.16
10.80	1.21	1.23	1.20
9.60	1.29	1.32	1.29
8.40	1.35	1.37	1.35
7.20	1.35	1.35	1.30
6.00	1.31	1.28	1.18
4.80	1.26	1.22	1.10
3.60	1.12	1.08	0.98
2.40	1.00	0.96	0.91
1.20	0.92	0.92	0.91
0.00	1.09	1.13	1.82

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Model	ZUS101212	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response 動的負荷変動	
Object	+12V0.900A	

Input Volt. 12 V

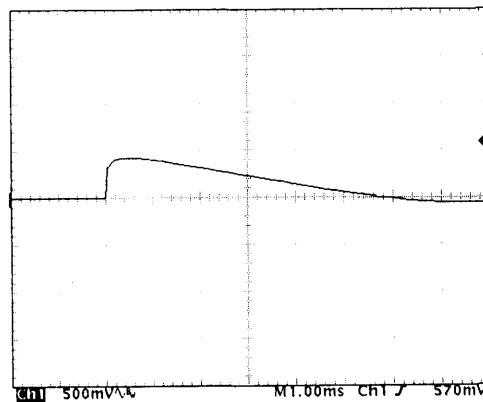
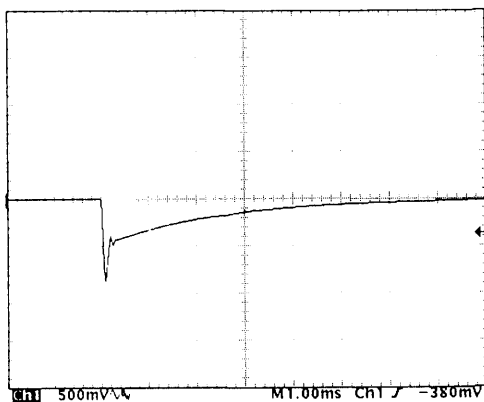
Cycle 100 mS

Load Current

Min. Load ←→

Load 100 %

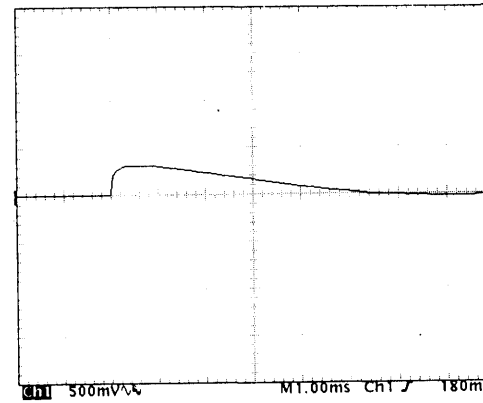
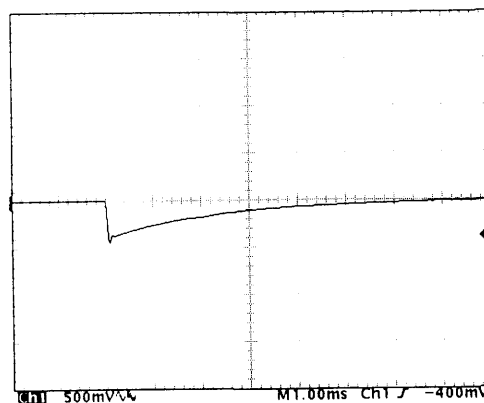
500 mV/div



Min. Load ←→

Load 50 %

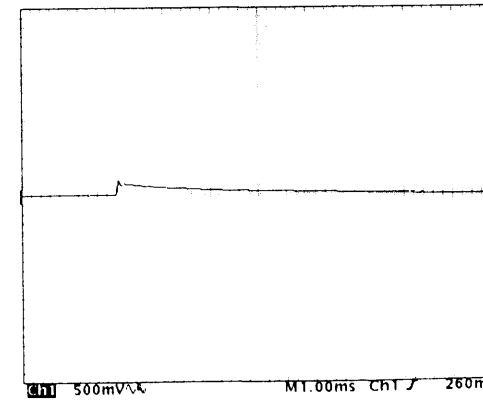
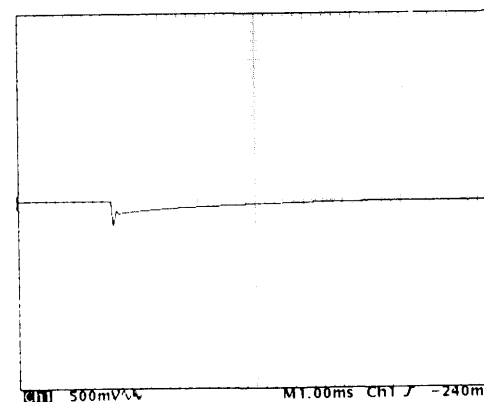
500 mV/div



Load 50% ←→

Load 100 %

500 mV/div



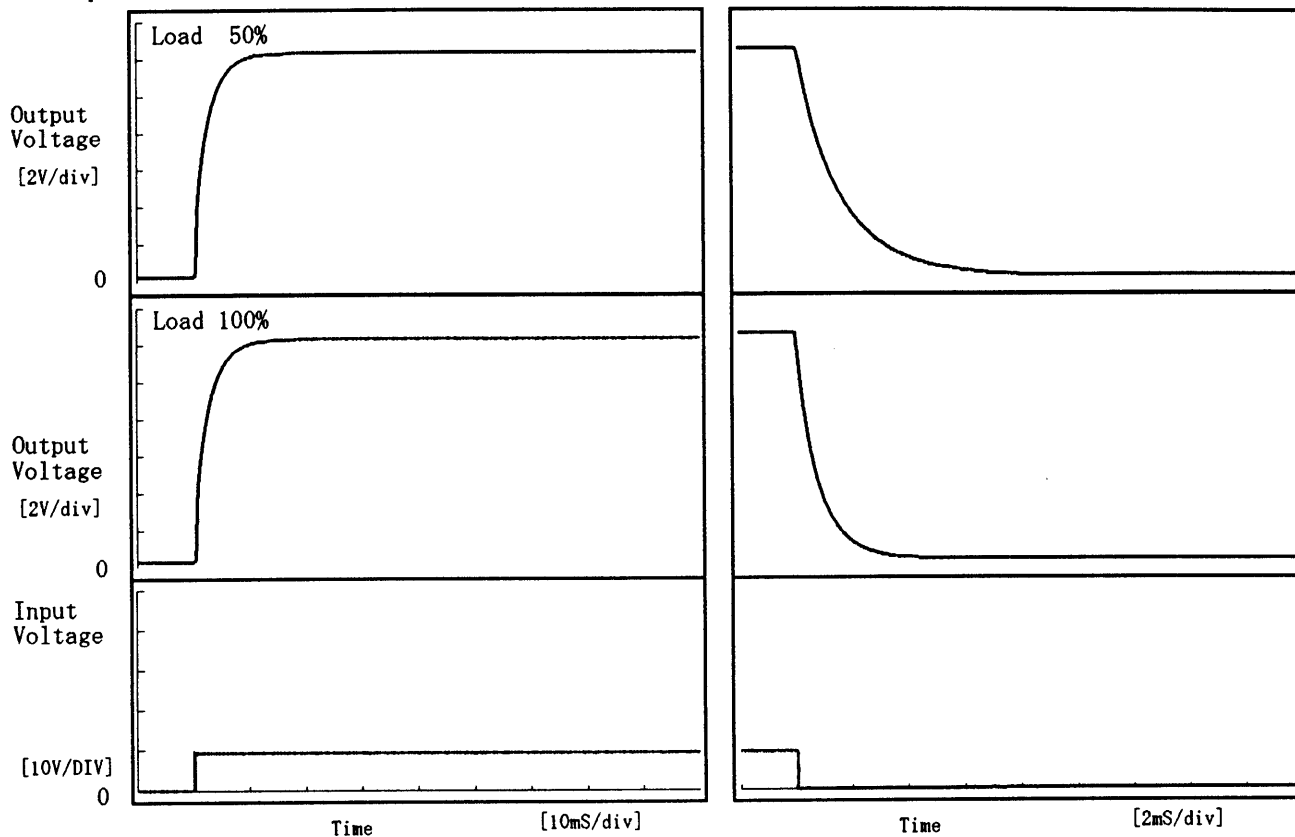
1 mS/div

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Model	ZUS101212	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12V0.900A		

1. Graph

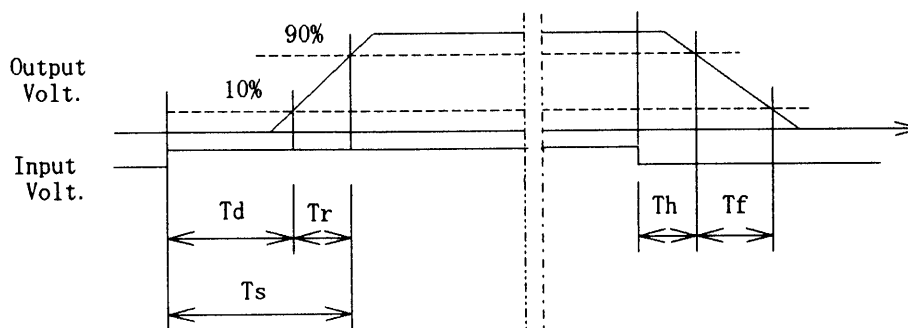
Input Volt. 9.0 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	0.50	5.15	5.65	0.27	3.50
100 %	0.50	5.30	5.80	0.13	1.79



COSEL

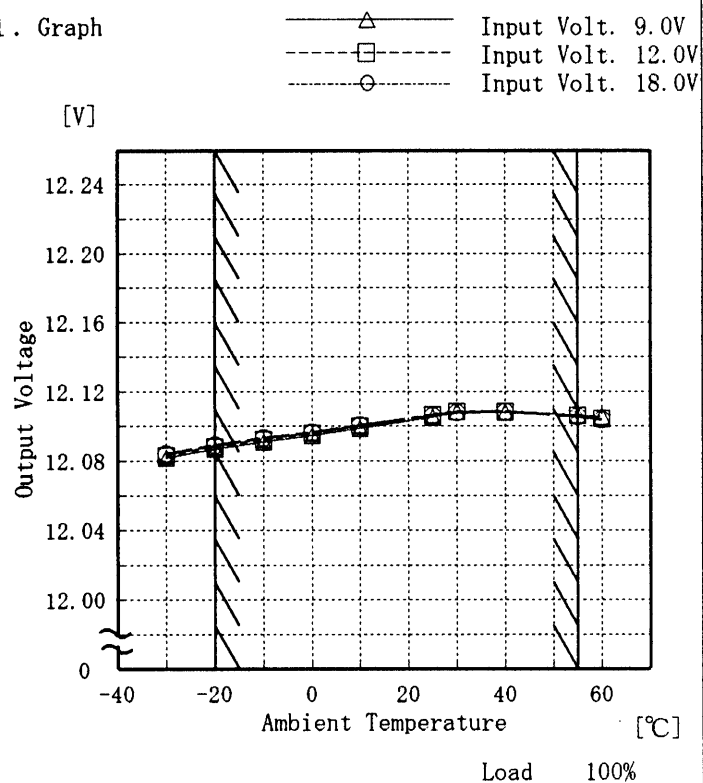
Model ZUS101212

Item Ambient Temperature Drift
周囲温度変動

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

Temperature [°C]	Input Volt. 9.0[V]	Input Volt. 12.0[V]	Input Volt. 18.0[V]
	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]
-30	12.082	12.083	12.084
-20	12.087	12.088	12.089
-10	12.091	12.092	12.093
0	12.095	12.096	12.097
10	12.099	12.100	12.101
25	12.105	12.106	12.106
30	12.109	12.108	12.108
40	12.108	12.108	12.109
55	12.107	12.106	12.106
60	12.106	12.104	12.104
—	—	—	—

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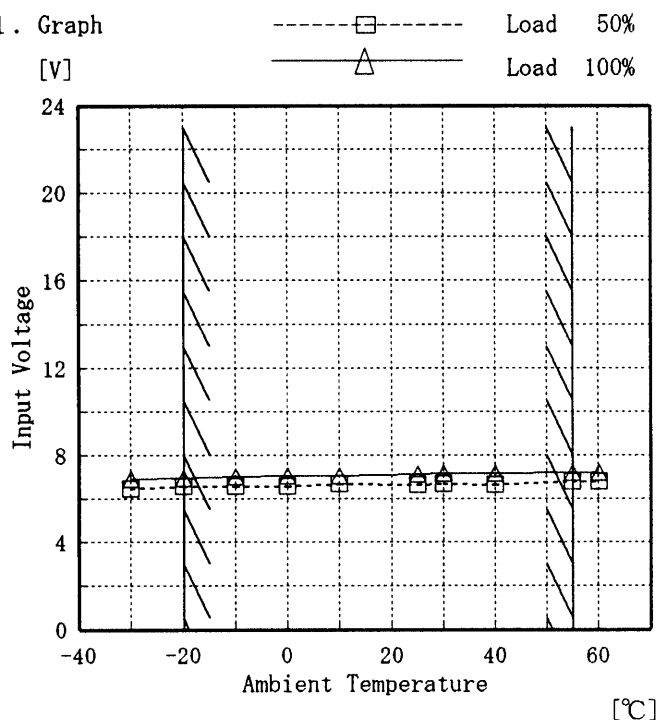
Model ZUS101212

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%	Load 100%
	Input Volt. [V]	Input Volt. [V]
-30	6.5	6.9
-20	6.6	7.0
-10	6.6	7.0
0	6.6	7.1
10	6.7	7.1
25	6.7	7.1
30	6.7	7.2
40	6.7	7.2
55	6.8	7.2
60	6.8	7.2
—	—	—

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Model		ZUS101212	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>Ripple Voltage</p><p>Ambient Temperature</p><p>[°C]</p><p>Input Volt. 9.0 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>15</td><td>20</td></tr><tr><td>-10</td><td>10</td><td>15</td></tr><tr><td>0</td><td>5</td><td>10</td></tr><tr><td>10</td><td>5</td><td>10</td></tr><tr><td>25</td><td>5</td><td>10</td></tr><tr><td>30</td><td>5</td><td>10</td></tr><tr><td>40</td><td>5</td><td>10</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	15	20	-10	10	15	0	5	10	10	5	10	25	5	10	30	5	10	40	5	10	55	10	15	60	10	15	—	—	—	
Ambient Temp. [°C]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]																																					
-30	15	25																																					
-20	15	20																																					
-10	10	15																																					
0	5	10																																					
10	5	10																																					
25	5	10																																					
30	5	10																																					
40	5	10																																					
55	10	15																																					
60	10	15																																					
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Model

ZUS101212

Item

Time Lapse Drift 経時ドリフト

Temperature

25 ℃

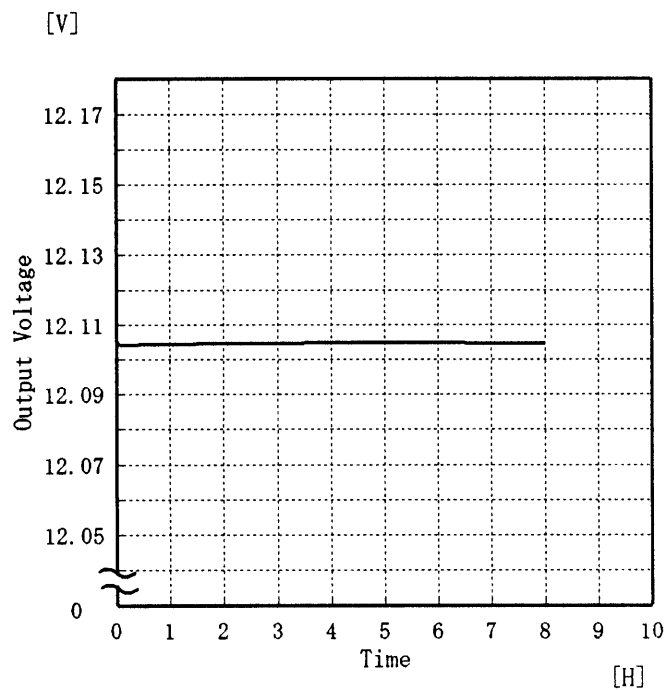
Testing Circuitry

Figure A

Object

+12V0.900A

1. Graph



2. Values

Time since start [H]	Output Voltage [V]
0.0	12.105
0.5	12.104
1.0	12.105
2.0	12.105
3.0	12.105
4.0	12.105
5.0	12.105
6.0	12.105
7.0	12.105
8.0	12.105

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Model		ZUS101212	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 : 9.0~18.0 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 (Ratio) = $\frac{\text{Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

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 : 0.000~0.900 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	55	18.0	0.000	12.112	±12	±0.1
Minimum Voltage	-20	9.0	0.900	12.089		

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Model	ZUS101212
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.

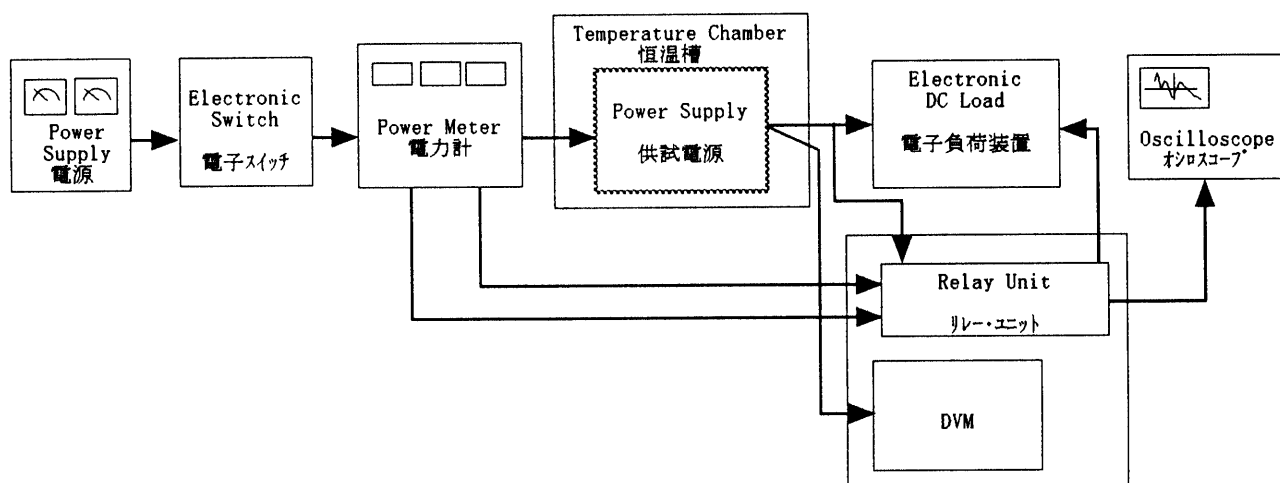
1. 結露特性試験

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	12.107	15	40
	2	12.104	15	40
	3	12.002	15	40
Load 100%	1	12.102	20	80
	2	12.101	20	80
	3	12.001	20	80

Input Volt. 12.0 V



Data Acquisition/Control Unit
データ集録システム

Figure A