



TEST DATA OF ZUS32412

(24.0V INPUT)

Regulated DC Power Supply

Date : Nov. 5. 1996

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コーセル株式会社
COSEL CO., LTD.

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Model		ZUS32412	
Item	Line Regulation	静的入力変動	
Object	+12V0.25A		

1. Graph

-----□-----

Load 50%

-----△-----

Load 100%

[V]

Output Voltage

11.98

11.96

11.94

11.92

11.90

11.88

11.86

0

0

15

25

35

45

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。

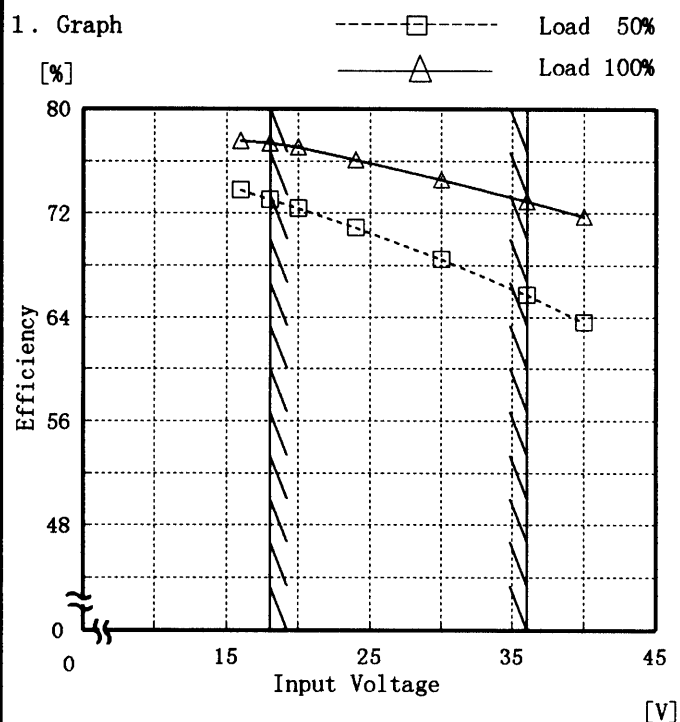
2. Values

Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]
16.0	11.916	11.914
18.0	11.916	11.914
20.0	11.916	11.914
24.0	11.916	11.914
30.0	11.916	11.914
36.0	11.916	11.914
40.0	11.916	11.914
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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Model	ZUS32412
Item	Efficiency 効率
Object	

Temperature 25℃
Testing Circuitry Figure A



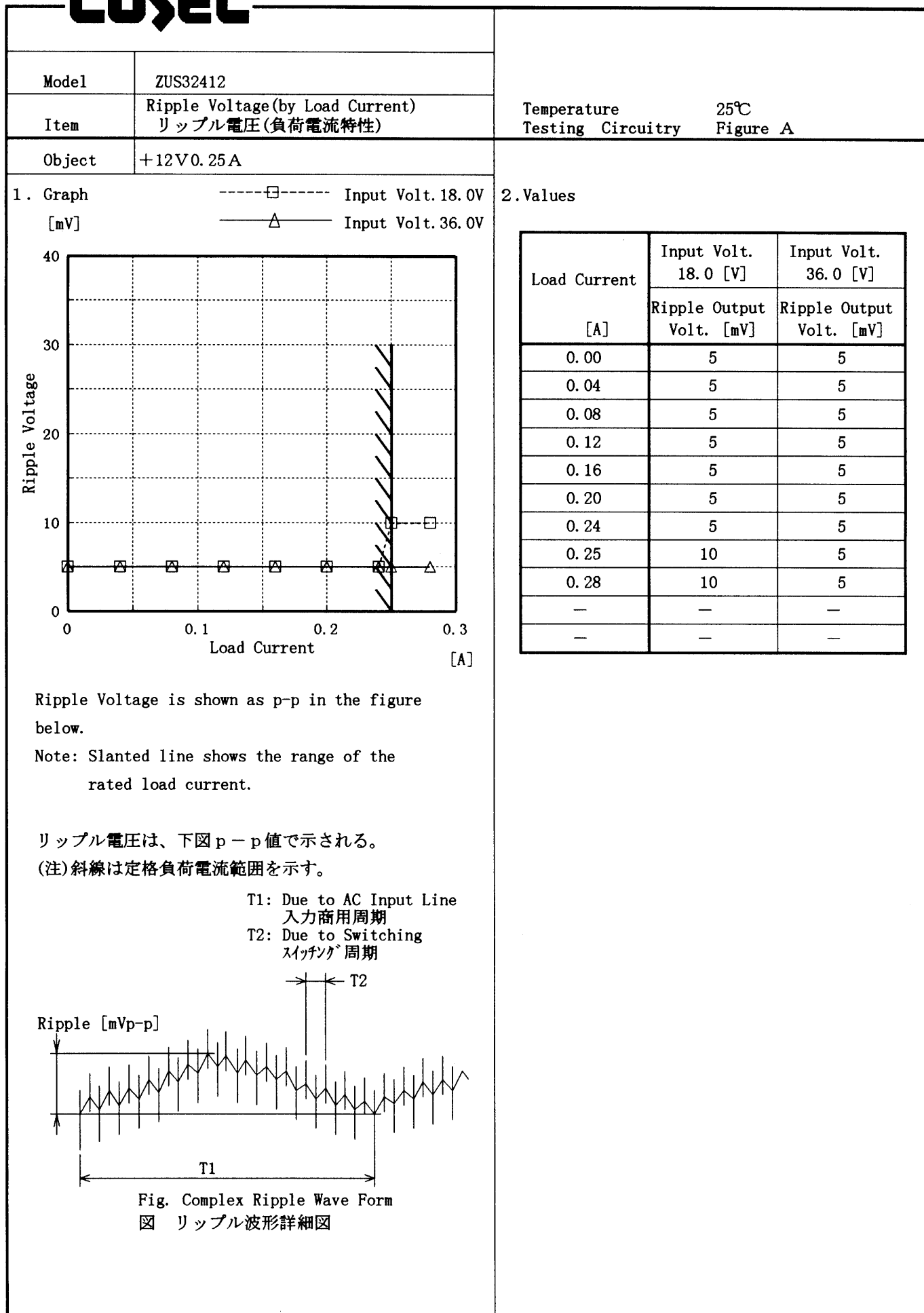
2. Values

Input Voltage [V]	Load 50%	Load 100%
	Efficiency [%]	Efficiency [%]
16.0	73.8	77.5
18.0	73.0	77.4
20.0	72.4	77.1
24.0	70.9	76.1
30.0	68.5	74.6
36.0	65.8	72.9
40.0	63.6	71.8
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

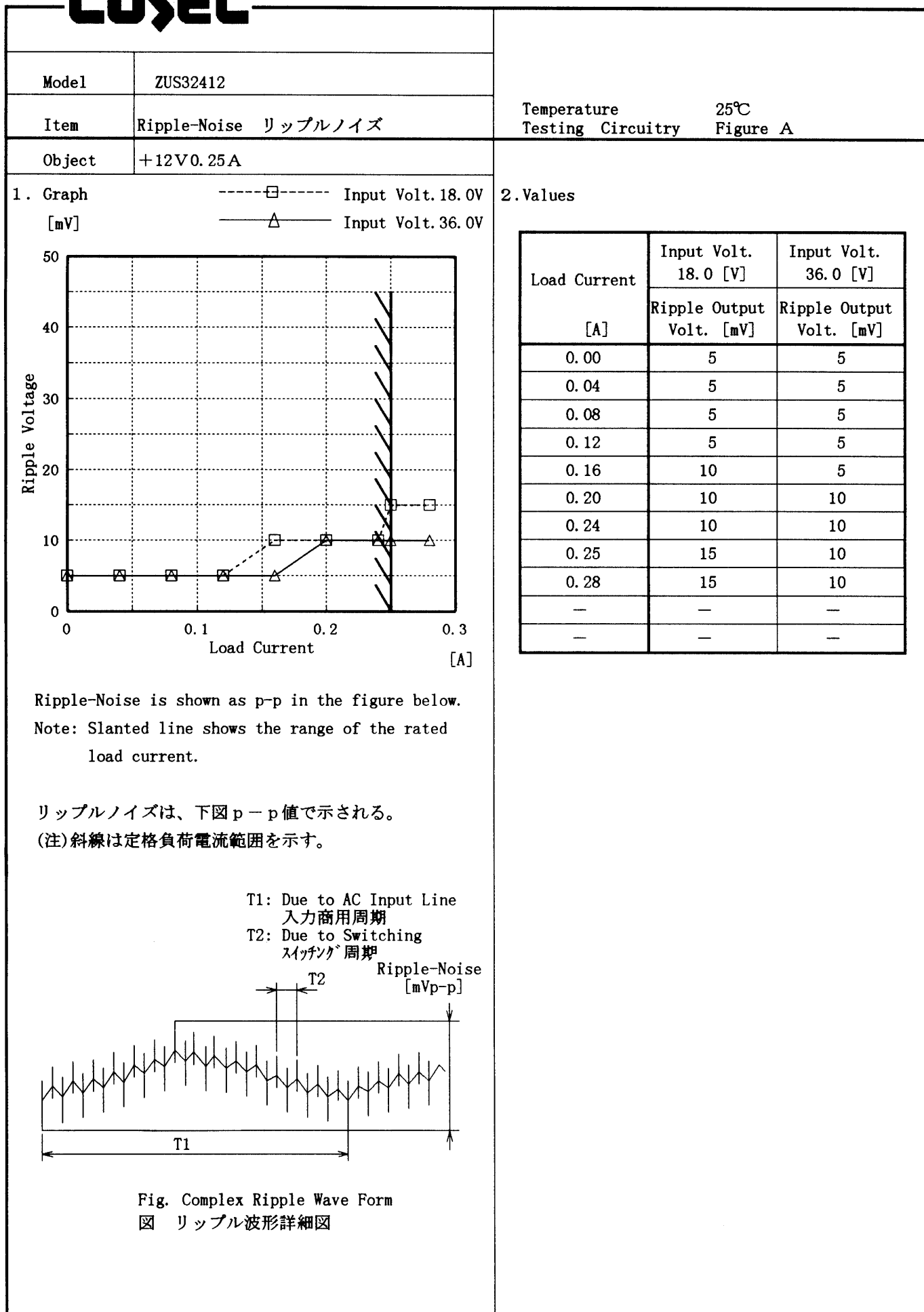
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Model		ZUS32412		Temperature		25℃																																																
Item		Load Regulation 静的負荷変動		Testing Circuitry		Figure A																																																
Object		+12V0.25A																																																				
1. Graph				2. Values																																																		
<div><div><div>△</div><div>□</div><div>○</div></div><div>Input Volt. 18.0V Input Volt. 24.0V Input Volt. 36.0V</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. 18.0[V]</th><th>Input Volt. 24.0[V]</th><th>Input Volt. 36.0[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>11.917</td><td>11.917</td><td>11.918</td></tr><tr><td>0.04</td><td>11.916</td><td>11.916</td><td>11.916</td></tr><tr><td>0.08</td><td>11.916</td><td>11.916</td><td>11.916</td></tr><tr><td>0.12</td><td>11.916</td><td>11.916</td><td>11.916</td></tr><tr><td>0.16</td><td>11.915</td><td>11.915</td><td>11.915</td></tr><tr><td>0.20</td><td>11.915</td><td>11.915</td><td>11.915</td></tr><tr><td>0.24</td><td>11.915</td><td>11.915</td><td>11.915</td></tr><tr><td>0.25</td><td>11.915</td><td>11.915</td><td>11.915</td></tr><tr><td>0.28</td><td>11.914</td><td>11.914</td><td>11.914</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current [A]	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]	0.00	11.917	11.917	11.918	0.04	11.916	11.916	11.916	0.08	11.916	11.916	11.916	0.12	11.916	11.916	11.916	0.16	11.915	11.915	11.915	0.20	11.915	11.915	11.915	0.24	11.915	11.915	11.915	0.25	11.915	11.915	11.915	0.28	11.914	11.914	11.914	—	—	—	—
Load Current [A]	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]																																																			
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	<div><div>~~~~~ Input Volt. 18.0V _____ Input Volt. 24.0V _____ Input Volt. 36.0V</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></div></div>	<table><tr><th>Output Voltage [V]</th><th>Input Volt. 18.0[V] Load Current [A]</th><th>Input Volt. 24.0[V] Load Current [A]</th><th>Input Volt. 36.0[V] Load Current [A]</th></tr><tr><td>12.00</td><td>0.36</td><td>0.40</td><td>0.38</td></tr><tr><td>11.40</td><td>0.36</td><td>0.40</td><td>0.38</td></tr><tr><td>10.80</td><td>0.36</td><td>0.40</td><td>0.37</td></tr><tr><td>9.60</td><td>0.36</td><td>0.39</td><td>0.36</td></tr><tr><td>8.40</td><td>0.36</td><td>0.39</td><td>0.35</td></tr><tr><td>7.20</td><td>0.36</td><td>0.38</td><td>0.33</td></tr><tr><td>6.00</td><td>0.35</td><td>0.36</td><td>0.31</td></tr><tr><td>4.80</td><td>0.34</td><td>0.34</td><td>0.29</td></tr><tr><td>3.60</td><td>0.32</td><td>0.30</td><td>0.25</td></tr><tr><td>2.40</td><td>0.29</td><td>0.26</td><td>0.22</td></tr><tr><td>1.20</td><td>0.25</td><td>0.22</td><td>0.20</td></tr><tr><td>0.00</td><td>0.26</td><td>0.24</td><td>0.25</td></tr></table>	Output Voltage [V]	Input Volt. 18.0[V] Load Current [A]	Input Volt. 24.0[V] Load Current [A]	Input Volt. 36.0[V] Load Current [A]	12.00	0.36	0.40	0.38	11.40	0.36	0.40	0.38	10.80	0.36	0.40	0.37	9.60	0.36	0.39	0.36	8.40	0.36	0.39	0.35	7.20	0.36	0.38	0.33	6.00	0.35	0.36	0.31	4.80	0.34	0.34	0.29	3.60	0.32	0.30	0.25	2.40	0.29	0.26	0.22	1.20	0.25	0.22	0.20	0.00	0.26	0.24	0.25
Output Voltage [V]	Input Volt. 18.0[V] Load Current [A]	Input Volt. 24.0[V] Load Current [A]	Input Volt. 36.0[V] Load Current [A]																																																			
12.00	0.36	0.40	0.38																																																			
11.40	0.36	0.40	0.38																																																			
10.80	0.36	0.40	0.37																																																			
9.60	0.36	0.39	0.36																																																			
8.40	0.36	0.39	0.35																																																			
7.20	0.36	0.38	0.33																																																			
6.00	0.35	0.36	0.31																																																			
4.80	0.34	0.34	0.29																																																			
3.60	0.32	0.30	0.25																																																			
2.40	0.29	0.26	0.22																																																			
1.20	0.25	0.22	0.20																																																			
0.00	0.26	0.24	0.25																																																			

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Model	ZUS32412	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	+12V0.25A		

Input Volt. 24.0 V

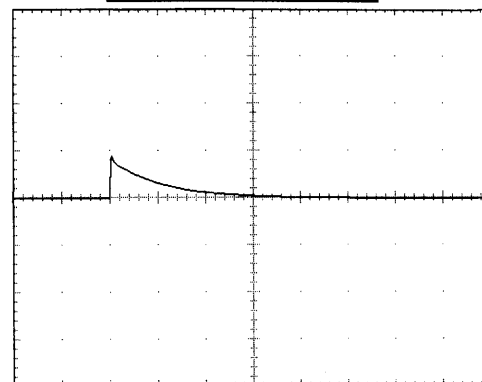
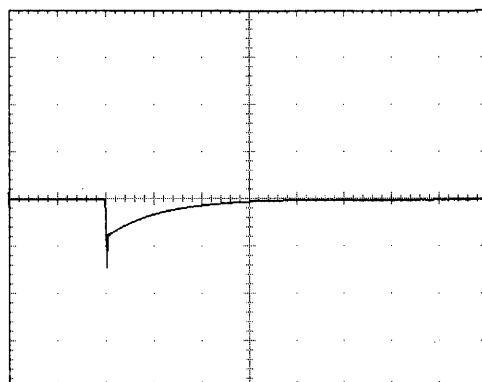
Cycle 100 mS

Load Current

Min. Load ↔

Load 100 %

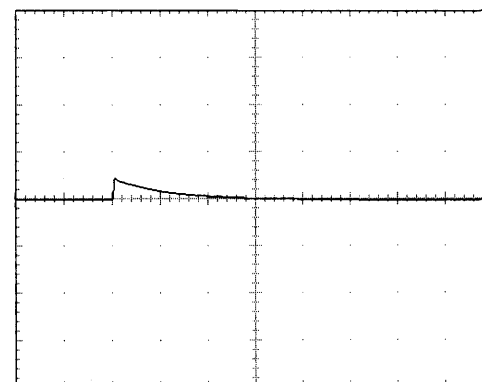
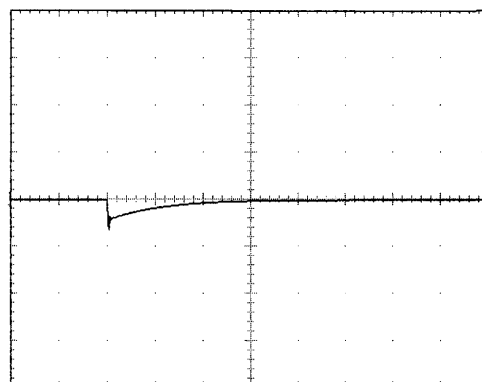
200 mV/div



Min. Load ↔

Load 50 %

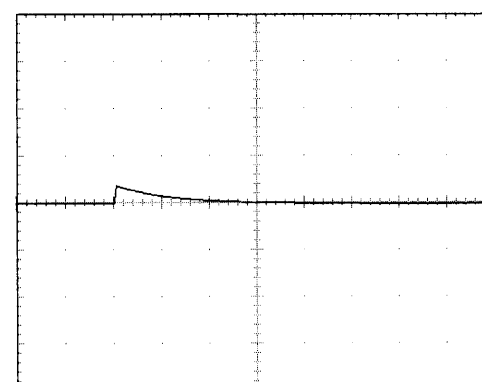
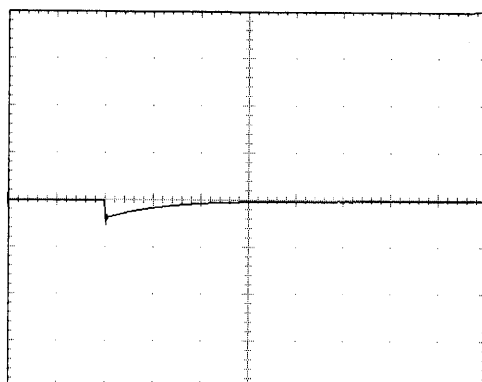
200 mV/div



Load 50% ↔

Load 100 %

200 mV/div



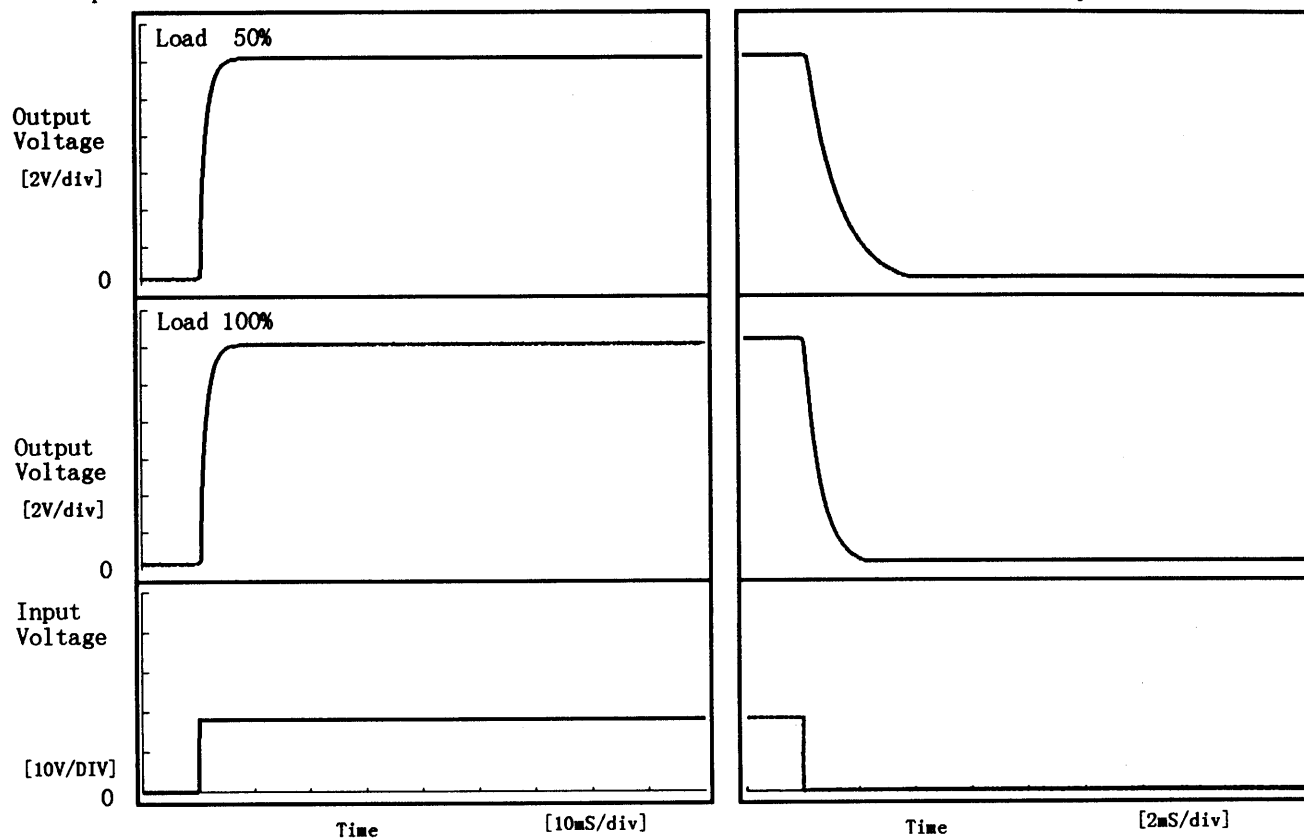
1 mS/div

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Model	ZUS32412	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12V 0.25A		

1. Graph

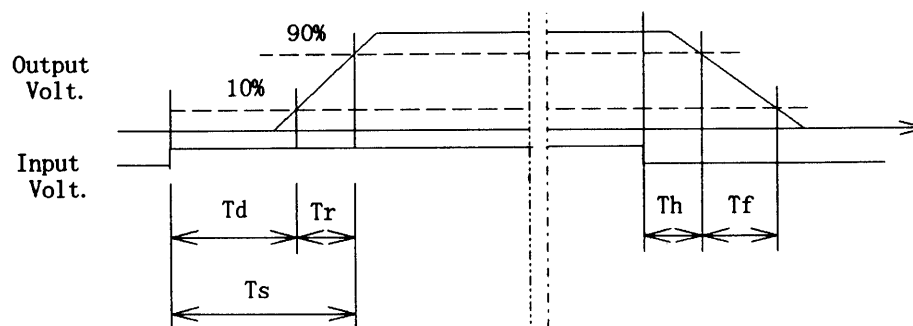
Input Volt. 18.0 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	0.50	2.65	3.15	0.38	2.18
100 %	0.50	2.70	3.20	0.18	1.21



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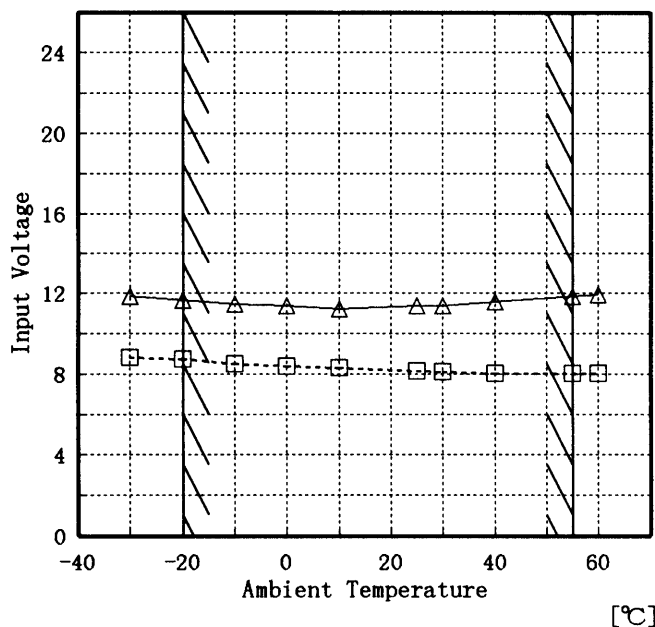
Model		ZUS32412	Testing Circuitry Figure A																																																					
Item		Ambient Temperature Drift 周囲温度変動																																																						
Object		+12V 0.25A																																																						
1. Graph		<div><div>△</div> Input Volt. 18.0V</div> <div><div>□</div> Input Volt. 24.0V</div> <div><div>○</div> Input Volt. 36.0V</div> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>	2. Values																																																					
			<table><tr><th>Temperature</th><th>Input Volt. 18.0[V]</th><th>Input Volt. 24.0[V]</th><th>Input Volt. 36.0[V]</th></tr><tr><th>[°C]</th><th>Output Volt. [V]</th><th>Output Volt. [V]</th><th>Output Volt. [V]</th></tr><tr><td>-30</td><td>11.901</td><td>11.901</td><td>11.901</td></tr><tr><td>-20</td><td>11.903</td><td>11.903</td><td>11.903</td></tr><tr><td>-10</td><td>11.904</td><td>11.905</td><td>11.905</td></tr><tr><td>0</td><td>11.907</td><td>11.907</td><td>11.907</td></tr><tr><td>10</td><td>11.910</td><td>11.910</td><td>11.910</td></tr><tr><td>25</td><td>11.913</td><td>11.914</td><td>11.914</td></tr><tr><td>30</td><td>11.914</td><td>11.914</td><td>11.914</td></tr><tr><td>40</td><td>11.912</td><td>11.912</td><td>11.912</td></tr><tr><td>55</td><td>11.907</td><td>11.907</td><td>11.907</td></tr><tr><td>60</td><td>11.904</td><td>11.904</td><td>11.903</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>	Temperature	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]	[°C]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]	-30	11.901	11.901	11.901	-20	11.903	11.903	11.903	-10	11.904	11.905	11.905	0	11.907	11.907	11.907	10	11.910	11.910	11.910	25	11.913	11.914	11.914	30	11.914	11.914	11.914	40	11.912	11.912	11.912	55	11.907	11.907	11.907	60	11.904	11.904	11.903	—	—	—	—	
Temperature	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]																																																					
[°C]	Output Volt. [V]	Output Volt. [V]	Output Volt. [V]																																																					
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Note: Slanted line shows the range of the rated ambient temperature.																																																								
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Model	ZUS32412
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+12V 0.25A

Testing Circuitry Figure A

1. Graph
- [V]
- Load 50%
- △----- Load 100%

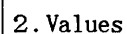


Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

2. Values

Ambient Temp. [°C]	Load 50%	Load 100%
	Input Volt. [V]	Input Volt. [V]
-30	8.8	11.9
-20	8.7	11.7
-10	8.5	11.4
0	8.4	11.4
10	8.3	11.2
25	8.2	11.4
30	8.1	11.4
40	8.0	11.6
55	8.0	11.9
60	8.0	11.9
—	—	—

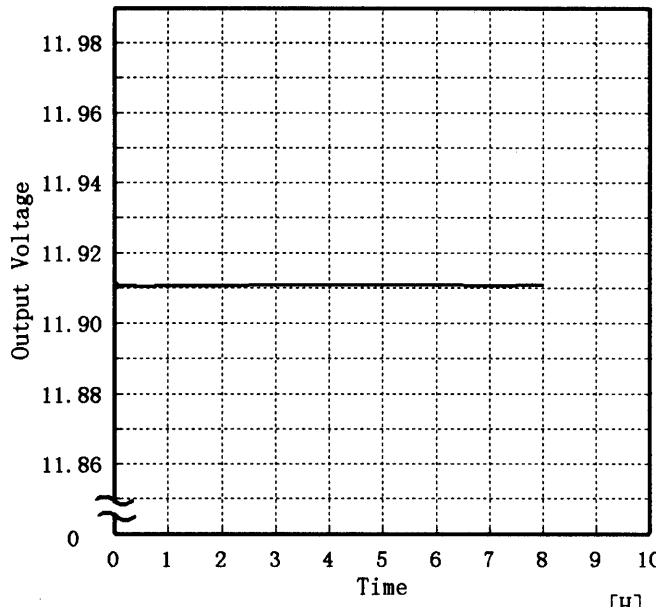
Testing Circuitry Figure A

Input Volt. 18.0 V

Note: Slanted line shows the range of the rated ambient temperature.

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Model	ZUS32412																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25 ℃																						
Object	+12V0.25A	Testing Circuitry	Figure A																						
1. Graph		2.Values																							
<div>[V]</div> <div></div> <div>Output Voltage [V]</div> <div>Time [H]</div> <div>Input Volt. 24V</div> <div>Load 100%</div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>11.913</td></tr><tr><td>0.5</td><td>11.910</td></tr><tr><td>1.0</td><td>11.911</td></tr><tr><td>2.0</td><td>11.911</td></tr><tr><td>3.0</td><td>11.911</td></tr><tr><td>4.0</td><td>11.911</td></tr><tr><td>5.0</td><td>11.911</td></tr><tr><td>6.0</td><td>11.911</td></tr><tr><td>7.0</td><td>11.911</td></tr><tr><td>8.0</td><td>11.911</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	11.913	0.5	11.910	1.0	11.911	2.0	11.911	3.0	11.911	4.0	11.911	5.0	11.911	6.0	11.911	7.0	11.911	8.0	11.911
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6.0	11.911																								
7.0	11.911																								
8.0	11.911																								

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Model	ZUS32412	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+12V0.25A	

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 : 18.0~36.0 V

Load Current : 0.00~0.25 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 : 18.0~36.0 V

負荷電流 : 0.00~0.25 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 (Ratio) [%]
Maximum Voltage	25	36.0	0.00	11.918	±7	±0.1
Minimum Voltage	-20	18.0	0.25	11.904		

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Model	ZUS32412	Testing Circuitry	Figure A
Item	Condensation 結露特性		
Object	+12V0.25A		

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	11.947	5	10
	2	11.947	5	10
	3	11.947	5	10
Load 100 %	1	11.946	10	20
	2	11.946	10	20
	3	11.946	10	20

Input Volt. 24.0 V

COSEL

