



TEST DATA OF ZTS32412

(24.0V INPUT)

Regulated DC Power Supply

Date : Mar. 5. 1998

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COSEL CO., LTD.

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Model		ZTS32412		Temperature		25℃																																								
Item		Line Regulation 静的入力変動		Testing Circuitry		Figure A																																								
Object		+12V0.25A																																												
1. Graph				2. Values																																										
<div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div> <div><p>[V]</p><p>Output Voltage</p><p>Input Voltage [V]</p></div> <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>				<table><tr><th>Input Voltage [V]</th><th>Load 50% Output Volt. [V]</th><th>Load 100% Output Volt. [V]</th></tr><tr><td>16.0</td><td>11.916</td><td>11.914</td></tr><tr><td>18.0</td><td>11.916</td><td>11.914</td></tr><tr><td>20.0</td><td>11.916</td><td>11.914</td></tr><tr><td>24.0</td><td>11.916</td><td>11.914</td></tr><tr><td>30.0</td><td>11.916</td><td>11.914</td></tr><tr><td>36.0</td><td>11.916</td><td>11.914</td></tr><tr><td>40.0</td><td>11.916</td><td>11.914</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><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]	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 ZTS32412		Temperature 25°C Testing Circuitry Figure A
Item	Efficiency 効率	
Object		

1. Graph

-----□----- Load 50%

-----△----- Load 100%

Efficiency [%]

80

72

64

56

48

0

Input Voltage [V]

0

15

25

35

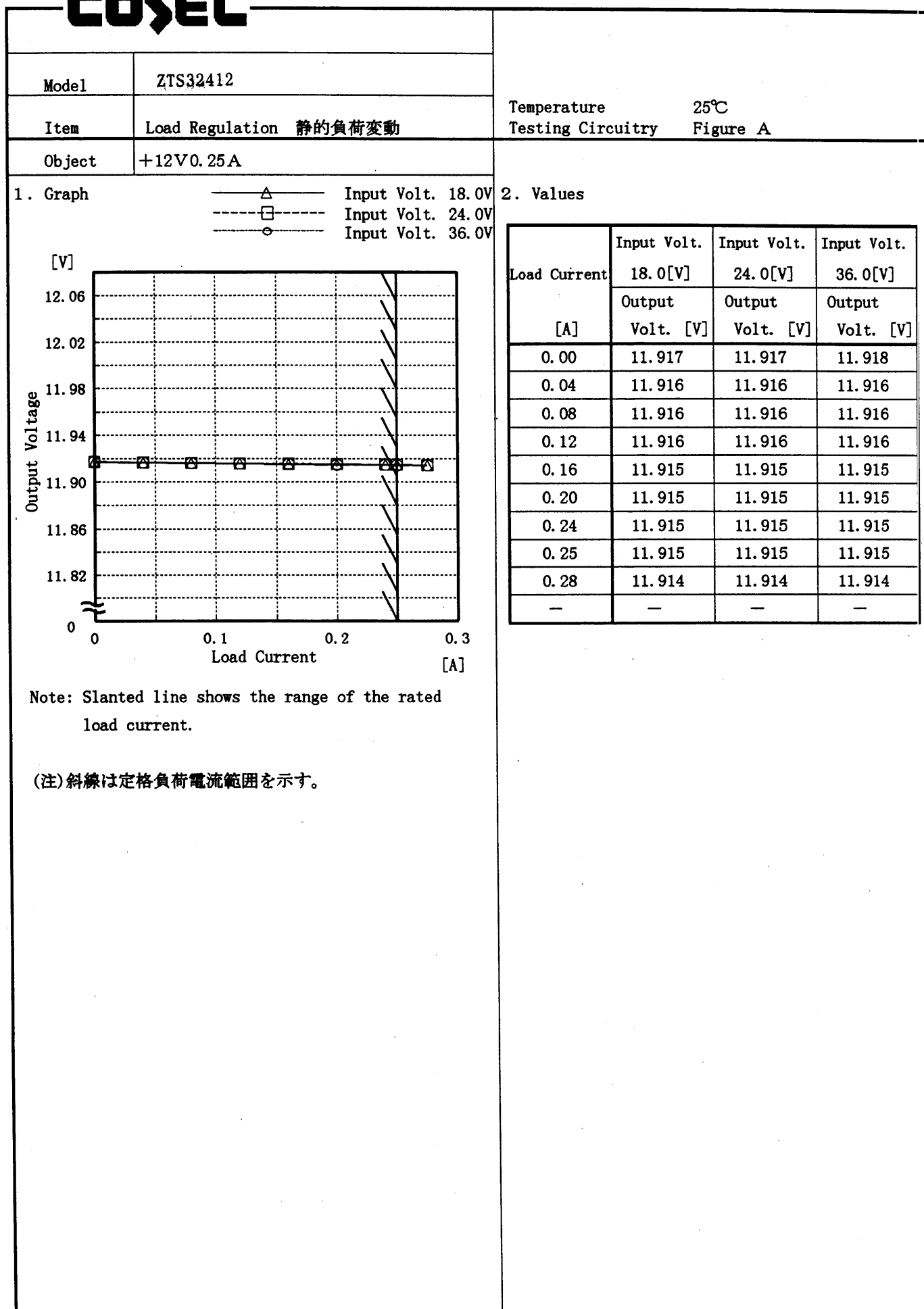
45

Note: Slanted line shows the range of the rated input voltage.

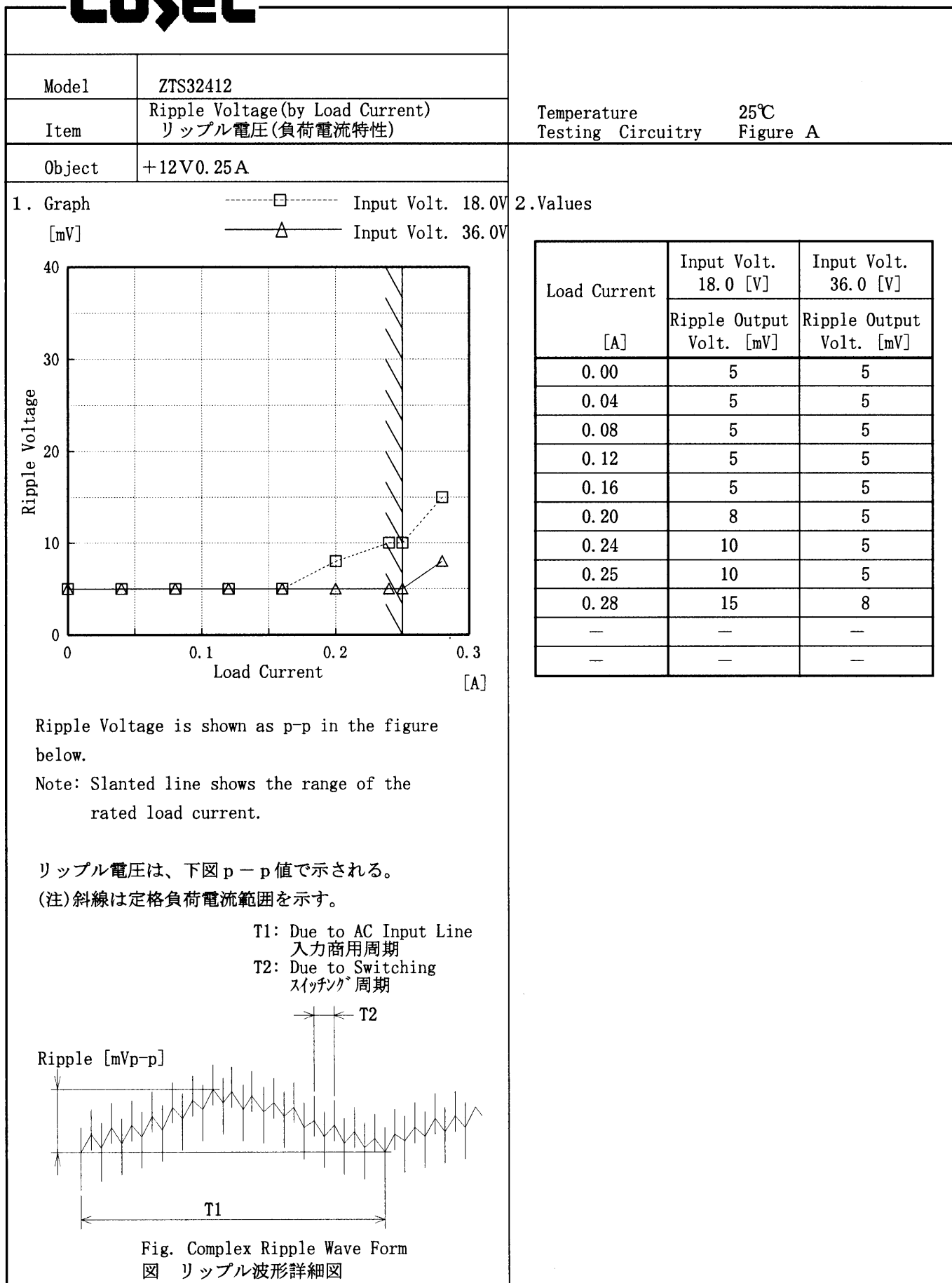
(注)斜線は定格入力電圧範囲を示す。

2. Values

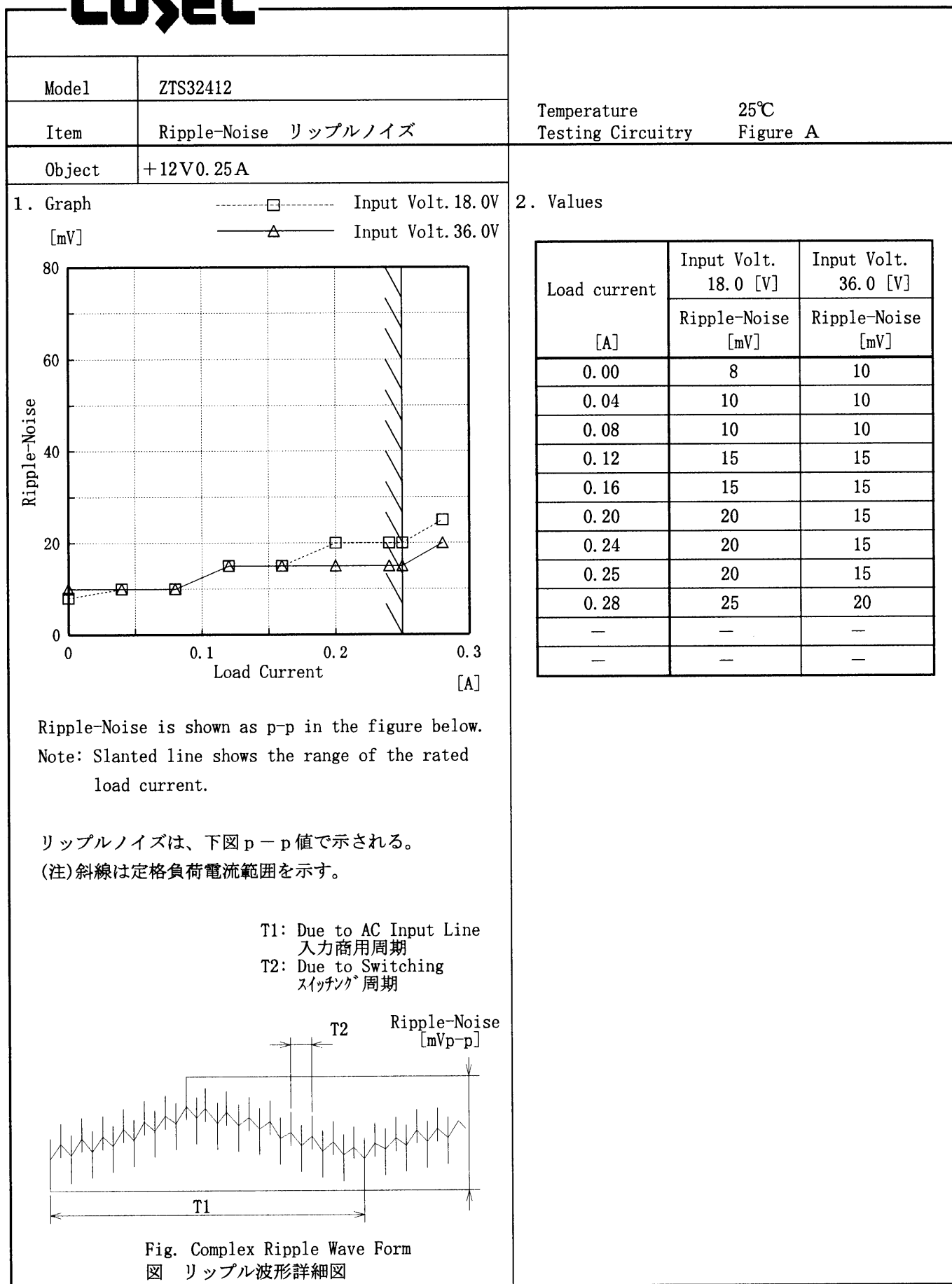
Input Voltage [V]	Load 50% Efficiency [%]	Load 100% Efficiency [%]
16.0	73.8	77.5
18.0	73.0	77.4
20.0	72.4	77.1
24.0	70.9	76.1
30.0	68.5	74.6
36.0	65.8	72.9
40.0	63.6	71.8
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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Model ZTS32412		Temperature 25°C Testing Circuitry Figure A																																																								
Item	Overcurrent Protection 過電流保護																																																									
Object	+12V0.25A																																																									
1. Graph <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> ~~~~~~ Input Volt. 18.0V _____ Input Volt. 24.0V _____ Input Volt. 36.0V </div> <div> </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>		2. Values <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</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>Load Current [A]</th><th>Load Current [A]</th><th>Load Current [A]</th></tr> </thead> <tbody> <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> </tbody> </table>		Output Voltage [V]	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]	Load Current [A]	Load Current [A]	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]	Input Volt. 24.0[V]	Input Volt. 36.0[V]																																																							
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Model	ZTS32412	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

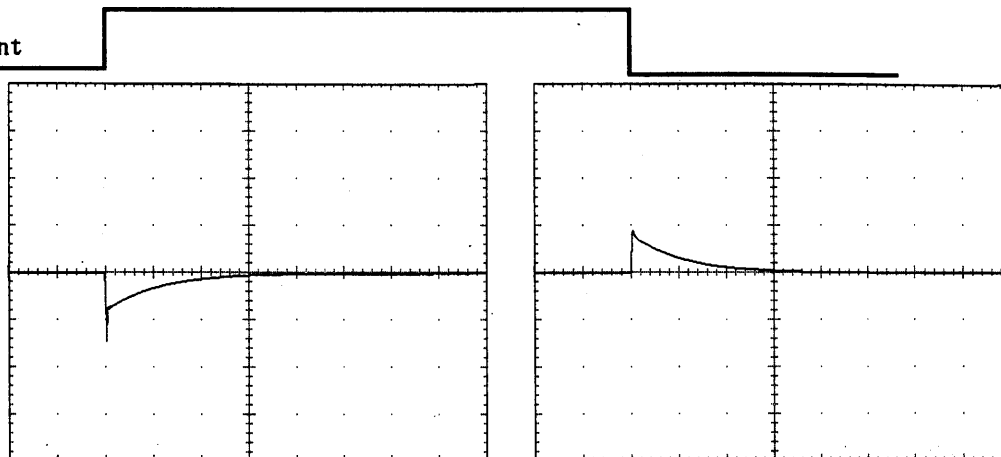
Cycle 100 mS

Load Current

Min. Load ←→

Load 100 %

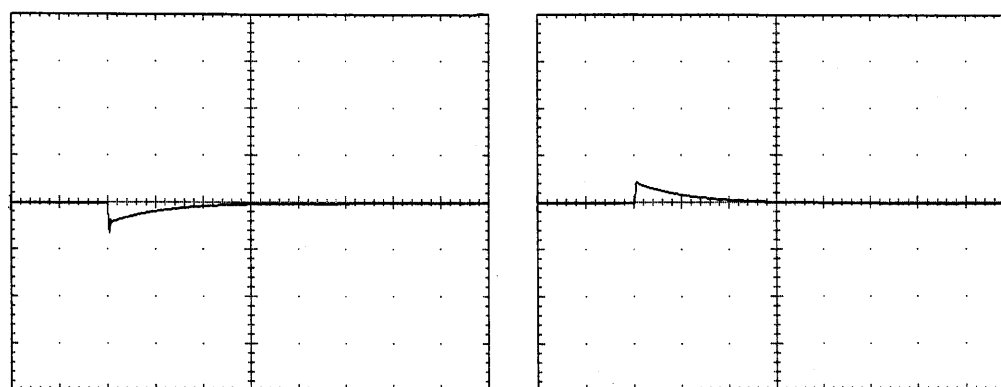
200 mV/div



Min. Load ←→

Load 50 %

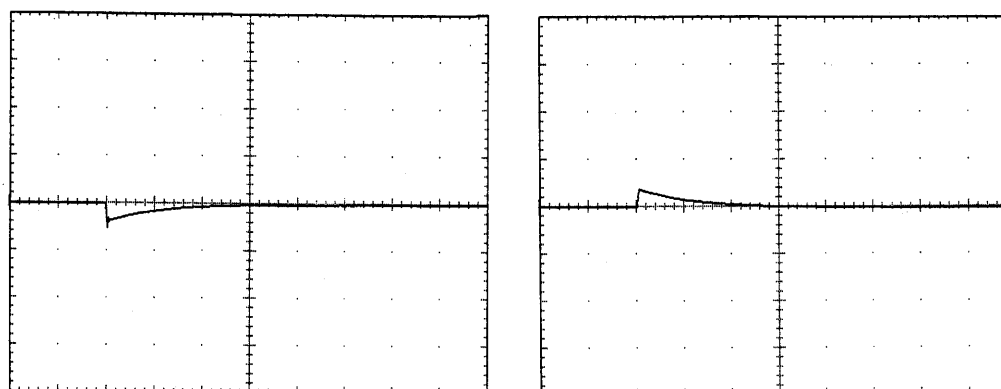
200 mV/div



Load 50%←→

Load 100 %

200 mV/div



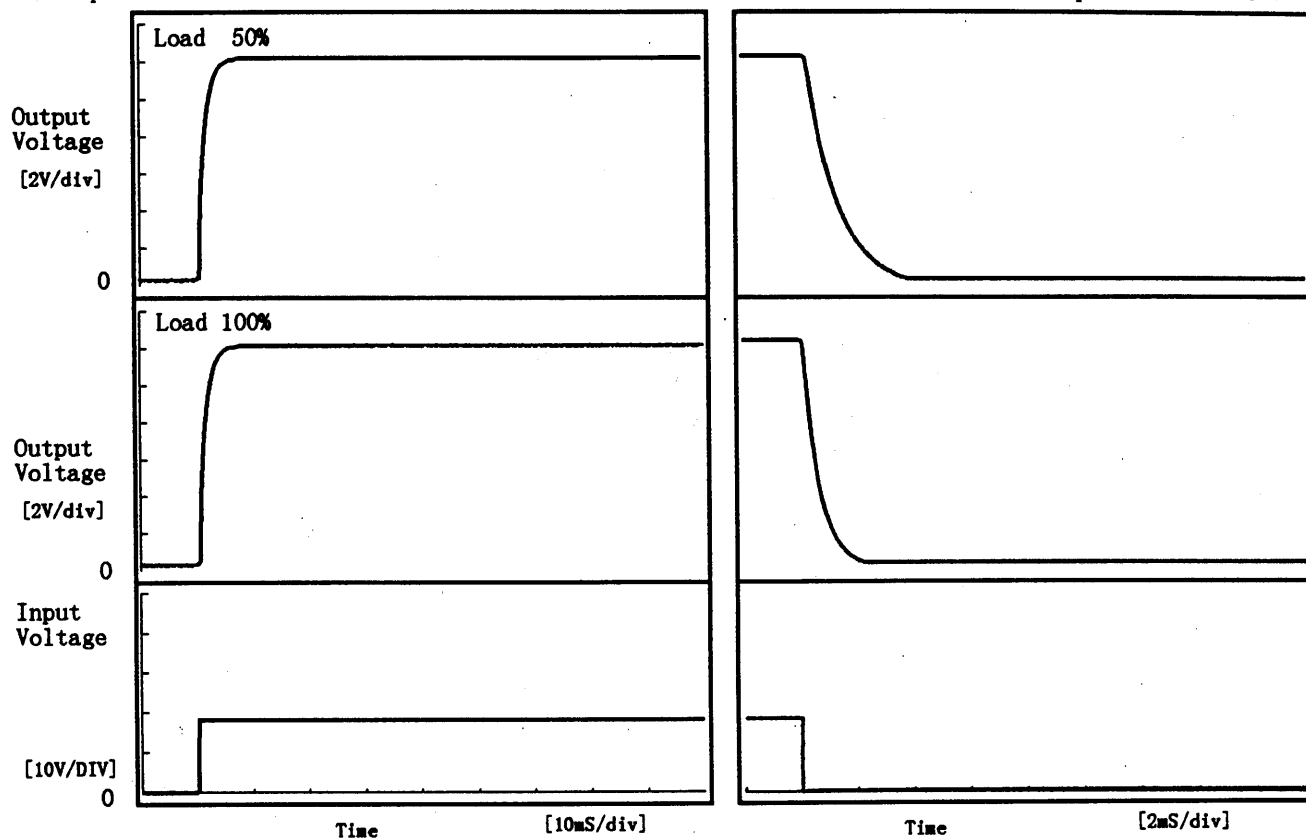
1 mS/div

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Model	ZTS32412	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

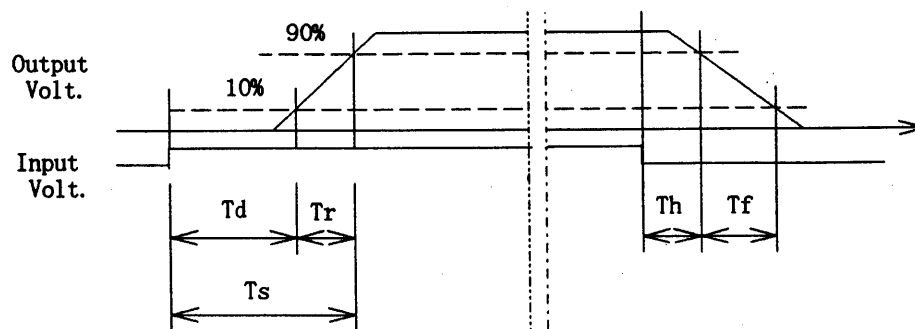
Input Volt. 18.0 V



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

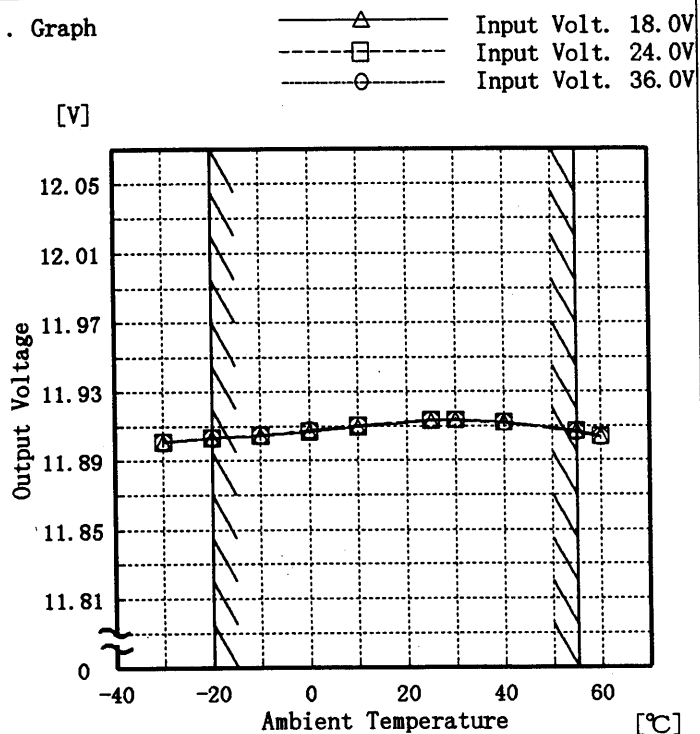


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Model	ZTS32412
Item	Ambient Temperature Drift 周囲温度変動
Object	+12V0.25A

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。

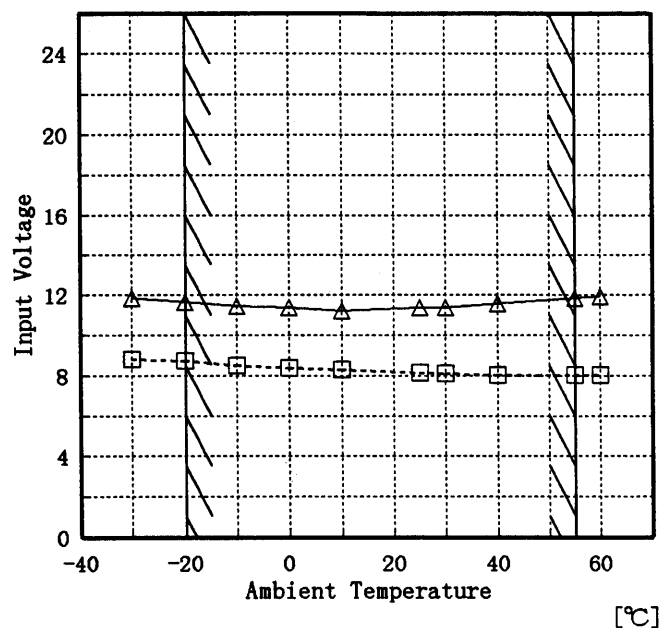
2. Values

Temperature [°C]	Input Volt. 18.0[V]	Input Volt. 24.0[V]	Input Volt. 36.0[V]
	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
—	—	—	—

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Model	ZTS32412
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+12V0.25A

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。

Testing Circuitry Figure A

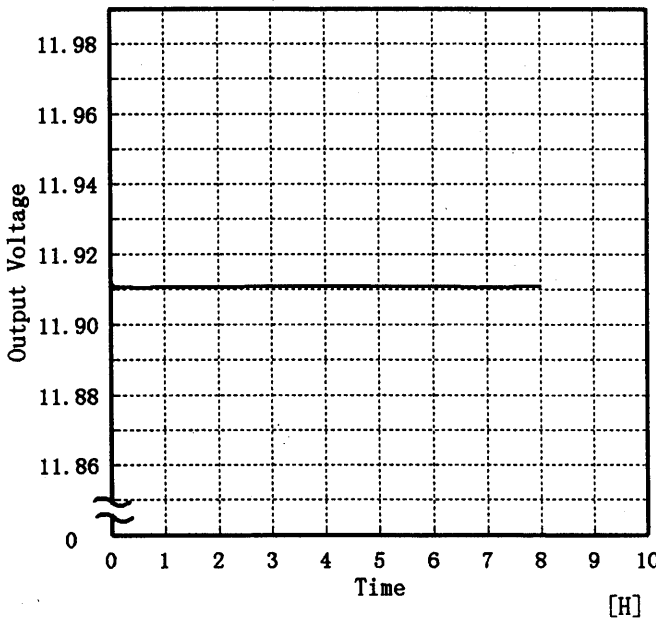
2. Values

Ambient Temp. [°C]	Load 50% Input Volt. [V]	Load 100% 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
—	—	—

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Model		ZTS32412	Testing Circuitry	Figure A																																		
Item		Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)																																				
Object		+12V0.25A																																				
1. Graph		<div><div>-----□-----</div>Load 50%</div> <div><div>———△———</div>Load 100%</div> <div><div>[mV]</div><div>60</div><div>40</div><div>20</div><div>0</div></div> <div><div>Ripple Voltage</div><div><div>Ambient Temperature</div><div>[°C]</div><div>-40</div><div>-20</div><div>0</div><div>20</div><div>40</div><div>60</div></div></div> <div>Input Volt. 18.0 V</div> <div>Note: Slanted line shows the range of the rated ambient temperature.</div> <div>(注)斜線は定格周囲温度範囲を示す。</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>5</td><td>20</td></tr><tr><td>-20</td><td>5</td><td>20</td></tr><tr><td>-10</td><td>5</td><td>15</td></tr><tr><td>0</td><td>5</td><td>15</td></tr><tr><td>10</td><td>5</td><td>15</td></tr><tr><td>25</td><td>5</td><td>15</td></tr><tr><td>30</td><td>5</td><td>15</td></tr><tr><td>40</td><td>5</td><td>10</td></tr><tr><td>55</td><td>5</td><td>10</td></tr><tr><td>60</td><td>5</td><td>10</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	5	20	-20	5	20	-10	5	15	0	5	15	10	5	15	25	5	15	30	5	15	40	5	10	55	5	10	60	5	10	—	—	—
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Model	ZTS32412	Temperature 25℃ Testing Circuitry Figure A																						
Item	Time Lapse Drift 経時ドリフト																							
Object	+12V0.25A																							
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
Time since start [H]	Output Voltage [V]																							
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6.0	11.911																							
7.0	11.911																							
8.0	11.911																							

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Model	ZTS32412	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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		Testing Circuitry Figure A
Model	ZTS32412	
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.

1. 結露特性試験

入力を切った状態で、恒温槽で－1 0℃に冷却しておき、約1時間後に恒温槽から取り出し、室温2 5℃、湿度4 0 %RHの状態におき結露させ、その電気的特性の測定を行い、異常のないことを確認する。

2. Values		
Item	Data	Testing Conditions
Output Voltage [V]	11.952	Input Volt. : 24V, Load Current:0.25A
Line Regulation [mV]	1	Input Volt. : 18～36V, Load Current:0.25A
Load Regulation [mV]	4	Input Volt. : 24V, Load Current:0～0.25A

-14-

BC-3133

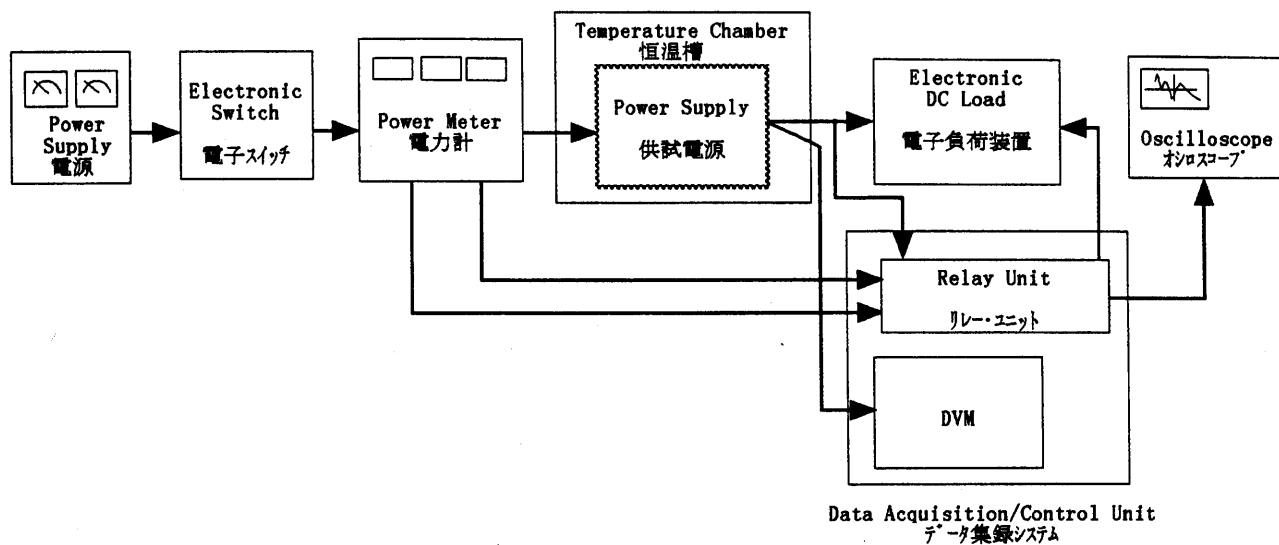
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Figure A