参考資料

COSEL

TEST DATA OF ZUS1R52412

(24.0V INPUT)

Regulated DC Power Supply

Date : June 14. 1996

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COSEL CO., LTD.

参考資料

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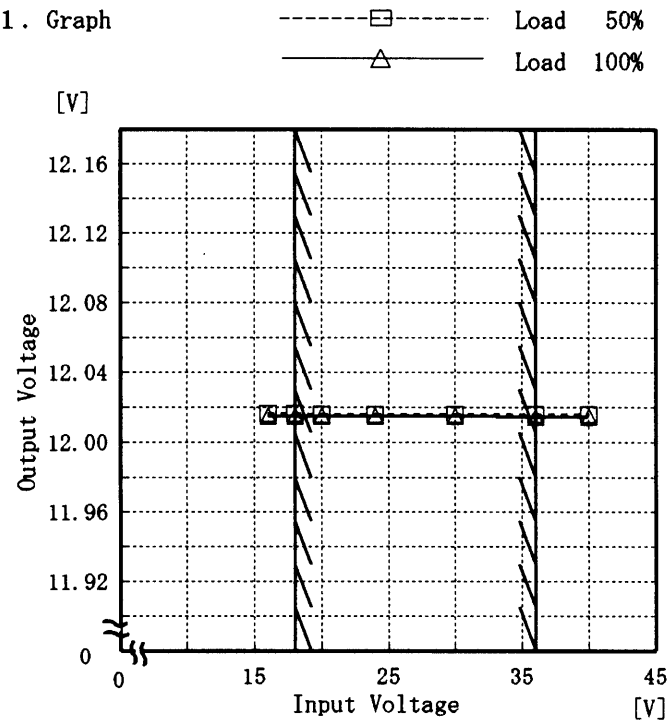
Model	ZUS1R52412
Item	Line Regulation 静的入力変動
Object	+12V0.13A

Temperature 25℃
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% Output Volt. [V]	Load 100% Output Volt. [V]
16.0	12.016	12.015
18.0	12.016	12.015
20.0	12.016	12.015
24.0	12.016	12.015
30.0	12.016	12.015
36.0	12.016	12.015
40.0	12.016	12.015
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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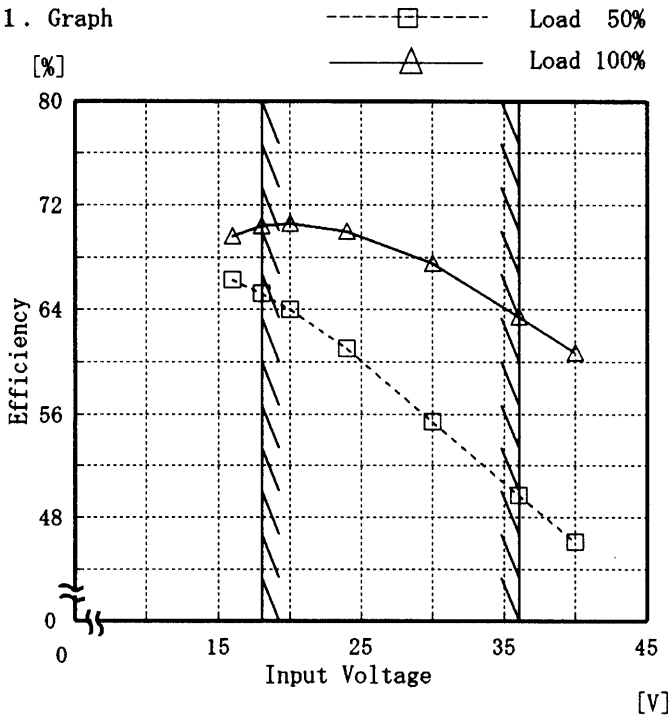
Model	ZUS1R52412
Item	Efficiency 効率
Object	――――――――――――

Temperature 25℃
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% Efficiency [%]	Load 100% Efficiency [%]
16.0	66.3	69.6
18.0	65.3	70.4
20.0	64.0	70.6
24.0	61.0	70.0
30.0	55.4	67.6
36.0	49.7	63.5
40.0	46.1	60.7
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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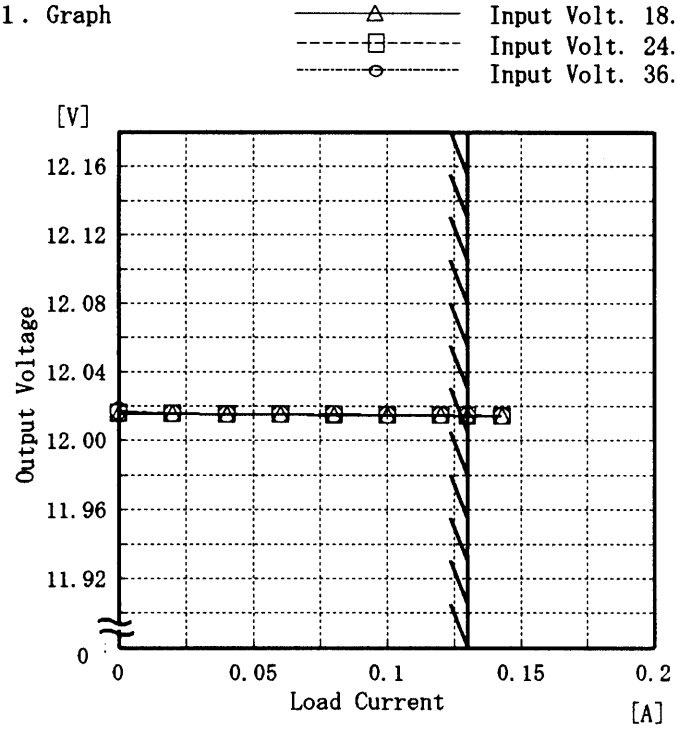
Model	ZUS1R52412
Item	Load Regulation 静的負荷変動
Object	+12V0.13A

Temperature 25℃
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

Load Current [A]	Input Volt. 18.0[V] Output Volt. [V]	Input Volt. 24.0[V] Output Volt. [V]	Input Volt. 36.0[V] Output Volt. [V]
0.00	12.016	12.016	12.017
0.02	12.016	12.016	12.016
0.04	12.016	12.016	12.016
0.06	12.015	12.015	12.015
0.08	12.015	12.015	12.015
0.10	12.015	12.015	12.015
0.12	12.015	12.015	12.015
0.13	12.015	12.015	12.015
0.14	12.014	12.015	12.015
—	—	—	—

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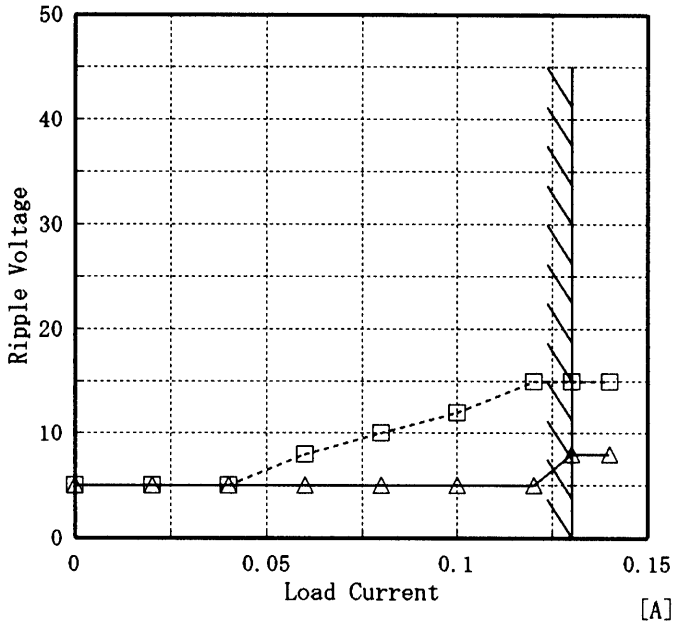
Model	ZUS1R52412
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+12V 0.13A

Temperature 25℃
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。

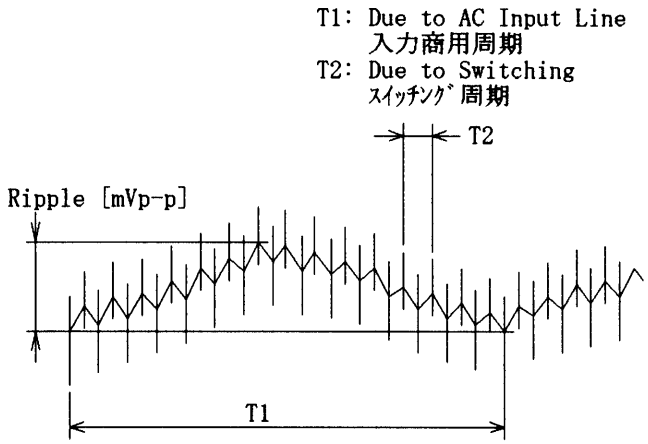


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

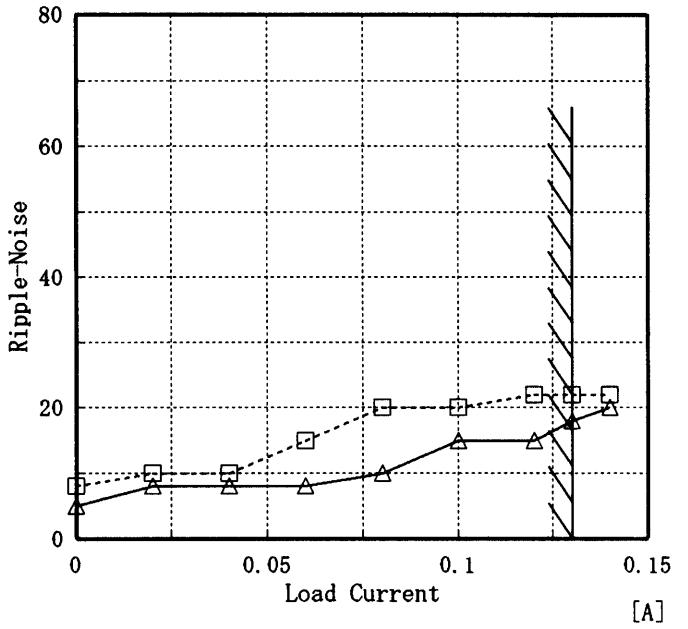
Load Current [A]	Input Volt. 18.0 [V] Ripple Output Volt. [mV]	Input Volt. 36.0 [V] Ripple Output Volt. [mV]
0.00	5	5
0.02	5	5
0.04	5	5
0.06	8	5
0.08	10	5
0.10	12	5
0.12	15	5
0.13	15	8
0.14	15	8
—	—	—
—	—	—

COSEL

Model	ZUS1R52412
Item	Ripple-Noise リップルノイズ
Object	+12V0.13A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



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
ｽｲｯﾁﾝｸﾞ周期

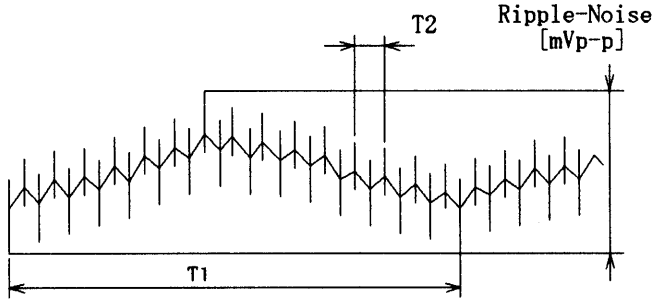


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

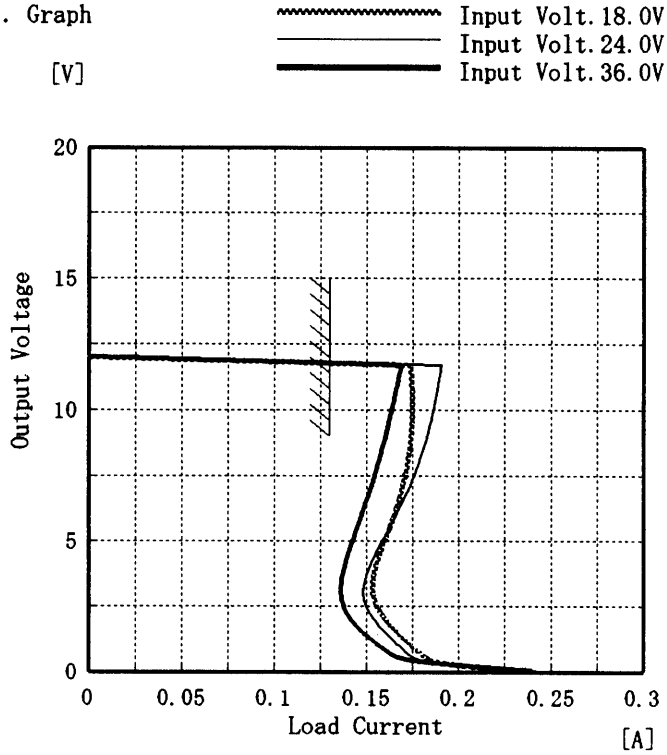
Load current [A]	Input Volt. 18.0 [V] Ripple-Noise [mV]	Input Volt. 36.0 [V] Ripple-Noise [mV]
0.00	8	5
0.02	10	8
0.04	10	8
0.06	15	8
0.08	20	10
0.10	20	15
0.12	22	15
0.13	22	18
0.14	22	20
—	—	—
—	—	—

COSEL

Model	ZUS1R52412
Item	Overcurrent Protection 過電流保護
Object	+12V0.13A

Temperature 25℃
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. 18.0[V] Load Current [A]	Input Volt. 24.0[V] Load Current [A]	Input Volt. 36.0[V] Load Current [A]
12.00	0.17	0.19	0.17
11.40	0.17	0.19	0.17
10.80	0.17	0.19	0.17
9.60	0.17	0.18	0.16
8.40	0.17	0.18	0.16
7.20	0.17	0.17	0.15
6.00	0.16	0.17	0.15
4.80	0.16	0.16	0.14
3.60	0.15	0.15	0.14
2.40	0.16	0.15	0.14
1.20	0.17	0.16	0.15
0.00	0.24	0.24	0.24

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Model	ZUS1R52412		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+12V0.13A		

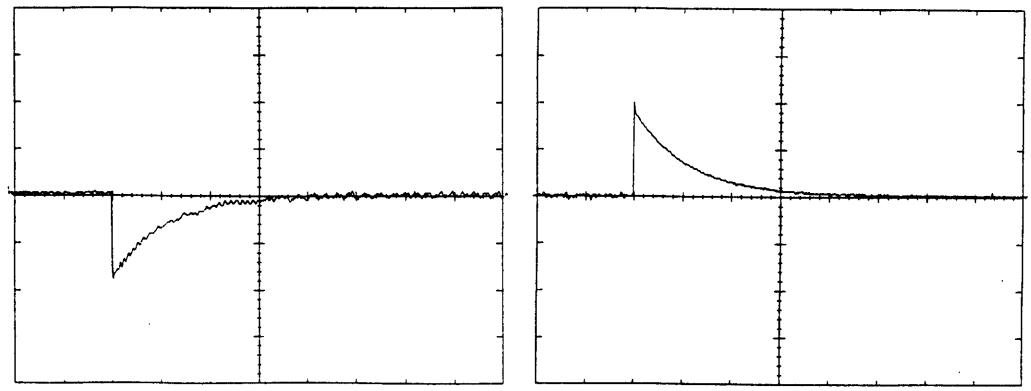
Input Volt. 24.0 V

Cycle 100 mS

Load Current

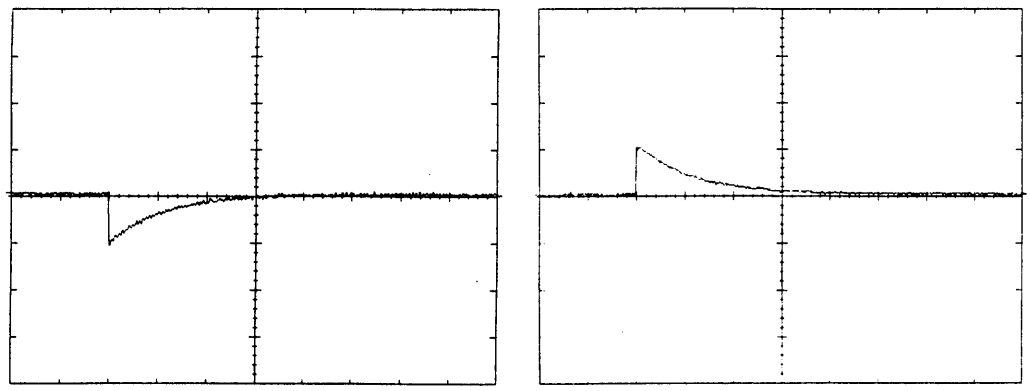
Min. Load ⟷
Load 100 %

100 mV/div



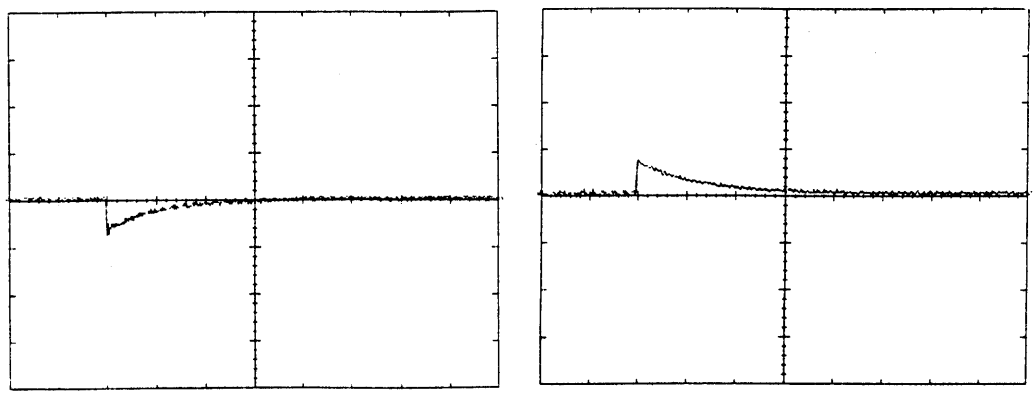
Min. Load ⟷
Load 50 %

100 mV/div



Load 50%⟷
Load 100 %

100 mV/div



1 mS/div

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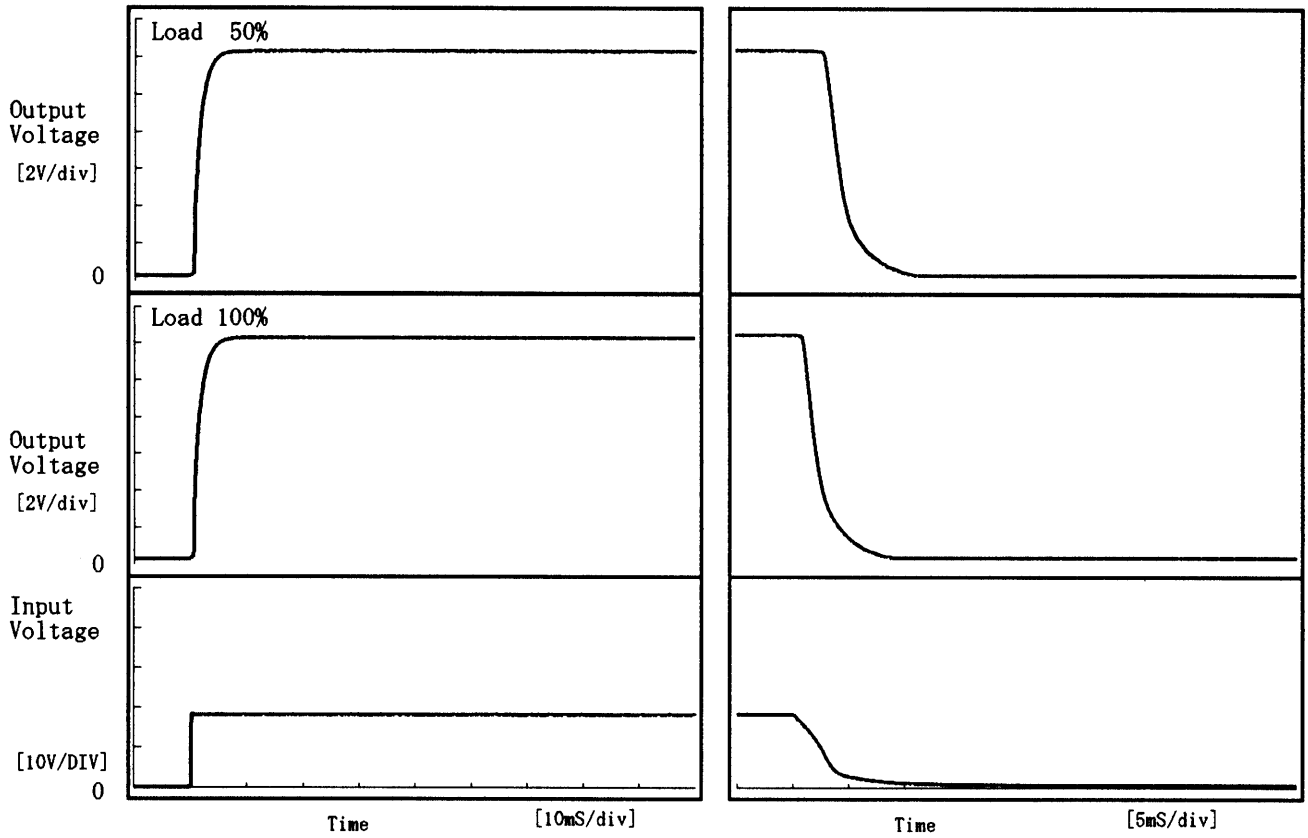
Model	ZUS1R52412		
Item	Rise and Fall Time 立上り、立下り時間	Temperature Testing Circuitry	25℃ Figure A
Object	+12V0.13A		

1. Graph

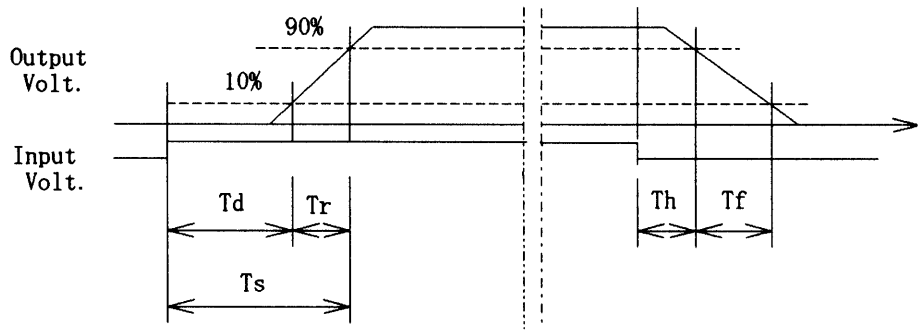
Input Volt. 18.0 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	0.50	2.60	3.10	3.13	3.88
100 %	0.50	2.65	3.15	1.23	3.78



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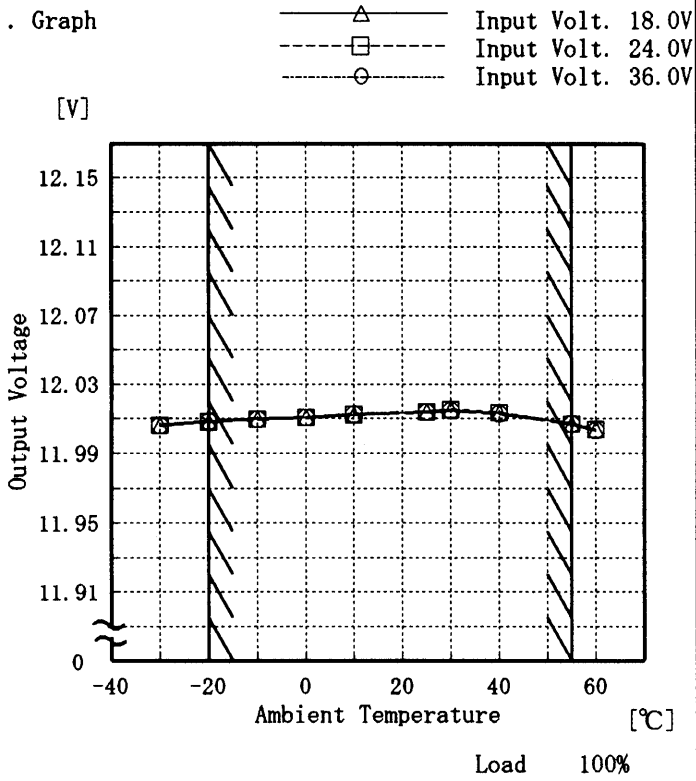
Model	ZUS1R52412
Item	Ambient Temperature Drift 周囲温度変動
Object	+12V0.13A

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 [℃]	Input Volt. 18.0[V] Output Volt. [V]	Input Volt. 24.0[V] Output Volt. [V]	Input Volt. 36.0[V] Output Volt. [V]
-30	12.006	12.006	12.006
-20	12.008	12.008	12.008
-10	12.010	12.010	12.010
0	12.011	12.011	12.011
10	12.012	12.012	12.012
25	12.014	12.014	12.014
30	12.015	12.015	12.015
40	12.013	12.013	12.013
55	12.007	12.007	12.007
60	12.004	12.004	12.004
—	—	—	—

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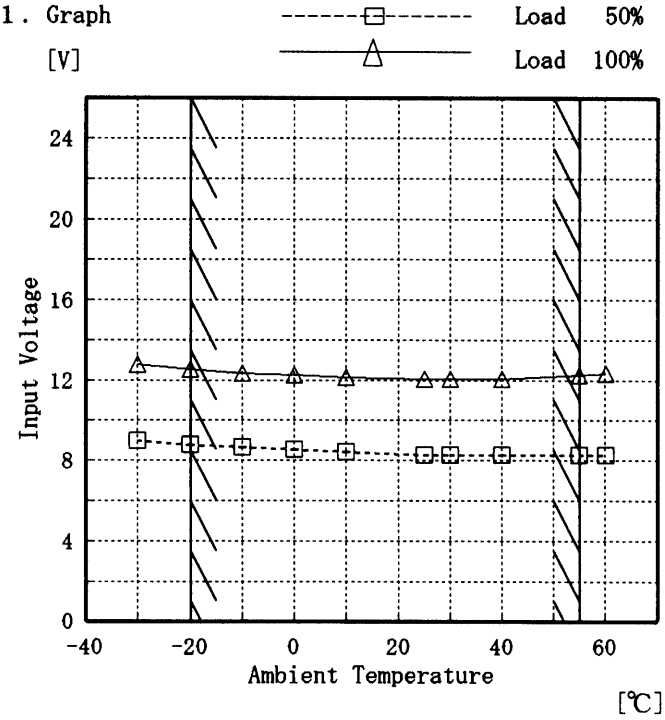
Model	ZUS1R52412
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+12V0.13A

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

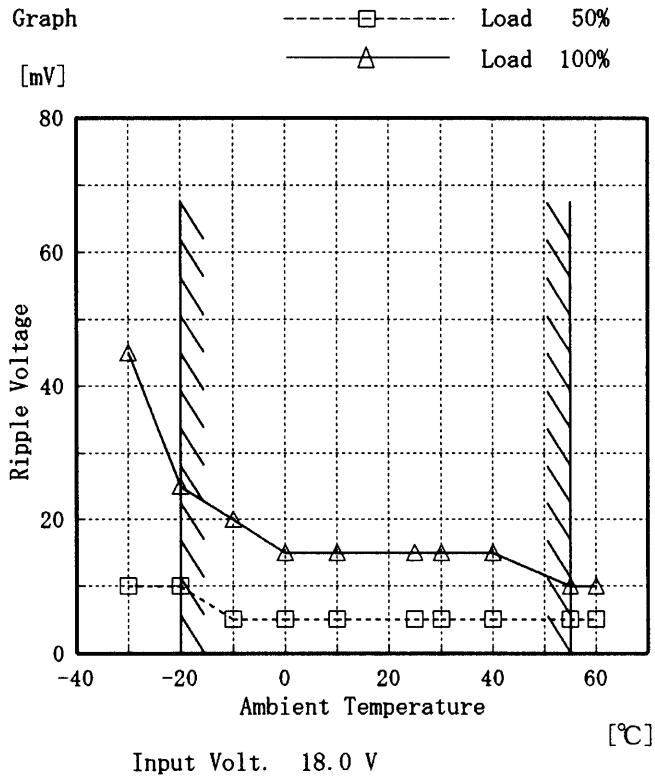
Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	9.0	12.8
-20	8.8	12.6
-10	8.7	12.3
0	8.6	12.3
10	8.4	12.1
25	8.3	12.1
30	8.3	12.1
40	8.3	12.1
55	8.3	12.3
60	8.3	12.3
—	—	—

COSEL

Model	ZUS1R52412
Item	Ripple Voltage (by Ambient Temp.) リップル電圧（周囲温度特性）
Object	+12V0.13A

Testing Circuitry　Figure A

1. Graph



Input Volt.　18.0 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

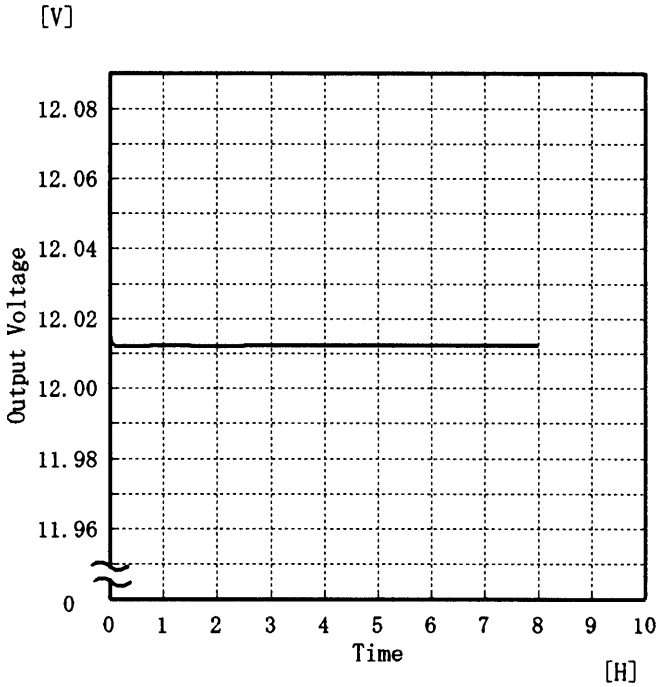
Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-30	10	45
-20	10	25
-10	5	20
0	5	15
10	5	15
25	5	15
30	5	15
40	5	15
55	5	10
60	5	10
—	—	—

COSEL

Model	ZUS1R52412
Item	Time Lapse Drift 経時ドリフト
Object	+12V0.13A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 24V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	12.016
0.5	12.012
1.0	12.013
2.0	12.012
3.0	12.012
4.0	12.012
5.0	12.012
6.0	12.012
7.0	12.013
8.0	12.013

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Model	ZUS1R52412	
Item	Output Voltage Accuracy 定電圧精度	Testing Circuitry Figure A
Object	+12V0.13A	

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 ℃
Input Voltage : 18.0～36.0 V
Load Current : 0.00～0.13 A

* Output Voltage Accuracy = ±(Maximum of Output Voltage − Minimum of Output Voltage)／2

$$* \text{ Output Voltage Accuracy (Ration)} = \frac{\text{Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

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 ℃
入力電圧 18.0～36.0 V
負荷電流 0.00～0.13 A

* 定電圧精度(変動値) ＝ ±(出力電圧の最高値－出力電圧の最低値)／2

$$* \text{ 定電圧精度(変動率)} = \frac{\text{変動値}}{\text{定格出力電圧}} \times 100$$

Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	25	36.0	0.00	12.018	±6	±0.1
Minimum Voltage	55	36.0	0.13	12.006		

COSEL

Model	ZUS1R52412
Item	Condensation 結露特性
Object	+12V 0.13A

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 24℃ 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２４℃、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	12.123	10	15
	2	12.129	10	15
	3	12.127	10	15
Load 100 %	1	12.121	15	20
	2	12.127	15	20
	3	12.126	15	20

Input Volt. 24.0 V

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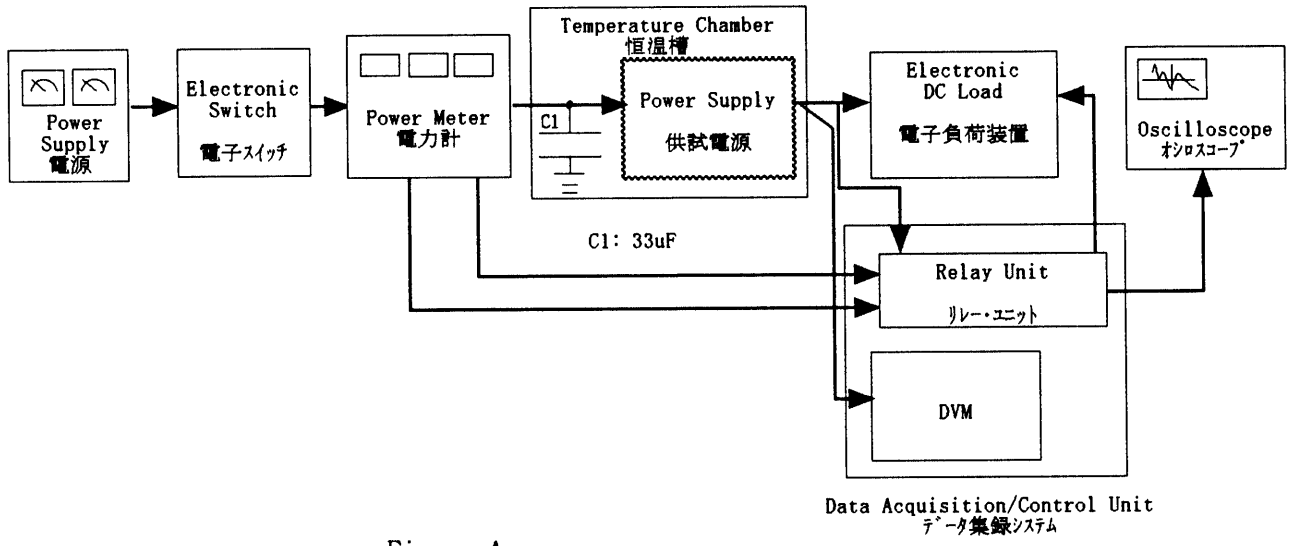

Figure A