参考資料

COSEL

TEST DATA OF ZUW34812

(48.0V INPUT)

Regulated DC Power Supply

Date : Nov. 5. 1996

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Design Manager

Prepared by : Y. Nagai
Design Engineer

コーセル株式会社

COSEL CO., LTD.

参考資料

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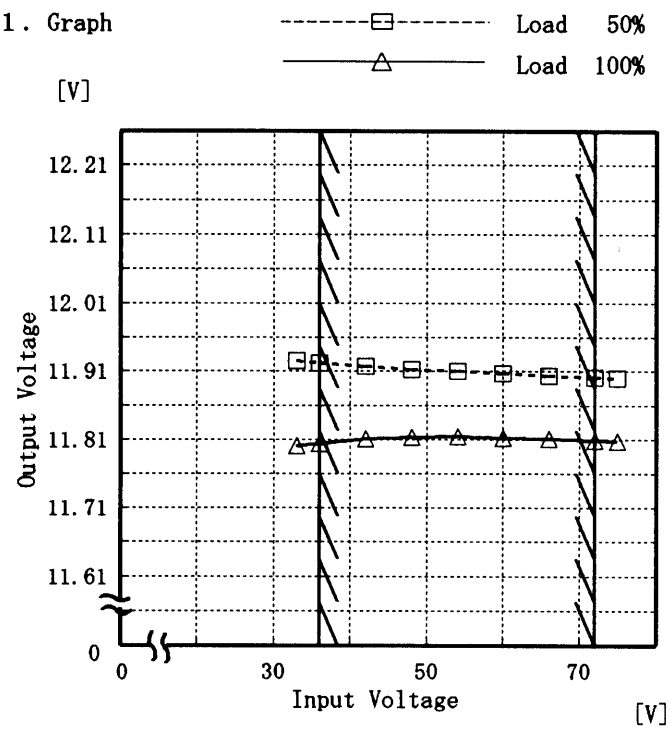
Model	ZUW34812
Item	Line Regulation 静的入力変動

Temperature 25℃
Testing Circuitry Figure A

Object +12V0.13A

1. Graph

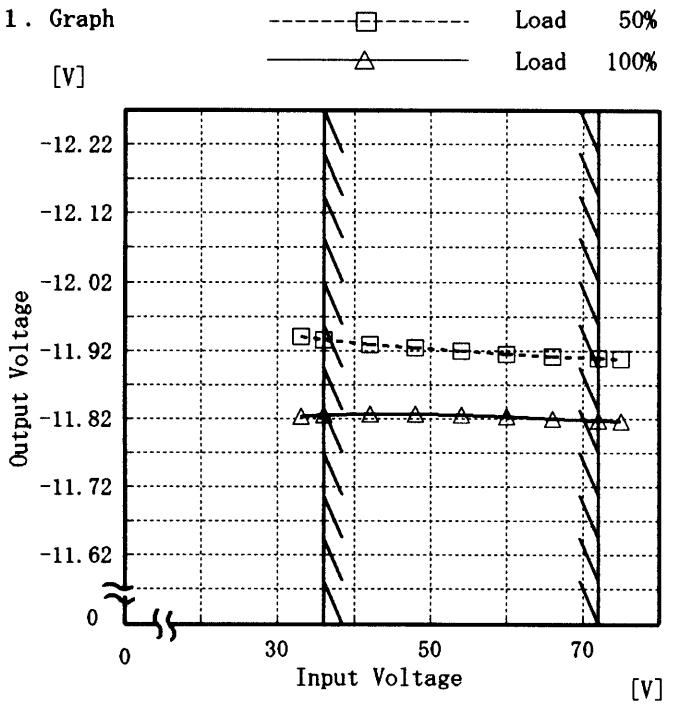


2. Values

Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]
33.0	11.925	11.800
36.0	11.923	11.804
42.0	11.917	11.811
48.0	11.913	11.814
54.0	11.910	11.814
60.0	11.907	11.813
66.0	11.903	11.811
72.0	11.901	11.808
75.0	11.900	11.807
—	—	—
—	—	—
—	—	—

Object −12V0.13A

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]
33.0	-11.941	-11.824
36.0	-11.936	-11.825
42.0	-11.929	-11.827
48.0	-11.924	-11.827
54.0	-11.919	-11.826
60.0	-11.915	-11.824
66.0	-11.912	-11.820
72.0	-11.909	-11.817
75.0	-11.908	-11.816
—	—	—
—	—	—
—	—	—

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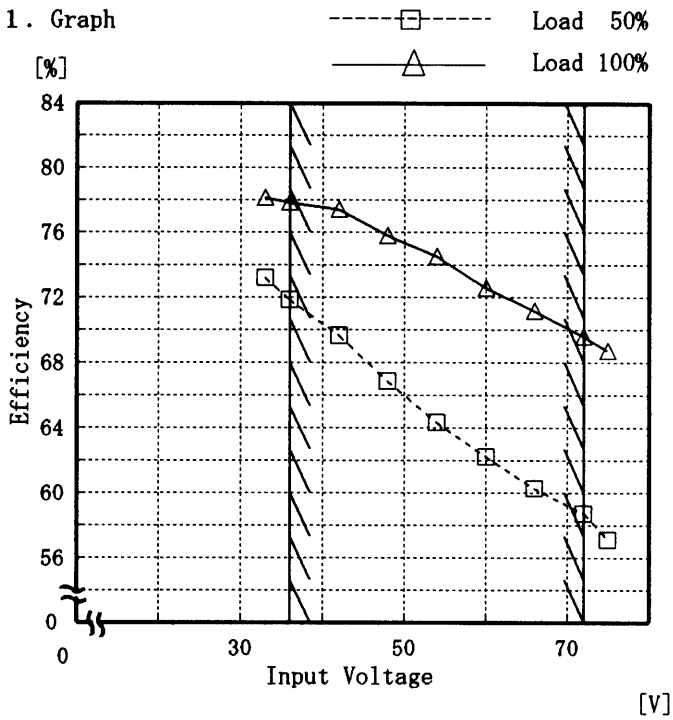
Model	ZUW34812
Item	Efficiency 効率
Object	――――――――――――

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 [%]
33.0	73.2	78.1
36.0	71.8	77.9
42.0	69.6	77.4
48.0	66.9	75.8
54.0	64.3	74.5
60.0	62.2	72.6
66.0	60.3	71.1
72.0	58.8	69.6
75.0	57.1	68.8
—	—	—
—	—	—
—	—	—

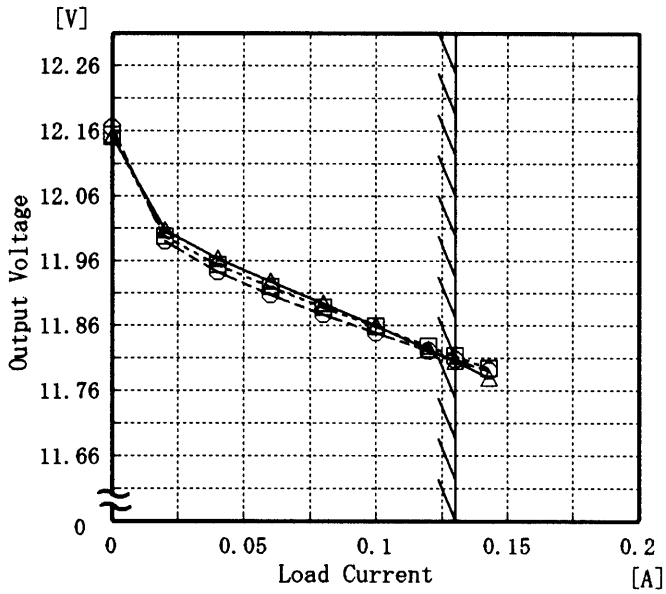
COSEL

Model	ZUW34812
Item	Load Regulation 静的負荷変動

Temperature 25℃
Testing Circuitry Figure A

Object +12V0.13A

1. Graph

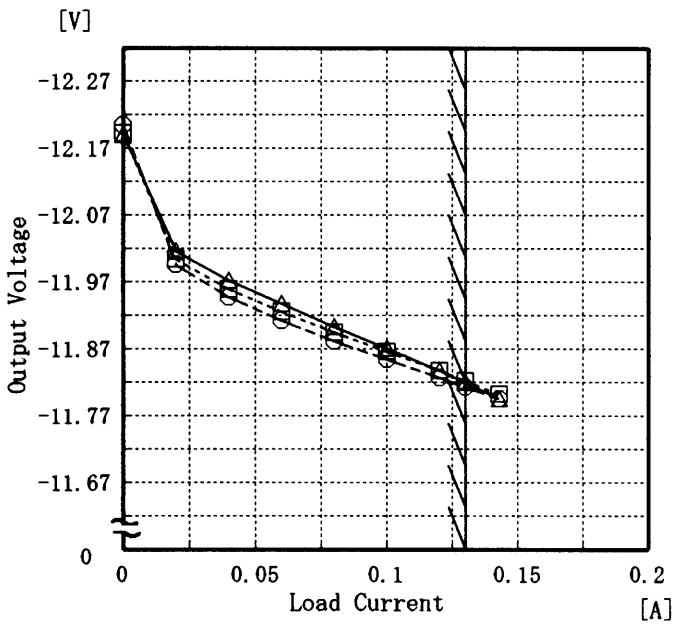


2. Values

Load Current [A]	Input Volt. 36.0[V] Output Volt. [V]	Input Volt. 48.0[V] Output Volt. [V]	Input Volt. 72.0[V] Output Volt. [V]
0.000	12.152	12.154	12.165
0.020	12.008	11.998	11.990
0.040	11.964	11.954	11.942
0.060	11.928	11.920	11.908
0.080	11.895	11.889	11.877
0.100	11.860	11.859	11.849
0.120	11.823	11.828	11.821
0.130	11.804	11.813	11.807
0.143	11.779	11.794	11.790
—	—	—	—

Object −12V0.13A

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. 36.0[V] Output Volt. [V]	Input Volt. 48.0[V] Output Volt. [V]	Input Volt. 72.0[V] Output Volt. [V]
0.000	-12.191	-12.194	-12.205
0.020	-12.017	-12.006	-11.996
0.040	-11.973	-11.960	-11.948
0.060	-11.938	-11.927	-11.913
0.080	-11.905	-11.896	-11.883
0.100	-11.872	-11.867	-11.855
0.120	-11.838	-11.838	-11.828
0.130	-11.820	-11.823	-11.814
0.143	-11.796	-11.803	-11.796
—	—	—	—

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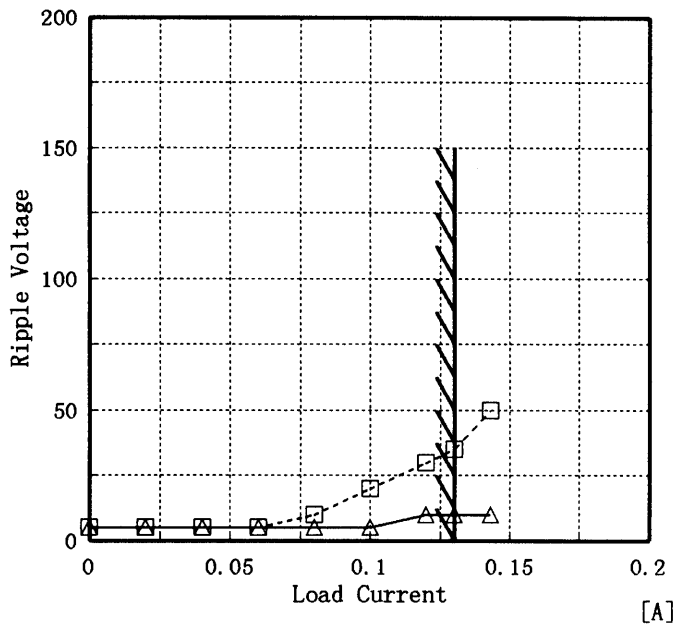
Model	ZUW34812
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+12V0.13A

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。

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

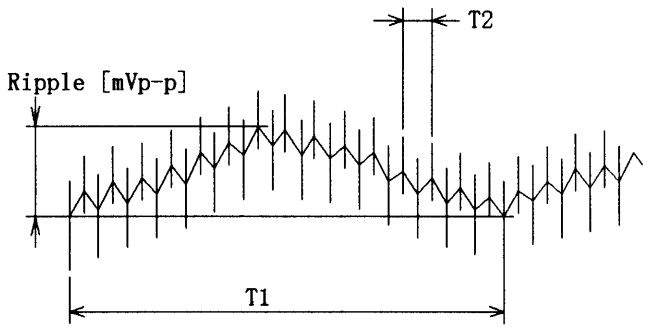


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

Load Current [A]	Input Volt. 36.0 [V] Ripple Output Volt. [mV]	Input Volt. 72.0 [V] Ripple Output Volt. [mV]
0.00	5	5
0.02	5	5
0.04	5	5
0.06	5	5
0.08	10	5
0.10	20	5
0.12	30	10
0.13	35	10
0.14	50	10
—	—	—
—	—	—

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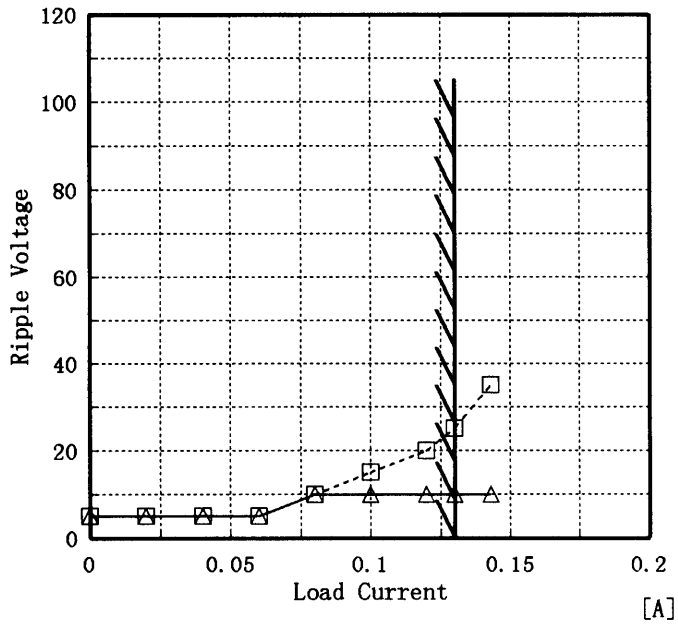
Model	ZUW34812
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	−12V0.13A

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。

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

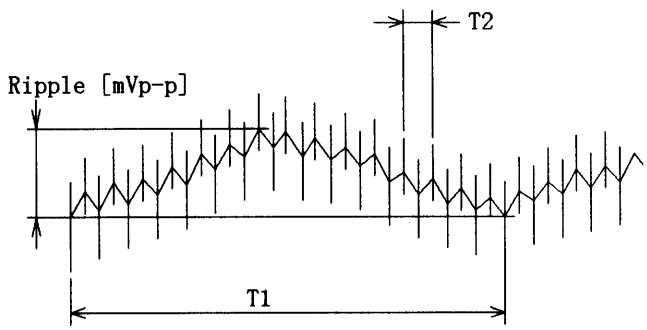


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

Load Current [A]	Input Volt. 36.0 [V] Ripple Output Volt. [mV]	Input Volt. 72.0 [V] Ripple Output Volt. [mV]
0.00	5	5
0.02	5	5
0.04	5	5
0.06	5	5
0.08	10	10
0.10	15	10
0.12	20	10
0.13	25	10
0.14	35	10
—	—	—
—	—	—

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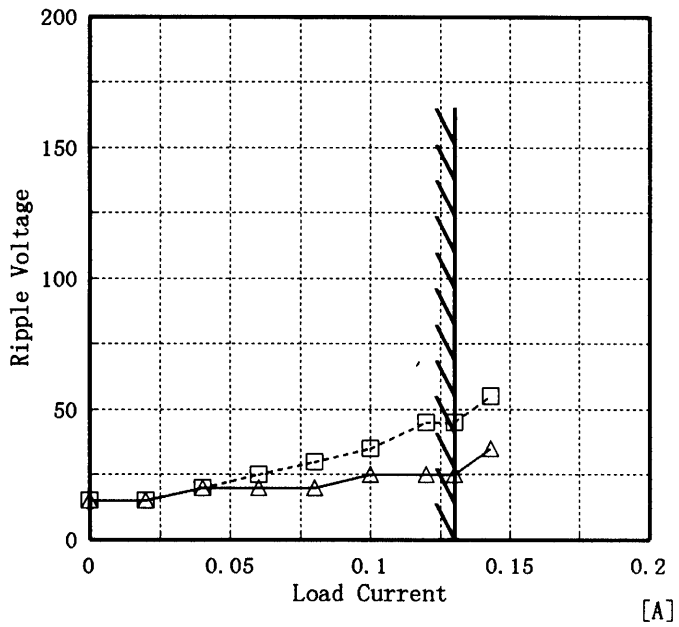
Model	ZUW34812
Item	Ripple-Noise リップルノイズ
Object	+12V0.13A

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。

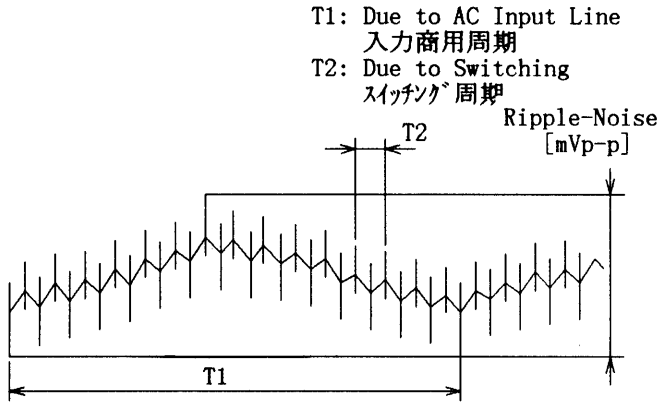


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

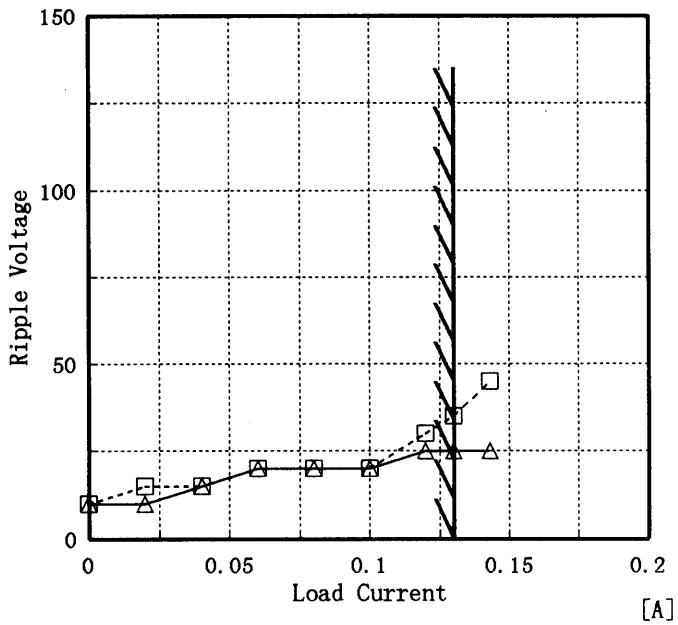
Load Current [A]	Input Volt. 36.0 [V] Ripple Output Volt. [mV]	Input Volt. 72.0 [V] Ripple Output Volt. [mV]
0.00	15	15
0.02	15	15
0.04	20	20
0.06	25	20
0.08	30	20
0.10	35	25
0.12	45	25
0.13	45	25
0.14	55	35
—	—	—
—	—	—

COSEL

Model	ZUW34812
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。

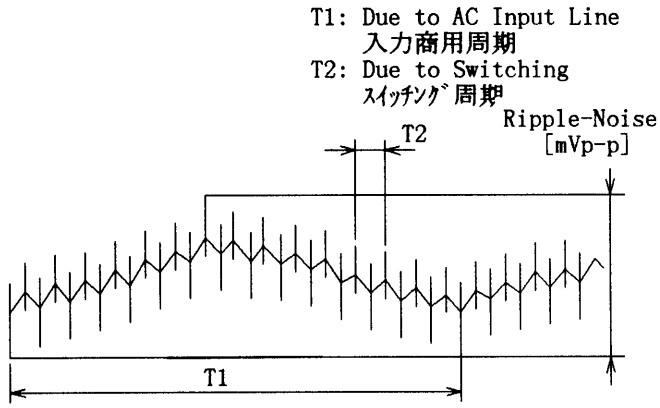


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

Load Current [A]	Input Volt. 36.0 [V] Ripple Output Volt. [mV]	Input Volt. 72.0 [V] Ripple Output Volt. [mV]
0.00	10	10
0.02	15	10
0.04	15	15
0.06	20	20
0.08	20	20
0.10	20	20
0.12	30	25
0.13	35	25
0.14	45	25
—	—	—
—	—	—

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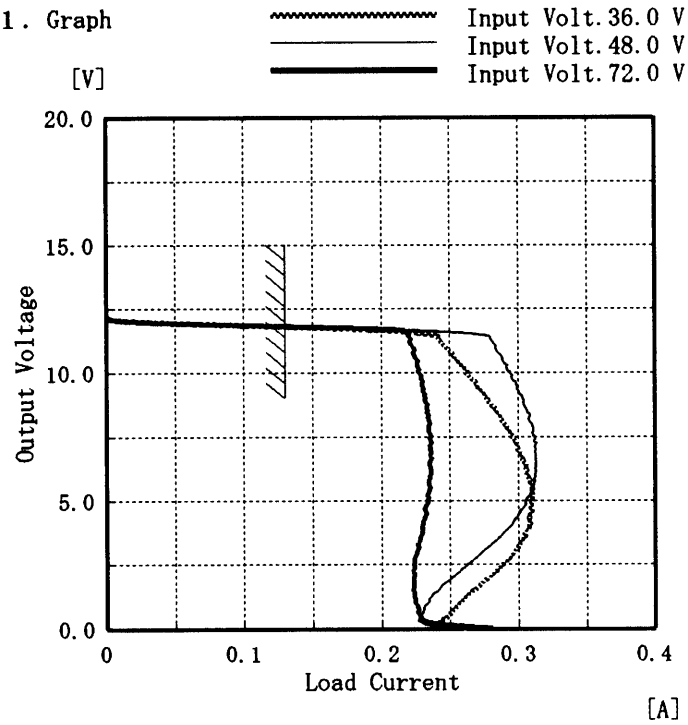
Model	ZUW34812
Item	Overcurrent Protection 過電流保護

Temperature 25℃
Testing Circuitry Figure A

Object ＋12V0.13A

1. Graph

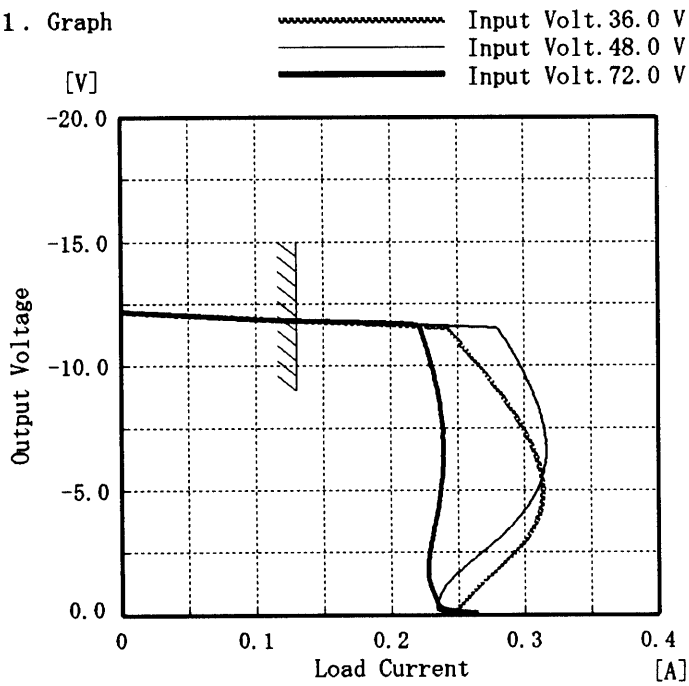


2. Values

Output Voltage [V]	Input Volt. 36.0[V] Load Current [A]	Input Volt. 48.0[V] Load Current [A]	Input Volt. 72.0[V] Load Current [A]
12.00	0.036	0.030	0.025
11.40	0.241	0.280	0.220
10.80	0.251	0.285	0.223
9.60	0.268	0.298	0.230
8.40	0.284	0.308	0.233
7.20	0.298	0.313	0.237
6.00	0.306	0.312	0.236
4.80	0.309	0.305	0.234
3.60	0.305	0.287	0.229
2.40	0.287	0.262	0.223
1.20	0.262	0.236	0.224
0.00	0.263	0.262	0.281

Object −12V0.13A

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] Load Current [A]	Input Volt. 48.0[V] Load Current [A]	Input Volt. 72.0[V] Load Current [A]
-12.00	0.111	0.110	0.102
-11.40	0.243	0.281	0.223
-10.80	0.253	0.288	0.226
-9.60	0.271	0.300	0.232
-8.40	0.287	0.309	0.237
-7.20	0.301	0.315	0.239
-6.00	0.310	0.315	0.239
-4.80	0.313	0.308	0.237
-3.60	0.308	0.290	0.233
-2.40	0.292	0.267	0.229
-1.20	0.267	0.241	0.229
0.00	0.254	0.249	0.265

COSEL

Model	ZUW34812		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+12V0.13A		

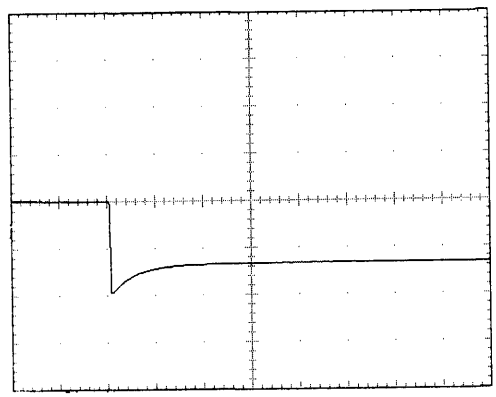
Input Volt. 48.0 V

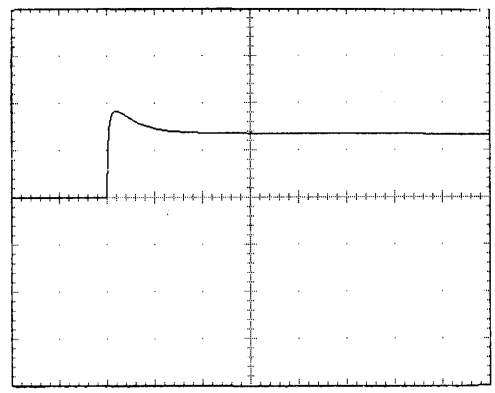
Cycle 100 mS

Load Current

Min. Load ⟷
Load 100 %

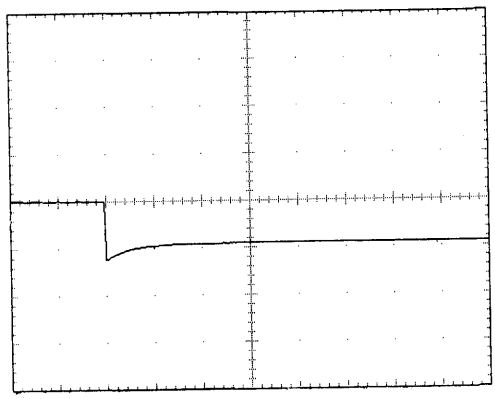
200 mV/div

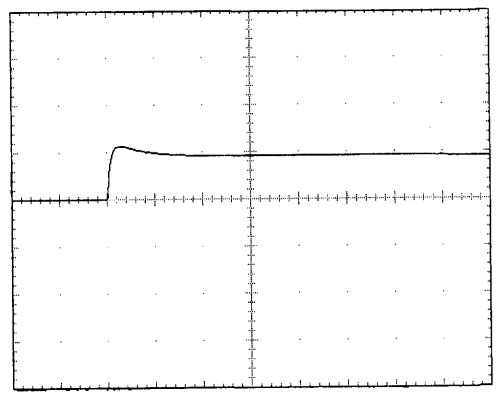




Min. Load ⟷
Load 50 %

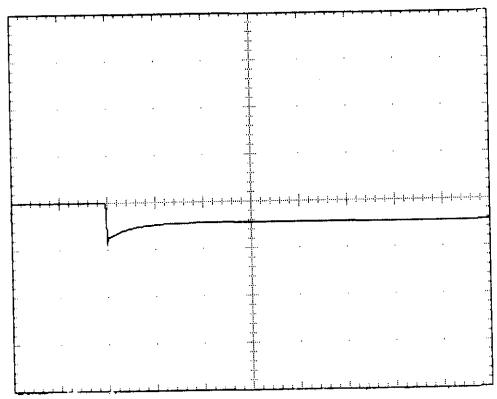
200 mV/div

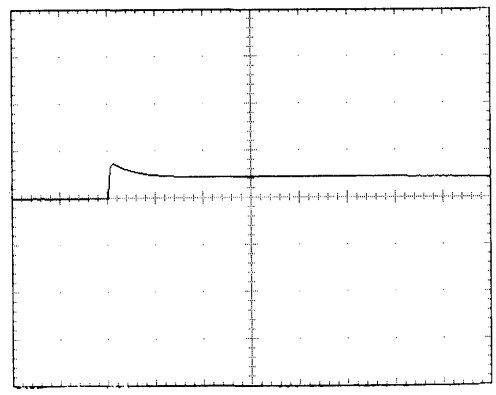




Load 50%⟷
Load 100 %

200 mV/div





1 mS/div

COSEL

Model	ZUW34812		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	−12V0.13A		

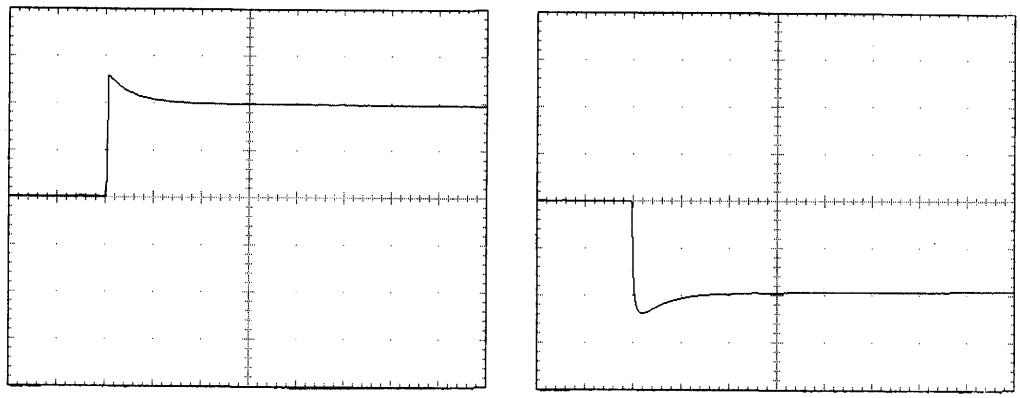
Input Volt. 48.0 V

Cycle 100 mS

Load Current

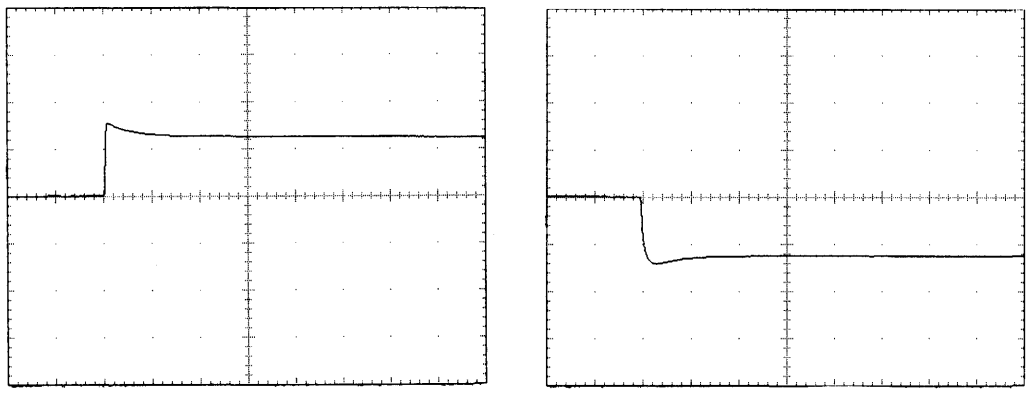
Min. Load ⟷
Load 100 %

200 mV/div



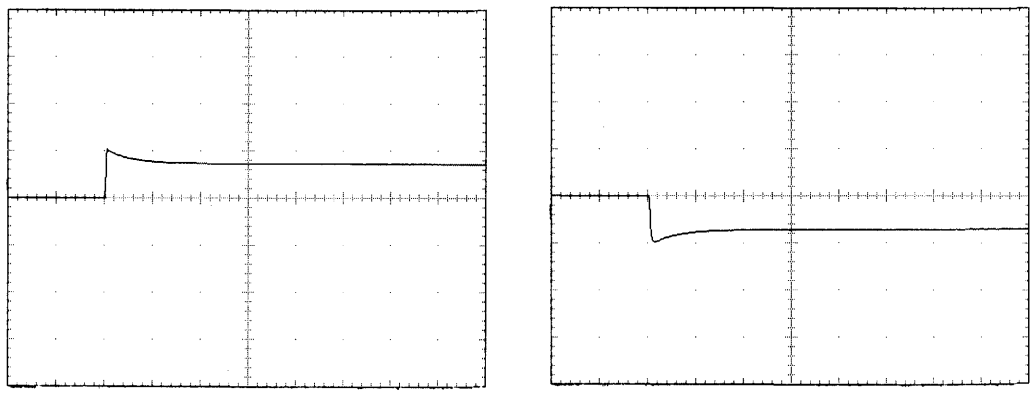
Min. Load ⟷
Load 50 %

200 mV/div



Load 50%⟷
Load 100 %

200 mV/div



1 mS/div

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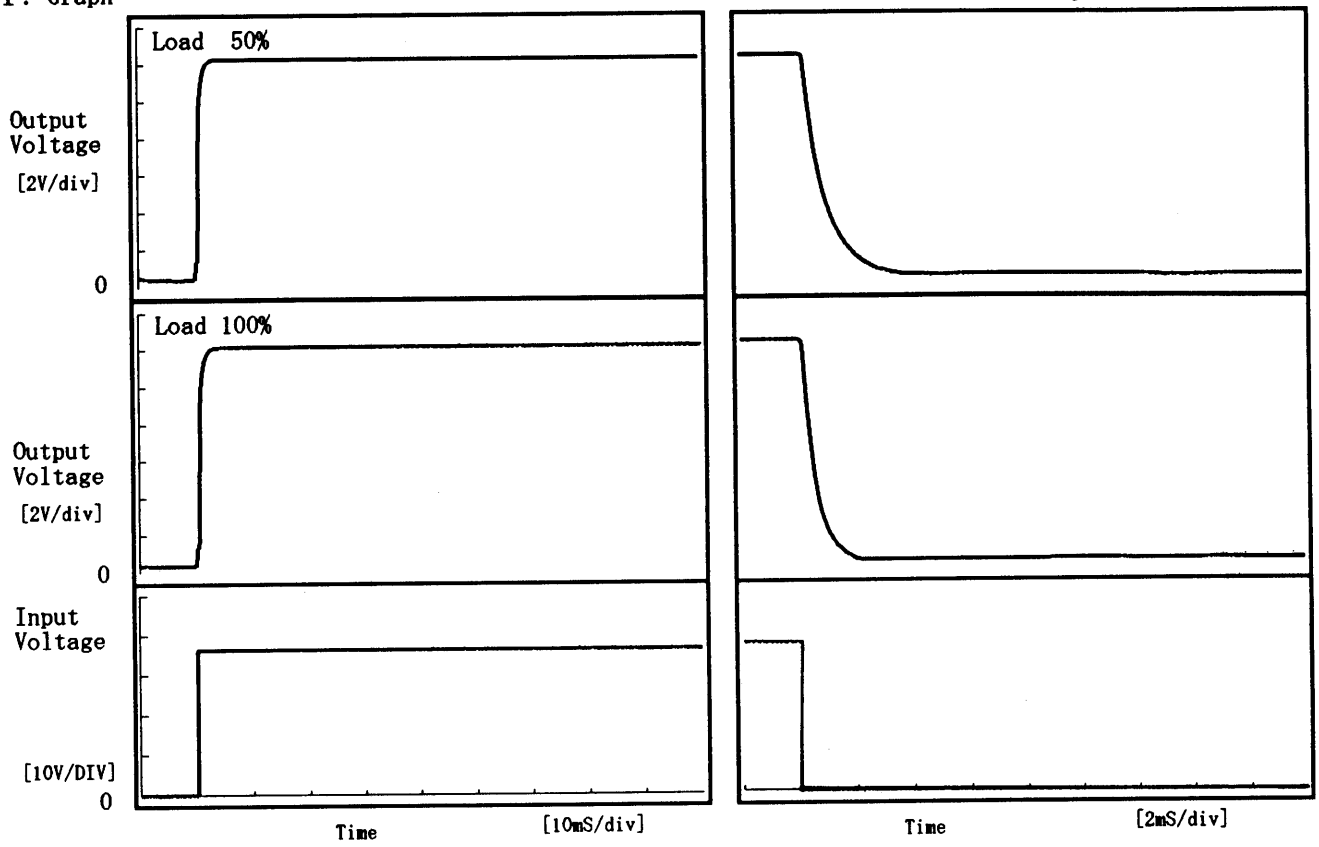
Model	ZUW34812	Temperature	25℃
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12V0.13A		

1. Graph

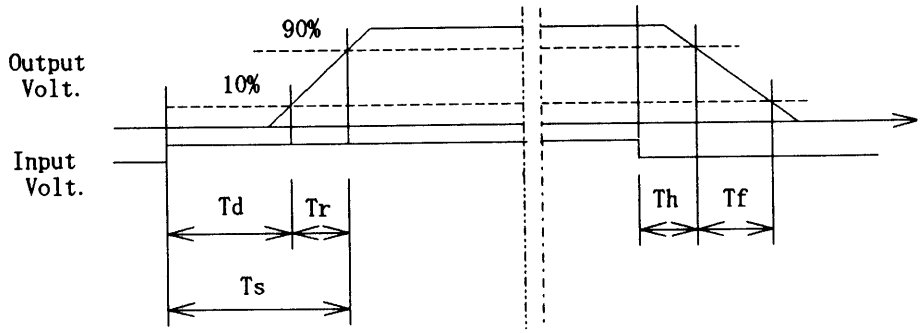
Input Volt. 36.0 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	0.45	0.80	1.25	0.28	1.86
100 %	0.45	0.90	1.35	0.19	1.08



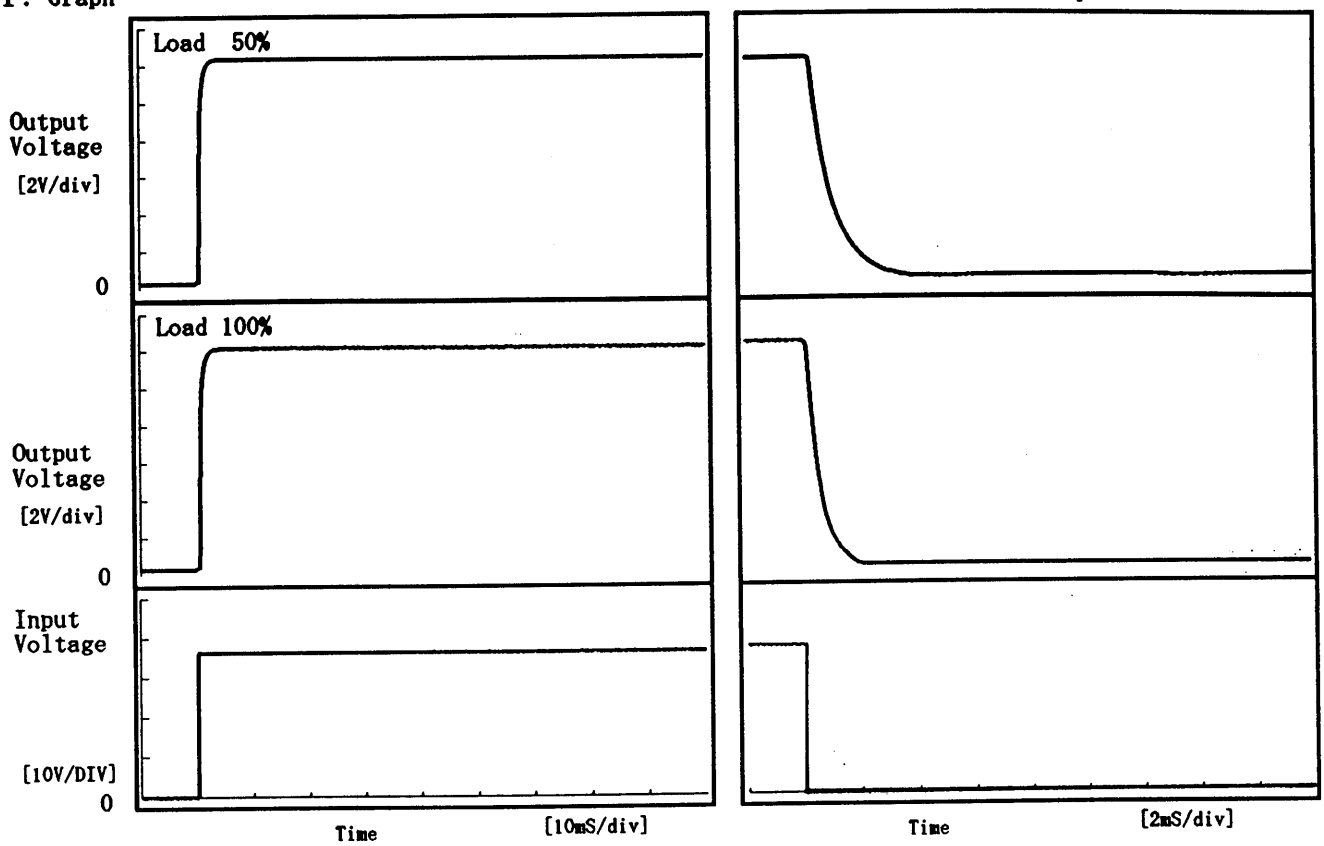
BC−2041

COSEL

Model	ZUW34812	Temperature	25℃
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	-12V0.13A		

1. Graph

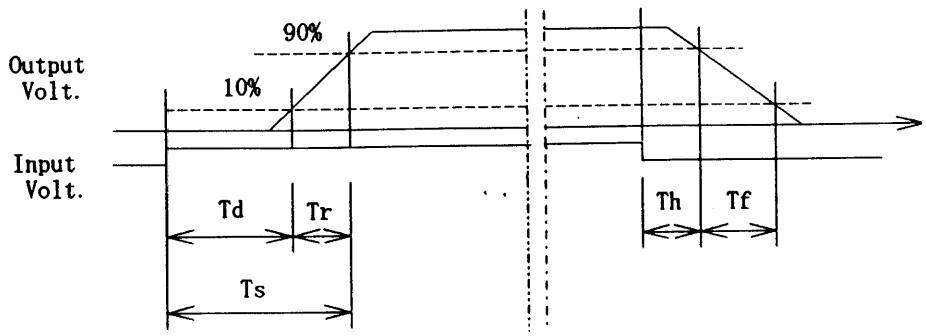
Input Volt. 36.0 V



2. Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.45	0.80	1.25	0.28	1.83
100 %	0.45	0.90	1.35	0.19	1.05



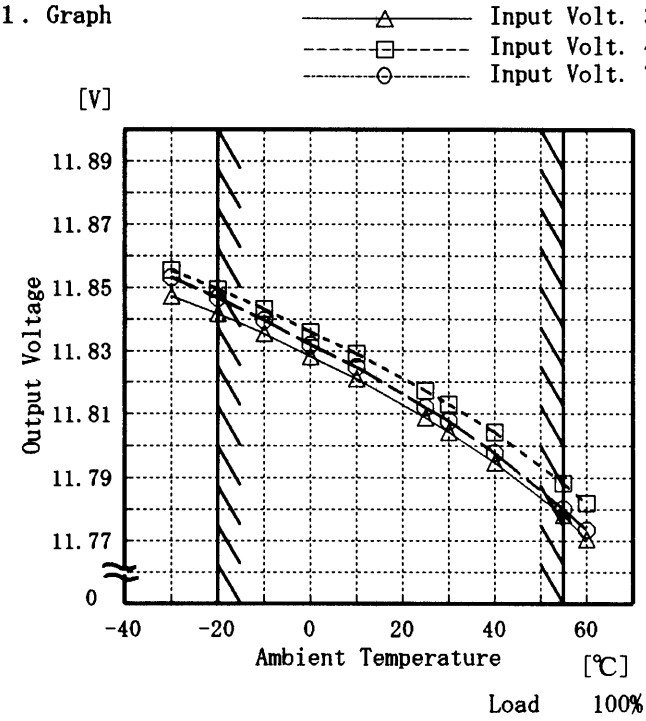
COSEL

Model	ZUW34812
Item	Ambient Temperature Drift 周囲温度変動

Testing Circuitry Figure A

Object +12V0.13A

1. Graph

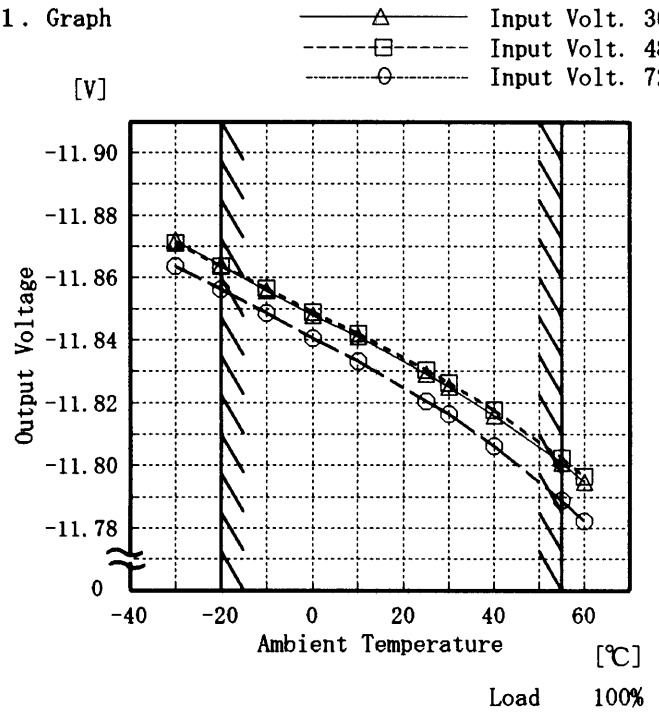


2. Values

Temperature [℃]	Input Volt. 36.0[V] Output Volt. [V]	Input Volt. 48.0[V] Output Volt. [V]	Input Volt. 72.0[V] Output Volt. [V]
-30	11.847	11.855	11.853
-20	11.842	11.849	11.847
-10	11.835	11.843	11.840
0	11.828	11.836	11.832
10	11.821	11.829	11.825
25	11.809	11.817	11.812
30	11.804	11.813	11.808
40	11.795	11.804	11.798
55	11.778	11.788	11.780
60	11.770	11.782	11.773
—	—	—	—

Object −12V0.13A

1. Graph



2. Values

Temperature [℃]	Input Volt. 36.0[V] Output Volt. [V]	Input Volt. 48.0[V] Output Volt. [V]	Input Volt. 72.0[V] Output Volt. [V]
-30	-11.872	-11.871	-11.864
-20	-11.864	-11.864	-11.856
-10	-11.856	-11.856	-11.849
0	-11.848	-11.849	-11.841
10	-11.841	-11.842	-11.833
25	-11.829	-11.830	-11.820
30	-11.825	-11.826	-11.816
40	-11.816	-11.817	-11.806
55	-11.801	-11.802	-11.789
60	-11.795	-11.797	-11.782
—	—	—	—

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。

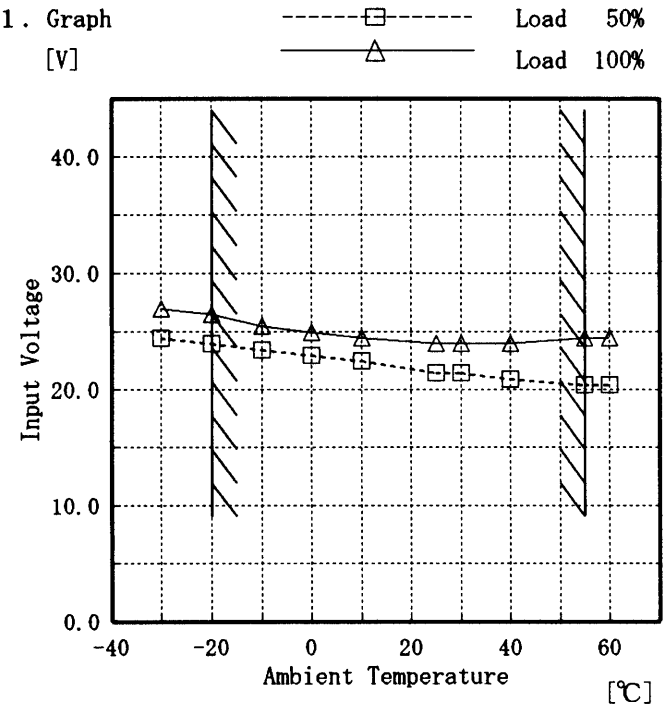
COSEL

Model	ZUW34812
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧

Testing Circuitry Figure A

Object +12V0.13A

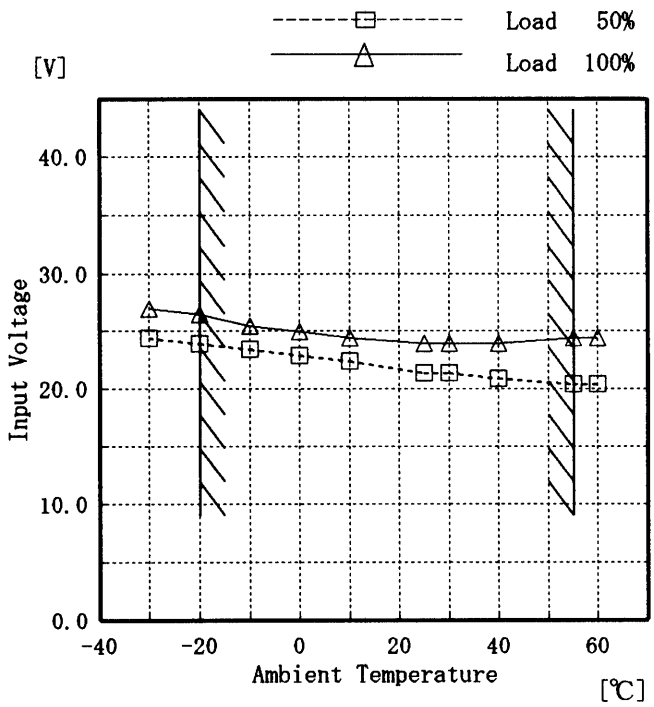
1. Graph



2. Values

Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	24.4	26.9
-20	23.9	26.4
-10	23.4	25.4
0	22.9	24.9
10	22.4	24.4
25	21.4	23.9
30	21.4	23.9
40	20.9	23.9
55	20.4	24.4
60	20.4	24.4
—	—	—

Object −12V0.13A



2. Values

Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	24.4	26.9
-20	23.9	26.4
-10	23.4	25.4
0	22.9	24.9
10	22.4	24.4
25	21.4	23.9
30	21.4	23.9
40	20.9	23.9
55	20.4	24.4
60	20.4	24.4
—	—	—

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。

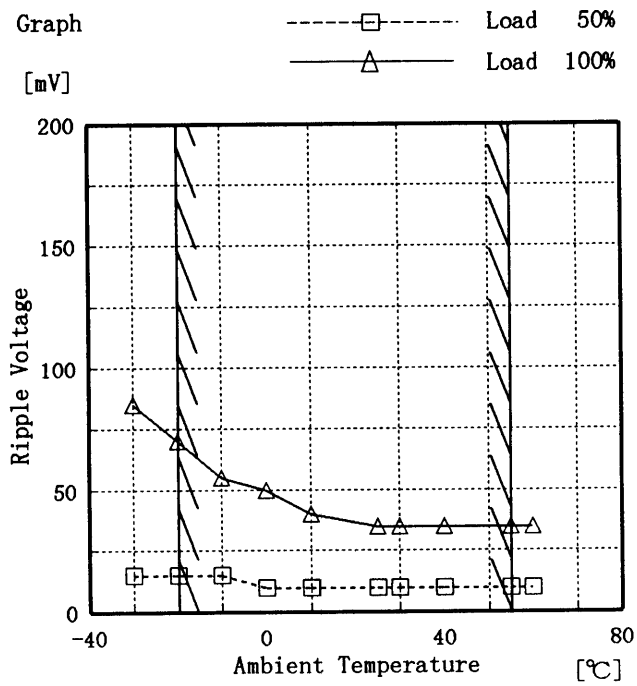
COSEL

Model	ZUW34812
Item	Ripple Voltage (by Ambient Temp.) リップル電圧（周囲温度特性）

Testing Circuitry　Figure A

Object　+12V0.13A

1. Graph



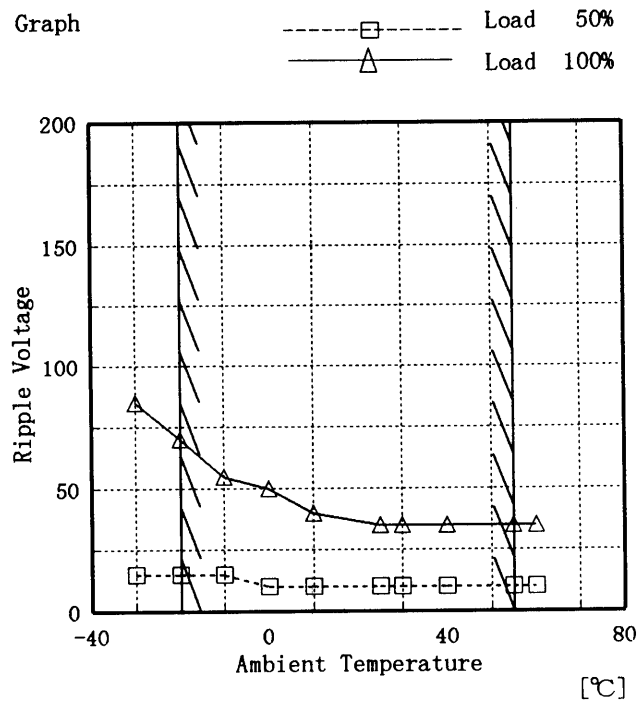
Input Volt.　36.0 V

2. Values

Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-30	15	85
-20	15	70
-10	15	55
0	10	50
10	10	40
25	10	35
30	10	35
40	10	35
55	10	35
60	10	35
—	—	—

Object　−12V0.13A

1. Graph



Input Volt.　36.0 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	15	70
-20	15	60
-10	15	45
0	10	40
10	10	30
25	10	25
30	10	25
40	5	25
55	5	25
60	5	25
—	—	—

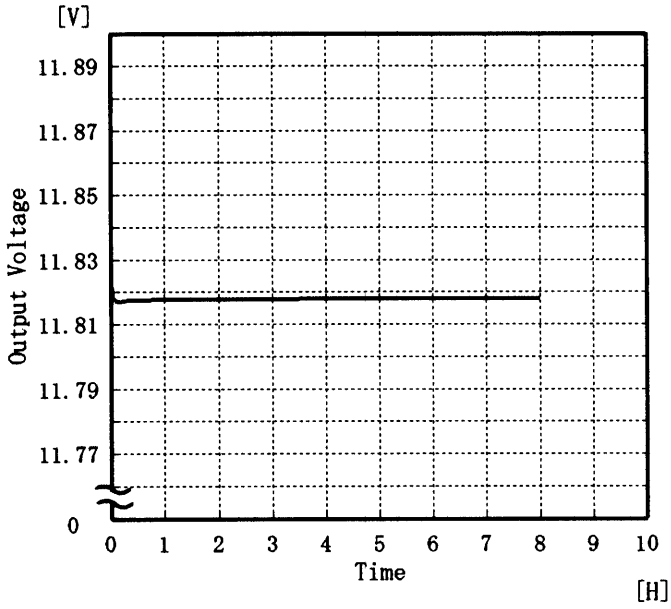
COSEL

Model	ZUW34812
Item	Time Lapse Drift 経時ドリフト

Temperature 25 ℃
Testing Circuitry Figure A

Object ＋12V0.13A

1. Graph



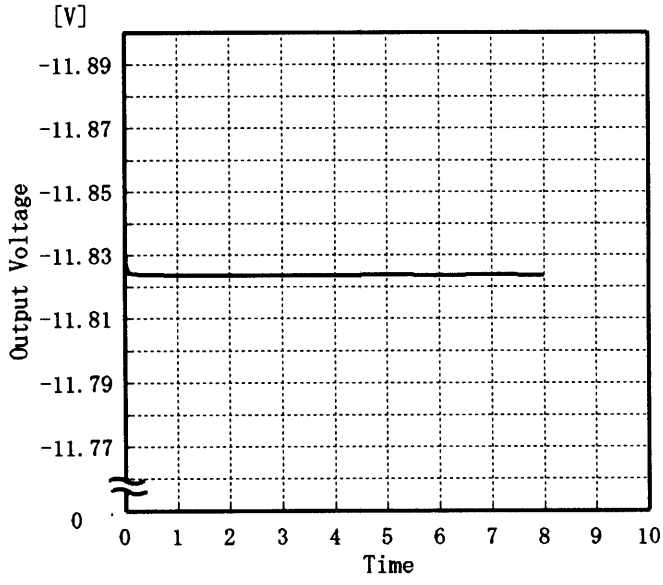
Input Volt. 48.0V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	11.823
0.5	11.818
1.0	11.818
2.0	11.818
3.0	11.818
4.0	11.818
5.0	11.818
6.0	11.818
7.0	11.818
8.0	11.818

Object －12V0.13A

1. Graph



Input Volt. 48.0V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	-11.832
0.5	-11.824
1.0	-11.824
2.0	-11.824
3.0	-11.824
4.0	-11.824
5.0	-11.824
6.0	-11.824
7.0	-11.824
8.0	-11.824

BC－2041

COSEL

Model	ZUW34812
Item	Output Voltage Accuracy 定電圧精度

Testing Circuitry Figure A

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 : 36.0～72.0 V

Load Current (AVR 1) : 0.00～0.13 A

(AVR 2) : 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 36.0～72.0 V

負荷電流 (AVR 1) 0.00～0.13 A

(AVR 2) 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

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

Object ＋12V0.13A

Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-20	48.0	0.13	11.847	±191	±1.6
Minimum Voltage	55	72.0	0.00	11.466		

Object －12V0.13A

Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-20	36.0	0.13	-11.862	±185	±1.6
Minimum Voltage	55	36.0	0.00	-11.492		

COSEL

Model	ZUW34812
Item	Condensation 結露特性
Object	+12V0.13A

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 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	11.923	10	20
	2	11.927	10	20
	3	11.923	10	20
Load 100 %	1	11.829	20	25
	2	11.829	20	25
	3	11.824	20	25

Input Volt. 48.0 V

COSEL

Model	ZUW34812
Item	Condensation 結露特性
Object	−12V0.13A

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 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	-11.922	10	25
	2	-11.924	10	25
	3	-11.928	10	25
Load 100 %	1	-11.828	15	30
	2	-11.832	15	30
	3	-11.838	15	30

Input Volt. 48.0 V

COSEL

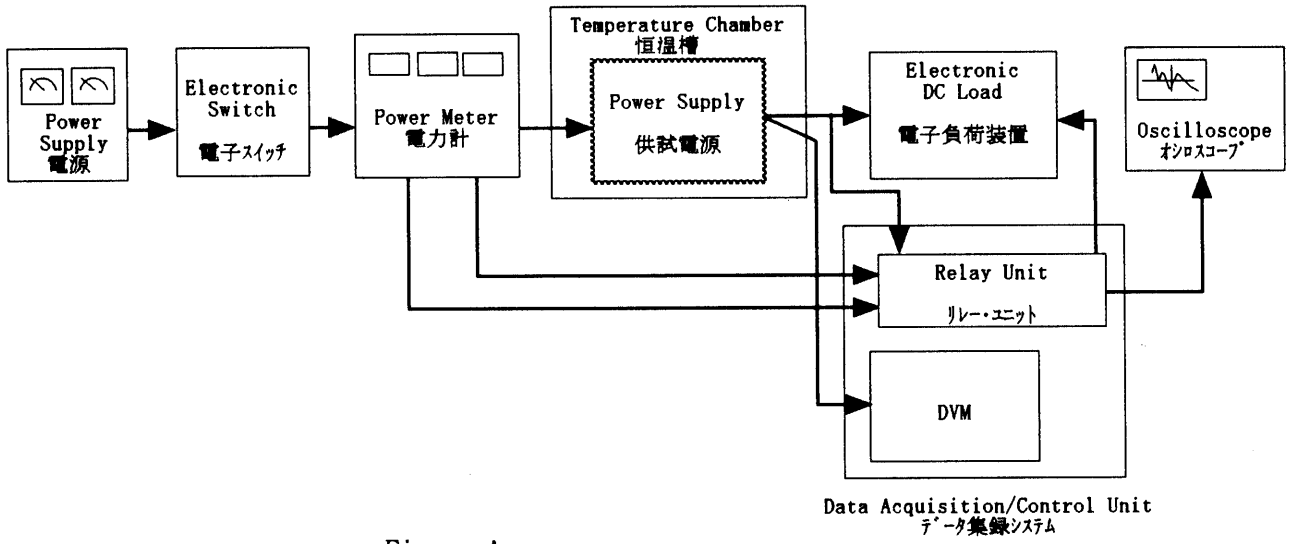


Figure A