参考資料

COSEL

TEST DATA OF ZUS60515

(5.0V INPUT)

Regulated DC Power Supply

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コーセル株式会社

COSEL CO.,LTD.

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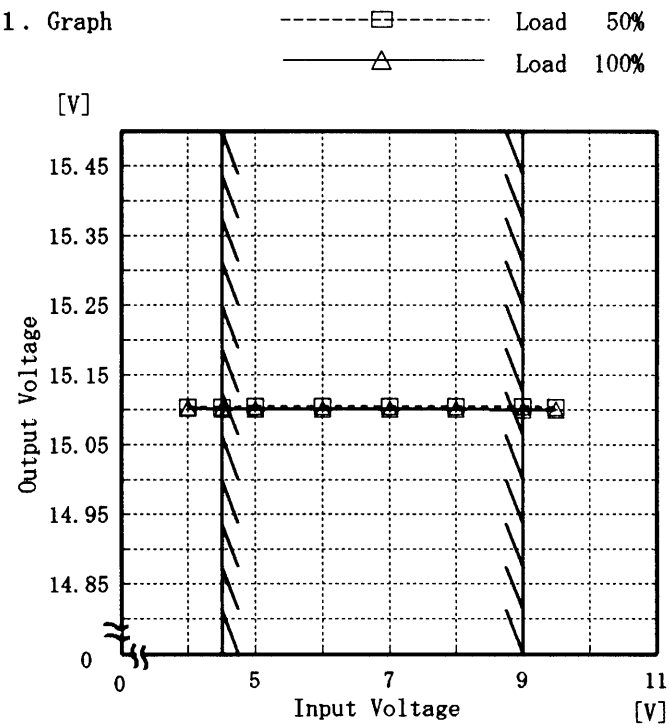


Note: Slanted line shows the range of the rated input voltage.

(注)斜線は定格入力電圧範囲を示す。

2. Values

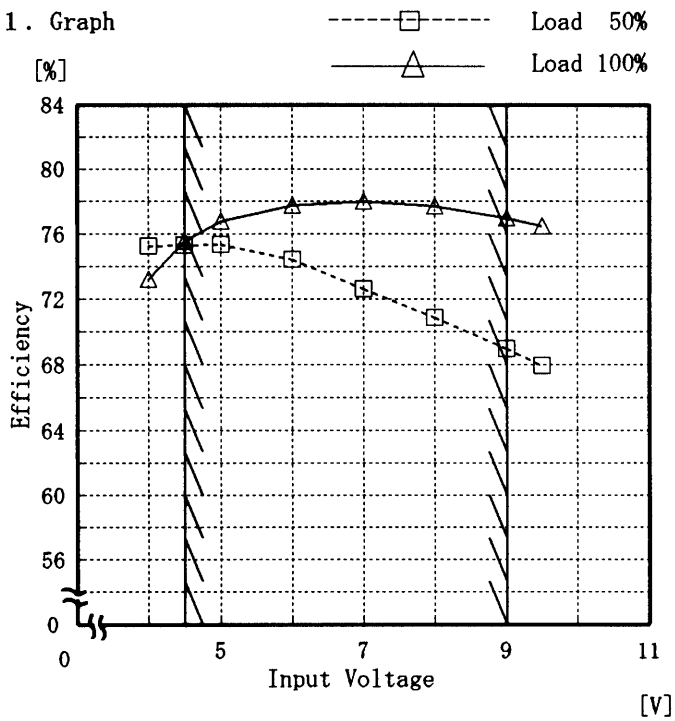
Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]
4.0	15.103	15.101
4.5	15.103	15.101
5.0	15.104	15.101
6.0	15.104	15.101
7.0	15.104	15.101
8.0	15.104	15.100
9.0	15.104	15.100
9.5	15.103	15.100
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	ZUS60515
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

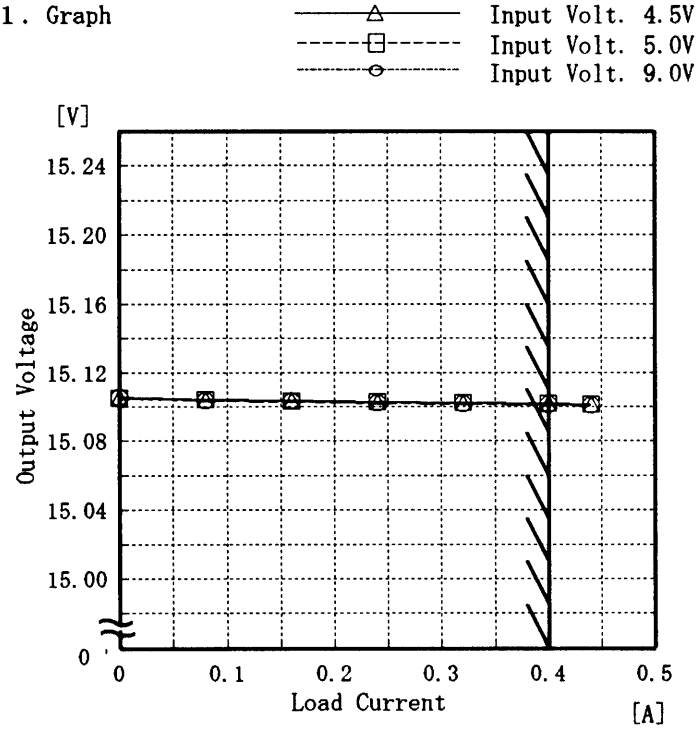
Input Voltage [V]	Load 50% Efficiency [%]	Load 100% Efficiency [%]
4.0	75.2	73.2
4.5	75.3	75.5
5.0	75.3	76.8
6.0	74.4	77.7
7.0	72.6	78.0
8.0	70.9	77.7
9.0	69.0	77.0
9.5	68.0	76.5
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	ZUS60515
Item	Load Regulation 静的負荷変動
Object	+15V0.4A

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

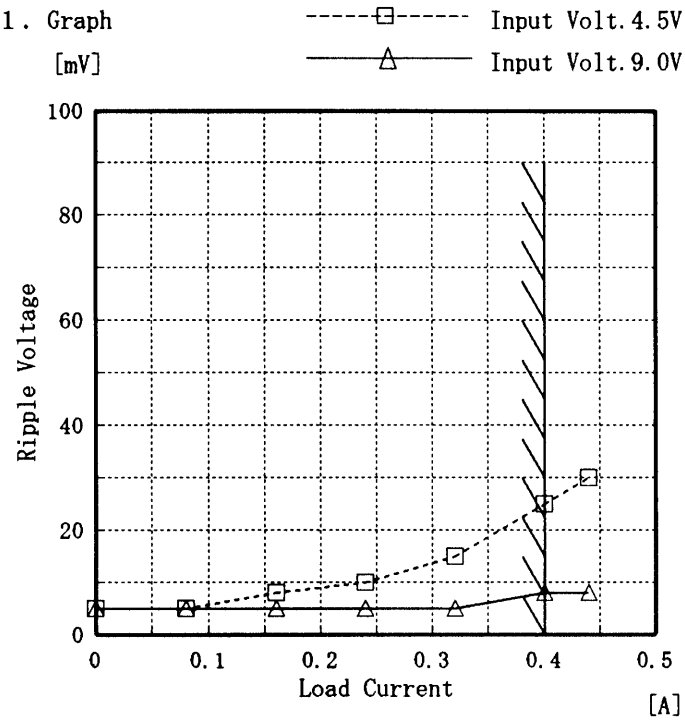
Load Current [A]	Input Volt. 4.5[V] Output Volt. [V]	Input Volt. 5.0[V] Output Volt. [V]	Input Volt. 9.0[V] Output Volt. [V]
0.00	15.105	15.105	15.106
0.08	15.104	15.104	15.104
0.16	15.104	15.103	15.103
0.24	15.103	15.103	15.102
0.32	15.102	15.102	15.102
0.40	15.102	15.102	15.101
0.44	15.102	15.101	15.101
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	ZUS60515
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+15V 0.4A

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

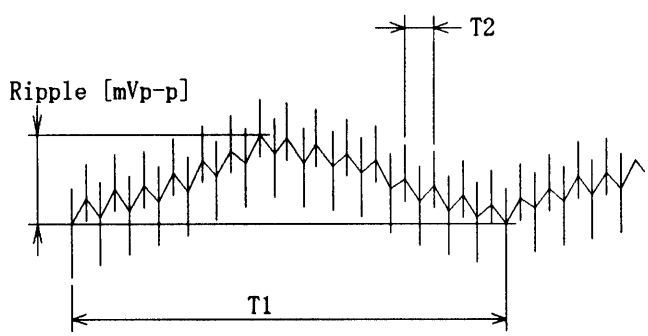


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

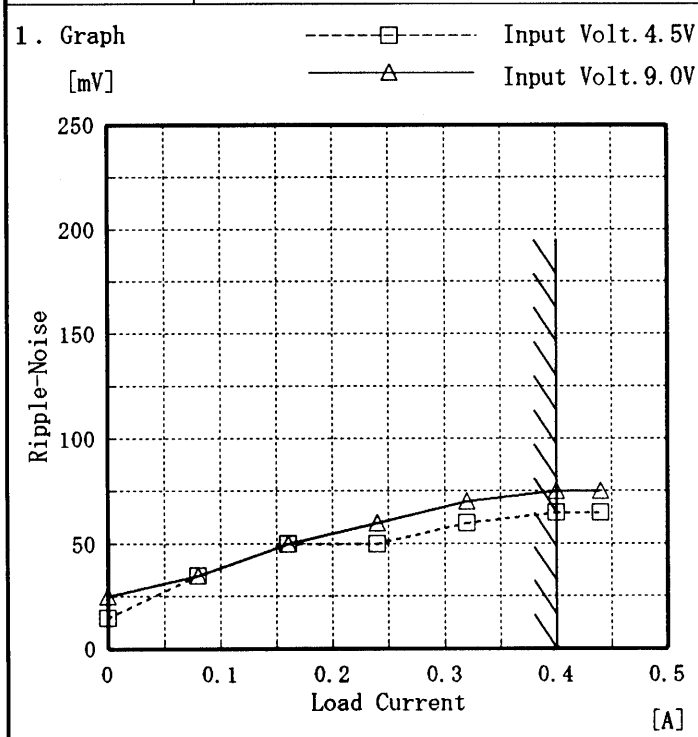
Load Current [A]	Input Volt. 4.5 [V] Ripple Output Volt. [mV]	Input Volt. 9.0 [V] Ripple Output Volt. [mV]
0.00	5	5
0.08	5	5
0.16	8	5
0.24	10	5
0.32	15	5
0.40	25	8
0.44	30	8
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	ZUS60515
Item	Ripple-Noise リップルノイズ
Object	+15V0.4A

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

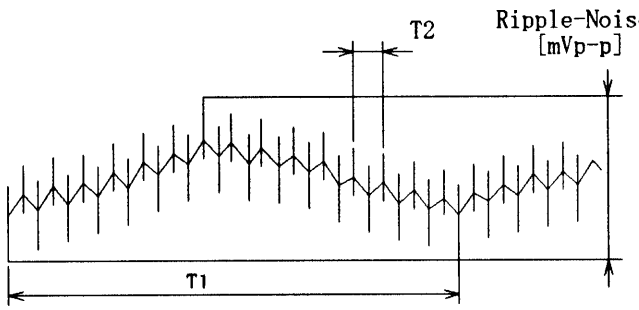


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

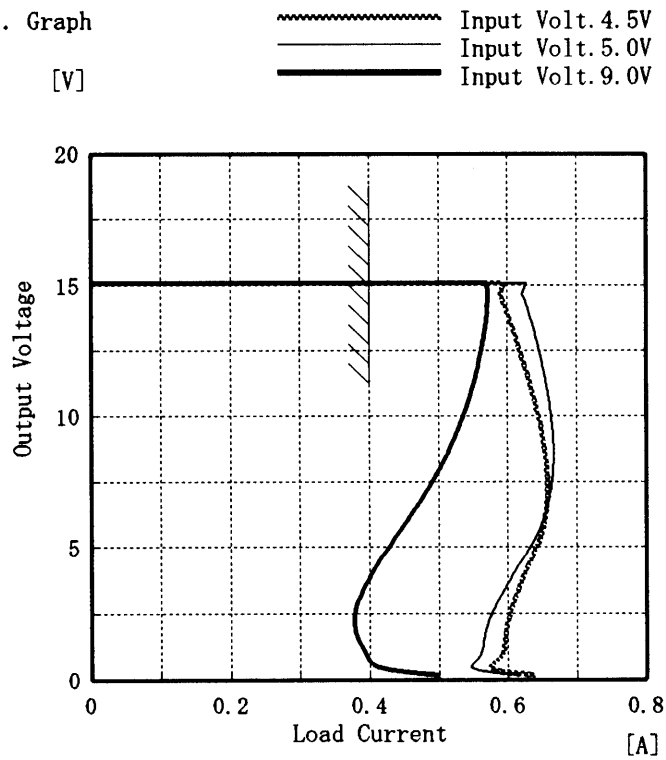
Load current [A]	Input Volt. 4.5 [V] Ripple-Noise [mV]	Input Volt. 9.0 [V] Ripple-Noise [mV]
0.00	15	25
0.08	35	35
0.16	50	50
0.24	50	60
0.32	60	70
0.40	65	75
0.44	65	75
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	ZUS60515
Item	Overcurrent Protection 過電流保護
Object	+15V0.4A

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. 4.5[V] Load Current [A]	Input Volt. 5.0[V] Load Current [A]	Input Volt. 9.0[V] Load Current [A]
15.00	0.59	0.62	0.57
14.25	0.59	0.63	0.57
13.50	0.60	0.64	0.57
12.00	0.62	0.65	0.56
10.50	0.64	0.66	0.54
9.00	0.65	0.67	0.52
7.50	0.66	0.66	0.49
6.00	0.65	0.65	0.46
4.50	0.63	0.62	0.42
3.00	0.61	0.59	0.38
1.50	0.60	0.56	0.38
0.00	0.54	0.57	0.57

COSEL

Model	ZUS60515		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+15V0.4A		

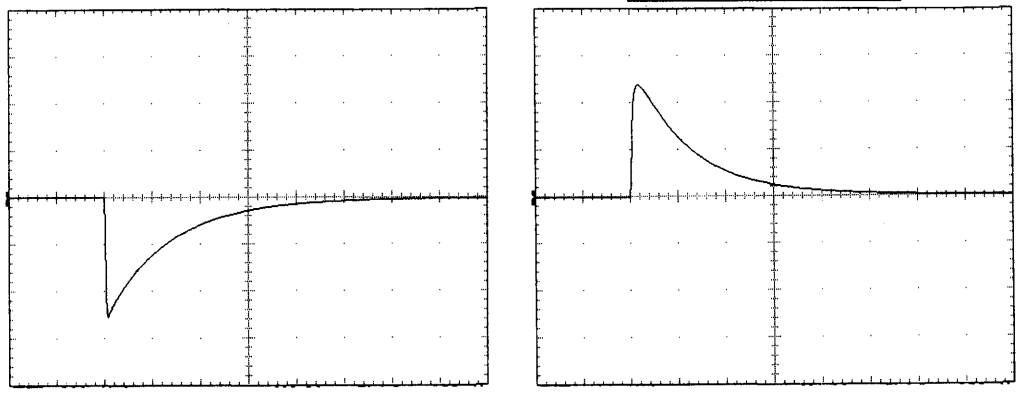
Input Volt. 5.0 V

Cycle 100 mS

Load Current

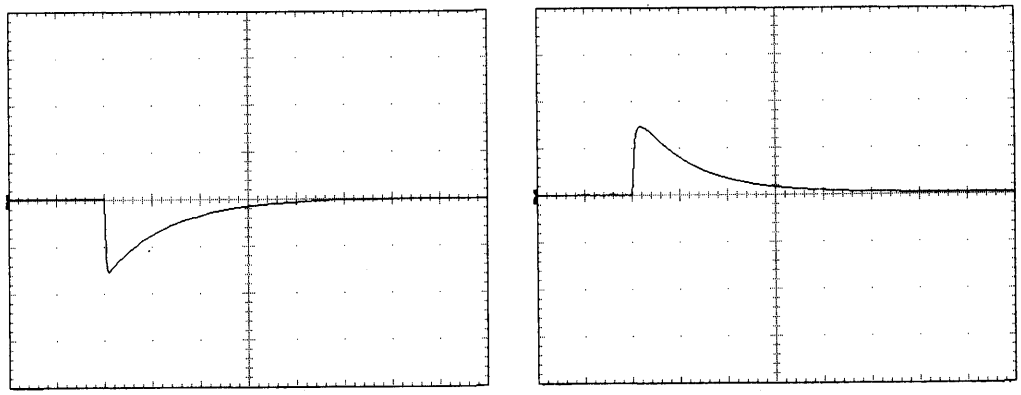
Min. Load ⟷
Load 100 %

200 mV/div



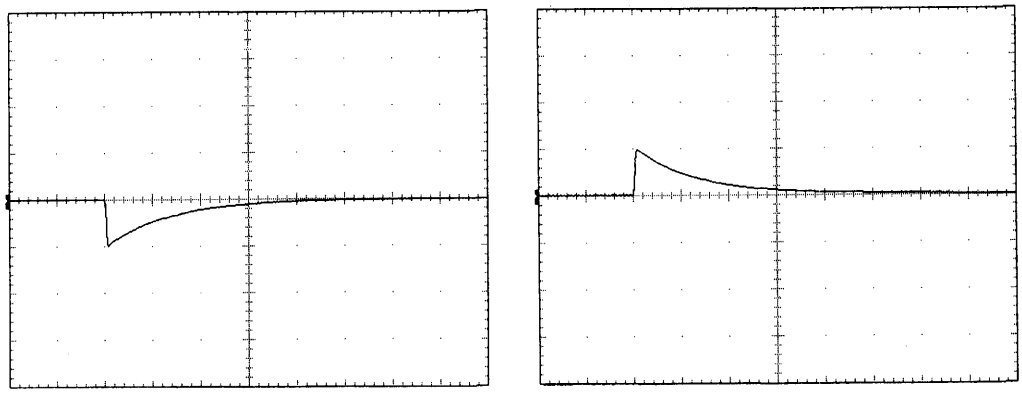
Min. Load ⟷
Load 50 %

200 mV/div



Load 50%⟷
Load 100 %

200 mV/div



1 mS/div

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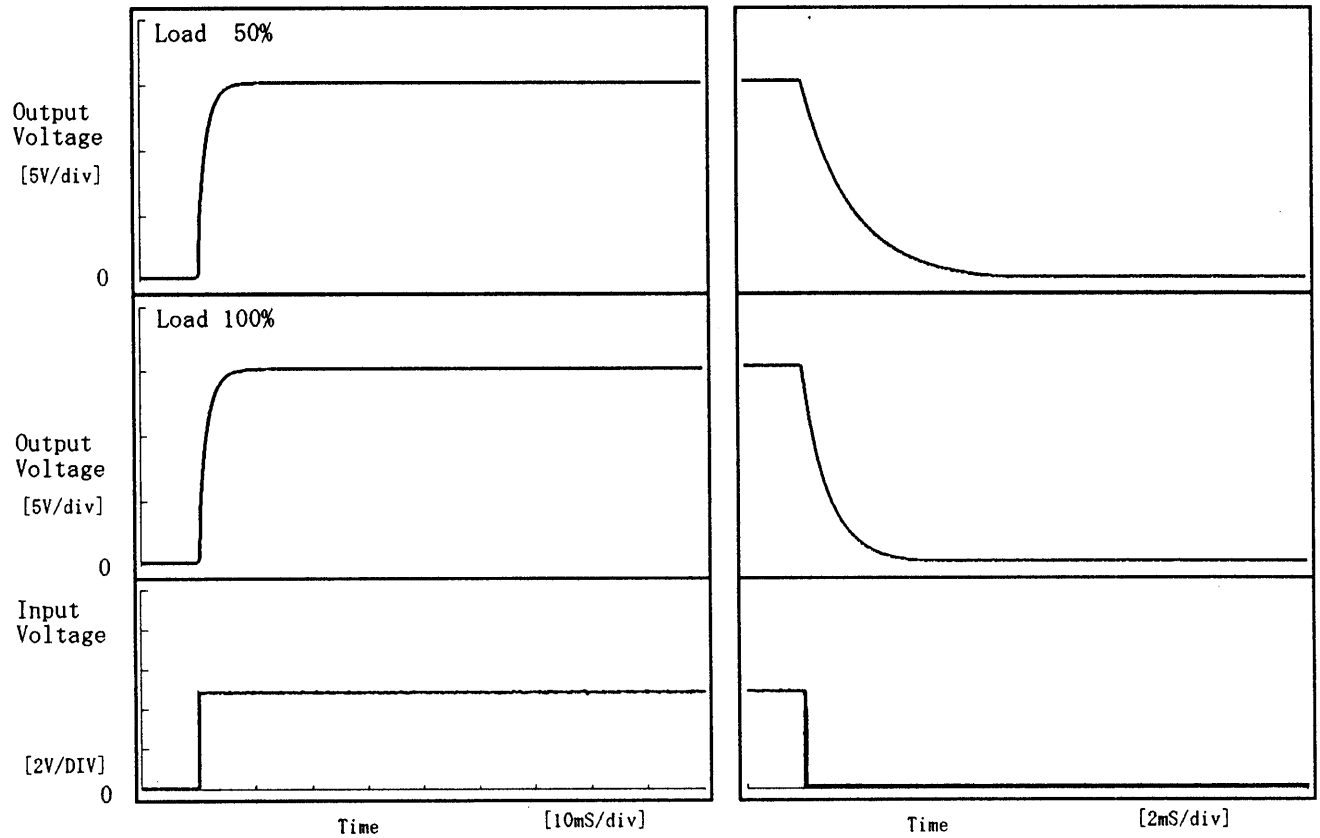
Model	ZUS60515		
Item	Rise and Fall Time 立上り、立下り時間	Temperature	25℃
		Testing Circuitry	Figure A
Object	+15V0.4A		

1. Graph

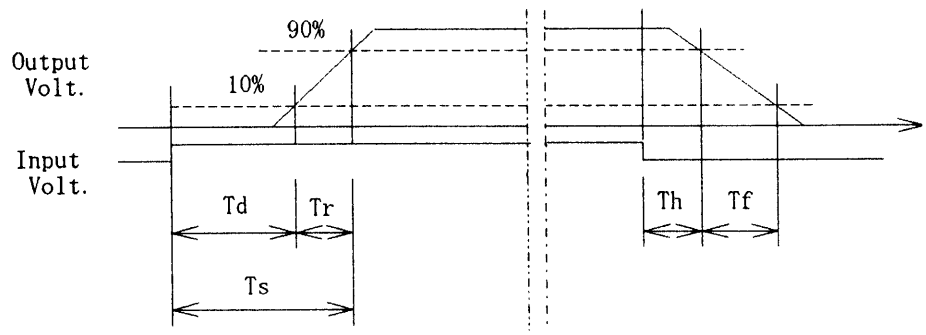
Input Volt. 4.5 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	0.30	3.20	3.50	0.21	3.81
100 %	0.30	3.30	3.60	0.11	2.01



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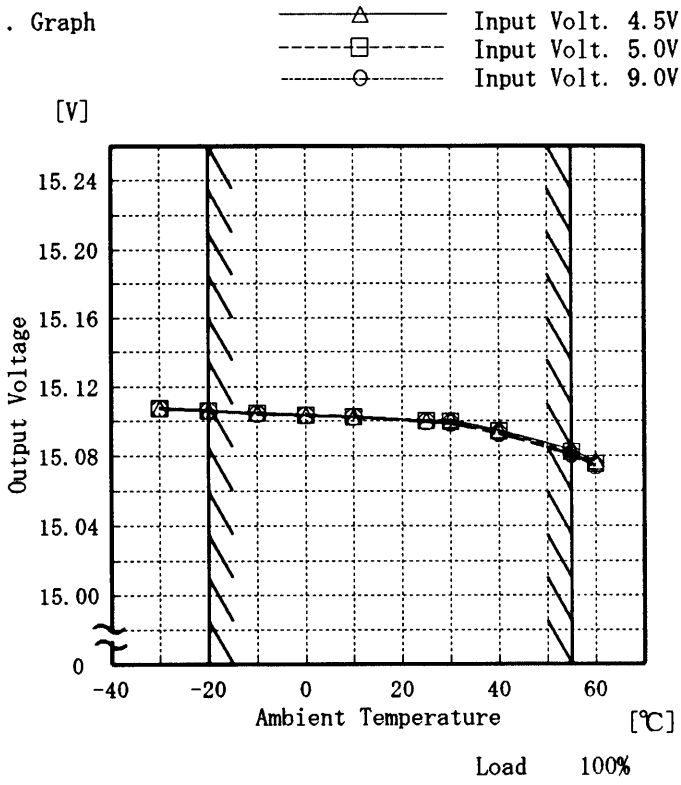
Model	ZUS60515
Item	Ambient Temperature Drift 周囲温度変動
Object	+15V0.4A

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

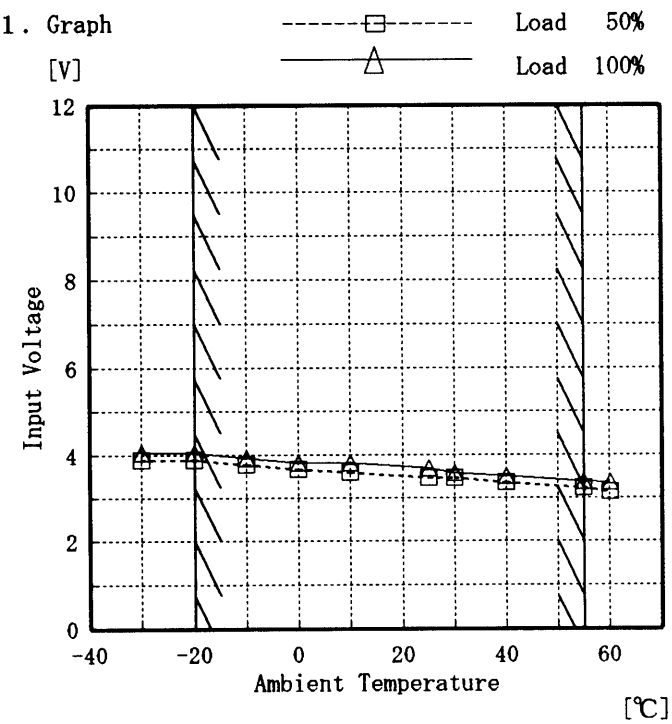
Temperature [℃]	Input Volt. 4.5[V] Output Volt. [V]	Input Volt. 5.0[V] Output Volt. [V]	Input Volt. 9.0[V] Output Volt. [V]
-30	15.107	15.107	15.107
-20	15.106	15.106	15.106
-10	15.104	15.105	15.104
0	15.103	15.103	15.103
10	15.102	15.102	15.102
25	15.100	15.100	15.099
30	15.101	15.100	15.099
40	15.095	15.094	15.093
55	15.084	15.082	15.081
60	15.077	15.076	15.074
—	—	—	—

COSEL

Model	ZUS60515
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+15V0.4A

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

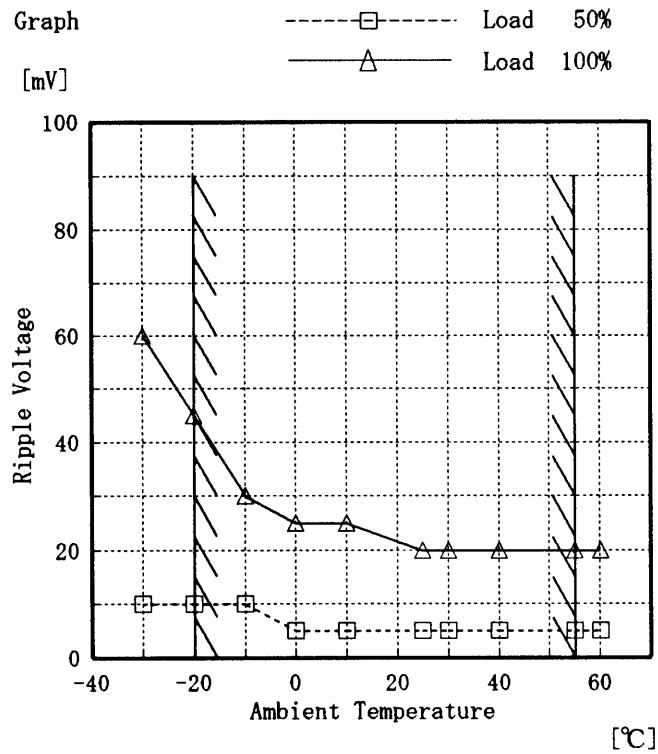
Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-30	3.9	4.1
-20	3.9	4.1
-10	3.8	3.9
0	3.7	3.8
10	3.6	3.8
25	3.5	3.7
30	3.5	3.6
40	3.4	3.5
55	3.3	3.4
60	3.1	3.4
—	—	—

COSEL

Model	ZUS60515
Item	Ripple Voltage (by Ambient Temp.) リップル電圧（周囲温度特性）
Object	+15V0.4A

Testing Circuitry Figure A

1. Graph



Input Volt. 4.5 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

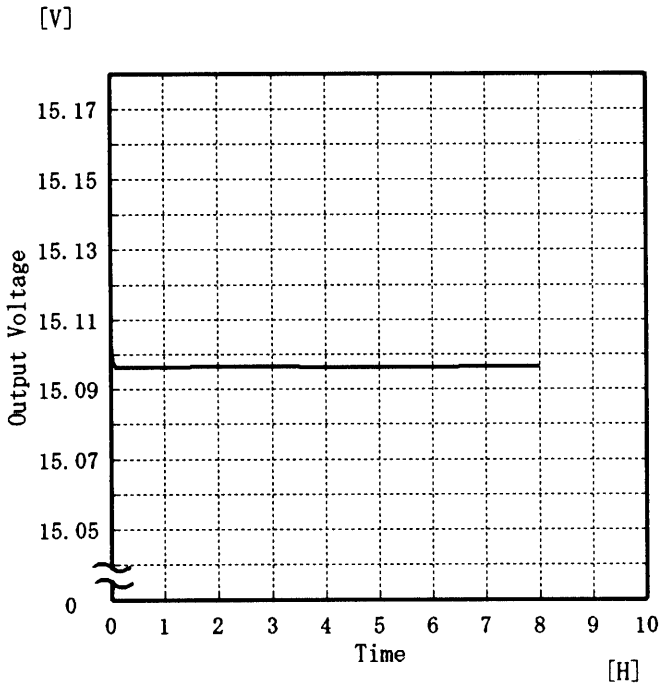
Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-30	10	60
-20	10	45
-10	10	30
0	5	25
10	5	25
25	5	20
30	5	20
40	5	20
55	5	20
60	5	20
—	—	—

COSEL

Model	ZUS60515
Item	Time Lapse Drift 経時ドリフト
Object	+15V0.4A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 5V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	15.103
0.5	15.096
1.0	15.096
2.0	15.097
3.0	15.097
4.0	15.096
5.0	15.096
6.0	15.096
7.0	15.097
8.0	15.097

COSEL

Model	ZUS60515
Item	Output Voltage Accuracy 定電圧精度
Object	+15V0.4A

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 : 4.5～9.0 V
Load Current : 0.0～0.4 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 4.5～9.0 V
負荷電流 0.0～0.4 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	-20	9.0	0.0	15.112	±18	±0.2
Minimum Voltage	55	4.5	0.4	15.077		

COSEL

Model	ZUS60515
Item	Condensation 結露特性
Object	+15V 0.4A

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 26℃ 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２６℃、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	15.387	5	40
	2	15.395	5	45
	3	15.394	5	45
Load 100 %	1	15.386	15	60
	2	15.393	20	60
	3	15.392	20	65

Input Volt. 5.0 V

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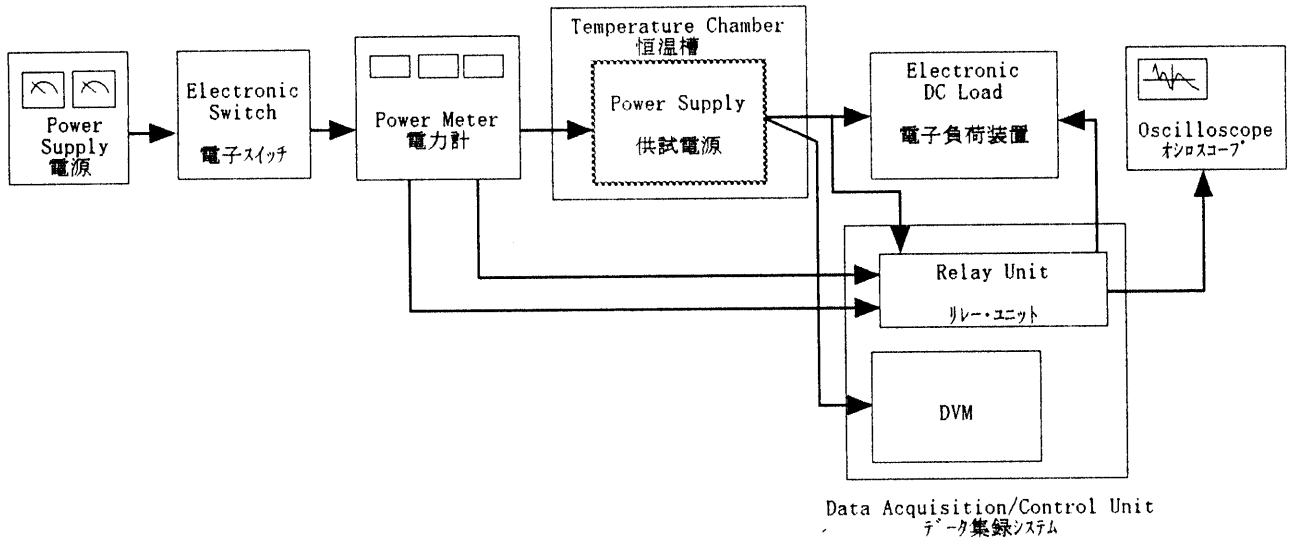

Figure A