参考資料

COSEL

TEST DATA OF R15A-12

(100V INPUT)

Regulated DC Power Supply

Date : May 19. 1998

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コーセル株式会社

COSEL CO.,LTD.

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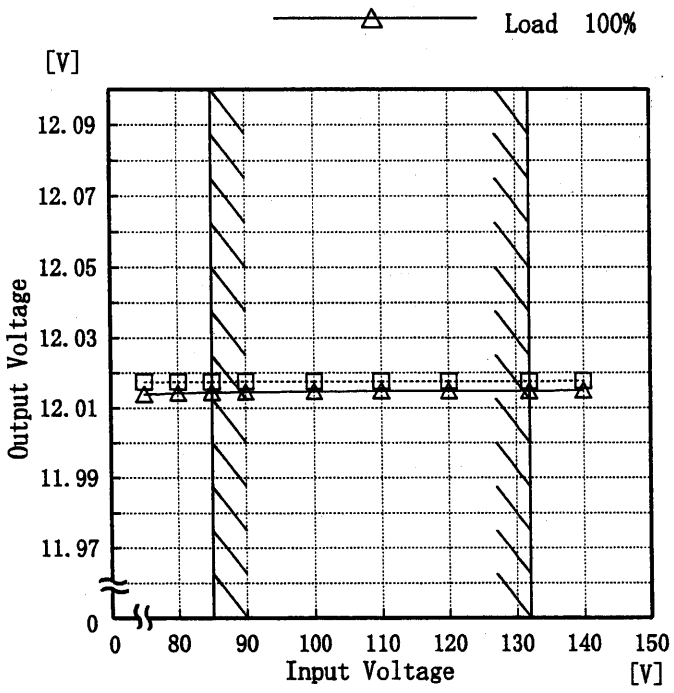


Note: Slanted line shows the range of the rated input voltage.

(注)斜線は定格入力電圧範囲を示す。

2. Values

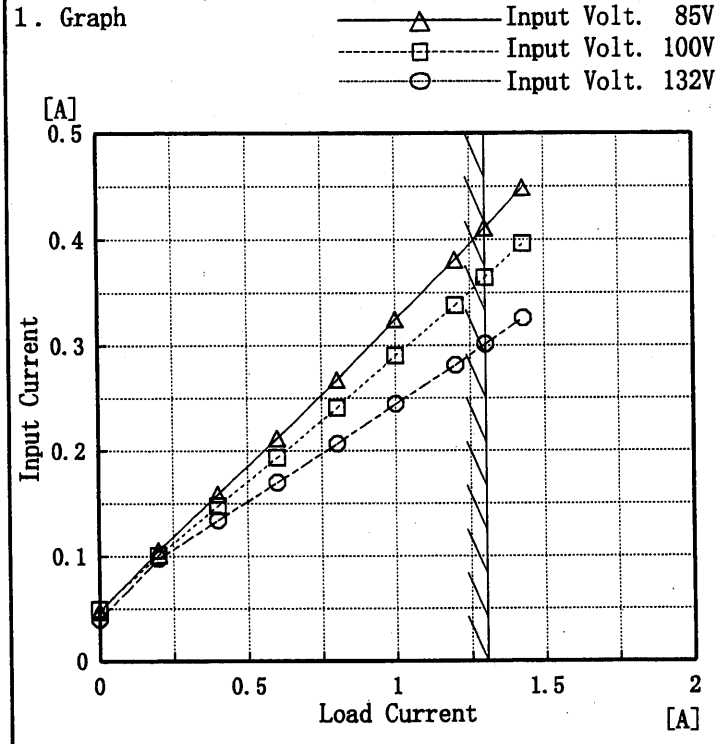
Input Voltage [V]	Load 50% Output Volt. [V]	Load 100% Output Volt. [V]
75	12.017	12.014
80	12.017	12.014
85	12.018	12.014
90	12.018	12.015
100	12.018	12.015
110	12.018	12.015
120	12.018	12.015
132	12.018	12.015
140	12.018	12.015

COSEL

Model	R15A-12
Item	Input Current (by Load Current) 入力電流 (負荷特性)
Output	————

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

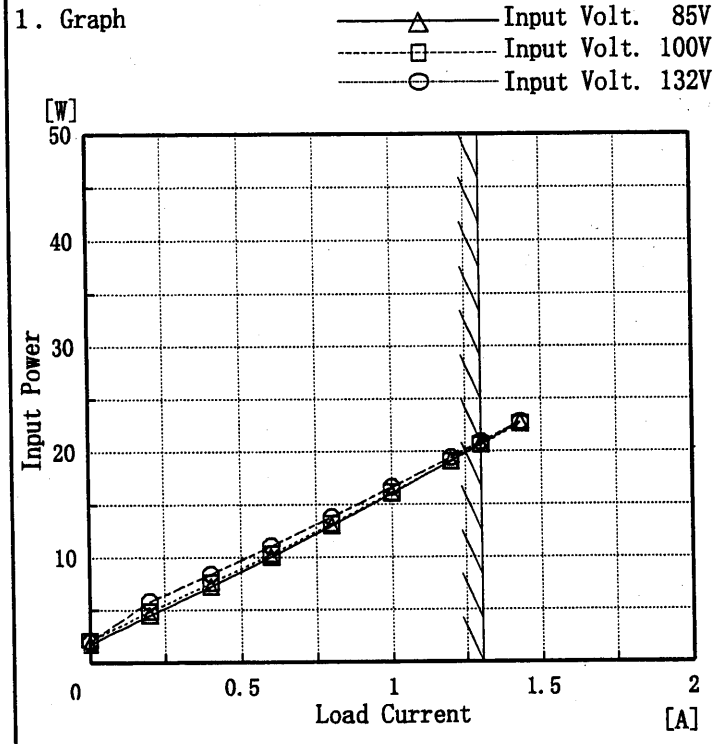
Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.047	0.050	0.040
0.20	0.105	0.101	0.098
0.40	0.158	0.148	0.134
0.60	0.212	0.194	0.170
0.80	0.268	0.241	0.207
1.00	0.325	0.291	0.245
1.20	0.381	0.338	0.281
1.30	0.411	0.364	0.301
1.43	0.448	0.396	0.326

COSEL

Model	R15A-12
Item	Input Power (by Load Current) 入力電力 (負荷特性)
Output	————

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 Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	1.69	2.03	1.96
0.20	4.50	4.86	5.82
0.40	7.24	7.57	8.42
0.60	10.04	10.29	11.06
0.80	13.00	13.16	13.79
1.00	16.06	16.14	16.63
1.20	19.08	19.06	19.41
1.30	20.70	20.63	20.91
1.43	22.77	22.64	22.81

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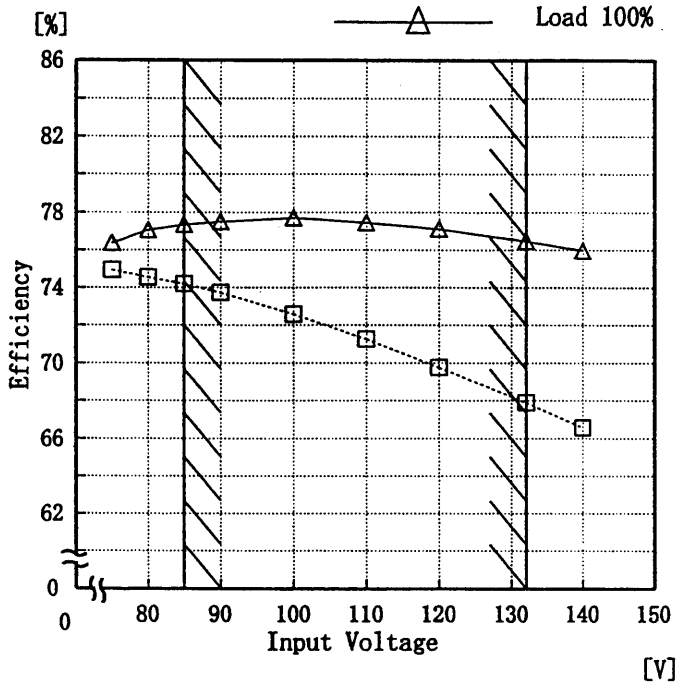
Model	R15A-12
Item	Efficiency 効率
Object	———————

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

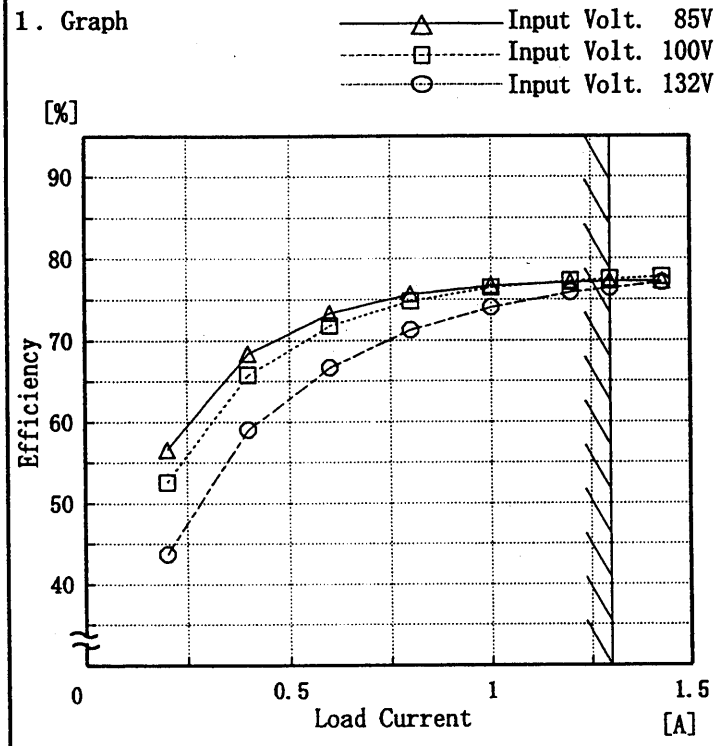
Input Voltage [V]	Load 50% Efficiency [%]	Load 100% Efficiency [%]
75	75.0	76.4
80	74.6	77.1
85	74.2	77.4
90	73.7	77.5
100	72.6	77.7
110	71.3	77.5
120	69.8	77.1
132	67.9	76.5
140	66.6	76.0

COSEL

Model	R15A-12
Item	Efficiency (by Load Current) 効率 (負荷電流特性)
Output	————

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]	Efficiency [%] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.20	56.5	52.6	43.7
0.40	68.4	65.8	59.0
0.60	73.3	71.8	66.7
0.80	75.6	74.8	71.3
1.00	76.7	76.5	74.1
1.20	77.1	77.3	75.9
1.30	77.2	77.5	76.4
1.43	77.2	77.8	77.1
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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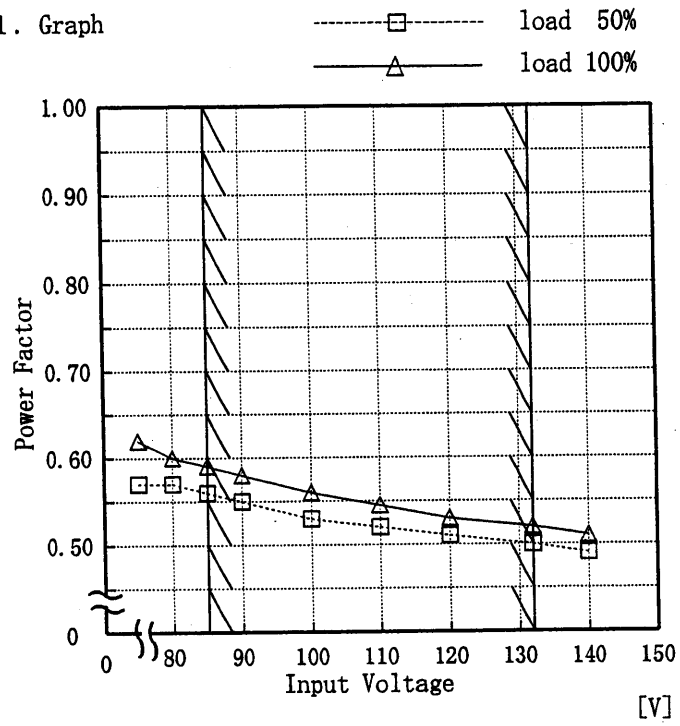
Model	R15A-12
Item	Power Factor (by Input Voltage) 力率（入力電圧特性）
Object	――――――――――

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% Power Factor	load 100% Power Factor
75	0.57	0.62
80	0.57	0.60
85	0.56	0.59
90	0.55	0.58
100	0.53	0.56
110	0.52	0.55
120	0.51	0.53
132	0.50	0.52
140	0.49	0.51

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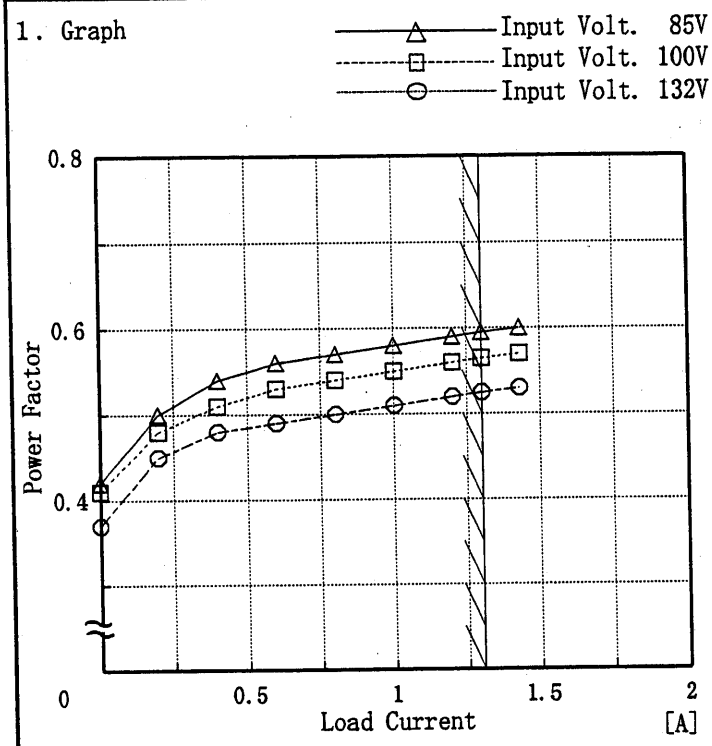
Model	R15A-12	Temperature	25℃
Item	Power Factor (by Load Current) 力率 (負荷電流特性)	Testing Circuitry	Figure A
Output	————		

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]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
—	0.42	0.41	0.37
0.20	0.50	0.48	0.45
0.40	0.54	0.51	0.48
0.60	0.56	0.53	0.49
0.80	0.57	0.54	0.50
1.00	0.58	0.55	0.51
1.20	0.59	0.56	0.52
1.30	0.60	0.57	0.53
1.43	0.60	0.57	0.53

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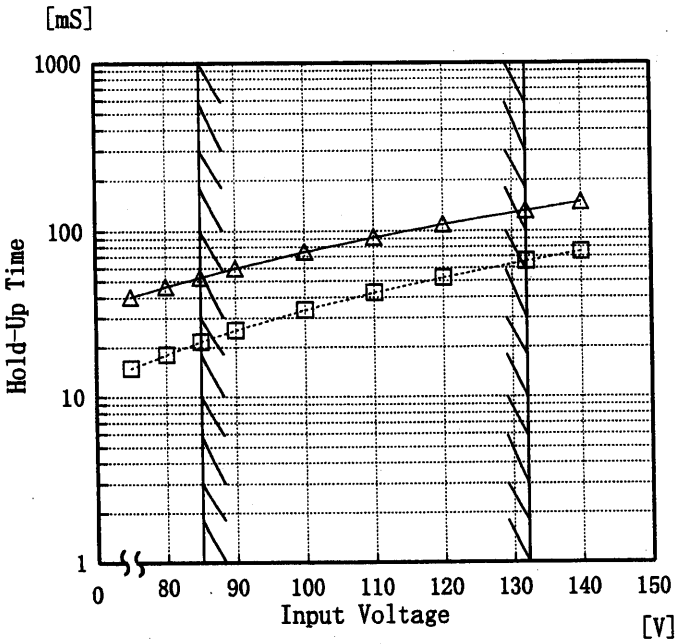
Model	R15A-12
Item	Hold-Up Time 出力保持時間
Object	+12V1.3A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

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

出力保持時間とは、入力電圧断から出力電圧が、定電圧精度の規格範囲を保持しているところまでの時間。

(注)斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Load 50% Hold-Up Time [mS]	Load 100% Hold-Up Time [mS]
75	40	15
80	46	18
85	53	22
90	60	25
100	75	34
110	91	42
120	109	52
132	132	66
140	149	75

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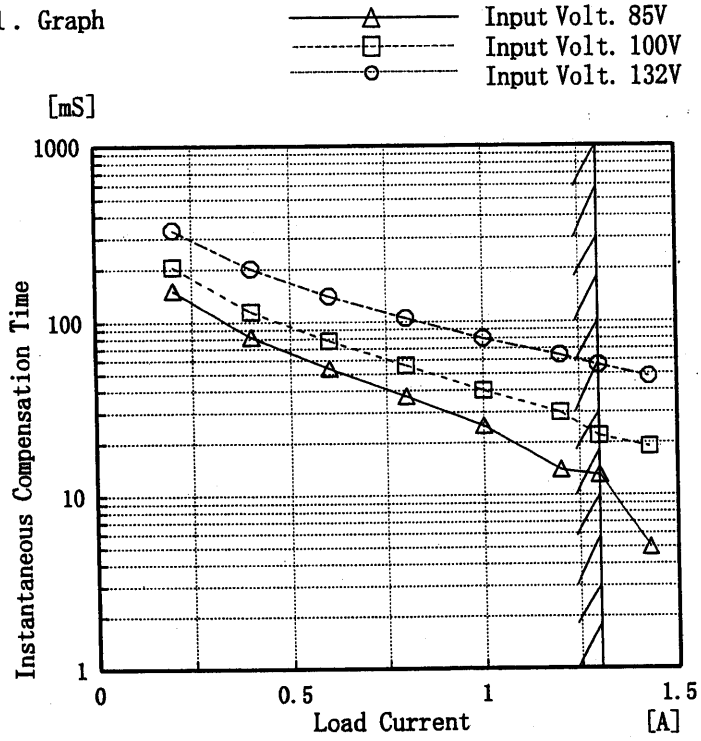
Model	R15A-12
Item	Instantaneous Interruption Compensation 瞬時停電保障
Object	+12V1.3A

Testing Circuitry Figure A

1. Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note:Slanted line shows the range of the rated load current.

瞬時停電保障時間とは、出力電圧が定電圧精度の規格範囲を保持している瞬時停電時間をいう。
(注)斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Time [mS]		
0.00	—	—	—
0.20	152	206	336
0.40	82	115	201
0.60	54	78	140
0.80	37	56	105
1.00	25	40	80
1.20	14	30	64
1.30	13	22	56
1.43	5	19	48

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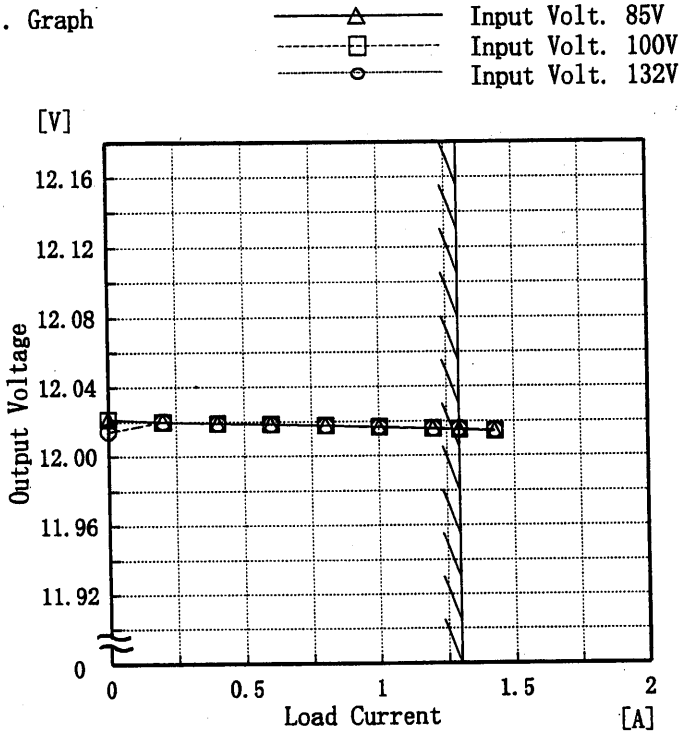
Model	R15A-12
Item	Load Regulation 静的負荷変動
Object	+12V1.3A

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. 85[V] Output Volt. [V]	Input Volt. 100[V] Output Volt. [V]	Input Volt. 132[V] Output Volt. [V]
0.00	12.021	12.022	12.014
0.20	12.020	12.020	12.020
0.40	12.019	12.019	12.019
0.60	12.018	12.018	12.018
0.80	12.018	12.018	12.018
1.00	12.017	12.017	12.017
1.20	12.016	12.016	12.016
1.30	12.015	12.015	12.015
1.43	12.014	12.014	12.015

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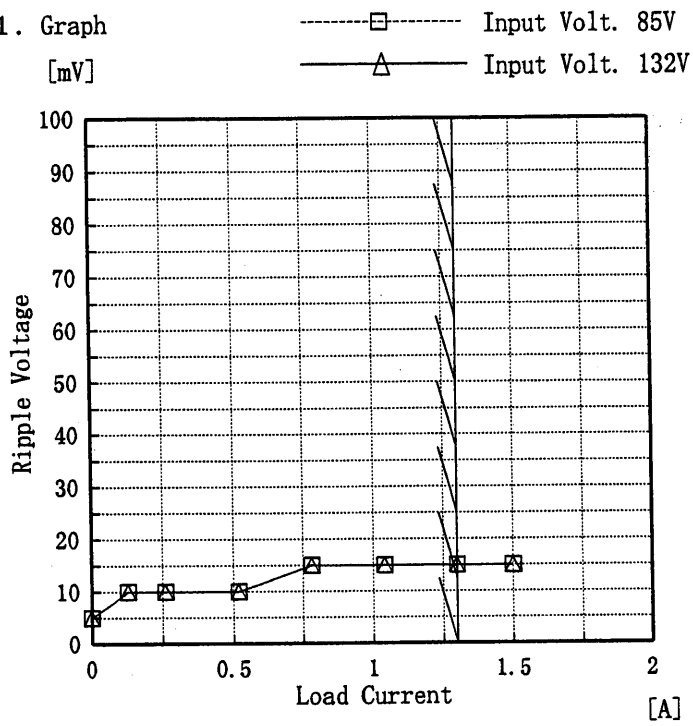
Model	R15A-12
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+12V1.3A

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

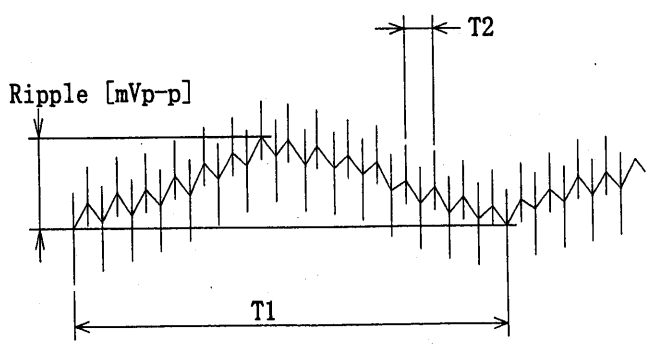


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

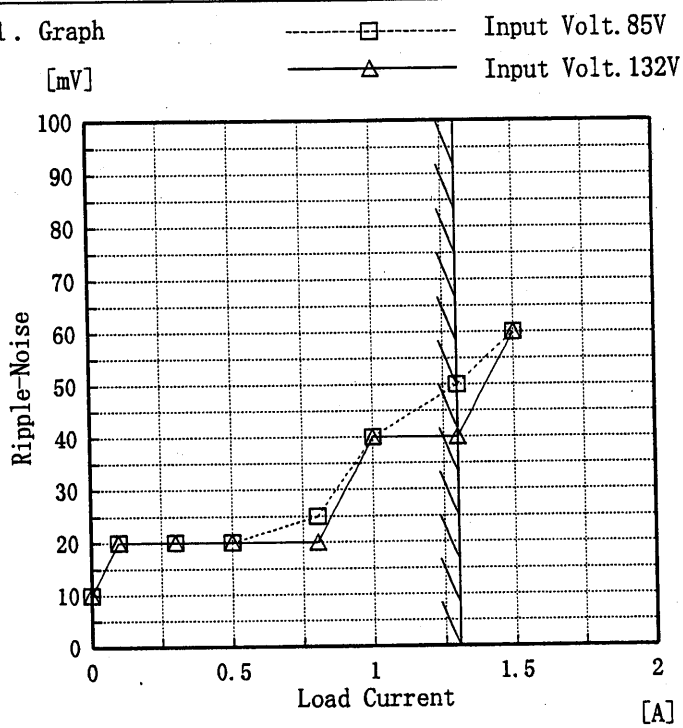
Load Current [A]	Input Volt. 85 [V] Ripple Output Volt. [mV]	Input Volt. 132 [V] Ripple Output Volt. [mV]
0.0	5	5
0.1	10	10
0.3	10	10
0.5	10	10
0.8	15	15
1.0	15	15
1.3	15	15
1.5	15	15

COSEL

Model	R15A-12
Item	Ripple-Noise リップルノイズ
Object	+12V1.3A

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

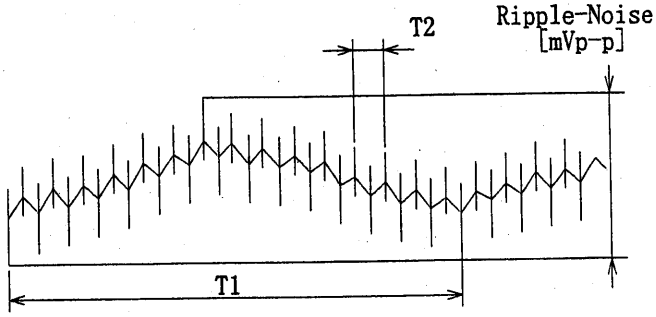


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

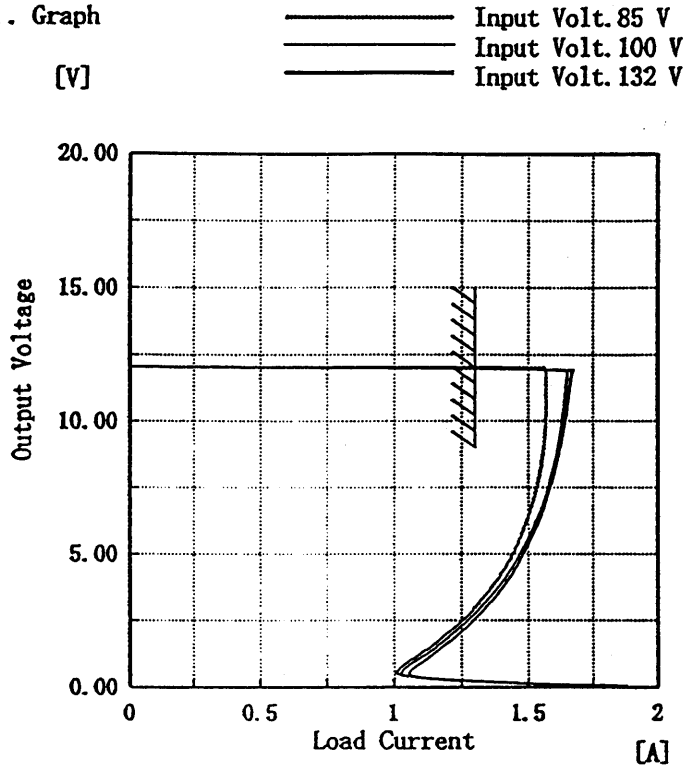
Load current [A]	Input Volt. 85 [V] Ripple-Noise [mV]	Input Volt. 132 [V] Ripple-Noise [mV]
0.0	10	10
0.1	20	20
0.3	20	20
0.5	20	20
0.8	25	20
1.0	40	40
1.3	50	40
1.5	60	60

COSEL

Model	R15A-12
Item	Overcurrent Protection 過電流保護
Object	+12V1.3A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated load current.

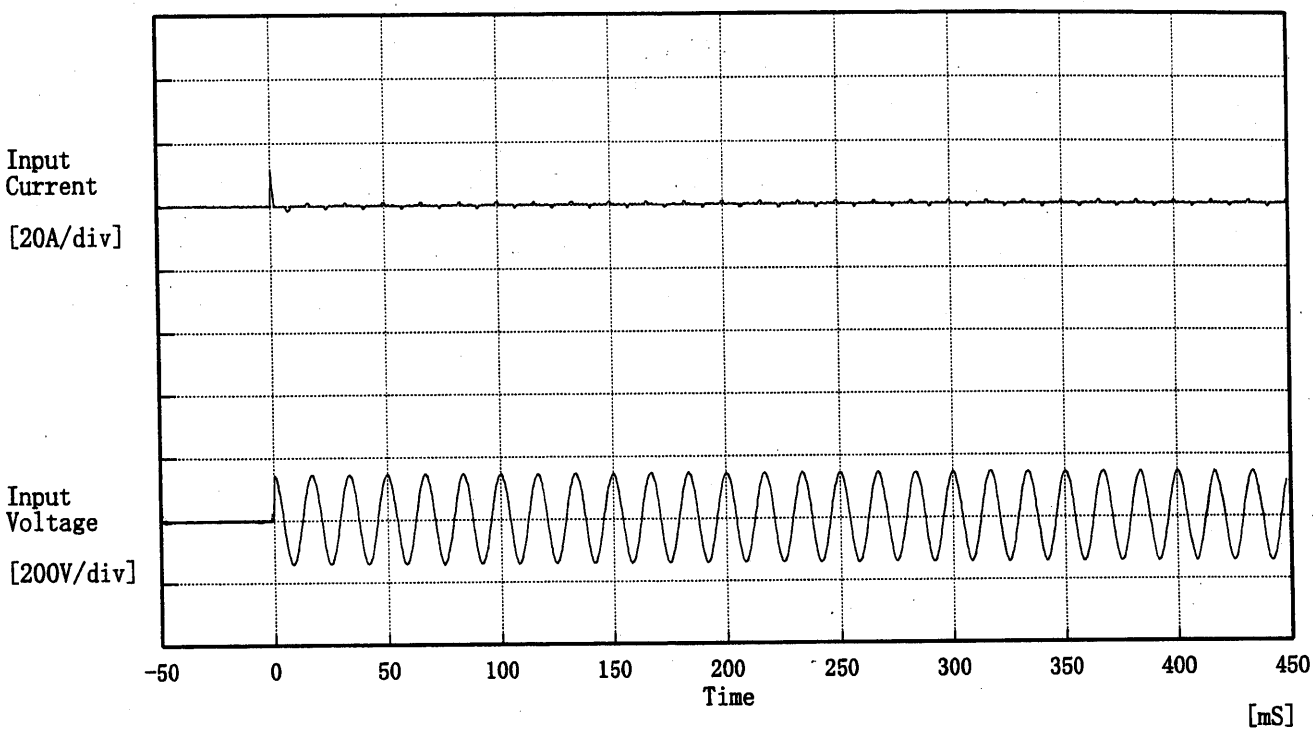
(注)斜線は定格負荷電流範囲を示す。

2. Values

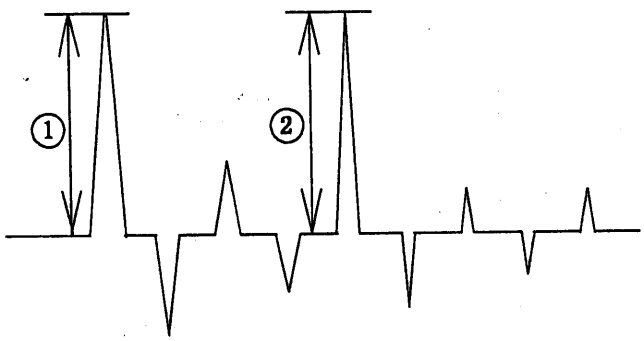
Output Voltage [V]	Input Volt. 85[V] Load Current [A]	Input Volt. 100[V] Load Current [A]	Input Volt. 132[V] Load Current [A]
12.00	1.57	1.65	1.66
11.40	1.57	1.65	1.66
10.80	1.57	1.64	1.66
9.60	1.57	1.62	1.64
8.40	1.55	1.60	1.61
7.20	1.53	1.57	1.58
6.00	1.49	1.52	1.54
4.80	1.43	1.46	1.47
3.60	1.36	1.38	1.40
2.40	1.24	1.26	1.28
1.20	1.09	1.12	1.14
0.00	1.84	1.87	1.88

COSEL

Model	R15A-12	Temperature	25℃
Item	Inrush Current 突入電流	Testing Circuitry	Figure A
Object	――――――		



Input Voltage 100 V
Frequency 60 Hz
Load 100 %
Inrush Current
① 11.60 [A]
② 1.20 [A]



COSEL

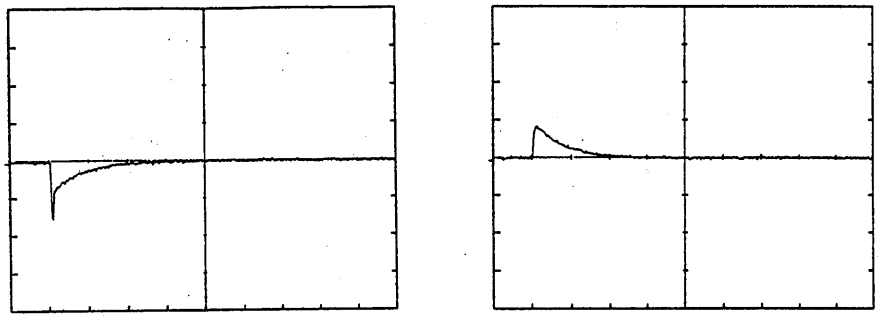
Model	R15A-12		
Item	Dynamic Load Responce 動的負荷変動	Temperature Testing Circuitry	25℃ Figure A
Object	+12V1.3A		

Input Volt. 100 V

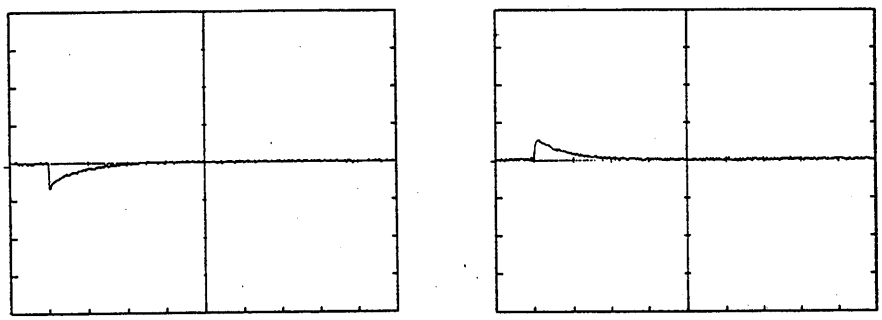
Cycle 1000 mS

Load Current

Load 0% ⟷
Load 100 %



Load 0% ⟷
Load 50 %



200 mV/div

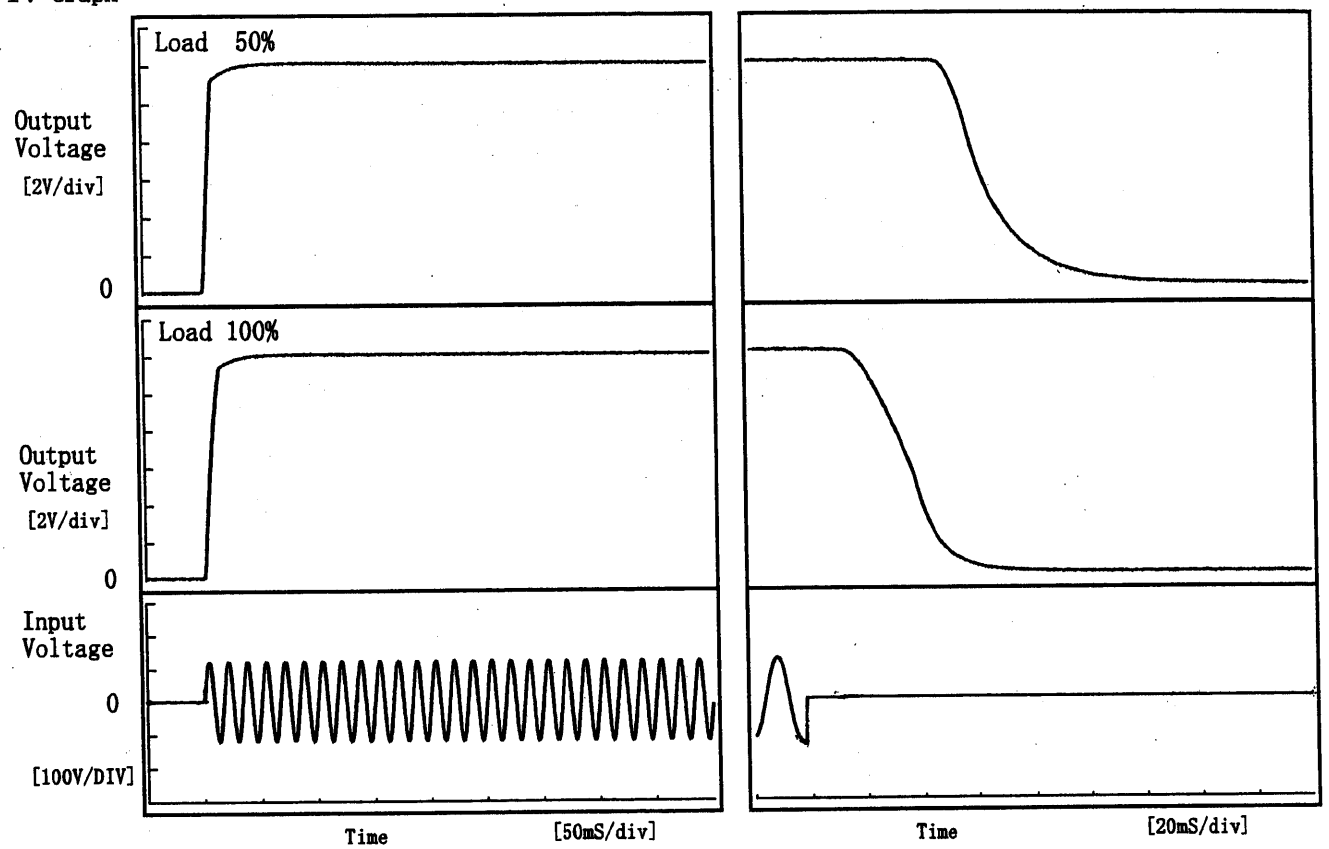
20 mS/div

COSEL

Model	R15A-12		
Item	Rise and Fall Time 立上り、立下り時間	Temperature	25℃
		Testing Circuitry	Figure A
Object	+12V1.3A		

1. Graph

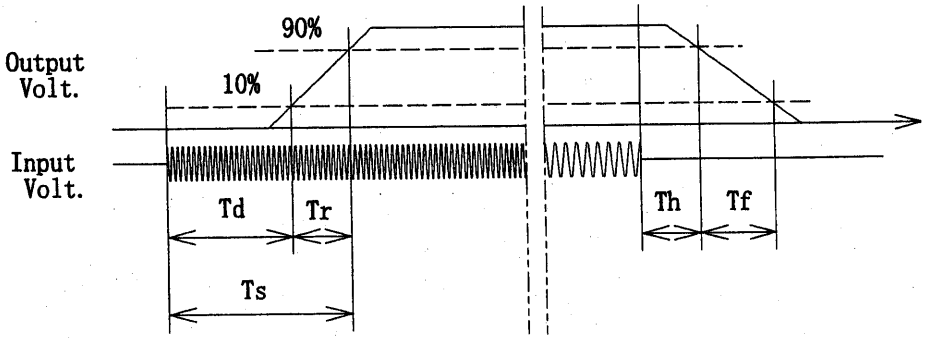
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	3.3	7.8	11.0	52.4	38.2
100 %	3.3	11.5	14.8	21.2	29.6



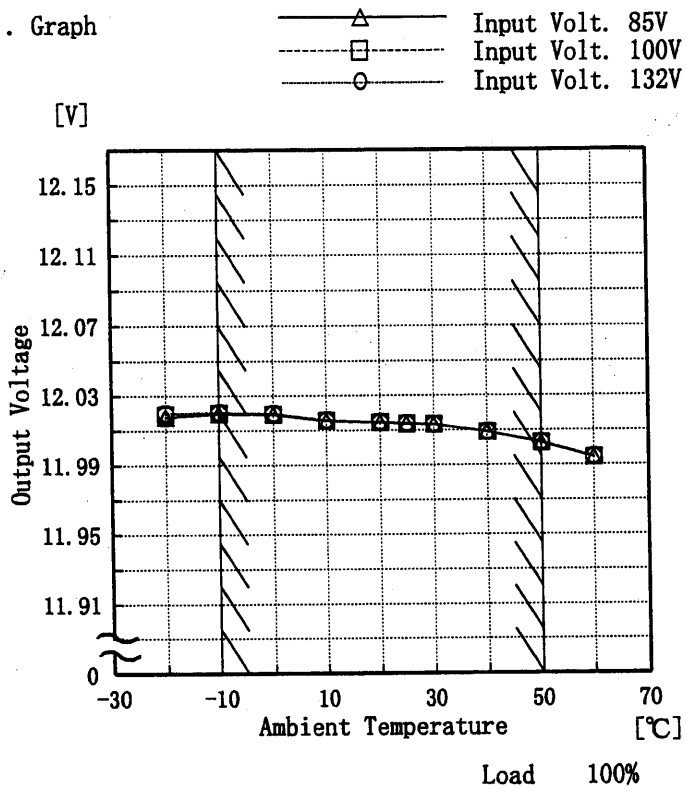
BC-3150

COSEL

Model	R15A-12
Item	Ambient Temperature Drift 周囲温度変動
Object	+12V1.3A

Testing Circuitry Figure A

1. Graph



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

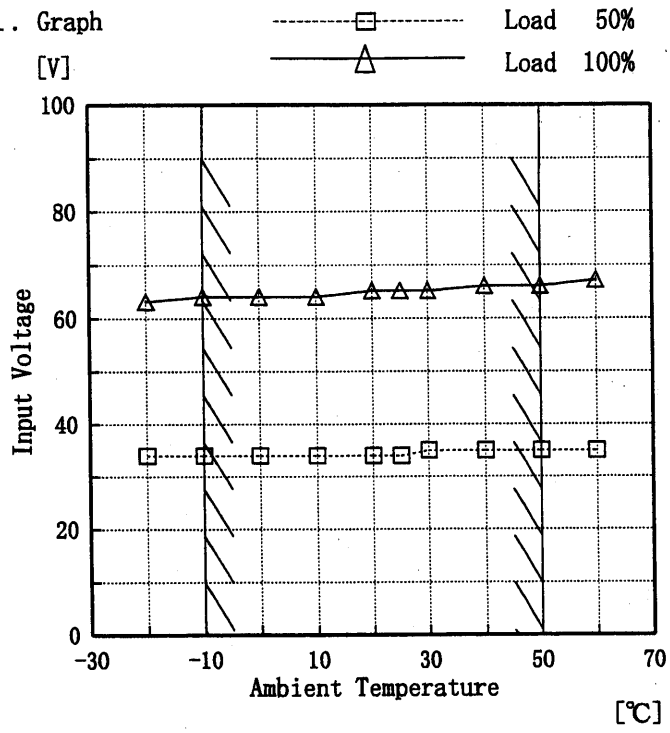
Temperature [℃]	Input Volt. 85[V] Output Volt. [V]	Input Volt. 100[V] Output Volt. [V]	Input Volt. 132[V] Output Volt. [V]
-20	12.018	12.019	12.020
-10	12.020	12.020	12.021
0	12.019	12.019	12.020
10	12.016	12.016	12.016
20	12.014	12.015	12.015
25	12.014	12.014	12.014
30	12.013	12.014	12.014
40	12.009	12.009	12.009
50	12.003	12.003	12.003
60	11.994	11.994	11.995

COSEL

Model	R15A-12
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+12V1.3A

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

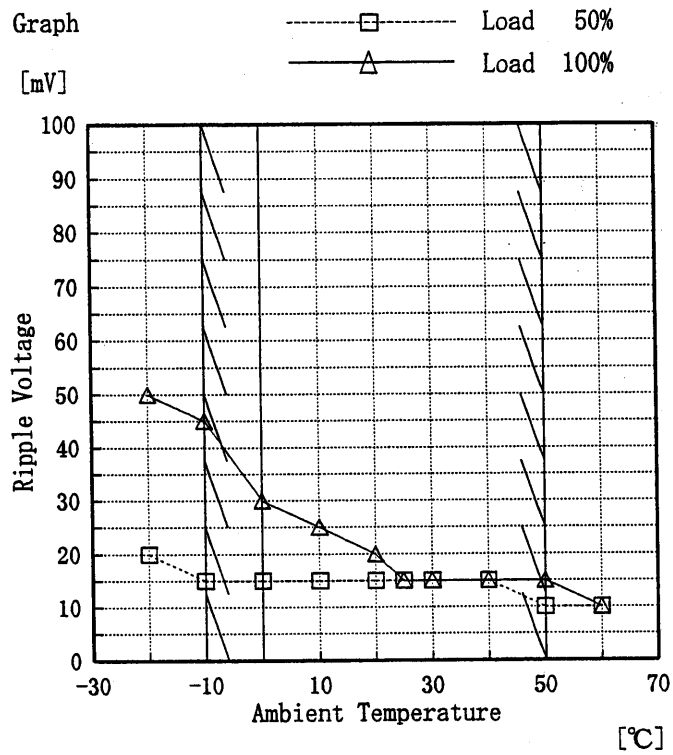
Ambient Temp. [℃]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]
-20	34	63
-10	34	64
0	34	64
10	34	64
20	34	65
25	34	65
30	35	65
40	35	66
50	35	66
60	35	67

COSEL

Model	R15A-12
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	+12V1.3A

Testing Circuitry Figure A

1. Graph



Input Volt. 85 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

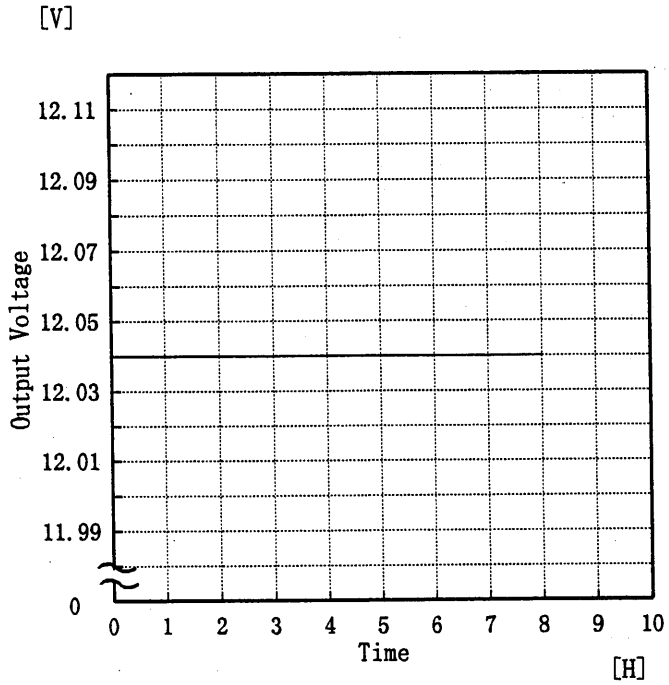
Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-20	20	50
-10	15	45
0	15	30
10	15	25
20	15	20
25	15	15
30	15	15
40	15	15
50	10	15
60	10	10

COSEL

Model	R15A-12
Item	Time Lapse Drift 経時ドリフト
Object	+12V1.3A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 100V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	12.040
0.5	12.040
1.0	12.040
2.0	12.040
3.0	12.040
4.0	12.040
5.0	12.040
6.0	12.040
7.0	12.040
8.0	12.040

COSEL

Model	R15A-12	
Item	Output Voltage Accuracy 定電圧精度	Testing Circuitry Figure A
Object	+12V1.3A	

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 : -10～50 ℃
Input Voltage : 85～132 V
Load Current : 0.00～1.30 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 -10～50 ℃
入力電圧 85～132 V
負荷電流 0.00～1.30 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

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

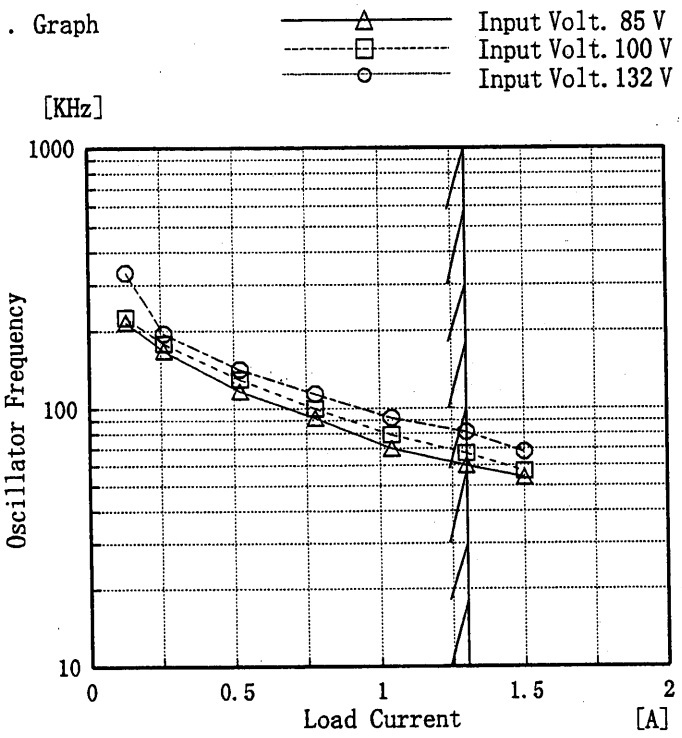
Item	Temperature [℃]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ration) [%]
Maximum Voltage	-10	100	0.00	12.028	±13	±0.2
Minimum Voltage	50	132	0.00	12.003		

COSEL

Model	R15A-12
Item	Oscillator Frequency 発振周波数
Object	+12V1.3A

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. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
	Oscillator Frequency [KHz]		
0.13	216	225	334
0.26	168	179	195
0.52	117	130	142
0.78	92	100	114
1.04	70	79	92
1.30	60	67	81
1.50	54	57	68

COSEL

Model	R15A-12
Item	Condensation 結露特性
Object	+12V1.3A

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	12.020	15	15
	2	12.010	15	20
	3	12.010	15	20
Load 100 %	1	12.020	15	35
	2	12.010	20	40
	3	12.010	20	40

Input Volt. 100 V

COSEL

Model	R15A-12
Item	Leakage Current 漏洩電流
Object	――――――

Testing Circuitry Figure B

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.18	0.18	0.28
(B) UL	0.18	0.18	0.28
(C) CSA	0.18	0.18	0.28

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 220 [V]	Input Volt. 264 [V]
(D) VDE	―	―	―

2. Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

交流入力の両相について測定し、その大きい方を漏洩電流測定値とする。

COSEL

Model	R15A-12
Item	Line Noise Tolerance 入力雑音耐量
Object	+12V1.3A

Testing Circuitry Figure C

1. Results

Pulse Width [nS]	MODE	Operating Point of Overvoltage Protection [V] 過電圧保護動作値	DC-like Regulation of Output Voltage 出力電圧の直流的変動
50	COMMON	-	no regulation
	NORMAL	-	no regulation
1000	COMMON	-	no regulation
	NORMAL	-	no regulation

Conditions

Input Voltage :100 V
Pulse Voltage :2000 V
Pulse Cycle :10 mS
Pulse Input Duration:1 min. or more
Load :100 %

COSEL

Model	R15A-12	
Item	Conducted Emission 雑音端子電圧	Testing Circuitry Figure D
Object	————————	

1. Graph

Remarks

Input Volt. 100V (VCCI -B)

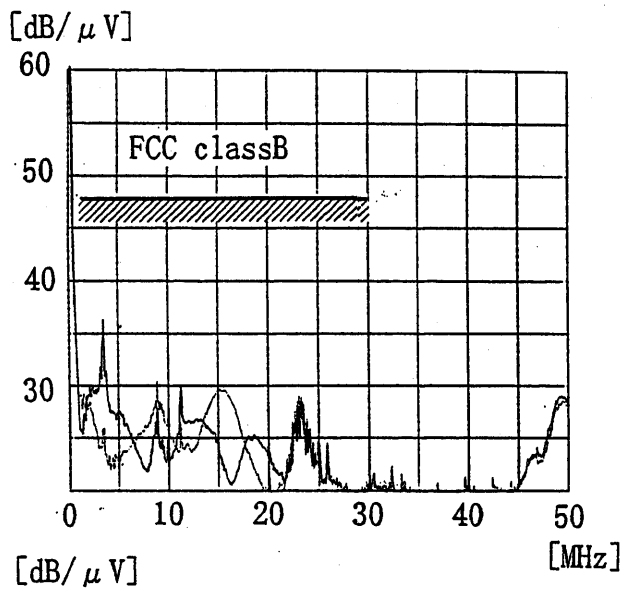
120V (FCC classB)

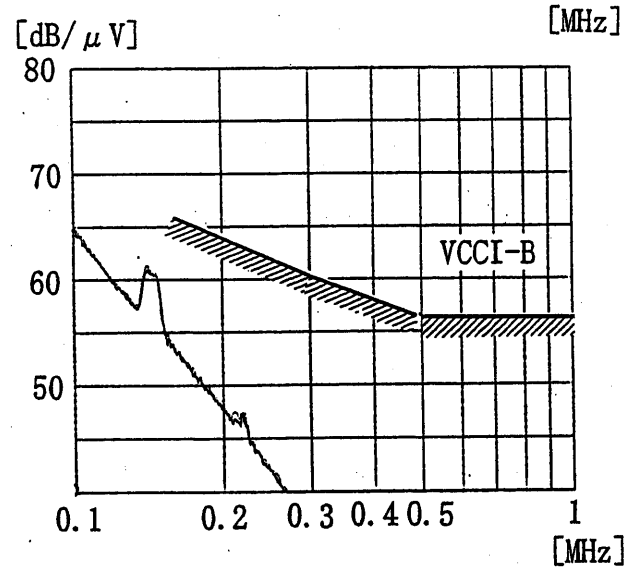
Load 100 %

Note: Slanted line shows the range of Tolerance.

(注)斜線は許容値を示す。

NO	Standards	Standards Complied	Frequency [MHz]	Tolerance [dB/μV]
1	FCC class A		0.45～1.6	60
			1.6～30	69.5
2	FCC class B	○	0.45～30	48
3	VCCI -A		0.15～0.5	79
			0.5～30	73
4	VCCI -B	○	0.15～0.5	66-56
			0.5～5	56
			5～30	60
5	CISPR Pub. 22 class A (EN55022)		0.15～0.5	79
			0.5～30	73
6	CISPR Pub. 22 class B (EN55022)		0.15～0.5	66-56
			0.5～5	56
			5～30	60





COSEL

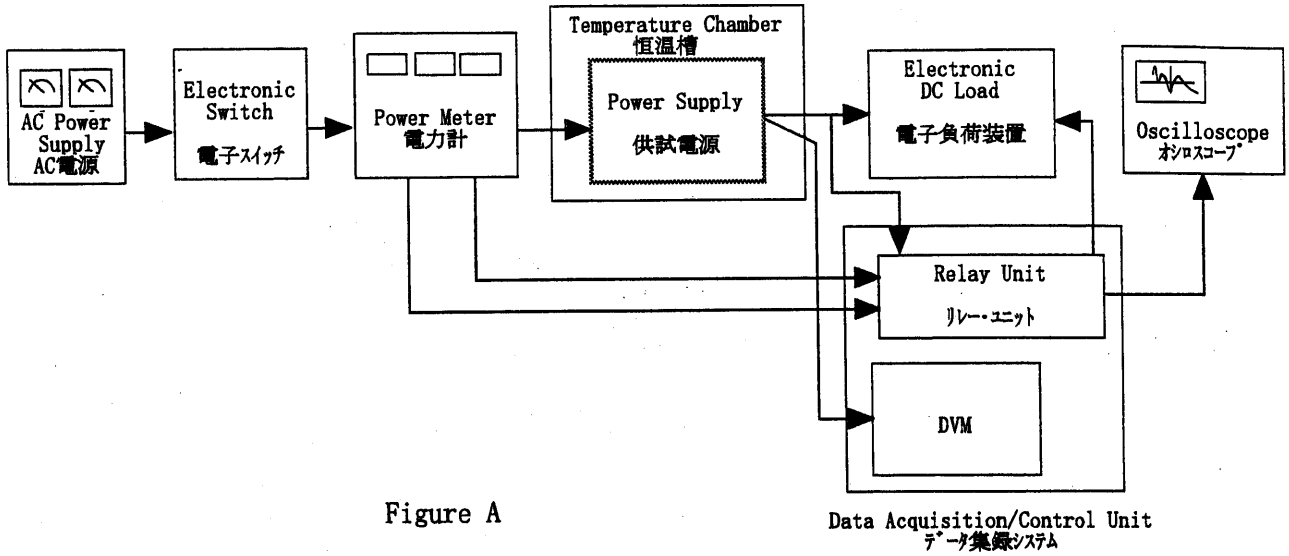


Figure A

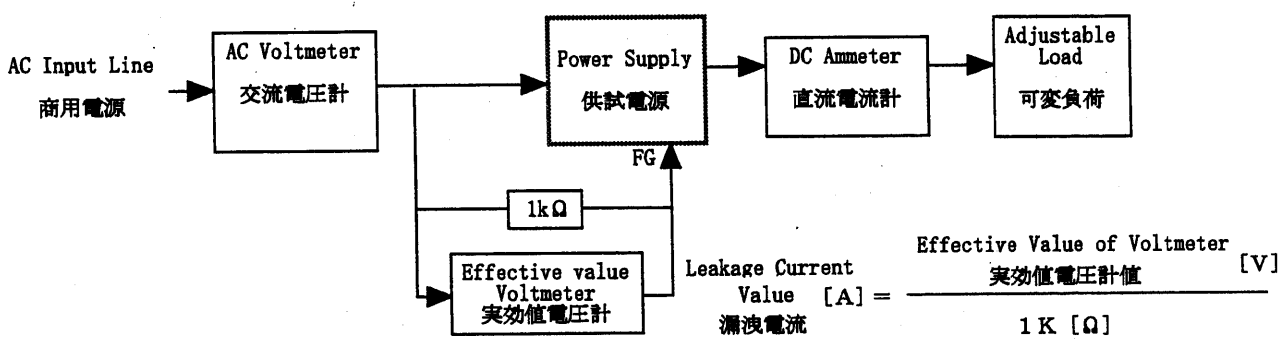


Figure B(DENTORI)

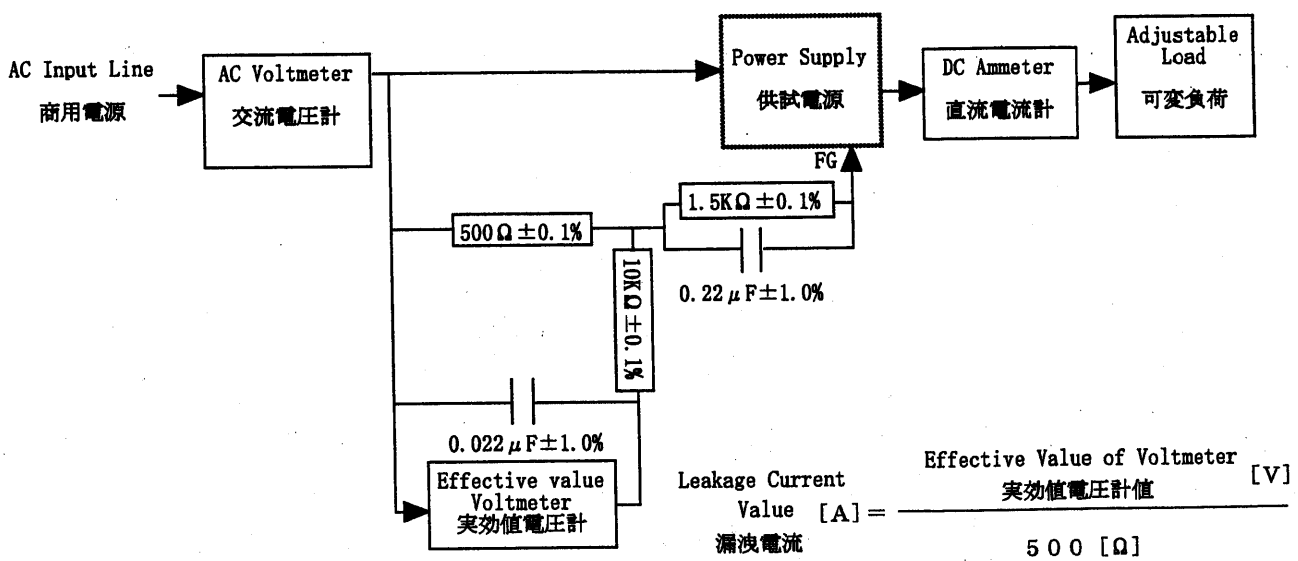


Figure B (UL, CSA, VDE)

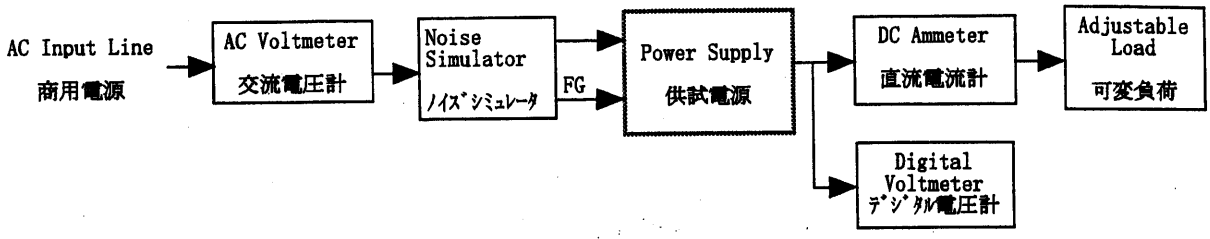


Figure C

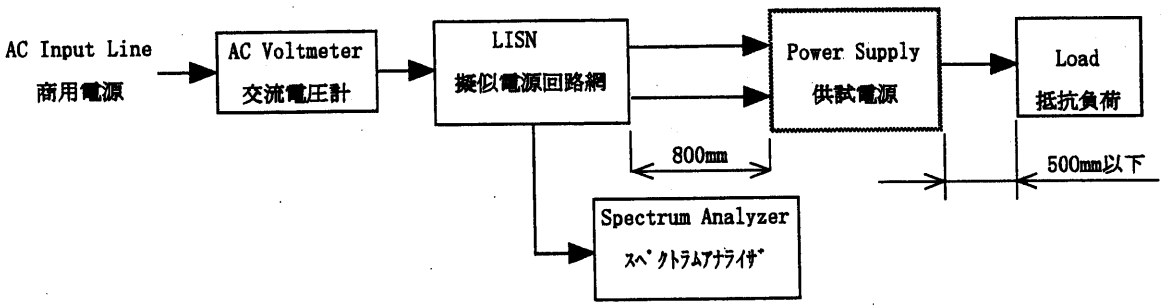


Figure D

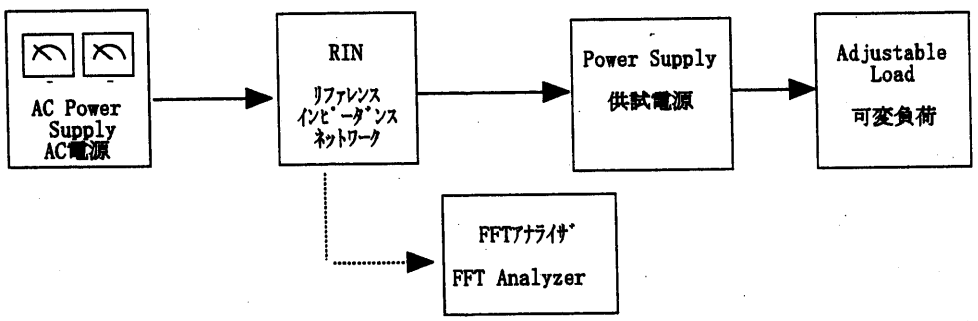


Figure E