参考資料

COSEL

TEST DATA OF LCA150S-5

(100V INPUT)

Regulated DC Power Supply

Date : Aug. 13. 1999

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Design Manager

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コーセル株式会社

COSEL CO., LTD.

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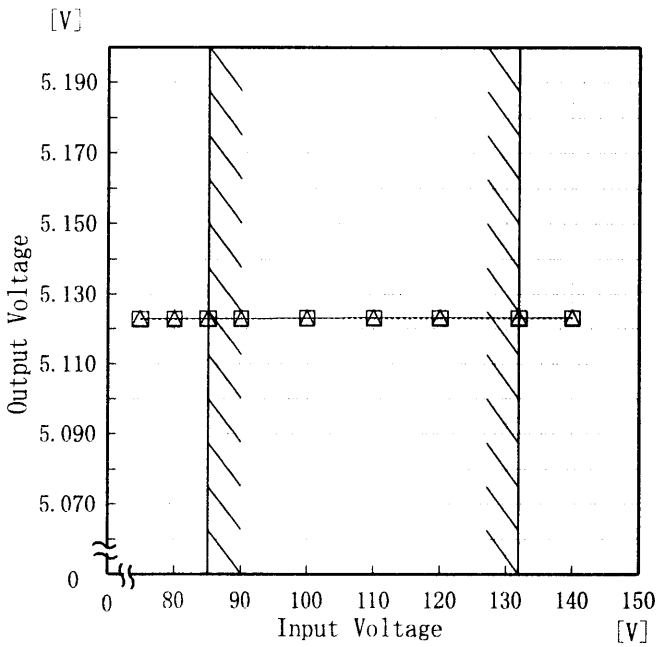
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Model	LCA150S-5
Item	Line Regulation 静的入力変動
Object	+5.0V30A

Temperature 25℃
Testing Circuitry Figure A

1. Graph

□ Load 50%
△ Load 100%



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

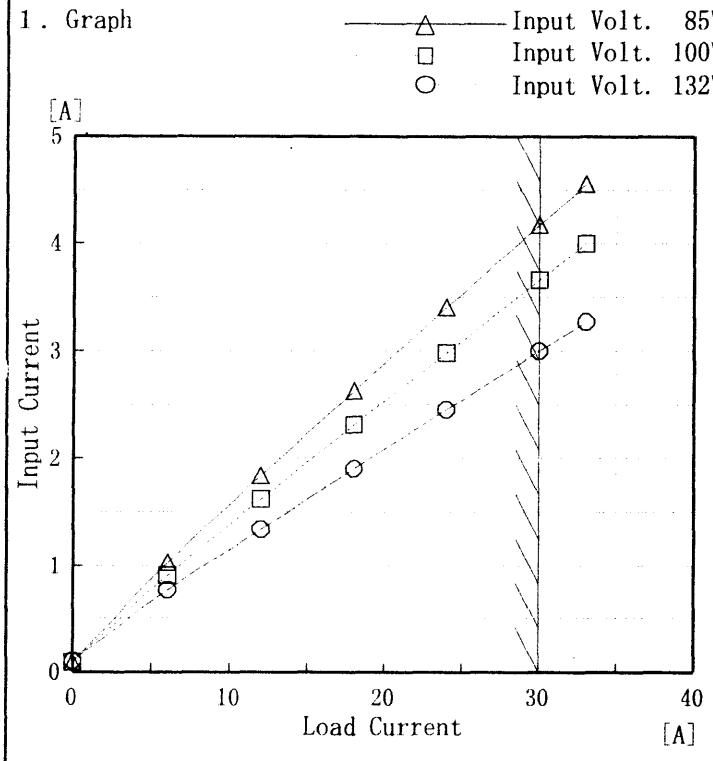
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	5.123	5.123
80	5.123	5.123
85	5.123	5.123
90	5.123	5.123
100	5.123	5.123
110	5.123	5.123
120	5.123	5.123
132	5.123	5.123
140	5.123	5.123

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Model	LCA150S-5
Item	Input Current (by Load Current) 入力電流（負荷特性）
Object	————

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	0.09	0.09	0.10
6	1.03	0.91	0.77
12	1.84	1.62	1.34
18	2.63	2.32	1.90
24	3.41	2.98	2.46
30	4.17	3.66	3.00
33	4.56	4.00	3.27
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—	—	—	—
—	—	—	—
—	—	—	—
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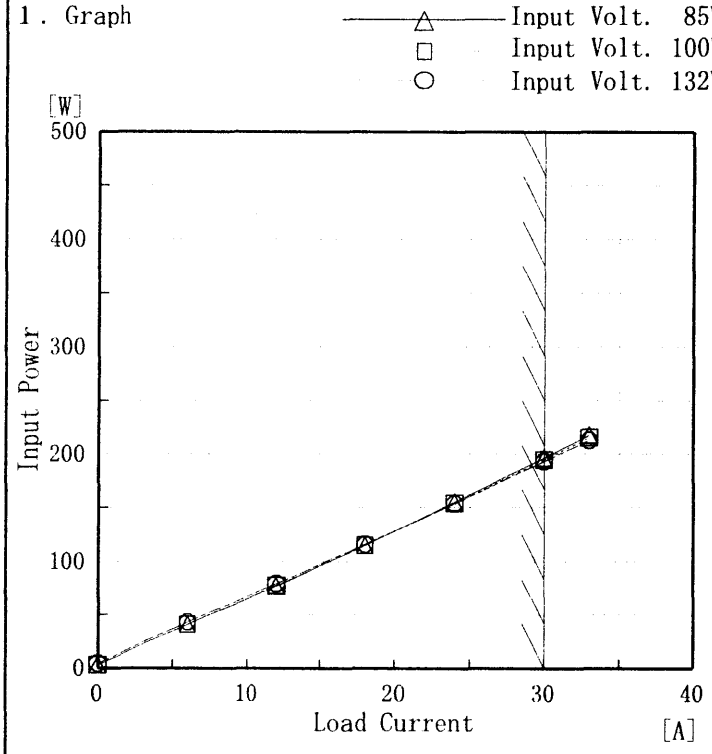
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Model	LCA150S-5
Item	Input Power (by Load Current) 入力電力（負荷特性）
Object	————

Temperature 25℃
Humidity 40%RH
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	3	3	4
6	41	41	43
12	77	77	79
18	115	115	116
24	155	154	154
30	197	195	193
33	218	216	213
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

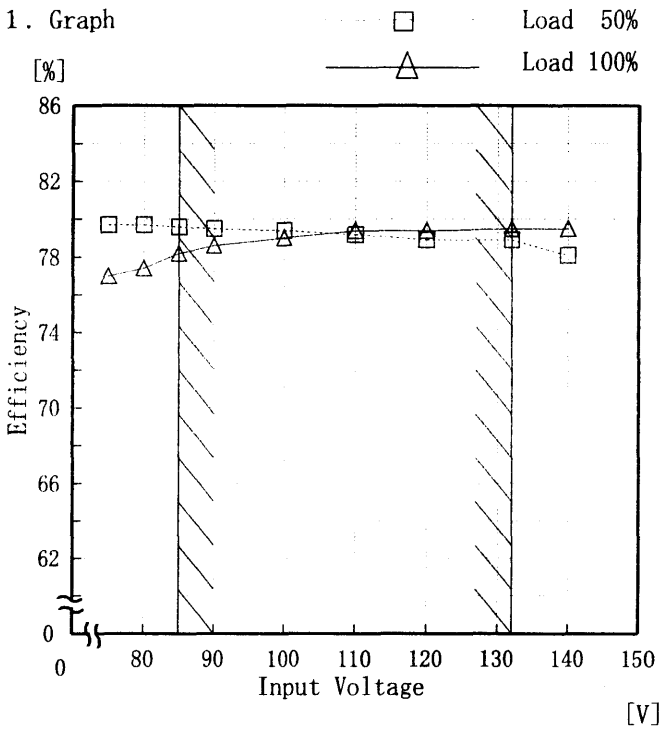
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COSEL

Model	LCA150S-5
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

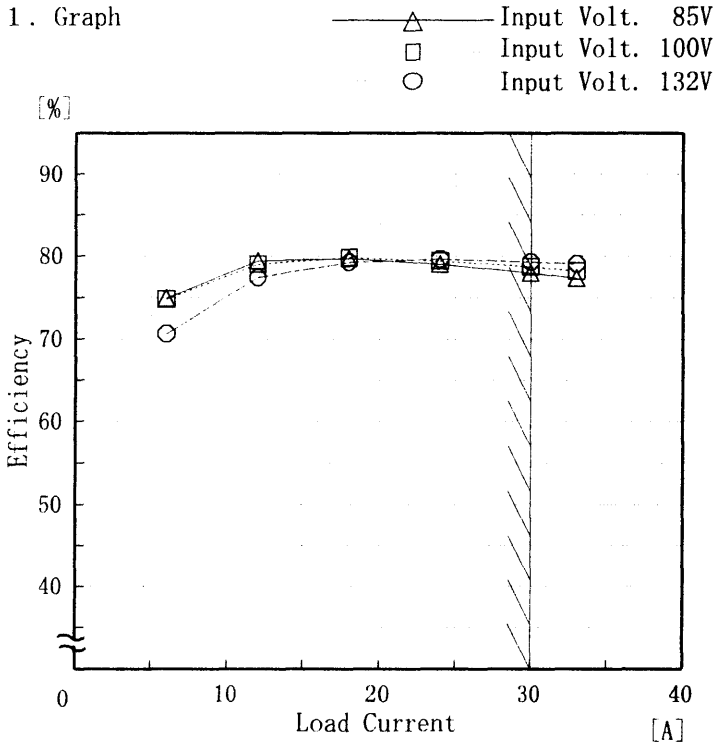
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	79.7	77.0
80	79.7	77.4
85	79.6	78.2
90	79.5	78.6
100	79.4	79.0
110	79.2	79.4
120	78.9	79.4
132	78.9	79.5
140	78.1	79.5

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Model	LCA150S-5
Item	Efficiency (by Load Current) 効率 (負荷特性)
Object	————

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]
6	75.0	74.8	70.6
12	79.4	79.0	77.4
18	79.7	79.9	79.3
24	79.0	79.4	79.6
30	78.0	78.8	79.4
33	77.4	78.3	79.1
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

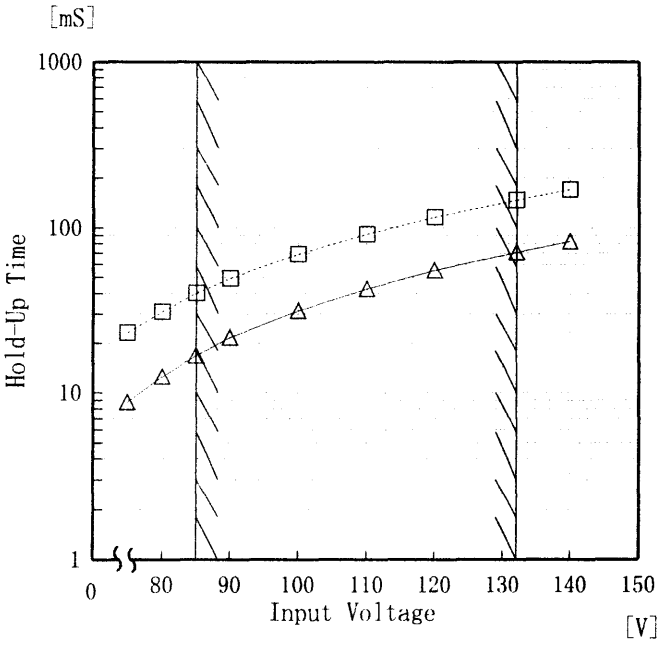
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Model	LCA150S-5
Item	Hold-Up Time　出力保持時間
Object	+5.0V30A

Temperature　25℃
Testing Circuitry　Figure A

1. Graph

□ Load 50%
△ Load 100%



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、ＡＣ入力断から出力電圧が、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。

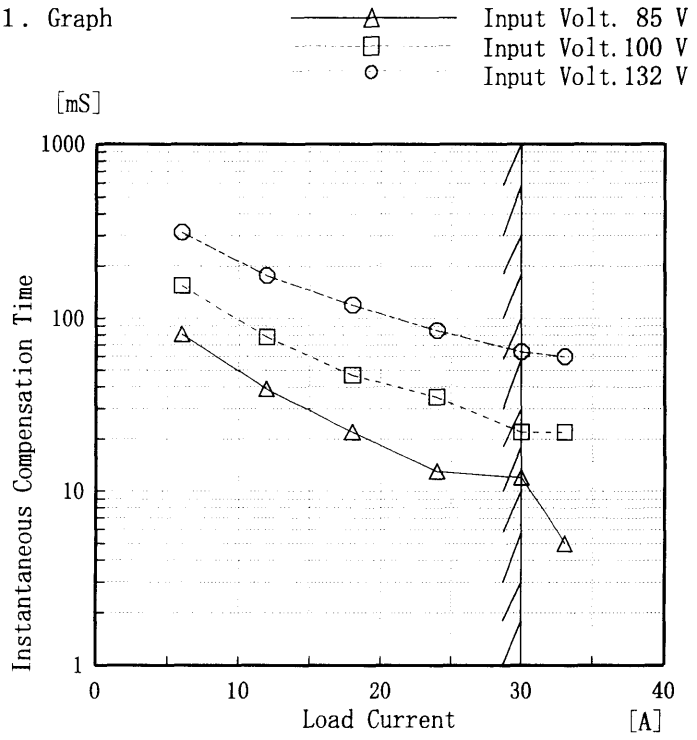
2. Values

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	23	9
80	31	13
85	40	17
90	49	22
100	69	31
110	91	42
120	116	55
132	147	71
140	171	83

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Model	LCA150S-5		
Item	Instantaneous Interruption Compensation 瞬時停電保障	Temperature Testing Circuitry	25℃ Figure A
Object	+5.0V30A		

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

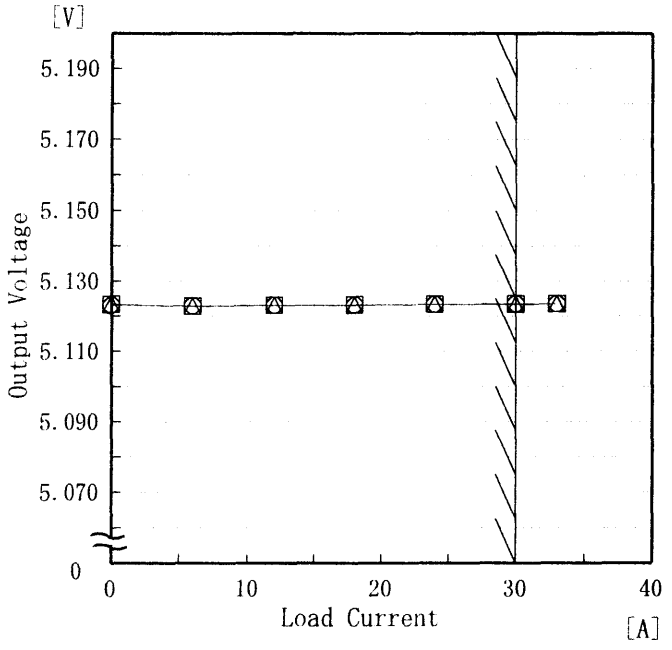
Load Current [A]	Time [mS]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0	—	—	—
6	81	154	314
12	39	78	177
18	22	47	119
24	13	35	85
30	12	22	64
33	5	22	60
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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Model	LCA150S-5	Temperature	25℃
Item	Load Regulation 静的負荷変動	Testing Circuitry	Figure A
Object	+5.0V30A		

1. Graph

△ Input Volt. 85V
□ Input Volt. 100V
○ Input Volt. 132V



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

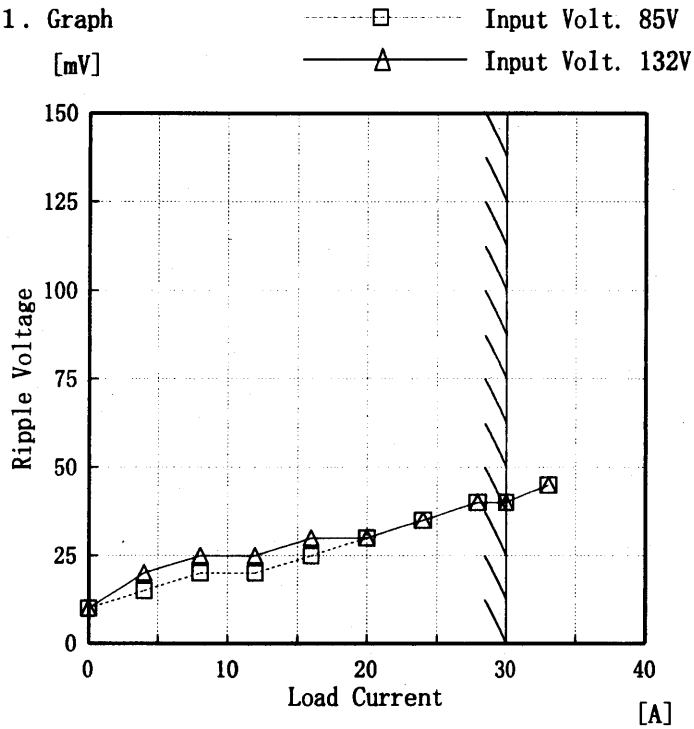
Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	5.123	5.123	5.123
6.0	5.123	5.123	5.123
12.0	5.123	5.123	5.123
18.0	5.123	5.123	5.123
24.0	5.123	5.123	5.123
30.0	5.124	5.124	5.124
33.0	5.124	5.124	5.124
—	—	—	—
—	—	—	—
—	—	—	—

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Model	LCA150S-5
Item	Ripple Voltage(by Load Current) リップル電圧(負荷電流特性)
Object	+5.0V30A

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

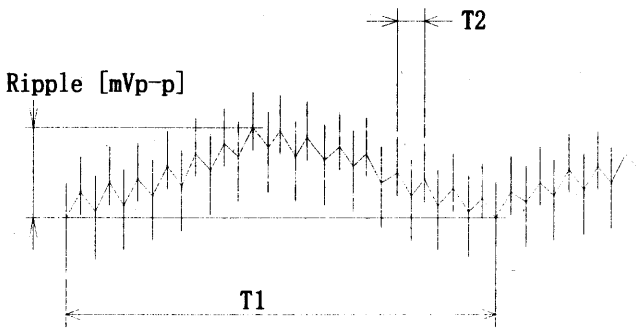


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

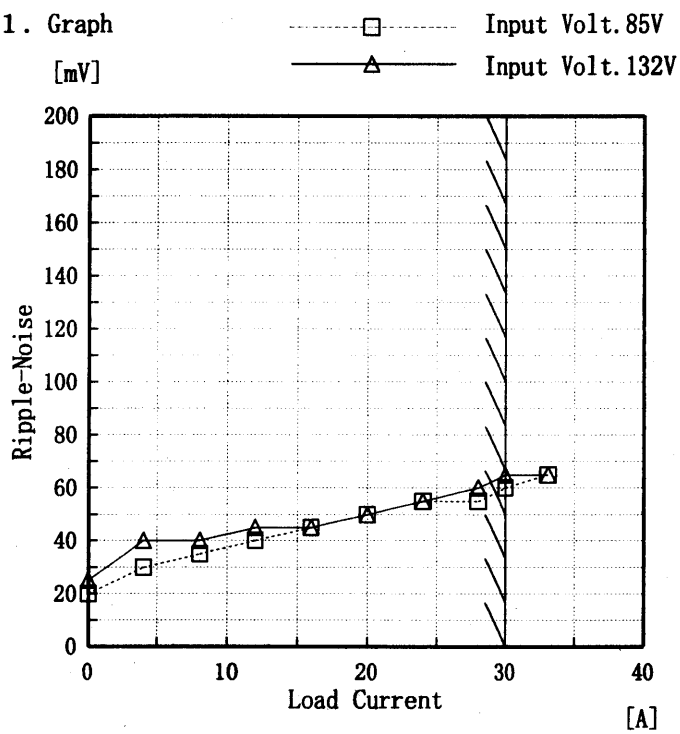
Load Current [A]	Input Volt. 85 [V] Ripple Output Volt. [mV]	Input Volt. 132 [V] Ripple Output Volt. [mV]
0.00	10	10
4.00	15	20
8.00	20	25
12.00	20	25
16.00	25	30
20.00	30	30
24.00	35	35
28.00	40	40
30.00	40	40
33.00	45	45
—	—	—

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Model	LCA150S-5
Item	Ripple-Noise リップルノイズ
Object	+5.0V30A

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

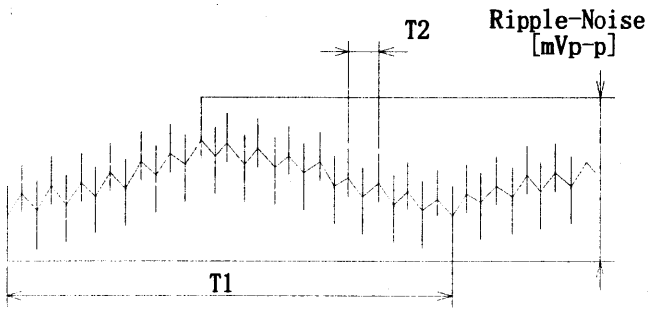


Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

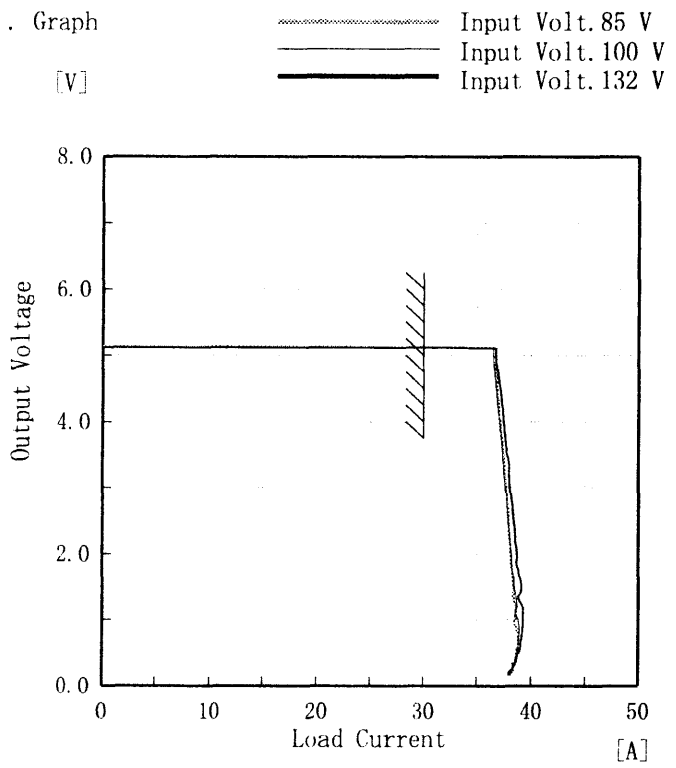
Load current [A]	Input Volt. 85 [V] Ripple-Noise [mV]	Input Volt. 132 [V] Ripple-Noise [mV]
0.00	20	25
4.00	30	40
8.00	35	40
12.00	40	45
16.00	45	45
20.00	50	50
24.00	55	55
28.00	55	60
30.00	60	65
33.00	65	65
—	—	—

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Model	LCA150S-5
Item	Overcurrent Protection 過電流保護
Object	+5.0V30A

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]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
5.00	36.68	36.45	36.68
4.75	36.74	36.53	36.84
4.50	36.83	36.67	37.07
4.00	37.07	37.02	37.40
3.50	37.40	37.30	37.71
3.00	37.64	37.56	37.99
2.50	37.87	37.81	38.30
2.00	38.12	38.13	38.64
1.50	38.38	38.32	39.01
1.00	38.61	38.78	39.22
0.50	38.66	38.62	38.89
0.00	38.25	38.08	37.93

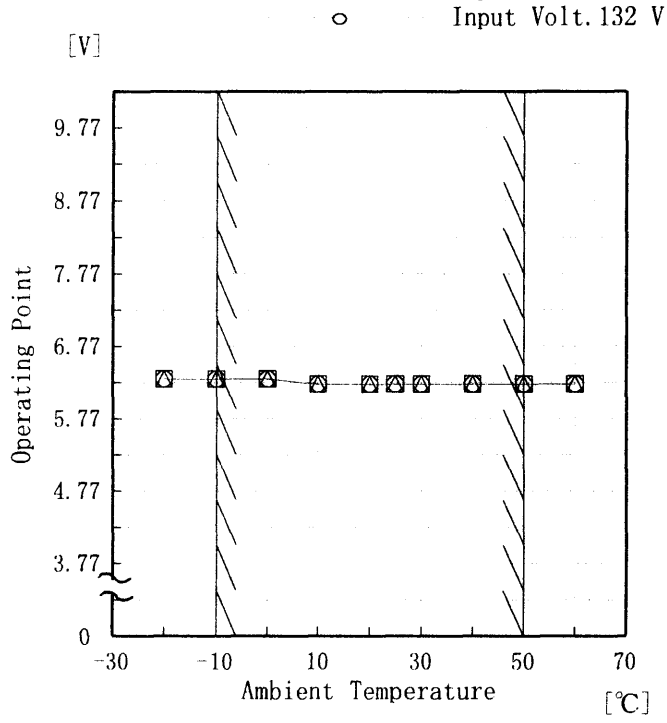
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Model	LCA150S-5
Item	Overvoltage Protection 過電圧保護
Object	5.0V30A

Testing Circuitry Figure A

1. Graph

△ Input Volt. 85 V
□ Input Volt. 100 V
○ Input Volt. 132 V



Load 0%

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。

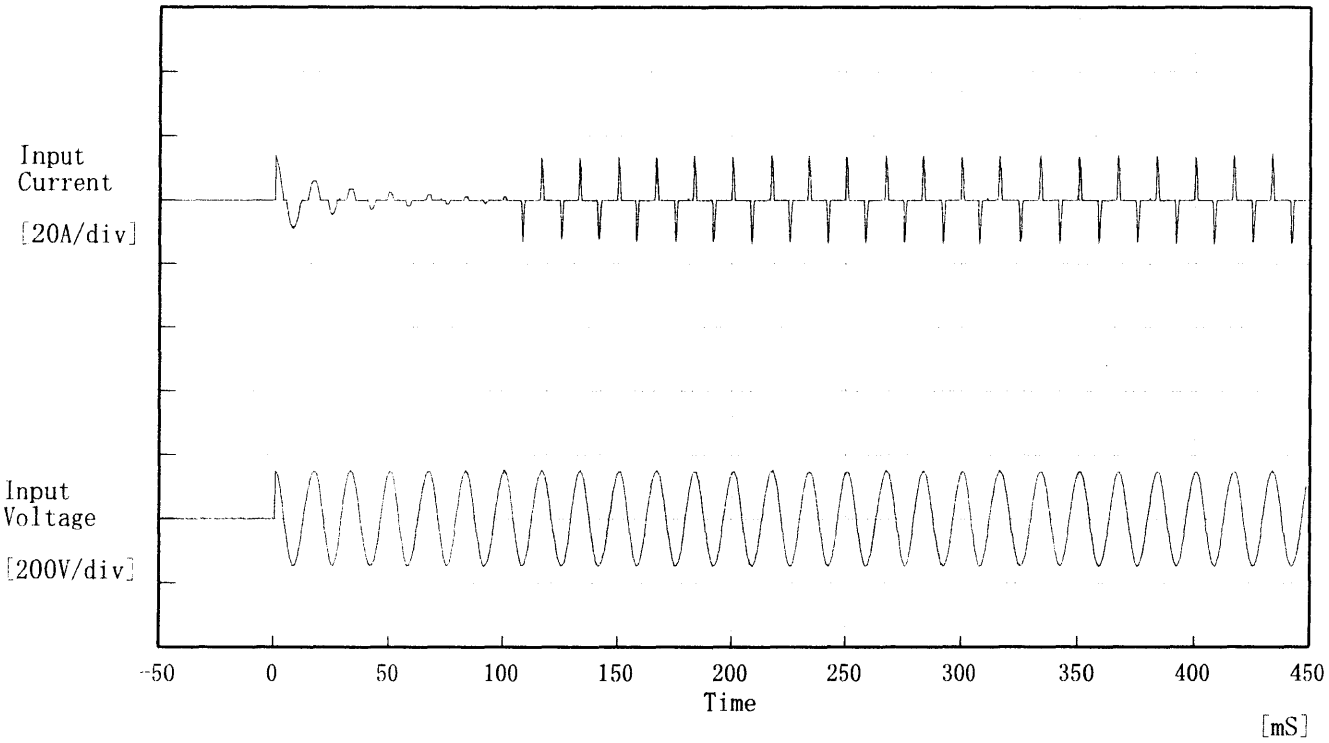
2. Values

Ambient Temp. [℃]	Operating Point [V] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	6.32	6.32	6.32
-10	6.32	6.32	6.32
0	6.32	6.32	6.32
10	6.25	6.25	6.25
20	6.25	6.25	6.25
25	6.25	6.25	6.25
30	6.25	6.25	6.25
40	6.25	6.25	6.25
50	6.25	6.25	6.25
60	6.25	6.25	6.25
—	—	—	—

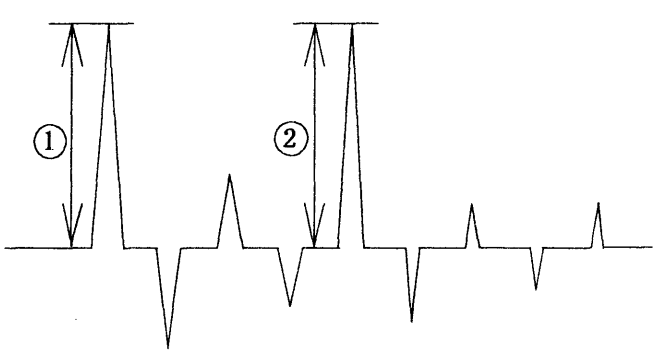
COSEL

Model	LCA150S-5
Item	Inrush Current 突入電流
Object	――――――――

Temperature 25℃
Testing Circuitry Figure A



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



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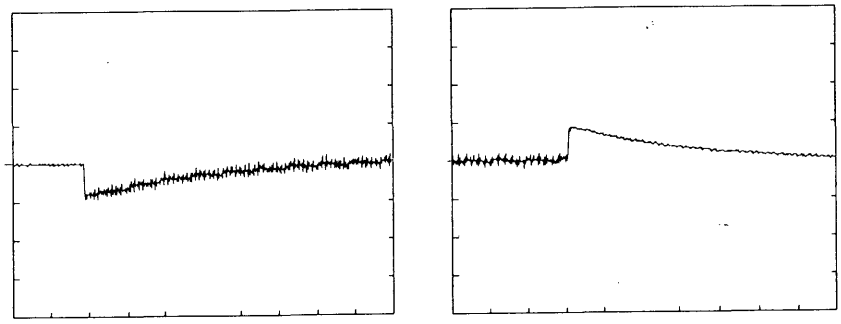
Model	LCA150S-5
Item	Dynamic Load Responce 動的負荷変動
Object	+5.0V30A

Temperature 25℃
Testing Circuitry Figure A

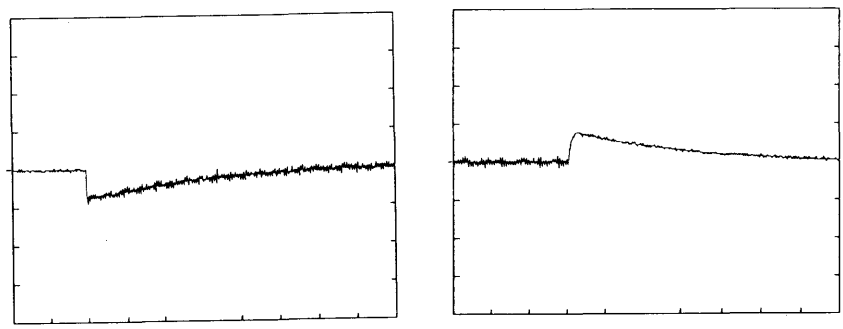
Input Volt. 100 V
Cycle 1000 mS

Load Current

Load 0% ⟷
Load 100 %



Load 0% ⟷
Load 50 %



100 mV/div

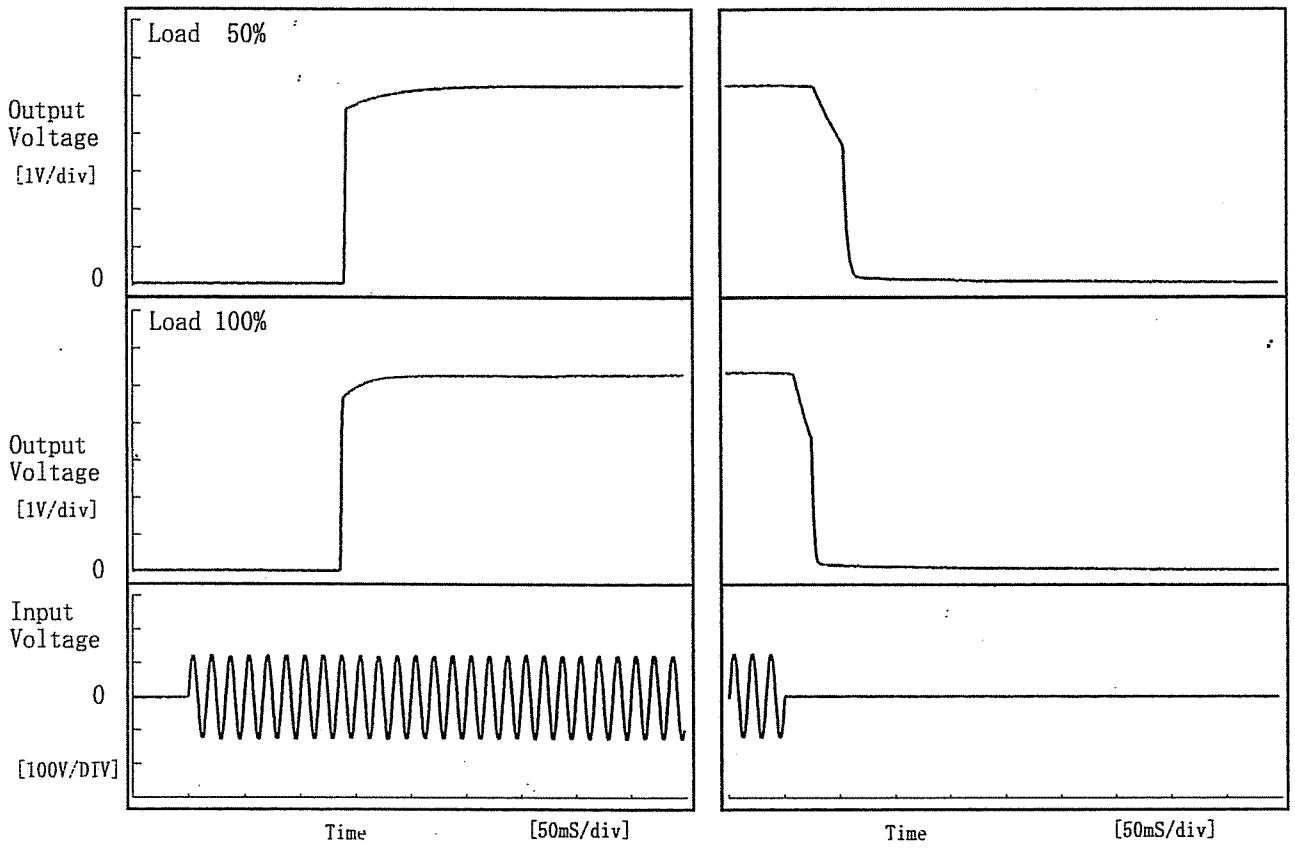
10 mS/div

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Model	LCA150S-5		
Item	Rise and Fall Time 立上り、立下り時間	Temperature	25℃
		Testing Circuitry	Figure A
Object	+5.0V30A		

1. Graph

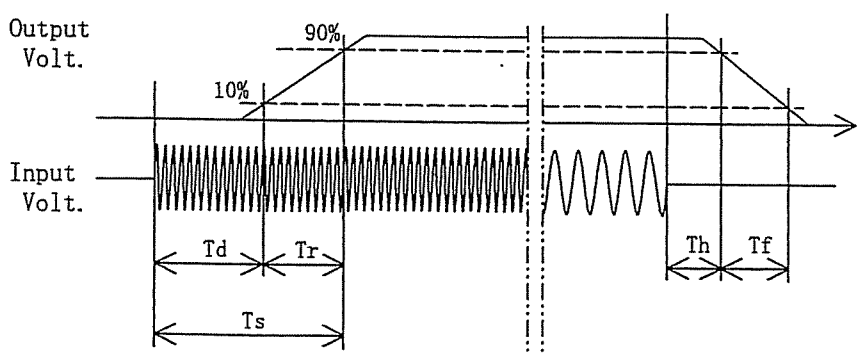
Input Volt. 85 V



2. Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	139.8	1.8	141.5	39.5	23.0
100 %	140.5	3.0	143.5	16.8	14.0



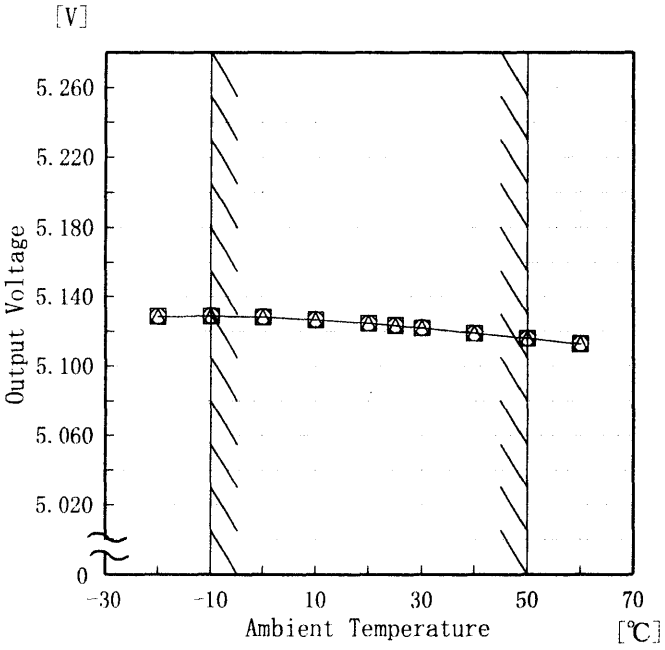
COSEL

Model	LCA150S-5
Item	Ambient Temperature Drift 周囲温度変動
Object	+5.0V30A

Testing Circuitry Figure A

1. Graph

△ Input Volt. 85V
□ Input Volt. 100V
○ Input Volt. 132V



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

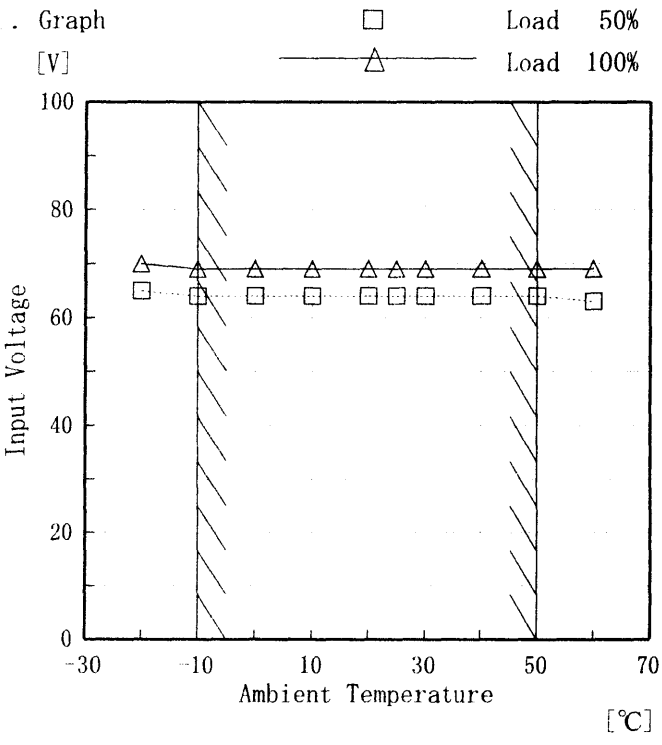
Temperature [℃]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	5.129	5.129	5.129
-10	5.129	5.129	5.129
0	5.128	5.128	5.128
10	5.127	5.127	5.127
20	5.125	5.125	5.125
25	5.123	5.124	5.124
30	5.122	5.122	5.122
40	5.119	5.119	5.119
50	5.116	5.116	5.116
60	5.113	5.113	5.113
—	—	—	—

COSEL

Model	LCA150S-5
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+5.0V30A

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

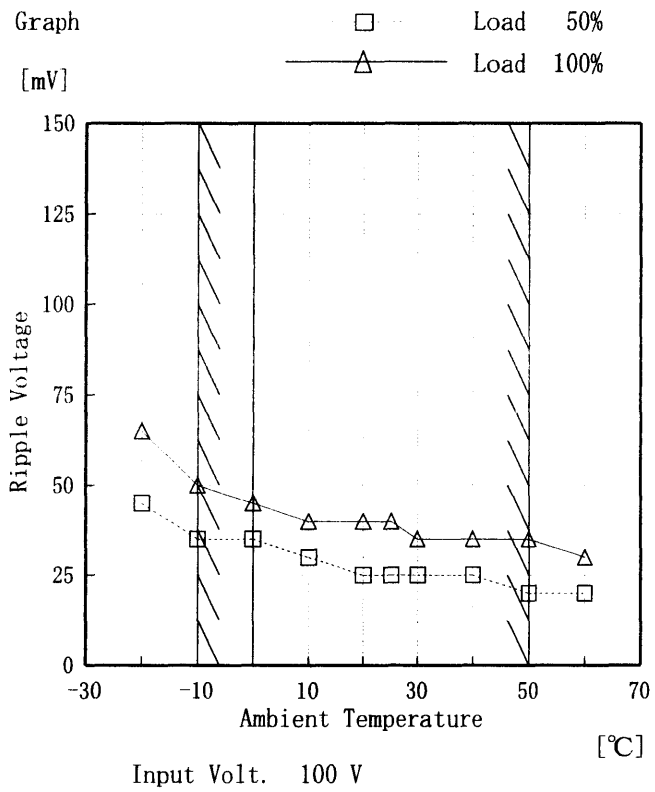
Ambient Temp. [℃]	Input Voltage [V]	
	Load 50%	Load 100%
-20	65	70
-10	64	69
0	64	69
10	64	69
20	64	69
25	64	69
30	64	69
40	64	69
50	64	69
60	63	69
—	—	—

COSEL

Model	LCA150S-5
Item	Ripple Voltage (by Ambient Temp.) リップル電圧（周囲温度特性）
Object	+5.0V30A

Testing Circuitry Figure A

1. Graph



Input Volt. 100 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

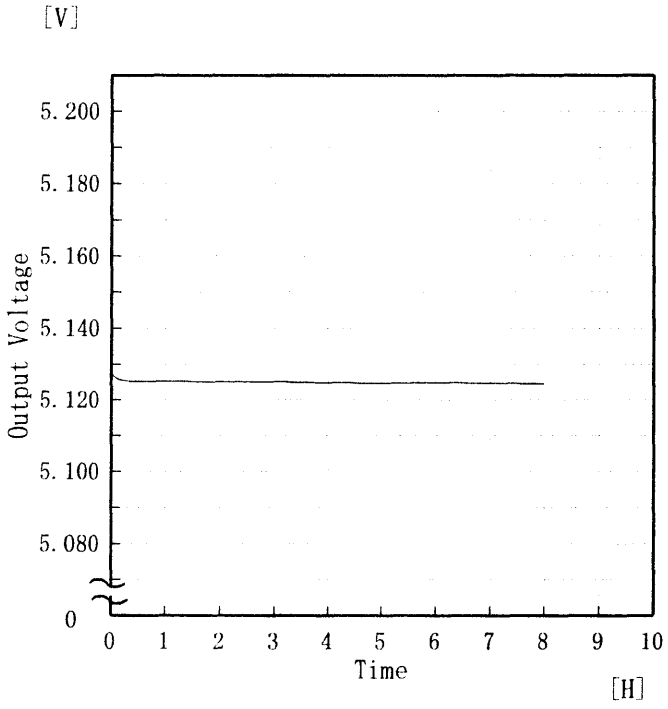
Ambient Temp. [℃]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]
-20	45	65
-10	35	50
0	35	45
10	30	40
20	25	40
25	25	40
30	25	35
40	25	35
50	20	35
60	20	30
—	—	—

COSEL

Model	LCA150S-5
Item	Time Lapse Drift 経時ドリフト
Object	+5.0V30A

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph



Input Volt. 100V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	5.127
0.5	5.125
1.0	5.125
2.0	5.125
3.0	5.125
4.0	5.125
5.0	5.125
6.0	5.125
7.0	5.125
8.0	5.124

COSEL

Model	LCA150S-5	
Item	Output Voltage Accuracy　定電圧精度	Testing Circuitry　Figure A
Object	+5.0V30A	

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　: 0.00～30.00 A

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

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

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　0.00～30.00 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	132	30.00	5.129	±7	±0.2
Minimum Voltage	50	132	0.00	5.116		

COSEL

Model	LCA150S-5	
Item	Condensation 結露特性	Testing Circuitry Figure A
Object	+5.0V30A	

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－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行い、異常のないことを確認する。

2．Values

Item	Data	Testing Conditions
Output Voltage [V]	5.121	Input Volt.: 100V, Load Current:30A
Line Regulation [mV]	2	Input Volt.: 85～132V, Load Current:30A
Load Regulation [mV]	5	Input Volt.: 100V, Load Current:0～30A

COSEL

Model	LCA150S-5		
Item	Leakage Current 漏洩電流	Temperature Testing Circuitry	25℃ Figure B
Object	————————		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.18	0.20	0.27
(B) IEC60950	0.18	0.21	0.27

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B) IEC60950	—	—	—

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	LCA150S-5		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25℃ Figure C
Object	+5.0V30A		

1. Results

Pulse Width [nS]	MODE	No protection failure should occur 保護回路の誤動作がない	DC-like Regulation of Output Voltage 出力電圧の直流的変動
50	COMMON	OK	no fluctuation
	NORMAL	OK	no fluctuation
1000	COMMON	OK	no fluctuation
	NORMAL	OK	no fluctuation

2. Conditions

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

COSEL

Model	LCA150S-5		
Item	Conducted Emission 雑音端子電圧	Temperature Testing Circuitry	25℃ Figure D
Object	———————		

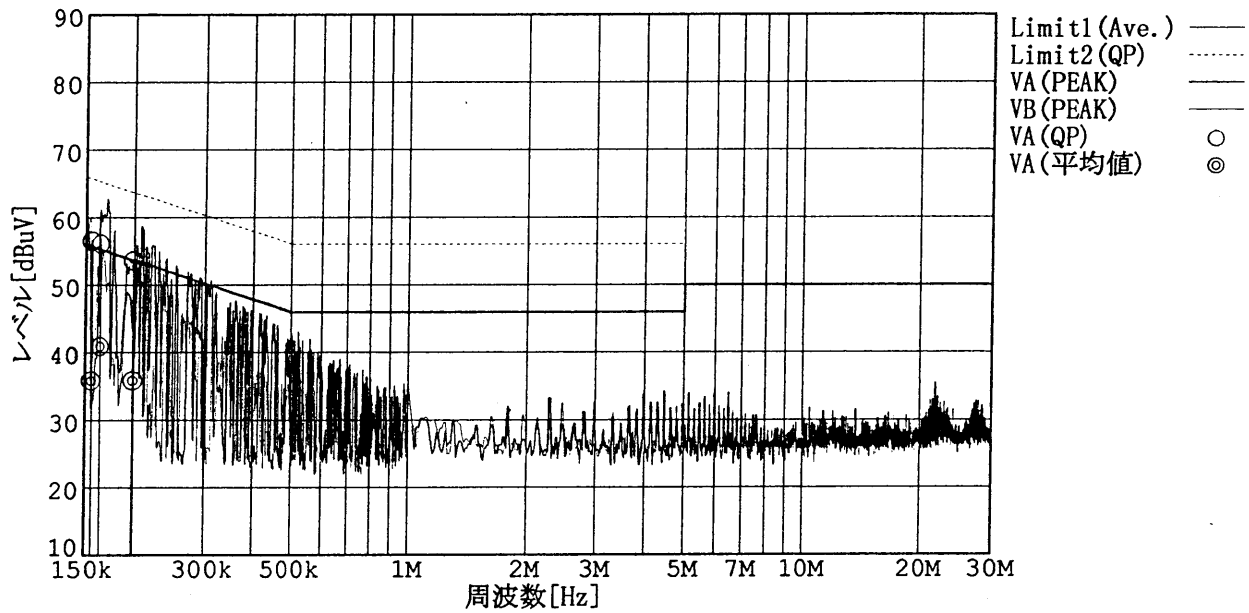
1. Graph

Remarks

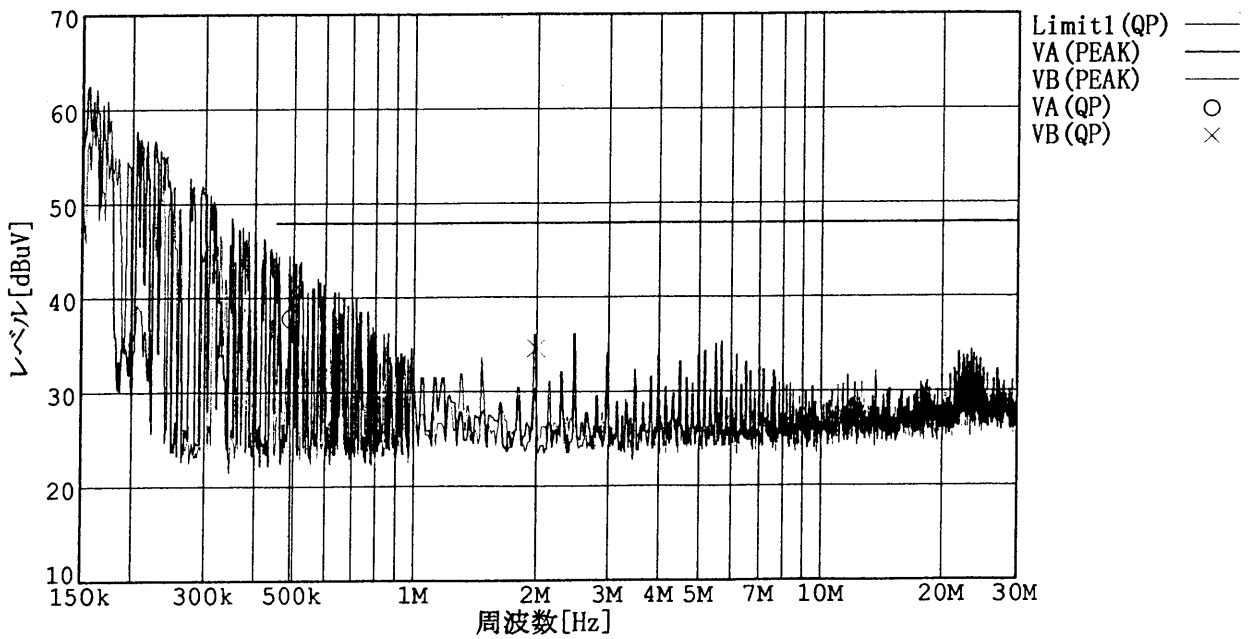
Input Volt. 100 V (VCCI Class B)
120 V (FCC Class B)

Load 100 %

規格1：[VCCI] Class B(平均値)
規格2：[VCCI] Class B(QP)



規格1：[FCC Part15] Class B



COSEL

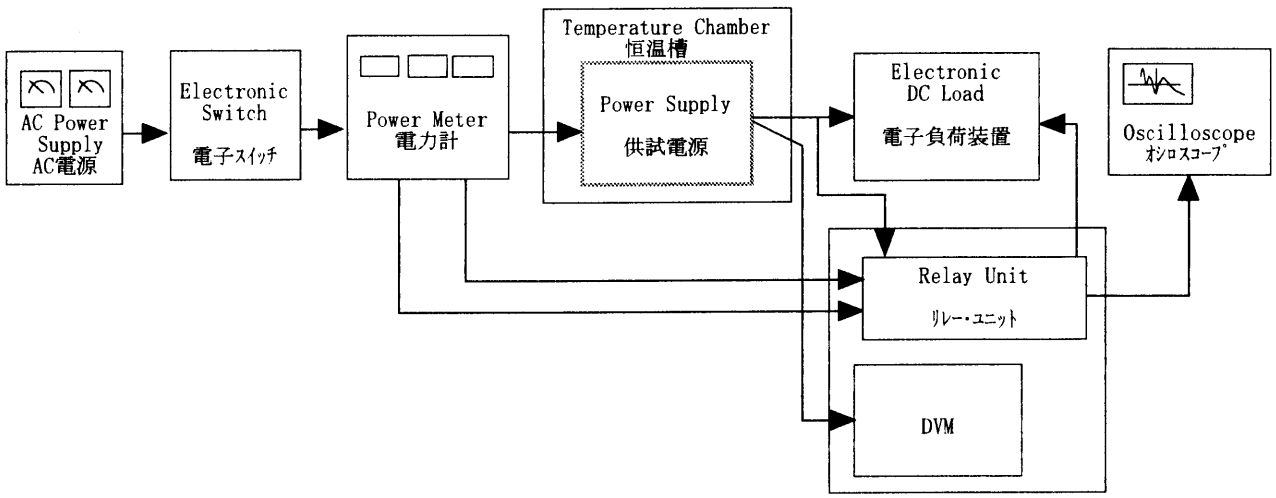


Figure A

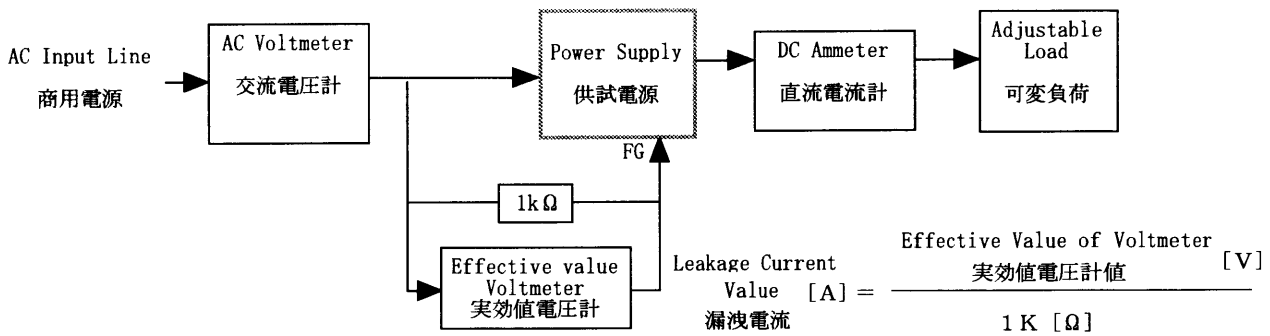


Figure B(DENTORI)

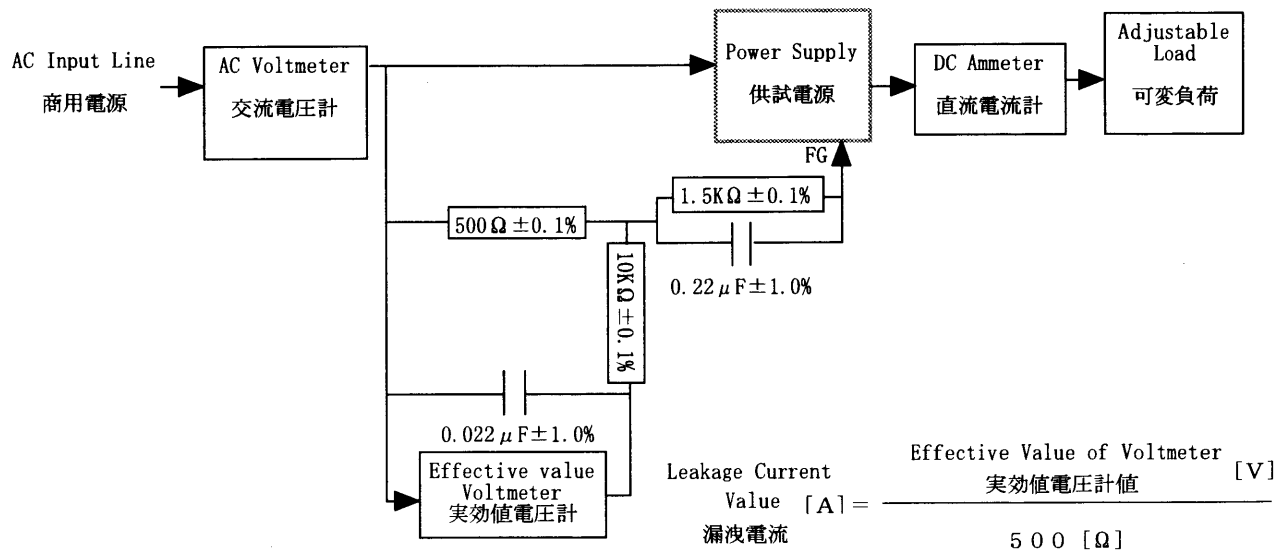


Figure B（ＩＥＣ６０９５０）

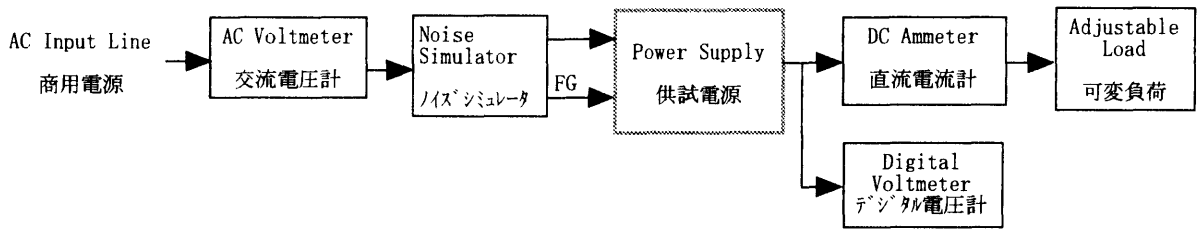


Figure C

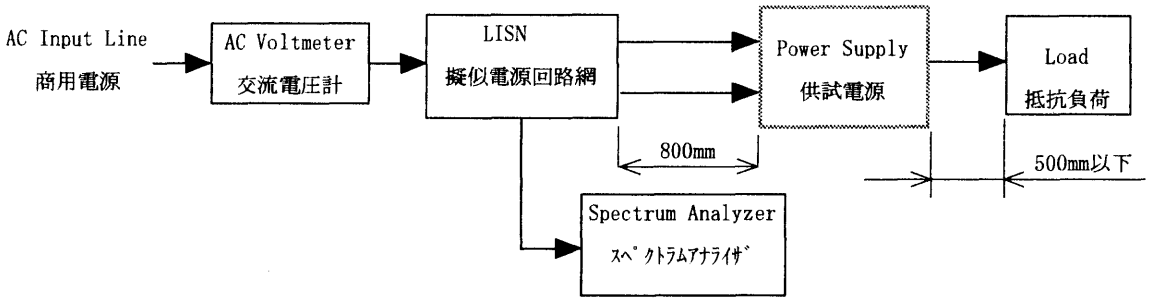


Figure D

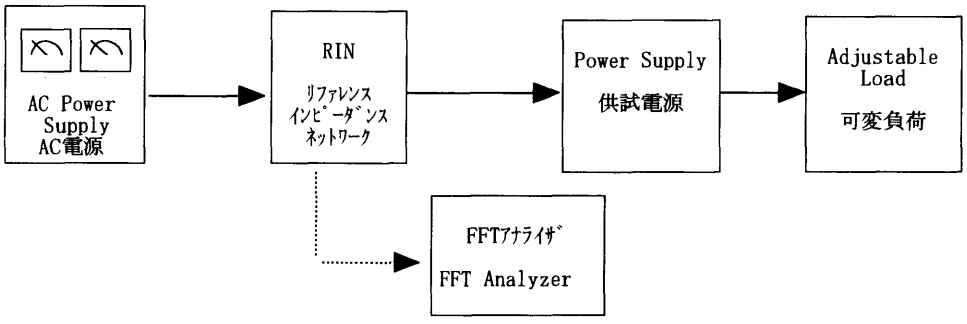


Figure E