参考資料

TEST DATA OF LEP150F-36
(AC100V INPUT)

Regulated DC Power Supply
Apr. 16. 2003

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COSEL CO.,LTD.

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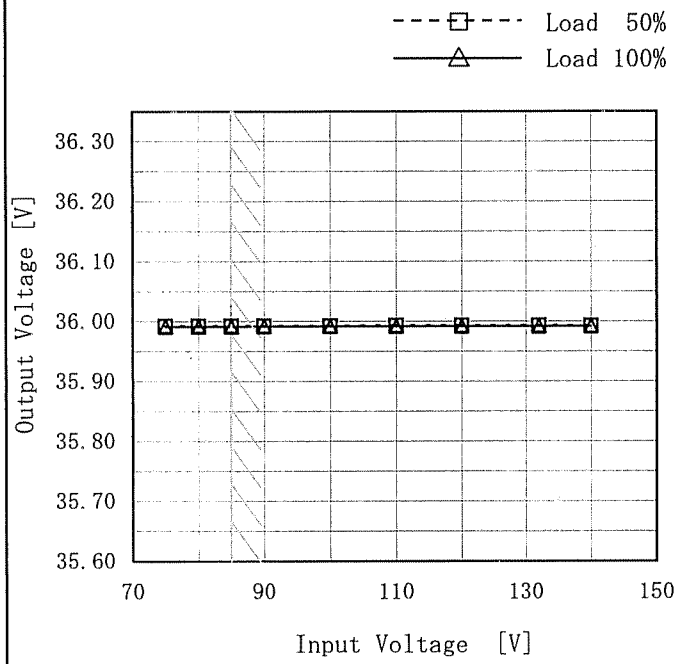
1. Graph



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

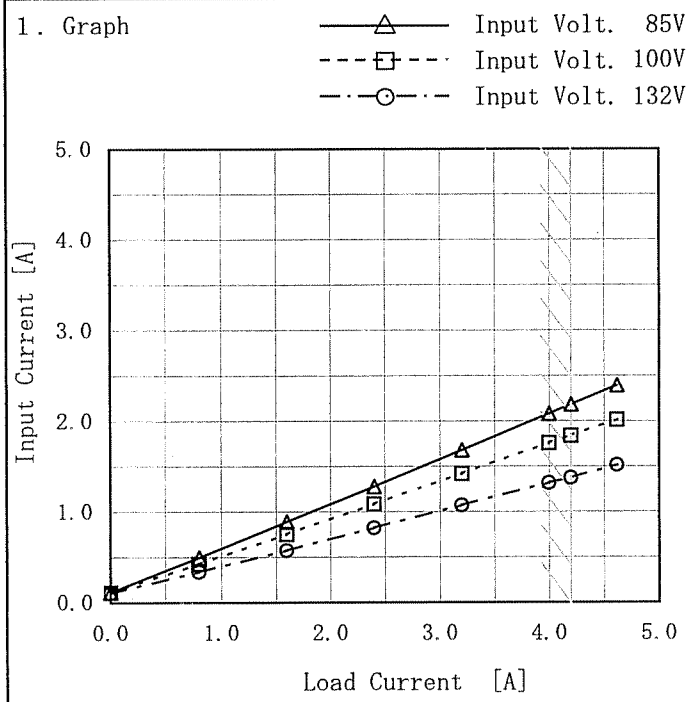
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	35.993	35.991
80	35.993	35.992
85	35.993	35.992
90	35.993	35.992
100	35.993	35.992
110	35.993	35.992
120	35.993	35.992
132	35.993	35.992
140	35.993	35.992

COSEL

Model	LEP150F-36
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

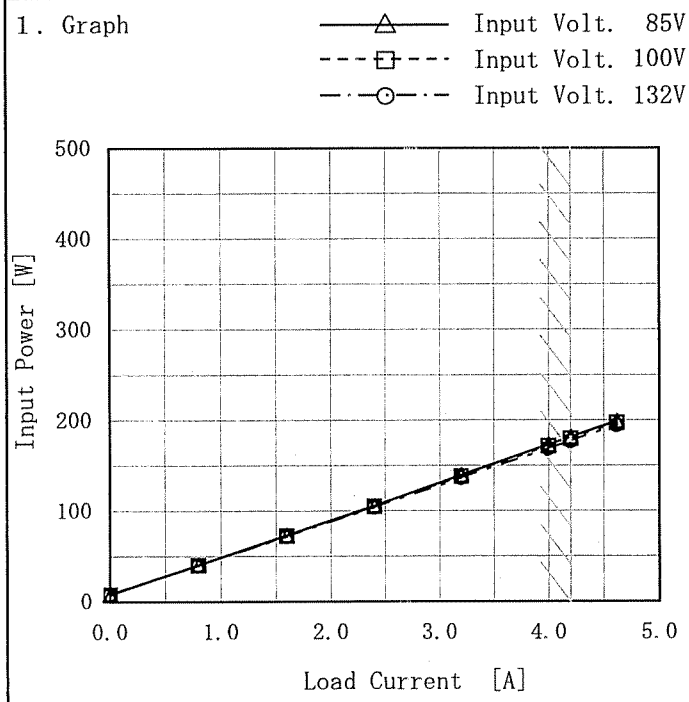
Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.113	0.107	0.101
0.80	0.497	0.424	0.337
1.60	0.889	0.754	0.573
2.40	1.278	1.085	0.820
3.20	1.680	1.419	1.068
4.00	2.080	1.755	1.316
4.20	2.182	1.838	1.373
4.62	2.394	2.014	1.514
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	LEP150F-36
Item	Input Power (by Load Current) 入力電力 (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

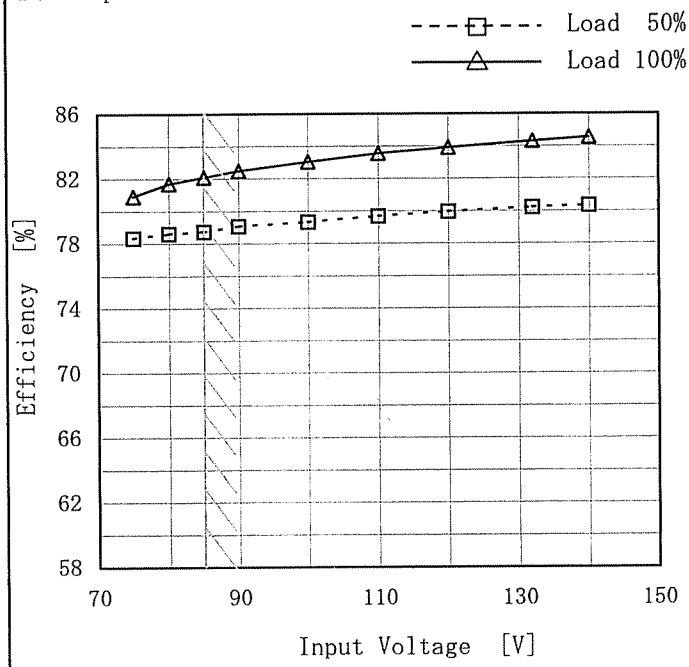
Load Current [A]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	7.7	7.8	7.9
0.80	40.5	40.1	40.1
1.60	73.1	72.5	71.9
2.40	105.7	105.0	103.9
3.20	139.2	137.8	136.2
4.00	172.8	171.3	168.6
4.20	181.2	179.4	176.7
4.62	198.9	197.1	194.4
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	LEP150F-36
Item	Efficiency (by Input Voltage) 効率（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

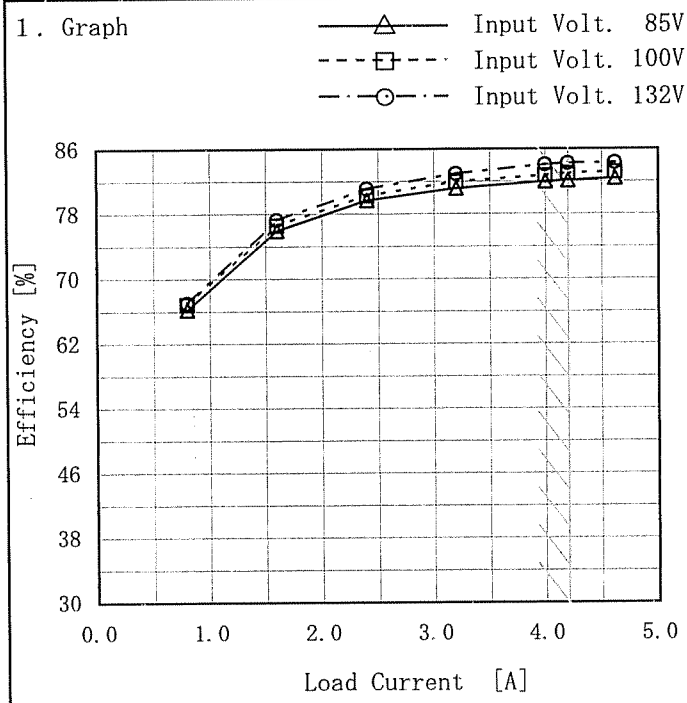
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	78.3	80.9
80	78.6	81.7
85	78.7	82.1
90	79.1	82.5
100	79.3	83.0
110	79.7	83.6
120	80.0	83.9
132	80.2	84.3
140	80.3	84.5

COSEL

Model	LEP150F-36
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

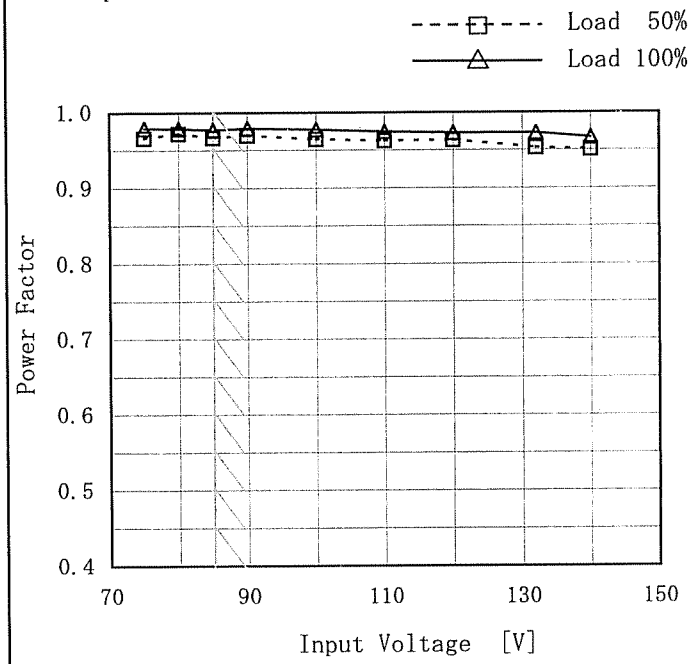
Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	—	—	—
0.80	66.2	66.9	67.0
1.60	75.9	76.6	77.2
2.40	79.7	80.3	81.1
3.20	81.1	81.9	82.9
4.00	82.0	82.7	84.0
4.20	82.1	83.0	84.2
4.62	82.4	83.1	84.3
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	LEP150F-36
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]	Power Factor	
	Load 50%	Load 100%
75	0.966	0.979
80	0.972	0.979
85	0.967	0.977
90	0.970	0.979
100	0.965	0.978
110	0.962	0.975
120	0.963	0.973
132	0.953	0.973
140	0.951	0.967

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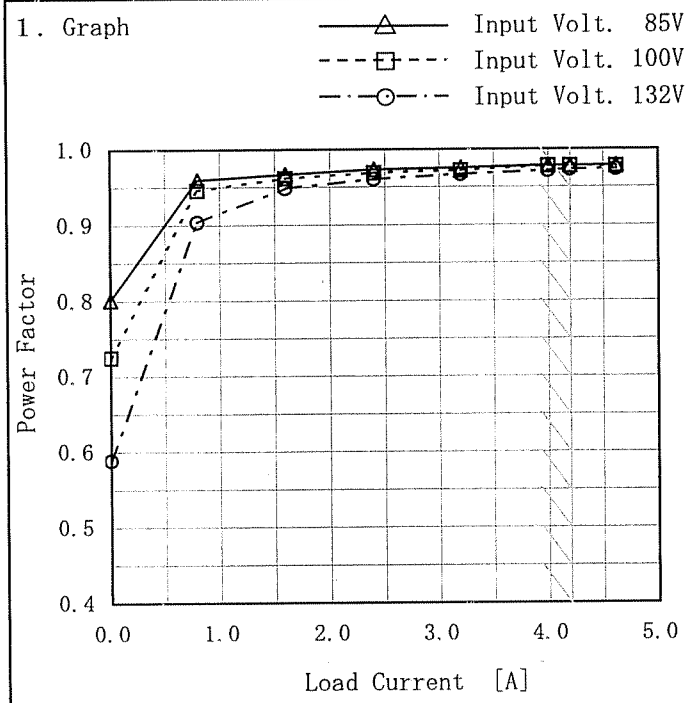
Model	LEP150F-36
Item	Power Factor (by Load Current) 力率 (負荷特性)
Object	————————

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]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.801	0.725	0.589
0.80	0.960	0.946	0.904
1.60	0.967	0.962	0.949
2.40	0.973	0.969	0.960
3.20	0.975	0.972	0.967
4.00	0.978	0.978	0.971
4.20	0.978	0.978	0.973
4.62	0.978	0.977	0.973
—	—	—	—
—	—	—	—
—	—	—	—

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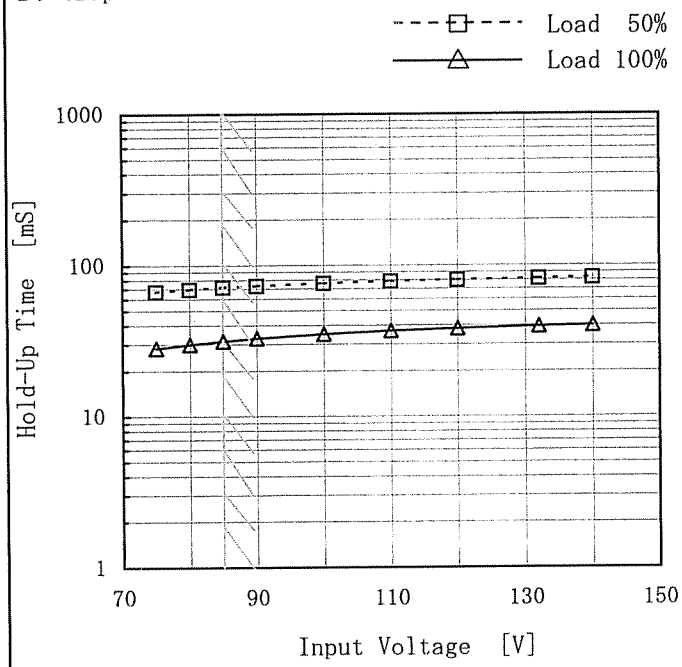
Model	LEP150F-36
Item	Hold-Up Time 出力保持時間
Object	+36V4.2A

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	67	28
80	69	30
85	72	32
90	73	33
100	76	35
110	78	37
120	80	38
132	82	39
140	82	40

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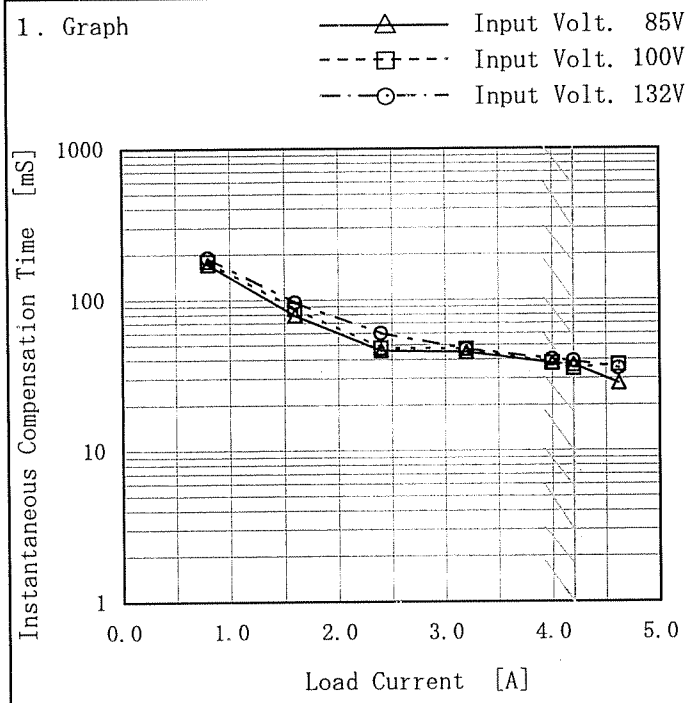
Model	LEP150F-36
Item	Instantaneous Interruption Compensation 瞬時停電保障
Object	+36V4.2A

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

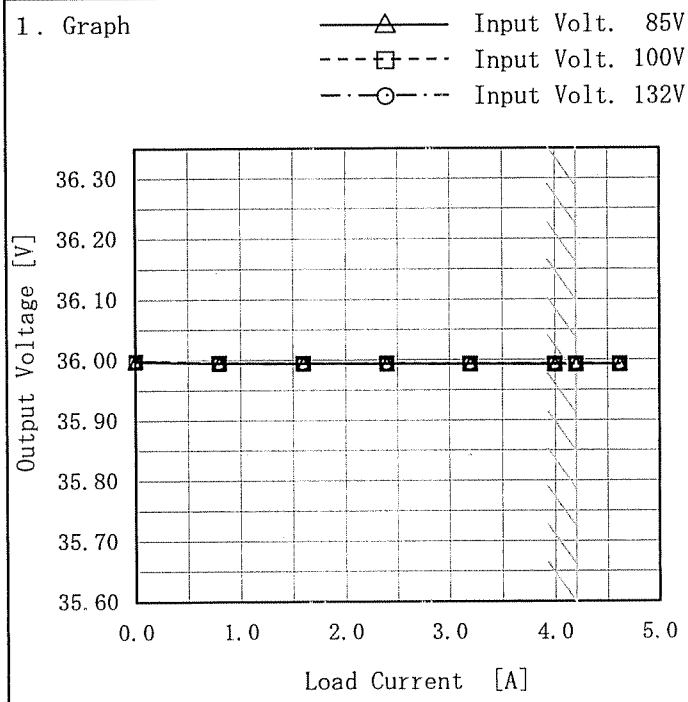
Load Current [A]	Time [mS]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	—	—	—
0.80	172	180	190
1.60	79	87	96
2.40	46	48	60
3.20	45	47	47
4.00	38	38	40
4.20	37	35	39
4.62	28	37	35
—	—	—	—
—	—	—	—
—	—	—	—

COSEL

Model	LEP150F-36
Item	Load Regulation 静的負荷変動
Object	+36V4.2A

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

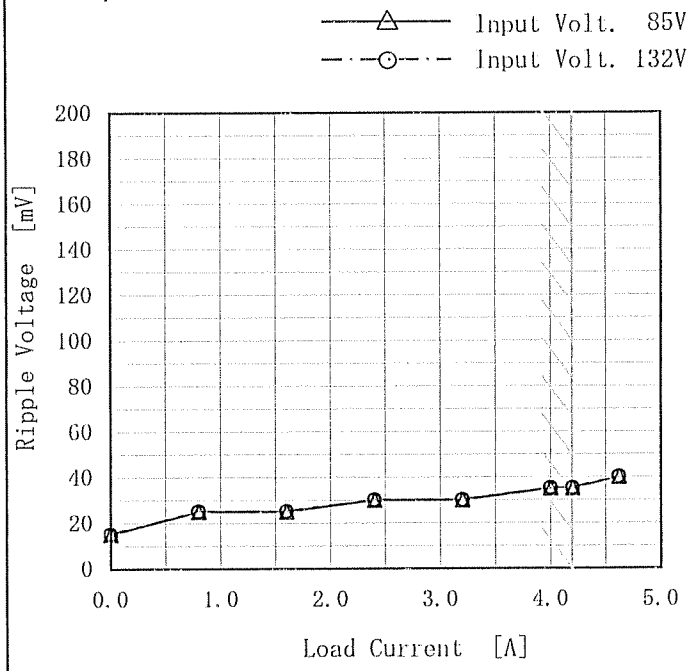
Load Current [A]	Output Voltage [V] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	35.998	35.998	35.998
0.80	35.995	35.995	35.995
1.60	35.994	35.994	35.994
2.40	35.994	35.994	35.994
3.20	35.993	35.993	35.993
4.00	35.993	35.993	35.993
4.20	35.993	35.993	35.993
4.62	35.993	35.993	35.993
--	—	—	—
--	—	—	—

COSEL

Model	LEP150F-36
Item	Ripple Voltage (by Load Current) リップル電圧（負荷特性）
Object	+36V4.2A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	15	15
0.80	25	25
1.60	25	25
2.40	30	30
3.20	30	30
4.00	35	35
4.20	35	35
4.62	40	40
—	—	—
—	—	—
—	—	—

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

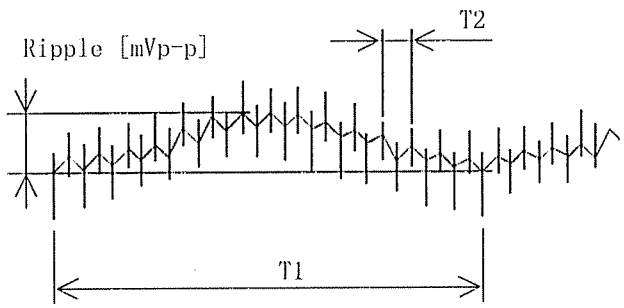


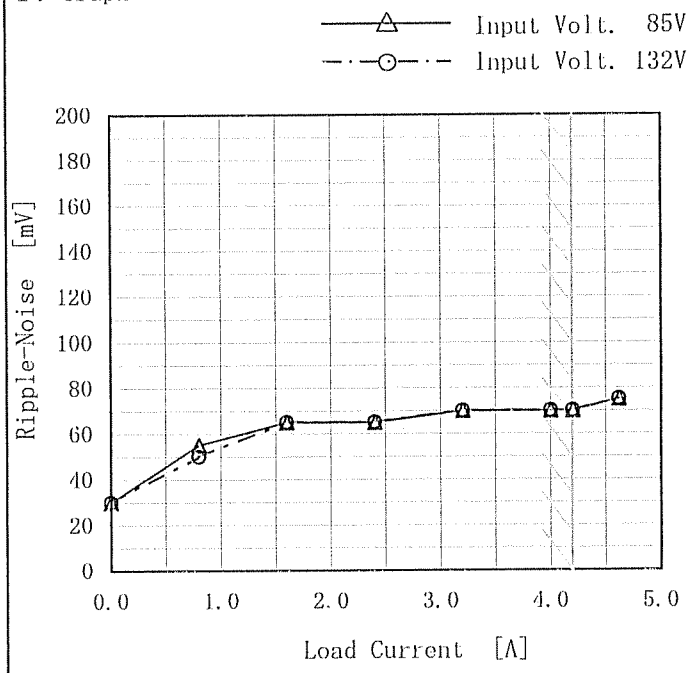
Fig. Complex Ripple Wave Form
図　リップル波形詳細図

COSEL

Model	LEP150F-36
Item	Ripple-Noise リップルノイズ
Object	+36V4.2A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	30	30
0.80	55	50
1.60	65	65
2.40	65	65
3.20	70	70
4.00	70	70
4.20	70	70
4.62	75	75
--	—	—
--	—	—
--	—	—

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

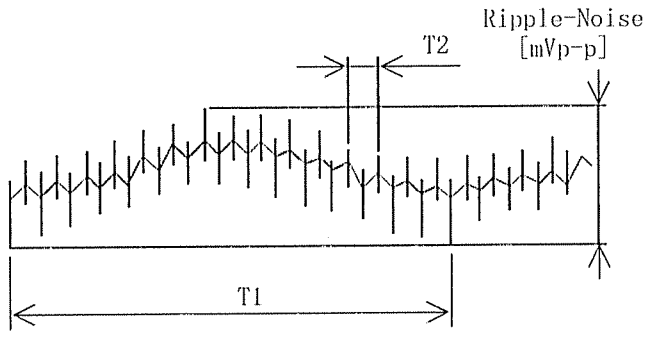


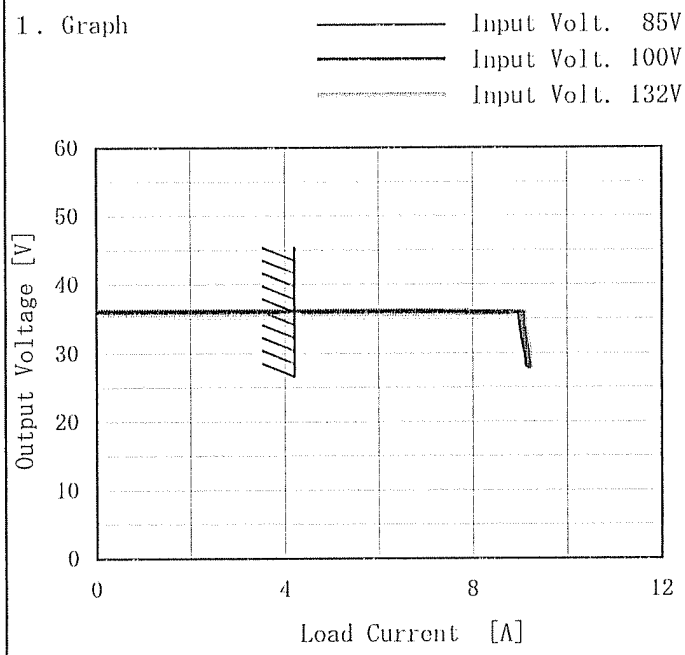
Fig. Complex Ripple Wave Form
図　リップル波形詳細図

COSEL

Model	LEP150F-36
Item	Overcurrent Protection 過電流保護
Object	+36V4.2A

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。

Intermittent operation occurs when the output voltage is from 28V to 0V.
28V～0V間は、間欠モードとなる。

2. Values

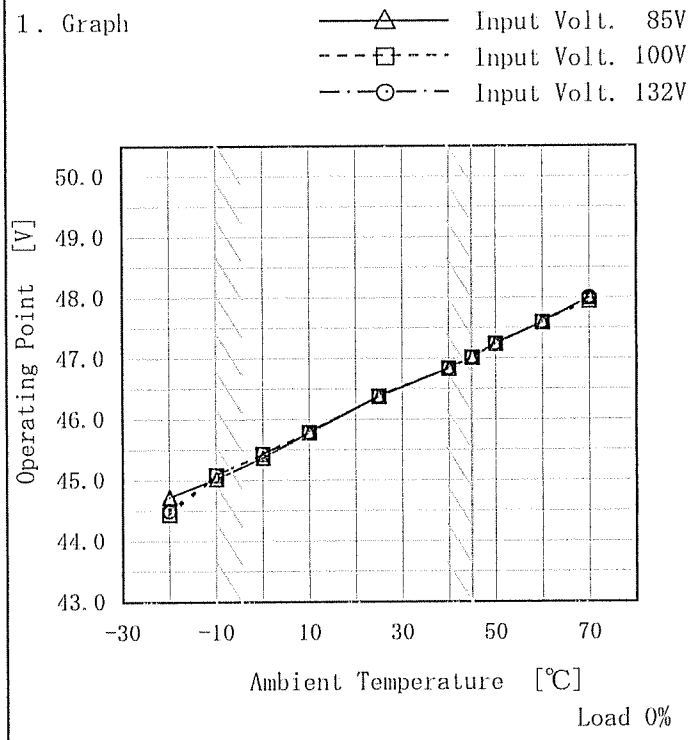
Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
36.0	6.69	7.16	6.76
34.2	8.93	9.06	9.08
32.4	9.02	9.10	9.12
28.8	9.11	9.17	9.19
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—
--	—	—	—

COSEL

Model	LEP150F-36
Item	Overvoltage Protection 過電圧保護
Object	+36V4.2A

Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated ambient temperature.

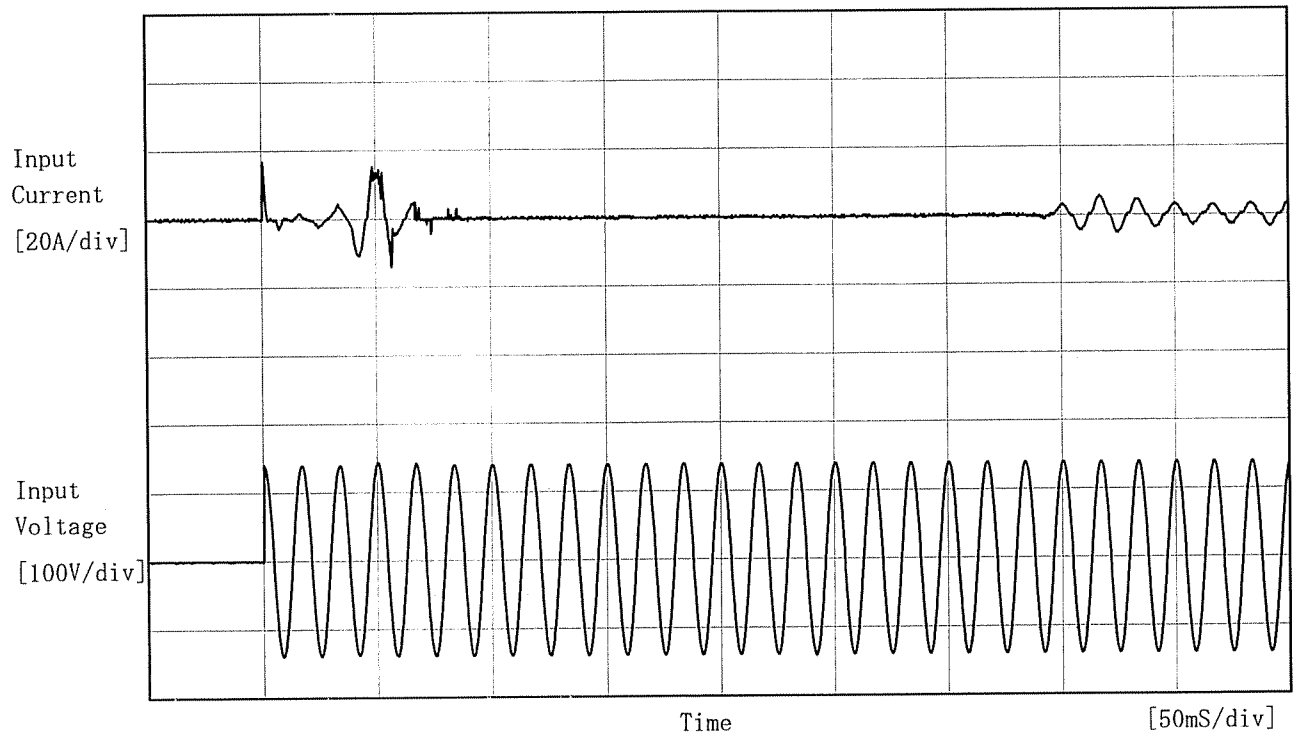
(注) 斜線は定格周囲温度範囲を示す。

2. Values

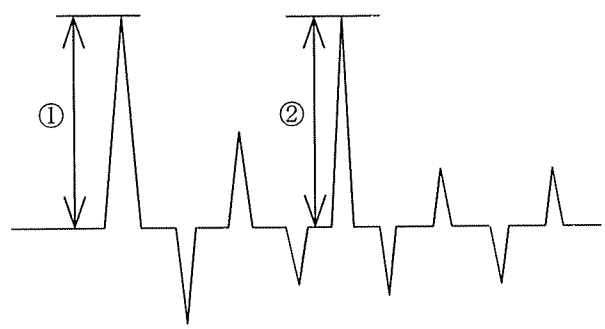
Ambient Temperature [℃]	Operating Point [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	44.74	44.45	44.51
-10	45.04	45.10	45.10
0	45.39	45.45	45.45
10	45.80	45.80	45.80
25	46.39	46.39	46.39
40	46.85	46.85	46.85
45	47.03	47.03	47.03
50	47.26	47.26	47.26
60	47.61	47.61	47.61
70	48.02	47.96	48.02
--	—	—	—

COSEL

Model	LEP150F-36		
Item	Inrush Current 突入電流	Temperature Testing Circuitry	25℃ Figure A
Object	————————		



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



COSEL

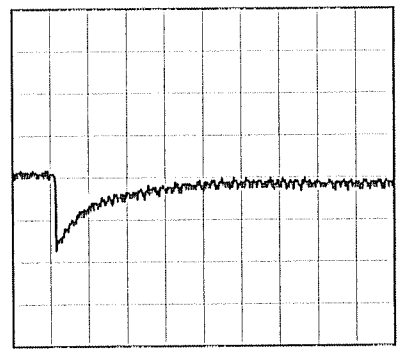
Model	LEP150F-36
Item	Dynamic Load Response 動的負荷変動
Object	+36V4.2A

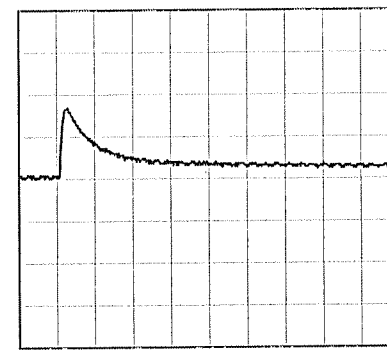
Temperature 25℃
Testing Circuitry Figure A

Input Volt. 100 V
Cycle 1000 ms

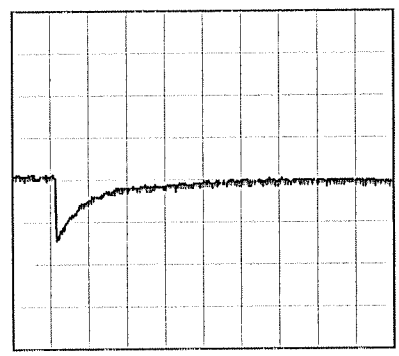
Load Current

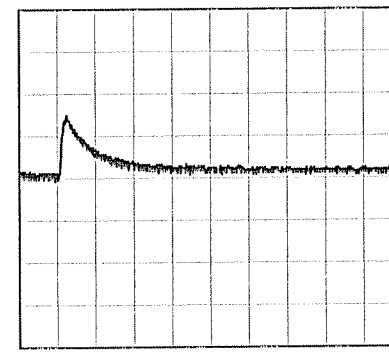
Min. Load (0A) ⟷
Load 100% (4.2A)





Min. Load (0A) ⟷
Load 50% (2.1A)

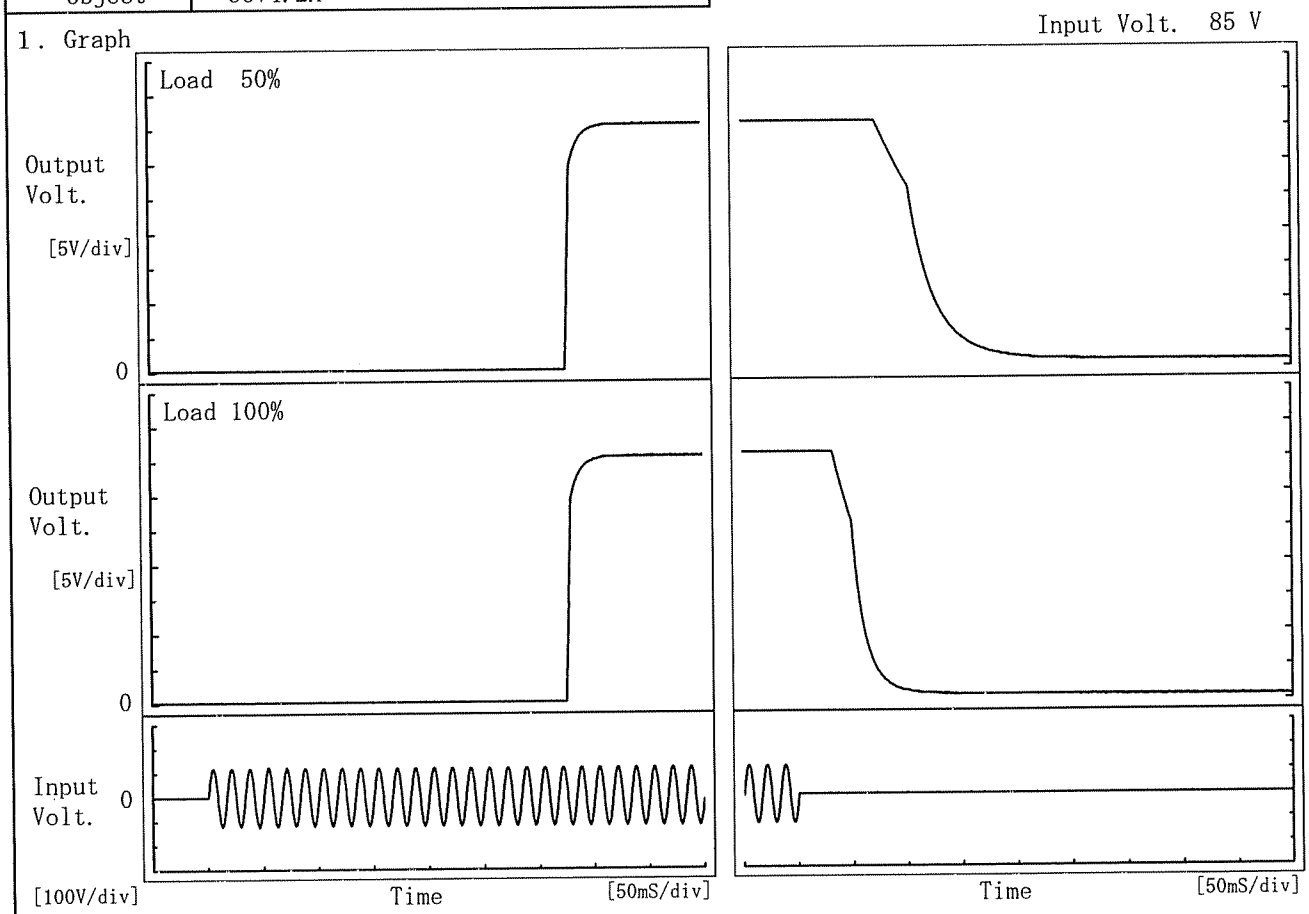




COSEL

Model	LEP150F-36		
Item	Rise and Fall Time 立上り、立下り時間	Temperature Testing Circuitry	25℃ Figure A
Object	+36V4.2A		

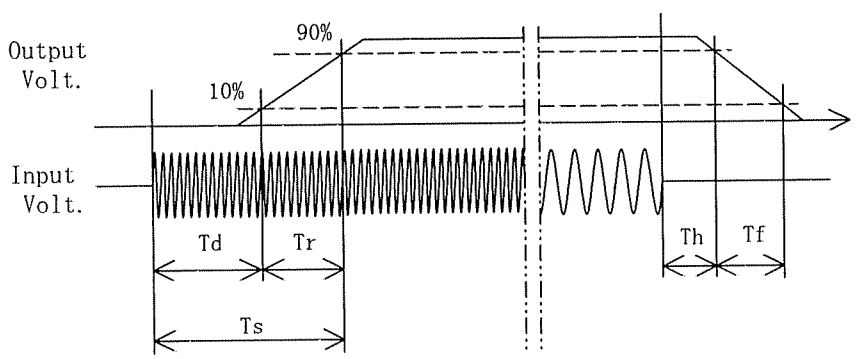
1. Graph



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	326.0	9.5	335.5	80.8	75.8
100 %	325.5	10.0	335.5	36.5	38.8



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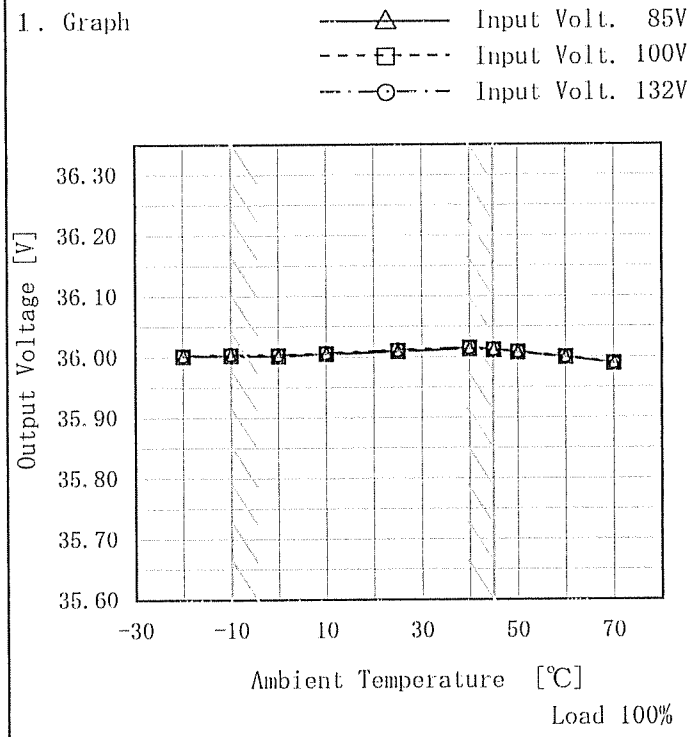
COSEL

Model	LEP150F-36
Item	Ambient Temperature Drift 周囲温度変動
Object	+36V4.2A

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

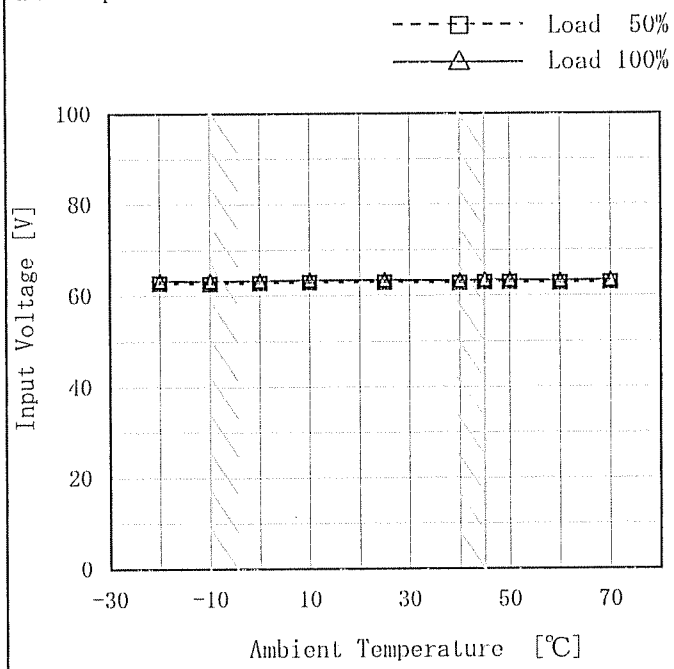
Ambient Temperature [℃]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	36.001	36.002	36.002
-10	36.003	36.003	36.004
0	36.002	36.003	36.003
10	36.005	36.006	36.006
25	36.009	36.010	36.011
40	36.014	36.015	36.015
45	36.011	36.012	36.012
50	36.007	36.008	36.009
60	36.000	36.000	36.000
70	35.990	35.990	35.990
—	—	—	—

COSEL

Model	LEP150F-36
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧
Object	+36V4.2A

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

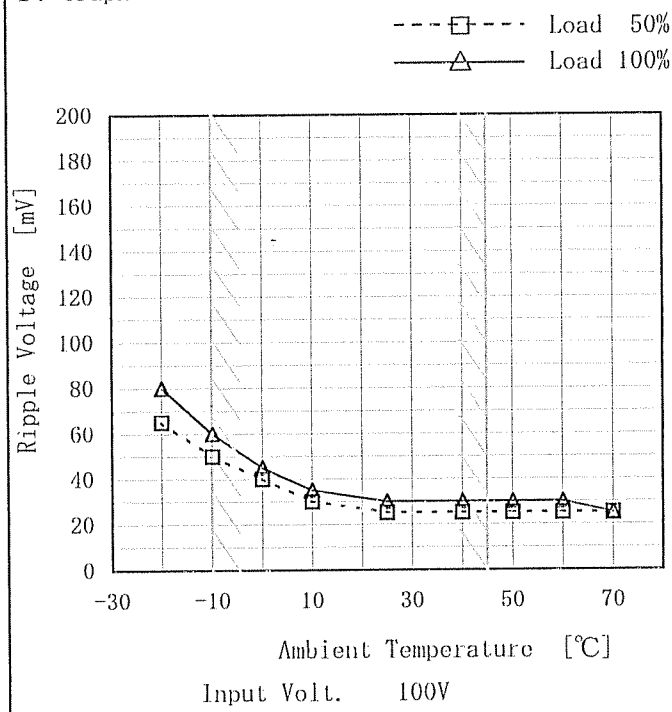
Ambient Temperature [℃]	Input Voltage [V]	
	Load 50%	Load 100%
-20	63	64
-10	63	64
0	63	64
10	63	64
25	63	64
40	63	64
45	63	64
50	63	64
60	63	64
70	63	64
—	—	—

COSEL

Model	LEP150F-36
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	+36V4.2A

Testing Circuitry Figure A

1. Graph



Input Volt. 100V

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

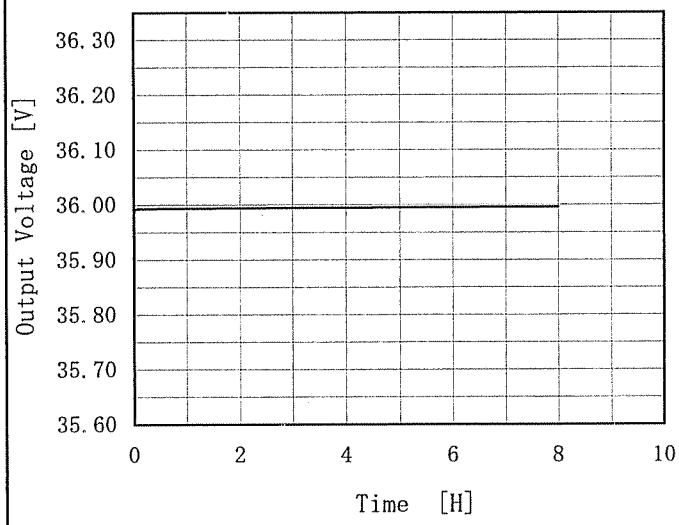
Ambient Temperature [℃]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	65	80
-10	50	60
0	40	45
10	30	35
25	25	30
40	25	30
50	25	30
60	25	30
70	25	25
--	—	—
--	—	—

COSEL

Model	LEP150F-36
Item	Time Lapse Drift 経時ドリフト
Object	+36V4.2A

Temperature 25℃
Testing Circuitry Figure A

1. Graph



Input Volt. 100V
Load 100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	35.987
0.5	35.994
1.0	35.994
2.0	35.995
3.0	35.995
4.0	35.995
5.0	35.996
6.0	35.996
7.0	35.996
8.0	35.996

COSEL

Model	LEP150F-36	
Item	Output Voltage Accuracy 定電圧精度	Testing Circuitry Figure A
Object	+36V4.2A	

1. 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 ～ 45℃

Input Voltage : 85 ～ 132V

Load Current : 0 ～ 4.2A

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

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

1. 定電圧精度

周囲温度、入力電圧、負荷電流を下記仕様内で、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 ～ 45℃

入力電圧 : 85 ～ 132V

負荷電流 : 0 ～ 4.2A

* 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

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

2. Values

Item	Temperature [℃]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	85	0	36.019	±8	±0.1
Minimum Voltage	-10	85	4.2	36.004		

COSEL

Model	LEP150F-36
Item	Harmonic Current 高調波電流
Object	———————

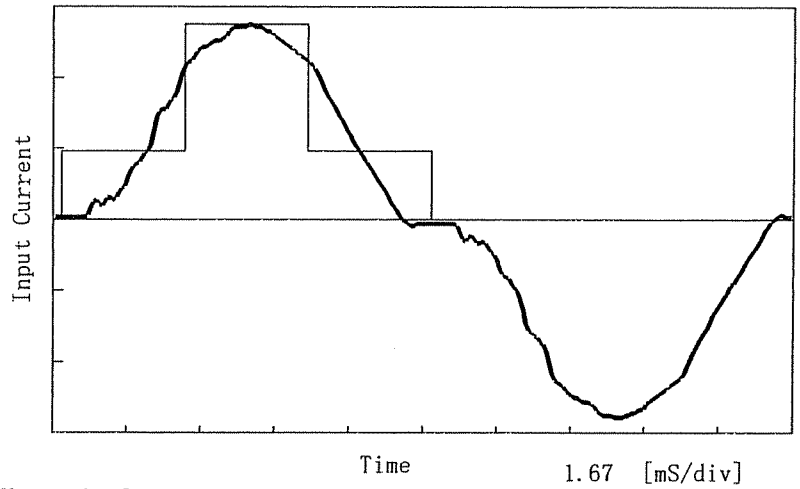
Temperature 25℃
Testing Circuitry Figure E

1. Input Current Waveform

——— Input Current

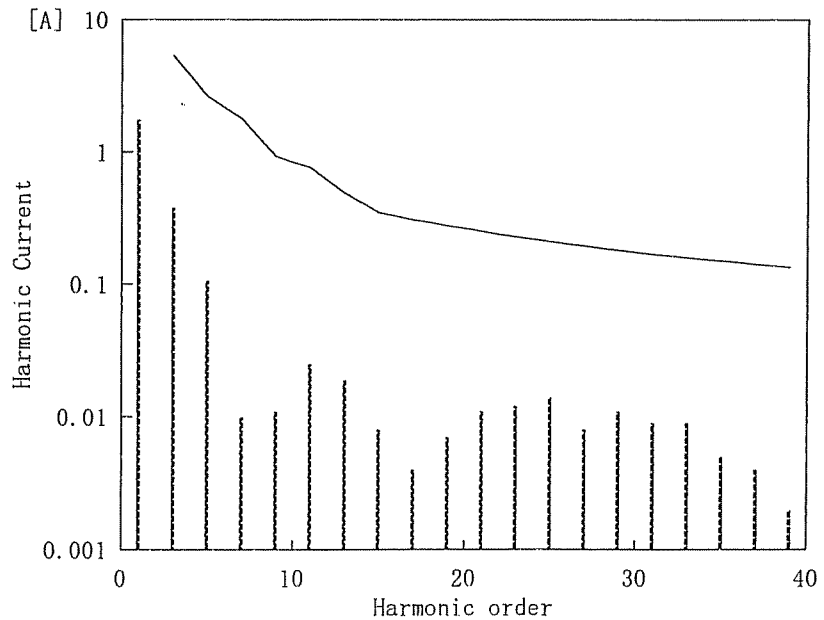
——— Envelope of the input current to classify equipment as Class D
ｸﾗｽDの機器を決定するための入力電流包絡線

1 A/div



Conditions	Values
Input Voltage [V]	99.7
Input Current [A]	1.798
Active Power [W]	174.8
Apparent Power[VA]	179.3
Frequency [Hz]	60
Power Factor	0.975
Output Power [W]	151.2

2. Harmonic Current



——— Harmonic Current
高調波電流

——— Limits for Class A equipment
ｸﾗｽAの機器に対する限度値

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	1.75300
2	—	0.00100
3	5.30592	0.37900
4	—	0.00000
5	2.62989	0.10700
6	—	0.00000
7	1.77633	0.01000
8	—	0.00000
9	0.92277	0.01100
10	—	0.00000
11	0.76128	0.02500
12	—	0.00000
13	0.48445	0.01900
14	—	0.00000
15	0.34604	0.00800
16	—	0.00000
17	0.30533	0.00400
18	—	0.00000
19	0.27319	0.00700
20	—	0.00000
21	0.24717	0.01100
22	—	0.00000
23	0.22568	0.01200
24	—	0.00000
25	0.20762	0.01400
26	—	0.00000
27	0.19224	0.00800
28	—	0.00000
29	0.17899	0.01100
30	—	0.00000
31	0.16744	0.00900
32	—	0.00000
33	0.15729	0.00900
34	—	0.00000
35	0.14830	0.00500
36	—	0.00000
37	0.14029	0.00400
38	—	0.00000
39	0.13309	0.00200
40	—	0.00000

COSEL

Model	LEP150F-36
Item	Harmonic Current 高調波電流
Object	———————

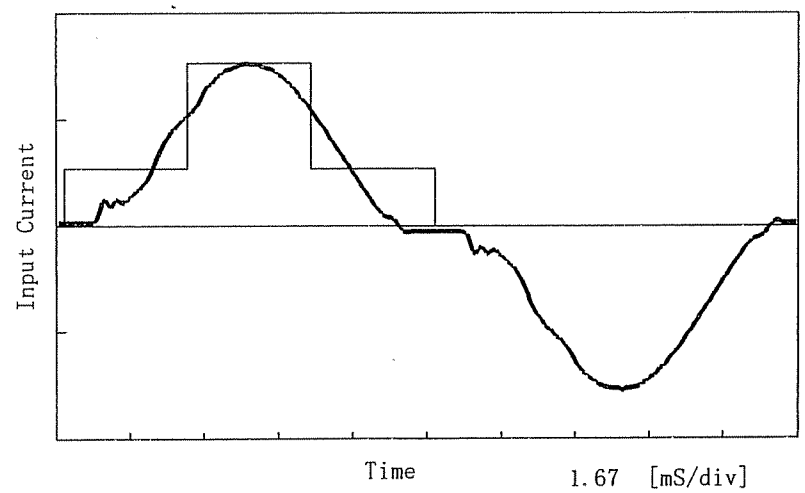
Temperature 25℃
Testing Circuitry Figure E

1. Input Current Waveform

——— Input Current

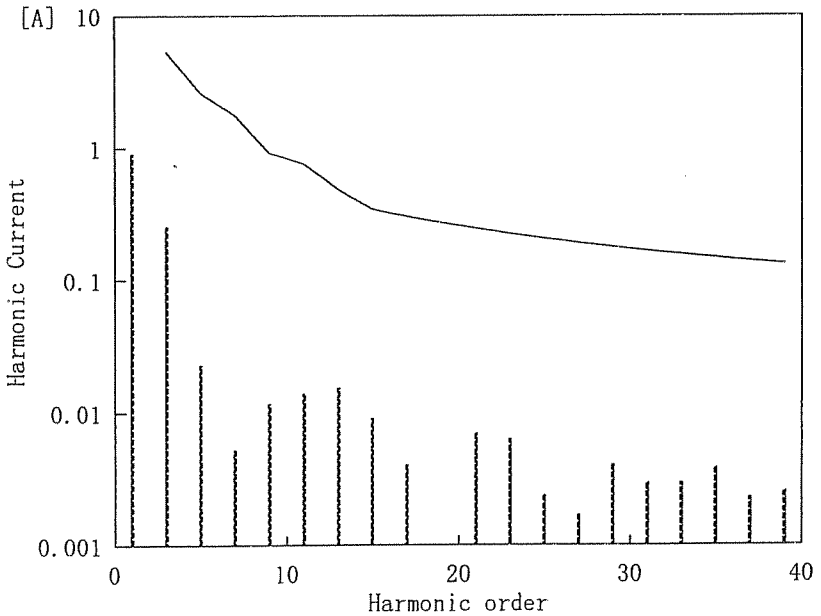
——— Envelope of the input current to classify equipment as Class D
ｸﾗｽDの機器を決定するための入力電流包絡線

1 A/div



Conditions	Values
Input Voltage [V]	100.1
Input Current [A]	0.945
Active Power [W]	90.7
Apparent Power[VA]	94.6
Frequency [Hz]	60
Power Factor	0.959
Output Power [W]	75.6

2. Harmonic Current



——— Harmonic Current
高調波電流

——— Limits for Class A equipment
ｸﾗｽAの機器に対する限度値

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	0.90860
2	—	0.00040
3	5.28472	0.25620
4	—	0.00030
5	2.61938	0.02300
6	—	0.00030
7	1.76923	0.00530
8	—	0.00000
9	0.91908	0.01170
10	—	0.00000
11	0.75824	0.01410
12	—	0.00010
13	0.48252	0.01550
14	—	0.00010
15	0.34466	0.00910
16	—	0.00000
17	0.30411	0.00410
18	—	0.00010
19	0.27210	0.00100
20	—	0.00010
21	0.24618	0.00710
22	—	0.00010
23	0.22478	0.00640
24	—	0.00000
25	0.20679	0.00240
26	—	0.00010
27	0.19148	0.00170
28	—	0.00010
29	0.17827	0.00410
30	—	0.00010
31	0.16677	0.00300
32	—	0.00000
33	0.15666	0.00300
34	—	0.00000
35	0.14771	0.00390
36	—	0.00000
37	0.13973	0.00230
38	—	0.00010
39	0.13256	0.00260
40	—	0.00000

COSEL

Model	LEP150F-36		
Item	Leakage Current 漏洩電流	Temperature	25℃
		Testing Circuitry	Figure B
Object	———————————		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DEN-AN	0.15	0.18	0.24
(B) IEC60950	0.15	0.18	0.24

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	LEP150F-36		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25℃ Figure C
Object	+36V4.2A		

1. Conditions

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

2. Results

Pulse Width [nS]	MODE	POLARITY	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
		−	OK	no fluctuation
	NORMAL	+	OK	no fluctuation
		−	OK	no fluctuation
1000	COMMON	+	OK	no fluctuation
		−	OK	no fluctuation
	NORMAL	+	OK	no fluctuation
		−	OK	no fluctuation

COSEL

Model	LEP150F-36		
Item	Conducted Emission 雑音端子電圧	Temperature Testing Circuitry	25℃ Figure D
Object	―――――――――――――		

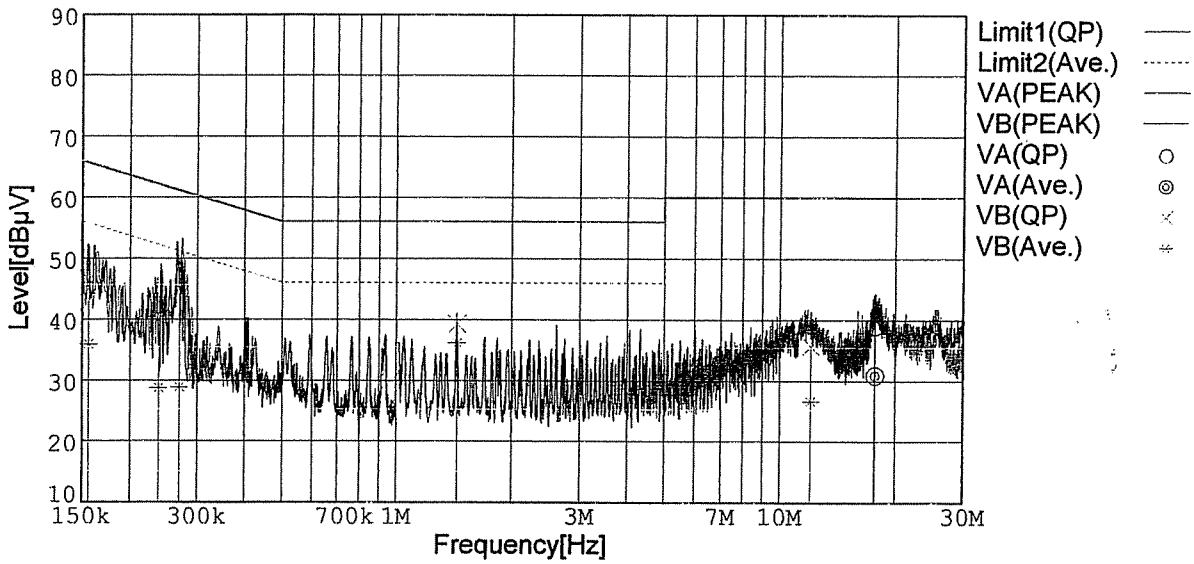
1. Graph

Remarks

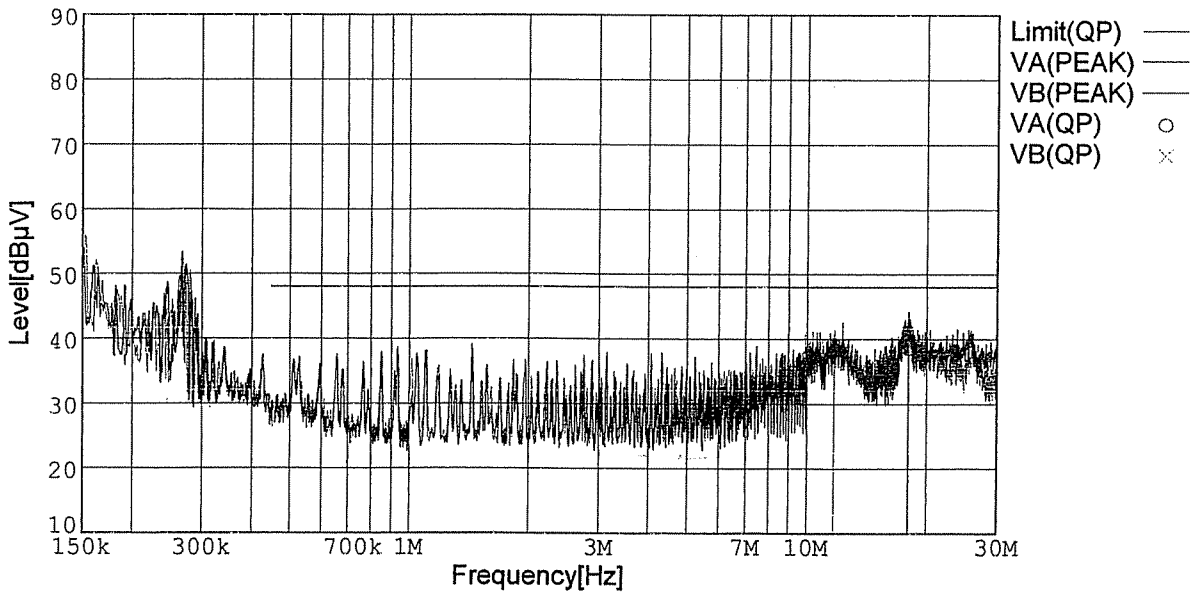
Input Volt. 100V (VCCI Class B)
120V (FCC Class B)

Load 100%

Limit1: [VCCI] Class B(QP)
Limit2: [VCCI] Class B(Ave.)



Limit: [FCC Part15] Class B



COSEL

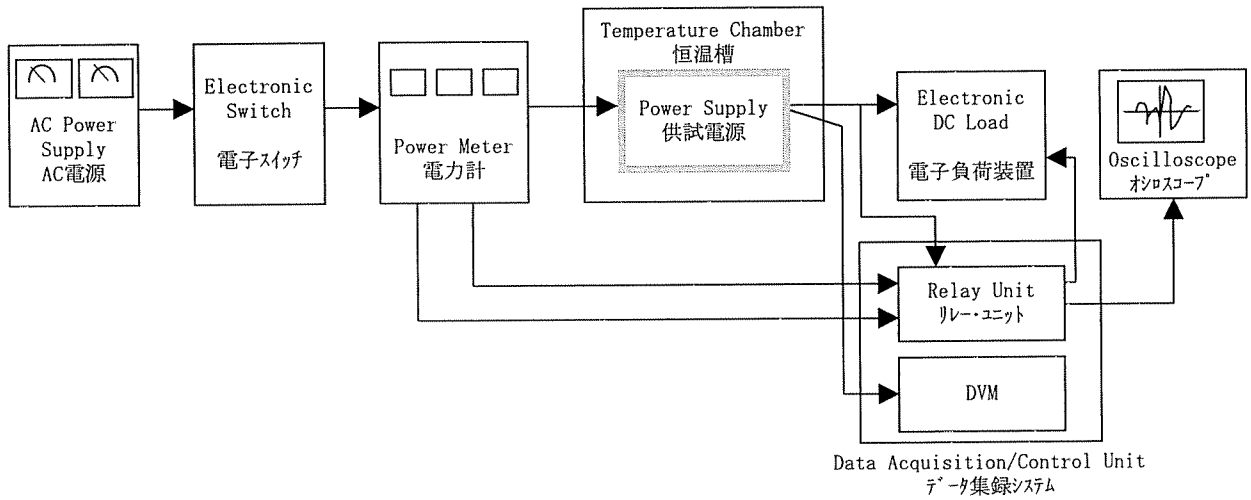


Figure A

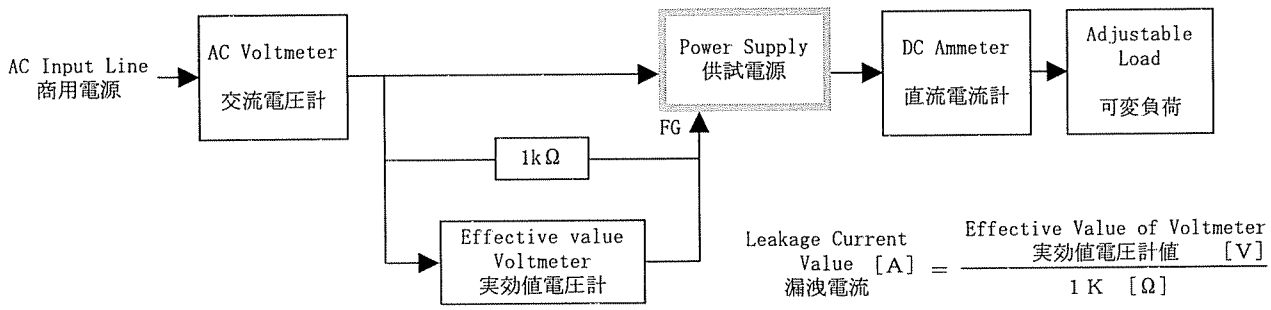


Figure B (DEN-AN)

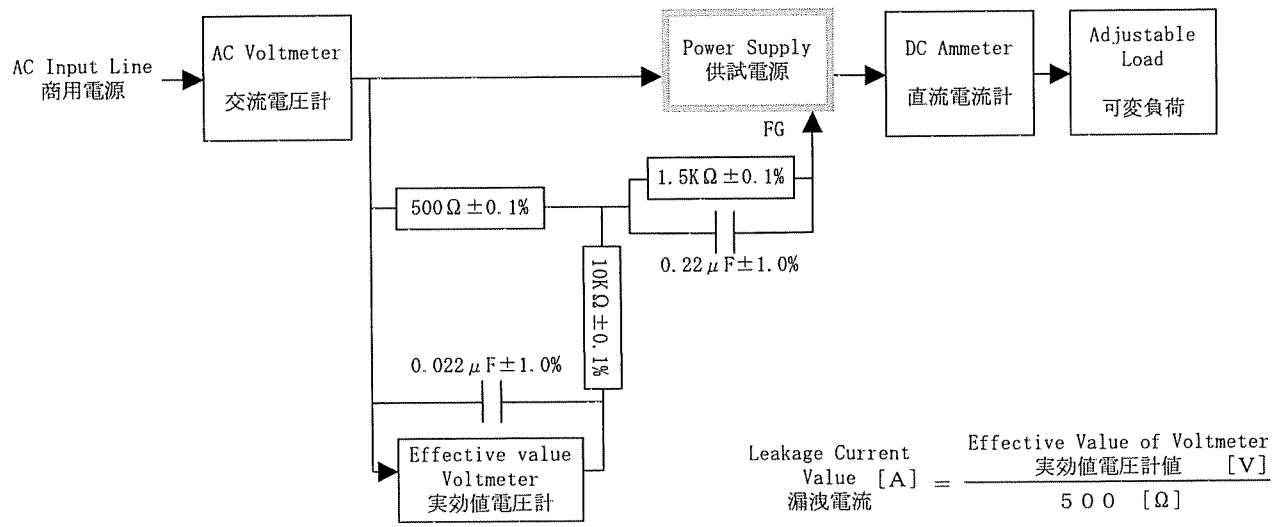


Figure B (IEC60950)

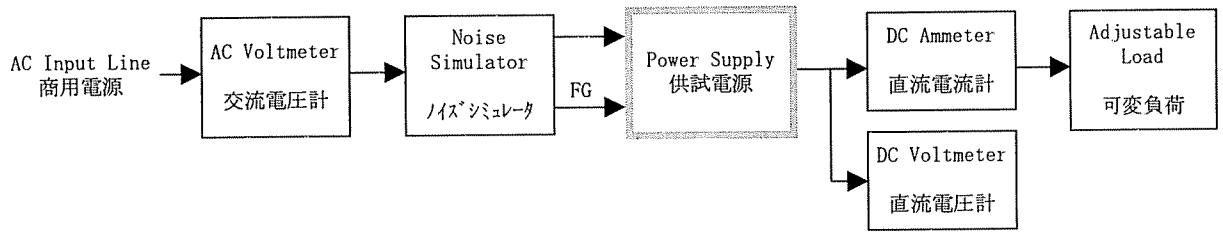


Figure C

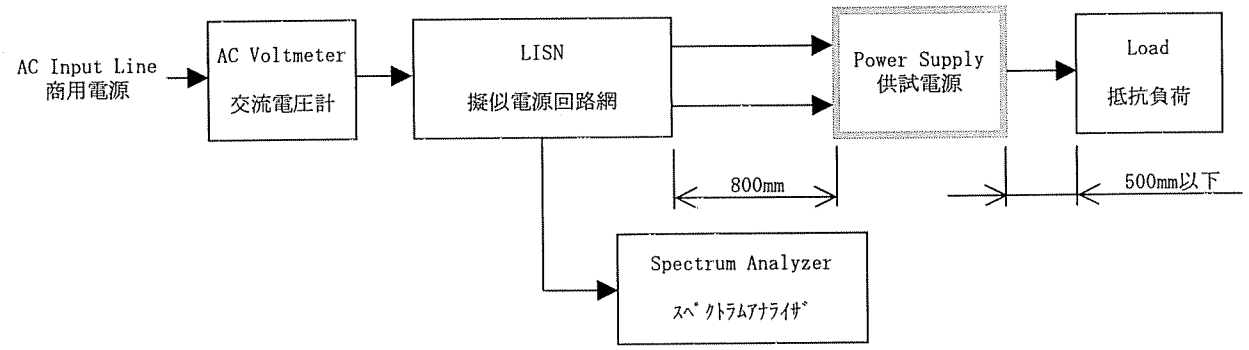


Figure D

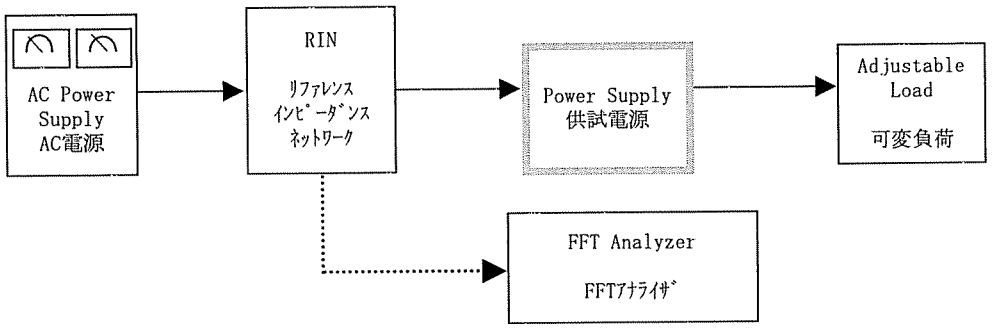


Figure E