COSEL

参考資料

TEST DATA OF LHA30F-24

Regulated DC Power Supply
September 13, 2019

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COSEL CO.,LTD.

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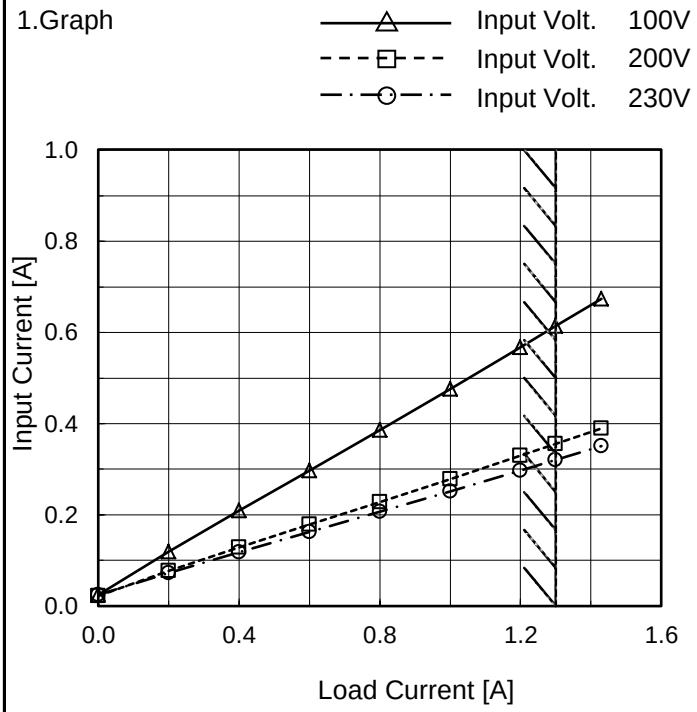
COSEL

Model	LHA30F-24
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

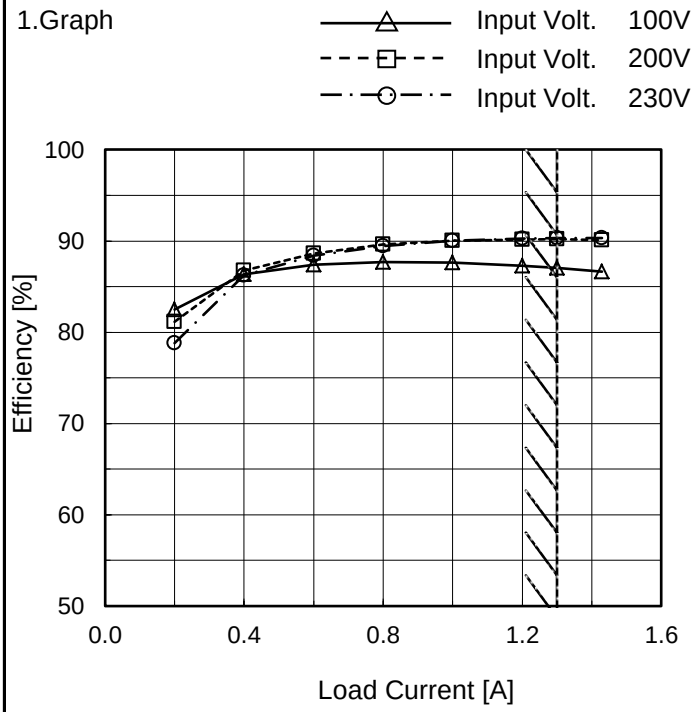
Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.024	0.022	0.024
0.20	0.120	0.077	0.072
0.40	0.209	0.129	0.117
0.60	0.297	0.179	0.162
0.80	0.386	0.228	0.207
1.00	0.476	0.279	0.251
1.20	0.567	0.330	0.297
1.30	0.615	0.356	0.320
1.43	0.674	0.390	0.350
--	-	-	-
--	-	-	-

COSEL

Model	LHA30F-24
Item	Efficiency (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

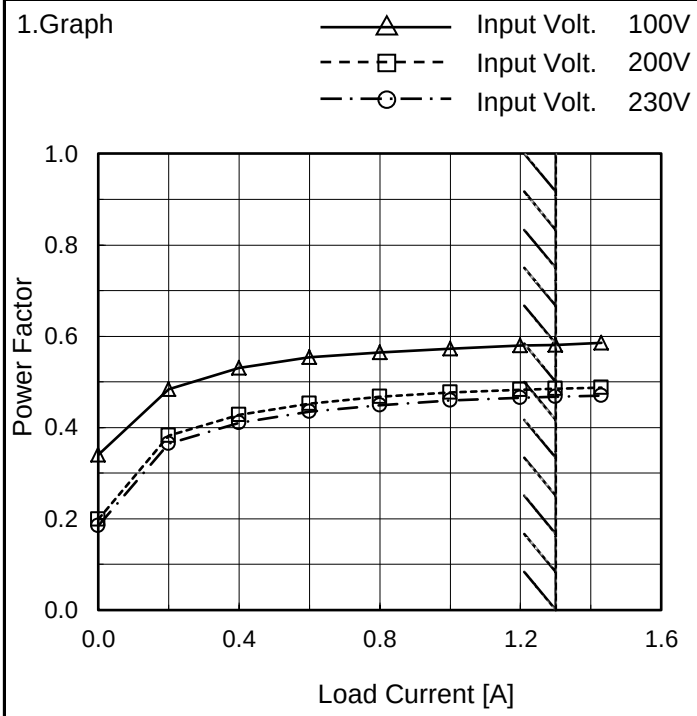
Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.20	82.5	81.1	78.8
0.40	86.4	86.8	86.2
0.60	87.4	88.6	88.4
0.80	87.7	89.6	89.5
1.00	87.6	90.0	90.0
1.20	87.3	90.2	90.3
1.30	87.1	90.2	90.3
1.43	86.7	90.1	90.3
--	-	-	-
--	-	-	-

COSEL

Model	LHA30F-24
Item	Power Factor (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.340	0.199	0.184
0.20	0.483	0.382	0.365
0.40	0.531	0.428	0.410
0.60	0.553	0.452	0.435
0.80	0.565	0.467	0.449
1.00	0.573	0.476	0.459
1.20	0.580	0.483	0.465
1.30	0.581	0.484	0.467
1.43	0.586	0.487	0.470
--	-	-	-
--	-	-	-

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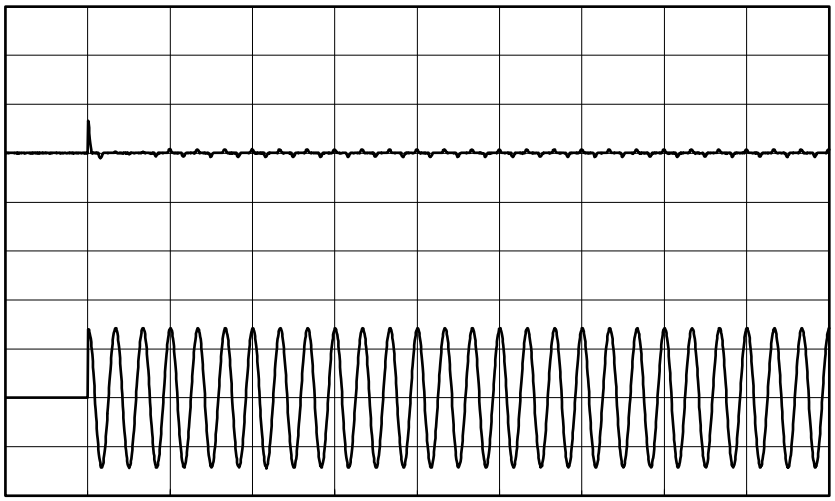
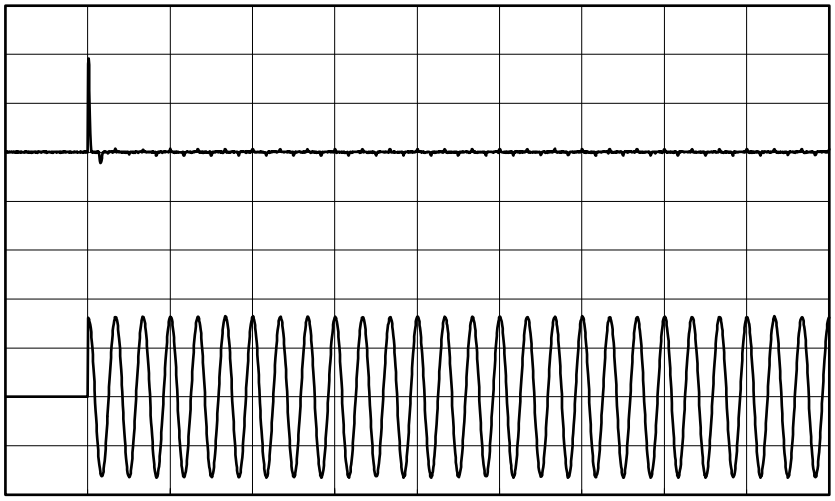
Model	LHA30F-24		
Item	Inrush Current	Temperature	25°C
		Testing Circuitry	Figure A
Object	———————		



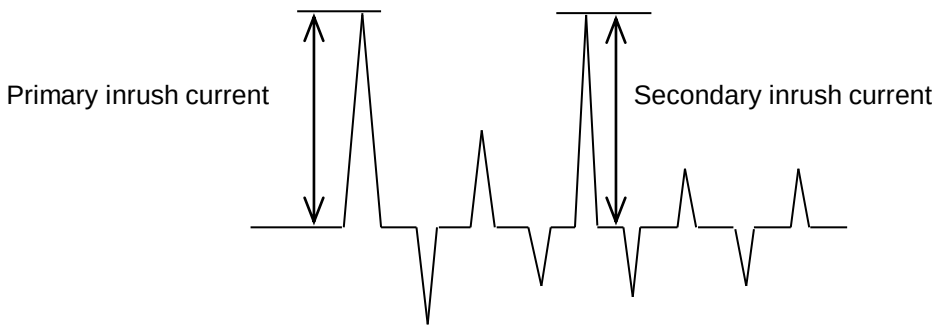
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
13.1 A
Secondary inrush current :
1.7 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
38.3 A
Secondary inrush current :
1.4 A



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Model	LHA30F-24		
Item	Leakage Current	Temperature	25°C
		Testing Circuitry	Figure B
Object	———————————		

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	230 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.10	0.17	0.17	Operation
		One of phases	0.16	0.44	0.45	Stand by
IEC62368-1	Figure B-2	Both phases	0.11	0.29	0.30	Operation
		One of phases	0.17	0.43	0.46	Stand by
	Figure B-3	Both phases	0.11	0.29	0.30	Operation
		One of phases	0.17	0.43	0.46	Stand by

The value for "One of phases" is the reference value only.

2.Condition

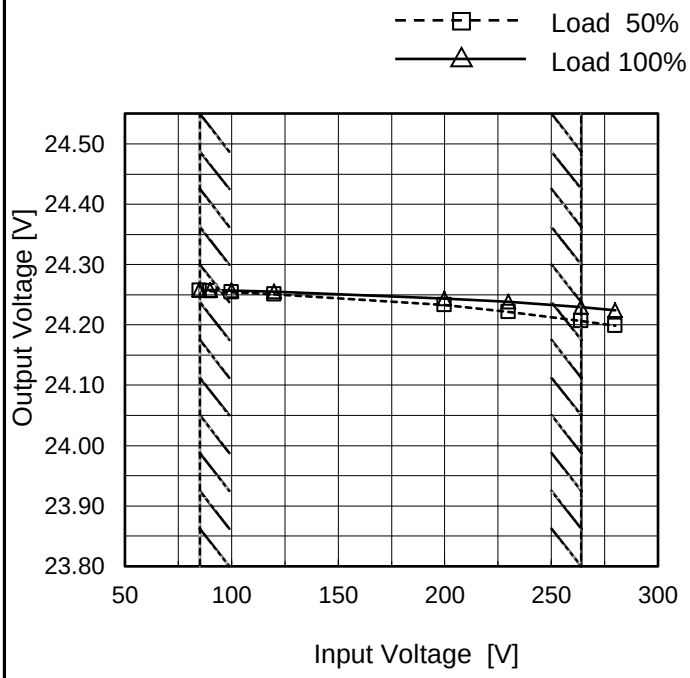
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	LHA30F-24
Item	Line Regulation
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

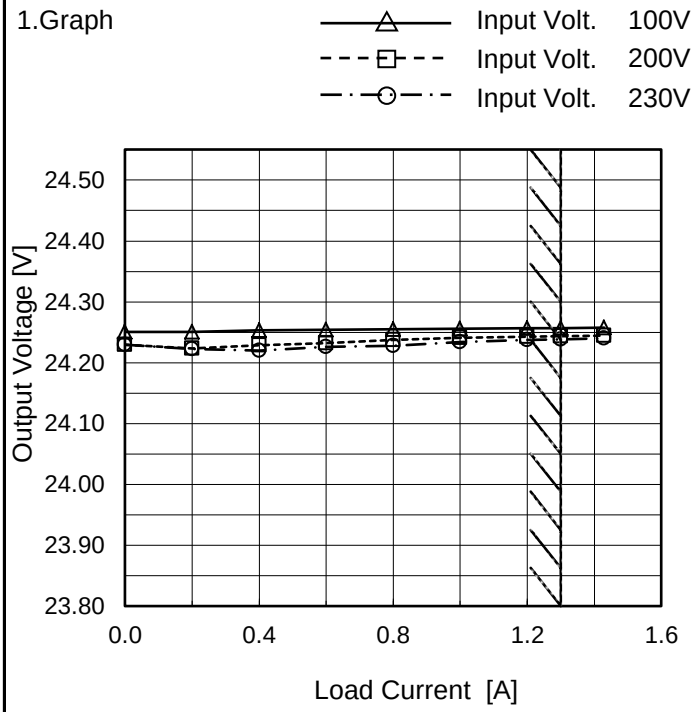
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	24.257	-
90	24.256	24.258
100	24.254	24.257
120	24.251	24.255
200	24.233	24.244
230	24.222	24.238
264	24.207	24.230
280	24.199	24.224
--	-	-

COSEL

Model	LHA30F-24
Item	Load Regulation
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	24.251	24.229	24.229
0.20	24.250	24.223	24.222
0.40	24.253	24.229	24.220
0.60	24.254	24.232	24.226
0.80	24.255	24.237	24.228
1.00	24.256	24.241	24.234
1.20	24.257	24.243	24.237
1.30	24.257	24.244	24.238
1.43	24.257	24.245	24.240
--	-	-	-
--	-	-	-

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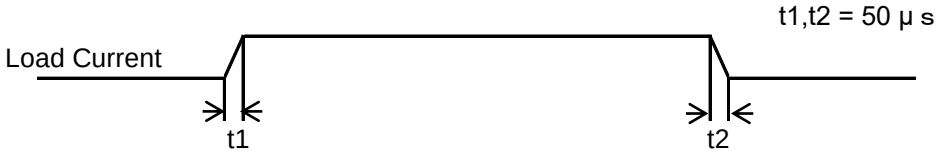
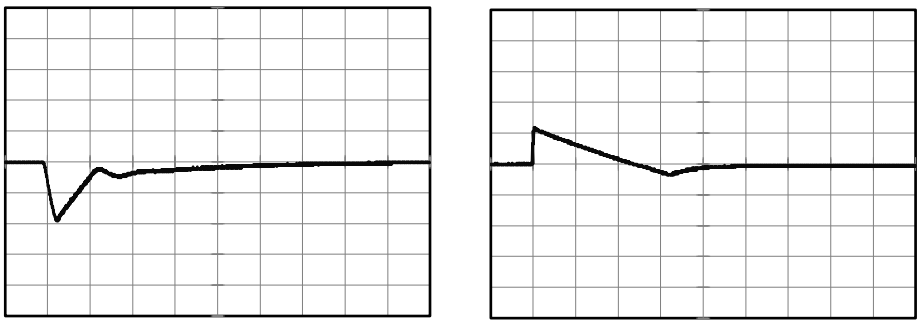
Model	LHA30F-24		
Item	Dynamic Load Response	Temperature Testing Circuitry	25°C Figure A
Object	+24V1.3A		

Input Volt. 230 V
Cycle 1000 ms



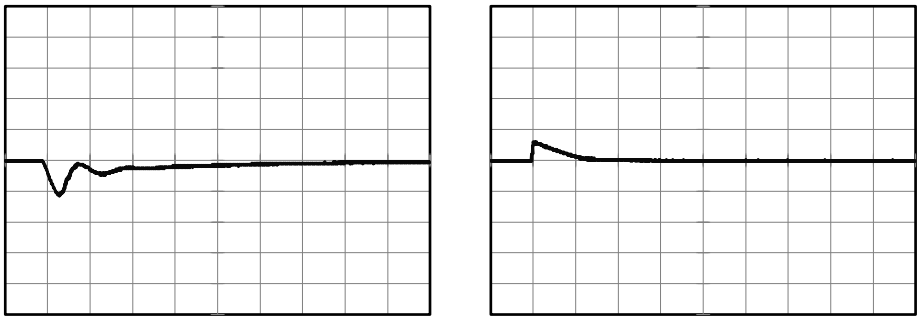
Min.Load (0A)←→
Load 100% (1.3A)



200 mV/div

800 μs/div 4 ms/div

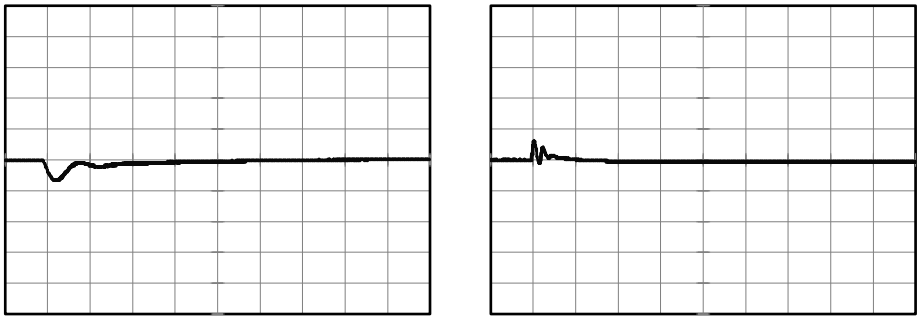
Min.Load (0A)←→
Load 50% (0.65A)



200 mV/div

800 μs/div 4 ms/div

Load 50% (0.65A)←→
Load 100% (1.3A)



200 mV/div

800 μs/div 4 ms/div

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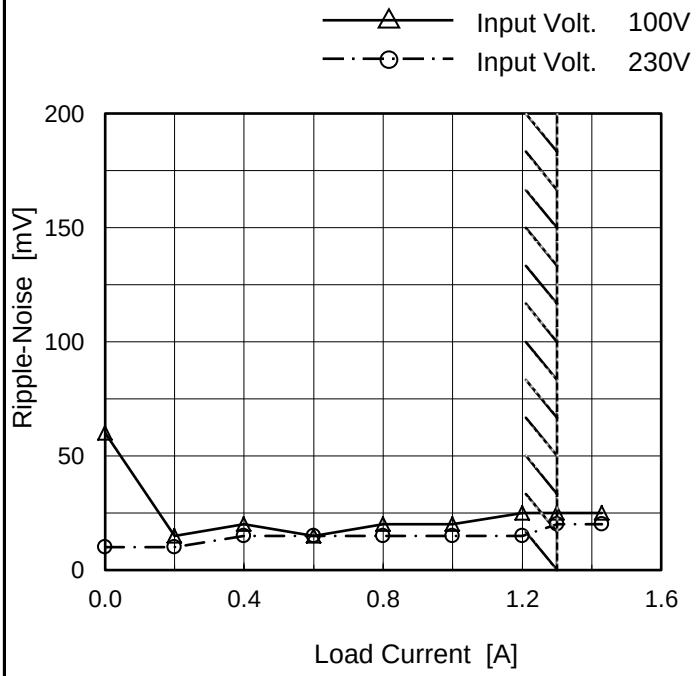
Model	LHA30F-24
Item	Ripple-Noise(by Load Current)
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



Measured by 20 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

T1: Due to AC Input Line
T2: Due to Switching

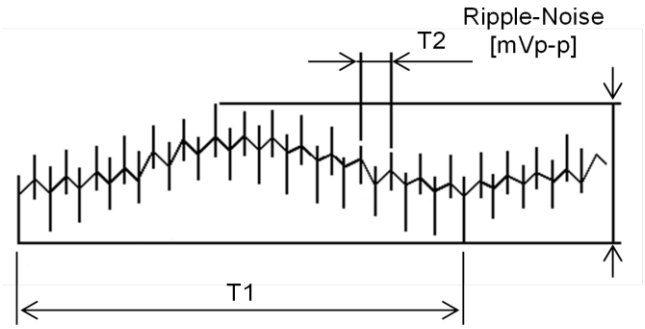


Fig. Complex Ripple Wave Form

2.Values

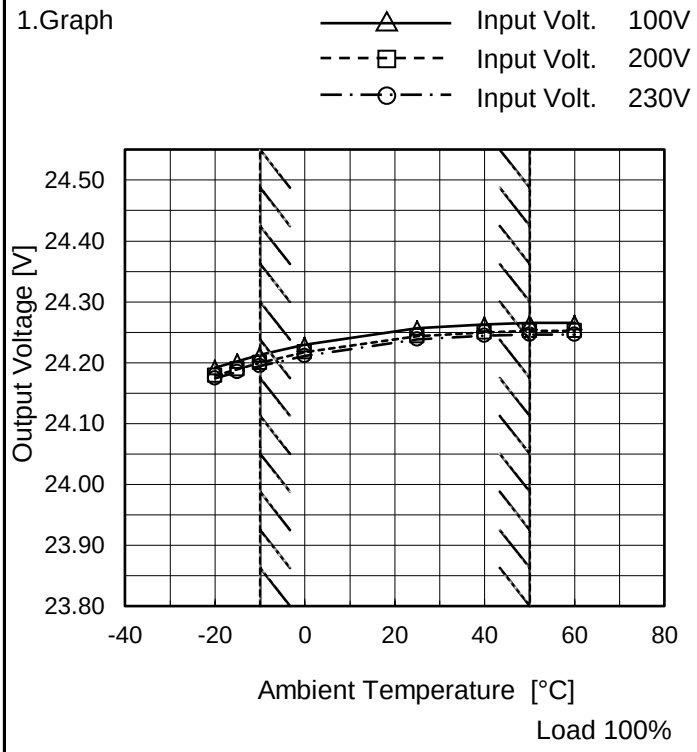
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.00	60	10
0.20	15	10
0.40	20	15
0.60	15	15
0.80	20	15
1.00	20	15
1.20	25	15
1.30	25	20
1.43	25	20
--	-	-
--	-	-

COSEL

Model	LHA30F-24
Item	Ambient Temperature Drift
Object	+24V1.3A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	24.191	24.178	24.174
-15	24.203	24.190	24.185
-10	24.213	24.200	24.195
0	24.230	24.217	24.211
25	24.257	24.244	24.238
40	24.263	24.250	24.245
50	24.265	24.252	24.246
60	24.265	24.252	24.246
--	-	-	-
--	-	-	-
--	-	-	-

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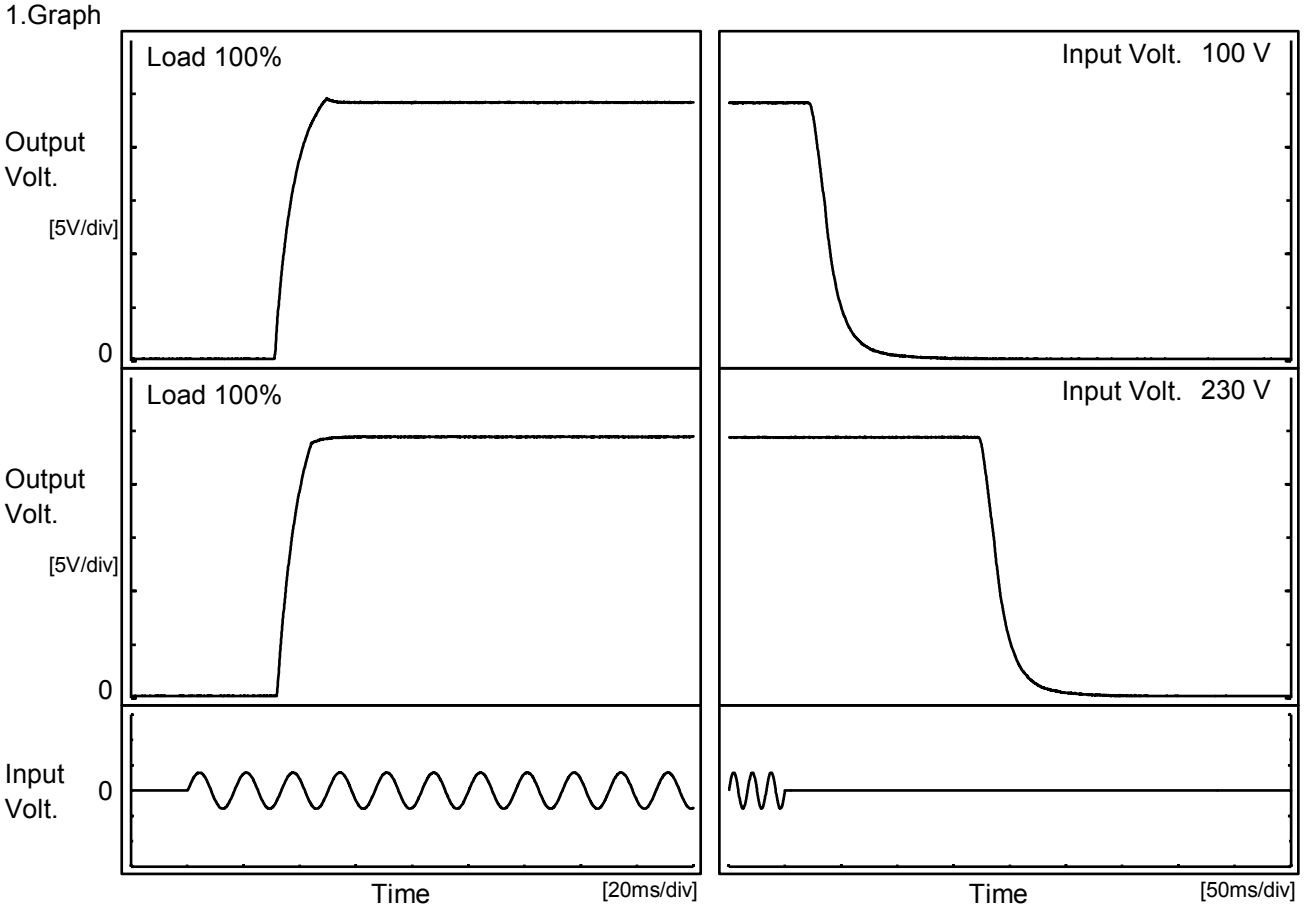
Model	LHA30F-24	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+24V1.3A	

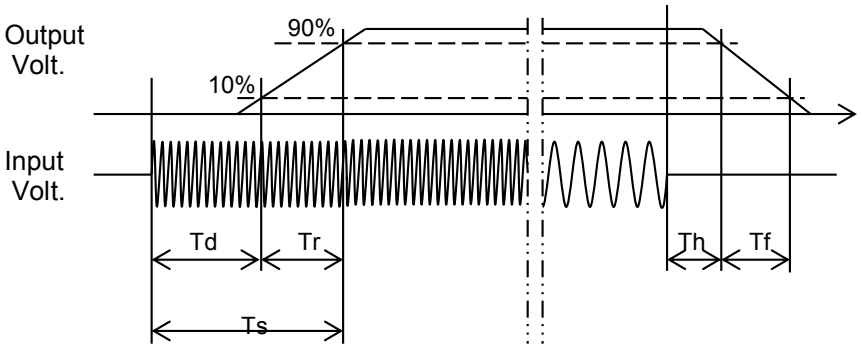
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	31.8	11.8	43.6	26.5	33.5
230 V	30.4	9.7	40.1	179.8	142.3

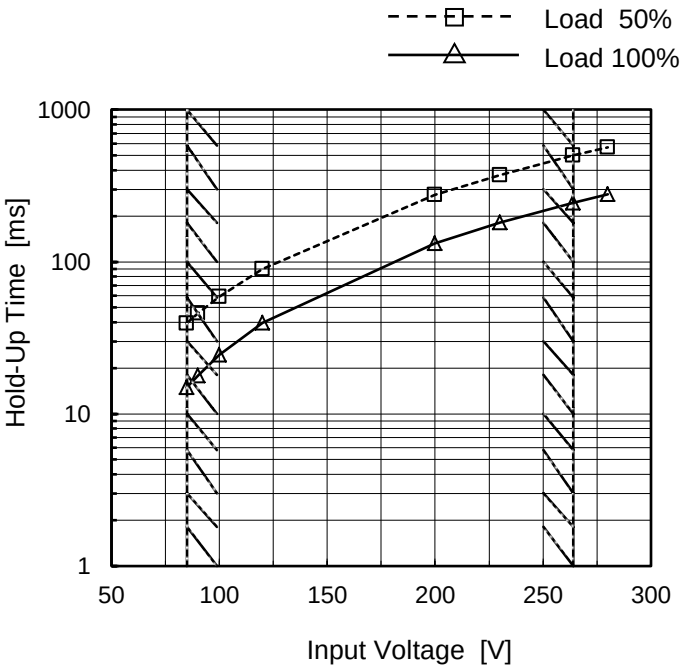


COSEL

Model	LHA30F-24
Item	Hold-Up Time
Object	+24V1.3A

Temperature 25°C
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.

2.Values

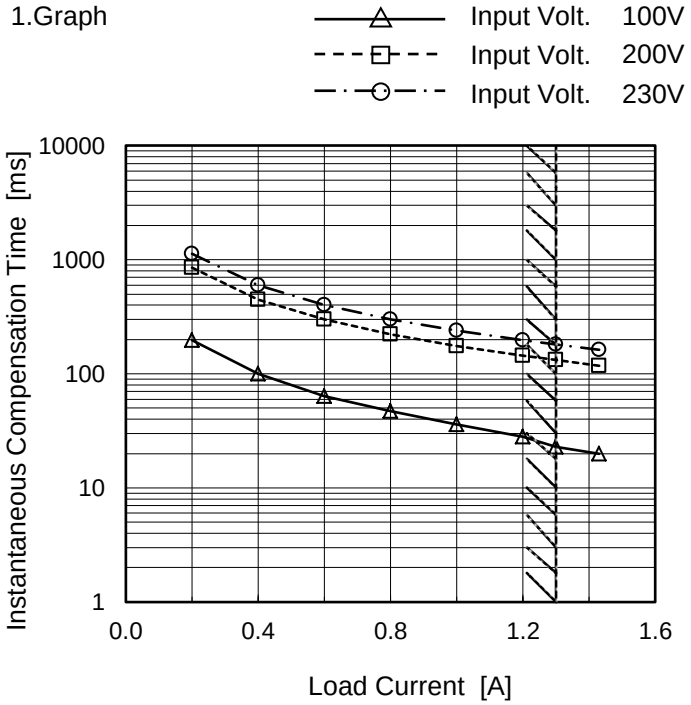
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	40	-
90	46	18
100	59	24
120	90	40
200	276	132
230	372	181
264	500	245
280	566	279
--	-	-

COSEL

Model	LHA30F-24
Item	Instantaneous Interruption Compensation
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

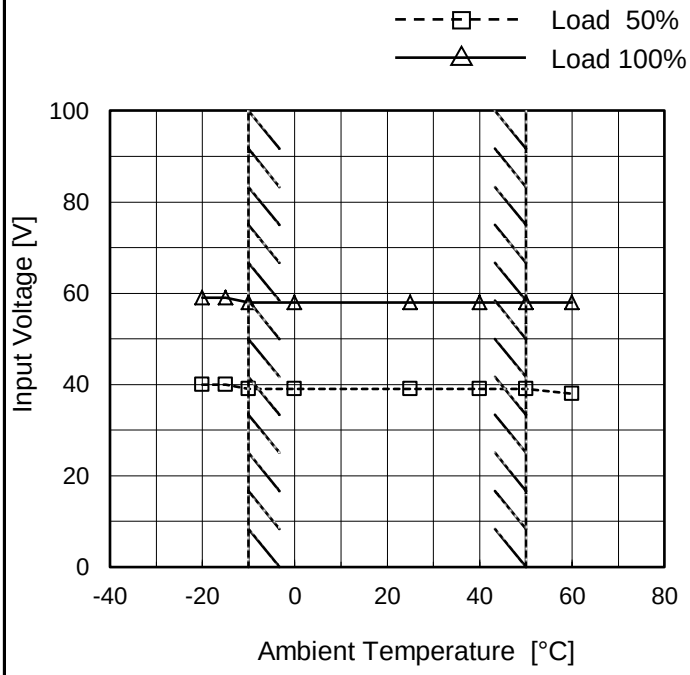
Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.20	198	851	1132
0.40	100	446	598
0.60	64	299	403
0.80	47	222	299
1.00	36	176	239
1.20	28	145	197
1.30	23	132	181
1.43	20	118	162
--	-	-	-
--	-	-	-

COSEL

Model	LHA30F-24
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V1.3A

Testing Circuitry Figure A

1.Graph



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

2.Values

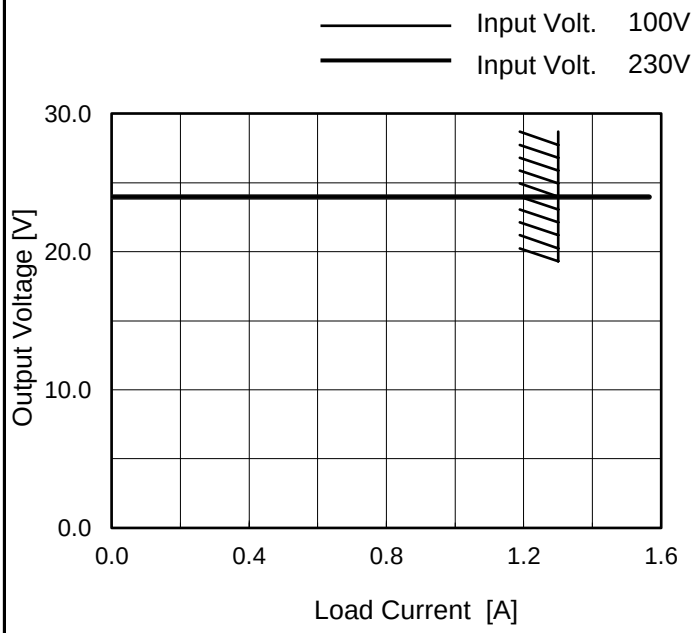
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	40	59
-15	40	59
-10	39	58
0	39	58
25	39	58
40	39	58
50	39	58
60	38	58
--	-	-
--	-	-
--	-	-

COSEL

Model	LHA30F-24
Item	Overcurrent Protection
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Overcurrent protection is Hiccup mode.

2.Values

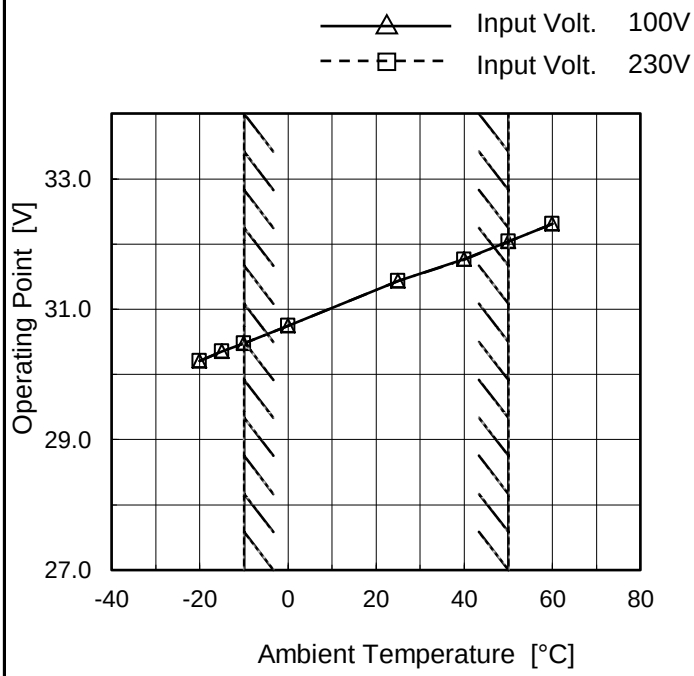
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
24.0	1.57	1.57
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	LHA30F-24
Item	Overvoltage Protection
Object	+24V1.3A

Testing Circuitry Figure A

1.Graph



Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-20	30.21	30.21
-15	30.35	30.35
-10	30.48	30.48
0	30.75	30.75
25	31.43	31.43
40	31.77	31.76
50	32.04	32.04
60	32.31	32.31
--	-	-
--	-	-
--	-	-

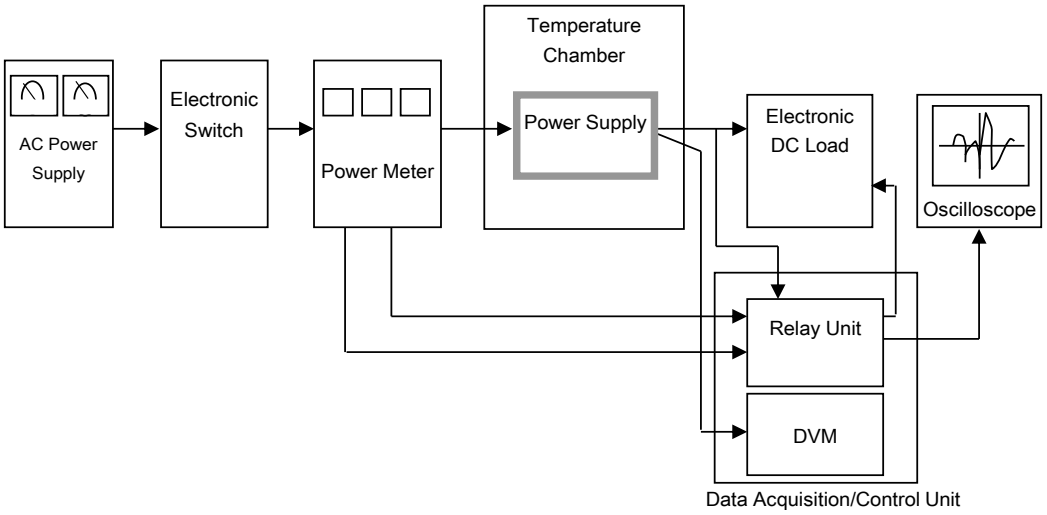


Figure A

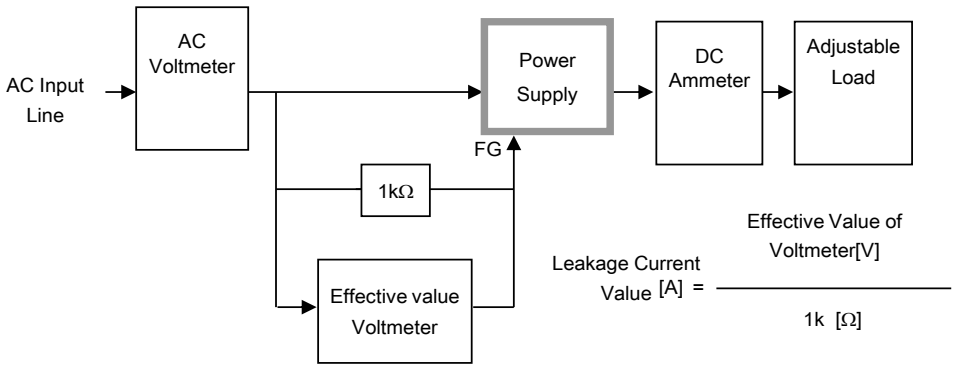


Figure B-1 (DEN-AN)

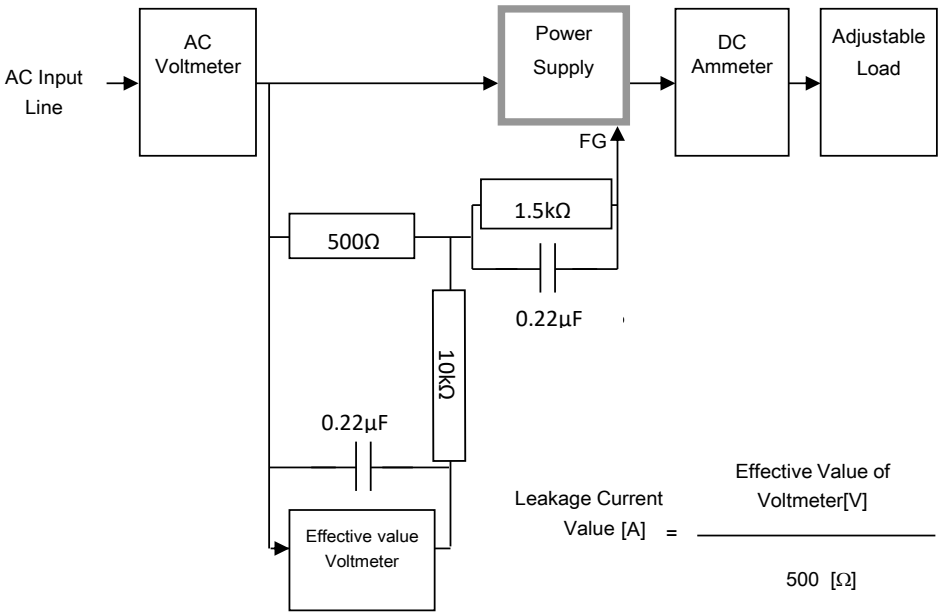


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

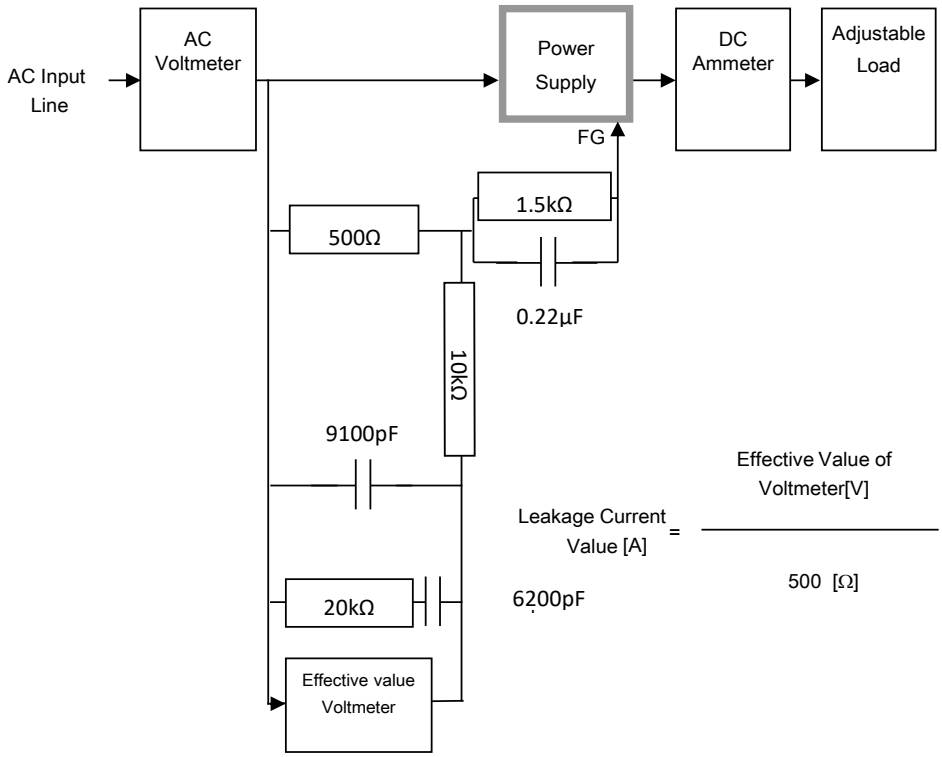
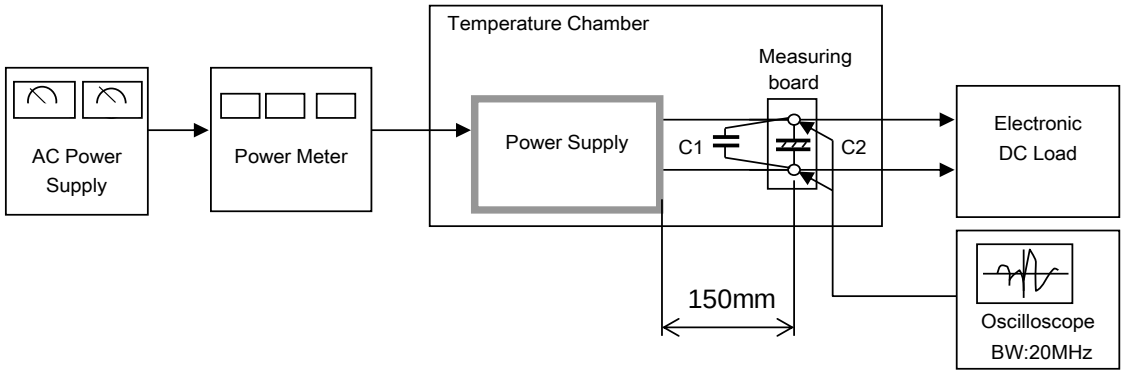


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)



C1= 0.1 μF
(Film capacitor)
C2= 22 μF
(Electrolytic capacitor)

Figure C