COSEL

参考資料

TEST DATA OF LHA30F-3R3-Y

Regulated DC Power Supply
September 5, 2019

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COSEL CO.,LTD.

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Item	Input Current (by Load Current)
Object	————————

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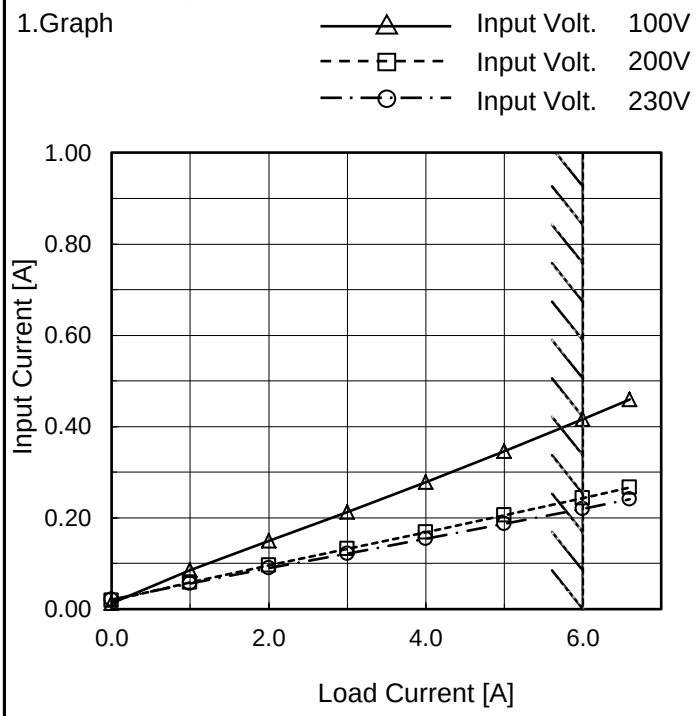
Testing Circuitry Figure A

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]
0.0	0.012	0.018	0.020
1.0	0.085	0.059	0.056
2.0	0.149	0.096	0.090
3.0	0.213	0.132	0.121
4.0	0.278	0.168	0.154
5.0	0.346	0.205	0.186
6.0	0.416	0.243	0.220
6.6	0.460	0.266	0.241
--	-	-	-
--	-	-	-
--	-	-	-

BC-11419

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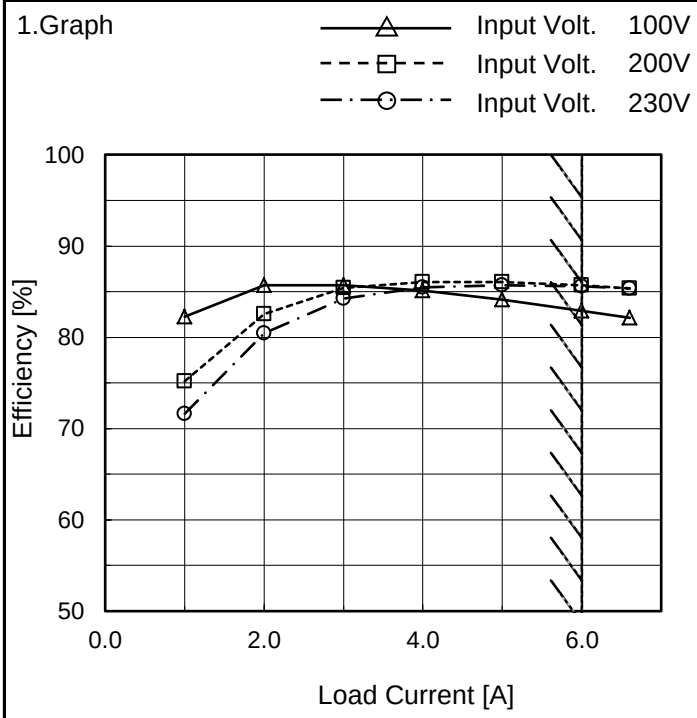
Model	LHA30F-3R3-Y
Item	Efficiency (by Load Current)
Object	————————

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]
0.0	-	-	-
1.0	82.3	75.2	71.6
2.0	85.7	82.5	80.5
3.0	85.7	85.4	84.2
4.0	85.1	86.1	85.5
5.0	84.1	86.1	85.7
6.0	82.9	85.7	85.6
6.6	82.1	85.4	85.3
--	-	-	-
--	-	-	-
--	-	-	-

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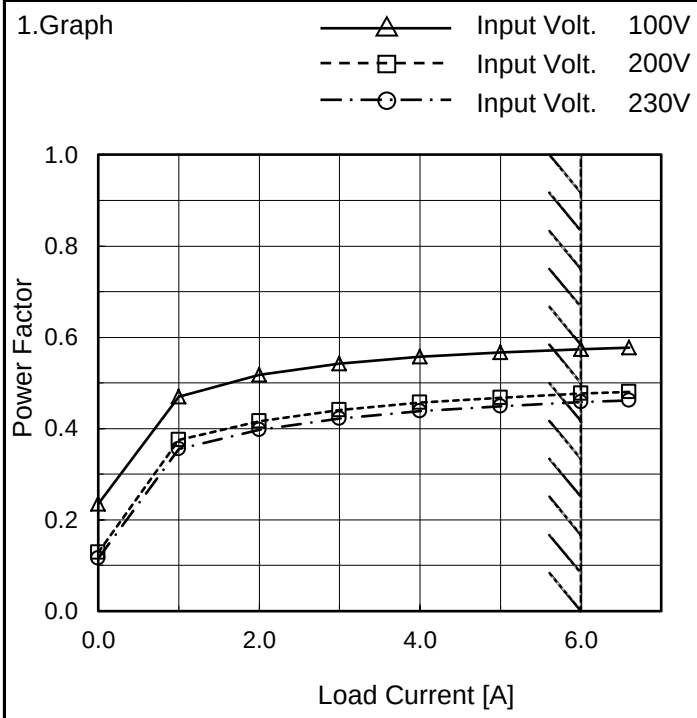
Model	LHA30F-3R3-Y
Item	Power Factor (by Load Current)
Object	———————

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]
0.0	0.235	0.129	0.115
1.0	0.469	0.375	0.355
2.0	0.517	0.416	0.397
3.0	0.542	0.440	0.421
4.0	0.557	0.456	0.438
5.0	0.567	0.468	0.449
6.0	0.574	0.476	0.458
6.6	0.577	0.480	0.462
--	-	-	-
--	-	-	-
--	-	-	-

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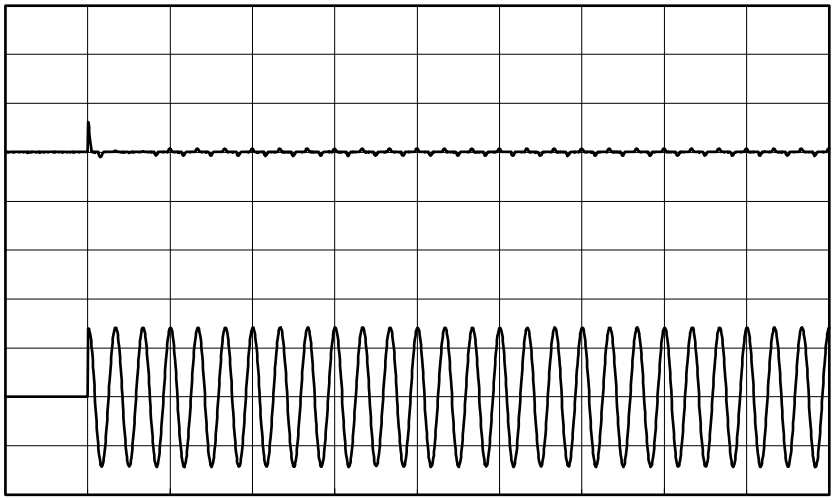
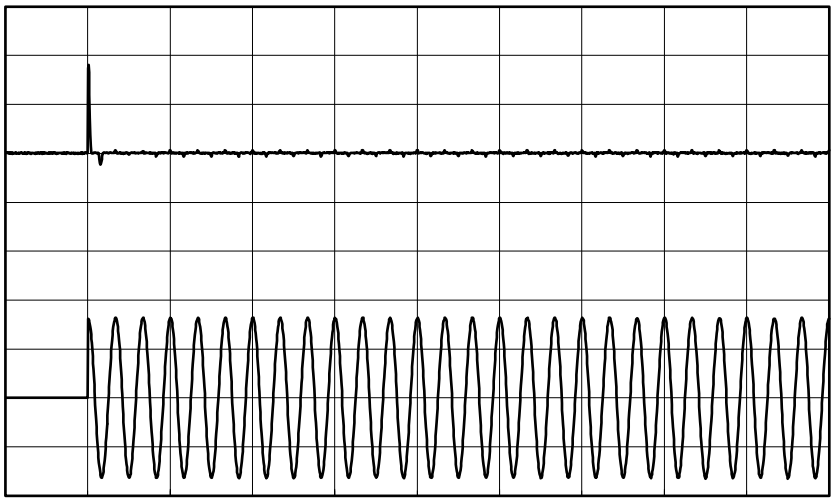
Model	LHA30F-3R3-Y		
Item	Inrush Current	Temperature	25°C
		Testing Circuitry	Figure A
Object	―――――――		



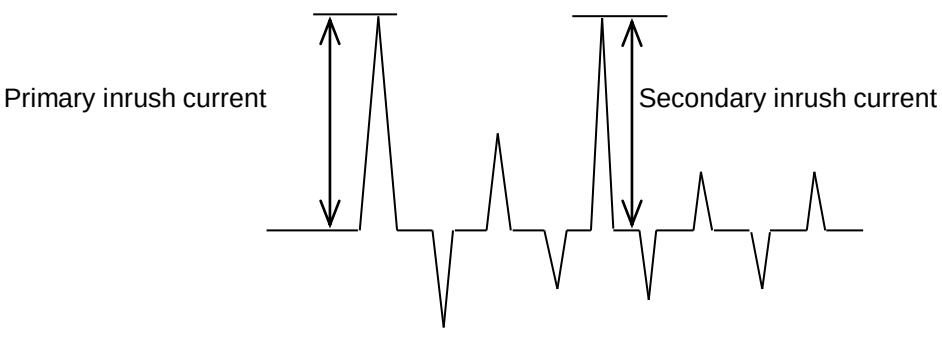
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
12.3 A
Secondary inrush current :
1.6 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
36.1 A
Secondary inrush current :
1.4 A



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Model	LHA30F-3R3-Y		
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.

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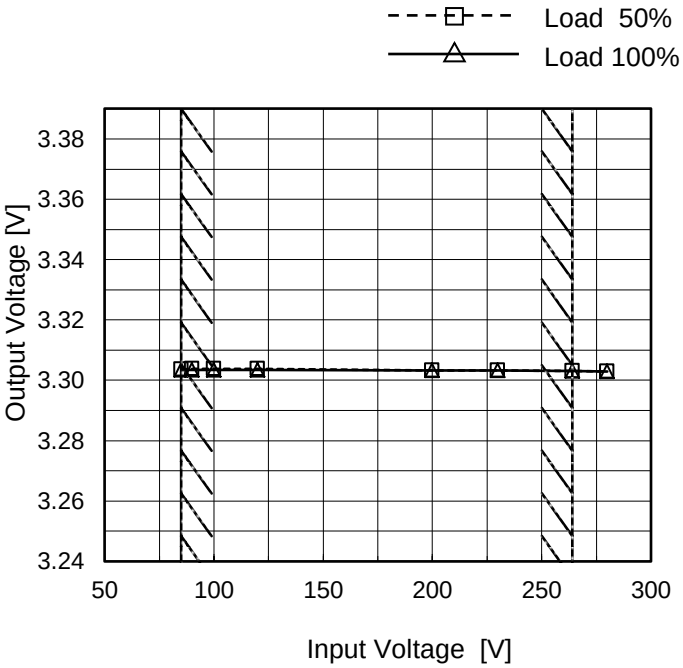
Model	LHA30F-3R3-Y
Item	Line Regulation
Object	+3.3V6A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

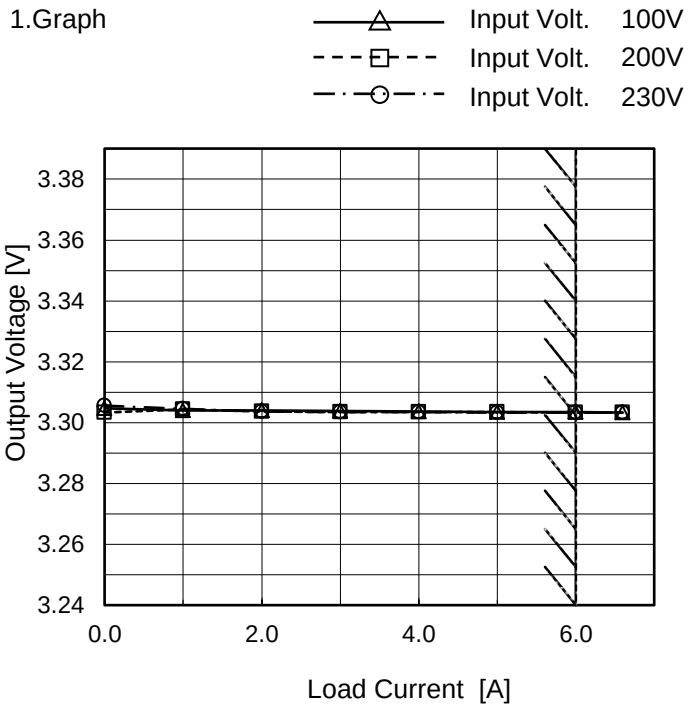
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	3.304	-
90	3.304	3.303
100	3.304	3.304
120	3.304	3.304
200	3.303	3.303
230	3.303	3.303
264	3.303	3.303
280	3.303	3.303
--	-	-

COSEL

Model	LHA30F-3R3-Y
Item	Load Regulation
Object	+3.3V6A

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]
0.0	3.305	3.303	3.306
1.0	3.304	3.304	3.305
2.0	3.304	3.304	3.304
3.0	3.304	3.304	3.304
4.0	3.304	3.304	3.303
5.0	3.304	3.303	3.303
6.0	3.303	3.303	3.303
6.6	3.303	3.303	3.303
--	-	-	-
--	-	-	-
--	-	-	-

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Model	LHA30F-3R3-Y		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+3.3V6A		

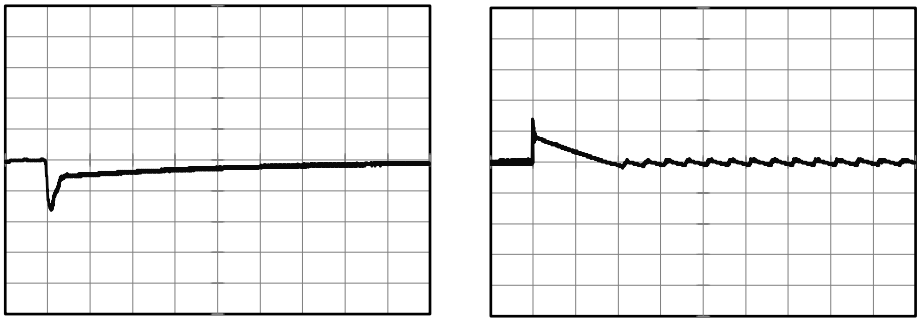
Input Volt. 230 V
Cycle 1000 ms

t1,t2 = 50 μ s

Load Current

t1 t2

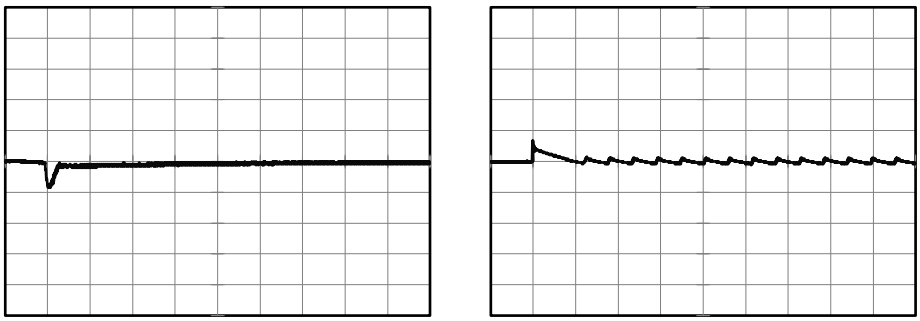
Min.Load (0A)←→
Load 100% (6A)



200 mV/div

800 μs/div 4 ms/div

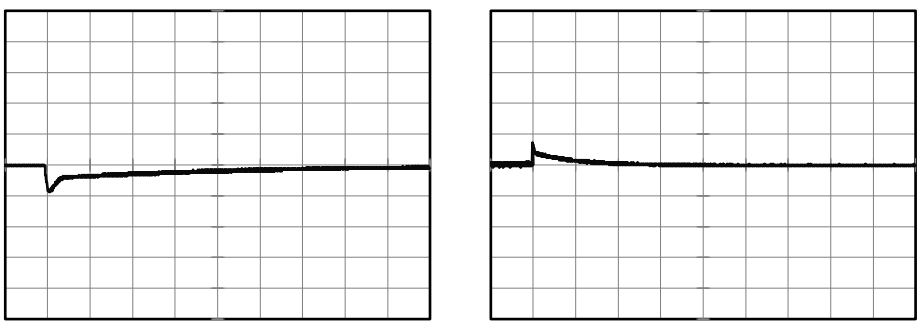
Min.Load (0A)←→
Load 50% (3A)



200 mV/div

800 μs/div 4 ms/div

Load 50% (3A)←→
Load 100% (6A)



200 mV/div

800 μs/div 4 ms/div

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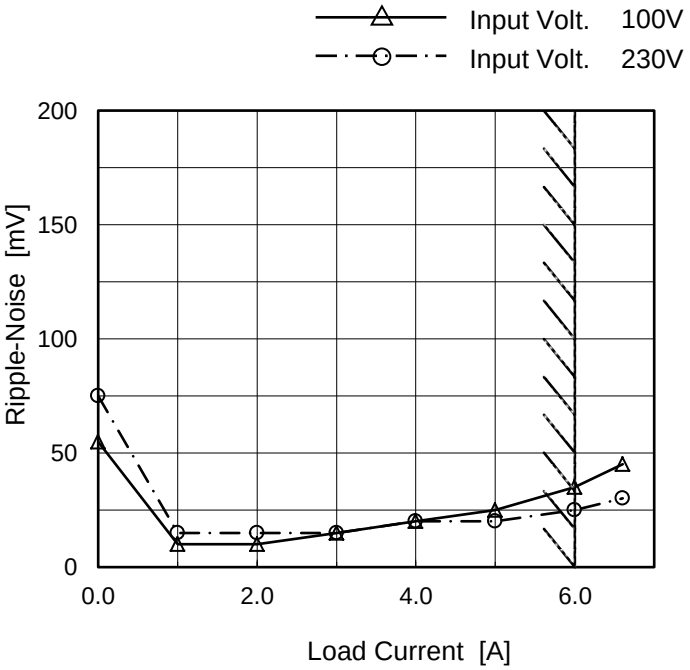
Model	LHA30F-3R3-Y
Item	Ripple-Noise(by Load Current)
Object	+3.3V6A

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

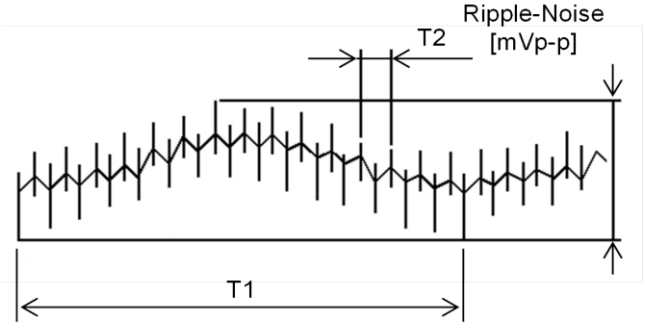


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	55	75
1.0	10	15
2.0	10	15
3.0	15	15
4.0	20	20
5.0	25	20
6.0	35	25
6.6	45	30
--	-	-
--	-	-
--	-	-

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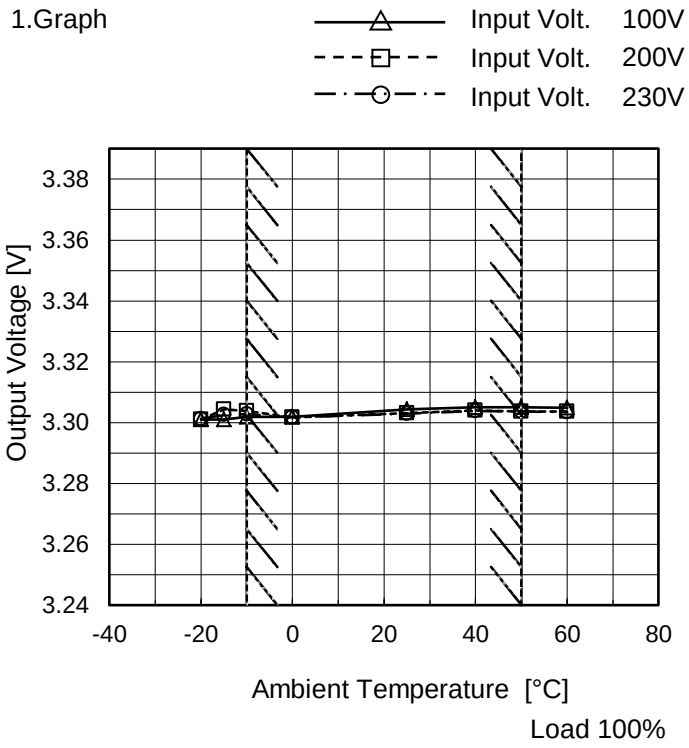
Model	LHA30F-3R3-Y
Item	Ambient Temperature Drift
Object	+3.3V6A

Testing Circuitry Figure A

1.Graph



Load 100%

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	3.301	3.301	3.301
-15	3.301	3.304	3.303
-10	3.302	3.304	3.303
0	3.302	3.302	3.302
25	3.304	3.303	3.303
40	3.305	3.304	3.304
50	3.305	3.304	3.304
60	3.305	3.304	3.303
--	-	-	-
--	-	-	-
--	-	-	-

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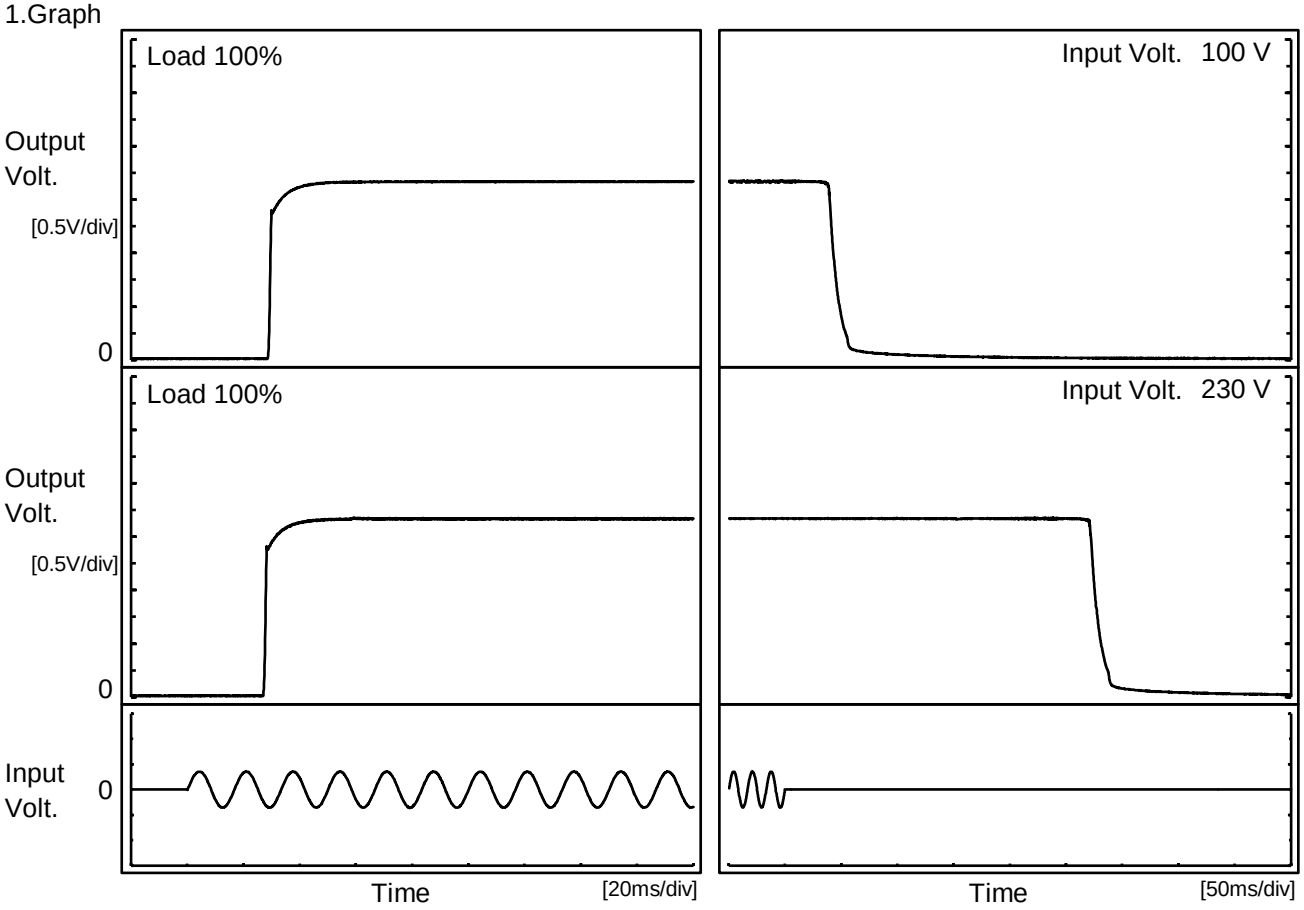
Model	LHA30F-3R3-Y	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+3.3V6A	

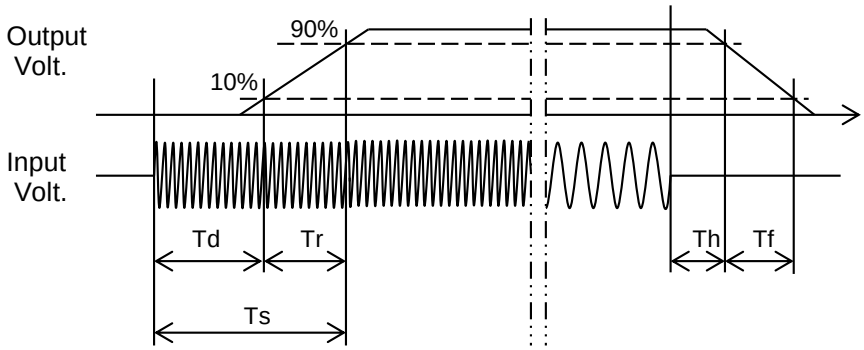
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	29.0	4.2	33.2	39.8	16.0
230 V	27.4	3.9	31.3	272.0	16.3

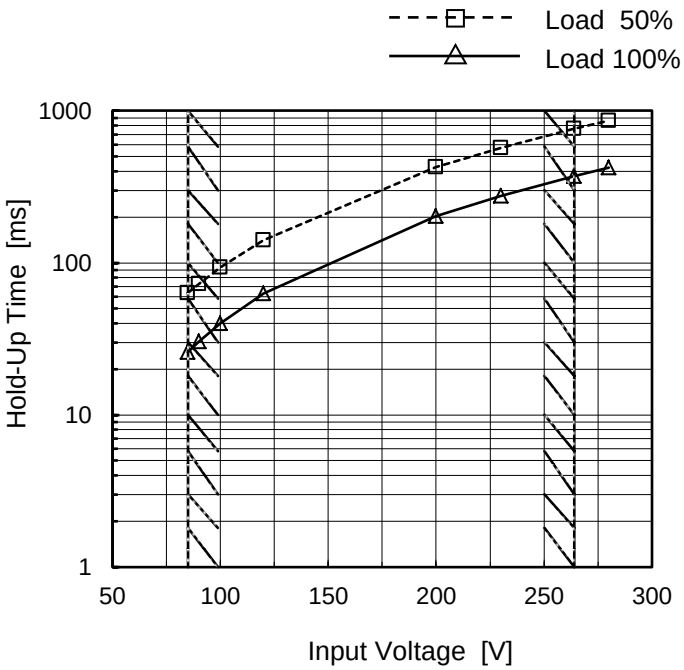


COSEL

Model	LHA30F-3R3-Y
Item	Hold-Up Time
Object	+3.3V6A

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	64	-
90	73	30
100	93	40
120	141	63
200	427	203
230	572	275
264	762	372
280	862	423
--	-	-

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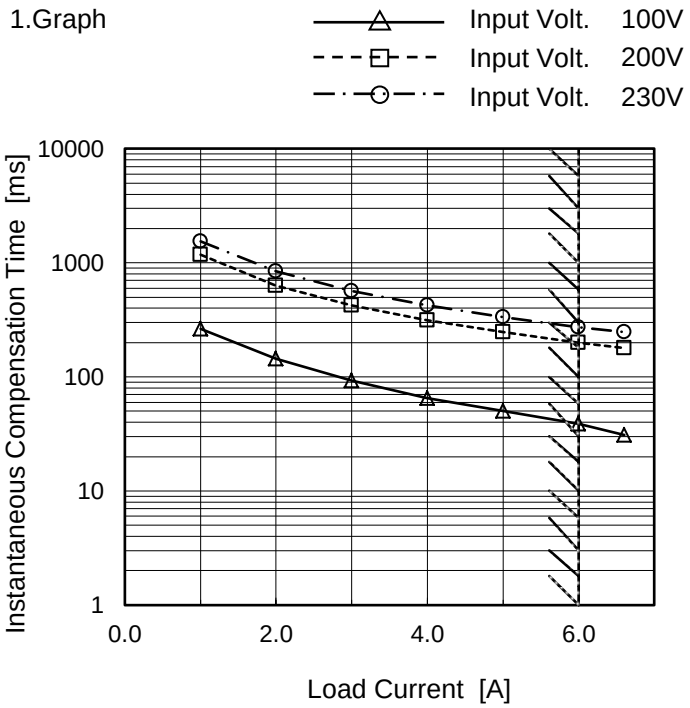
Model	LHA30F-3R3-Y
Item	Instantaneous Interruption Compensation
Object	+3.3V6A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

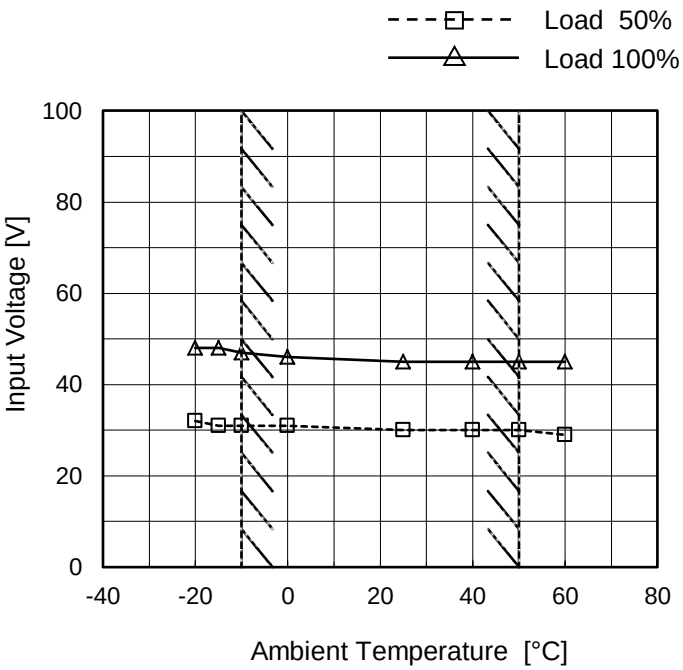
Load Current [A]	Time [ms] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.0	265	1180	1548
2.0	145	631	846
3.0	93	423	569
4.0	65	314	422
5.0	50	247	335
6.0	39	200	272
6.6	31	180	246
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LHA30F-3R3-Y
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V6A

Testing Circuitry Figure A

1.Graph



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

2.Values

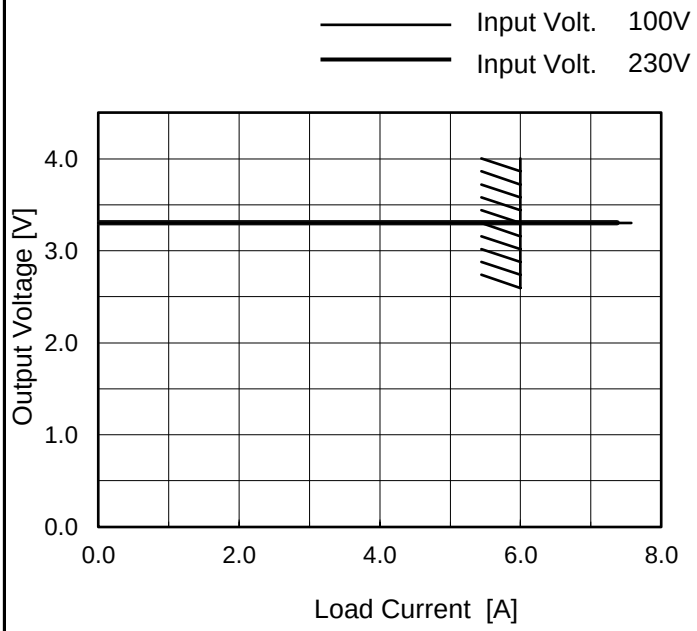
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	32	48
-15	31	48
-10	31	47
0	31	46
25	30	45
40	30	45
50	30	45
60	29	45
--	-	-
--	-	-
--	-	-

COSEL

Model	LHA30F-3R3-Y
Item	Overcurrent Protection
Object	+3.3V6A

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]
3.3	7.57	7.37
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

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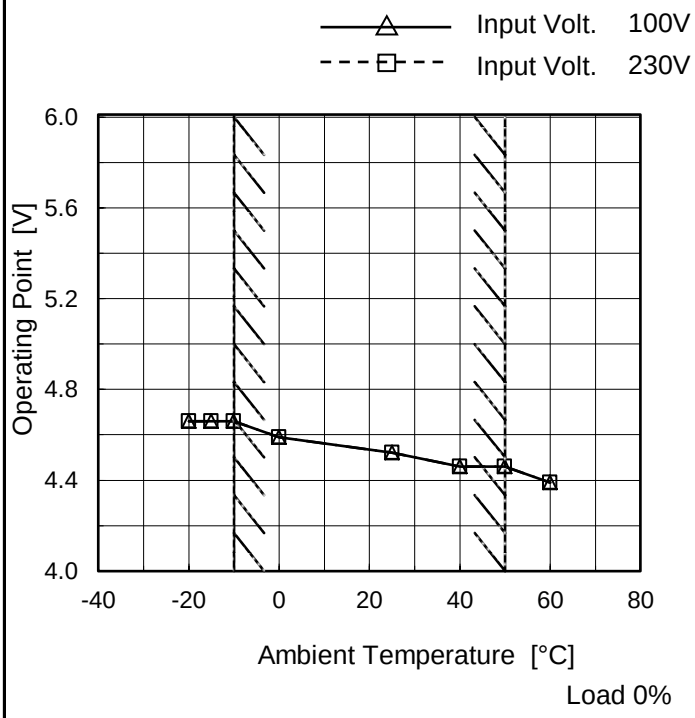
Model	LHA30F-3R3-Y
Item	Overvoltage Protection
Object	+3.3V6A

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	4.66	4.66
-15	4.66	4.66
-10	4.66	4.66
0	4.59	4.59
25	4.52	4.52
40	4.46	4.46
50	4.46	4.46
60	4.39	4.39
--	-	-
--	-	-
--	-	-

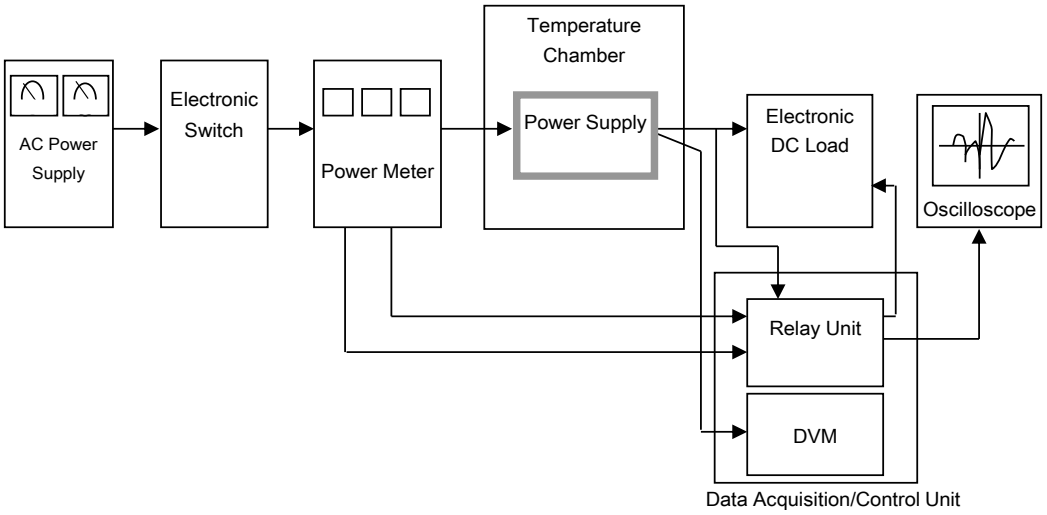


Figure A

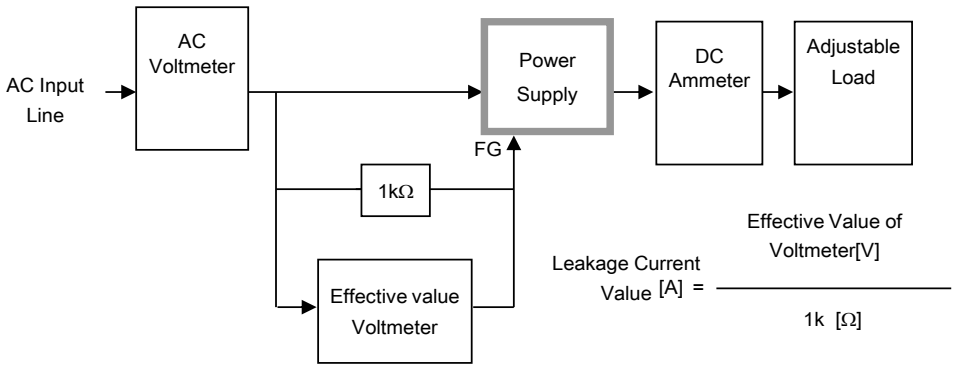


Figure B-1 (DEN-AN)

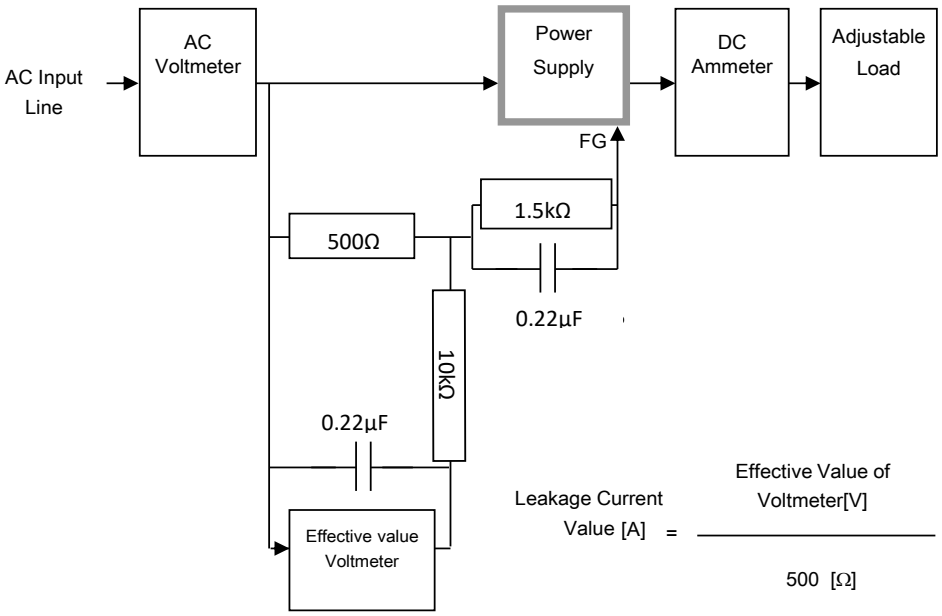


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

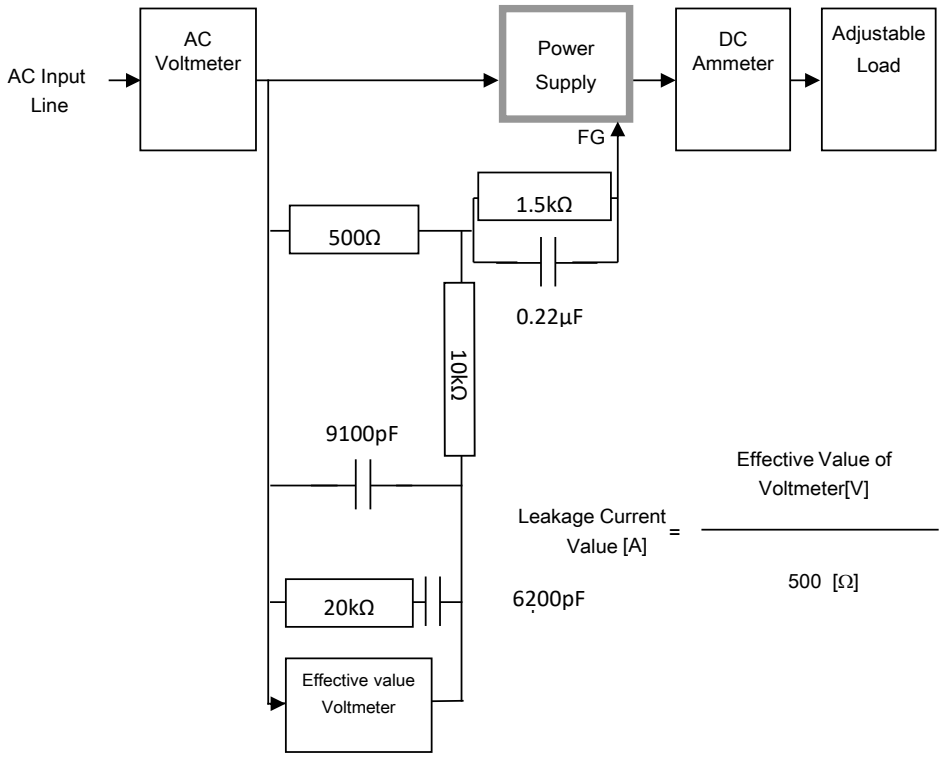
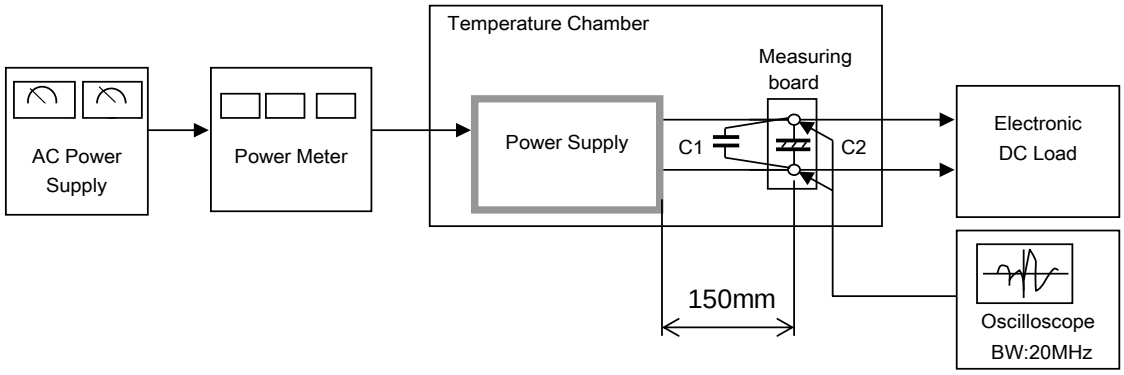


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)



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

Figure C