LED Driver

Indoor 15 W Dimmable
SI-EPF00664OWW

Constant Current LED Driver
Wide Operating Range up to 0.5 A – Dimmable

Features & Benefits

- Output Current Range: 0.18 ~ 0.5 A (adjustable via LED set)
- Output Voltage Range: 20 ~ 50 Vdc
- Output Power Range: 3.6 ~ 15 W
- Dimming Control: 0-10 V
- Input Voltage: 120 ~ 277 Vac 50/60 Hz
- Safety: UL / cUL (UL 60950 + UL 8750)
- EMI: FCC Part 15 Class B
- Protections: Open Load, Short Circuit
- t_a Range: -20 ~ +50 °C
- Expected lifetime: 50,000 hours at t_a = 50 °C
- Long lasting & high reliability
- Small compact housing

Applications

- Downlights, Spotlights and other Indoor Lighting Applications

Table of Contents

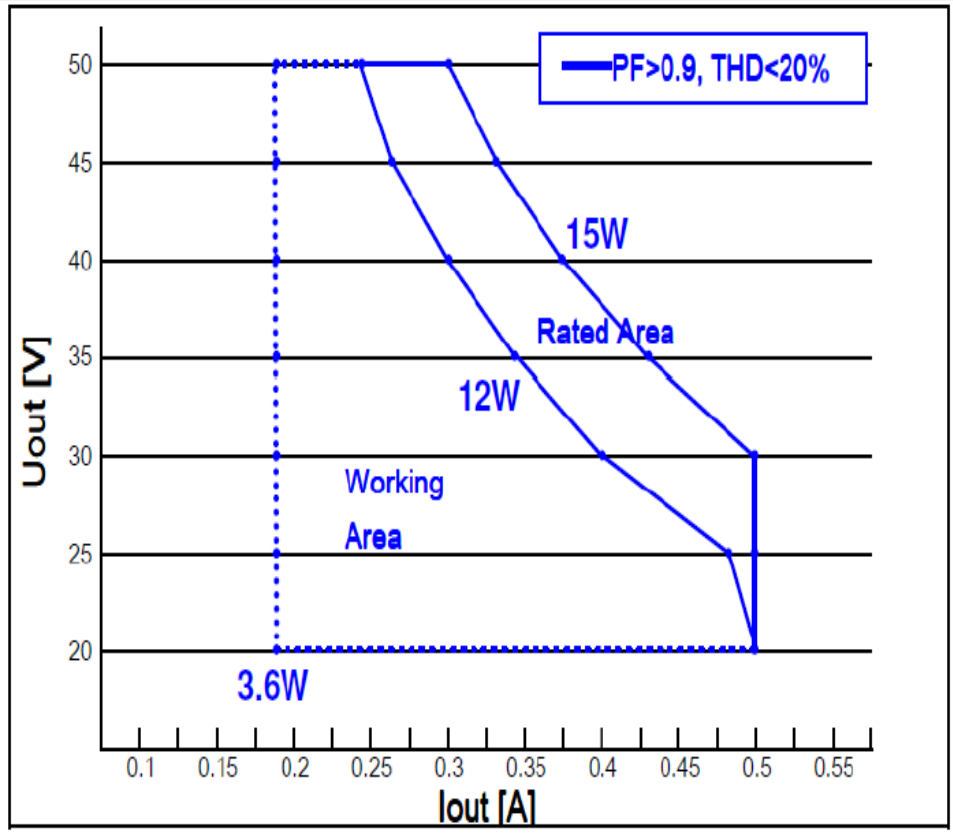
1. Characteristics

Article		Symbol	Specification			Unit	Note
			Min.	Typ.	Max.		
INPUT SPECIFICATIONS							
Nominal Voltage		Vin	120		277	Vac	Full input range, no range switching
Voltage Range			108		305	Vac	
Nominal Frequency		fin	50		60	Hz	
Frequency Range			47		63	Hz	
Input Current	At 120 Vac	Iin			0.18	A	At full load
	At 277 Vac	Iin			0.08	A	At full load
Total Harmonic Distortion		THD			20	%	At Po>12 W, 120-277 Vac
Power Factor		PF	0.9			-	At Po>12 W, 120-277 Vac
Efficiency		η	83	86		%	At full load, 120-277 Vac
Stand-by Power					1	W	At <1 V dimming voltage, 120-277 Vac
Protection Class				2		-	
In-rush Current					20	A_{pk}	Cold or hot start (t_{width} = 350 µs measured at 50 % Ipk) at 277 Vac
OUTPUT SPECIFICATIONS							
Nominal Voltage		Vo		20 ~ 50		Vdc	±2 %; at Io = 0.18-0.5 A
Max. Voltage					59	Vdc	Open circuit, No-load protection
Nominal Current		Io		0.18 ~ 0.5		A	±5 % (0.5 A), ±10 % (0.18 A)
Nominal Power		Po		3.6 ~ 15	15	W	At Io = 0.18-0.5 A, Vo = 20-50 V
Turn-on Delay Time		Td			1	s	At full load, 108 Vac input

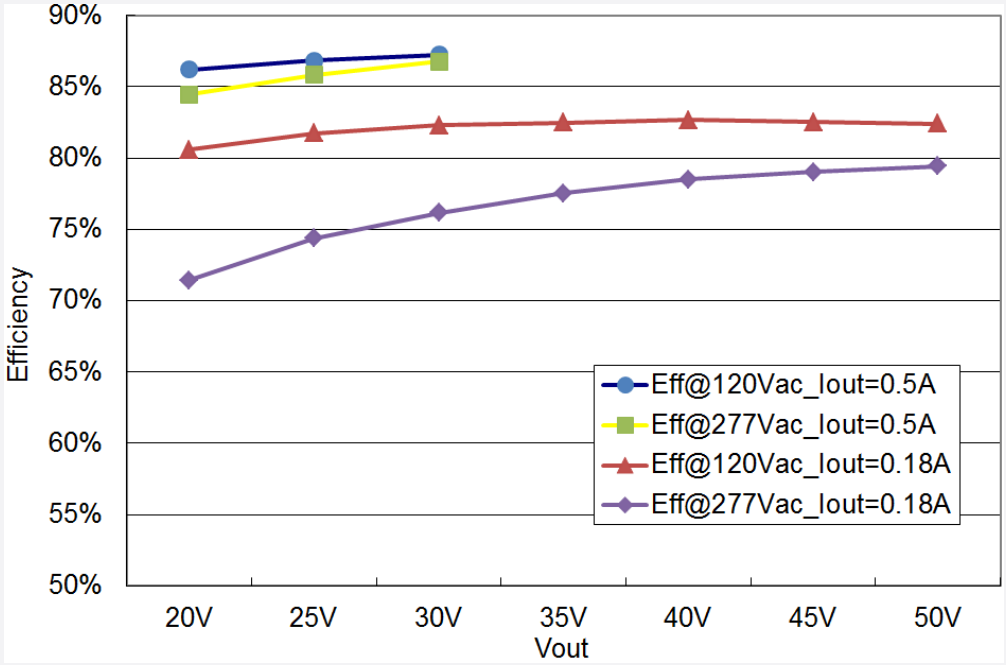
Article		Symbol	Specification			Unit	Note
			Min.	Typ.	Max.		
DIMMING SPECIFICATIONS							
Dimming Control				0-10 V			See Dimming Specification section
ENVIRONMENTAL SPECIFICATIONS							
Ambient Temperature		t_a	-20		50	ºC	
Case Temperature		t_c			90	ºC	Measured at t_c point as indicated on the product label
Storage Temperature		t_s	-25		80	ºC	Cool down before operating
Relative Humidity			20		90	%	Not condensing
Surge Transient Protection	L / N				±1	kV	According to IEC/EN 61547
	LN / GND				±2	kV	
IP Rating				20		-	Suitable for indoor environment
Expected Lifetime (e-cap)			50,000			h	At t_a = 50 ºC, full load, 120-277 Vac
MTBF			100,000			h	At t_a = 25 ºC, full load, 120-277 Vac
Dimensions		L x W x H		4.8 x 3.1 x 1.3		inch	
				123 x 79 x 33		mm	
Net Weight				240		g	± 25 g

2. Typical Characteristics Graphs

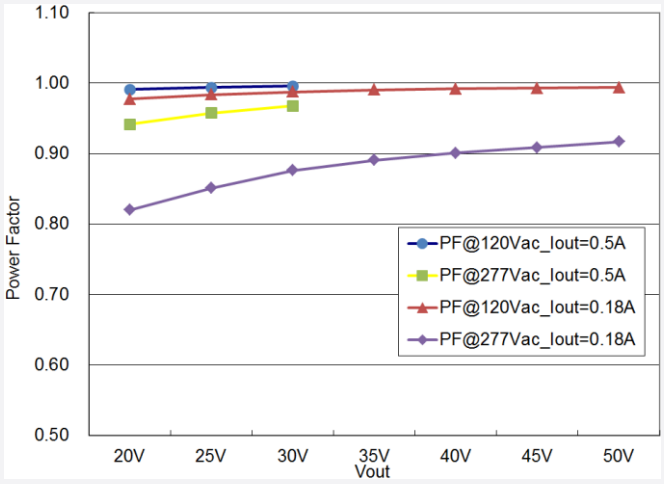
a) Operating Window



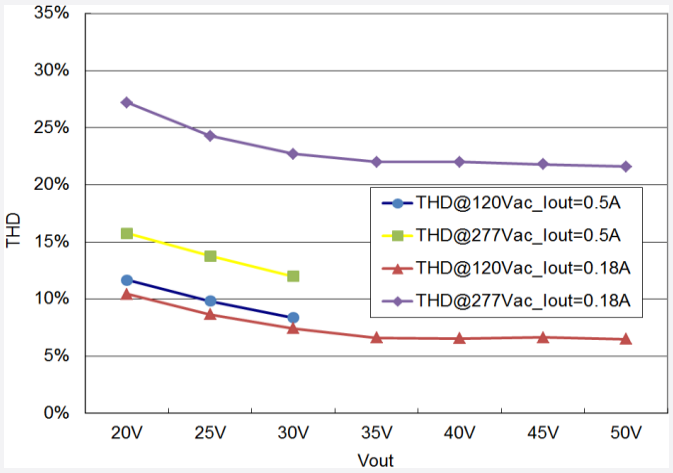
b) Efficiency vs. Load



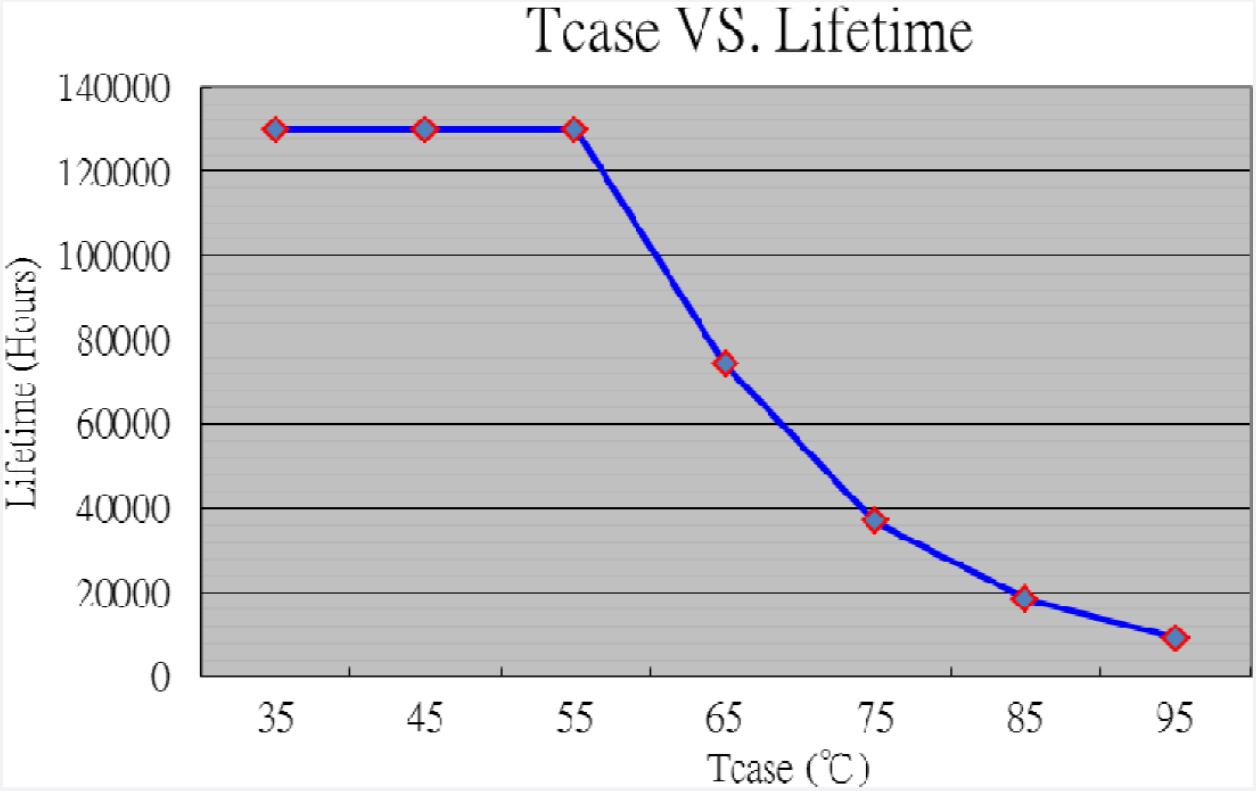
c) Power Factor vs. Load



d) Total Harmonic Distortion vs. Load



e) Total Harmonic Distortion vs. Load



f) Current Setting

The output current can be adjusted using Rset resistor:

- Disconnect Rset resistor to set full load at 0.5 A / 30 V condition
- Connect Rset resistor to set output current (see below table and curve); for Rset = 3.9 kOhm, the output is full load at 0.3 A / 50 V condition
- The unit has minimum output current at 0.18 A when the Rset is 1 kOhm or less
- The output voltage is limited by maximum output power (if the output current is set at 0.5 A, the maximum output voltage will be 30 V; if the output current is set at 0.3 A, the maximum output voltage will be 50 V)

Rset (Ω)	Output Current (A)	Current Tolerance (%)	Output Voltage (V)	Open Load Voltage(V)
1K	0.180	±10	20 ~ 50	52
1.3K	0.190		20 ~ 50	52
1.5K	0.200		20 ~ 50	52
1.6K	0.210		20 ~ 50	52
2K	0.230		20 ~ 50	52
2.4K	0.250		20 ~ 50	52
2.7K	0.265		20 ~ 50	52
3.3K	0.280		20 ~ 50	52
3.9K	0.300		20 ~ 50	52
4.3K	0.310	±7	20 ~ 48	52
4.7K	0.330		20 ~ 46	52
5.6K	0.340		20 ~ 44	52
6.2K	0.350		20 ~ 43	52
6.8K	0.365		20 ~ 42	52
7.5K	0.370		20 ~ 41	51
8.2K	0.380		20 ~ 40	50
9.1K	0.395		20 ~ 39	49
10K	0.400		20 ~ 38	48
11K	0.405		20 ~ 37	47
13K	0.420	±5	20 ~ 37	45
15K	0.430		20 ~ 36	44
20K	0.440		20 ~ 35	42
22K	0.450		20 ~ 34	41
24K	0.460		20 ~ 33	40
30K	0.470		20 ~ 32	40
43K	0.480		20 ~ 31	39
51K	0.490		20 ~ 31	38
82K	0.500		20 ~ 30	37
110K	0.500		20 ~ 30	37

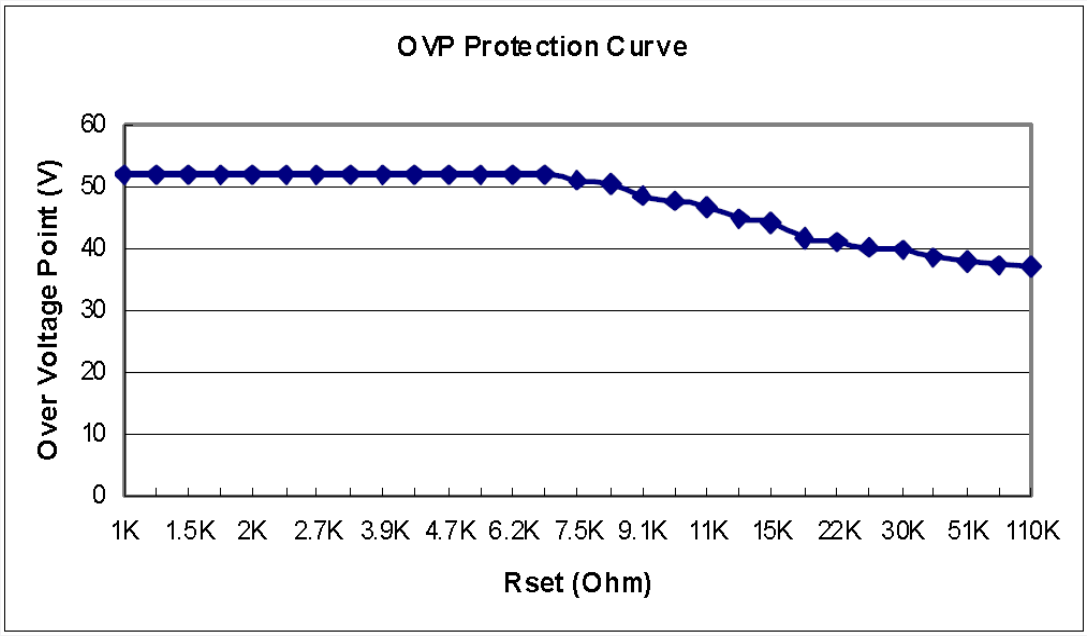
3. Protection

a) Output Short Circuit Protection

The unit is protected when output is short thus avoiding fire hazard, shock hazard and damage to the unit.
After the short circuit fault condition is removed, the unit will be in auto recovery mode.

b) Output Over Voltage Protection

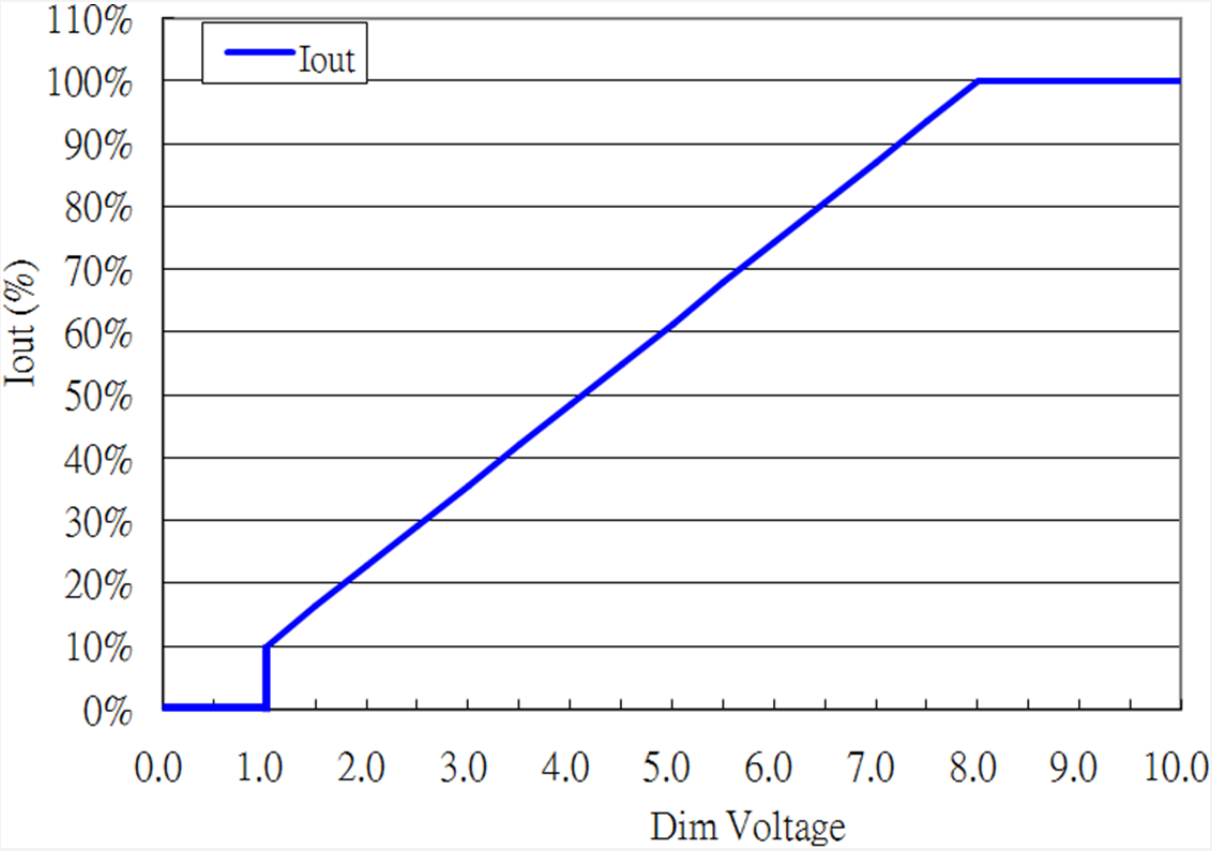
When no load /Open load condition occurs, the unit will clamp output voltage to the OVP Voltage avoiding damage to the unit.
After the load is connected, the unit will be in auto recovery mode.
The OVP Voltage varies according to the Rset resistor value (see below curve and table) and under 59 V.



Protection Specification	Protection Mode	Condition
Short Circuit Protection	Auto-Recovery	(1)AC turn on then output short
		(2)Output short then AC turn on
Open Load Protection	Clamp Open Load Voltage	(1)AC turn on then output open
	(Refers to OLP curve)	(2)Output open then AC turn on
AC Transient Protection	Auto-Recovery	120~277Vac range switching

4. Dimming Specification

The unit has Analog Dimming (AD) function, using 0-10 Vdc. The typical dimming curve is shown below:
(the current of LED module is 0.5 A at full load condition)



	Symbol	Unit	Min	Typ	Max	Remark
Dimming	Range	V	0		10	
	Dim off	V	0		1	
	Dim. Min.	V	1			
	Dim Max.	V	8		10	
	I_{SOURCE}	mA			0.6	

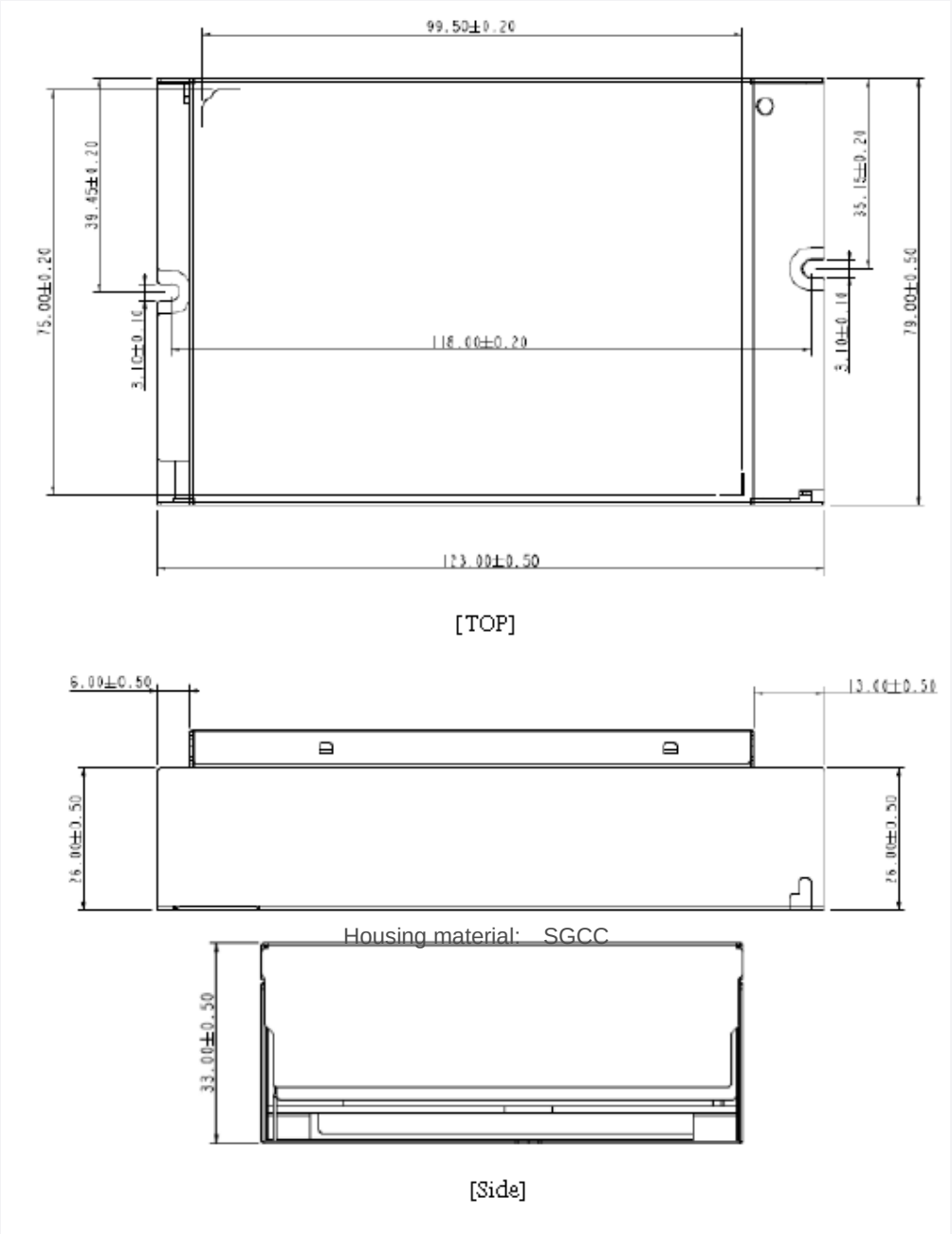
5. Reliability

Test Items and Conditions

Test Item		Specification	Condition
Leakage Current		< 0.7 mA	According to IEC/EN 60950
Earth Continuity		< 0.5 Ω	According to IEC/EN 61347 100 % tested in production line
Hi-Pot	Input – Output	3750 Vac, 60 s, cut-off current 10 mA	100 % tested in production line
	Input – Case	1500 Vac, 60 s, cut-off current 10 mA	100 % tested in production line
Insulation Resistance	Input – Output	500 Vdc, 60 s, insulation resistance 4 MΩ	100 % tested in production line
	Input – Case	500 Vdc, 60 s, insulation resistance 2 MΩ	100 % tested in production line
Surge	L / N	±1 kV	According to IEC/EN 61547
	LN / GND	±2 kV	
ESD	Contact	±4 kV	According to IEC 61000-4-2
	Air	±8 kV	

6. Outline Drawing & Dimension

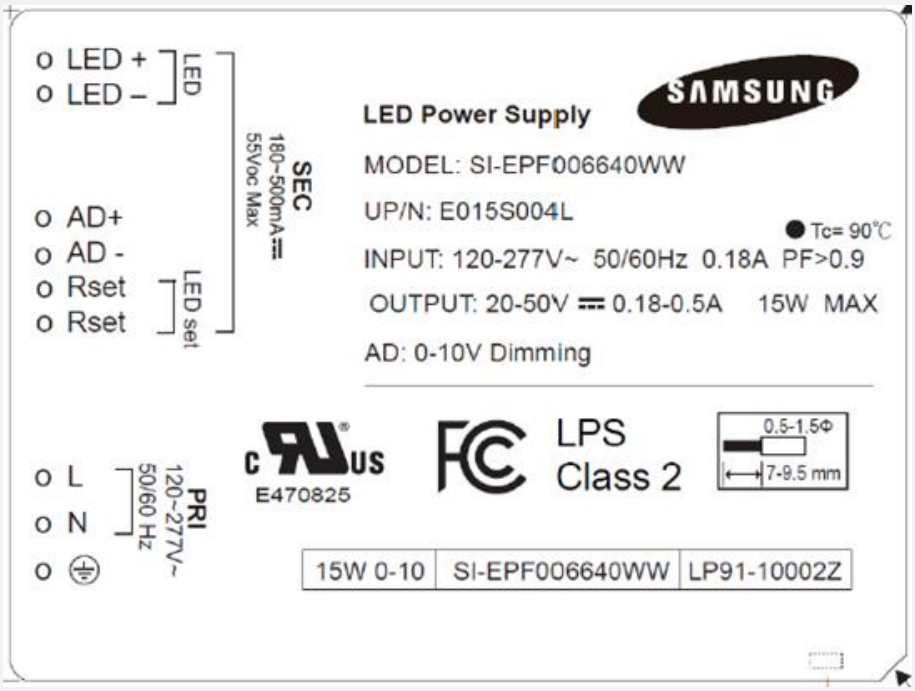
a) Dimension (mm)



b) Wiring

Connectors type (input and output):	DN250A or compatible
Wire cross-section:	0.5 - 1.5 Ø
Wire peeling length:	7 - 9.5 mm

7. Label Structure



8. Packing Structure

Packing material	Max. quantity (pcs)	Dimension (mm)		
		Length	Width	Height
Outer Box	20	483	385	108
Pallet	960 (48 outer boxes)	1220	1020	120

9. Precautions in Handling & Use

1) To prevent the LED Driver from any defect, please handle and store it with care
    - Do not drop or give shock
    - Do not store in very humid location or at extreme temperature
    - Do not open or disassemble the product
2) Static electricity or surge voltage may damage the components inside LED Driver, as such please observe proper anti-electrostatic working process
    - People handing the Driver should be well grounded (e.g. using ESD wrist band) and wear anti-static working clothes and gloves
    - All related devices and instruments in the production line should be well grounded (e.g. working table, measuring equipment, assembly jigs)
3) Observe the correct polarity of output terminal
4) Avoid input voltage exceeds the maximum rating, which will cause damage to the circuit and result in malfunction

Legal and additional information.

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