

LED Driver

Indoor 15 W Dimmable SI-EPF006640WW



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



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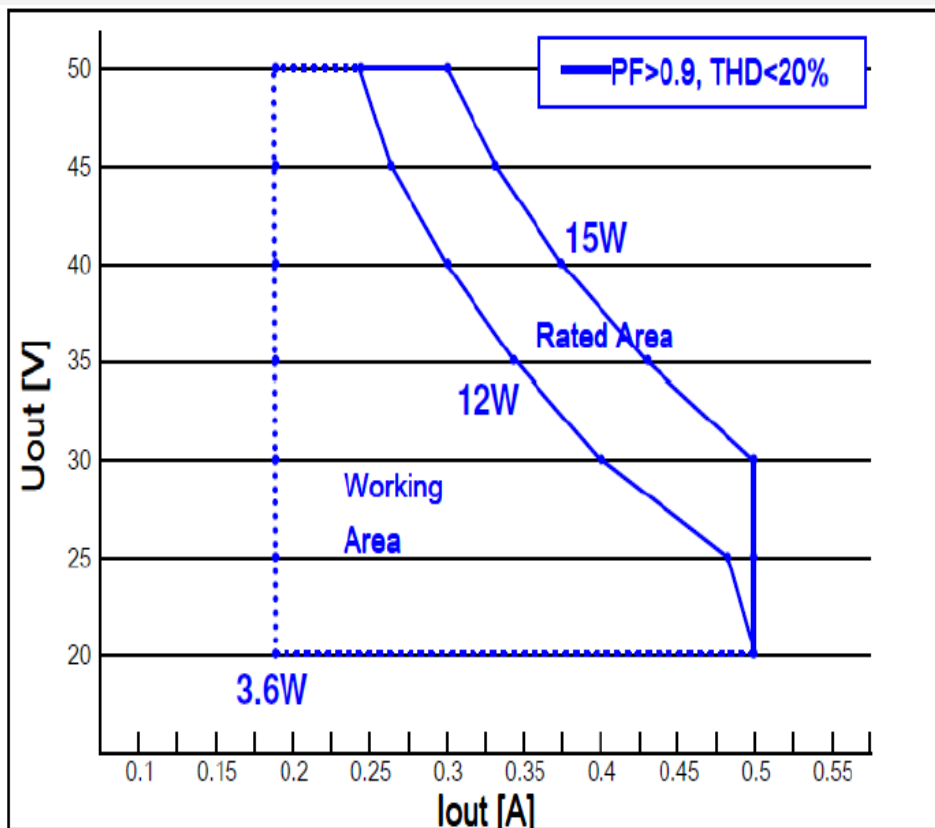
1. Characteristics

Article	Symbol	Specification			Unit	Note
		Min.	Typ.	Max.		
INPUT SPECIFICATIONS						
Nominal Voltage	V _{in}	120		277	Vac	Full input range, no range switching
Voltage Range		108		305	Vac	
Nominal Frequency	f _{in}	50		60	Hz	
Frequency Range		47		63	Hz	
Input Current	At 120 Vac	i _{in}		0.18	A	At full load
	At 277 Vac	i _{in}		0.08	A	At full load
Total Harmonic Distortion	THD			20	%	At P _o >12 W, 120-277 Vac
Power Factor	PF	0.9			-	At P _o >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 % I _{pk}) at 277 Vac
OUTPUT SPECIFICATIONS						
Nominal Voltage	V _o		20 ~ 50		Vdc	±2 %; at I _o = 0.18-0.5 A
Max. Voltage				59	Vdc	Open circuit, No-load protection
Nominal Current	I _o		0.18 ~ 0.5		A	±5 % (0.5 A), ±10 % (0.18 A)
Nominal Power	P _o		3.6 ~ 15	15	W	At I _o = 0.18-0.5 A, V _o = 20-50 V
Turn-on Delay Time	T _d			1	s	At full load, 108 Vac input

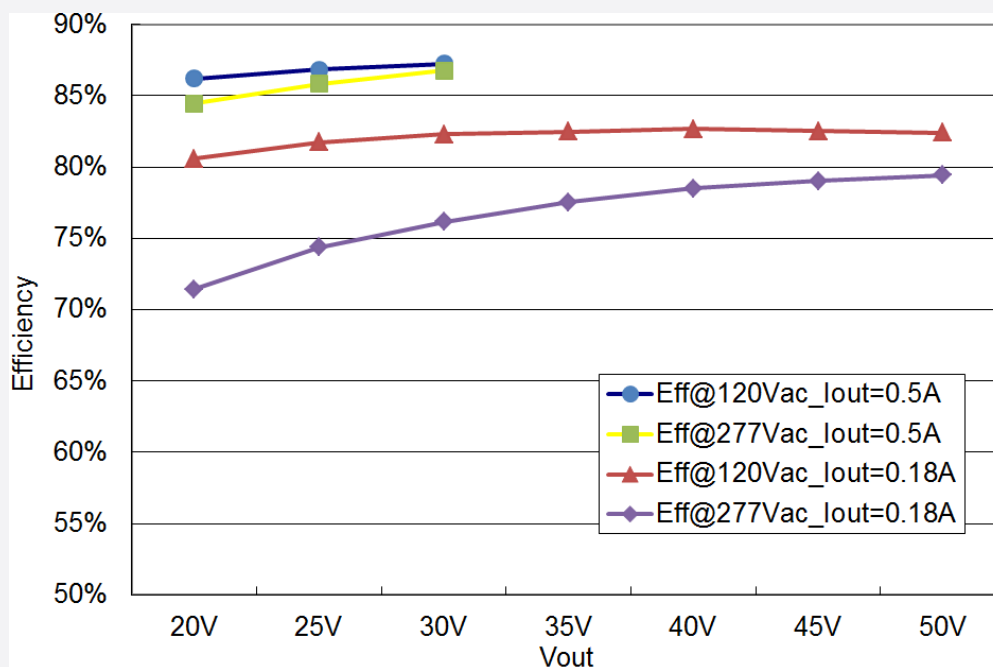
Article	Symbol	Specification			Unit	Note
		Min.	Typ.	Max.		
DIMMING SPECIFICATIONS						
Dimming Control			0-10 V			See Dimming Specification section
ENVIRONMENTAL SPECIFICATIONS						
Ambient Temperature	t_a	-20		50	°C	
Case Temperature	t_c			90	°C	Measured at t_c point as indicated on the product label
Storage Temperature	t_s	-25		80	°C	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 $t_a = 50$ °C, full load, 120-277 Vac
MTBF		100,000			h	At $t_a = 25$ °C, 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

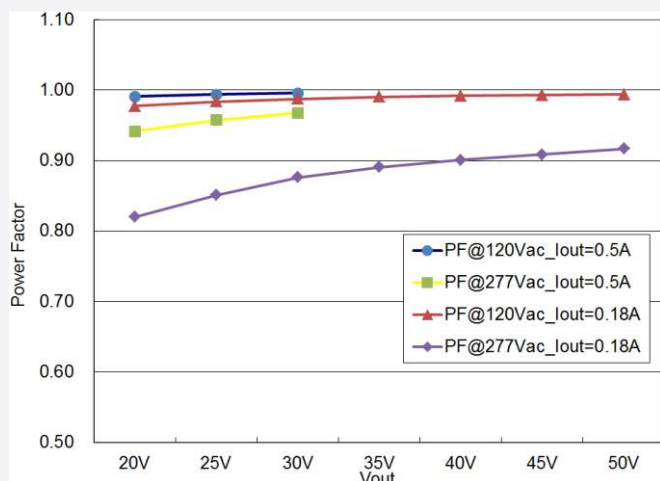
a) Operating Window



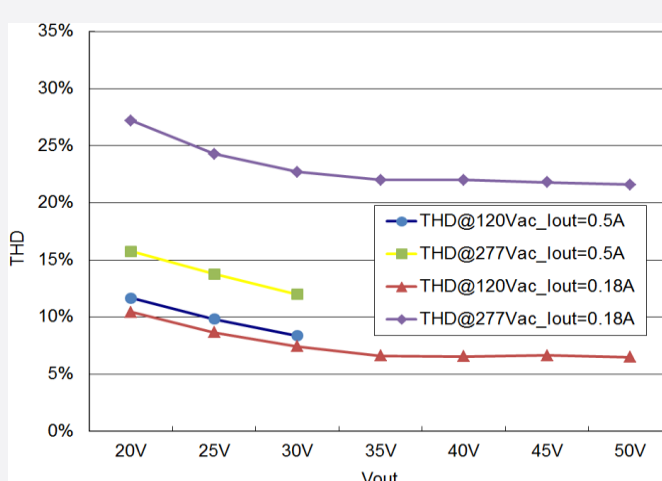
b) Efficiency vs. Load



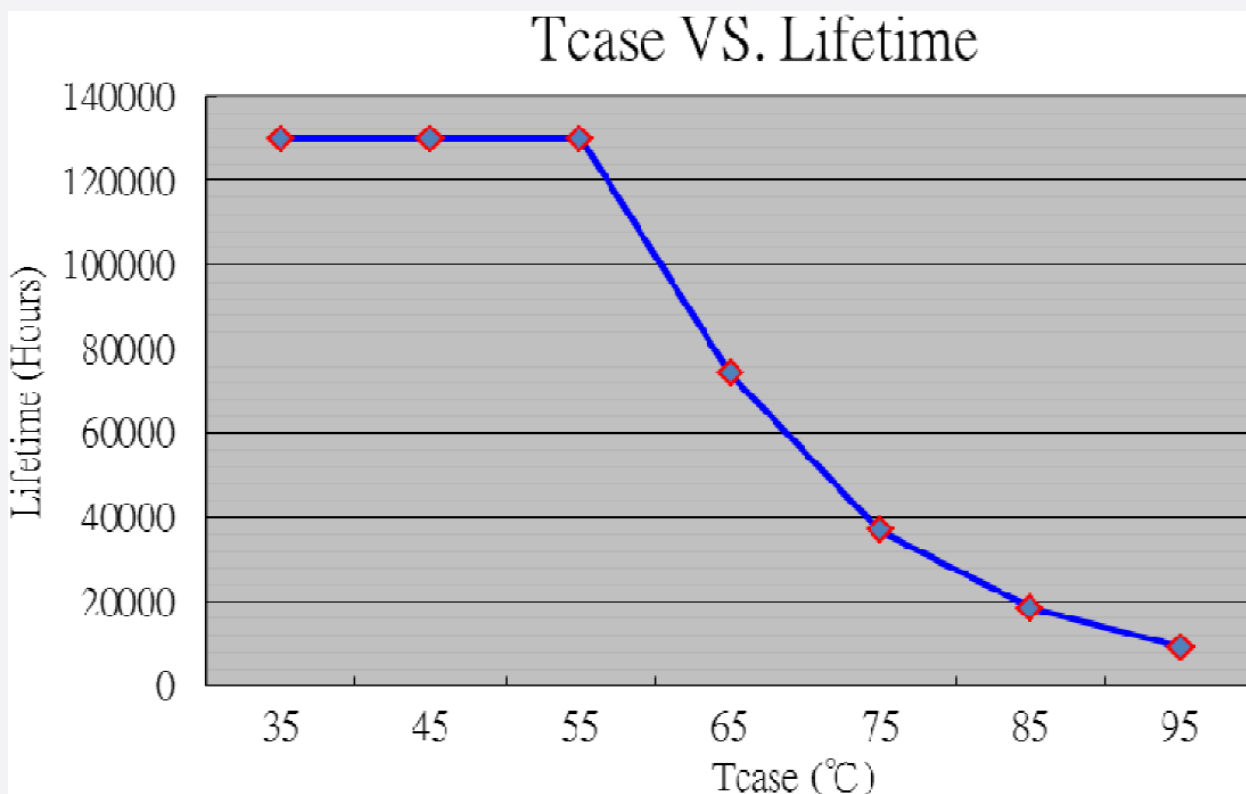
c) Power Factor vs. Load



d) Total Harmonic Distortion vs. Load



e) Total Harmonic Distortion vs. Load



f) Current Setting

The output current can be adjusted using R_{set} resistor:

- Disconnect R_{set} resistor to set full load at 0.5 A / 30 V condition
- Connect R_{set} resistor to set output current (see below table and curve); for R_{set} = 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 R_{set} 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
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.

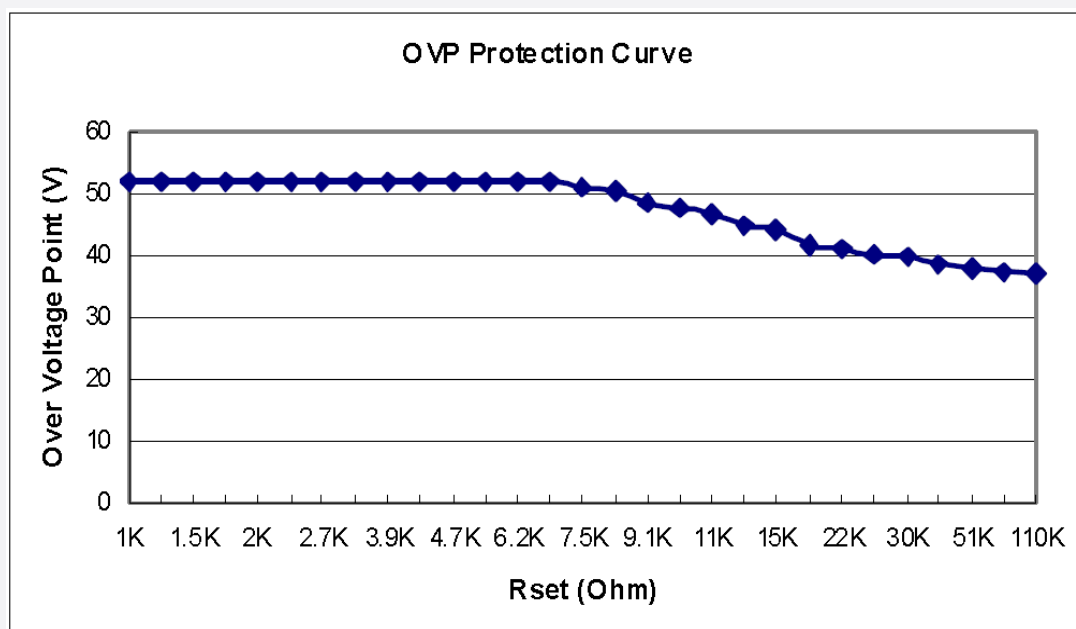
After the short circuit fault condition is removed, the unit will be in auto recovery mode.

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.

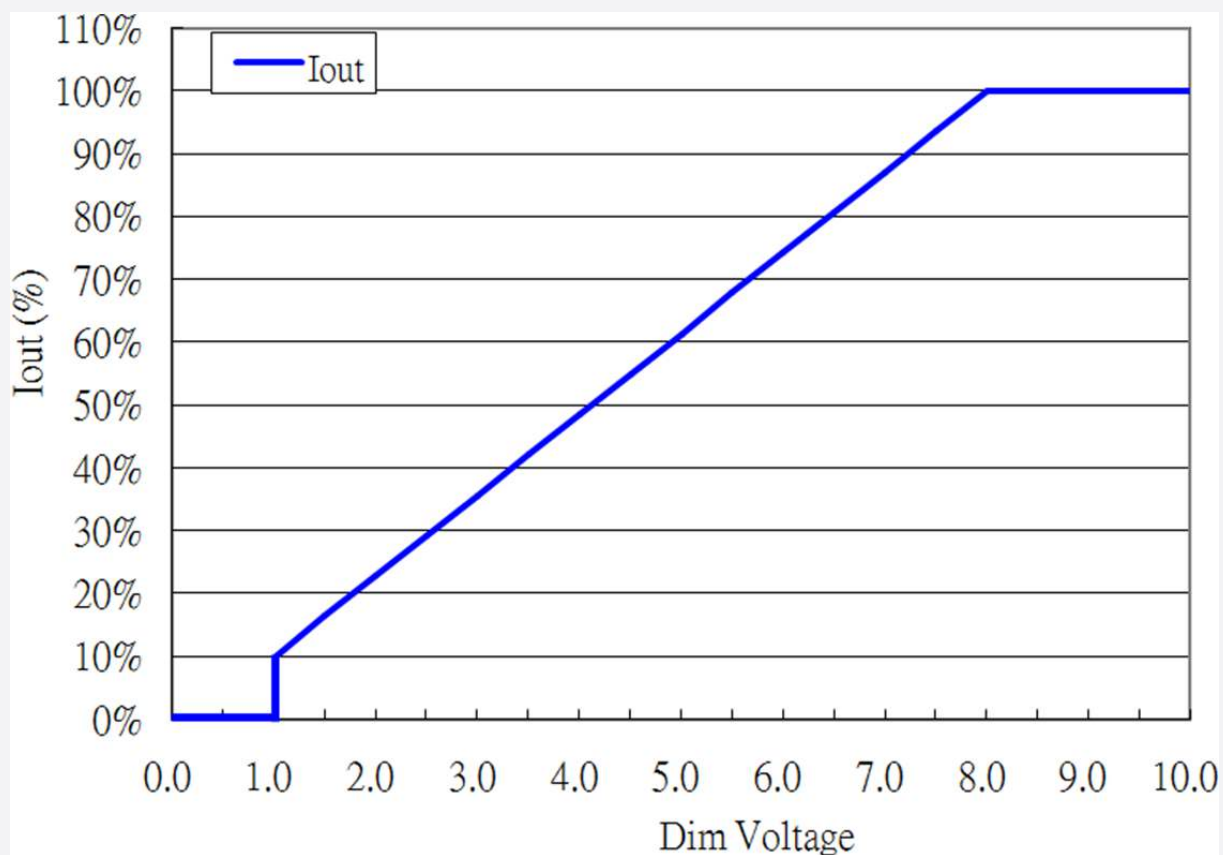
The OVP Voltage varies according to the Rset resistor value (see below curve and table) and under 59 V.



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

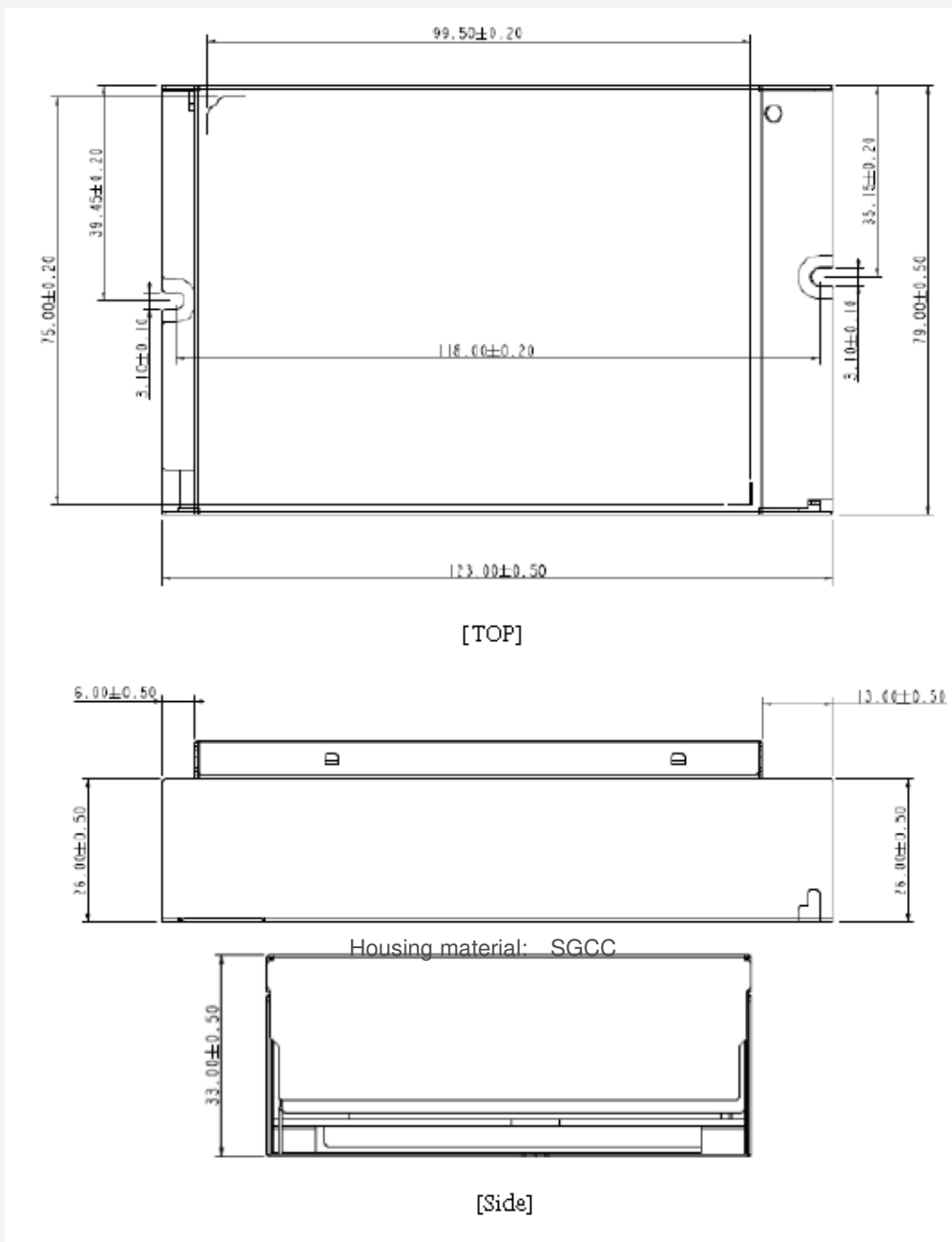
5. Reliability

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
	Input – Case	1500 Vac, 60 s, cut-off current 10 mA
Insulation Resistance	Input – Output	500 Vdc, 60 s, insulation resistance 4 M Ω
	Input – Case	500 Vdc, 60 s, insulation resistance 2 M Ω
Surge	L / N	± 1 kV
	LN / GND	± 2 kV
ESD	Contact	± 4 kV
	Air	± 8 kV

6. Outline Drawing & Dimension

a) Dimension (mm)



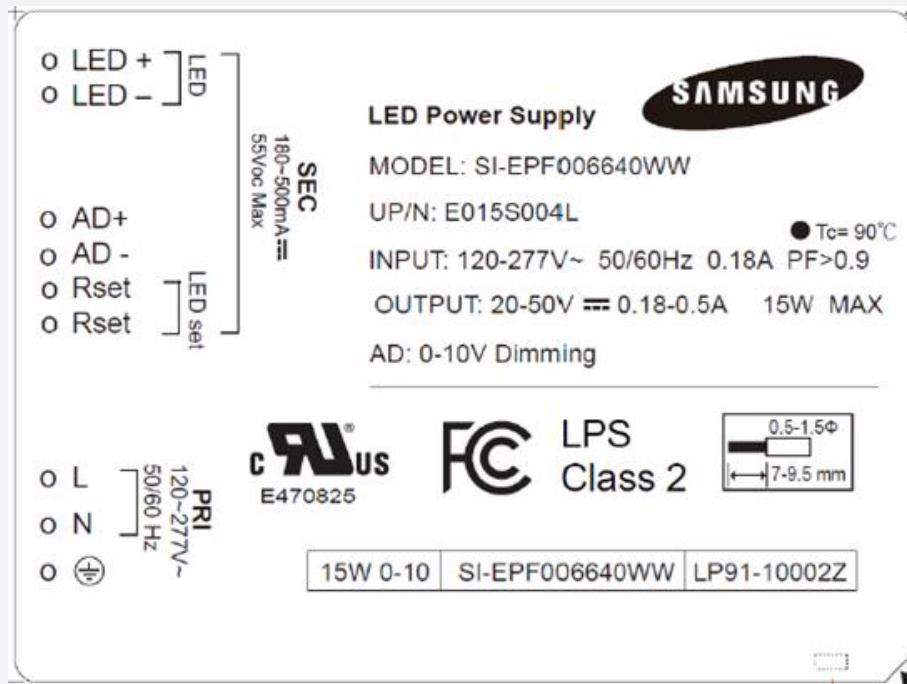
b) Wiring

Connectors type (input and output): DN250A or compatible

Wire cross-section: $0.5 - 1.5 \text{ } \varnothing$

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 handling 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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Samsung Electronics Co., Ltd.

95, Samsung 2-ro

Giheung-gu

Yongin-si, Gyeonggi-do, 446-711

KOREA

www.samsungled.com

