LED Driver

Indoor 15W 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 LEDset)
- 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: Overload, No Load, Short Circuit, Over Temperature, Over Voltage
- 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
- Office – Industry – Shop

Table of Contents

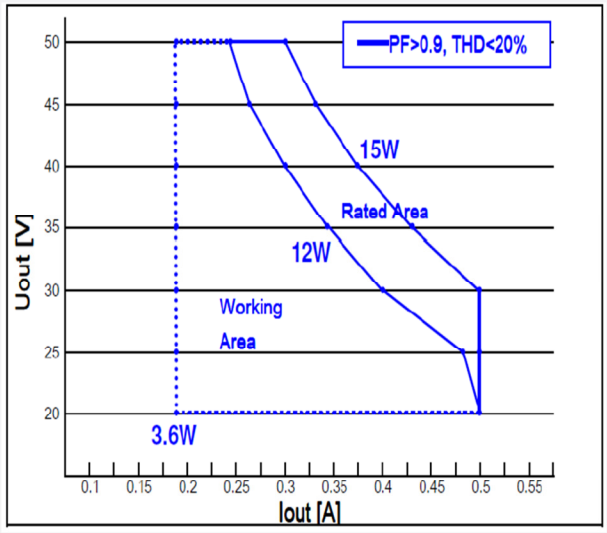
1. Characteristics

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					55	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

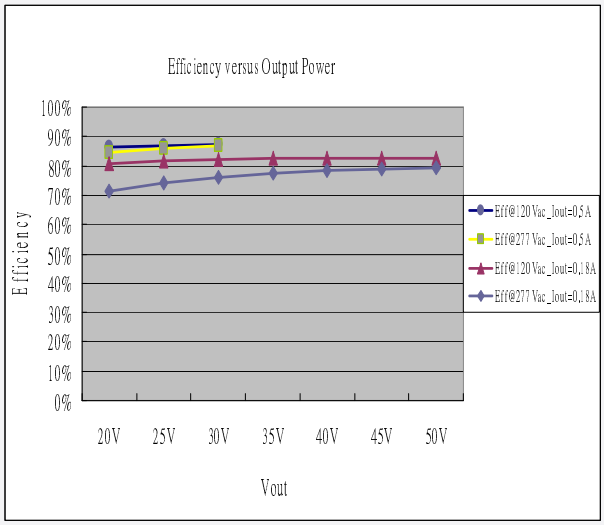
Article		Symbol	Specification			Unit	Note
			Min.	Typ.	Max.		
DIMMING SPECIFICATIONS							
Dimming Control				0-10 V			See Dimming Specification section
ENVIRONMENTAL SPECIFICATIONS							
Ambient Temperature		t_a	-20		50	°C	
Case Temperature		t_c			90	°C	Measured at t_c point as indicated on the product 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

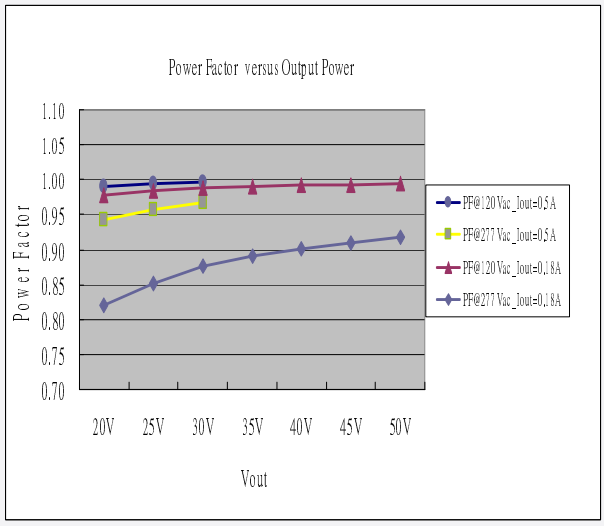
a) Operating Window



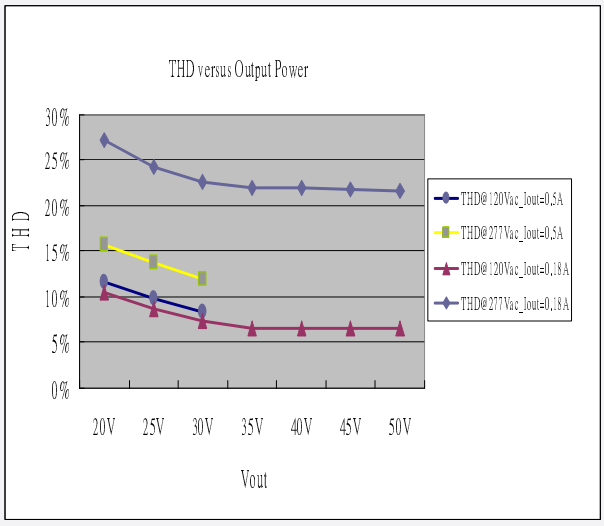
b) Efficiency vs. Load



c) Power Factor vs. Load



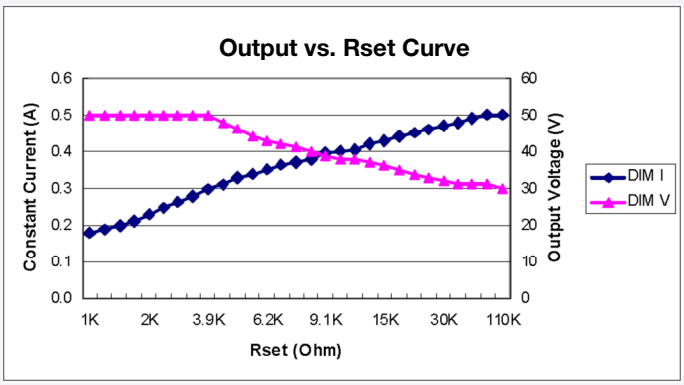
d) Total Harmonic Distortion vs. Load



e) 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 Value	Output Current	Output Voltage	Max Operating Voltage	OVP Voltage
1K	0.1800A	20~50V	50V	52V
1.3K	0.1900A	20~50V	50V	52V
1.5K	0.2000A	20~50V	50V	52V
1.6K	0.2100A	20~50V	50V	52V
2K	0.2300A	20~50V	50V	52V
2.4K	0.2500A	20~50V	50V	52V
2.7K	0.2650A	20~50V	50V	52V
3.3K	0.2800A	20~50V	50V	52V
3.9K	0.3000A	20~50V	50V	52V
4.3K	0.3100A	20~48V	48V	52V
4.7K	0.3300A	20~46V	46V	52V
5.6K	0.3400A	20~44V	44V	52V
6.2K	0.3500A	20~43V	43V	52V
6.8K	0.3650A	20~42V	42V	52V
7.5K	0.3700A	20~41V	41V	51V
8.2K	0.3800A	20~40V	40V	50V
9.1K	0.3950A	20~39V	39V	49V
10K	0.4000A	20~38V	38V	48V
11K	0.4050A	20~37V	38V	47V
13K	0.4200A	20~37V	37V	45V
15K	0.4300A	20~36V	36V	44V
20K	0.4400A	20~35V	35V	42V
22K	0.4500A	20~34V	34V	41V
24K	0.4600A	20~33V	33V	40V
30K	0.4700A	20~32V	32V	40V
43K	0.4800A	20~31V	31V	39V
51K	0.4900A	20~31V	31V	38V
82K	0.5000A	20~31V	31V	37V
110K	0.5000A	20~30V	30V	37V

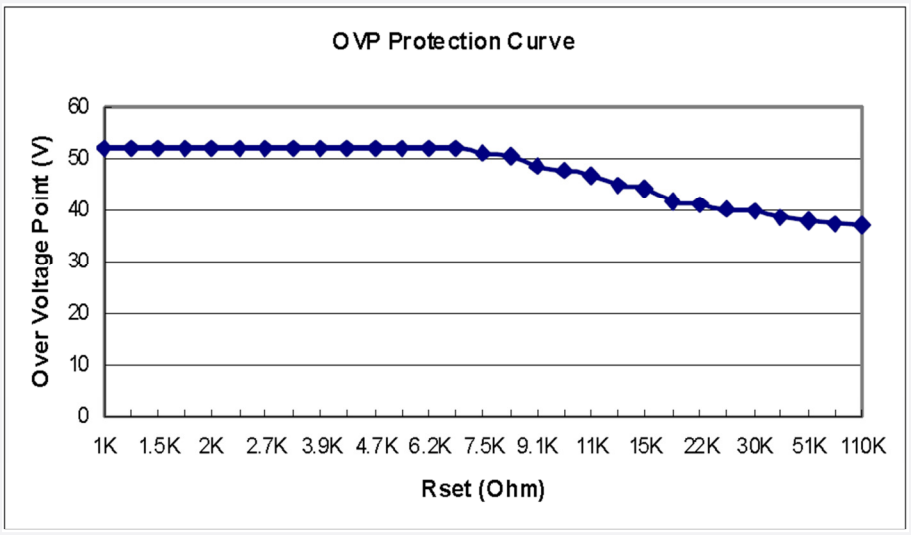
3. Protection

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 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 55 V.

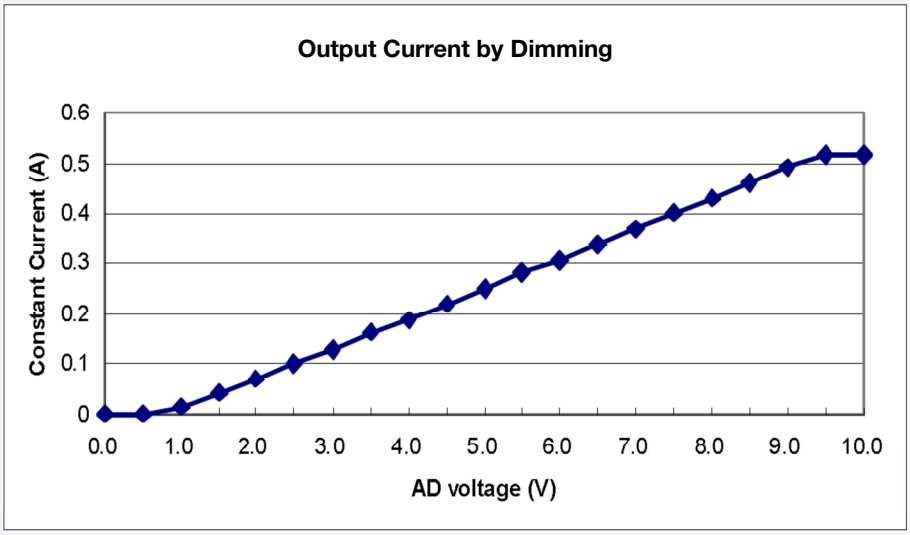


c) Over Temperature Protection

The unit is protected when IC is over 140 °C thus avoiding fire hazard and shock hazard. After the temperature is cooled down, the unit will be in auto recovery mode.

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)



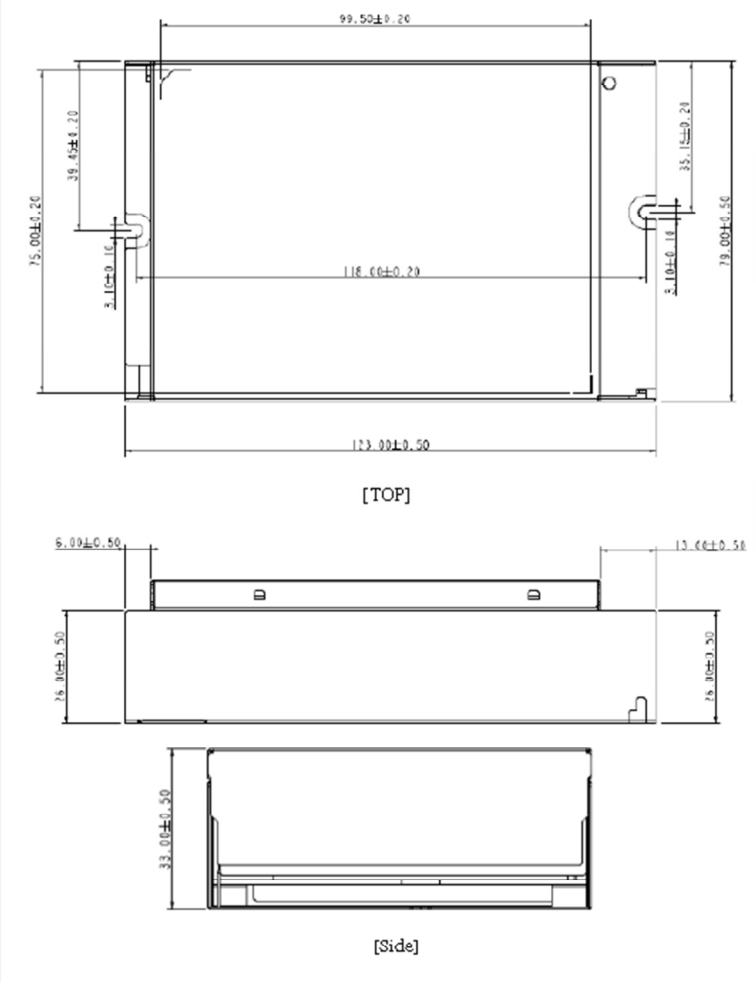
5. Reliability

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)

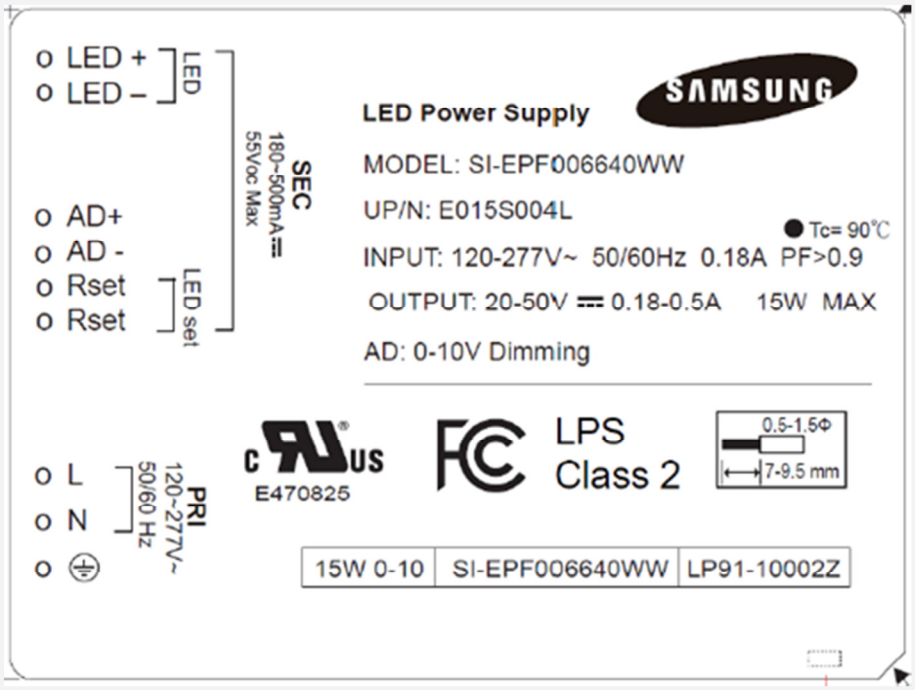


Housing material: SGCC

b) Wiring

Connectors type (input and output):	DN250A or compatible
Wire cross-section:	0.5 - 1.5 mm^2
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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