LED Driver

Indoor 75W Dimmable
SI-EPF006450WW

SELV Constant Current LED Driver
Wide Operating Range up to 2.1 A – Dimmable

Features & Benefits

- Output Current Range: 1.0 ~ 2.1 A (adjustable via LEDset)
- Output Voltage Range: 20 ~ 54 Vdc (SELV equivalent)
- Output Power Range: 32 ~ 80 W
- Dimming Control: DALI, smart dimming down to 1 %
- Input Voltage: 220 ~ 240 V
- Protections: Overload, No Load, Short Circuit, Over Temperature, Over Voltage, Load Hot Plug
- t_a Range: -25 ~ +45 °C
- Expected Lifetime: 100,000 hours at t_c = 70 °C
- Long lasting & high reliability
- Slim white metal housing
- Double output connectors (parallel connection)
- Very low output current ripple

Applications

- Ambient Lighting (Linear and Area) and other Indoor Lighting Applications
- Office – Industry – Shop
- Suitable for emergency lighting units

Table of Contents

1. Characteristics

Article	Symbol	Specification			Unit	Note
		Min.	Typ.	Max.		
INPUT SPECIFICATIONS						
Nominal Voltage	Vin		220 ~ 240		Vac	
Nominal Frequency	fin		0 / 50 / 60		Hz	Incl. DC or pulse DC
AC Voltage Range		198		264	Vac	
DC Voltage Range		176		276	V	DC or pulse DC
Maximum Voltage				350	Vac	1 hour max. (unit might not operate in this abnormal condition)
Nominal Current	Iin		410		mA	
Total Harmonic Distortion	THD			20	%	At full load, 220-240 V, 50 Hz (see graph)
Power Factor	PF	0.95			-	At full load, 220-240 V, 50 Hz (see graph)
Efficiency	η	90			%	At full load, 220-240 V, 50 Hz (see graph)
Power Losses				9	W	At full load
No-load Power			n/a		W	Load switching on output side is safe but not permitted
Stand-by Power				0.5	W	
Protection Class			I		-	PE can be connected to either terminal or housing
In-rush Current				53	A_{pk}	t_{width} = 200 µs typ. (at 50% Ipeak)
Units per Circuit Breaker				B16: 13 B10: 8	-	Imax = 53 A, t_{width} = 200 µs
Leakage Current				0.5	mA	Through PE, output floating
OUTPUT SPECIFICATIONS						
Nominal Voltage	Vo		20 ~ 54		Vdc	With load
Max. Voltage				60	Vdc	Open circuit, No-load protection, restart trials every 2-3 s
Nominal Current	Io		1.0 ~ 2.1		A	LEDset open: 0.5 A LEDset short: 2.1 A ±5 % through LEDset interface
Current Ripple				200	mA_{pk}	High frequency ripple (peak); Low frequency ripple is negligible
Nominal Power	Po		32 ~ 80	80	W	Dimmable down to 0.2 W
Galvanic Isolation			SELV-equivalent			Output and LEDset to mains – Touch current < 0.7 mA
Touch Current				0.7	mA	According to EN 60598-1 annex G and EN 61347-1 annex A
Switchover Time				0.5	s	Both AC and DC mains

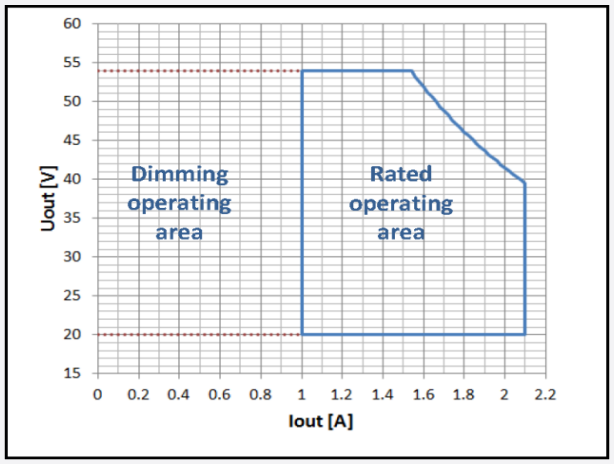
Article		Symbol	Specification			Unit	Note
			Min.	Typ.	Max.		
DIMMING SPECIFICATIONS							
Dimming Control				DALI			
Dimming Range				1 – 100		%	Of selected nominal current
Dimming Technique				Mixed			1-30 % PWM, 30-70 % Amplitude
Frequency			450			Hz	1-30 %
Galvanic Isolation				Basic / Double			Basic: DALI to primary-earth Double: DALI to secondary
ENVIRONMENTAL SPECIFICATIONS							
Ambient Temperature		t_a	-25		45	ºC	
Case Temperature		t_c			80	ºC	Measured at t_c point as indicated on the product label
Case Temperature in fault condition					120	ºC	
Storage Temperature		t_s	-25		85	ºC	Cool down before operating
Relative Humidity			5		85	%	Not condensing
Surge Transient Protection	L / N				±1	kV	According to EN 61547-5.7
	LN / PE				±2	kV	
IP Rating				IP20		-	Suitable for indoor environment
Mains Switching cycles			100,000			-	
Expected Lifetime			50,000			h	t_c = 80 ºC, 0.2 % / 1000 h failure rate (14 h on / 10 h standby per day)
			100,000			h	t_c = 70 ºC, 0.1 % / 1000 h failure rate (14 h on / 10 h standby per day)
Dimensions		L x W x H		360 x 30 x 21		mm	

Notes:

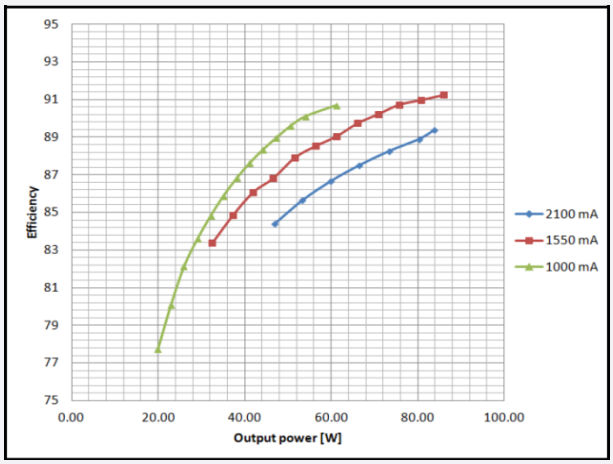
- Standards: EN 61347-1, EN 61347-2-13, EN 55015, EN 61547, EN 61000-3-2, EN 62384, EN 62386
- This LED Power Supply is suitable for emergency lighting fixtures according to EN 60598-2-22; EOF_l = 1% - 100% according to EN 61347-2-13. Continuous output power at t_a = 80 °C up to 30 W.

2. Typical Characteristics Graphs

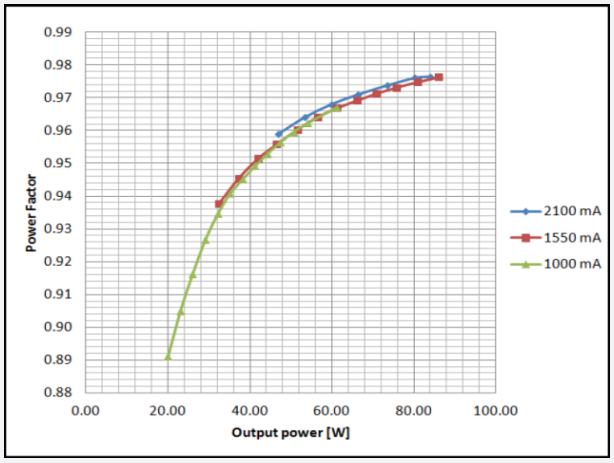
a) Operating Window



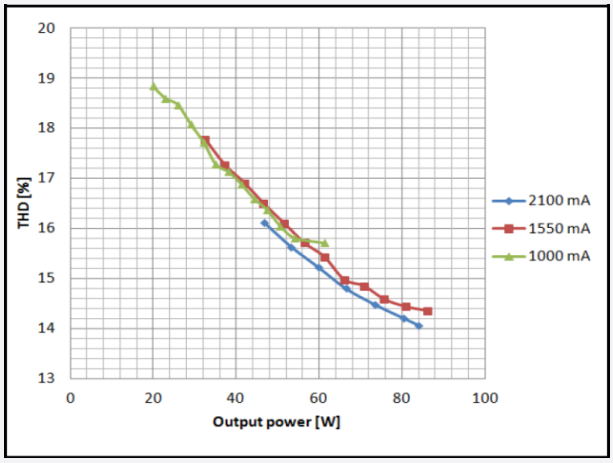
b) Efficiency vs. Load



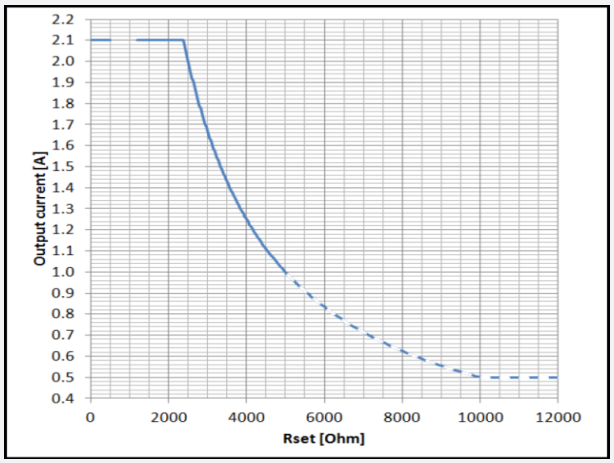
c) Power Factor vs. Load



d) Total Harmonic Distortion vs. Load



e) Output Current vs. Rset



Rset Formula and Standard Current Values

$$I_{OUT[A]} = \frac{5V}{R_{set[\Omega]}} \times 1000$$

Iout [mA] **nominal**	Iout [mA] set, +/-5%	**Rset [kOhm]** **E48 series**
1050	1064 1027	4.7 (E24) 4.87 (E48)
1400	1389 1437	3.6 (E24) 3.48 (E48)
1600	1667 1661	3.0 (E24) 3.01 (E48)
2100	2100 2100	2.2 (E24) 2.37 (E48)

3. Protection

- **Input over voltage protection**
  Mains up to 350 Vac, for one hour maximum, will not destroy both the unit and the load; shut down of load might occur in this condition.

- **Output short circuit / under voltage protection**
  Shut down of load happens if output voltage is below 20 V (typ. 18 V); the unit automatically tries to switch on the load again every 2-3 s for 0.1 s delivering the selected nominal current.

- **Output overload protection**
  The unit automatically reduces the output current to keep the output power below 80 W.

- **Output over voltage protection**
  Shut down of load happens if output voltage exceeds 54 V (typ. 55 V); the unit automatically tries to switch on the load again every 2-3 s for 0.1 s delivering the selected nominal current.

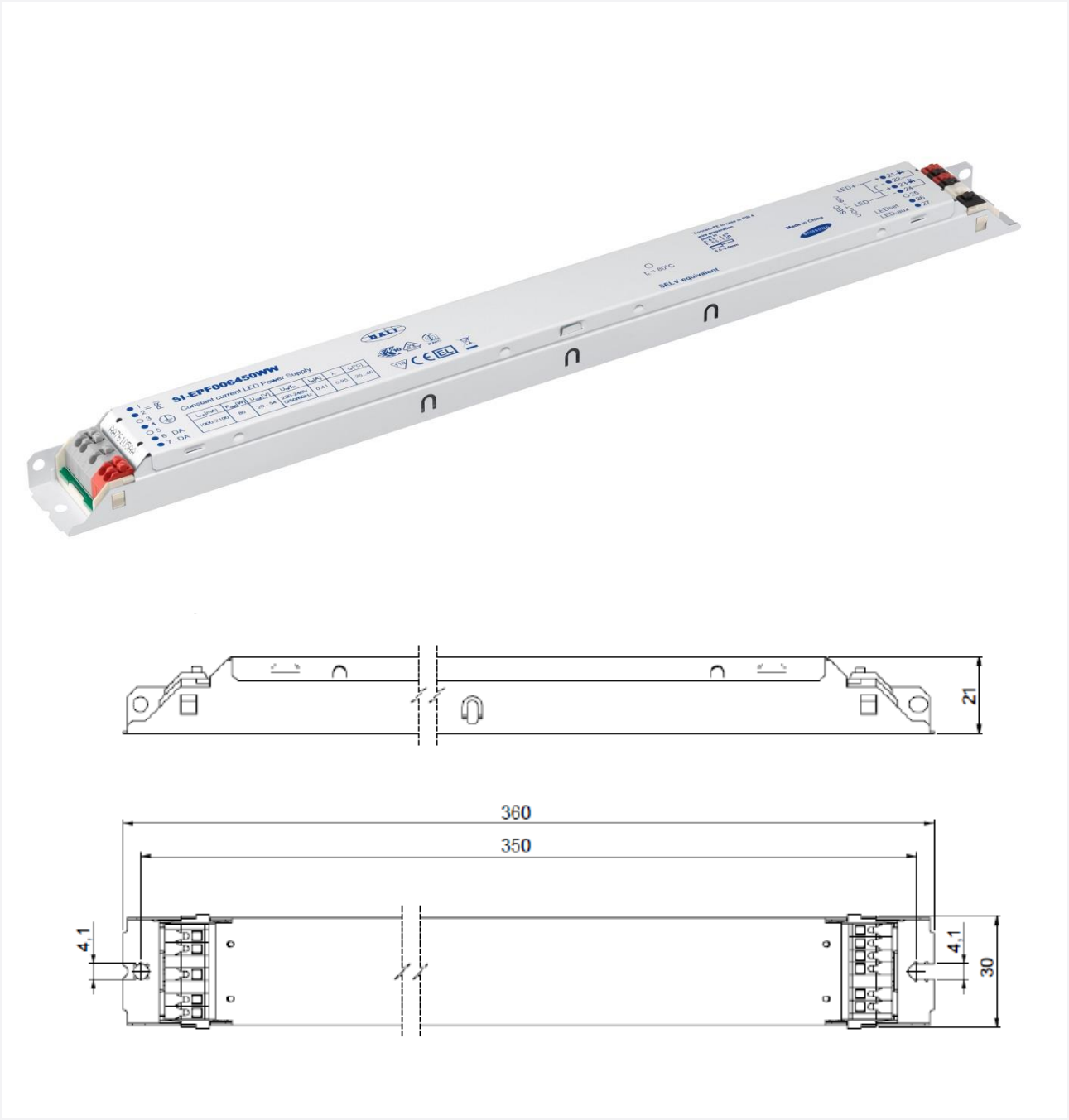
- **No load operation**
  The unit automatically tries to switch on the load every 2-3 s for 0.1 s delivering the selected nominal current; despite this operation mode is safe for both unit and load, it is not recommended. Do not put a switch between load and unit.

- **Over temperature protection**
  The unit is protected against temporary overheating by automatic reduction of the output current when 80 °C < t_c < 95 °C typ., and by automatic power off if 95 °C < t_c < 100 °C typ. The protection is self restoring.

- **Load hot plug protection**
  Connection of LED load on secondary side is allowed without damage to the LED; LED will turn on automatically.

4. Outline Drawing & Dimension

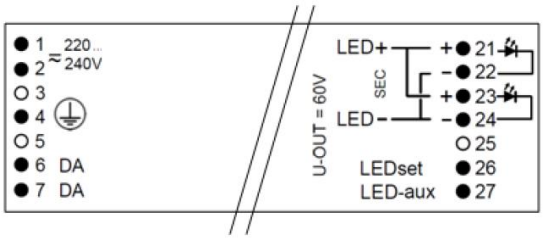
a) Dimension (mm)



Housing material: metal, white painted

b) Wiring Diagram

Input:
Gray 1 – Mains
Gray 2 – Mains
Gray 3 – n/a
Gray 4 – PE
White 5 – n/a
White 6 – DALI
White 7 – DALI



Output:
Red 21 – LED +
Black 22 – LED –
Red 23 – LED +
Black 24 – LED –
White 25 – n/a
White 26 – LEDset
Black 27 – LEDset-aux

21 & 23 internally connected
22 & 24 internally connected

Connectors type (input and output):	Wago 250
Wire cross-section:	solid and flexible: 0.5 - 1.5 mm^2
Wire peeling length:	8.5 - 9.5 mm
Load wire length:	Max. 2 m

Two or more units cannot be connected together on secondary side (terminals 21 .. 27)

5. Label Structure

6. Packing Structure

Packing material	Max. quantity (pcs)
Outer Box	20

7. 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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