



Spot High Voltage LED Light Engines

AC Powered LED Light Engines

SQS FF02 high-voltage LED light engines adopt a proprietary and patented technology including driving scheme which allows LEDs to be driven from 230 V AC directly. The FF02 engines contain mostly surface mounted devices and high-voltage LEDs mounted in the form of bare chips directly attached to the substrate (COB technology) to minimize light engine dimensions and improve thermal management. There are no components that would significantly affect reliability of the LED light engine, e.g. electrolytic capacitors. The light engine is certified according to CE standards.

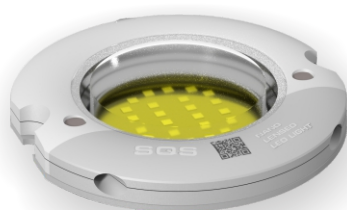
SQS FF02 LED light engines offer high light efficacy together with high reliability, uniformity, and efficiency in a compact all-solid-state package.

Features:

- long lifetime, high reliability – direct 230V AC power supply, no power converters, no electrolytic capacitors
- environmentally friendly (RoHS compliant) – lead-free, no restricted substances
- excellent thermal management – HV LED InGaN chips directly attached to metal core printed circuit board (MCPCB)
- high lumen output, high light efficacy – polished mirroring area for back reflections improving light output
- CRI and CCT variability – luminophore compound customization
- CCT binning according to ANSI NEMAANSLG C78.377-2008 standard
- compact size
- custom light distribution – wide range of lenses; materials: silicon, glass, PMMA; shapes: spherical, aspherical, TIR, Fresnel, symmetrical, asymmetrical

Applications:

- LED lighting fixtures
- interior and exterior building lighting (residential and public)
- interior and exterior industrial lighting
- park and street lighting

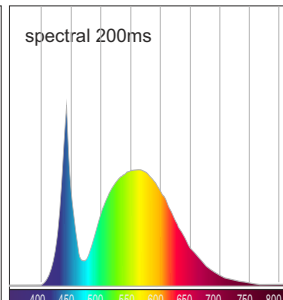
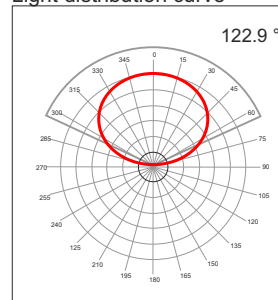


Electrical parameters	Min.	Typical	Max.
Ff02 Light engine wattage	5W	10, 20, 30, 40W	45 W
AC input voltage	nominal 230 V		
Frequency	nominal 50 Hz		
Power factor	0.91	0.93	0.96
Thermal resistance R _{9(jLED-MCPCB)}	0.95 °C/W		

Photometrical parameters		Standard values of CCT (other CCT available on demand)		
		3000 K	4700 K	6000 K
FF02 10W	Typical luminous power [lm]	830	930	870
	Typical light efficacy [lm/W]	83	93	87
FF02 20W	Typical luminous power [lm]	1600	1800	1700
	Typical light efficacy [lm/W]	80	90	85
FF02 30W	Typical luminous power [lm]	2310	2610	2460
	Typical light efficacy [lm/W]	77	87	82
FF02 40W	Typical luminous power [lm]	2960	3360	3160
	Typical light efficacy [lm/W]	74	84	79
Typical CRI		85	80	75
Typical beam angle		123°		

Other parameters	
Dimensions	Ø 45 mm
Operating MCPCB temperature ¹⁾	80 °C
Storage temperature	from -40 °C to +80 °C

Light distribution curve



All parameters measured at T_a = 22 °C. Optical parameters measured by MP4 production line measurement system including CAS 140 CT optical spectrometer and ISP 250 integrating sphere (Instrument Systems). LED modules powered by nominal sinusoidal voltage 230 V/50 Hz for 100 ms.

Notes: ¹⁾ Temperature of Al core of MCPCB.

Die attach process



Wirebonding process



Dam and Fill process

