

Efficient LED Driver Driving Up to 4 RGB Dots While Extending the Device Battery Life

An integrated boost, Auto-pattern, and ultra-low operational current LED driver reduces both power and MCU overhead in compact battery-powered applications.

MILPITAS, CA., Sept 1, 2026 – Lumissil Microsystems introduces the [IS31FL3713](#), a 4x3 matrix LED driver with integrated boost, designed to drive up to 12 individual LEDs or 4 RGB LEDs. The integrated synchronous boost converter switches at 1MHz frequency, allowing designers to use an inductor as small as 1μH and keep the application form factor to a minimum. The device operates from a 2.2V to 5.5V supply and is offered in a WLCSP-12 package (0.4mm ball pitch, 0.2mm ball diameter).

Battery-powered devices often underestimate the impact of LED indicators on overall power consumption. While each LED appears small; multiple indicators, animations, and frequent MCU handshakes can significantly reduce battery life. The IS31FL3713 addresses this challenge through a combination of ultra-low operational current of 1.1mA (typ.), 0.3μA hardware shutdown current, and time-multiplexed matrix operation. The built-in DC-DC boost converter removes the need for an external conversion stage. Its output voltage is register-programmable from 3.0V to 5.0V in 100mV steps, allowing designers to match the rail to the LED forward voltage and minimize power dissipation. Selectable scan modes (4x3, 3x3, 2x2, 1x3, and direct drive (4Ch)) let the driver scale exactly the number of LEDs used for an application.

The [IS31FL3713](#) is also equipped with an autonomous animation engine. An integrated state machine that stores up to 12 independent patterns, one per LED, each defined by five programmable PWM duty with programmable start, crossfade, and end times selectable from 0ms up to 4.2 seconds per segment at the default PWM frequency, plus programmable loop counts. Since each LED duty sequence is stored on their own register, the combined sequences define both the color and its animation directly in the driver. Color, timing, and pattern all reside on chip, so a single I2C command starts the animation, and the driver executes it without further MCU handshakes. Loop completion can be reported back to the MCU through the INTB interrupt pin. When direct host MCU control is preferred, the internal PWM engine supports 6+4-bit PWM (1024 steps) with 8-bit DC scaling per dot and 6-bit global current control over a 1MHz I2C interface. Individual open/short detection with fault registers and a de-ghost function complete with the feature set for hand-held, wearable, and IoT applications.

Availability

The [IS31FL3713](#) is available now in a compact WLCSP-12 package and is specified for operation over the -40°C to +125°C industrial temperature range. The ordering part number is [IS31FL3713-CLS4-TR](#) and comes in 3,000 units per reel.

About Lumissil Microsystems

Lumissil Microsystems specializes in analog/mixed-signal products for automotive, communications, industrial, and consumer markets. Lumissil's primary products are LED drivers for low to mid-power RGB color mixing and high-power lighting applications. Other products include audio, sensors, high-speed wire communications, optical networking, and application-specific microcontrollers. Lumissil Microsystems has worldwide offices in the US, Taiwan, Japan, Singapore, mainland China, Europe, Hong Kong, India, Israel, and Korea. Website: www.lumissil.com

Afrith Anifa

afrith@lumissil.com

Lyn Zastrow

lzastrow@lumissil.com

A promotional graphic for the IS31FL3713 LED driver. On the left, a smart toothbrush with a glowing blue ring and a rainbow-colored charging dock are shown on a bathroom counter. On the right, a dark blue background contains the Lumissil logo, the product name "IS31FL3713", and a list of features. Below the features is a "Size Comparison" section showing a CR2032 3V coin cell battery next to the tiny WLCSP-12 package of the IS31FL3713.

IS31FL3713

Feature Highlights

- ▲ Sync Boost with 1MHz Switching Frequency
- ▲ 6+4-bit PWM @ 83.64kHz Frequency
- ▲ 12 Auto Pattern Relaxes MCU Overhead
- ▲ Sync Pin for Multi-Device Synchronization

Size Comparison

CR2032 3V LITHIUM CELL

IS31FL3713