

IS32FL3749, 24x4 Matrix Mini-LED Driver IC for LCD Backlight

33MHz Serial Bus with 16-bit PWM Dithering and 8-bit Current Adjust for Accurate Local Dimming

MILPITAS, Calif., September 26, 2023 -- Lumissil Microsystems, a division of Integrated Silicon Solution, Inc. (ISSI), announces the release of the IS32FL3749, its latest matrix driver IC for controlling arrays of mini-LEDs. It is targeted at the automotive LCD backlight market that utilizes white mini-LED arrays for large ultra-high contrast Central Information Displays (CID).

The IS32FL3749 is an automotive-grade mini-LED matrix driver IC for LCD backlight applications that supports multiple local dimming zones. More dimming zones offer greater contrast control (difference between dark and bright parts of an image), true black levels, and minimized blooming (halos of light around bright light sources). LCDs with more backlight LEDs and more dimming zones, result in brighter displays with a highly granular contrast control. The IS32FL3749 integrates a 33MHz serial bus that communicates with other IS32FL3749 devices to create thousands of dimming zones using a daisy-chain cascade protocol.

Local dimming refers to an array of individually addressed white LEDs behind the LCD panel to create a backlight. Controlling the LCD backlight's local dimming enables selective dimming of screen areas that are darker while keeping luminous screen areas bright. This technology enhances the apparent contrast ratio resulting in improved image quality. Array local dimming is necessary to display High Dynamic Range (HDR) content and improve content visibility under all lighting conditions.

"Automotive displays have evolved and we're entering a new era where the central information display has become the primary means for presenting vehicle information," said Ven Shan VP of Lumissil Marketing. "Automotive displays must support an ever-growing assortment of images, information, and data, making their luminance, and readability essential for a safe driving environment. The IS32FL3749 provides accurate zonal dimming and LED brightness control to meet these demanding backlight display requirements."

The IS32FL3749 is a configurable 24xn matrix LED driver with a selectable number of columns ($n=1\sim 4$) and 24 high voltage (16V) constant current rows. Each of the 96 LEDs in the array can be pulse-width-modulated (PWM) with 16-bit precision and its 60mA current can be adjusted with 8-bit control registers resulting in a fine granularity of backlight dimming zones. Each LED can be scanned for an open/short condition with the result stored in a register. All registers such as the current, temperature, spread spectrum, LED open/short, etc., can be accessed and programmed via the 33MHz serial bus.

The IS32FL3749 can be turned off by either pulling the SDB pin low or by using the software shutdown feature to obtain a minimum current consumption of 3.3uA. Proprietary algorithms such as spread spectrum of the PWM clock, channel-to-channel timing skew, and channel group delay are used in the IS32FL3749 to minimize power bus and EMI noise.

Availability and pricing

The automotive version IS32FL3749 is available now in production quantities and comes in an eTQFP-48 package. The industrial version IS31FL3749 is also available now in production quantities and comes in a

QFN-48 package. Both operate from 4.3V to 16V over the temperature range of -40°C to +125°C. The IS32FL3749 is priced at \$1.63 and the IS31FL3749 is priced at \$1.44 in 1k pcs quantities.

About Lumissil Microsystems

Lumissil Microsystems is a division of ISSI specializing 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. ISSI and Lumissil Microsystems have worldwide offices in the US, Taiwan, Japan, Singapore, mainland China, Europe, Hong Kong, India, and Korea. Website: <https://www.lumissil.com>

About Integrated Silicon Solution, Inc. (ISSI)

ISSI is a fabless semiconductor company that designs, develops, and markets high-performance SRAM, DRAM, Flash memory (including NOR flash, NAND flash, and managed NAND solutions (eMMC)), and Analog/Mixed-signal integrated circuits. ISSI provides high-quality semiconductor products and has been a committed long-term supplier to its customers. ISSI has worldwide offices in the US, Taiwan, Japan, Singapore, mainland China, Europe, Hong Kong, India, and Korea. Visit our website at <https://www.issi.com>

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IS32FL3749
4-Channel High Current LED Controller

- Cascade Operations for Controlling Many LED Backlight Zones
- 16-bit PWM and Current Adjustments for Fine Local Dimming
- Support 20V LED Strings up to 60mA
- Programmable spread Spectrum and Phase Delay for Reduced EMI
- Low Standby and Sleep Mode Current

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