

4 x 24 Automotive LED Matrix Driver with ASIL B Features

General Description

The MAX25501 is a 4 x 24-channel modular matrix backlight driver for use with local-dimming automotive displays. The integrated current outputs can sink up to 72mA LED current each. The source drive pins provide current to the columns of the matrix on a multiplexed basis. Device power comes from an external 3.3V or 5V supply, while the LED current-sink outputs can operate at up to 14V.

A feedback output pin (FB) is provided to control an external DC-DC converter so that voltage headroom can be optimized and the overall system power dissipation reduced.

The device is highly flexible due to its programmability using the SPI interface. Among the programmable parameters are the LED current, individual PWM settings, and multiplex ratio.

The MAX25501 includes multiple diagnostic features to aid in the building of ASIL B systems.

The device features a high-speed SPI interface for control using a daisy-chain or star configuration. Up to 16 devices can be daisy-chained to reduce connection complexity.

The MAX25501 is available in TQFN and TSSOP packages and operates in the -40°C to +125°C temperature range.

Applications

- Central Information Displays
- Instrument Clusters
- Interior Lighting

Benefits and Features

- Flexible Configuration Using SPI Interface with CRC
 - Programmable Multiplex Ratio Between 4:1 and 1:1
 - Integrated Column Drivers
 - Programmable Dither for Enhanced Resolution
 - Optional Individual Programmable Delays
 - Optional Pseudorandom Fine Delay on Each Output
- 24 Row Drivers
 - Up to 72mA Peak Output Current
 - Individual Current Control for Each LED Zone
 - Very Narrow Minimum Current Pulse for Maximum Dimming Ratio
 - Ghosting Elimination Features
- Extensive Diagnostics Supporting ASIL B
 - Shorted or Open LEDs
 - Programmable V_{LED} Undervoltage/Overvoltage Detection with Flag
 - Adjacent SNK_ to SNK_ Short Detection
 - Shorted SNK_ or SRC_ to GND
 - I_{SET} Out of Range
 - Internal Clock Out-of-Range Detection
 - Bandgap Reference Out-of-Range
 - CRC on SPI Transactions
 - CRC on Internal Memory Contents
 - Undervoltage/Overvoltage Detection on All Supplies
 - Thermal Warning/Shutdown
- FB Output to Control External DC-DC Converter
- High-Speed Daisy-Chain/Star SPI Interface
- V_{SYNC} Synchronization Input (Programmable Active High/Low)
- 48-Lead TQFN and TSSOP Packages
- AEC-Q100 Grade 1 Qualified

Visit [Web Support](#) to complete the nondisclosure agreement (NDA) required to receive additional product information.

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DOCUMENT FEEDBACK

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