

## MAX25500

## 4 x 24 Automotive LED Matrix Driver

### General Description

The MAX25500 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 light-emitting diode (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 serial peripheral interface (SPI). Among the programmable parameters are the LED current, individual pulse-width modulation (PWM) settings, and multiplex ratio.

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

The MAX25500 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
  - 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
  - Shorted or Open LEDs
  - Programmable  $V_{LED}$  Undervoltage/Overvoltage Detection with Flag
  - Adjacent SNK\_ to SNK\_ Short Detection
  - Shorted SNK\_ or SRC\_ to GND
  - ISET Out of Range
  - Thermal Warning/Shutdown
- FB Output to Control External DC-DC Converter
- High-Speed Daisy-Chain/Star SPI
- $V_{SYNC}$  Synchronization Input (Programmable Active High/Low)
- 48-Lead TQFN and TSSOP Packages
- AEC-Q100 Grade 1

Simplified Block Diagram



