4 x 24 Automotive LED Matrix Drivers with ASIL Features

MAX25504/MAX25505

General Description

The MAX25504/MAX25505 are 4 x 24-channel modular matrix drivers. The integrated current outputs can sink up to 65mA 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 devices are highly flexible due to their programmability using the SPI interface. Among the programmable parameters are the LED current, individual PWM settings, and multiplex ratio.

The devices feature a high-speed interface for controlling up to 16 devices in a daisy-chain configuration. In addition, they include multiple diagnostic features to aid in the building of ASIL B systems.

The MAX25504/MAX25505 are available in TQFN and TSSOP packages and operate in the -40°C to +125°C temperature range.

Applications

- Central Information Displays
- Instrument Clusters
- Interior Lighting
- Exterior Rear 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 Spread Spectrum on Each Output
- 24 Row Drivers
  - Up to 65mA Peak Output Current
  - Very Narrow Minimum Current Pulse for Maximum Dimming Ratio
  - Optional Ghosting Elimination
- Extensive Diagnostics Supporting ASIL B
  - Shorted or Open LEDs
  - Programmable V_{LED} Overvoltage Detection with Flag
  - Adjacent SNK_ to SNK_ Short Detection
  - Shorted SNK_ or SRC_ to GND
  - ISET Out of Range
  - Internal Clock Out-of-Range Detection
  - Bandgap Reference Out-of-Range
  - CRC on Internal Memory Contents
  - Undervoltage/Overvoltage Detection on All Supplies
  - Thermal Warning/Shutdown
- FB Output to Control External DC-DC Converter
- SPI Interface Optionally with CRC (MAX25505)
- V_{SYNC} Synchronization Input (Programmable Active-High/Low)
- 48-Lead TQFN and TSSOP Packages
- AEC-Q100 Grade 1

Ordering Information appears at end of data sheet.