

ABRIDGED DATA SHEET

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MAX25024

Automotive Low Input Voltage I²C 4-Channel 150mA Backlight Driver supporting ASIL B

General Description

The MAX25024 is a 4-channel backlight driver IC with boost controller for automotive displays. The integrated current outputs can sink up to 150mA LED current each. The device accepts a wide 2.5V to 36V input voltage range and withstands automotive load-dump events.

The internal current-mode switching DC-DC controller supports boost or SEPIC topologies and operates in the 400kHz to 2.2MHz frequency range. Integrated spread spectrum helps reduce EMI. An adaptive output-voltage-control scheme minimizes power dissipation in the LED current-sink paths.

Control is included for an external nMOSFET series switch to reduce quiescent current when the backlight is off and to disconnect the boost converter in the case of a fault.

The device features I²C-controlled pulse-width-modulation (PWM) dimming and hybrid dimming. In either case, the minimum pulse width is 500ns. Phase-shifted dimming of the strings is incorporated for lower EMI.

Comprehensive diagnostic information is available through the I²C interface to ease integration in systems requiring ASIL B compliance.

The MAX25024 is available in a 24-pin TQFN or 24-pin side-wettable TQFN (SWTQFN) package and operates over the -40°C to +125°C temperature range.

Applications

- Instrument Clusters
- Central Information Displays
- Infotainment Displays

Benefits and Features

- Wide Voltage-Range Operation
 - Operates Down to 2.5V Supply After Startup
 - Survives Load Dumps Up to 40V
- High Integration
 - Complete 4-Channel Solution Including Boost Controller
 - I²C Control for Minimum Parts Count
- Robust and Low EMI
 - Spread-Spectrum Oscillator
 - Phase Shifting
 - 400kHz to 2.2MHz Switching-Frequency Range
 - nMOS Input Protection Switch
- Multiple Features for ASIL B Systems
 - LED-Current Measurement
 - Boost Input Current Measurement
 - Boost Output Voltage Measurement
 - LED Open/Short Detection and Protection
 - Boost Output Undervoltage and Overvoltage
- Versatile Dimming Scheme Allows Hybrid or PWM-Only Dimming Using DIM Input or I²C
 - Dimming Ratio > 10,000:1 Using Hybrid Dimming
 - 10,000:1 Dimming Ratio at 200Hz Using PWM Dimming
- Compact (4mm x 4mm) 24-Pin TQFN and SWTQFN Packages

Ordering Information appears at end of data sheet.

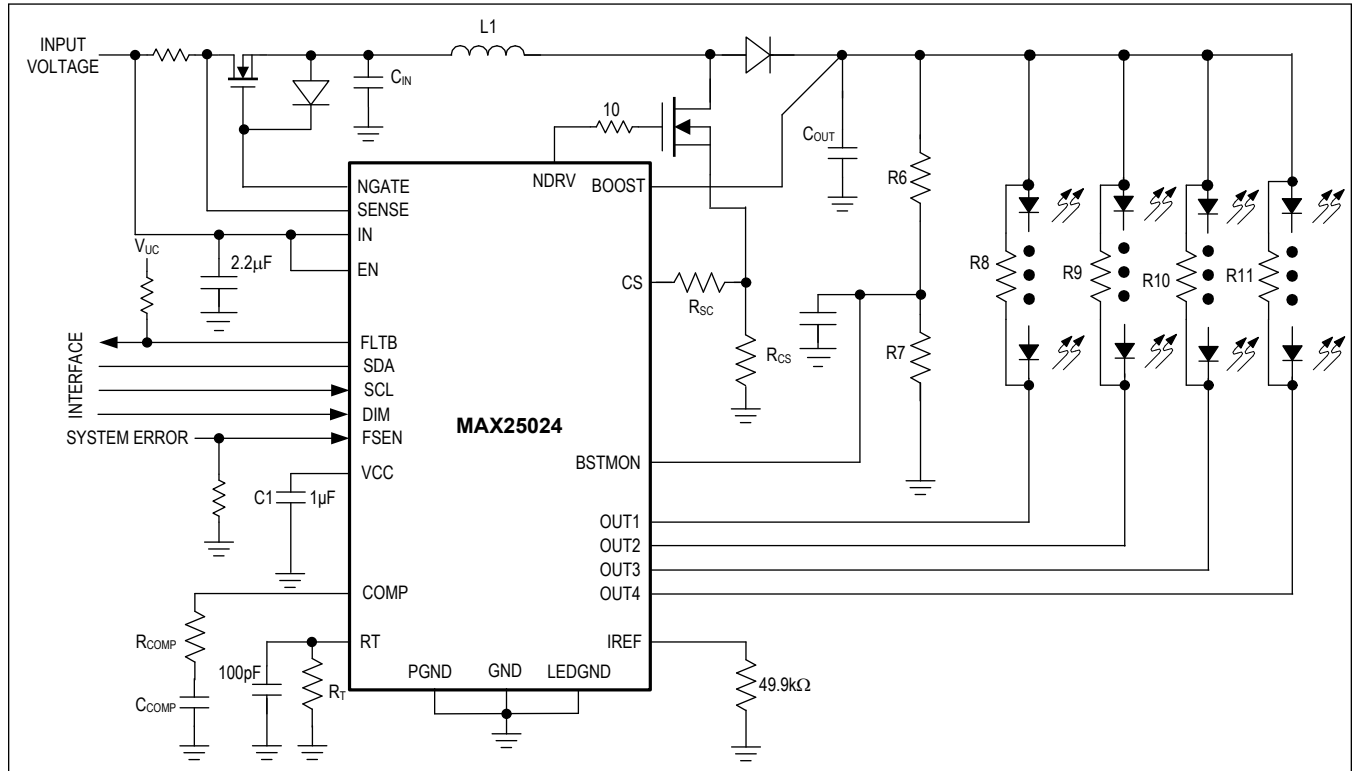
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Typical Application Circuits

MAX25024 Applications Circuit



Ordering Information

PART NUMBER	TEMPERATURE RANGE	PIN-PACKAGE
MAX25024ATG/V+	-40°C to +125°C	24 TQFN-EP*
MAX25024ATG/VY+	-40°C to +125°C	24 SWTQFN-EP*

+Denotes a lead(Pb)-free/RoHS-compliant package.

$T = \text{Tape and reel.}$

N denotes an automotive qualified part.

Y = Side-wettable package.

$$EP^* = \text{Exposed Pad}$$

**Future product—contact factory for availability.*

Mouser Electronics

Authorized Distributor

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[Maxim Integrated:](#)

[MAX25024ATG/V+](#)