

## MAX16813

# Integrated, 4-Channel, High-Brightness LED Driver with High-Voltage DC-DC Controller and Battery Disconnect

*Multistring Driver Provides Highest Efficiency and Complete Fault Protection with the Lowest External Component Count*

Overview

## Status

Active: In Production.

## Data Sheet

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NDA Required

## Description

The MAX16813 high-efficiency, high-brightness LED (HB LED) driver provides four integrated LED current-sink channels. An integrated current-mode switching controller drives a DC-DC converter that provides the necessary voltage to multiple strings of HB LEDs. The device accepts a wide 4.75V to 40V input voltage range and withstands direct automotive load-dump events. The wide input range allows powering HB LEDs for small- to medium-sized LCD displays in automotive and general lighting applications.

An internal current-mode switching DC-DC controller supports boost or SEPIC topologies and operates in an adjustable frequency range between 200kHz and 2MHz. An integrated spread-spectrum mode helps reduce EMI. Current-mode control with programmable slope compensation provides fast response and simplifies loop compensation. An adaptive output-voltage control scheme minimizes power dissipation in the LED current-sink paths. The device has a separate p-channel drive (PGATE) pin that is used for output undervoltage protection. Whenever the output falls below the threshold, the external p-MOSFET is latched off, disconnecting the input source. Cycling the EN or the input supply is required to restart the converter. The external p-MOSFET is off when the EN pin is below 0.3V (typ). The shutdown current is 1 $\mu$ A (typ) at an input voltage of 12V.

The device consists of four identical linear current-sink channels, adjustable from 20mA to 150mA with an accuracy of  $\pm 3\%$  using a single external resistor. Multiple channels can be connected in parallel to achieve higher current per LED string. The device also features a unique pulsed dimming control through a logic input (DIM), with minimum pulse width as low as 500ns. Protection features include output overvoltage, open-LED detection and protection, programmable shorted LED detection and protection, output undervoltage protection and detection, and overtemperature protection. The device operates over the -40°C to +125°C automotive temperature range. The MAX16813 is available in 20-pin (6.5mm x 4.4mm) TSSOP and 20-pin (4mm x 4mm) TQFN packages.

## Key Features

- 4-Channel Linear LED Current Sinks with Internal MOSFETs
  - Full-Scale LED Current Adjustable from 20mA to 150mA
  - Drives 1 to 4 LED Strings
- Boost or SEPIC Current-Mode DC-DC Controller
  - 200kHz to 2MHz Programmable Switching Frequency
  - External Switching Frequency Synchronization
  - Spread-Spectrum Mode to Reduce EMI
- Adaptive Output-Voltage Optimization to Minimize Power Dissipation
- Output-to-Ground Undervoltage Protection
- 4.75V to 40V Operating Input Voltage Range
- Less than 2 $\mu$ A Shutdown Current
- 10000:1 PWM Dimming at 200Hz
- Open-Drain Fault-Indicator Output
- Open-LED and LED Short Detection and Protection

## Applications/Uses

- Architectural, Industrial, and Ambient Lighting
- Automotive Displays LED Backlights
- Automotive RCL, DRL, Front Position, and Fog Lights
- LCD TV and Desktop Display LED Backlights

- Overtemperature Protection
- Thermally Enhanced, 20-Pin TQFN and TSSOP Packages

## Key Specifications:

LED Drivers											
Part Number	Regulation Topology	Max. No. of LEDs	LED Channels	LED Configuration	I <sub>LED</sub> per Channel (A)	PWM Dimming Freq. (kHz)	Dimming Ratio	Dimming Control	P <sub>OUT</sub> (W)	V <sub>IN</sub> (V)	V <sub>IN</sub> (V)
					max	max	max			min	max
<b>MAX16813 NEW!</b>	Inductor Based	44	4	Series-Parallel	0.15	200	10000	PWM	32	4.75	40

[See All LED Drivers \(76\)](#)

### Pricing Notes:

This pricing is BUDGETARY, for comparing similar parts. Prices are in U.S. dollars and subject to change. Quantity pricing may vary substantially and international prices may differ due to local duties, taxes, fees, and exchange rates. For volume-specific prices and delivery, please see the [price and availability](#) page or contact an authorized distributor.

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