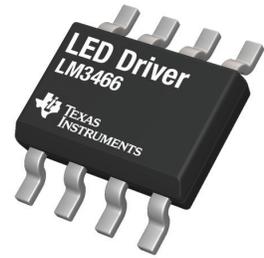


LM3466

Smart Linear LED Driver for Multi-Channel LED Systems



Product Bulletin

Highly-Integrated LED Driver with Dynamic Current Equalization Balances Current Through Multiple LED Strings

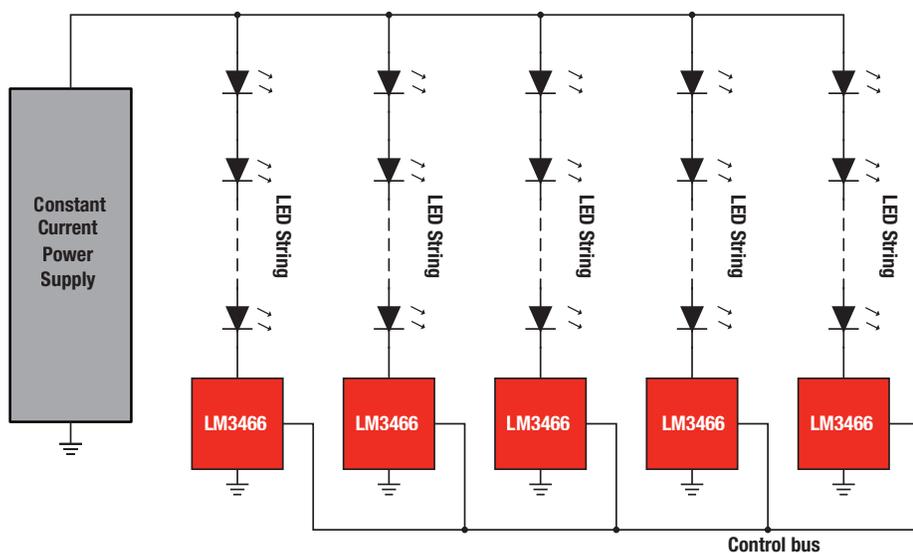
High-Brightness LED Driver Simplifies Area-Lighting Design

Designing an efficient, current balanced, and robust multi-string lighting system has never been easier than with the LM3466. A multi-string LED array can be built in minutes using an off-the-shelf constant current AC/DC power supply, just one LM3466, and a few passive components per string.

Maintaining equal currents among LED strings requires a complex design and multiple components. The LM3466 solves these problems by utilizing a unique dynamic current equalizing control scheme. Each LM3466, connected by a simple control bus line, ensures that the current through each active LED string is automatically equalized regardless of the number of strings or the forward voltage of each string.

Key Features

- Easy to use
 - Works with a constant current power supply with no feedback necessary
 - Requires only a few external components
- Automatically equalizes the current through every active LED string
- Provides robust fault protection and reporting
 - Maintains near constant output brightness if a string opens (inactive) by re-equalizing the current through the remaining active LED strings
 - Delivers thermal and under-voltage protection
 - Offers fault status output
- Operates with minimum voltage overhead to maximize power efficiency (up to 99%)
- Linear circuitry does not deteriorate system EMI
- Supports operating voltages from 6V to 70V
- Supports LED currents up to 1.5A



Simplified application overview using LM3466.

Simplest Configuration with an AC/DC Constant Current Power Supply

The LM3466 combines the best of alternatives such as ballast resistors, which are inefficient and offer poor current matching, and switching regulators, which can be complicated and introduce EMI.

Reduced Solution Size and Complexity

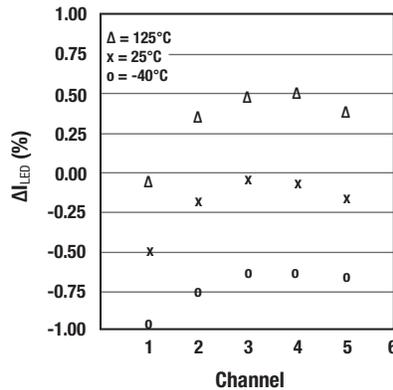
As a linear regulator with an integrated MOSFET, the LM3466 only requires a few additional components per string for a small and cost-effective solution.

Automatic Current Matching for Even Brightness

By implementing a unique dynamic current equalization scheme, each LM3466 in a system ensures that the current is balanced through each active string, even with string-to-string mismatches that can occur due to binning or changes in temperature.

Based on a 5-channel system (at 350 mA per channel), the current deviation between each channel is only 0.5%:

The LM3466 achieves very tight channel-to-channel matching even over the wide industrial temperature range (based on a 5-channel system):



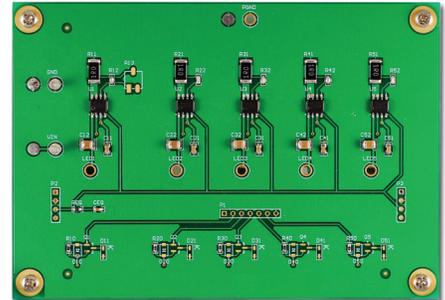
Current regulation (channel-to-channel) vs temperature.

High Efficiency

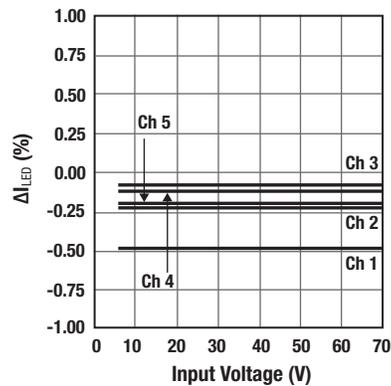
By maintaining a minimum voltage overhead, the LM3466 can operate at efficiencies up to 99%:

Increased System Protection and Reliability

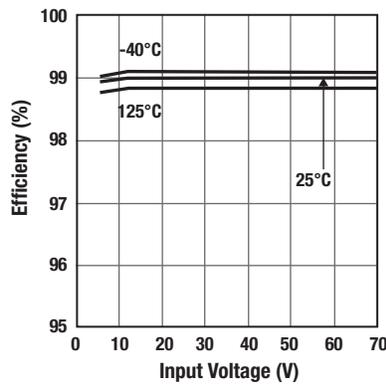
The LM3466 maintains system performance during both open- and short-circuit LED faults. If an LED string opens, each LM3466 automatically re-equalizes the system current through the remaining active LED strings in order to preserve overall system brightness. If a single LED is shorted, creating a string-to-string voltage mismatch, the dynamic current equalization control scheme ensures that current still remains balanced between each string. The LM3466 also provides thermal and under-voltage protection as well as a fault report output.



LM3466 evaluation kit and other resources available at www.ti.com/lm3466



Current regulation (channel-to-channel) vs V_{IN} .



Efficiency vs V_{IN} .

Important Notice: The products and services of Texas Instruments Incorporated and its subsidiaries described herein are sold subject to TI's standard terms and conditions of sale. Customers are advised to obtain the most current and complete information about TI products and services before placing orders. TI assumes no liability for applications assistance, customer's applications or product designs, software performance, or infringement of patents. The publication of information regarding any other company's products or services does not constitute TI's approval, warranty or endorsement thereof.

The platform bar is a trademark of Texas Instruments. All other trademarks are the property of their respective owners.

For more information visit:
www.ti.com/lm3466

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components which meet ISO/TS16949 requirements, mainly for automotive use. Components which have not been so designated are neither designed nor intended for automotive use; and TI will not be responsible for any failure of such components to meet such requirements.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com