



**THE DATASHEET OF
LM3444MR16BBRB/NOPB**



AN-1773 LM3410X LED Driver 5-Pin SOT-23 Demo Board

1 Introduction

The demo board included in this shipment converts 2.7V to 5.5V input, and illuminates four 50mA LED's in series using the LM3410X 1.6MHz LED driver switching converter. This is a 2-layer board using the bottom layer as a ground plane.

A bill of materials (see [Section 2](#)) describes the parts used on this demo board. A schematic and layout have also been included below along with measured performance characteristics. The above restrictions for the input voltage are valid only for the demo board as shipped with the demo board schematic below.

Operating Conditions

$$V_{IN} = 2.7V \text{ to } 5.5V$$

$$V_O \approx V_F \times 4 + V_{FB} \approx 3.6V \times 4 + 0.198V \approx 14.4V$$

$$I_O = 50mA$$

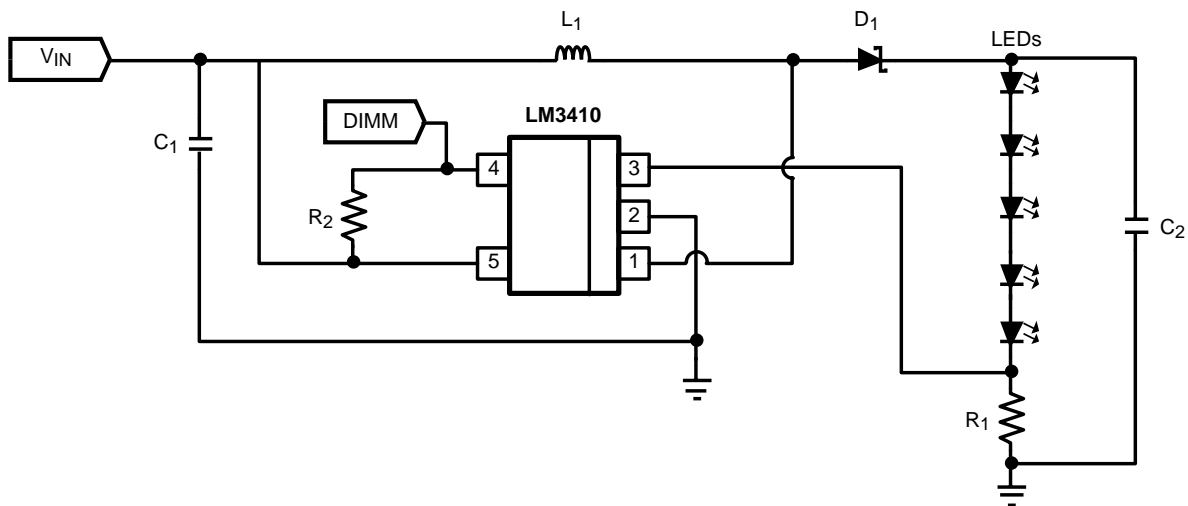


Figure 1. LM3410X 5-Pin SOT23 Schematic

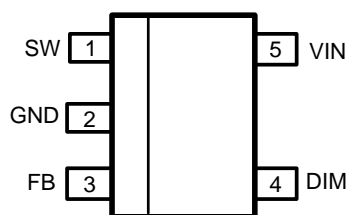


Figure 2. Pinout

All trademarks are the property of their respective owners.

Table 1. Pin Descriptions - 5-Pin SOT23

Pin	Name	Function
1	SW	Output switch. Connect to the inductor, output diode.
2	GND	Signal and power ground pin. Place the bottom resistor of the feedback network as close as possible to this pin.
3	FB	Feedback pin. Connect FB to external resistor divider to set output voltage.
4	DIM	Dimming & shutdown control input. Logic high enables operation. Duty Cycle from 0 to 100%. Do not allow this pin to float or be greater than VIN + 0.3V.
5	VIN	Supply voltage pin for power stage, and input supply voltage.

2 Bill of Materials LM3410X

Part ID	Part Value	Manufacturer	Part Number
U1	2.8A I _{sw} LED Driver	TI	LM3410X
C1, Input Cap	10µF, 6.3V, X5R	TDK	C2012X5R0J106M
C2 Output Cap	2.2µF, 25V, X5R	TDK	C2012X5R1E225M
D1, Catch Diode	0.4V _f Schottky 500mA, 30VR	Diodes Inc	MBR0530
L1	10µH 1.2A	Coilcraft	DO1608C-103
R1	4.02Ω, 1%Ω	Vishay	CRCW08054R02FRT1
R2	100kΩ, 1%	Vishay	CRCW06031003F
LED's	SMD-1206, 50mA, V _f ≈ 3.6V	Lite-On	LTW-150k

2.1 Performance Characteristics

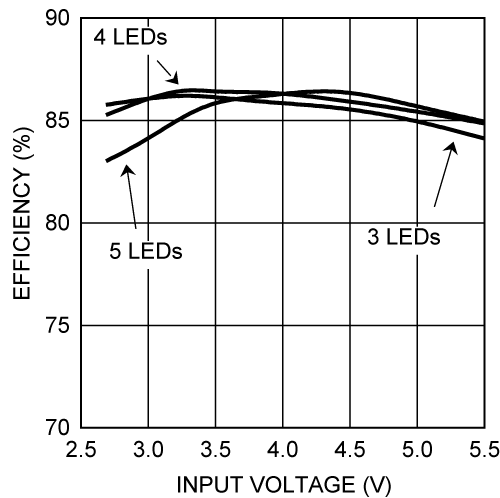


Figure 3. LM3410X Efficiency vs Input Voltage Series LEDs @ 50mA

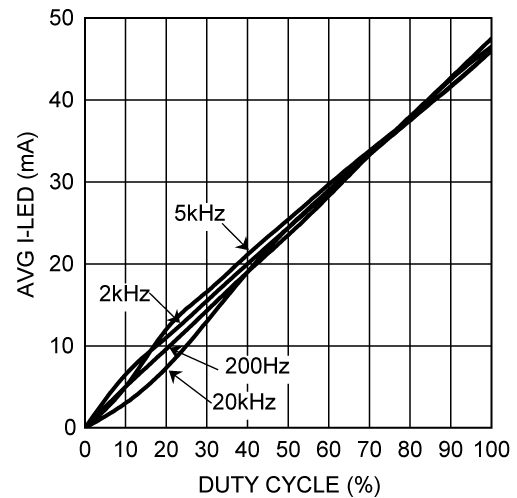


Figure 4. LM3410X Average LED Current vs Duty-Cycle & Dimming Frequency

3 PCB Layout

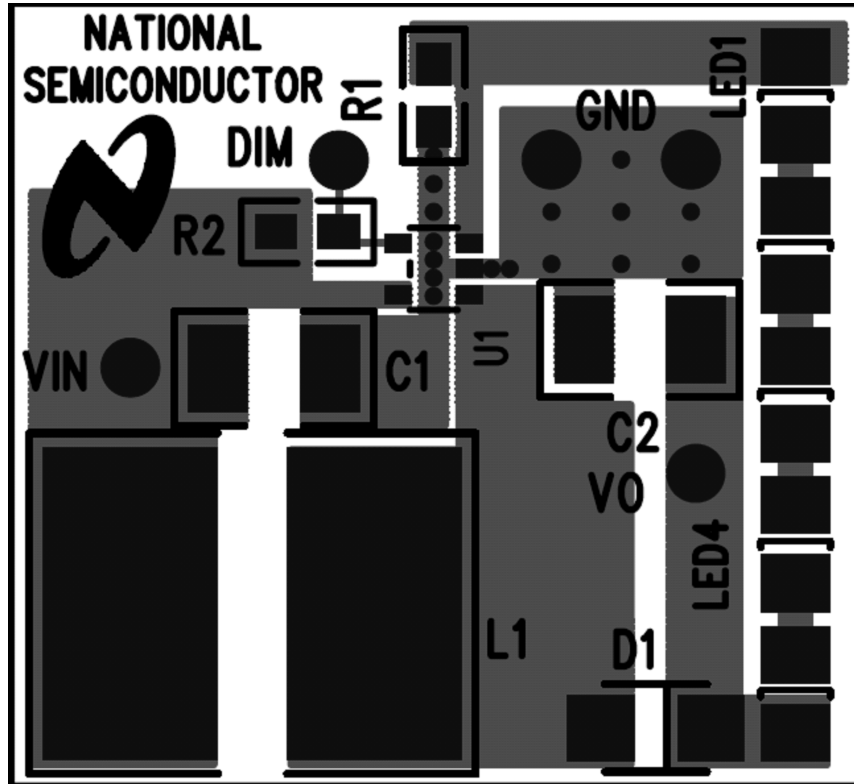


Figure 5. Demonstration Board Top Layer

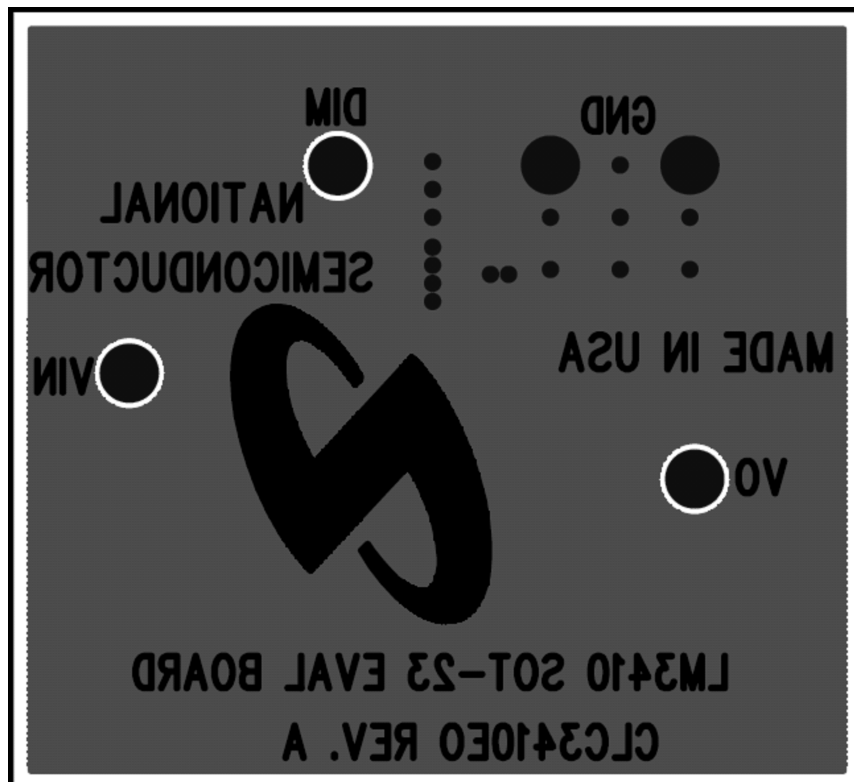


Figure 6. Demonstration Board Bottom Layer

4 16V > V_{PWR} > 5.5V Application Circuit

The circuit shown in Figure 7 allows for a single supply to be used with a simple Zener diode regulation circuit to provide the LM3410 with a housekeeping and driver voltage that is below 5.5V.

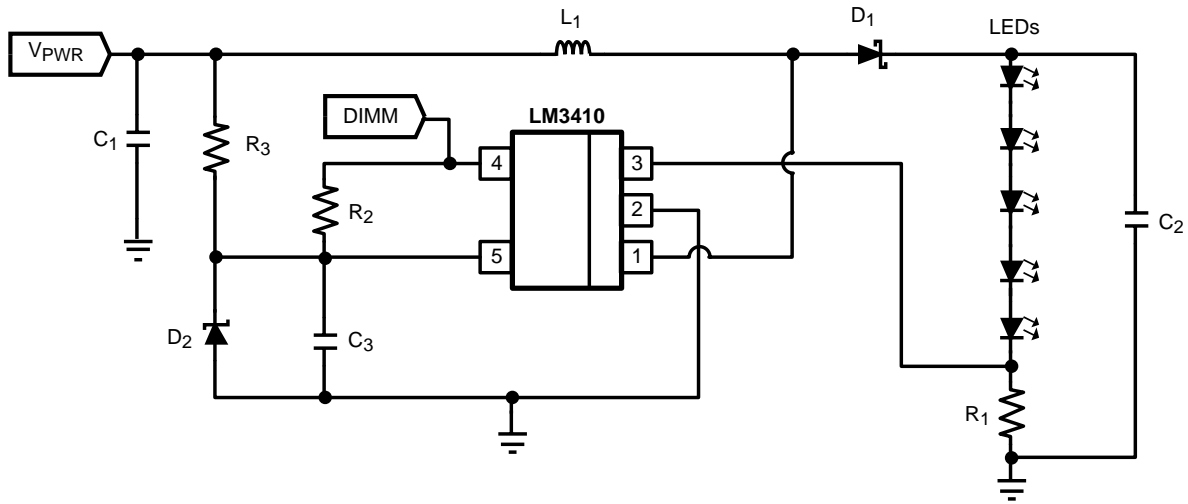


Figure 7. Circuit Allows Single Supply

The demonstration board provided can easily be modified to allow the user to derive the power from an input supply that is larger than 5.5V. In Figure 8 two separate supplies are needed. V_{IN} must be between 2.7V minimum to 5.5V maximum, but V_{PWR} can be as great as 16V.

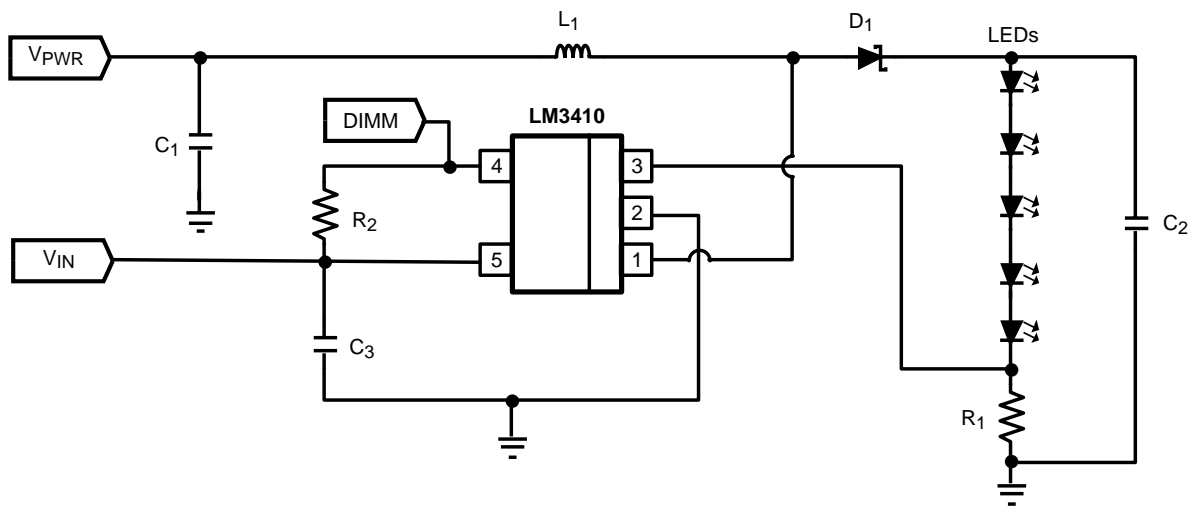


Figure 8. Circuit Needs Two Separate Supplies

The LM3410 VIN supply will draw approximately 7 mA while it is switching. Zenner diode should have a breakdown voltage lower than 5V, and size R3 to allow for 7 mA of current draw.

Table 2. List of Components

Part ID	Part Value	Manufacturer	Part Number
U1	2.8A I _{SW} LED Driver	TI	LM3410X
C1 V _{PWR} Input Cap	10μF, 6.3V, X5R	TDK	C1608X5R0J106K
C2 Output Cap	1μF, 25V, X5R	TDK	C2012X5R1E105K
C3 V _{IN} Input Cap	0.1μF, 6.3V, X5R	TDK	C1005X5R1C104K
D1, Catch Diode	0.43V _f , Schotky, 0.5A, 30V _R	Diodes Inc	B0530W
L1	6.8μH 2.7A	Coilcraft	MOS6020-682
R1	4.02Ω, 1%	Vishay	CRCW08054R02FRT1
R2	100kΩ, 1%	Vishay	CRCW08051003F
R3	576Ω, 1%	Vishay	CRCW08055760F
D2	3.3V Zener, SOT23	Diodes Inc	BZX84C3V3
LEDs	SMD-1206, 50mA, V _f ≈ 3.6V		

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 as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

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

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View LM3444MR16BBRB/NOPB on WIN SOURCE](#)
- ⊖ [Texas Instruments](#) Information

Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management