



1.3 MHz Boost Regulator / White LED Driver
TF4602 Evaluation Board

Features

- Low cost, highly efficient, white LED driver
- Wide input voltage range: 2.5V to 6V
- Compact 1" x 1" reference layout (Full main board size is 2.5" x 2.25")
- Double 0.1" headers for VIN, LED+, LED- and GND connections
- Add-on card enables evaluation with up to 13x3 WLEDs; assembled for evaluation with 9x3 WLEDs
- Easily modifiable for TF4601 evaluation

Description

The TF4602EVK is an evaluation board designed for demonstration of all features and performance of the TF4602. The TF4602 is a monolithic asynchronous boost regulator / WLED driver featuring integrated 500 mΩ MOSFETs capable of driving up to 13 parallel strings of 3 WLEDs. The board operates over a wide 2.5V to 6V input voltage range while providing constant 180 mA current ideal for driving a 9x3 WLED array.

The TF4602EVK consists of a main board (2.5" x 2.75") featuring all converter components and an add-on board (2.5" x 1.25") featuring a 9x3 WLED array (footprint for 13x3 array). The board features 0.1" headers for easy connection to instrumentation and / or system prototypes. Its compact reference layout may easily be integrated into the prototype layouts.

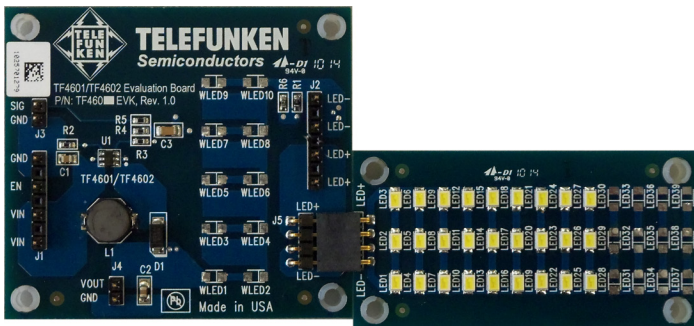
Applications

- Cellular Phones
- Digital Cameras
- PDAs, Smart Phones, MP3 Players, OLEDs
- Portable Instruments

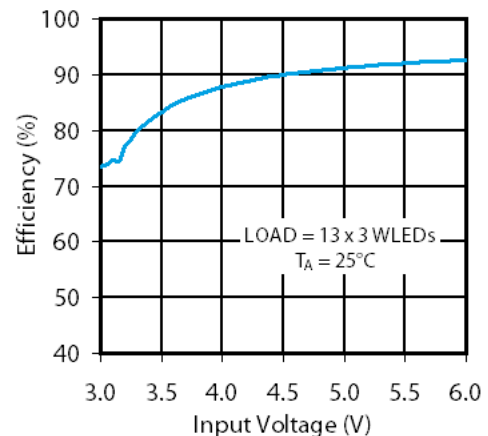
Ordering Information

PART NUMBER	MAIN IC (U1) PART NUMBER
TF4602EVK	TF4602-UTP

Evaluation Board Photo



Typical Efficiency



TF4602EVK Layout

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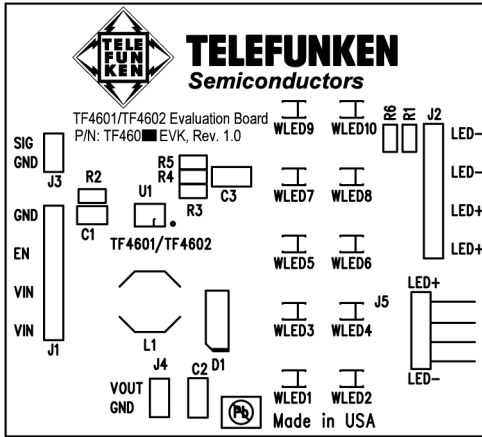


Figure 1. MAIN Board Top Silkscreen Layer

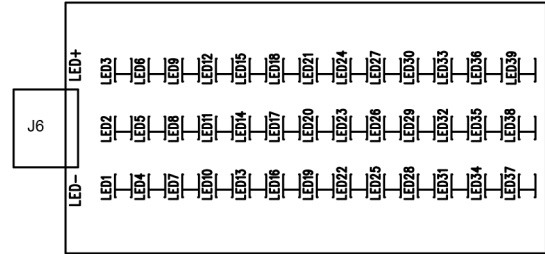


Figure 4. ADD-ON Card Top Silkscreen Layer

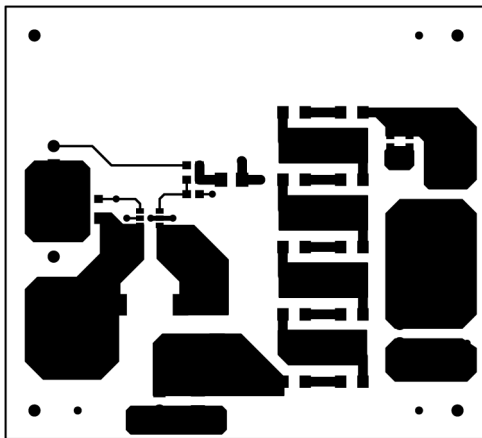


Figure 2. MAIN Board Top Copper Layer

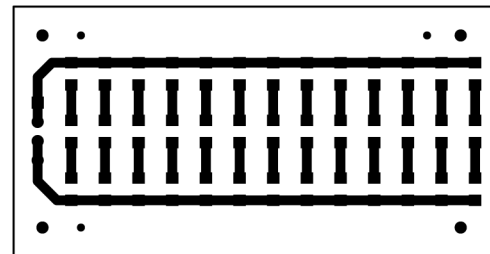


Figure 5. ADD-ON Card Top Copper Layer

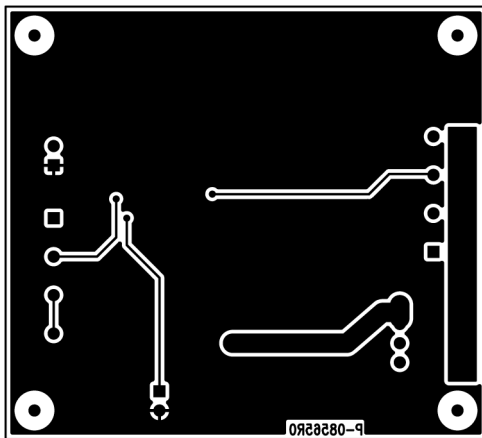


Figure 3. MAIN Board Bottom Copper Layer

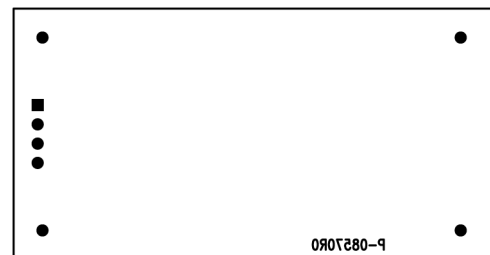


Figure 6. ADD-ON Card Bottom Copper Layer

Quick Start Guide

1. Attached the ADD-ON card to the MAIN board (J5). Ensure that LED+ and LED- pins of J5 mate with the equivalent pins of the ADD-ON card connector.
2. Connect the VIN and GND pins of J1 connector on the TF4602EVK MAIN board to the external power supply. The recommended input voltage is between 2.5V and 6V. Applying a voltage that exceeds the absolute maximum rating of the TF4602 VIN pin (6.5V) may damage the device.
3. Drive EN pin high to enable the TF4602.
4. Refer to the product datasheet for different dimming methods.
5. Use a voltmeter and / or an oscilloscope with voltage and current probes to check the operation of the TF4602.

TYPICAL PERFORMANCE

Figure 7 shows typical steady state operation waveforms measured with a digital storage oscilloscope and current and voltage probes.

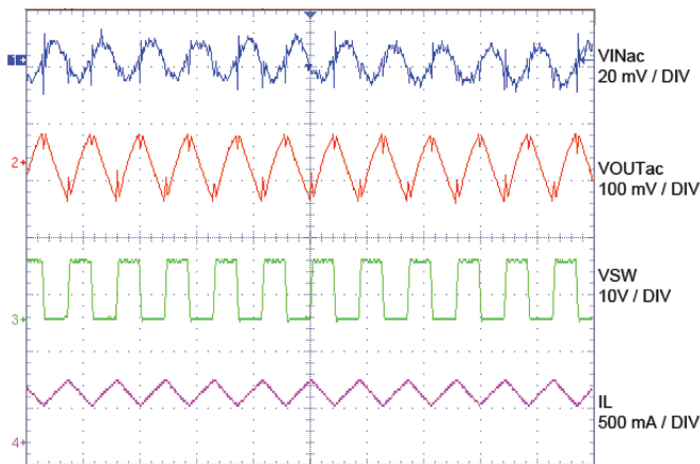


Figure 7. TF4602EVK Typical Operation

The waveforms of Figure 7 represent the TF4602EVK typical operation for the input voltage of 5V and a 9x3 WLED array as a load.

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SETTING THE OUTPUT VOLTAGE

The TF4602EVK output current is preset to 180 mA which is optimal for driving 9 strings of 20 mA WLEDs. However, it may easily be adjusted to other common values. Based on the TF4602EVK schematic, the LED current depends on the reference voltage, V_{REF} and the resistor, R_{SET} ($R1 \parallel R6$ on the board), as expressed with the following equation:

$$I_{LED} = \frac{V_{REF}}{R_{SET}}$$

Table 1 exemplifies several standard resistor values needed for a given LED current. If standard resistor values are not available a parallel combination of two standard resistors may also be used to get the desired LED current.

V_{REF} [mV]	I_{LED} [mA]	R_{SET} [Ω]
104	10	10.5
	20	5.23
	100	1.05
	180	1.2 1.1
	260	0.4

Table 1. Examples of Standard Value Resistors for a Given LED Current

Notes

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