DEMO CIRCUIT 1405
QUICK START GUIDE

LT3492
Triple Boost or Buck/Boost LED Driver

DESCRIPTION

WARNING!

Do not look directly at operating LED.
This circuit produces light that can damage eyes.

Demonstration circuit 1405 is a Triple Boost or Buck/Boost LED Driver featuring the LT3492. The LT3492 is a triple output DC/DC converter designed to operate as current sources for driving LEDs.

The board can be configured into either boost (default) or buck-boost mode. The current for each output is 61mA in either mode. The over-voltage protection is at 58V. For a typical application with a LED voltage of 3.6V, each boost circuit can drive around 15 LEDs. Applications with different input voltages and load combinations can be demonstrated on this circuit with some board modifications. Call the LTC applications group for support.

Each of the three regulators on the demo board is independently operated. The PWM dimming feature of the LT3492 allows True Color PWM dimming with the dimming ratio of 3000:1. Additional analog dimming is done through adjusting the CTRL voltages.

Setting CTRL voltage to be less than 1V will set the current sense voltage to be one-tenth of CTRL voltage, therefore, reduce the LED current. The output current should not exceed the rated current of the LEDs used. The LED current thermal de-rating should be considered to protect the LEDs.

The LT3492 datasheet gives complete description of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for working on or modifying the demo circuit 1405.

Design files for this circuit board are available. Call the LTC factory.

LT, LTC and LT are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners

PERFORMANCE SUMMARY

Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
PV_{IN}	Power Input Supply*	Boost Mode, I_{LED} = 61mA, LED String Voltage = 48V.	8		40	V
V_{IN}	Chip Bias Input Supply**		4.5	5	5.5	V
I_Q	Quiescent Current at V_{IN}	Boost Mode, I_{LED} = 61mA, PVIN=12V, VIN=5V, LED String Voltage = 48V.		29		mA
V_{OVP}	Output Over-voltage Protection			58.7		V
I_{LED}	Output LED Current, per Channel		59	61	63	mA
F_{SW}	Switching Frequency		0.77	1	1.23	MHz
η	Conversion Efficiency	Boost Mode, I_{LED} = 61mA, PVIN=12V, VIN=5V, LED String Voltage = 48V.		85		%
PWM_D	PWM Dimming Ratio	PWM Frequency: 100Hz		3000:1		

* MIN and MAX PVIN are determined by switch current limit, minimum/maximum duty cycle, output voltage, etc.
** V_{IN} of the demo board is limited by the choice of the input capacitor. The LT3496 input range is 3V-30V with transient protection to 40V. A lower V_{IN} helps to reduce the power dissipation in the chip.

QUICK START PROCEDURE

Demonstration circuit 1405 is easy to set up to evaluate the performance of the LT3492. Refer to 0 for proper measurement equipment setup and follow the procedure below:

1. Make sure JP4=ON. With power off, select boost or buck/boost mode. The default setting is for boost mode. If buck/boost mode is selected, also remove C2, C4, C6 and populate C1, C3, C5.
2. Connect an input power supply to V_{IN} and GND. To achieve highest efficiency, a low voltage supply, such as 5V, is recommended.
3. With power off, connect a second input power supply to PV_{IN} and GND.
4. Connect LED strings as shown in Figure 1.
5. If LED string *n* is not used, the PWM*n* should be tied to GND.
6. Turn on PV_{IN} power supply.
7. Turn on V_{IN} power supply.
8. Check for the proper LED current and LED string voltage.

   NOTE. If there is no output, turn off the power supplies. Check all connections.
9. To observe PWM dimming, turn off all power supplies. Connect the PWM*n* to a pulse generator. Then repeat step 6 – 8.

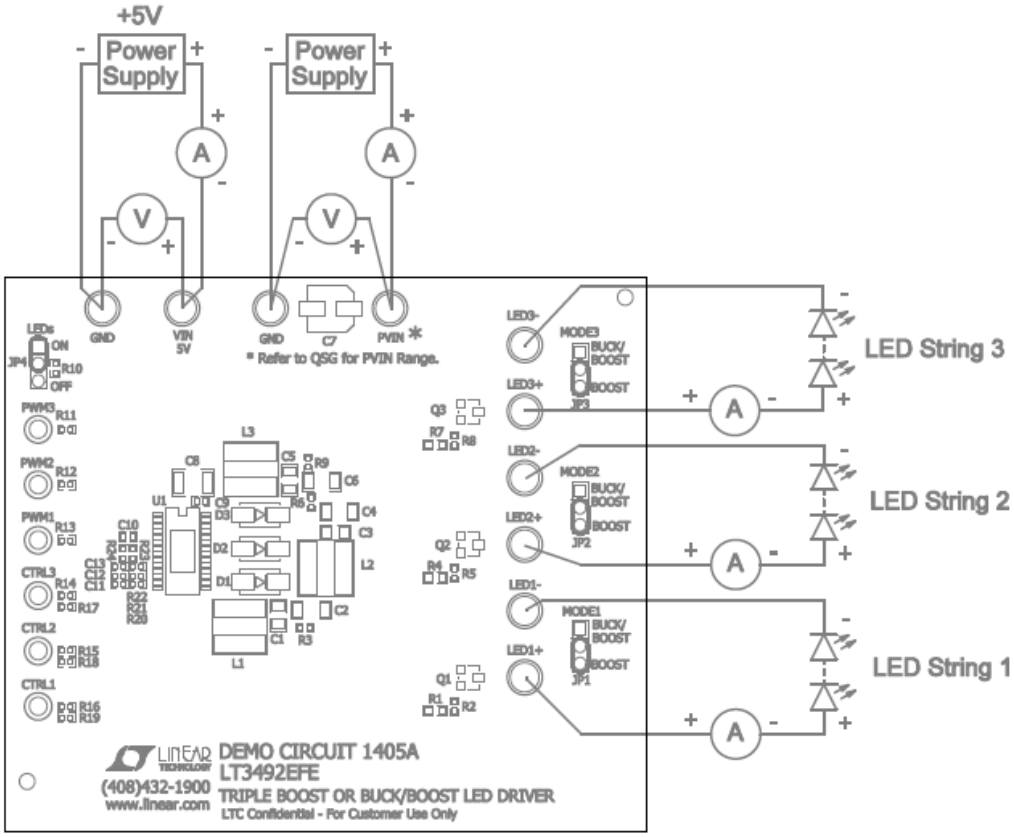
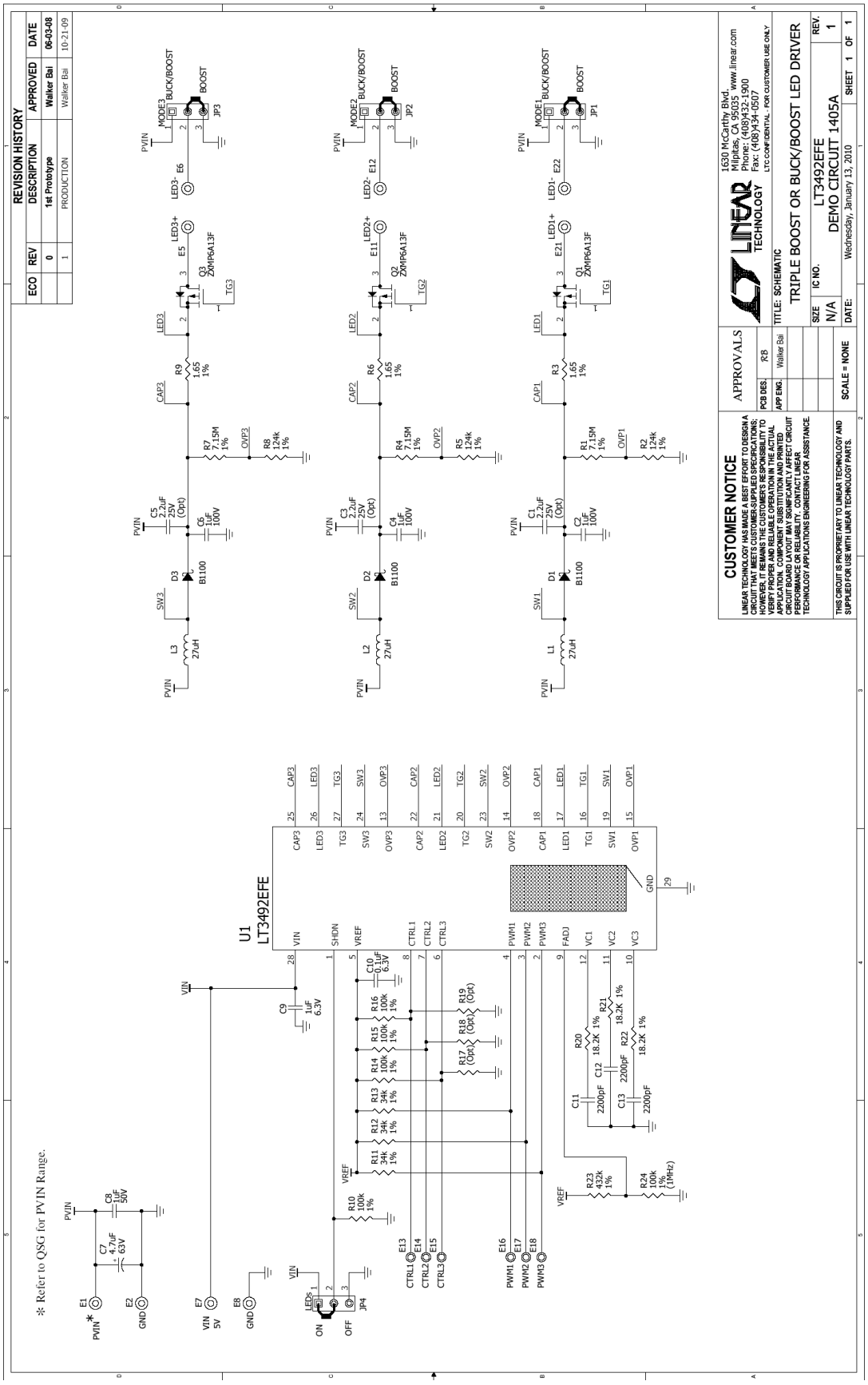


Figure 1. Proper Measurement Equipment Setup (LEDs on the High Side)


REVISION HISTORY
ECO REV DESCRIPTION APPROVED DATE
0 1st Prototype Walker Bai 06-03-08
1 PRODUCTION Walker Bai 10-21-09
U1
LT3492EFE
* Refer to QSG for PVIN Range.
CUSTOMER NOTICE
APPROVALS
PCB DES. RB
APP ENG. Walker Bai
LINEAR TECHNOLOGY
1630 McCarthy Blvd.
Milpitas, CA 95035 www.linear.com
Phone: (408)432-1900
Fax: (408)434-0507
LTC CONFIDENTIAL - FOR CUSTOMER USE ONLY
TITLE: SCHEMATIC
TRIPLE BOOST OR BUCK/BOOST LED DRIVER
SIZE IC NO. LT3492EFE REV. 1
N/A DEMO CIRCUIT 1405A
DATE: Wednesday, January 13, 2010
SCALE = NONE
SHEET 1 OF 1
THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.