# LT3590
# 48V Buck-Mode LED Driver

**WARNING!**
**DO NOT LOOK DIRECTLY AT OPERATING LED**
This Circuit Produces Light that Can Damage Eyes.

## DESCRIPTION

Demonstration circuit 1166A is a 48V Buck-Mode LED Driver featuring the LT®3590. The LT3590 is a fixed frequency buck-mode converter specifically designed to drive up to 10 LEDs in series from a 48V DC source. Series connection of the LEDs provides identical LED currents of up to 50mA, resulting in uniform brightness and eliminating the need for ballast resistors. A fixed frequency current mode architecture results in stable operation over a wide range of input voltage and load condition. The high switching frequency allows using tiny components for the circuit.

The LT3590 data sheet gives complete descriptions of the part, operation and application information. The data sheet must be read in conjunction with this quick start guide for working on or modifying the demo circuit 1166A.

**Design files for this circuit board are available at http://www.linear.com/demo/DC1166A**



## PERFORMANCE SUMMARY

**Specifications are at $T_A$ = 25°C**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| $V_{IN}$ | Input Supply Range | | 4.5 | | 55 | V |
| $D_{MAX}$ | Maximum Duty Cycle | | 90 | | | % |
| $I_{QSHDN}$ | Quiescent Current in Shutdown | $V_{IN}$ = 48V | | 15 | 20 | µA |
| $f_{SW}$ | Switching Frequency | | 650 | 850 | 1050 | KHz |
| $V_{REG}$ | VREG Pin Voltage | 1mA Load on VREG Pin | 3.1 | 3.3 | 3.5 | V |
| EFF | Efficiency | $V_{IN}$ = 48V; $V_{LED}$ = 30V; $I_{LED}$ = 50mA | | 90 | | % |

## QUICK START PROCEDURE

Demonstration circuit 1166A is easy to set up to evaluate the performance of the LT3590. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions:

   **JP1** ON

2. With power off, connect the input power supply to VIN and GND.
3. With power off, connect LEDs to LED+ and LED–.
4. Turn on the power at the input.

   NOTE: Make sure that the input voltage does not exceed 55V.

5. Check for the proper output voltage and current.

## QUICK START PROCEDURE

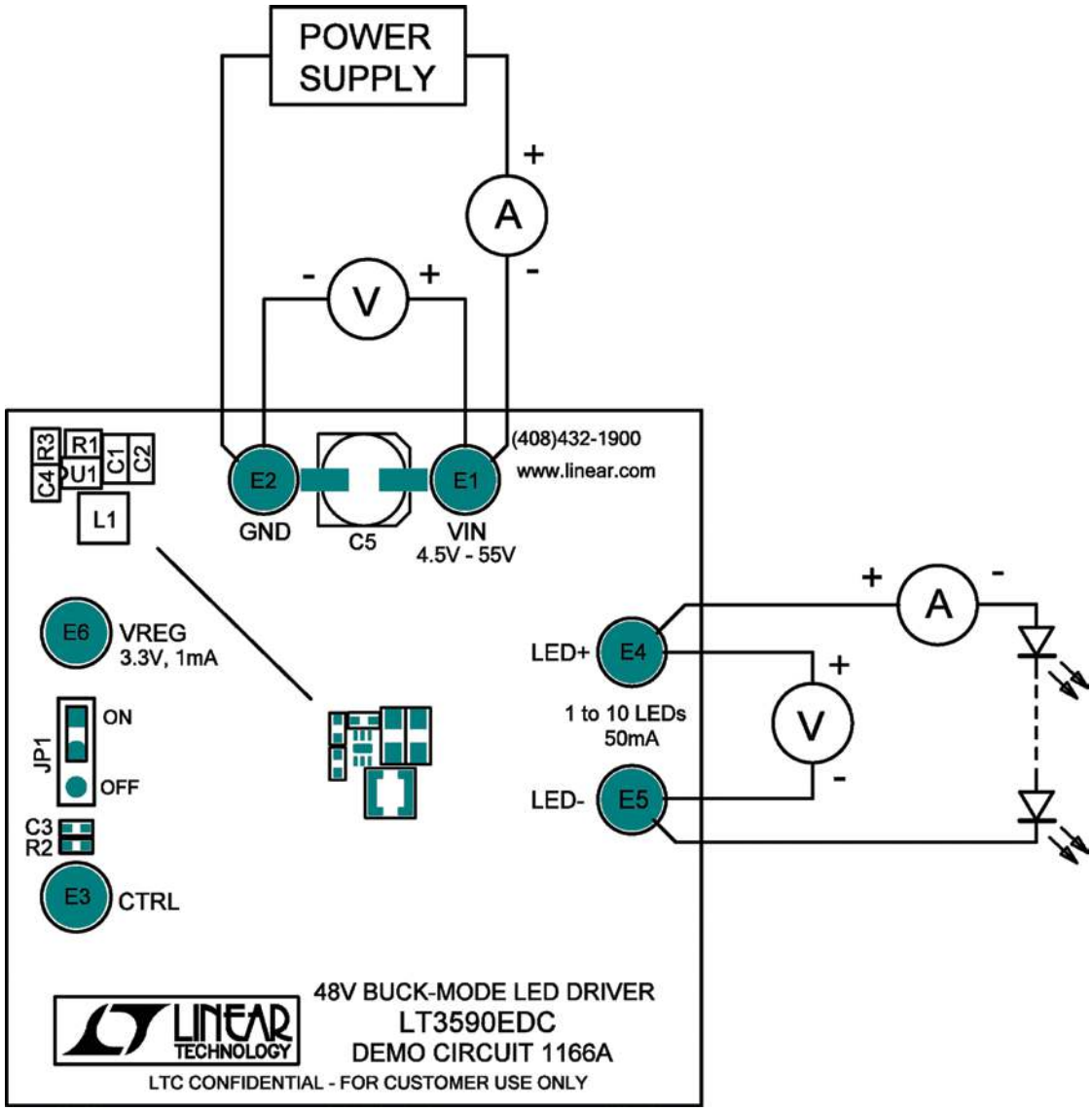
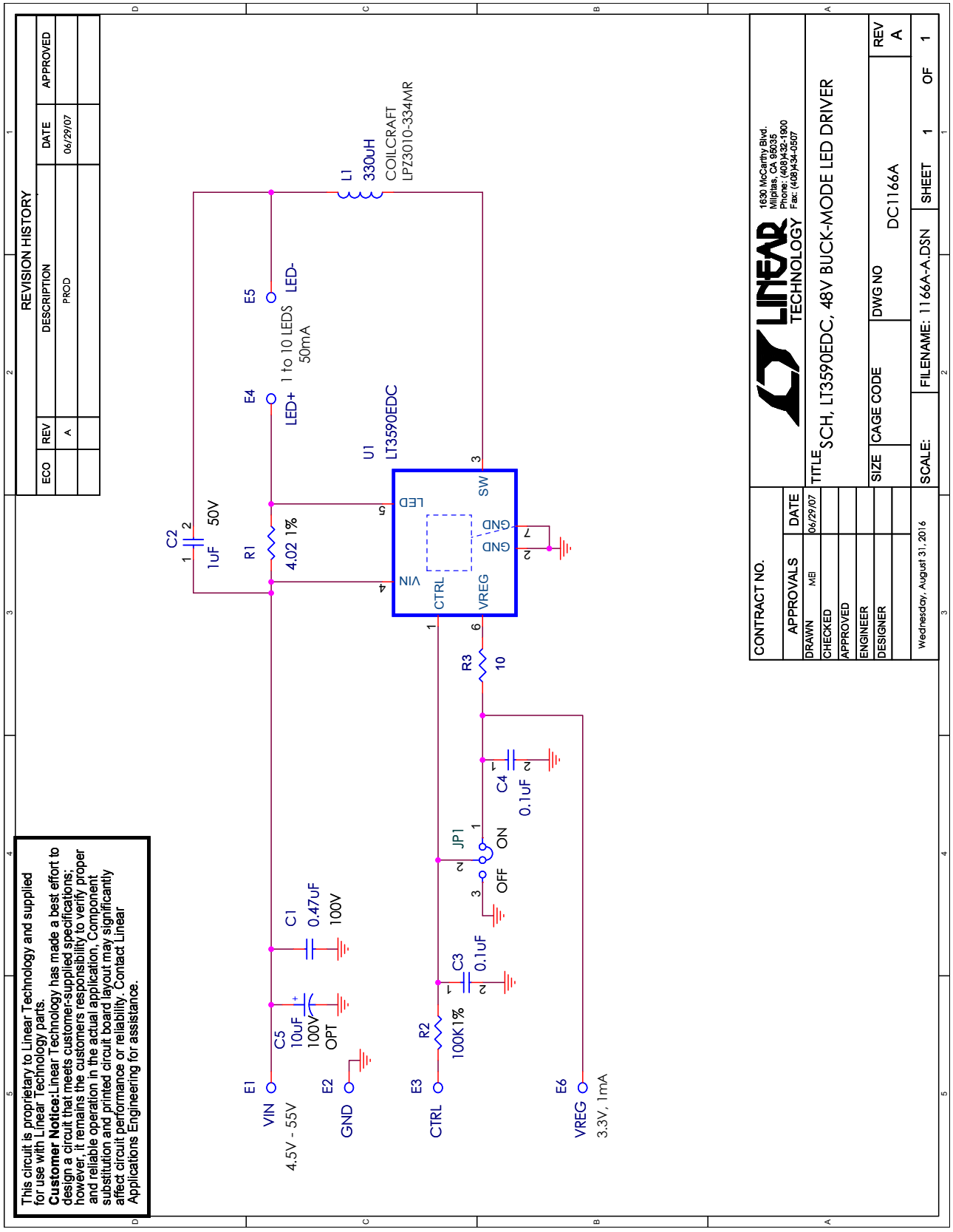



**Figure 1. Proper Measurement Equipment Setup**

## PARTS LIST

| ITEM | QTY | REFERENCE | PART DESCRIPTION | MANUFACTURER/PART NUMBER |
|---|---|---|---|---|
| **Required Circuit Components** | | | | |
| 1 | 1 | C1 | CAP, 0805 0.47µF 10% 100V X7R | MURATA GRM21BR72A474KA73BL |
| 2 | 1 | C2 | CAP, 0805 1µF 10% 50V X7R | MURATA GRM21BR71H105K |
| 3 | 1 | L1 | INDUCTOR, 330µH | COILCRAFT LPZ3010-334MR |
| 4 | 1 | R1 | RES, 0402 4.02Ω 1% 1/16W | VISHAY CRCW04024R02FKED |
| 5 | 1 | U1 | IC, LT3590EDC | LINEAR TECH. LT3590EDC |
| **Additional Demo Board Circuit Components** | | | | |
| 1 | 2 | C3, C4 | CAP, 0402 0.1µF 10% 16V X5R | AVX 0402YD104K |
| 2 | 1 | C5 | CAP, 10µF 20% 100V ALUM | SANYO 100CE10BS |
| 3 | 1 | JP1 | HEADER, 3-PIN 0.100 | SAMTEC TSW-103-26-L-S |
| 4 | 1 | JP1 | SHUNT | SAMTEC SNT-100-BK-G |
| 5 | 1 | R2 | RES, 0402 100k 1% 1/16W | VISHAY CRCW04021003FKED |
| 6 | 1 | R3 | RES, 0402 10Ω 5% 1/16W | VISHAY CRCW040210R0JNED |
| **Hardware: For Demo Board Only** | | | | |
| 1 | 5 | E1, E2, E3, E4, E5 | TURRET | MILL-MAX 2501-2-00-80-00-00-07-0 |

## SCHEMATIC DIAGRAM



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