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

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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

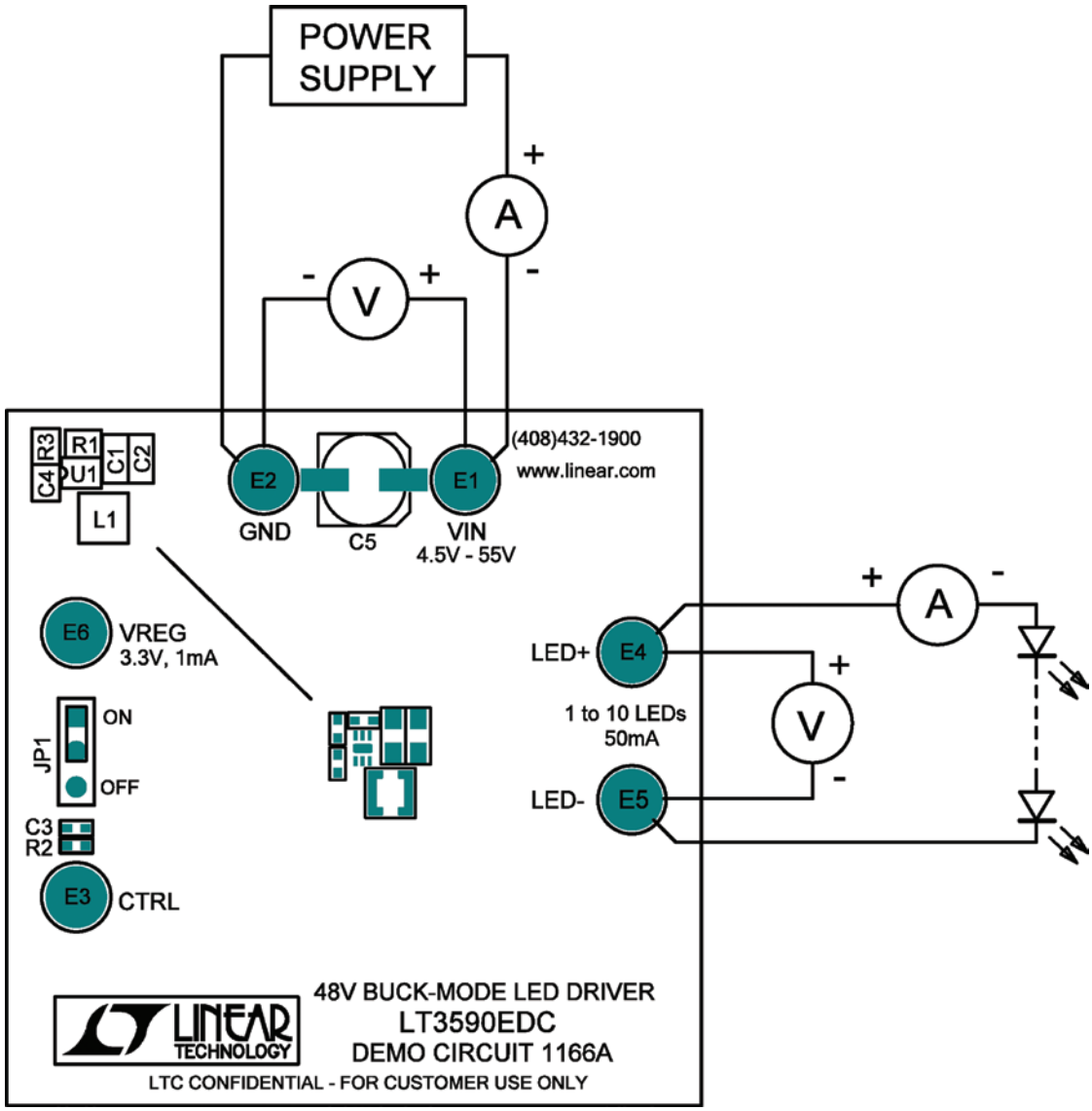
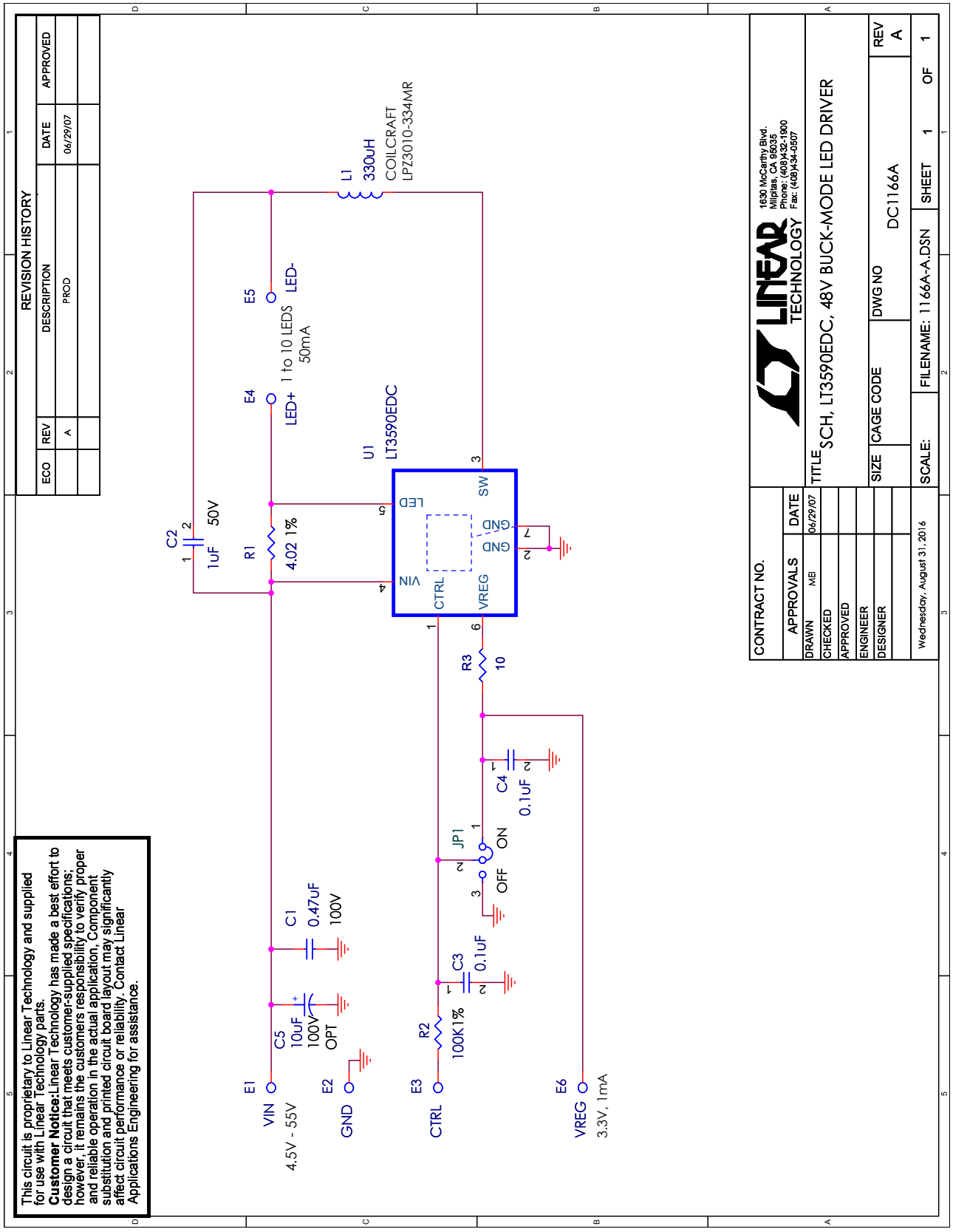


Figure 1. Proper Measurement Equipment Setup

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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This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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