

## DESCRIPTION


Demonstration circuit 902 is a low noise high current LED charge pump featuring the LTC®3214 and a cell phone camera flash LED. The board has two versions (-A, -B) that are optimized separately for a short LED flash current or a lower but constant LED torch current with a single lithium ion battery input voltage range of 2.9V to 4.4V or three AAA batteries in series. The lithium ion battery input voltage range, high LED flash current and separate torch mode current setting, internal charge pump switches, inductorless solution, minimal external components, and simple design makes the LTC3214 the top solution for space-constrained cellular telephone camera flash solutions with flash current below 500mA. The LTC3214 is very similar to the LTC3215 and LTC3216, but with lower maximum flash current of 500mA as opposed to 700mA and 1000mA respectively.

DC902A can be built with three AAA batteries in series in a battery pack on the back to simulate the capabilities of a typical lithium ion cellular telephone battery. The LED is turned on and off by pressing the LED ON button. Without the FLASH button pressed, the LED ON button sets the LED current to the TORCH MODE setting in the schematic. The FLASH button flashes the LED at higher current as shown in

the schematic for cellular telephone camera flash operation. The FLASH only works when the LED ON button is also pressed. The FLASH button activates a MOSFET that places a second ISET resistor in parallel with the original, raising the LED current. FLASH MODE is intended to be less than one second long. Holding down the FLASH button with the LED ON can damage the LED and potentially damage the IC.

The LTC3214 datasheet gives a complete description of the part, operation and applications information. The datasheet must be read in conjunction with this Quick Start Guide for demonstration circuit 902. In addition, the datasheets for the two LEDs must be read in order to understand the thermal and light output specifications of the LEDs. The LTC3214 is assembled in a small low profile DFN package. Proper board layout is essential for maximum thermal performance. See the datasheet section 'Layout Considerations'.

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

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## QUICK START PROCEDURE

Demonstration circuit 902 is easy to set up to evaluate the performance of the LTC3214. Follow the procedure below:

**NOTE:** Make sure that the input voltage does not exceed 5.5V if a source other than the three AAA batteries is used.

**NOTE:** If batteries are not used, do not hot-plug the input voltage terminals VIN (+) and GND (-). The absolute maximum voltage on VIN is 5.5V and hot-plugging a power supply through wire leads to the demonstration circuit can cause the voltage on the

extremely low-ESR ceramic input capacitor to ring to twice its DC value. *See Application Note 88 for more details.*

1. Connect 2.9V to 4.4V input power supply to the VIN and GND terminals on the PCB or three AAA batteries in a battery pack that is connected to the + and – terminals on the PCB.
2. Press LED ON to turn on the LED in torch mode.
3. Briefly (less than 1 second) Press FLASH to observe a higher cell phone camera flash LED current.



# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 902

## LOW NOISE HIGH CURRENT LED CHARGE PUMP

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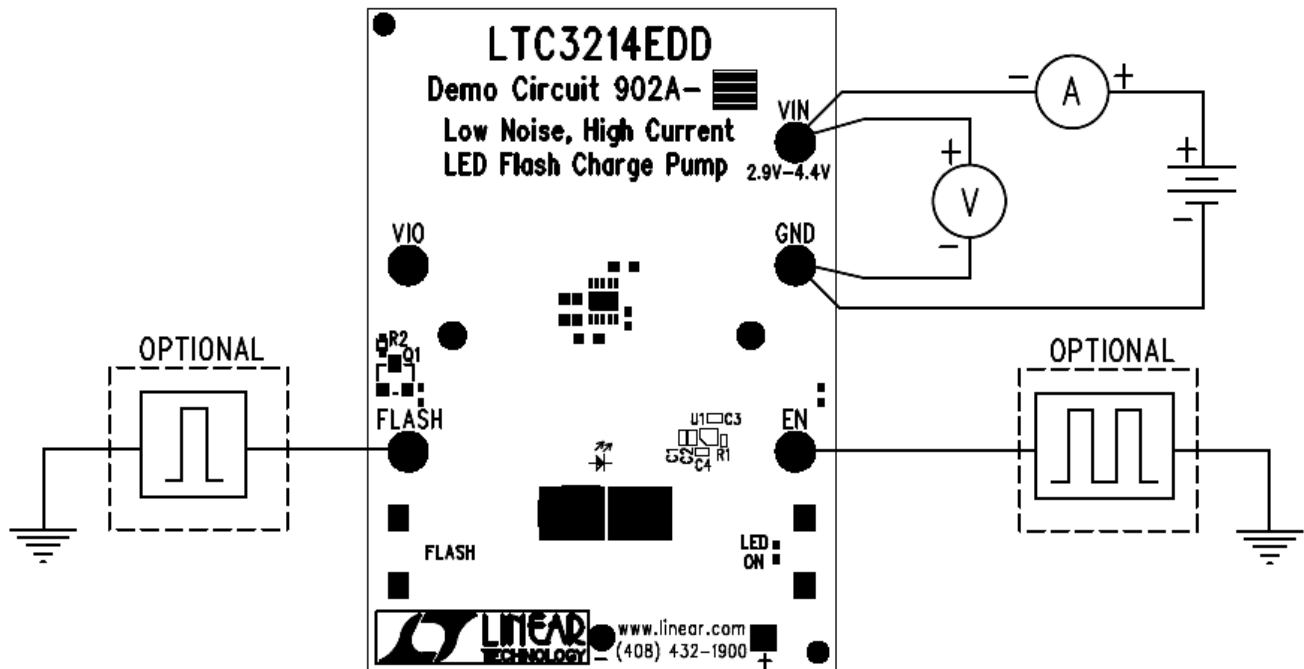
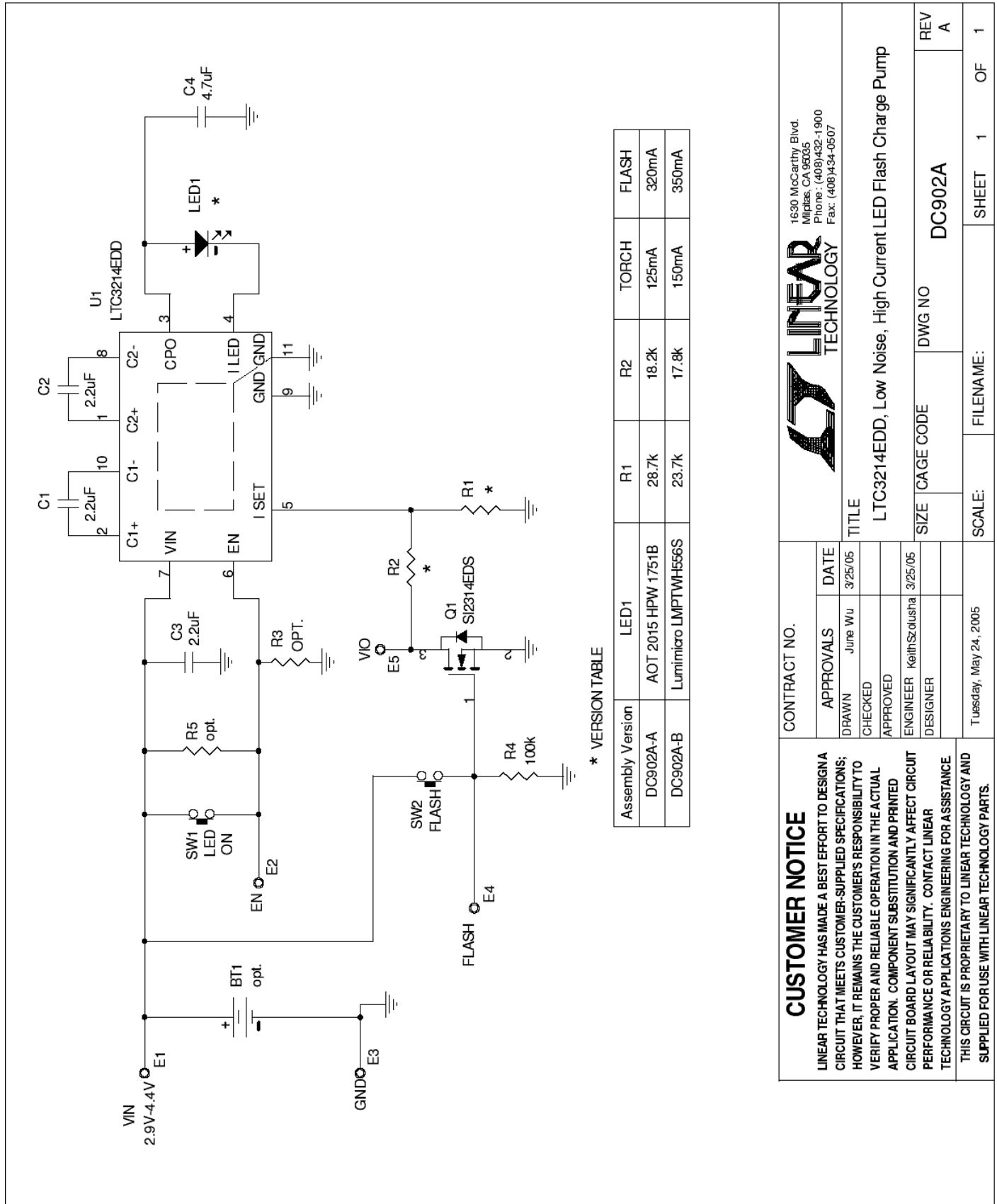


Figure1. Proper Measurement Equipment Setup



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### CUSTOMER NOTICE

LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS; HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE. THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.

### CONTRACT NO.

APPROVALS	DATE
DRAWN June Wu	3/25/05
CHECKED	
APPROVED	
ENGINEER Keith Szolusha	3/25/05
DESIGNER	
Tuesday, May 24, 2005	



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### TITLE

LTC3214EDD, Low Noise, High Current LED Flash Charge Pump

SIZE	CAGE CODE	DWG NO	REV
		DC902A	A
SCALE:	FILENAME:	SHEET	OF
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