

## DESCRIPTION

Demonstration circuit 805 is a low noise high current LED charge pump featuring the LTC<sup>®</sup>3216 and the LXCL-PWF1 Lumileds Luxeon Flash. The board is optimized for 800mA 300ms LED flash current or 200mA 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 LTC3216 is the top solution for space-constrained cellular telephone camera flash solutions.

DC805 comes with three AAA batteries in series to simulate the capabilities of a typical lithium ion cellular telephone battery. This portable board is turned on and off by pressing the ON/OFF button. A TORCH button turns the LED on at 200mA for cellular telephone video recording. The FLASH button flashes the LED at 800mA for 300ms for cellular telephone camera flash operation. The buttons control the state of the PIC microcontroller IC that is programmed with DC805 software. The PIC keeps the LED from being flashed constantly, preventing overheating and burnout. The PIC also controls the flash time. When no buttons are pressed for a short time, the PIC turns off and the

circuit enters low-power mode for battery-life preservation.

A red/green LED indicates the state of the PIC. The LED is ready to flash or torch if the state indicator is blipping green. If the indicator is not on, the PIC is turned off. For a brief time after the flash has occurred, the state-indicator LED is red, indicating that another flash cannot happen, even if the button is pressed, until the red LED is off and the green LED is blipping again.

The LTC3216 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 805. In addition, Lumileds Luxeon Flash datasheet featuring LXCL-PWF1 ([www.lumileds.com](http://www.lumileds.com)) must be read to understand thermal and LED current constraints for varying flash current pulse-widths and intensity. The LTC3216 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 805 is easy to set up to evaluate the performance of the LTC3216. Follow the procedure below:

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

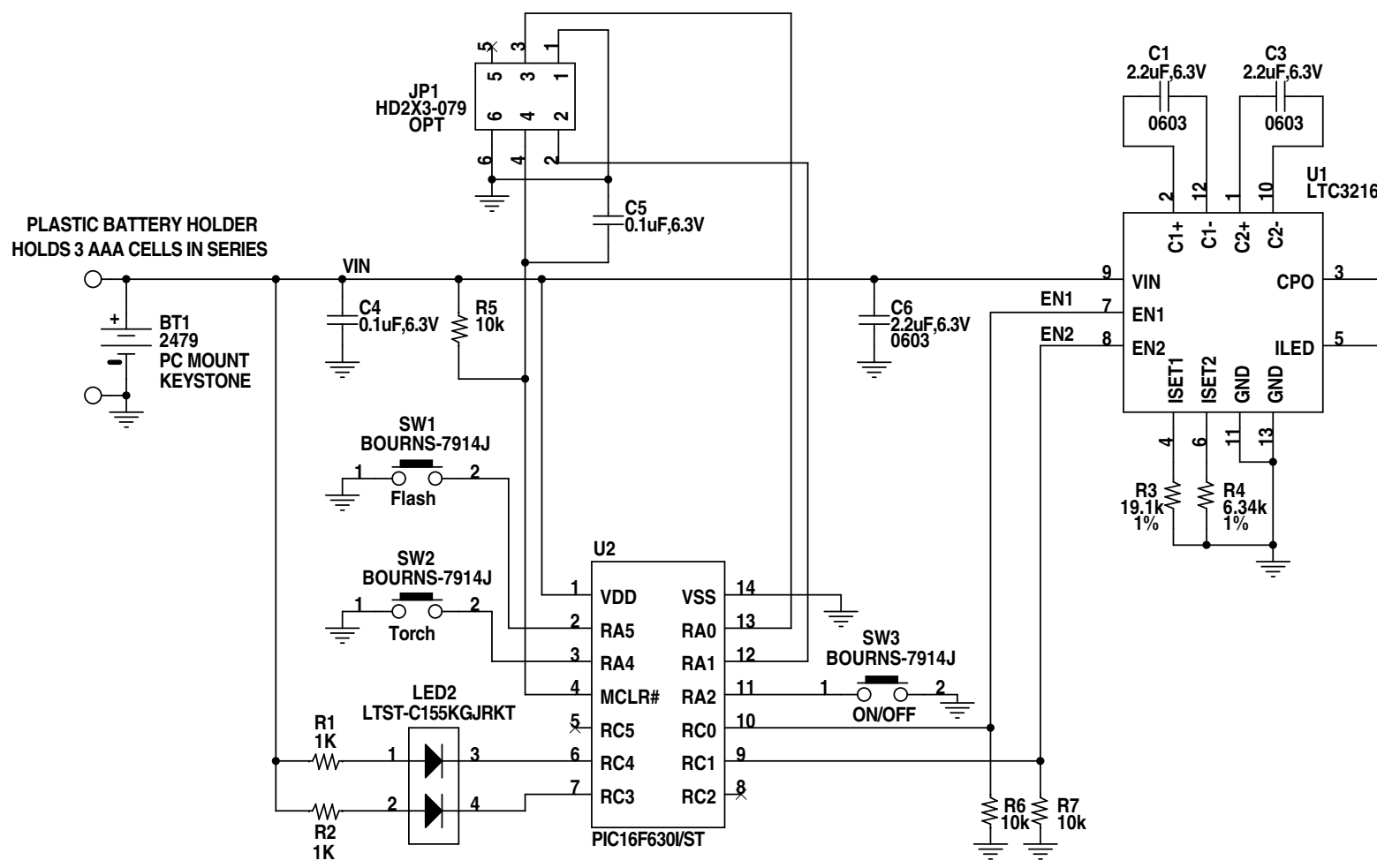
**NOTE:** Connect the three AAA batteries as indicated in the battery pack with the polarity indicated on the back of the PCB.

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 805

## LOW NOISE HIGH CURRENT LED CHARGE PUMP

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1. Insert three AAA batteries in the battery pack on the back of the PCB.
2. If the state-indicator LED is not blipping green, press the ON/OFF button to turn on the circuit.
3. Press 'FLASH' to observe a 300ms, 800mA camera flash on the LXCL-PWF2 LED.
4. Press 'TORCH' to observe constant 200mA LED light for recording video.
5. Press 'TORCH' to turn off the 200mA video mode.
6. Press 'ON/OFF' to turn off the circuit or let the circuit turn off by not pressing any buttons for approximately 10 seconds.



**NOTES: UNLESS OTHERWISE SPECIFIED**

- 1. ALL RESISTORS ARE IN OHMS, 0402.

**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

DRAWN: KIM T.

CHECKED:

APPROVED:

ENGINEER: KEITH S.

DESIGNER:



TITLE: SCHEMATIC

**LOW NOISE HIGH CUR**

SIZE A DWG NO.

**DC805A**

DATE: Thursday, September

# Linear Technology Corporation

LTC3216EDE

LOW NOISE HIGH CURRENT LED CHARGE PUMP

ENG: KEITH SZOLUSHA (23-30)

<i>Item</i>	<i>Qty</i>	<i>Reference</i>	<i>Part Description</i>	<i>Manu</i>
1	1	BT1 (CUSTOMER PROVIDE)	BATTERY HOLDER, 3AAA	KEYSTONE
2	2	SCREWS (CUSTOMER PROVIDE)	M2 X 0.4 SCREW	M2 X 0.4 SC
3	2	HEX NUT (CUSTOMER PROVIDE)	M2 X 0.4 HEX NUT	M2 X 0.4 HE
4	4	WASHER (CUSTOMER PROVIDE)	3MM METRIC WASHER	H275125019
5	3	C1,C3,C6	CAP., X5R, 2.2uF 6.3V, 10%,0603	AVX, 06036
6	1	C2	CAP., X5R, 4.7uF 6.3V, 10%,0603	AVX, 06036
7	2	C4,C5	CAP., X5R, 0.1uF 6.3V, 20%,0402	AVX, 04026
<b>8</b>	<b>0</b>	<b>JP1</b>	<b>JMP, 2X3PIN, 0.079CC</b>	<b>COMM COM</b>
9	1	LED1 (CUSTOMER PROVIDE)	LED EMITTER, LXCL-PWF1	LUMILEDS,
10	1	LED2	LED CHIP, GREEN/RED COLOR,LED-LTST-C155KGJRKT	LITE-ON, LT
11	2	R1,R2	RES., CHIP, 1K 1/16W, 5%, 0402	AAC., CR05
12	1	R3	RES., CHIP, 19.1K, 1%, 0402	AAC., CR05
13	1	R4	RES., CHIP, 6.34K, 1%, 0402	VISHAY, CR
14	3	R5,R6,R7	RES., CHIP, 10K 1/16W, 5%, 0402	AAC., CR05
15	3	SW1,SW2,SW3 (CUSTOMER PROVIDE)	SWITCH, PUSH BUTTON,SW-7914J	BOURNS, 7
16	1	U1	IC, LTC3216EDE,DFN12DE	LINEAR TE
17	1	U2	IC, PIC16F630I/ST, TSSOP14	MICROCHIP

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