

LX1995 LED DRIVER: CAMERA FLASH APPLICATION

AN-30

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APPLICATION INFORMATION

Many high end PDAs and smart phones have adopted color LCD screens. These LCDs are usually illuminated using white LEDs as a backlight. Since white LEDs require a higher voltage than the typical battery voltage, a boost circuit is required to boost the battery voltage. Many smart phones and PDAs also include a digital camera. Many of these cameras utilize an LED flash that helps illuminate the subject in a dark environment. The requirements for the camera flash are usually different than the requirements for the LCD backlight which necessitates two separate LED driver circuits; however, if the LCD illumination can vary during the period of the flash, it is quite easy to provide both LED driver functions using one boost converter.

Boost circuits typically come in one of two forms; the classical inductor based boost converter or the capacitor based charge pump converter. The charge pump converter is efficient if the output voltage is a multiple (whole or fractional) of the input voltage which places some restrictions on how it can be applied. The inductor based boost converter has no such output voltage restrictions and is highly efficient over a wide range of output voltages. This application circuit requires an inductor based boost converter.

The schematic below shows the application circuit. In this circuit an SC-70 Dual NMOS (Fairchild FDG6303N) device is used to switch on the flash LEDs. The flash LEDs are set for a current of 83mA (as determined by the value of R6). The backlight LEDs are dimmable by either a logic PWM signal applied to the PWM input or a DC adjust voltage applied to the DC_ADJ input. When the flash LEDs are on, the LED backlight will dim. Other than this, the LED backlight is not affected by the addition of the flash feature. The flash control circuit is designed to over-ride the backlight dimming control so this has no affect on the brightness of the flash LEDs. The circuit relies on the LED flash voltage being less than the backlight voltage(which is usually the case), however, if this is not the case an additional transistor can be placed in series with the backlight LED string to open circuit the string during the flash period.

The LX1995-2 is well suited for this application, because it is capable of driving loads up to 1.25 watts from a lithium ion battery. The fixed feedback voltage node of the LX1995 is suitable for switching between feedback from two different current sense resistors. If more power is necessary, consult Microsemi for higher power LX1995 versions.

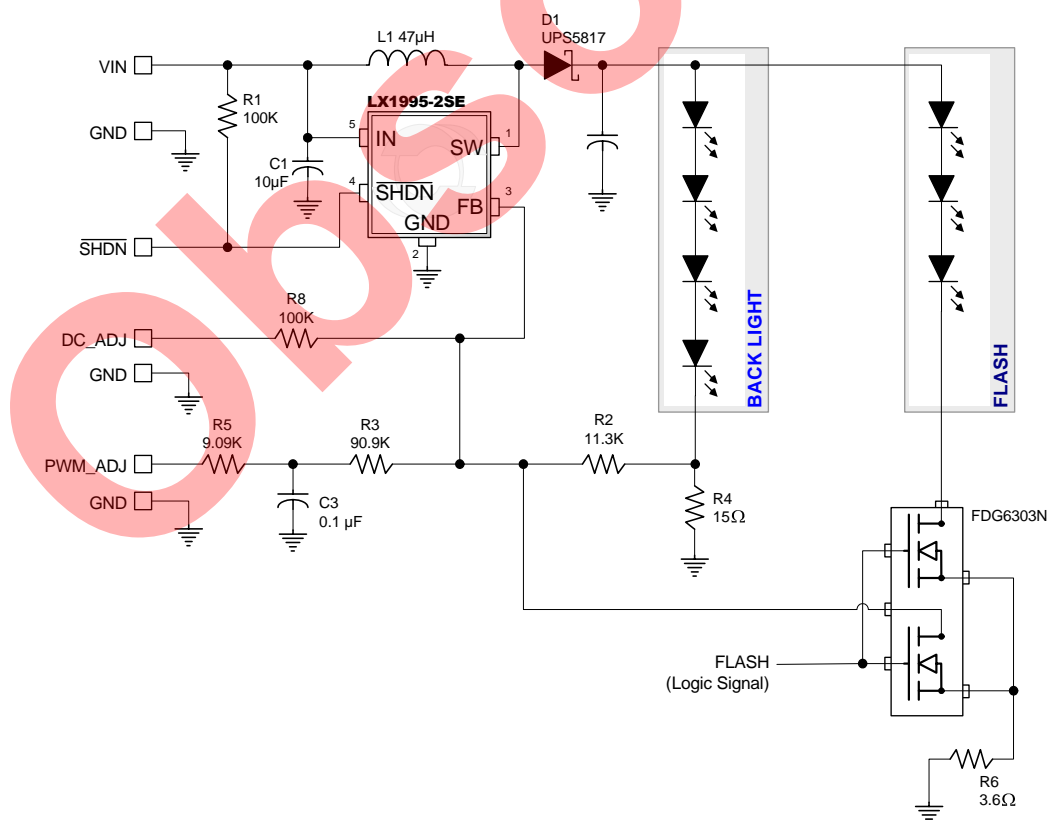


Figure 1 – LX1995 Application Schematic for Backlight & Flash Function