

## ■ General Description

Since the incorporation of color LCDs in cellular phones and portable game machines, there has been demand for bright achromatic backlights. White LEDs are considered the best among currently available backlights. Serial driving circuits capable of suppressing variation of brightness are best suited to driving white LEDs. Various companies market specially designed ICs for that purpose, but those ICs are expensive.

Torex suggests the use of a high-performance circuit incorporating a general-purpose step-up DC/DC converter, which is available as the **XC9103** or **XC6367** series.

## ■ Features

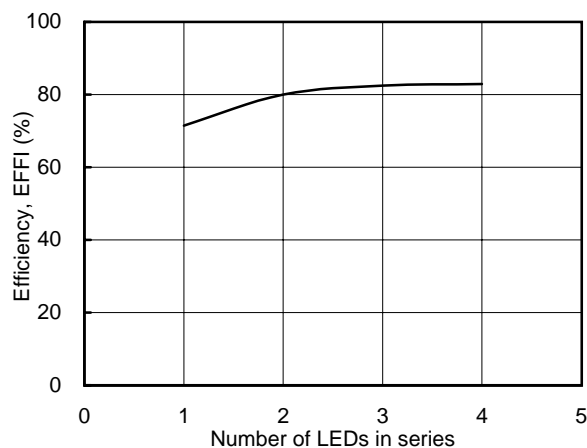
- High efficiency achieved by serial driving
- Number of LEDs changeable with few circuit changes
- Only one resistor required for changing LED drive current
- Standby capability
- Free from fluctuation of drive current caused by fluctuation in LED forward voltage
- It becomes possible to use a ceramic capacitor as CL if the **XC9103** series is used, thereby suppressing unwanted emissions.

## ■ Functional Description

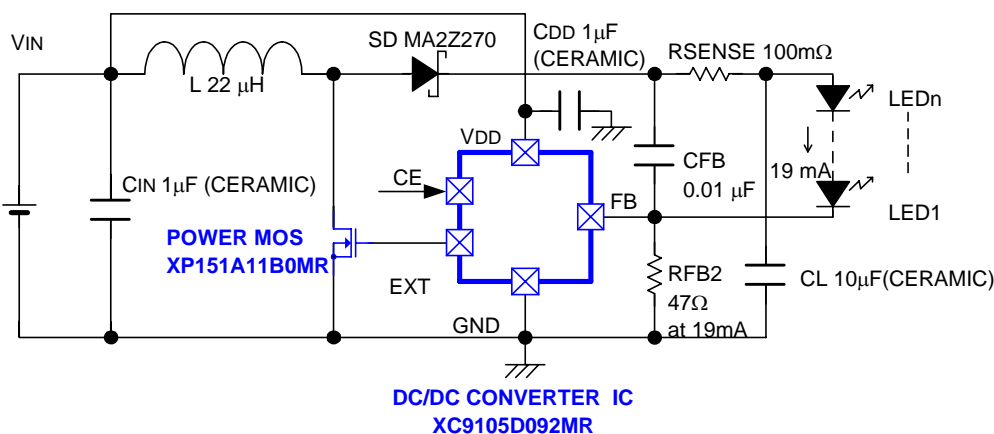
A step-up DC/DC converter is used to output a constant current to drive LEDs. The value of the LED driving current is determined by dividing the FB control voltage (0.9 V or 1.0V for the **XC9103** or **XC6367** series, respectively) by the value of the connected resistor. It is possible to change the value of the LED driving current as desired by changing the resistor.

The output voltage of the DC/DC converter is the sum of the forward voltage of an LED (or the forward voltage multiplied by the number of LEDs if more than one LED is in use) and the FB terminal voltage.

## ■ Example of Characteristics



## ■ Circuits



**LED drive current = FB control voltage/RFB2** (FB control voltage: 0.9 V or 1.0V for the **XC9103** or **XC6367** series, respectively)  
A 47Ω resistor is used in the above example to gain an LED drive current of 19 mA.

$$\text{Efficiency, EFFI (\%)} = \text{Voltage across LED} \times \text{Drive current} / (\text{VIN} \times \text{IIN}) \times 100$$

\* RSEN is not required if the **XC6367** series is used. Use a 221µF tantalum capacitor as CL.

\* The **XC9103** series includes the **XC9103**, **XC9104**, and **XC9105**. The **XC6367** series includes the **XC6367** and **XC6368**.