IS32LT3128

TRIPLE CHANNEL LINEAR LED DRIVER WITH FADE IN/OUT AND PWM DIMMING

GENERAL DESCRIPTION

The IS32LT3128 is a triple channel linear programmable current regulator capable of up to 150mA of each LED channel and up to 30mA for the backlight LED. It integrates a debounce and latch circuit on the channel enable pin (EN) to facilitate the use of a low cost momentary contact switch or a regular latched switch. The PWM pin can be interfaced to a logic level "courtesy light" signal to directly drive the LED channel. The EN input has higher priority over the PWM input. The device also integrates a PWM source inside to realize automatic dimming which is triggered by PWM pin voltage level. That allows dimming without external PWM signal input. The IS32LT3128 accepts both positive and negative polarity PWM signal.

The device operates as a stand-alone LED driver configurable with external resistors; no microcontroller is required. A single external resistor programs the current level, while two separate resistors independently program the fade in and fade out ramp rate for the channel.

The device integrates a 63 steps fade in and fade out algorithm (Gamma correction) which causes the output LED current to gradually ramp up to the full source value after the EN pin is triggered. The same controller causes the LED current to gradually ramp down to zero if the EN pin is triggered while the output channel is ON. The fade ramp can be interrupted mid-cycle before completion of the ramp cycle.

The IS32LT3128 is targeted at the automotive market with end applications to include map and dome lighting as well as exterior accent lighting. For 12V automotive applications the low dropout driver can support 1 to 3 LEDs (V_F = 3.2V) per channel. It is offered in a small thermally enhanced eTSSOP-20 package.

FEATURES

- Operating voltage 5V to 42V
- Dual channel current sources
  - Programmable current via a single external resistor
  - Configurable from 20mA to 150mA
- Max 30mA current source for push button backlight
- EN input supports both momentary contact and latched switch
  - Input is debounced and latched
  - Higher priority than PWM input
  - Gamma corrected Fade In/Out algorithm
  - Pull down resistors set independent fade IN and OUT ramp time
- PWM input pin driven by external and internal PWM source
  - External PWM directly drives the current source
  - Support both positive and negative polarity PWM
  - Internal 300Hz PWM source for automatic dimming the current source
- Fault Protection with reporting:
  - LED strings shorted
  - ISET pin shorted to GND (no reporting)
  - Over temperature
- eTSSOP-20 package
- Operating temperature range from -40°C ~ +125°C
- AEC-Q100 qualification in progress

APPLICATIONS

- Automotive Interior:
  - Map/Dome light
  - Puddle lamp in doors
  - Glove box
  - Vanity mirror

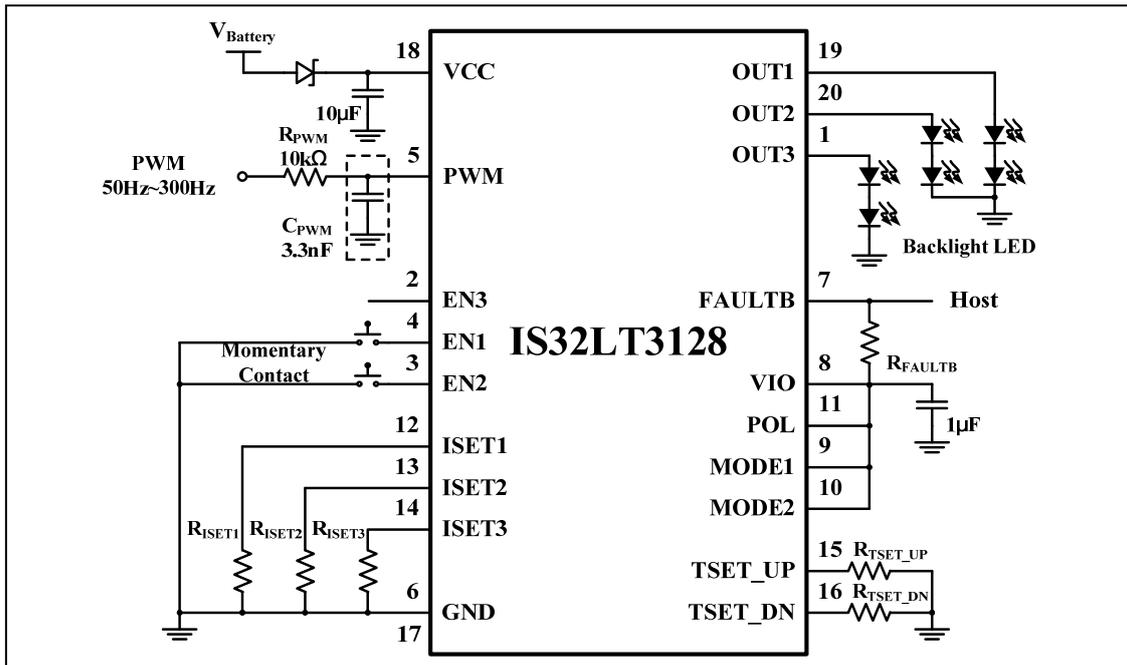## TYPICAL APPLICATION CIRCUIT

Figure 1 Typical Application Circuit With Momentary Contact Switch And External PWM Dimming
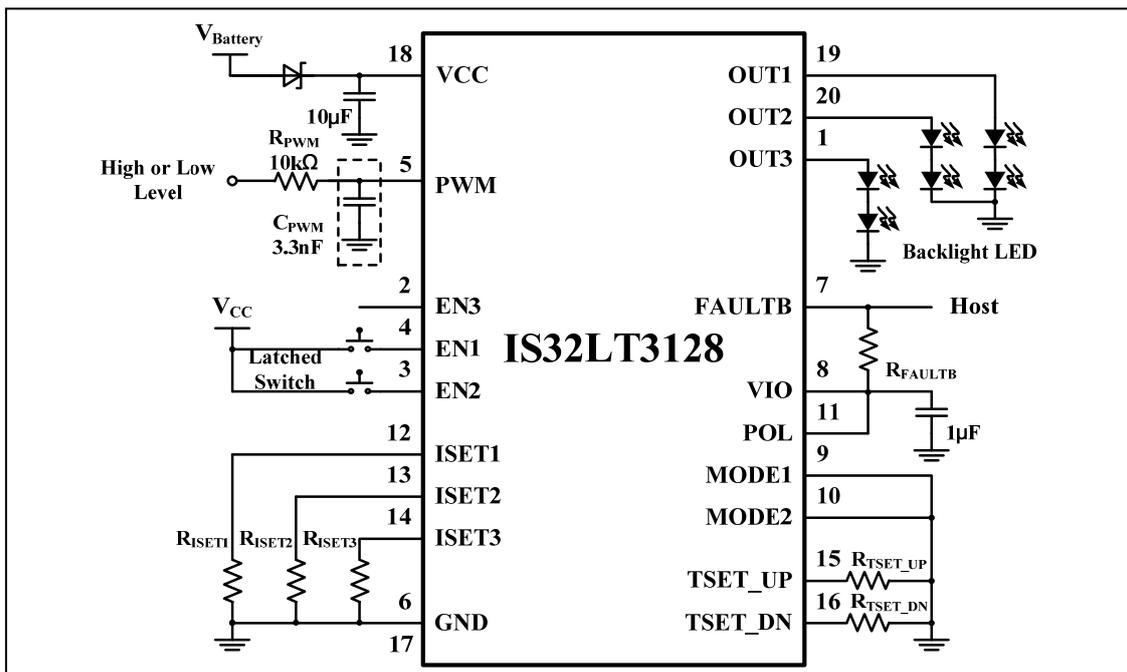

Figure 2 Typical Application Circuit With Latched Switch And Internal PWM Dimming

Note: The resistor R_{PWM} is a fixed value. Please don't change it. C_{PWM} is optional. Add it for robust electromagnetic susceptibility.