White LED Driver with Backlighting and Flash Mode

■ General Description

With a 40-V rated integrated switch FET, the OCP81780 is a boost converter that drives LEDs in series. The boost converter runs at 800KHz fixed switching frequency to reduce output ripple, improve conversion efficiency, and allows for the use of small external components.

In backlighting mode, default white LED current is set with the external sensor resistor Rset, and the feedback voltage is regulated to 200mV. During the operation, A pulse width modulation (PWM) signal can be applied to the EN/PWM pin through which the duty cycle determines the feedback reference voltage. In PWM mode, the OCP81780 does not burst the LED current; therefore, it does not generate audible noises on the output capacitor.

In flash mode, the feedback voltage is regulated to 400mV to 600mV through 1-wire control on FLASH pin.

For maximum protection, the device features integrated open LED protection that disables the OCP81780 to prevent the output voltage from exceeding the IC's absolute maximum voltage ratings during open LED conditions.

The OCP81780 is available in a space-saving, 2mm × 2mm DFN package with thermal pad.

● Features

- 3V to 5.5V Input Voltage Range
- 38V Open LED Protection
- 200mV Reference Voltage In Backlighting Mode
- PWM Brightness Control In Backlighting Mode
- Built-in Soft Start
- 400mV to 600mV Reference Voltage In Flash Mode
- Flash Current Controlled By 1-wire Interface
- Up to 90% Efficiency
- 2mm × 2mm × 0.8mm DNF2X2-6L(6-pin DFN) Package With Thermal Pad

● Applications

- Cellular Phones
- Portable Media Players
- Ultra Mobile Devices
- GPS Receivers
- White LED Backlighting for Media Form Factor Display

■ Pin Configuration

DFN2X2-6L(TOP VIEW)

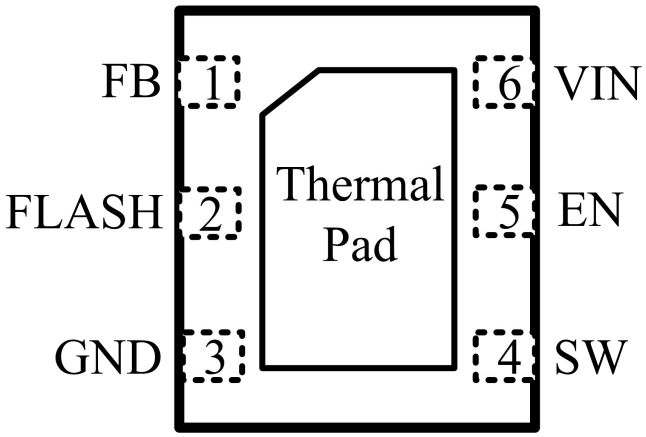

Figure 1, Pin Assignments of OCP81780

Pin Name	Pin No.	I/O	Pin Function
VIN	6	I	The input supply pin for the IC. Connect VIN to a supply voltage between 3V and 5.5V.
SW	4	O	This is the switching node of the IC. Connect the inductor between the VIN and SW pin. This pin is also used to sense the output voltage for open LED protection
GND	3	I	Ground
FB	1	I	Feedback pin for current. Connect the sense resistor from FB to GND.
FLASH	2	O	Flash mode 1-wire dimming interface pin.
EN/PWM	5	I	Control pin of the boost converter. It is a multi-functional pin which can be used for enable control, PWM dimming.
Thermal Pad			The thermal pad should be soldered to the analog ground plane. If possible, use thermal via to connect to ground plane for ideal power dissipation.

■ Typical Application Circuit

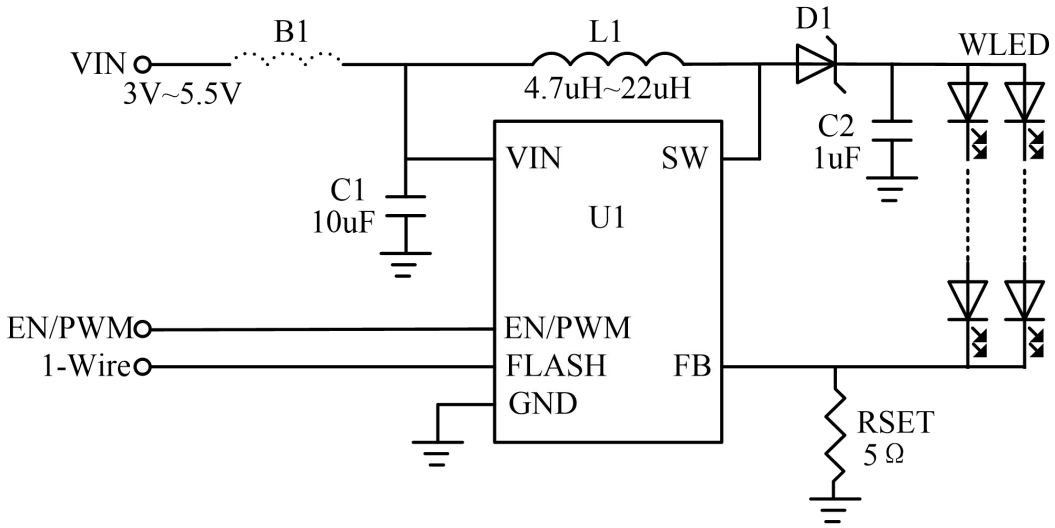

Figure 2, Typical Application Circuit of OCP81780

■ Block Diagram

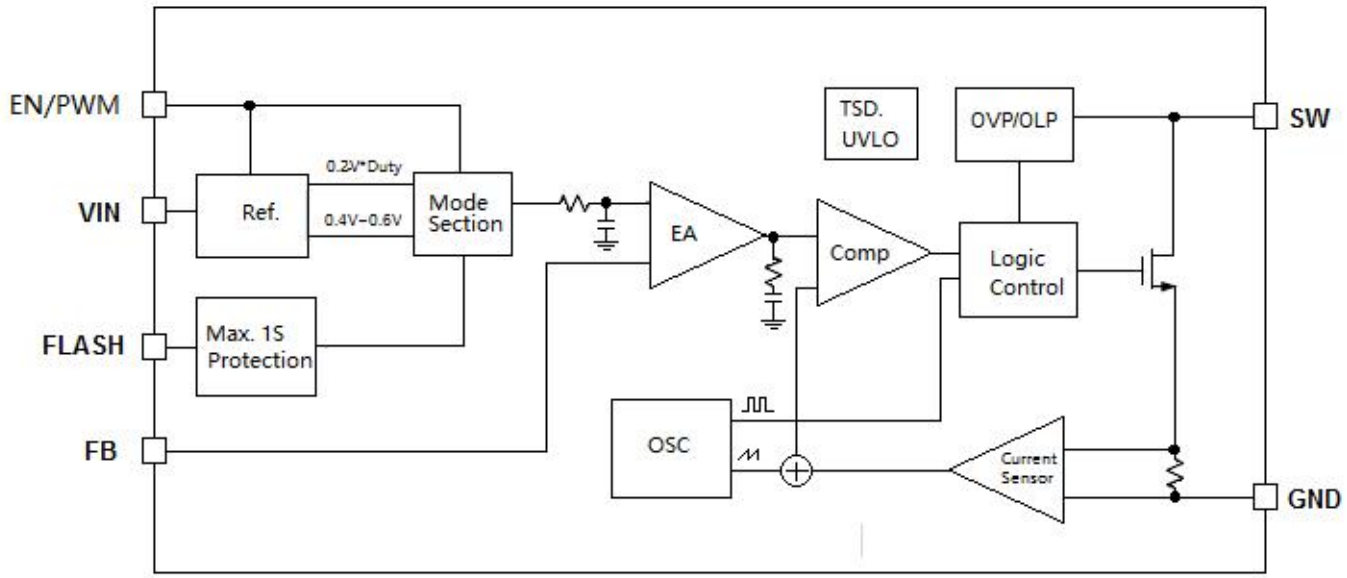

Figure 3, Block Diagram of OCP81780