High Efficiency Synchronous Boost Converter With Dual Independent 1.5A Current Sources

General Description

The OCP81373 is a dual LED flash driver that provides a high level of adjustability within a small solution size. The OCP81373 utilizes a 2MHz or 4MHz fixed-frequency synchronous boost converter to provide power to the dual 1.5A constant current LED sources. The total LED current the OCP81373 boost can deliver is 2A (I_{LED1}+ I_{LED2}). The dual 128 level current sources provide the flexibility to adjust the current ratios between LED1 and LED2 with each driver capable of delivering a maximum of 1.5A. An adaptive regulation method ensures the current sources remain in regulation and maximizes efficiency.

Features of the OCP81373 are controlled via an I^2C-compatible interface. These features include: hardware flash and hardware torch pins (STROBE and TORCH/TEMP), a TX interrupt, and an NTC thermistor monitor. The device offers independently programmable currents in each output leg to drive the LEDs in a Flash or Movie Mode (Torch) condition.

The 2MHz or 4MHz switching frequency options, overvoltage protection (OVP), and adjustable current limit allow for the use of tiny, low-profile inductors and (10μF) ceramic capacitors. The device operates over a –40°C to 85°C ambient temperature range.

Features

- 2A Total Allowed LED Current During Operation
- Dual Independent LED Current Source Programmability
- Accurate and Programmable LED Current Range from 2.92mA to 1.5A
- Optimized Flash LED Current During Low Battery Conditions (IVFM)
- Grounded Cathode LED Operation for Improved Thermal Management
- Small Solution Size:<16mm^2
- Hardware Strobe Enable (STROBE)
- Synchronization Input for RF Power Amplifier Pulse Events (TX)
- Hardware Torch Enable (TORCH/TEMP)
- Remote NTC Monitoring (TORCH/TEMP)
- 400-kHz I^2C-Compatible Interface
  - OCP81373(I^2C Address=0x63)
- WLCSP-12B

Application

- Smart Phone White LED Flash
- Digital Still Cameras

■ Pin Configuration

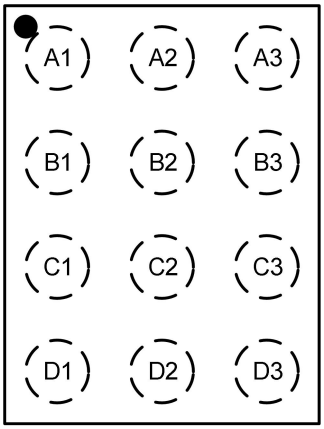

Figure 1, Pin Assignments of OCP81373（Top View）

Pin Name	Pin No. WLCSP-12B	I/O	Pin Function
GND	A1	P	Ground
IN	A2	I	Input voltage connection. Connect IN to the input supply and bypass to GND with a 10μF or larger ceramic capacitor.
SDA	A3	I/O	Serial data input/output in the I^2C Mode on OCP81373.
SW	B1	P	Drain Connection for Internal NMOS and Synchronous PMOS Switches.
STROBE	B2	I/O	Active high hardware flash enable. Drive STROBE high to turn on Flash pulse. Internal pulldown resistor 300kΩ between STROBE and GND.
SCL	B3	I/O	Serial clock input for OCP81373
OUT	C1	O	Step-up DC/DC Converter Output. Connect a 10μF ceramic capacitor between this terminal and GND.
HWEN	C2	I	Active high enable pin. High = Standby, Low = Shutdown/Reset. Internal pulldown resistor of 300kΩ between HWEN and GND.
TORCH/TEMP	C3	I	Torch terminal input or threshold detector for NTC temperature sensing and current scale back.
LED2	D1	O	High-side current source output for flash LED.
TX	D2	I	Configurable dual polarity power amplifier synchronization input. Internal pulldown resistor of 300kΩ between TX and GND.
LED1	D3	O	High-side current source output for flash LED.

■ Typical Application Circuit

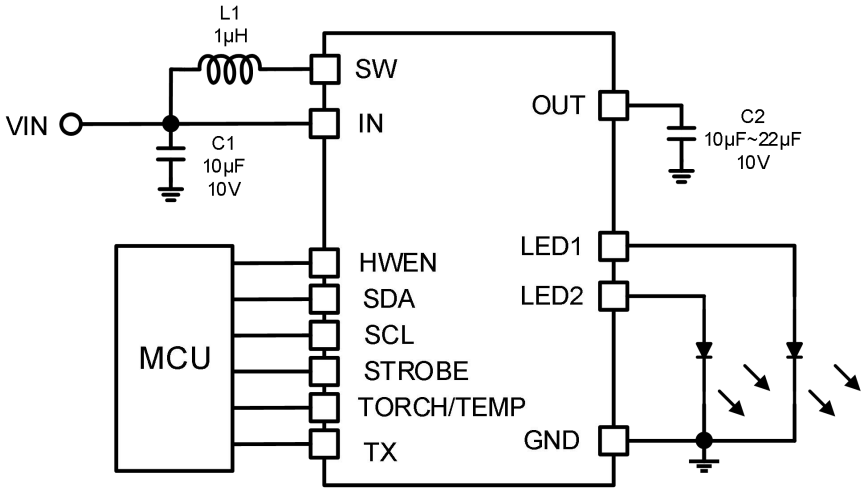

Figure 2, Typical Application Circuit of OCP81373

■ Block Diagram

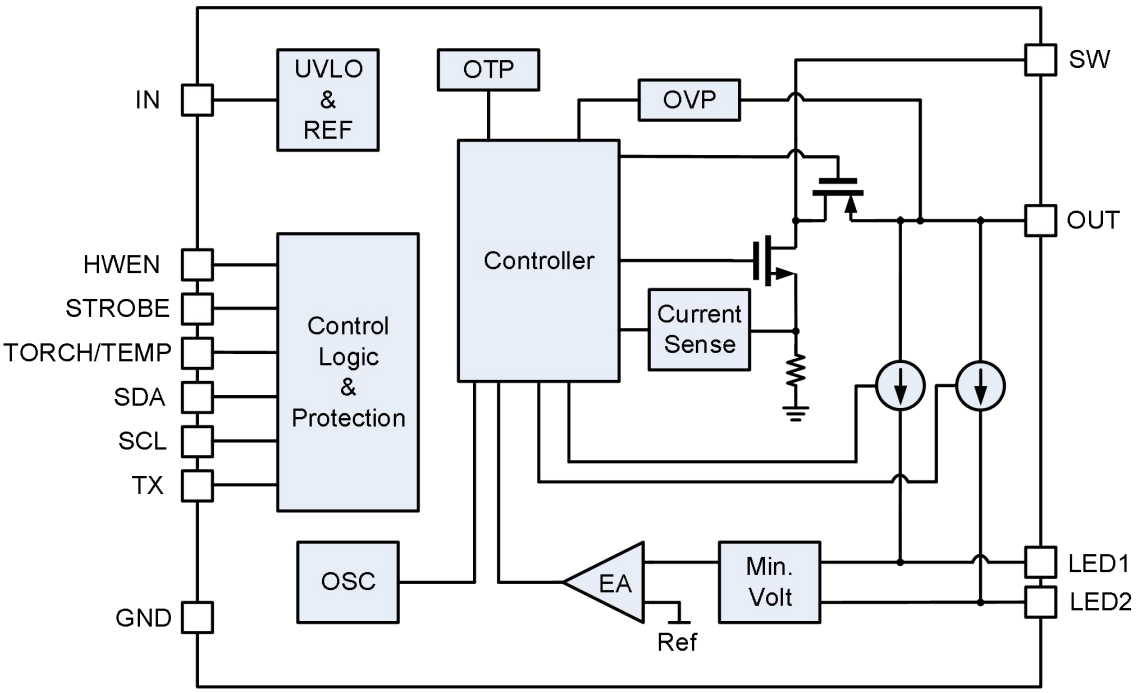

Figure 3, Block Diagram of OCP81373