



High Efficiency Synchronous Boost Converter With Dual Independent 2A Current Sources

■ General Description

The OCP81378 is a dual LED flash driver that provides a high level of adjustability within a small solution size. The OCP81378 utilizes a 2-MHz or 4-MHz fixed-frequency synchronous boost converter to provide power to the dual 2A constant current LED sources. The total LED current the OCP81378 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 2A. An adaptive regulation method ensures the current sources remain in regulation and maximizes efficiency.

Features of the OCP81378 are controlled via an I²C-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 Torch Mode condition.

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

The OCP81378 is available in small 0.4mm pitch 12-Ball WLCSP 1.18mm x 1.6mm package.

■ Features

- 2A Total Allowed LED Current During Operation
- Dual Independent LED Current Source Programmability
- Accurate and Programmable LED Current Range from 2.9mA to 2.0A
Torch mode : 2.9mA to 490mA , 128 levels, 3.84mA/level
Flash mode : 15mA to 2.0A , 128 levels, 15.65mA/level
- Optimized Flash LED Current During Low Battery Conditions (IVFM)
- Grounded Cathode LED Operation for Improved Thermal Management
- 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 I²C-Compatible Interface
-OCP81378 (I²C Address = 0x63)

■ Applications

- Smart Phone White LED Flash
- Digital Still Cameras
- Notebook
- PADs
- IR Driver

■ Pin Configuration

WLCSP-12B (Top View)

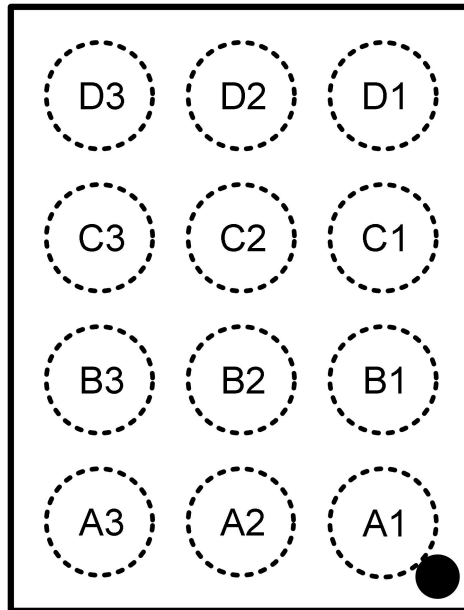


Figure 1, Pin Assignments of OCP81378

Pin Name	Pin No.	TYPE	Pin Function
	WLCSP-12B		
GND	A1	Ground	Ground
IN	A2	Power	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 ² C Mode on OCP81378.
SW	B1	Power	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 in the I ² C Mode on OCP81378.
OUT	C1	Power	Step-up DC/DC Converter Output. Connect a 10μF ceramic capacitor between this terminal and GND.
HWEN	C2	I/O	Active high enable pin. Low = Shutdown/Reset, High = Standby. Internal pulldown resistor of 300kΩ between HWEN and GND.
TORCH/TEMP	C3	I/O	Torch terminal input or threshold detector for NTC temperature sensing and current scale back.
LED2	D1	Power	High-side current source output for flash LED.
TX	D2	I/O	Configurable dual polarity power amplifier synchronization input. Internal pulldown resistor of 300kΩ between TX and GND.
LED1	D3	Power	High-side current source output for flash LED.

■ Typical Application Circuit

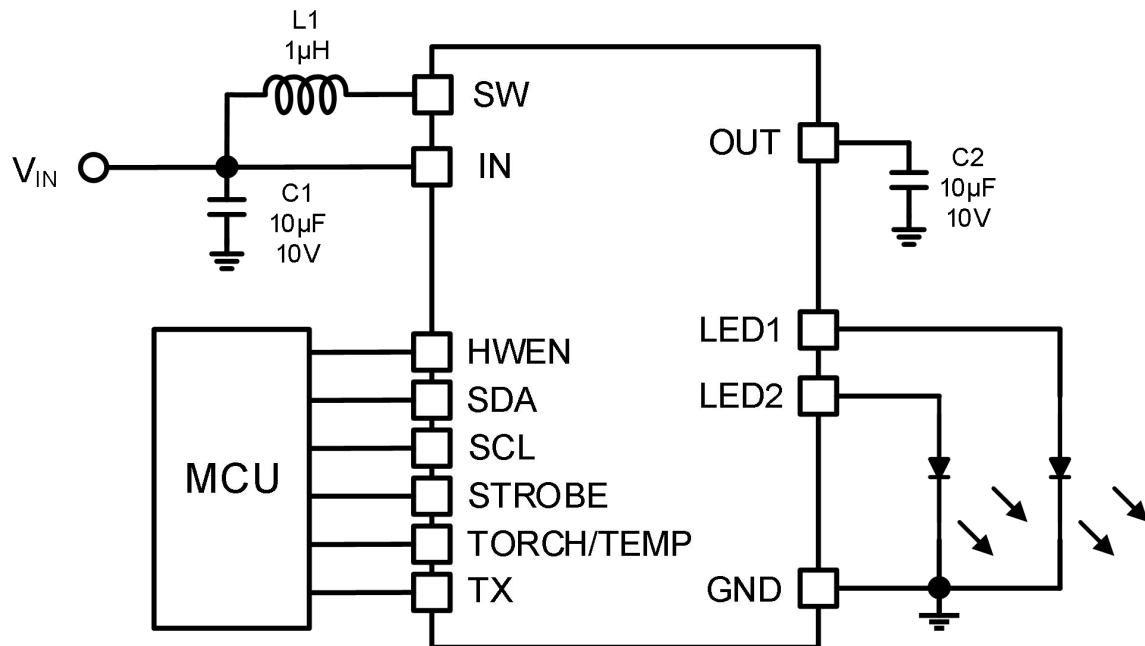


Figure 2, Typical Application Circuit of OCP81378

■ Block Diagram

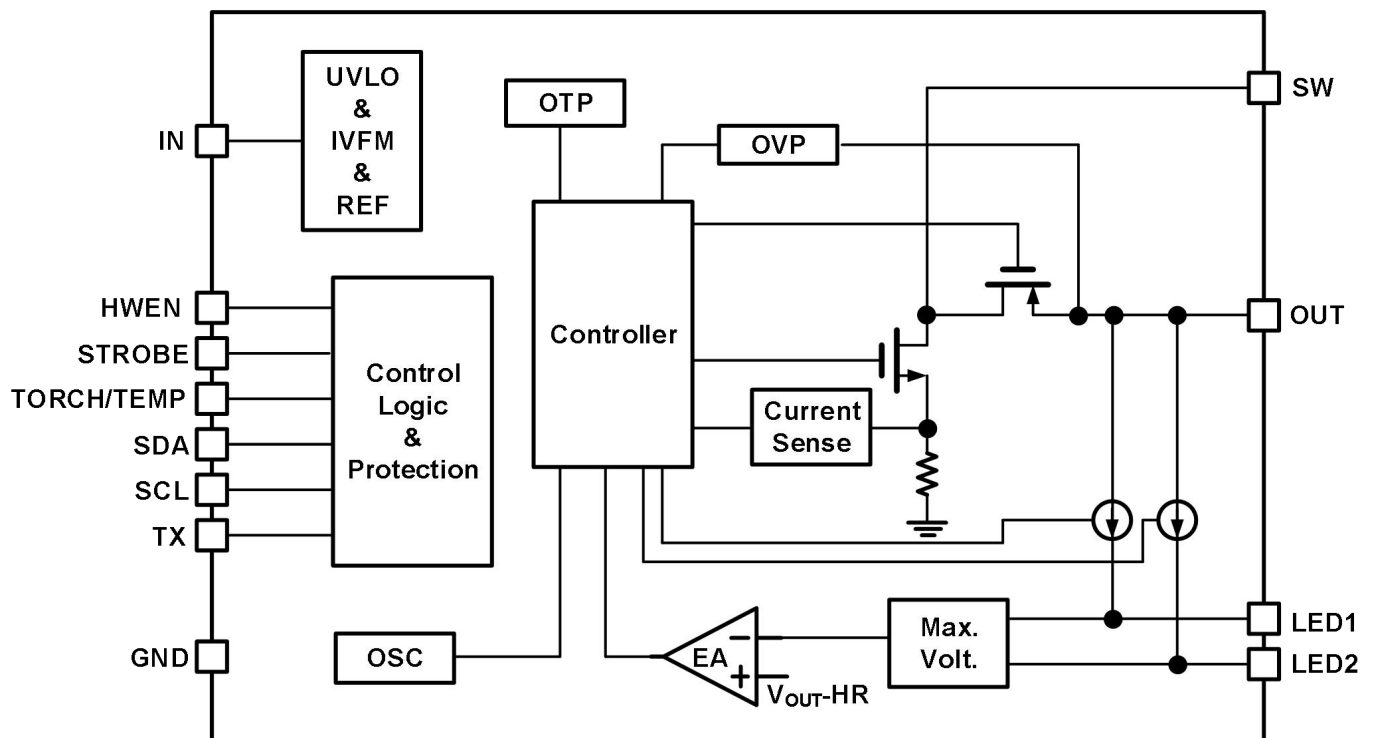


Figure 3, Block Diagram of OCP81378