General Description

The OCP8113 is current-regulated charge pump ideal for powering high brightness LEDs for camera flash applications. The charge pump can be set to regulate two current levels for FLASH and TORCH modes.

The OCP8113 automatically switches modes between step-up and step-down ensuring that LED current does not depend on the forward voltage. It switches at 1.8MHz, allowing the use of tiny components. The supply voltage ranges from 2.7V to 5.5V and is ideally suited for all applications powered by a single Li_Ion battery cell or three to four NiCd, NiMH, or Alkaline battery cells.

The OCP8113 also features a very low shutdown current (less than 1uA), an automatic soft-start mode to limit inrush current, as well as over current, over voltage and over temperature shutdown control.

The OCP8113 has two packages: DFN-10L and QFN-16L package and is specified over an ambient temperature range of -40˚C to 85˚C.

Features

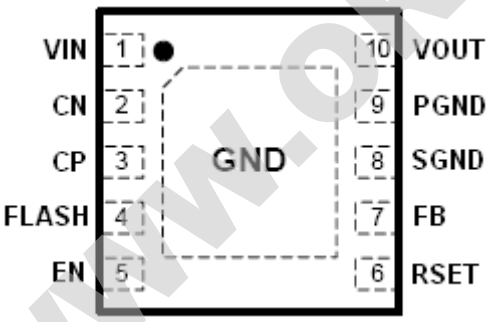
- Output Current up to 1.3A at VIN=3.6V
- Up to 94% Efficiency in Torch Mode
- Adjustable FLASH Mode Current
- Minimum External Components: No Inductors
- Automatic Buck/Boost Mode Switchover
- Wide V_{IN} Range: 2.7V to 5.5V
- High Frequency Operation: 1.8MHz
- 50mV Reference for low Loss Sensing
- ISD < 1μA in Shutdown
- PWM Dimming Control
- Automatic Soft Start Limits Inrush Current
- Over Voltage Protection on Output
- Over Current Protection
- Over Temperature Protection
- Low Input and Output Ripple and Low EMI
- Ultra-low Dropout Voltage in Buck Mode
- Space Saving RoHS Compliant, Lead Free Package: 10-pin 3mm x 3mm DFN and 16-pin 4mm x4mm QFN

Applications

- White LED Torch/Flash for Cell Phones, DSCs, and Camcorders
- White LED Backlighting
- Generic Lighting/Flash/Strobe Applications

Pin Configuration

DFN3030-10L (Top View)



QFN4040-16L (Top View)

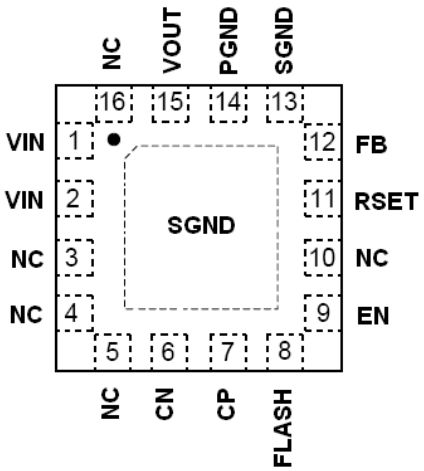


Figure 1, Pin Assignments of OCP8113

Pin Name	Pin No.		Pin Function
	DFN3030 -10L	QFN4040 -16L	
V_{IN}	1	1,2	Input Voltage for the charge pump. Decouple with 4.7µF or 10uF ceramic capacitor close to the pins of the IC.
CN	2	6	Negative input for the external flying capacitor. Connect a ceramic 1 µF capacitor close to the pins of the IC.
CP	3	7	Positive input for the external flying capacitor. Connect a ceramic 1 µF capacitor close to the pins of the IC.
FLASH	4	8	Logic input to toggle operation between FLASH and TORCH mode. In TORCH mode FB is regulated to the internal 50mV reference. In FLASH mode FB reference voltage can be adjusted by changing the resistor from R_{SET} pin to ground. Choose the external current sense resistor (R_{SENSE}) based on desired current in TORCH mode. This pin does not have an internal pull-up/pull- down; do not leave this pin floating. (R_{SENSE} Resistance should be less than 0.25 Ω).
EN	5	9	Shutdown control input. Connect to V_{IN} for normal operation, connect to ground for shutdown. Don't leave this pin floating.
R_{SET}	6	11	Connect a resistor from this pin to ground. When in FLASH mode (FLASH = High) this resistor sets the current regulation point according to the following: $V_{FB} = \frac{14uA * R_{SET}}{5}$ (Flash Mode).
FB	7	12	Feedback input for the current control loop. Connect directly to the current sense resistor.
SGND	8	13	Internal ground pin. Control circuitry returns current to this pin.
PGND	9	14	Power ground pin. Flying capacitor current returns through this pin.
VOUT	10	15	Charge Pump Output Voltage. Decouple with an external capacitor. At least 1 µF is recommended. Higher capacitor values reduce output ripple.
NC	-	3,4,5,10,16	Not Connected.
GND	Exposed Pad	Exposed Pad	Exposed pad should be soldered to PCB board and connected to GND.

■ Typical Application Circuit

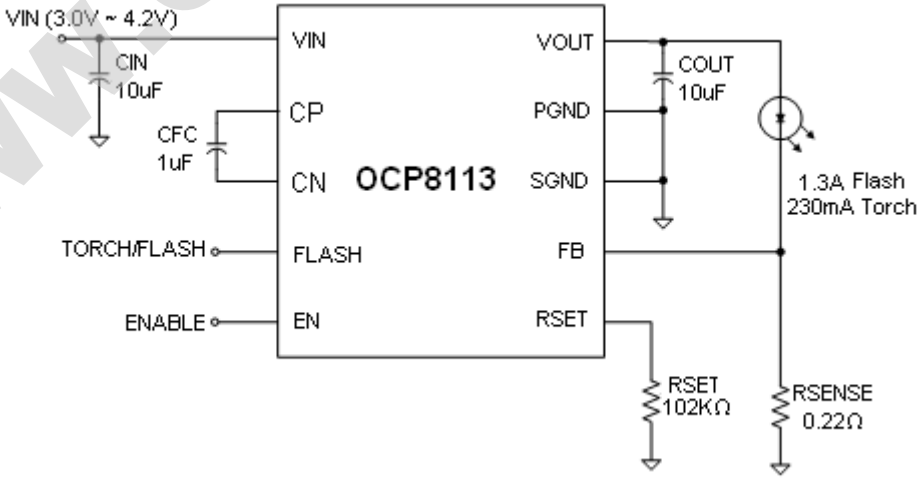


Figure 2, Typical Application Circuit of OCP8113

■ Ordering Information

Part Number	Current Limit	Package Type	Package Qty	Temperature	Eco Plan	Lead
OCP8113VAD	1.3A	DFN3030-10L	13-in reel 3000pcs/reel	-40～85℃	Green	Cu
OCP8113QAD	1.3A	QFN4040-16L	13-in reel 3000pcs/reel	-40～85℃	Green	Cu

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