



High Efficiency Dual Color Temperature Dimming Dual-1.2A Flash LED Driver With Separate 1-Wire Flash Dimming

■ General Description

The OCP8136 is a dual-channel 2MHz fixed frequency synchronous boost converter, optimized for maximum 2.4A(1.2A/channel) camera flash application and maximum 1000mA (500mA/channel) movie mode applications using high-current white LEDs in all single cell Li-ion powered products. An adaptive regulation method ensures the current for each LED remains in regulation and maximizes efficiency.

The dual-channel flash LED drivers are independent. ENM1 and ENF1 pins control channel 1 flash LED driver; ENM2 and ENF2 pins control channel 2 flash LED driver.

Two simple logic control inputs (ENM1/2 and ENF1/2) enable and disable flash and movie mode operation of the OCP8136. Movie-mode and Flash-mode current levels are independently fixed by two separate resistors (RSETM1/2 and RSETF1/2).

For Flash mode, a default timer can be used either to terminate a flash event or as a safety flash timer. In flash mode, the flash LED current can be programmed in 16 steps by the 1-wire dimming interface at ENF pin. Two LEDs can be connected to the OCP8136.

The OCP8136 integrate an input voltage monitor to monitor low battery conditions and can force the LED current into movie mode.

Thermal regulation is integrated in Flash mode to limit the IC's temperature and continuously provide the maximum allowed output current.

The OCP8136 contain a thermal management system to protect the device; a internal over-voltage protection (OVP) circuitry prevents damaged to the OCP8136 from open LED or open circuit conditions; and a cycle-by-cycle current limit prevents damage to the OCP8136. Built-in circuitry prevents excessive inrush current during start-up. The shutdown feature reduces quiescent current to less than 1.0 μ A.

The 2MHz switching frequency allow for the use of tiny, low profile (1 μ H or 2.2 μ H) inductors and 4.7 μ F ceramic capacitors. The device is available in 24-pin 4mmX4mm QFN package and is rated over the -40°C to 85°C.

● Features

- Input Voltage Range : 2.7V to 4.8V
- Separate Two Channel Control
- Drives up to 1.2A Regulated Output Current per Channel (Total 2.4A)
- High Efficiency PWM Boost Converter
- 2.0MHz Fixed Switching Frequency
- Up to 97% Efficiency with Small Inductor 1 μ H
- Integrated Soft-Start Eliminates Inrush Current
- Under Voltage Lock-Out
- Thermal management and Current Scale Back
- VIN Battery Voltage Sensing
- Optimize Flash Current During Low Battery
- Over Voltage (Open LED) Protection
- LED Short Circuit Protection
- Movie Mode Dimming via Maximum 10KHz PWM Control
- 800mS Flash Timer Control
- Cycle by Cycle Current Limit
- Separate Hardware Flash and Movie Enable
- Flash Mode With 1-wire Dimming
- Independently Set Flash/Movie Currents
 - Flash Mode Current Up to 1.2A/channel
 - Movie Mode Current Up to 500mA/channel
- Two Resistors Set Flash and Movie Current Independently
- Small Solution Size
- Less than 1 μ A Shutdown Current
- RoHS and Green Compliant
- 24-pin, 4mm X 4mm QFN Packages
- -40°C to +85 °C Temperature Range

● Applications

- Camera Flashes and Movies
- Cell Phones or Smart Phones
- PDAs and Digital Camera
- White LED Biasing
- Mobil Handsets
- Tablet PCs and Laptops/Netbooks
- Camcorder Video Light (Movie Light)



Pin Configuration QFN4040-24L (Top View)

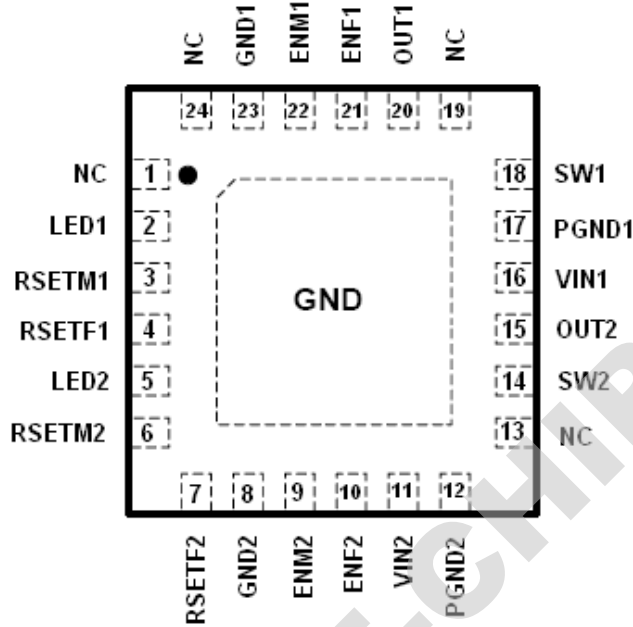


Figure 1, Pin Assignments of OCP8136

Typical Application Circuit

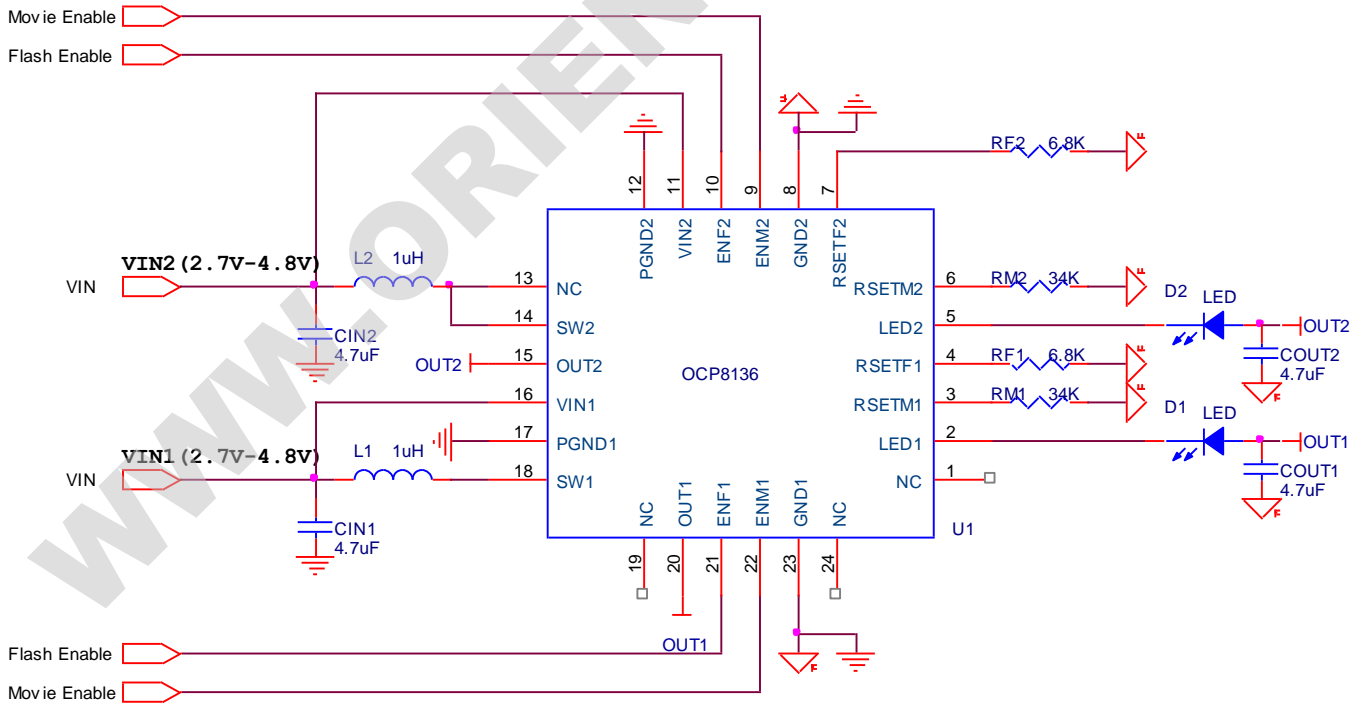


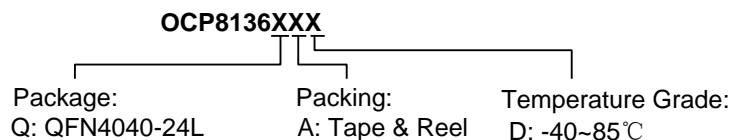
Figure 2A, Typical Application Circuit of OCP8136



■ Pin Configuration

Pin Name	Pin No.	I/O	Pin Function
	QFN4040-24L		
LED1	2	O	Channel 1 flash LED pin. Connect cathode of a flash LED to GND1.
RSETM1	3	I/O	Channel 1 Movie mode current setting input. A 34kΩ resistor from RSETM1 to GND1 sets the desired movie current available at LED1 up to 200mA current.
RSETF1	4	I/O	Channel 1 Flash mode current setting input. A 6.8kΩ resistor from RSETF1 to GND1 sets the maximum flash current available at LED1 up to 1.0A current.
LED2	5	O	Channel 2 flash LED pin. Connect cathode of a flash LED to GND2.
RSETM2	6	I/O	Channel 2 Movie mode current setting input. A 34kΩ resistor from RSETM2 to GND2 sets the desired movie current available at LED2 up to 200mA current.
RSETF2	7	I/O	Channel 2 Flash mode current setting input. A 6.8kΩ resistor from RSETF2 to GND2 sets the maximum flash current available at LED2 up to 1.0A current.
GND2	8	P	Channel 2 Analog Ground and flash ground.
ENM2	9	I	Channel 2 Movie mode enable pin. A low to high transition on the ENM2 pin initiates movie mode current level set by RSETM2 resistor. ENM2 is a active high control input with a internal 300kΩ resistance to GND2.
ENF2	10	I	Channel 2 Flash mode 1-wire dimming interface pin. A low to high transition on the ENF2 pin initiates flash mode current level set by RSETF2 resistor. ENF2 is a active high control input with a internal 300kΩ resistance to GND2.
VIN2	11	P	Channel 2 Power input. Connect VIN2 to the input power supply voltage. Connect a 4.7uF ceramic capacitor from VIN2 to GND2 as close as possible.
PGND2	12	P	Channel 2 Boost power ground pin. Connect PGND2 to GND2 at a single point as close as possible to OCP8136.
SW2	14	O	Channel 2 drain for internal NMOS and Synchronous PMOS Switches.
OUT2	15	O	Channel 2 Power output of the boost converter. Connect a 4.7uF ceramic capacitor from OUT2 to PGND2 as close as possible to the OCP8136. Connect OUT2 to the anodes of the Flash LEDs.
VIN1	16	P	Channel 1 Power input. Connect VIN1 to the input power supply voltage. Connect a 4.7uF ceramic capacitor from VIN1 to GND1 as close as possible.
PGND1	17	P	Channel 1 Boost power ground pin. Connect PGND1 to GND1 at a single point as close as possible to OCP8136.
SW1	18	O	Channel 1 drain for internal NMOS and Synchronous PMOS Switches.
OUT1	20	O	Channel 1 Power output of the boost converter. Connect a 4.7uF ceramic capacitor from OUT1 to PGND1 as close as possible to the OCP8136. Connect OUT1 to the anodes of the Flash LEDs.
ENF1	21	I	Channel 1 Flash mode 1-wire dimming interface pin. A low to high transition on the ENF1 pin initiates flash mode current level set by RSETF1 resistor. ENF1 is a active high control input with a internal 300kΩ resistance to GND1.
ENM1	22	I	Channel 1 Movie mode enable pin. A low to high transition on the ENM1 pin initiates movie mode current level set by RSETM1 resistor. ENM1 is a active high control input with a internal 300kΩ resistance to GND1.
GND1	23	P	Channel 1 Analog Ground and flash ground.
NC	1, 13, 19, 24	-	Not Connected.
GND	EP	P	Exposed paddle (bottom). Connect EP to PGND as close as possible.

■ Ordering Information



Part Number	Driver Capability	Package Type	Package Qty	Temperature	Eco Plan	Lead
OCP8136QAD	2.4A or 2*1.2A	QFN4040-24L	13-in reel 3000pcs/reel	-40~85°C	Green	Cu

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