BL8040

High Efficiency 1.2MHz 30V Boost LED Driver

DESCRIPTION

BL8040 is a step-up converter designed for driving up to 7 series white LED's from a single cell Lithium Ion battery. Its low 250mV feedback voltage reduces power loss and improves efficiency.

Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency. Internal soft start function can reduce the inrush current. Tiny package type provides the best solution for PCB space saving and total BOM cost.

BL8040 is available in SOT23-6 package that is PB free.

FEATURES

- 2.5V to 5.5V Input Voltage
- Drivers up to 8 Series WLEDs
- Low 250mV Feedback Voltage
- 1.2MHz Fixed Switching Frequency
- Internal 1.6A Switch Current Limit
- Internal Compensation
- Thermal Shutdown
- Over Voltage Protection
- Dimming with wide Frequency Range
- Available in SOT23-6 Package

APPLICATIONS

- Camera Flash White LED
- PDA LED back light
- Digital still cameras

TYPICAL APPLICATION

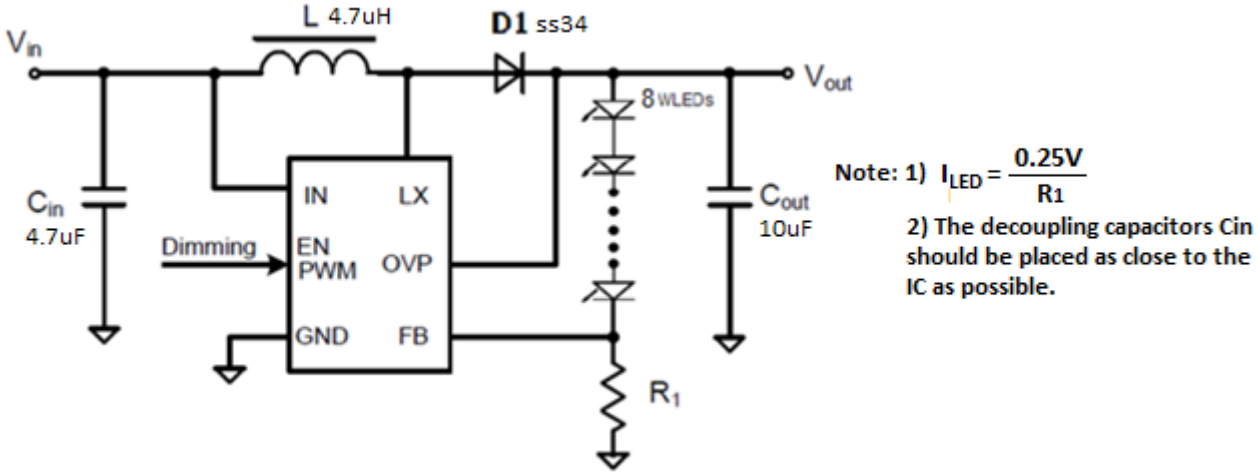


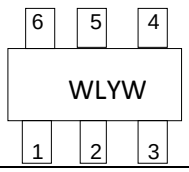
Figure1. BL8040 Typical Application Circuit

ORDERING INFORMATION

BL8040 ①②③

Code	Description
1	Temperature & Rohs: C: -40~85°C, Pb Free Rohs Std.
2	Package Type: B6: SOT-23-6
3	Packing Type: TR: Tape & Reel (Standard)

MARKING INFORMATION

Product Classification		BL8040CB6TR
Marking		
WLYW	WL: Product Code	
	YW: Date Code	

PIN DESCRIPTION

Pin No.	Symbol	Description
1	LX	Power Switch Output. LX is the drain of the internal MOSFET switch. Connect the power inductor and output rectifier to LX. LX can swing between GND and 30V.
2	GND	Ground.
3	FB	Feedback Input. The FB voltage is 0.25V. Connect a resistor divider to FB.
4	EN	Chip enable, but a PWM signal with various duty cycle can directly sent to EN pin to achieve the backlight dimming.
5	OVP	Over Voltage Input. OV measures the output voltage for open circuit protection. Connect OV to the output at the top of the LED string.
6	IN	Power Supply. Must be locally bypassed.

ABSOLUTE MAXIMUM RATING

Parameter		Value
IN, EN Pin Voltage		-0.3V to 6V
SW Pin Voltage		-0.3V to 30V
All Other Pin Voltage		-0.3V to 6V
Junction Temperature (T_J)		150°C
Ambient Temperature (T_A)		-40°C to 85°C
Power Dissipation	SOT23-6	600mW
Thermal Resistance (θ_{JA})		250°C/W
Thermal Resistance (θ_{JC})		130°C/W
Storage Temperature (Ts)		-65°C to 150°C
Lead Temperature & Time		260°C, 10Sec

RECOMMENDED WORK CONDITIONS

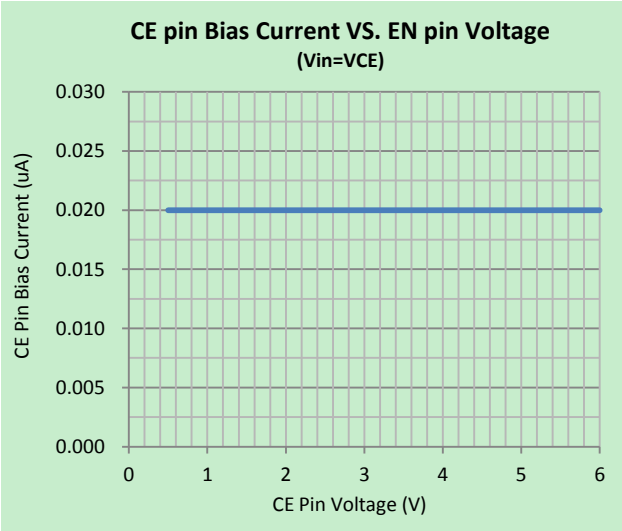
Parameter	Value
Input Voltage Range	2.5V to 5.5V
Output Voltage Range	VIN to 30V
Operating Junction Temperature(Tj)	-40°C –125°C

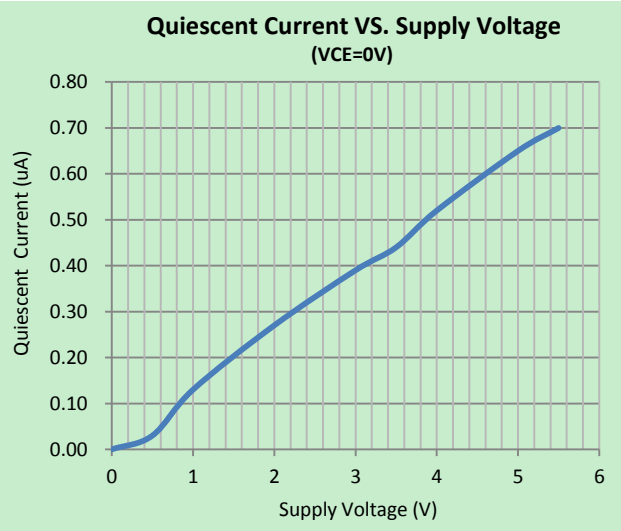
ELECTRICAL CHARACTERISTICS

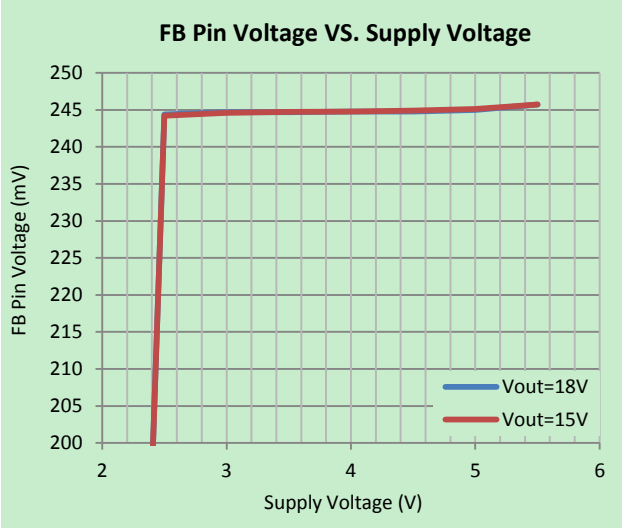
(Ta=25°C, unless otherwise noted)

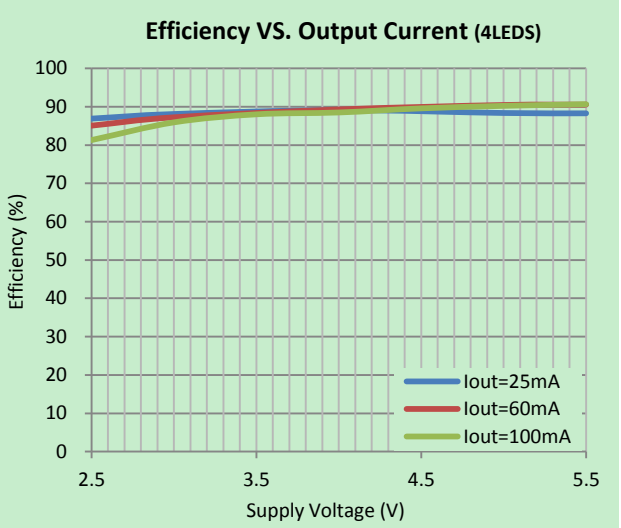
Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Operating Input Voltage		2.5		5.5	V
V_{FB}	Feedback Voltage		237	250	263	mV
I_{FB}	FB input Bias Current		-50	-10		nA
	SW Leakage	V_{SW}=20V			1	uA
I_Q	Quiescent Current	V_{FB}=0.2V, Switch		0.15	0.3	mA
		V_{EN}=0V		0.1	1	uA
F_{SW}	Oscillator Frequency			1.2		MHz
D_{MAX}	Maximum Duty Cycle			90		%
V_{EN}	EN Threshold			1		V
V_{OVP}	OVP Threshold			28		V
	SW On-Resistance			400	650	mΩ
I_{LIMIT}	Current Limit	V_{IN}=4V, Duty Cycle = 50%		1.6		A
	Thermal Shutdown			160		°C

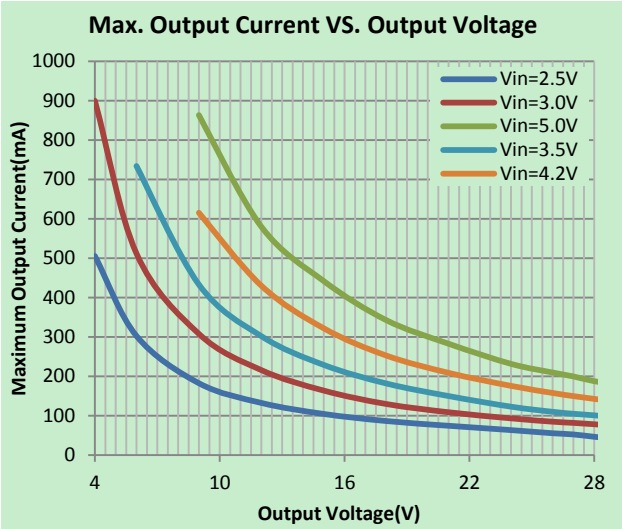
TYPICAL PERFORMANCE CHARACTERISTICS

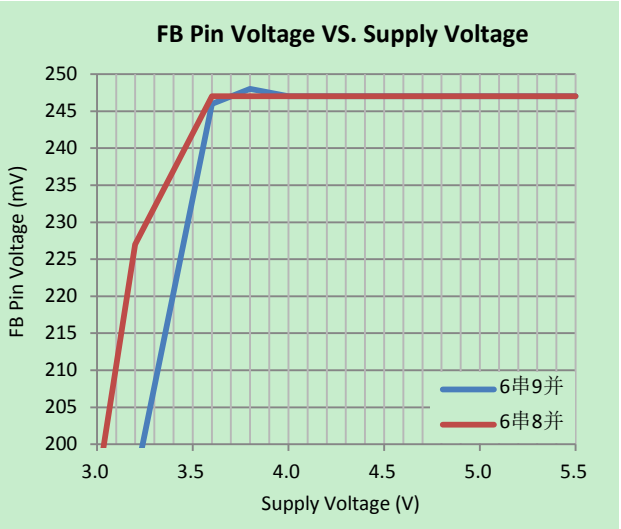












PWM BRIGHTNESS DIMMING CONTROL at EN PIN

When EN pin is forced a PWM signal with frequency higher than 20KHz, the chip is in dimming mode. The internal circuit changes the feedback voltage according to the duty cycle of the PWM signal. The feedback voltage (Vfb) is simply defined as below:

Vfb=250mV x Duty Cycle (%)

To shut down the chip, one has to make the EN signal low, and keep its low state for more than 2.5ms.

PACKAGE INFORMATION

Package	SOT-23-6	Devices per reel	3000Pcs	Unit	mm

Package dimension：