上海贝岭 SHANGHAI BELLING

BL8548

Max. 3MHz, Variable Frequency Step-up DC/DC Converter

DESCRIPTION

The BL8548 variable frequency step-up Converter drives white LEDs with a constant current to provide backlight in cell phones, PDAs, and other hand-held devices. It features allowing series connection of the white LEDs so that the LED currents are identical for uniform brightness. An enable input can be pulsed repeatedly to adjust LEDs brightness. The fast 3MHz operation frequency allows for smaller capacitor and inductor. Fault condition protection uses cycle-by cycle current limiting to sense maximum inductor current and over-voltage protection. The 0.2V low reference voltage minimized the power loss across the current sense resistor.

The converter can operate from 2V to 6V, and capable of delivering maximum 250mA output current at 4-LEDs application with 3V input voltage. Quiescent current drawn from power source is as low as 120uA. All of these features make BL8548 be suitable for the portable devices, which are supplied by a single battery.

BL8548 is available in SOT23-6 package that is PB free.

FEATURES

- Up to 19V Output Voltage
- Wide Operation Range: 2V to 6V
- Maximum 3MHz Operating Frequency
- PWM Dimming Control
- Shutdown Current <1uA
- Current Limit Cycle-by-Cycle
- Low Current Sense Threshold: 200mV
- 19V Over Output Voltage Protection
- Compact SOT23-6 Package

APPLICATIONS

- Compact Back Light Module
- Power Source for LED
- Constant Current Source

TYPICAL APPLICATION

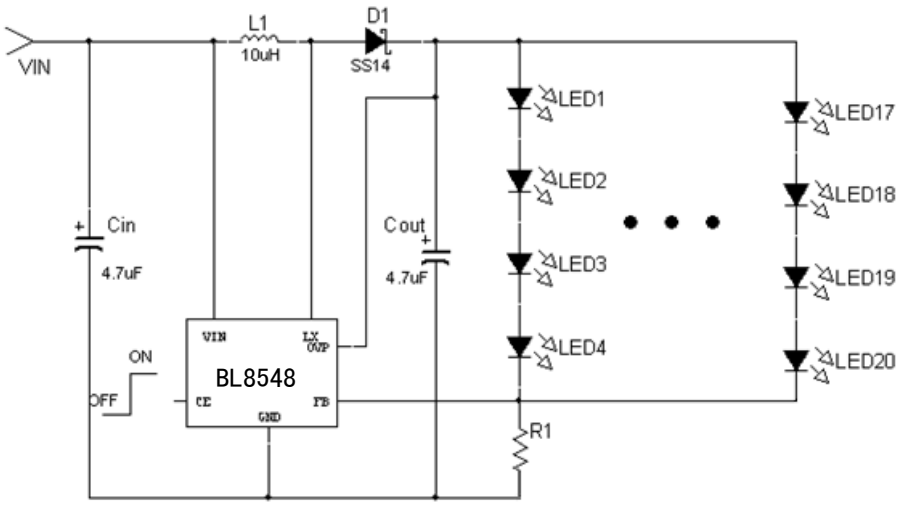


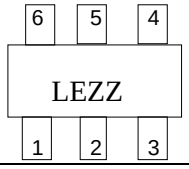
Figure1. BL8548 Typical Application Circuit

ORDERING INFORMATION

BL8548 □1 □2 □3

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)

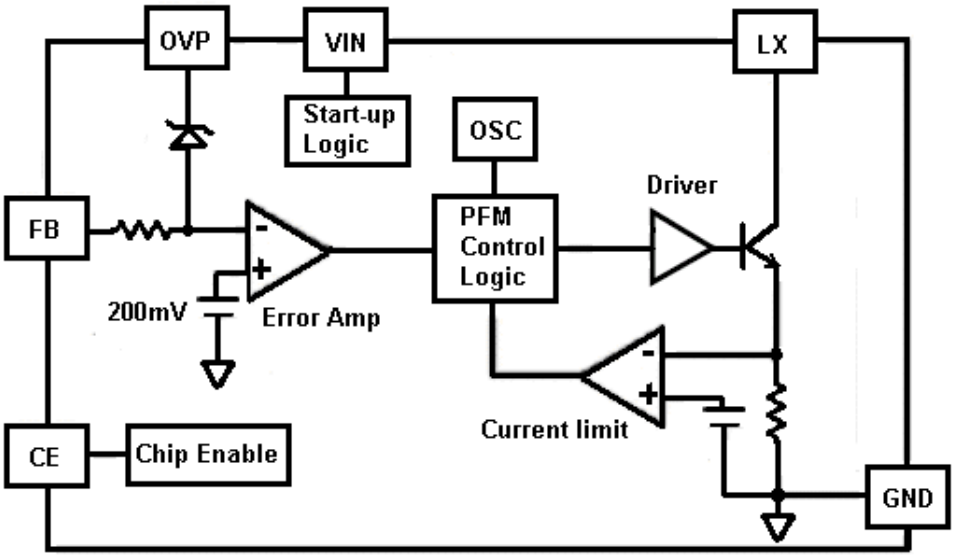
MARKING INFORMATION

Product Classification		BL8548CB6TR
Marking		
LEZZ	LE: Product Code	
	ZZ: Date Code	

PIN DESCRIPTION

Pin No.	Symbol	Description
1	LX	Switching node
2	GND	Ground
3	FB	Pin for Feedback Voltage
4	CE	Chip Enable Pin (Active with “H”), connect to VIN if not used.
5	OVP	Over Voltage Protection
6	VIN	Power Supply

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		-0.3V to 8V
CE Pin Voltage		-0.3V to (Vin+0.3V)
LX Pin Output Current		1.8A
LX Pin Voltage		19.4V
Operating Junction Temperature (TJ)		125°C
Ambient Temperature (TA)		-40°C to 85°C
Power Dissipation	SOT-23-6	400mW
Storage Temperature (Ts)		-40°C to 150°C
Lead Temperature & Time		260°C, 10Sec

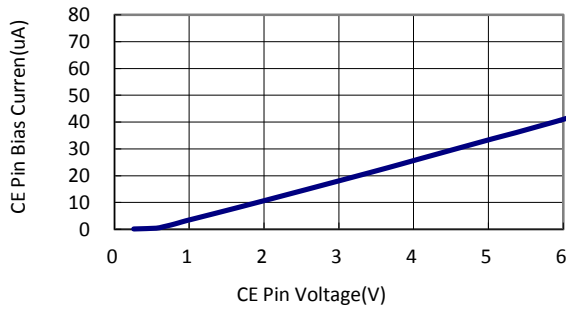
ELECTRICAL CHARACTERISTICS

(Ta=25ºC，VIN=3V，VCE=3V, unless otherwise noted)

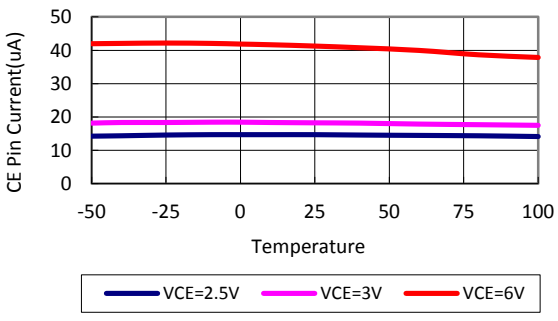
Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
VIN	Operating Input Voltage		2		6	V
VFB	Feedback Voltage		0.190	0.200	0.210	V
IFB	FB Pin Bias Current		10	45	100	nA
IQ	Quiescent Current	VFB=0.3V		93	120	uA
		VCE=0V		0.4	1.0	uA
FMAX	Maximum switching Frequency	VFB=0V, Floating OVP Pin		3		MHz
ILIMIT	Switching Current Limit			1.8		A
VCESAT	Switching Saturation Voltage	ILX=300mA		260		mV
ILX	Switching pin Leak Current	VLX=5V		0.11		uA
VCEH	CE Voltage High	VCE=0 to 3V	1.5			V
VCEL	CE Voltage Low	VCE=3 to 0V			0.4	V
ICE	CE Pin Bias Current	VIN=VCE=3V		18		uA
VOVP	Over Voltage Protection			19		V

TYPICAL PERFORMANCE CHARACTERISTICS

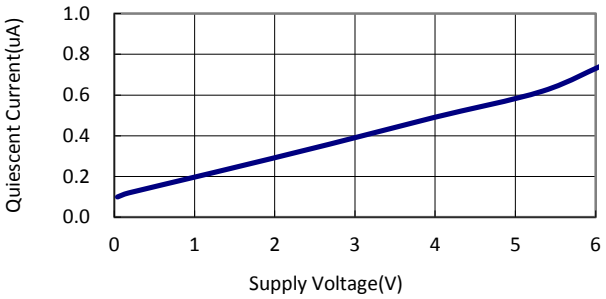
CE Pin Bias Current vs. EN pin Voltage (VIN=VCE)



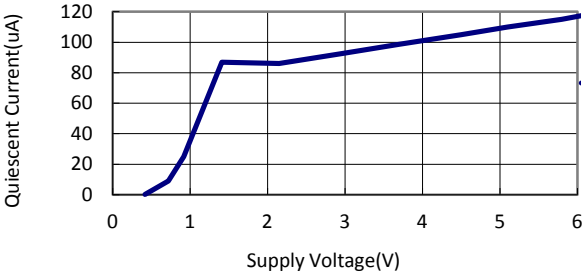
CE Pin Current vs. Temperature (VIN=VCE))



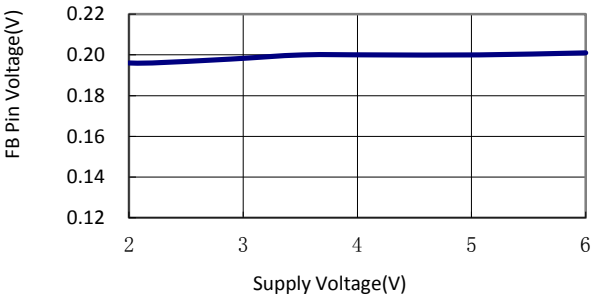
Quiescent Current vs. Supply Voltage (VCE=0V)



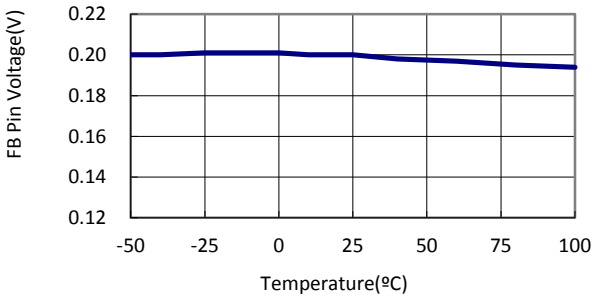
Quiescent Current vs. Supply Voltage (VCE=VIN,VFB=0.3V)



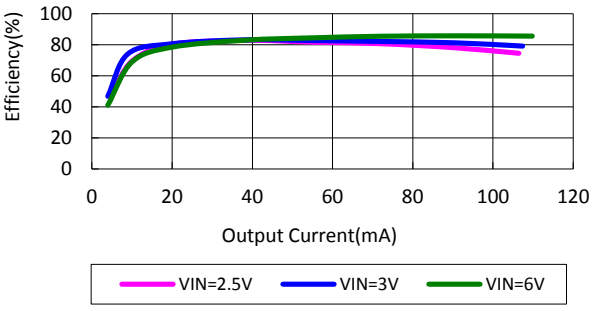
FB Pin Voltage vs.Supply Voltage



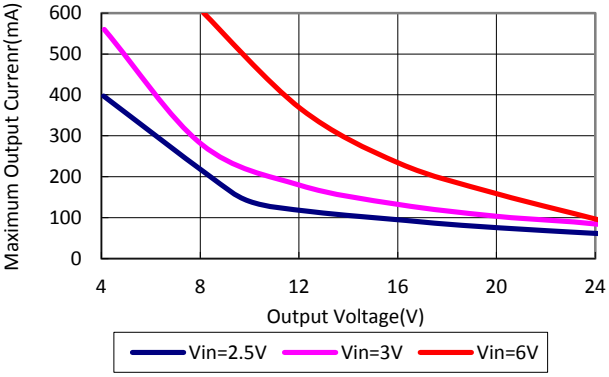
FB Pin Voltage vs. Temperature



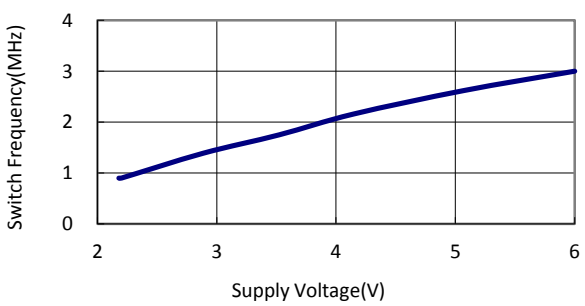
Efficiency vs. Output Current (4LEDs)



Maximum Output Currenr vs. Output Voltage



Switch Frequency vs. Supply Voltage (4LEDs*100mA)



APPLICATION INFORMATION

Dimming Control

1. Using a PWM Signal to CE Pin

When adding the PWM signal to CE pin, the BL8548 is turned on or off by the PWM signal, so the LEDs operate at either zero or full current. The average LED current increase proportionally with the duty cycle of the PWM signal.

2. Using a DC Voltage to FB Pin

From the Figure 2, we can add a DC voltage to FB pin, we adjust the LED current by Changing the DC voltage, which control the brightness, DC voltage range is from 0V to 2V.

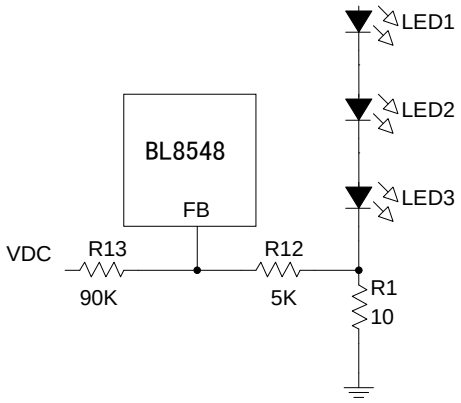


Figure 2. Dimming Control Using a DC Voltage

3. Using a Filtered PWM Signal to FB Pin

The filtered PWM signal can be considered as an adjustable DC voltage. It can be used to replace the variable DC voltage source in dimming control. The circuit is shown in Figure 3.

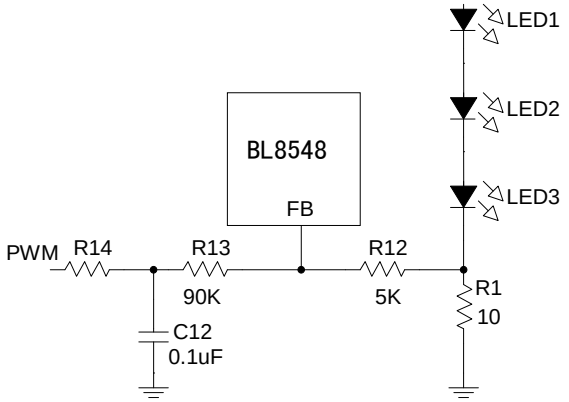


Figure 3. Dimming Control Using a Filtered PWM Signal

4. PCB Layout

Layout is critical to achieve clean and stable operation. The switching power stage requires particular attention. Follow these guidelines for good PC board layout:

1) Place decoupling capacitors as close to the IC as possible
2) Connect input and output capacitors to the same power ground node with a star ground configuration then to IC ground.
3) Keep the high-current paths as short and wide as possible.
4) If possible, connect VIN, LX, and GND separately to a large copper area to help cool the IC to further improve efficiency and long-term reliability.
5) Ensure all feedback connections are short and direct. Place the feedback resistors as close to the IC as possible.
6) Route high-speed switching nodes away from sensitive analog areas

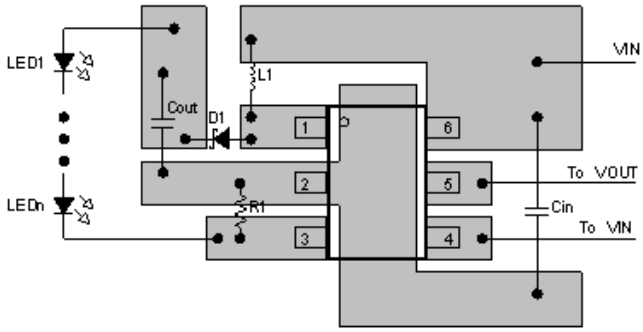


Figure 4. Recommended Component Placement

PACKAGE INFORMATION

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

Package dimension：

