

### DESCRIPTION

The BL8584 is a CMOS based White/Blue LED driver with stand-alone capability. The driver is primarily designed for LED backlighting of LCD display powered by Li-ion battery. With its high efficiency, low standby current and wide range of input supply voltage, the BL8584 is suitable for applications such as portable device display and keypad backlighting. There are six identical channels in BL8584, each of which can drive one LED by current rating of 20mA.

BL8584 is available with QFN 3X3-16 package

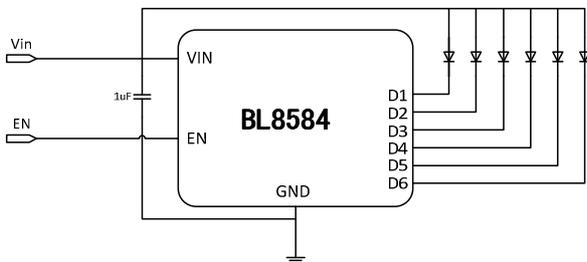
### FEATURES

- 6-channels output
- 2.7 to 5.5V input range
- PWM dimming control
- LED sink current of 20mA
- Independent current sink circuit for each LED output
- Low standby current
- High accuracy current match on each channel

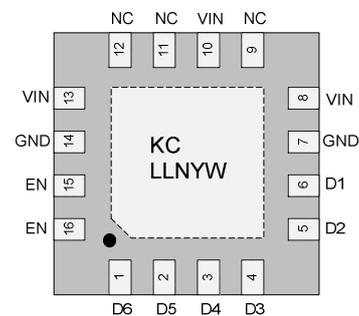
### APPLICATIONS

- LCD screen backlights driver
- Mobile phone, portable device keypad backlights driver

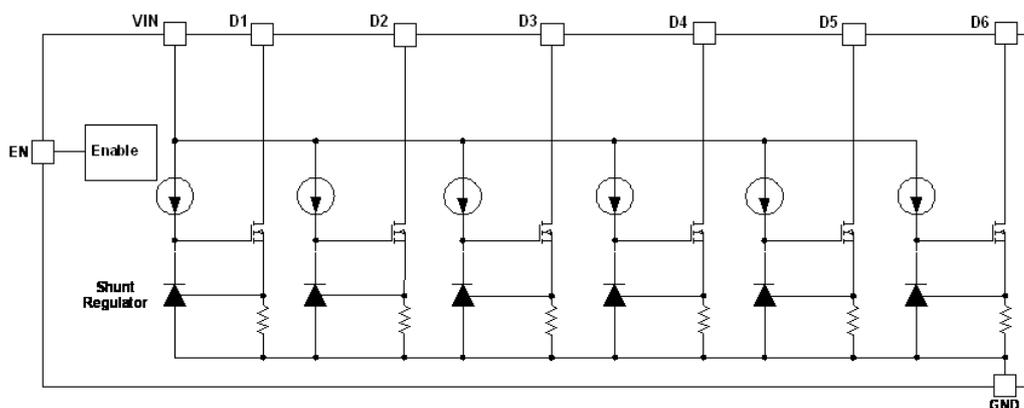
### TYPICAL APPLICATION



### PIN ASSIGNMENT

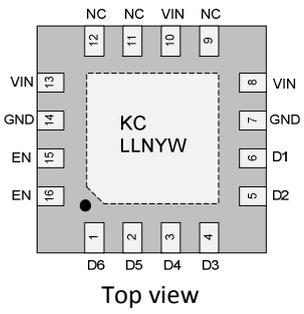


### BLOCK DIAGRAM



## 6-Channels WLED Linear Driver

### MARKING INFORMATION

Product Classification	BL8584CJKTR	
Marking	 <p>Top view</p>	
KC	KC: Product Code	
LLNYW	LL: LOT No.	
	N: FAB Code	
	Y: Year No.	
	W: Week No.	

### ORDERING INFORMATION

 BL8584 1 2 3

Code	Description
<span style="border: 1px solid black; padding: 0 2px;">1</span>	Temperature&RoHS: C: -40~85°C, Pb Free RoHS Std.
<span style="border: 1px solid black; padding: 0 2px;">2</span>	Package type: JK: QFN 3X3 -16
<span style="border: 1px solid black; padding: 0 2px;">3</span>	Packing type: TR:Tape&Reel (Standard)

### PIN DESCRIPTION

Name	Function Description
D1-D6	RGB or WLED Cathode Connection Pin
EN	Chip Enable and Dimming Control. <b>Pin15 and Pin16 both are EN pins, they are shorted internally, so please don't connect one of them to GND</b>
VIN	Power Supply
GND	Ground
NC	Not Connected

### ABSOLUTE MAXIMUM RATING

Supply voltage	-0.3V to 7V
Voltage of LEDn, EN pin	-0.3V to 7V
Maximum Junction Temperature	125°C
Operating Ambient Temperature Range	-40°C to 85°C
Storage Temperature Range	-40°C to 150°C
Lead Temperature (Soldering, 10 sec)	260°C

Note: Exceed these limits to damage to the device.

Note: Exposure to absolute maximum rating conditions may affect device reliability.

### RECOMMENDED OPERATING CONDITIONS

Items	MIN	MAX	Unit
Supply Voltage Range	2.7	5.5	V
Operating Temperature	-25	85	°C

## ELECTRICAL CHARACTERISTICS

VCC=3.7V, T <sub>a</sub> =25°C, No Load, Input: VEN=3.7V. (Unless otherwise noted)						
Symbols	Parameters	Conditions	SPEC			Unit
			MIN	TYP	MAX	
V <sub>IL</sub>	EN Pin "Low" Logic				0.4	V
V <sub>IH</sub>	EN Pin "High" Logic		1.7			V
I <sub>IL</sub>	EN Pin "Low" Input Current		-1			μA
I <sub>IH</sub>	EN Pin "High" Input Current				1	μA
V <sub>LEDL</sub>	LEDn Dropout Voltage			100		mV
I <sub>LED</sub>	LEDn Sink Current		18	20	22	mA
I <sub>LEDn</sub>	LEDn Sink Current Deviation		-5		5	%
I <sub>Q</sub>	Quiescent Current			500	800	μA
I <sub>STBY</sub>	Standby Supply Current	VEN="0"		0.5		μA

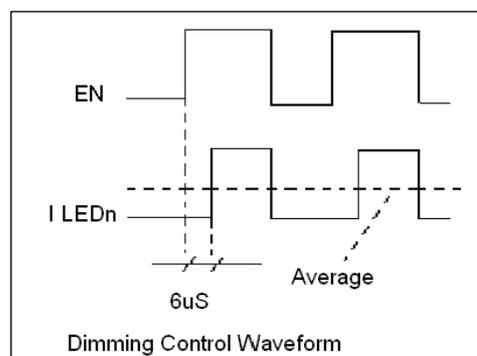
## DETAILED DESCRIPTION

BL8584 works with a wide range of supply voltage, from 2.7V to 6V. The forward voltage of commercial white/blue LED is in the range of 2.9V to 3.5V at a current level of 20mA. Proper selection of the LED to match the supply voltage can fully utilize the Li-ion battery. For example, there is 1% ~ 3 % power left in the Li-ion battery when its voltage reaches 3.275V. So a LED with a forward voltage value of 3.2V can use up to 99% of the battery power under normal working condition. When the voltage of the battery drops below 3.2V, the current through the LED (hence the brightness) starts to decrease.

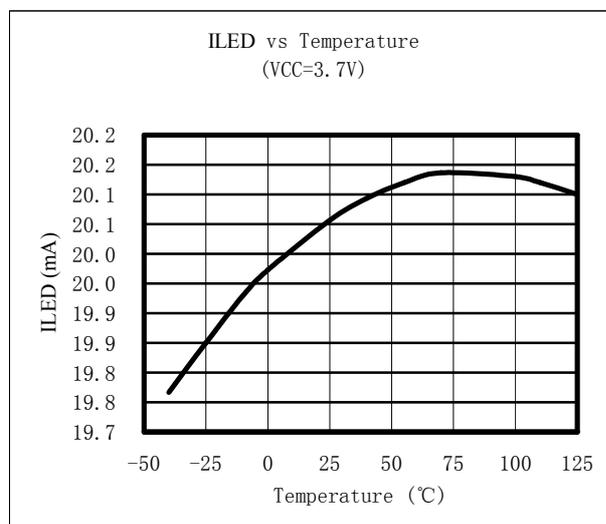
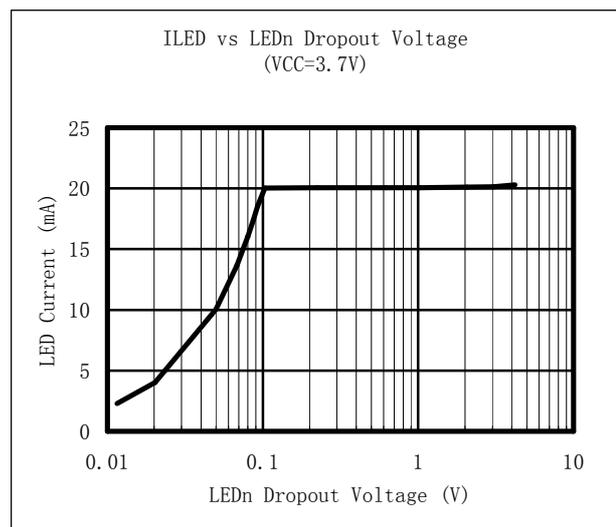
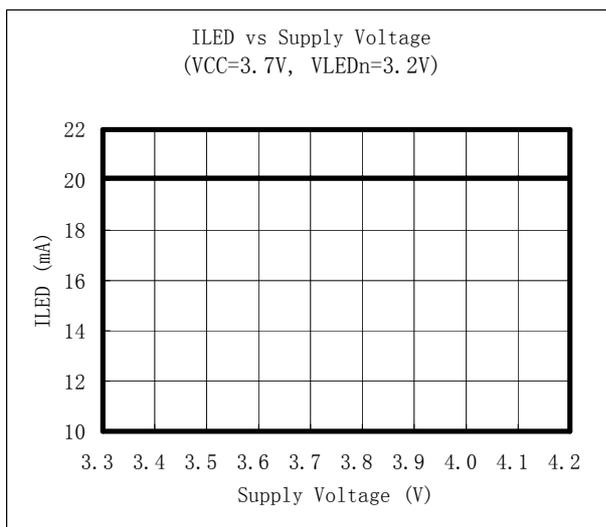
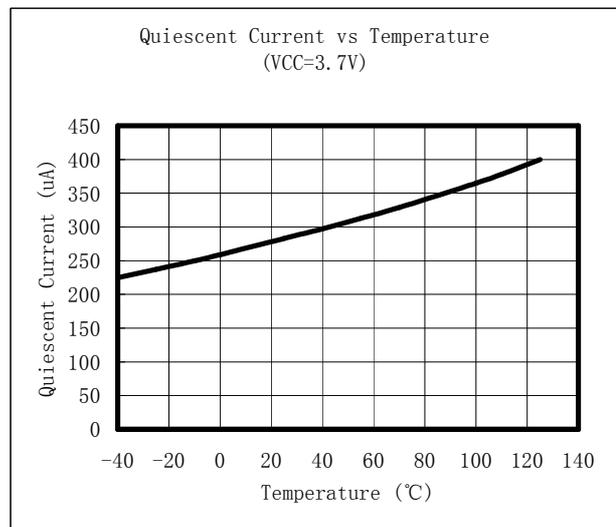
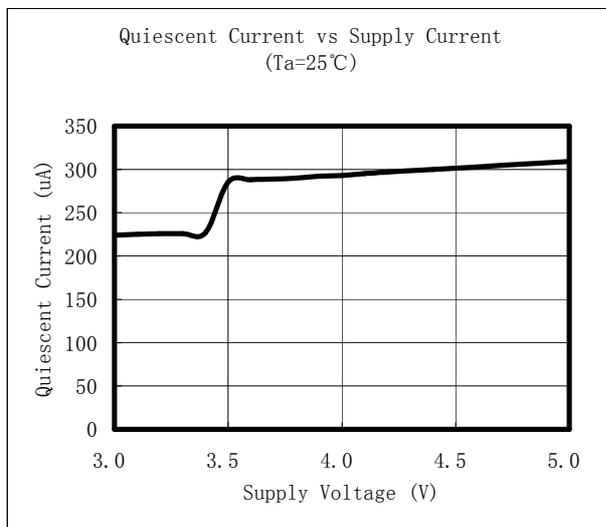
Due to its uniquely designed current regulator, BL8584 offers low output dropout and provide superior efficiency performance over standard Inductive boost type and capacitive charge pump type LED driver.

The EN pin controls the on/off state of the device. A high level state turns on the device and a low level turns off the device, results in the low off state current. This pin needs to be terminated since a floating level of the EN pin will cause the instability of the device.

The sink current has a constant value of 20mA. The brightness of the LED can be adjusted by controlling the duty cycle of the BL8584's LEDn output. This can be accomplished by applying a PWM signal to the EN pin. In BL8584, the internal power on sequence presents a delay time of 6μs from EN pin to LEDn pin. Hence, in order to modulate the output of LEDn in every cycle normally, the width of dimming signal applied EN pin have to be no less than 6μs. For example, when a dimming signal of 20KHz is applied, the minimum range of dimming is about 12%, that is, the average output current on each channel is 2.4mA.



## TYPICAL PERFORMANCE CHARACTERISTICS



## PACKAGE INFORMATION

Package	QFN3X3-16	Devices per reel	3000	Unit	mm