■ FEATURES

No external component required
PWM dimming control available
Low noise and EMI
LED sink current of 20mA
Independent current sink circuit for each LED output
Versatile supply voltage range
Low standby current
High accuracy current match on each channel

■ APPLICATIONS

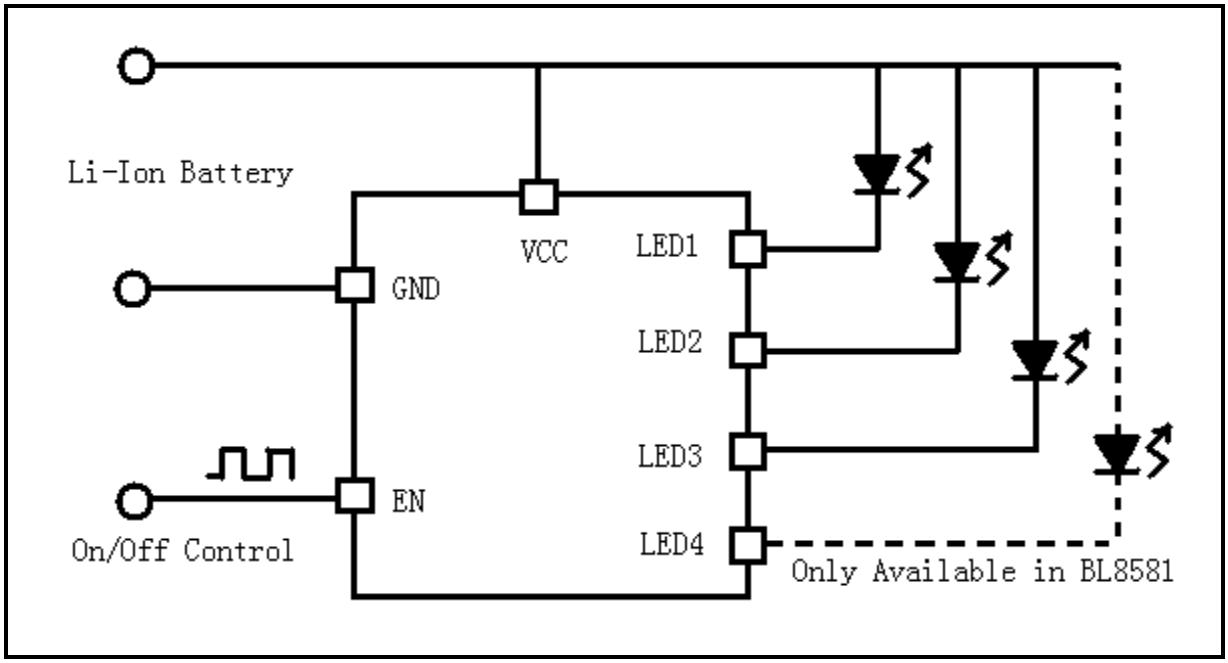
Small Size Color LCD Backlights Driver
Mobile Phone, Portable Device Keypad Backlights Driver

■ DESCRIPTOIN

The BL8580/1 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 BL8580/1 is suitable for applications such as portable device display and keypad backlighting.

In portable application, three or four-channel LED solutions are popular. BL8580 has three LED channels with a SOT-23-6 package. BL8581 has four LED channels with a SOP-8 package.

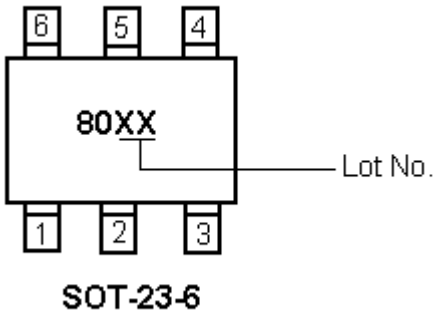
■ TYPICAL APPLICATION



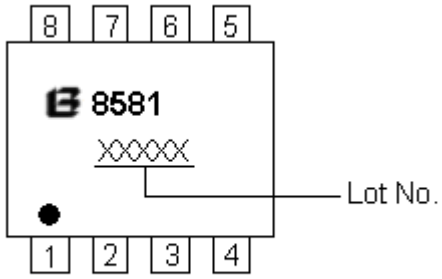
■ ORDERING INFORMATION

BL8580PRC	SOT-23-6	3 Channel	Pb free	3k/reel	-25~125°C
BL8581PS	SOP-8	4 Channel	Pb free	2.5k/reel	-25~125°C

■ MARKING INFORMATION

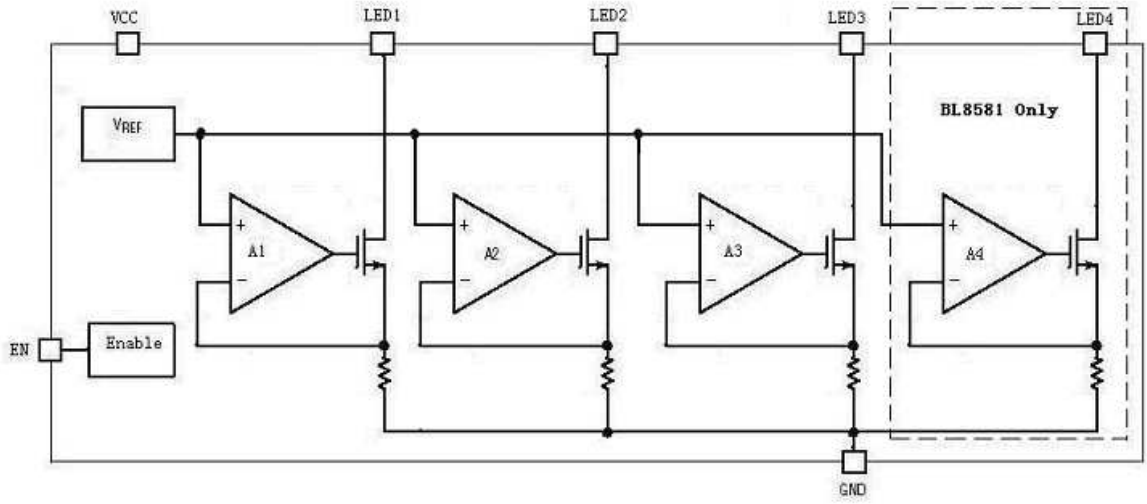


SOT-23-6

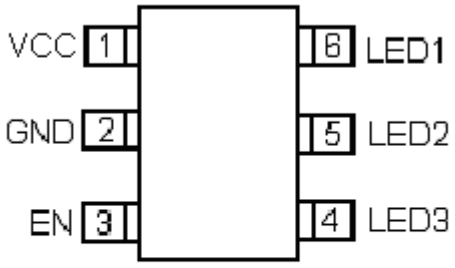


SOP-8

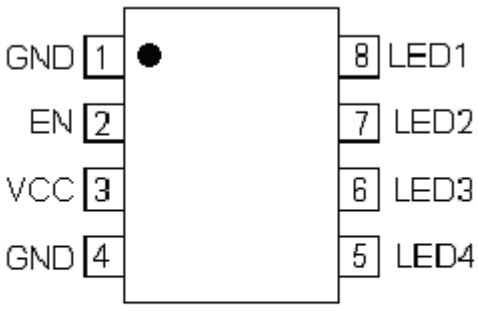
■ BLOCK DIAGRAM



■ PIN CONFIGURATION



BL8580
SOT-23-6



BL8581
SOP-8

■ PIN DESCRIPTION

Pin Name	Function
LED1-LEDn	RGB or WLED cathode connection pin
EN	Chip enable pin. High level activates the chip. Connect the pin to VCC if not used, do not leave this pin floating
VCC	Power Supply
GND	Analog ground. In BL8581, for good LED current match, it is recommended that the two GND pins should be tied together by external copper.

■ ABSOLUTE MAXIMUM RATING

Supply voltage range	-0.3V~7V
Voltage of LEDn, EN pin	-0.3V~7V
Maximum junction temperature	-150℃
Storage temperature range	-40~150℃
Lead temperature and time	-260℃, 10s

■ RECOMMENDED OPERATING CONDITION

PARAMETERS	MIN	NOM	MAX	UNIT
Supply voltage	2.7		6	V
Output sink current on each channel			25	mA
Operating free-air temperature range	-25		125	℃

■ ELECTRICAL CHARACTERISTICS

V_{DD}=3.7V, T_a=25°C, No Load, Input: V_{IH}=3.7V, V_{IL}=GND. (Unless otherwise noted)

Symbols	Parameters	Conditions	Reference Data			Unit
			MIN	TYP	MAX	
V_{IL}	EN Pin “Low” Logic				0.4	V
V_{IH}	EN Pin “High” Logic		1.7			V
I_{IL}	EN Pin “Low” Input Current		-1			μA
I_{IH}	EN Pin “High” Input Current				1	μA
V_{LEDL}	LEDn Dropout Voltage			100		mV
I_{LED}	LEDn Sink Current		19	20	21	mA
ΔI_{LEDn}	LEDn Sink Current Deviation				+/-3	%
I_Q	Quiescent Current	VEN=”1”		250	400	μA
I_{STBY}	Standby Supply Current	VEN=”0”		0.5		μA

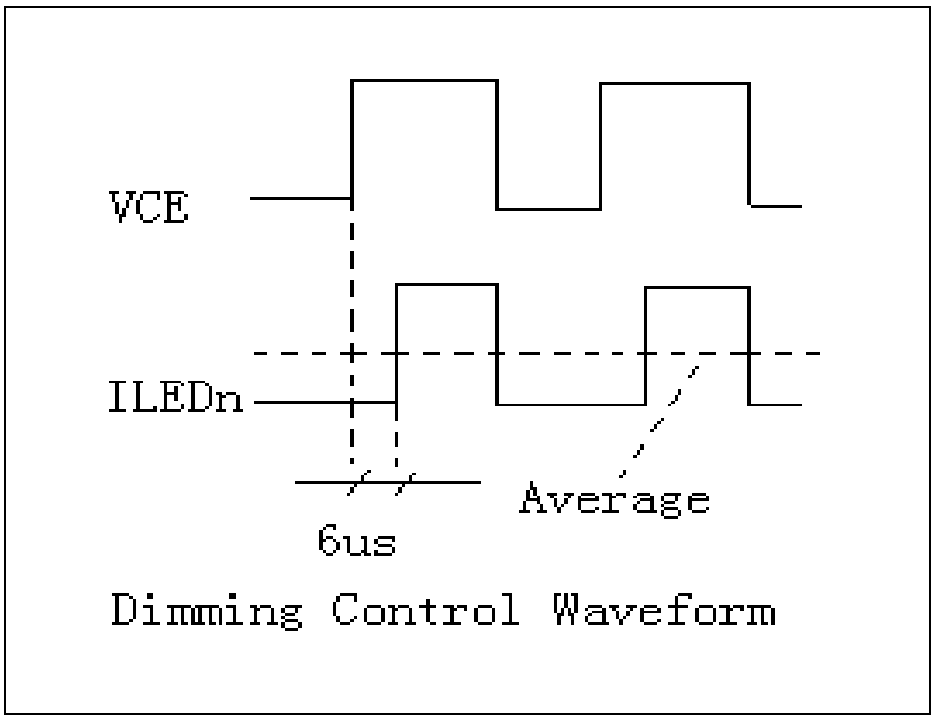
■ DETAILED DESCRIPTION

BL8580/1 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, BL8580/1 offer low output dropout and provide superior efficiency performance over standard Inductive boost type and capacitive charge pump type LED driver.

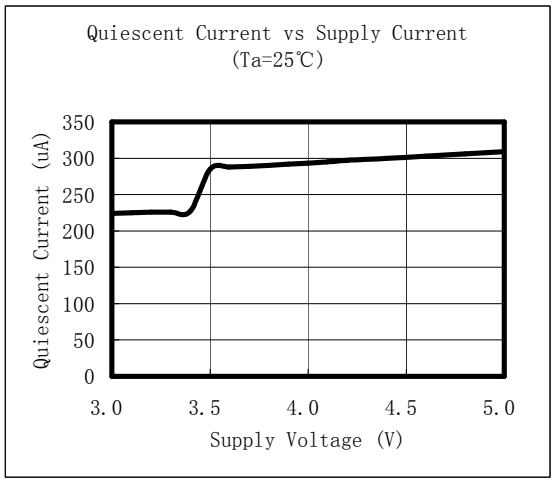
The EN pin controls the on/off state of the device. A high level state turns on the device and a low level turns off the device, results in the low off state current. This pin needs to be terminated since a floating level of the EN pin will cause the instability of the device.

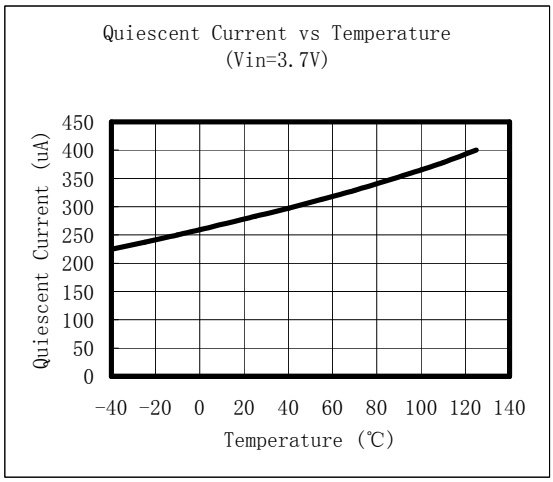
The sink current has a constant value of 20mA. The brightness of the LED can be adjusted by controlling the duty cycle of the BL8580/1's LEDn output. This can be accomplished by applying a PWM signal to the EN pin. In BL8580/1, the internal power on sequence presents a delay time of 6us from CE pin to LEDn pin. Hence, In order to normally modulate the output of LEDn in every cycle, the width of dimming signal applied CE pin have to be no less than 6us. 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 2.4 mA.

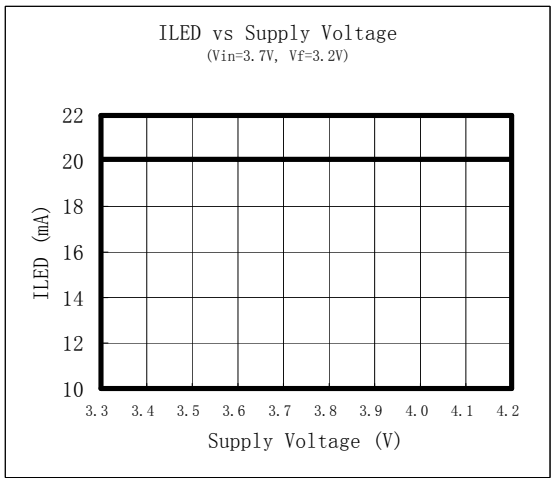


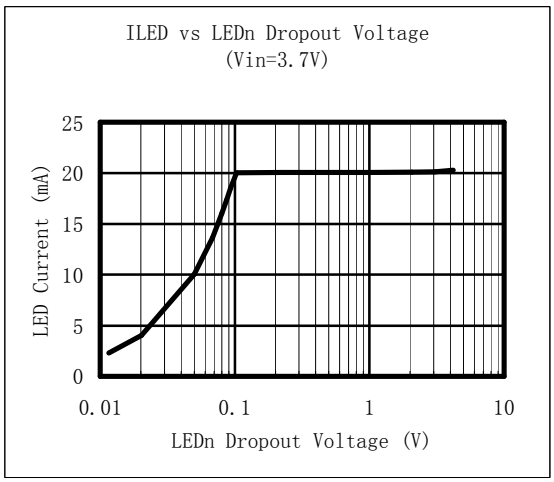
Dimming Control Waveform

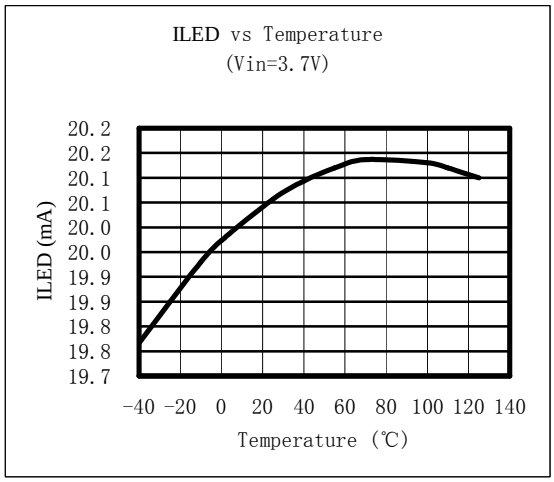
■ TYPICAL CHARACTERISTICS





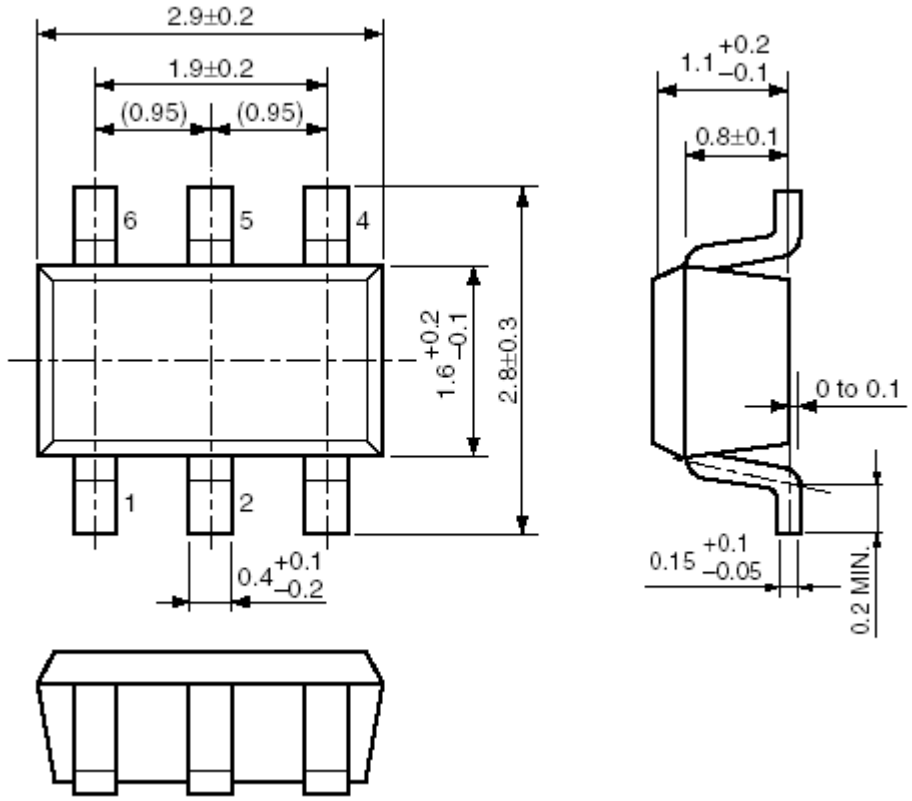




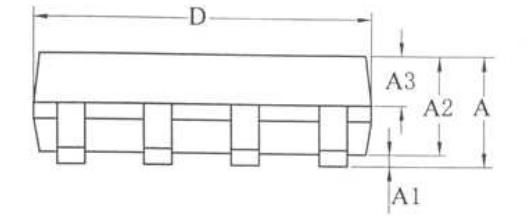


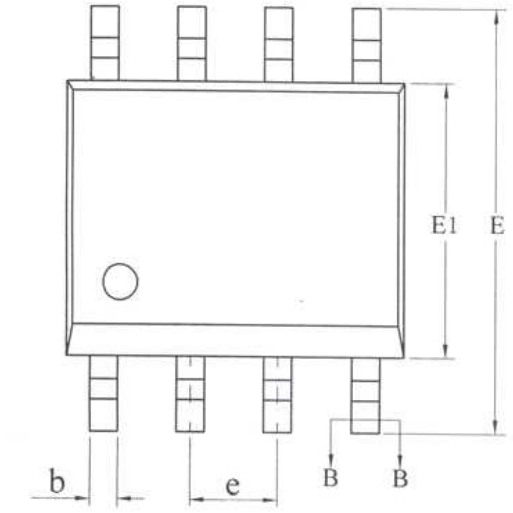
■ MECHANICAL DATA

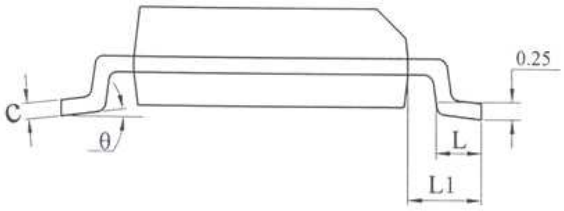
SOT-23-6 (Units: mm)



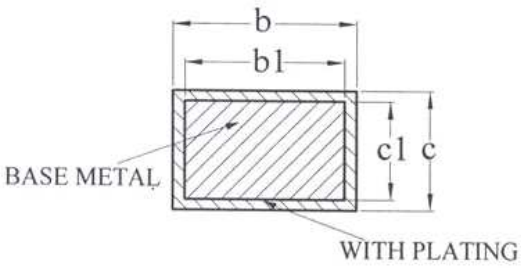
SOP-8







SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.77
A1	0.08	0.18	0.28
A2	1.20	1.40	1.60
A3	0.55	0.65	0.75
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	0.65	0.80
L1	1.05BSC		
θ	0	—	8°



SECTION B-B