

## 4-Channel Current Source White LED Driver

### General Description

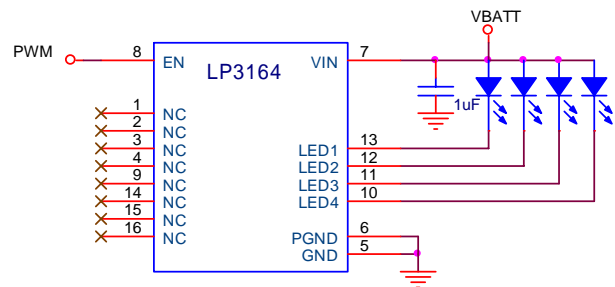
The LP3164 is a low-dropout bias supply for white LEDs is a high-performance alternative to the simple ballast resistors used in conventional white LED designs. It supports 4 white LEDs with regulated constant current for uniform intensity. The LP3164 maintains low dropout current regulators. The LP3164 requires a 50mV dropout at a 20mA load on each output to match the LED brightness. The brightness of LEDs can be tuned through a pulse width modulated signal at the PWM pin.

The LP3164 is available in a QFN-16 package.

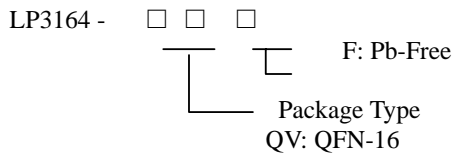
### Features

- ✧ 2.7V to 6V Input Voltage
- ✧ 20mA maxim sink current
- ✧ PWM tuned LED brightness through PWM pin(2KHz)
- ✧ Soft Start Function
- ✧ Built-in Thermal Protection
- ✧  $I_Q < 1\mu A$  in Shutdown
- ✧ QFN-16 Package
- ✧ RoHS Compliant and 100% Lead (Pb)-Free

### Typical Application Circuit



### Order Information



### Marking Information

Please see website.

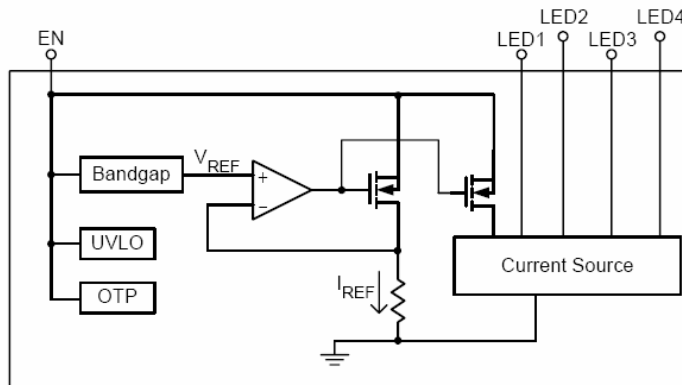
### Applications

- ✧ LCD Panel
- ✧ Cellular and Smart mobile phone
- ✧ PDA/DSC
- ✧ PMP

### Functional Pin Description

Part No.	Package Type	Pin Configurations
LP3164	QFN-16	
PIN	NAME	DESCRIPTION
QFN-16		
1,2,3,4,9,14,15,16	NC	No Internal Connection.
5/6	AGND/PGND	Ground.
7	VIN	Power Supply.
8	EN/PWM	Chip Enable(active High).and connects to a GPIO of MCU,the GPIO supply a PWM signal dimming method to control the brightness(0-20mA) of white LEDs and the PWM frequency from 200Hz to 10KHz,the duty from 0% to 100%.the typical frequency is 2KHz.
10	LED4	LED4 cathode terminal.
11	LED3	LED3 cathode terminal.
12	LED2	LED2 cathode terminal.
13	LED1	LED1 cathode terminal

### Function Block Diagram



### Absolute Maximum Ratings

- ✧ Input Voltage to GND ( $V_{INA}, V_{INB}$ ) ----- 6V
- ✧ EN/LED to GND Voltage ( $V_{en/LED}$ ) ----- 0.3V to  $V_{in}+0.3V$
- ✧ Maximum DC Output Current( $I_{out}$ ) ----- 150mA
- ✧ Operating Junction Temperature Range ( $T_j$ ) -----40°C to 150°C
- ✧ Maximum Soldering Temperature (at leads, 10sec) -----300°C

### Thermal Information

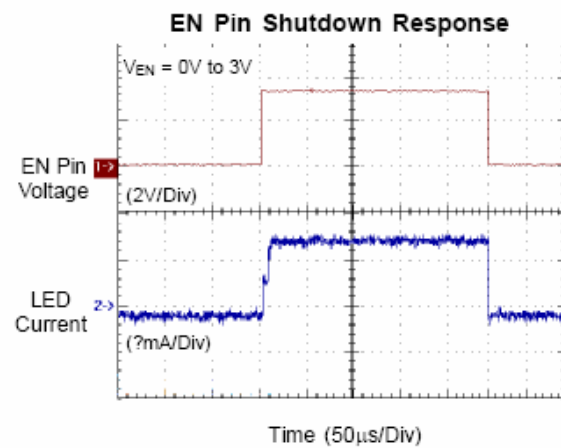
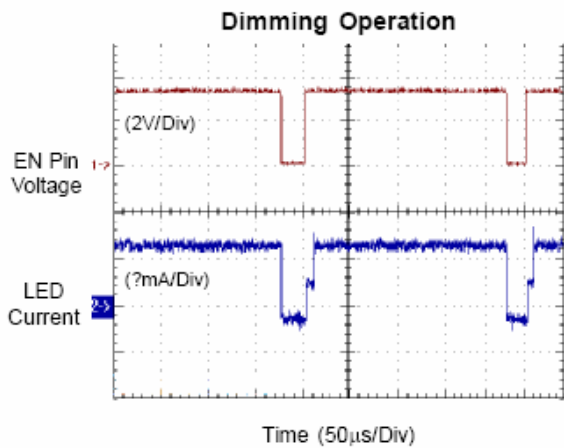
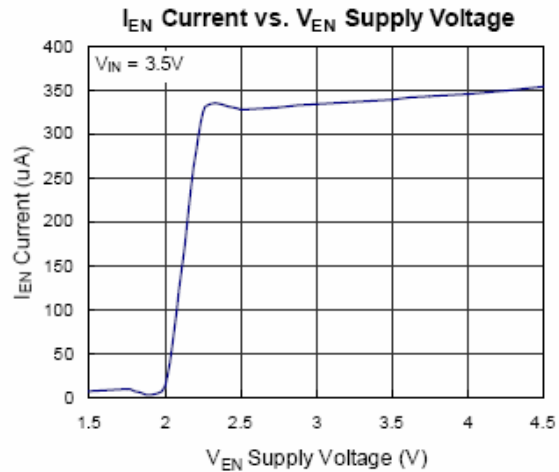
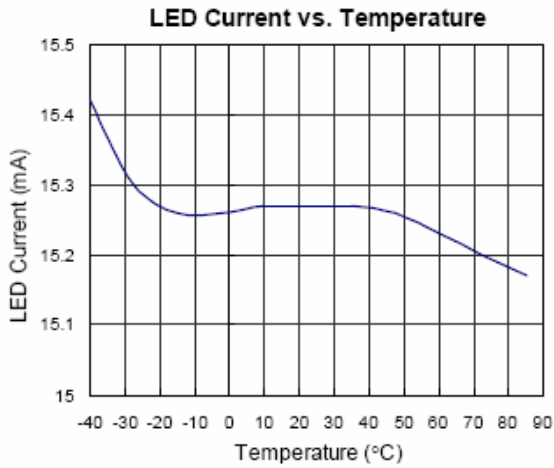
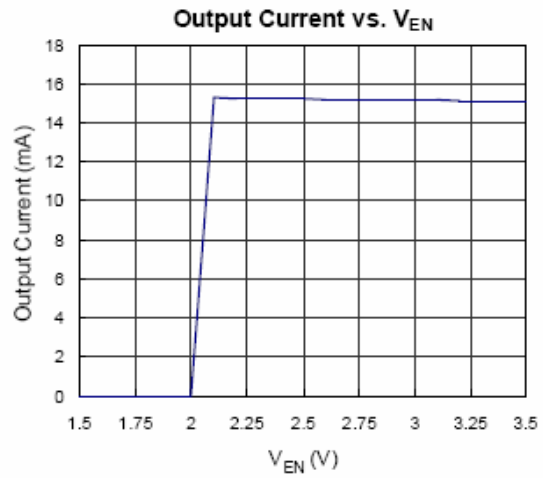
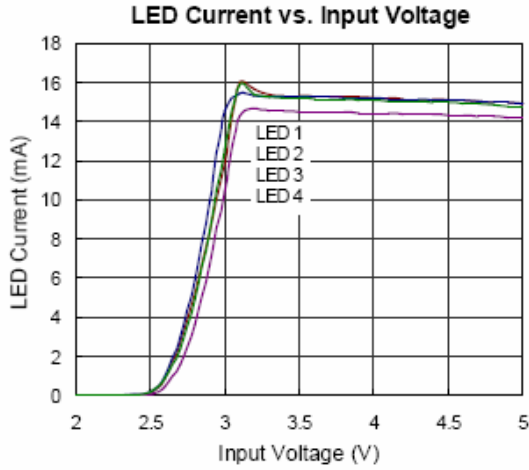
- ✧ Maximum Power Dissipation ( $P_D$ ) QFN-16 ----- 1.5W
- ✧ Thermal Resistance ( $J_A$ ) -----50°C/W

### Electrical Characteristics

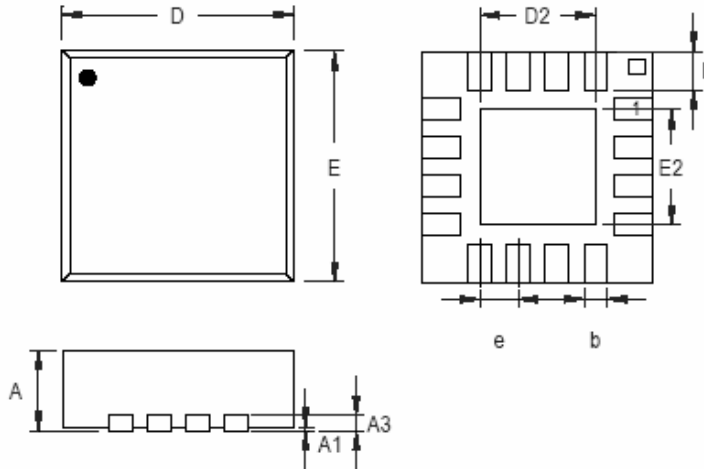
(Over recommended operating conditions unless specified otherwise)  $V_{INA}=3.6V, EN=High, T_A=25^\circ C$  )

Symbol	Parameter	Conditions	LP3164			Unit
			Min.	Typ.	Max.	
$V_{IN}$	Input Voltage		3		5.5	V
$V_{OUT}$	Output Voltage Range		0.6		$V_{INB}$	V
$I_Q$	Quiescent Current	No Load, 1X mode		100	250	uA
$I_{SHDN}$	Shutdown Current	ENB = GND		0.1	1	μA
$I_{LED-ERR}$	LED Current Accuracy	3mA < $I_{LED}$ < 30mA	19	20	21	mA
$I_{LED-LED-ERR}$	LED Channel Matching	Any two channel mismatch	-3		3	%
$V_{EN(L)}$	Enable Threshold Low				0.5	V
$V_{EN(H)}$	Enable Threshold High		2			V

### Typical Operating Characteristics



Packaging Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.000	0.031	0.039
A1	0.000	0.050	0.000	0.002
A3	0.200 Ref.		0.008 Ref.	
b	0.180	0.300	0.007	0.012
D	3.000		0.118	
D2	1.250	1.900	0.049	0.075
E	3.000		0.118	
E2	1.250	1.900	0.049	0.075
e	0.500		0.020	
L	0.300	0.500	0.012	0.020