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## High-efficiency Constant Current LED Driver

### Features

- Input voltage range: 0V to 5.5V
- Programmable LED Drive Current : up to 700mA
- Operating Frequency: 1.4MHz
- Quiescent Current: 320uA
- High efficiency (up to 93%)
- Low Profile SOT-23-5L Package (lead-free packaging is now available)

### Applications

- Automotive lighting
- Low voltage industrial lighting
- LED back-up lighting
- Constant Current Source
- RGB High Brightness LED lighting

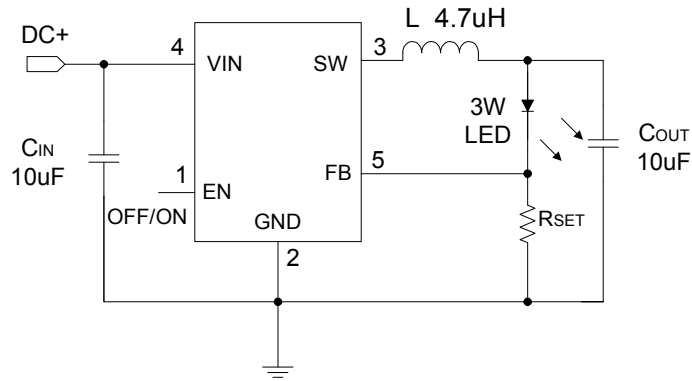
### Description

The HM2804 is a high-efficiency buck constant-current LED driver, designed for driving single or multiple series connected LED efficiently. The device operates from an input supply between 0V and 5.5V and provides an externally adjustable output current of up to 700mA. Depending upon the supply voltage and external components, the HM2804 can drive 3 watts of LED.

The HM2804 includes the power switch which operating frequency up to 1.4MHz. The HM2804 is available in SOT-23-5L package.

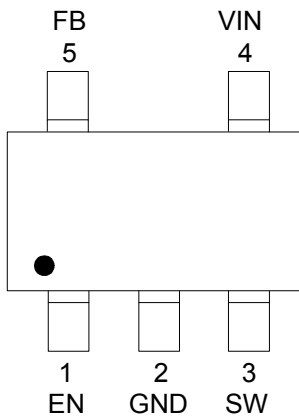


Typical Application Circuit



\*  $I_{LED} = 0.1V / R_{SET}$ .

Pin Assignment



PIN NUMBER SOT-23- 5L	PIN NAME	FUNCTION
1	EN	ON/OFF Control (High Enable)
2	GND	Ground
3	SW	Switch Output
4	VIN	Input
5	FB	Feedback Pin

SOT-23-5L

## Absolute Maximum Ratings (Note 1)

- Supply Voltage.....-0.3V to 6.5V
- SW Pin Voltage.....-0.3V to 6.5V
- Other I/O Pin Voltages.....-0.3V to (VDD + 0.3V)
- SW Pin Current .....1.3A
- Operating Junction Temperature..... 125°C
- Storage Temperature Range..... -65°C ~ +150°C
- Lead Temperature (Soldering 10 sec) ..... 300°C

**Note 1.** Stresses listed as the above “Absolute Maximum Ratings” may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

## Electrical Characteristics

(VIN = VEN =5V, RSET=0.165Ω, drive one 3W' LED, TA = 25°C, unless otherwise specified)

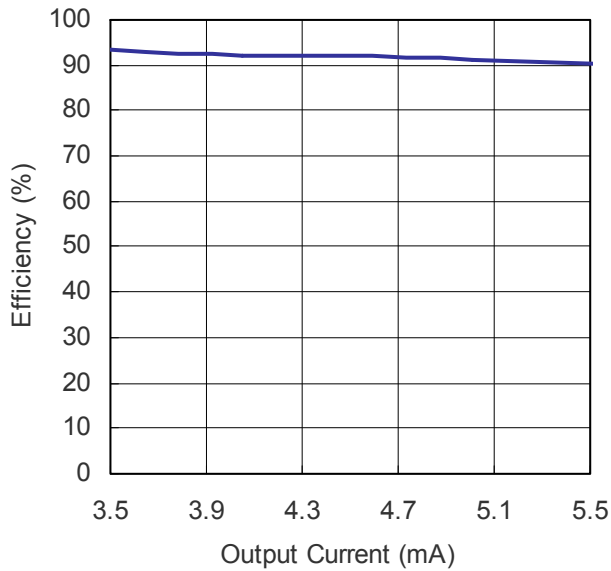
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage		0		5.5	V
Regulated Voltage (V <sub>FB</sub> )			0.1		V
Supply Current (shutdown)	V <sub>EN</sub> = 0V		0.1		μA
Quiescent Current	VIN = VEN =5V		320		μA
Output Current		0		700	mA
Switching Frequency			1.4		MHz
EN Threshold	V <sub>EN</sub> Rising		1.3		V
	V <sub>EN</sub> Falling		0.7		
SW Current Limit			0.95		A
Efficiency	VIN = VEN = 3.5V		93		%

\* EFFI = [(Output Voltage × Output Current) / (Input Voltage × Input Current)] × 100%

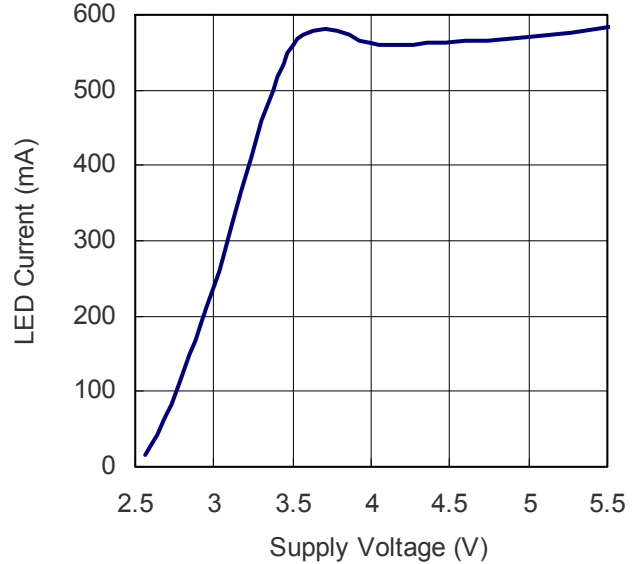
## Typical Performance Characteristics

TA=25°C, C<sub>IN</sub> =10 uF, C<sub>OUT</sub> =10 uF, L=4.7μH, unless otherwise noted.

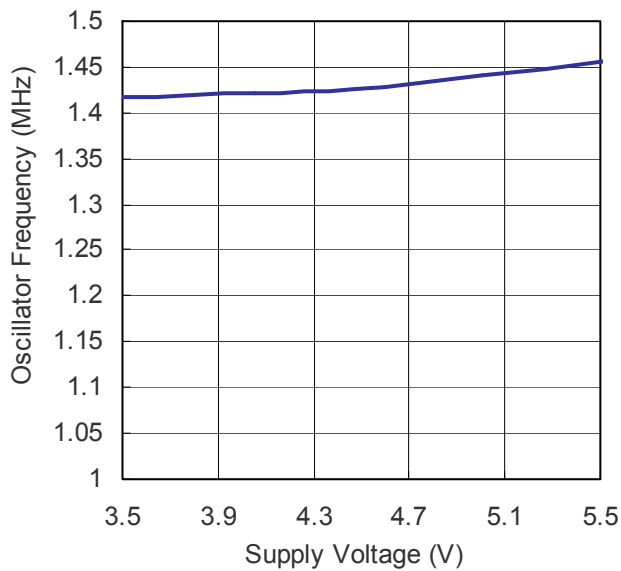
Efficiency vs. Input Voltage  
(RSET=0.165Ω)



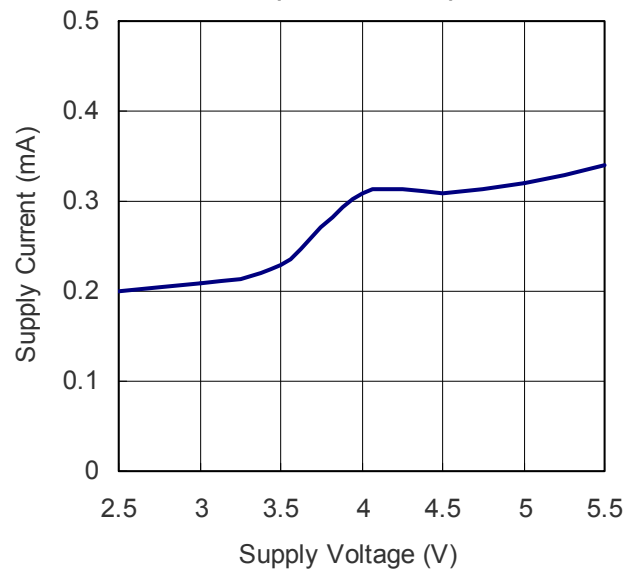
LED Current vs. Supply Voltage  
(RSET=0.165Ω)



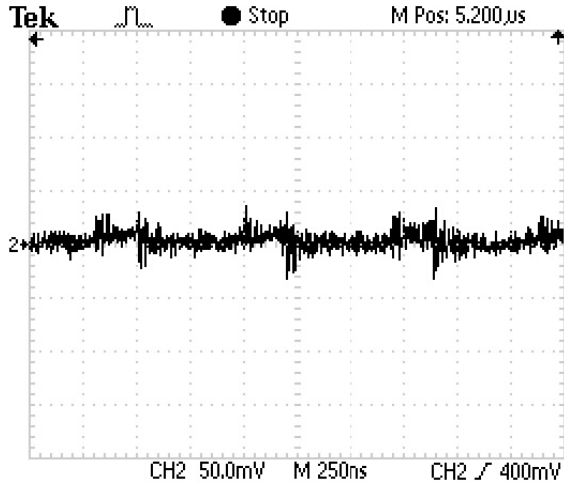
Oscillator Frequency vs. Supply Voltage  
(RSET=0.165Ω)



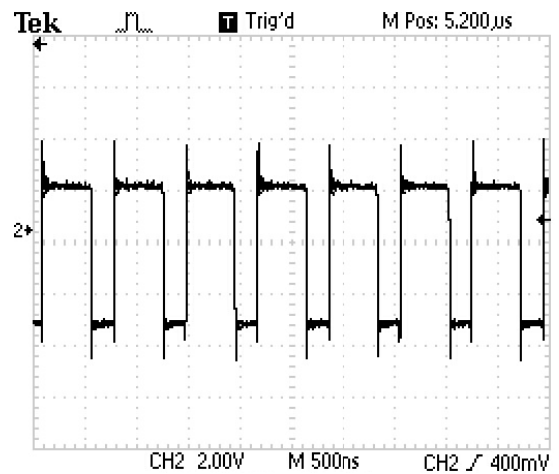
Quiescent Current vs. Supply Voltage  
(RSET=0.165Ω)



Output Noise (VIN = 5V, RSET=0.165Ω  
AC COUPLED)



SW Noise (VIN = 5V, RSET=0.165Ω  
AC COUPLED)



## Pin Description

**EN (Pin 1):** En Control Input. Forcing this pin above 1.3V enables the part. Forcing this pin below 0.7V can shuts down the device. In shutdown, all functions are disabled drawing <math><1\mu\text{A}</math> supply current. Do not leave EN floating.

**GND (Pin 2):** Ground Pin.

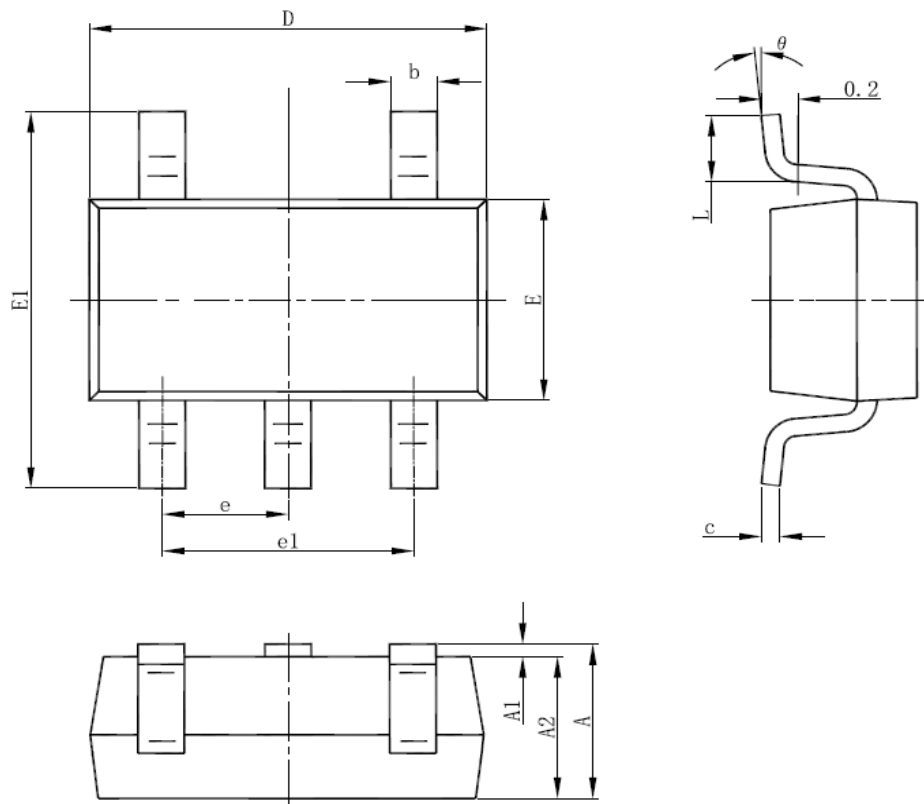
**SW (Pin 3):** Switch Node Connection to Inductor. This pin connects to the drains of the internal main and synchronous power MOSFET switches.

**VIN (Pin 4):** Main Supply Pin. It must be closely decoupled to GND, Pin 2, with a  $10\mu\text{F}$  or greater ceramic capacitor.

**FB (Pin 5):** Output feedback. The output current is set by a resistor  $R_{\text{SET}}$  according to the following formula:  $I_{\text{LED}} = 0.1\text{V} / R_{\text{SET}}$ .

## Packaging Information

### SOT-23-5L Package Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°