# 1.5MHz Step-up DC/DC Converter

General Description

The LP3301 is a 1.5MHz PWM boost switching regulator designed for constant-Voltage driver applications.

The LP3301 implements a constant frequency 1.5MHz PWM control scheme. The high frequency PWM operation also saves board space by reducing external component sizes. To improve efficiency, the feedback voltage is set to 1.25V.

Highly integration and internal compensation network minimizes as 5 external component counts. Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency.
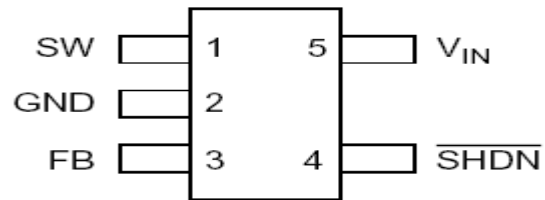
Ordering Information

LP3301 ☐ ☐ ☐

F:Pb-Free
Package Type
B5: SOT-23-5
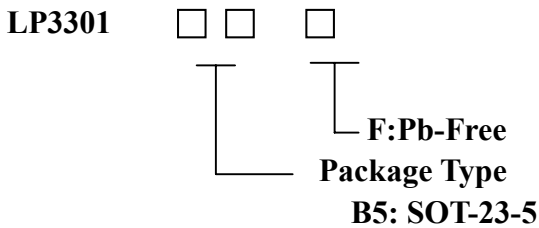
Features

◆ **High Efficiency: 85%**
◆ **1.5MHz Fixed-Frequency PWM Operation**
◆ **36V 500mA Integrated switch**
◆ **Shutdown Supply Current:<1uA**
◆ **Available in SOT23-5 Package**
◆ **Built-in Over Voltage Protection of 29V**
◆ **Minimize the External Component**
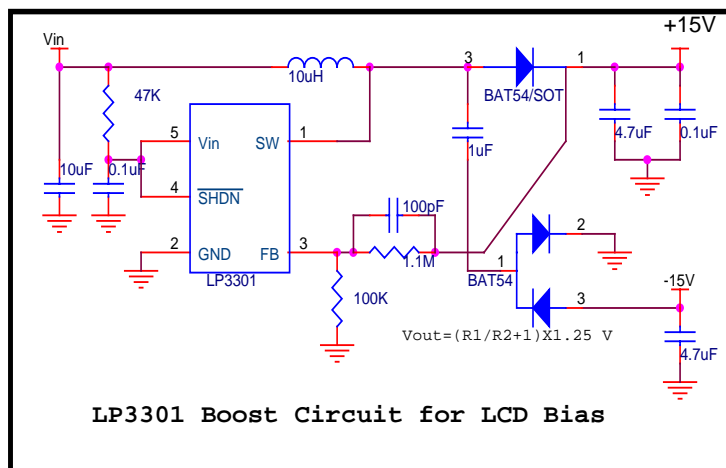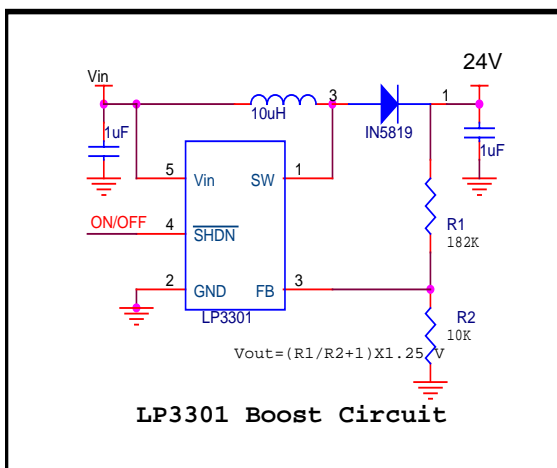◆ **RoHS Compliant and 100% Lead (Pb)-Free**

Pin Configurations

Applications

✧ **LCD Bias Supply**
✧ **OLED Driver**
✧ **GPS/PDA/Mobile phone**

Marking information

Please view website.

Typical Application Circuit

LP3301 Boost Circuit

Vout=(R1/R2+1)X1.25 V

LP3301 Boost Circuit for LCD Bias

Vout=(R1/R2+1)X1.25 V

Functional Pin Description

SOT-23-5	Pin Name	Pin Function
1	SW	Switch Pin. Connect this Pin to inductor and catch diode. Minimize the track area to reduce EMI.
2	GND	Ground Pin
3	FB	Feedback Reference Voltage Pin. Connect R1 and R2 resistor divider here. Calculate the Output Voltage according to the formua:Vout=1.25*(1+R1/R2).
4	SHDN	Chip Enable (Active High). Voltage sensing input to trigger the function of over voltage protection. Note that this pin is high impedance. There should be a pull low 100kΩ resistor connected to GND when the control signal is floating.
5	VIN	Supply Input Voltage Pin. Bypass 1uF capacitor to GND to reduce the input noise.

Function Block Diagram
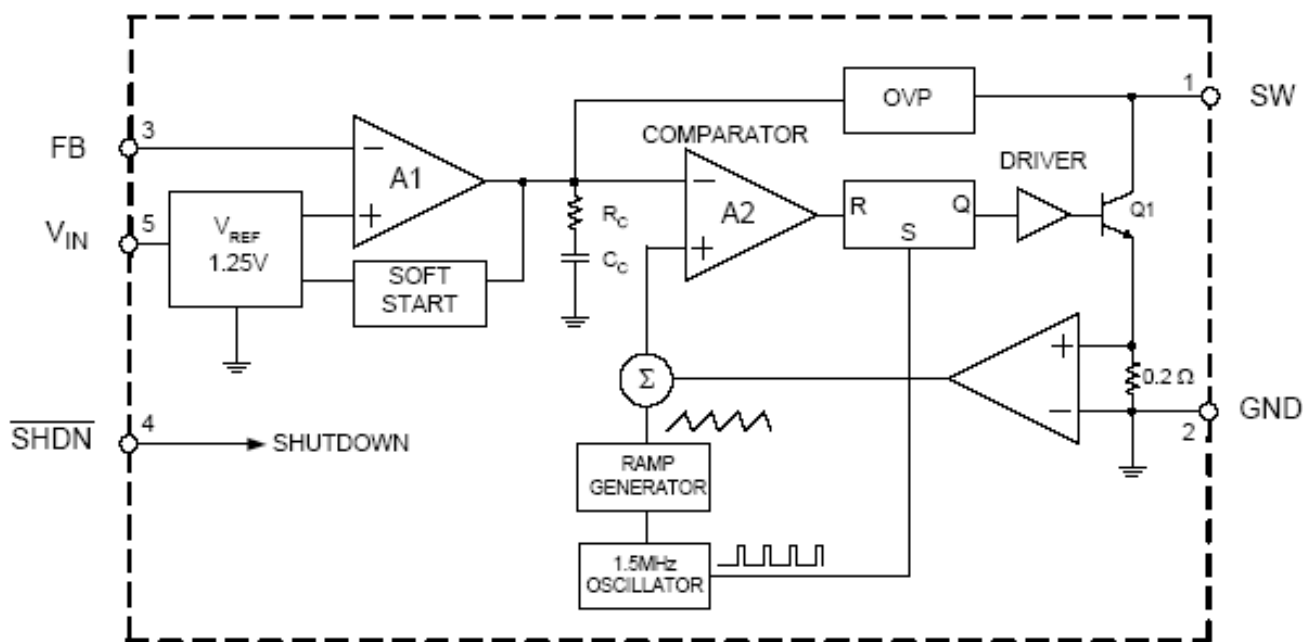
Absolute Maximum Ratings

Supply Input Voltage---−0.3V to 16V

LX Input Voltage --−0.3V to 38V

SHDN Input Voltage ---−0.3V to 16V

OVP Voltage--−0.3V to 29V

The Other Pins --−0.3V to 5V

Power Dissipation, P$_D$ @ T$_A$ = 25°C

SOT-23-5 ---0.455W

Lead Temperature (Soldering, 10 sec.) --- 260°C

Operation Temperature Range ---−40°C to 80°C

Junction Temperature Range --0°C to 125°C

Storage Temperature Range ---−65°C to 150°C

Operation Junction Temperature Range --0°C to 125°C

Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
System Supply Input						
Operation voltage Range	V$_{DD}$		2.6		16	V
Under Voltage Lock Out	V$_{DD}$		--	2.2		V
Supply Current	I$_{DD}$	FB=0V, Switch ON		2	3.5	mA
Shut Down Current	I$_{DD}$	V$_{SHDN}$= 0V ,V$_{FB}$=0V		0.1	1	uA
Line Regulation		V$_{IN}$: 3.0~4.3V		3		%
Oscillator						
Operation Frequency	F$_{OSC}$		1.1	1.5	1.9	MHz
Maximum Duty Cycle			85	90		%
Reference Voltage						
Feedback Voltage (Note 4)	LP3301		1170	1250	1330	mV
MOSFET						
On Resistance of MOSFET	R$_{DS(ON)}$		--	0.6		Ω
Protection						
OVP Threshold	V$_{OVP}$			29		V
OVP Sink Current				5		μA
Switching Current Limit				500		mA
Shut Down Voltage	V$_{EN}$		--		0.4	V
Enable Voltage	V$_{EN}$		1.5			V
Soft Star time				550		uS

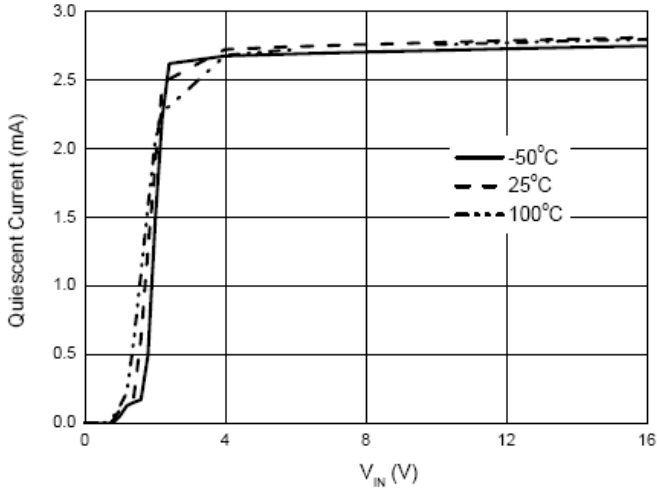# Typical Performance Characteristics
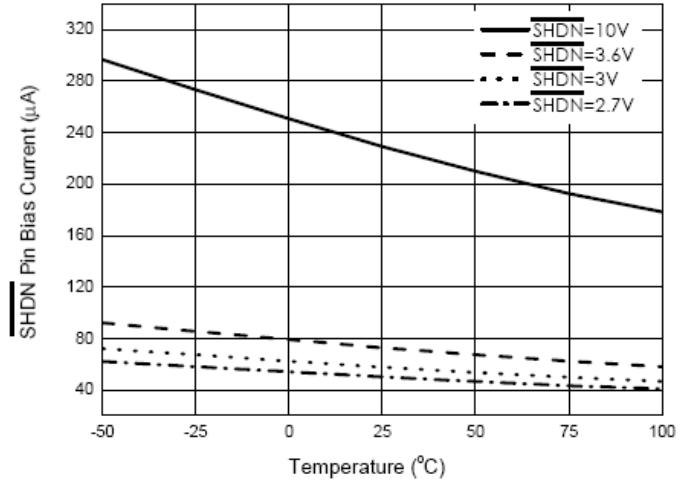

Figure 4. Quiescent Current vs. Input Voltage

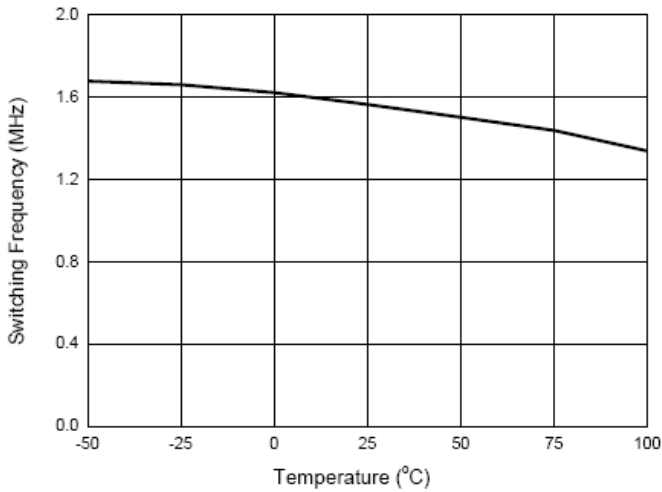Figure 5. SHDN Pin Bias Current vs. Temperature

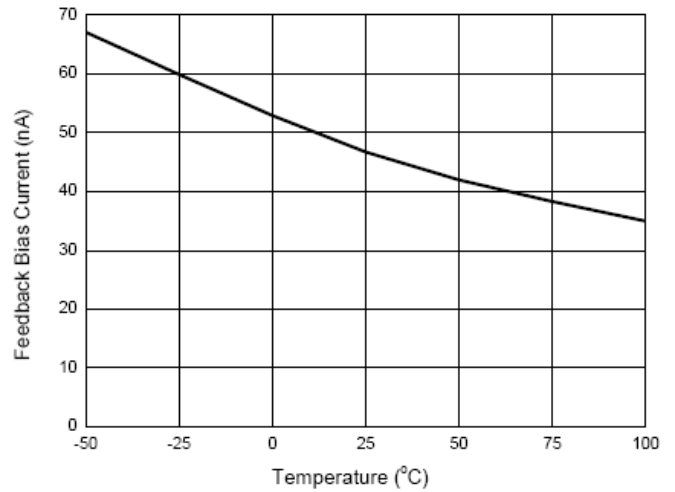Figure 6. Switching Frequency vs. Temperature

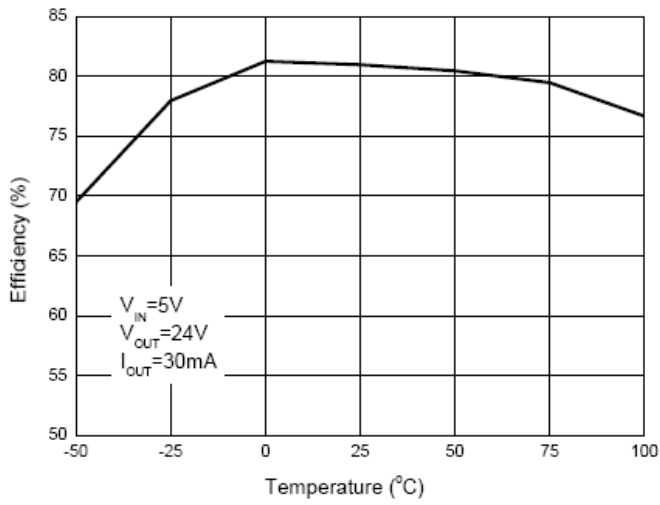

Figure 7. Feedback Bias Current vs. Temperature

Figure 8. Efficiency vs. Temperature

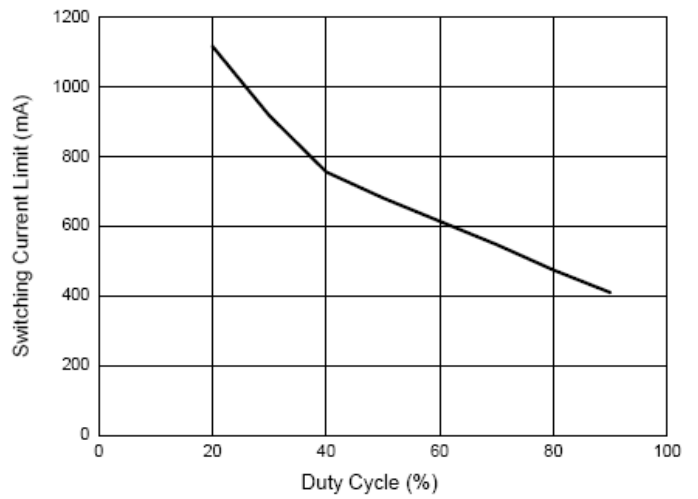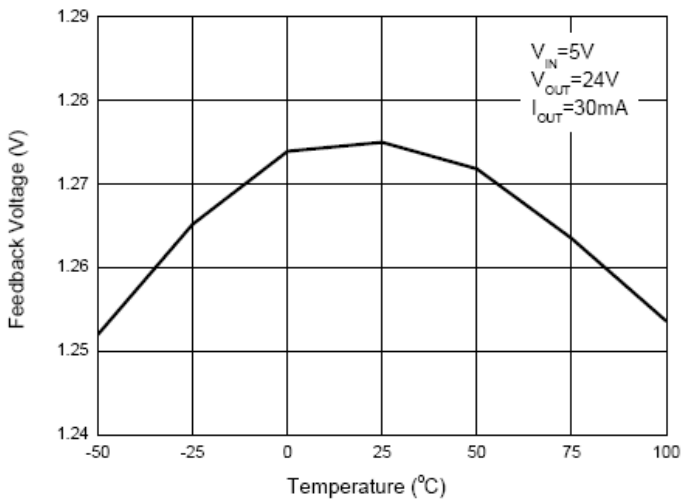
Figure 9. Switching Current Limit vs. Duty Cycle
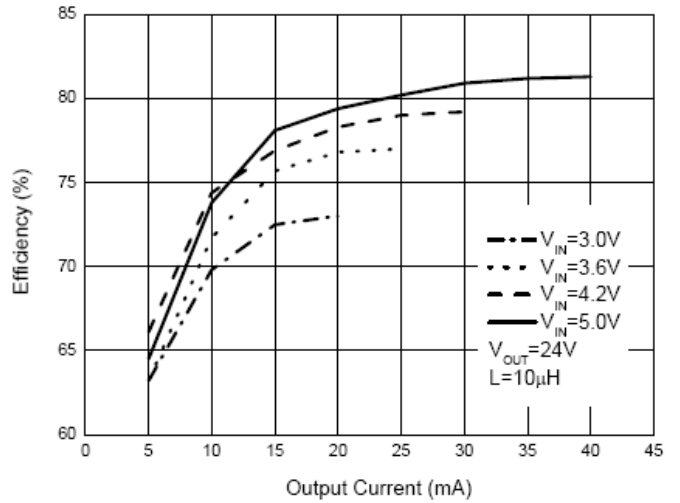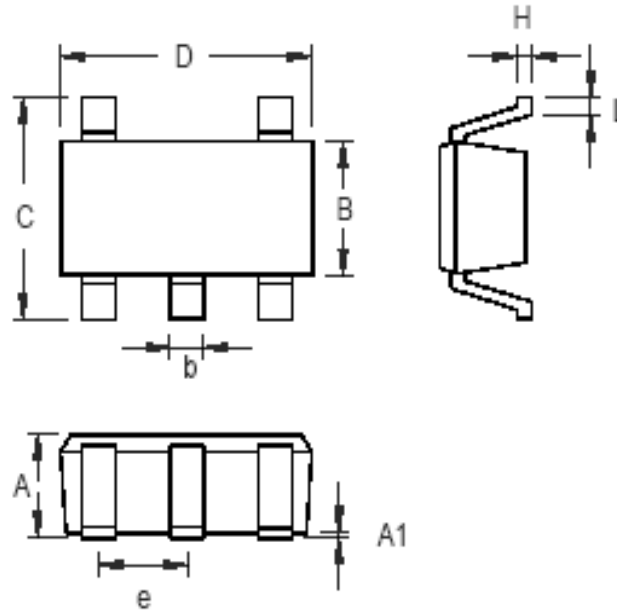

Figure 10. Feedback Voltage vs. Temperature

Figure 11. Efficiency vs. Output Current

Packing information

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.031	0.051
A1	0.000	0.100	0.000	0.004
B	1.397	1.803	0.055	0.071
b	0.300	0.559	0.012	0.022
C	2.591	3.000	0.102	0.118
D	2.692	3.099	0.106	0.122
e	0.838	1.041	0.033	0.041
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024