

1.5MHz Step-up DC/DC Converter

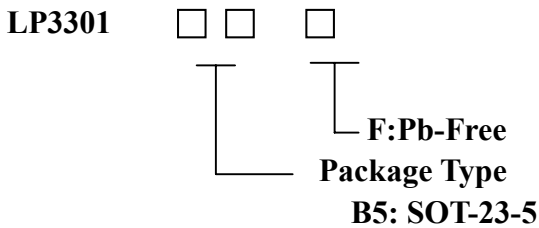
General Description

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.

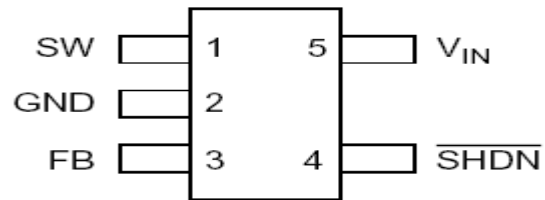
Ordering Information



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



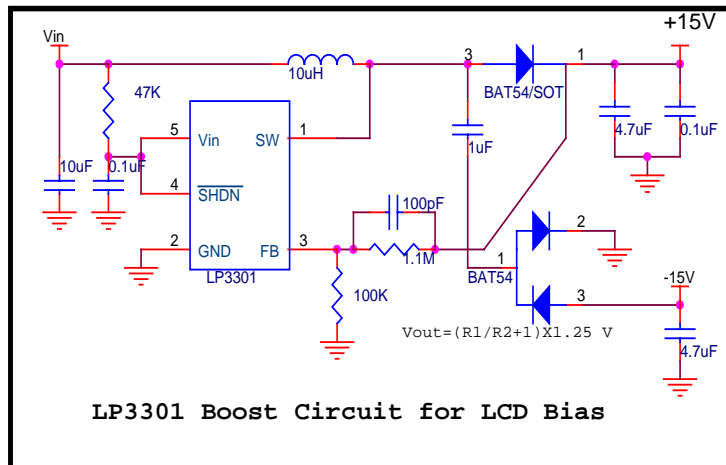
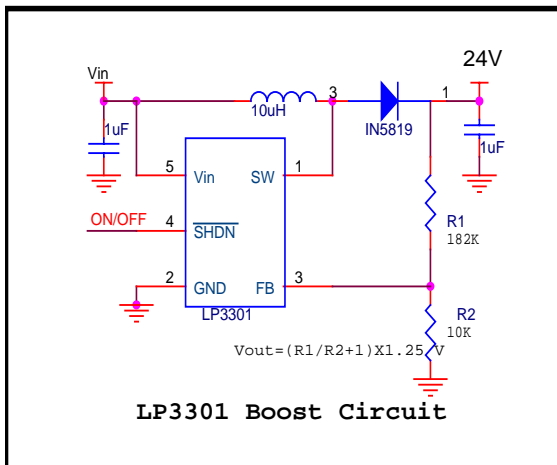
Applications

- ◇ LCD Bias Supply
- ◇ OLED Driver
- ◇ GPS/PDA/Mobile phone

Marking information

Please view website.

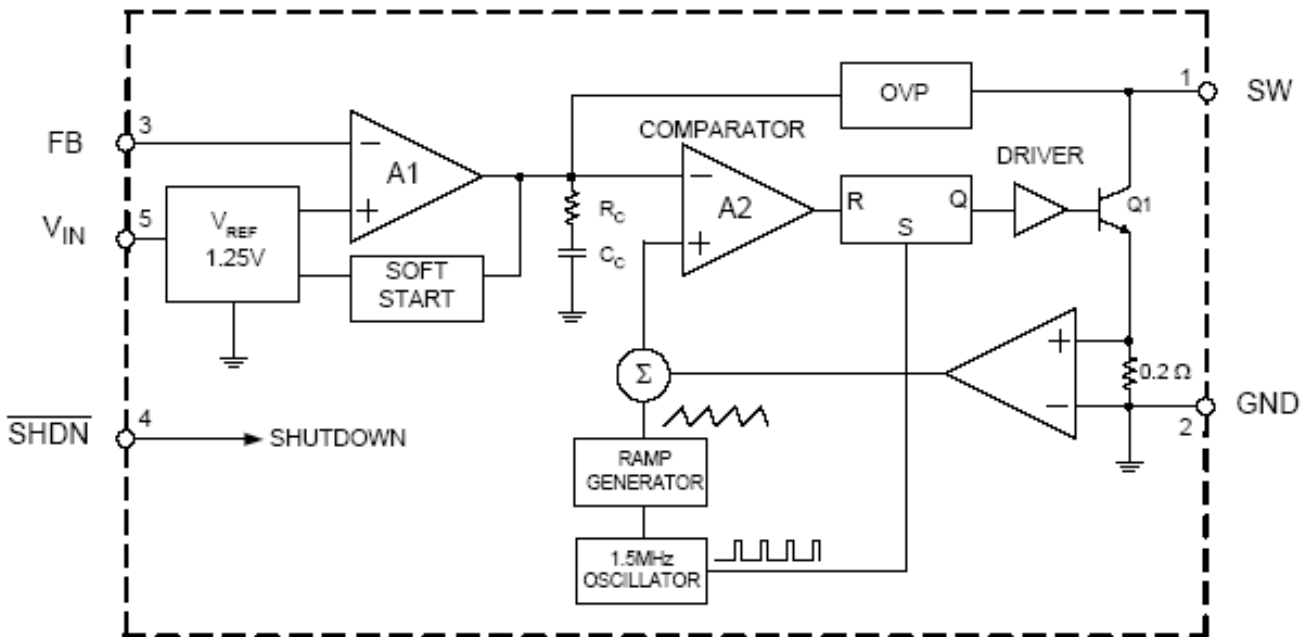
Typical Application Circuit



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 formula: $V_{out}=1.25*(1+R1/R2)$.
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 @ $T_A = 25^\circ\text{C}$	
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		μ A
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

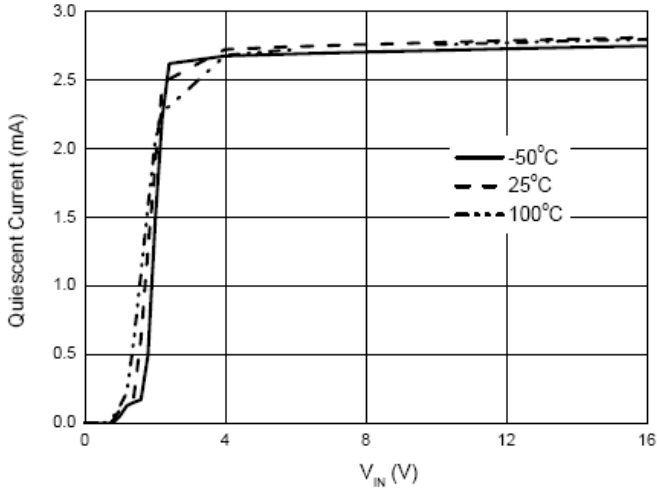


Figure 4. Quiescent Current vs. Input Voltage

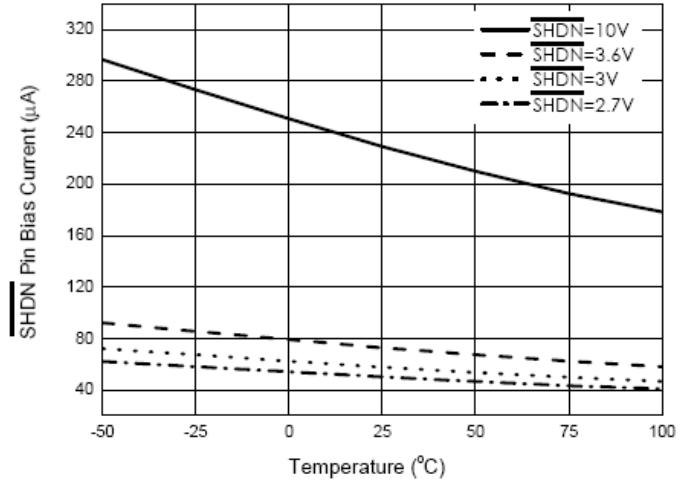


Figure 5. SHDN Pin Bias Current vs. Temperature

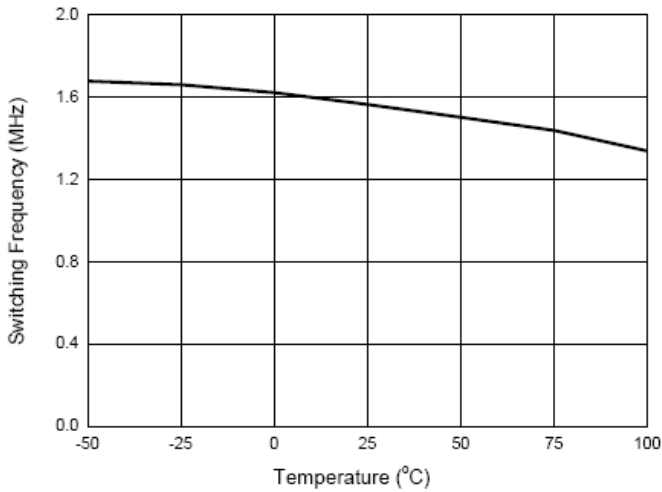


Figure 6. Switching Frequency vs. Temperature

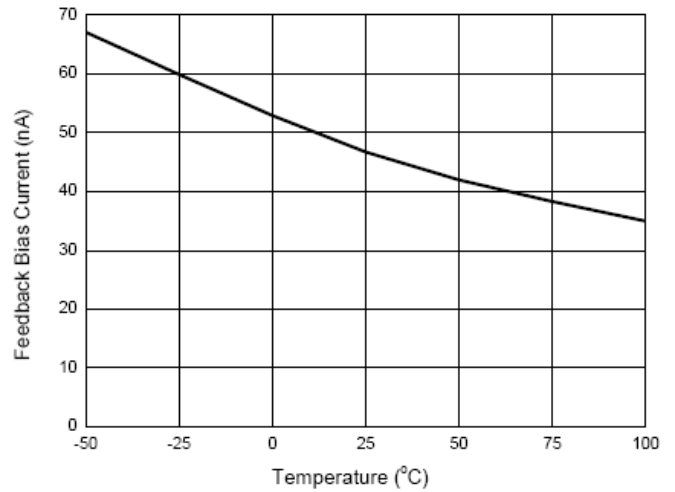


Figure 7. Feedback Bias Current vs. Temperature

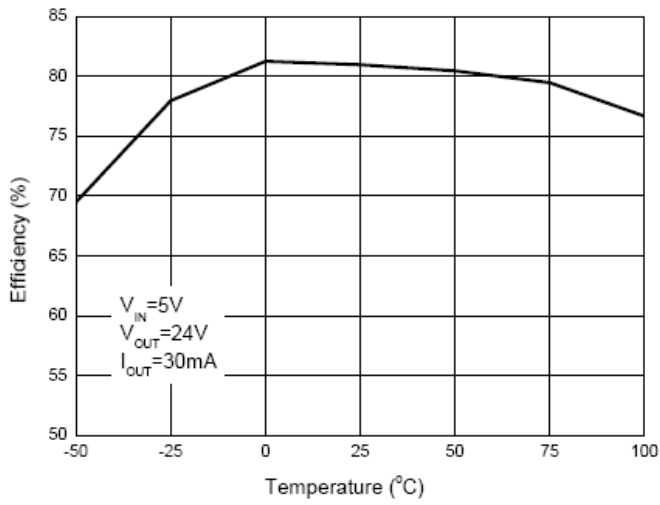


Figure 8. Efficiency vs. Temperature

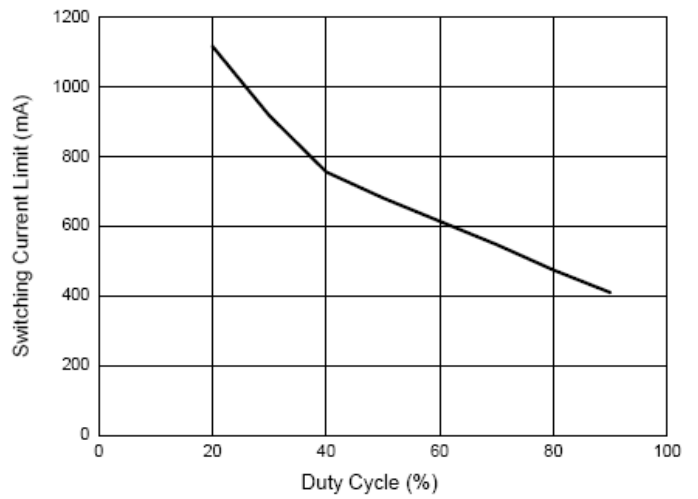


Figure 9. Switching Current Limit vs. Duty Cycle

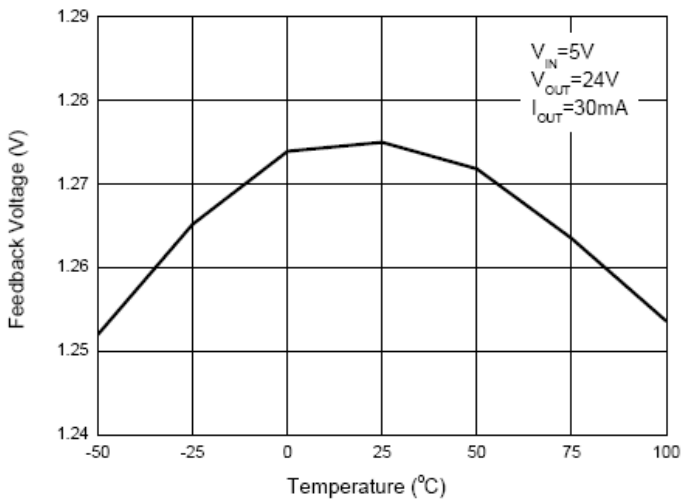


Figure 10. Feedback Voltage vs. Temperature

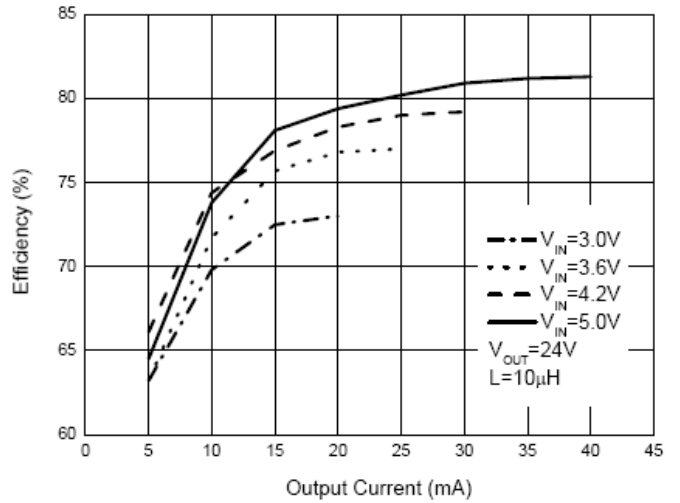
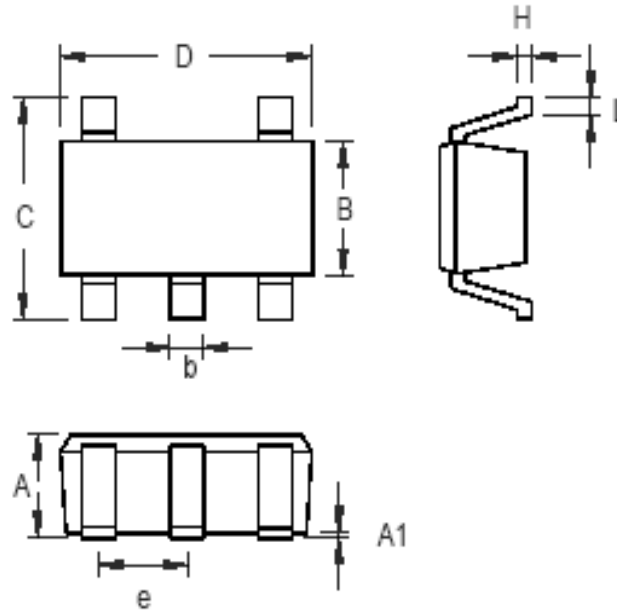


Figure 11. Efficiency vs. Output Current

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