1.2MHz,30V/1A High Performance, Boost Converter

General Description

The ELP3301 is a 1.2MHz PWM boost switching regulator designed for constant-voltage boost applications. The ELP3301 can drive a string of up to 30V. The ELP3301 implements a constant frequency 1.2MHz 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 1250mV, which reduces the power dissipation in the voltage setting resistor. 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.

Features

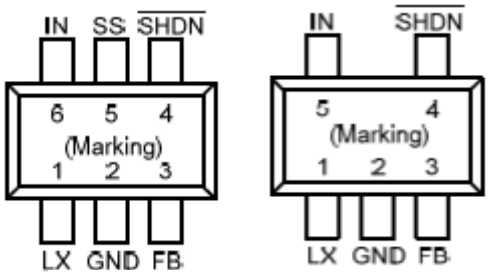
- High Efficiency: 90%
- 1.2MHzFixed-Frequency PWM Operation
- Maximum Output Voltage up to 30V
- Guaranteed 13V/200mA Output with 5V input
- Operating Range : 2.7V to 5.5V
- Shutdown Supply Current:<1uA
- Programmable Soft-star
- Available in SOT23-6/SOT23-5 Package
- Minimize the External Component
- RoHS Compliant and 100% Lead (Pb)-Free

Applications

- Panel Bais Voltage supply
- OLED Backlight driver
- Notebook Computers
- Portable Applications
- MID/PTV

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Pin Assignments



SOT23-6 SOT23-5

Pin Description

SOT-23-5	SOT-23-6	Pin Name	Pin Function
1	1	LX	Switch Pin. Connect this Pin to inductor and catch diode. Minimize the track area to reduce EMI.
2	2	GND	Ground Pin
3	3	FB	Feedback Reference Voltage Pin. Series connect a resistor between Vout and ground as a voltage sense. The feedback voltage is 1250mV.
4	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	SS	Softstar pin. Leave SS open to disable the soft-star function.
5	6	Vin	Supply Input Voltage Pin. Bypass 1uF capacitor to GND to reduce the input noise.

Ordering Information

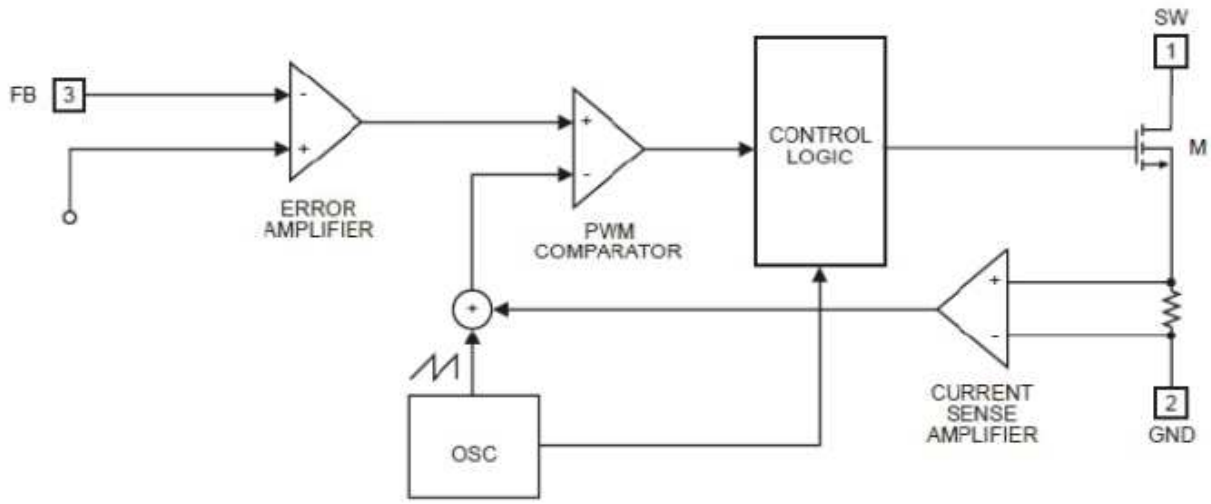
ELP3301 NN XX X

R：Tape & Reel

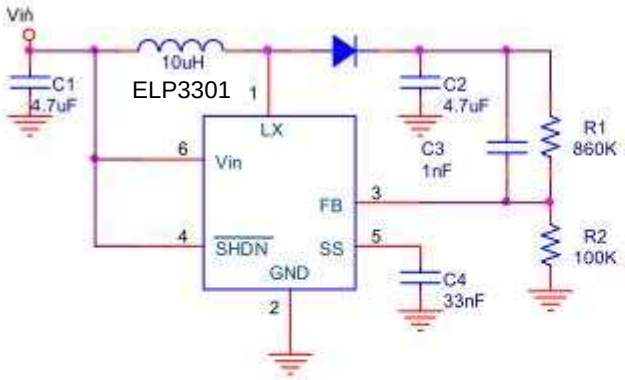
B2：SOT23-5
B3：SOT23-6

Part Number	Package	Marking	Marking Information
ELP3301NNB2R ELP3301NNB3R	SOT23-5 SOT23-6		

Function Block Diagram



Typical Application Circuit



Absolute Maximum Ratings

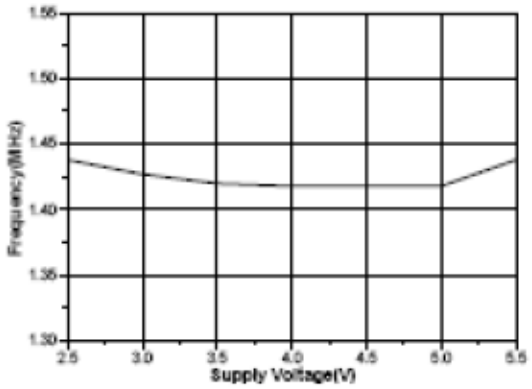
ELP6230A

- Supply Input Voltage----------−0.3V to 6.0V
- LX Input Voltage ----------−0.3V to 30V
- The Other Pins ----------−0.3V to 5.5V
- Power Dissipation, PD @ TA = 25℃ TSOT-23-5/6---- ----------0.455W
- Lead Temperature (Soldering, 10 sec.) ---------- 260℃
- Operation Temperature Range ----------−40℃ to 80℃
- Storage Temperature Range ----------−65℃ to 150℃

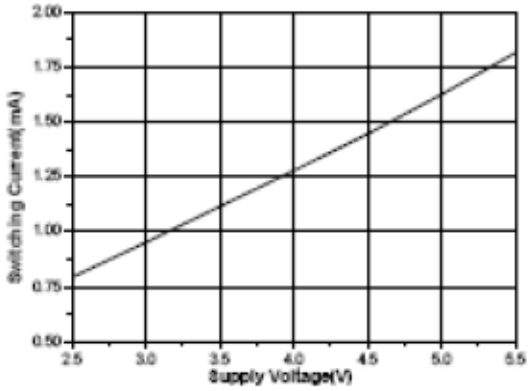
Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Typ.	Max	Units
System Supply Input						
Operation voltage Range	V_{DD}		2.7		5.5	V
Under Voltage Lock Out	V_{DD}		2.2	2.4	2.6	V
Supply Current	I_{DD}	FB=1.2V, Switch		430	550	uA
Shut Down Current	I_{DD}	V_{EN} < 0.4V		0.1	1	uA
Line Regulation		V_{IN} : 3.0~4.3V		2		%
Oscillator						
Operation Frequency	F_{OSC}			1.2		MHz
Maximum Duty Cycle			93			%
Feedback Voltage	ELP3301		1.22	1.25	1.28	V
MOSFET						
On Resistance of MOSFET	$R_{DS(ON)}$			0.4		Ω
SW Current Limit	I_{LM}			1		A
Protection						
Shut Down Voltage	V_{EN}				0.3	V
Enable on Voltage	V_{EN}		1.0			V

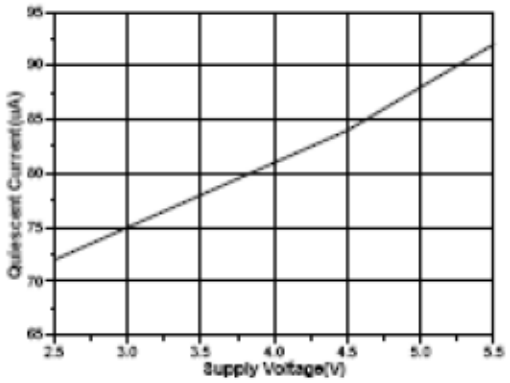
Typical Operation Characteristics



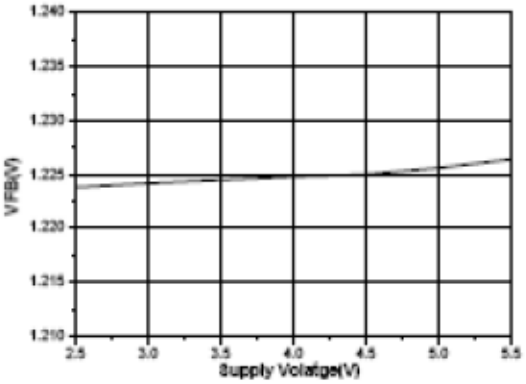
Frequency vs. Supply Voltage



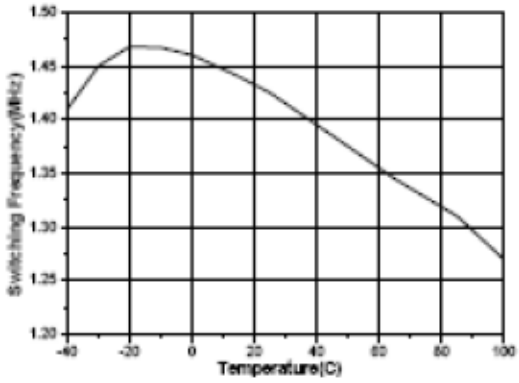
Switching Current vs. Supply voltage



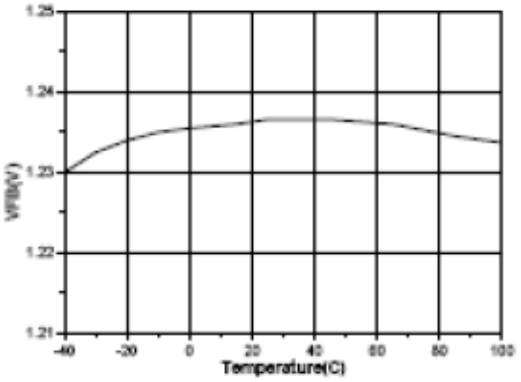
Non-Switching Current vs. Supply Voltage



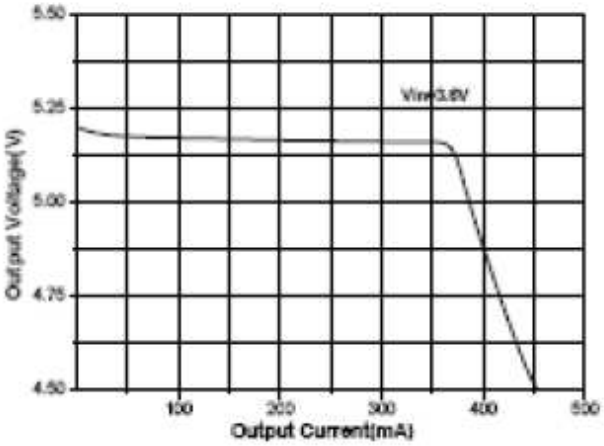
Feedback Voltage vs. Supply Voltage



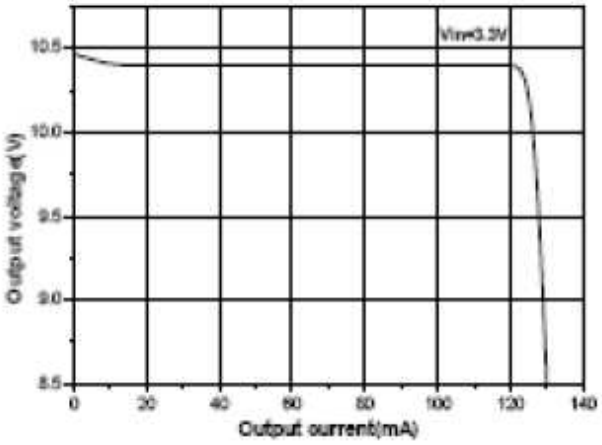
Switching Frequency vs. Temperature



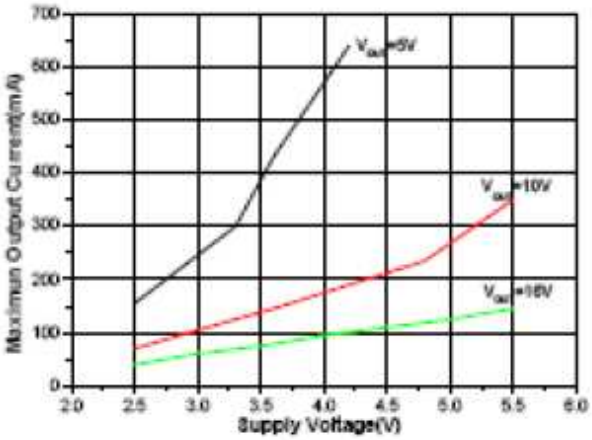
Feedback Voltage vs. Temperature



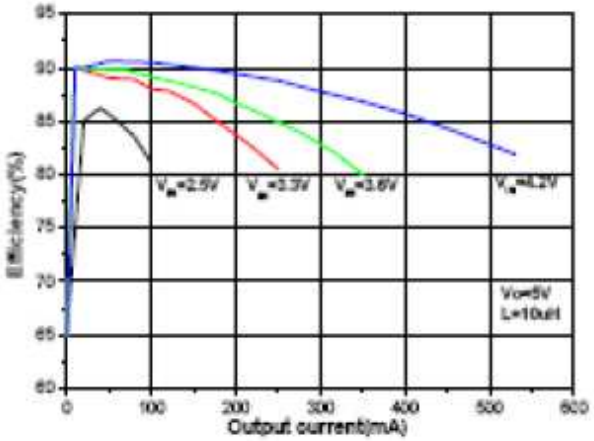
Load Regulation (Vo=5V)



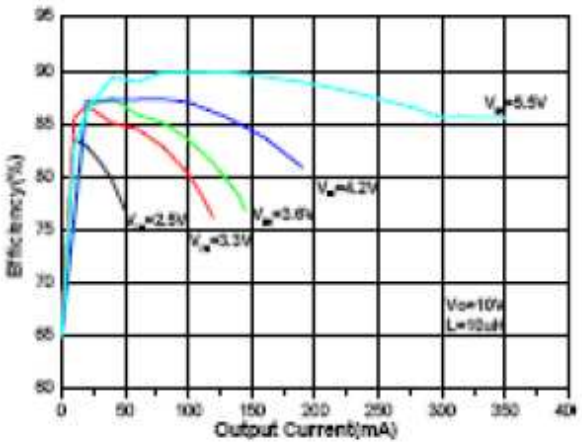
Load Regulation (Vo=10V)



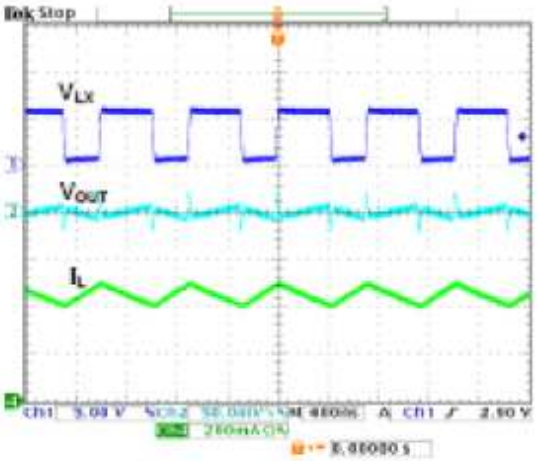
Maximum Output Current vs. Supply Voltage



Efficiency vs. Output Current (Vo=5V)

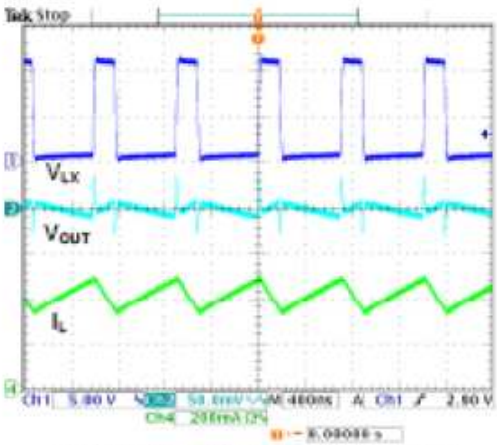


Efficiency vs. Output Current (Vo=10V)



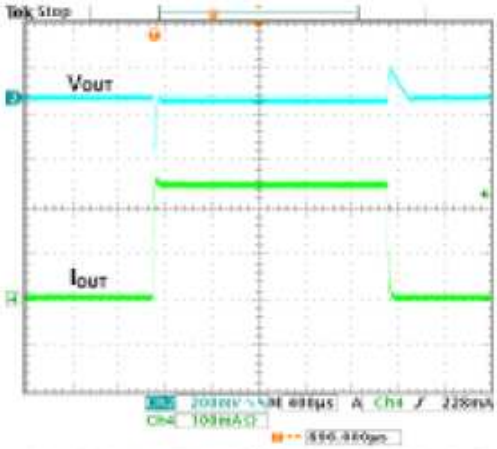
V_{IN}=3.6V, V_o=5V, Io=250mA, L1=10μH

Operation Waveform



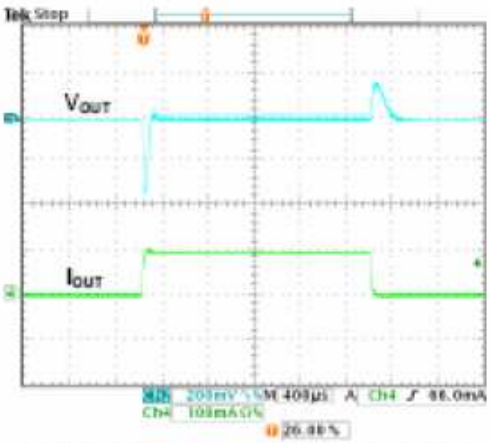
V_{IN}=3.3V, Vo=10V, Io=100mA, L1=10μH

Operation Waveform



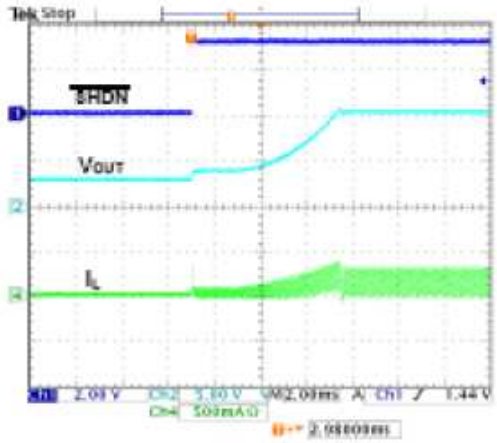
V_{IN}=3.6V, V_o=5V,Io=5 to 250mA, CFF=220pF

Load Step Response



V_{IN}=3.3V, V_o=10V, Io=5 to 250mA, CFF=220pF

Load Step Response



V_{IN}=3.3V, V_{OUT}=10V, Io=50mA, CSS=33nF

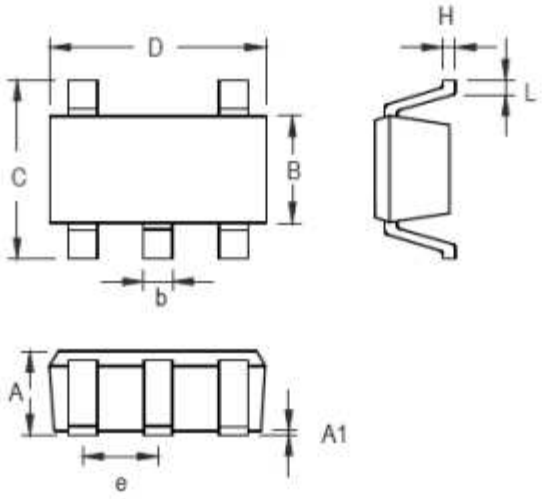
Start-Up from Shutdown

Applications Information

Inductor Selection

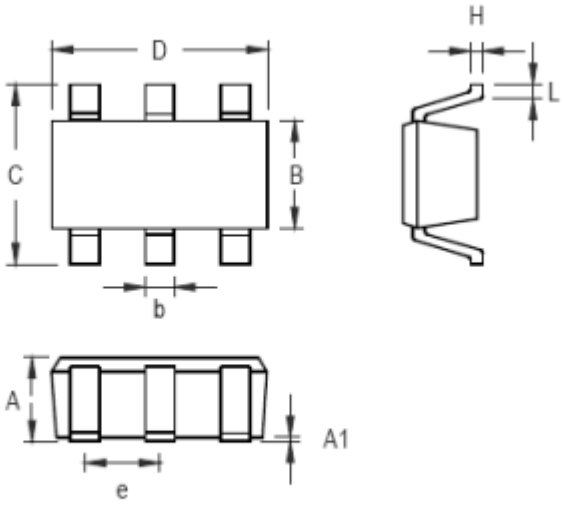
The recommended value of inductor for 30V applications are 4.7 to 22μH. Small size and better efficiency are the major concerns for portable device, such as LP3301 used for mobile phone. The inductor should have low core loss at 1.2MHz and low DCR for better efficiency. To avoid inductor saturation current rating should be considered.

Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.035	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.356	0.559	0.014	0.022
C	2.591	2.997	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

SOT-23-5 Surface Mount Package



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.031	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.250	0.560	0.010	0.022
C	2.591	2.997	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

SOT-23-6 Surface Mount Package