

## Async Boost with 600KHz switching

### FEATURES

- PFM control Asynchronous Booster
- Up to 86% Efficiency
- Quiescent Supply Current: 4.5 $\mu$ A
- Zero Shutdown current
- Output Voltage Accuracy:  $\pm$ 1%
- Fixed Output Voltage
- Provides 20mA from single AAA cell
- Input Voltage Range: 0.8V to 5.5V
- Startup Voltage : 0.9V
- 6L SOT-26 Package

### APPLICATIONS

- Cellular and cordless phones
- Wireless LAN cards
- Palmtop computers
- Personal communication equipment
- Pen drives
- Bluetooth devices
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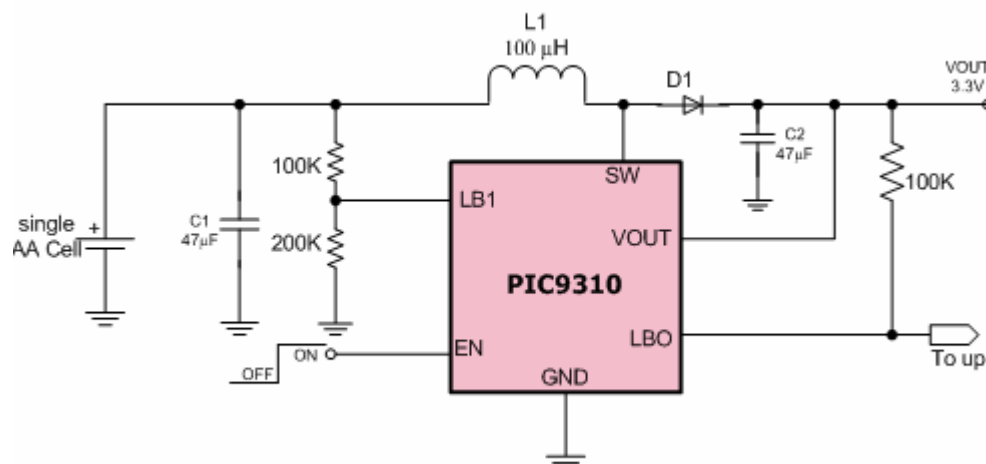
### DESCRIPTION

The PIC9310 compact, high-efficiency, step-up DC-DC converters are available in tiny, 6-pin thin SOT26 packages. They feature an extremely low 5 $\mu$ A quiescent supply current to ensure the highest possible light-load efficiency. Optimized for operation from one to two alkaline or nickel-metal-hydride (NiMH) cells, or a single Li+ cell, these devices are ideal for applications where extremely low quiescent current and ultra-small size are critical.

The PIC9310 also feature proprietary noise-reduction circuitry, which suppresses electromagnetic interference (EMI) caused by the inductor in many step-up applications. The family offers different combinations of fixed outputs, shutdown, and EMI reduction (see Selector Guide).

Its unique design is optimized for high efficiency at light load condition.

### TYPICAL APPLICATION CIRCUIT



## ELECTRICAL CHARACTERISTICS

(Typical values are at  $T_A = +25^\circ\text{C}$ .  $V_{\text{BATT}} = 1.2\text{V}$ ,  $V_{\text{OUT}} = 3.3\text{V}$ ,  $V_{\text{OUT}} = V_{\text{OUT(NOM)}}$ , SHDN = OUT,  $R_L = \infty$ , unless otherwise noted.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Input Voltage	$V_{\text{IN}}$	( Note 1 )			5.5	V
Output Voltage variation	$V_{\text{OUT}}$		3.224	3.307	3.389	V
Minimum Startup Input Voltage		$I_{\text{OUT}}=1\text{mA}$ , $V_{\text{IN}}:0 \rightarrow 2\text{V}$		0.86	0.92	V
Hold on Voltage		$I_{\text{OUT}}=1\text{mA}$ , $V_{\text{IN}}:0 \rightarrow 2\text{V}$			0.7	V
No Load Input Current		$I_{\text{OUT}} = 0\text{mA}$		10		$\mu\text{A}$
N-Channel On-Resistance	$R_{\text{DS(ON)}}$	Measured from SW pin voltage and inductor current during SW on time		1.4		$\Omega$
Maximum oscillating freq	$F_{\text{OSC}}$	$V_{\text{OUT}}$ forced = $V_{\text{OUT (NOM)}} * 0.95$	75	107	140	KHz
Duty ratio	$D_{\text{MAX}}$	$V_{\text{OUT}}$ forced = $V_{\text{OUT (NOM)}} * 0.95$	70	77	85	%
Efficiency	Eff			86		%
Quiescent Current into OUT (no switching)		$V_{\text{IN}} = V_{\text{OUT}} + 0.5\text{V}$ ( $V_{\text{OUT}}$ pin) (Notes 2, 3)		4.5		$\mu\text{A}$
Quiescent Current into OUT		$V_{\text{OUT}}$ forced = $V_{\text{OUT (NOM)}} * 0.95$		13		$\mu\text{A}$
Switch leakage		$V_{\text{SW}}=5.5\text{V}$ , $V_{\text{IN}} = V_{\text{OUT}} + 0.5\text{V}$		1		nA
SHDN Voltage Threshold	$V_{\text{IL}}$		1.2			mV
	$V_{\text{IH}}$				0.4	
SHDN Input Bias current		$V_{\text{SHDN}} = 5.5\text{V}$		1.1		nA
LBI voltage threshold		$V_{\text{OUT}}$ forced = $V_{\text{OUT (NOM)}} * 1.05$	645	670	700	mV
LBI input hysteresis		$V_{\text{OUT}}$ forced = $V_{\text{OUT (NOM)}} * 1.05$		18		mV
LBI input current		$V_{\text{OUT}}$ forced = $V_{\text{OUT (NOM)}} * 1.05$		0.02		nA
LBO output low voltage		Force 20mA into LBO		0.5	0.6	v

**Note 1:** Guaranteed with the addition of a Schottky MBR0520L external diode between LX and OUT when using the PIC9310 with only one cell, and assumes a 0.3V voltage drop across the Schottky diode.

**Note 2:** Supply current is measured with an ammeter between the output and OUT pin. This current correlates Directly with actual battery supply current, but is reduced in value according to the step-up ratio and efficiency.

**Note 3:**  $V_{\text{OUT}}$  forced to the following conditions to inhibit switching:  $V_{\text{OUT}} = 1.05 * V_{\text{OUT(NOM)}}$ ,  $V_{\text{OUT}} = 3.307\text{V}$ .