100mA Synchronous Boost Converter

FEATURES

- Up to 92% efficiency
- Low start-up voltage 0.9V
- Internal synchronous rectifier
- Up to 2MHz switching allows for tiny external components
- 0.5V to 4.4V input range
- 2.5V to 5.5V output range (Note 2)
- Fully discharged shutdown output voltage
- Logic controlled shutdown (<1μA)
- Low 250μA operating supply current (measured at V_{OUT})
- Pulse skipping at light load for extended battery life
- Generates 3.3V at 100mA from single AA cell
- Stable with ceramic output capacitor
- Low profile 6-Leads SOT-26 package
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APPLICATIONS

- MP3/MP4 players
- PDAs and organizers
- Digital cameras
- Wireless mice/ keyboards
- Portable medical equipment
- Cordless phones
- Wireless Headsets

DESCRIPTION

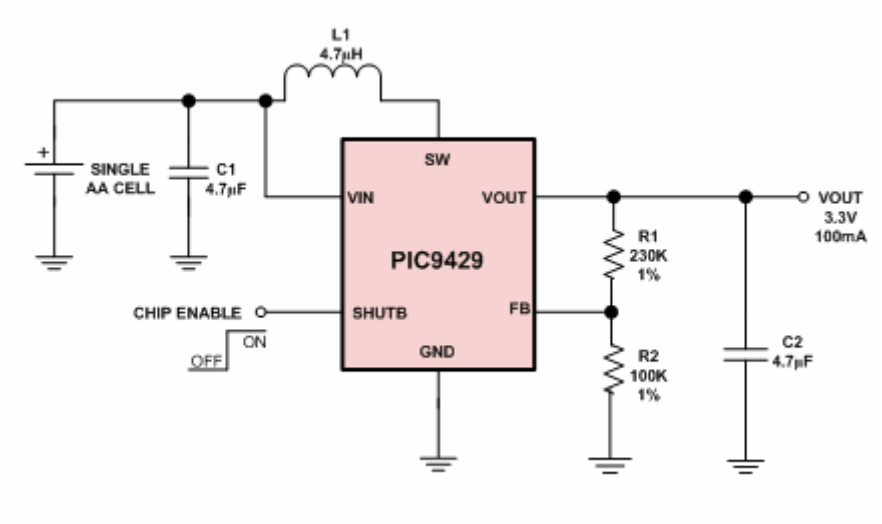
The PIC9429 is a synchronous, step-up DC/DC converter delivering high efficiency in a SOT-26 package. The device has an internal NMOS switch and PMOS synchronous rectifier and has the capacity of supplying 3.3V at 100mA from a single AA cell input.

High frequency switching (up to 2MHz) minimizes the board area by allowing the use of tiny, low profile inductors and ceramic capacitors.

The PIC9429 provides automatic pulse skipping at light loads, thus reducing the supply current for extended battery life. At shutdown, the PIC9429 fully discharges the output to ground and draws no supply current.

The PIC9429 is available in small 6L-SOT-26 package with both fixed and adjustable output voltage versions.

TYPICAL APPLICATION CIRCUIT



ELECTRICAL CHARACTERISTICS

(All specifications are at T_A = 25°C, V_{IN} = 1.5V, V_{OUT} = 3.3V, V_{SHUTB} = 1.5V, unless otherwise specified.)

Parameter	Conditions	Min	Typ	Max	Unit
Minimum Start-Up Voltage	I_{LOAD} = 1mA, V_{OUT} = 0V		0.91	1.07	V
Minimum Operating Voltage	SHUTB = V_{IN}, Note 1		0.5	0.65	V
Output Voltage Adjust Range	Note 2	2.5		5.5	V
Feedback Voltage	T_A = -40°C to 85°C (Note 3)	0.97	1.0	1.03	V
Feedback Input Current	V_{FB} = 1.2V		1	50	nA
Quiescent Current (No-Switching, Active)	V_{FB} = 1.2V, measured at V_{OUT}		250	420	µA
Quiescent Current (Shut-down)	V_{SHUTB} = GND, V_{OUT} = 0V, Not including switch leakage		0.01	1	µA
NMOS Switch Leakage	V_{SW} = 5V		0.13	2	µA
PMOS Switch Leakage	V_{SW} = 5V, VOUT = 0V		0.29	5	µA
NMOS Switch On Resistance	V_{OUT} = 3.3V		0.45		Ω
PMOS Switch On Resistance	V_{OUT} = 3.3V		0.6		Ω
NMOS Current Limit		430	615		mA
Current Limit Delay to Output			100		nS
Max Duty Cycle	V_{FB}=0.95V	75	85		%
SHUTB Input High		0.95			V
SHUTB Input Low				0.35	V
SHUTB Input Current	V_{SHUTB} = 5.5V		1	50	nA
Frequency at Start-Up			960		KHz

Note 1: Minimum operating input voltage is fixed by the battery's ability to provide necessary power at that (terminal) voltage. Below this voltage, the battery fails to deliver required power as it enters into deeply discharged state. This voltage can be lower if the required duty cycle is less.

Note 2: For applications where V_{OUT} > 4.3V, an external Schottky diode is recommended.

Note 3: Limits are 100% production tested at T_A=25°C. Specifications over the -40°C to +85°C operating temperature range are assured by design.