High Efficiency, 1-Cell and 2-Cell Boost Converter

FEATURES

- Up to 92% Efficiency.
- Low Start-Up Voltage: 0.8V
- Internal Synchronous Rectifier
- 2.5V to 5V Output Range (Note 3)
- Fully Discharged Shutdown Output Voltage
- Logic Controlled Shutdown (<1μA)
- Pulse Skipping at Light Load for Extended Battery Life
- Generates 3.3V at 20mA from Single AA Cell
- Stable with Ceramic Output Capacitor
- 6L SOT-26 Package
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APPLICATIONS

- MP3 / MP4 players
- PDAs and Organizers
- Digital Cameras
- Wireless Mice / Keyboards
- Portable Medical Equipments
- GPS Receivers
- Remote controls
- Wireless Headsets

DESCRIPTION

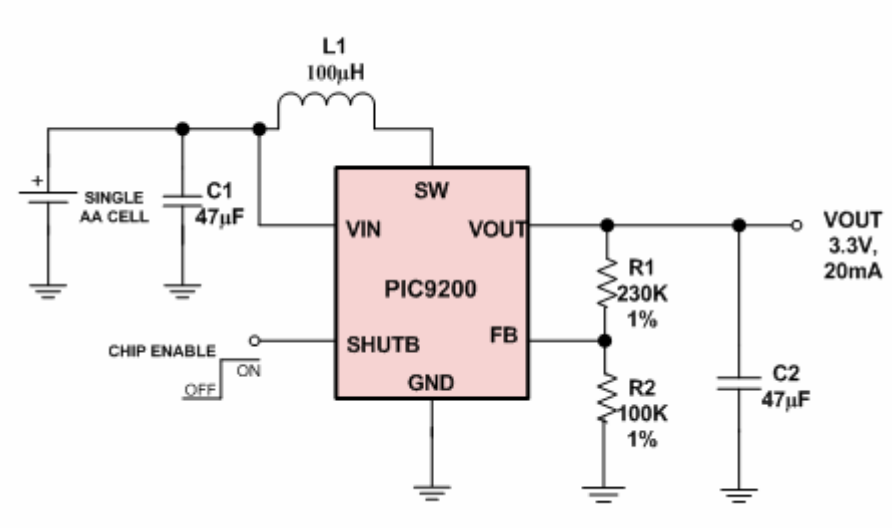
The PIC9200 is a synchronous, step-up DC/DC converter delivering high efficiency in a 6-leads SOT-26 package. The device having an internal NMOS switch and PMOS synchronous rectifier has the capacity of supplying 3.3V at 20mA from a single AA cell input.

A high frequency switching minimizes board area by allowing the use of tiny, low profile inductors and ceramic capacitors.

The PIC9200 provides automatic pulse skipping at light loads reducing supply current for extended battery life. At shutdown the PIC9200 fully discharges the output to ground and takes very low supply current.

The PIC9200 is available in small SOT26 package with both fixed and adjustable output voltage versions.

TYPICAL APPLICATION CIRCUIT



ELECTRICAL CHARACTERSTICS

T_A = 25°C. V_{IN} = 1.5V, V_{OUT} = 3.3V, V_{SHUTB} = 1.5V (unless otherwise noted).

Parameter	Conditions	Min	Typ	Max	Unit
Min start-up Voltage	No load		0.8	0.95	V
Min Operating Voltage	Note 1		0.5		V
Maximum Input Operating Voltage	Note 2		4.4		V
Output Voltage Adjust Range	Note 3	2.5		5.0	V
Feedback Voltage	T_A = -40°C to 85°C (Note 4)	0.95	1.0	1.03	
Feedback Input Current	V_{FB} = 1.2V		1		nA
Load Regulation	I_{LOAD} = 1mA to 20mA		2.2		%
Quiescent Current (No-switching)	V_{FB} = 1.2V, Measured at V_{OUT}		35	60	μA
Quiescent Current (Shut-down)	V_{SHUTB} = 0V, V_{OUT} = 0V, Including Switch Leakage		0.01	1	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		300			mA
PMOS Turn-Off Current			10		mA
Current Limit Delay to Output			343		nS
Minimum Off-Time			2.26		μS
Maximum On-Time	V_{IN} = 0.5V	12	20	28	μS
Maximum On-Time to Minimum Off-Time Ratio	V_{FB} = 0.95V, V_{IN} = 0.5V, T_A = -40°C to 85°C (Note 4)		7.5		
SHUTB Input High		0.95			V
SHUTB Input Low				0.35	V
SHUTB Input Current				10	μA
Frequency in Start-up			200		kHz
Thermal Shutdown	15°C Hysteresis		125		°C

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: When input voltage is greater than output voltage regulation point, the part is in track mode (see Track Mode).
Note 3: For applications where V_{OUT} > 4.3V, an external Schottky diode is required.
Note 4: Limits are 100% production tested at T_A = 25°C. Recommended operating temperature is -40°C to 85°C. Limits over the operating temperature range are not guaranteed by design.