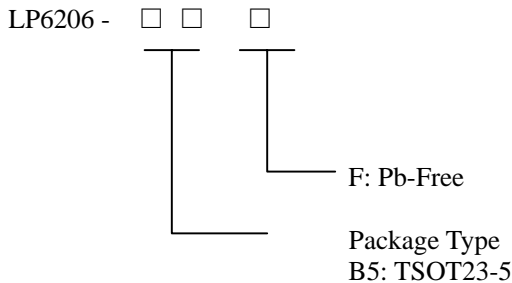


Synchronous Boost DC/DC Regulator

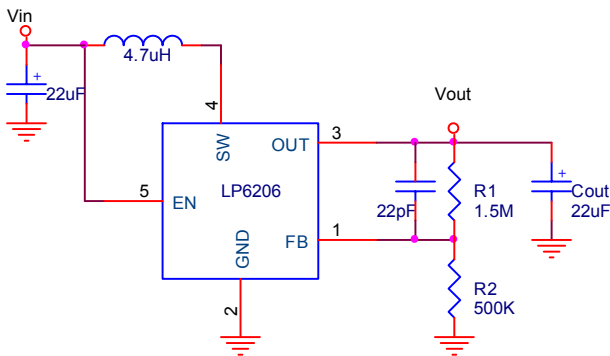
General Description

The LP6206 is high efficiency synchronous, fixed frequency, current-mode step-up converter with output to input disconnect. A PWM step-up DC/DC converters optimized to provide a high efficiency solution to medium power system. When LP6206 is disabled, the internal conduction path from the battery. This output disconnect feature reduces the shutdown current to typically only 50nA. the devices regulates the output voltage up to 6V from either a 2cell NiMH/NiCd or a single-cell Li-ion Battery with a 500KHz fixed frequency switching. These features minimize overall solution footprint by allowing the use of tiny, low profile inductors and ceramic capacitors.

Ordering Information



Typical Application Circuit



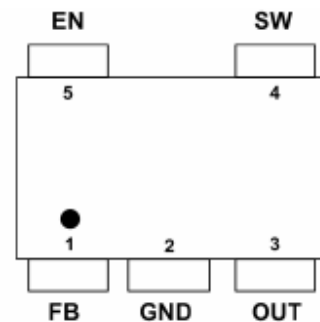
Features

- ◆ Up to 94% efficiency
- ◆ Output to Input Disconnect at Shutdown Mode
- ◆ Shut-down current:<1uA
- ◆ Output voltage Up to 5V
- ◆ Internal Synchronous Rectifier
- ◆ Internal Soft-start
- ◆ Internal Compensation
- ◆ 500KHz fixed frequency switching
- ◆ High switch on current:1.6A
- ◆ 50nA Shutdown Current
- ◆ Available in SCT23-5 Package

Applications

- ◇ Battery products
- ◇ Host Products

Pin Configurations



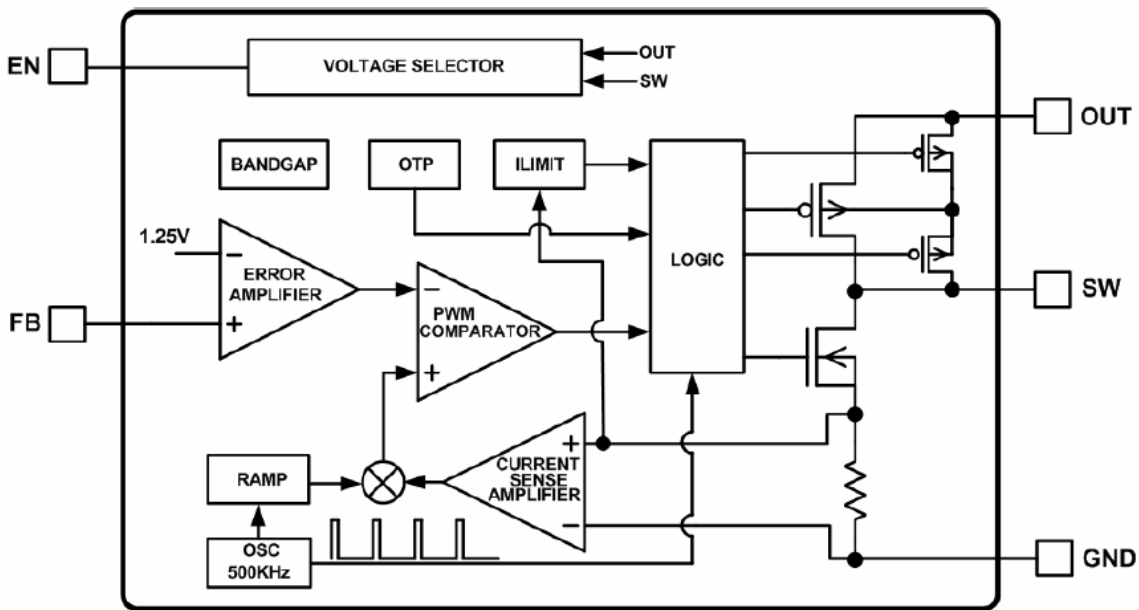
Marking Information

Please see website.

Functional Pin Description

PIN	PIN Name	Description
1	FB	Regulation Feedback Input. Connect to an external resistive voltage divider from the output to FB to set the output voltage.
2	GND	Ground.
3	OUT	Supply Input for the LP6206. Connect to the output of the converter.
4	SW	Output switching node. SW is the drain of the internal low-side N-Channel MOSFET and high-side P-Channel MOSFET. Connect the inductor to SW to Complete the step-up converter.
5	EN	Regulator On/off Control Input. A logic high input(VEN>1.4V) turns on the regulator. A logic low input(VEN<0.4V) puts the LP6206 into low current shutdown mode.

Function Block Diagram



Absolute Maximum Ratings

Supply Input Voltage	-----6V
Power Dissipation, PD @ TA = 25° C	
SOT23-5	-----600mW
Package Thermal Resistance	
SOT23-5, θ_{JA}	-----250°C/W
Lead Temperature (Soldering, 10 sec.)	-----260°C
Storage Temperature Range	----- -65°C to 150°C
Recommended Operating Conditions	
Supply Input Voltage	-----2.2V to 6V
EN Input Voltage	-----0V to 5.5V
Operation Junction Temperature Range	----- -40°C to 125°C
Operation Ambient Temperature Range	----- -40°C to 85°C

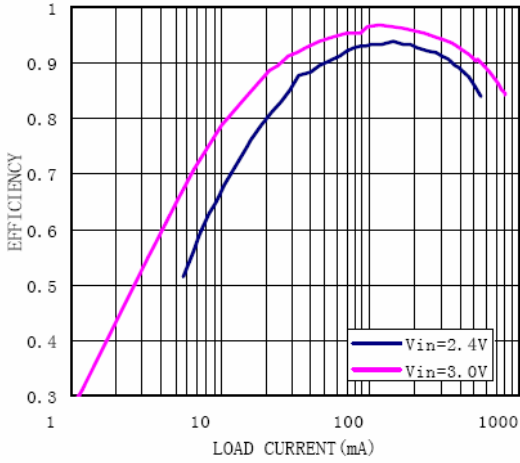
Electrical Characteristics

(Vin=2.4V, Vout=3.5V, Cin=10uF, Cout=10uF, L1=4.7uH, R1=178K, R2=100K, Ta=-40 °C to 85 °C , unless otherwise noted. Typical values are at TA=25°C.)

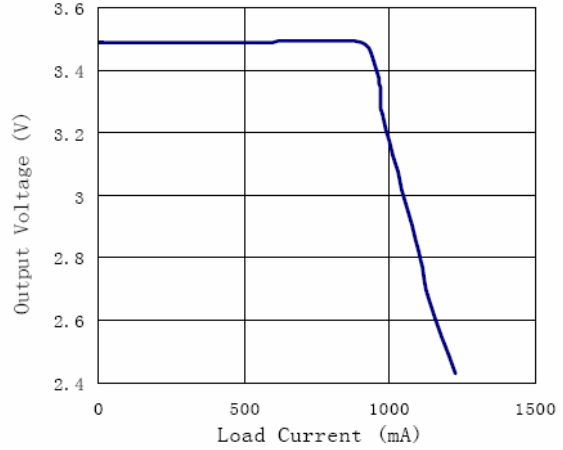
Parameter	Conditions	LP6206			Units
		Min	Typ	Max	
Supply Voltage		2.2		5	V
Output Voltage Range		2.5		6	V
Supply Current(Shutdown)	VEN=VOUT=0V, VSW=5V		0.05	1	uA
Supply Current	VFB=1.3V		0.39		mA
Feedback Voltage		1.2	1.25	1.3	V
Feedback Input Current	VFB=1.2V		50		nA
Switching Frequency		310	500	690	KHz
Maximum Duty Cycle		80	85	90	%
EN Input Low Voltage				0.4	V
EN Input High Voltage		1.4			V
EN Pull Down Resistance			1		MΩ
Low-side On Resistance	Vout=3.3V		450		mΩ
Low-side Current Limit		1.4	1.6	2	A
High-side On Resistance	Vout=3.3V		650		mΩ

Typical Operating Characteristics

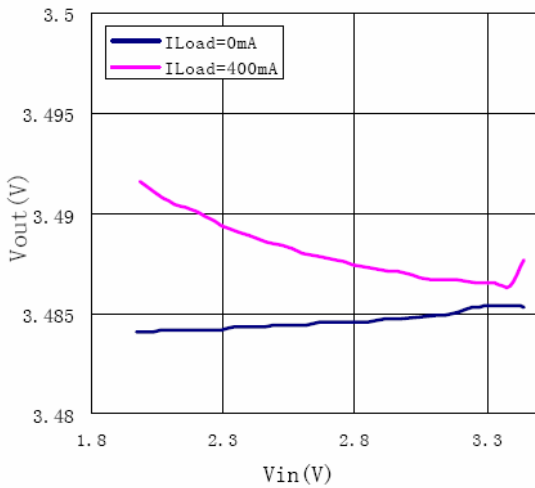
Efficiency vs Load Current



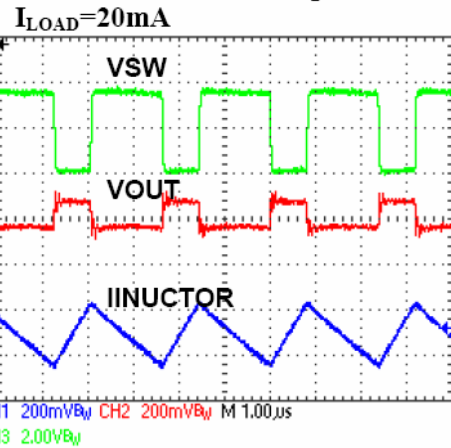
Load Regulation



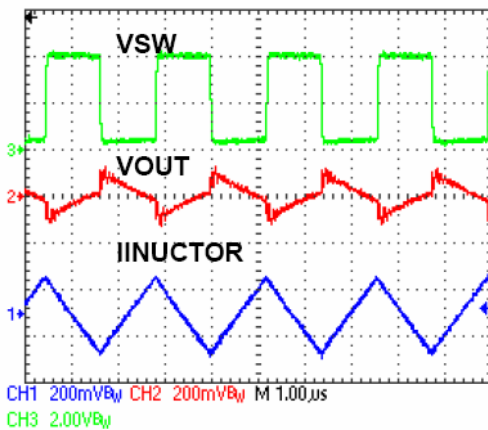
Line Regulation



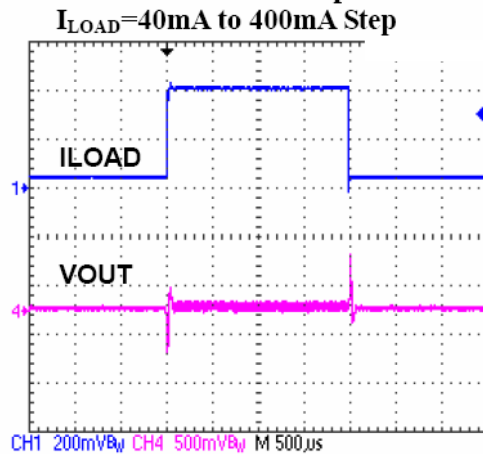
Continuous Mode Operation



Continuous Mode Operation

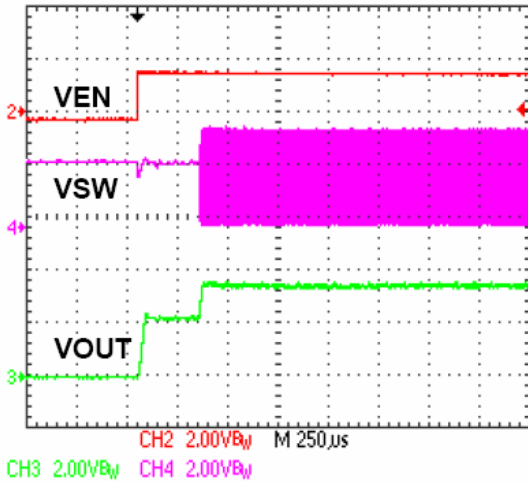


Transient Response

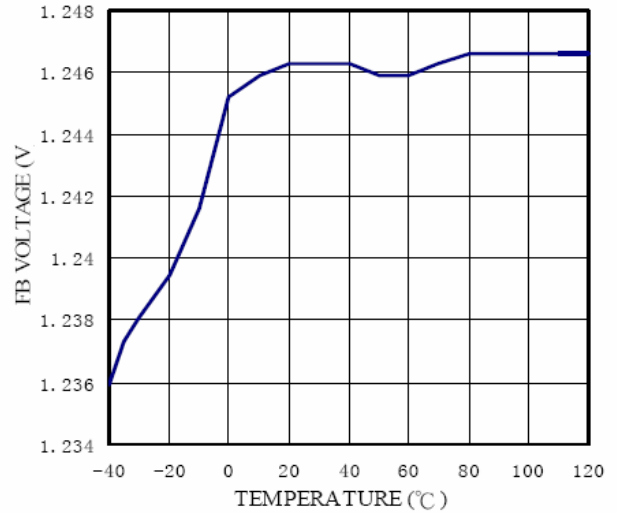


Startup

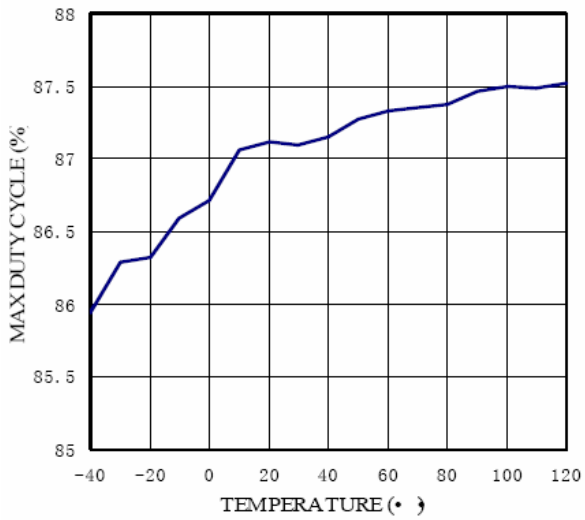
$R_{LOAD}=16\Omega$



Feedback Voltage vs Temperature



Maximum Duty Cycle vs Temperature



Operation Information

The LP6206 uses a 500KHz fixed-frequency, current-mode regulation architecture to regulate the output voltage. The LP6206 measures the output voltage through an external resistive voltage divider and compares that to the internal 1.25V reference to generate the error voltage to the inductor current to regulate the output voltage. The use of current-mode regulation improves transient response and control loop stability.

When the LP6206 is disabled (EN=Low), both power switches are off. There is no current path from SW to OUT. Therefore, the output voltage discharges to ground. When the LP6206 is enabled (EN=High), a limited start-current charges the output voltage rising to SW, then the part operates in force PWM mode for regulating the output voltage to the target value. At the beginning of each cycle, the N-channel MOSFET switch is turned on, forcing the inductor current to rise. The current at the source of the switch is internally measured and converted to a voltage by the current sense amplifier. That voltage is compared to the error voltage. When the inductor current rises sufficiently, the PWM comparator turns off the switch, forcing the inductor current to the output capacitor through the internal P-Channel MOSFET rectifier, which forces the inductor current to decrease. The peak inductor current is controlled by the error voltage. Thus the output voltage controls the inductor current to satisfy the load.

Soft-Start

The LP6206 includes a soft-start timer that limits the voltage at the error amplifier output during startup to prevent excessive current at the input. This prevents premature termination of the source voltage at start-up due to inrush current. This also limits the inductor current at startup, forcing the input current to rise slowly to the amount required to regulate the output voltage during soft-start.

Application Information

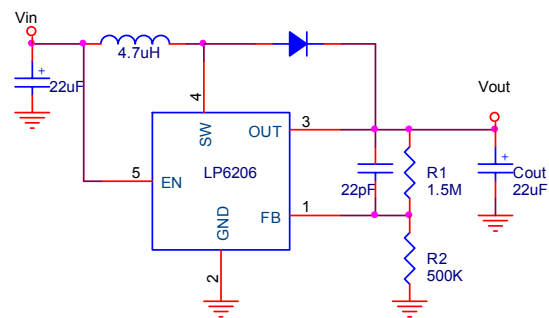
Component selection

Setting the Output Voltage

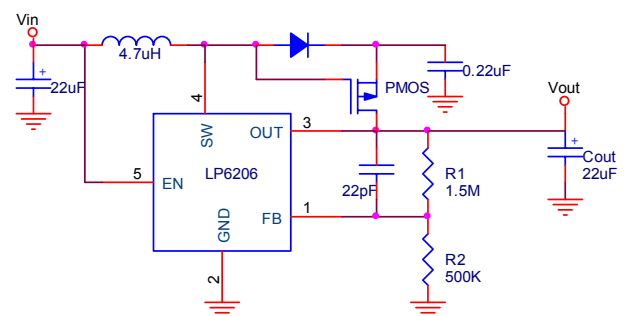
Set the output voltage by selecting the resistive voltage divider ratio. The voltage divider drops the output voltage to the 1.25V feedback voltage. Use a 100K resistor for R2 of the voltage divider. Determine the high-side resistor R1 by the equation:

$$V_{out} = (R1/R2 + 1) \times V_{FB}$$

5V Typical Application with External Diode(A)

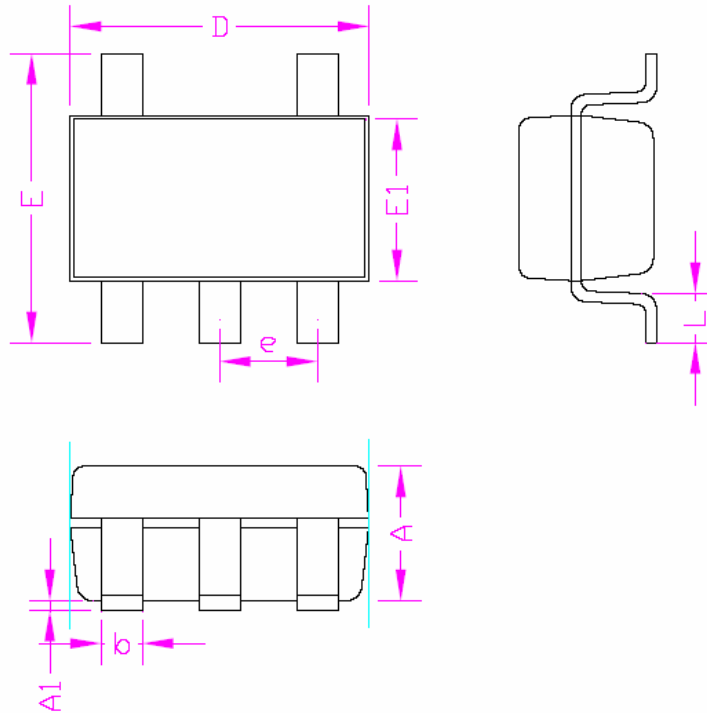


5V Typical Application with External Diode(B)



Packaging Information

TSOT23-5



SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.00	-	0.039
A1	0.00	0.15	0.000	0.006
D	2.90		0.114	
E1	1.60		0.063	
E	2.60	3.00	0.102	0.118
L	0.30	0.60	0.012	0.024
b	0.30	0.50	0.012	0.020
e	0.95		0.037	