

---

## Low Noise, Regulated Charge Pump DC/DC Converter

### Features

- Fixed 5V Outputs
- VIN Range: 2.7V to 5V(G320-5)
- Output Current: Up to 250mA(G320-5)
- Constant Frequency Operation at All Loads
- Low Noise Constant Frequency (1.2MHz) Operation
- Shutdown Disconnects Load from Input
- Shutdown Current <1 $\mu$ A
- Short-Circuit/Thermal Protection
- Available in Low Profile 6-Lead SOT23 Package

### Application

- Li-Ion to 5V
- USB On-The-Go Devices
- White LED Drivers
- Handheld Devices

### Description

The G320 is a low noise, constant frequency (1.2MHz) switched capacitor voltage doublers. Light load operation is initiated if the output load current fall below 45mA. The G320 can produce 5V from a minimum of 2.7V (Li-Ion battery) input.

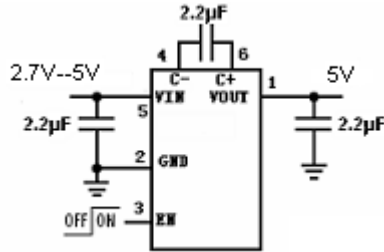
G320 feature constant frequency operation at any load. Built-in soft-start circuitry prevents excessive inrush current during start-up. Thermal shutdown and current-limit circuitry allow the parts to survive a continuous short-circuit from  $V_{OUT}$  to GND.

High switching frequency minimizes overall solution footprint by allowing the use of tiny ceramic capacitors. In shutdown, the load is disconnected from the input and the quiescent current is reduced to <1 $\mu$ A.

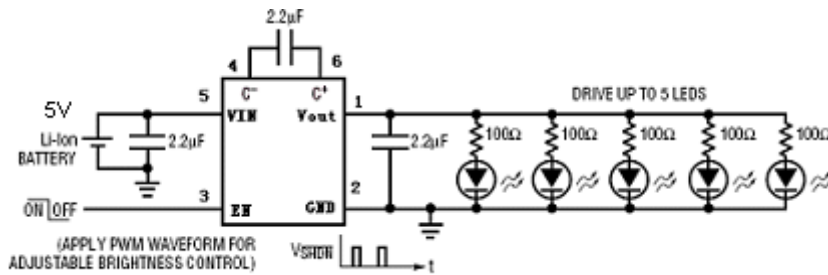
The G320 is available in the 6-pin SOT23-6.

Typical Application

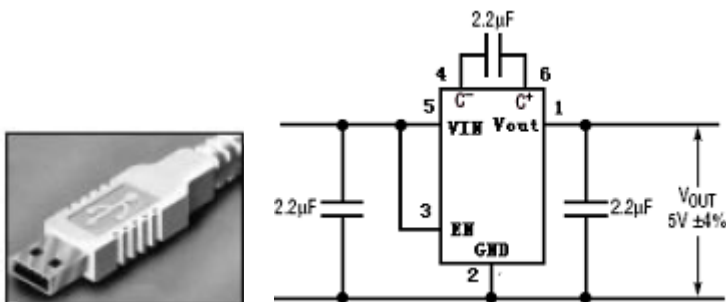
Regulated 5V Output



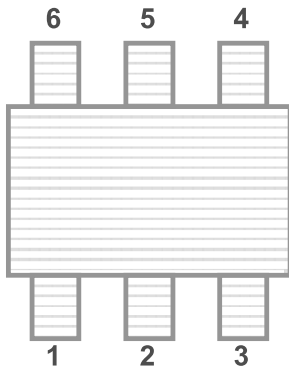
Lithium-Ion Battery to 5V White or Blue LED Driver



USB Port to Regulated 5V Power Supply



Pin Assignment



PIN NUMBER SOT-23-6	PIN NAME
1	V <sub>OUT</sub>
2	GND
3	EN
4	C-
5	V <sub>IN</sub>
6	C+

Absolute Maximum Ratings

- V<sub>IN</sub> .....- 0.3 V ~ + 6 V
- V<sub>OUT</sub>.....- 0.3 V ~+ 5.5 V
- V<sub>OUT</sub> Short-circuit Duration.....indefinite
- V<sub>EN</sub>.....- 0.3 V ~ + 6 V
- Operating Temperature Range .....- 30°C ~ + 85°C
- Lead Temperature (Soldering 10 sec.) .....+ 300°C
- Storage Temperature Range .....- 65°C ~ + 125°C

## Electrical Characteristics

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at  $T_A = 25\text{ }^{\circ}\text{C}$ .  $V_{IN} = 3.6\text{V}$ ,  $EN = V_{IN}$ ,  $C_{IN} = C_{OUT} = 2.2\mu\text{F}$  or  $1\mu\text{F}$  unless otherwise noted.

PARAMETER	Conditions		MIN	TYP	MAX	UNITS
Input Voltage Range( $V_{IN}$ )	G320-5	●	2.7		5.5	V
Output Voltage Range( $V_{OUT}$ )	$2.7\text{V} < V_{IN} < 5.5\text{V}$ , $I_{OUT} < 65\text{mA}$	●	4.7	5	5.2	V
$I_{SHDN}$ Shutdown Current	$EN = 0\text{V}$ , $V_{OUT} = 0\text{V}$	●	0.3	0.5	0.9	$\mu\text{A}$
No load input current	$I_{OUT} = 0\text{mA}$ , $V_{IN} = 2.7\text{V}$	●		0.25		mA
Output current limit		●		250		mA
Output Ripple (VR)	$I_{OUT} = 100\text{mA}$			20		mVP-P
Efficiency	$V_{IN} = 2.7\text{V}$ , $I_{OUT} = 80\text{mA}$			83		%
Open-Loop Output Resistance $R_{OL}$ $= (2V_{IN} - V_{OUT}) / I_{OUT}$	$V_{IN} = 2.7\text{V}$ , $V_{OUT} = 4.5\text{V}$	●		6		$\Omega$
Switching Frequency ( $f_{osc}$ )		●	0.6	1.2	1.8	MHz

## Application Information

$V_{OUT}$  (Pin 1): Regulated Output Voltage.  $V_{OUT}$  should be bypassed with a low ESR ceramic capacitor providing at least  $2\mu\text{F}$  of capacitance as close to the pin as possible for best performance.

GND (Pin 2): Ground. These pins should be tied to a ground plane for best performance. The exposed pad must be soldered to PCB ground to provide electrical contact and optimum thermal performance.

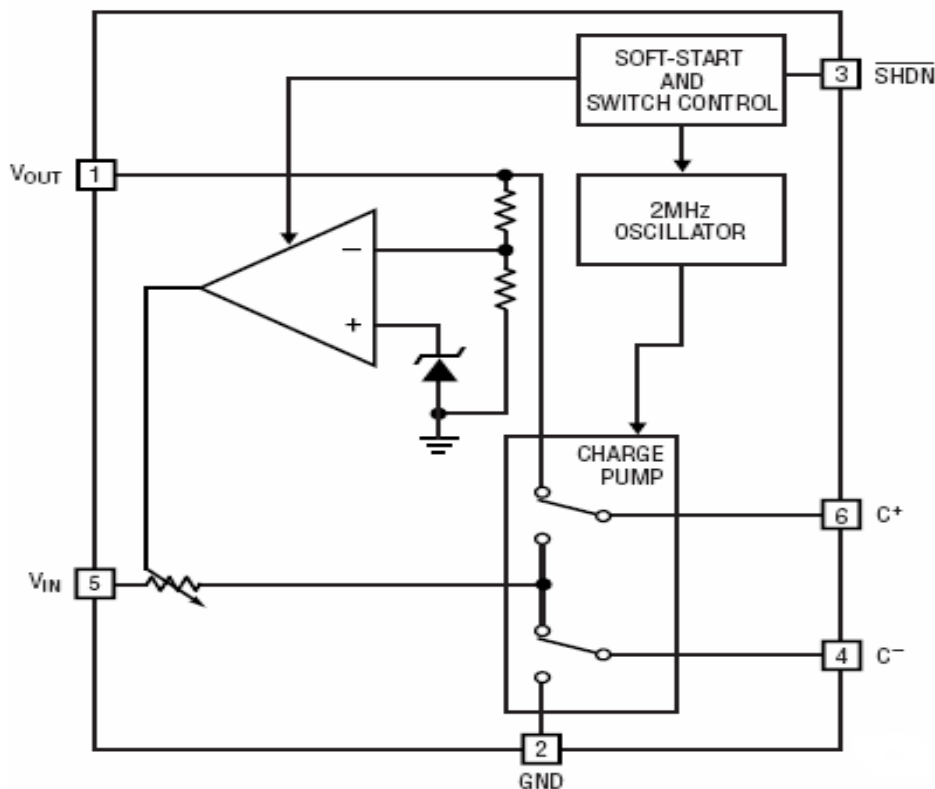
EN (Pin3): Active Low Shutdown Input. This pin must not be allowed to float.

C- (Pin 4): Flying Capacitor Negative Terminal.

$V_{IN}$  (Pin 5): Input Supply Voltage.  $V_{IN}$  should be bypassed with a  $1\mu\text{F}$  to  $4.7\mu\text{F}$  low impedance ceramic capacitor.

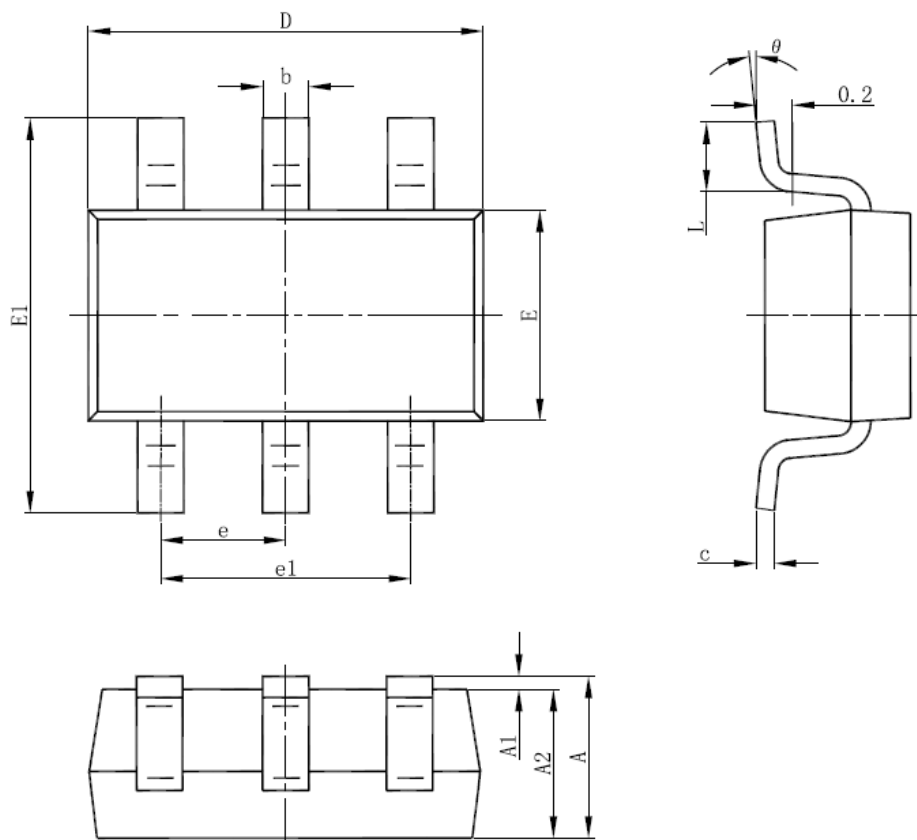
C+ (Pin6): Flying Capacitor Positive Terminal.

## Functional Diagram



## Packaging Information

## SOT-23-6 Package Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°