1.4MHz, 2A Synchronous Step-Down DC/DC Converter

FEATURES

- High Efficiency: Up to 95%
- 1.4MHz Constant Frequency Operation
- 2A Output Current
- No Schottky Diode Required
- 2.4V to 5.5V Input Voltage Range
- Output Voltage as Low as 0.6V
- Low Quiescent Current: 40μA
- Slope Compensated Current Mode Control for Excellent Line and Load Transient Response
- Inrush Current Limit and Soft Start
- <1μA Shutdown Current
- Available in DFN33-10 and WQFN-16L 3x3 package

APPLICATIONS

- Cellular and Smart Phones
- Wireless and DSL Modems
- PDAs
- Digital Still and Video Cameras
- PC Cards

GENERAL DESCRIPTION

The MT3420 is a constant frequency, current mode PWM step-down converter. The device integrates a main switch and a synchronous rectifier for high efficiency without an external Schottky diode. It is ideal for powering portable equipment that runs from a single cell Lithium-Ion (Li+) battery. The output voltage can be regulated as low as 0.6V. The MT3420 can also run at 100% duty cycle for low dropout operation, extending battery life in portable system. This device offers two operation modes, PWM control and PFM Mode switching control, which allows a high efficiency over the wider range of the load.

Typical Application

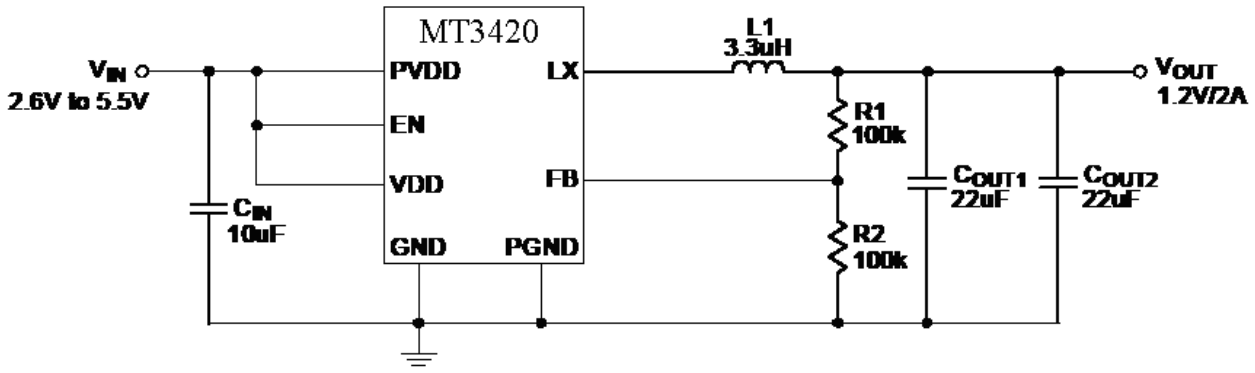
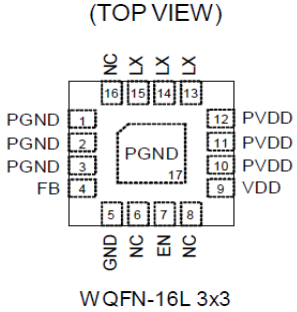
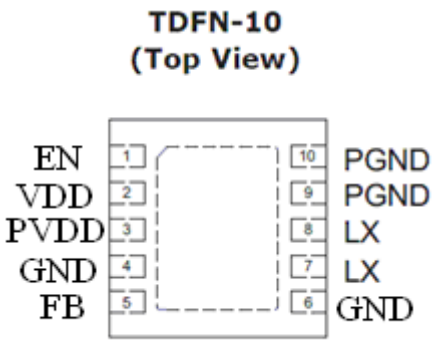


Figure 1. Basic Application Circuit

Package/Order Information





Part Number	SWICHING FREQUENCY	Temp Range	OUTPUT VOLTAGE (V)	OUTPUT CURRENT (A)
MT3420-ADJ	1.4MHz	-40°C to +85°C	ADJ	0.6

Electrical Characteristics (Note 3)

(V_{IN}=V_{RUN}=3.6V, V_{OUT}=1.8V, T_A = 25°C, unless otherwise noted.)

Parameter	Conditions	MIN	TYP	MAX	unit
Input Voltage Range		2.4		5.5	V
UVLO Threshold		1.7	1.8	1.9	V
Input DC Supply Current	(Note 4)				μA
PWM Mode	Vout = 90%, Iload=0mA		160	240	μA
PFM Mode	Vout = 105%, Iload=0mA		40	70	μA
Shutdown Mode	V_{RUN} = 0V, V_{IN}=4.2V		0.1	1.0	μA
Regulated Feedback Voltage	T_A = 25°C	0.582	0.600	0.618	V
Reference Voltage Line Regulation	Vin=2.7V to 5.5V		0.04	0.40	%/V
Output Voltage Line Regulation	V_{IN} = 2.7V to 5.5V		0.04	0.4	%
Output Voltage Load Regulation			0.5		%
Oscillation Frequency	Vout=100%		1.4		MHz
	Vout=0V		300		KHz
On Resistance of PMOS	I_{SW}=100mA		0.10	0.2	Ω
ON Resistance of NMOS	I_{SW}=-100mA		0.09	0.15	Ω
Peak Current Limit	V_{IN}= 3V, Vout=90%		3.5		A
RUN Threshold		0.30	1.0	1.50	V
RUN Leakage Current			±0.01	±0.1	μA
SW Leakage Current	V_{RUN}=0V,V_{IN}=Vsw=3.6V		±0.01	±1.0	μA