

PFM Step-Up DC-DC Converter

General Description

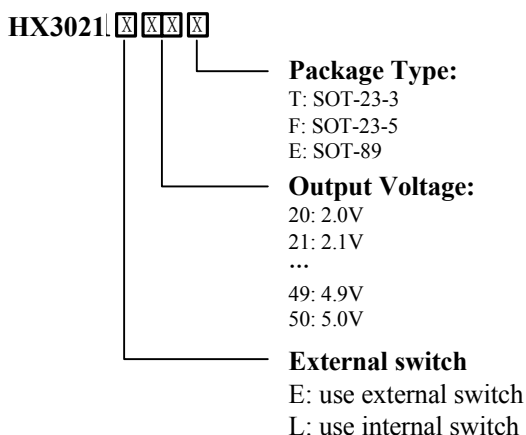
The HX3021 Series are PFM step-up DC-DC converters with very low ripple noise due to the high operation frequency. The maximum operation frequency is 400 KHz.

Only three components are required to realize the conversion from the battery voltage to a selected output voltage.

A driver pin (EXT) is provided for driving external power transistor to extend the output current capability where large current is required.

Enable pin (EN) is also provided so that the circuit can be powered down.

Ordering Information



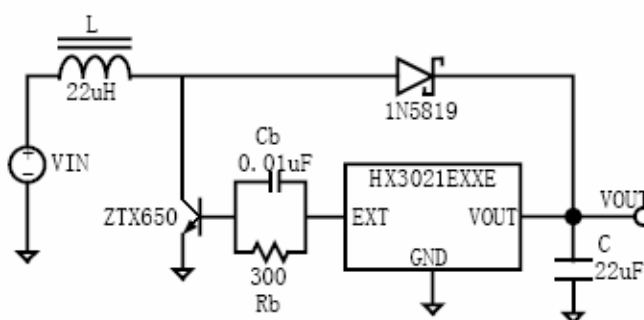
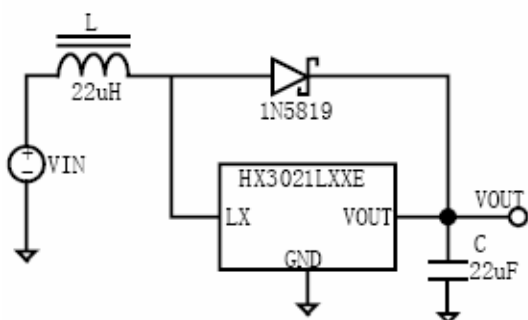
Features

- 400 KHz Maximum Operation Frequency
- 2.0V to 5.0V Output Voltage With 0.1V Step
- Low Start-up Voltage: 0.8V at 1mA
- $\pm 2\%$ Output Voltage Accuracy
- Up to 88% Efficiency
- Output current: 300mA at 2.5V input, 3.3V output
- Low Ripple and Low Noise
- Output Current Extendable by External Switch

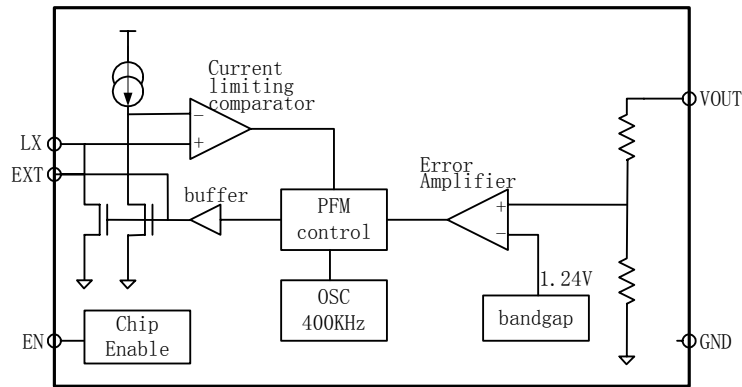
Applications

- Power source for applications where a higher voltage than the battery voltage is required
- One to three cell battery devices
- Power source for cameras, camcorders, VCRs, PDAs, LED and hand held communication instrument

Typical Applications

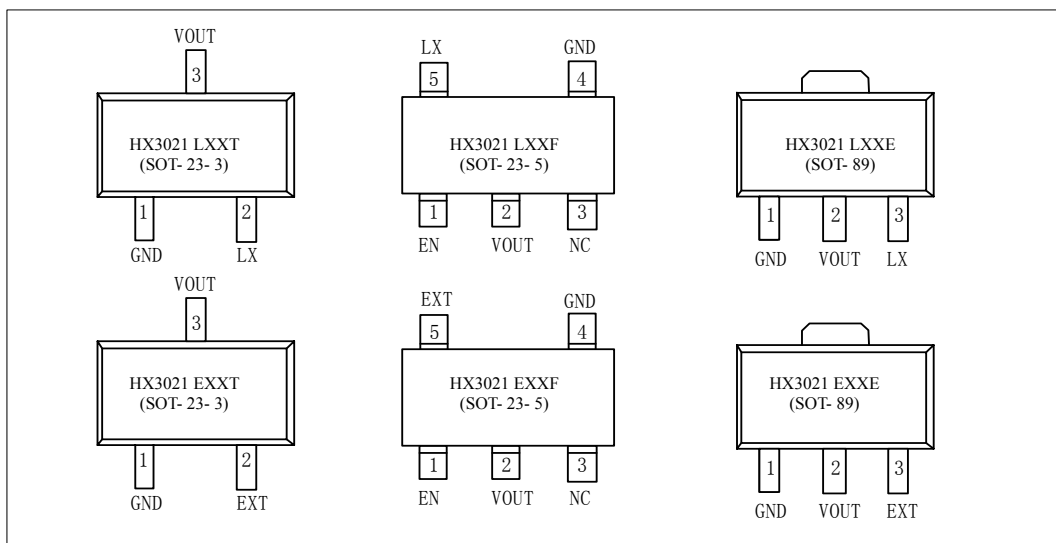


Block Diagram



Pin Assignment

Pin Name	Part Marking and Package Type						Description
	HX3021 LXXT SOT-23-3	HX3021 LXXF SOT-23-5	HX3021 LXXE SOT-89	HX3021 EXXT SOT-23-3	HX3021 EXXF SOT-23-5	HX3021 EXXE SOT-89	
LX	2	5	3	-	-	-	Switching pin
EXT	-	-	-	2	5	3	Buffer output for external transistor
VOUT	3	2	2	3	2	2	Output voltage
EN	-	1	-	-	1	-	Chip enable (active high)
GND	1	4	1	1	4	1	Ground
NC	-	3	-	-	3	-	No connection



Absolute Maximum Ratings

Type	Symbol	Description	Value	Unit
Voltage	V _{max}	Maximum voltage on VOUT and VLX pins	8	V
	V _{min-max}	Voltage range on EXT and EN pins	-0.3-VOUT+0.3	V
Current	ILX _{max}	Maximum current on LX pin	1000	mA
	IEXT _{max}	Maximum current on EXT pin	100	mA
Power dissipation	Psot-23-3	Maximum Power dissipation for SOT-23-3 package	0.25	W
	Psot-23-5	Maximum Power dissipation for SOT-23-5 package	0.25	W
	Psot-89	Maximum Power dissipation for SOT-89 package	0.5	W
Thermal	T _{min-max}	Operation temperature range	-20-85	°C
	T _{storage}	Storage temperature range	-40-165	°C
ESD	VESD	ESD voltage for human body mode	2000	V

Electronic Characteristics

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output voltage accuracy	ΔV _{OUT}		-2		2	%
Maximum input voltage	V _{INMAX}		0.7		V _{OUT}	V
Start-up voltage	V _{START}	I _{LOAD} =1mA, V _{IN} :0→2V			0.85	V
Hold-on voltage	V _{HOLD}	I _{LOAD} =1mA, V _{IN} :2→0V	0.6			V
Maximum oscillation frequency	F _{MAX}		220	260	280	KHz
Oscillator duty cycle	DC _{OSC}		75	80	85	%
Efficiency	η			85	88	%
Current limit	I _{LIMIT}		600	800	1000	mA
Input current at no load	I _{IN0}	V _{IN} =1.8V V _{OUT} =3.0V		20		uA
		V _{IN} =1.8V V _{OUT} =5.0V		25		uA
Input standby current	I _{INQ}	No load, EN="low"			1	uA
EN "High" voltage level			0.4*V _{OUT}			V
EN "low" level					0.2	V
EN "high" input current					0.1	uA
EN "low" input current			-0.1			uA
EXT output current			-5		5	mA

Typical Characteristics (Using Internal Switch Transistor)

