



LC2321

18V (30V spike) 2A Synchronous PFM/PWM Buck Converter

DESCRIPTION

The LC2321 is a high efficiency current-mode synchronous, 18V/2A buck converter. Its input voltage ranges from 4.5V to 18V and it provides an adjustable regulated output voltage from 0.923V to 15V while delivering up to 2A of output current.

The internal synchronous switches increase efficiency and eliminate the need for an external Schottky diode. The switching frequency is set to 340KHz. And the LC2321 will automatically switch between PFM and PWM mode based on the load current, thus to enhance the converter efficiency at light load.

LC2321 consists of many protection block such as UVLO, input voltage over voltage protection to stand much higher input voltage spike, thermal protection and output short circuit protection.

The LC2321 is available in the SOP8 and ESOP8 (with exposed pad for heat dissipation) package

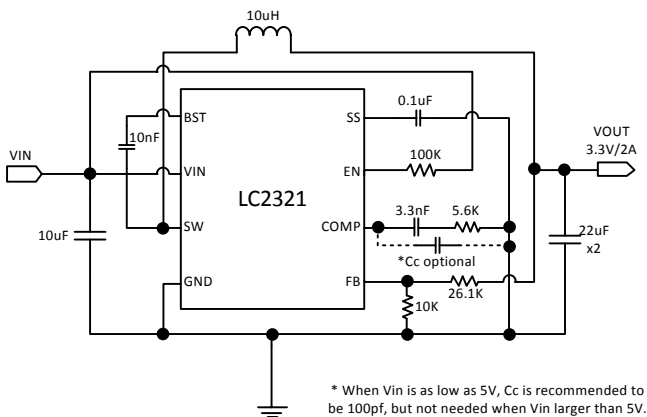
FEATURES

- Adjustable Output Voltage, $V_{fb}=0.923V$
- Maximum output current is 2A
- Range of operation input voltage: Max 18V
- Withstand input voltage spike >30V
- Standby current: 1mA (typ.)
- Operating current at zero load: 1.2mA (typ.)
- Line regulation: 0.1%/V (typ.)
- Load regulation: 10mV (typ.)
- High efficiency, up to 95%
- Environment Temperature: $-20^{\circ}C \sim 85^{\circ}C$

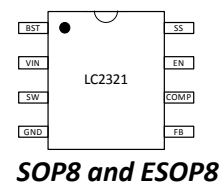
APPLICATIONS

- Set-top-box
- Consumer Electronic Device for automobile
- LCD Monitor and LCD TV
- Portable DVD
- ADSL Modem, WLAN router
- Other 12V or double cell Li-ion battery powered device

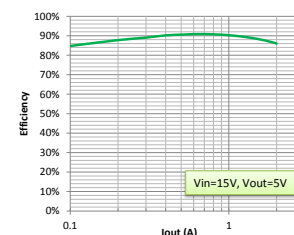
TYPICAL APPLICATION



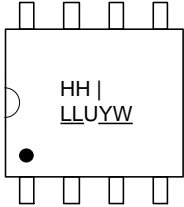
PIN OUT



EFFICIENCY



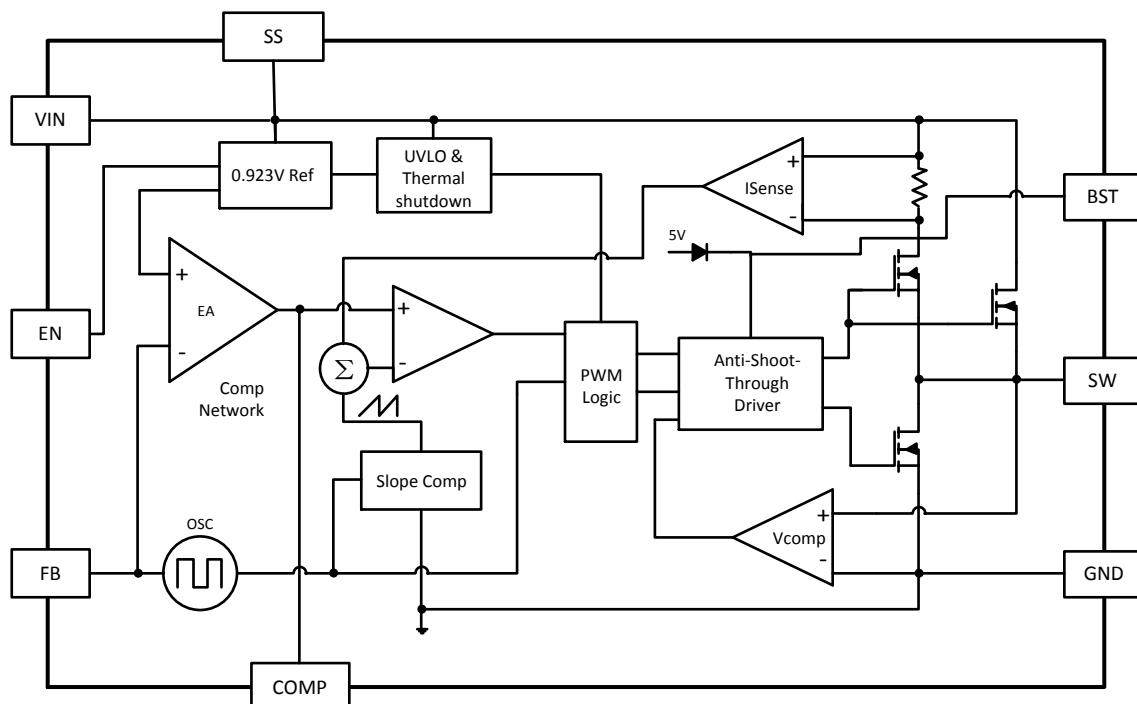
MARK and ORDERING INFORMATION

Mark Explanation		Ordering Information	
HH : Product Code LL: Lot No. U: Fab code YW: Date code		SOP8 2500pcs/reel	LC2321CD8TR
	ESOP8 2500pcs/reel	LC2321CS8TR	

PINOUT DESCRIPTION

PIN #	NAME	DESCRIPTION
1	BST	High side power transistor gate drive boost input
2	VIN	Power input, the input capacitor should be placed as close to VIN and GND pin as possible
3	SW	Power switching node to connect inductor
4	GND	Ground.
5	FB	Feedback input with reference voltage set to 0.923
6	COMP	Compensation node. A serial RC connected to this pin is required to maintain the Buck converter control loop stable.
7	EN	Enable input. Setting it to high level or connecting to Vin via a resistor may turn on the chip, while setting it to ground level will turn off the chip.
8	SS	Soft-start node. Connecting a 0.1uF capacitor to ground make the Buck converter output rise smoothly.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		30V
Max Operating Junction Temperature(Tj)		125°C
Ambient Temperature(Ta)		-20°C – 85°C
Package Thermal Resistance (θ_{jc})	SOP-8L	45°C / W
	ESOP-8L	10°C / W
Storage Temperature(Ts)		-40°C - 150°C
Lead Temperature & Time		260°C, 10S
ESD (HBM)		>2000V

Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMENDED WORK CONDITIONS

Parameter		Value
Input Voltage Range		Max. 18V
Operating Junction Temperature(Tj)		-20°C –125°C

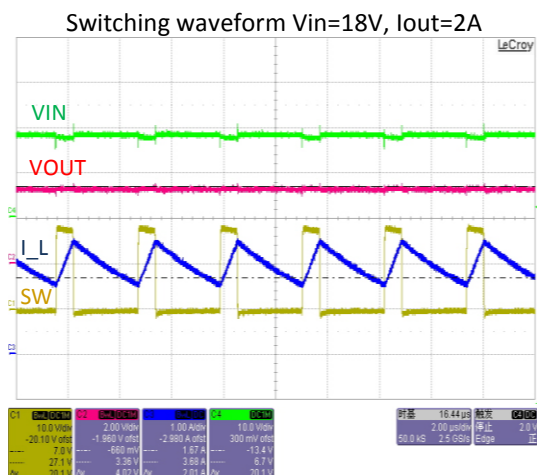
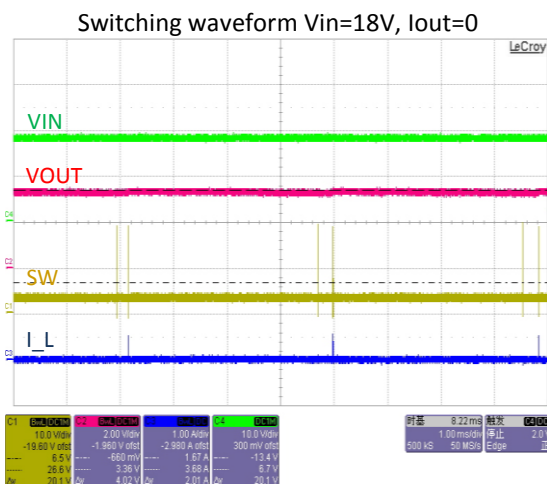
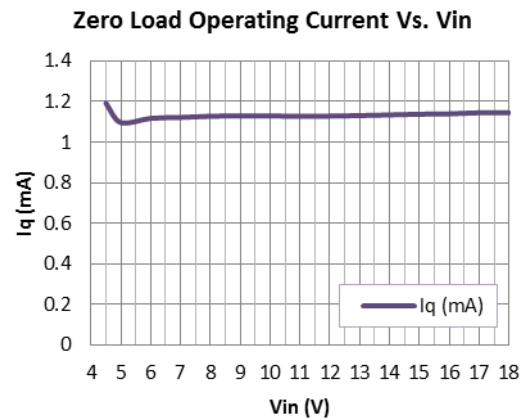
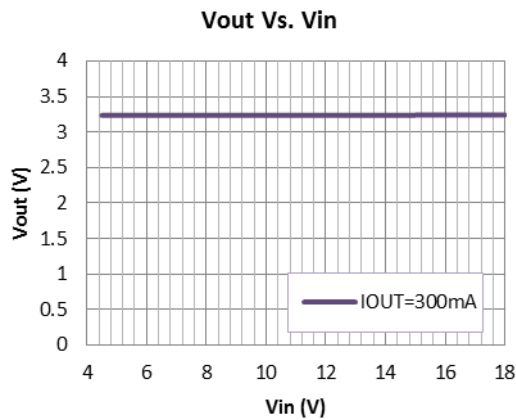
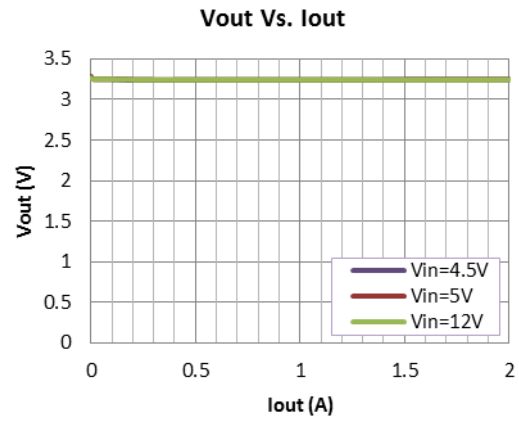
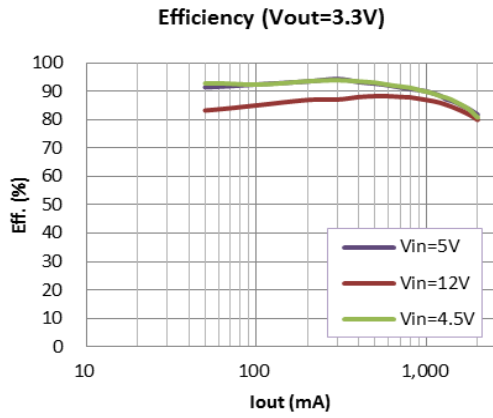
ELECTRICAL CHARACTERISTICS

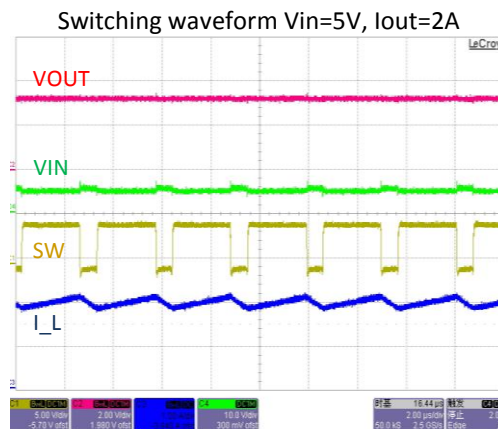
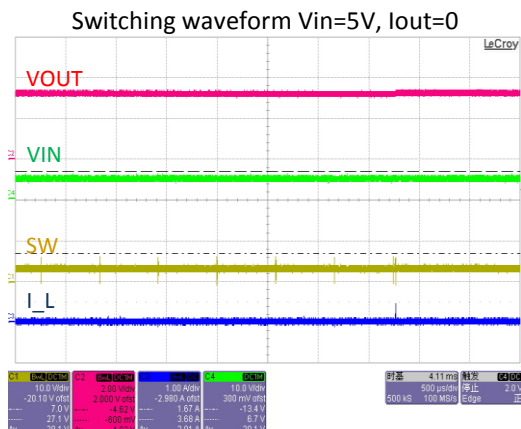
(VIN=12V, TA=25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VDD	Input Voltage Range		4.5		18	V
Vref	Feedback Voltage	Vin=12V, Ven=5V	0.900	0.923	0.946	V
I _{fb}	Feedback Leakage current			0.1	0.4	uA
I _q	Quiescent Current	Active, V _{fb} =1V, No Switching		1.1	1.5	uA
		Shutdown		1	3	uA
LnReg	Line Regulation	Vin=5V to 12V		0.1		%/V
LdReg	Load Regulation	I _{out} =0.1 to 2A		0.02		%/A
F _{soc}	Switching Frequency	Ven=2V, Vin=12V		340		KHz
R _{dsonP}	PMOS R _{dson}			130		mohm
R _{dsonN}	NMOS R _{dson}			110		mohm
I _{limit}	Peak Current Limit			2.5		A
V _{enh}	EN High Threshold		1	1.5	2	V
V _{enl}	EN Low Threshold				0.5	
V _{ovp}	Input Over-Voltage Protection	Ven=2V	18			V
TSD	Over Temperature Proection			160		°C

TYPICAL PERFORMANCE CHARACTERISTICS

($V_{in}=12V$, $V_{out}=3.3V$, $L=10\mu H$, $C_{in}=10\mu F$, $C_{out}=22\mu F$, $T_A=25^\circ C$, unless otherwise stated)





THERMAL CONSIDERATION

LC2321 is high efficiency Buck converter, which means it consumes very few power when converting the high voltage to low voltage. However, when output power is very large, like 5V/2A, the output power is as high as 10W, a heat dissipation path is strongly recommended to be routed on PCB. LC2321 has two different SOP8 package. For the normal SOP8, the heat is conducted out via Pin 4 (GND), so the heat dissipation route on PCB should be connected to the Pin 4 of the chip. If ESOP8 is selected, the heat dissipation copper area should be exposed and connected to the exposed pad underneath the chip body.

When output power is larger than 10W, the ESOP8 package is recommended.

PACKAGE OUTLINE

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