LC2123

3A 1.5MHz 5.5V Synchronous Buck Converter

DESCRIPTION

The LC2123 is a high efficiency synchronous, buck DC/DC converter. Its input voltage range is from 2.6V to 5.5V and provides an adjustable regulated output voltage from 0.8V to 5.5V while delivering up to 3A of output current.

The internal synchronous switches increase efficiency and eliminate the need for an external Schottky diode. The switching frequency is set by an external resistor or can be synchronized to an external clock. The 100% duty cycle provides low dropout operation extending battery life in portable systems.

The LC2123 is operated in forced continuous PWM Mode which minimizes ripple voltage and reduces the noise and RF interference.

The LC2123 is available in the SOP8 package

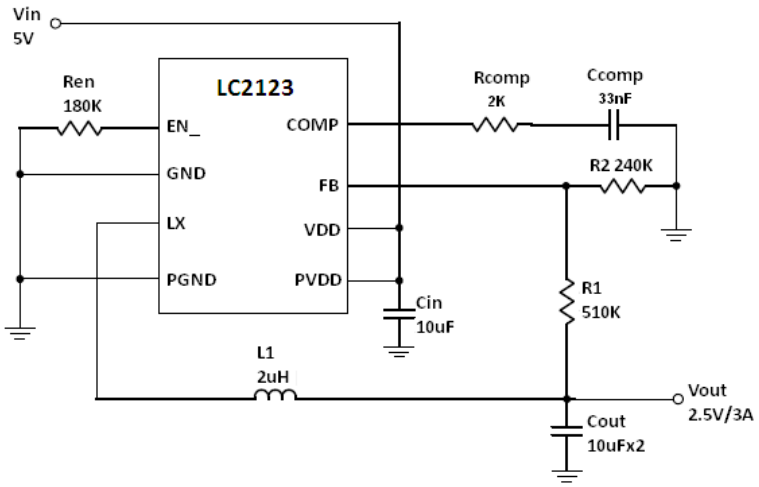
FEATURES

- Adjustable Output Voltage, Vfb=0.8V
- Maximum output current is 3A
- Range of operation input voltage: Max 5.5V
- Standby current: 0.5mA (typ.)
- Line regulation: 0.1%/V (typ.)
- Load regulation: 10mV (typ.)
- High efficiency, up to 96%
- Environment Temperature: -20°C~85°C

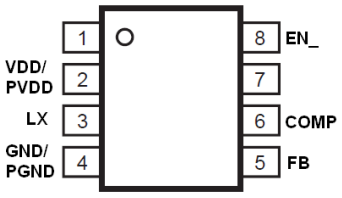
APPLICATIONS

- Power Management for 3G modem
- 3W LED driver from Li-ion battery
- LCD Monitor and LCD TV
- DVD Decode Board
- ADSL Modem
- Post Regulators for Switching Supplies

TYPICAL APPLICATION



PIN OUT & MARKING



SOP8

ORDERING INFORMATION

PART No.	PACKAGE	Tape&Reel
LC2123CD8TR	SOP8	2500/Reel

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		6.5V
Max Operating Junction Temperature(Tj)		125°C
Ambient Temperature(Ta)		-20°C – 85°C
Package Thermal Resistance	DFN3x3-10	20°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.

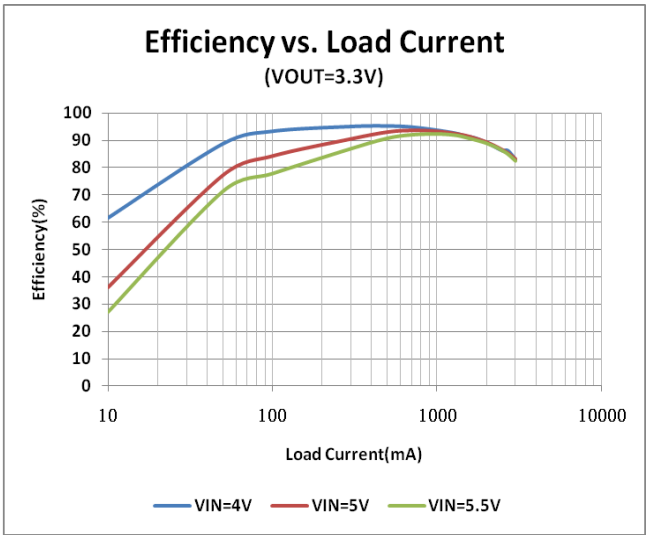
RECOMMENDED WORK CONDITIONS

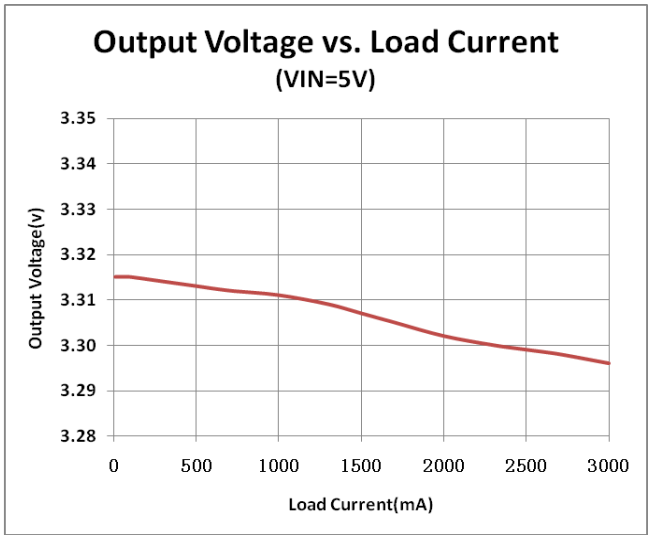
Parameter	Value
Input Voltage Range	Max. 6V
Operating Junction Temperature(Tj)	-20°C –125°C

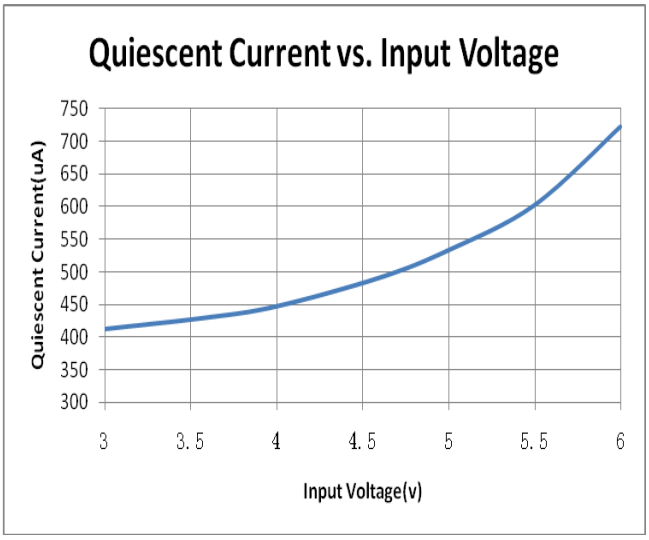
ELECTRICAL CHARACTERISTICS

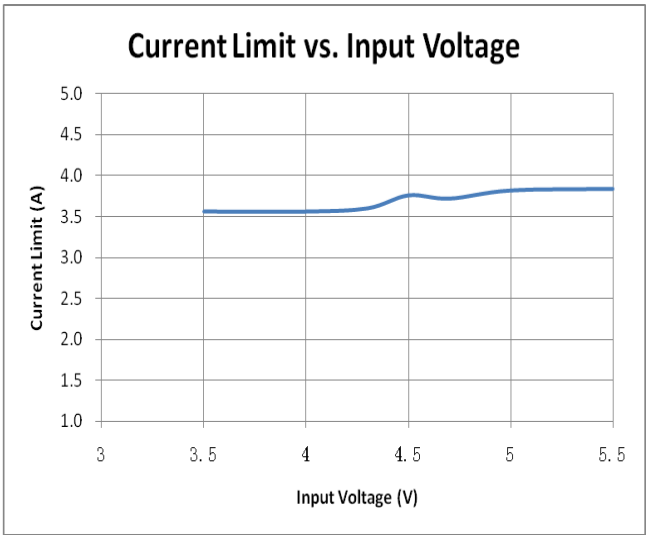
(VDD=5V, TA=25°C)

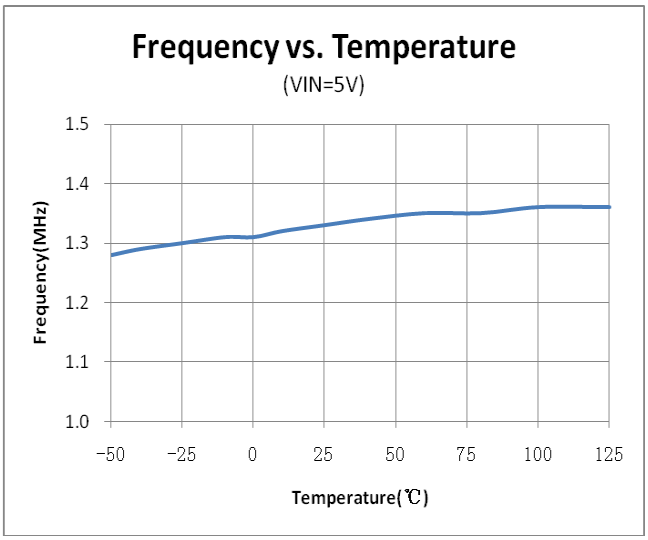
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VDD	Input Voltage Range		3.6		6	V
Vref	Feedback Voltage		0.784	0.8	0.816	V
Ifb	Feedback Leakage current			0.1	0.4	uA
Iq	Quiescent Current	Active, Vfb=0.78, No Switching		450		uA
		Shutdown		1		uA
LnReg	Line Regulation	Vin=4V to 5.5V		0.1		%/V
LdReg	Load Regulation	Iout=1 to 3A		0.02		%/A
Gm	EA Transconductance			600		us
Fsoc	Switching Frequency	Ren_=180K		1.35		MHz
RdsonP	PMOS Rdson			150		mohm
RdsonN	NMOS Rdson			130		mohm
Ilimit	Peak Current Limit			3.8		A
Ven_	EN_ Shutdown Voltage		Vin-0.7V		Vin	

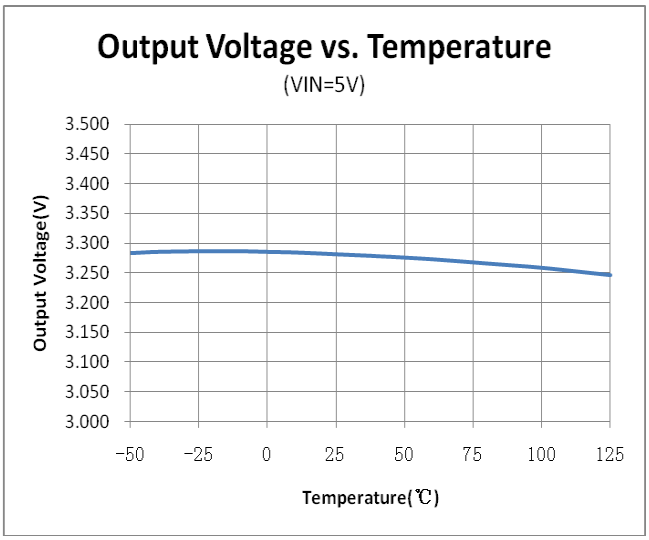

Efficiency vs. Load Current
(VOUT=3.3V)
Efficiency(%)
100
90
80
70
60
50
40
30
20
10
0
10
100
1000
10000
Load Current(mA)
VIN=4V
VIN=5V
VIN=5.5V


Output Voltage vs. Load Current
(VIN=5V)
Output Voltage(v)
3.35
3.34
3.33
3.32
3.31
3.30
3.29
3.28
0
500
1000
1500
2000
2500
3000
Load Current(mA)

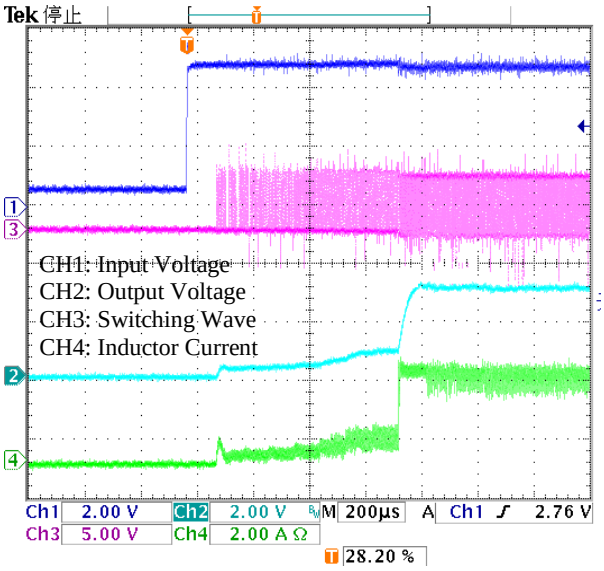

Quiescent Current vs. Input Voltage
Quiescent Current(uA)
750
700
650
600
550
500
450
400
350
300
3
3.5
4
4.5
5
5.5
6
Input Voltage(v)


Current Limit vs. Input Voltage
Current Limit (A)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
3
3.5
4
4.5
5
5.5
Input Voltage (V)

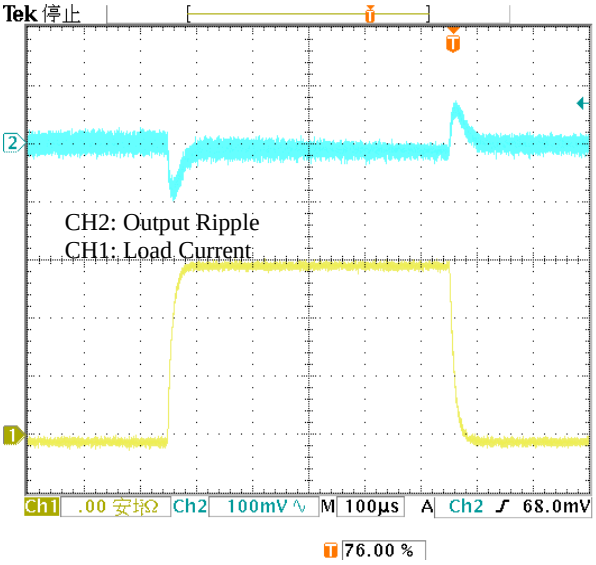

Frequency vs. Temperature
(VIN=5V)
Frequency(MHz)
1.5
1.4
1.3
1.2
1.1
1.0
-50
-25
0
25
50
75
100
125
Temperature(℃)


Output Voltage vs. Temperature
(VIN=5V)
Output Voltage(V)
3.500
3.450
3.400
3.350
3.300
3.250
3.200
3.150
3.100
3.050
3.000
-50
-25
0
25
50
75
100
125
Temperature(℃)

Power On & Soft Start



Load Transient Response



DETAILED DESCRIPTION

LC2123 is a 3A synchronous buck, with frequency adjusted by Ren_. It can achieve conversion efficiency up to 95%. It also support 100% duty cycle which will maximize the battery usage. Only a inductor and a few R & C need for peripheral. The PCB size can be very small

Please note that EN_ pin has to be pull high if one wants to shutdown the chip. And release it (with a Ren_ connected to GND) to have it work.
(请注意，要关断该颗 IC 和输出，EN_脚必须拉高，要使 IC 工作，必须释放该 EN_，控制 EN_脚的前级输出必须高阻，同时 EN_脚接与推荐值 180K 同数量级的电阻到地，电阻阻值变化可以微调震荡频率)