上海贝岭 SHANGHAI BELLING

BL8523

PWM/PFM Step-down DC-DC Controller

DESCRIPTION

The BL8523 is a CMOS-based PWM step-down DC-DC Controller. The device offers the following advantages: lower supply current and wider operating input-voltage range.

The BL8523 consists of an oscillator, a PWM control circuit, a reference voltage unit, an error amplifier, a soft-start circuit, a protection circuit, a PWM/PFM alternative circuit, a Chip Enable circuit, and under voltage lockout circuit. A low ripple, high efficiency step-down DC-DC converter can be easily composed of this IC. Output Voltage can be adjusted with external resistors.

The BL8523 uses voltage type PWM/PFM mixed operation mode. When the load current is small, the operation will switch into the PFM mode from PWM mode. Therefore the efficiency at small load is improved, and then the chip works on PWM mode.

The BL8523 embeds reset type protection circuit. If the term of maximum duty cycle keeps on a certain time, the protection circuit restarts the operation with soft-start and repeat this operation until maximum duty cycle condition is released. When the cause of large load current is removed, the chip returns to normal condition.

FEATURES

- Range of Input Voltage: 3V~16V
- Built-in Soft-start Function and Protection Function(Reset type protection)
- <1μA Shutdown Current and 80uA Quiescent Current
- Oscillation Frequency: 500KHz
- High efficiency: 95%
- High Accuracy Output Voltage:±2.0%
- Low Temperature Coefficient: ±100ppm/°C
- Operating Temperature Range: -40°C ~85°C
- Small Package:SOT23-5
- Demo Board Available

APPLICATIONS

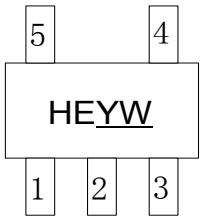
- Power source for hand-held communication equipment, cameras, video instruments such as VCRs, camcorders.
- Power source for battery-powered equipment.
- Power source for household electrical appliance

ORDERING INFORMATION

BL8523CB5TR

Code	Description
BL8523	Product code
C	Temperature & Rohs: C: -40~85°C, Pb Free Rohs Std.
B5	Package Type: SOT23-5
TR	Tape & Reel (Standard), 3000pcs/Reel

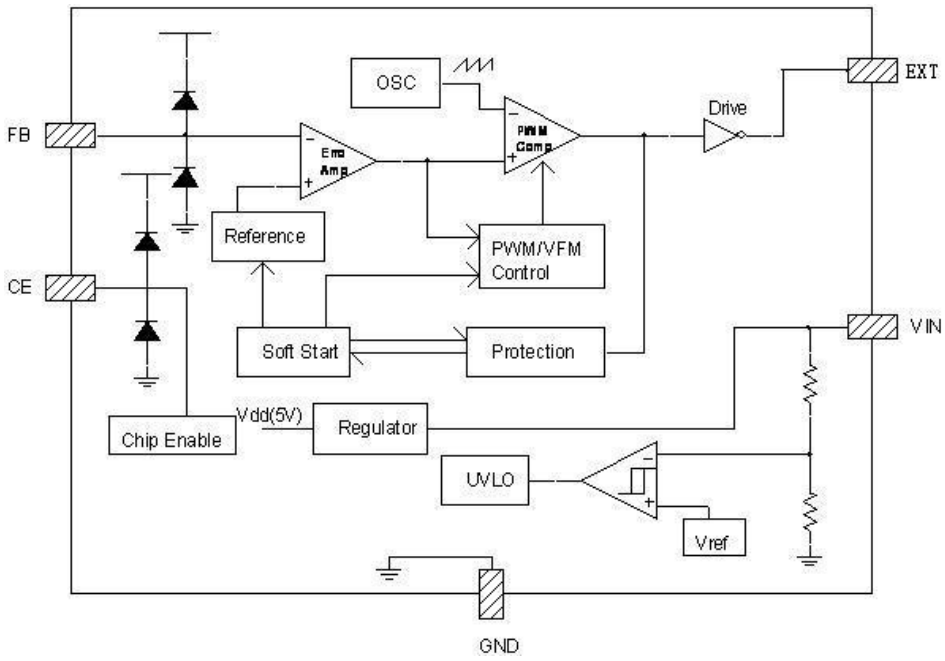
PIN CONFIGURATION

Product ID		BL8523CB5TR
Marking		
HE	Product Code	
Y	Year	
W	Week	

PIN DESCRIPTION

Pin No.	Symbol	Description
1	CE	Chip Enable Pin (Active with “H”)
2	GND	Ground Pin
3	FB	Pin for Feedback Voltage
4	EXT	Switching Pin
5	VIN	Power Supply Pin

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING

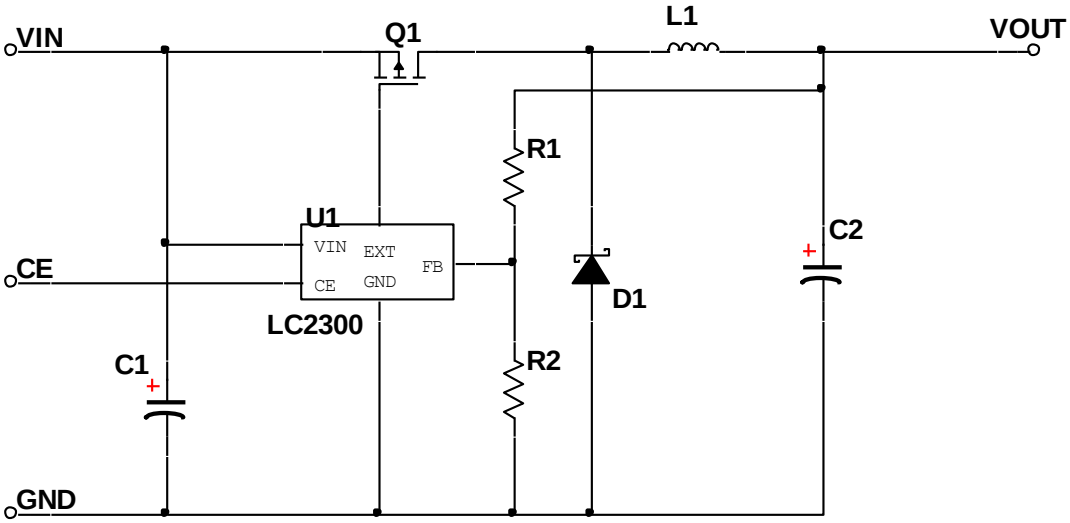
Supply Voltage	-0.3V to 18V
CE Pin Voltage	–0.3V to Vin+0.3V
EXT Pin Voltage	–0.3V to Vin+0.3V
FB Pin Voltage	–0.3V to 6V
Operating Ambient Temperature Range	–40°C to 85°C
Storage Temperature Range	–65°C to 150°C
Lead Temperature (Soldering, 10 sec)	260°C
Thermal resistance: Θ_{JA}	150°C/W

ELECTRICAL CHARACTERISTICS

(Test condition: Ta=25°C, VIN=12V, unless otherwise noted.)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
VIN	Operating Input Voltage		3		16	V
VFB	Feedback Voltage	VIN=VCE=12V, Iout=100mA	1.196	1.221	1.246	V
△ VFB/△ T	Feedback Voltage Temperature Coefficient	-25℃ ≤ Topt≤ 85℃		±100		ppm/℃
*f*osc	Oscillator Frequency	VIN=VCE=12V, Iout=100mA	300	500	700	KHz
△ *f*OSC/△ T	Oscillator Frequency Temperature Coefficient	-25℃ ≤ Topt≤ 85℃		±0.2		%/℃
IDD1	Supply Current 1	VIN = VCE =12V VFB =1.4V		80		μA
Istb	Standby Current	VIN=12V, VCE =0V		0	1	μA
ICEH	CE "H" Input Current	VIN = VCE =12V		0	0.5	μA
ICEL	CE "L" Input Current	VIN =12V, VCE = 0V	-0.5	0		μA
VCEH	CE "H" Input Voltage	VIN = 12V	1.5			V
VCEL	CE "L" Input Voltage	VIN = 12V			0.3	V
VUVLO1	UVLO Threshold Voltage	VIN=VCE=5 to 0V	1.5	1.9	2.3	V
VUVLO2	UVLO Release Voltage	VIN=VCE=0 to 5V	1.6	2.0	2.4	V
Maxdty	Oscillator Maximum Duty Cycle				100	%
Tstart	Delay Time by Soft-start function	VIN = 12V, VCE = 0—>8V	2	5	10	ms
Tprot	Delay Time for protection circuit	VIN = VCE = 12V VFB = 2.5V—>0V	150	200	250	μs

TYPICAL APPLICATION CIRCUIT

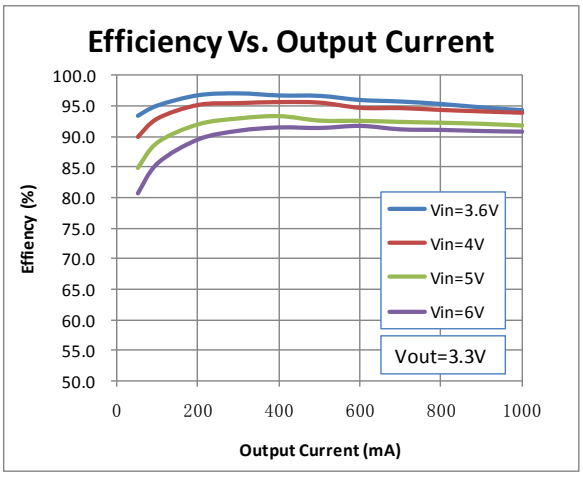


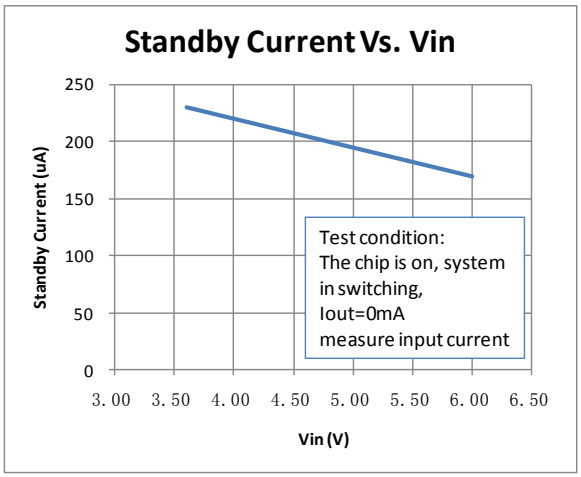
DEMO BOARD BOM

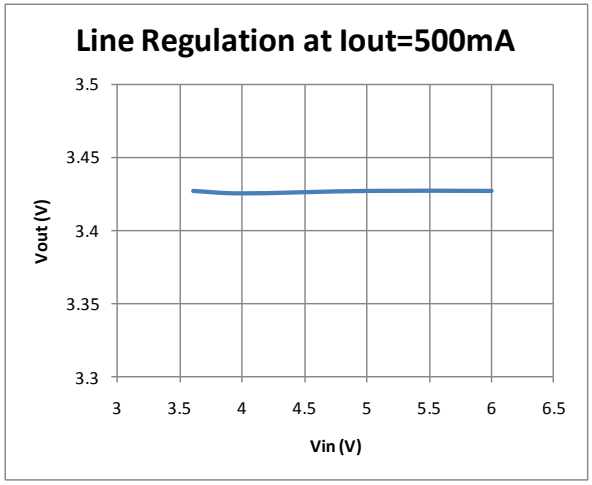
No.	Reference	Type	Specification
1	C1	Capacitor	Tantalum Capacitor; 25V/47uF; SMD
2	C2	Capacitor	Tantalum Capacitor; 25V/47uF; SMD
3	D1	Diode	SS34; 40V, 3A; SMD
4	L1	Inductor	10uH; 3A; SMD, Shielding
5	IC1	IC	BL8523; SMD SOT23-5
6	R1	Resistor	SMD 0805; 1%
7	R2	Resistor	SMD 0805; 1%
8	Q1	MOSFET	2301;-20V,-3.4A,P-MOS;SMD SOT23-3

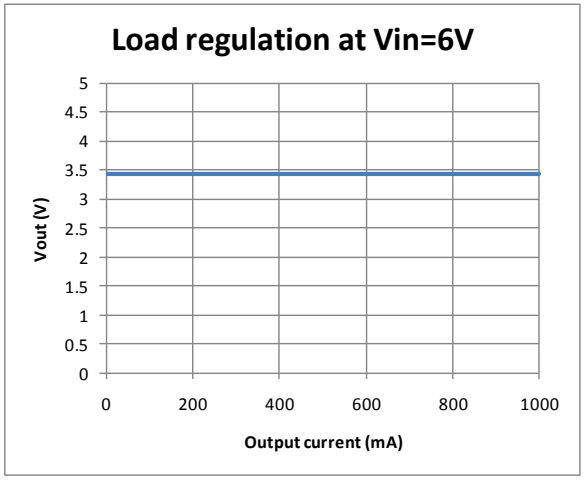
ELECTRICAL PERFORMANCE

(Test condition: Ta=25°C, configuration as what is listed in above demo board BOM, unless otherwise noted.)









PACKAGE OUTLINE

Package	SOT23-5	Devices per reel	3000Pcs	Unit	mm

Package specification：