

BST60500

1. Product Overview

The BST60500 is a switched capacitor voltage converter designed for space critical battery powered applications.

The BST60500 step-down charge pump generates an adjustable output voltage. Only four small ceramic capacitors are required to build a complete, high-efficiency DC-DC charge pump converter. To achieve high efficiency over a wide input voltage range, the charge pump automatically selects between three different conversion modes. The output can provide a maximum output current of 250 mA. The power good function monitors the output voltage and goes high when the output voltage rises to 97% of the nominal value.

2. Product Features

- Wide input voltage range from 1.8V to 6.5V.
- Adjustable output voltage.
- Up to 250 mA output current.
- 4% output voltage tolerance over line, load and temperature variations.
- The device quiescent current is less than 1mA.
- Includes output voltage monitor (power good).
- Overheat and overcurrent protection.
- CLCC10 leadless ceramic package/plastic MSOP10 package

3. Functional Block Diagram

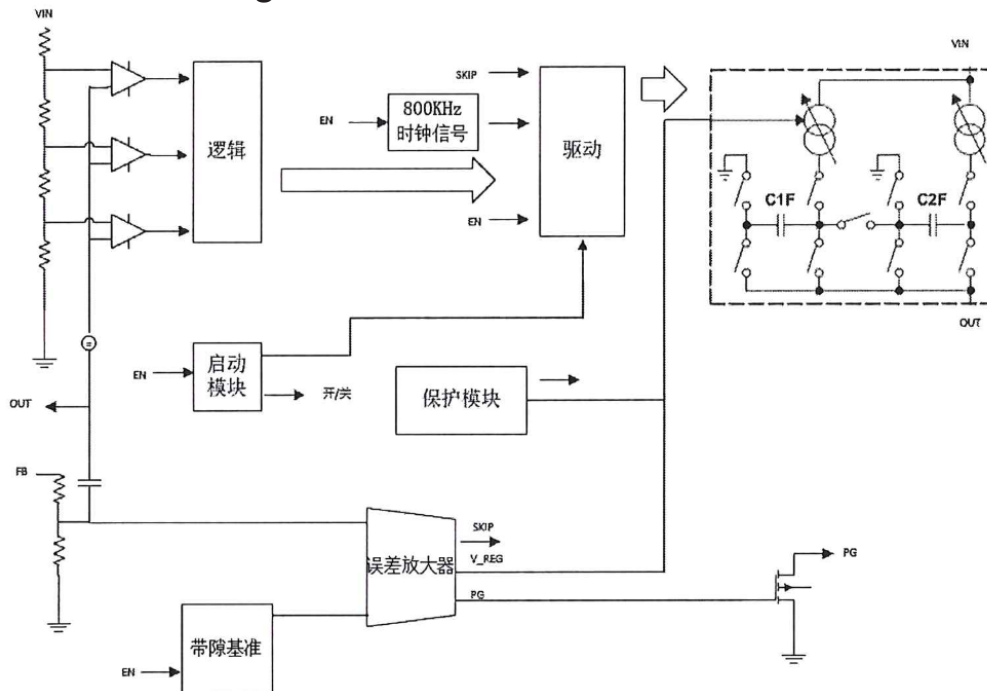


Figure 1. Functional Block Diagram

4. Pin Information

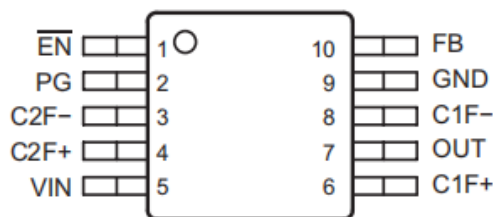


Figure 2. BST60500 M SOP10 package outline and pin arrangement

The pin description of BST60500 is shown in the following table.

Table 1. Pin Description

Pin number	Pin Symbols	Functional Description
1	$\overline{EN}$	Device enable input, low level is effective
2	PG	Open-drain Power Good Detector Output. This pin goes high once the voltage at OUT reaches approximately 97% of its nominal value.
3	C2F-	The negative terminal of capacitor C 2F
4	C2F+	capacitor C 2 F
5	VIN	Power Input
6	C1F+	The positive terminal of capacitor C 1F
7	OUT	Regulated 3.3V , 1.8V , 1.5V or adjustable output Use output filter capacitor C O to shunt OUT to ground
8	C 1F-	The negative terminal of capacitor C 1F
9	G	land
10	FB	UT through a voltage divider resistor

5. Absolute Maximum Ratings and Recommended Operating Ranges

Absolute Maximum Ratings

Serial number	Parameter name	Parameter Value
1	Input voltage (VIN terminal, EN terminal)	-0.3V~7V
2	Feedback voltage (FB terminal), output voltage (OUT terminal)	-0.3V ~ 3.6V
3	Capacitor C1 and C2 positive and negative plate voltages (C1F+, C1F-, C2F+, C2F-)	-0.3V~7V
4	Storage ambient temperature (T_{stg})	-65°C ~ +150°C
5	Lead wire soldering temperature resistance (T_h)	300°C
6	Junction temperature (T_j)	150°C

Note: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device.

Recommended working range

Serial number	Parameter name	Parameter Value
1	Power supply voltage (V_{IN} terminal)	1.8 V~ 6.5 V
2	Enable voltage (EN terminal), feedback voltage (FB terminal)	0 V~ 5 V
3	Output voltage (OUT terminal)	0V ~3.6V
4	Working environment temperature (T_A)	- 55 °C~125°C

6. Electrical characteristics parameters

The electrical characteristics are the best indicators that this series of products can achieve. Different quality levels and packaging forms are slightly different. Please refer to the corresponding detailed specifications for details.

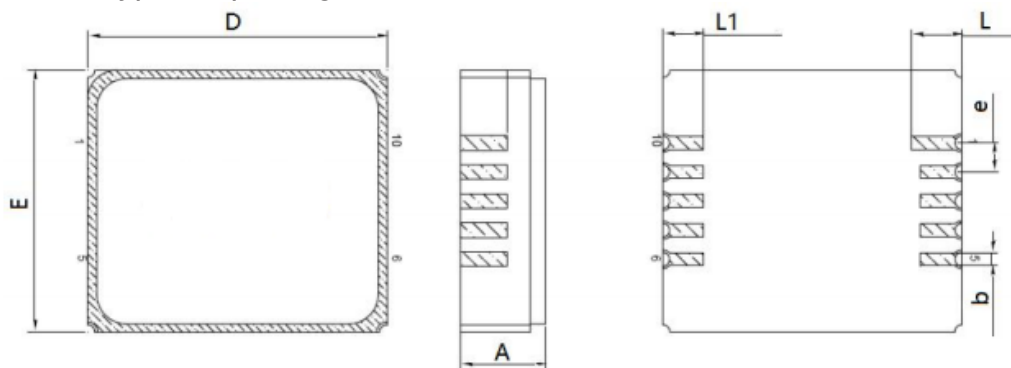
Table 2. Electrical properties

characteristic	symbol	Condition (Unless otherwise specified, $V_{IN} = 5V$, $-55^{\circ}C \leq T_A \leq 125^{\circ}C$)	Limit value			unit
			Minimum	typical	maximum	
Operating voltage	V_{IN}		1.8	—	6.5	V
Output voltage	V_{OUT}		0.8	—	3.3	V
Supply Current	I_q		—	—	1	mA
Output Current	I_{OUT}	$T_A = 25^{\circ}C$	250	—	—	mA
Feedback voltage	V_{FB}	$I_{OUT} = 50mA$	0.76	0.8	0.84	V
Output accuracy	V_{OUTA}	$I_{OUT} = 50mA$	- 5	—	5	%
EN input leakage current	$I_{lkg(SD)}$	$V_{(EN)} = 0V$ or V_{IN}	-1	—	1	μA
EN input logic low	V_{ENL}		—	—	$0.4 \times V_{IN}$	
EN input logic high	V_{ENH}		$0.8 \times V_{IN}$	—	—	
FB input leakage current	$I_{lkg(FB)}$		—	—	1	μA
PG output voltage low level	V_{OL}	$V_{OUT} = 0V$, $I_{(PG)} = 1mA$	—	—	0.3	V
PG leakage current	I_{lkg}	$V_{OUT} = 3.3V$, $V_{(PG)} = 3.3V$	—	—	1	μA
Switching frequency	f	$V_{IN} = 5V$, $T_A = 25^{\circ}C$	600	—	1200	kHz
PG rise delay time	$t_{d,r}$	V_{OUT} rises (from low to high)	80	—	240	μs
PG falling delay time	$t_{d,f}$	V_{OUT} falling (from high to low)	20	—	150	μs

If feasible, maintain relative humidity above 50%.

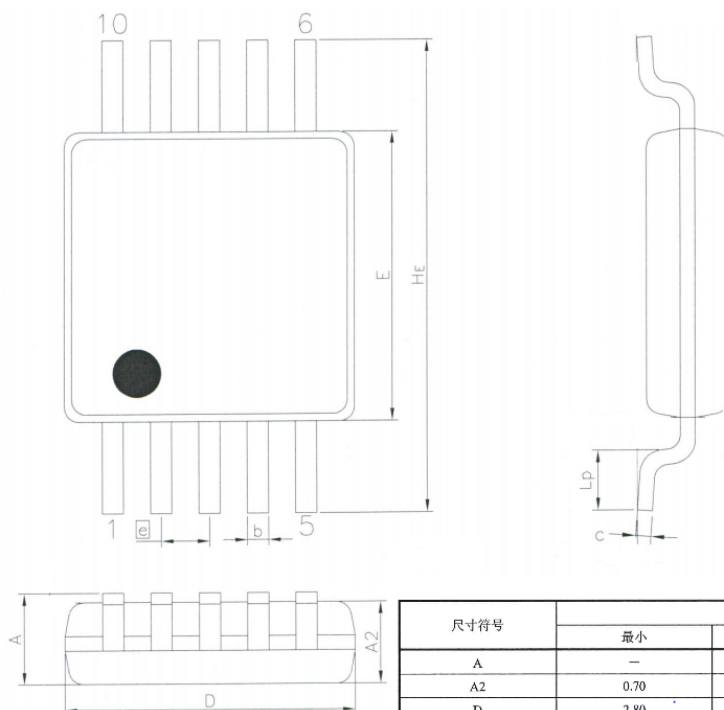
7. Dimensions

BST60500 has two types of packages: C LCC10 and M SOP10.



单位为毫米

尺寸符号	数值		
	最小	公称	最大
D	4.85	—	5.40
E	4.25	—	4.80
A	—	—	1.85
e	—	0.50	—
b	0.12	—	0.32
L1	—	0.70	—
L	—	0.86	—



单位为毫米

尺寸符号	数值		
	最小	公称	最大
A	—	—	1.20
A2	0.70	—	1.00
D	2.80	—	3.20
E	2.80	—	3.20
H _E	4.65	—	5.15
e	—	0.50	—
b	0.12	—	0.32
c	0.03	—	0.28
L _p	0.35	—	0.85

8. Ordering Information

Table 3. Product Ordering Information

Serial number	model	Package	Packaging materials	Device level	Lead material	Weight (g)	Typical size (mm) (Length × Width × Height)	Detailed specifications
1	BST60500	CLCC10	ceramics	B	No lead terminal	0.12-0.14	5.1 × 4.5 × 1.6	Q/BST 60020-2021
2	BST60500MSOP10M3	MSOP10	plastic	N1	Copper tinning	0.01-0.03	4.9 × 3 × 1	Q/BST 50321-2023

Note 1:

- Q/B /B1 grade devices meet GJB 597 A -1996 or GJB 597B-2012 Screening requirements for Q/B /B1 levels of the General Specifications for Semiconductor Integrated Circuits .
- N /N1 level devices meet the N /N1 level screening requirements of GJB 7400 "General Specification for Semiconductor Integrated Circuits for Qualified Manufacturer Certification".

Note 2: The product ordering information is for our existing products or devices that have been confirmed to be developed. We can develop devices in other packaging forms according to user needs.