

BST62420

1. Product Overview

The BST62420 device is a synchronous dual step- down DC- -DC converter. It provides two independent output voltage rails that can be powered by batteries and is suitable for operation from standard 3.3V or 5V voltage rails.

The BST62420 has an input voltage range of 2.5V to 6V, making it ideal for battery-powered portable applications such as smartphones, PDAs, and other portable devices. With the EasyScale™ serial interface, the output voltage can be modified during operation. Thus, it supports dynamic voltage scaling for low-power DSPs and processors.

The BST62420 operates at a fixed switching frequency of 2.25MHz and performs power-save mode operation at light load currents to maintain high efficiency over the entire load current range. For low noise applications, the device can be forced into fixed frequency PWM mode by pulling the MODE/DATA pin high. In shutdown mode, current consumption drops to 1.2uA. The device allows the use of small inductors and capacitors to achieve a small solution size.

The BST62420 operates over the free air temperature range of -40 to 85 °C and is available in a 10-pin lead-free package (3mm x 3mm).

Device Information ⁽¹⁾

model	Encapsulation	size
BST62420	PDFN(10)	3mm*3mm

⁽¹⁾For all available packages, see the orderable addendum at the end of the data sheet

2. Product Features

- Efficiency up to 95%.
- VIN range is 2.5V to 6V.
- 2.25MHz fixed operating frequency.
- Output current 600mA and 1000mA.
- Adjustable output voltage range from 0.6V to VIN.
- Pin-selectable output voltages allow for simple dynamic voltage scaling.
- Optional EasyScale single-pin serial interface for dynamic output voltage adjustment.
- Power Save Mode at Light Load Current.
- 180° out-of-phase operation.
- Output voltage accuracy in PWM mode $\pm 1\%$.
- Typical quiescent current of each converter is 32uA.
- 100% duty cycle for lowest voltage drop.
- Available in 10-pin PDFN (3mm×3mm).

3. Functional Block Diagram

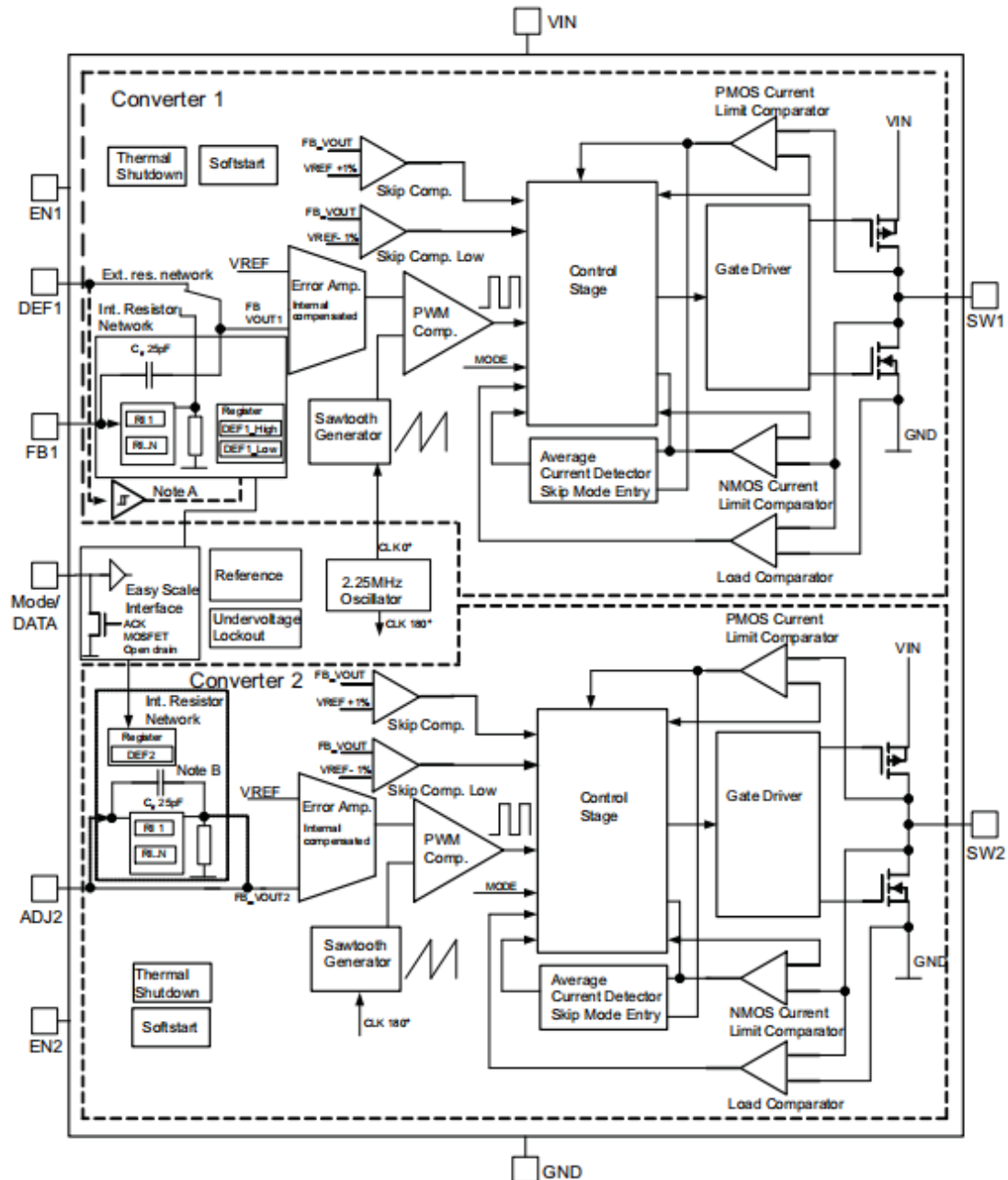


Figure 1. Functional block diagram

4. Pin Information

Pin Assignment

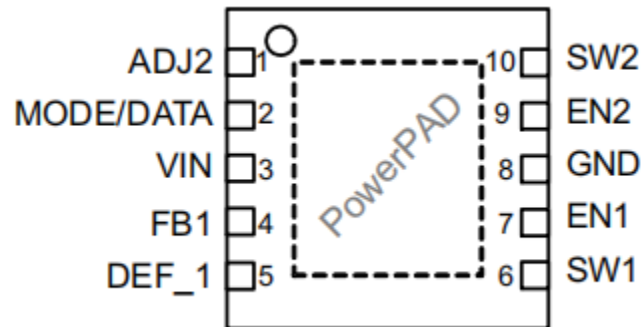


Figure 2. BST62420 pinout

Pin Description

Table 1. Pin Description

Pin number	Pinout Symbol	Functional Description
1	ADJ2	Input for regulating the output voltage of converter 2
2	MODE/DATA	Working mode selection/interface function
3	VIN	Supply voltage
4	FB1	Feedback voltage of converter 1
5	DEF_1	Define the output voltage of converter 1
6	SW1	Switch pin of converter 1, connected to inductor
7	EN1	Enable input of converter 1, active high
8	GND	land
9	EN2	Enable input of converter 2, active high
10	SW2	Switch pin of converter 2, connected to inductor
-	PowerPAD™	Grounding

5. Absolute Maximum Ratings and Recommended Operating Ranges

Absolute Maximum Ratings

Table 2. Maximum rated voltage

parameter	scope
Maximum supply voltage (V_{IN})	-0.3~7V
Voltage on EN, MODE/DATA, DEF_1	-0.3~ $V_{IN} + 0.3$, $\leq 7V$
Maximum current when entering MODE/DATA	500uA
Voltage on SW1, SW2	-0.3~7V
Voltage on ADJ2, FB1	-0.3~ $V_{IN} + 0.3$, $\leq 7V$
Storage temperature range (T_{stg})	-65 °C ~ 150 °C
Maximum junction temperature (T_J)	150 °C
Recommended working conditions: working environment temperature $T_A = -40\text{ °C} \sim 85\text{ °C}$	

6. Electrical characteristics parameters

Table 3 Electrical characteristics

(Unless otherwise specified, VIN=3.6V, VOUT=1.8V, EN=VIN, MODE=GND, L=2.2uH, COUT=20uF, TA=-40 °C to 85 °C, typical TA=25 °C)

symbol	Parameter name		Test conditions	Limit value		unit
				Minimum	Maximum	
V _{IN}	Input power voltage			2.5	6	V
Q	Quiescent Current		IOUT=0mA,MODE/DATA=VIN, for a converter, VOUT=1.575V	-	5	mA
I _{SD}	Shutdown current		EN1,EN2=GND,VIN=3.6V	-	10	uA
V _I	High level input voltage, EN1, EN2			2	VIN	V
V _{IL}	Low level input voltage, EN1, EN2			0	0.4	V
V _I	High level input voltage, MODE/DATA			2	VIN	V
V _{IL}	Low level input voltage, MODE/DATA			0	0.4	V
V	Confirm that the output voltage is high		Open drain, pull-up resistor via external		VIN	V
V _{OL}	Confirm that the output voltage is low		Open drain, pull-down current 500uA		0.5	V
timeout	Timeout for entering power saving mode		MODE/DATA port changes from high to low	-	1000	us
I _{LIMF}	Forward current limiting PMOS and N1OS	OUT1 600mA	2.5V≤VIN≤6V	0.8		A
		OUT2 1000mA		1.1		
Vref	Reference voltage			575	625	mV
f	Oscillator frequency			2.0	2.5	MHz
VOUT	Adjustable voltage output range			0.6	VIN	V
V _{OUT(PFM)}	DC output voltage accuracy PFM mode		Voltage positioning active, MODE/DATA=GND, device operating in PFM mode, VIN=2.5V to 5V(6)(7)	-4%	5%	
VOUT			MODE/DATA=GND, the device works in PWM mode, VIN=2.5V to 6V	-4%	4%	
			V _{IN} =2.5V to 6V, Mode/Data = V _{IN} , fixed PWM operation, 0mA < IOUT < IOUTMAX	-4%	4%	
t _{Start up}	Startup time		Activation time starts switching	-	300	us
t _{Ramp}	VOUT Rise Time		VOUT rises from 5% to 95%	-	1500	us

7. Dimensions

PDFN10 encapsulation

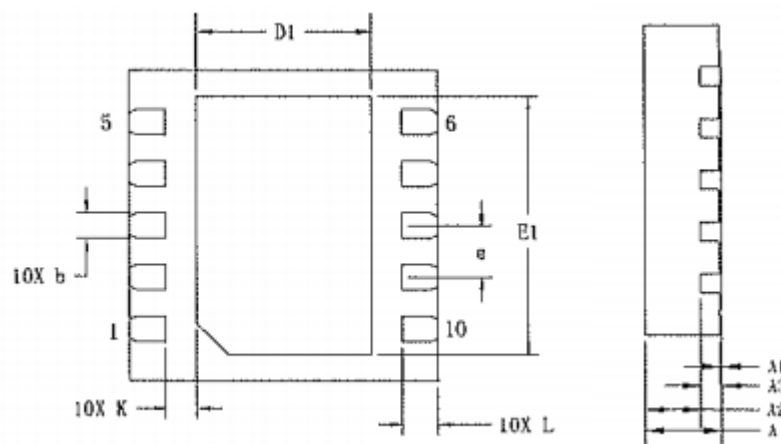


Figure 3. Package dimensions

Unit is mm

Dimension symbols	Numeric		
	Minimum	Nominal	maximum
A	0.70	0.75	0.80
A1	0	0.02	0.05
A2	0.50	0.55	0.60
A3	-	0.203	-
D (E)	2.90	3.00	3.10
D1	1.60	1.70	1.80
E1	2.40	2.50	2.60
L	0.25	0.35	0.45
e	-	0.50	-
b	0.20	0.25	0.30
k	-	0.30	-

8. Ordering Information

Table 3. Product ordering information

Product Model	Package	Packaging materials	Quality Grade	Detailed specifications	Product Status
BST62420	PDFN10	Plastic packaging	N1 Level	Q/BST 60034-2021	Assessment