BST54610

1. Product Overview

BST54610 is a power management chip with an input voltage of 3~6V and an adjustable output voltage. It can provide a load capacity of 6A and is mainly used for memory power consumption. The internal frequency of the chip is 350kHz. At the same time, the chip operating frequency can be adjusted by adjusting the parameters of external components. The frequency can be adjusted in the range of 280k H z ~700k H z. At the same time, the chip integrates over-temperature protection and over-current protection.

2. Product Features

- Wide PWM frequency : fixed 350kHz or adjustable 280kHz ~ 700kHz.
- 47 mΩ, 12A peak MOSFET switch for high efficiency at 6A continuous output source or sink current.
- Loads are protected by peak current limiting and thermal shutdown.
- PSSOP28 package.

3. Functional Block Diagram

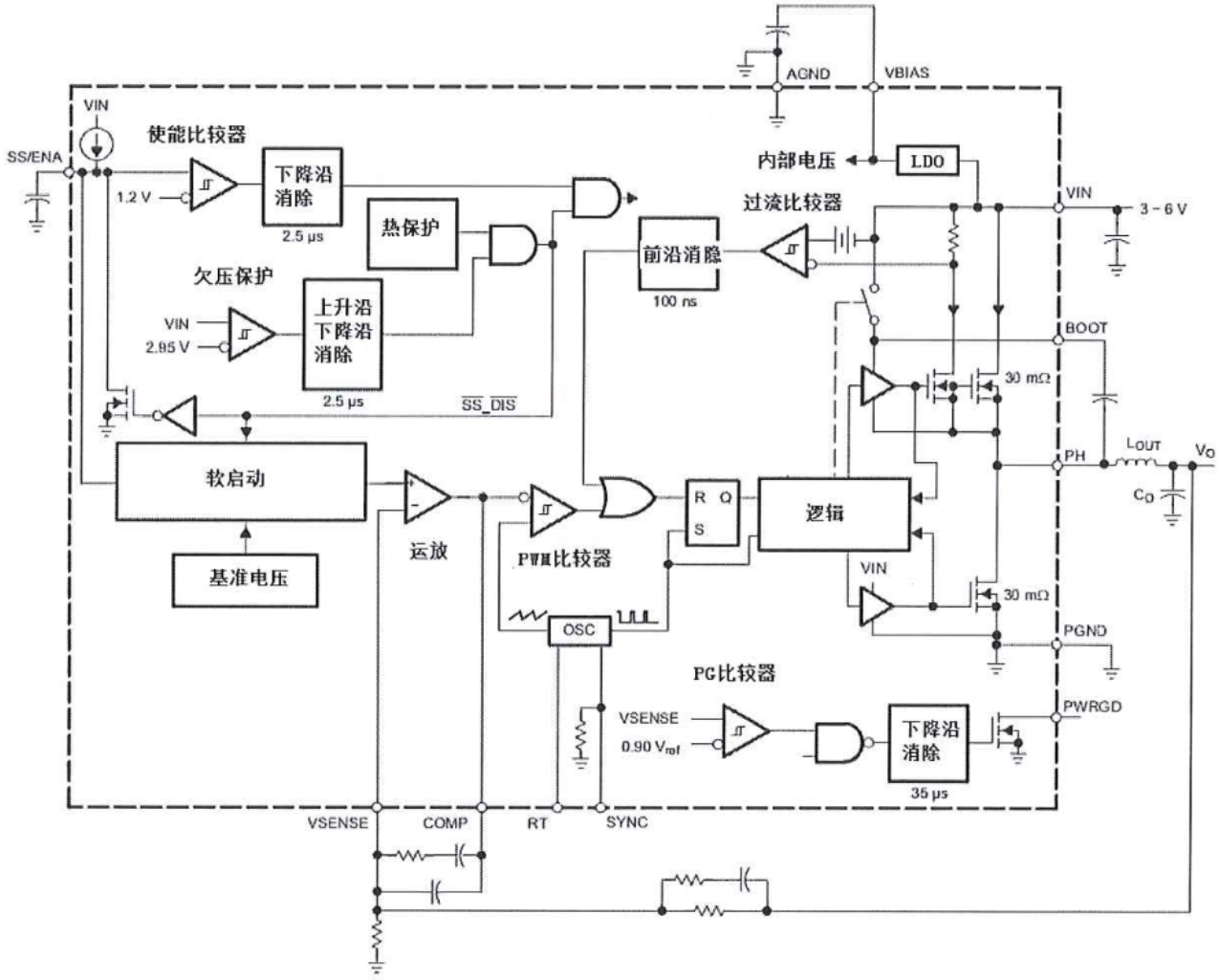


Figure 1. Functional Block Diagram

4. Pin Information

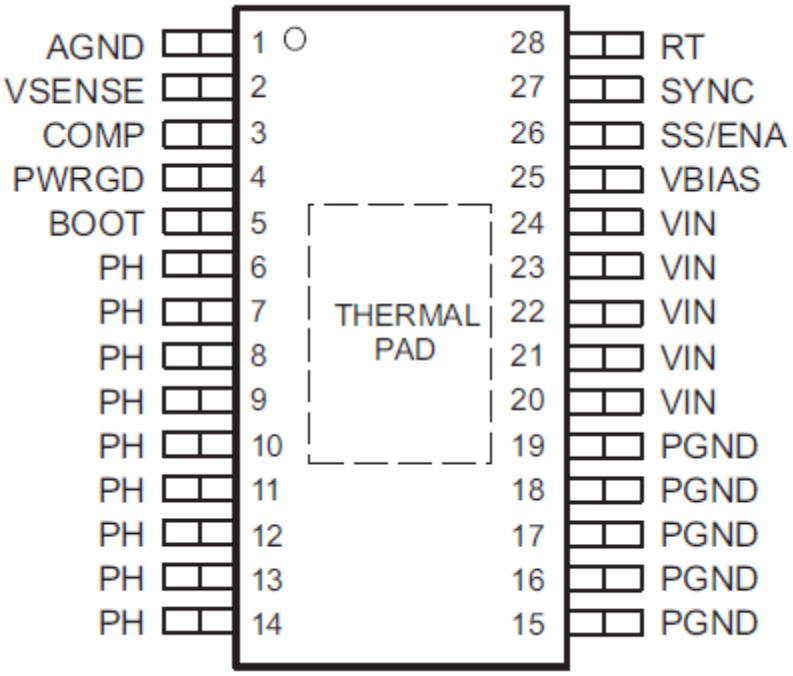


Figure 2. BST54610PSSOP28X package outline and pin arrangement

The pin description of BST54610PSSOP28X is shown in the following table.

Table 1. Pin Description

Pin number	symbol	Function
AGND	1	Analog Ground
BOOT	5	Bootstrap Output
SYNC	2 7	Sync Input
COMP	3	Error amplifier output
PGND	15-19	Power Ground
PH	6-14	Phase output
PWRGD	4	Power Good Output
RT	28	Frequency setting resistor input
SS/ENA	2 6	Soft-Start/Enable Input
VBIAS	25	Internal power supply voltage output
VIN	20-24	Input Power
VSENSE	2	Error amplifier negative input

5. Absolute Maximum Ratings and Recommended Operating Ranges

Absolute Maximum Ratings

Serial number	Parameter name	Parameter Value
1	Input voltage (VIN terminal, SS/EN terminal, SYNC terminal)	-0.3V～7V
2	Input voltage (RT terminal)	-0.3V～6V
3	Input voltage (VSENSE terminal)	-0.3V～4V
4	Input voltage (BOOST terminal)	～
5	Output voltage (VBIAS terminal, PWRGD terminal, COMP terminal)	-0.3V～7V
6	Output voltage (PH terminal)	-0.6V～10V
7	Storage ambient temperature (T_{stg})	-65°C ～ +150°C
8	Lead wire soldering temperature resistance (*Th*)	360°C
9	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	Input power (VIN)	3V～6V
2	Operating environment temperature (T_A)	-55°C～125°C

6. Electrical characteristics parameters

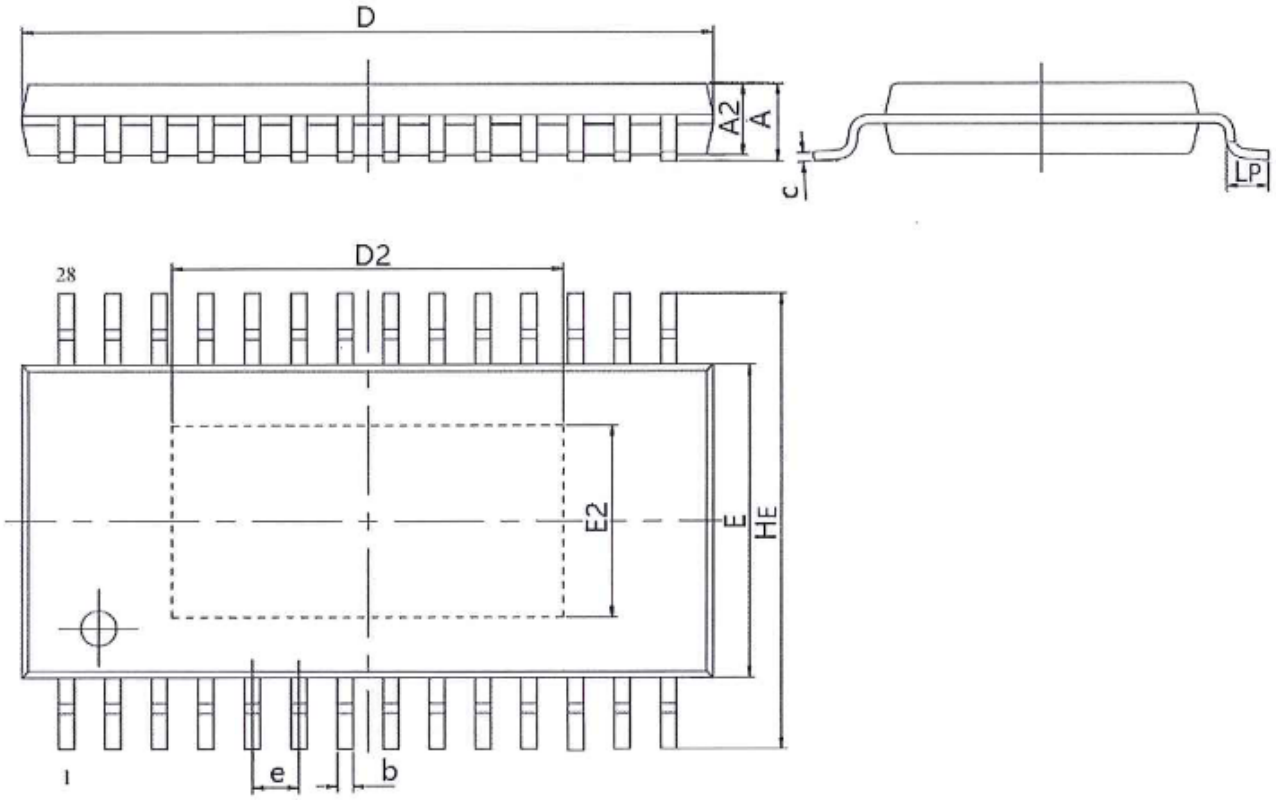
The electrical characteristics are the best indicators that this series of products can achieve. Different quality levels and packaging forms are slightly different. Please refer to the corresponding detailed specifications for details .

Table 2. Electrical characteristics

characteristic	symbol	Condition (Unless otherwise specified , V_{IN} =5.0V, -55 °C ≤ T_A ≤125 °C)	Limit value		unit
			Minimum	maximum	
Quiescent Current	*Q*	*fs* = 550 kHz, *VSYNC* ≥ 2.5 V, RT floating, PH pin floating	0	twenty four	mA
		fs = 350 kHz, *VSYNC* ≤ 0.8 V, RT floating, PH pin floating	0	16	
		Shutdown, $VSS_{/ENA}$ = 0V		1.4	
Input undervoltage protection threshold	V_{STP}	Input falling threshold voltage, T_A = 25 °C	2.7	—	V
Hysteresis Voltage	V_H		0.1	—	V
BIAS output voltage	V_{OB}	I_{VBIAS} =0V, T_A = 25 °C	2.7	2.95	V
V ref accuracy		T_A = 25 °C	0.8 91	0.9 09	V
SYNC high threshold	V_{SYNC-H}		2.5	—	V
SYNC low threshold	V_{SYNC-L}		—	0.8	V
EN/SS Threshold	V_{EN-H}		2.5	—	V
	V_{EN-L}		—	0.4	V
Internal soft start time	t_{start}		2	4	ms
SS charging current	I_{SS}	$VSS_{/ENA}$ = 0 V	3	8	μA
PWGRD threshold	V_{PG_F}	V_{sense} falling edge	7 5	9 0	%
Output saturation voltage (PWRGD pin)	V_{OS}	I_{sink} =2.5mA	—	0.3	V
Leakage current (PWRGD pin)	1_L	V_I =5.5V	—	1.0	μA
On-resistance	$r_{DS(on)}$	*V* in =6V, bottom tube, T_A = 25 °C	0	47	mΩ
frequency	F_{SW}	V_{SYNC} ≤ 0.8 V, RT floating	280	420	K Z
		V_{SYNC} ≥ 0.8 V, RT floating	440	660	
		R_T = 180 kΩ	252	308	
		RT = 100 kΩ	460	540	
		R_T = 68 kΩ	663	762	

7. Dimensions

BST54610PSSOP28X package shape and pin arrangement are shown in the figure below.



单位为毫米

尺寸符号	数值		
	最小	公称	最大
D	9.50	—	9.90
H_E	6.10	—	6.70
E1	4.20	—	4.60
e	—	0.65	—
b	0.15	—	0.33
c	0.10	—	0.20
L_P	0.40	—	0.80
D2	—	5.50	—
E2	—	2.70	—
A	—	—	1.30
A2	0.70	—	1.10

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	BST54610PSSOP28E	PSSOP28	plastic	Military Temperature	Copper tinning	0.11	9.7 × 6.4 × 1	Q/BST 50615-2024
2	BST54610PSSOP28M3	PSSOP28	plastic	N1	Copper tinning	0.11	9.7 × 6.4 × 1	Q/BST 50625-2024

Note 1:

a) N /N1 level devices meet the N /N1 level screening requirements of GJB 7400 "General Specification for Semiconductor Integrated Circuits for Qualified Manufacturer Certification ".

b) Military temperature grade devices meet the screening requirements of Q / BST40020-2018 "General Specifications for Huawei Military Temperature Grade Products", and their operating environment temperature range should be -55 ℃ ～+ 125℃.

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.