BSTCH28S12

DC/DC Converter

Data Sheet v.1.0

I. Product Introduction

BSTCH28S12 is a single-channel 1.2V / 0.125A, 1.5W DC/DC converter manufactured using thick-film hybrid integrated circuit technology and a fully sealed metal casing. It is used in DC power supply systems to achieve DC voltage conversion.

II. Product Performance Indicators

The electrical characteristics shall conform to the specifications in Table 1.

Table 1. Electrical Characteristics

CHARACTERISTIC	SYMBOL	CONDITION (UNLESS OTHERWISE SPECIFIED) -55°C ≤ T_C ≤ 125°C V_I = 28V±0.5 V, C_L = 0.1μF)	GROUP A GROUPING	LIMIT VALUE		UNIT
				MINIMUM	MAXIMUM	
Output voltage	V_O	V_I =12V ~ 50V, I_O =125mA	1	11.88	12.12	V
			2,3	11.52	12.48	
Output current	I_O	V_I = 12V～50V	1,2,3	-	125	mA
Output ripple voltage (Peak-to-peak value)	V_{RIP}	I_O = 125mA, BW ≤ 20MHz	1	-	50	mV
			2,3		60	
Voltage regulation	S_V	V_I = 12V → 50V, I_O = 125mA	1,2,3	-	50	mV
Current regulation	S_I	I_O = 0mA → 125mA	1,2,3	-	50	mV
Input current	I_I	No load, prohibit the connection of the terminal to the input ground terminal.	1,2,3	-	10	mA
		No load, no open circuit allowed			20	
Input ripple current (peak-to-peak value)	I_{RIP}	BW ≤ 20MHz , I_O = 125mA	1	-	30	mA
			2,3		40	
Efficiency	η	I_O = 125mA	1	72	-	%
			2,3	70		
Short-circuit power consumption	P_D	Output short circuit	1,2,3	-	4.5	W
Insulation resistance	R_I	Apply 500VDC between the input/output terminals or between any of the leads (except pin 5) and the casing. T_A = 25℃	1	100	-	MΩ

Table 1. (continued)

CHARACTERISTIC	SYMBOL	CONDITION (UNLESS OTHERWISE SPECIFIED) -55°C ≤ T_C ≤ 125°C V_I = 28V±0.5 V, C_L = 0.1μF)	GROUP A GROUPING	LIMIT VALUE		UNIT
				MINIMUM	MAXIMUM	
Startup threshold	V_{ION}	Input voltage from 0V → 12V	1,2,3	6.5	11.8	V
capacitive load [a]	C_L	No effect on DC parameters, T_A = 25 ℃	4	-	200	μF
Switching frequency	f_s	I_O = 125mA	4,5,6	325	475	kHz
Output voltage change (peak value) during load transients [bc]	V_{LT}	50% load → Full load or Full load → 50% load	4,5,6	-300	300	mV
Recovery time of output voltage during load transients [bcd]	t_{LT}	50% load → Full load or Full load → 50% load	4,5,6	-	400	μs
Output voltage change (peak value) during input voltage transients [be]	V_{VT}	Input voltage V_I: 12V→50V, I_O = 125mA	4,5,6	-400	400	mV
Output voltage recovery time during input voltage transient [bde]	t_{VT}	Input voltage V_I: 12V→50V, I_O = 125mA	4,5,6	-	400	μs
Start-up overshoot (peak value)	V_{TO}	Input voltage V_I: 0V→28V, I_O = 125mA	4,5,6	-	50	mV
Startup delay [f]	t_d	Input voltage V_I: 0V→28V, I_O = 125mA	4,5,6	-	20	ms

a. Capacitive load can be any value from 0 to the maximum limit, without affecting DC parameters;
b. This parameter is guaranteed by design and is only tested during the initial quality conformity inspection and design or process changes.
c. The jump time of the load should be greater than 10μs;
d. The recovery time refers to the time from the start of the jump until the output voltage returns to within ±1% of the corresponding stable value;
e. The jump time of the input voltage should be greater than 10μs;
f. The start-up delay time can be calculated either from the power supply transition or from when the grounded prohibition terminal is disconnected.

III. Shape and Dimensions

The outer casing shape should conform to the specifications in Figure 1.

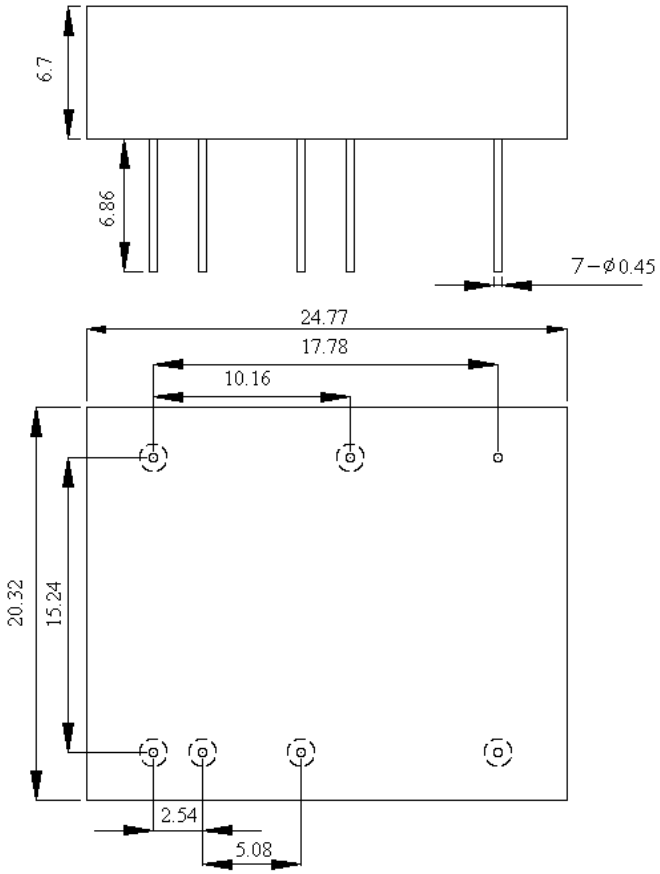

Figure 1. External Dimensions

The unit is millimeters

IV. Functional Description of Lead-Out Pins

The arrangement of the leads should conform to the specifications in Figure 2.

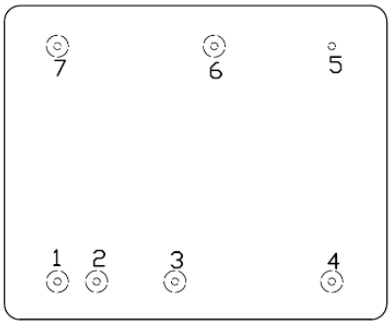

Figure 2. Arrangement of lead-out ends (top view)

Table 2

LEAD-OUT SERIAL NUMBER	SYMBOL	ACHIEVEMENT ABLE	LEAD-OUT SERIAL NUMBER	SYMBOL	ACHIEVEMENT ABLE
1	V_I	Input positive	5	CASE	Case
2	GND_I	Input common	6	N/C	N/C
3	V_O	Output positive	7	INH	Inhibit
4	GND_O	Output common	-	-	-

V. Typical Application Diagram

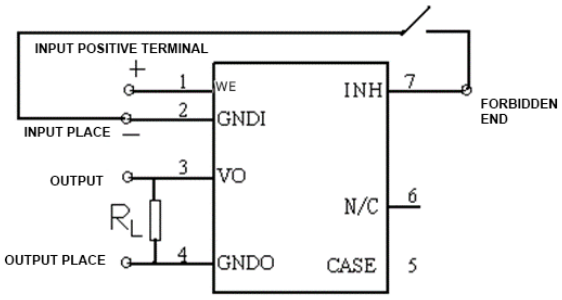

Figure 2. Typical application diagram

VI. Application Instructions

Application description of the prohibited terminal function:

The input ground is disabled and there is no output; when the disable function is not in use, the disable terminal is left floating.

VII. Precautions

1. Do not reverse the power supply polarity; pay attention to the input voltage range.

2. Prevent product collisions;

3. Pay attention to the "1" pin marking. Install and solder the board according to the correct installation direction. The pin closest to the "△" marking on the product casing surface is pin 1.

4. Heat sinks or other heat dissipation measures should be installed to ensure that the case temperature is below the product's specified operating temperature range. The product's operating temperature range is: -55℃ ≤ T_C ≤ 125℃.

5. The lead-out feet (excluding the outer casing feet) are connected to the metal casing by glass insulators. Bending or impacting the lead-out feet is prohibited. For products with flanges, the product should be fixed to the structural components before welding the lead-out feet. For products without flanges, epoxy adhesive should be used to reinforce the connection between the casing and the structural components after welding.

6. The product cannot be assembled by reflow soldering, wave soldering or wave soldering. It is recommended to use manual soldering for the pins. The soldering temperature should be below 300℃ and the soldering time should not exceed 10 seconds.