

## BSTCH28S05

### DC/DC Converter

### Data Sheet v.1.0

#### I. Product Features

BSTCH28S05 DC/DC converter is manufactured using thick-film hybrid integrated circuit technology and features a fully sealed metal casing. This product offers a single 5V isolated output. It is compact, has low output ripple, excellent output stability, strong transient load capacity, and input-output isolation, making it suitable for operation over a full temperature range.

#### II. Product Performance Indicators

Table 1

CHARACTERISTIC	SYMBOL	CONDITION (UNLESS OTHERWISE SPECIFIED) -55°C ≤ T <sub>C</sub> ≤ 125°C V <sub>I</sub> = 28V±0.5 V, C <sub>L</sub> = 0.1μF)	GROUP A GROUPING	LIMIT VALUE		UNIT
				MINIMUM	MAXIMUM	
Output voltage	V <sub>O</sub>	V <sub>I</sub> = 12V ~ 50V, I <sub>O</sub> = 300mA	1	4.95	5.05	V
			2,3	4.80	5.20	
Output current	I <sub>O</sub>	V <sub>I</sub> = 12V ~ 50V	1,2,3	-	300	mA
Output ripple voltage (Peak-to-peak value)	V <sub>RIP</sub>	BW ≤ 20MHz, I <sub>O</sub> = 300mA	1		80	mV
			2,3		100	
Voltage regulation	S <sub>V</sub>	V <sub>I</sub> = 12V → 50V, I <sub>O</sub> = 300mA	1,2,3	-	50	mV
Current regulation	S <sub>I</sub>	I <sub>O</sub> = 0mA → 300mA	1,2,3	-	50	mV
Input current	I <sub>I</sub>	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 <sub>RIP</sub>	BW ≤ 20MHz, I <sub>O</sub> = 300mA	1	-	30	mA
			2,3		40	
Efficiency	η	I <sub>O</sub> = 300mA	1	70	-	%
			2,3	68		
Insulation resistance	R <sub>I</sub>	Apply 500VDC between the input/output terminals or between any of the leads (except pin 5) and the casing; T <sub>A</sub> = 25°C	1	100	-	MΩ

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				MINIMUM	MAXIMUM	
Short-circuit power consumption	P <sub>D</sub>	Output short circuit	1,2,3	-	4	W
Startup threshold	V <sub>ION</sub>	Input voltage from 0V → 12V	1,2,3	6.5	11.8	V
Capacitive load <sup>a</sup>	C <sub>L</sub>	No effect on DC parameters, T <sub>A</sub> = 25°C	4	-	500	μF
Switching frequency	f <sub>s</sub>	I <sub>o</sub> = 300mA	4,5,6	325	475	kHz
Output voltage change (peak value) during load transients <sup>bc</sup>	V <sub>LT</sub>	50% load → Full load or Full load → 50% load	4,5,6	-500	500	mV
Recovery time of output voltage during load transients <sup>bcd</sup>	t <sub>LT</sub>	50% load → Full load or Full load → 50% load	4,5,6	-	600	μs
Output voltage change (peak value) during input voltage transients <sup>be</sup>	V <sub>VT</sub>	Input voltage V <sub>I</sub> : 12V → 50V, I <sub>o</sub> = 300mA	4,5,6	-400	400	mV
Output voltage recovery time during input voltage transient <sup>bde</sup>	t <sub>VT</sub>	Input voltage V <sub>I</sub> : 12V → 50V, I <sub>o</sub> = 300mA	4,5,6	-	600	μs
Start-up overshoot (peak value)	V <sub>TO</sub>	Input voltage V <sub>I</sub> : 0V → 28V, I <sub>o</sub> = 300mA	4,5,6	-	25	mV
Startup delay <sup>f</sup>	t <sub>d</sub>	Input voltage V <sub>I</sub> : 0V → 28V, I <sub>o</sub> = 300mA	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 external dimensions shall conform to the provisions of GB/T15138 and Figure 1.

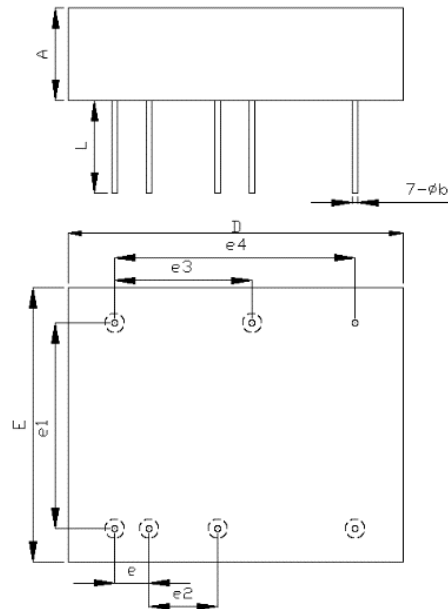


Figure 1. External dimensions of BSTCH28S05

Table 2

The unit is millimeters

DIMENSION SYMBOLS	NUMERICAL VALUES		
	MINIMUM	NOMINAL	MAXIMUM
A	-	-	6.90
$\Phi b$	0.40	-	0.50
D	-	-	24.87
E	-	-	20.42
E	-	2.54	-
$e_1$	-	15.24	-
$e_2$	-	5.08	-
$e_3$	-	10.16	-
$e_4$	-	17.78	-
L	6.61	-	7.11

Notes: Unspecified tolerances shall comply with GB/T m-level execution in 1804-2000.

## IV. Description of Lead-Out Pin Functions

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

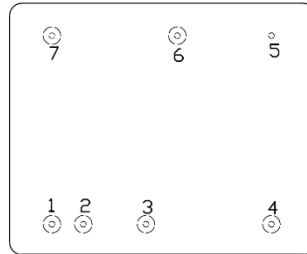


Figure 2. Lead-out terminal arrangement diagram

Table 3

LEAD-OUT SERIAL NUMBER	SYMBOL	FUNCTION	LEAD-OUT SERIAL NUMBER	SYMBOL	FUNCTION
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. Test Schematic Diagram

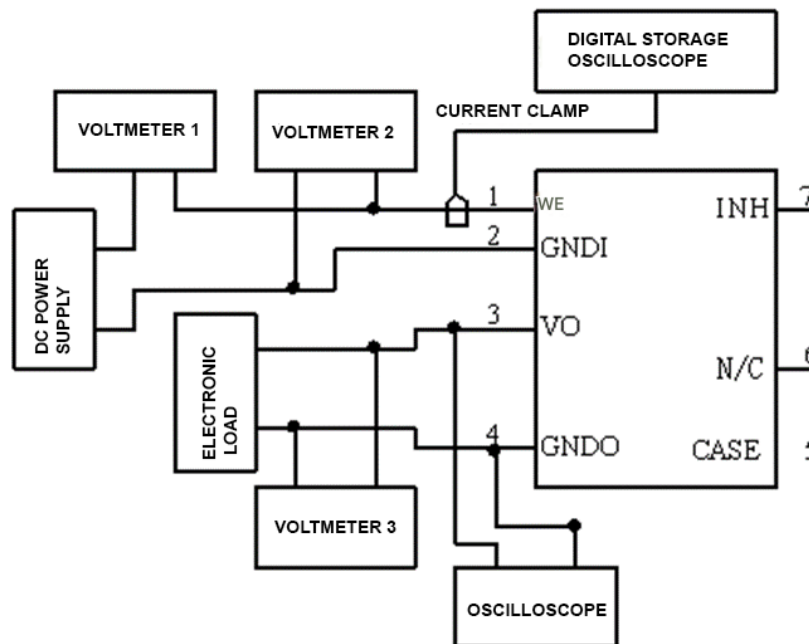


Figure 3. Test principle block diagram

Multimeter 1 (ammeter) measures the input current  $I_{in}$ , multimeter 2 (voltmeter) measures the input voltage  $V_{in}$ , and multimeter 3 (voltmeter) measures the output voltage  $V_o$ . The electronic load has an output current of 300mA, and its output current is also measured. (If a resistive load is used, a digital multimeter needs to be added to the output terminal to measure its output current. The load resistor should be  $17 \Omega$ . The oscilloscope measures the output ripple voltage; to avoid interference, the ripple voltage should be measured using a proximity method whenever possible.

## VI. Application

Power the corresponding modules in the system.

## VII. Precautions

The following are precautions for hybrid circuits.

- Prevent the circuit from being bumped;
- Protect the glass insulators of the pins; do not bend or bump the pins;
- Trim any excess pin length before installation.