BSTSA28D12F

DC/DC Converter

Data Sheet v.1.0

I. Product Features

BSTSA28D12F DC/DC converter is an isolated output DC/DC converter. This product has dual outputs, stable parameters, and good consistency. It features a fully sealed metal casing, making it robust and highly reliable.

II. Product Performance Indicators

Table 1

CHARACTERISTIC	SYMBOL	CONDITION (UNLESS OTHERWISE SPECIFIED) -55°C ≤T_C≤125°C V_I = 28 V±0.5V, C_L =0.1uF)		GROUP A GROUPING	LIMIT VALUE		UNIT
					MINIMUM	MAXIMUM	
Output voltage	V_{O1}	I_{O1} = I_{O2} =250mA, V_I =15V ~ 50V		1	11.88	12.12	V
				2,3	11.82	12.18	
	V_{O2}			1	-12.20	-11.80	
				2,3	-12.48	-11.52	
Output current	I_{O1}	V_I = 15V～50V		1,2,3	-	250	mA
	I_{O2}						
Output ripple voltage (Peak-to-peak value)	V_{RIP1}	I_{O1} = I_{O2} = 250mA BW ≤ 20MHz		1,2,3	-	65	mV
	V_{RIP2}						
Voltage regulation	S_{V1}	V_I = 15V→50V, I_{O1} = I_{O2} = 250mA	12V circuit	1,2,3	-	25	mV
	S_{V2}		-12V circuit			100	
Current regulation	S_{I1}	I_{O1} = I_{O2} = 0mA → 250mA, both outputs change simultaneously.	12V circuit	1,2,3	-	50	mV
	S_{I2}		-12V circuit			100	
Cross adjustment degree	V_C	I_{O1} = 75mA I_{O2} =75mA→175mA; I_{O2} = 75mA I_{O1} =75mA→175mA	12V circuit	1,2,3	-	450	mV
			-12V circuit				
Input current	I_I	I_{O1} = I_{O2} = 0mA, disable the input ground terminal.		1,2,3	-	6	mA
		I_{O1} = I_{O2} = 0mA, prohibiting open circuit at the terminal.		1,2,3	-	60	

Input ripple current (Peak-to-peak value)	I_{RIP}	BW ≤ 20MHz I_{O1} = I_{O2} = 250mA	1,2,3	-	50	mA
Efficiency	η	I_{O1} = I_{O2} = 250mA	1,2,3	73	-	%
Insulation resistance	R_I	D_C between the input/output terminals or between any of the leads (except for the 8-pin terminal) and the casing.	1	100	-	MΩ
Short-circuit power consumption	P_D	Output short circuit	1,2,3	-	3	W
capacitive load [a]	C_{L1}	I_{O1} = I_{O2} = 250mA	4	-	500	μF
	C_{L2}					
Switching frequency	f_e	I_{O1} = I_{O2} = 250mA	4,5,6	350	500	kHz
Output voltage change (peak value) during load transients [bc]	V_{LOR1}	I_{O1} = I_{O2} =125mA → 250mA or I_{O1} = I_{O2} =250mA → 125mA, Each output has a balanced load.	4,5,6	-300	300	mV
	V_{LOR2}					
Recovery time of output voltage during load transients [(bcd)]	t_{LOR1}	I_{O1} = I_{O2} =125mA → 250mA or I_{O1} = I_{O2} =250mA → 125mA, Each output has a balanced load.	4,5,6	-	450	μs
	t_{LOR2}					
Output voltage change (peak value) during input voltage transients [be]	V_{V0R}	Input voltage V_I: 16V→ 40V, I_{O1} = I_{O2} = 250mA Input voltage V_I: 40V→ 16V, I_{O1} = I_{O2} = 250mA	4,5,6	-1200	1200	mV
Output voltage recovery time during input voltage transient [bde]	t_{VOR}	Input voltage V_I: 16V→40V, I_{O1} = I_{O2} = 250mA	4,5,6	-	500	μs
		Input voltage V_I: 40V→ 16V, I_{O1} = I_{O2} = 250mA				
Turn-off voltage [b]	Voff	I_{O1} = I_{O2} = 250mA	1,2,3	11	14.5	V
Start-up overshoot (peak value)	V_{TO1}	Input voltage V_I: 0V → 28V, I_{O1} = I_{O2} = 250mA	4, 5, 6	-	50	mV
	V_{TO2}					
Startup delay [f]	t_{TR1}	Input voltage V_I: 0V → 28V, I_{O1} = I_{O2} = 250mA	4,5,6	-	20	ms
	t_{TR2}					

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 10 μs;
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 10 μs;
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.

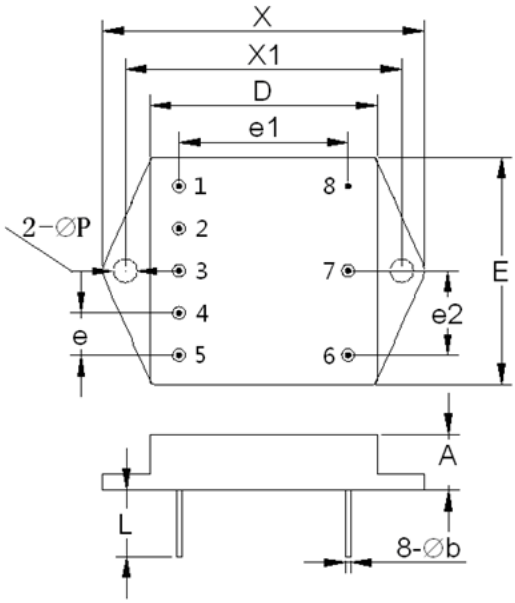

Figure 1. External dimensions (including mounting holes)

Table 1

The unit is millimeters

RULER INCH TALISMAN NUMBER	NUMERICAL VALUES		
	MINIMUM	NOMINAL	MAXIMUM
A	-	-	6.86
Φb	0.54	-	0.74
D	-	-	27.31
E	-	-	27.31
e	-	5.08	-
e_1	-	20.32	-
e_2	-	10.16	-
L	4.91	-	5.51
ΦP	-	2.80	-
X_1	-	33.20	-
X	-	-	38.70
Notes: 1. Unspecified tolerances shall be in accordance with GB/T m-level execution in 1804-2000; 2. The interchangeability of e, e_1, and e_2 dimensions is guaranteed by the housing manufacturing process and is not subject to assessment requirements in this specification.			

IV. Functional Description of Lead-Out Pins

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

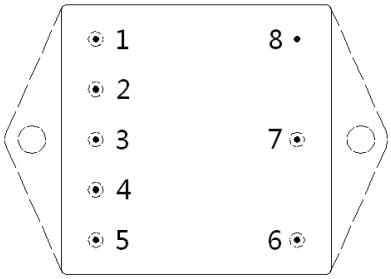

Figure 2. Arrangement of lead-out ends (top view)

Table 2

LEAD-OUT SERIAL NUMBER	SYMBOL	FUNCTION	LEAD-OUT SERIAL NUMBER	SYMBOL	FUNCTION
1	V_O	Output positive	5	INH	Inhibit
2	GND_O	Output common	6	IN	Input positive
3	V_{O2}	Output negative	7	GND_I	Input common
4	NC	N/C	8	GND_C	Case

V. Test Schematic Diagram

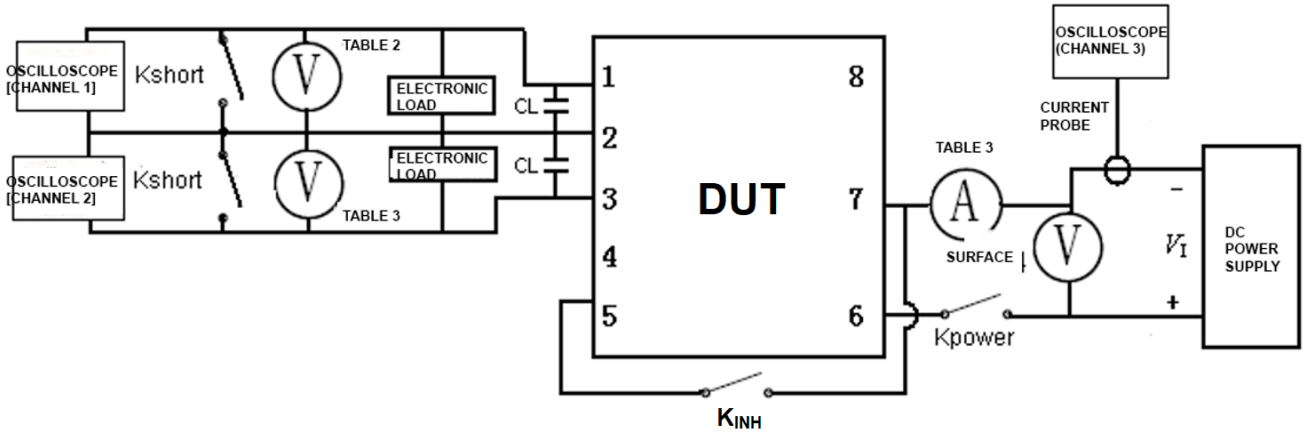

Figure 3

Multimeter 4 (voltmeter) measures its input voltage Vin, multimeter 1 (ammeter) measures its input current $A_{IN,}$ and multimeters 2 and 3 (voltmeters) measure its output voltage V_O. The electronic load carries its 0.25 A output current load. The oscilloscope measures the output ripple voltage. To avoid interference, the ripple voltage test should be performed using a proximity measurement 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.