

BST100-461-50/BST100-461-80

EMI Filter

Product Description

Model BST100-461-50 and Model BST100-461-80 EMI filter are specifically designed for 100V input voltage DC/DC converter. The main function is to reduce both input line reflection ripple current and electromagnetic interference of power supply. Both model filters can be used with a single DC/DC converter connected in series, or be used with multiple parallel DC/DC converter, however the total current of filter must be less than rated value 0.5A and 0.8A BST100-461-50 model and BST100-461-80 model respectively.

Product features

- Operating temperature range (TC) : -55°C~+125°C ;
- Input DC voltage range : 80 V~120V, typically 100V ;
- Circuit structure : two levels of common mode filtering, one level of differential mode filtering ;

MTBF: $\geq 2 \times 10^6$ h; Weight: 30g~40g;

Dimensions: 51.00mm×28.94 mm×8.68mm;

Application scope

Aerospace Systems, communication system, satellite, manned space engineering.

Operating conditions

Maximum rating

Model BST100-461-50 :

Output Power (PO : 70W (Output current less than 0.5A) ;

Input Voltage(VI : -0.5V~140V ;

Operating Temperature (TC : -55°C~125°C ;

Storage Temperature (Tstg) : -65°C~150°C ;

Lead temperature (Th) : 300 °C(10s)。

Model BST100-461-80 :

Output Power (PO) : 112W (Output current less than 0.8A) ;

Input Voltage (VI) : -0.5V~140V ;

Operating Temperature (TC) : -55°C~125°C ;

Storage Temperature (Tstg) : -65°C~150°C ;

Lead temperature (Th) : 300 °C(10s)。

Notes: Device can not work with two or more maximum ratings at the same time.

Recommended operating conditions

Model BST100-461-50 :

Input Voltage (VI) : 80V~120V ;

Operating Temperature (TC) : -55°C~125°C ;

Output current : 0.5A Model BST100-461-80 :

Input Voltage (VI) : 80V~120V ;

Operating Temperature (TC) : -55°C~125°C ;

Output current : 0.8A。

1.4 Marking and Designation

1.4.1 Marking

Device marking mainly includes the following items.

- Device identification number ;
- Orientation point ;
- Lot identification code or date code ;

- Manufacturer or trademark ;
- Serial number ;
- (ESDS) identification code ;

Device identification code is defined as follow.

BST100-461-80 (50)	M	C
Device number	Package type	Lead finish

Besides, each device has an unique continuous number and should be labeled to identify the identification code of the sealing week. Equilateral triangle (Δ) serves as a mark of electrostatic sensitive devices, also as the first pin.

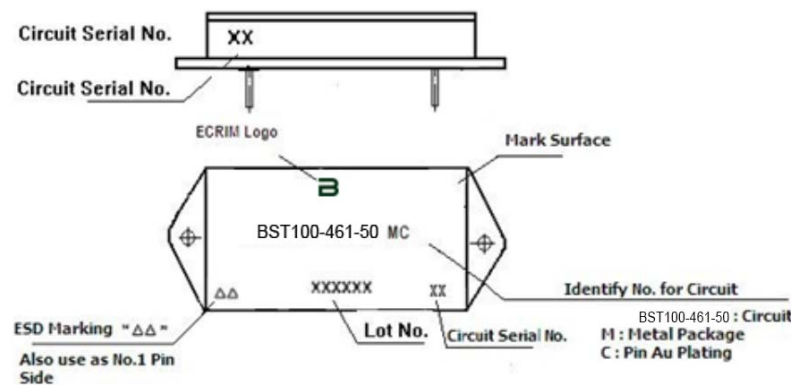
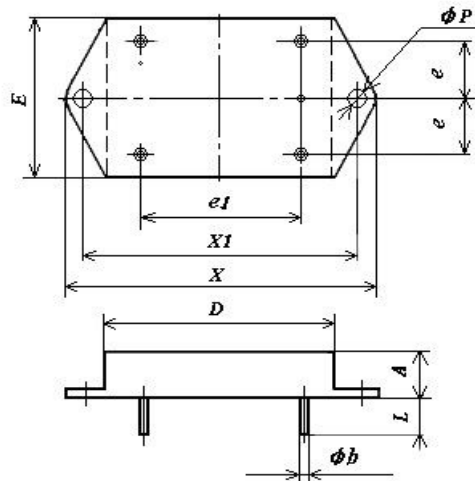


Fig1. BST100-461-50 Diagram of the device marking

Mechanical Specifications

Mechanical specifications for both Model BST100-461-50 and Model BST100-461-80 EMI filters are shown in Fig 3:

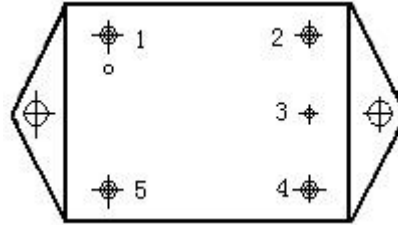


Units mm

Symbol	Data		
	Min	Typical	Max
A	-	-	8.38
ϕb	0.66	-	0.86
D	-	-	37.08
E	-	-	28.70
e	-	10.16	-
e1	-	25.40	-
L	-	-	6.60
ϕP	3.00	-	3.60
X1	-	43.95	-
X	-	50.80	-

Fig. 3. Model BST100-461-50 and Model BST100-461-80 EMI filters mechanical specifications

Pin Designation



Pin out is shown in Fig 4.

Fig.4. Pin layout arrangement (Bottom View)

Pin	Symbol	Designation	Pin	Symbol	Designation
1	V_{in}	Positive Input	4	GND_{out}	Output Common
2	V_{out}	Positive Output	5	GND_{in}	Input Common
3	GND_c	Case Ground			

Electrical specifications

Electrical characteristics for Model BST100-461-50 and Model BST100-461-80 EMI filters are shown in Table 1 and Table 2.

Table 1. Model BST100-461-50 Electrical Characteristics

No	Features	Symbol	Conditions (unless otherwise specified, $V_I=100V\pm0.5V$ - $55^{\circ}C\leq TC\leq125^{\circ}C$)	Group A	Limit		Units
					min	max	
1	Input voltage	V_{in}	series	1,2,3	80	120	V

2	Output current	I_{out}	$V_I=80V\sim 120V$, full load	1,2,3	-	0.5	A
3	Output, Input DC Voltage	SOI	Full load	1,2,3	96	-	%
4	Noise Suppression	N_o	Test frequency 200 kHz	4	35	-	dB
			Test frequency 500 kHz	4	45	-	
			Test frequency 1000 kHz	4	40	-	
			Test frequency 2000 kHz	4	40	-	
5	Insulated resistance	RISO	200Vdc between output, input Common and case	1	100	-	MΩ

Tab.2. BST100-461-80 Electrical Characteristics

No	Features	Symbol	Condition ((unless otherwise specified, $V_I=100V\pm 0.5V$ $-55^{\circ}C\leq TC\leq 125^{\circ}C$)	Group A	Limit		Units
					min	max	
1	Input Voltage	V_{in}	series	1,2,3	80	120	V
2	Output Current	I_{out}	$V_I=80V\sim 120V$, Full load	1,2,3	-	0.8	A
3	Output, Input DC Voltage	SOI	Full load	1,2,3	96	-	%

4	Noise Suppression	No	Test frequency 200 kHz	4	35	-	dB
			Test frequency 500 kHz	4	45	-	
			Test frequency 1000 kHz	4	40	-	
			Test frequency 2000 kHz	4	40	-	
5	Insulated resistance	RISO	200Vdc between Output Common and Shell、input	1	100	-	MΩ

User Manual

Electrical connection

According to numbers of DC-DC converters that are used in the system, combined with space in the system, when calculating each input DC-DC converter [80V]input current, because the input current at low input voltages for maximum. Based on the above calculations, both the numbers and output current of EMI filters needed by the system shall be considered rationally.

A filter can be connected with multiple DC-DC converters, filters and power connections are shown in Fig.5 :

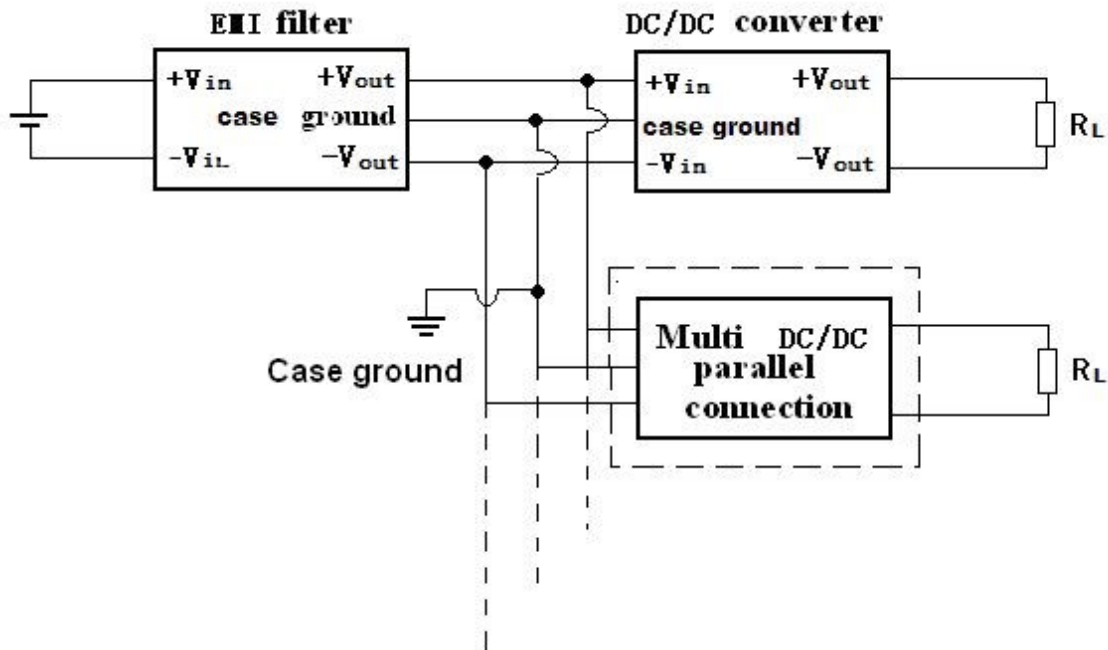


Fig.5. Connections of filter and DC/DC converter

Testing Method of the Devices

Static parameters test diagram for BST100-461-50 and BST100-461-80 E

MI filter is shown in Fig.6 and dynamic parameters testing diagram is shown in Fig.7.

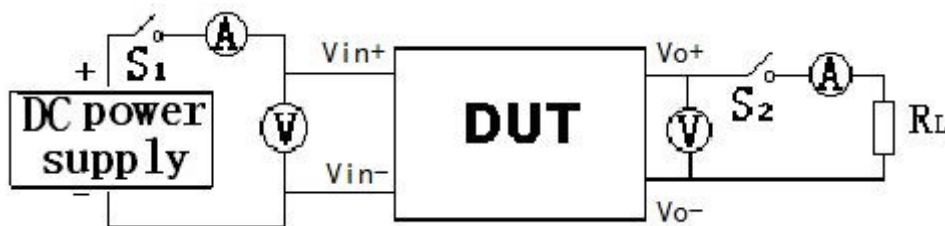


Fig.6. Diagram of static parameter test

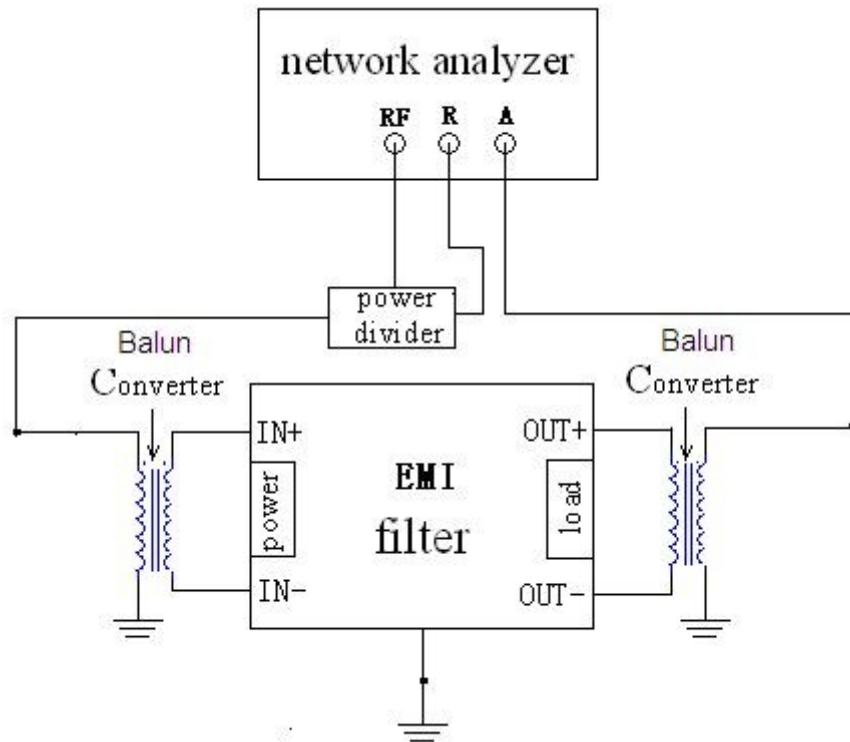


Fig.7. Diagram of dynamic parameter test

MTBF Curve

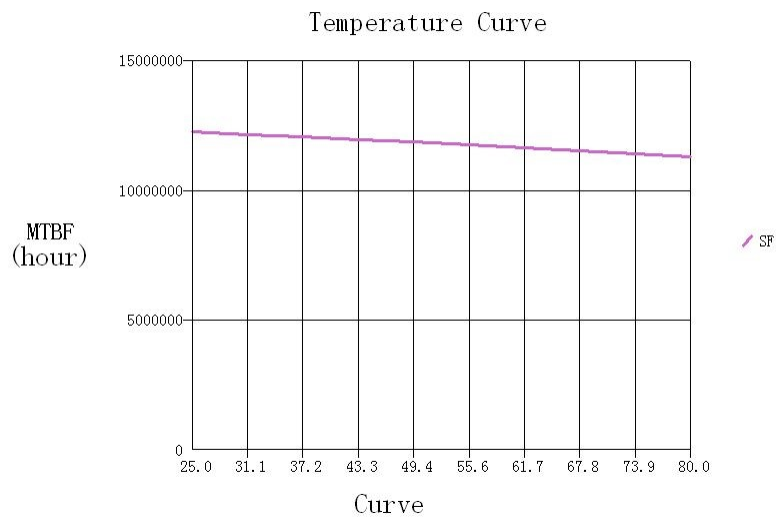


Fig.8. MTBF Curve of BST100-461-50 and BST100-461-80

Internal thermal resistance

Cold-rolled steel with higher thermal conductivity is used as metal case of devices.

Internal thermal resistance is shown in Table 3:

Table 3. Internal thermal resistances

Model	Internal thermal resistance (°C/W)	Heat sink dimensions (mm ³)	Power Consumption(W)	Heat sink material
BST100-461-50	5	10×10×2	0.24	Cu
BST100-461-80	5	10×10×2	0.24	Cu

Application Notes

The principle of mounting filter is to insulate main power supply from DC/DC converter effectively. The filter will not be performed properly if the EMI filter is not correctly mounted, and it may even work the other way.

- It's better to be mounted in the outlet of interference source filter, and to isolate the interference source from filter. If the internal space of interference source is limited, filter shall be mounted near the source of interference power line outlet side. Both the filter case and interference source case shall have a good overlapping joint.
- Both input line and output line of the filter must be separated to avoid coupling an input line and an output line, and reduce filter characteristics. Usually use partition
- type ground fixed filter, if not, shielding lead shall be used to reduce the coupling of common impedance;
- The twisted pair for the connection of filter shall be used, which eliminate part of the high frequency interference
- Pay attention to the selection of voltage, current and leakage current;

- Low frequency characteristic of the filter is related to the volume. In case a good low frequency characteristic is expected, the filter dimensions shall be increased;
- Grounding wire of the filter shall be as short as possible, and the electromagnetic coupling filter between input terminal and output terminal shall be reduced to the minimum, which may not damage the suppressive effect of the shielding structure to the electromagnetic interference noise.

The mounting method of ideal EMI power-supply filter is shown in Fig.9.

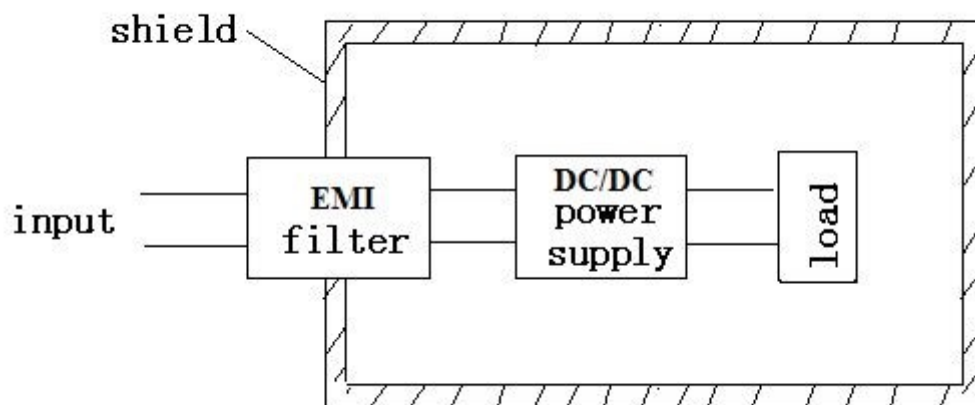


Fig9. Mounting diagram of an ideal EMI power-supply filter