BST 100-461- 100 / BST 100-461- 300

EMI Filter

Product Description

Model BST100-461-100 EMI filter and Model BST100-461-300 EMI filter are made of hybrid integrated circuits, metal package and parallel seam welding process. Input voltage range shall be 80V～120V while maximum operating current is 1.0A and 3.0A respectively. The filters shall meet requirements of DC loss, noise suppression etc and are featured with low start-up surge current, radiation hardness, SEE hardness to LET, and high quality grade etc. Filter model is shown in Table 1. Table 1 EMI filter for 100V input

Filter Model	Input Voltage	Output current
BST100-461-100	80V~120V,typically 100V	1A
BST100-461-300	80V~120V,typically 100V	3A

Product features

- Operating temperature range（TC）：-55℃～+125℃；
- Input DC voltage range：80 V～120V，typically 100V；
- The circuit structure ： two levels of common mode filtering, one level of
- differential mode filtering；
- MTBF：≥2×106h；
- Total dose is 100K rad(Si)
- SEE hardness to LET is up to 65MeV·cm2/mg

Weight：75g～85g；Dimensions：76.70mm×38.60 mm×10.66mm；

Table 2. Rated conditions and recommended operating conditions

(Model BST100-461-300)(100)

Absolute maximum rating	Recommended operating conditions
Input Voltage(VI) ： -0.5V～140V Output Power（PO） ：140W (Model BST100-461-100),output current no more than 1.0A, 420W (Model BST100-461-300), Output current no more than 3.0A） Operating temperature（TC）: -55℃～125℃ Storage Temperature（Tstg） ： -65℃～ 150℃； Lead temperature（Th） ： 300 ℃(10s) Notes: Device can not work with two or more maximum ratings at the same time.	Input Voltage（VI）： 80V～120V Operating Temperature（TC）： -55℃～125℃ Output current：1.0A(ModelBST100-461-100) 3.0A(Model BST100-461-300)

Operating conditions

Application scope

Aerospace Systems, communication system, Satellite manned space engineering.

Marking and Designation

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.

BST100-461-300（100）/SP	M	C	R
Device number	Package type	Lead finish	

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

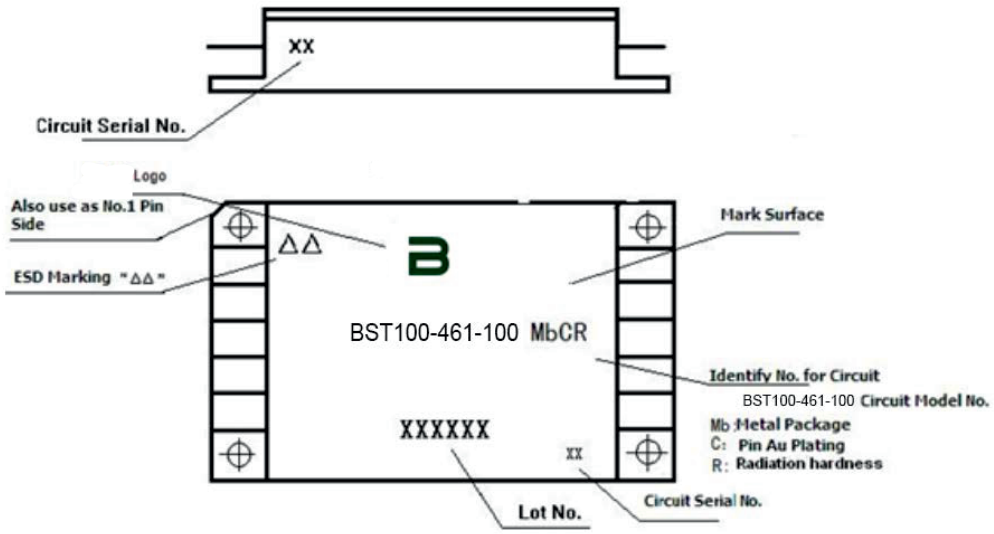
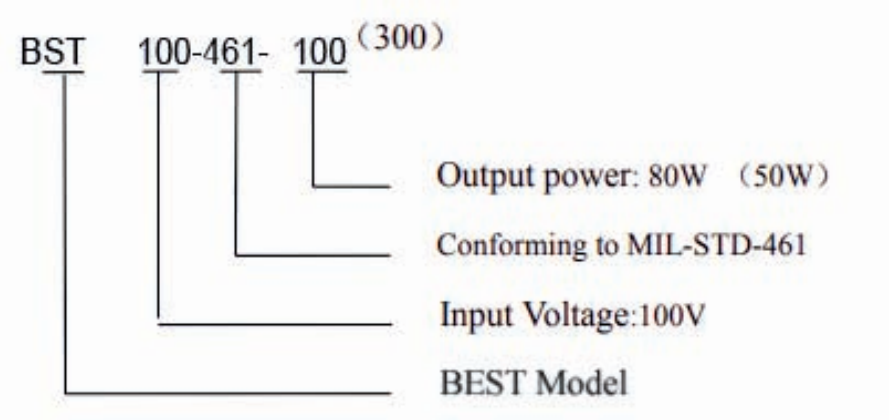


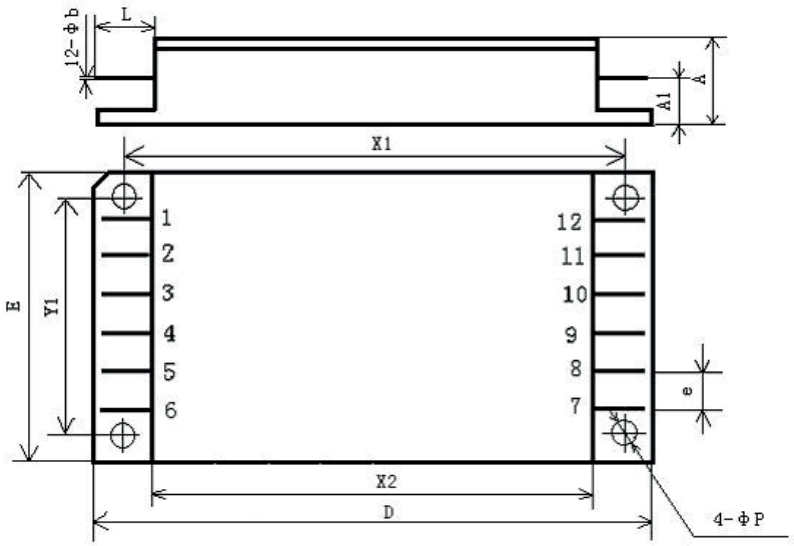
Fig.1. BST100-461-100 Diagram of the device marking

Device Designation



Mechanical Specifications

Mechanical specifications for both Model BST100-461-100 and Model BST100-461-300 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 BST100-461-100 and Model BST100-461-300 EMI filters mechanical specifications

Pin Designation

（Bottom View）

Pin	Symbol	Designation	Pin	Symbol	Designation
1	VIN+	Positive Input	7	VO-	Negative Output
2	VIN+	Positive Input	8	VO-	Negative Output
3	GV	Grand output voltage	9	VO-	Negative Output
4	INH	Inhibit	10	VO+	Positive Output
5	VIN-	Negative Input	11	VO+	Positive Output
6	VIN-	Negative Input	12	VO+	Positive Output

Fig.4. Pin layout arrangement

Electrical specifications

Electrical characteristics for Model BST100-461-100 and Model BST100-461-300 EMI filters are shown in Table 3 and Table 4 ：

Table 3. Model BST100-461-100 Electrical Characteristics

No	Features	Symbol	Conditions (unless otherwise specified, V_I=100V±0.5V -55℃≤T_C≤125℃)	Group A	Limit		Units
					min	max	
1	Input voltage	V_I	series	1,2,3	80	120	V
2	Output current	I_O	V_I=80V~120V, full load	1,2,3	-	1.0	A
3	Output, Input DC Voltage	S_{OI}	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	R_{ISO}	200Vdc between output, input Common and case	1	100	-	MΩ
6	Grid voltage	VRP		1	5	15	V
7	Surge protection voltage[a]	IS	Full load	1	-	3	A
8	Inhibit voltage	VINH		1	3．0	5.0	V

[a] This parameter is guaranteed by designer, test only when the identification test and design or process change.

Table 4. BST100-461-300 Electrical Characteristics

No	Features	Symbol	Condition ((unless otherwise specified，V_I=100V±0.5V -55℃≤T_C≤125℃)	Group A	Limit		Units
					min	max	
1	Input Voltage	V_I	series	1,2,3	80	120	V
2	Output Current	I_O	V_I=80V~120V，Full load	1,2,3	-	3.0	A
3	Output, Input DC Voltage	$_S$OI	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 Shell	1	100	-	MΩ
6	Grid voltage	VRP		1	5	15	V
7	Surge protection voltage[a]	I_s	Full load	1	-	9.0	A
8	Inhibit voltage	VINH		1	3．0	5.0	V
[a] This parameter is guaranteed by design, and tested only when there is qualification test and design or process change.							

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：

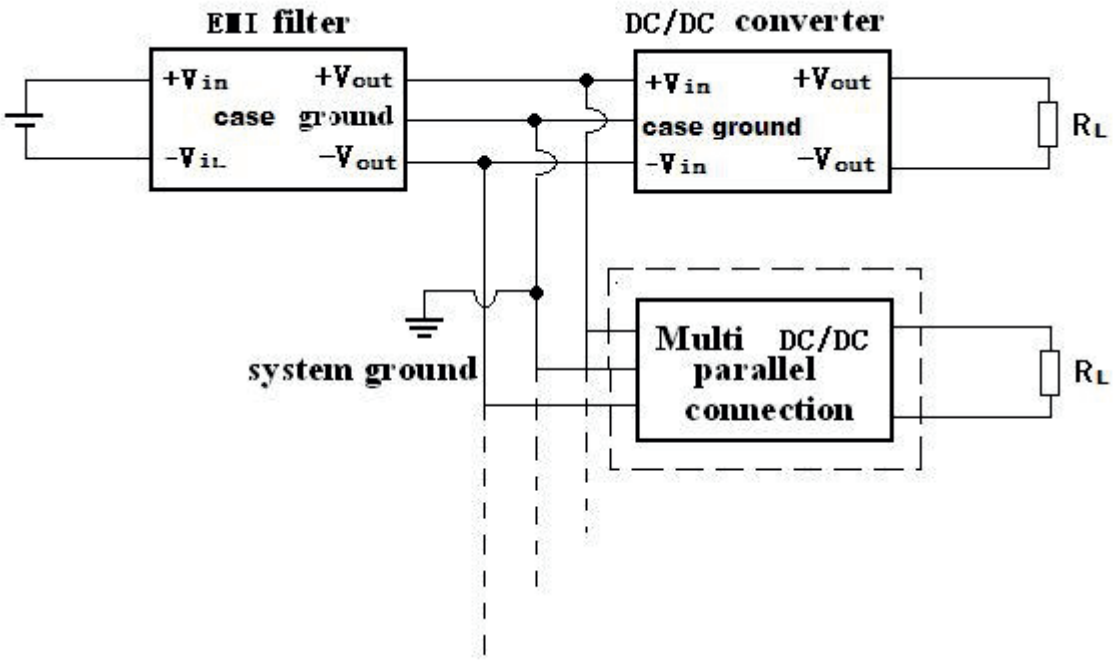


Fig.5. Connections of filter and DC/DC converter

Inhibit function

The device has inhibit function, inhibiting at low voltage (<0.2V). The device operates normally at high voltage (2V~5V) or when dangled. When the device is inhibited, input current shall be less than 20mA; output voltage shall be less than 0.5V.

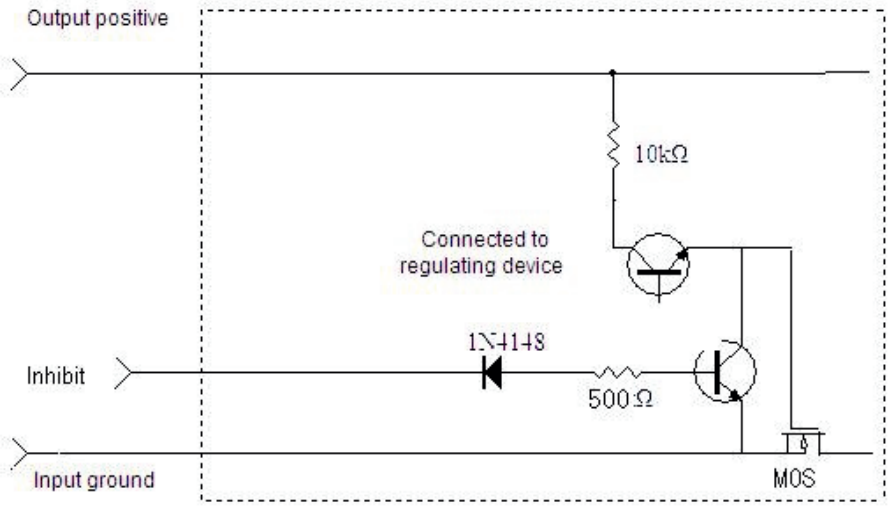


Fig.6. Connections of inhibit terminal

Testing Method

Static parameters test diagram for BST100-461-100 and BST100-461-300 EMI filter is shown in Fig.7 and dynamic parameters testing diagram is shown in Fig.8.

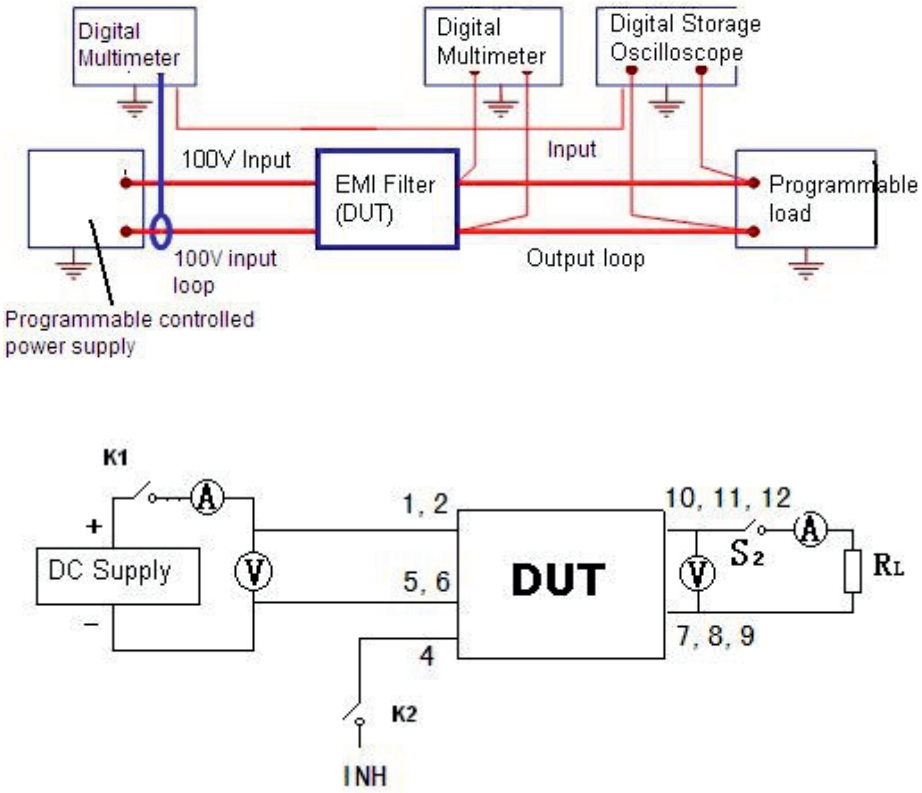


Fig.7. Diagram of Static parameters

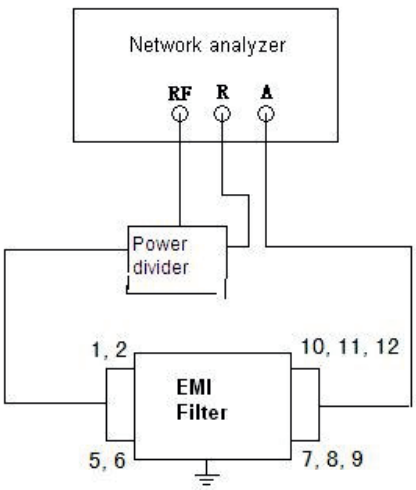


Fig.8. Diagram of dynamic parameter test

MTBF Curve

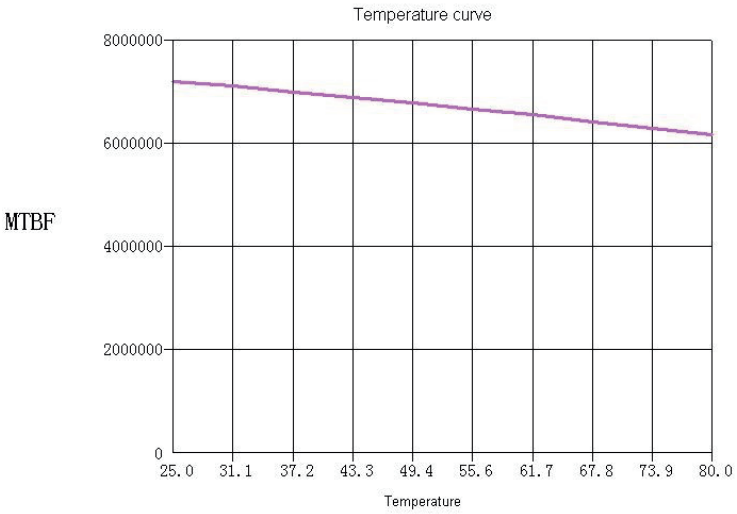


Fig.9. MTBF Curve

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 resistance

Ar	Internal thermal resistance（℃/W）	Heat sink dimensions (mm^3)	Power Consumption (W)	Heat sink material
BST100-461-100	0.5	20×20×2	5.5	Cu
BST100-461-300	0.5	20×20×2	5.5	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 inlet of DC power supply. Filter case and power supply case shall be fairly jointed together and finally connected to the system.
- Both input line and output line of the filter must be separated, avoiding coupling an input line and an output line. Shielding lead shall be used.
- Pay attention to the selection of voltage, current and leakage current;