

## Noise Filter BLF03VK□□□SN□□

## Reference Specification

### 1.Scope

This reference specification applies to Noise Filter BLF03VK\_SN Series.

### 2.Part Numbering

(Ex)	<u>BL</u>	<u>F</u>	<u>03</u>	<u>VK</u>	<u>221</u>	<u>S</u>	<u>N</u>	<u>G</u>	<u>D</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

- |                              |                     |
|------------------------------|---------------------|
| (1)Product ID                | (7)Category         |
| (2)Type                      | (8)Rated Current No |
| (3)Dimension (L×W)           | (9)Packaging        |
| (4)Characteristics           | D:Taping            |
| (5)Typical Impedance at 5GHz | B:Bulk              |
| (6)Performance               |                     |

\*Bulk packing also available. (A product is put in the plastic bag under the taping conditions.)

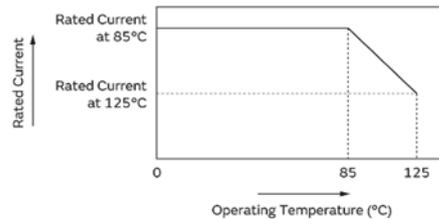
### 3.Rating

Customer Part Number	MURATA Part Number	Impedance (Ω) (at 5GHz)	*1 Rated Current (mA)		DC Resistance (Ω max.)	
			at 85°C	at 125°C	Initial Values	Values After Testing
	BLF03VK600SNLD	60±40%	1200	780	0.065	0.08
	BLF03VK221SNGD	220±40%	800	500	0.155	0.17

■ Operating Temperature : -55°C to +125°C    ■ Storage Temperature : -55°C to +125°C

(Note) As for the Rated current marked with \*1, Rated Current is derated as right figure depending on the operating temperature.

Derating of Rated Current



### 4.Style and Dimensions

Marking

L	0.6±0.03
W	0.3±0.03
T	0.3±0.03
e	0.15±0.05

□ : Electrode  
(in mm)

#### ■ Equivalent Circuit



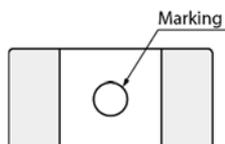
( Resistance element becomes dominant at high frequencies. )

#### ■ Unit Mass(Typical value)

0.22mg

### 5.Marking

Polarity Marking : White



### 6.Standard Testing Conditions

< Unless otherwise specified >

Temperature : Ordinary Temp. (15 °C to 35 °C)  
Humidity : Ordinary Humidity (25%(RH) to 85%(RH))

< In case of doubt >

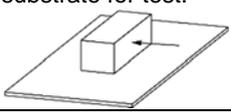
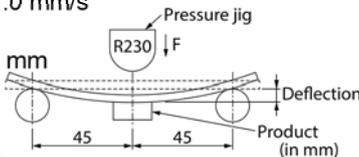
Temperature : 20°C±2°C  
Humidity : 60%(RH) to 70%(RH)  
Atmospheric Pressure : 86kPa to 106 kPa

## 7.Specifications

### 7-1.Electrical Performance

No.	Item	Specification	Test Method
7-1-1	Impedance	Meet item 3.	Measuring Frequency : 5GHz Measuring Equipment : KEYSIGHT N5222A or the equivalent Test Fixture : KEYSIGHT 16197A or the equivalent
7-1-2	DC Resistance		Measuring Equipment : Digital multi meter * Except resistance of the Substrate and Wire

### 7-2.Mechanical Performance

No.	Item	Specification	Test Method
7-2-1	Shear test	No significant mechanical damage or no sign of electrode peeling off shall be observed.	The product is soldered on a substrate for test. Applying force: 2 N Holding time: 5 s 
7-2-2	Bending test	No significant mechanical damage or no sign of electrode peeling off shall be observed.	The product is soldered on a substrate for test. Test substrate: glass-epoxy substrate (100 mm x 40 mm x 1.6 mm) Pressurizing speed: 1.0 mm/s Pressure jig: R230 Amount of bending: 2 mm Holding time: 20 s 
7-2-3	Vibration	Appearance shall have no significant mechanical damage.	The product is soldered on a substrate for test. Oscillation frequency: 10 Hz to 2000 Hz to 10 Hz/20 min Amplitude: total amplitude of 3.0 mm or acceleration amplitude of 196 m/s <sup>2</sup> , whichever is smaller Test time: 3 directions perpendicular to each other, 2 h for each direction (6 h in total)
7-2-4	Solderability	95% or more of the outer electrode shall be covered with new solder seamlessly.	Flux: Ethanol solution of rosin, 25(wt)% Pre-heating: 150°C/60 s Solder: Sn-3.0Ag-0.5Cu solder Solder temperature: 245°C±3°C Immersion time: 3 s

### 7-3.Environmental Performance

The product is soldered on a substrate for test.

No.	Item	Specification	Test Method
7-3-1	Heat life	Appearance: No significant mechanical damage shall be observed. Impedance change rate (at 5GHz): within ±30% DC resistance: Meet chapter 3 ratings.	Temperature: 125°C±2°C Applying Current: Rated Current (at 125°C) Test time: 1000 h (+48 h, -0 h) Post-treatment: left for 4 hours to 48 hours at room temperature..
7-3-2	Cold resistance	Appearance: No significant mechanical damage shall be observed. Impedance change rate (at 5GHz): within ±30% DC resistance: Meet chapter 3 ratings.	Temperature: -55°C±2°C Test time: 1000 h (+48 h, -0 h) Post-treatment: left for 4 hours to 48 hours at room temperature.
7-3-3	Humidity	Appearance: No significant mechanical damage shall be observed. Impedance change rate (at 5GHz): within ±30% DC resistance: Meet chapter 3 ratings.	Temperature: 40°C±2°C Humidity: 90% to 95% (RH) Test time: 1000 h (+48 h, -0 h) Post-treatment: left for 4 hours to 48 hours at room temperature.
7-3-4	Temperature cycle	Appearance: No significant mechanical damage shall be observed. Impedance change rate (at 5GHz): within ±30% DC resistance: Meet chapter 3 ratings	Single cycle conditions: Step 1: -55°C (+0°C, -3°C), 30 min (+3 min, -0 min) Step 2: ordinary temperature, 3 min max. Step 3: +125°C (+3°C, -0°C), 30 min (+3 min, -0 min) Step 4: ordinary temperature, 3 min max. Number of testing: 100 cycles Post-treatment: left for 4 hours to 48 hours at room temperature.



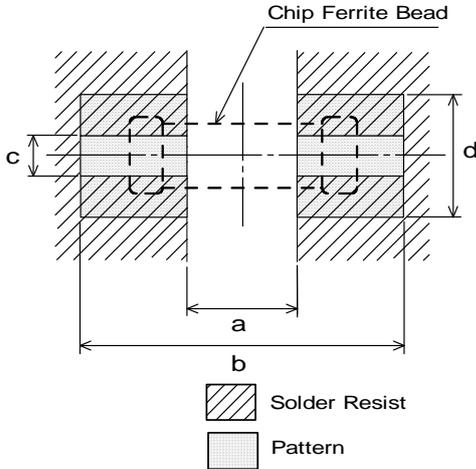


**10. Notice**

Products can only be soldered with reflow.  
 This product is designed for solder mounting.  
 Please consult us in advance for applying other mounting method such as conductive adhesive.

**10-1.Land pattern designing**

- Standard land dimensions (Reflow soldering)



Rated Current (A)	a	b	c	Land pad thickness and dimension d		
				18μm	35μm	70μm
max.0.9	0.25	0.80	0.30	0.3	0.3	0.3
max.1.8				1.2	0.7	0.3

(in mm)

\*The excessive heat by land pads may cause deterioration at joint of products with substrate.

**10-2.Mounting Conditions**

- Please check the mounting condition before using.
- Using mounting conditions (nozzles, equipment conditions, etc.) that are not suitable for products may lead to pick up errors, misalignment, or damage to the product.

**10-3.Soldering Conditions**

(1) Flux,Solder

Flux	Use rosin-based flux, but not highly acidic flux (with chlorine content exceeding 0.2(wt)%.) Do not use water-soluble flux.
Solder	Use Sn-3.0Ag-0.5Cu solder Standard thickness of solder paste : 100 μm to 150 μm

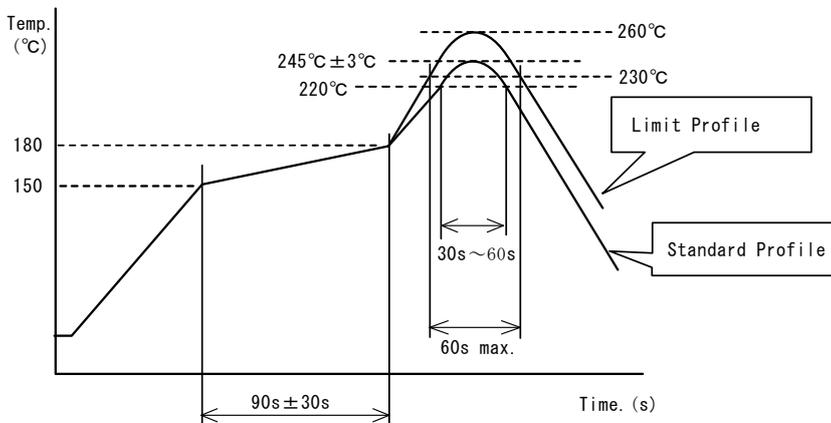
(2) Soldering conditions

- Pre-heating should be in such a way that the temperature difference between solder and ferrite surface is limited to 150°C max. Also cooling into solvent after soldering should be in such a way that the temperature difference is limited to 100°C max.

Insufficient pre-heating may cause cracks on the ferrite, resulting in the deterioration of product quality.

- Standard soldering profile and the limit soldering profile is as follows.

The excessive limit soldering conditions may cause leaching of the electrode and / or resulting in the deterioration of product quality.



	Standard Profile	Limit Profile
Pre-heating	150~180°C , 90s±30s	
Heating	above 220°C、30s~60s	above 230°C、60s max.
Peak temperature	245±3°C	260°C,10s
Cycle of reflow	2 times	2 times

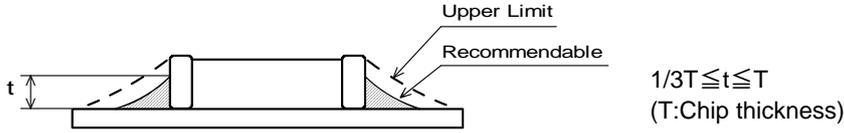
**10-4. Reworking with soldering iron**

- Pre-heating: 150°C, 1 min
- Tip temperature: 350°C max.
- Soldering time : 3(+1,-0) s
- Soldering iron output: 80W max.
- Tip diameter: φ 3mm max.
- Times : 2times max.

Note :Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the ferrite material due to the thermal shock.

**10-5.Solder Volume**

Solder shall be used not to be exceeded as shown below.



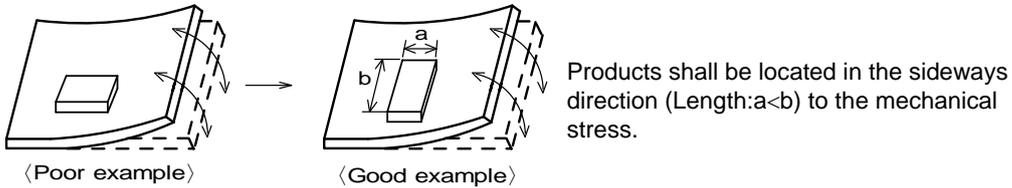
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance.

**10-6.Attention regarding P.C.B. bending**

The following shall be considered when designing and laying out P.C.B.'s.

- (1) P.C.B. shall be designed so that products are not subject to the mechanical stress for board warpage.

<Products direction>

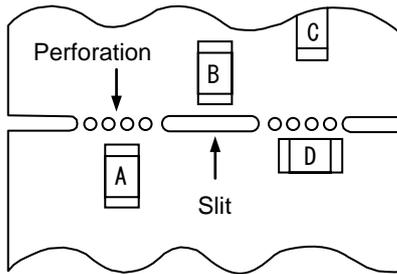


- (2)Components location on P.C.B. separation.

It is effective to implement the following measures, to reduce stress in separating the board.

It is best to implement all of the following three measures; however, implement as many measures as possible to reduce stress.

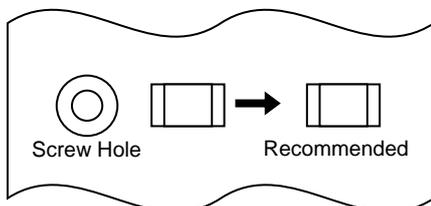
Contents of Measures	Stress Level
(1) Turn the mounting direction of the component parallel to the board separation surface.	A > D *1
(2) Add slits in the board separation part.	A > B
(3) Keep the mounting position of the component away from the board separation surface.	A > C



\*1 A > D is valid when stress is added vertically to the perforation as with Hand Separation. If a Cutting Disc is used, stress will be diagonal to the PCB, therefore A > D is invalid.

- (3) Mounting Components Near Screw Holes

When a component is mounted near a screw hole, it may be affected by the board deflection that occurs during the tightening of the screw. Mount the component in a position as far away from the screw holes as possible.



**10-7.Mounting density**

Add special attention to radiating heat of products when mounting the inductor near the products with heating.  
The excessive heat by other products may cause deterioration at joint of this product with substrate.

**10-8.Cleaning Conditions**

Products shall be cleaned on the following conditions.

- (1)Cleaning temperature shall be limited to 60°C max. (40°C max. for IPA.)
- (2)Ultrasonic cleaning shall comply with the following conditions, avoiding the resonance phenomenon at the mounted products and P.C.B.  
Power:20W/ℓ max. Frequency:28kHz to 40kHz Time:5 min max.
- (3)Cleaner
  - 1.Alternative cleaner
    - Isopropyl alcohol (IPA)
  - 2.Aqueous agent
    - PINE ALPHA ST-100S
- (4)There shall be no residual flux and residual cleaner after cleaning.  
In the case of using aqueous agent, products shall be dried completely after rinse with de-ionized water in order to remove the cleaner.
- (5)Other cleaning  
Please contact us.

**10-9. Operating Environment**

Do not use this product under the following environmental conditions, on deterioration of the Insulation Resistance of the Ferrite material and/or corrosion of Inner Electrode may result from the use.

- (1) in the corrodible atmosphere such as acidic gases, alkaline gases, chlorine, sulfur gases, organic gases and etc. (the sea breeze, Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>,etc)
- (2) in the atmosphere where liquid such as organic solvent, may splash on the products.
- (3) in the atmosphere where the temperature / humidity changes rapidly and it is easy to dew.

**10-10. Resin coating**

The impedance value may change and/or it may affect on the product's performance due to high cure-stress of resin to be used for coating / molding products. So please pay your careful attention when you select resin. In prior to use, please make the reliability evaluation with the product mounted in your application set.

**10-11. Handling of a substrate**

After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting to the substrate when cropping the substrate, inserting and removing a connector from the substrate or tightening screw to the substrate.

Excessive mechanical stress may cause cracking in the product.

**10-12.Storage Conditions**

- (1)Storage period  
Use the products within 6 months after delivered.  
Solderability should be checked if this period is exceeded.
- (2)Storage conditions
  - Products should be stored in the warehouse on the following conditions.  
Temperature : -10°C to 40°C  
Humidity : 15% to 85% relative humidity  
No rapid change on temperature and humidity
  - Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solderability.
  - Products should be stored on the palette for the prevention of the influence from humidity, dust and so on.
  - Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.
  - Products should be stored under the airtight packaged condition.
- (3)Delivery  
Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

**11. ⚠ Note**

- (1) Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
- (2) You are requested not to use our product deviating from the reference specifications.
- (3) The contents of this reference specification are subject to change without advance notice. Please approve our product specifications or transact the approval sheet for product specifications before ordering.