

Chip Ferrite Bead BLM41□□□□SH1L Murata Standard Reference Specification [AEC-Q200]

1. Scope

This reference specification applies to Chip Ferrite Bead for Automotive Electronics BLM41_SH Series based on AEC-Q200.

2. Part Numbering

(1)Product ID (4)Characteristics (7)Category(for Automotive Electronics)
(2)Type (5)Typical Impedance at 100MHz (8)Numbers of Circuit

(3)Dimension (L×W) (6)Performance (9)Packaging (L:Taping)

3. Rating

Rating								
Customer Part Number	MURATA Part Number	Impedance (Ω (at 100MHz,Under State Testing Control (*1) (refer to below come	andard ondition)		Current () (*2)	DC Resistance (Ω) max. (*1) (refer to below comment) Initial Values		ESD Rank 6:25kV
			Typical	at 85°C	at 125℃	Values	After Testing	
	BLM41PG600SH1L	30 min.	60	*2 6000	*2 3700	0.009	0.018	
	BLM41PG750SH1L	45 min.	75	*2 3500	*2 2450	0.015	0.03	
	BLM41PG181SH1L	180±25%	180	*2 3500	*2 2100	0.02	0.04	6
	BLM41PG471SH1L	470±25%	470	*2 2000	*2 1350	0.05	0.10	
	BLM41PG102SH1L	1000±25%	1000	*2 1500	*2 1000	0.09	0.18	

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

(*1)

Standard Testing Conditions

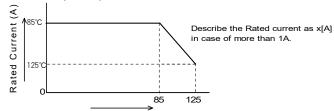
< Unless otherwise specified >

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

(*2) In case of Rated current is more than *1, Rated Current is derated as right figure depending on the operating temperature. < In case of doubt >

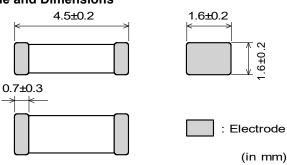
Temperature : 20°C±2 °C Humidity : 60%(RH) to 70%(RH)

Atmospheric pressure: 86kPa to 106kPa

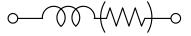


Operating Temperature (°C)

4. Style and Dimensions



■ Equivalent Circuit



Resistance element becomes dominant at high frequencies.

■ Unit Mass (Typical value) 0.050g



5. Marking

No marking.

6. Specifications

6-1. Electrical Performance

No.		Specification	Test Method
6-1-1	Impedance	Meet item 3.	Measuring Frequency : 100MHz±1MHz Measuring Equipment : KEYSIGHT 4291A or the equivalent Test Fixture : KEYSIGHT 16192A or the equivalent
6-1-2	DC Resistance	Meet item 3.	Measuring Equipment : Digital multi meter *Except resistance of the Substrate and Wire

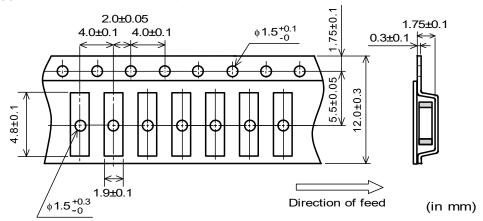
6-2. Mechanical Performance (based on Table 13 for FILTER EMI SUPPRESSORS/ FILTERS) AEC-Q200 Rev.D issued June. 1 2010

	AEC	-Q200			
No.		Test Method	Murata Specification / Deviation		
3	High	1000hours at 125 deg C	Meet Table A after testing.		
	Temperature	Set for 24hours at room	<u>Table A</u>		
	Exposure	temperature, then	Appearance No damage		
		measured.	Impedance		
			Change Within ±30%		
			(at 100MHz)		
			DC Meet item 3.		
			Resistance Weet term 5.		
4	Temperature Cycling	1000cycles	Meet Table A after testing.		
		-55 deg C to +125 deg C			
		Set for 24hours at room temperature, then			
		measured.			
5	Destructive	Per EIA469	No defects		
	Physical Analysis	No electrical tests			
7	Biased Humidity	1000hours at 85 deg C,	Meet Table A after testing.		
		85%RH			
		Apply max rated current.			
8	Operational Life	Apply 125 deg C	Meet Table A after testing.		
		1000hours	If the rated current of parts exceed 1A, the operating temperature should be 85 deg C.		
		Set for 24hours at room	the operating temperature should be 85 deg C.		
		temperature, then measured			
	E 4		No abnormalities		
	External Visual	Visual inspection			
10	Physical Dimension	Meet ITEM 4	No defects		
		(Style and Dimensions)			
12	Resistance to Solvents	Per MIL-STD-202 Method	Not Applicable		
		215			
13	Mechanical Shock	Per MIL-STD-202 Method	Meet Table A after testing.		
		213 Condition F:			
		Condition F: 1500g's(14.7N)/0.5ms/			
		Half sine			
14	Vibration	5g's(0.049N) for 20	Meet Table A after testing.		
		minutes, 12 cycles each of			
		3 orientations			
		Test from 10-2000Hz.			

AEC-Q200		-Q200	Museta Consciliantian / Deviation
No	Stress	Test Method	Murata Specification / Deviation
15	Resistance to Soldering Heat	Solder temperature 260C+/-5 deg C Immersion time 10s	Pre-heating:150C +/-10 deg,60s to 90s Meet Table A after testing.
17	ESD	Per AEC-Q200-002	Meet Table A after testing. ESD Rank: Refer to Item 3. Rating
18	Solderability	Per J-STD-002	Method b : Not Applicable 95% of the terminations is to be soldered.
19	Electrical Characterization	Measured : Impedance	No defects
20	Flammability	Per UL-94	Not Applicable
21	Board Flex	Epoxy-PCB(1.6mm) Deflection 2mm(min) 60s minimum holding time	Meet Table A after testing.
22	Terminal Strength	Per AEC-Q200-006 A force of 17.7N for 60sec	No defects
30	Electrical Transient Conduction	Per ISO-7637-2	Not Applicable

7. Specification of Packaging

7-1. Appearance and Dimensions (12mm-wide plastic tape)



*Dimension of the Cavity is measured at the bottom side.

(1) Taping

Products shall be packaged in the each embossed cavity of 12mm-wide, 4mm-pitch and plastic tape continuously and sealed by cover tape.

- (2) Sprocket hole: Sprocket hole shall be located on the left hand side toward the direction of feed.
- (3) Spliced point: The base tape and top tape have no spliced point.
- (4) Missing components number

Missing components number within 0.1% of the number per reel or 1 pc., whichever is greater, and are not continuous. The specified quantity per reel is kept.

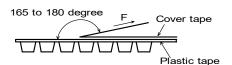
7-2. Tape Strength

(1) Pull Strength

Plastic tape	5N min.
Cover tape	10N min.

(2) Peeling off force of Cover tape 0.2N to 0.7N (Minimum value is typical.)

*Speed of Peeling off:300mm/min



7-3. Taping Condition

(1) Standard quantity per reel

Quantity per 180mm reel: 2500 pcs. / reel

- (2) There shall be leader-tape(cover tape only and empty tape) and trailer- tape(empty tape) as follows.
- (3) Marking for reel

The following items shall be marked on a label and the label is stuck on the reel.

(Customer part number, MURATA part number, Inspection number(*1), RoHS marking(*2), Quantity, etc)

*1) « Expression of Inspection No. »

 $\frac{\square\square}{(1)} \quad \frac{OOOO}{(2)} \quad \frac{\times\times\times}{(3)}$

(1) Factory Code

First digit Year / Last digit of year (2) Date

Second digit Month / Jan. to Sep. \rightarrow 1 to 9, Oct. to Dec. \rightarrow O, N, D

Third, Fourth digit: Day

(3) Serial No.

*2) « Expression of RoHS marking »

ROHS $-\frac{Y}{(1)}(\underline{\Delta})$

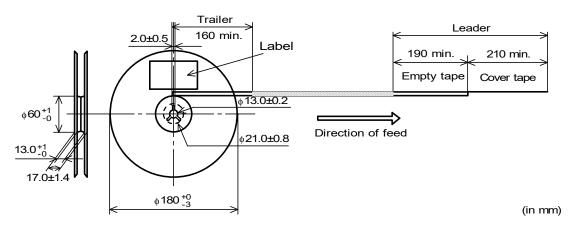
(1) RoHS regulation conformity parts.(2) MURATA classification number

(4) Outside package

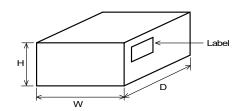
These reels shall be packed in the corrugated cardboard package and the following items shall be marked on a label and the label is stuck on the box.

(Customer name, Purchasing order number, Customer part number, MURATA part number, RoHS marking (*2), Quantity, etc)

(5) Dimensions of reel and taping (leader-tape, trailer-tape)



7-4. Specification of Outer Case



Outer Case Dimensions (mm)		nsions	Standard Reel Quantity in Outer Case
W	D	Н	(Reel)
186	186	93	3

^{*} Above Outer Case size is typical. It depends on a quantity of an order.

8. / Caution

8-1. Rating

Do not use products beyond the Operating Temperature Range and Rated Current.

8-2. Surge current

Excessive surge current (pulse current or rush current) than specified rated current applied to the product may cause a critical failure, such as an open circuit, burnout caused by excessive temperature rise. Please contact us in advance in case of applying the surge current.

8-3. Fail Safe

Be sure to provide an appropreate fail-safe function on your product to prevent from a second damage that may be caused by the abnormal function or the failure of our products.

8-4. Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- (1)Aircraft equipment
- (2)Aerospace equipment
- (3)Undersea equipment
- (4)Power plant control equipment
- (5)Medical equipment
- (6)Disaster prevention / crime prevention equipment
- (7)Traffic signal equipment
- (8)Transportation equipment (trains, ships, etc.)
- (9) Data-processing equipment
- (10)Applications of similar complexity and /or reliability requirements to the applications listed in the above



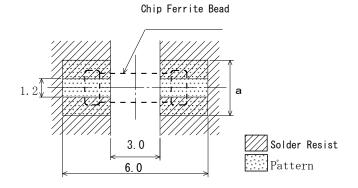
9. Notice

This product is designed for solder mounting.

Please consult us in advance for applying other mounting method such as conductive adhesive.

9-1. Land pattern designing

• Standard land dimensions (Flow and Reflow soldering)

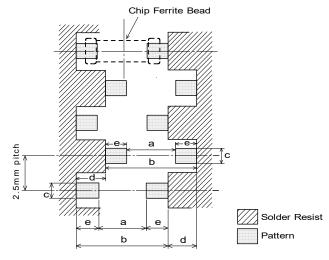


Ī	Rated	Land pad thickness and			
	Current	dimension a			
	(A)	18µm	35µm	70µm	
I	1.5/2	1.2	1.2	1.2	
	3.5	2.4	1.2	1.2	
ľ	6	6.4	3.3	1.65	

(in mm)

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

• Land dimensions on Flow soldering for 2.5mm pitch mounting



*Taking land pad thickness and rated current into account.

а	b	С	d	е
3.0	6.0	1.2	1.8	1.5
				(in mm)

*The pattern shall be designed to above drawing to prevent causing the solder bridge when products are mounted by 2.5mm pitch flow soldering.



9-2. Soldering Conditions

Products can be applied to reflow and flow soldering.

(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 200 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.

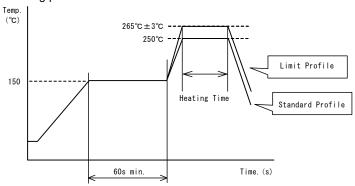
• Standard soldering profile and the limit soldering profile is as follows.

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

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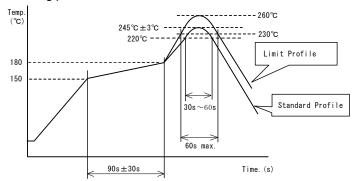
(3) soldering profile

□Flow soldering profile



	Standard Profile	Limit Profile
Pre-heating	150°C、60s min.	
Heating	250°C、4∼6s	265°C±3°C, 5s max.
Cycle of flow	2 times	2 times

□Reflow soldering profile



	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



9-3. Reworking with soldering iron

• Pre-heating: 150°C, 1 min

Soldering iron output: 80W max.Tip diameter:

3mm max.

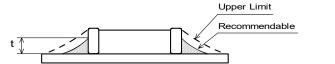
Tip temperature: 350°C max.
Soldering time: 3(+1,-0) seconds.

• 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.

9-4. Solder Volume

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



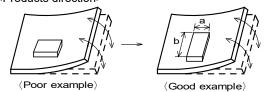
1/3T≦t≦T (T: Chip thickness)

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.

9-5.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>



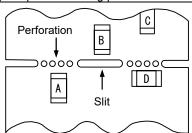
Products shall be located in the sideways direction (Length:a<b) to the mechanical stress.

(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.

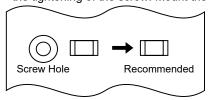
Contents of Measures	Stress Level
(1) Turn the mounting direction of the component parallel to the board separation surface.	A > D*1
(2) Add slits in the board separation part.	A > B
(3) Keep the mounting position of the component away from the board separation surface.	A > C



*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.





9-6. 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.

9-7. 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, Cl₂, H₂S, NH₃, SO₂, NO₂,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.

9-8. 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.

9-9. 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

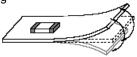
Please contact us.

9-10. Handling of a substrate

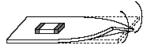
After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting to the substrate when cropping the substrate, inserting and removing a connector from the substrate or tightening screw to the substrate.

Excessive mechanical stress may cause cracking in the product.





Twisting



9-11. 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.



10 . 🔬 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 agreed 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.