muRata

Specification No. JELF243A-0040D
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Reference Specification

Part Description: CHIP COIL

MURATA Part No: LQH32CN□□□□33L

RoHS regulation conformity parts.

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LQH32CN□□□□33L Series CHIP COIL SPECIFICATION

1.Scope

This specification applies to LQH32CN□□□□33L Series, Chip coil.

2.Part Numbering

(ex)	LQ	H	32	C	N	R15	M	3	3	L
	Product ID	Struture	Dimension (L×W)	Applications and Characteristics	Category	Inductance	Tolerance	Features	Electrode	Pakaging L:Taping

3.Rating

- Operating Temperature Range. -25 to+85°C
- Storage Temperature Range. -40 to +85°C

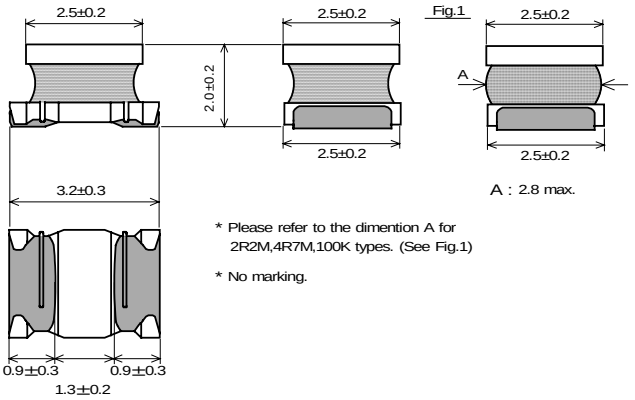
Customer Part Number	MURATA Part Number	Inductance		DC Resistance (Ω)	Self Resonant Frequency (MHz min)	Allowable DC Current (mA)
		(μH)	Tolerance(%)			
	LQH32CNR15M33L	0.15	±20%	0.028 ± 30%	400	1450
	LQH32CNR27M33L	0.27		0.034 ± 30%	250	1250
	LQH32CNR47M33L	0.47		0.042 ± 30%	150	1100
	LQH32CN1R0M33L	1.0		0.060 ± 30%	100	1000
	LQH32CN2R2M33L	2.2		0.097 ± 30%	64	790
	LQH32CN4R7M33L	4.7		0.15 ± 30%	43	650
	LQH32CN100K33L	10	±10%	0.30 ± 30%	26	450

4. Testing Conditions

《Unless otherwise specified》
Temperature : Ordinary Temperature (15 to 35°C)
Humidity : Ordinary Humidity (25 to 85 %(RH))

《In case of doubt》
Temperature : 20 ± 2°C
Humidity : 60 to 70 %(RH)
Atmospheric Pressure : 86 to 106 kPa

5.Appearance and Dimensions

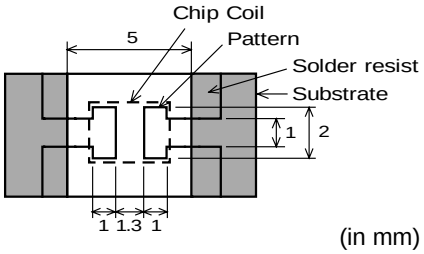
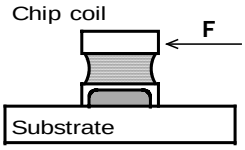
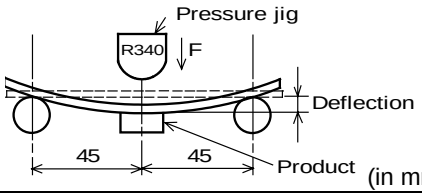


(in mm)

6.Electrical Performance

No.	Item	Specification	Test Method
6.1	Inductance	Inductance shall meet item 3.	Measuring Equipment : YHP-4192A or equivalent Measuring Frequency:1MHz
6.2	DC Resistance	DC Resistance shall meet item 3.	Measuring Equipment:Digital multi meter
6.3	Self Resonant Frequency(S.R.F)	S.R.F shall meet item 3.	Measuring Equipment: HP-4291A or equivalent
6.4	Allowable DC Current	Self temperature rise shall be limited to 20°C max. Inductance Change: within ± 10%	The allowable current is applied.

7.Mechanical Performance

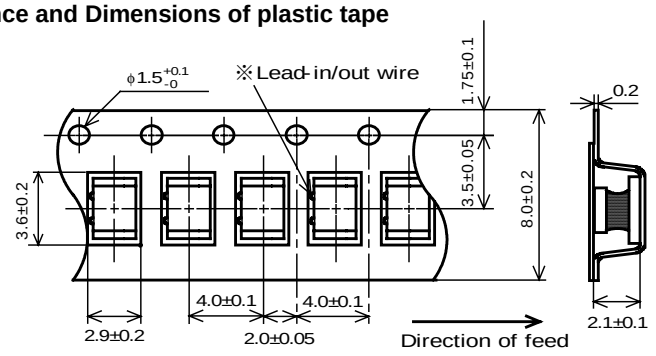
No.	Item	Specification	Test Method
7.1	Shear Test	Chip coil shall not be damaged.	Substrate:Glass-epoxy substrate  (in mm) Applied Direction :  Force:10N Hold Duration : 5±1s
7.2	Bending Test		Substrate:Glass-epoxy substrate (100×40×1.6mm) Speed of Applying Force:1mm / s Deflection:2mm Hold Duration:30s  (in mm)
7.3	Vibration		Oscillation Frequency : 10~55~10Hz for 1 minute Total Amplitude:1.5mm Testing Time: A period of 2 hours in each of 3 mutually perpendicular directions. (Total 6 hours)
7.4	Solderability	The wetting area of the electrode shall be at least 90% covered with new solder coating.	Flux:Ethanol solution of rosin,25(wt)% (Immersed for 5s to 10s) Solder : (1)Sn/Pb = 60/40 (2)Sn-3.0Ag-0.5Cu Pre-Heating: 150±10°C / 60 to 90seconds Solder Temperature:(1)230±5°C (2)240±5°C Immersion Time: (1)4±1 s (2)3±1 s
7.5	Resistance to Soldering Heat	Appearance:No damage Inductance Change: within ± 5%	Flux:Ethanol solution of rosin,25(wt)% (Immersed for 5s to 10s) Solder : Sn/Pb = 60/40 or Sn-3.0Ag-0.5Cu Pre-Heating:150±10°C / 60 to 90seconds Solder Temperature:270±5°C Immersion Time:10±1 s Then measured after exposure in the room condition for 24±2 hours.

8.Environmental Performance (It shall be soldered on the substrate)

No.	Item	Specification	Test Method
8.1	Heat Resistance	Appearance:No damage Inductance Change: within ± 5% DC Resistance Change: within ± 5%	Temperature:85±2°C Time:1000± $^{48}_{0}$ hours Then measured after exposure in the room condition for 24±2 hours.
8.2	Cold Resistance		Temperature:-25±2°C Time:1000± $^{48}_{0}$ hours Then measured after exposure in the room condition for 24±2 hours.
8.3	Humidity		Temperature:40±2°C Humidity:90 to 95%(RH) Time:1000± $^{48}_{0}$ hours Then measured after exposure in the room condition for 24±2 hours.
8.4	Temperature Cycle		1 cycle: 1 step: -25±2°C / 30±3 minutes 2 step:Ordinary temp. / 10 to 15 minutes 3 step:+85±2°C / 30±3 min 4 step: Ordinary temp. / 10 to 15 minutes Total of 10 cycles Then measured after exposure in the room condition for 24±2 hours

9.Tape Packing

9.1 Appearance and Dimensions of plastic tape



※The packing directions of the chip coil in taping are unified with the in/out positions of the lead wire.

(in mm)

9.2 Specification of Taping

(1) Packing quantity (standard quantity)
2,000 pcs / reel

(2) Packing Method
Products shall be packed in the each embossed cavity of plastic tape and sealed by cover tape.

(3) Sprocket hole
Sprocket hole shall be located on the left hand side toward the direction of feed.

(4) Spliced point
Plastic tape and Cover tape has no spliced point.

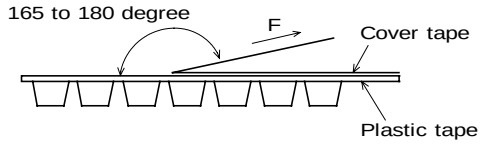
(5) Missing components number
Missing components number within 0.1 % of the number per reel or 1 pc., whichever is greater, and are not continuous. The specified quantity per reel are kept.

9.3 Pull Strength

Embossed carrier tape	10N min.
Cover tape	5N min.

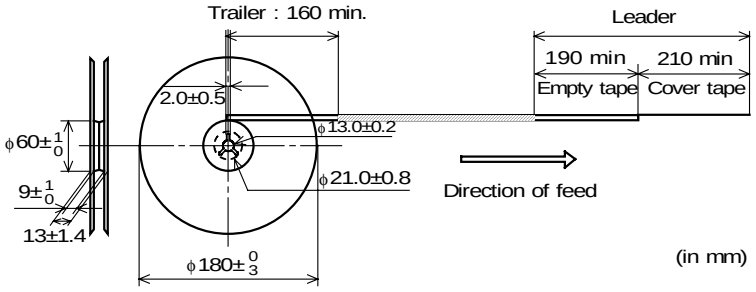
9.4 Peeling off force of cover tape

Speed of Peeling off	300mm/min
Peeling off force	0.2 to 0.7N (minimum value is typical)



9.5 Dimensions of Leader-tape,Trailer and Reel

There shall be leader-tape (cover tape) and trailer-tape (empty tape) as follows



9.6 Marking for reel

Customer part number; MURATA part number; Inspection number; Quantity etc ・・・

<Expression of Inspection No.>

□□ OOOO ×××
(1) (2) (3)

(1) Factory Code (2) Date of outgoing inspection (3) Serial No.

First digit ：Year / Last digit of year

Second digit：Month / Jan. ~ Sep.→ 1～9

Oct. ~ Dec.→ O,N,D

Third, Fourth digit：Day

9.7 Marking for Outside package (corrugated paper box)

Customer name, Purchasing order number, Customer part number, MURATA part number Quantity, etc ・・・

10. ⚠ Caution

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.

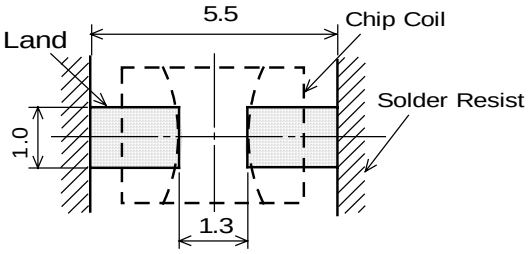
(1) Aircraft equipment
(2) Aerospace equipment
(3) Undersea equipment
(4) Power plant control equipment
(5) Medical equipment
(6) Transportation equipment (vehicles, trains, ships, etc.)
(7) Traffic signal equipment
(8) Disaster prevention / crime prevention equipment
(9) Data-processing equipment
(10)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

11. Notice

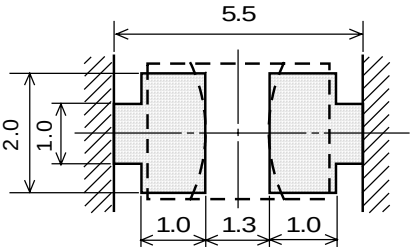
This product is designed for solder mounting.
Please consult us in advance for applying other mounting method such as conductive adhesive.

11.1 Land pattern designing

Flow Soldering



Reflow Soldering *



(in mm)

* Applicable to flow soldering.

11.2 Flux, Solder

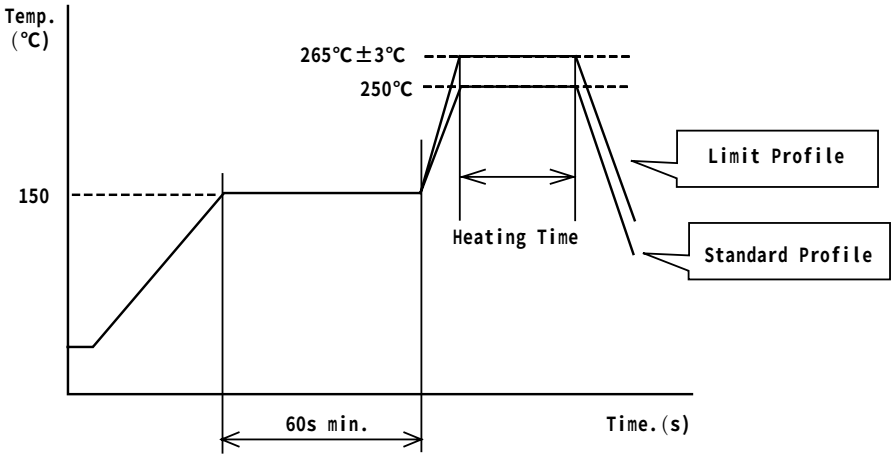
- Use rosin-based flux.
  Don't use highly acidic flux with halide content exceeding 0.2(wt)% (chlorine conversion value).
- Don't use water-soluble flux.
- Use 63/37 solder (Sn 63% / Pb 37%) or 60/40 solder (Sn 60% / Pb 40%).
  In case of Lead-free solder, use Sn-3.0Ag-0.5Cu solder
- Standard thickness of solder paste : 200 µm to 300 µm.

11.3 Flow soldering conditions / Reflow soldering conditions

- Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150°C max. Cooling into solvent after soldering also should be in such a way that the temperature difference is limited to 100°C max.
  Unenough pre-heating may cause cracks on the product, 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.

soldering profile

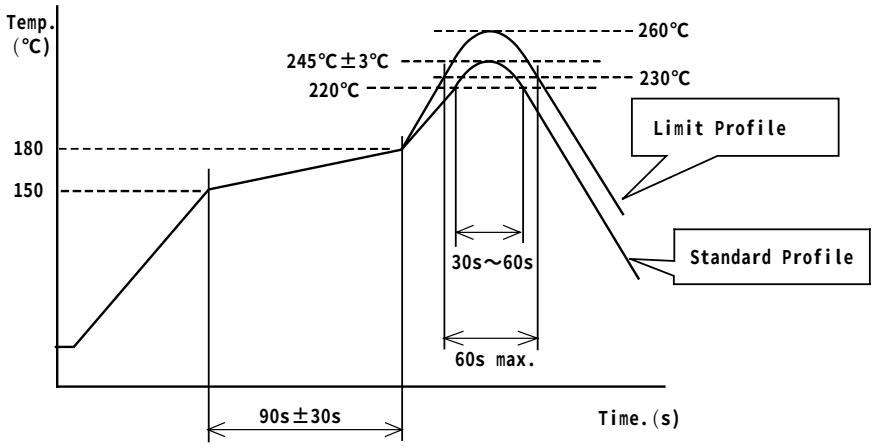
(1)Flow soldering profile (Eutectic solder, Sn-3.0Ag-0.5Cu solder)



	Standard Profile	Limit Profile
Pre-heating	150℃、60s min.	
Heating	250℃、4s～6s	265℃±3℃、5s
Cycle of flow	2 times	1 time

(2)Reflow soldering profile

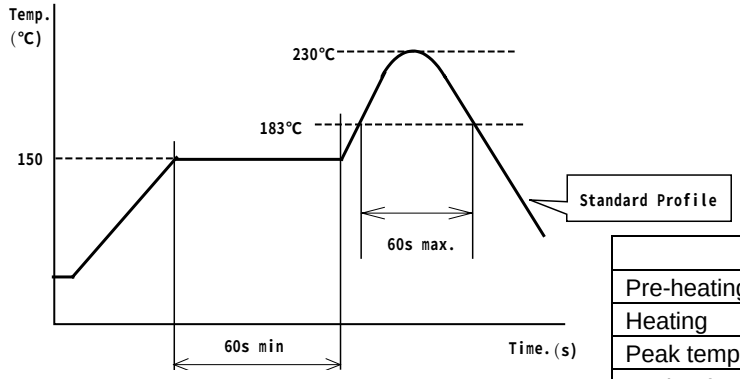
①Soldering Profile for Lead Free solder (Sn-3.0Ag-0.5Cu solder)



	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	1 time

②Soldering Profile for Eutectic solder

(Limit Profile : refer to ①.)



	Standard Profile
Pre-heating	150°C、60s min.
Heating	above 183°C、60s max.
Peak temperature	230°C
Cycle of reflow	2 times

11.4 Reworking with soldering iron.

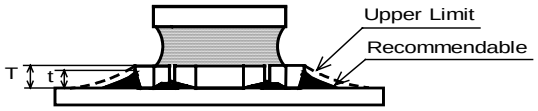
The following conditions must be strictly followed when using a soldering iron.

Pre-heating	150°C,1 min
Tip temperature	350°C max.
Soldering iron output	30W max.
Tip diameter	ϕ 3mm max.
Soldering time	3(+1,-0)s
Times	2 times

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

11.5 Solder Volume

- Solder shall be used not to be exceed the upper limits as shown below.
- Accordingly increasing the solder volume, the mechanical stress to Chip is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance..



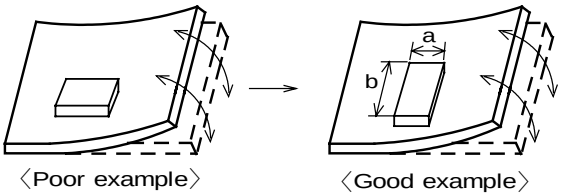
1/3T≦ t ≦T
(T: Lower flange thickness)

11.6 Product's location

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 subjected to the mechanical stress due to warping the board.

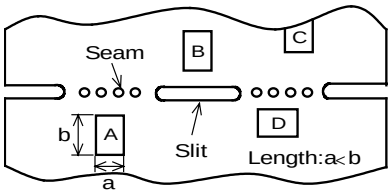
[Products direction]



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

(2) Products location on P.C.B. separation

Products (A,B,C,D) shall be located carefully so that products are not subjected to the mechanical stress due to warping the board. Because they may be subjected the mechanical stress in order of A>C>B ≅ D.



11.7 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 with avoiding the resonance phenomenon at the mounted products and P.C.B.
Power : 20 W / l max. Frequency : 28kHz to 40kHz Time : 5 minutes 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.

11.8 Resin coating

The inductance value may change due to high cure-stress of resin to be used for coating/molding products. An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating condition etc. Some resin contains some impurities or chloride possible to generate chlorine by hydrolysis under some operating condition may cause corrosion of wire of coil, leading to open circuit. So, please pay your careful attention in selecting resin in case of coating/molding the products with the resin.Prior to use the coating resin, please make sure no reliability issue is observed by evaluating products mounted on your board.

11.9 Caution for use

- Sharp material,such as a pair of tweezers,shall not be touched to the winding portion to prevent the breaking of wire.
- Mechanical shock should not be applied to the products mounted on the board to prevent the breaking of the core

11.10 Storage and Handling Requirements

(1) Storage period

Use the products within 12 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 ~ 40°C
  Humidity : 30 to 70% relative humidity No rapid change on temperature and humidity
  The electrode of the products is coated with solder. 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 not be storaged on bulk packaging condition to prevent the chipping of the core and the breaking of winding wire caused by the collision between the products.
- Products should be storaged on the palette for the prevention of the influence from humidity, dust and so on.
- Products should be storaged in the warehouse without heat shock, vibration, direct sunlight and so on.

(3) Handling Condition

Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

12. ⚠ 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) Please return one duplicate of this product specification to us with your signature to acknowledge your receipt. If the duplicate is not returned by two month after issued date, the product specification will be deemed to have been received by you.

(4) We consider it not appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.