Inductor for Power Lines (Power Inductor) ⚠Caution/Notice

⚠Caution

● Rating

Do not use products beyond the rated current as this may create excessive heat.

Notice

● Storage and Operating Condition

<Operating Environment>

Do not use products in chemical atmosphere such as chlorine gas, acid or sulfide gas.

<Storage Requirements>

1. Storage Period
   LQM series should be used within 6 months; the other products should be used within 12 months. Check solderability if this period is exceeded.
2. Storage Conditions
   (1) Store products in a warehouse in compliance with the following conditions:
   Temperature: -10 to +40 degrees C.
   Humidity: 15 to 85% (relative humidity)
   Do not subject products to rapid changes in temperature and humidity.
   Do not store them in chemical atmosphere such as one containing sulfurous acid gas or alkaline gas.
   This will prevent electrode oxidation which causes poor solderability and possible corrosion of inductors.
   (2) Do not store products in bulk packaging to prevent collision among inductors which causes core chipping and wire breakage.
   (3) Store products on pallets to protect from humidity, dust, etc.
   (4) Avoid heat shock, vibration, direct sunlight, etc.

● Handling

This item is designed to have sufficient strength, but handle with care to avoid chipping or breaking its ceramic structure.

LQW_C series

- To prevent breaking the wire, avoid touching with sharp material, such as tweezers or other material such as bristles of cleaning brush, to the wire wound portion.
- To prevent breaking the core, avoid applying excessive mechanical shock to products mounted on the board.
- In some mounting machines, when picking up components, support pin pushes up the components from the bottom of base tape. In this case, please remove the support pin. The support pin may damage the components and break wire.
- In rare case, the laser recognition can not recognize this component. Please contact us when you use laser recognizion. (There is no problem with the permeation and reflection type.)
- The product temperature rises about 40°C maximum when the permissible current is applied to LQW15C/LQW18C. Please care heatproof temperatures of the substrate and parts in the surrounding.

LQH_C/D/H/M/N/P series

- To prevent breaking the wire, avoid touching with sharp material, such as tweezers or other material such as bristles of cleaning brush, to the wire wound portion of this product.
- To prevent breaking the core, avoid applying excessive mechanical shock to products mounted on the board.
- Temperature may rise up to max. 40 °C when applying the rated current to Inductor for Power Lines. Be careful of the temperature rating of the circuit board and components around the chip inductor.

LQM series

- There is the possibility that magnetism may change the inductance value. Do not use a magnet or tweezers with magnetism when handling chip inductors. (The tip of the tweezers should be molded with resin or pottery.)
- When the excessive current over rated current is applied, it may cause the inductance value to change due to magnetism.

<Handling>

1. Avoid applying excessive stress to products to prevent damage.
2. Do not touch wire wound with sharp objects such as tweezers to prevent wire breakage.
3. Do not apply excessive force to products mounted on boards to prevent core breakage.

<Transportation>

Do not apply excessive vibration or mechanical shock to products.

<Resin Coating>

When coating products with resin, the relatively high resin curing stress may change inductance values. For exterior coating, select resin carefully so that electrical and mechanical performance of the product is not affected. Prior to use, please evaluate reliability with the product mounted in your application set.

(LQW, LQH series)

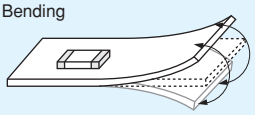
An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating condition etc. Some resins containing impurities or chloride may possibly generate chlorine by hydrolysis under some operating condition may cause corrosion of wire of inductor, leading to open circuit.

Continued on the following page.

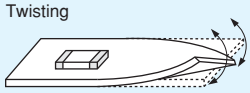
<Rated Current>
(LQH2HP_G0·LQH2HP_J0 Series)
Inductance will be more than the value which is 30% down from minimum rated Inductance value.
(Other LQH_P Series except for LQH2HP_G0 Series)
Inductance will be within ±30% of nominal Inductance value.
• Based on Temperature Rise
For LQH2MC series·LQH_P series rated current is set to keep temperature rise caused by self heating 40°C or less.
For other Inductor for Power Lines please refer to individual specifications.

<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.

Bending



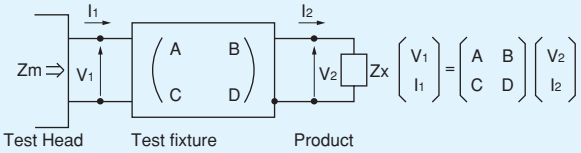
Twisting



● Measuring Method

Measuring Method of Inductance/Q

1. Residual elements and stray elements of test fixture can be described by F-parameter as shown in the following:



2. The impedance of chip inductor (chip coil) Zx and measured value Zm can be described by input/output current/voltage.

$$Zm = \frac{V_1}{I_1}, \quad Zx = \frac{V_2}{I_2}$$

3. Thus, the relation between Zx and Zm is shown in the following:

$$Zx = \alpha \frac{Zm - \beta}{1 - Zm\Gamma}$$

where, $\alpha = D / A = 1$
$\beta = B / D = Zsm - (1 - Yom\ Zsm)\ Zss$
$\Gamma = C / A = Yom$

Zsm: measured impedance of short chip
Zss: residual impedance of short chip*
Yom: measured admittance when opening the fixture

*Residual impedance of short chip

Residual Impedance	Series
0.556nH	**LQW15C**
0.771nH	**LQW18C**

4. Lx and Qx should be calculated with the following equation.

$$Lx = \frac{Im\ (Zx)}{2\pi f}, \quad Qx = \frac{Im\ (Zx)}{Re\ (Zx)}$$

Lx: Inductance of chip inductor (chip coil)
Qx: Q of chip inductor (chip coil)
f: Measuring frequency