

## ⚠ 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

LQG/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.

### ■ Notice (Handling)

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

#### LQW\_A series/LQW\_H/LQW\_C series

- To prevent breaking the wire, avoid touching sharp material, such as tweezers, 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 recognition. (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 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 sharp material, such as tweezers, to the wire wound portion.
- 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 LQH3NP. Be careful of the temperature rating of the circuit board and components around the chip inductor.

#### LQG,LQP series (except LQP02T\_02/LQP03T\_02)


- The pattern of the chip inductor is covered with protective film. Take care to avoid damaging the chip inductor when handling it with pick-up nozzles, sharp instruments, etc.

#### 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.

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## ⚠ Caution/Notice

Continued from the preceding page.

### <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.

(LQP02T\_02, LQP03T\_02)

When products are coated with resin, please contact us in advance.

### <Allowable DC Current>

(LQH2MCN, LQH\_P series)

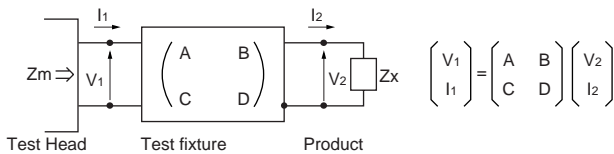
When Allowable DC Current is applied to the Products, self-generation of heat will rise to 40°C or less.

When Allowable DC Current is applied to the Products, Inductance will be within ±30% of nominal Inductance value.

## ■ Notice (Measuring Method)

### Measuring Method of Inductance/Q

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



- The impedance of chip inductor (chip coil)  $Z_x$  and measured value  $Z_m$  can be described by input/output current/voltage.

$$Z_m = \frac{V_1}{I_1}, \quad Z_x = \frac{V_2}{I_2}$$

- Thus, the relation between  $Z_x$  and  $Z_m$  is shown in the following:

$$Z_x = \alpha \frac{Z_m - \beta}{1 - Z_m \Gamma} \quad \text{where, } \alpha = D / A = 1$$

$$\beta = B / D = Z_{sm} - (1 - Y_{om} Z_{sm}) Z_{ss}$$

$$\Gamma = C / A = Y_{om}$$

$\left\{ \begin{array}{l} Z_{sm}: \text{measured impedance of short chip} \\ Z_{ss}: \text{residual impedance of short chip}^* \\ Y_{om}: \text{measured admittance when opening the fixture} \end{array} \right\}$

### \*Residual impedance of short chip

Residual Impedance	Series
0nH	<b>LQG15HS</b>
0.110nH	<b>LQP02T</b>
0.430nH	<b>LQP03T_00/_04</b>
0.464nH	<b>LQW04A</b>
0.480nH	<b>LQP03T_02</b>
0.556nH	<b>LQG15HN, LQW15A, LQP15T/M</b>
0.771nH	<b>LQG18H, LQP18M, LQW18A/C, LQW21H</b>

- $L_x$  and  $Q_x$  should be calculated with the following equation.

$$L_x = \frac{\text{Im}(Z_x)}{2\pi f}, \quad Q_x = \frac{\text{Im}(Z_x)}{\text{Re}(Z_x)}$$

$L_x$ : Inductance of chip inductor (chip coil)  
 $Q_x$ : Q of chip inductor (chip coil)  
 $f$ : Measuring frequency