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# Inductor Precautions in Use

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### ▶ A – G

#### Automatic Insertion

- Insert the parts to the center of the PWB holes.
- Mount in such a way that inductors do not rise out of the board.
- Keep away from heat radiation from other high temperature parts.
- During insertion, take care and do not to cause chucking or driving damage on the parts.
- When using parts feeders, check beforehand the influence of the magnetic field on core.
- Keep away from a metal board in order to avoid the influence on electrical characteristics.
- Do not use inductors that once fall down as electrical and magnetic characteristics of ferrite cores may change when excessive stress or impact is given.
- Do not have inductors contacted with other components to avoid capacitive coupling, magnetic interference, and magnetic combining with other inductors.
- Ensure open space and insulation distance from high-voltage components and power supplies, conforming to applicable safety regulations. Take special care of contacts with lead wires of different potentials.
- When bending lead wires during forming, take care to ensure the straight part of the lead and never give excessive mechanical stress on the base of the lead wires.

#### Caution about Applying Excessive Current

The rated current is defined as the smaller value of either the current value when the inductance drops 10% down from the initial point or the current value when the average temperature of coil inside rises 20°C up from the initial point. Do not operate product over the specific max. Current.

#### Cleaning and Washing

- Ultrasonic washing is based on within 5 minutes at 20W/liter or lower. Check it with actual equipment in advance as vibration levels and mode vary with washing equipment.
- Do not use acid or alkali agents. Some cleaning solvents may damage the part. Confirm by testing the reliability in advance of mass production.
- For ultrasonic cleaning of KL73, use volatile detergents such as methyl alcohol, isopropyl alcohol, etc. Please confirm the reliability in advance.
- It is possible that combined resonance of component and PWB and cavitation can cause an abnormal vibration mode to exist causing damage.

## ▶ H – N

### Handling and Mounting

- When mounting, do not give an excessive shock or strong force to inductors as it may change electricity and magnetic characteristics of inductors.
- Some high frequency inductors have polarity in the characteristics of inductors. When mounting, those directions must be arranged.
- As chip inductors are type of open-magnetic constructions, other components, chassis, substrate constructions, patterns, etc. may affect them to change L and Q.
- When high density mounting is applied, check the characteristic in advance on the actual conditions. Further, take care of positioning components as small spaces between inductors may cause magnetic interference.
- Do not place big magnetic materials like audio speakers etc. around the inductors. The influence of their magnetic field can change the inductance value.
- Do not give inductors heat radiation from other high temperature parts.
- Do not bend or twist the PWB after mounting the part.

### Inductors Common Care

- The characteristics of L(Inductance)/Q(Quality factor) values etc. of inductors have the characteristics of frequency dependence. Confirm L/Q values etc. by the frequency for use on the actual machine.
- Fully confirm the evaluation of reliability at resin, coating, potting, or molded sealing inductor. Take care especially for urethane sealing compounds because they are easy to adsorb humidity and may cause electric erosion.
- The protection coat of the inductor may be peeled off due to the stress at the resin stiffening time; it is recommended to use small contractile stress at a resin stiffening time.
- Pay attention to that the magnetic characteristics of the core and inductance may be changed by the stress of molded sealing.
- Keep the inductors away from magnetic tweezers or magnets because magnetization may change the inductance. For prevention of disconnection, the wire wound portion of the chip inductor should not be touched by sharp things like tweezers etc.

### Inrush Current

Please confirm before use because there is a risk of disconnection (open).

When excessive current (inrush current) is flown by the occurrence of the transition phenomenon in the circuit of the electric charge and discharge.

Also confirm taking the dispersion of the constants of other components on the actual circuit into the consideration.

### Land Pattern Design

- Refer to the recommended land pattern for each type shown on the datasheet.
- Avoid placing the chip inductor on any metal pattern except the recommended land pattern because a drop of Q and mutual conductance may occur.
- In case of flow soldering, venting of soldering flux gases should be made for high density assemblies to get a good solder connection.
- In case of reflow soldering, consider the layout because taller components close to chip inductor tend to block thermal conduction.

### Measuring

Be sure to ground the equipment that measures the circuit with inductors assembled, etc. and to use a wrist band at the operation.

## ▶ O – Z

### Operation Range and Environments

- Do not use inductors in an atmosphere filled with corrosive gas such as chlorine, sulfide, acid, etc.
- Keep inductors away from all magnets and magnetic objects (magnetic body metal tweezers) and equipment generating magnetic field (audio speakers).
- These products are designed and manufactured for general and standard use in general electronic equipment (e.g. AV equipment, home electric appliances, office equipment, information and communication equipment)
- These products are not intended for use in the following special conditions. Before using the products, carefully check the effects on their quality and performance, and determine whether or not they can be used.
  - In direct sunlight, outdoors, or in dust
  - In liquid, such as water, oil, chemicals, or organic solvent
  - In an environment where these products cause dew condensation
  - In salty air or air with a high concentration of corrosive gas, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>

### Quality Factor

Quality factor is the quality of a coil and asks by the below formula.

$$Q = (\omega L/R)$$

Q: Quality Factor

$\omega$ : Angular Frequency ( $\omega = 2\pi f$ )

R: Effective Resistance

### Safety Precautions

- When using our products, no matter what sort of equipment they might be used for, be sure to make a written agreement on the specifications with us in advance. The design and specifications in this catalog or website are subject to change without prior notice.
- Do not use the products beyond the specifications described in this catalog or website.
- This catalog or website explains the quality and performance of the products as individual components. Before use, check and evaluate their operations when installed in your products.
- Install the following systems for a failsafe design to ensure safety if these products are to be used in equipment where a defect in these products may cause the loss of human life or other significant damage, such as damage to vehicles (automobile, train, vessel), traffic lights, medical equipment, aerospace equipment, electric heating appliances, combustion/gas equipment, rotating equipment, and disaster/crime prevention equipment.

### Soldering Chip Inductors

- Solder at the shortest possible time if a soldering iron is used.
- Solder by reflowing at a 240°C peak 2 times or less. Ask us if 3 times or more are required.
- For non-mold type inductors, during and after soldering, take care not to give mechanical stress on the wound wire and flat top film.

### Soldering Leaded Inductors

- Solder at not more than 260°C within 10 sec.
- During and after soldering, do not to give mechanical stress on lead wires.
- When using a soldering iron, do not directly touch the tip of the iron to lead wires to heat.

### Storage

- Do not pile individual inductors in bulk.
- In bulk storage, take care to avoid chipping core or disconnection caused by rubbing each other.
- Store inductors indoor without steep temperature changes, away from direct sun rays, high temperature, humidity, magnetic field, vibration, dust, and corrosive gas (sulfide, chlorine, acid) that may deteriorate solderability and taping strength.