

# General Characteristics

Unlike other surface mount components, chip inductors are relatively new to the market. Standards have yet to be established. Designs vary from manufacturer to manufacturer. Soldering techniques and equipment also vary. At ISI we believe it is necessary to provide additional data regarding the "general characteristics" of the chip inductors to be useful in your products.

## 1. SOLDERING

All ISI chip inductors have high heat resistance and are good for either flow or re-flow soldering systems. However, some precautions are necessary. To facilitate the application of ISI chip inductors, we recommend the following:

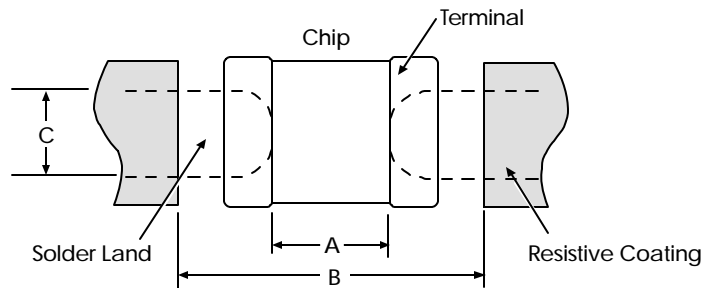
- 1.1 Infrared – conduct up to 60 seconds dwelling time in electrode temperature rate of 215°C or more (but not more than 235°C), and for no more than 5 seconds at peak temperature of 250°C. If the solder at the two electrodes does not melt simultaneously the chip inductor may not be mounted in the right place. It is recommended to mount with adhesive when the deviation is great.
- 1.2 Vapor Phase – conduct the soldering process at a temperature of 215°C + 5°C for 20 to 60 seconds dwelling time.
- 1.3 Flow – after fluxing, dip the inductor in a melted solder bath at 230°C ± 5°C for 3 ± 0.5 seconds. Solder should be 63/37 tinned copper.
- 1.4 Solder Dip – dip for 3 seconds or less at solder bath temperature of 250°C ± 5°C. Immediately after dipping, conduct forced air cooling for the entire underside of the board for 30 seconds or more.
- 1.5 Soldering Iron – the temperature of the tip of the soldering iron should be 350°C or slightly less. Soldering should be conducted for no more than 5 seconds. Re-soldering with soldering iron is not recommended. If necessary, however, it should be limited to one time only.
- 1.6 Pre-heat – It is necessary that all chip inductors be pre-heated at a temperature of 120°C ± 10°C for 5 minutes before using the soldering process.
- 1.7 Flux – It is recommended that copper wire, non-corrosive flux be used. Be careful of the PH and amount of chlorine contained in the flux. Use as little flux as possible. Make sure it does not spread to the surface of the board. It will destroy the board and the chip will become an open coil.
- 1.8 MIL-STD-202, METHOD 208 – This is not the recommended solder method for commercial surface mount inductors.

## 2. CLEANING SOLVENT

Cleaning with freon or trichlorethane is permissible. Do not use acid or alkali agents. Do not use ultrasonic cleaning. If necessary, contact ISI for confirmation of the inductor's ability to withstand specified conditions.

## 3. LAND PATTERN DESIGN

Recommended land dimensions for flow and re-flow soldering are given in the table below:



Type	A	B	C
LCM1210R	1.6 – 1.8	4.0 – 4.6	1.9 – 2.4
LCM1812R	2.4 – 2.6	5.5 – 6.0	2.0 – 3.0

All dimensions in mm

Avoid placing inductor over any metal pattern such as interconnect lines or traces. This may cause a change in inductance value, reduction in Q and generate mutual inductance.

## 4. MOUNTING

Placement force should not exceed 5 lbs. If more than 5 lbs., it may cause a change in electric and magnetic characteristics. High component mounting densities may degrade solder adhesion performance in flow soldering. In such a situation, care should be given to degassing (flux gases).

## 5. PRECAUTIONS WHEN APPLYING ELECTRICAL LOADS

The rated current is expressed by whichever is smaller: either the current by which the coil temperature rises by 20°C or the current by which inductance value is 10% to 20% lower than initial inductance value.

## 6. HANDLING AND STORAGE

Chip inductors must be carefully packed. Make sure they are not dropped and that they do not get wet. It is recommended not to use any product that has been dropped. Be careful where they are stored. No high temperatures, high humidity, atmospheric gases, or magnetic fields. When the products are stored for more than one year, check external appearance before using them. Do not pile products with coils on top of each other.