



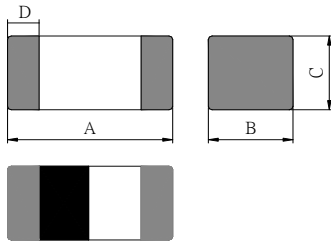
**High Frequency Chip Inductor (Lead Free)** HCI1005LF-1N5S-MS8

**1.Features**

1. Monolithic inorganic material construction.
2. Closed magnetic circuit avoids crosstalk.
3. S.M.T. type.
4. Suitable for reflow soldering.
5. Shapes and dimensions follow E.I.A. spec.
6. Available in various sizes.
7. Excellent solder ability and heat resistance.
8. High SRF up to 6GHz and above.
9. 100% Lead(Pb) & Halogen-Free and RoHS compliant.



**2. Dimensions**



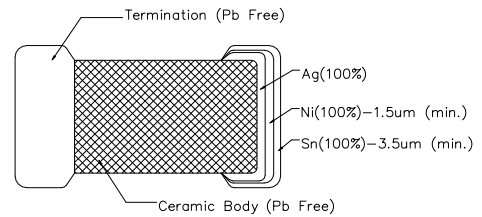
| Chip Size |           |
|-----------|-----------|
| A         | 1.00±0.15 |
| B         | 0.50±0.15 |
| C         | 0.50±0.15 |
| D         | 0.25±0.10 |

Units: mm

**3. Part Numbering**



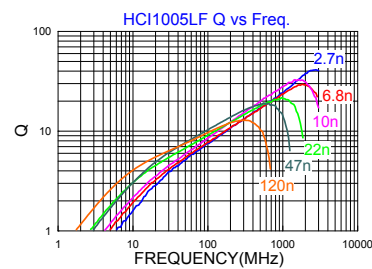
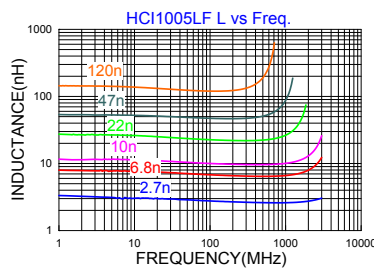
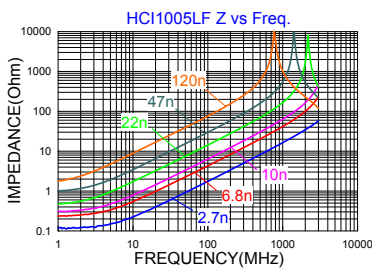
- A: Series
- B: Dimension L x W
- C: Category Code
- D: Material **Lead Free Material**
- E: Inductance **1N5=1.5 nH**
- F: Inductance Tolerance **S=±0.3**
- G: marking



**4.Specification**

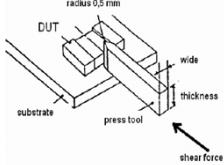
| Tai-Tech Part Number | Inductance (nH) | Test Frequency (Hz) | Q min. | Rated Current (mA) max | DCR (Ω) max. | SRF (MHz) min. |
|----------------------|-----------------|---------------------|--------|------------------------|--------------|----------------|
| HCI1005LF-1N5S-MS8   | 1.5±0.3         | 100M / 50mV         | 7      | 300                    | 0.10         | 6000           |

- Rated current: based on temperature rise test
- In compliance with EIA 595



## 5. Reliability and Test Condition

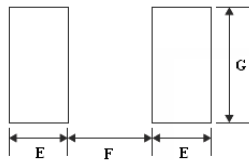
| Item                               | Performance  | Test Condition   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
|------------------------------------|--|--|-----------|-----------------------------|--------------------------|-----------|-----------------------------|-----|----|----|-----------|------|------|----|----|-----------|------|
| Series No.                         | HCI  | --   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Operating Temperature              | -40~+105℃<br>(Including self-temperature rise)   | --   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Transportation Storage Temperature | -40~+105℃<br>(on board)  | For long storage conditions, please see the Application Notice   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Inductance (Ls)                    | Refer to standard electrical characteristics list  | Agilent4291  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Q Factor                           |  | Agilent E4991  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| DC Resistance                      |  | Agilent4287  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Rated Current                      |  | Agilent16192   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
|                                    |  | Agilent 4338   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Temperature Rise Test              | Rated Current < 1A ΔT 20℃Max<br>Rated Current ≥ 1A ΔT 40℃Max   | 1. Applied the allowed DC current.<br>2. Temperature measured by digital surface thermometer.  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Life test                          | Appearance: no damage.   | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020D Classification Reflow Profiles)<br>Temperature: 105±2℃<br>Applied current: rated current.<br>Duration: 1000±12hrs.<br>Measured at room temperature after placing for 24±2 hrs.   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Load Humidity                      | Impedance: within±15%of initial value.<br>Inductance: within±10%of initial value.<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value                              | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020D Classification Reflow Profiles)<br>Humidity: 85±2%R.H.<br>Temperature: 85±2℃.<br>Duration: 1000hrs Min. with 100% rated current.<br>Measured at room temperature after placing for 24±2 hrs.   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Thermal shock                      | Appearance: no damage.<br>Impedance: within±15%of initial value.<br>Inductance: within±10%of initial value.<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value    | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020D Classification Reflow Profiles)<br>Condition for 1 cycle<br>Step1: -40±2℃ 30±5 min.<br>Step2: 25±2℃ ≤0.5min<br>Step3: +105±2℃ 30±5min.<br>Number of cycles: 500<br>Measured at room temperature after placing for 24±2 hrs.  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Vibration                          | Appearance : No damage.<br>Impedance : within±15% of initial value<br>Inductance : within±10% of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020D Classification Reflow Profiles)<br>Oscillation Frequency: 10~ 2K~ 10Hz for 20 minutes<br>Equipment : Vibration checker<br>Total Amplitude:1.52mm±10%<br>Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) °  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Bending                            | Appearance : No damage.<br>Impedance : within±10% of initial value<br>Inductance : within±10% of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value | Shall be mounted on a FR4 substrate of the following dimensions:<br>>=0805inch(2012mm):40x100x1.2mm<br><0805inch(2012mm):40x100x0.8mm<br>Bending depth:<br>>=0805inch(2012mm):1.2mm<br><0805inch(2012mm):0.8mm<br>Duration of 10 sec for a min.  |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Shock                              | Appearance : No damage.<br>Impedance : within±10% of initial value<br>Inductance : within±10% of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value | Test condition:<br><table border="1"> <thead> <tr> <th>Type</th> <th>Peak Value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (Vt)/ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> <tr> <td>Lead</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> </tbody> </table> | Type      | Peak Value (g's)            | Normal duration (D) (ms) | Wave form | Velocity change (Vt)/ft/sec | SMD | 50 | 11 | Half-sine | 11.3 | Lead | 50 | 11 | Half-sine | 11.3 |
| Type                               | Peak Value (g's)   | Normal duration (D) (ms)   | Wave form | Velocity change (Vt)/ft/sec |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| SMD                                | 50   | 11   | Half-sine | 11.3                        |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Lead                               | 50   | 11   | Half-sine | 11.3                        |                          |           |                             |     |    |    |           |      |      |    |    |           |      |
| Insulation Resistance              | IR>1GΩ   | Chip Inductor Only<br>Test Voltage:100±10%V for 30Sec.   |           |                             |                          |           |                             |     |    |    |           |      |      |    |    |           |      |

| Item                         | Performance  | Test Condition  |                  |          |  |                      |       |                |
|------------------------------|--|---|------------------|----------|--|----------------------|-------|----------------|
| Solderability                | More than 95% of the terminal electrode should be covered with solder.   | Preheat: 150°C,60sec.<br>Solder: Sn96.5%-Ag3%-Cu0.5%<br>Solder temperature: 245±5°C<br>Flux for lead free: Rosin. 9.5%<br>Depth: completely cover the termination.<br>Dip time: 4±1sec.   |                  |          |  |                      |       |                |
| Resistance to Soldering Heat | Appearance : No damage.<br>Impedance : within±15% of initial value<br>Inductance : within±10% of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value | Number of heat cycles: 1<br><table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Time (s)</th> <th>Temperature ramp/immersion and emersion rate</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> </tr> </tbody> </table> Depth: completely cover the termination  | Temperature (°C) | Time (s) | Temperature ramp/immersion and emersion rate | 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s |
| Temperature (°C)             | Time (s)   | Temperature ramp/immersion and emersion rate  |                  |          |  |                      |       |                |
| 260 ±5 (solder temp)         | 10 ±1  | 25mm/s ±6 mm/s  |                  |          |  |                      |       |                |
| Terminal strength            | Appearance : No damage.<br>Impedance : within±15% of initial value<br>Inductance : within±10% of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within ±15% of initial value and shall not exceed the specification value |  Preconditioning: Run through IR reflow for 2 times. ( IPC/JEDEC J-STD-020D Classification Reflow Profiles)<br>Component mounted on a PCB apply a force >0805inch(2012mm):1kg <=0805inch(2012mm):0.5kg to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to shock the component being tested. |                  |          |  |                      |       |                |

## 6.Soldering and Mounting

### 6-1. Recommended PC Board Pattern

| Chip Size |      |           |           |           | Land Patterns For Reflow Soldering |       |       |       |
|-----------|------|-----------|-----------|-----------|------------------------------------|-------|-------|-------|
| Series    | Type | A(mm)     | B(mm)     | C(mm)     | D(mm)                              | E(mm) | F(mm) | G(mm) |
| HCI       | 1005 | 1.00±0.15 | 0.50±0.15 | 0.50±0.15 | 0.25±0.10                          | 0.50  | 0.40  | 0.60  |



PC board should be designed so that products can prevent damage from mechanical stress when warping the board.

### 6-2. Soldering

Mildly activated rosin fluxes are preferred. The terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

Note.

If wave soldering is used ,there will be some risk.

Re-flow soldering temperatures below 240 degrees, there will be non-wetting risk

#### 6-2.1 Lead Free Solder re-flow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. (Referred to J-STD-020C)