High Frequency Chip Inductor (Lead Free) HCI1005LF-12NJ-MS8

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	17/06/27	初版發行	楊祥忠	詹偉特	張嘉玲
備註					

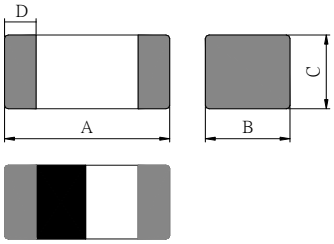
High Frequency Chip Inductor (Lead Free) HCI1005LF-12NJ-MS8

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.

Halogen-free Pb-free Certificate of Green Partner

2. Dimensions



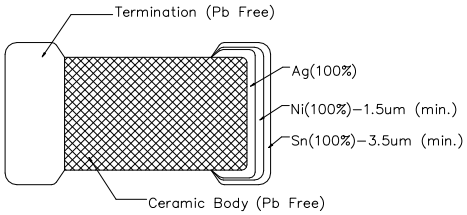
Chip Size	
A	1.00±0.15
B	0.50±0.15
C	0.50±0.15
D	0.25±0.10

Units: mm

3. Part Numbering

HCI	1005	L	F	-	12N	J	-	MS8
A	B	C	D		E	F		G

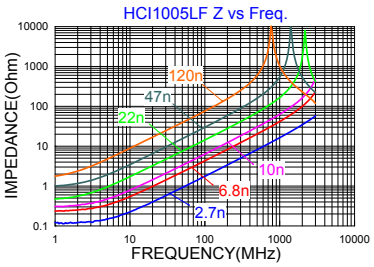
A: Series
B: Dimension L x W
C: Category Code
D: Material Lead Free Material
E: Inductance 12N=12 nH
F: Inductance Tolerance J=±5%
G: marking

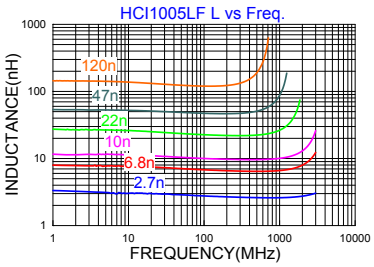


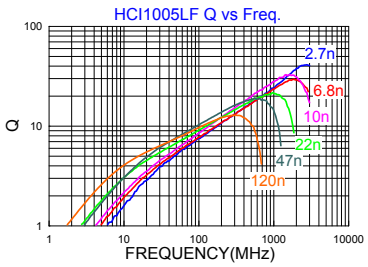
4.Specification

Tai-Tech Part Number	Inductance (nH)	Test Frequency (Hz)	Q min.	Rated Current (mA) max	DCR (Ω) max.	SRF (MHz) min.
HCI1005LF-12NJ-MS8	12±5%	100M / 50mV	8	300	0.50	2700

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





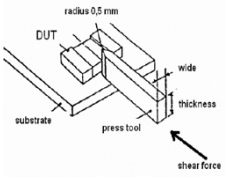


5. Reliability and Test Condition

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Series No.</td><td>HCI</td><td>--</td></tr>
<tr><td>Operating Temperature</td><td>-40~+105℃
(Including self-temperature rise)</td><td>--</td></tr>
<tr><td>Transportation
Storage Temperature</td><td>-40~+105℃
(on board)</td><td>For long storage conditions, please see the Application Notice</td></tr>
<tr><td>Inductance (Ls)</td><td rowspan="4">Refer to standard electrical characteristics list</td><td>Agilent4291
Agilent E4991</td></tr>
<tr><td>Q Factor</td><td>Agilent4287
Agilent16192</td></tr>
<tr><td>DC Resistance</td><td>Agilent 4338</td></tr>
<tr><td>Rated Current</td><td>DC Power Supply
Over Rated Current requirements, there will be some risk</td></tr>
<tr><td>Temperature Rise Test</td><td>Rated Current < 1A ΔT 20℃Max
Rated Current ≧ 1A ΔT 40℃Max</td><td>1. Applied the allowed DC current.
2. Temperature measured by digital surface thermometer.</td></tr>
<tr><td>Life test</td><td rowspan="2">Appearance: no damage.

Impedance: within±15%of initial value.
Inductance: within±10%of initial value.
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Temperature: 105±2℃
Applied current: rated current.
Duration: 1000±12hrs.
Measured at room temperature after placing for 24±2 hrs.</td></tr>
<tr><td>Load Humidity</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Humidity: 85±2%R.H.
Temperature: 85±2℃.
Duration: 1000hrs Min. with 100% rated current.
Measured at room temperature after placing for 24±2 hrs.</td></tr>
<tr><td>Thermal shock</td><td>Appearance: no damage.

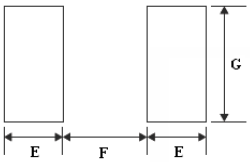
Impedance: within±15%of initial value.
Inductance: within±10%of initial value.
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Condition for 1 cycle
Step1: -40±2℃ 30±5 min.
Step2: 25±2℃ ≦0.5min
Step3: +105±2℃ 30±5min.
Number of cycles: 500
Measured at room temperature after placing for 24±2 hrs.</td></tr>
<tr><td>Vibration</td><td>Appearance：No damage.
Impedance：within±15% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Oscillation Frequency: 10～2K～10Hz for 20 minutes
Equipment： Vibration checker
Total Amplitude:1.52mm±10%
Testing Time：12 hours(20 minutes, 12 cycles each of 3 orientations)。</td></tr>
<tr><td>Bending</td><td>Appearance：No damage.
Impedance：within±10% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Shall be mounted on a FR4 substrate of the following dimensions:
>=0805inch(2012mm):40x100x1.2mm
<0805inch(2012mm):40x100x0.8mm
Bending depth:
>=0805inch(2012mm):1.2mm
<0805inch(2012mm):0.8mm
Duration of 10 sec for a min.</td></tr>
<tr><td>Shock</td><td>Appearance：No damage.
Impedance：within±10% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Test condition:<table><tr><th>Type</th><th>Peak Value (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)ft/sec</th></tr><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></table></td></tr>
<tr><td>Insulation Resistance</td><td>IR>1GΩ</td><td>Chip Inductor Only
Test Voltage:100±10%V for 30Sec.</td></tr>
</table>

Item	Performance	Test Condition
Solderability	More than 95% of the terminal electrode should be covered with solder.	Preheat: 150℃,60sec. Solder: Sn96.5%-Ag3%-Cu0.5% Solder temperature: 245±5℃ Flux for lead free: Rosin. 9.5% Depth: completely cover the termination. Dip time: 4±1sec.
Resistance to Soldering Heat	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：within ±15% of initial value and shall not exceed the specification value	Number of heat cycles: 1 Temperature (°C) / Time (s) / Temperature ramp/immersion and emersion rate 260 ±5 (solder temp) / 10 ±1 / 25mm/s ±6 mm/s Depth: completely cover the termination
Terminal strength	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. 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) 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. (Refered to J-STD-020C)