

High Frequency Chip Inductor (Lead Free)

HCI1005LF-4N7S-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					

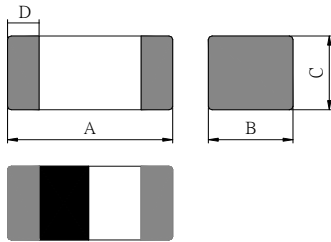
High Frequency Chip Inductor (Lead Free) HCI1005LF-4N7S-MS8

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



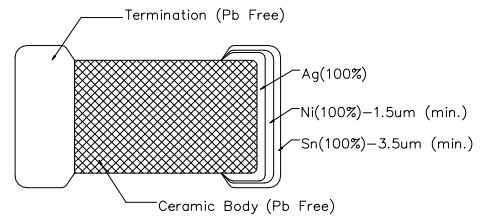
Chip Size	
A	1.00±0.15
B	0.50±0.15
C	0.50±0.15
D	0.25±0.10

Units: mm

3. Part Numbering



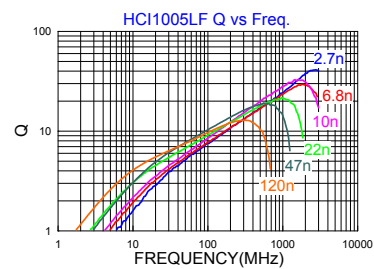
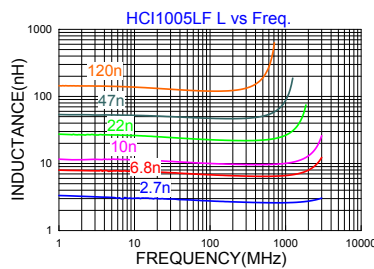
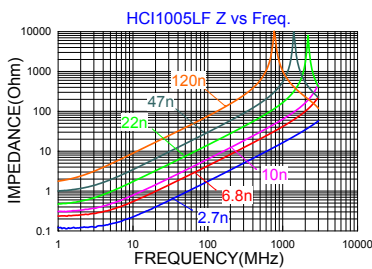
- A: Series
- B: Dimension L x W
- C: Category Code
- D: Material Lead Free Material
- E: Inductance 4N7=4.7 nH
- F: Inductance Tolerance S=±0.3
- G: marking



4. Specification

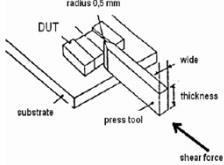
Tai-Tech Part Number	Inductance (nH)	Test Frequency (Hz)	Q min.	Rated Current (mA) max	DCR (Ω) max.	SRF (MHz) min.
HCI1005LF-4N7S-MS8	4.7±0.3	100M / 50mV	7	300	0.20	4000

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



5. Reliability and Test Condition

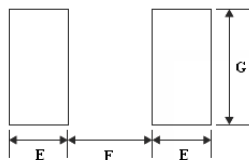
Item	Performance	Test Condition															
Series No.	HCI	--															
Operating Temperature	-40~+105℃ (Including self-temperature rise)	--															
Transportation Storage Temperature	-40~+105℃ (on board)	For long storage conditions, please see the Application Notice															
Inductance (Ls)	Refer to standard electrical characteristics list	Agilent4291															
Q Factor		Agilent E4991															
DC Resistance		Agilent4287															
Rated Current		Agilent16192															
Rated Current		Agilent 4338															
Temperature Rise Test	Rated Current < 1A ΔT 20℃Max Rated Current ≥ 1A ΔT 40℃Max	1. Applied the allowed DC current. 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) Temperature: 105±2℃ Applied current: rated current. Duration: 1000±12hrs. Measured at room temperature after placing for 24±2 hrs.															
Load Humidity	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) 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.															
Thermal shock	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) 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.															
Vibration	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) 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) °															
Bending	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	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.															
Shock	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	Test condition: <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 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. Solder: Sn96.5%-Ag3%-Cu0.5% Solder temperature: 245±5°C 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 <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. 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 >0.805inch(2012mm):1kg <=0.805inch(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)