AntennaFactor by Linx

Ultra Compact Chip Antenna Data Guide

Wireless made simple®

Applications

- Bluetooth
- 802.11
- ZigBee
- Wireless PCMCIA cards
- Telemetry
- Data collection
- Industrial process monitoring
- Compact wireless products
- External antenna elimination

Ordering Information

Ordering Information	
Part Number	**Description**
ANT-868-CHP-x	868Mhz Chip Antenna
ANT-916-CHP-x	916MHz Chip Antenna
ANT-2.45-CHP-x	2.45GHz Chip Antenna

x = "T" for tape/reel, "B" for bulk

All parts are RoHS compliant.
Standard reel is 3,000pcs. (868/916MHz), 1,500pcs. (2.45GHz)
Quantities less than reel size are supplied in bulk.

Figure 4: Ordering Information

Electrical Specifications

Specifications			
Parameter	**2.45GHz**	**868MHz**	**916MHz**
Physical			
Dimensions (mm)	6.5(L) x 2.2(W) x 1.0(H)	16.0(L) x 3.0(W) x 1.7(H)	16.0(L) x 3.0(W) x 1.7(H)
Operating/Storage Temp	–40 to +85°C	–40 to +85°C	–40 to +85°C
Construction	LTCC	LTCC	LTCC
Electrical			
Center Frequency	2.45GHz	868MHz	916MHz
Bandwidth	180MHz	10MHz	10MHz
Wavelength	¼-wave	¼-wave	¼-wave
Pattern	Omni-directional	Omni-direction	Omni-directional
Polarization	Linear	Linear	Linear
VSWR	≤2.0 (Max.)	≤2.0 (Max.)	≤2.0 (Max.)
Maximum Gain	+0.5dBi	+0.5dBi	+0.5dBi
Impedance	50Ω	50Ω	50Ω
Power Handling	3W (Max.)	3W (Max.)	3W (Max.)

Figure 5: Ordering Information

Theory of Operation

The CHP Series antennas utilize Low Temperature Cofired Ceramic (LTCC) technology to embed the antenna element into a ceramic substrate. Advances in this technology have resulted in materials that are extremely stable over time and temperature, producing an antenna that is highly reliable across a wide range of applications. The high-frequency characteristics of this technology enable exceptional performance in a very small package. The construction techniques for LTCC devices lends itself well to favorable pricing in high volume.

Layout Considerations

Proper layout is vital to ensure correct operation and optimum performance. Improper placement of planes, traces, or system components will result in nulls or complete de-tuning. Ideally, the antenna will be mounted on the board in such a way as to allow an unobstructed field of view. The area underneath the antenna must be free of components, traces, and planes. Components may be placed to the rear of the antenna in the ground plane counterpoise area. The feed trace from the RF stage to the antenna must be a microstrip trace or coax transmission line and should be kept as short as practical.

The layout of our reference jigs is illustrated on the following pages. While they demonstrate various aspects of a layout, it is not necessary to replicate them exactly. While your board size and layout may differ, it is important to recognize that the counterpoise plays an important role in resonance and stability since it acts, in essence, as part of the antenna. After your own layout is complete, the performance of the antenna in your specific product should be carefully checked using tools like a network analyzer. In some cases, the size of the product's PCB, proximity of the case, or other factors may make a custom version of the antenna necessary. Contact Linx for more information.

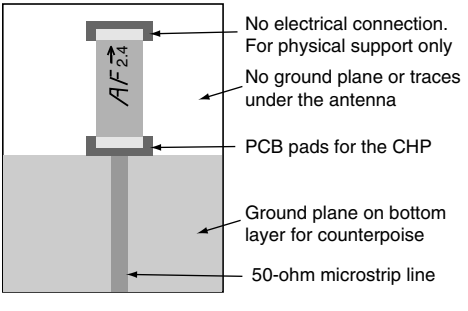

Figure 10: Layout

Assembly Considerations

The antenna is RoHS Compliant and designed to support hand or automated assembly. To avoid damage to the part, the reflow solder guidelines found below should be carefully followed. The antenna is single ended meaning that one pad is electrically connected while the other is for mechanical support only. The antenna terminals are not interchangeable so the polarity indicated in the Pin Configuration section must be observed during assembly.

Hand Soldering

This antenna is designed for high-volume automated assembly, however, it may be successfully attached by hand assembly techniques. A hand-solder temperature of 225°C or lower should be used. Do not exceed a 10sec. heating time.

Reflow Temperature Profile

The single most critical stage in the automated assembly process is the reflow process. The reflow profile below should be closely followed since excessive temperatures or transport times during reflow will irreparably damage the antennas. Assembly personnel will need to pay careful attention to the oven's profile to ensure that it meets the requirements necessary to successfully reflow all components while still meeting the limits mandated by the antennas themselves.

Test Boards

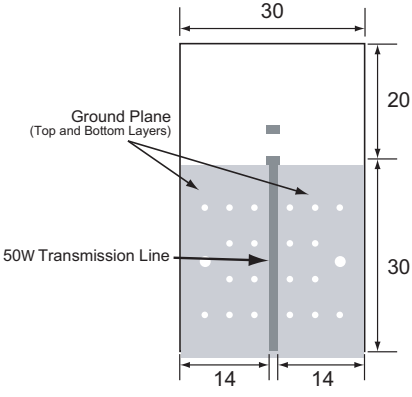

Figure 15. 2.4GHz Test Board

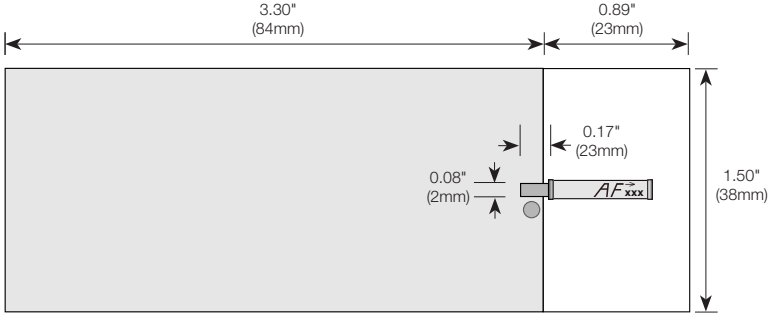

Figure 16: 868MHz and 916MHz Test Board

Tape Dimensions

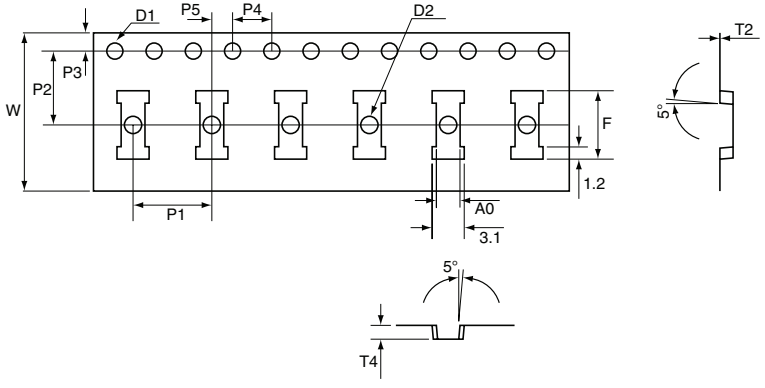

Figure 19: 2.4GHz Tape Dimensions

2.4GHz Tape Dimensions			
Symbol	Dimension	Tolerance	Unit
A0	2.30	±0.10	mm
D1	1.50	±0.10 –0.00	mm
D2	1.50	±0.25 –0.00	mm
F	6.60	±0.10	mm
P1	8.00	±0.10	mm
P2	7.50	±0.10	mm
P3	1.75	±0.10	mm
P4	4.00	±0.10	mm
P5	2.00	±0.10	mm
T2	0.30	±0.05	mm
T4	1.30	±0.10	mm
W	16.00	±0.10	mm

Figure 20: 2.4GHz Tape Dimensions Table

Reel Dimensions

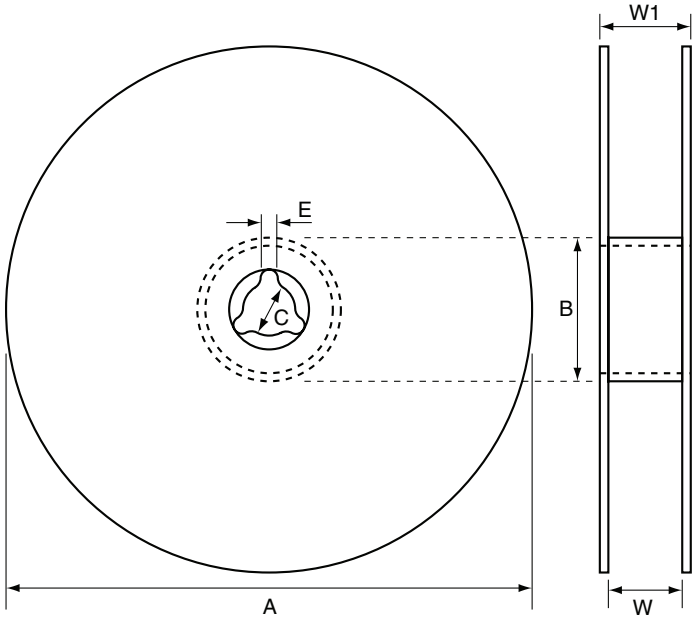

Figure 22: Reel Dimensions

Reel Dimensions			
Symbol	**868/916MHz**	**2.45GHz**	**Unit**
QTY per reel	3,000	1,500	pcs
Tape width	24	16	mm
A	330±1	180±1	mm
B	100±0.5	62±0.5	mm
C	13±0.5	13±0.2	mm
E	2.2±0.5	2.2±0.5	mm
W	24±0.5	16±0.5	mm
W1	28.9±0.2	20±0.2	mm

Figure 23: Reel Dimensions Table

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