

# Airgain™



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## Profile Series N2425D

Airgain P/N: N2425D-T2R-PK1-G150U  
Antenna Type : pifa

## Airgain Embedded Antenna

## Engineering Data Sheet

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## Revision History (Required)

Revision	Date	Note
343C-02-00-001-1 Rev1.0	08 July 2014	Preliminary Datasheet 1.0

## Disclaimers

The information in this document is provided in connection with Airgain Antenna products and is proprietary and confidential. Airgain may make changes at any time, without notice.

***Please verify with Airgain before finalizing a product design.***

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## 1. Airgain N2425D Embedded Antenna

Based on Airgain's patented technology, the Model N2425D Embedded Antenna provides a high efficiency, low gain, dual band embedded antenna solution for Wi-Fi and ISM band applications, such as WLAN products. As embedded antenna solutions become the focus of next generation wireless product design, the Model N2425D provides the flexibility of an embedded antenna with top performance. The Model N2425D Embedded Antenna is a shorter, center fed version of its predecessor, the N2425D, allowing it to fit in shorter spaces where center feeding is better suited.. It is designed to accommodate most WLAN access point applications, such as routers and gateways can be easily integrated into an ID package design.

## 2. Features

The Model N2425D Embedded Antenna is defined by the following features:

- IEEE 802.11 a/b/g/n /ac standards
- Dual Band operation
- Case mount
- High efficiency
- Quick integration



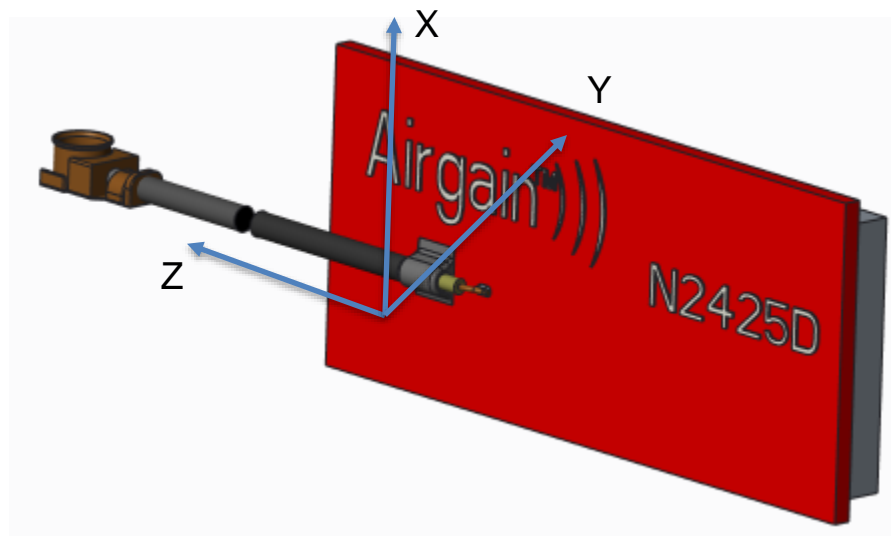
**Figure 1** Model N2425D Embedded Antenna

### 3. Specifications and Interface

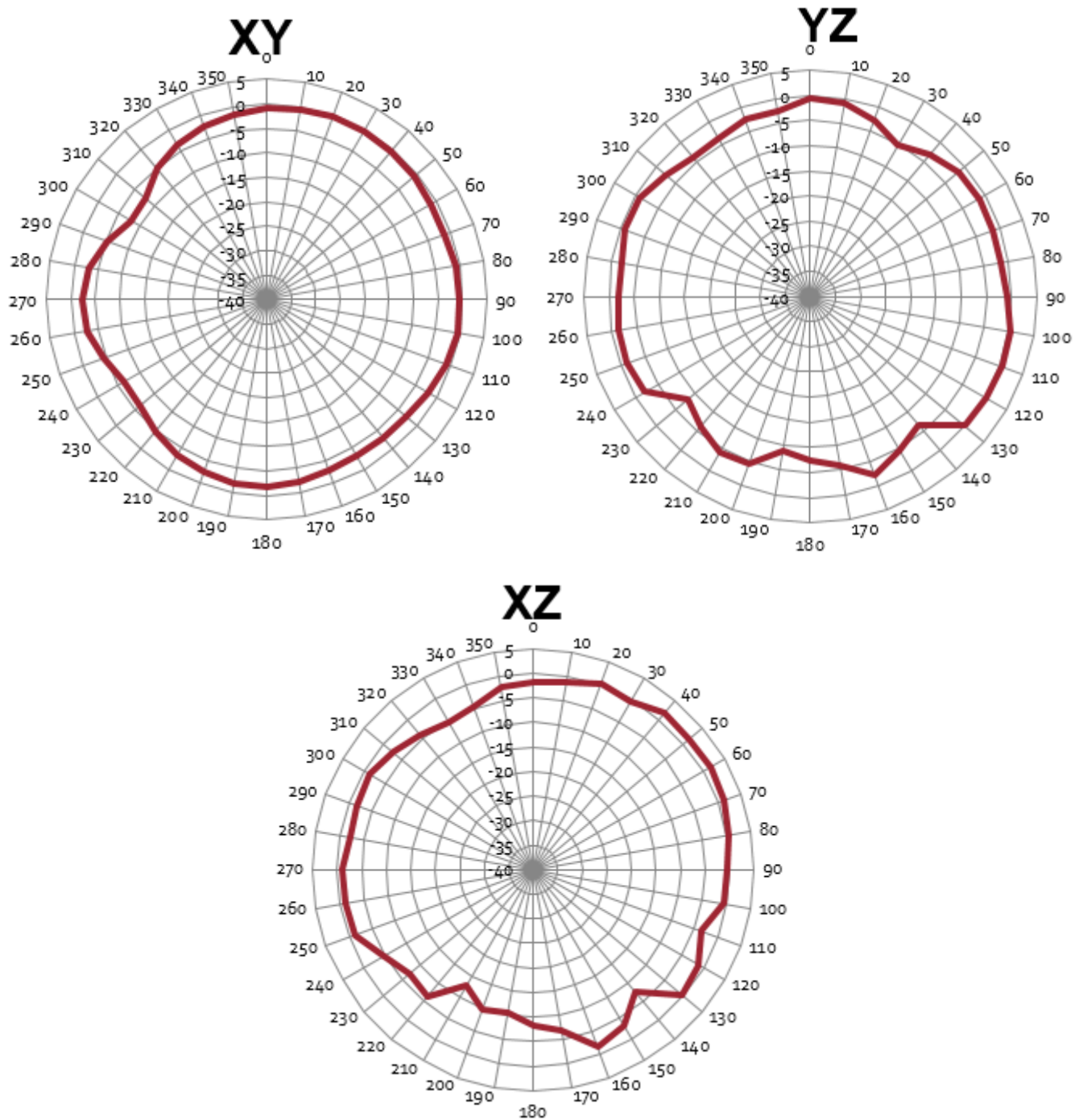
<b>Standard</b>	IEEE 802.11n and 802.11 a/b/g/ac
<b>Frequency range</b>	2.4 to 2.49 GHz, 4.9 to 5.9 GHz
<b>Peak gain</b>	1.9 dBi @2.4 GHz, 3.5 dBi @ 5.0 GHz
<b>VSWR</b>	< 2:1
<b>Feed impedance</b>	50 ohms
<b>Power handling</b>	30 dBm
<b>Interface</b>	50 ohms, 1.13 mm diameter, micro coax cable (available with optional U.FL-compatible cable connector and/or cable-mounted EMI ferrites)
<b>Antenna dimensions</b>	31.5 x 14.2 x 0.8 mm
<b>Weight</b>	0.79 g (0.028 oz.)
<b>Temperature range</b>	Operating: -40° C to +75° C (-40° F to +167° F) Storage: -40° C to +85° C (-40° F to +185° F)
<b>Humidity range</b>	0% to 95% non-condensing

### 4. Radiation Patterns

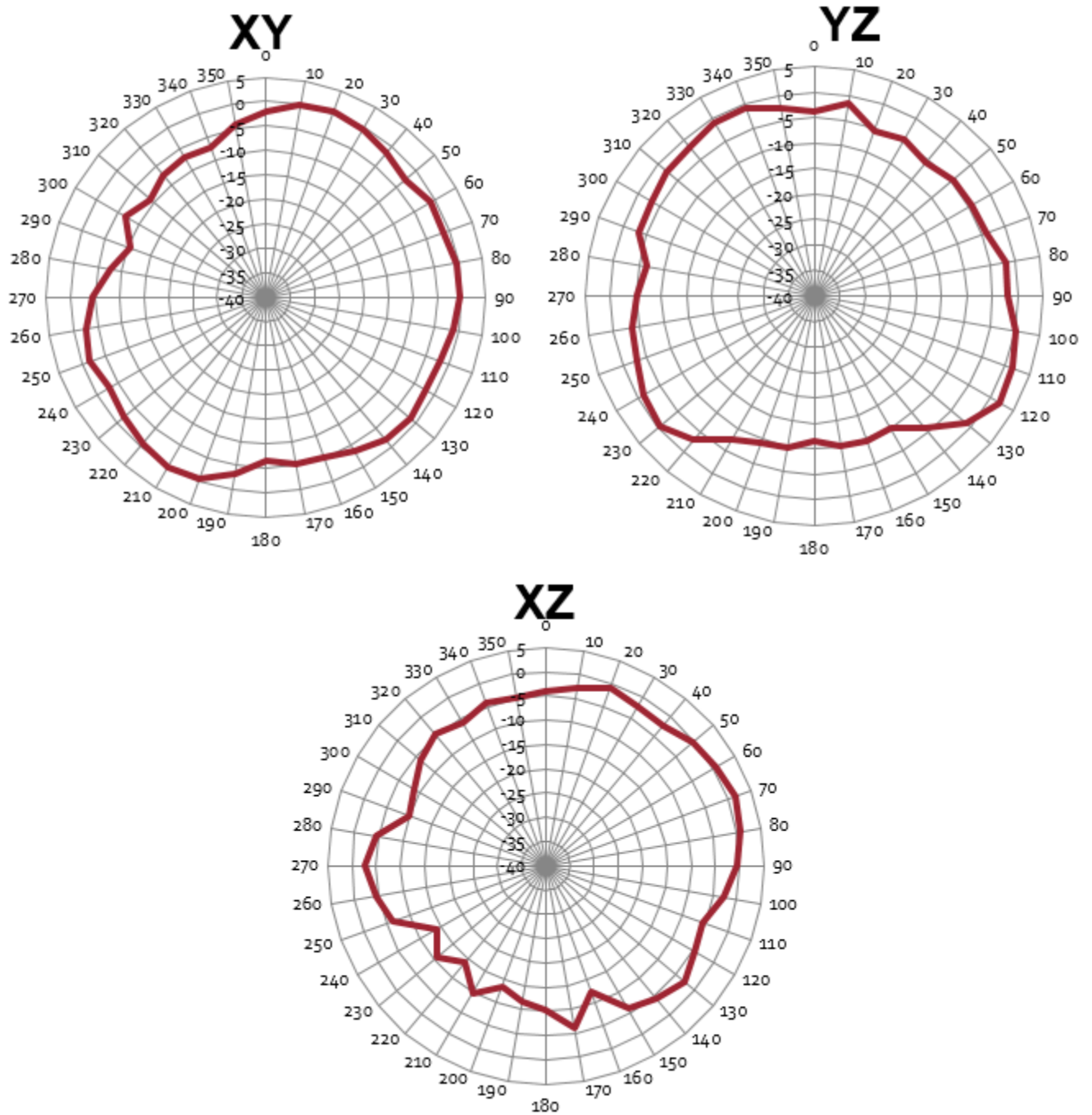
Radiation patterns for the Airgain N2425D were measured with the antenna mounted in testing AP.



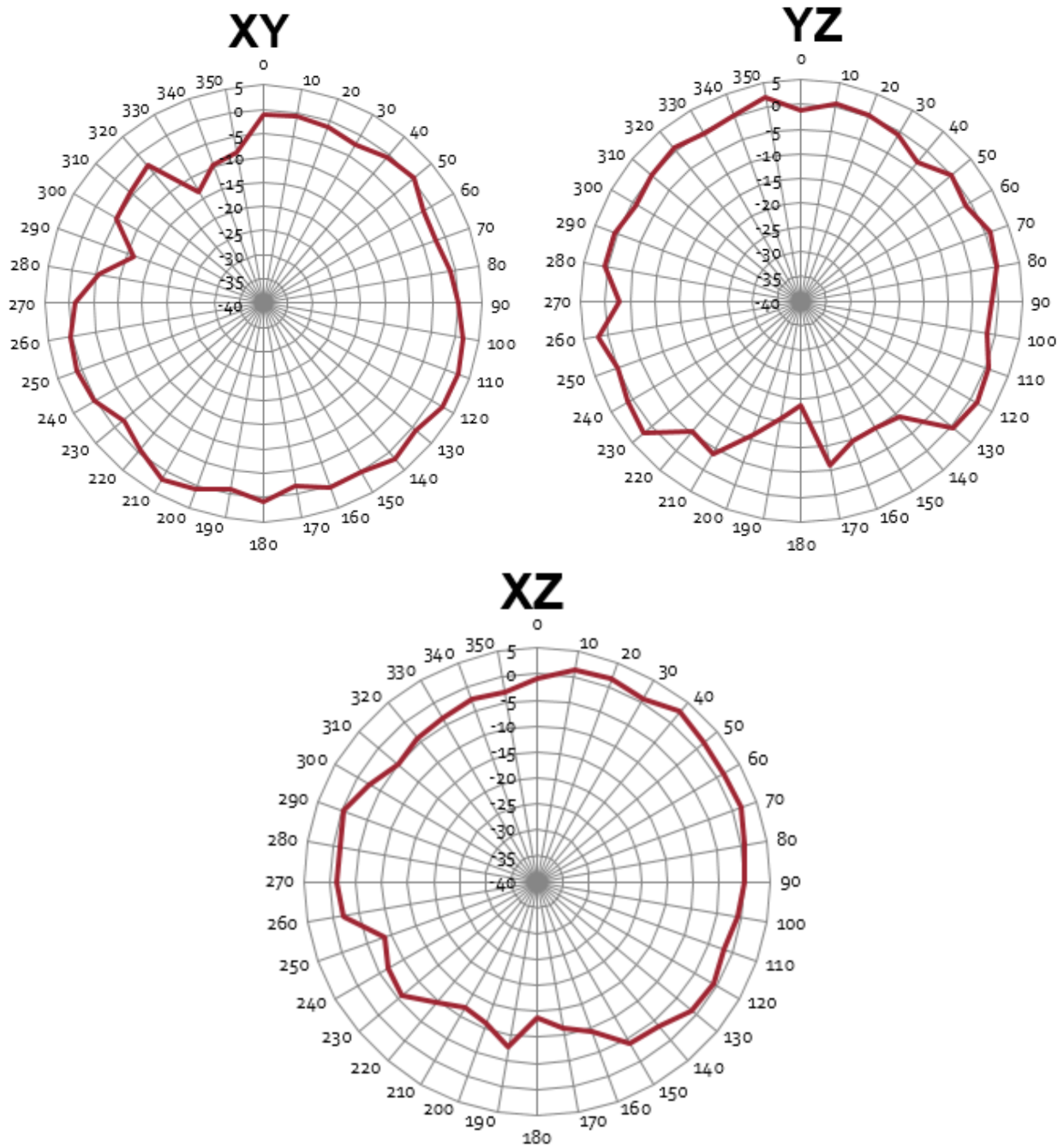
**Figure 2** Model N2425D Measurement axes



**Figure 3** Model N2425D Measured Radiation Patterns at 2.44 GHz



**Figure 4** Model N2425D Measured Radiation Patterns at 5.2 GHz



**Figure 5** Model N2425D Measured Radiation Patterns at 5.8 GHz



## 5. Dimensions

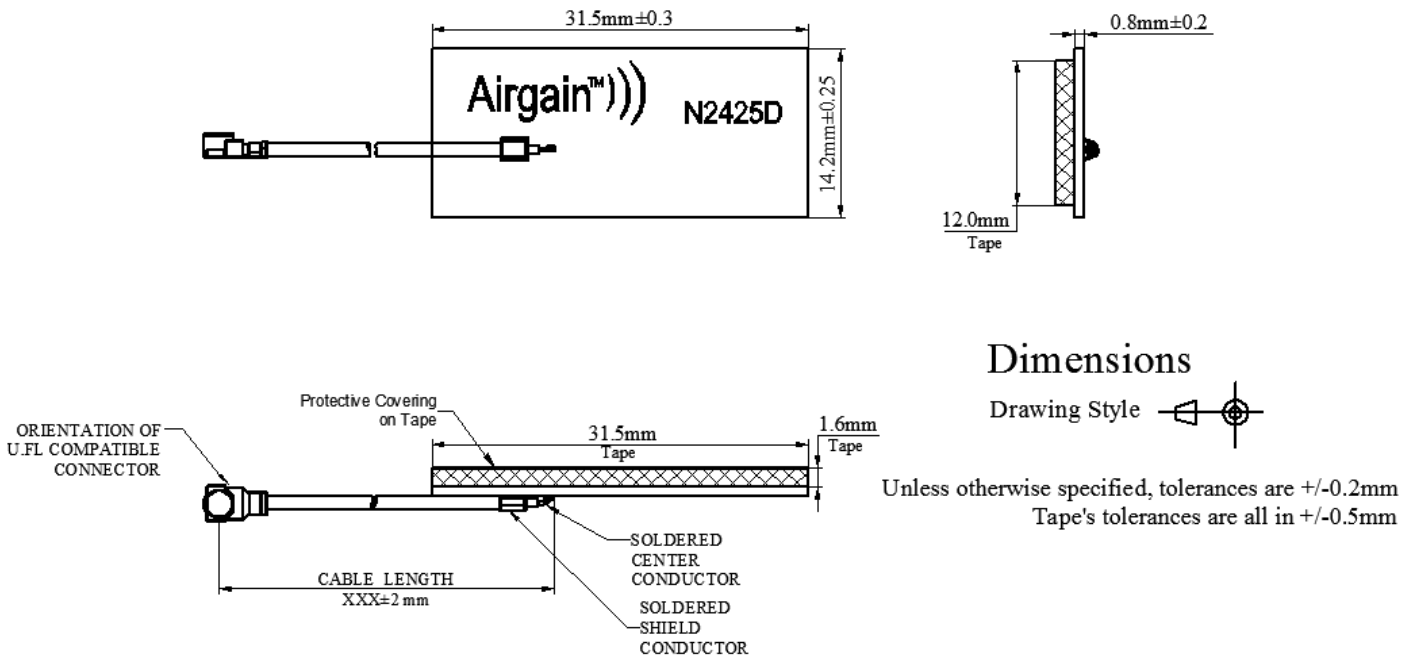


Figure 6 N2425D Antenna dimensions

## 6. ROHS

Airgain N2425D embedded antennas are RoHS compliant.

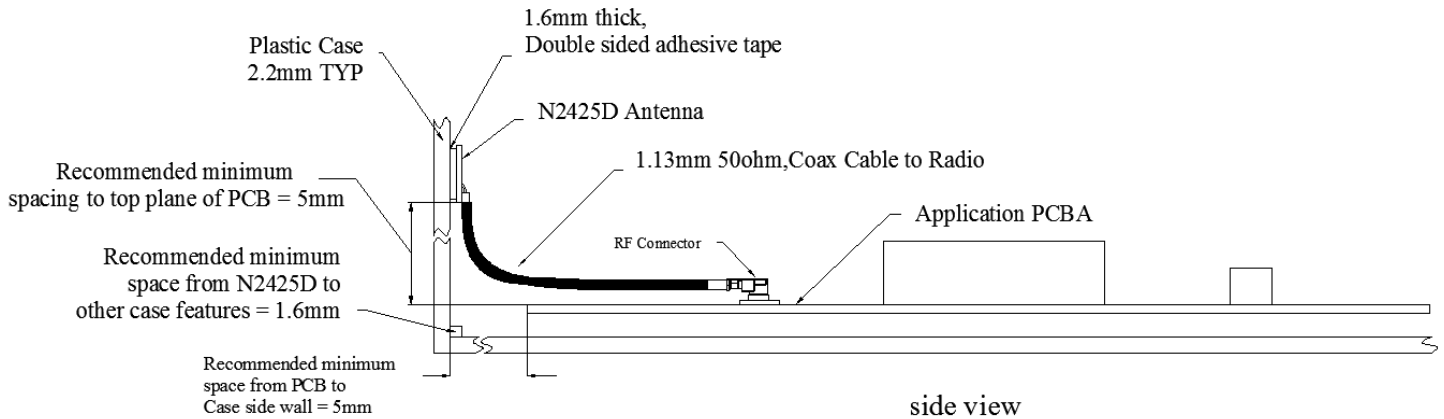
## 7. Mounting Guidelines

The Airgain N2425D embedded antenna can be simply mounted on the interior of an ABS plastic case using double-sided adhesive tape. This can simplify the industrial design process and shorten the product development cycle. Alternatively, the N2425D embedded antenna can be mounted on clips formed in the case itself.

The N2425D antenna can be mildly loaded (detuned) if it is not properly spaced away from the ABS plastic mounting surface. You should mount the antenna onto a 2.2-mm thick ABS plastic case with 1.6-mm double-sided tape for optimum performance. You can mount the N2425D to case walls of different thicknesses, but should determine the optimum separation between the N2425D and the case wall on a case-by-case basis. As the case material becomes thicker, the loading effect becomes more pronounced, which can be offset by a larger air gap.

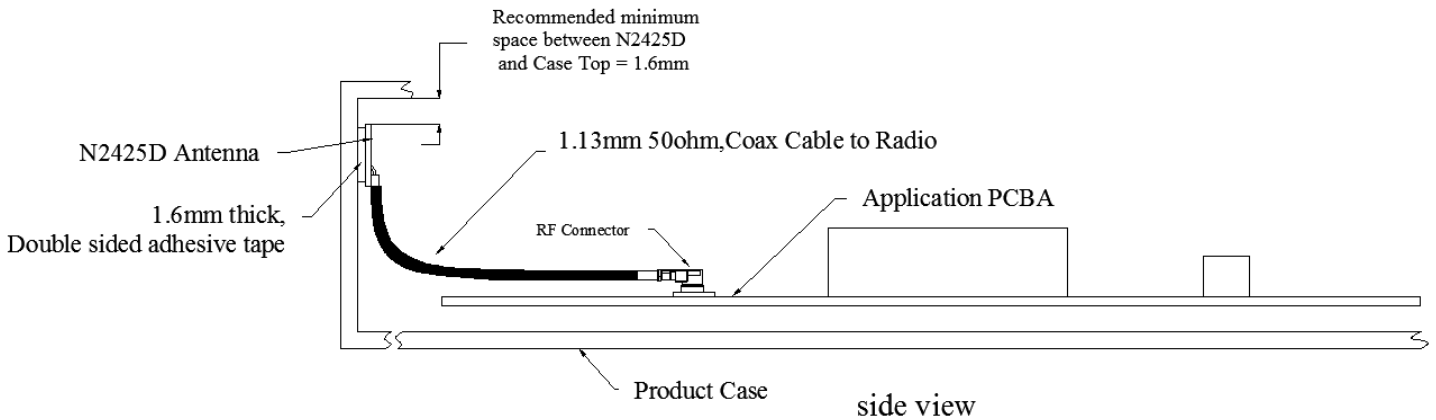
For a case wall mount, mount the N2425D in an application case by using a 31.5 mm by 12 mm piece of

double-sided adhesive tape placed behind the antenna PCB, as shown in Figure 7 and Figure 10. Place the N2425D on the case side wall at a height where the lowest antenna PCB edge is 5 mm above the application PCBA top plane. A space of 5 mm is recommended between the PCBA edge near the N2425D and the case wall mounting location, as shown in Figure 7.



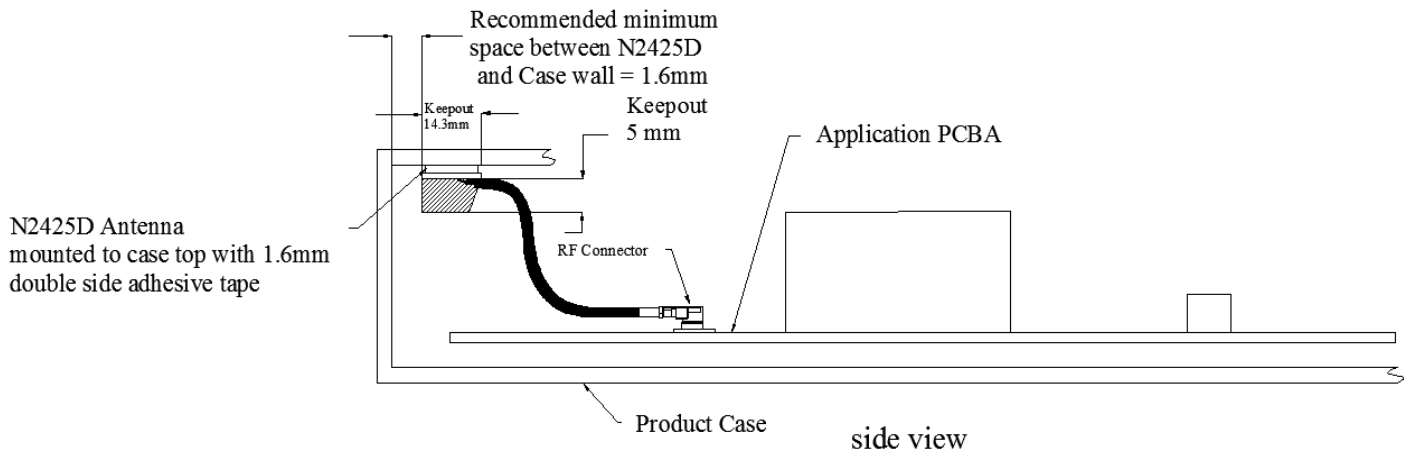
**Figure 7** Case side wall mounting considerations for Airgain N2425D (side view)

For a case top location, ensure that a space of 1.6 mm minimum is maintained between any other case walls, case features, or case-top, which are near the N2425D antenna mounting location, as shown in Figure 8 and Figure 9.

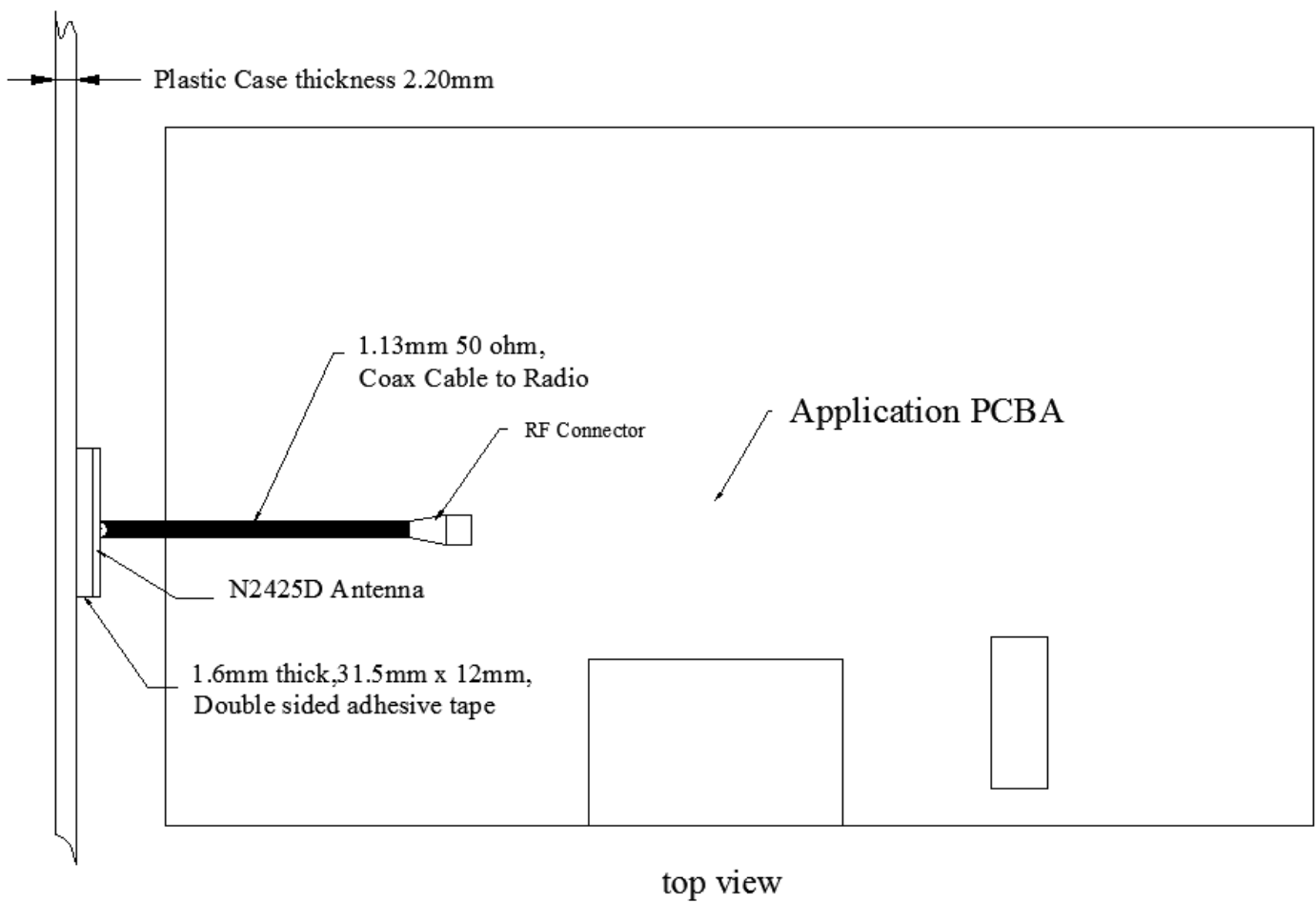


**Figure 8** Case top considerations when mounting Airgain N2425D on case side wall

In Figure 9, a tall component keep out area is defined beneath the N2425D antenna. No portion of any tall components on the application PCBA should come within 5 mm of the N2425D. This helps ensure maximum antenna performance.



**Figure 9** Clearance considerations when case top mounting Airgain N2425D (side view)



**Figure 10** Top View: Case side wall mounting considerations when mounting Model N2425D

## 8. Feature and Options Information

Airgain N2425D antennas are equipped with an RF cable I/O interface. Optional cable termination such as U.FL-compatible micro coax connectors and cable mounted EMI ferrite cores are available. To aid mounting the N2425D, pre-applied, double-sided adhesive tape is available on the N2425D -T Series.

### 8.1 Part Number Conventions

Airgain uses a six-staged standard number system for our part numbers, which serially define the antenna type, tape type, packaging type, cable type/length, and connector type/interface, as described below:

Antenna #	Tape type -XX (if required)	Packaging type -XX	Cable type -X	Cable length - XXX	Connector type -XX (if required)
N2425D	Blank = No Tape T = Tape on bottom element T2L= Tape affixed to bottom surface of antenna with left peel flag T2R = Tape affixed to bottom surface of antenna with right peel flag	PK1= singulated (individual) antennas	G = Grey (Standard) B = Black (Non Standard) W = White (Non Standard) A = Blue(Non Standard)	Cable length in millimeters (mm)  Sample Lengths*: 65, 100, 130, 150, 190, 230, 250, 300,400	Blank = Stripped Cable U = U.FL connector C = U.FL connector plus Ferrite Core, core size: 3.5mm * 9.0mm * 1.5mm  CCBxx = Optional core location with bottom side tube, (xx)mm distance from the edge of the core and the connector; xx = length in mm  UR2 = U.FL compatible connector, rotated 180°

\* Standard cable lengths listed in RF Cable Datasheet

### 8.2 Part Number Example

N2425D-T-G100U – N2425D antenna with 1.6-mm double-sided adhesive tape, 100-mm cable, and U.FL-compatible connector.

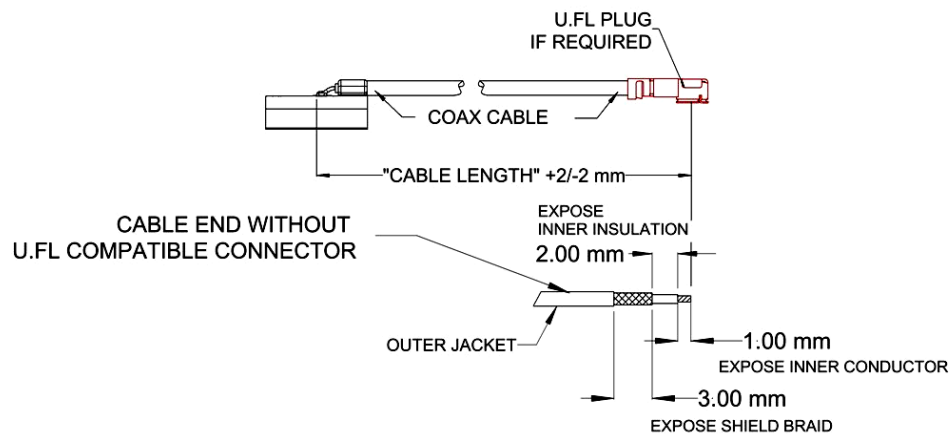
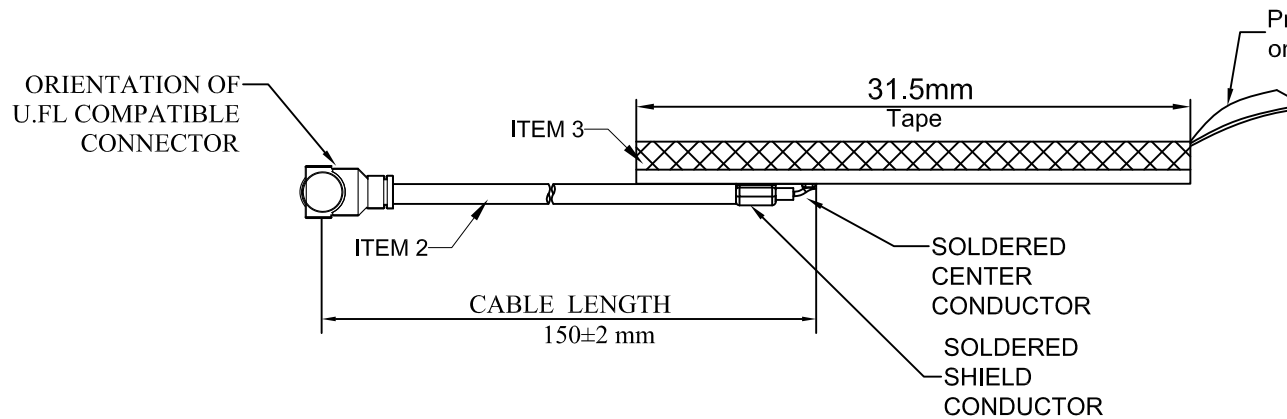
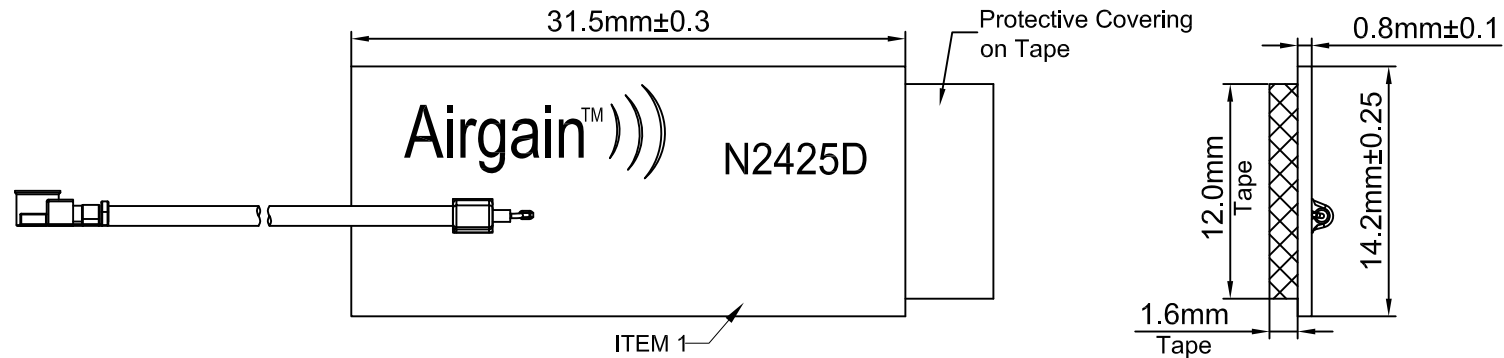


Figure 11 N2425D with connector or stripped cable

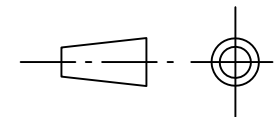
## 9. Cable Data Sheet

Item	Specification	
Cable type	OD1.13	
Impedance	50 ± 3 ohms	
Inner conductor	Material	Tin-coated copper
	Conductor numbers	7
	Conductor size	0.08 mm
	Outer diameter	0.24 ± 0.02 mm
Dielectric layer	Material	FEP
	Color	Clear
	Average thickness	0.22 mm
	Diameter	0.7 ± 0.03 mm
Braid (shielding)	Material	Tin-coated copper
	Conductor size :total / O.D. of every wire(mm)	16*4/0.05 mm
	Coverage	90%± 0.05%
	Diameter	0.92 ± 0.05 mm
Outer cover	Material	FEP
	Color	Black / white / grey
	Average thickness	0.10 mm
	Diameter	1.13 ± 0.05 mm
VSWR testing	< 1.3@0~6GHz	
Attenuation (dB/1meter)	1GHz	≤2.2
	2GHz	≤3.1
	3GHz	≤3.8
	4GHz	≤4.4
	5GHz	≤4.9
	6GHz	≤5.4
Operating temperature	-55℃~+150℃	

REV	DESCRIPTION	BY	DATE
A	Initial Design	BWU	06/JAN/2020



DRAWING STYLE



Notes:

The processes used to assemble this antenna shall comply with the following specifications, unless otherwise specified.

1. Solder: use lead free solder if applies for lead free soldering process to assemble the antenna, unless otherwise specified.
2. Bom: use the bom file for assembling the antenna. this table is provide for reference only.
3. Unless otherwise specified dimension, tolerances are  $\pm 0.2\text{mm}$ .
4. Unless otherwise specified dimension, tape tolerances are  $\pm 0.5\text{mm}$ .
5. Packaging type: Break up panel packaging.

ITEM#	DESIGNATOR	QUANTITY	NOTE
1	Antenna	1	
2	Coax Cable	1	Cable color is Grey
3	Tape	1	

BOM No. 343C-06-00-001-1	3611 Valley Centre Drive, Suite 150 San Diego, CA 92130 USA		Airgain™
PCB No. 343C-12-00-001-1	Project PROFILE EMBEDDED ANTENNA		
Drawn by BWU	Date 06/JAN/2020	Title N2425D-T2R-PK1-G150U	
Checked by	Date	Size B	Number 343C-07-02-031-3
Approved by	Date	Layer	Scale Sheet 1 of 1
		File	

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