Airgain™

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# Profile Series
# N02FVAAG

# Airgain Embedded Antenna
# Engineering Data Sheet

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# Revision History

| Revision | Date | Note |
|---|---|---|
| 4180C-02-00-001-1 Rev 1.0 | June 30, 2023 | Preliminary Datasheet 1.0 |
| | | |
| | | |

# Contents

1. Airgain N02FVAAG Embedded Antenna ..... 4
2. Features ..... 4
3. Specifications and Interface ..... 5
4. Radiation Patterns ..... 5
5. Dimensions ..... 7
6. ROHS ..... 7
7. Feature and Options Information ..... 7
7.1 Part Number Conventions ..... 8
7.2 Part Number Example ..... 8
8. Cable Data Sheet ..... 9

# Figures

**Figure 1:** Model N02FVAAG Embedded Antenna ..... 4
**Figure 2:** Model N02FVAAG Measurement axes ..... 5
**Figure 3:** Airgain N02FVAAG radiation patterns at 5.15 GHz & 5.5 GHz & 5.85 GHz ..... 6
**Figure 4:** N02FVAAG Antenna dimensions ..... 7
**Figure 5:** N02FVAAG with connector or stripped cable ..... 8

# 1. Airgain N02FVAAG Embedded Antenna

The Model N02FVAAG Embedded Antenna provides a high efficiency, 5GHz 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 N02FVAAG provides the flexibility of an embedded antenna with top performance. N02FVAAG has a (patent pending) perfectly balanced design, which makes the antenna decoupled from the feeding cable, making its behaviors independent of the details of the cable routing and improving noise rejection.

# 2. Features

The Model N02FVAAG Embedded Antenna is defined by the following features:

- IEEE 802.11 a/n/ac standards
- Case mount
- Single 5GHz Band operation
- Truly balanced operation
- High efficiency
- Quick integration

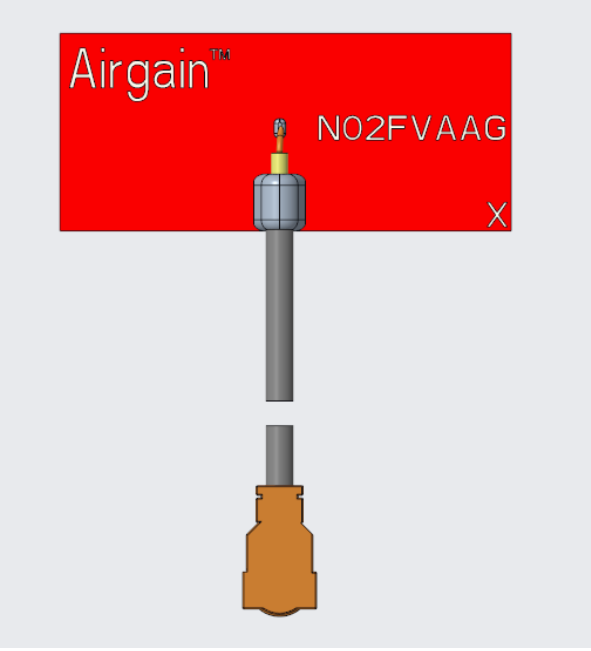



**Figure 1:**Model N02FVAAG Embedded Antenna

# 3. Specifications and Interface

| | |
|---|---|
| **Standard** | IEEE 802.11 a/n/ac |
| **Frequency range** | 5.15 to 5.85 GHz |
| **Peak gain** | 5.0 dBi @ 5.5 GHz; |
| **VSWR** | < 1.5:1 |
| **Feed impedance** | 50 ohms |
| **Power handling** | 30 dBm |
| **Interface** | 50 ohms, 1.13 mm diameter, micro coax cable (available with optional U.FL-compatible cable connector and/or cable-mounted EMI ferrites) |
| **Antenna dimensions** | 18.3 x 8.0 x 0.5 (mm) |
| **Weight** | TBD |
| **Temperature range** | Operating: -40° C to +75° C (-40° F to +167° F)<br>Storage: -40° C to +85° C (-40° F to +185° F) |
| **Humidity range** | 0% to 95% non-condensing |

# 4. Radiation Patterns

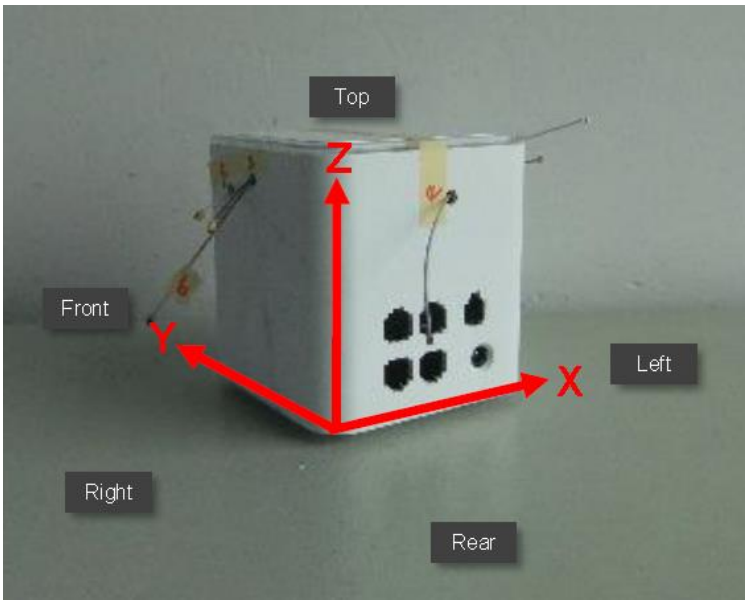



**Figure 2:**Model N02FVAAG Measurement axes

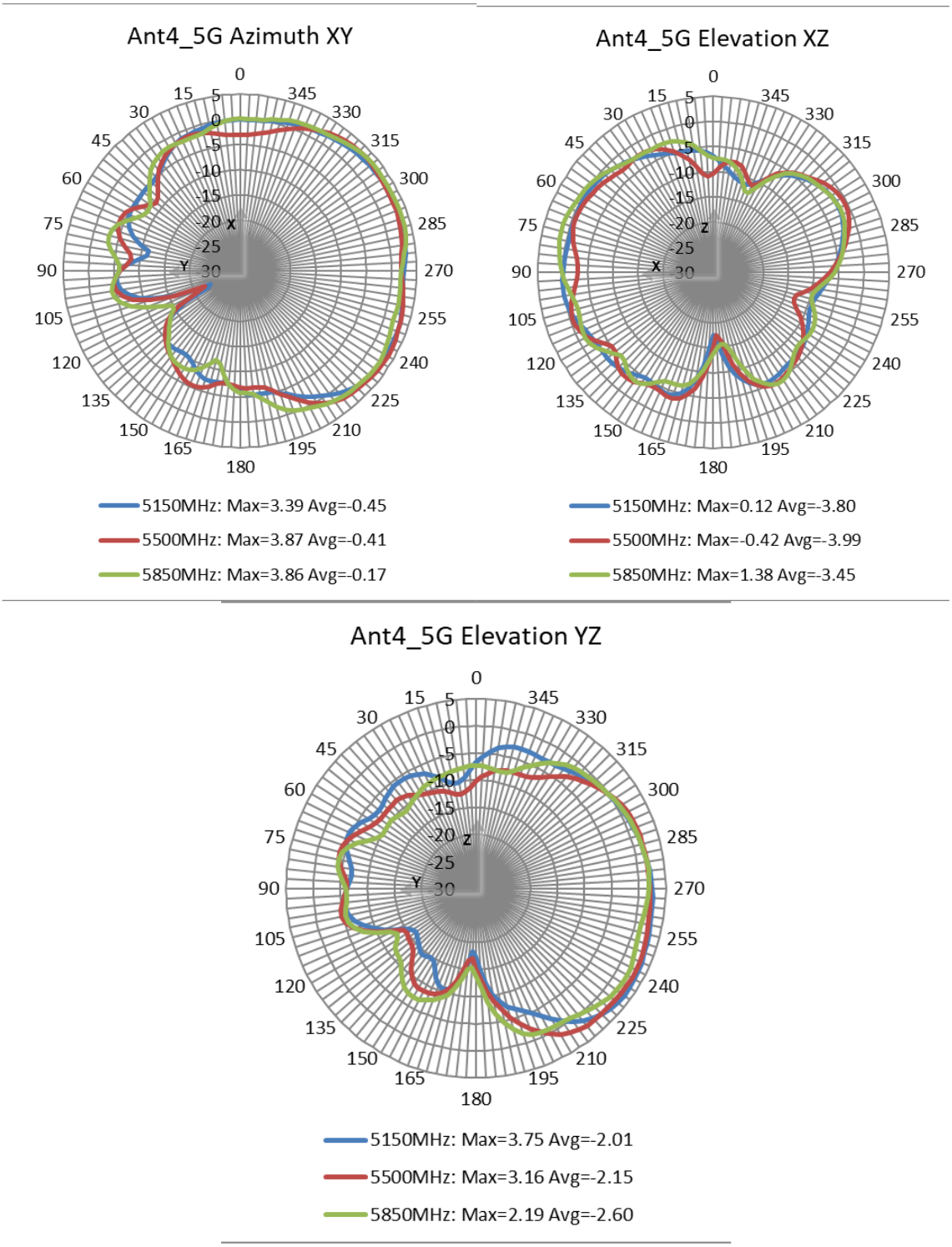



**Figure 3:**Airgain N02FVAAG radiation patterns at 5.15 GHz & 5.5 GHz & 5.85 GHz

## 5. Dimensions

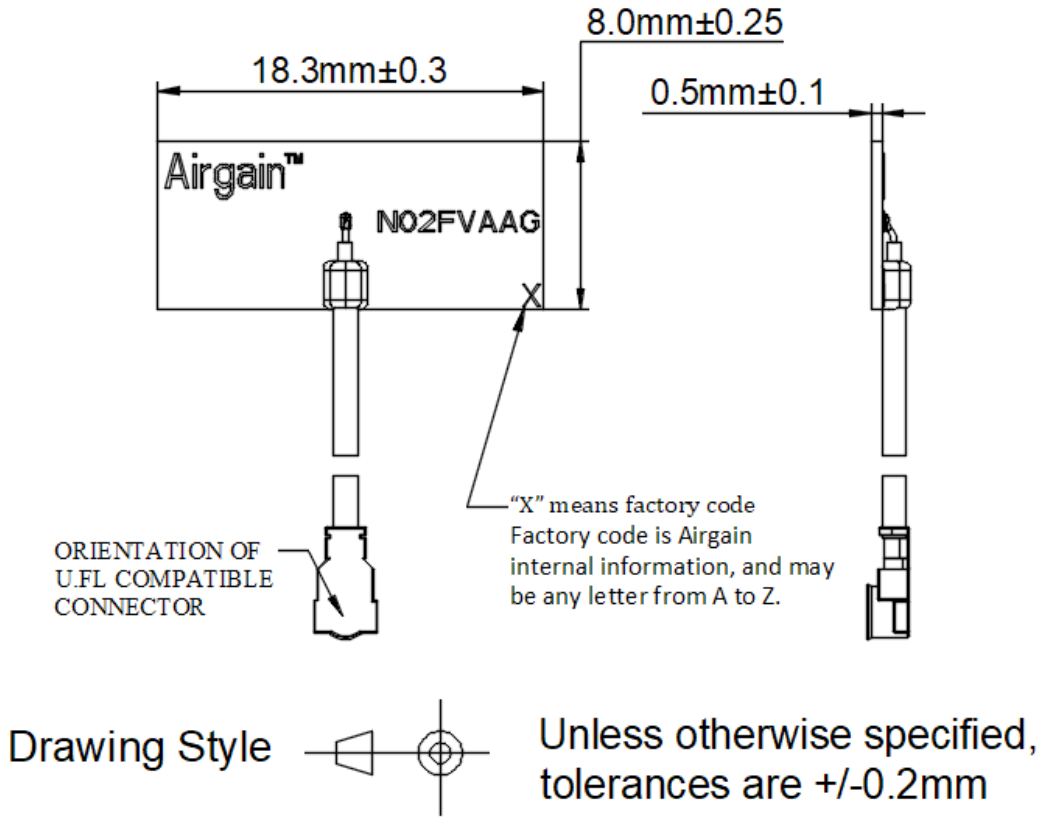



**Figure 4:**N02FVAAG Antenna dimensions

## 6. ROHS

Airgain N02FVAAG embedded antennas are RoHS compliant.

## 7. Feature and Options Information

Airgain N02FVAAG 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 N02FVAAG, pre-applied, double-sided adhesive tape is available on the N02FVAAG -T Series.

## 7.1 Part Number Conventions

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

| Antenna # | Tape type -XX (if required) | Packaging type -xx | Cable Assembly Type –xxxxxx | | |
|---|---|---|---|---|---|
| | | | Cable color -X | Cable length XXX | Connector type XX (if required) |
| N02FVAAG | Blank = No tape<br>T = Tape on bottom of element<br>T10 = 1mm thick PE Tape affixed to bottom surface of antenna | PK1= singulated<br>(PK1 is mandatory) | G = Grey (Standard)<br>R = Red (Non Standard)<br>Y = Yellow (Non Standard)<br>K = Orange(Non Standard)<br>E = Green (Non Standard) | Cable length in millimeters (mm)<br>Commonly used Lengths*: 65, 100, 130, 150, 190, 230, 250, 300,400, etc. | Blank = Stripped Cable<br>U = U.FL connector<br>C = U.FL connector plus Ferrite Core, core size: 3.5mm * 9.0mm * 1.5mm<br>CS = stripped cable plus Ferrite Core, core size: 3.5mm * 9.0mm * 1.5mm |

** Standard cable lengths listed in RF Cable Datasheet*

## 7.2 Part Number Example

**N02FVAAG-T-PK1-G100U –** N02FVAAG antenna with 1.6-mm double-sided adhesive tape, 100-mm cable, and U.FL-compatible connector.

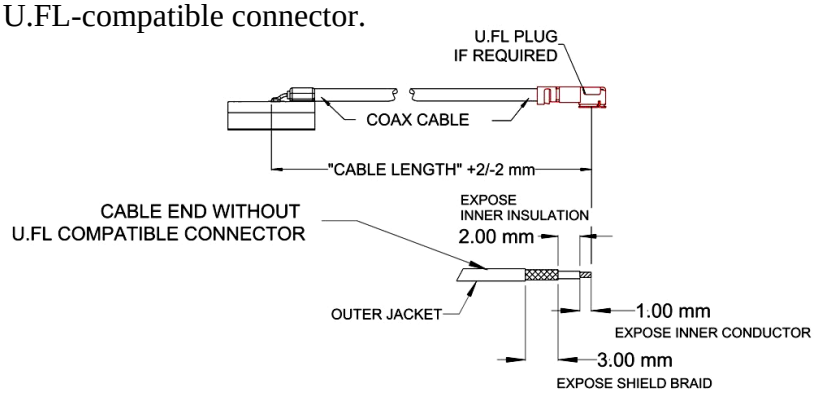
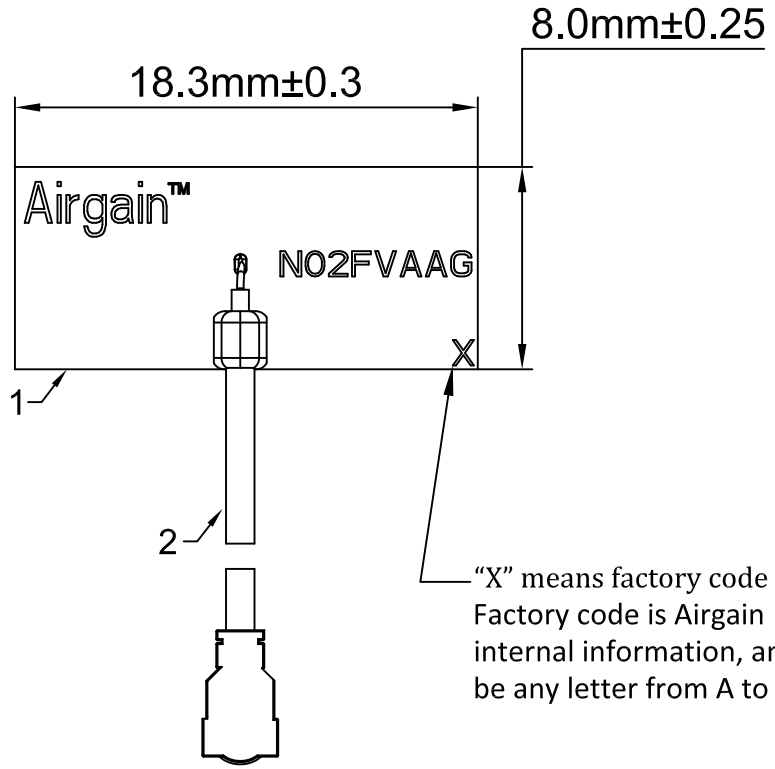


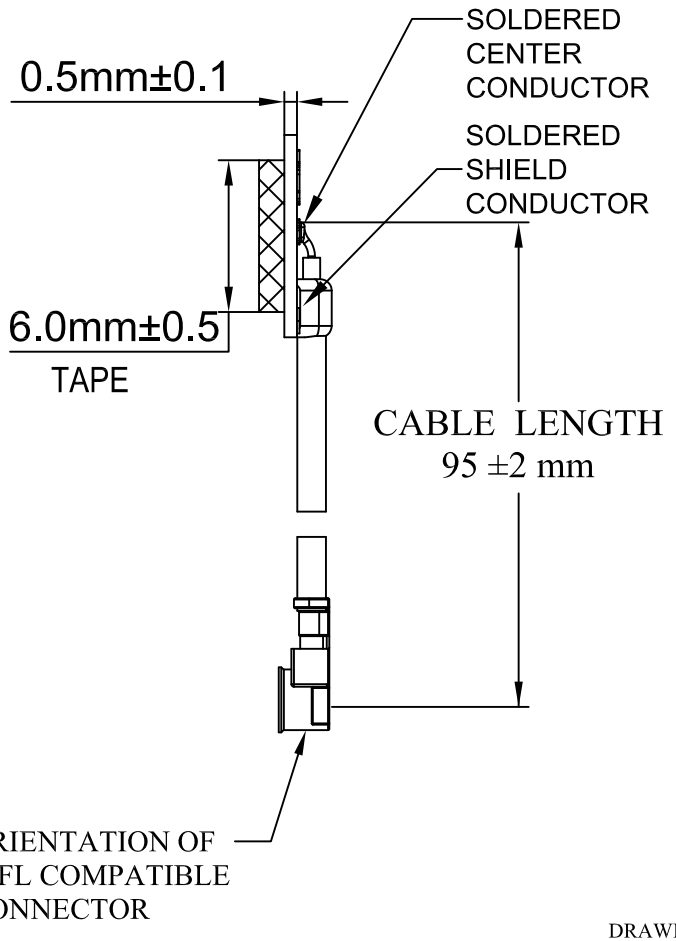

**Figure 5:**N02FVAAG with connector or stripped cable

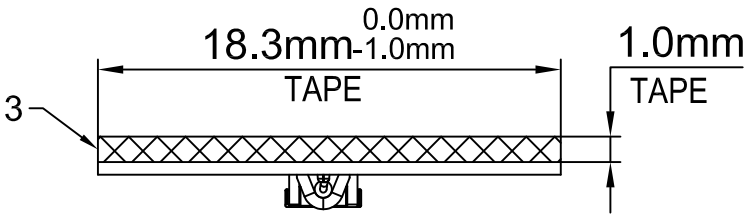
# 8. Cable Data Sheet

| 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%± 5% |
| | 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℃ | |

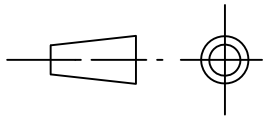
| REV | DESCRIPTION | BY | DATE |
|---|---|---|---|
| A | Initial Design | BWU | 30/June/2023 |




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 provided for reference only.
3.Unless otherwise specified dimension, tolerances are +/-0.2mm,tape's tolerances are +/-0.5mm
4.Packaging type: break up panel packaging

| ITEM# | DESIGNATOR | QUANTITY | NOTE |
|---|---|---|---|
| 1 | Antenna | 1 | |
| 2 | Coax Cable | 1 | 1.13mm OD,Grey Cable |
| 3 | Tape | 1 | Size:18.3 x 6 x 1.0 mm |



| | | | |
|---|---|---|---|
| BOM No. 4180C-06-00-001-1 | | 3611 Valley Centre Drive, Suite 150<br>San Diego, CA 92130 USA | Airgain™ |
| PCB No. 4180C-12-00-001-1 | | Project | PROFILE EMBEDDED ANTENNA |
| Drawn by BWU | Date 30/June/2023 | Title | N02FVAAG-T10-PK1-G95U |
| Checked by | Date | Size B / Number 4180C-07-00-001-3 | Rev. A |
| Approved by | Date | Layer | Scale |
| | | File | Sheet 1 of 1 |