

DATASHEET

Abdita

SRCW090 • ceriANT®



Features

- All 2.4GHz applications
- Bluetooth, Wi-Fi, Zigbee, ISM
- Omni-directional with High Efficiency
- SMD mounted Ceramic antenna
- Resistant to de-tuning
- RoHS compliant
- Small clearance area

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1. Description

Antenna for all 2.4GHz applications with clearance area of 7x7mm. Suited to small wearable devices. Antenna is simple to integrate into a design and operates on various GND plane sizes. Resistant to de-tuning effects means devices can work well in different environments. Antenna operates with other antenna types nearby (good coexistence). Designs using this antenna are suitable for high volume manufacturing

2. Applications

- Small wearable devices
- Wrist-worn fitness trackers and Headsets
- Medical devices with Bluetooth/Wi-Fi
- Sat-navs / PNDs
- Wireless sensor networks

3. General data



| | |
|--------------------------------|----------------------|
| Frequency | 2400 – 2500 MHz |
| Polarization | Linear |
| Operating Temperature | -40°C to 125°C |
| Impedance With Matching | 50 Ω |
| Weight | <0.1g |
| Antenna Type | SMD |
| Dimensions | 1.0 x 0.5 x 0.5 (mm) |
| Footprint Area | 7.0 x 7.0 (mm) |

4. Part number

ABDITA
SRCW090



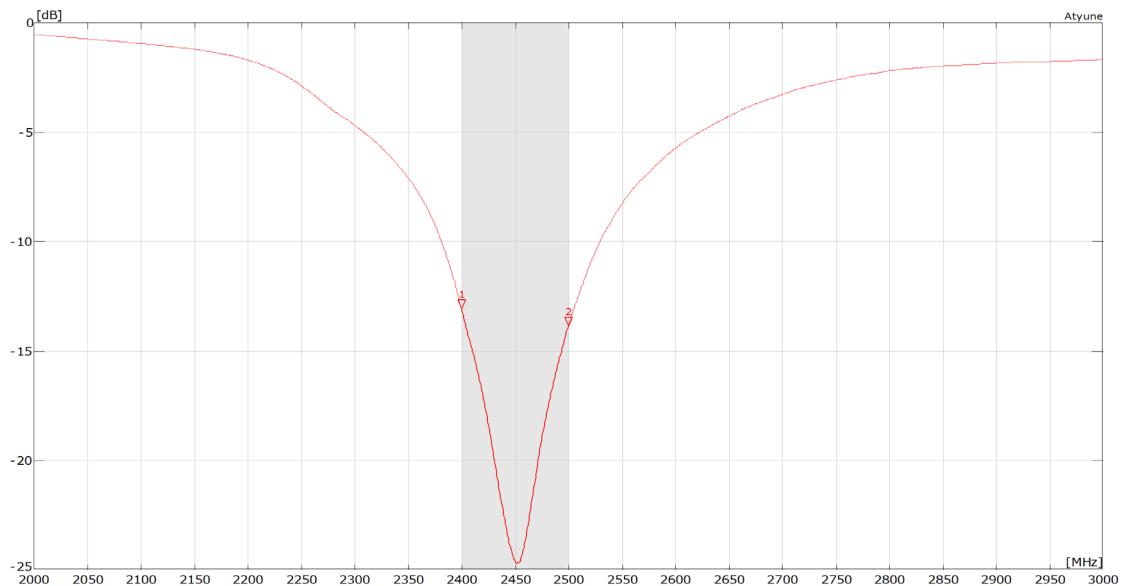
5. RF characteristics

| | |
|---------------------|-----------------|
| Frequency | 2400 – 2500 MHz |
| Peak Gain | 2.8dBi |
| Average Gain | -1.9dB |
| Average Efficiency | 60.5% |
| Maximum Return Loss | -13.0dB |
| Maximum VSWR | 1.6:1 |

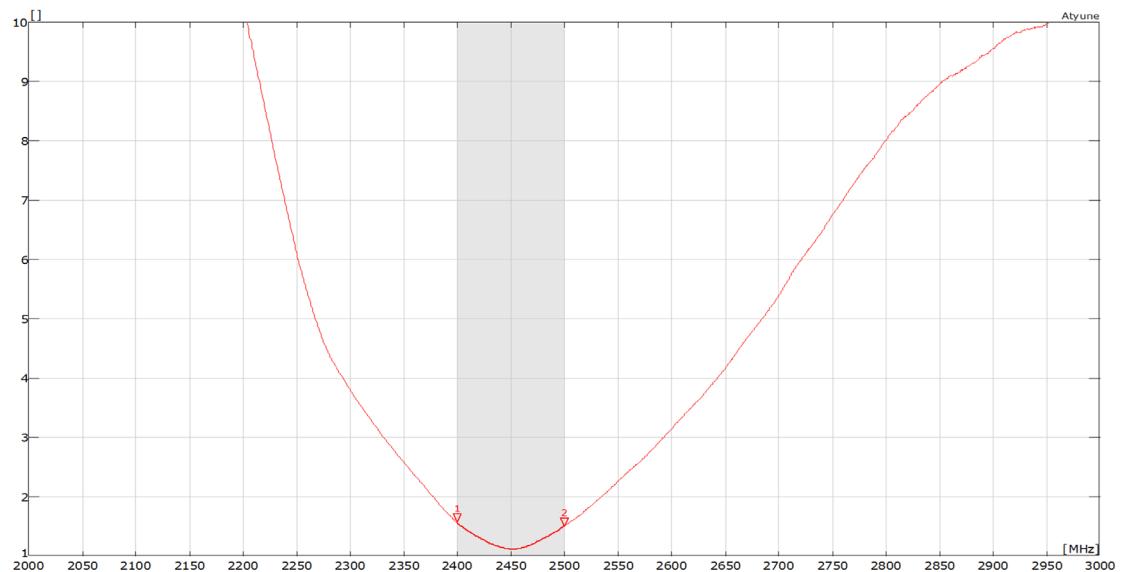
All data measured on Antenova's evaluation PCB
Part No. SRCW090-EVB-1

6. RF performance

6.1. Return loss

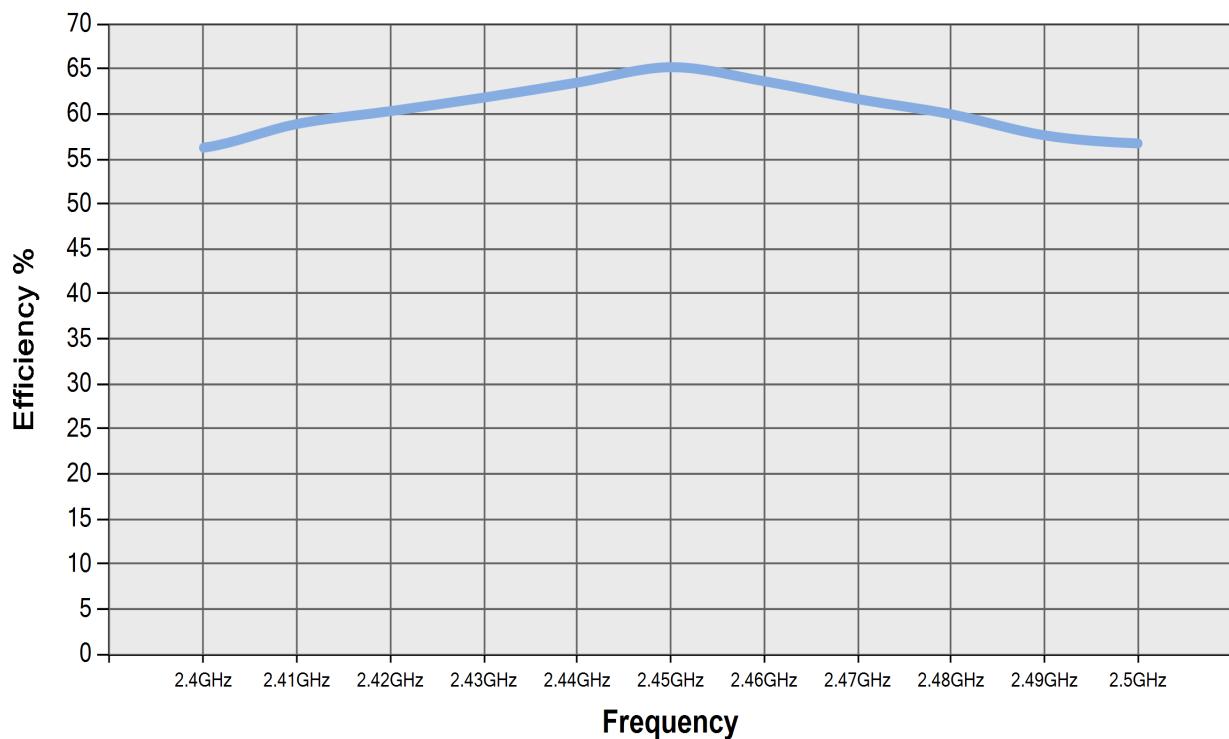


6.2. VSWR



All data measured on Antenova's evaluation PCB
Part No. SRCW090-EVB-1

6.3. Efficiency

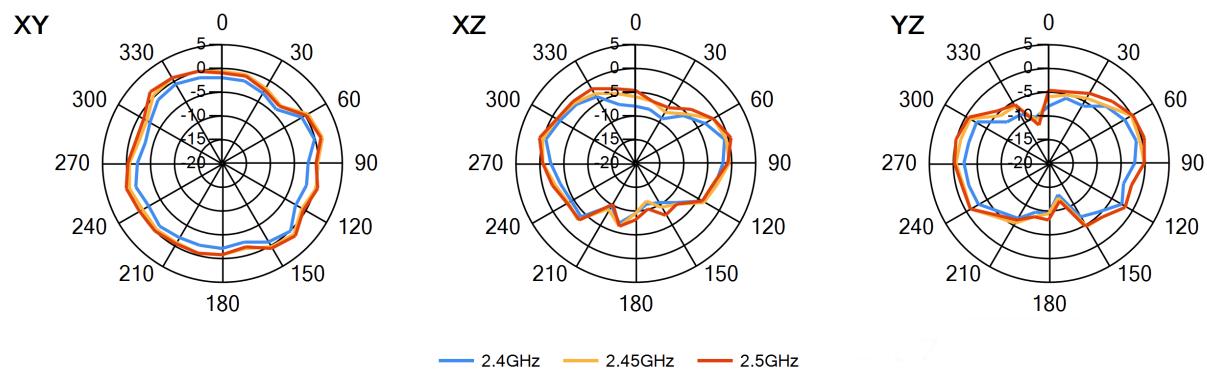
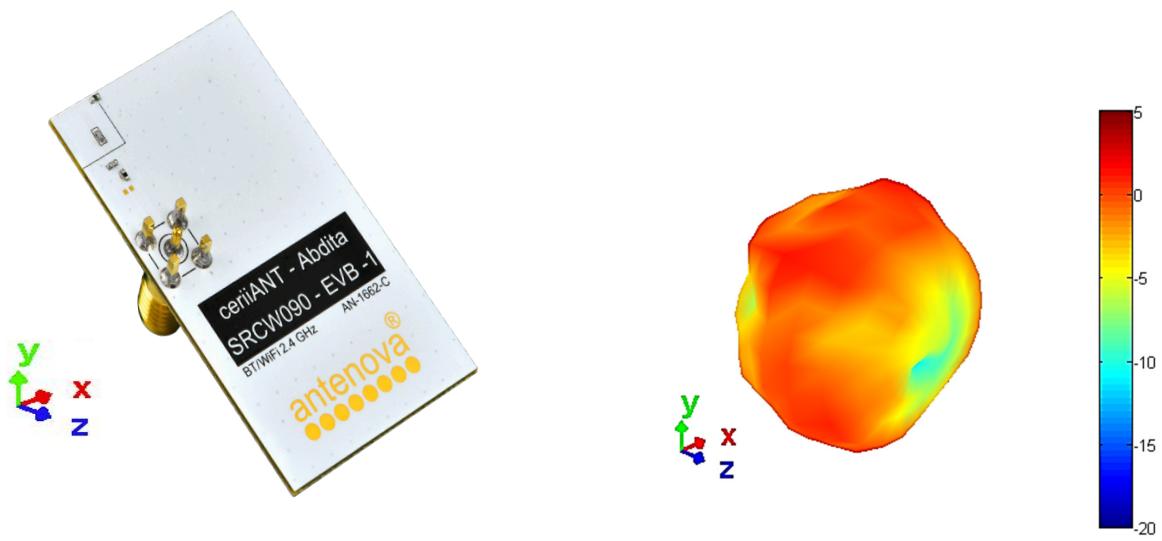


All data measured on Antenova's evaluation PCB
Part No. SRCW090-EVB-1

6.4. Antenna patterns

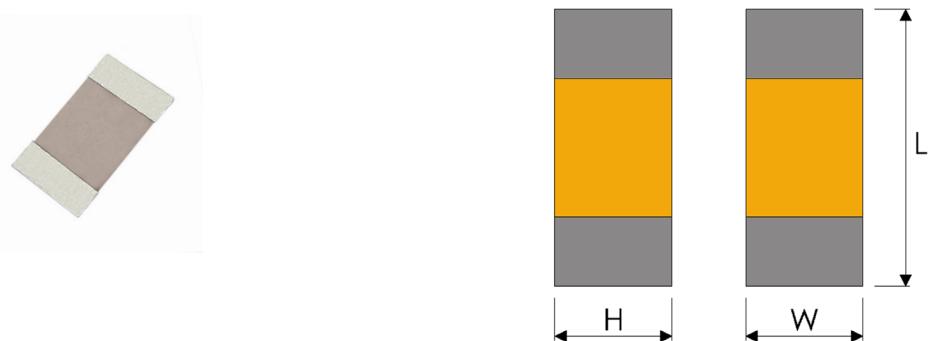
6.4.1. 2450MHz

3D pattern at 2450MHz



7. Antenna dimensions

7.1. Antenna dimensions

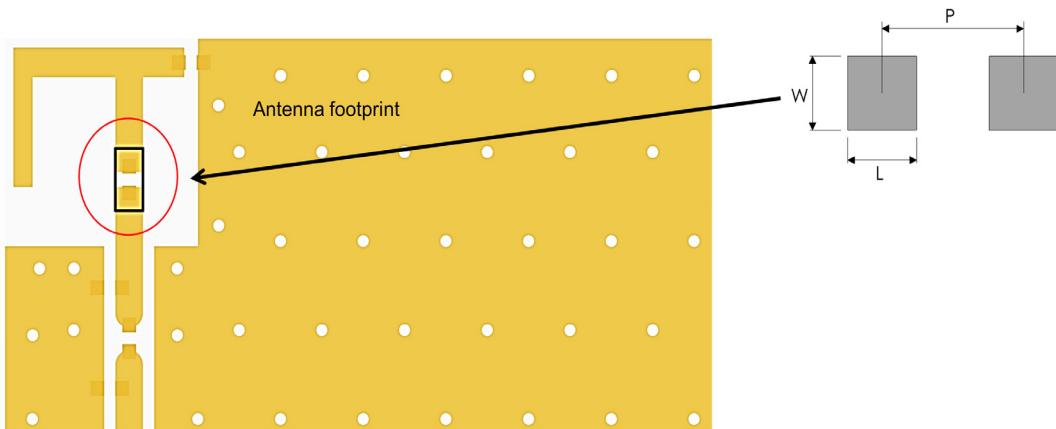


Top view

| L | W | H |
|---------------|---------------|---------------|
| 1.0 ± 0.1 | 0.5 ± 0.1 | 0.5 ± 0.1 |

All dimensions in (mm)

7.2. Antenna footprint



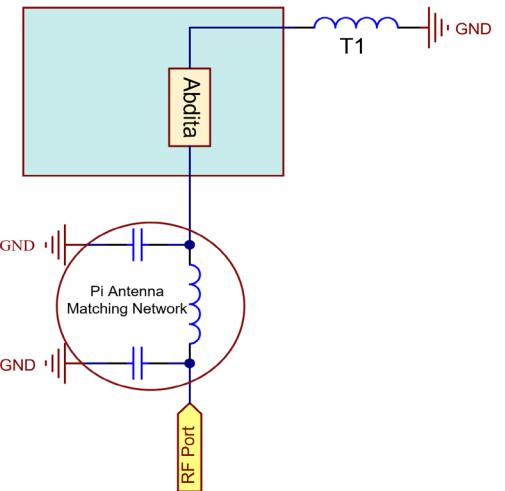
| L | W | P |
|---------------|---------------|---------------|
| 0.5 ± 0.1 | 0.5 ± 0.1 | 0.9 ± 0.1 |

All dimensions in (mm)

8. Schematic

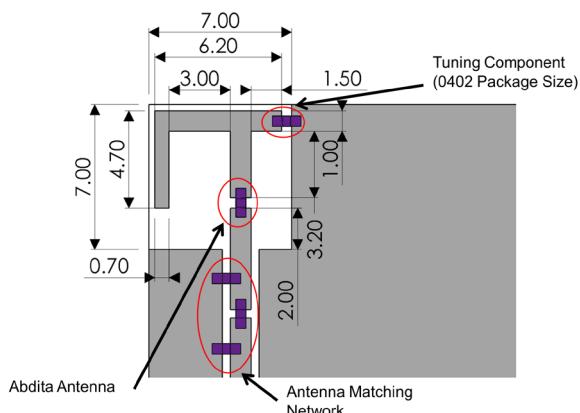
The circuit symbol for the antenna is shown below.

| NAME | DESCRIPTION |
|------------------|--------------------------|
| Abdita (SRCW090) | Antenna |
| T1 | Tuning Component |
| Pi Network | Antenna matching network |



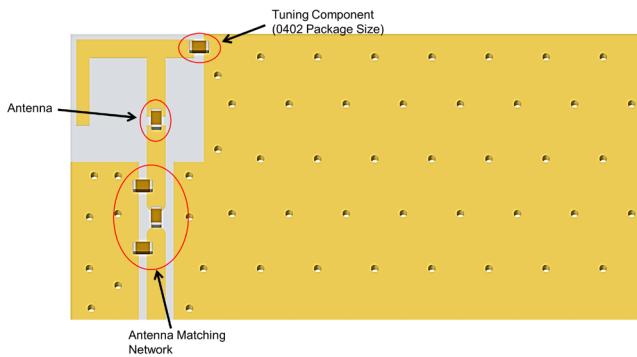
9. Host PCB footprint

The recommended host PCB footprint is below.



Antenna clearance area = 7mm x 7mm

Unit: mm
COPPER AREA



10. Electrical interface

10.1. Transmission line

All transmission lines should be designed to have a characteristic impedance of 50Ω .

- The length of each transmission lines should be kept to a minimum
- All other parts of the RF system like transceivers, power amplifiers, etc, should also be designed to have a 50Ω impedance

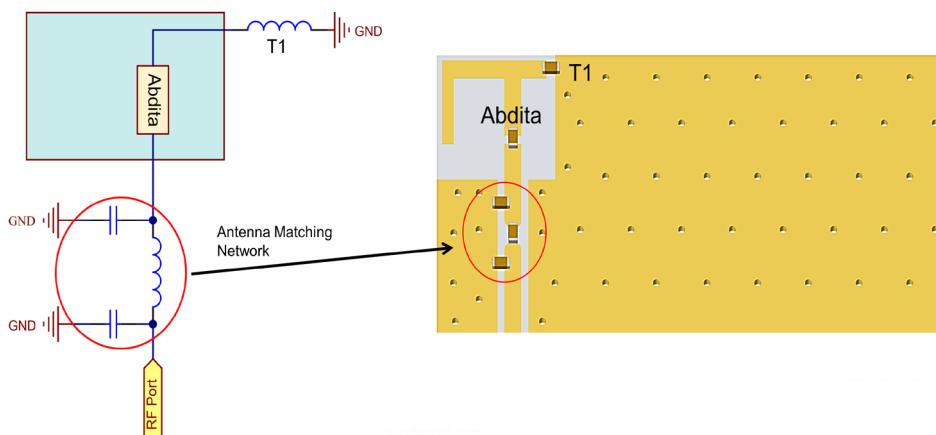
A co-planar transmission line can be designed using an online transmission line calculator tool, such as:

<https://blog.antenova.com/rf-transmission-line-calculator>

The PCB thickness, copper thickness and substrate dielectric constant are entered, then the tool calculates the transmission line width and gaps on either side of the track to give a 50Ω impedance.

10.2. Matching circuit

The antenna requires a matching circuit that must be optimized for each product. The matching circuit will require up to three components and the following circuit should be designed into the host PCB. Not all components may be required but should be included as a precaution. The matching network should be placed close to the antenna feed to ensure it is optionally effective in tuning the antenna.

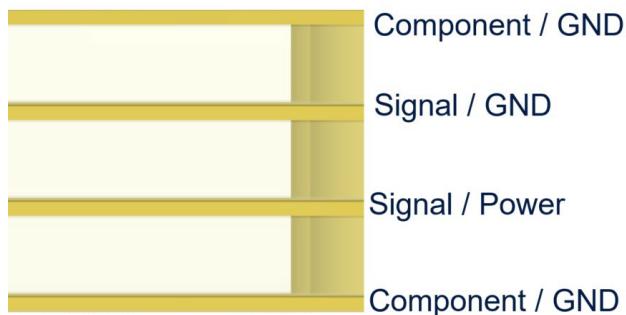


11. Antenna integration guide

We recommend the following during the design phase to maximise antenna performance and minimize noise:

- Minimum 4 layer PCB
- Route signals and power internally where possible
- Flood all layers with ground
- Knit ground on all layers together with plenty of vias

Follow placement guidance carefully. Antenova provide technical support to help you with your design, and also provide design assistance on PTCRB certification. Register for an account on <https://ask.antenova.com/> to access technical support.



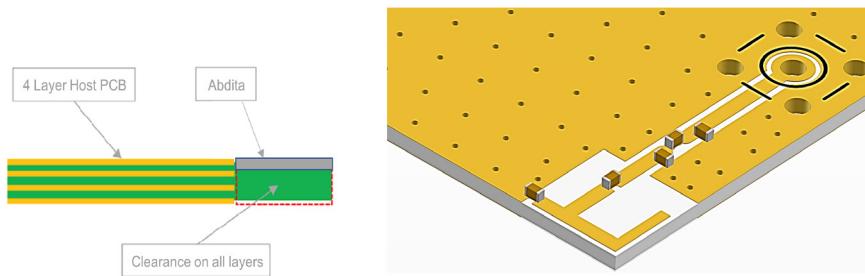
11.1. Antenna placement

The antenna should be placed in the best suited position to effectively radiate. Whichever the PCB size used, it can be left hand side placement.



11.2. Host PCB Clearance

The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.



All dimensions in (mm)

12. Reference board

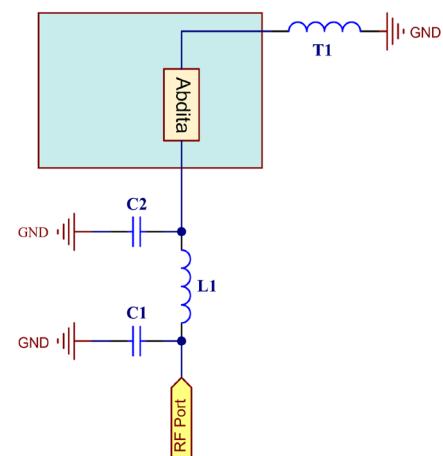
A reference board is used for evaluating the antenna SRCW090 and it includes a SMA female connector. (part number SRCW090-EVB-1)

*To order a reference board
please see antenova.com*



12.1. Reference board matching circuit

| DESIGNATOR | TYPE | VALUE | Description |
|------------|------------|----------|-----------------------|
| Abdita | Antenna | Antenova | 2400 – 2500 MHz |
| T1 | Inductor | 2.7nH | Murata LQG15HS series |
| C1 | Not Fitted | | |
| C2 | Capacitor | 1.0pF | Murata GJM15 series |
| L1 | Resistor | 0ohm | Non-Spec |



13. Soldering

This antenna is suitable for lead free soldering. The reflow profile should be adjusted to suit the device, oven and solder paste, while observing the following conditions:

- For leaded soldering, the maximum temperature should not exceed 240 °C.
- For lead free soldering, a maximum temperature of 255 °C for no more than 20 seconds is permitted.
- The antenna should not be exposed to temperatures exceeding 120 °C more than 3 times during the soldering process.

14. Hazardous material regulation conformance

The antenna has been tested to conform to RoHS and REACH requirements. A certificate of conformance is available from Antenova's website.

15. Packaging

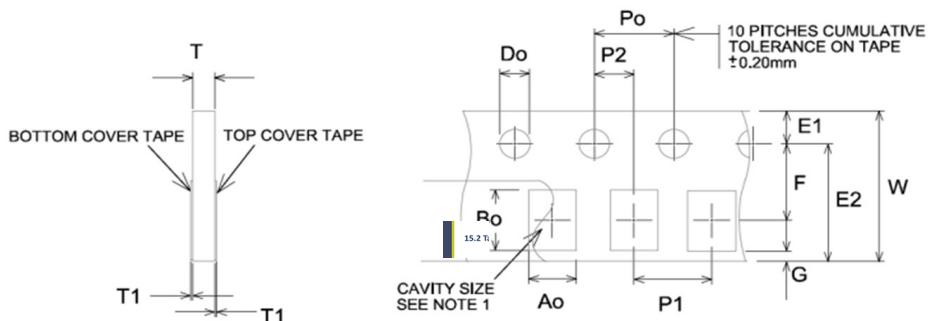
15.1. Optimal storage conditions

| | |
|---------------|---|
| TEMPERATURE | -10°C to 40°C |
| HUMIDITY | Less than 75% RH |
| SHELF LIFE | 24 Months |
| STORAGE PLACE | Away from corrosive gas and direct sunlight |
| PACKAGING | Reels should be stored in unopened sealed manufacturer's plastic packaging. |
| MSL LEVEL | 1 |

Note: Storage of open reels of antennas is not recommended due to possible oxidization of pads on antennas. If short term storage is necessary, then it is highly recommended that the bag containing the antenna reel is re-sealed and stored in conditions as described in the table above.

The shelf life of the antenna is 2 years provided the factory seal on the package has not been broken.

15.2. Tape characteristics



All dimensions in mm

| Do | E1 | E2 | F | G | Po |
|----------|----------|----------|-----------|----------|----------|
| 1.50±0.1 | 1.75±0.1 | 6.25±0.1 | 3.50±0.05 | 0.75 min | 4.00±0.1 |

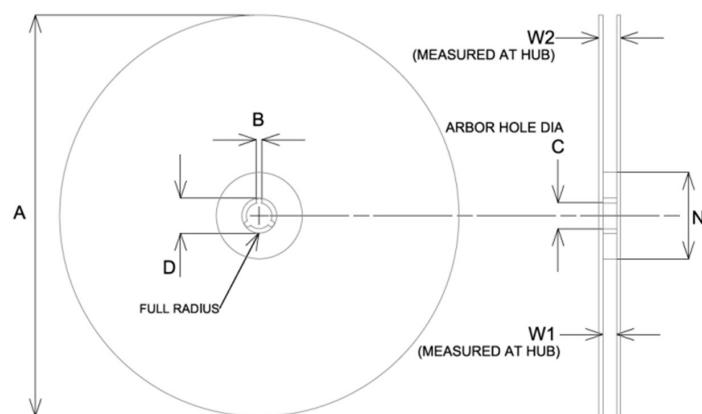
| P1 | P2 | T | T1 | W | Ao & Bo |
|----------|-----------|----------|---------|----------|------------|
| 4.00±0.1 | 2.00±0.05 | 1.10 max | 0.1 max | 8.00±0.3 | See note 1 |

Notes:

The cavity defined by Ao, Bo, and T shall be configured to provide sufficient clearance surrounding the antenna so that:

- The component does not protrude beyond either surface of the carrier tape.
- The component can be removed from the cavity in a vertical direction without mechanical restriction after the top cover tape has been removed.
- Rotation of the component is limited to 20° maximum.
- Lateral movement of the component is restricted to 0.5mm maximum.

15.3. Reel dimensions

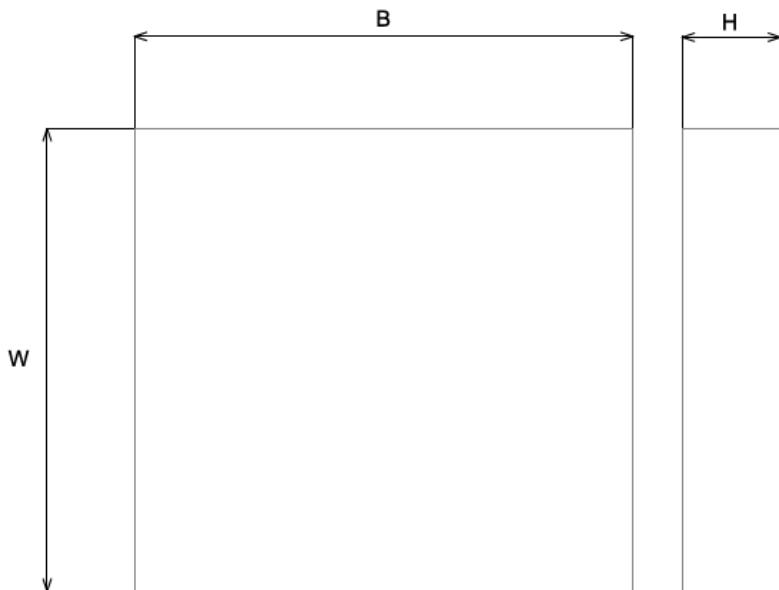


All dimensions in mm

| A | B | C | D | W1 | W2 |
|-----------|-------------|----------|-----------|-----------|--------------|
| 178+/-1mm | 2.2+/-0.5mm | 13.0±0.5 | 20.2(min) | 9+/-0.5mm | 11.4+/-0.5mm |

| Quantity | Leading Space | Trailing Space |
|-----------------|---------------|----------------|
| 10000 pcs /reel | 390+/-1mm | 390+/-1mm |

15.4. Box dimensions



| WIDTH (W) | BREADTH (B) | HEIGHT (H) |
|-----------|-------------|------------|
| 180mm | 185mm | 40mm |

15.5. Bag properties

Reels are supplied in protective plastic packaging.

15.6. Reel label information



Quality statements

Antenova's products conform to REACH and RoHS legislation. For our statements regarding these and other quality standards, please see antenova.com.



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Datasheet version

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Antenna design, integration and test resources

Product designers – the details contained in this datasheet will help you to complete your embedded antenna design. Please follow our technical advice carefully to obtain optimum antenna performance.

We aim to support our customers to create high performance wireless products. You will find a wealth of design resources, calculators and case studies to aid your design on our website.

Antenova's design laboratories are equipped with the latest antenna design tools and test chambers. We provide antenna design, test and technical integration services to help you complete your design and obtain the required certifications.

If you cannot find the antenna you require in our product range, please contact us to discuss creating a custom antenna to meet your exact requirements.

Share knowledge with **RF experts** around the world.

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