Brevis GPS SMD Antenna

Part No. A10204 gigaNOVA® Product Specification

1 Features

- GPS antenna designed for embedded applications
- Designed for use with the ground plane extended beneath the antenna
- Good efficiency to size ratio
- Near omni-directional characteristics enable good performance for any device orientation
- Good resistance to de-tuning
- Intended for SMD mounting
- Supplied in tape on reel
- Low profile, small footprint, light weight

2 Description

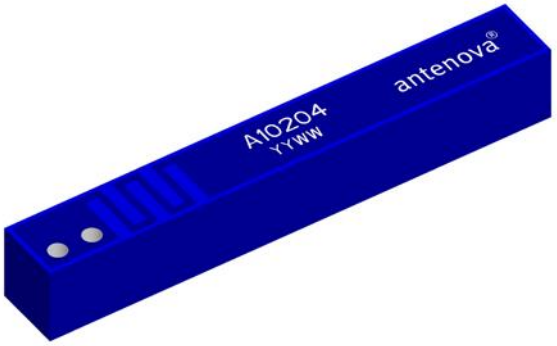
The A10204 GPS antenna is intended for reception of GPS signals at 1575 MHz.

The antenna uses a ground plane in order to radiate efficiently. It should be noted that the radiation patterns and efficiency will change with the size of the ground plan, and optimized efficiency is achieved with appropriate matching.

The antenna has RHCP characteristics suitable for reception of GPS signals.

3 Applications

- Small mobile and handheld devices with embedded GPS systems
- Application specific tracking modules
- GPS accessories: USB dongle, SDIO cards, PCMCIA card



4 Part number

Brevis: A10204

5 General data

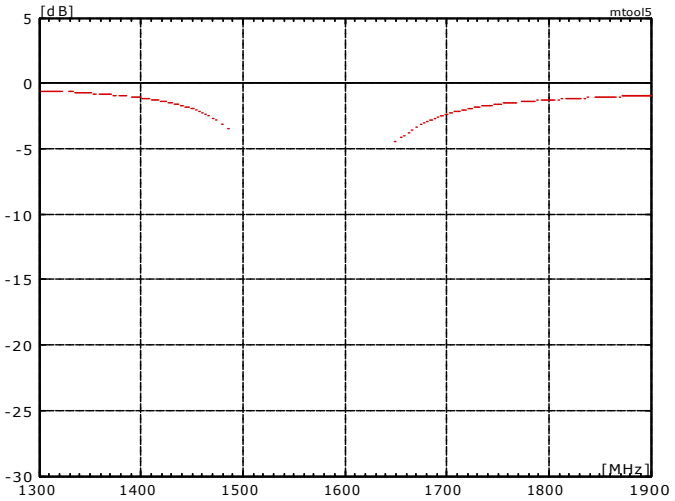
Product name	Brevis GPS
Part Number	A10204
Frequency	GPS - 1575 MHz
Polarization	Linear
Operating temperature	-40 ºC to +85 ºC
Impedance with matching	50 Ω
Weight	<0.2 g
Antenna type	SMD
Dimensions	3 x 22 x 3 [mm]

6 Electrical characteristics

	Typical performance	Conditions
Bandwidth	>50 MHz at –10 dB Return Loss	All data measured on Antenova's reference boards, part numbers A10204-U1
Peak gain (Linear)	0 dBi	
Average gain (Linear)	-2.4 dBi	
Average efficiency (Linear)	>50%	
Peak gain (RHCP)	-2.8 dBi	
Average gain (RHCP)	-5 dBi	
Average efficiency (RHCP)	>30%	
Maximum Return Loss	-17 dB	
Maximum VSWR	1.4:1	

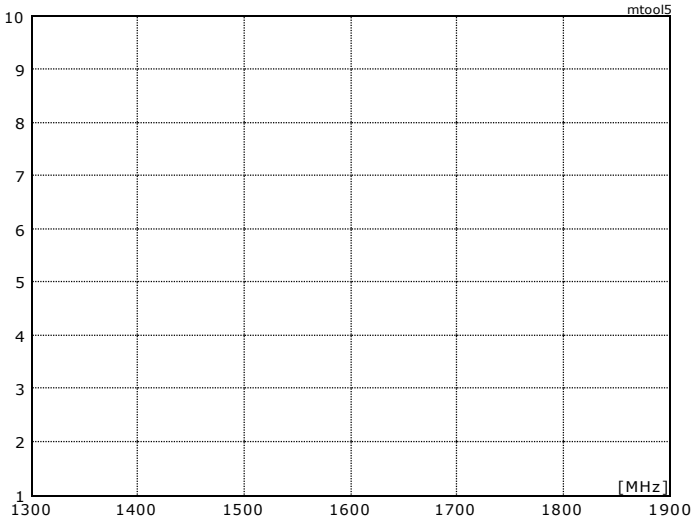
7 Electrical performance

7-1 Return Loss



Reference Board A10204-U1

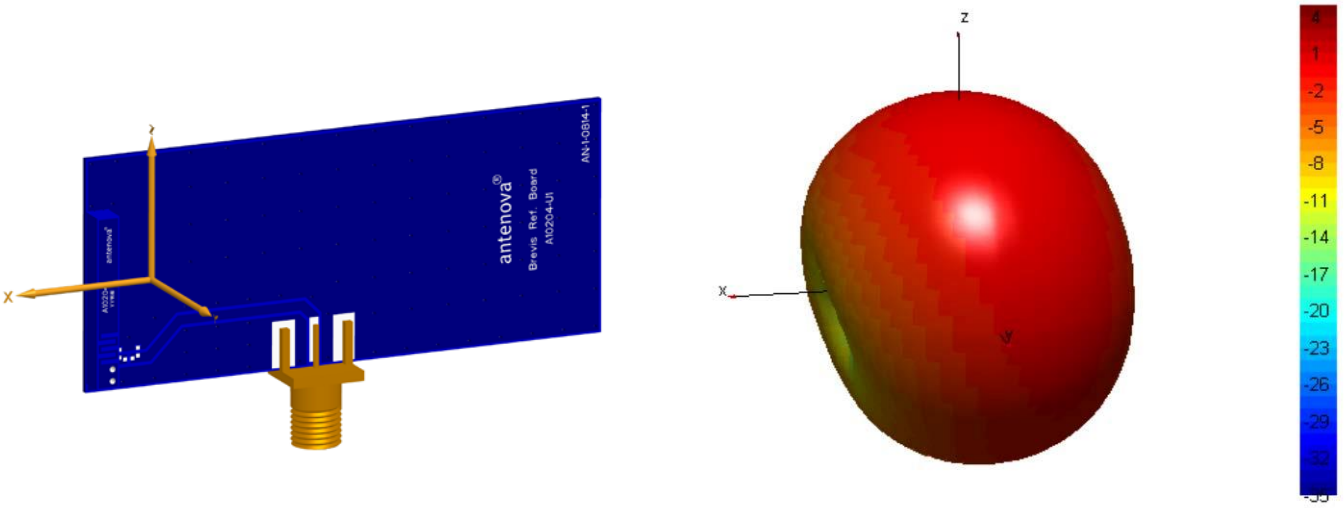
7-2 VSWR

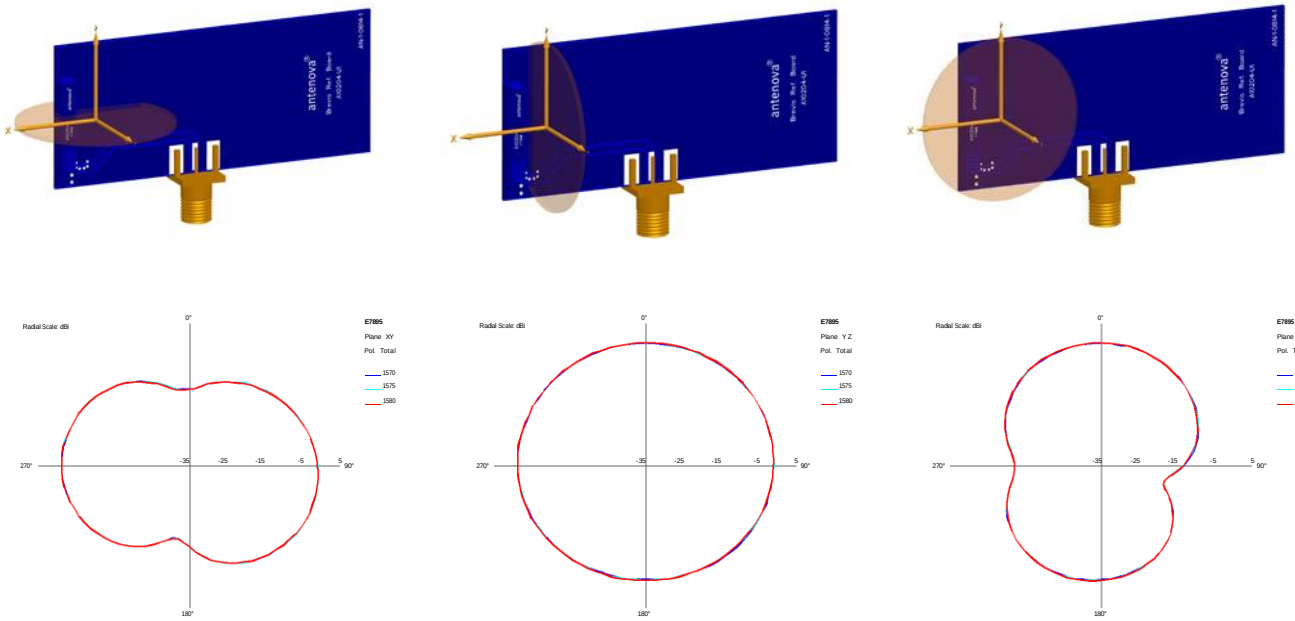


Reference Board A10204-U1

7-3 Antenna patterns

7.3.1. Reference Board A10204-U1 [Linear Polarization]



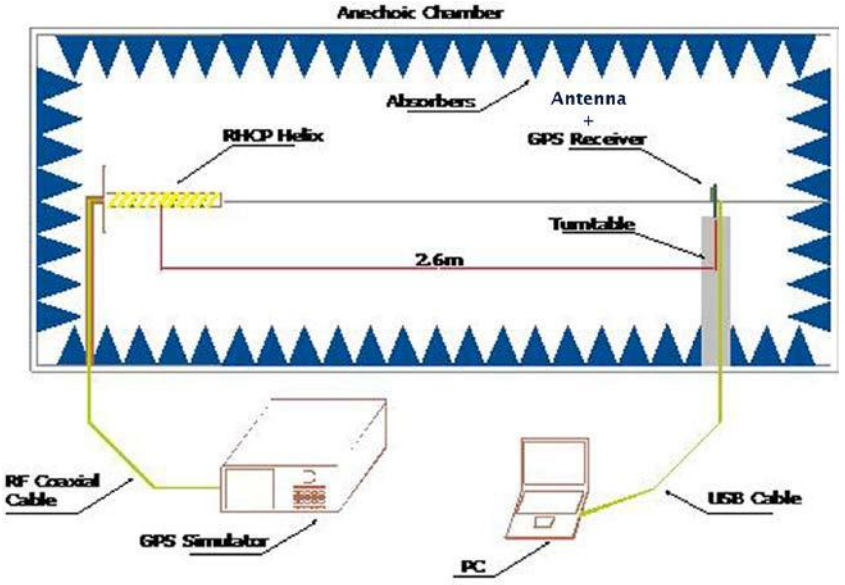


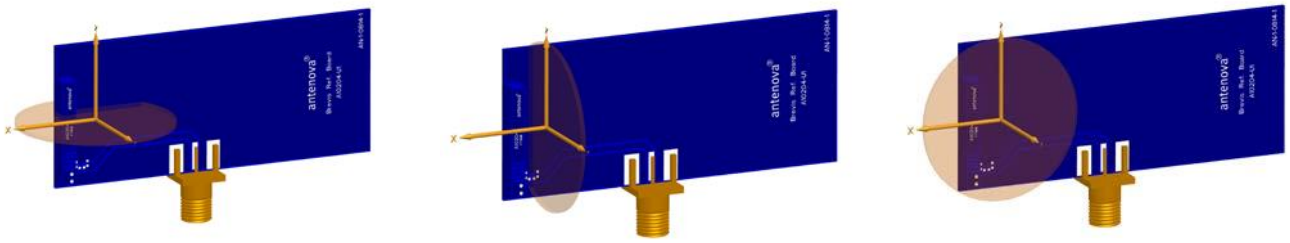
XY plane | YZ plane | XZ plane

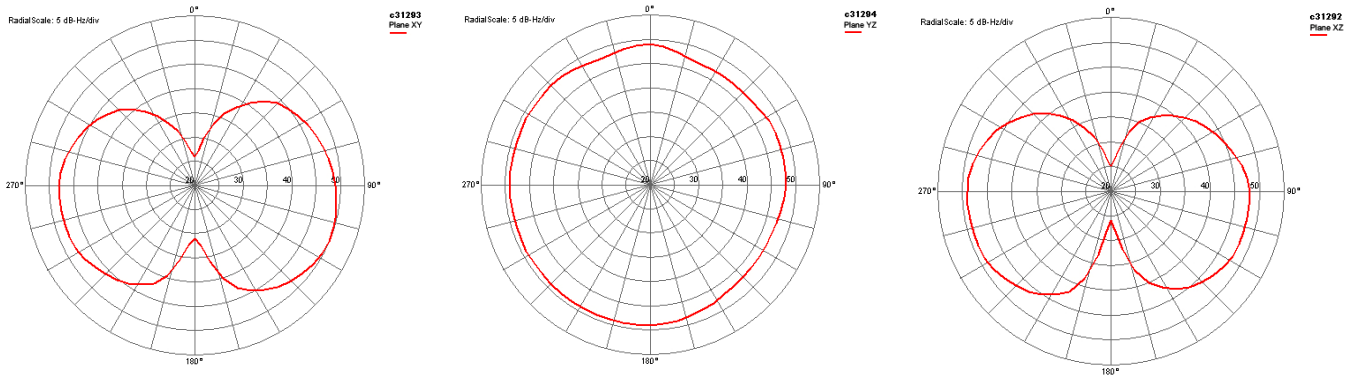
Patterns show combined polarisations measured on reference board A10204-U1

7.3.2. Active Test Patterns

The typical radiation pattern of the Brevis A10204 GPS antenna has been measured in Antenova's "Active GPS" chamber, using Antenova's standard RF module based on SiRFstarIII™ GSC3LT IC combined with two stages of Saw Filters.



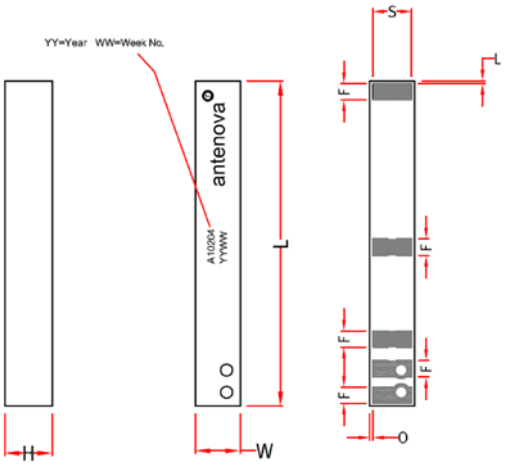




XY plane YZ plane XZ plane

The above plots are CN number in dB.Hz on a scale of 20-50 dB.Hz.

8 Antenna dimensions

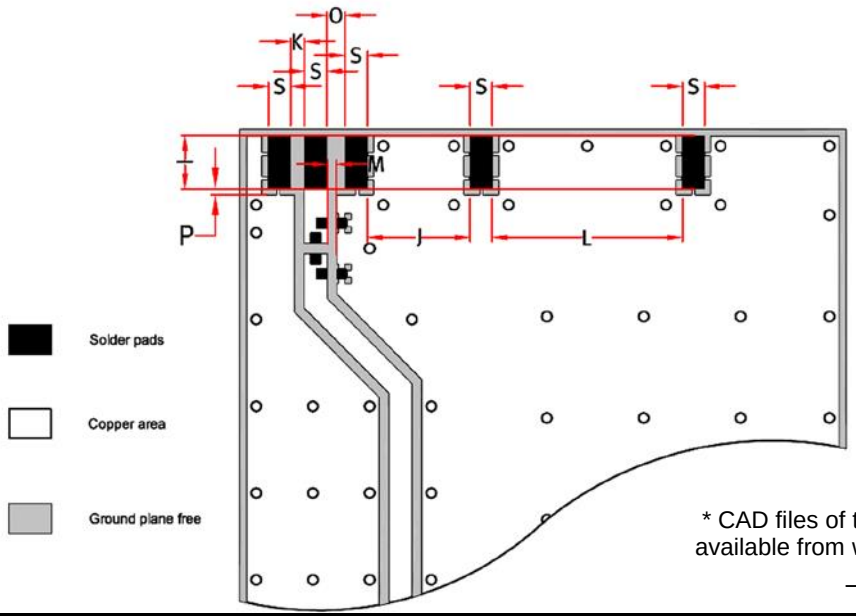


L	W	H	F	S	O	L
Length	Width	Height				
22.0 +/- 0.2	3.0 +/- 0.2	3.2 +/- 0.15	1.1 +/- 0.15	2.6 +/- 0.15	0.2 +/- 0.15	0.35 +/- 0.15

Dimensions in mm

9 Antenna footprint

Brevis (Part No: A10204)



* CAD files of the antenna footprint are available from www.antenova-m2m.com

I	S	K	J	L	O	M	P
2.6 +- 0.1	1.1 +/- 0.1	0.7 +/- 0.1	5.1 +/- 0.1	9.4 +/- 0.1	0.9 +/- 0.1	0.43 +/- 0.1	0.30 +/- 0.1

Dimensions in mm

10 Electrical interface

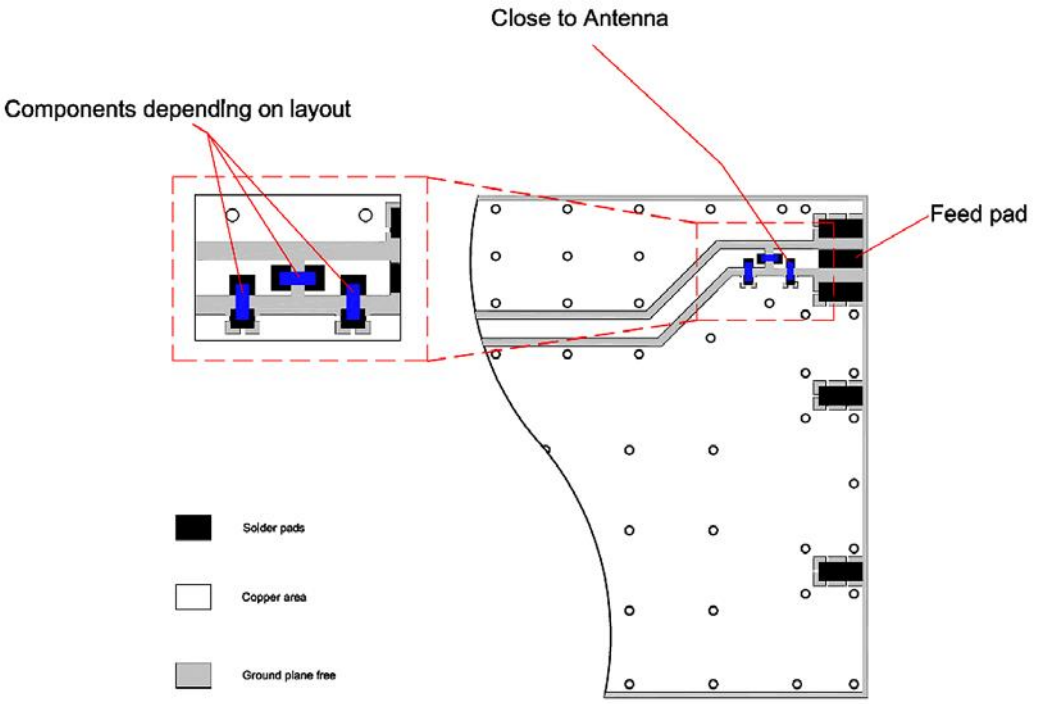
10-1 Transmission lines

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

Once the material for the PCB has been chosen (PCB thickness and dielectric constant), a co-planar transmission line can easily be designed using any of the commercial software packages for transmission line design. For the chosen PCB thickness, copper thickness and substrate dielectric constant, the program will calculate the appropriate transmission line width and gaps on either side of the track so the characteristic impedance of the coplanar transmission line is 50Ω.

10-2 Matching circuit

The antenna requires a matching circuit that must be optimized for each customer's product. The matching circuit will require up to three components and the following pad layout should be designed into the device so the correct circuit can be installed:



The antenna feed pad and the antenna ground pads are indicated in the drawing above. Additional pads are for mechanical attachment only and should not be grounded.

In addition to the matching circuit, a separate DC blocking capacitor will also be required between the radio and the antenna matching circuit.

Note: The component values for the matching circuit will vary depending on the size of the PCB and surrounding components. The impedance of the antenna should be measured before selecting suitable matching components. Antenova M2M offers this service on request. Contact sales@antenova-m2m.com for further information.

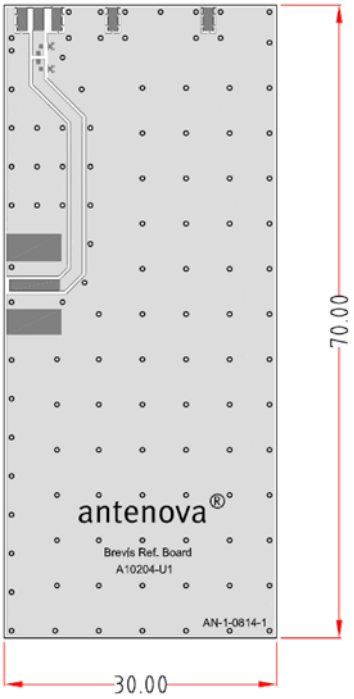
10-3 Antenna placement

Antenna placement locations and orientations are critical for achieving optimal system performance. Antenova strongly recommends placing the antenna near the edge of the board. Maximum antenna performance is achieved by placing the antenna towards one of the corners of the PCB, with the feed point of the antenna as close to the corner of the PCB as possible.

Antenova M2M offers a full range of development support to ensure efficient implementation of the antenna into the specific design. To overcome RF design issues, matching circuits, transmission lines, layout and other components, please contact Antenova M2M (sales@antenova-m2m.com) for design and placement recommendations.

10-4 Reference board

The reference board has been designed for evaluation purposes of the Brevis A10204 antenna and it includes a SMA female connector



Dimensions in mm

Contact sales@antenova-m2m.com for further details

11 Soldering

This antenna is suitable for lead free soldering.

The reflow profile should be adjusted to suit the PCBA, oven and solder paste, while observing the following conditions:

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

12 Hazardous material regulation conformance

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available from Antenova M2M's website.

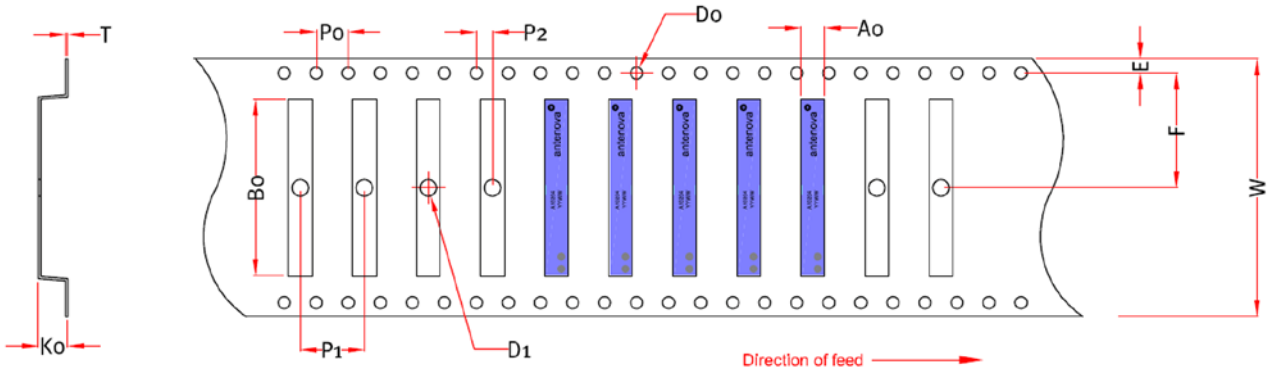
13 Packaging

13-1 Optimal storage conditions for packaged reels

Temperature	-10ºC to 40ºC
Humidity	Less than 75% RH
Shelf Life	18 Months
Storage place	Away from corrosive gas and direct sunlight
Packaging	Reels should be stored in unopened sealed manufacturer's plastic packaging.

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 like storage conditions as in above table.

13-2 Tape characteristics

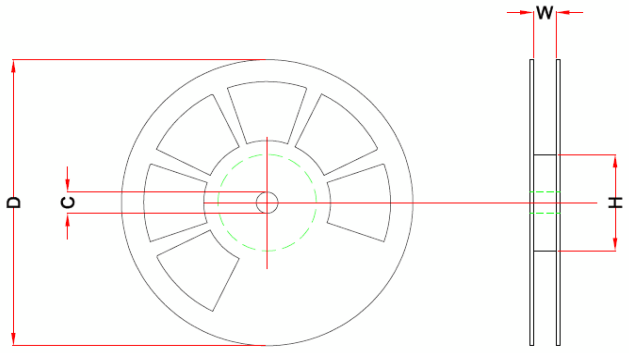


W	F	E	P0	P1	P2	B0	K0	T	D0	D1	A0
32.0 +/- 0.3	26.2 +/- 0.1	1.75 +/- 0.1	4.0 +/- 0.1	8.0 +/- 0.1	2.0 +/- 0.1	22.35 +/- 0.1	3.55 +/- 0.1	0.3 +/- 0.1	1.5 +/- 0.1	2.05 +/- 0.1	3.3 +/- 0.05

Dimensions in mm

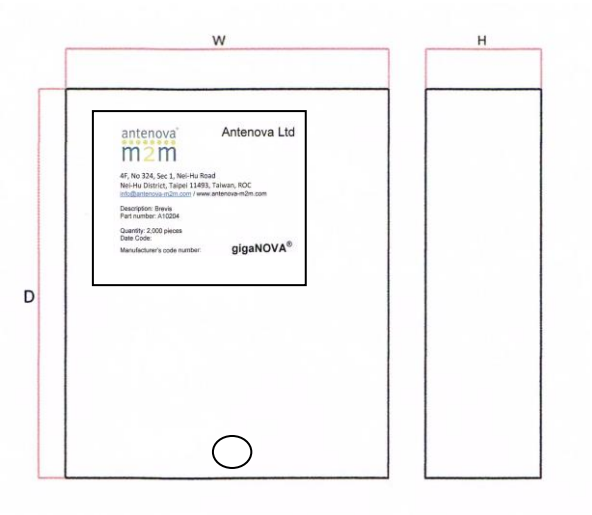
Quantity	Leading Space	Trailing Space
2000 pcs / reel	50 blank antenna holders	37 blank antenna holders

13-3 Reel dimensions



Width (W)	Reel Diameter (D)	Hub Diameter (H)	Shaft Diameter (C)
57.5	330 +/- 2.0	80	13 +/- 0.5

13-4 Box dimensions

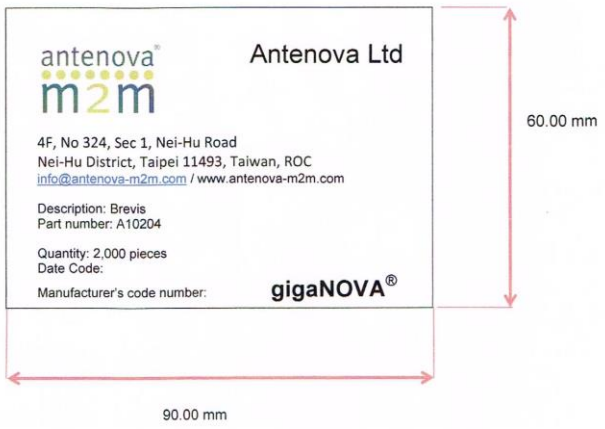


Width (W)	Breadth (B)	Thickness (H)
345 mm	354 mm	45 mm

13-5 Bag properties

Reels are supplied in protective plastic packaging

13-6 Reel label information



Dimensions in mm

www.antenova-m2m.com

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