antenova

DATASHEET

# Calvus

## A10340H • gigaNOVA®




## Featuers

- GSM/UMTS antenna supporting up to five frequency bands
- High efficiency
- Easy to Integrate
- Intended for SMD mounting
- Supplied in Tape and reel



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# 1. Description

Calvus uses a ground plane to radiate efficiently, but the ground plane must not be present underneath the antenna itself.

The antenna uses a matching circuit to achieve optimized results for the specific frequency bands that are required. This product specification shows the performance of the antenna when optimized to cover a typical penta-band reception: GSM850/900/1800/1900 and WCDMA. If the antenna is used for fewer than five bands, higher efficiencies are possible.

# 2. Applications

- Femto / Pico base stations
- Vehicle tracking
- Machine to machine communication
- Remote monitoring
- Remote security
- Vending machines

# 3. General data

| | |
|---|---|
| Frequency | 824 – 960 MHz, 1710 – 2170 MHz |
| Polarization | Linear |
| Operating temperature | -40°C to 140°C |
| Environmental condition test | ISO16750-4 5.1.1.1/5.1.2.1/5.3.2 |
| Impedance with matching | 50 Ω |
| Weight | <2.0g |
| Antenna type | SMD |
| Dimensions | 27.0 x 8.0 x 3.2 (mm) |



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# 4. Part number

A10340H




# 5. RF characteristics

| | 824–960 MHz | 1710–2170 MHz |
|---|---|---|
| Peak gain | 1.70dBi | 3.0dBi |
| Average gain (Linear) | -1.80dBi | -1.60dBi |
| Average efficiency | 65% | 65% |
| Maximum return loss | -6dB | -6dB |
| Maximum VSWR | 3.2:1 | 3.0:1 |

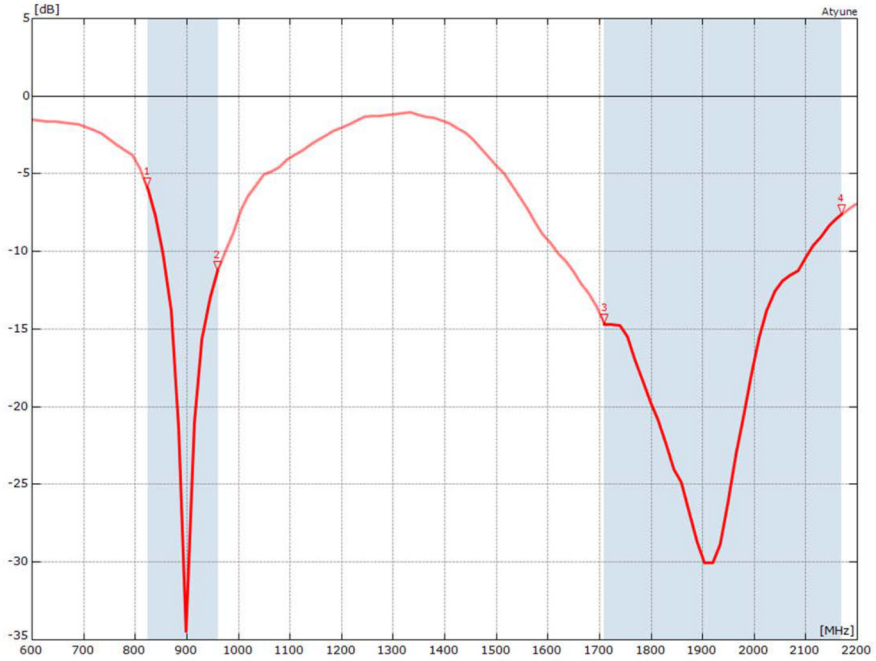
All data measured on Antenova's evaluation PCB Part No. A10340H-EVB-1 (EVK size 120mm x 50mm)



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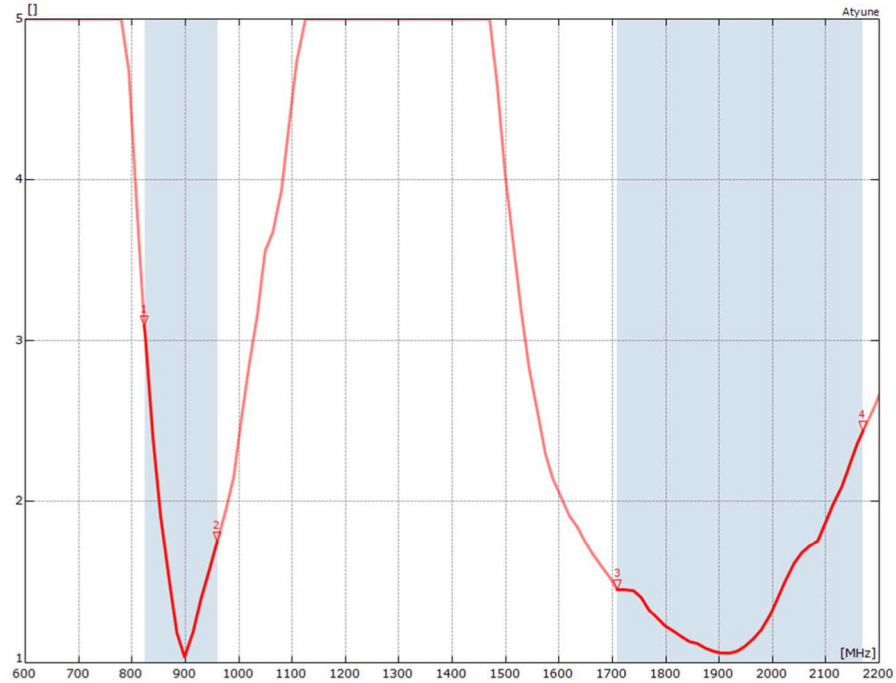
# 6. RF performance

## 6.1. Return loss




All data measured on Antenova's evaluation PCB Part No. A10340H-EVB-1 (EVK size 120mm x 50mm)

## 6.2. VSWR

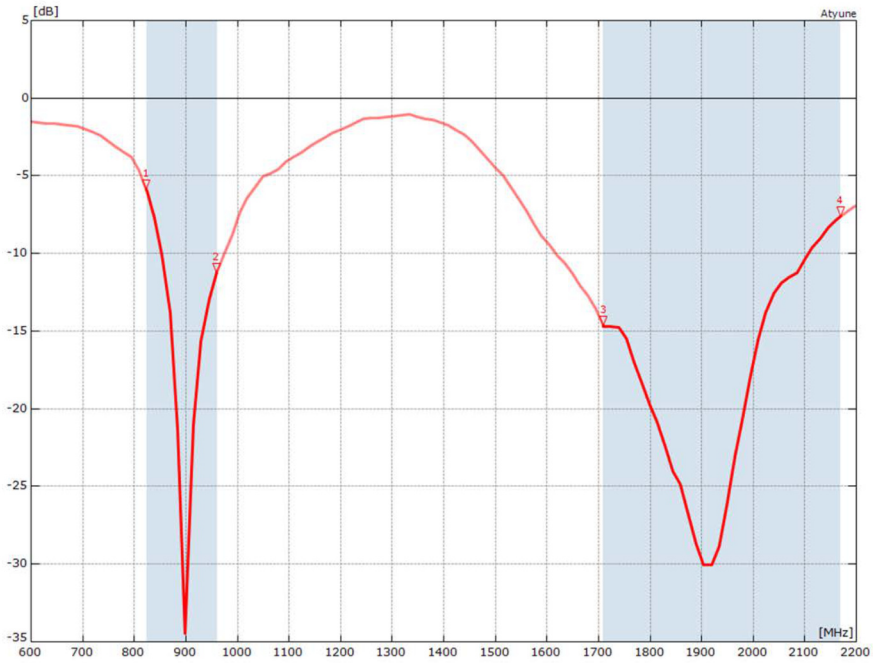



All data measured on Antenova's evaluation PCB Part No. A10340H-EVB-1 (EVK size 120mm x 50mm)



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## 6.3. Efficiency




All data measured on Antenova's evaluation PCB Part No. A10340H-EVB-1 (EVK size 120mm x 50mm)



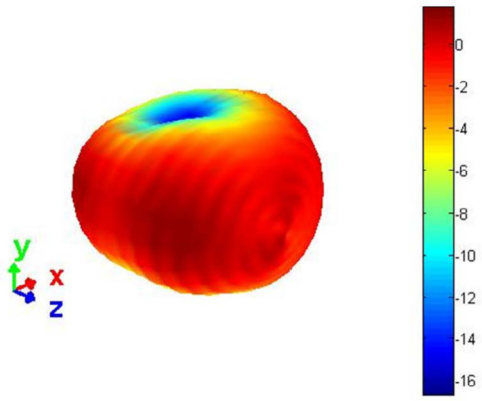
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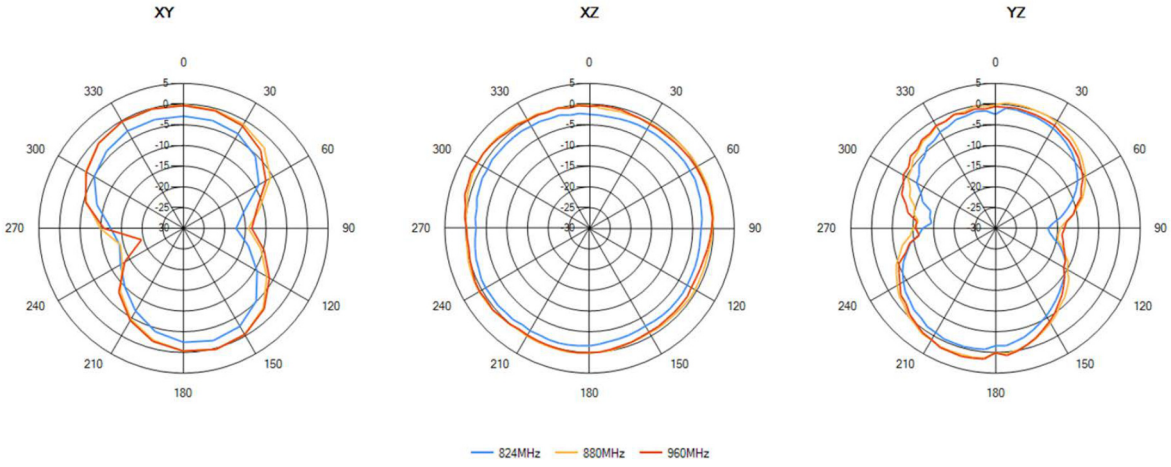
## 6.4. Antenna pattern

### 6.4.1. 824 MHz – 960 MHz

3D pattern at 880 MHz



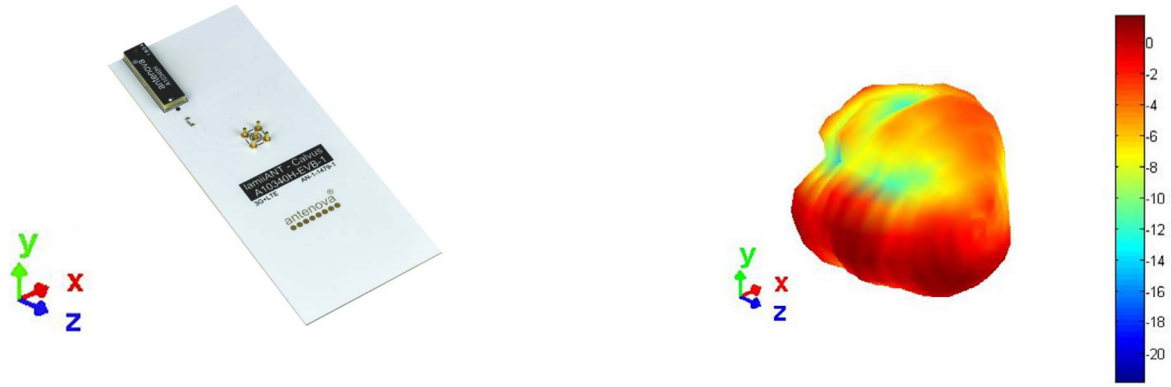



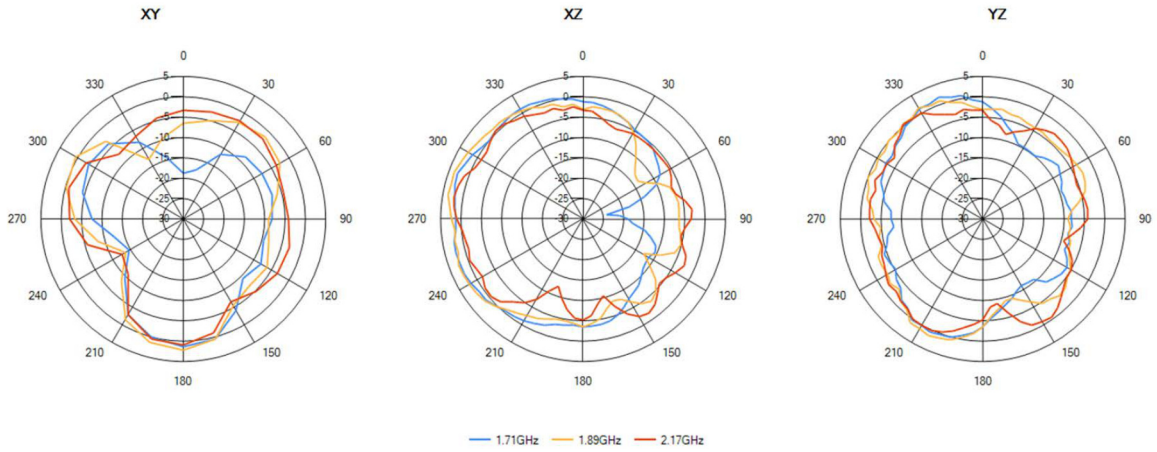



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## 6.4.2. 1710 - 2170 MHz

**3D pattern at 1930 MHz**



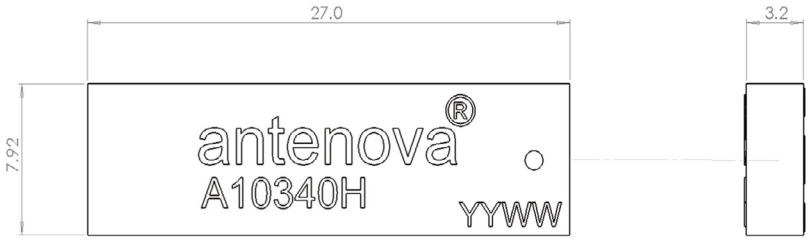






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# 7. Antenna dimensions

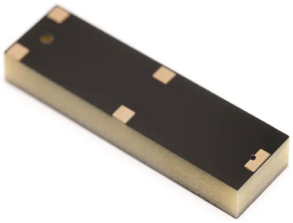


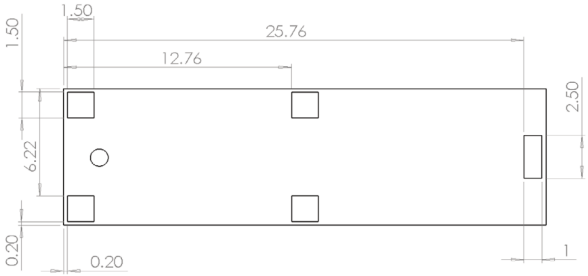




Top view

| L | W | H |
|---|---|---|
| Length | Width | Height |
| 27.0 ±0.1 | 7.92 ±0.1 | 3.2 ±0.2 |

All dimensions in (mm)






Bottom view

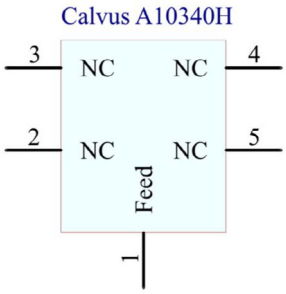


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# 8. Schematic symbol and pin definition

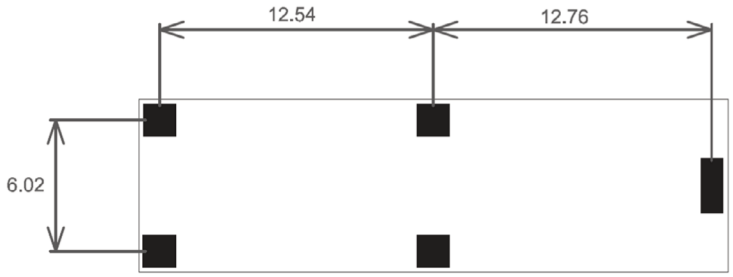
The circuit symbol for the antenna is shown below. The antenna has five pins with only one as functional. All other pins are for mechanical strength.

| Pin | Description |
|---|---|
| 1 | Feed (Transceiver port) |
| 2, 3, 4, 5 | Not used (Mechanical only) |




# 9. Host PCB footprint

The recommended host PCB footprint is below.




Pads 1 = 2.5 x 1.0 (mm)
Pads 2, 3, 4, 5 = 1.5 x 1.5 (mm)



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# 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 50 Ω impedance

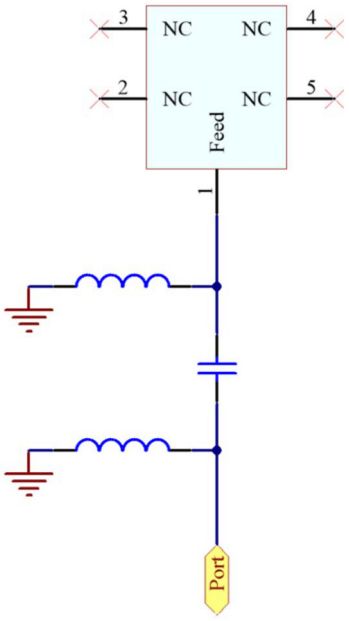
A co-planar transmission line can be designed using an online transmission line calculator tool, such as:

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 50 Ω 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.





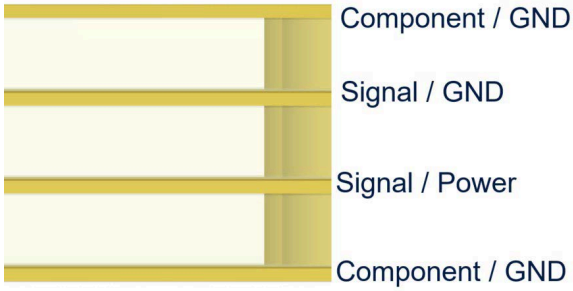

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# 11. Antenna integration guide

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

Calvus should be fitted to the device so that power from the antenna can radiate into free space. Antenova recommends fitting the antenna close to the corner of the PCB with few components or metal objects nearby. Ground can be placed at the side of the antenna closest to the feed, and it is recommended that any ground either side of the antenna should be at least 15mm away. The area directly above and below should be free from components or conducting objects. Antenova offers a full range of development support to ensure efficient implementation of the antenna into the specific design.

Two recommended configurations are shown below, but other layouts are possible.In both the distance to the antenna from the GND plane is 5.6mm.

The Antenova placement tool can be used to advise on antenna placement, see: https://blog.antenova.com/intelligent-antenna-selection-andplacement-tool-antenova

**Recommended PCB layouts:**




Antena mounted straight



Antena mounted at 45 degrees



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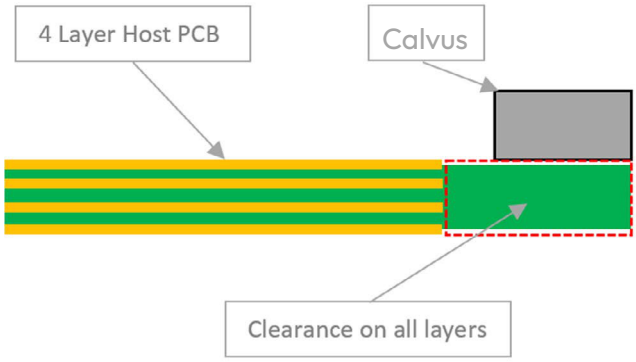
## 11.2. Host PCB layout

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.

## 11.3. Host PCB clearance

The diagram below shows the antenna footprint and clearance through all layers on the PCB. Only the antenna pads and connections to feed and GND are present within this clearance area.

Placement of components and GND with traces adjacent to the antenna should maintain a minimum clearance of 10mm x 6mm. The antenna should therefore be placed in the corner to only have one side affected.



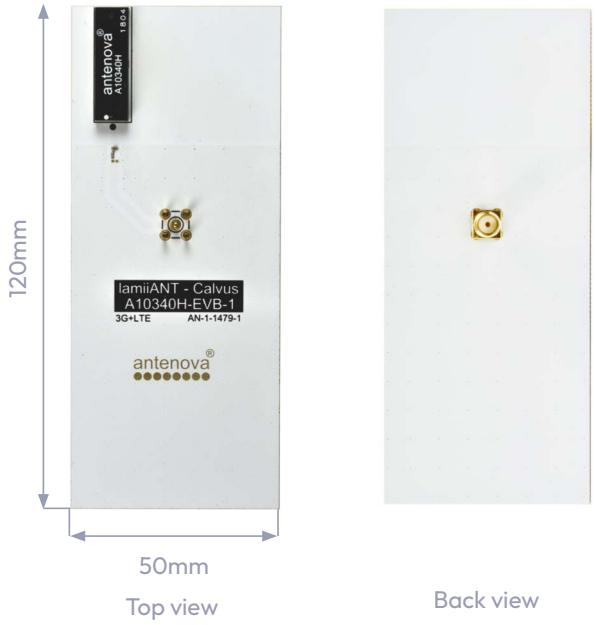



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# 12. Reference board

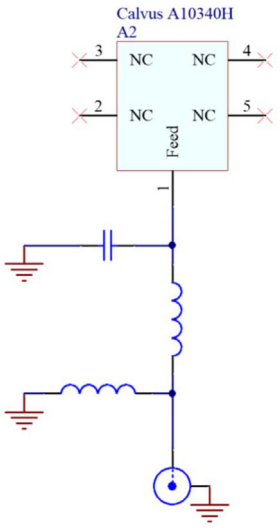
A reference board is used for evaluating the antenna A10340H and it includes a SMA female connector. (Part number: A10340H-EVB-1)

To order a reference board please see antenova.com




## 12.1. Reference board matching circuit

| Designator | Type | Value | Description |
|---|---|---|---|
| L1 | Inductor | 10nH | Murata LQG15HN series |
| L2 | Capacitor | 1.8nH | Murata LQG15HN series |
| C2 | Capacitor | 1pF | Murata GJM15 series |






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# 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 |
| Humitidy | 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 |

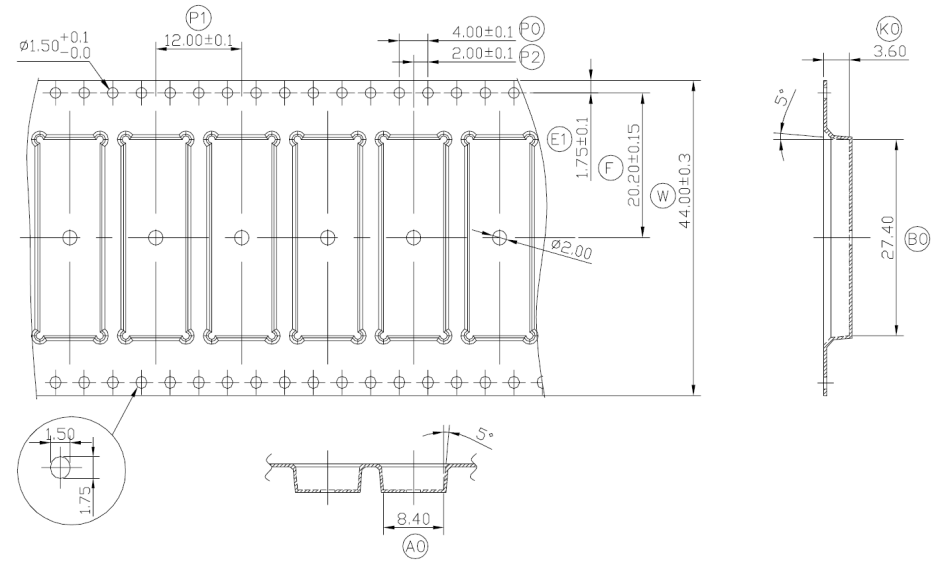
Note: Storage of open reels of antennas is not recommended due to possible oxidization of pads on antennas. If short term storage is necessary, then it is highly recommended that the bag containing the antenna reel is re-sealed and stored in conditions as described in the table above.

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



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## 15.2. Tape characteristics







| P0 | P1 | P2 | A0 | B0 | K0 |
|---|---|---|---|---|---|
| 4.00 ± 0.1 | 12.00 ± 0.1 | 2.00 ± 0.1 | 8.40 | 27.40 | 3.60 |

| E1 | F | W |
|---|---|---|
| 1.75 ± 0.1 | 20.20 ± 0.15 | 44.00 ± 0.3 |

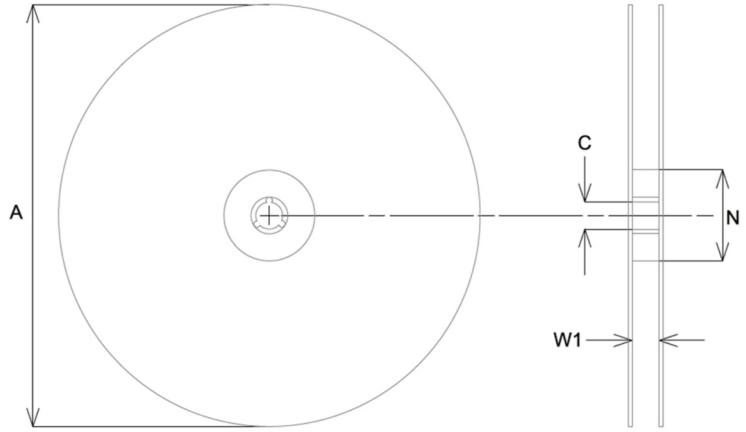
All dimensions in (mm)

| Quantity | Leading space | Trailing space |
|---|---|---|
| 1000 pcs / reel | 50 blank antenna holders | 50 blank antenna holders |



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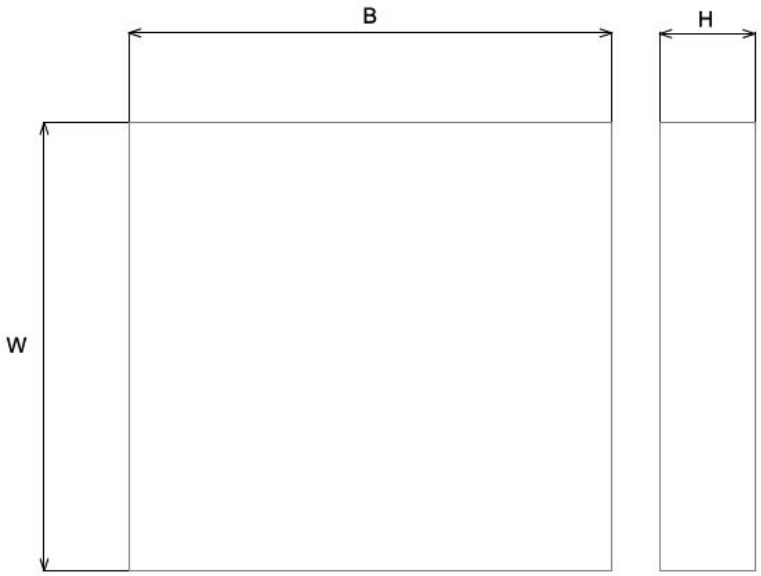
## 15.3. Reel dimensions




| A | C | N | W1 |
|---|---|---|---|
| 330.0 ± 2.0 | 13.5 ± 0.5 | 100.0 ± 0.5 | 44.4 ± 0.3 |

All dimensions in (mm)

## 15.4. Box dimensions




| Width (W) | Breadth (B) | Height (H) |
|---|---|---|
| 349mm | 351mm | 57mm |

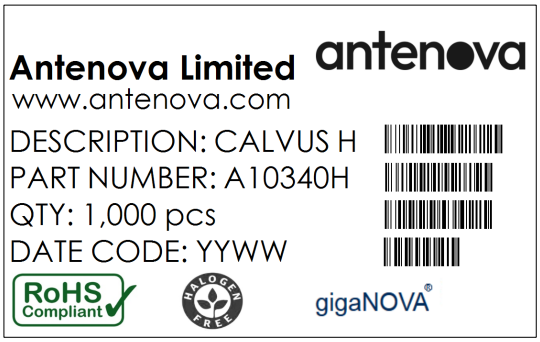


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## 15.5. Bag properties

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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RoHS compliant

REACH COMPLIANT

ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS
0026
Certification No. 11070
ISO 9001

Prop 65

## Datasheet version

2.01 released 5th June 2026



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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

ask.antenova is a global forum for designers and engineers working with wireless technology

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sales@antenova.com

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