antenova

DATASHEET

Curta

SR4L096 • IamiiANT®

Features

- Antenna for 4G and 3G applications
- Placement on short edge of PCB.
- LTE, GSM, CDMA, DCS, PCS, WCDMA, UMTS, HSPDA, GPRS, EDGE, IMT
- Bands: 698-960MHz; 1710-2170MHz; 2300-2400MHz; 2500-2700MHz
- SMD mounted device supplied on Tape and Reel
- Automotive temperature rating
- Compact 40 x 10 x 1.7mm
- Ideal for MIMO systems

1. Description

Curta is intended for use with 4G/3G applications. This antenna is placed on the short edge of the host PCB and is designed for coexistence requirements, it can be integrated as a single antenna or in a MIMO system. This product specification gives the antenna performance over all stated frequency ranges.

2. Applications

- OBD2 vehicle tracking systems
- 4G Routers
- Medical equipment
- Tablets and Industrial systems
- MIMO Systems
- Femtocell / Picocell networks
- IoT sensor networks

3. General data

Frequency	698-960MHz 1710-2170MHz 2300-2400MHz 2500-2700MHz
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	<1.5g
Antenna type	SMD
Dimensions	40.0 x 10.0 x 1.7 (mm)

4. Part number

SR4L096

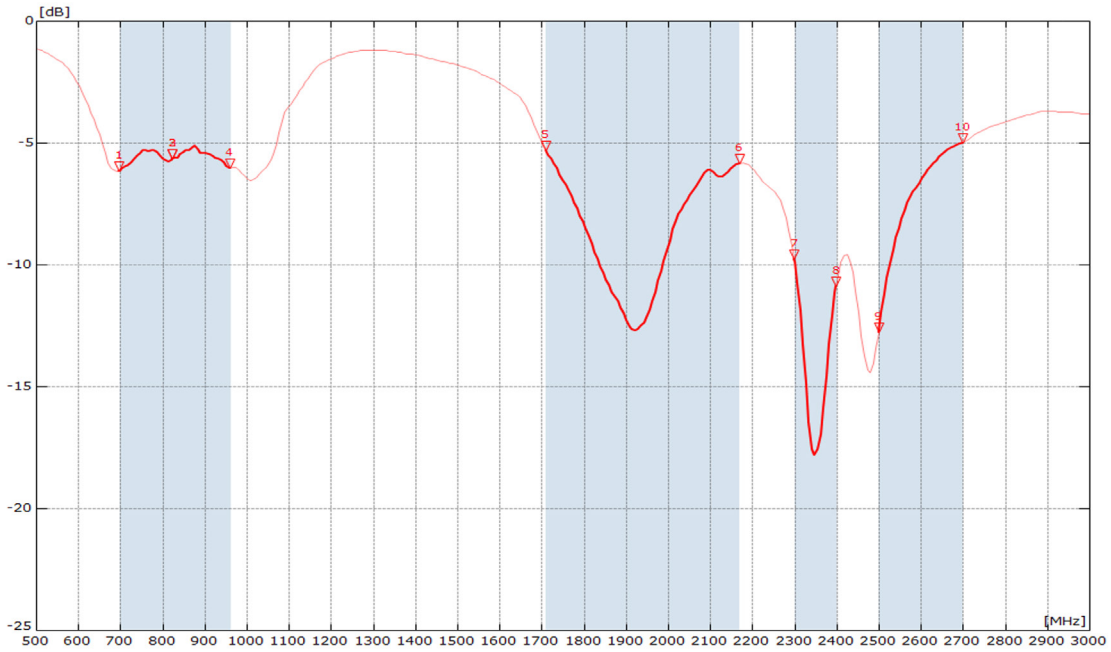
5. RF characteristics

Frequency	698-960 MHz	1710-2170 MHz	2300-2400 MHz	2500-2700 MHz
Peak gain	2.1dBi	3.8dBi	3.8dBi	2.7dBi
Average gain (Linear)	-2.5dB	-1.7dB	-2.8dB	-2.7dB
Average efficiency	56%	66%	52%	53%
Maximum return loss	-5.1dB	-5.2dB	-9.7dB	-4.9dB
Maximum VSWR	3.5:1	3.3:1	1.9:1	3.5:1

All data measured on Antenova's evaluation PCB
Part No. SR4L096-EVB-1

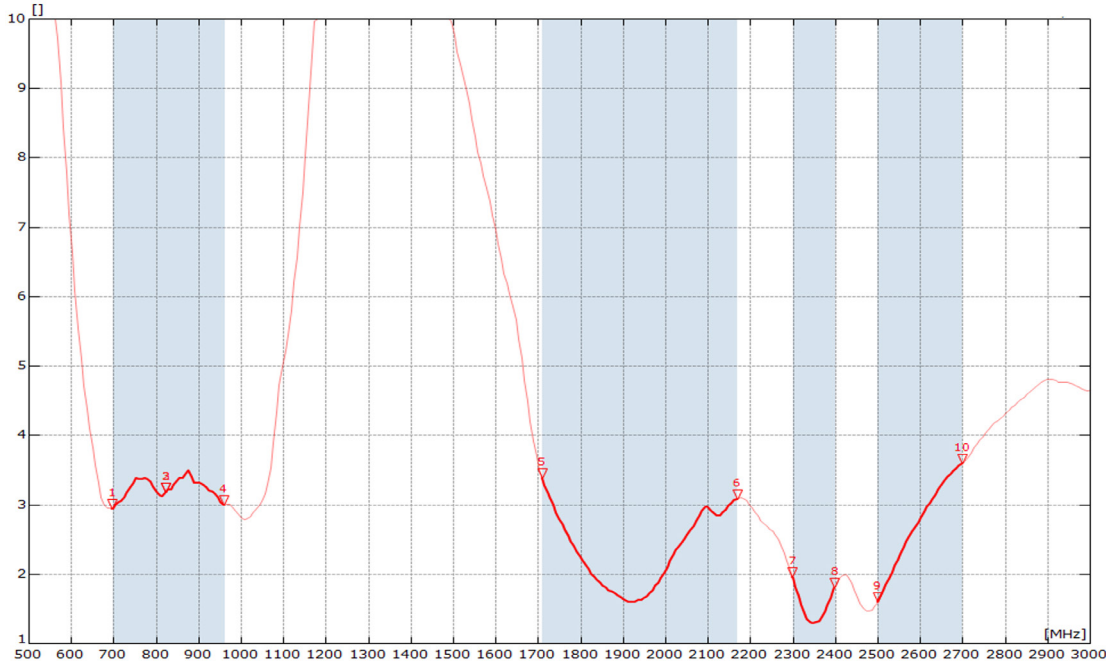
6. RF performance

6.1. Return loss



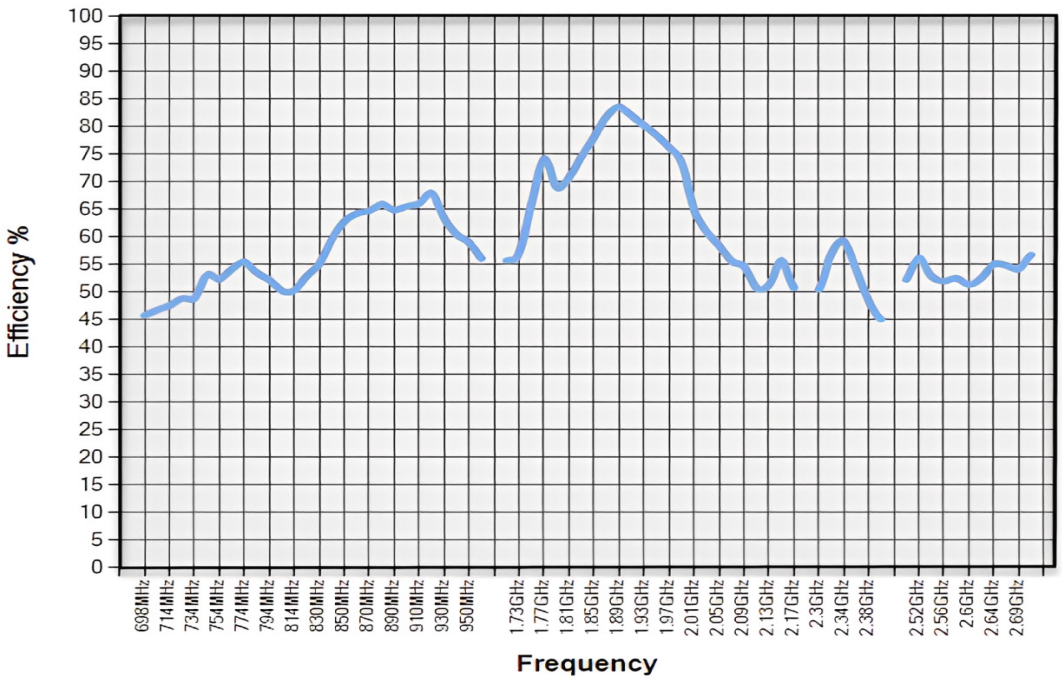
All data measured on Antenova's evaluation PCB
Part No. SR4L096-EVB-1

6.2. VSWR



All data measured on Antenova's evaluation PCB
Part No. SR4L096-EVB-1

6.3. Efficiency

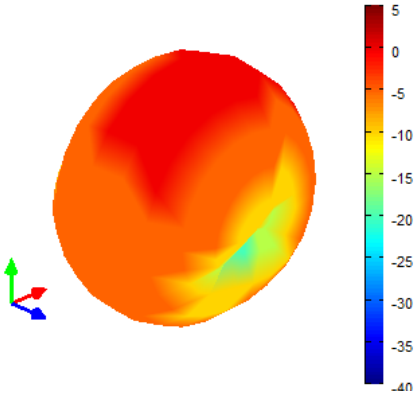


All data measured on Antenova's evaluation PCB
Part No. SR4L096-EVB-1

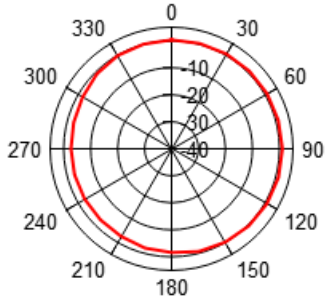
6.4. Antenna pattern

6.4.1. 764 MHz

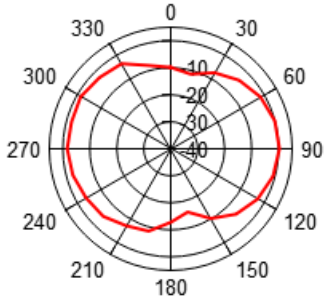
3D pattern at 764 MHz



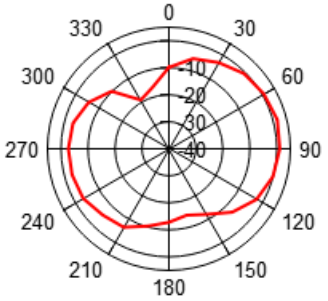
XY



XZ



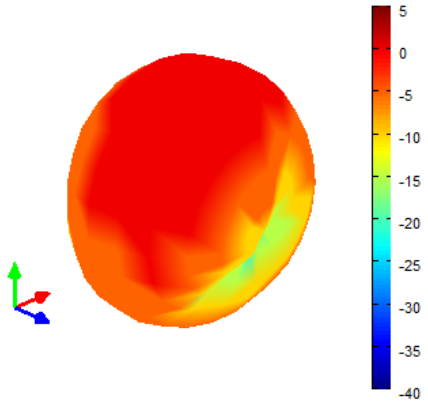
YZ



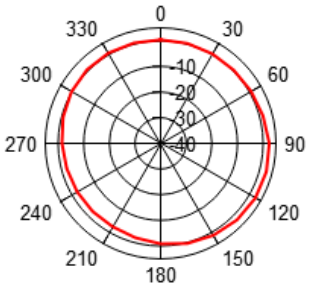
764MHz

6.4.2. 900 MHz

3D pattern at 900 MHz



XY



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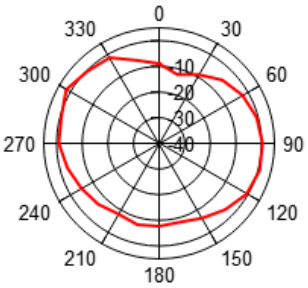

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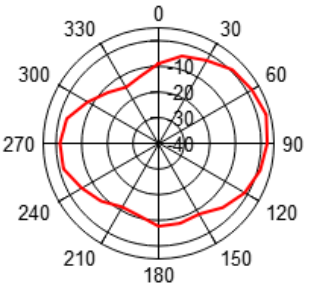
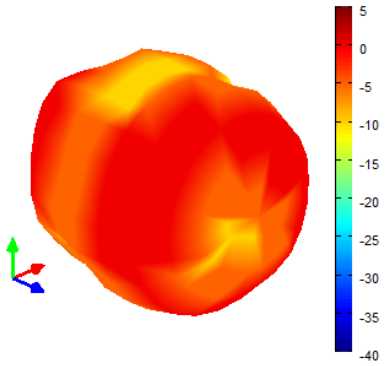


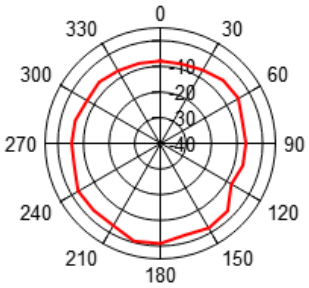
900MHz

6.4.3. 1930 MHz

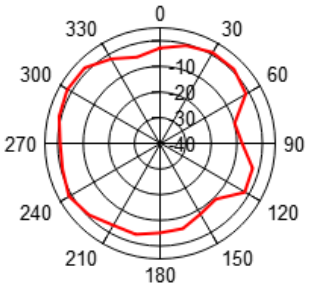
3D pattern at 1930 MHz



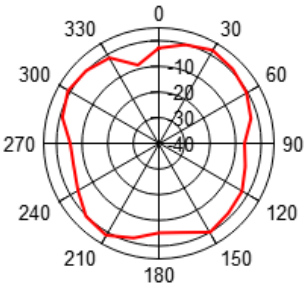
XY



XZ



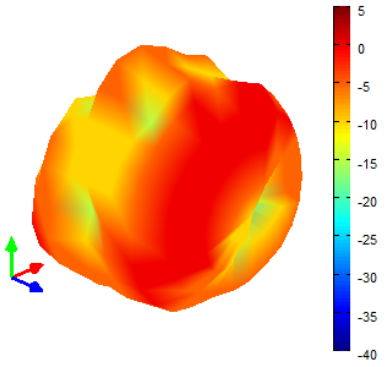
YZ



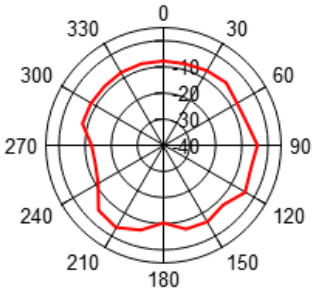
1.93GHz

6.4.4. 2340 MHz

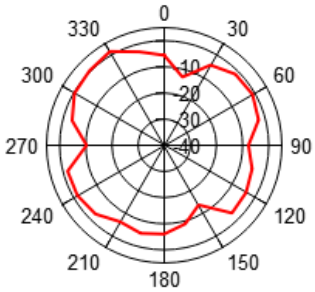
3D pattern at 2340 MHz



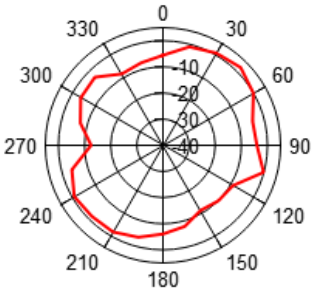
XY



XZ



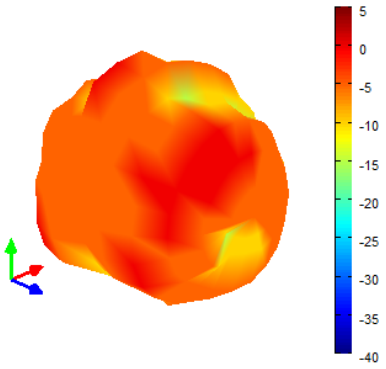
YZ

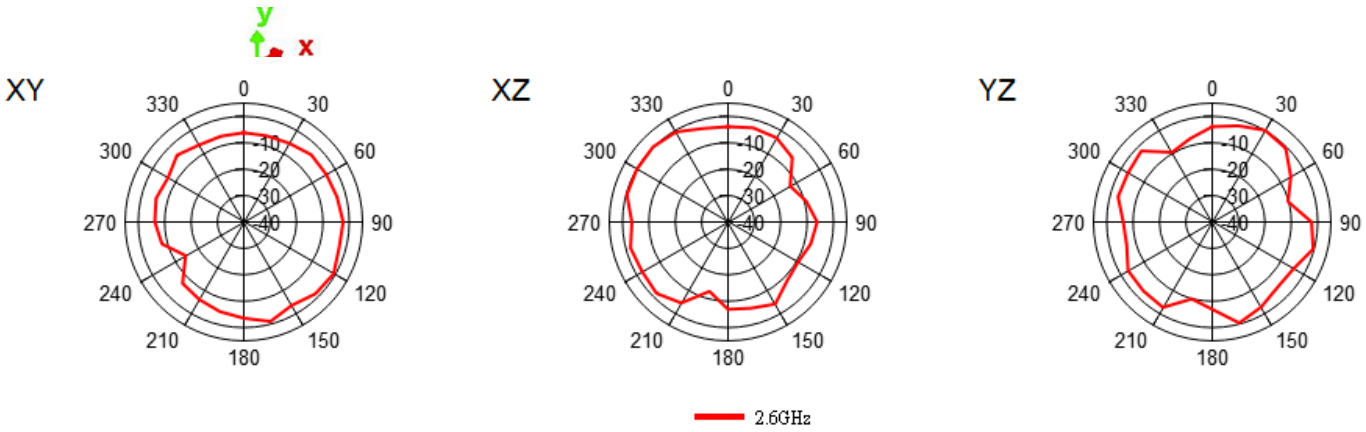


2.34GHz

6.4.5. 2600 MHz

3D pattern at 2600 MHz

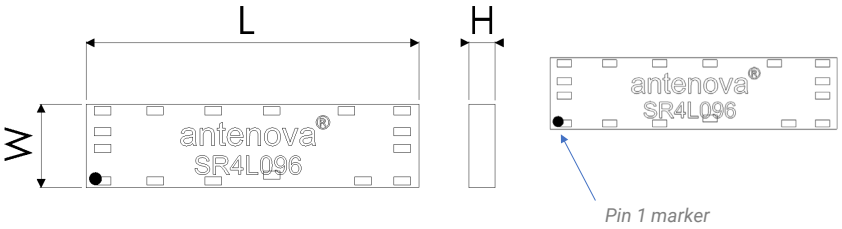




7. Antenna dimensions

7.1. Dimensions assembled

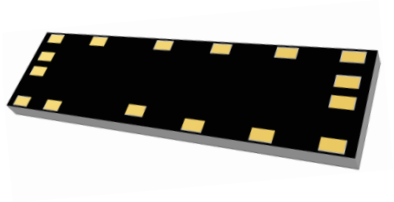
Top view

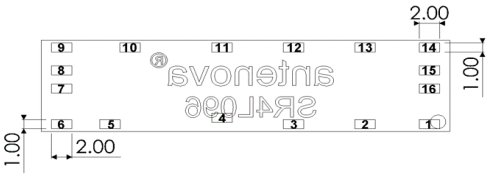


L	W	H
Length	Width	Height
40.0 ±0.1	10.0 ±0.1	1.7 ±0.1

All dimensions in (mm)

Bottom view



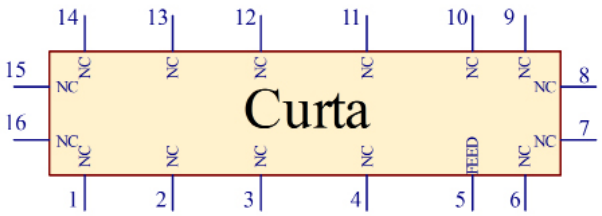


1-16copper pads: 1.0 x 2.0 (mm)

8. Schematic symbol and pin definition

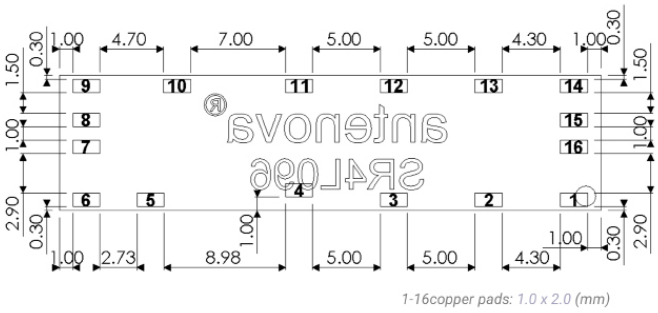
The circuit symbol for the antenna is shown below. The antenna has 16 pins with only 1 as functional. All other pins are for mechanical strength.

Pin	Description
5	Feed
Others	Not used (Mechanical only)



9. Host PCB footprint

The recommended host PCB footprint is below.



1-16copper pads: 1.0 x 2.0 (mm)

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

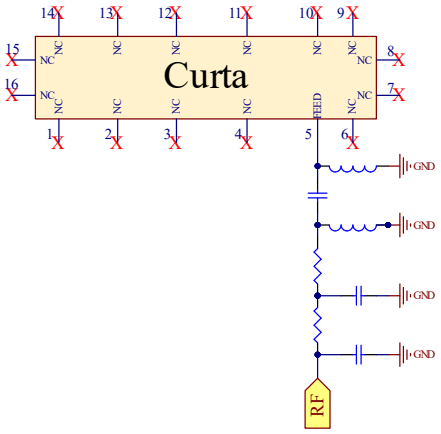
A co-planar transmission line can be designed using an online transmission line calculator tool, such as:

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 seven 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.

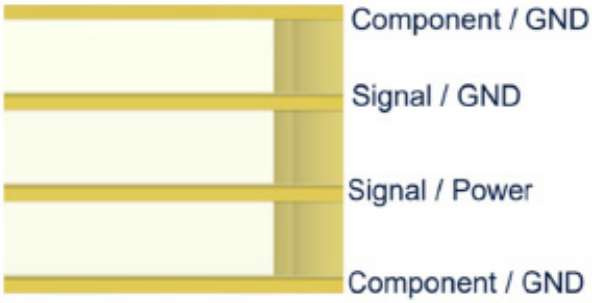


11. Antenna integration guide

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, in addition Antenova provide technical support to help you through all stages of your design. Register for an account on https://ask.antenova.com/ to access technical support.



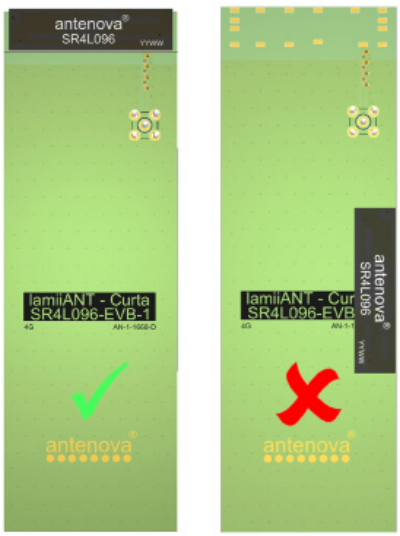
11.1. Antenna placement

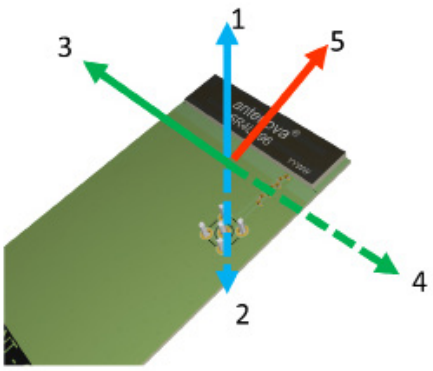
The antenna requires clearance ideally in 5 spatial directions in antenna area as shown below.

The Antenova placement tool can be used to advise on antenna placement, see:

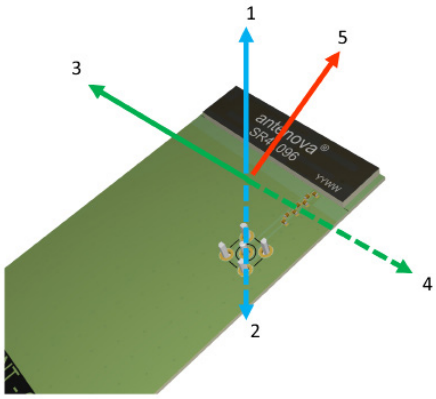
https://blog.antenova.com/intelligent-antenna-selection-and-placement-tool-antenova

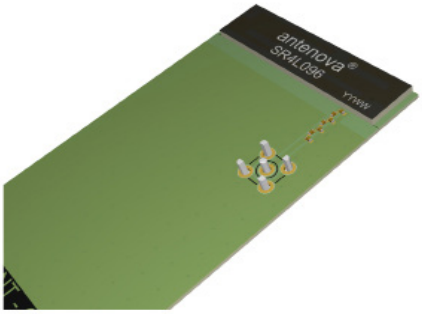
Correct Incorrect





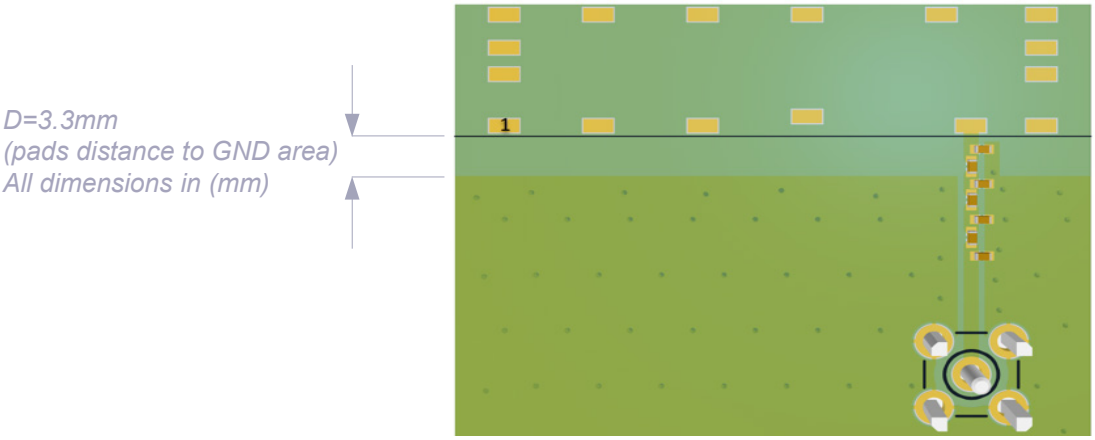
11.1. Antenna placement





11.2. Host PCB layout

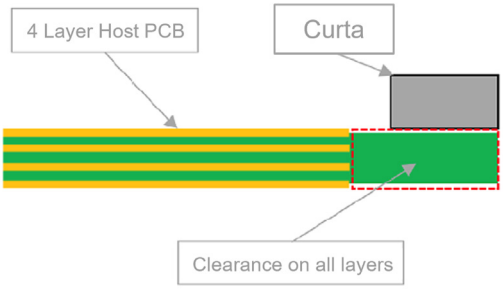
The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.

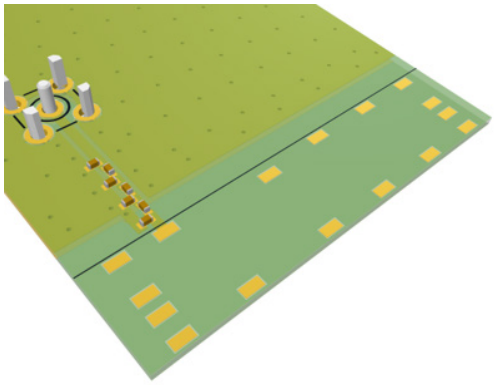


All dimensions in (mm)

11.3. Host PCB clearance

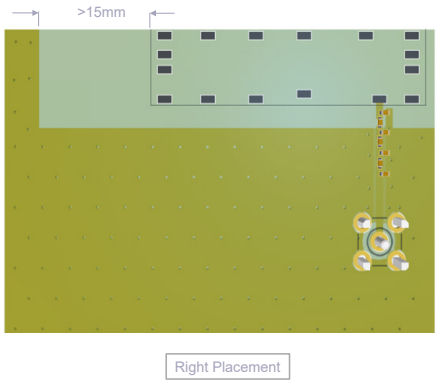
The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.

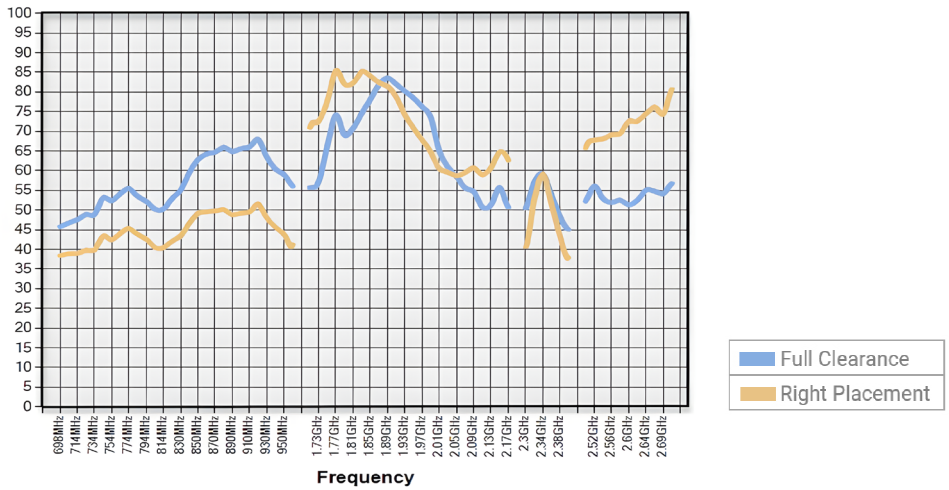




Below shows the antenna footprint and clearance through all layers on the PCB. Only the antenna pads and connections to feed and GND are present within this clearance area.

The best position for the antenna is in the full clearance area PCB. However, this antenna also can be placed at right side with at least 15mm gap from the top of PCB GND.



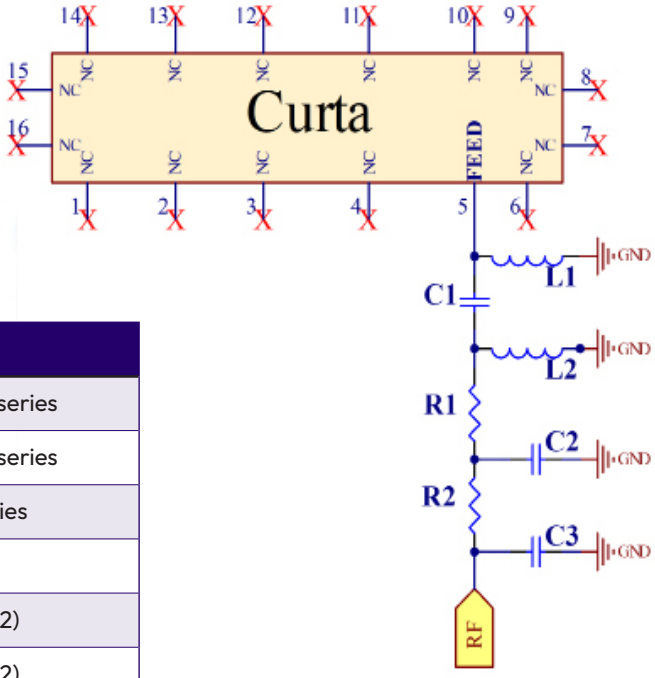


12. Reference board

A reference board is used for evaluating the antenna SR4L096 and it includes a SMA female connector. (part number SR4L096-EVB-1)

To order a reference board please see antenova.com

12.1. Reference board matching circuit



Designator	Type	Value	Description
L1	Inductor	6.8nH	Murata LQG15HS series
L2	Inductor	12nH	Murata LQG15HS series
C1	Capacitor	3.0pF	Murata GJM15 series
C2, C3	Not fitted	Not fitted	Not fitted
R1	Resistor	0 ohm	Non-specific (0402)
R2	Resistor	0 ohm	Non-specific (0402)

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

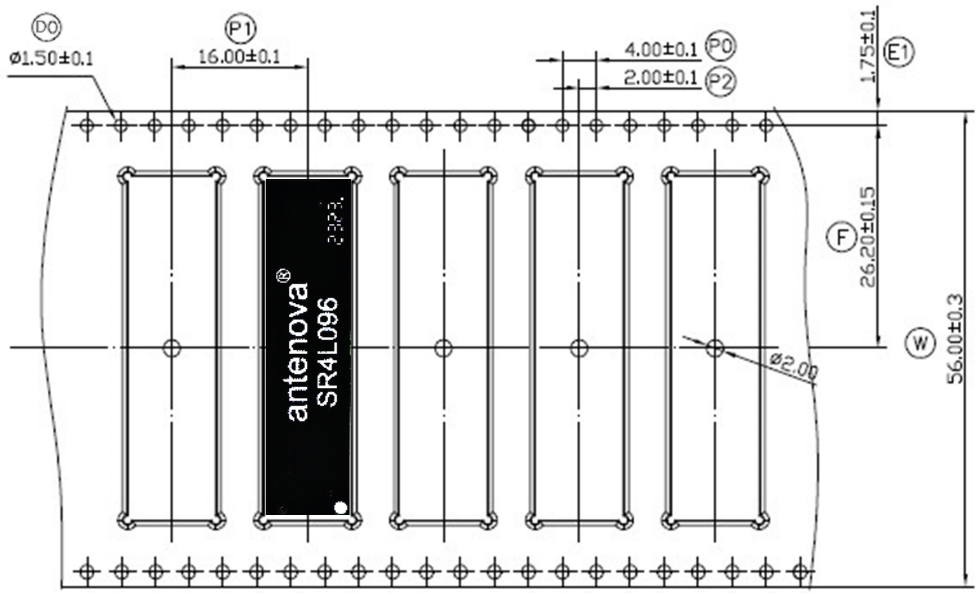
15.1. Optimal storage conditions

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 un-opened 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 tabel 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



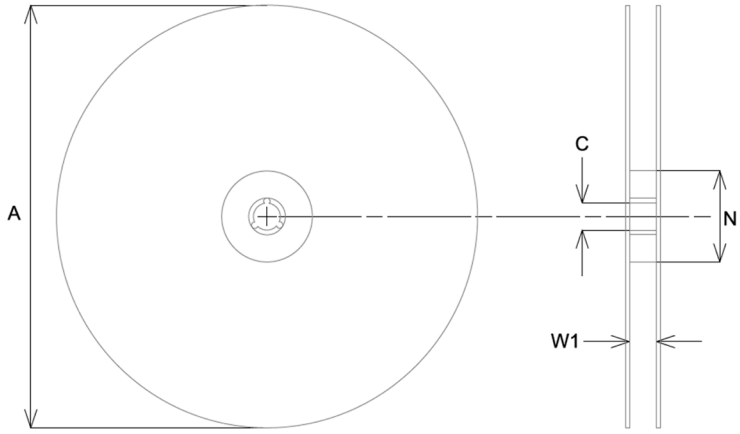
P0	P1	P2	D0
4.00 ± 0.1	16.00 ± 0.1	2.00 ± 0.1	1.50 ± 0.1

E	F	W
1.75 ± 0.1	26.20 ± 0.15	56.00 ± 0.3

All dimensions in (mm)

Quantity	Leading space	Trailing space
1000 pcs / reel	25 blank antenna holders	25 blank antenna holders

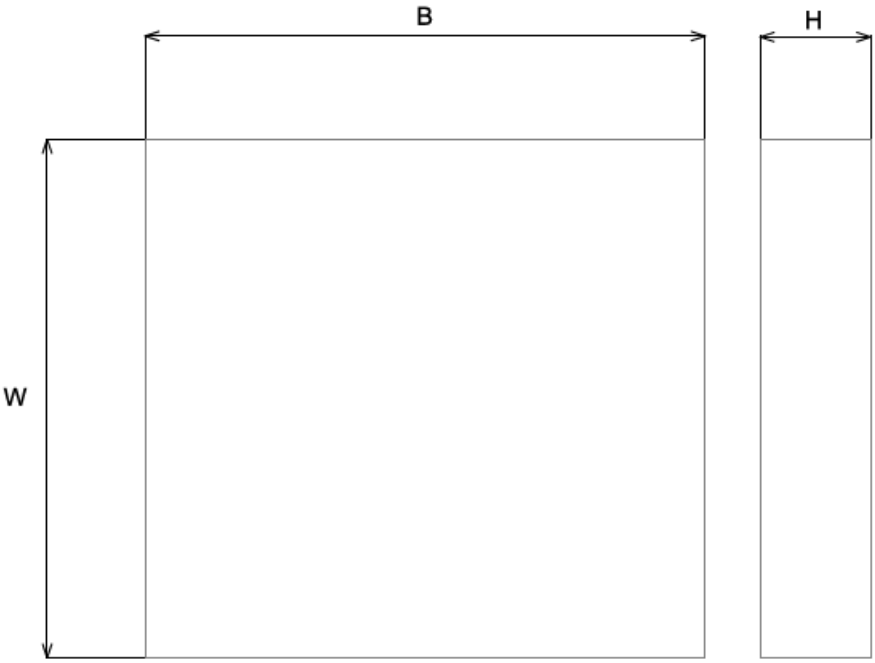
15.3. Reel dimensions



A	C	N	W1
330.0 ± 2.0	13.0 ± 0.5	178.0 ± 0.5	56 ± 2.0

All dimensions in (mm)

15.4. Box dimensions



Width (W)	Breadth (B)	Height (H)
350mm	355mm	70mm

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**.

RoHS compliant REACH COMPLIANT ISOQAR REGISTERED UKAS MANAGEMENT SYSTEMS 0026 Certification No. 11070 ISO 9001 TSCA CERTIFIED Prop 65

Datasheet version

2.01 release August 2024

antenova

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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