

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

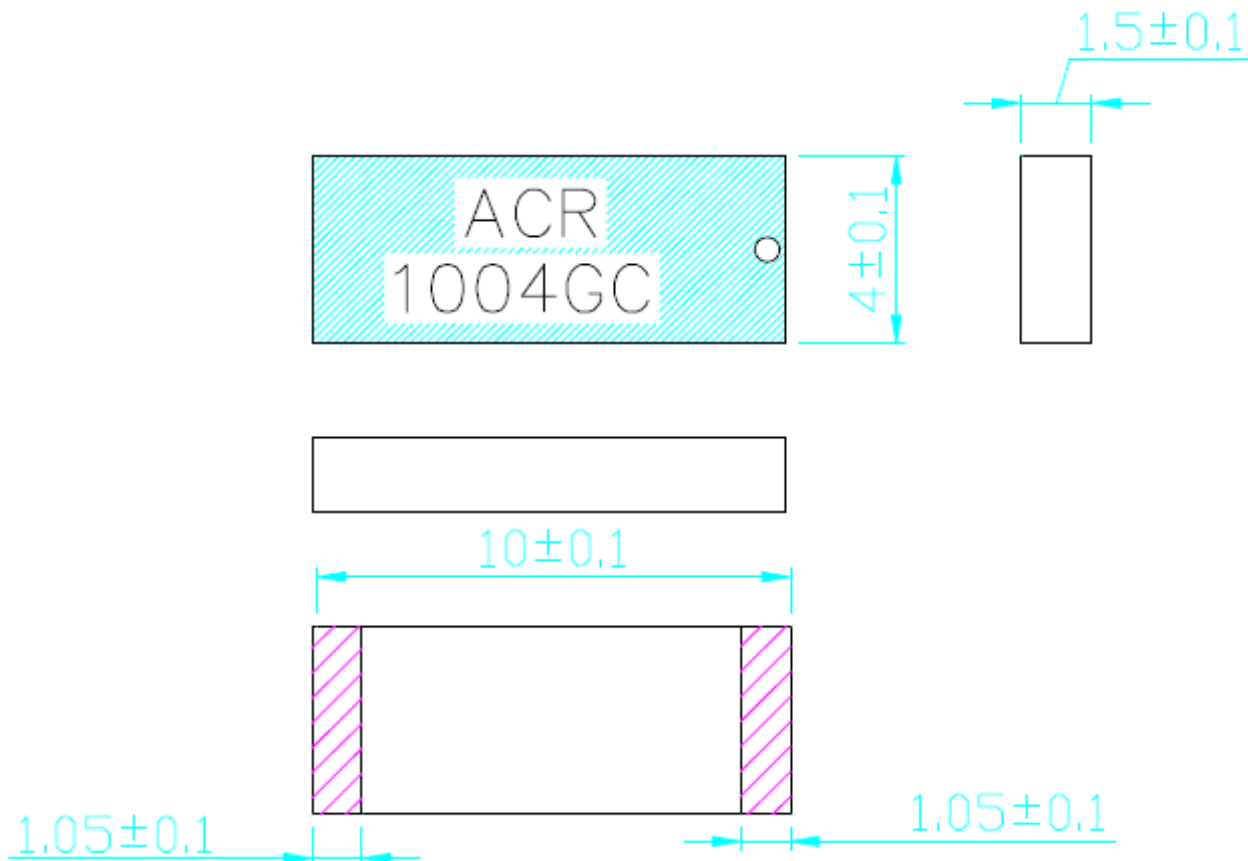
## Features


- Compact & Low-Profile Loop Antenna
- Centimeter Level Accuracy
- Multiband – Upper band GNSS + GPS L5
- L1 Peak Gain of 2.85 dBi
- L5 Peak Gain of 1.91 dBi
- Linear Polarization
- High Efficiency up to 80%


## Applications

- IoT
- M2M
- Automotive
- Tracking
- Fleet Management
- Smart Agriculture
- Smart City

## Product Dimensions



 Metalized Area

 Solder Dam Color : Black

Unit : mm



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Electrical Specification

| Parameter                    | Specification    |     |      | Unit     |
|------------------------------|------------------|-----|------|----------|
|                              | Min              | Typ | Max  |          |
| Operating Frequency          | 1166             |     | 1186 | MHz      |
|                              | 1561             |     | 1610 |          |
| Impedance                    | 50               |     |      | $\Omega$ |
| Return Loss                  |                  |     | -12  | dB       |
| Peak Gain (1166 to 1186 MHz) |                  |     | 1.9  | dBi      |
| Peak Gain (1561 to 1610 MHz) |                  |     | 2.8  |          |
| Polarization                 | Linear           |     |      |          |
| Azimuth Pattern              | Omni-directional |     |      |          |

## Mechanical Specification

| Parameter         | Specification   |
|-------------------|-----------------|
| Antenna Dimension | 10 x 4 x 1.5 mm |
| Mounting Type     | Surface Mount   |

## Environmental Specification

| Parameter              | Specification  |
|------------------------|----------------|
| Operating Temperature  | -40°C to +85°C |
| Storage Temperature    | -40°C to +85°C |
| Relative Humidity      | Up to 95%      |
| Pb Free                | Yes            |
| RoHS/RoHS II Compliant | Yes            |



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

## GNSS + GPS L5 Chip Ant

**ACR1004GC**

## Request Samples



Check Inventory

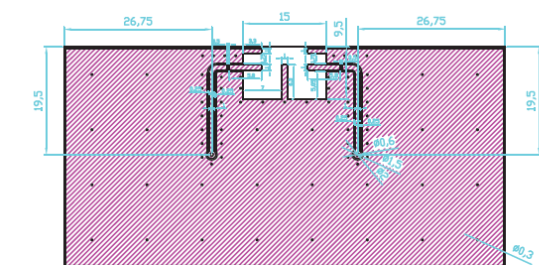


**10 x 4 x 1.5 mm**

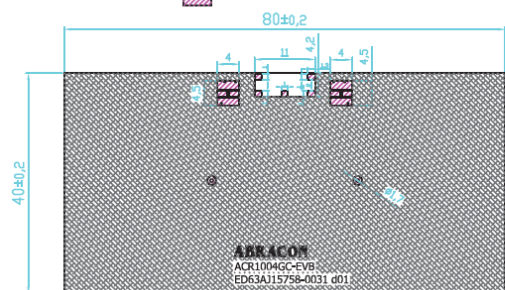
## RoHS/RoHS II Compliant

**MSL Level = 1**

### Evaluation Board Dimensions



 Copper foil area TOP

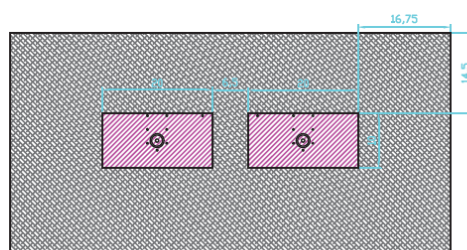


 Bare copper area

 Welding paint TOP Layer



 Copper foil area Bottom



 Bare copper area

 Welding paint Bottom Layer

Unit : mm



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

**REVISED: 08-11-21**

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

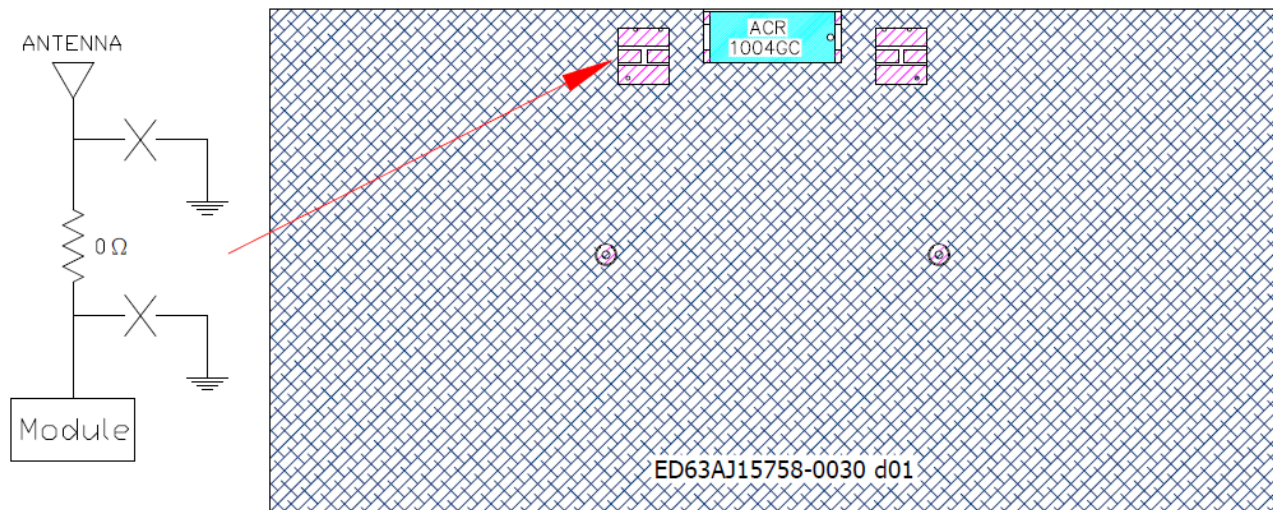


10 x 4 x 1.5 mm

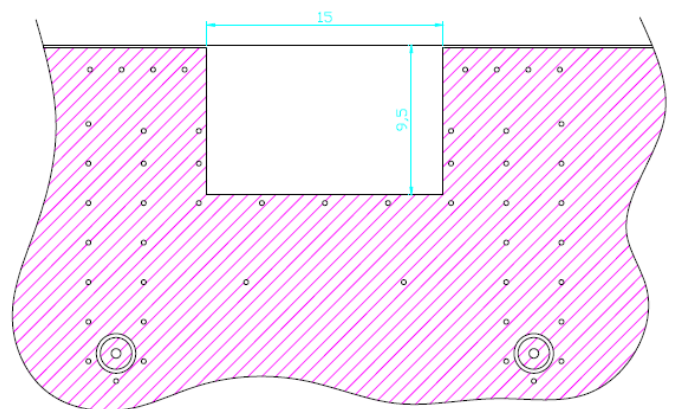
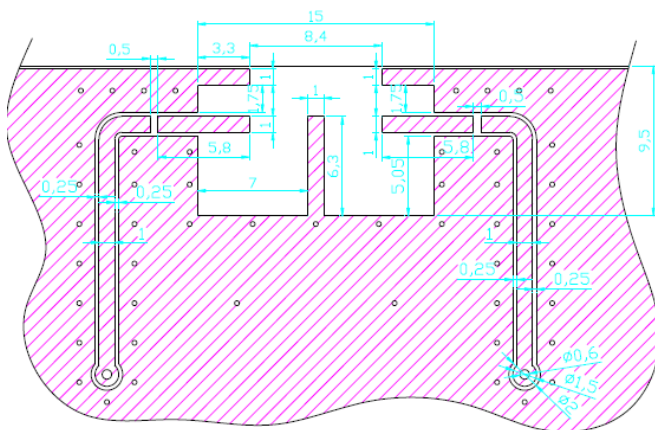
RoHS/RoHS II Compliant

MSL Level = 1

## Evaluation Board with Matching Circuit



## Recommended Layout



Unit



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



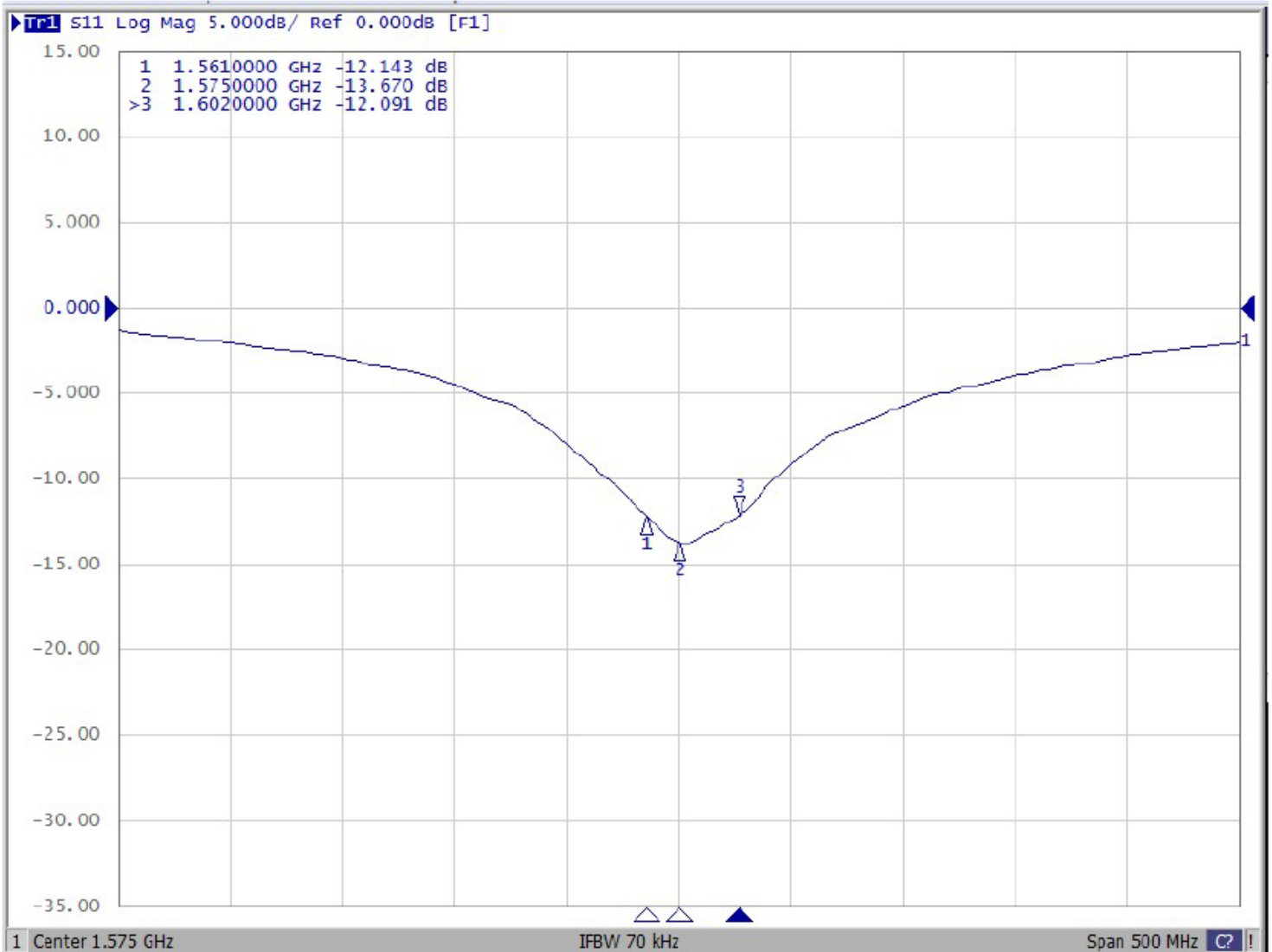
10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Return Loss

Upper band GNSS + GPS L1:



| Frequency (MHz) | S11 (dB) |
|-----------------|----------|
| 1561            | -12.14   |
| 1575            | -13.67   |
| 1602            | -12.09   |



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

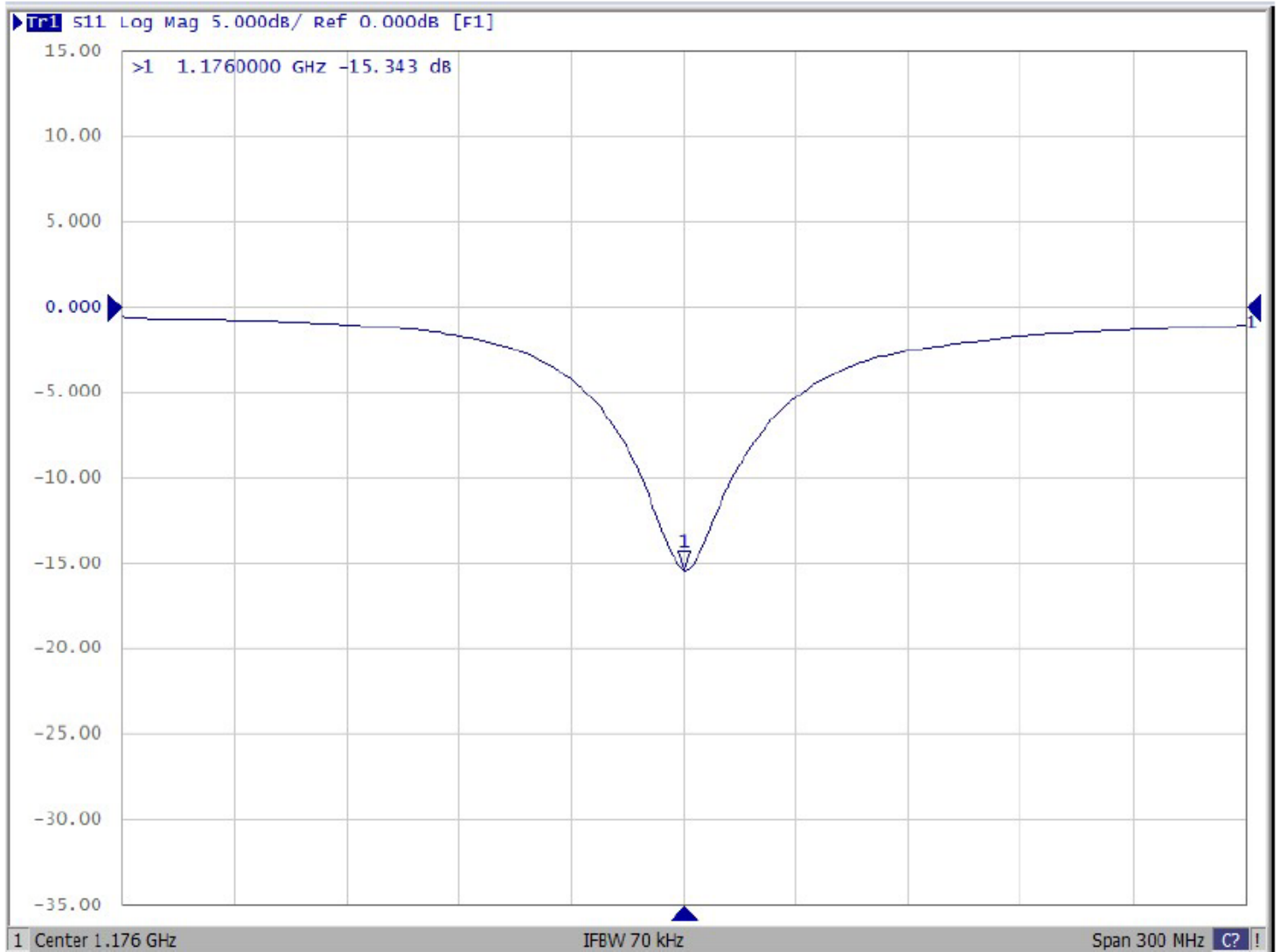


10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

## GPS L5:



| Frequency (MHz) | S11 (dB) |
|-----------------|----------|
| 1176            | -15.34   |



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED



# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



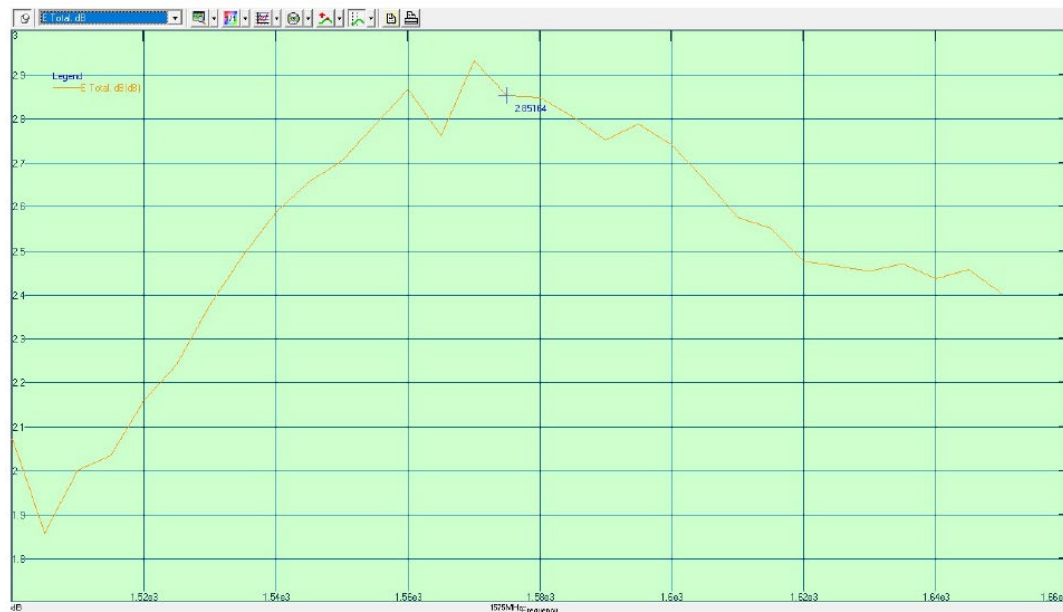
10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

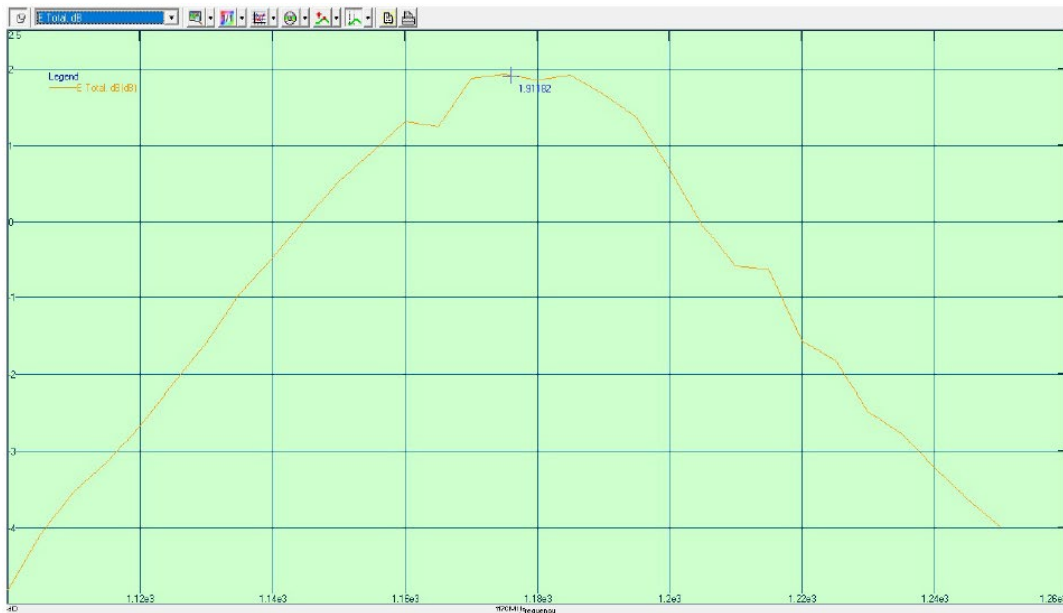
MSL Level = 1

## Peak Gain

Upper band GNSS + GPS L1:



GPS L5:



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

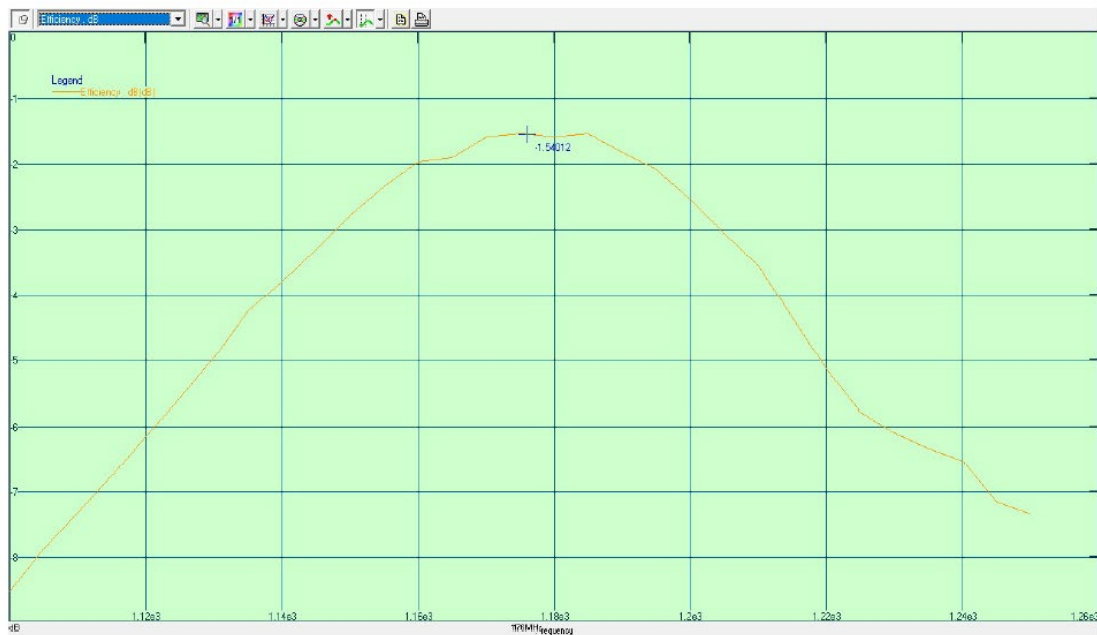
MSL Level = 1

## Average Gain

### Upper band GNSS + GPS L1:



### GPS L5:



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

REVISED: 08-11-21

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

ABRACON IS  
ISO9001-2015  
CERTIFIED



# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



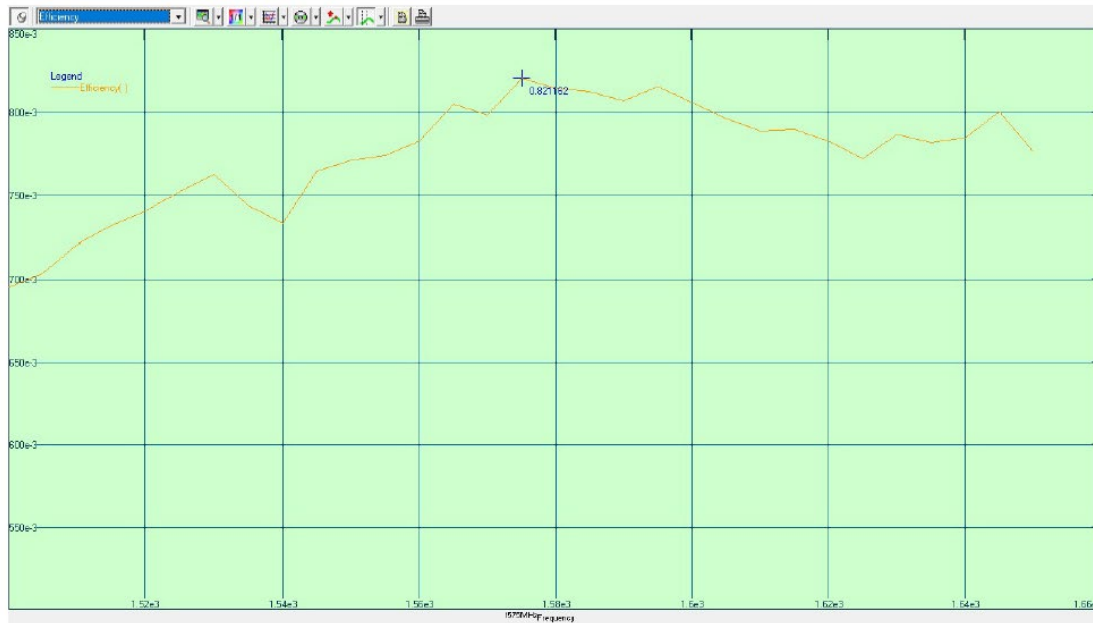
10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

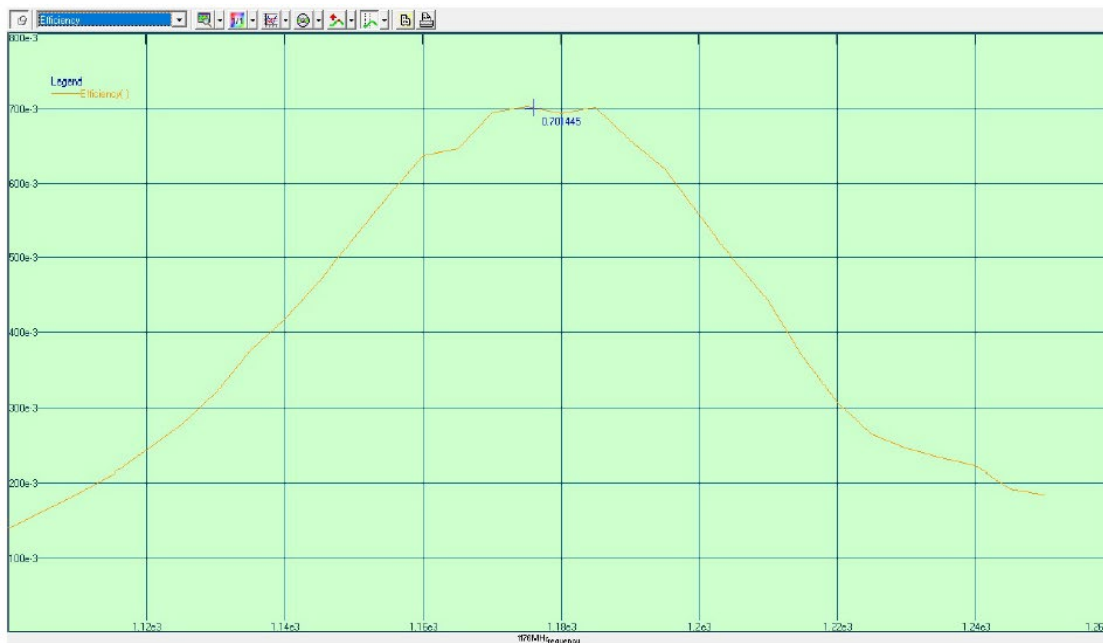
MSL Level = 1

## Efficiency

### Upper band GNSS + GPS L1:



### GPS L5:



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

REVISED: 08-11-21

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

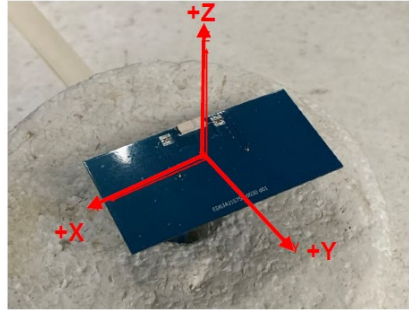


10 x 4 x 1.5 mm

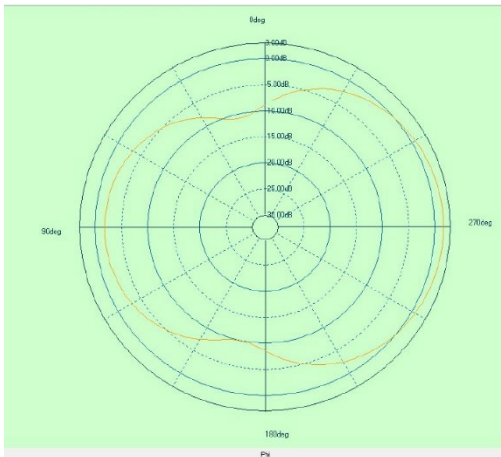
RoHS/RoHS II Compliant

MSL Level = 1

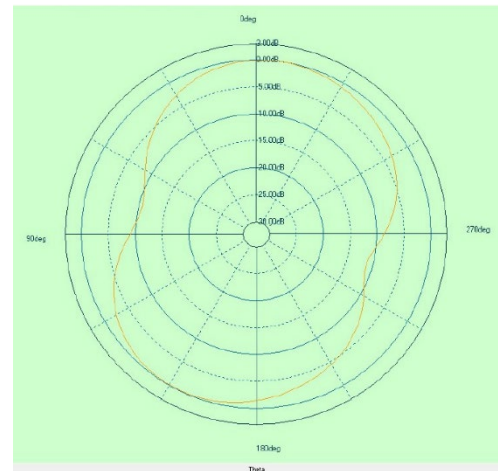
## Radiation Characteristics- 2D



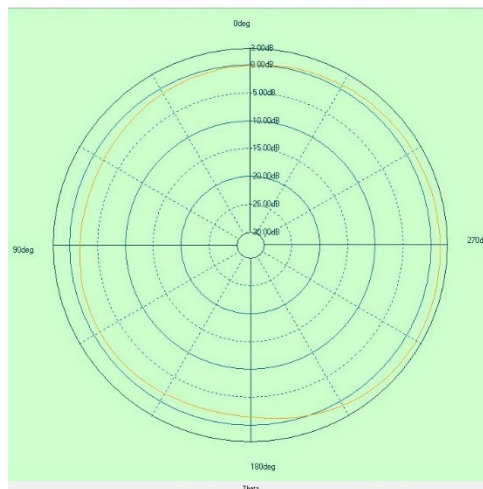
1176 MHz



XY-Plane



XZ-Plane



YZ-Plane



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

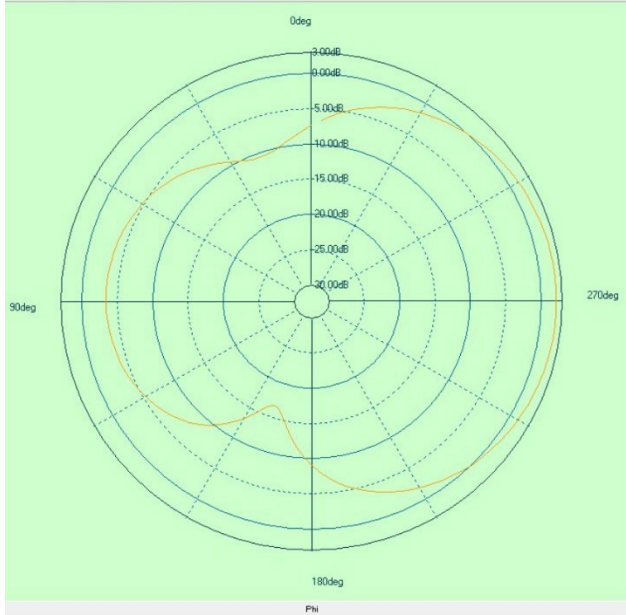


10 x 4 x 1.5 mm

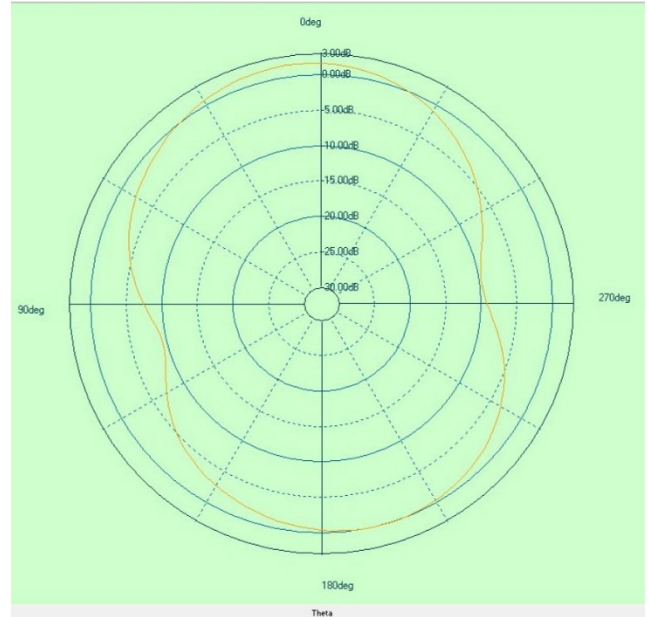
RoHS/RoHS II Compliant

MSL Level = 1

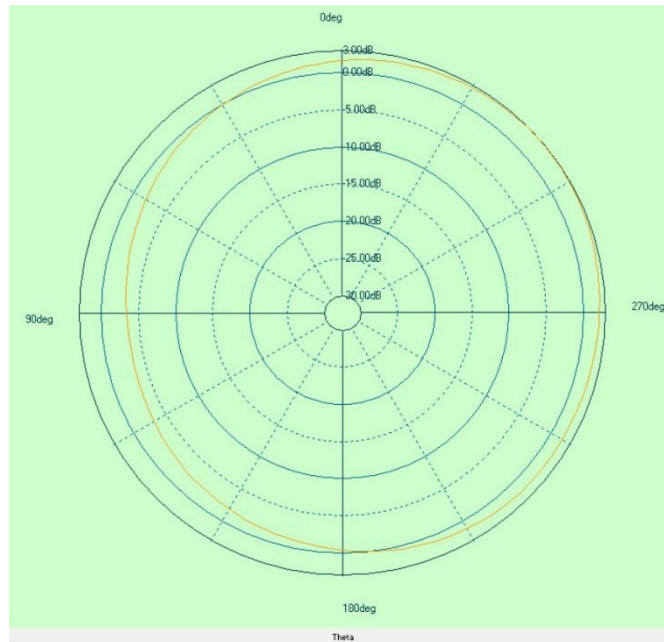
1561 MHz



XY-Plane



XZ-Plane



YZ-Plane



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples

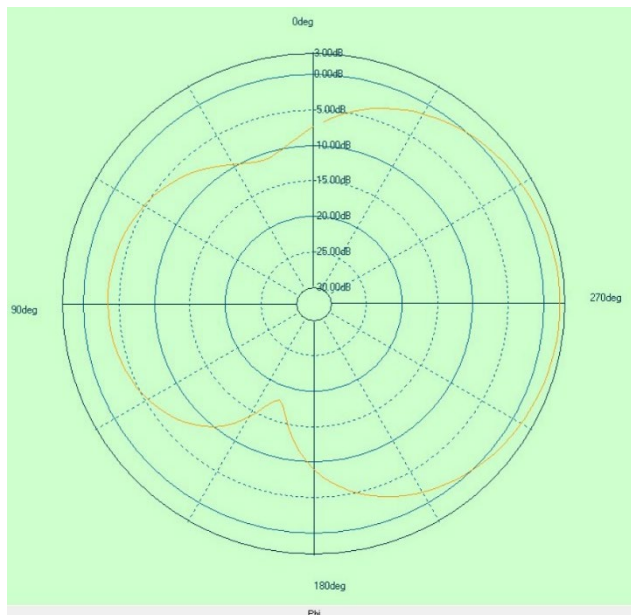


Check Inventory

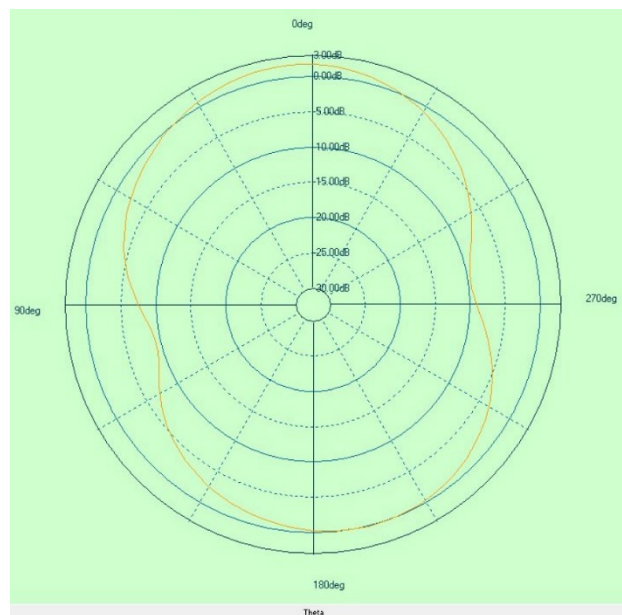


10 x 4 x 1.5 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

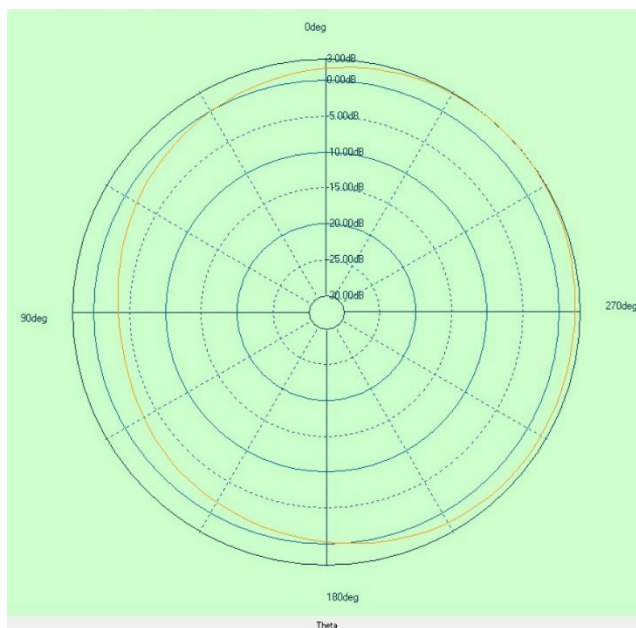
1575 MHz



XY-Plane



XZ-Plane



YZ-Plane



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED



# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

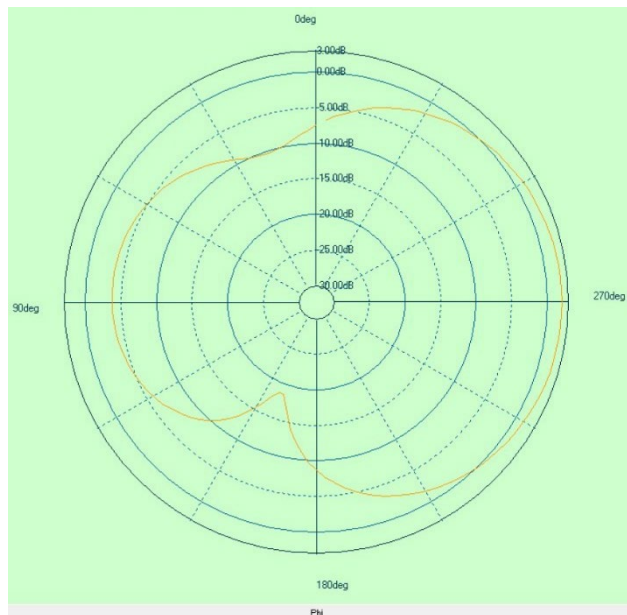


10 x 4 x 1.5 mm

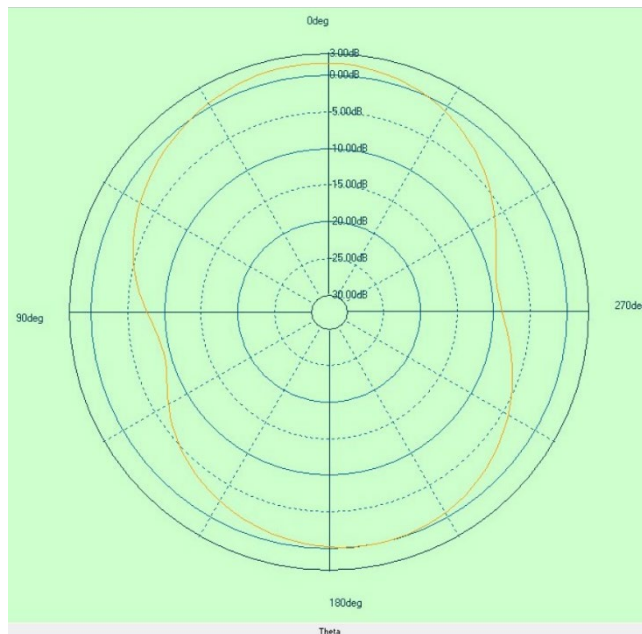
RoHS/RoHS II Compliant

MSL Level = 1

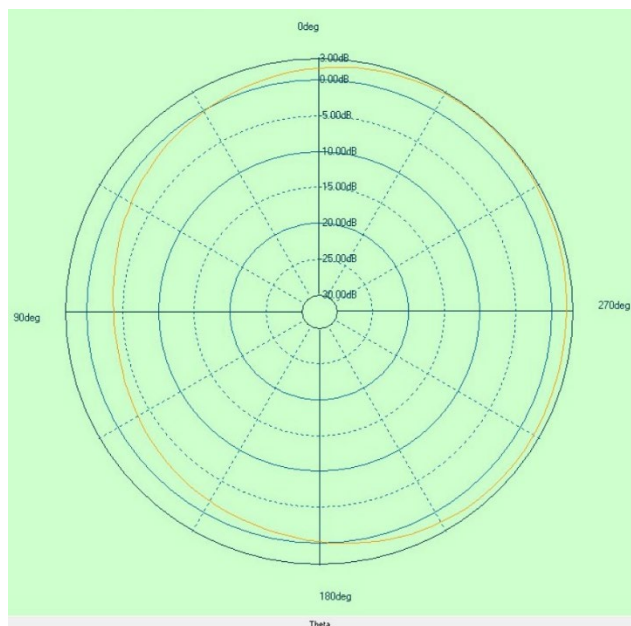
1602 MHz



XY-Plane



XZ-Plane



YZ-Plane



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

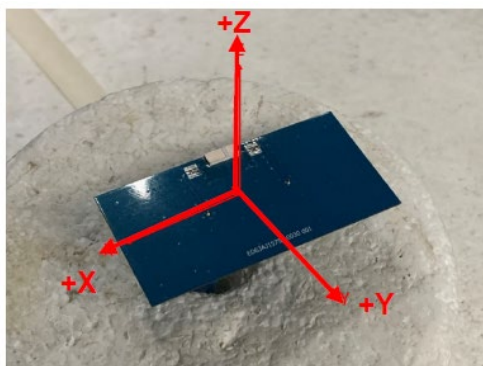


10 x 4 x 1.5 mm

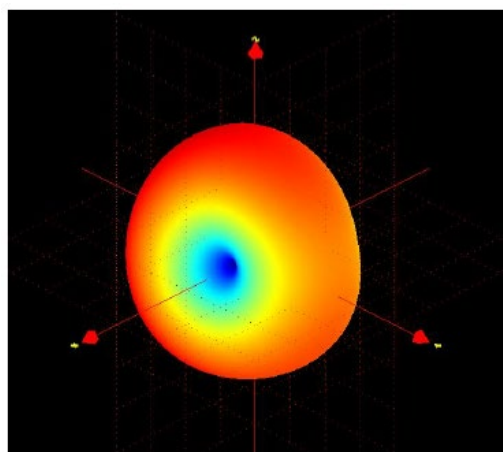
RoHS/RoHS II Compliant

MSL Level = 1

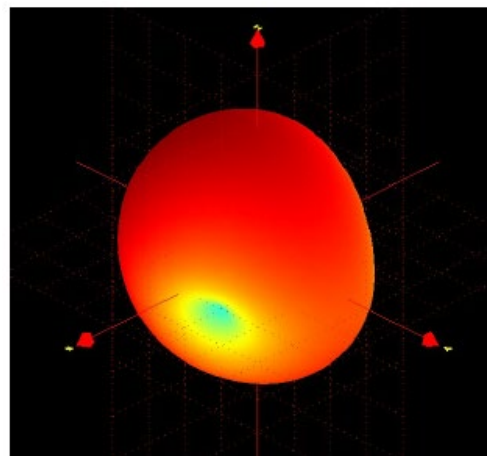
## Radiation Characteristics- 3D



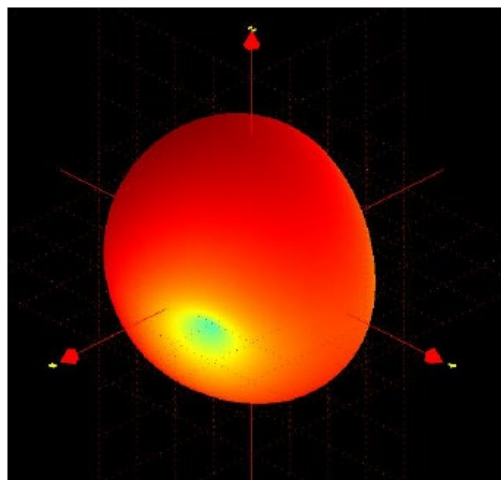
1176 MHz



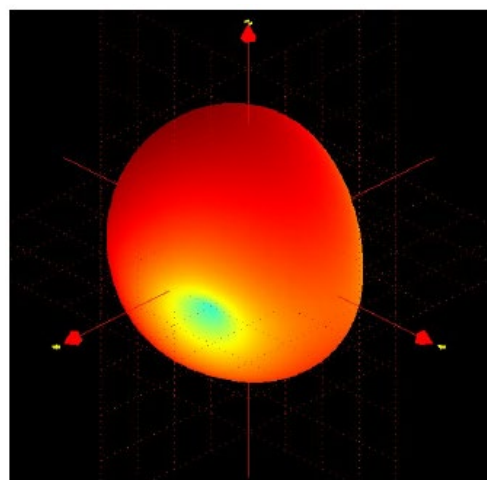
1561 MHz



1575 MHz



1602 MHz



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED



# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Reliability Test Report

| Test Condition                       | Test Exposure and Duration  |
|--------------------------------------|---|
| Low Temperature test                 | Expose the specimen to -40°C for 16 hours and then to normal temperature/ humidity for 24 hours or more. After this test, examine its appearance and functions.   |
| High-temperature test                | Expose the specimen to +85°C for 16 hours and then to normal temperature / humidity for 24 hours or more. After this test, examine its appearance and functions.  |
| High-temperature/high-humidity test  | Subject the object to the environmental conditions of +85°C and 90-95% relative humidity for 96 hours, then expose it to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.   |
| Thermal shock test                   | Subject the object to cyclic temperature change (-40°C for 30 minutes, then +85°C for 30 minutes) for 5 cycles, then expose to normal temperature/humidity for 24 hours or more.  |
| Sinusoidal vibration test            | Subject the object to vibrations of 5 to 200 to 5Hz swept in 10 minutes, 4.5G at maximum (2 mm amplitude), in X and Y directions for two hours each and in Z direction for four hours. After this test, examine its appearance functions.   |
| Vibration test in packaged condition | Subject the object, which is packaged as illustrated, to vibrations of 15 to 60 to 15Hz swept in 6 minutes, 4G at maximum (2mm amplitude at maximum), applied in X, Y and Z directions for two hours each, i.e. six hours in total. After this test, examine its appearance and functions.                    |
| Free fall test in packaged condition | Drop the object, which is packaged as illustrated, to a concrete surface from the height of 90 cm, on one corner, three edges and six faces once each, i.e. 10 times in total. After this test, examine its appearance and functions.   |
| Soldering heat resistance test       | After the lead pins of the unit are soaked in solder bath at $260 \pm 5$ °C for 10 seconds. After this test, examine its appearance and functions.  |
| Adhesion test                        | The device is subjected to be soldered on test PCB. Then apply 0.5 Kg (5 N) of force for $5 \pm 1$ second in the direction of parallel to the substrate (the soldering should be done by reflow and be conducted with care so that the soldering is uniform and free of defect by stress such as heat shock). |



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



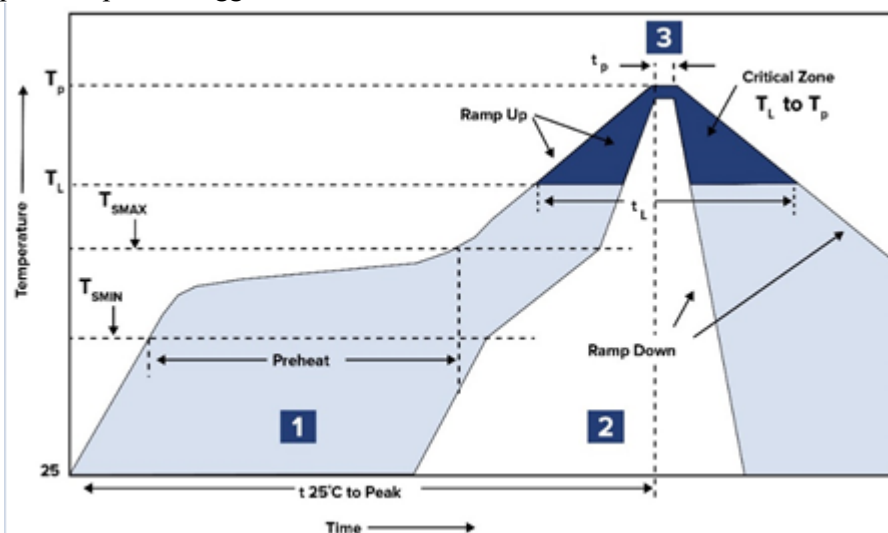
10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Reflow Profile

The chip antenna can be assembled using the following Pb-free assembly. According to the standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follows :



| Zone                               | Description | Temperature                               | Times        |
|------------------------------------|-------------|---|--------------|
| 1                                  | Preheat     | $T_{SMIN} \sim T_{SMAX}$<br>150°C ~ 200°C | 60 ~ 120 sec |
| 2                                  | Ramp-Up     | $T_{SMAX} \sim T_P$ : 3 °C/s              |              |
| 3                                  | Reflow      | $T_L$<br>217°C                            | 30 ~ 100 sec |
|                                    | Peak heat   | $T_P$<br>260°C                            | 5 to 10 sec  |
|                                    | Ramp-Down   | 6 °C/s                                    |              |
| Time from 25°C to Peak Temperature |             | 8 minutes (max)                           |              |
| Composition of solder paste        |             | 96.5Sn/3Ag/0.5Cu                          |              |
| Solder Paste Model                 |             | SHENMAO PF606-P26                         |              |

## Soldering with Iron

- Soldering Iron Temperature : 270±10 °C
- Apply pre-heating at 120 °C for 2~3 min.
- Complete soldering for each terminal within 3 s .
  - If the soldering iron temperature exceeds 270±10 °C or 3 seconds, it can damage the component.

**Note:** All temperature measurement points are on top surface of the component. If the temperature goes over the recommend, it will cause surface peeling or damage to the com



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory



10 x 4 x 1.5 mm

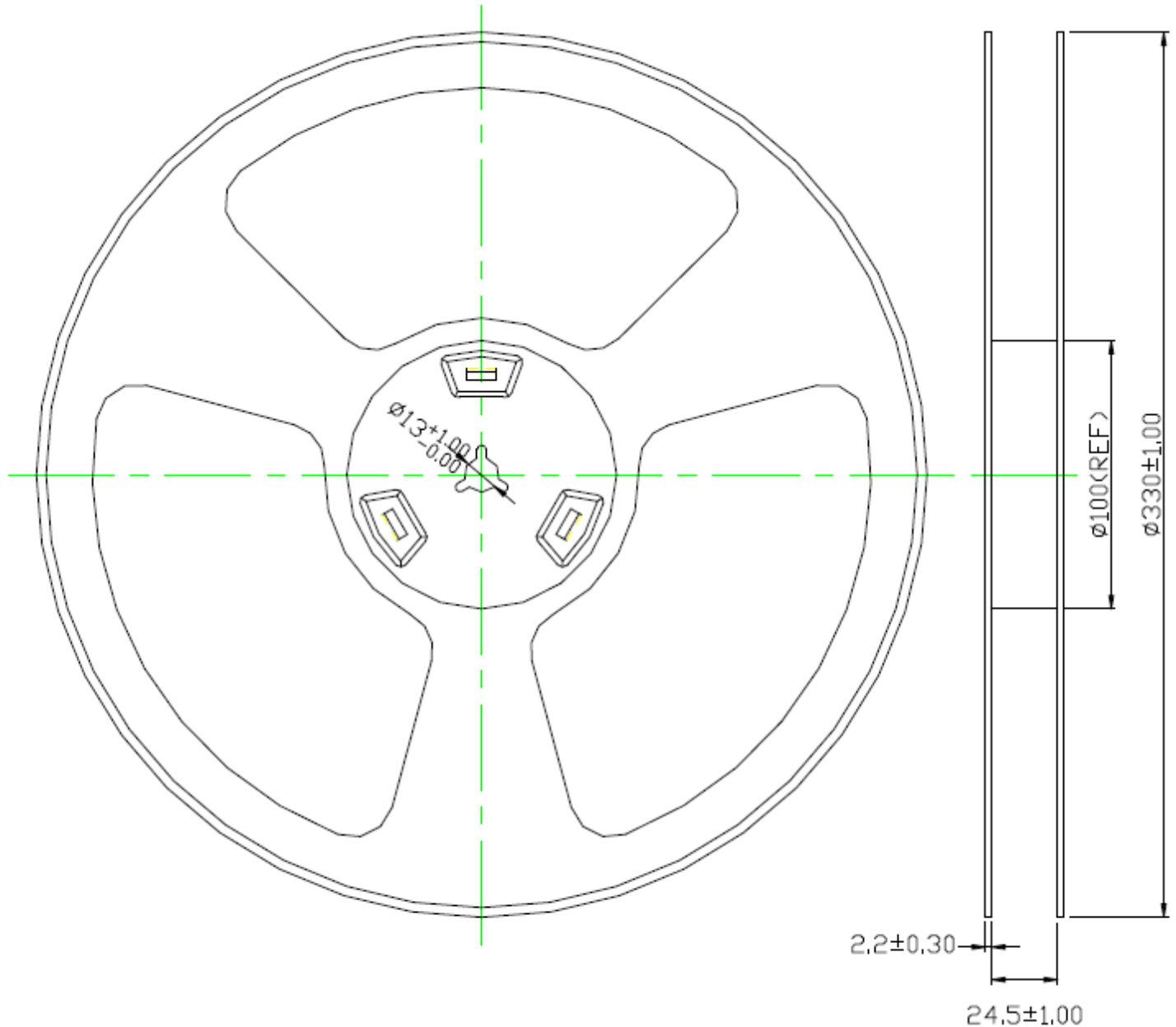
RoHS/RoHS II Compliant

MSL Level = 1

## Packaging

Packaging type : Tape & Reel

Number of pieces per tape: 2000 pcs



Unit: mm



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED

# GNSS + GPS L5 Chip Ant

ACR1004GC

Request Samples



Check Inventory

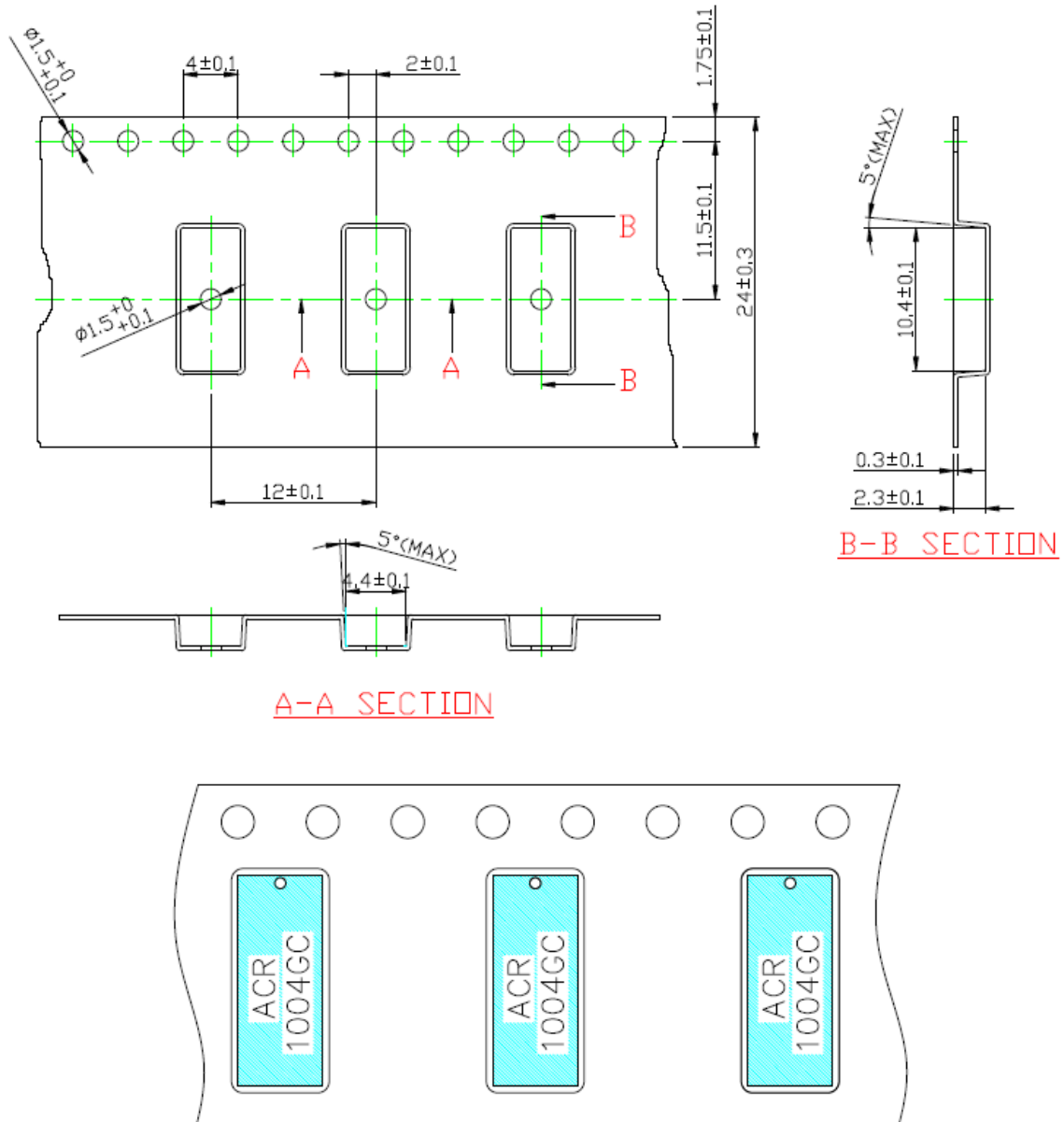


10 x 4 x 1.5 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Tape Dimensions:



Unit: mm

**ATTENTION:** Abracon LLC's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependent Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon LLC is required. Please contact Abracon LLC for more information.



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858

For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-11-21

ABRACON IS  
ISO9001-2015  
CERTIFIED