OnBoard GSM/NB-IoT - EVB

PRO-EB-575

Request Samples

Check Inventory

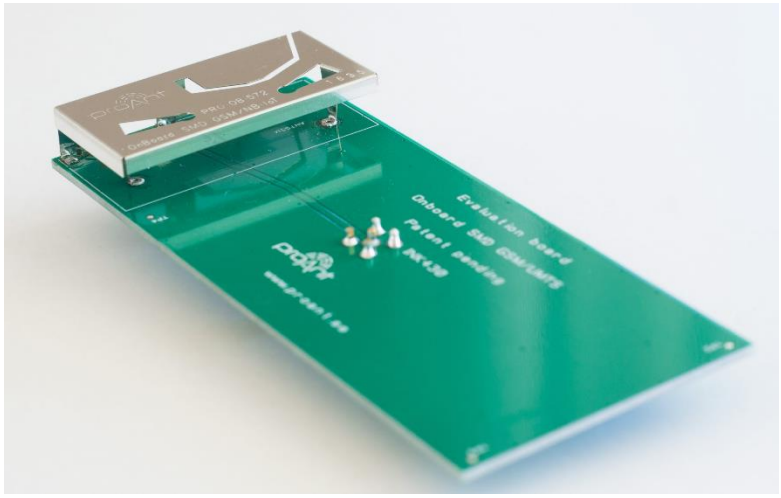
120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Description

The PRO-EB-575 Evaluation board is designed to provide a means to facilitate engineering evaluation of the OnBoard GMS/NB-IoT antenna: PRO-OB-572. With a typical operating frequency range of 791 ~ 960 MHz and 1.71 ~ 2.17 GHz, the antenna can be used for NB IoT/4G/3G/2G/GSM applications. The evaluation board is 52 x 120 mm in size.

To evaluate the performance of the antenna, calibrate the Vector Network analyzer (VNA) for the testing frequency band and connect the evaluation board to the calibrated port using the given SMA connector on the board.

Product Image



Antenna Image

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

OnBoard GSM/NB-IoT - EVB

PRO-EB-575

Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification		Unit
Operating Frequency	791 - 960	1710 - 2170	MHz
Return Loss	< -5.1	< -6.4	dB
Polarization	Mixed Linear		
Peak Gain	2.2	2.3	dBi
Efficiency	> 65	> 49	%
Impedance	50		Ω

Note: All measurements were conducted on the evaluation board in free space. Performance will vary depending on the ground plane, application, and environment.

Mechanical Specification

Parameter	Specification
Antenna Dimension	50.00 x 25.00 x 10.00 mm
Evaluation board Dimension	120 x 52 mm

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

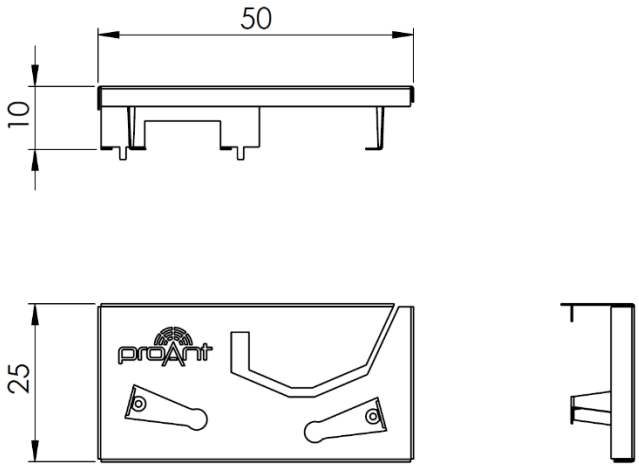
OnBoard GSM/NB-IoT - EVB

PRO-EB-575

Request Samples | Check Inventory

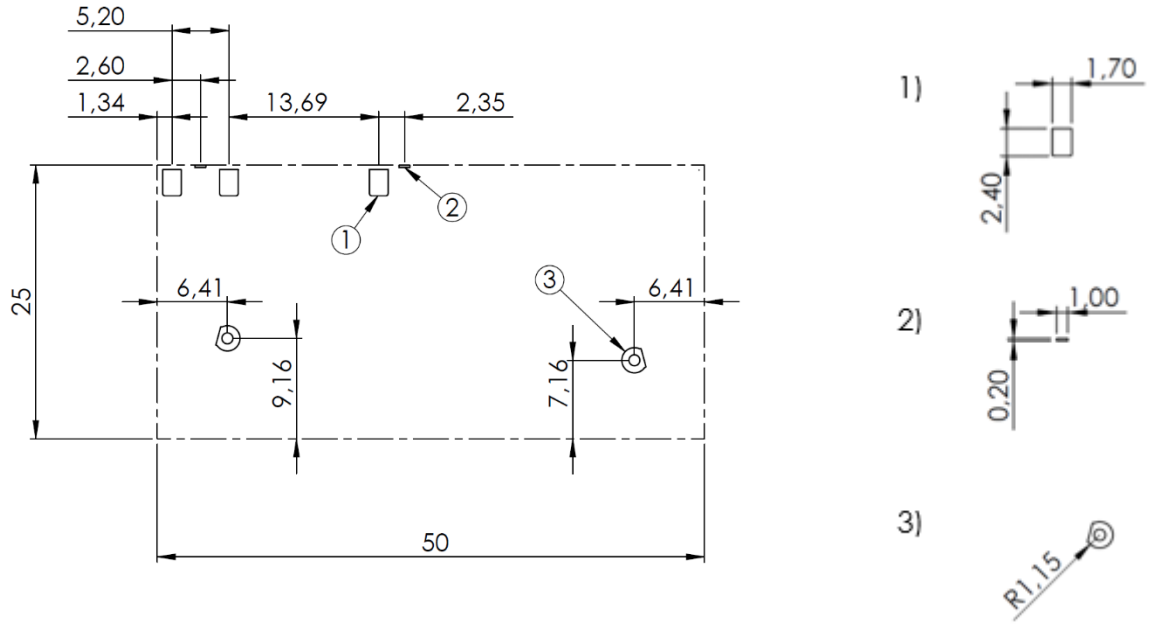
120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Antenna Dimension



Unit : mm

Antenna pins and keep-out block



Unit : mm

ABRACON

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

REVISED:

ABRACON IS ISO9001-2015 CERTIFIED

OnBoard GSM/NB-IoT - EVB

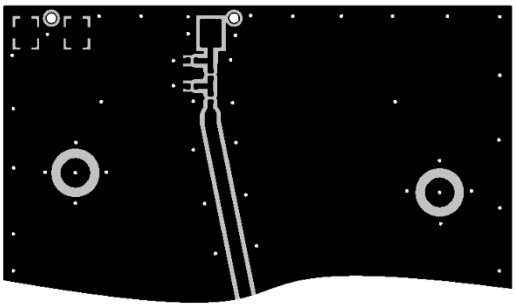
PRO-EB-575

Request Samples | Check Inventory

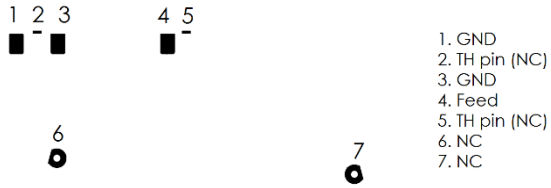
120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

PCB layout and antenna pin numbering

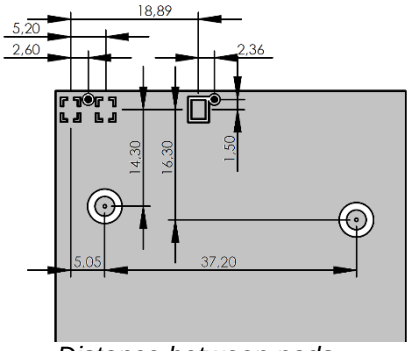
The antenna uses PIFA technology and should thus be mounted on a ground plane. If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that there is a ground clearance around the NC pads and the RF feed pad, through all layers of the PCB. It is recommended to implement a matching network to optimize the antenna impedance in your application. The components can be positioned under the antenna. See recommendations in the figures below. All units in mm.



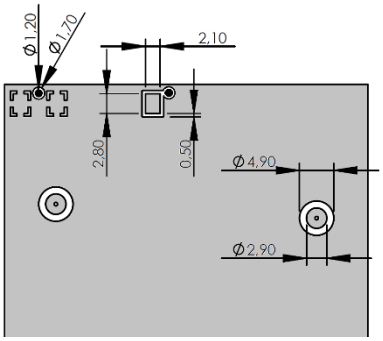
PCB Layout (from evaluation board)



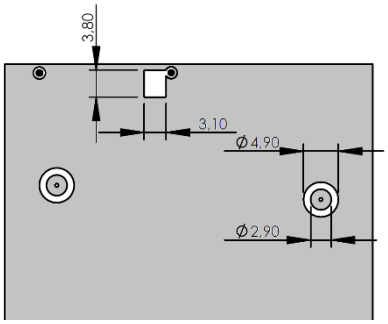
Pin configuration



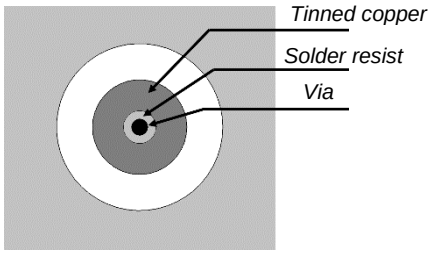
Distance between pads



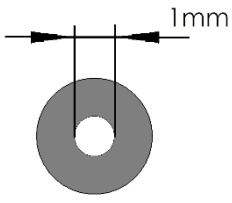
Pad dimensions (top layer). 1,3 and 4 are identical. 2 and 5 are identical. 6 and 7 are identical.



Bottom layer. Clearance through all layers. Pad 6 and 7 have identical layout as top layer and are connected by via



The sketch shows recommended design for pad 6 & 7 at top-layer.



Solder mask as an annular ring with inner diameter of 1 mm, the solder resist in center will prevent solder paste/tin to flow down the via.

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

OnBoard GSM/NB-IoT - EVB

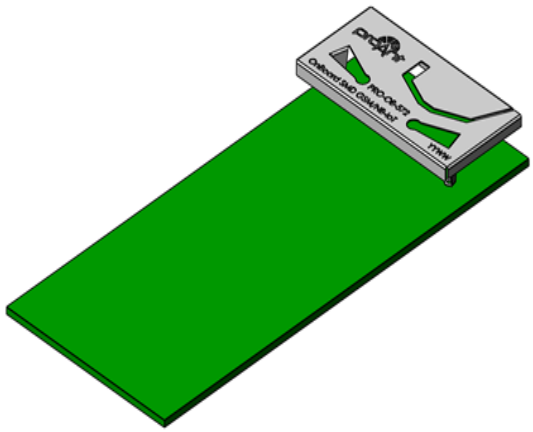
PRO-EB-575

Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The measurements were all done in free space.



ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

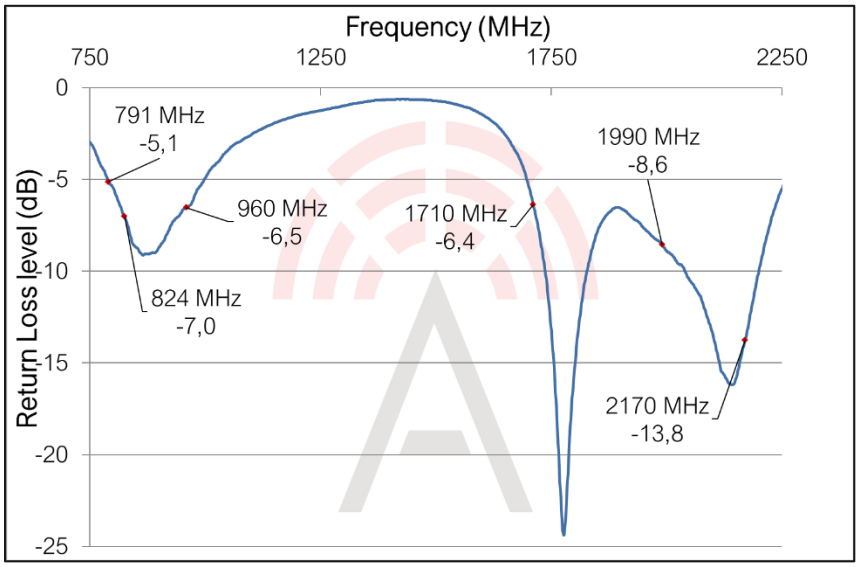
OnBoard GSM/NB-IoT - EVB

PRO-EB-575

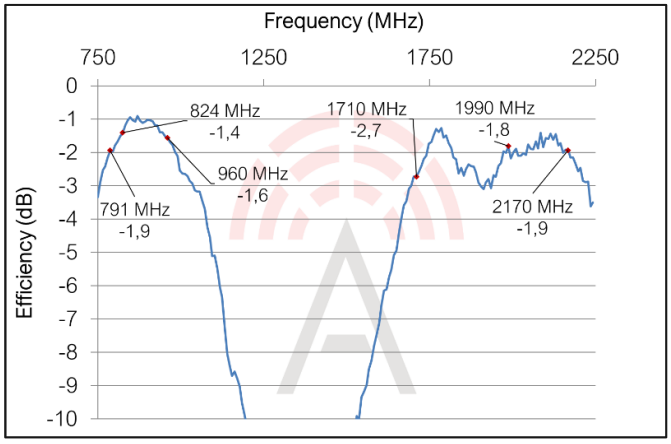
Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

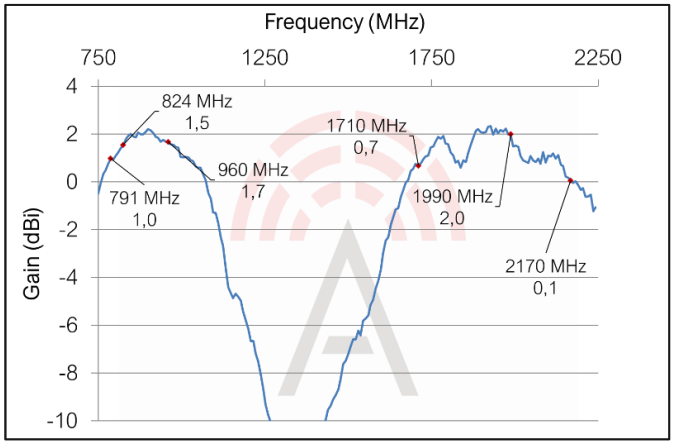
Reflection Characteristics - Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

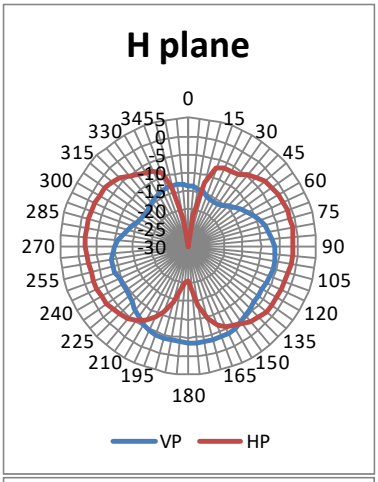
OnBoard GSM/NB-IoT - EVB

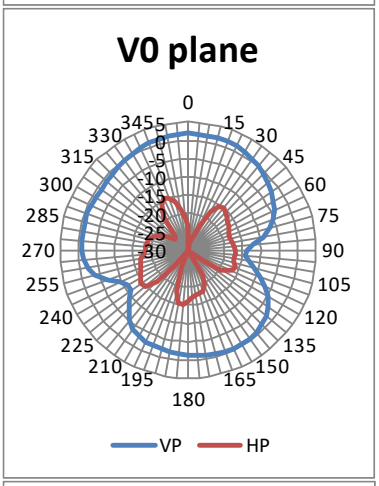
PRO-EB-575

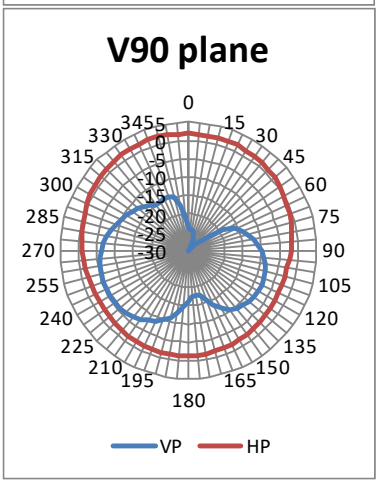
Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics - 2D Pattern (890 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

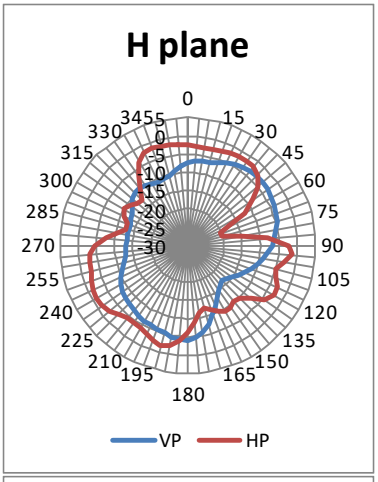
OnBoard GSM/NB-IoT - EVB

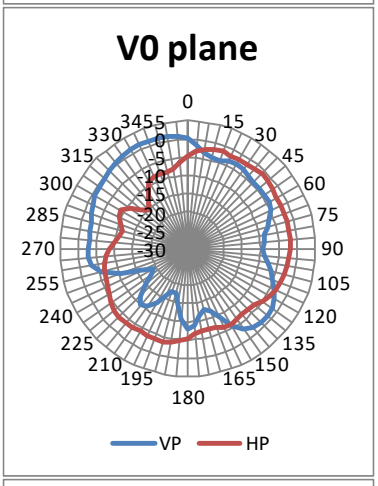
PRO-EB-575

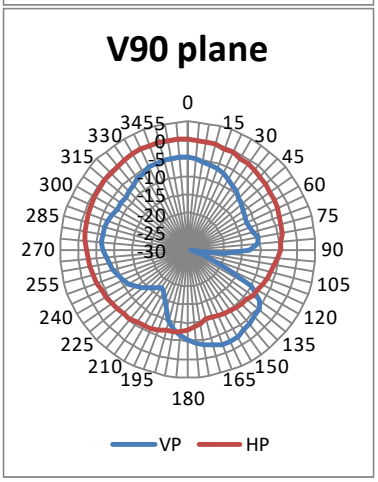
Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern (1800 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

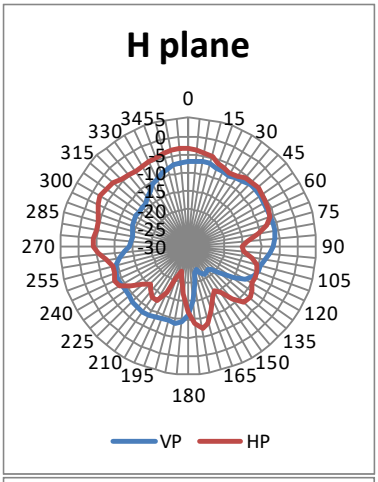
OnBoard GSM/NB-IoT - EVB

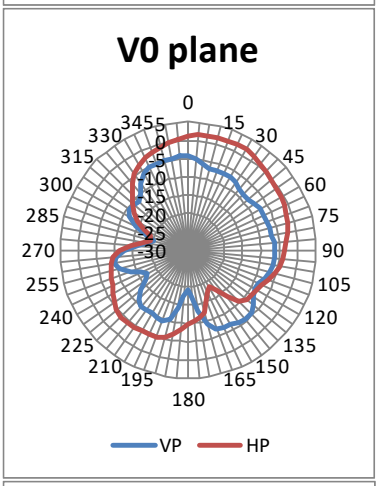
PRO-EB-575

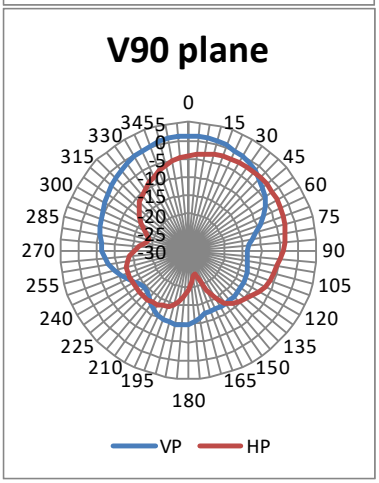
Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics - 2D Pattern (1900 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

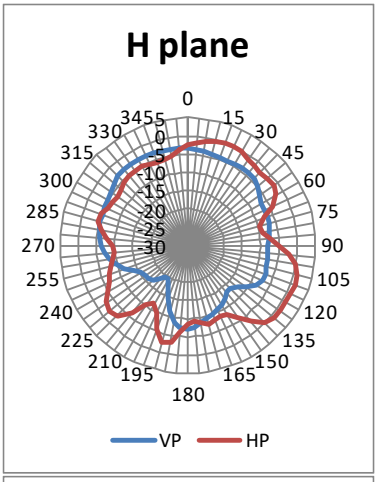
OnBoard GSM/NB-IoT - EVB

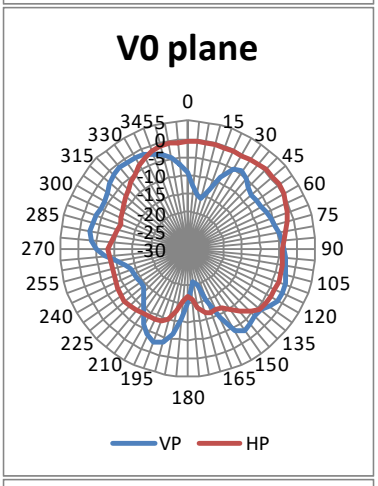
PRO-EB-575

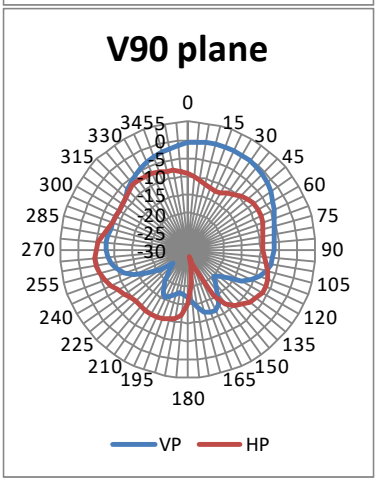
Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern (2100 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

OnBoard GSM/NB-IoT - EVB

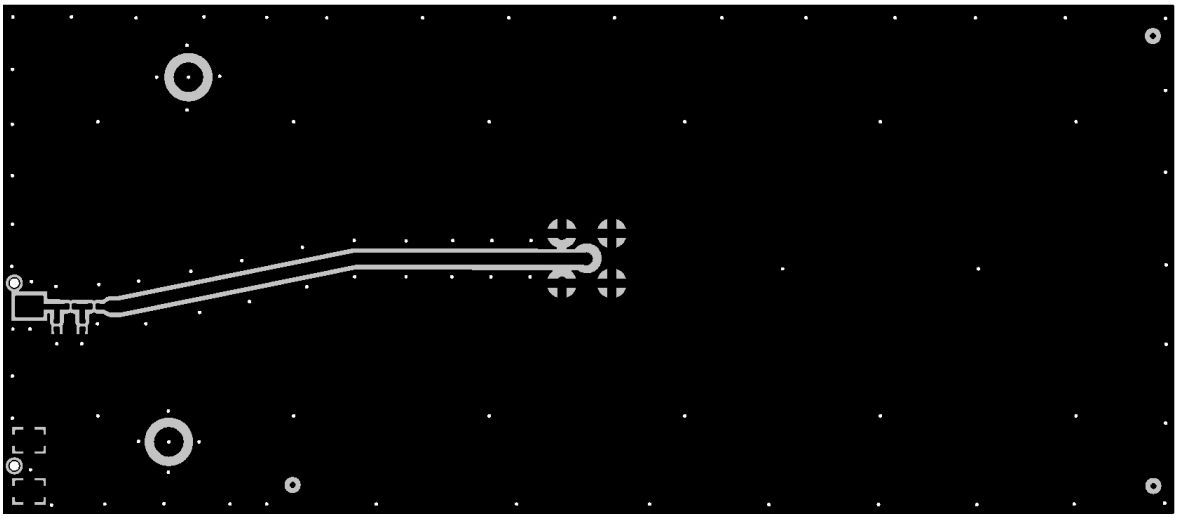
PRO-EB-575

Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

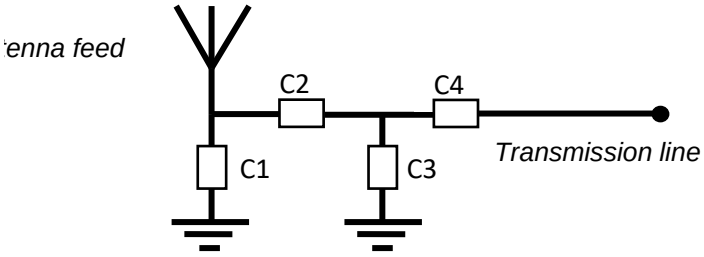
Evaluation Board Outline & Matching Circuit

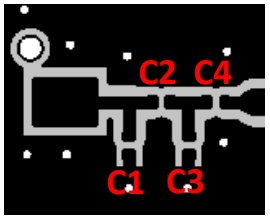
The evaluation board (PRO-EB-575) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 120 x 52 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by cutting and soldering the PCB into any device.



Evaluation board outline

The evaluation board has a matching circuit implemented next to the antenna. This is aimed to enable optimization possibilities for the user. The component positions are sized for 0402 (1005 metric) SMD components.





Matching circuit

The antenna needs a matching circuit to adjust the resonant frequency balance. When delivered, the evaluation board is tuned for optimum balance at the GSM/UMTS frequency bands using the following (can be replaced by equivalent):

C1 = 0.9pF (Murata GJM1555C1HR90WB01)
C2 = 6.8pF (Murata GJM1555C1H6R8WB01)
C3 = N/A
C4 = 2.4nH (Murata LQW15AN2N4B00)

However, it is common that the resonant frequency will shift during implementation in an arbitrary device. Therefore, this matching may be changed with other values/components/brands for compensation of such effects. This is further described in the General Implementation Guidelines section below.

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED

OnBoard GSM/NB-IoT - EVB

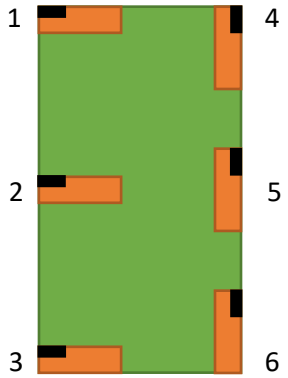
PRO-EB-575

Request Samples | Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

General Implementation Guidelines

The antenna can be positioned in different ways, although there are some positions which are more beneficial. Below picture shows a typical PCB with examples on different antenna positions. The optimal position is option 1 or 4.



= *GND pin(s)*

Optimal

1 & 4
3
6
2 & 5

The antenna should be aligned with the PCB edge if possible, preferably with the GND pin(s) close to a corner.

The antenna enables that small electrical components are mounted inside the antenna keep-out block. This is a space-efficient solution which has very little influence on the performance. It may have an impact on the antenna tuning, but is fully possible if there is limited space on the PCB.

Another general aspect on surface mounted antennas is regarding the PCB population. If other electrical components are positioned in the surrounding area of the antenna, some impact on the antenna tuning and radiated performance may be expected. It is recommended that such components are distributed below a topographical slope that starts on PCB level at the antenna keep-out block, and slowly increases the height.

It shall also be highlighted that plastic and metal parts in the near proximity of antennas may influence the antenna tuning and/or performance. This aspect should be noted as a general guideline for all antennas. The effects are difficult to estimate without detailed information, but it is common that a plastic housing above the antenna shifts the resonant frequency down. It is recommended to measure the antenna in the actual device after implementation.

OnBoard GSM/NB-IoT - EVB

PRO-EB-575

Request Samples Check Inventory

120.0 x 52.0 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

1 pcs/box.

Ordering Information

Part number	Part name	Details
PRO-OB-572	OnBoard SMD GSM/NB-IoT	Antenna for NB-IoT and GSM/UMTS
PRO-EB-575	Evaluation board, OnBoard SMD GSM/NB-IoT	Evaluation board with PRO-OB-572 for NB-IoT and GSM/UMTS applications.

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.

ABRACON

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

REVISED:

ABRACON IS
ISO9001-2015
CERTIFIED