Engineering/Process Change Notice

ECN/PCN No.: R0092

For Manufacturer			
Product Description: OnBoard SMD antennas	**Abracon Part Number / Part Series:** PRO-OB	☐ Documentation only ☐ **ECN** ☐ EOL	☐ Series ☐ Part Number
Affected Revision: I.R.	**New Revision:** Ascending drawing/CAD number	**Application**:	☐ Safety ☐ Non-Safety

Prior to Change:
All OnBoard SMD antennas had Proant marking (and maybe Logo).

After Change:
All OnBoard SMDs have Abracon marking, including Proant part number and lot code.

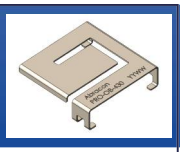
Cause/Reason for Change:
Rebranding after aquasition.

Change Plan		
Effective Date: 2022-06-01	**Additional Remarks:** Necessary documents changed 2022-04-11.	
Change Declaration: No affect on FFF.		
Issued Date: 2022-04-11	**Issued By:** *Viktor Lundström*	**Issued Department:** Engineering
Approval: *Thomas Culhane* Engineering Director	**Approval:** *Reuben Quintanilla* Quality Director	**Approval:** *Ying Huang* Purchasing Director

For Abracon EOL only		
Last Time Buy (if applicable):	**Alternate Part Number / Part Series:**	
Additional Approval:	**Additional Approval:**	**Additional Approval:**

Customer Approval (If Applicable)		
Qualification Status: ☐ Approved ☐ Not accepted *Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.*		
Customer Part Number:	**Customer Project:**	
Company Name:	**Company Representative:**	**Representative Signature:**
Customer Remarks:		

OnBoard GNSS/GPS SMD - Antenna



PRO-OB-430

Request Samples | Check Inventory

12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

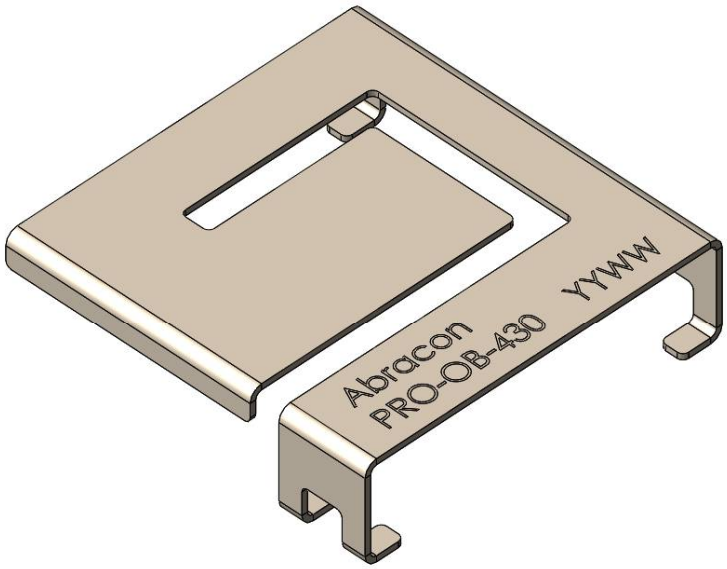
Features

- Supports upper GNSS Bands
  - GPS/GLONASS/BeiDou/Galileo
- Compact
- Low Profile of 3.33 mm
- Mixed Linear Polarization
- Peak Gain of 0.7 dBi
- Efficiency >42%
- Surface Mount
- Durable-Shelf life of up to 10 years

Applications

- GNSS - GPS/GLONASS/BeiDou/Galileo
- IoT, M2M
  - Industrial
  - Infrastructure
  - Medical
- Remote Technology / Monitoring
- Consumer Tracking
- Smart Wearables

Product Image



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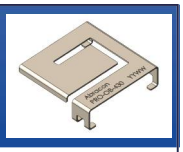
OnBoard GNSS/GPS SMD - Antenna



PRO-OB-430

Request Samples | Check Inventory

12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification	Unit
Operating Frequency	1560 - 1602	MHz
Return Loss	< -5.0	dB
Polarization	Mixed Linear	-
Peak Gain	0.7	dBi
Efficiency	> 42	%
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.

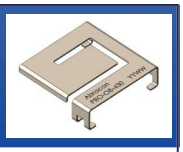
Mechanical Specification

Parameter	Specification
Antenna Dimension	12.50 x 12.43 x 3.33 mm
Evaluation board Dimension	100 x 50 mm
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test

OnBoard GNSS/GPS SMD - Antenna



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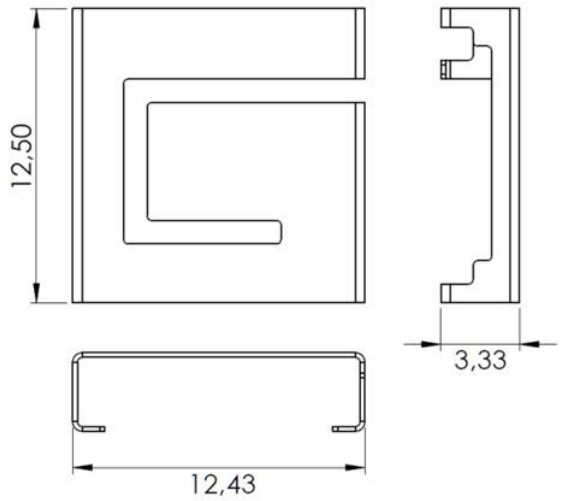
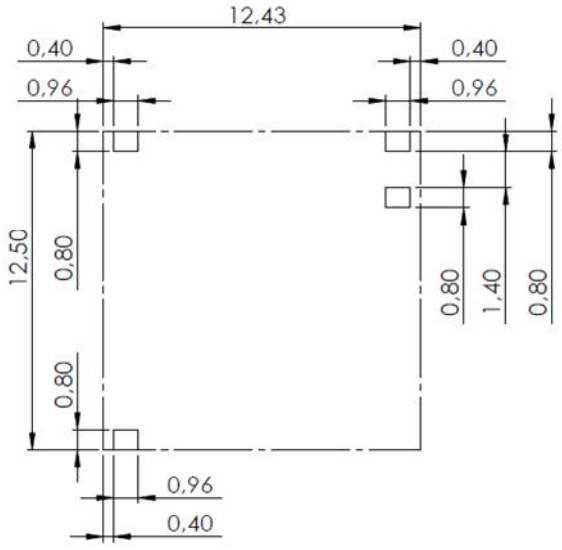
MSL Level = 1

Product Dimensions



Unit : mm

Antenna pins and keep-out block



Unit : mm

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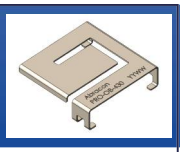

PRO-OB-430

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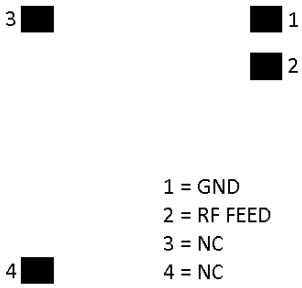
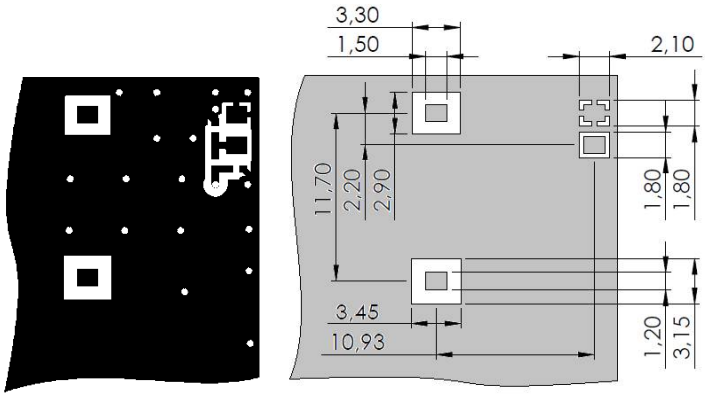
12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

PCB layout and antenna pin numbering

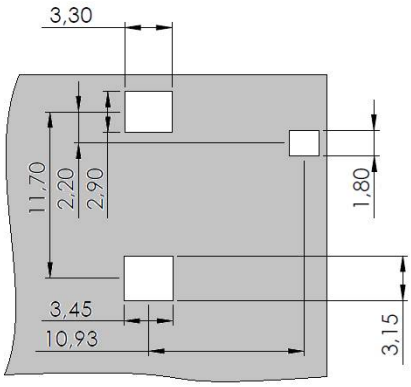
The antenna uses PIFA technology and should thus be mounted on a ground plane. If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that there is a ground clearance around the 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.



Pin configuration



PCB Layout (from evaluation board)



Clearance through all layers

Unit: mm

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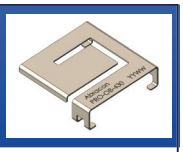


PRO-OB-430

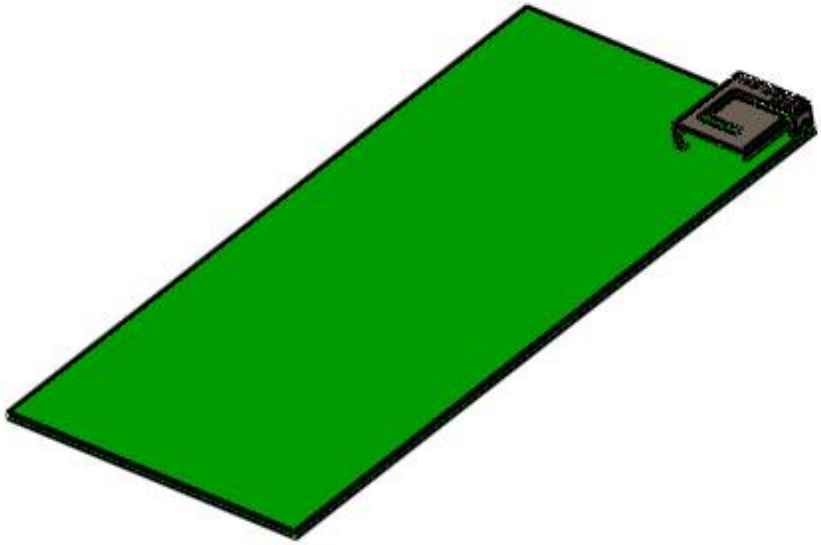
Request Samples

Check Inventory

12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The antenna measurements were all done in free space with the GNSS evaluation board (PRO-EB-453) that has a PCB size of 100 x 50 mm.



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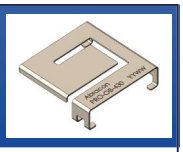


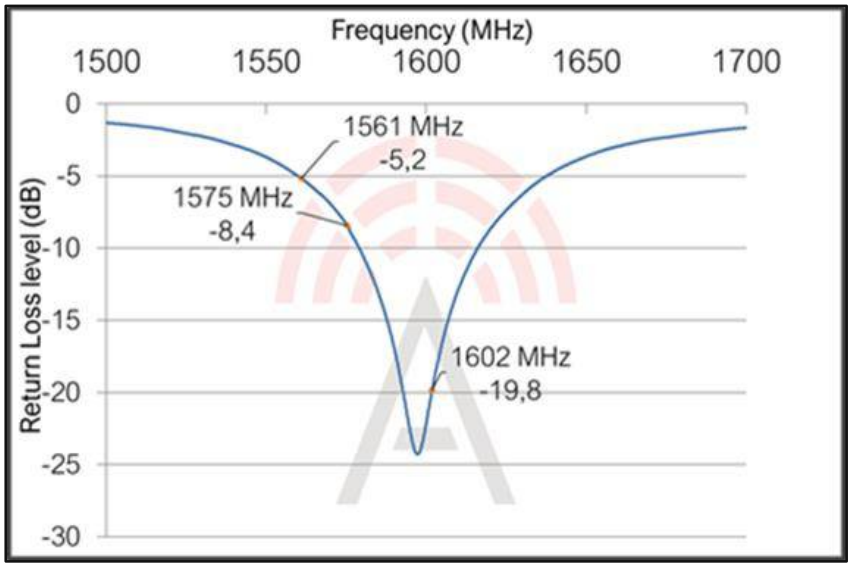
PRO-OB-430

Request Samples

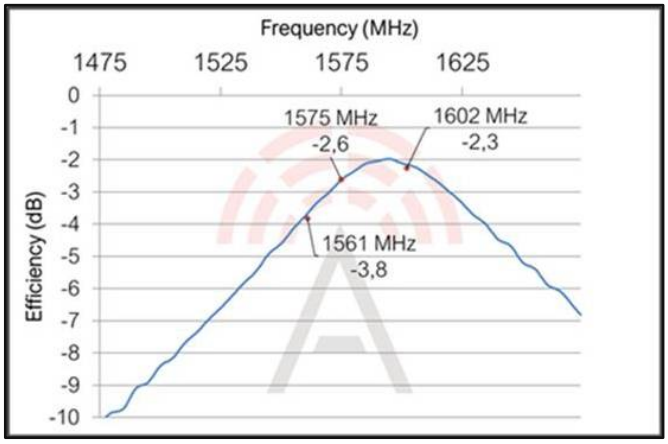
Check Inventory

12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

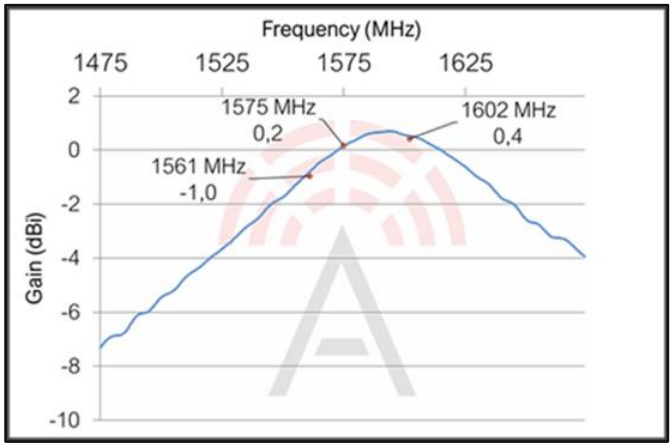
Reflection Characteristics – Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



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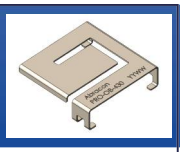


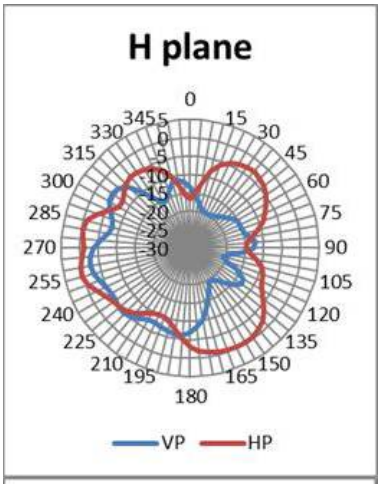
PRO-OB-430

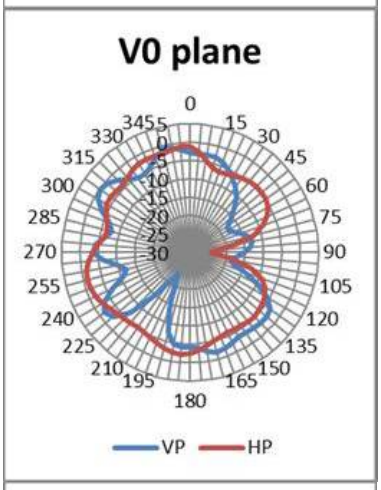
Request Samples

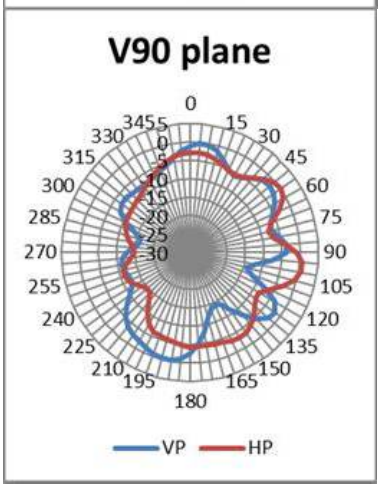
Check Inventory

12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

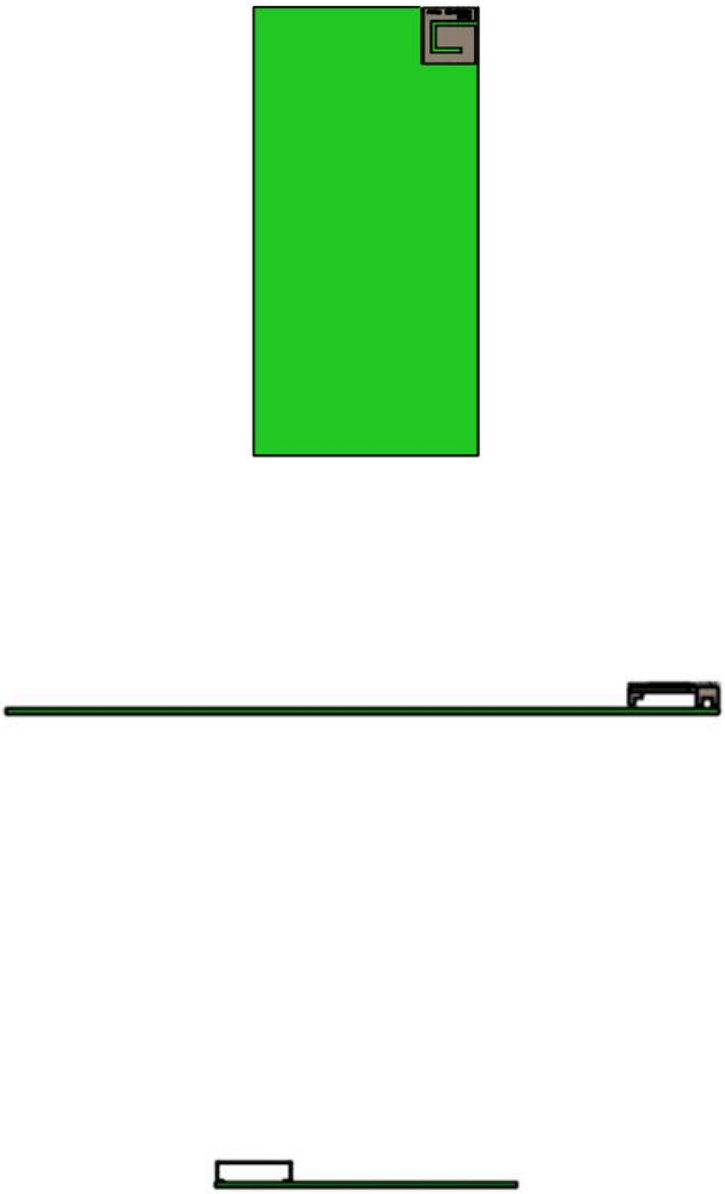
Radiation Characteristics – 2D Pattern (1590 MHz)







VP: Vertical Polarization
HP: Horizontal Polarization



Unit: dBi

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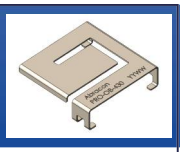


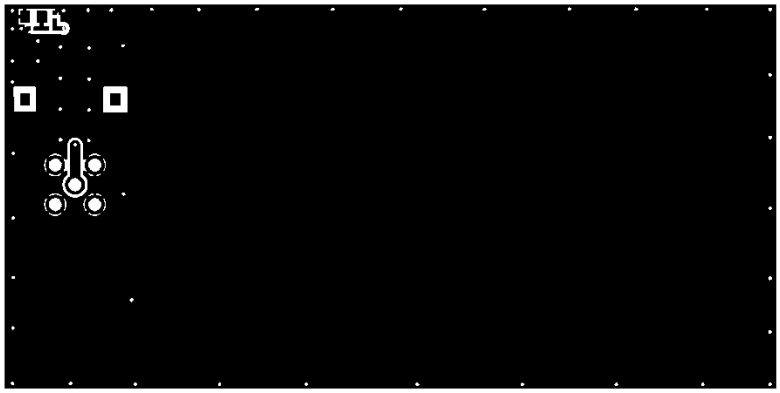
PRO-OB-430

Request Samples | Check Inventory

12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

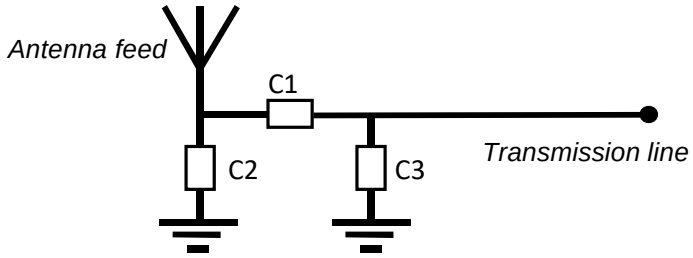
Evaluation Board Outline & Matching Circuit

The evaluation board (PRO-EB-453) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 100 x 50 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.



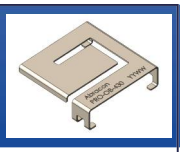
Matching circuit

The antenna needs a matching circuit to adjust the resonant frequency balance. When delivered, the evaluation board is tuned for optimum balance at 1.575 GHz and 1.602 GHz using the following component values:

C1 = 2.9 nH C2 = 1.8 pF C3 = N/A

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

OnBoard GNSS/GPS SMD - Antenna



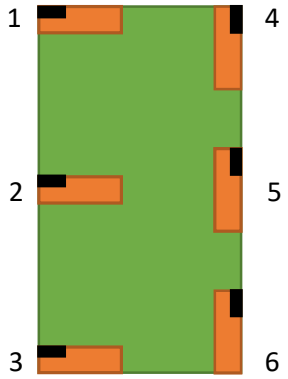
PRO-OB-430

Request Samples | Check Inventory

12.50 x 12.43 x 3.33 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

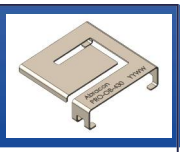
The antenna should be aligned with the PCB edge if possible, preferably with the GND pin(s) close to a corner.

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 GNSS/GPS SMD - Antenna



PRO-OB-430

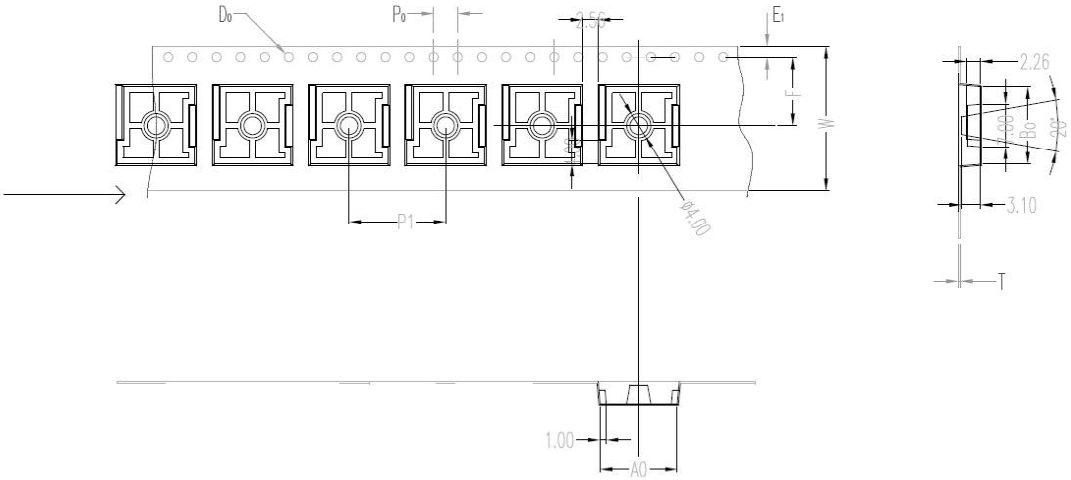
Request Samples

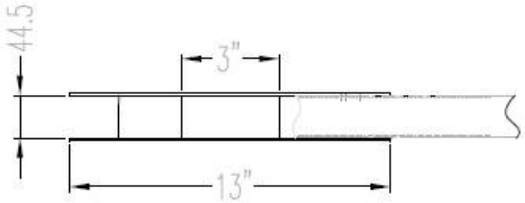
Check Inventory

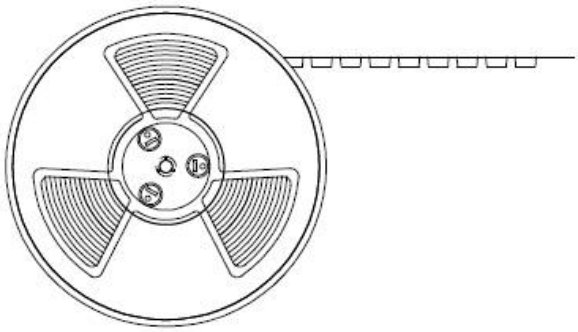
12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13" reel is 500 pcs.







A_0	12.80 ±0.1
B_0	12.75 ±0.1
D_0	Ø1.5 $^{+0.10}_{-0.00}$
E_1	1.75 ±0.1
F	11.5 ±0.15
K_0	3.65±0.1
P_0	4.0 ±0.1
P_1	16. ±0.1
P_2	2.0 ±0.15
S_0	
T	0.35 ±0.05
W	24.0 ±0.3

Unit: mm (unless otherwise noted)

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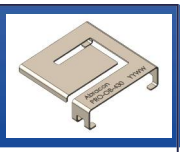


PRO-OB-430

Request Samples | Check Inventory

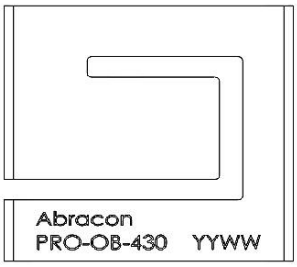
12.50 x 12.43 x 3.33 mm
RoHS/RoHS II Compliant
MSL Level = 1

Part Marking

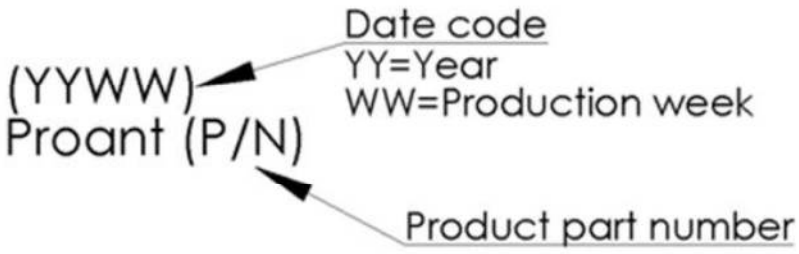
The top marking of the antenna is arranged according to the following illustration.

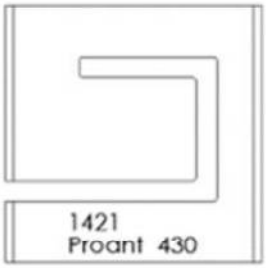
Abracon
PRO-OB-430
Product part number

YYWW
Date code
YY=Year
WW=Week



There will be a transition period for the part marking until production batches after 2222 (YYWW). Produced batches before 2222 are marked according to the below illustration.





Example top marking

Ordering Information

Part number	Part name	Details
PRO-OB-430	OnBoard GNSS/GPS SMD	Antenna for GPS/GLONASS/BeiDou/Galileo
PRO-EB-453	Evaluation board, OnBoard GNSS/GPS SMD	Evaluation board with PRO-OB-430 for GNSS applications.

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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

Request Samples | Check Inventory

13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

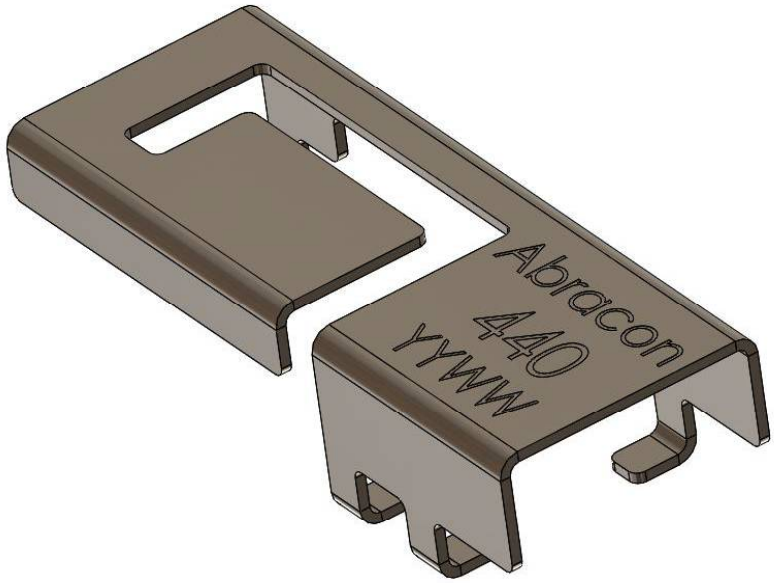
Features

- Compact
- Low Cost
- Mixed Linear Polarization
- Peak Gain of 5.2 dBi
- Efficiency > 65%
- Surface Mount
- Durable-Shelf life of up to 10 years

Applications

- 2.4 GHz - Wi-Fi/BT/BLE/ZigBee/ISM
- IoT, M2M
  - Industrial IoT
  - Consumer IoT
  - Medical IoT
- Telemetry
- Wireless Remote Control
- Personal Area Networks (PAN)
- Industrial/Commercial Equipments

Product Image



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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

Request Samples | Check Inventory

13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification	Unit
Operating Frequency	2400 - 2500	MHz
Center Frequency	2450	
Return Loss	< -6.9	dB
Polarization	Mixed Linear	-
Peak Gain	5.2	dBi
Efficiency	> 65	%
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	13.75 x 5.23 x 3.53 mm
Evaluation board Dimension	100 x 50 mm
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test

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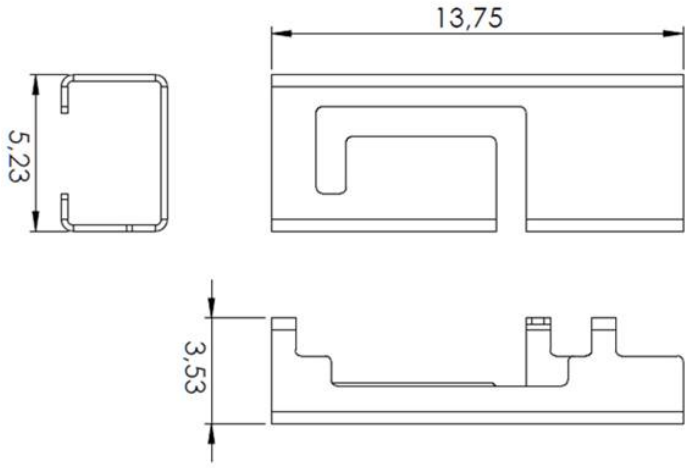
OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

Request Samples | Check Inventory

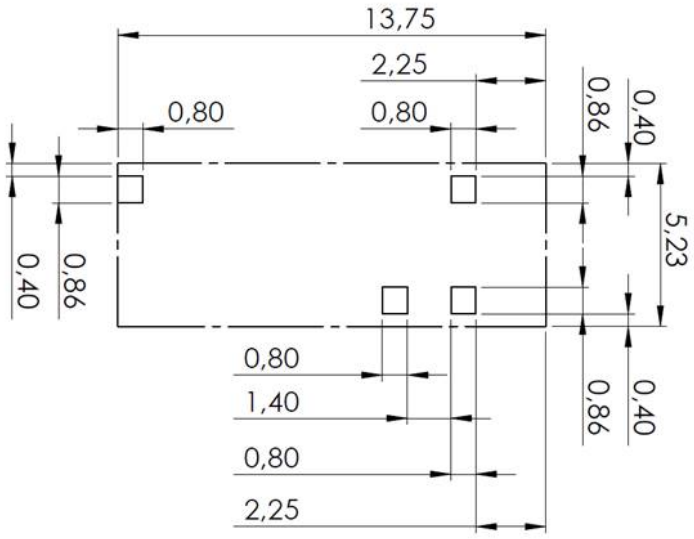
13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

Product Dimension



Unit : mm

Antenna pins and keep-out block



Unit : mm

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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

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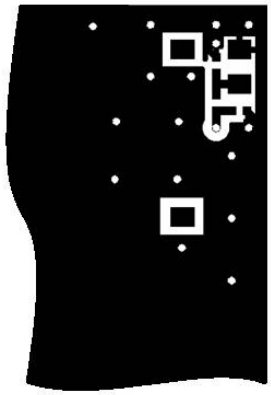
13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

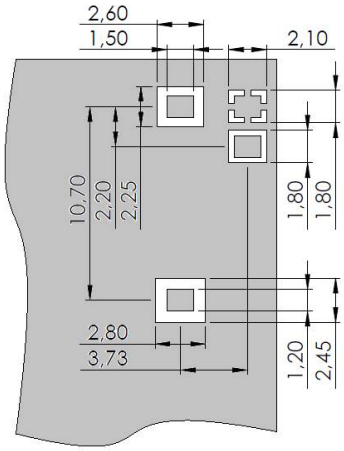
PCB layout and antenna pin numbering

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.

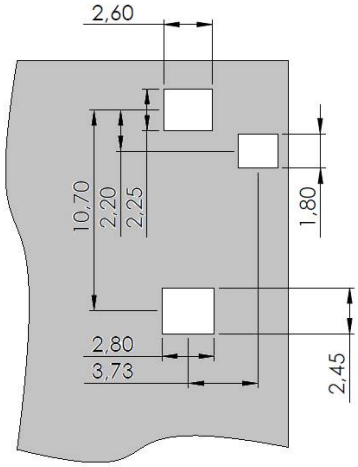
1 = GND
2 = RF FEED
3 = NC
4 = NC

Pin configuration





PCB Layout (from evaluation board)



Clearance through all layers

Unit : mm

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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

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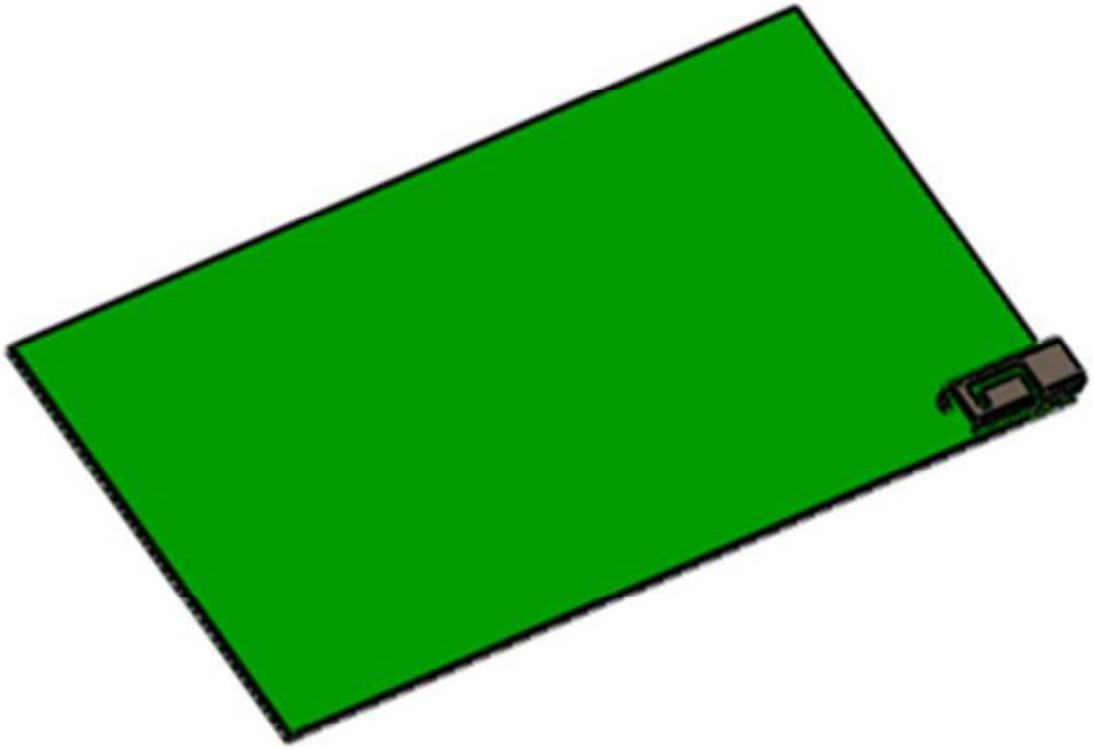
13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The antenna measurements were all done in free space with the OnBoard SMD 2400 evaluation board (PRO-EB-450) that has a PCB size of 100 x 50 mm.



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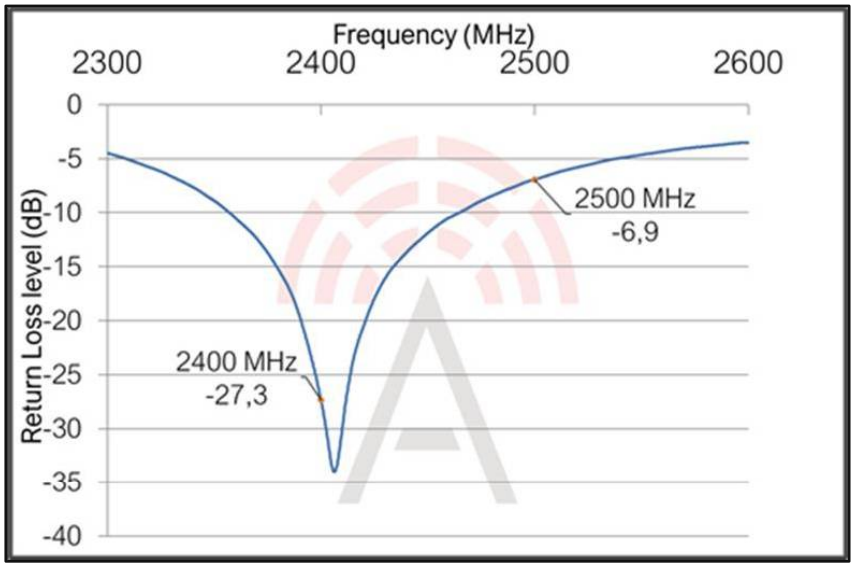
OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

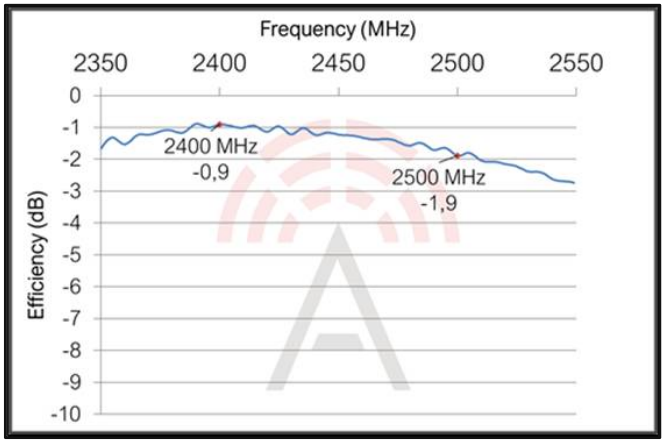
Request Samples | Check Inventory

13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

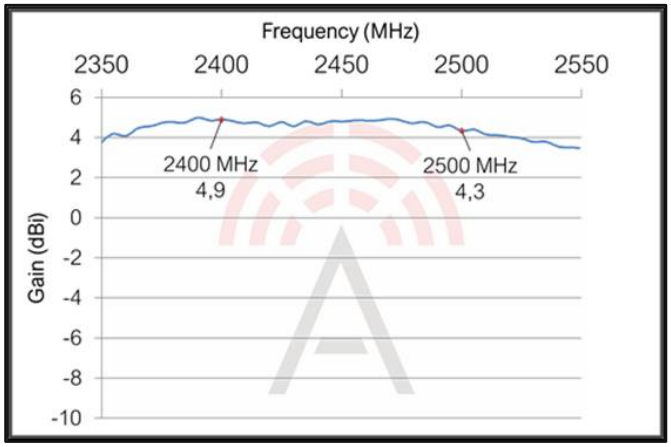
Reflection Characteristics – Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

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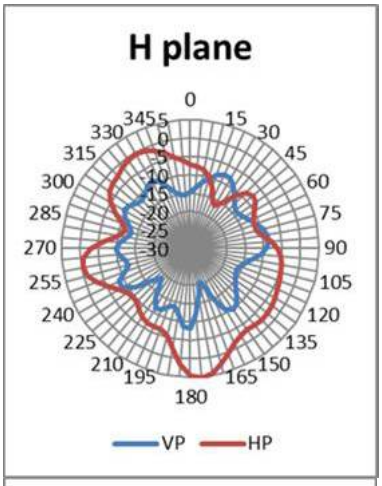
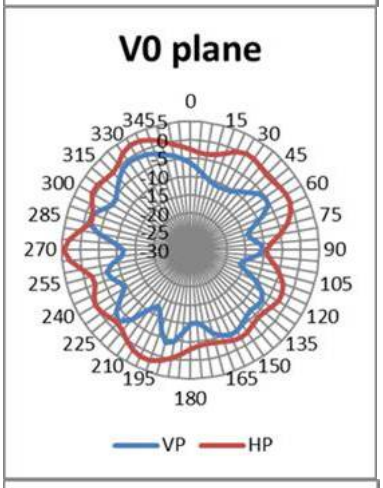
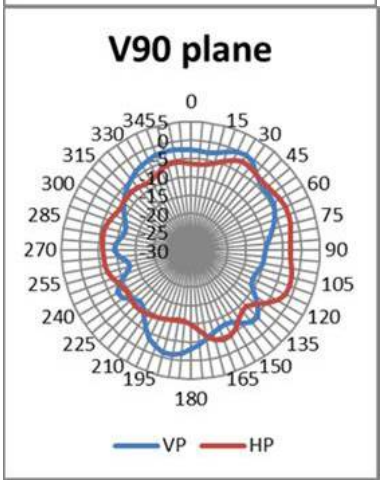
RoHS/RoHS II Compliant
MSL Level = 1

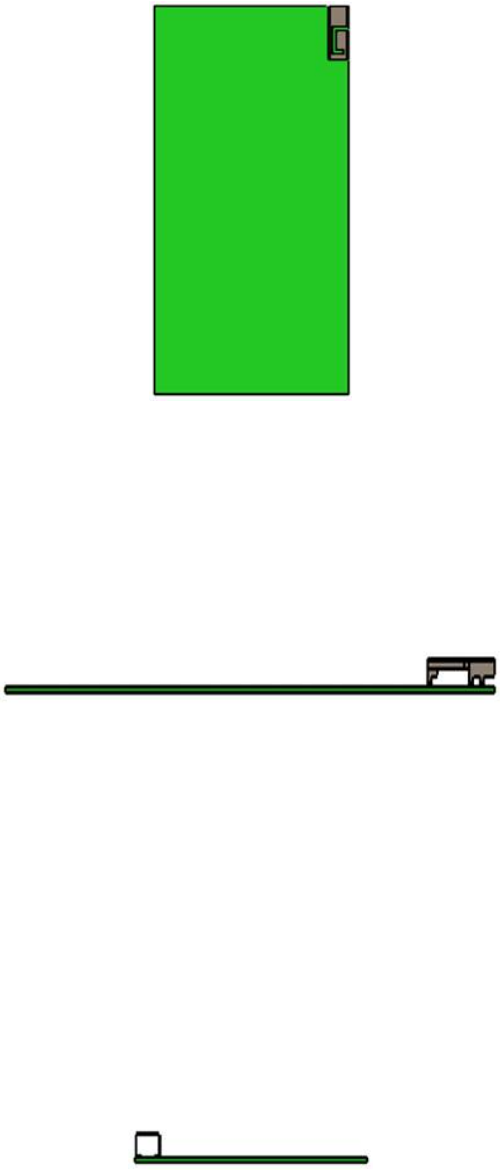
Radiation Characteristics – 2D Pattern (2400 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

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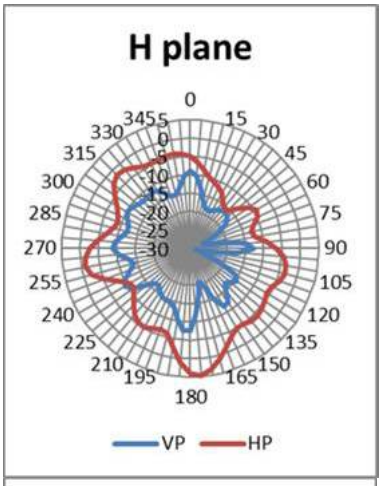
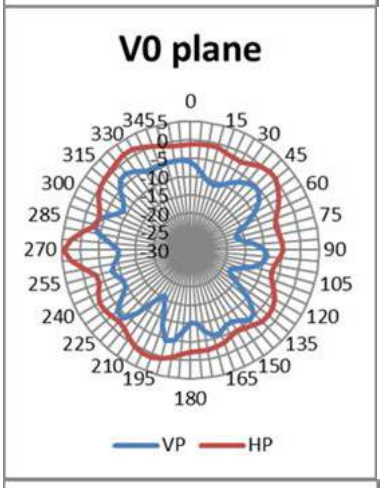
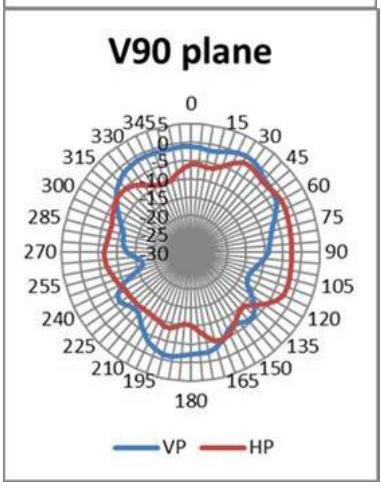
RoHS/RoHS II Compliant
MSL Level = 1

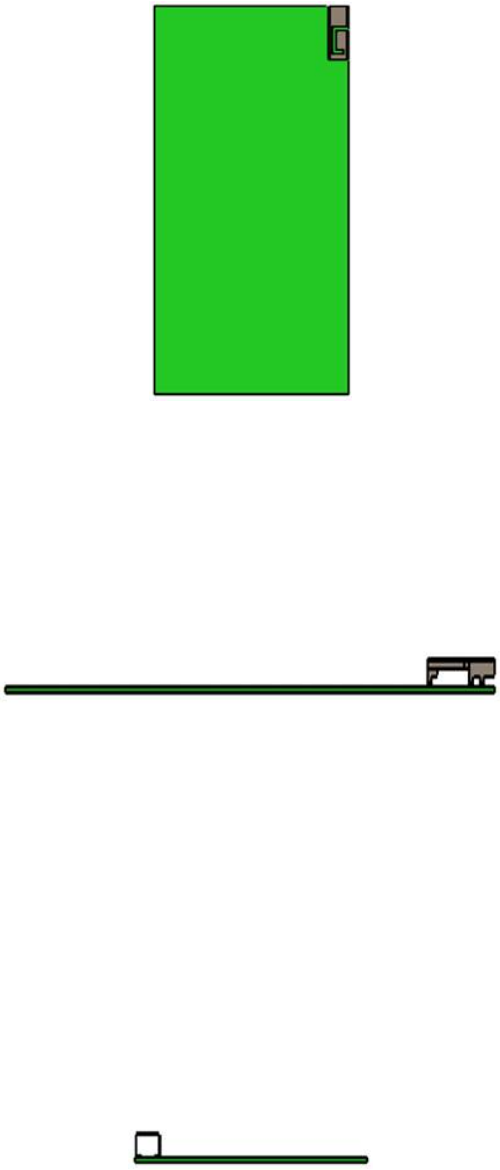
Radiation Characteristics – 2D Pattern (2500 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

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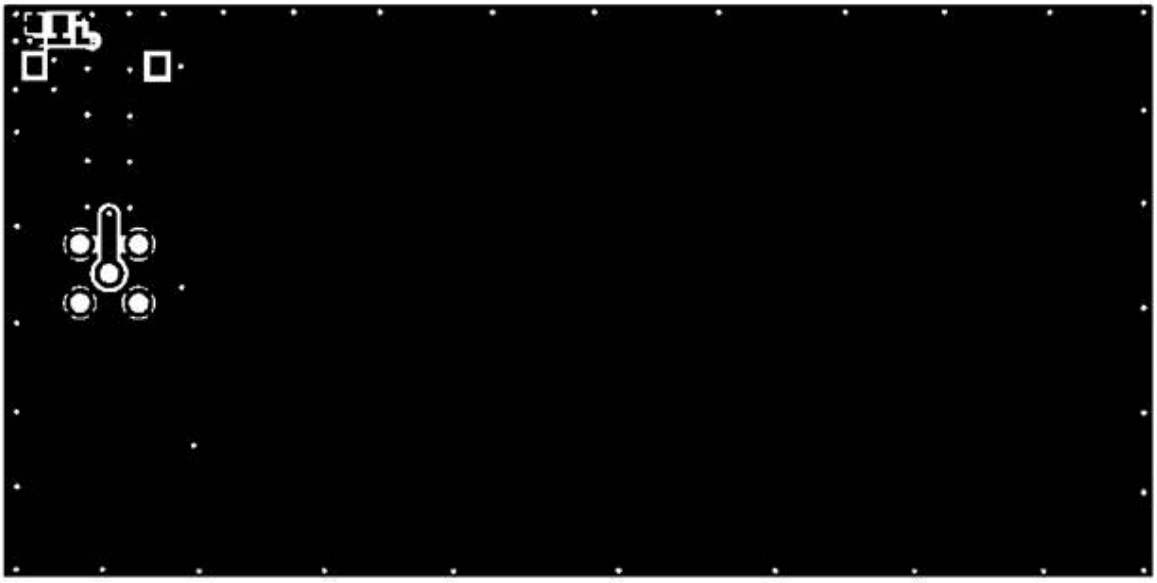
13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

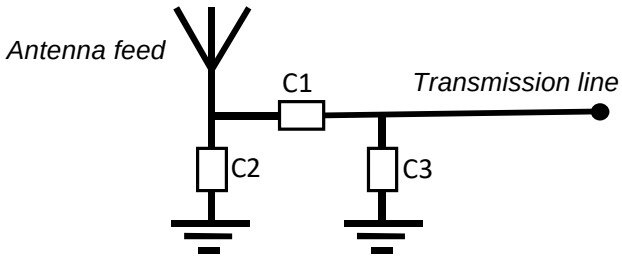
Evaluation Board Outline & Matching Circuit

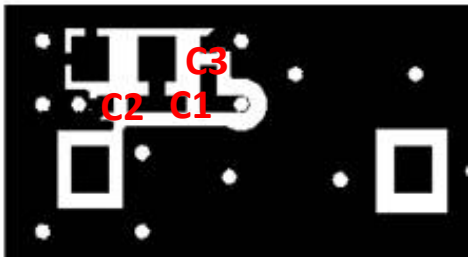
The evaluation board (PRO-EB-450) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 100 x 50 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations 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 2.4 GHz frequency band using the following component values:

C1 = 1.5 nH C2 = 0.5 pF C3 = N/A.

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

OnBoard 2.4 GHz SMD - Antenna

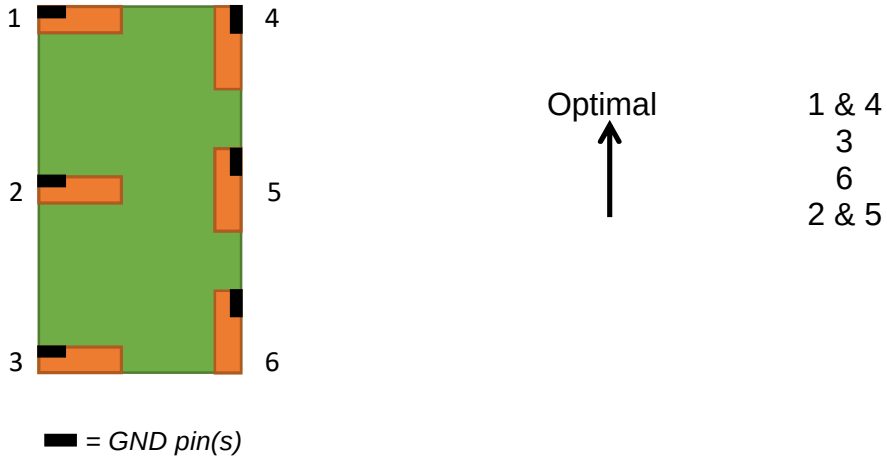
PRO-OB-440

Request Samples | Check Inventory

13.75 x 5.23 x 3.53 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.



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 2.4 GHz SMD - Antenna

PRO-OB-440

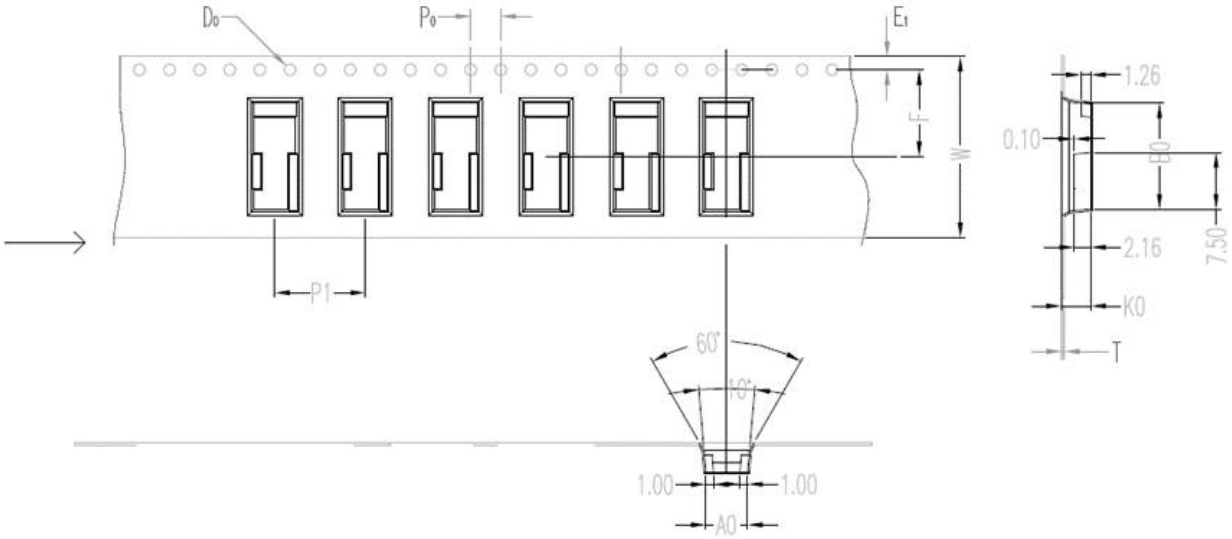
Request Samples

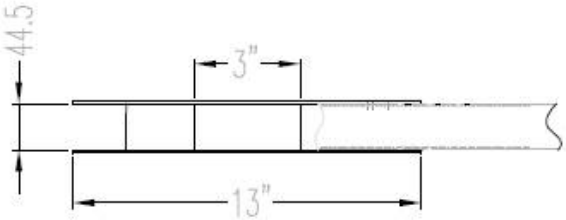
Check Inventory

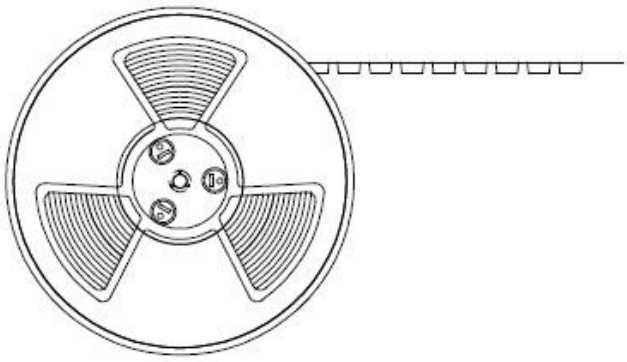
13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13” reel is 1000 pcs.







A_0	5.53 ±0.1
B_0	14.05 ±0.1
D_0	ø1.5 $^{+0.10}_{-0.00}$
E_1	1.75 ±0.1
F	11.5 ±0.15
K_0	3.83±0.1
P_0	4.0 ±0.1
P_1	12. ±0.1
P_2	2.0 ±0.15
S_0	
T	0.35 ±0.05
W	24.0 ±0.3

Unit: mm (unless otherwise noted)

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OnBoard 2.4 GHz SMD - Antenna

PRO-OB-440

Request Samples | Check Inventory

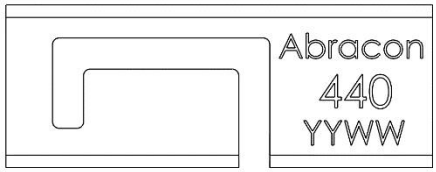
13.75 x 5.23 x 3.53 mm
RoHS/RoHS II Compliant
MSL Level = 1

Part Marking

The top marking of the antenna is arranged according to the following illustration.

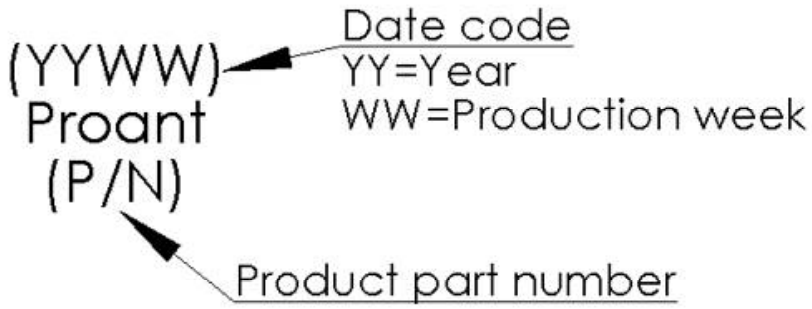
Abracon
440
Product part number

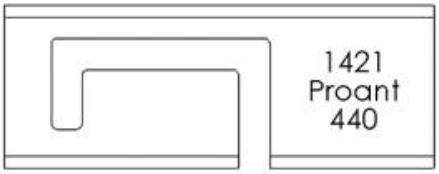
YYWW
Date code
YY=Year
WW=Week



Example top marking

There will be a transition period for the part marking until production batches after 2222 (YYWW). Produced batches before 2222 are marked according to the below illustration.





Example top marking

Ordering Information

Part number	Part name	Details
PRO-OB-440	OnBoard SMD 2400	Antenna for 2.4-2.5 GHz.
PRO-EB-450	Evaluation board, Onboard SMD 2400	Evaluation board with PRO-OB-440 for 2.4 - 2.5 GHz (Wi-Fi/BT/BLE/Zigbee) applications.

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OnBoard GSM/NB-IoT - Antenna

PRO-OB-572

Request Samples | Check Inventory

50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

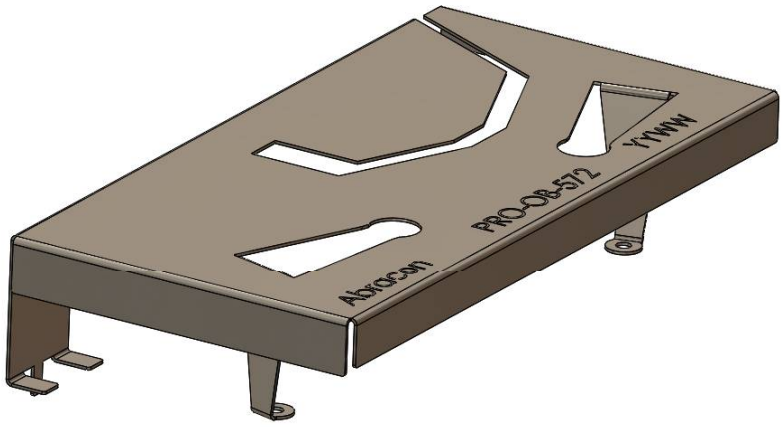
Features

- Support NB –IoT Bands:
- 791 ~ 960 MHz + 1710 ~ 2170 MHz
- Profile of 10 mm
- Mixed Linear Polarization
- Max Gain of 2.3 dBi
- Efficiency > 49%
- Surface Mount
- Durable-Shelf life of up to 10 years

Applications

- LPWA/NB-IoT/4G/LTE/3G/2G/GSM
  - IoT, M2M
  - Industrial
- Infrastructure IoT
- Consumer electronics
- Wireless modules
- Video and surveillance
- Broadband cellular connectivity
- Networking & Telecommunication

Product Image



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OnBoard GSM/NB-IoT - Antenna

PRO-OB-572

Request Samples | Check Inventory

50.00 x 25.00 x 10.00 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
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test

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PRO-OB-572

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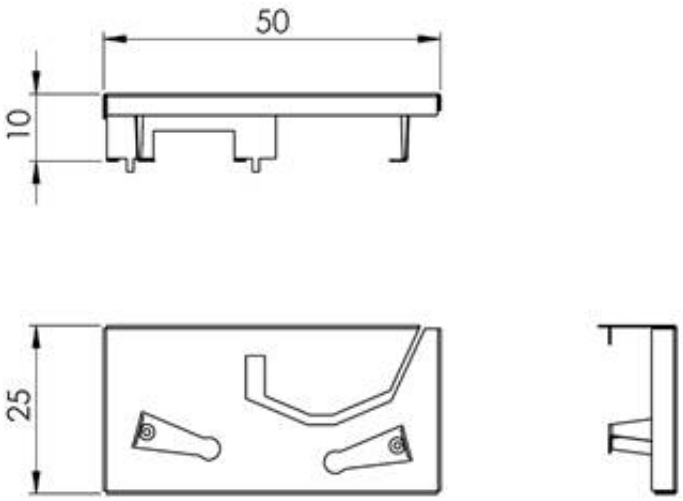
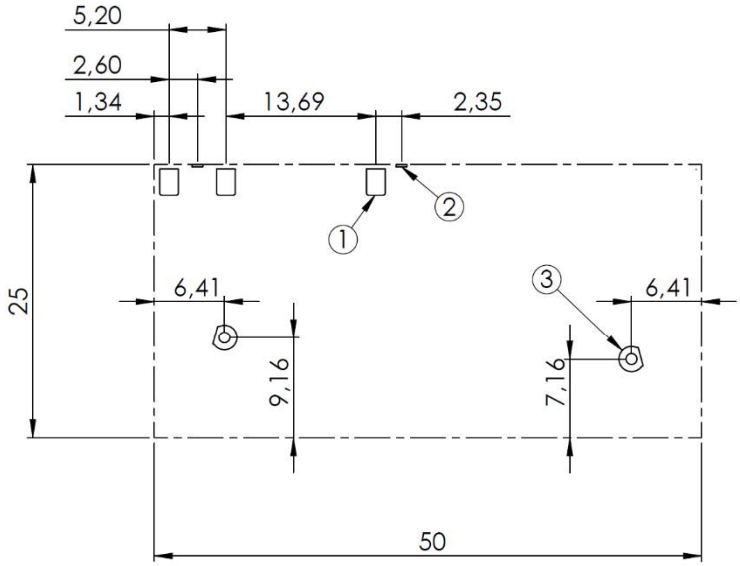
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

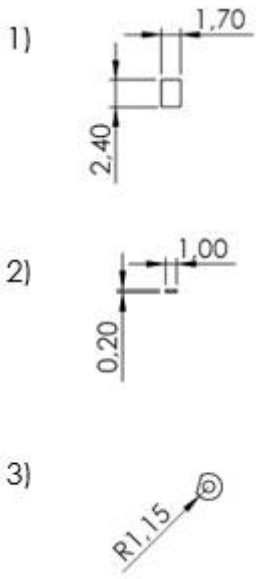
Product Dimension



Unit : mm

Antenna pins and keep-out block





Unit : mm

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OnBoard GSM/NB-IoT - Antenna

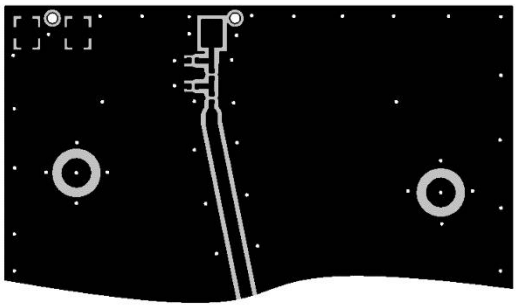
PRO-OB-572

Request Samples | Check Inventory

50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

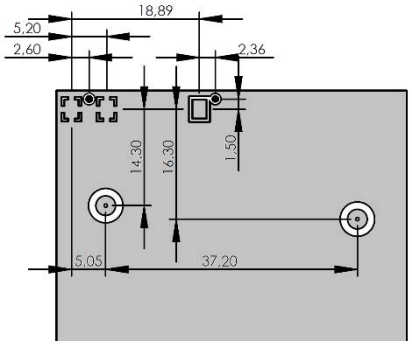
PCB layout and antenna pin numbering

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.

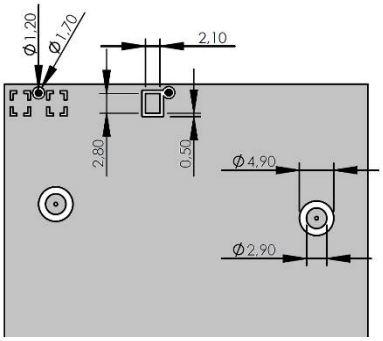


PCB Layout (from evaluation board)

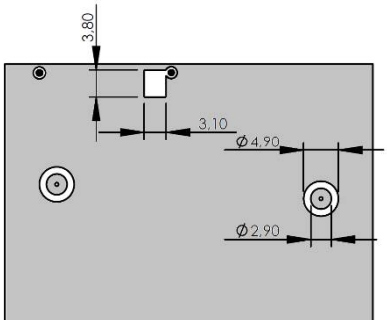
Pin configuration



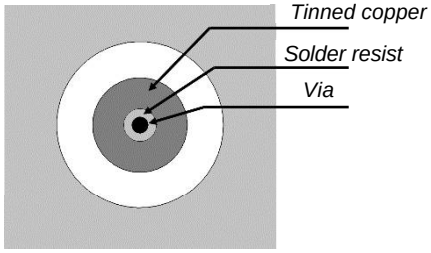
Distance between pads



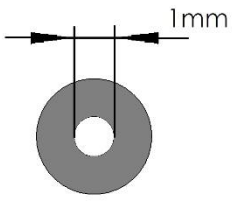
Pad dimensions (top layer). 1,3 and 4 are identical. 2 and 5 are identical. 6 and 7 are identical.



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.

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OnBoard GSM/NB-IoT - Antenna

PRO-OB-572

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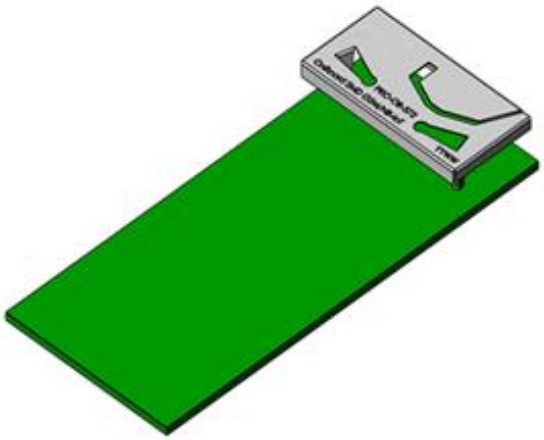
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The antenna measurements were all done in free space with the OnBoard SMD GSM/NB-IoT evaluation board (PRO-EB-575) that has a PCB size of 120 x 52 mm.



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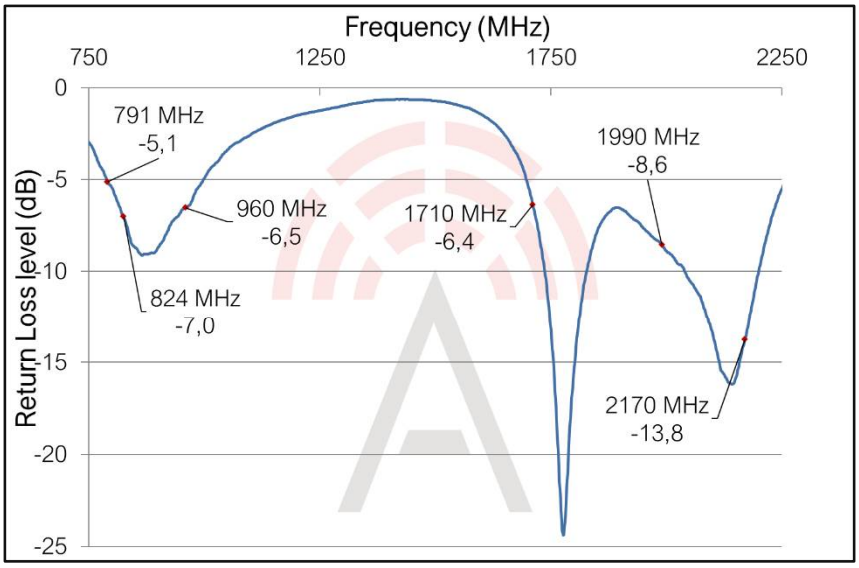
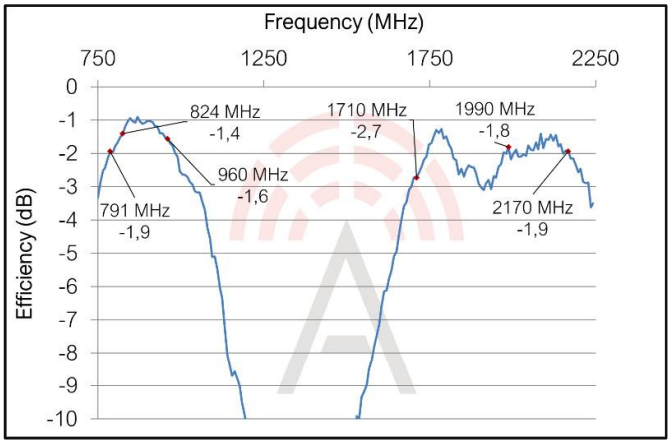
RoHS/RoHS II Compliant
MSL Level = 1

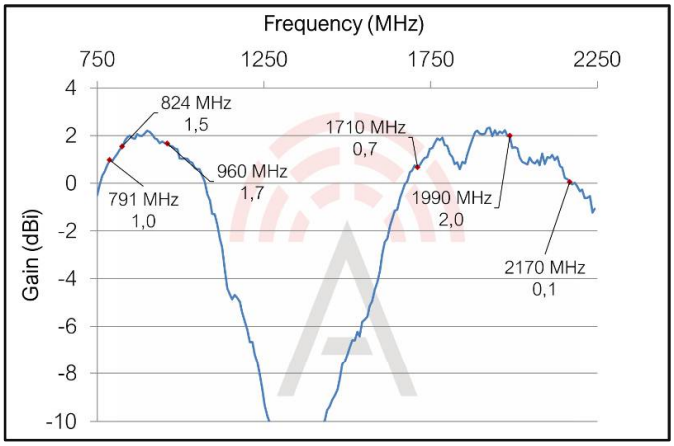
Reflection Characteristics - Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



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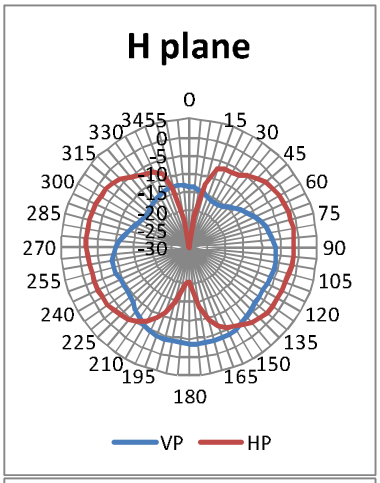
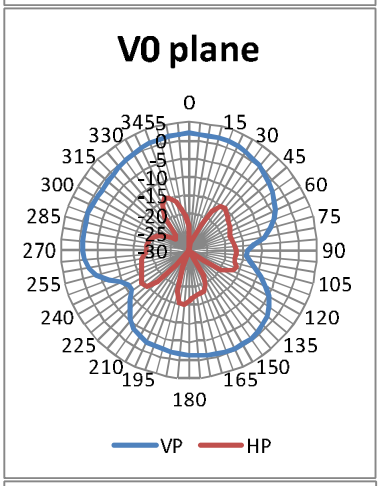
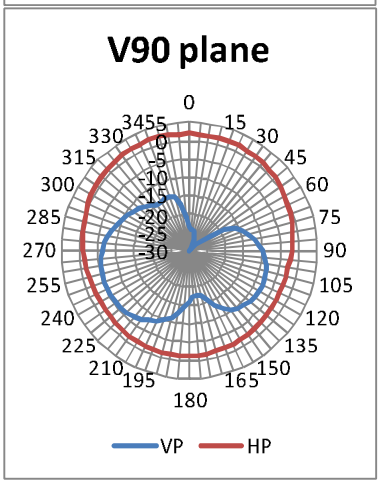
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics - 2D Pattern (890 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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PRO-OB-572

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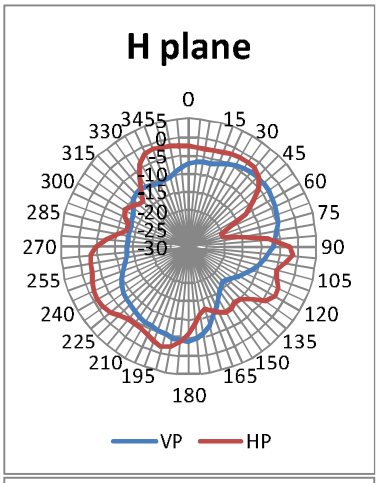
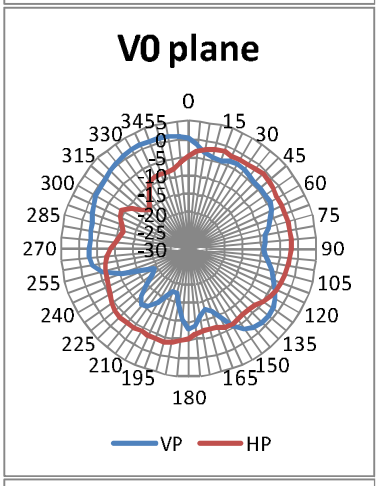
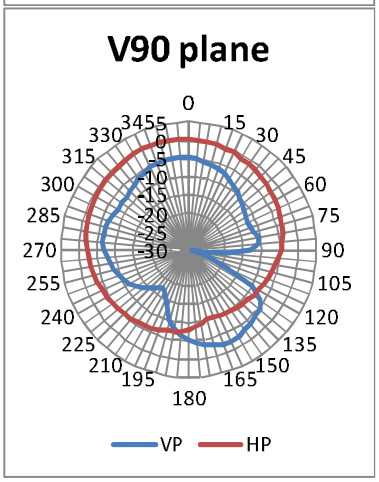
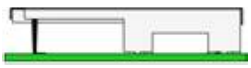
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern (1800 MHz)









VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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PRO-OB-572

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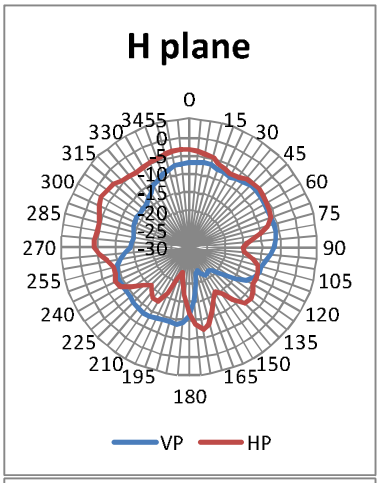
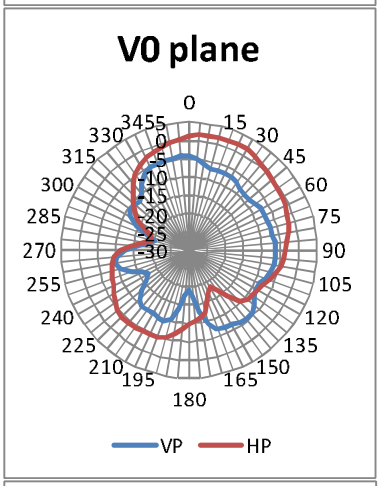
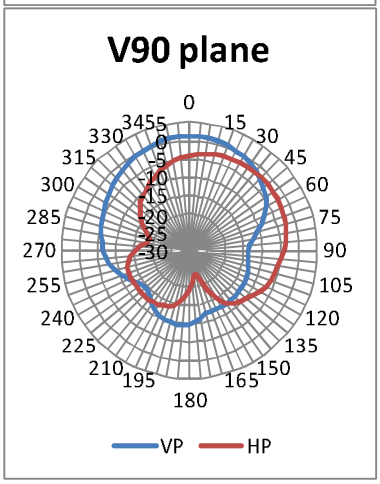
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics - 2D Pattern (1900 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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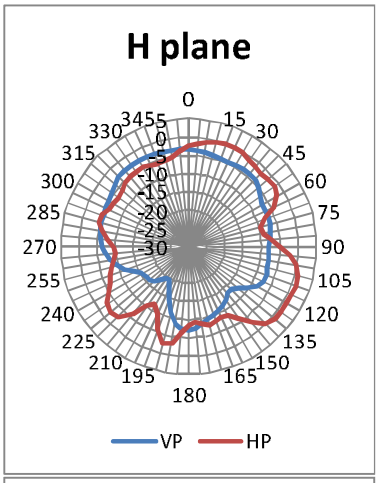
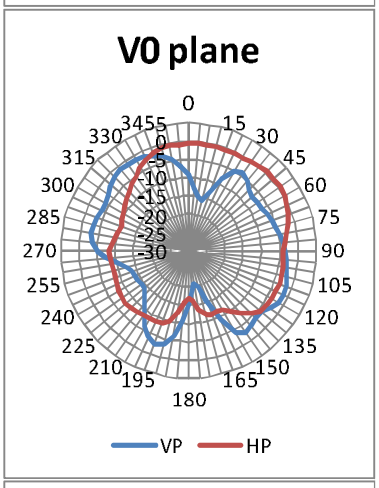
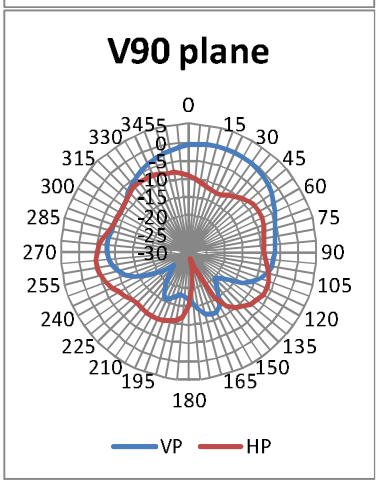
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

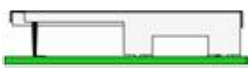
Radiation Characteristics – 2D Pattern (2100 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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PRO-OB-572

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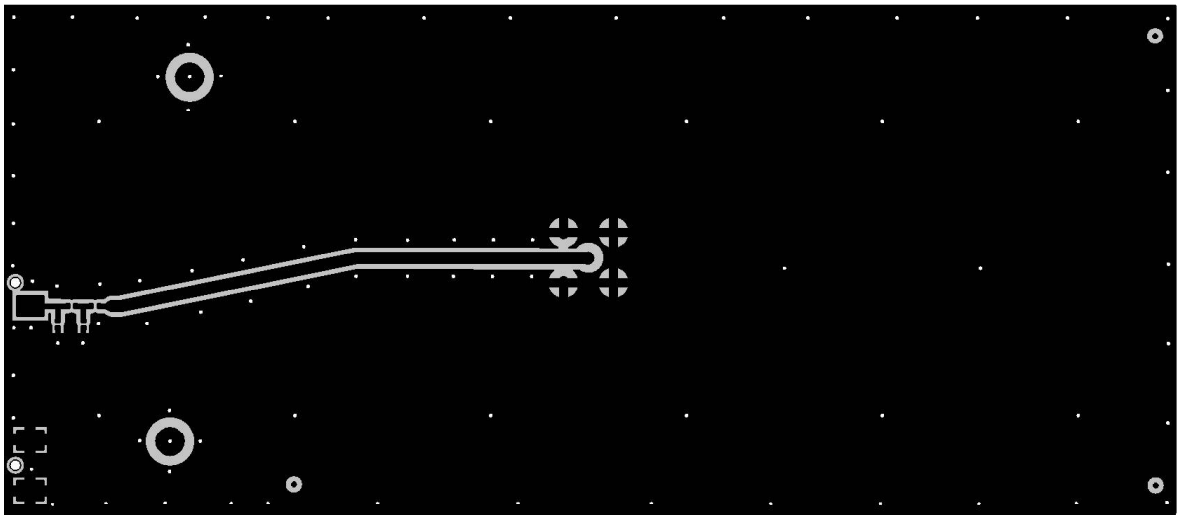
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

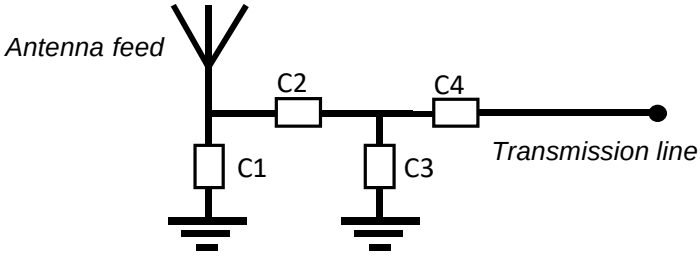
Evaluation Board Outline & Matching Circuit

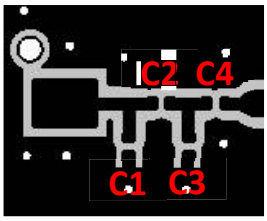
The evaluation board (PRO-EB-575) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 120 x 52 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations 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 = 0.9 pF (Murata GJM1555C1HR90WB01)
C2 = 6.8 pF (Murata GJM1555C1H6R8WB01)
C3 = N/A
C4 = 2.4 nH (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.

OnBoard GSM/NB-IoT - Antenna

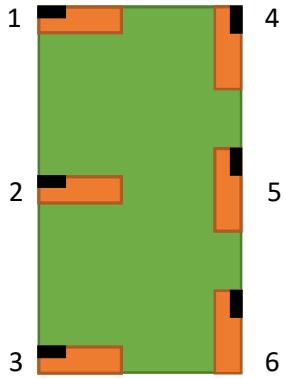
PRO-OB-572

Request Samples | Check Inventory

50.00 x 25.00 x 10.00 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.



Optimal ↑

1 & 4
3
6
2 & 5

■ = *GND pin(s)*

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 - Antenna

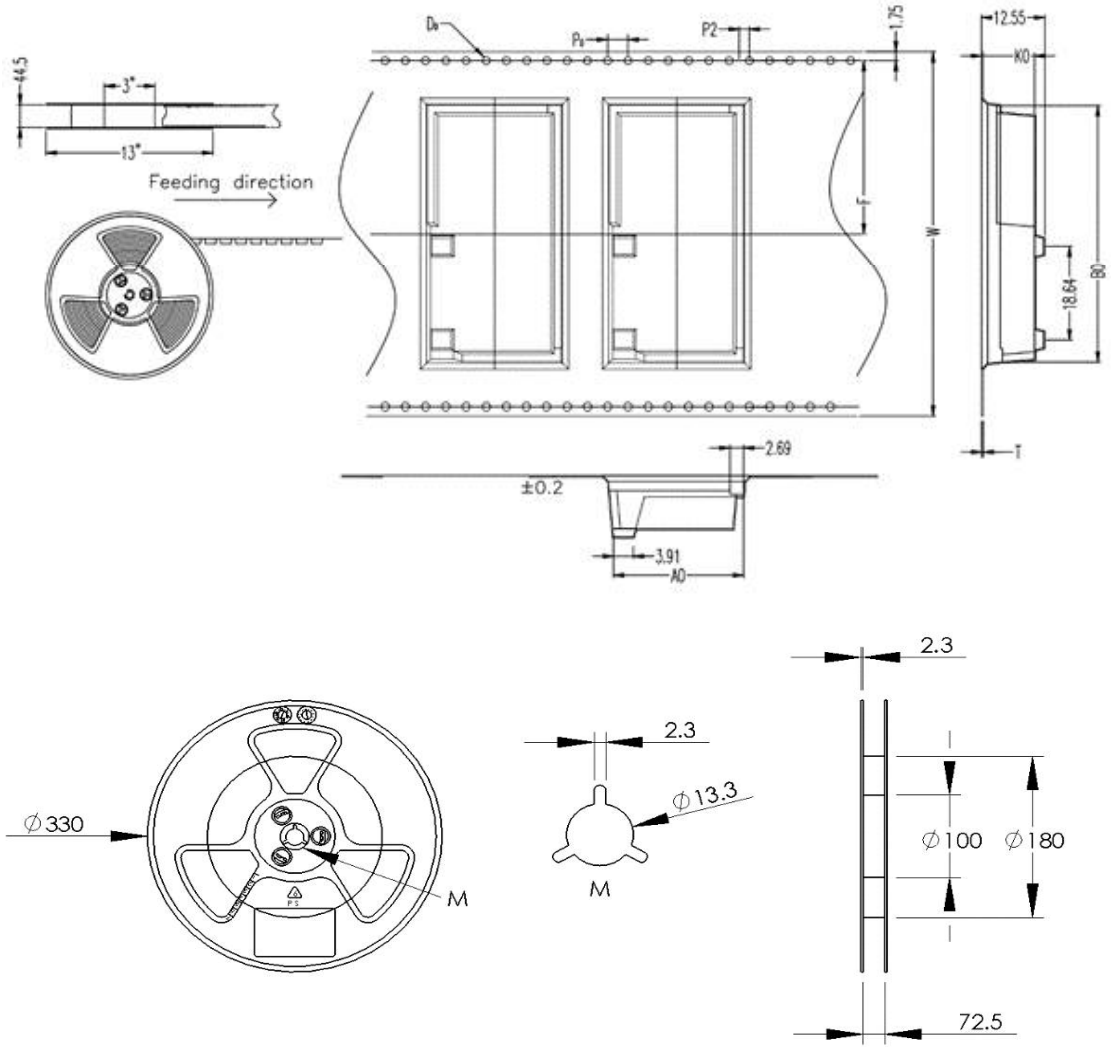
PRO-OB-572

Request Samples | Check Inventory

50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13" reel is 100 pcs.



A_0	25.72 ±0.1
B_0	50.74 ±0.1
D_0	ø1.5 $^{+0.10}_{-0.00}$
E_1	1.75 ±0.1
F	34.2 ±0.15
K_0	10.5±0.1
P_0	4.0 ±0.1
P_1	12.0 ±0.1
P_2	2.0 ±0.15
S_0	
T	0.35 ±0.05
W	72.0 ±0.3

Unit: mm (unless otherwise noted)

- 10 sprocket hole pitch cumulative tolerance
- Camber not to exceed 1mm in 100m
- A0 and B0 measured on a plane 0.35mm above the bottom of the pocket
- K0 measured from a plane on the inside bottom of the Pocket to the top surface of the carrier
- Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole
- Component load per 13" reel: 100 pcs
- Packing length per 22" reel: M

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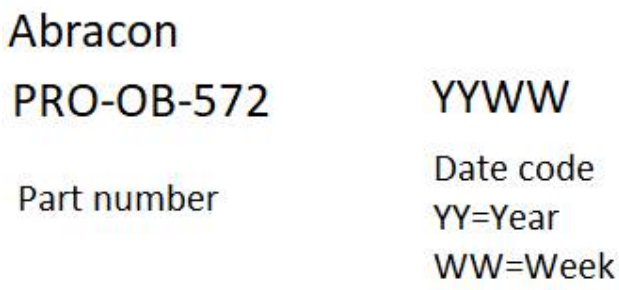
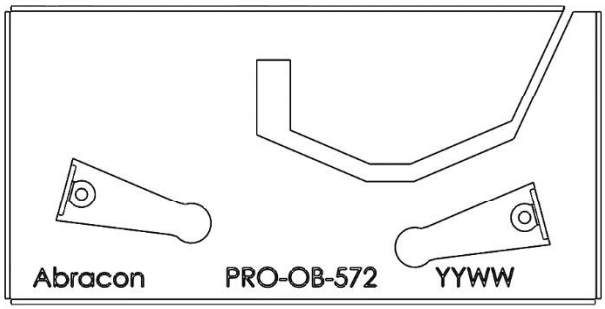
50.00 x 25.00 x 10.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

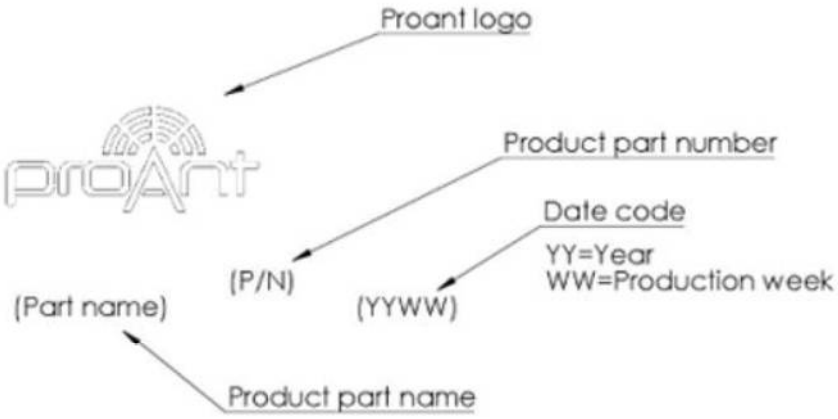
Part Marking

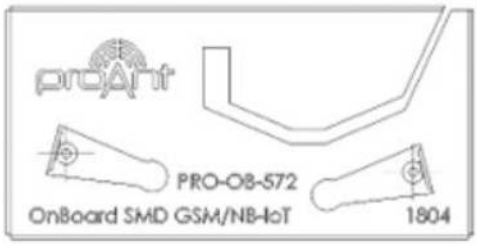
The top marking of the antenna is arranged according to the following illustration.





There will be a transition period for the part marking until production batches after 2222 (YYWW). Produced batches before 2222 are marked according to the below illustration.





Example top marking

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.

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2.4/5GHz OnBoard WLAN SMD - Antenna

PRO-OB-536

Request Samples | Check Inventory

14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

Features

- Compact
- Profile of 2.5 mm
- Mixed Linear Polarization
- Peak Gain of 2.7 dBi
- Efficiency > 44%
- Surface Mount
- Durable-Shelf life of up to 10 years

Applications

- 2.4/5 GHz
  - Wi-Fi/BT/BLE/ZigBee/ISM
- IoT, M2M
- Telemetry
- Wireless Remote Control
- Personal Area Networks (PAN)
- Industrial/Commercial Equipment

Product Image

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2.4/5GHz OnBoard WLAN SMD - Antenna

PRO-OB-536

Request Samples | Check Inventory

14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification		Unit
Operating Frequency	2400 - 2500	5150 - 5850	MHz
Center Frequency	2450	5500	
Return Loss	< -6.2	< -3.2	dB
Polarization	Mixed Linear		-
Peak Gain	1.7	2.7	dBi
Efficiency	> 51	> 44	%
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	14.20 x 6.60 x 2.50 mm
Evaluation board Dimension	47 x 17 mm
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test

Note: •The product has been tested according to the standard IEC 60721-3-5 – Class 5M3 (road vehicles in areas without well-developed road systems, light-weighted vehicles, tracked vehicles and self-propelled machines).

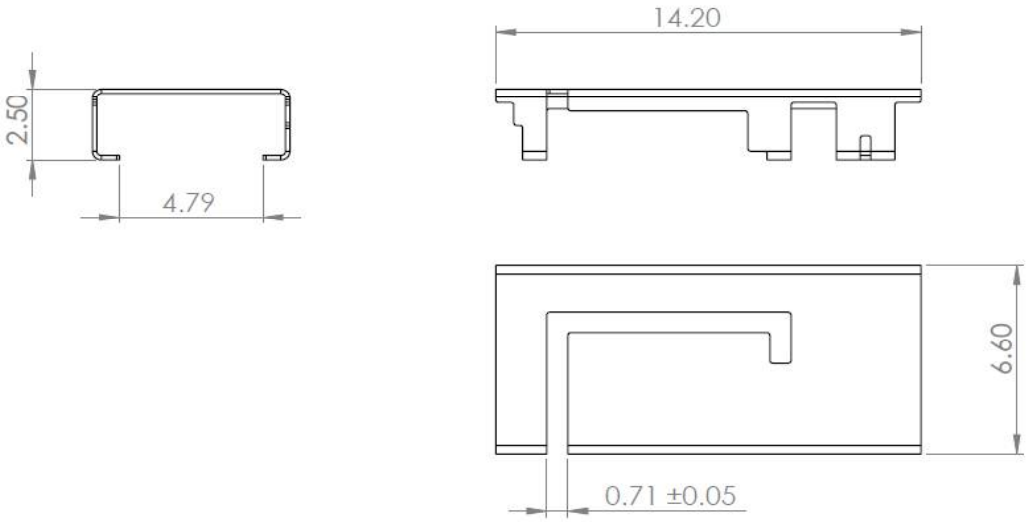
2.4/5GHz OnBoard WLAN SMD - Antenna

PRO-OB-536

Request Samples | Check Inventory

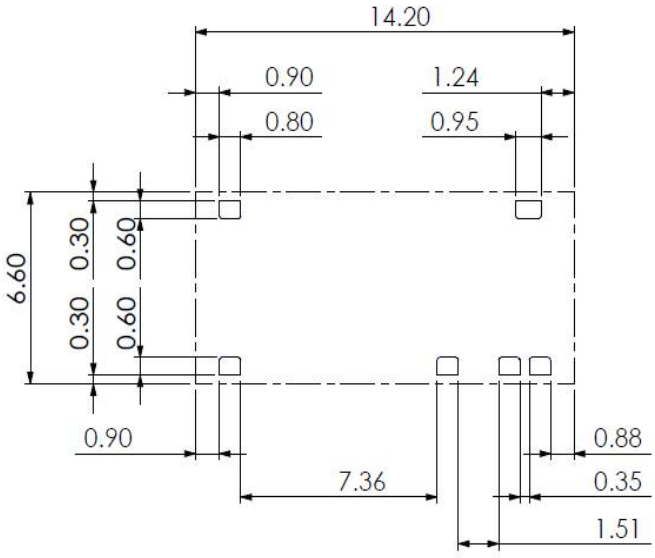
14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

Product Dimensions



Unit : mm

Antenna pins and keep-out block



Unit : mm

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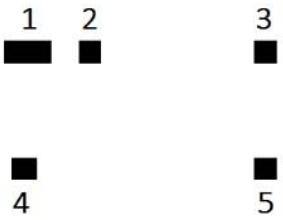
PRO-OB-536

Request Samples | Check Inventory

14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

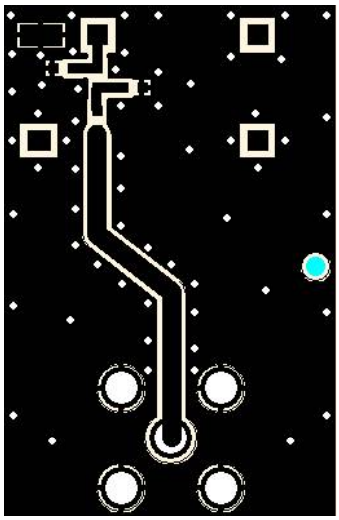
PCB layout and antenna pin numbering

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.

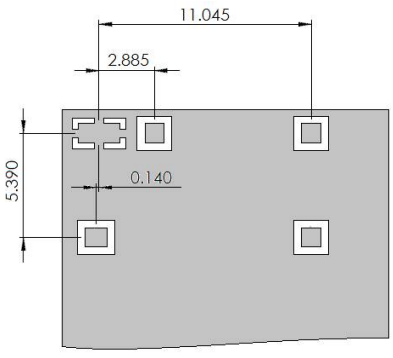


1 = GND
2 = Feed
3 = NC
4 = NC
5 = NC

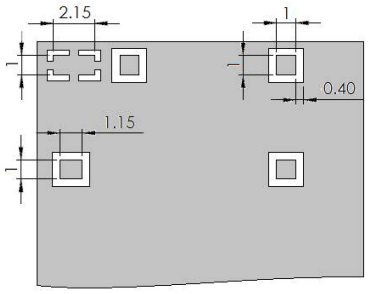
Pin configuration



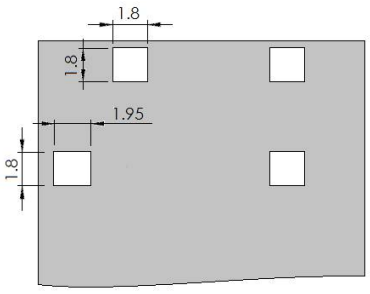
PCB Layout (from evaluation board)



Distance between pads



Pad dimensions, size of pads 2, 3 & 5 are identical



Clearance through all layers. Size of pads 2, 3 & 5 are identical

Unit: mm

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2.4/5GHz OnBoard WLAN SMD - Antenna

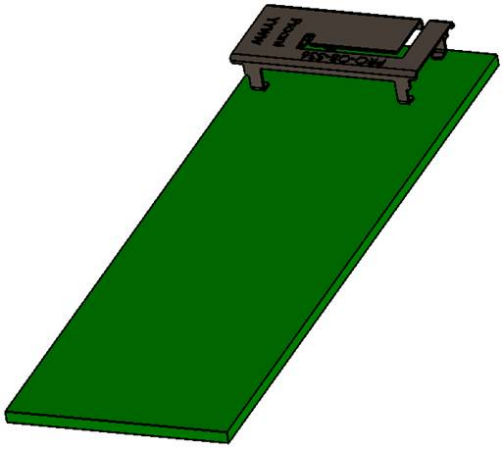
PRO-OB-536

Request Samples | Check Inventory

14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The antenna measurements were all done in free space with the OnBoard WLAN SMD evaluation board (PRO-EB-550) that has a PCB size of 47 x 17 mm.



2.4/5GHz OnBoard WLAN SMD - Antenna

PRO-OB-536

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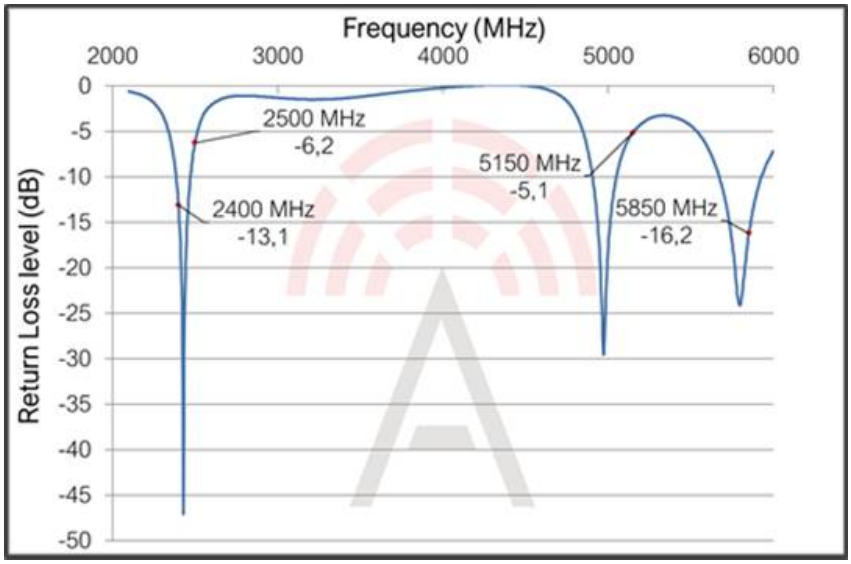
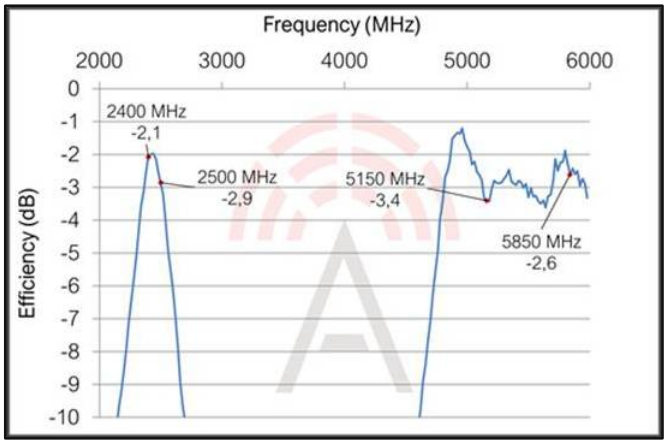
14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

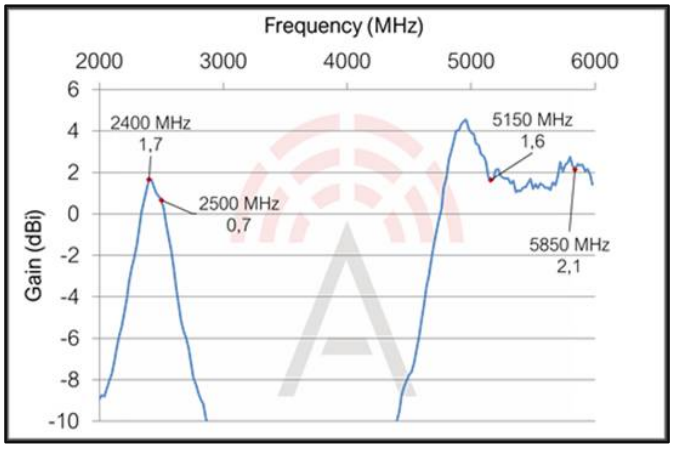
Reflection Characteristics – Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



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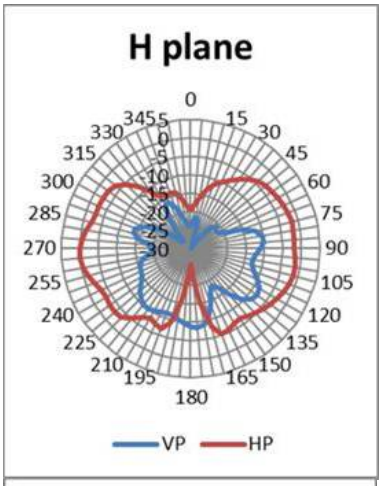
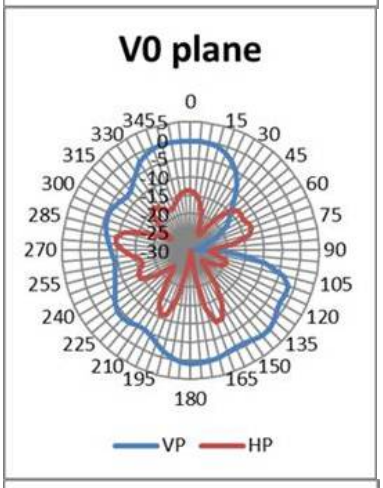
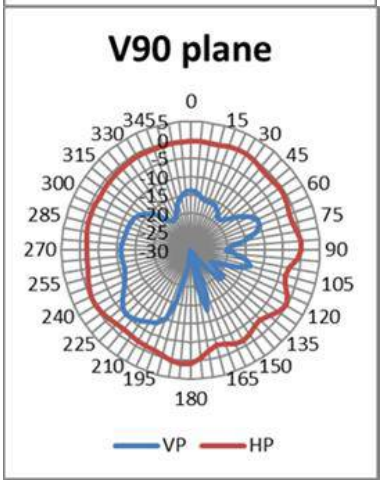
RoHS/RoHS II Compliant
MSL Level = 1

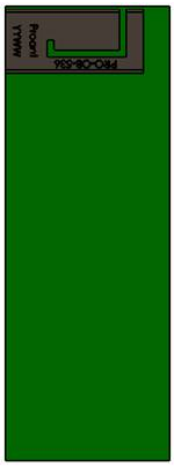
Radiation Characteristics – 2D Pattern (2450 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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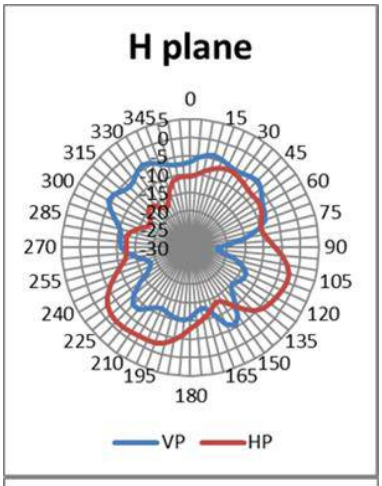
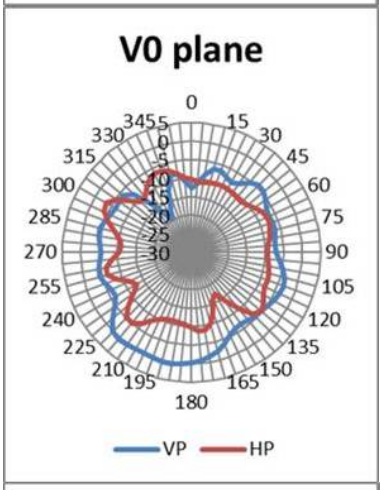
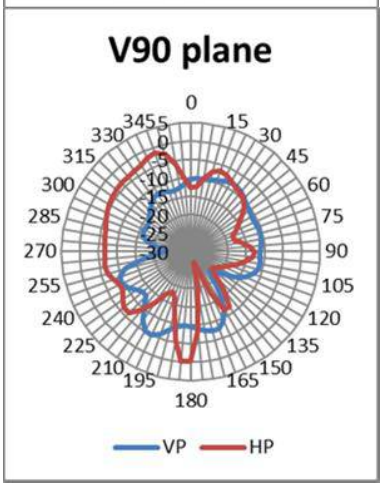
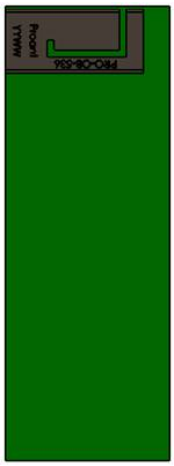
14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern (5150 MHz)









VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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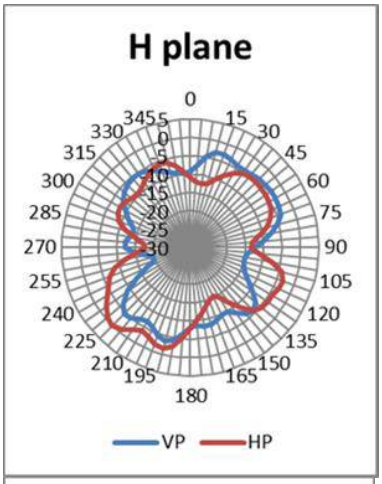
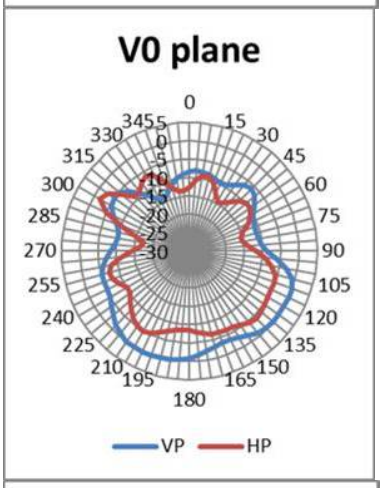
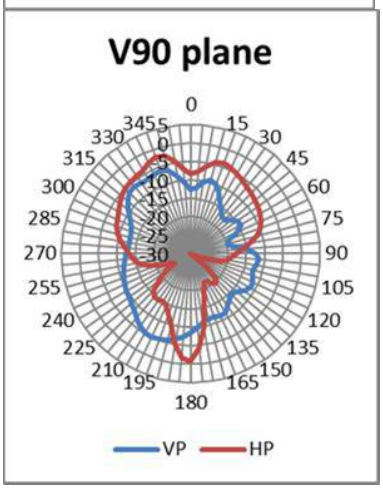
RoHS/RoHS II Compliant
MSL Level = 1

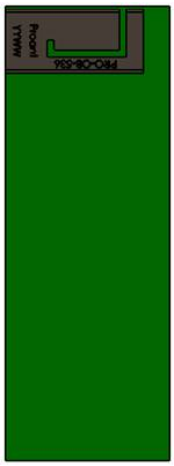
Radiation Characteristics – 2D Pattern (5850 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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PRO-OB-536

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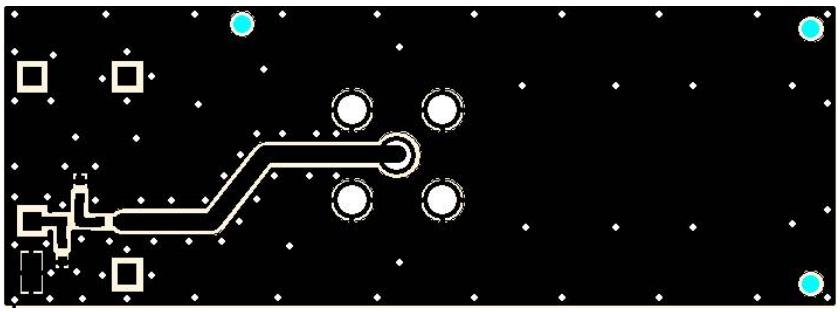
14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

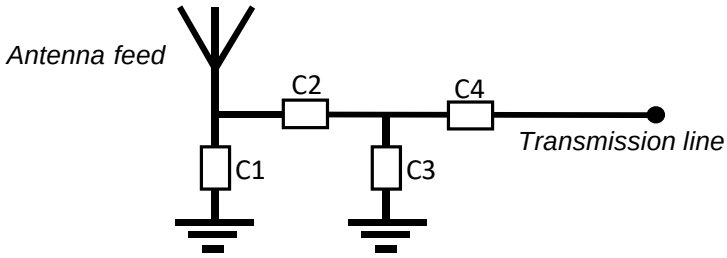
Evaluation Board Outline & Matching Circuit

The evaluation board (PRO-EB-550) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 47 x 17 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.

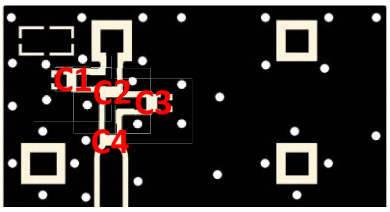


Evaluation board outline

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



Layout on evaluation board

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

C1 = 0.3 pF (Murata GJM1555C1HR30WB01D)
C2 = 2.2 nH (Murata LQW15AN2N2C10D)
C3 = 0.4 pF (Murata GJM1555C1HR40WB01D)
C4 = 1.5 pF (Murata GJM1555C1H1R5WB01D)

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.

2.4/5GHz OnBoard WLAN SMD - Antenna

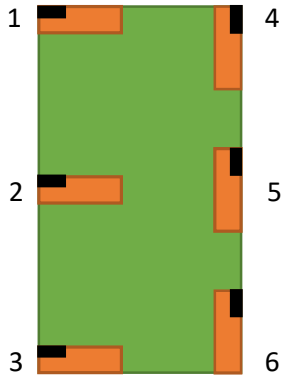
PRO-OB-536

Request Samples | Check Inventory

14.20 x 6.60 x 2.50 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.

2.4/5GHz OnBoard WLAN SMD - Antenna

PRO-OB-536

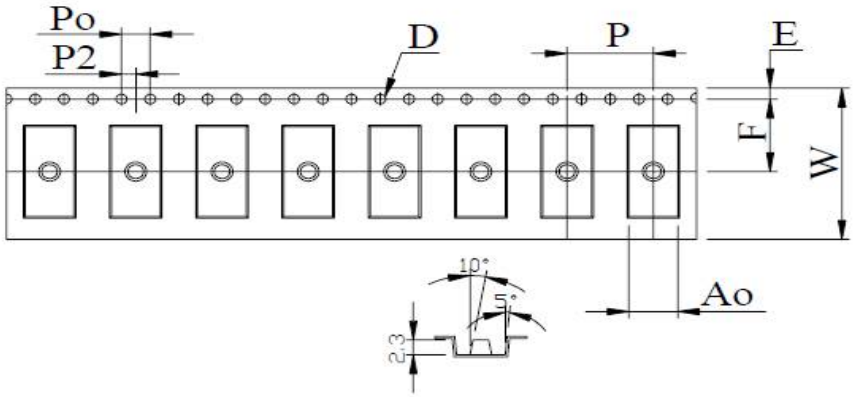
Request Samples

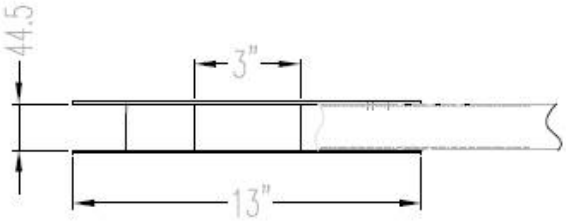
Check Inventory

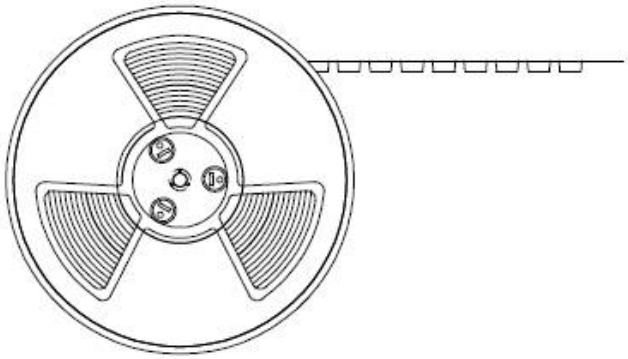
14.20 x 6.60 x 2.50 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13” reel is 1000 pcs.







ITEM	SPEC
W	$24.0^{+0.30}_{-0.30}$
Ao	$6.80^{+0.10}_{-0.10}$
Bo	$14.2^{+0.10}_{-0.10}$
Ko	$2.90^{+0.10}_{-0.10}$
P	$12.0^{+0.10}_{-0.10}$
F	$11.5^{+0.10}_{-0.10}$
E	$1.75^{+0.10}_{-0.10}$
D	$1.50^{+0.10}_{-0.00}$
D1	$0.00^{+0.10}_{-0.10}$
Po	$4.00^{+0.10}_{-0.10}$
P2	$2.00^{+0.10}_{-0.10}$
t	$0.35^{+0.05}_{-0.05}$

Unit: mm (unless otherwise noted)

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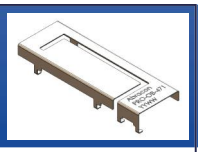
OnBoard 868/915/868+2400 MHz - Antenna



PRO-OB-471

Request Samples | Check Inventory

34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

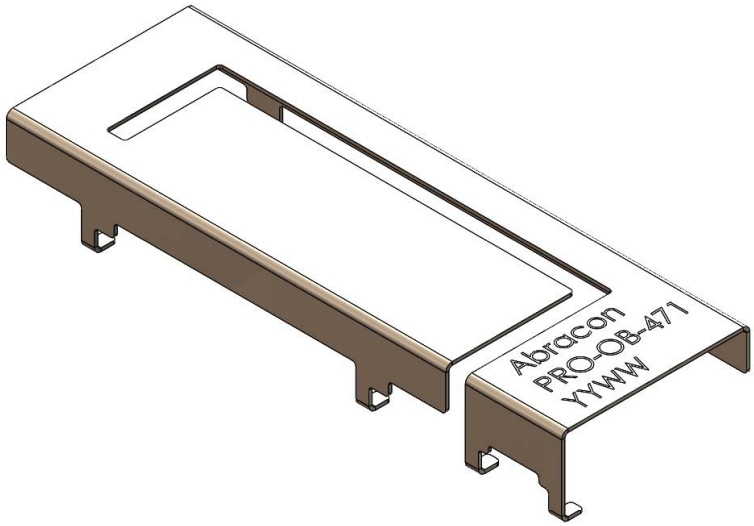
Features

- Supports 868, 915 or 868+2400 MHz
- Profile of 4.93 mm
- Mixed Linear Polarization
- Surface Mount
- Durable-Shelf life of upto 10 years
- Three different evaluation boards available:
  - "SMD 868" for 860-870 MHz
  - "SMD 915" for 902-928 MHz
  - "SMD 868+2400" for 860-870 + 2400-2500 MHz

Applications

- Wi-Fi/BT/LPWA/LoRA/SigFox/ISM
- IoT, M2M
  - Industrial
  - Infrastructure
  - Medical
- Remote Technology / Monitoring
- Network devices
- Consumer Tracking
- Smart Metering

Product Image



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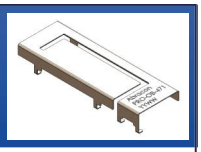

PRO-OB-471

Request Samples | Check Inventory

34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification				Unit
	"SMD 868"	"SMD 915"	"SMD 868+2400"		
Operating Frequency	860 - 870	902 - 928	860 - 870	2400 - 2500	MHz
Center Frequency	865	915	865	2450	
Return Loss	< -9.9	< -6.6	< -8.3	< -4.3 dB	dB
Polarization	Mixed Linear				
Peak Gain	1.7	2.4	1	3.8	dBi
Efficiency	> 63	> 50	> 49	> 43	%
Impedance	50				Ω

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

Mechanical Specification

Parameter	Specification
Antenna Dimension	34.00 x 11.53 x 4.93 mm
Evaluation board Dimension "SMD 868"	120 x 50 mm
Evaluation board Dimension "SMD 915"	120 x 50 mm
Evaluation board Dimension "SMD 868+2400"	95 x 38 mm
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test

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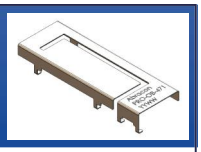
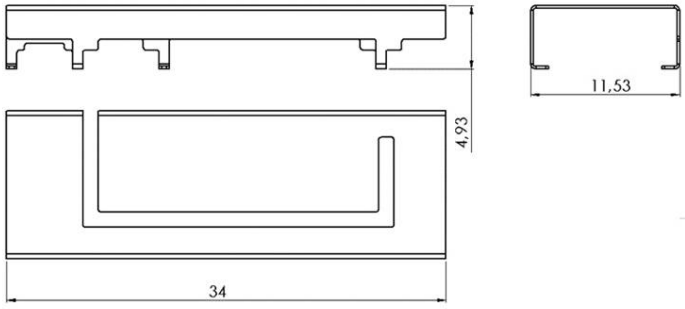


PRO-OB-471

Request Samples | Check Inventory

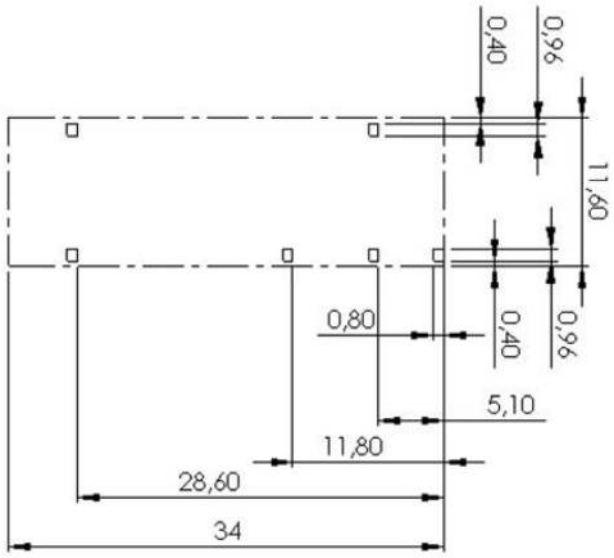
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Product Dimension



Unit : mm

Antenna pins and keep-out block



Unit : mm

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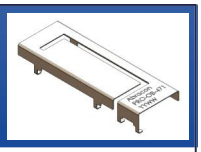


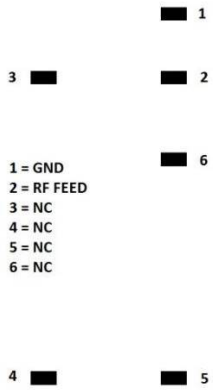
PRO-OB-471

Request Samples | Check Inventory

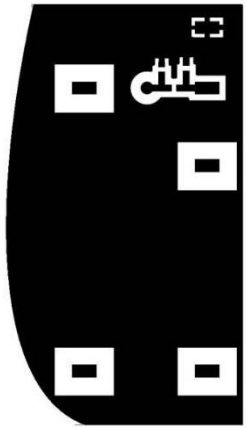
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

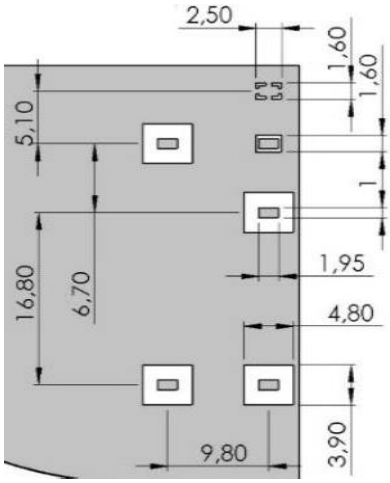
PCB layout and antenna pin numbering

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.

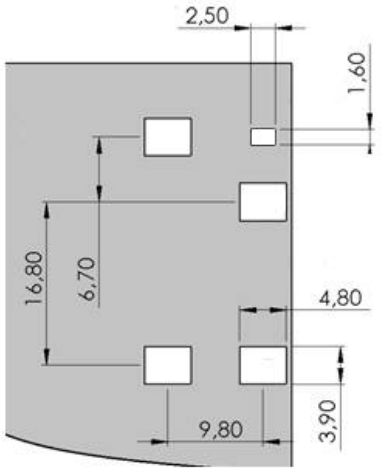


Pin configuration





PCB Layout (from evaluation board)



Clearance through all layers

Unit: mm

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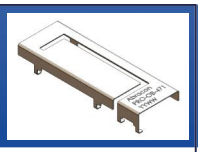

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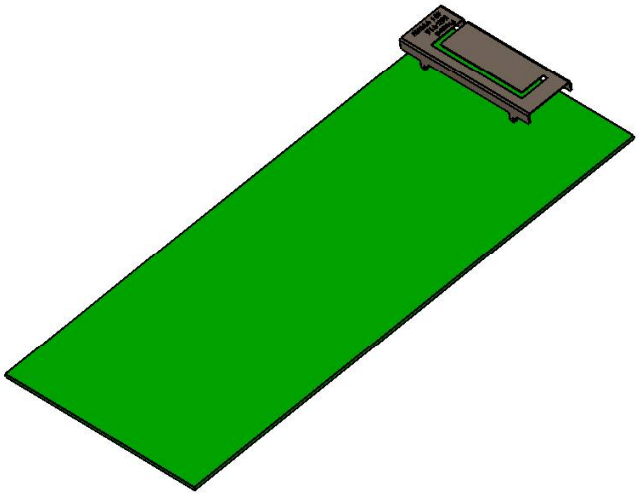
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

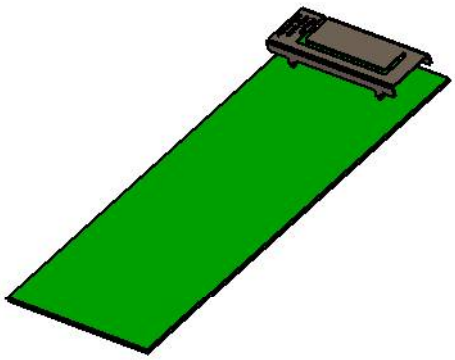
Measurement Setup

The antenna measurements for 868 MHz were done with the OnBoard “SMD 868” evaluation board (PRO-EB-472, 120 x 50 mm) - measured in free space.

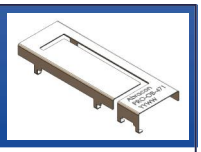
The antenna measurements for 915 MHz were done with the OnBoard “ SMD 915” evaluation board (PRO-EB-476, 120 x 50 mm) - measured in free space.



The antenna measurements for 868+2400 MHz were done with the OnBoard “SMD 868+2400” evaluation board (PRO-EB-531, 95 x 38 mm) - measured in free space.



OnBoard 868/915/868+2400 MHz - Antenna



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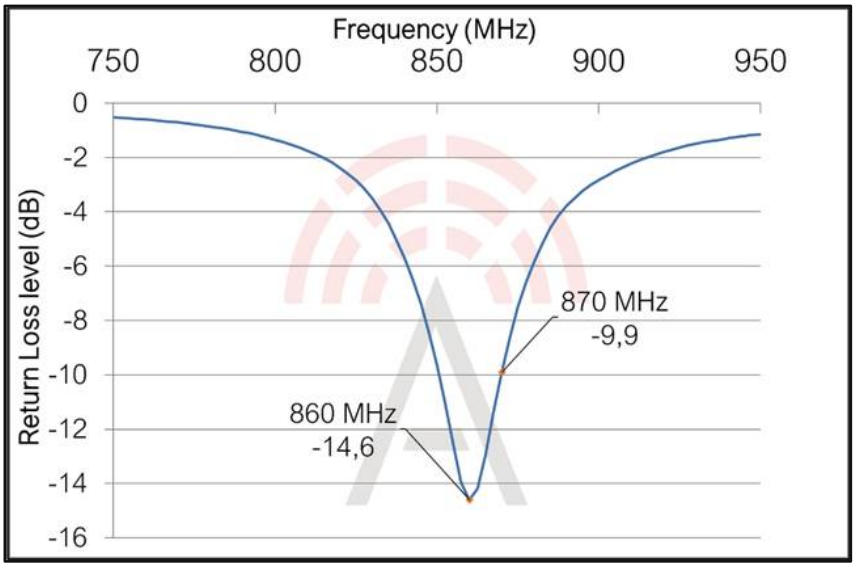
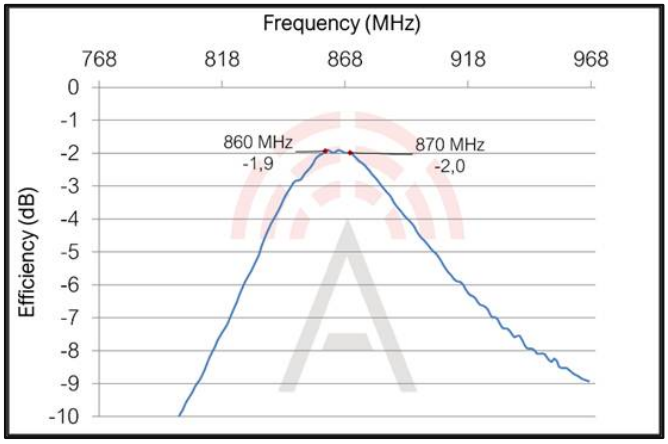
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

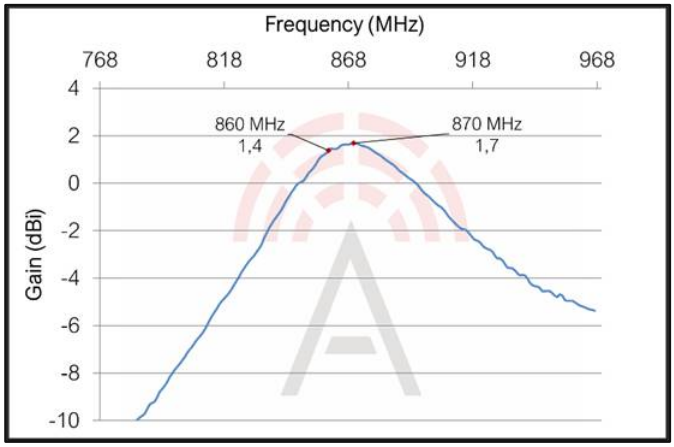
Reflection Characteristics "SMD 868" – Return Loss



Total Radiation Efficiency "SMD 868"



Maximum Radiation Gain "SMD 868"



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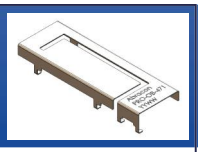

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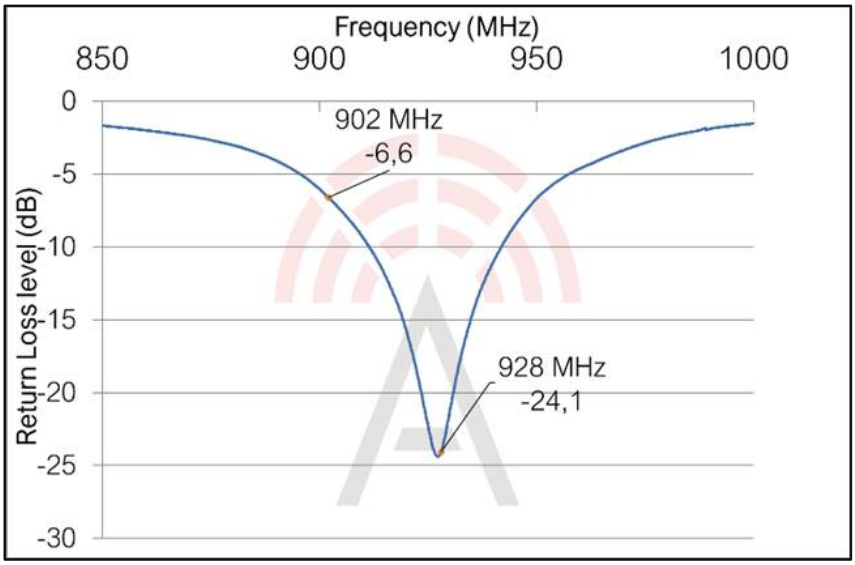
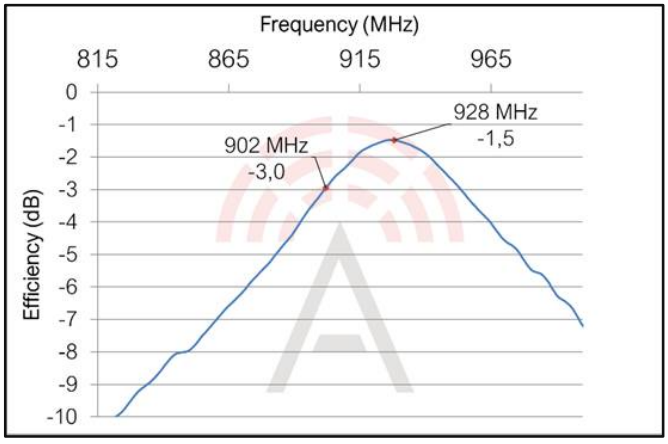
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

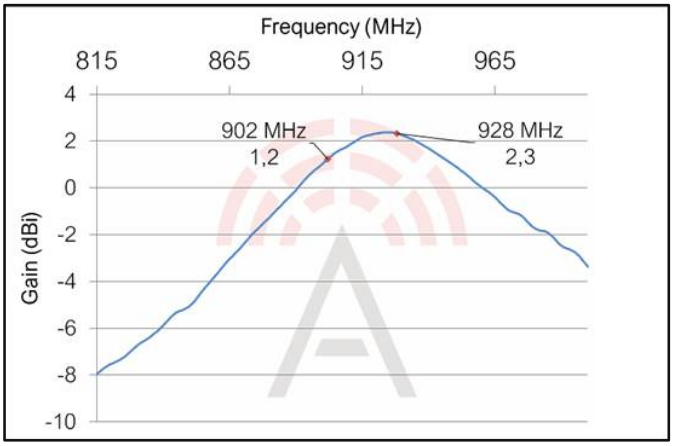
Reflection Characteristics "SMD 915" – Return Loss



Total Radiation Efficiency "SMD 915"



Maximum Radiation Gain "SMD 915"



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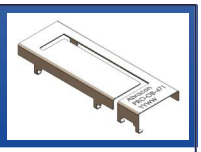

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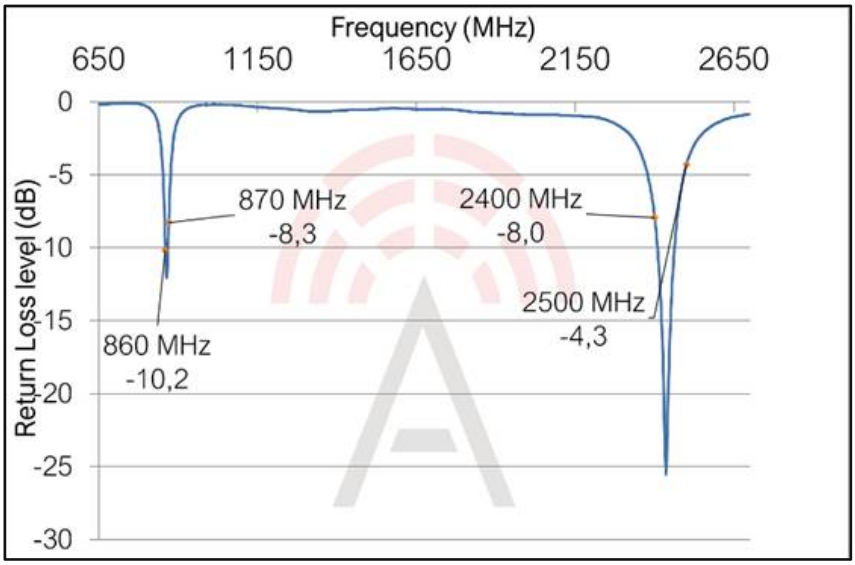
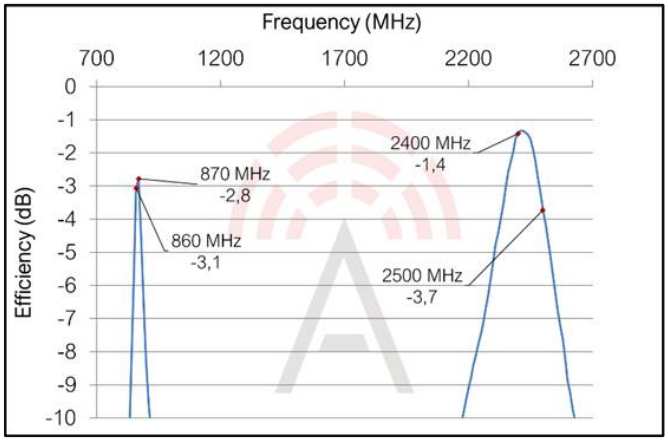
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

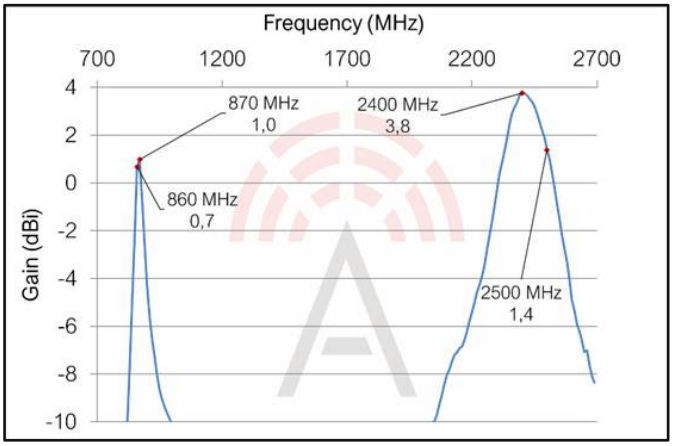
Reflection Characteristics "SMD 868+2400" – Return Loss



Total Radiation Efficiency "SMD 868+2400"



Maximum Radiation Gain "SMD 868+2400"



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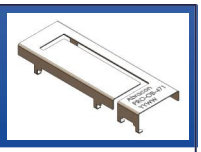

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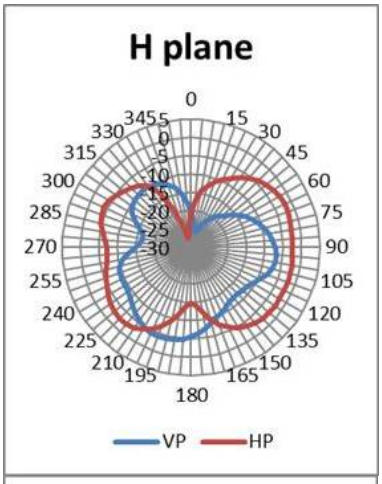
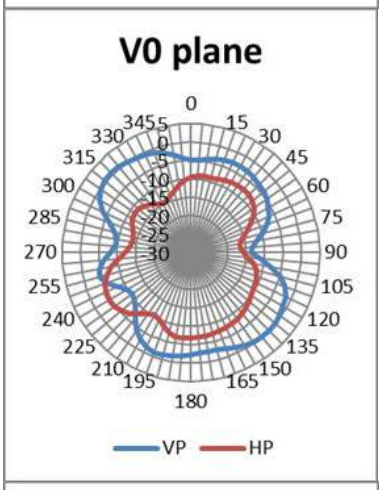
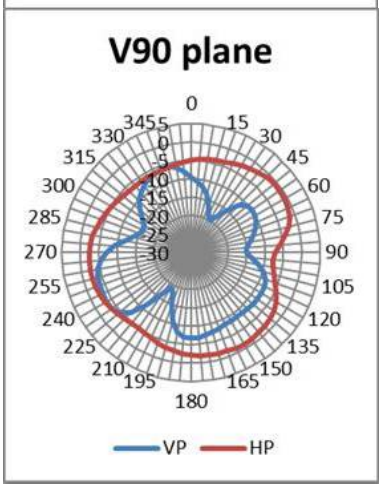
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

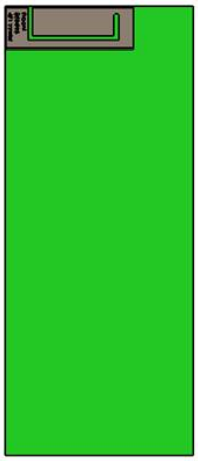
Radiation Characteristics – 2D Pattern "SMD 868" at 868 MHz







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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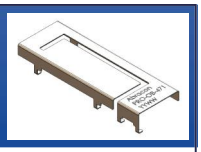
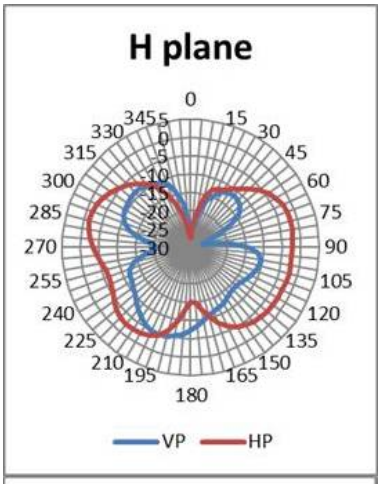


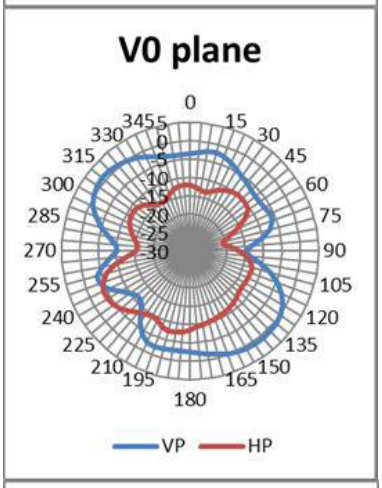
PRO-OB-471

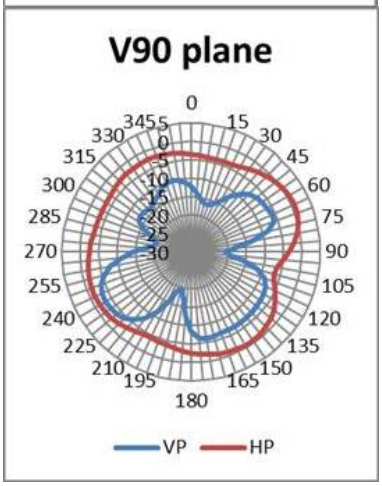
Request Samples | Check Inventory

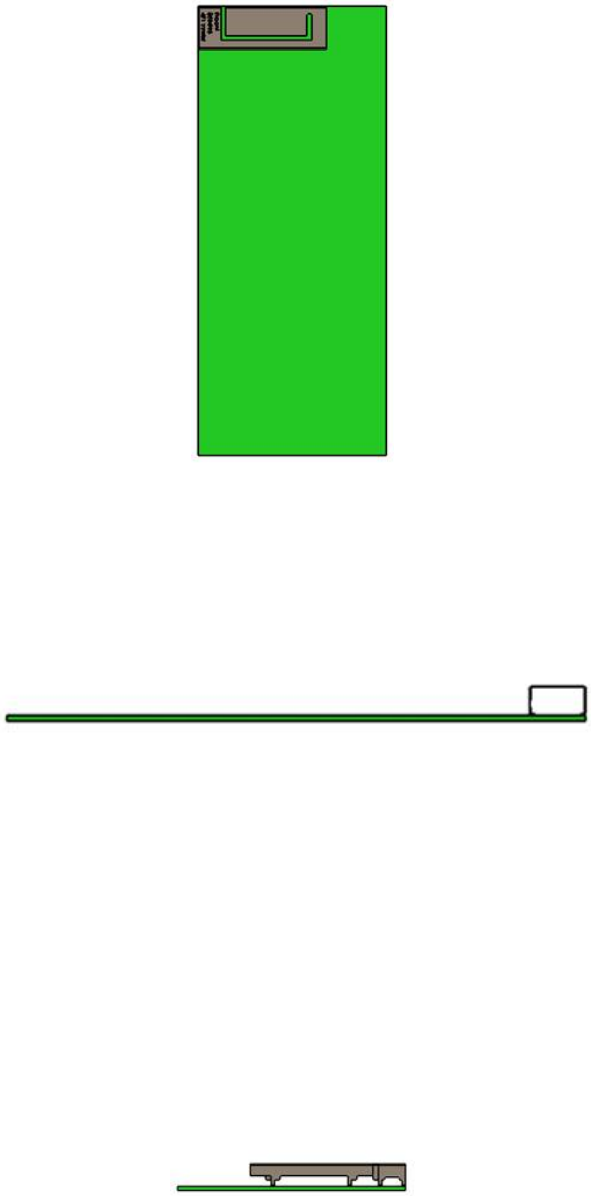
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern "SMD 915" at 915 MHz









VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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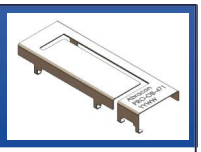

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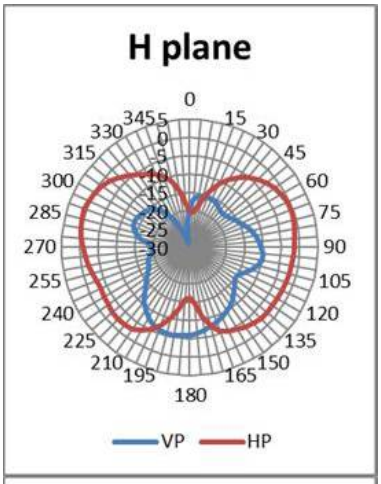
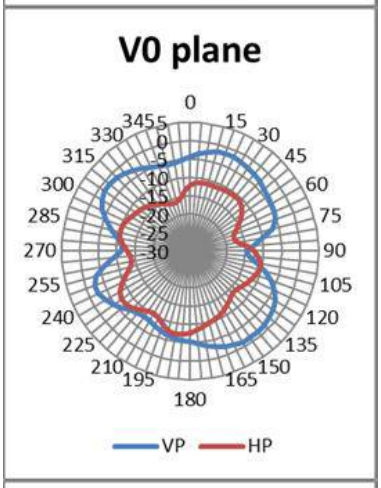
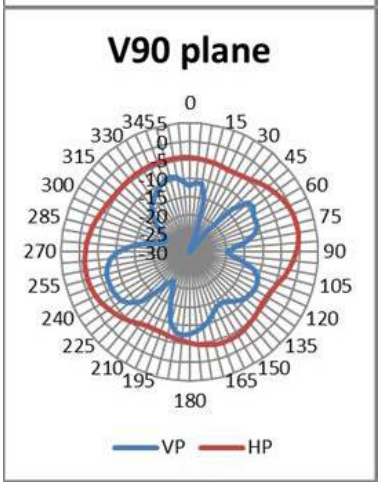
Request Samples | Check Inventory

34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

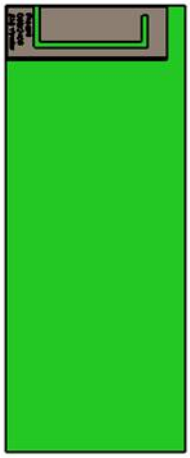
Radiation Characteristics – 2D Pattern "SMD 868+2400" at 868 MHz







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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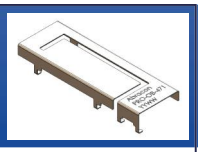

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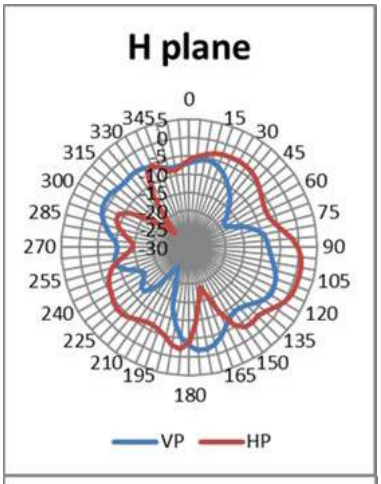
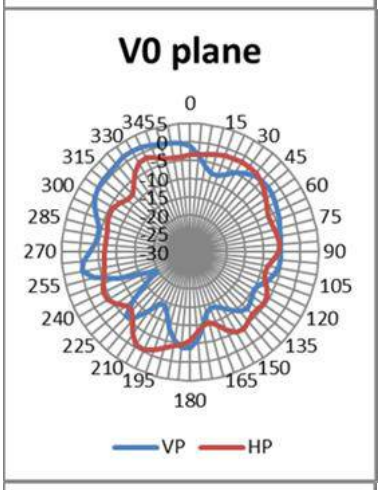
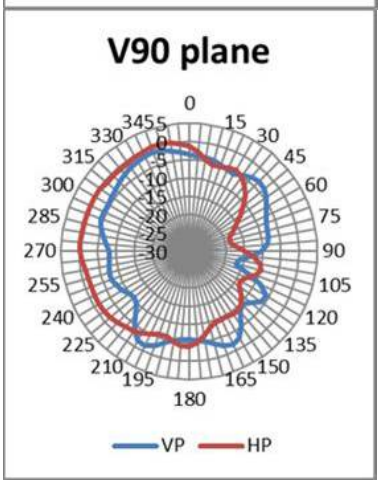
Request Samples | Check Inventory

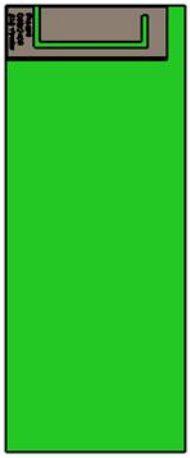
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern "SMD 868+2400" at 2400 MHz









VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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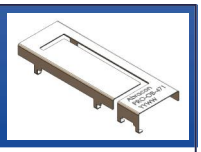

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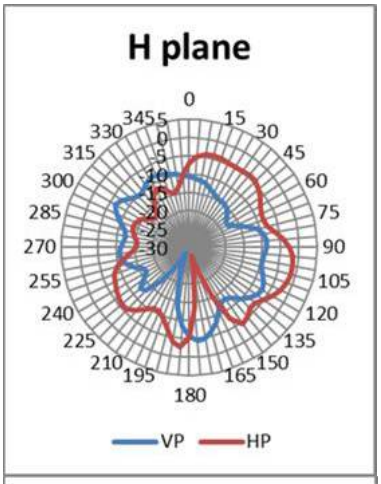
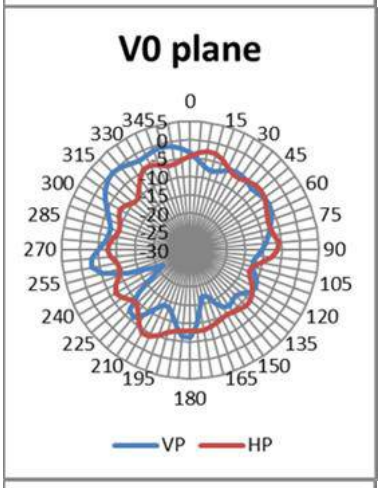
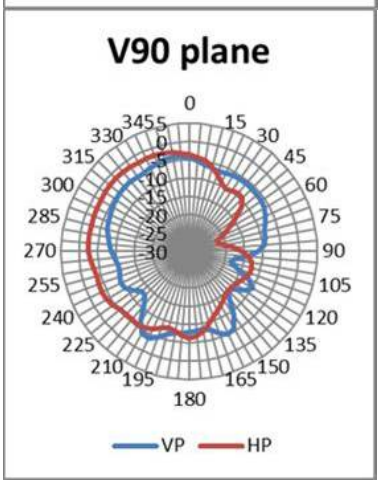
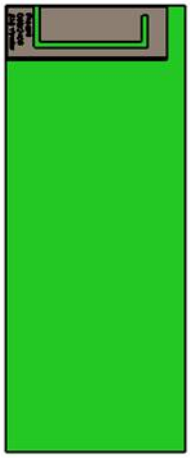
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern "SMD 868+2400" at 2500 MHz









VP: Vertical Polarization
HP: Horisontal Polarization

Unit: dBi

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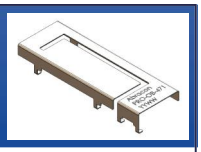


PRO-OB-471

Request Samples | Check Inventory

34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

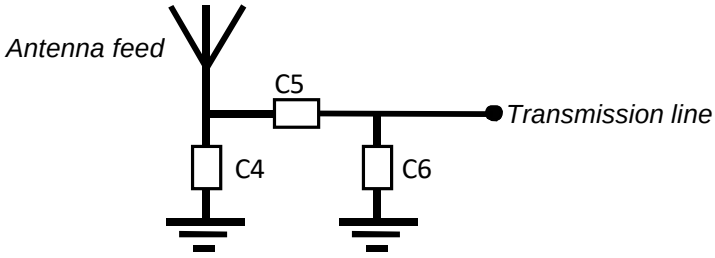
Evaluation Board Outline & Matching Circuit ("SMD 868" or "SMD 915")

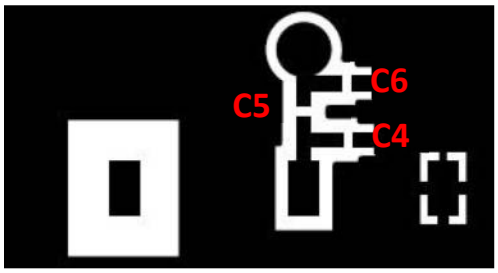
The evaluation board is developed to simplify antenna (PRO-OB-471) testing and evaluation. It has an arbitrary size of 120 x 50 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by cutting and soldering the PCB into any device. For this antenna the evaluation board is available with three different tuning options, two of which is:

1. Evaluation board "SMD 868" (PRO-EB-472) for 860-870 MHz operation
2. Evaluation board "SMD 915" (PRO-EB-476) for 902-928 MHz operation.

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.





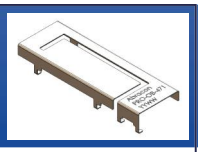
Matching circuit

The antenna needs a matching circuit to adjust the resonant frequency balance. When delivered, the evaluation board is tuned for optimum balance for 868 MHz or 915 MHz using the following (can be replaced by equivalent):

Component	"SMD 868" (PRO-EB-472)	"SMD 915" (PRO-EB-476)
C4	N/A	N/A
C5	5.6 pF (Murata GJM1555C1H5R6WB01)	1.5 nH (Murata LQW15AN1N5B00)
C6	2.2 pF (Murata GJM1555C1H2R2WB01)	5.6 pF (Murata GJM1555C1H5R6WB01)

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 General Implementation Guidelines section below.

OnBoard 868/915/868+2400 MHz - Antenna



PRO-OB-471

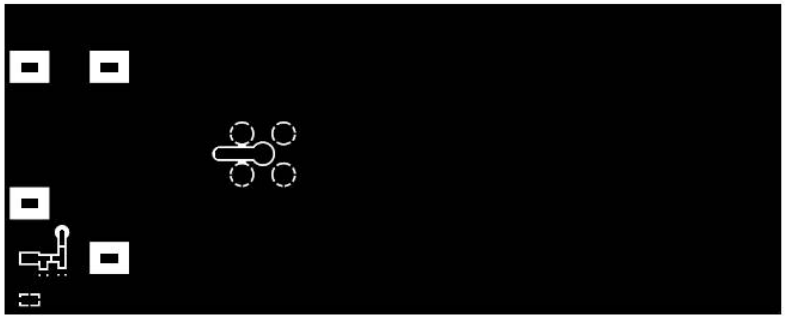
Request Samples | Check Inventory

34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Evaluation Board Outline & Matching Circuit ("SMD 868+2400")

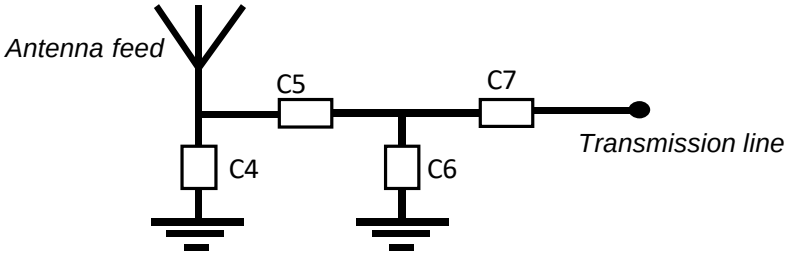
The evaluation board is developed to simplify antenna (PRO-OB-471) testing and evaluation. It has an arbitrary size of 120 x 50 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by cutting and soldering the PCB into any device. For this antenna the evaluation board is available with three different tuning options, the third one is:

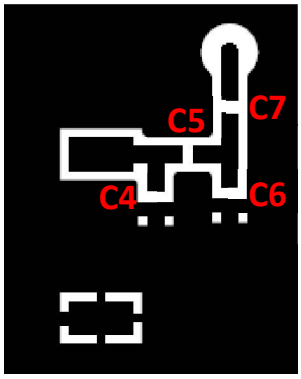
3. Evaluation board "SMD 868+2400" (PRO-EB-531) for 860 - 870 MHz and 2.4 - 2.5 GHz operation.



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.





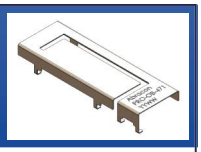
Matching circuit

The antenna needs a matching circuit to adjust the resonant frequency balance. When delivered, the evaluation board is tuned for optimum balance for 868 MHz and 2400 MHz using the following (can be replaced by equivalent):

Component	"SMD 868+2400" (PRO-EB-531)
C4	0.6 pF (Murata GJM1555C1HR60WB01)
C5	2.2 pF (Murata GJM1555C1H2R2WB01)
C6	0.7 pF (Murata GJM1555C1HR70WB01)
C7	0 Ω

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 General Implementation Guidelines section below.

OnBoard 868/915/868+2400 MHz - Antenna



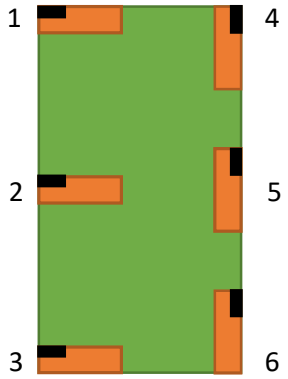
PRO-OB-471

Request Samples | Check Inventory

34.00 x 11.53 x 4.93 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

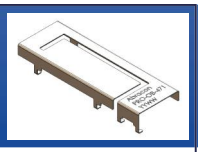
The antenna should be aligned with the PCB edge if possible, preferably with the GND pin(s) close to a corner.

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 868/915/868+2400 MHz - Antenna



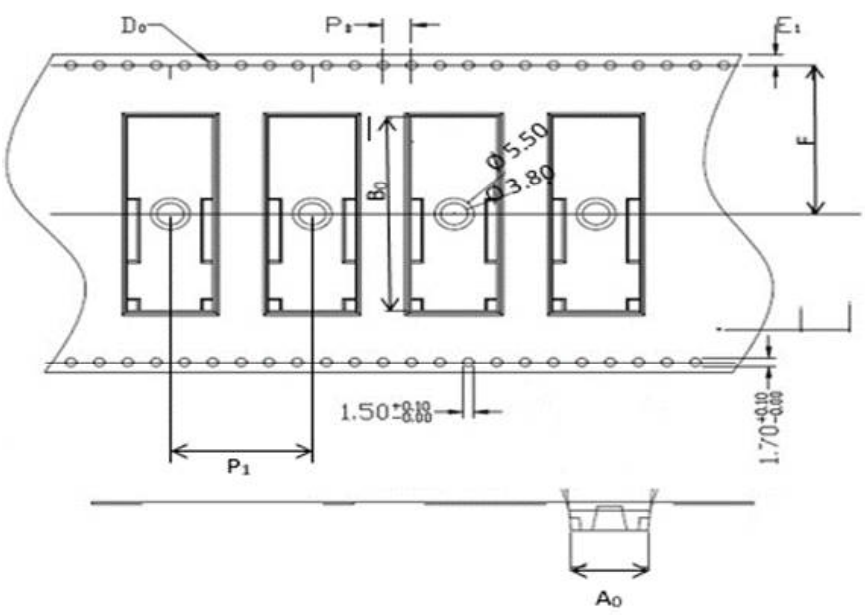
PRO-OB-471

Request Samples | Check Inventory

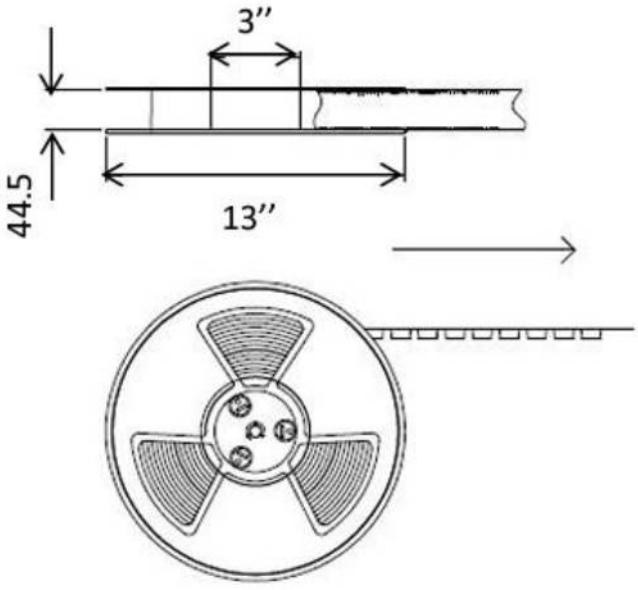
34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13" reel is 250 pcs.



A_0	12.2±0.1
B_0	34.2±0.1
D_0	Ø1.5 +0.10 −0.00
E_1	1.75±0.1
F	26.2±0.15
K_0	5.5±0.1
P_0	4.0 ±0.1
P_1	20.0±0.1
P_2	2.0±0.15
S_0	
T	0.40±0.05
W	56.0±0.3



- 10 sprocket hole pitch cumulative tolerance ±0.2
- Camber not to exceed 1mm in 100m
- A0 and B0 measured on a plane 0.35mm above the bottom of the pocket
- K0 measured from a plane on the inside bottom of the Pocket to the top surface of the carrier
- Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole
- Component load per 13" reel: 250 pcs

Unit: mm (unless otherwise noted)

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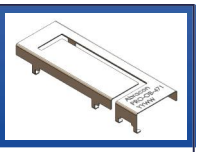
OnBoard 868/915/868+2400 MHz - Antenna



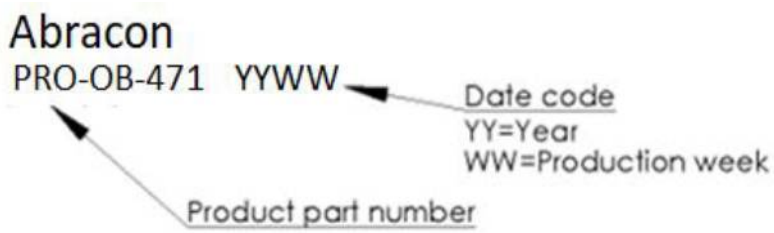
PRO-OB-471

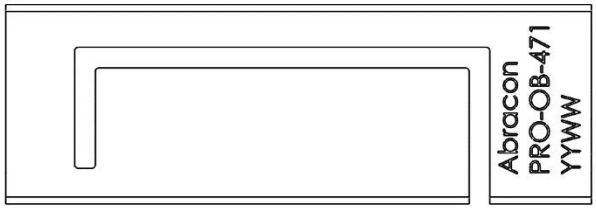
Request Samples | Check Inventory

34.00 x 11.53 x 4.93 mm
RoHS/RoHS II Compliant
MSL Level = 1

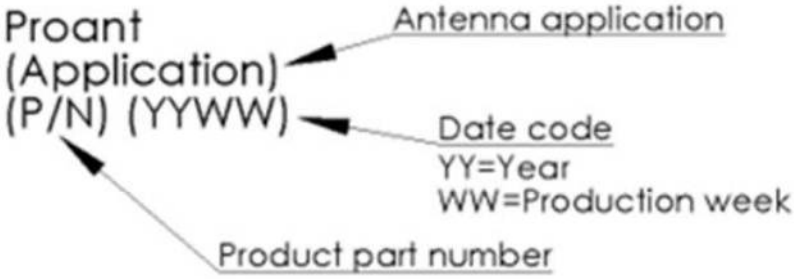
Part Marking

The top marking of the antenna is arranged according to the following illustration.





There will be a transition period for the part marking until production batches after 2222 (YYWW). Produced batches before 2222 are marked according to the below illustration.

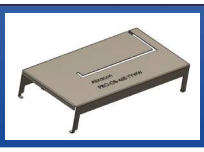


Example top marking

Ordering Information

Part number	Part name	Details
PRO-OB-471	OnBoard SMD 868/915 or 868+2400 MHz	Antenna for 860-870 MHz, 902-928 MHz or 868+2400 MHz operation
PRO-EB-472	Evaluation board, Onboard "SMD 868"	Evaluation board with PRO-OB-471, operation in 860-870 MHz
PRO-EB-476	Evaluation board, Onboard "SMD 915"	Evaluation board with PRO-OB-471, operation in 902-928 MHz
PRO-EB-531	Evaluation board, Onboard "SMD 868+2400"	Evaluation board with PRO-OB-471, operation in 860 - 870 MHz and 2.4 - 2.5 GHz

GSM/UMTS - ProAnt OnBoard Antenna



PRO-OB-468

Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

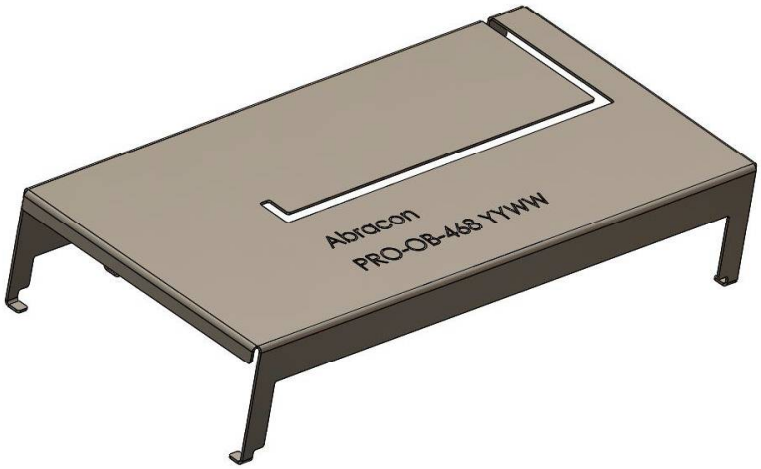
Features

- Supports 824-960 + 1710-2170 MHz
- Peak Gain of 4.9 dBi
- Efficiency >58%
- Surface Mount
- Durable-Shelf life of up to 10 years

Applications

- 2G/3G/GSM/UMTS Applications
- IoT
  - Industrial
  - Medical / Telemetry
  - Consumer
- M2M
- Metering
- Wireless Remote Control

Product Image



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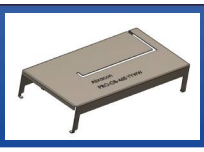

PRO-OB-468

Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification		Unit
Operating Frequency	824 - 960	1710 - 2170	MHz
Return Loss	< -7.3	< -6.2	dB
Polarization	Mixed Linear		
Peak Gain	3.3	4.9	dBi
Efficiency	> 58	> 60	%
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	49.93 x 24.97 x 10.00 mm
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited

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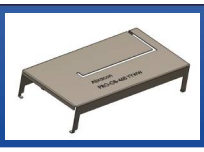


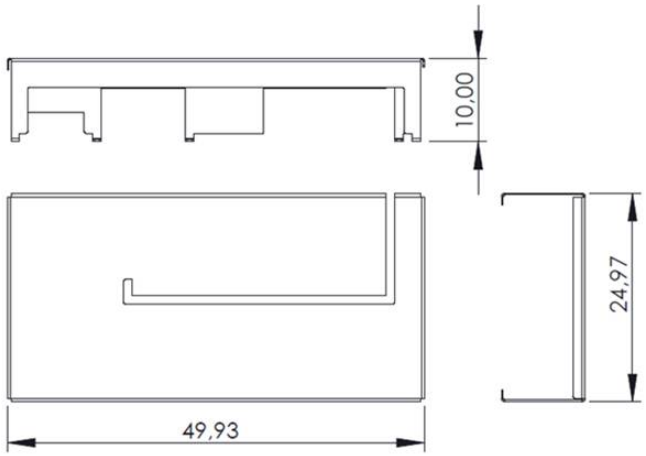
PRO-OB-468

Request Samples

Check Inventory

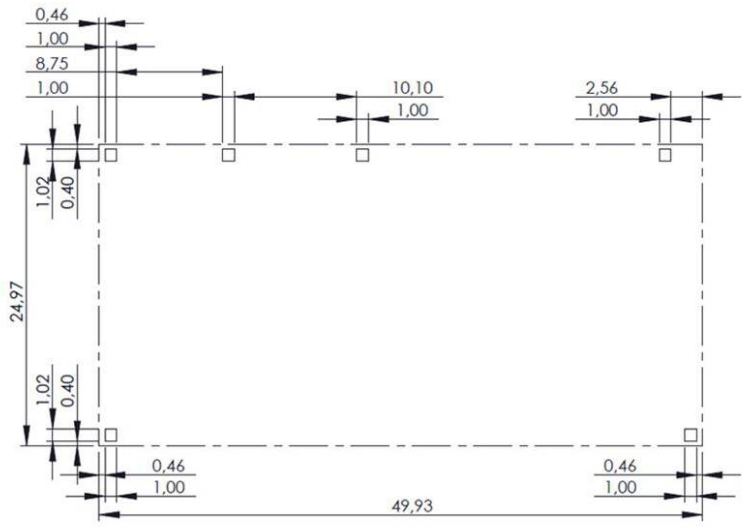
49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

Product Dimension



Unit : mm

Antenna pins and keep-out block



Unit : mm

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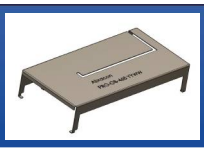


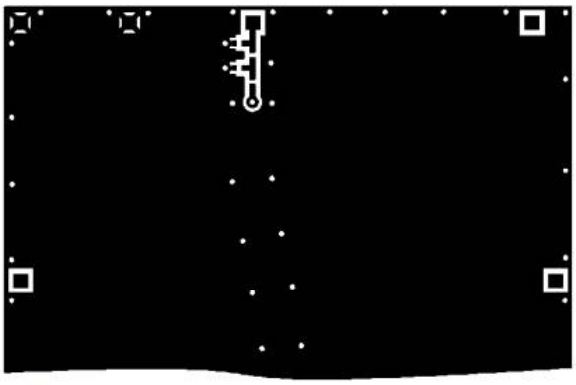
PRO-OB-468

Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

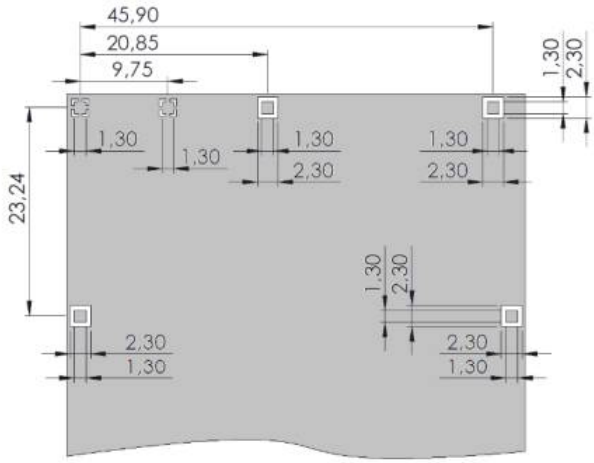
PCB layout and antenna pin numbering

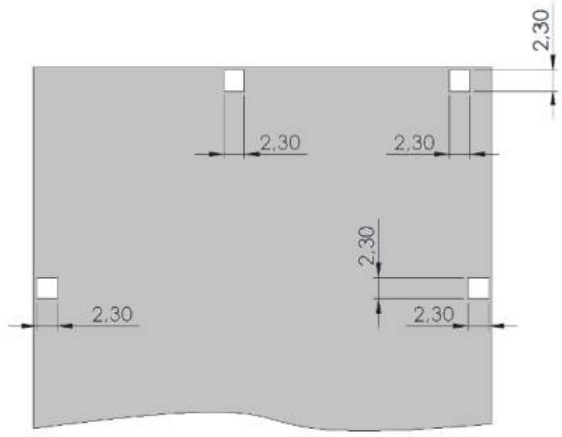
The antenna uses PIFA technology and should thus be mounted on a ground plane. If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that there is a ground clearance around the 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.



PCB Layout (from evaluation board)

Pin configuration





Clearance through all layers

Unit: mm

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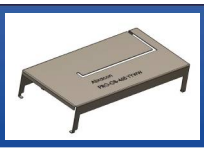


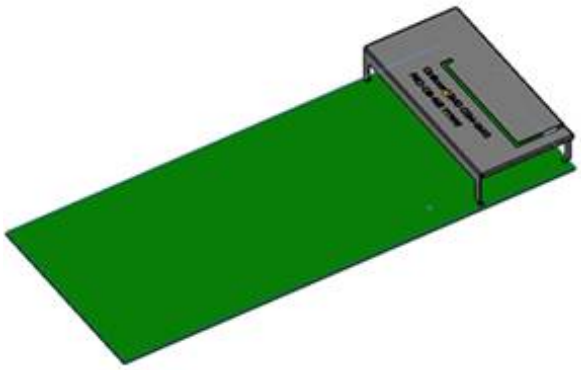
PRO-OB-468

Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The antenna measurements were all done in free space with the evaluation board (PCB size of 120 x 52 mm).



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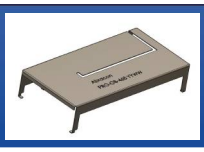
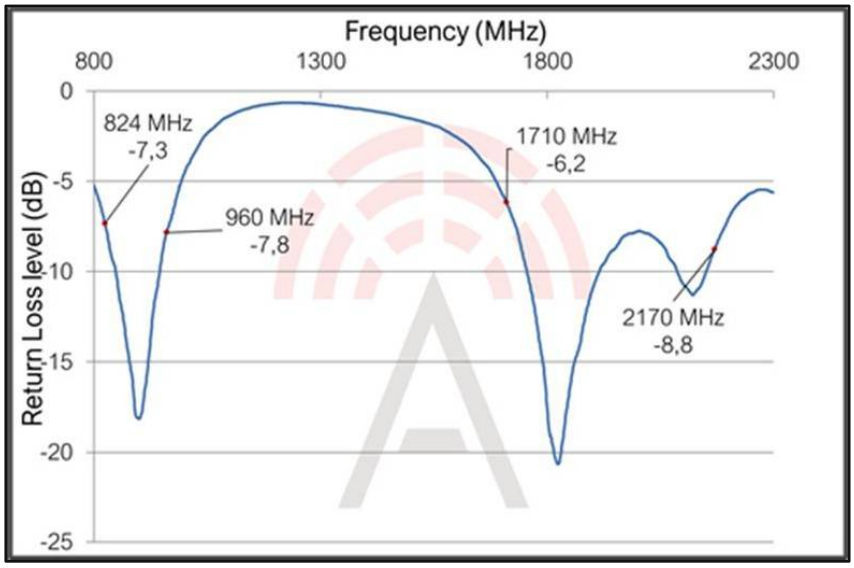


PRO-OB-468

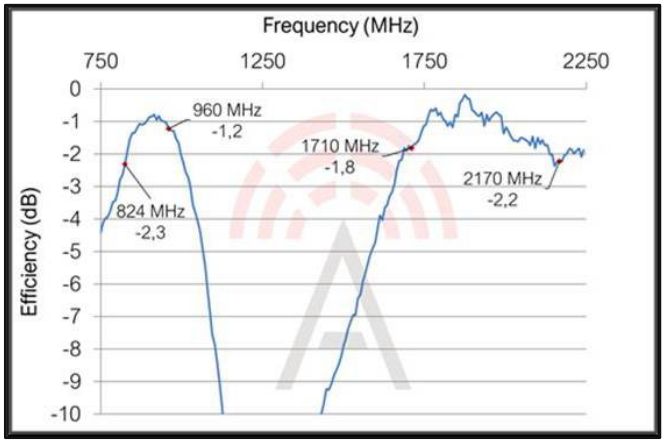
Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

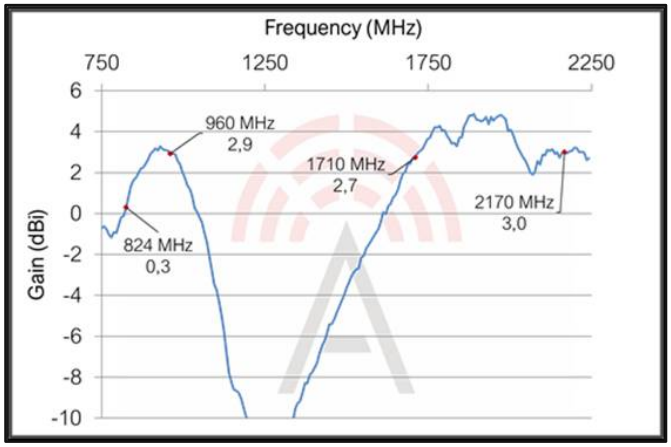
Reflection Characteristics – Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



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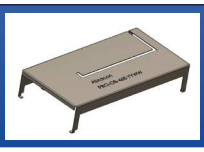
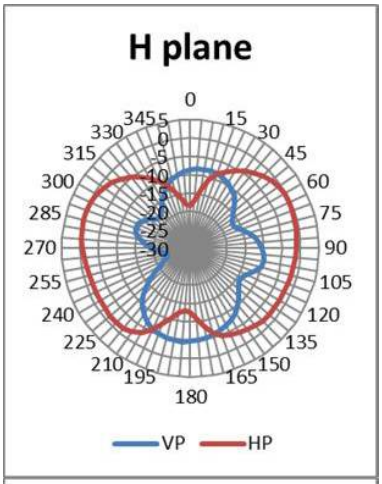


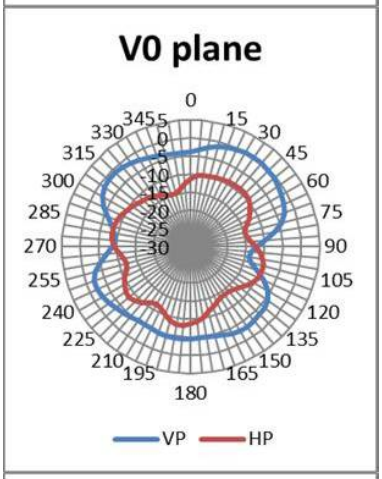
PRO-OB-468

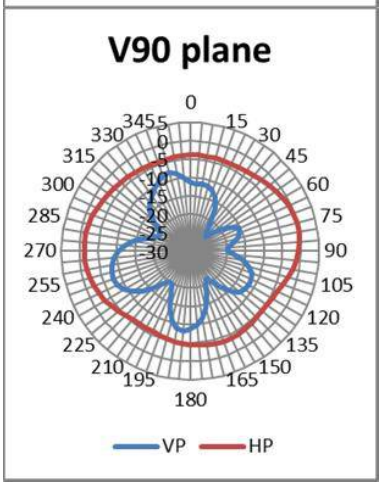
Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

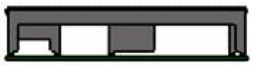
Radiation Characteristics – 2D Pattern (824 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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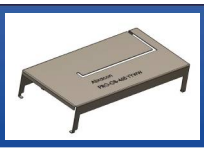
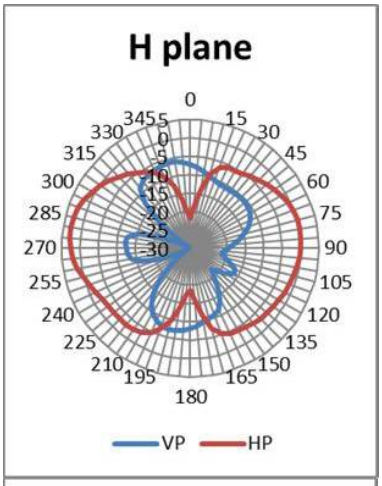


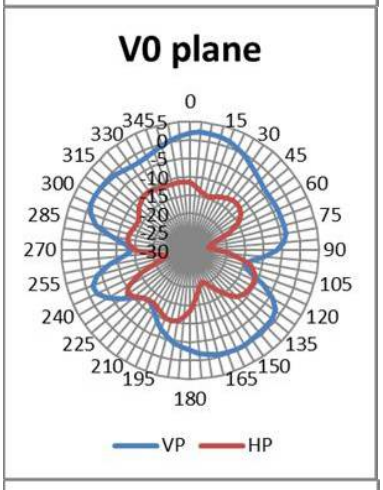
PRO-OB-468

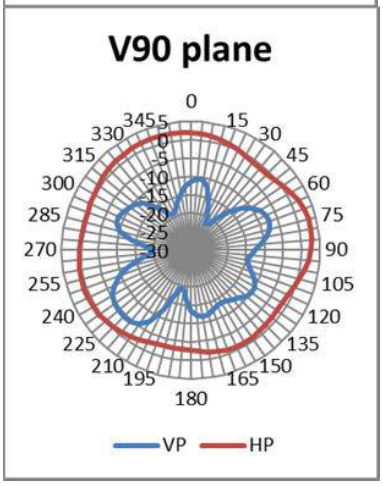
Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

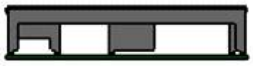
Radiation Characteristics – 2D Pattern (960 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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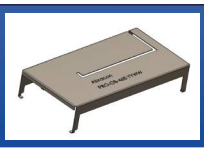
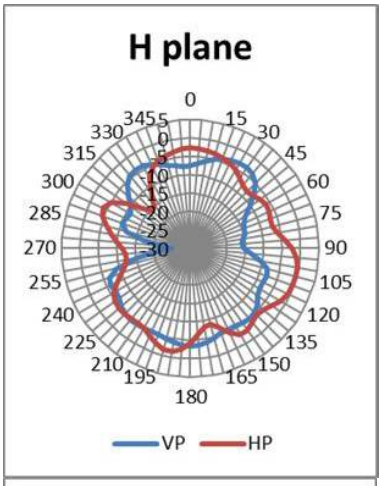


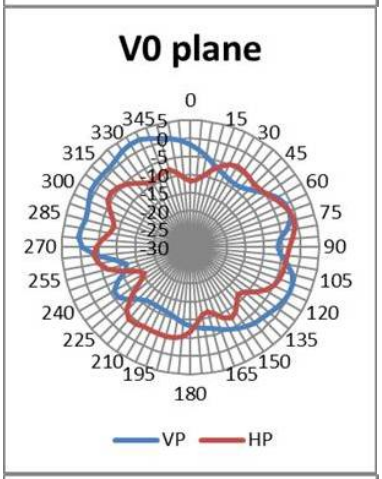
PRO-OB-468

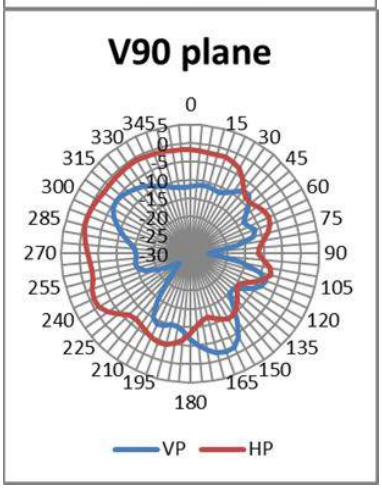
Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

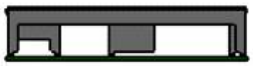
Radiation Characteristics – 2D Pattern (1710 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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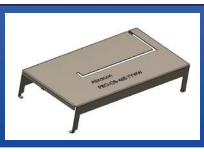
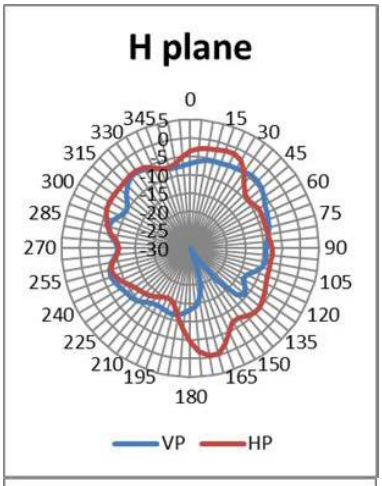


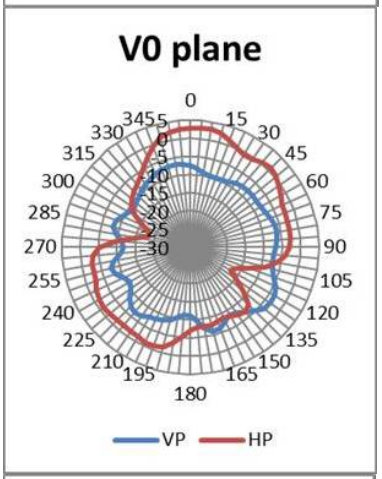
PRO-OB-468

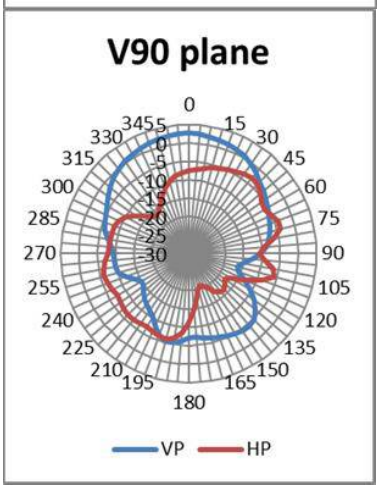
Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

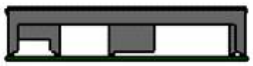
Radiation Characteristics – 2D Pattern (2170 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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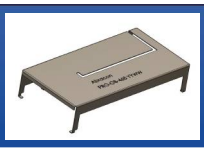


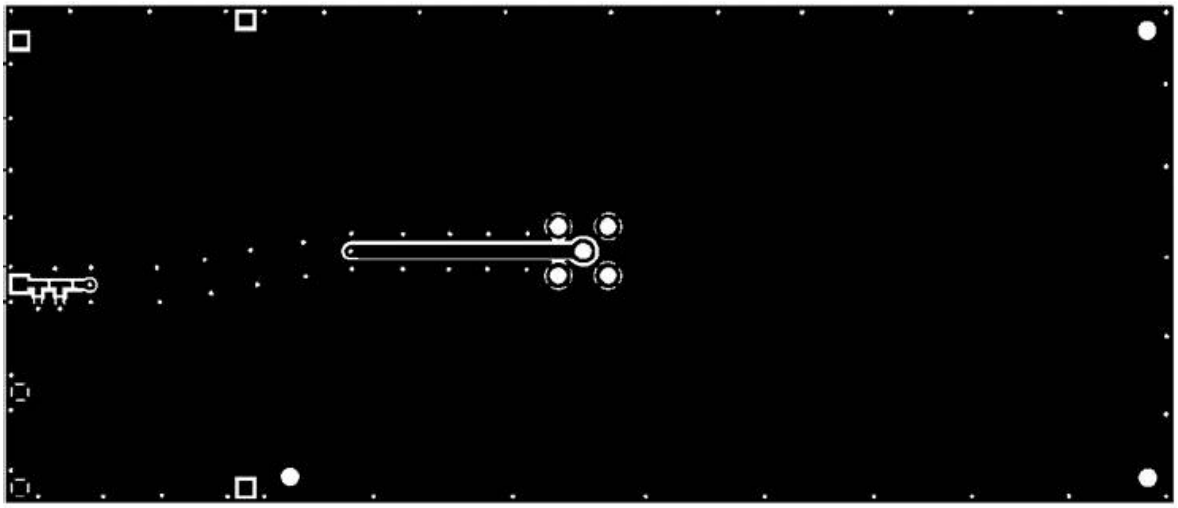
PRO-OB-468

Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

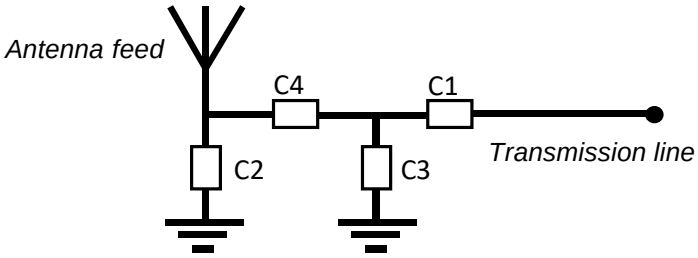
Evaluation Board Outline & Matching Circuit

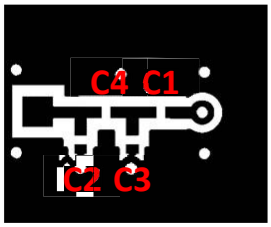
The evaluation board is developed to simplify antenna testing and evaluation. It has an arbitrary size of 120 x 52 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by 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.





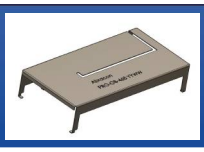
Matching circuit

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 = 2.4nH (Murata LQW15AN2N4B00)
C2 = N/A
C3 = 0.5pF (Murata GJM1555C1HR50WB01)
C4 = 5.6pF (Murata GJM1555C1H5R6WB01)

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.

GSM/UMTS - ProAnt OnBoard Antenna



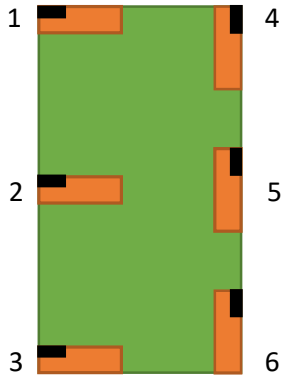
PRO-OB-468

Request Samples | Check Inventory

49.93 x 24.97 x 10 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

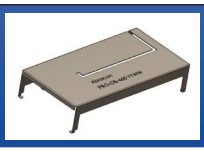
The antenna should be aligned with the PCB edge if possible, preferably with the GND pin(s) close to a corner.

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.

GSM/UMTS - ProAnt OnBoard Antenna



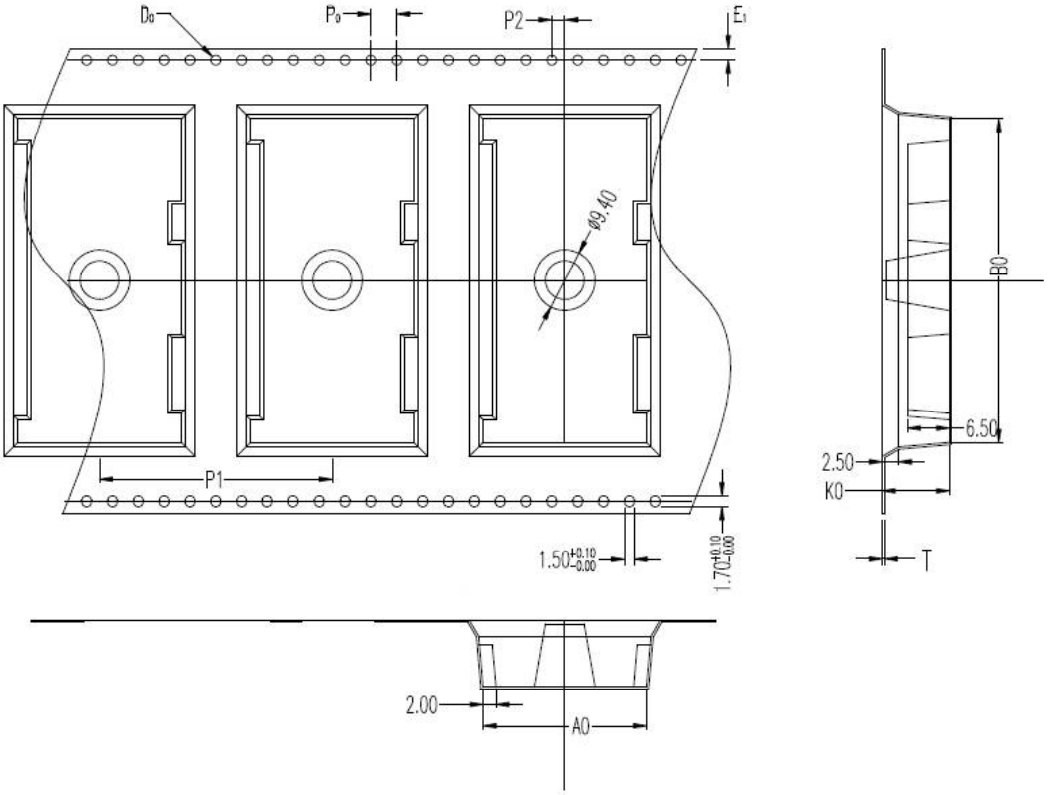
PRO-OB-468

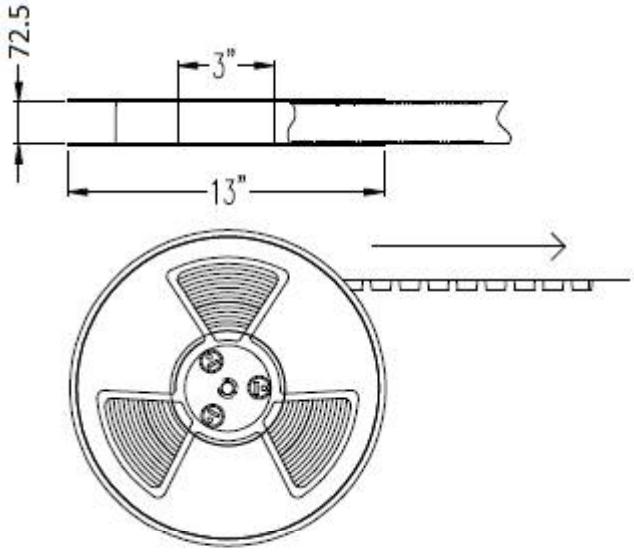
Request Samples | Check Inventory

49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13" reel is 100 pcs.





A_0	25.3 ±0.1
B_0	50.3 ±0.1
D_0	ø1.5 $^{+0.10}_{-0.00}$
E_1	1.75 ±0.1
F	26.2 ±0.15
K_0	10.4±0.1
P_0	4.0 ±0.1
P_1	12.0 ±0.1
P_2	2.0 ±0.15
S_0	
T	0.4 ±0.05
W	72.0 ±0.3

Unit: mm (unless otherwise noted)

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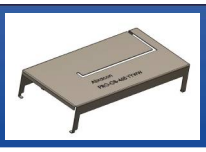


PRO-OB-468

Request Samples | Check Inventory

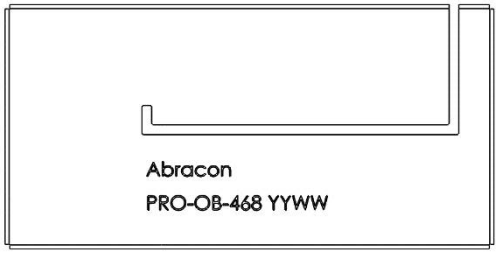
49.93 x 24.97 x 10 mm
RoHS/RoHS II Compliant
MSL Level = 1

Part Marking

The top marking of the antenna is arranged according to the following illustration.

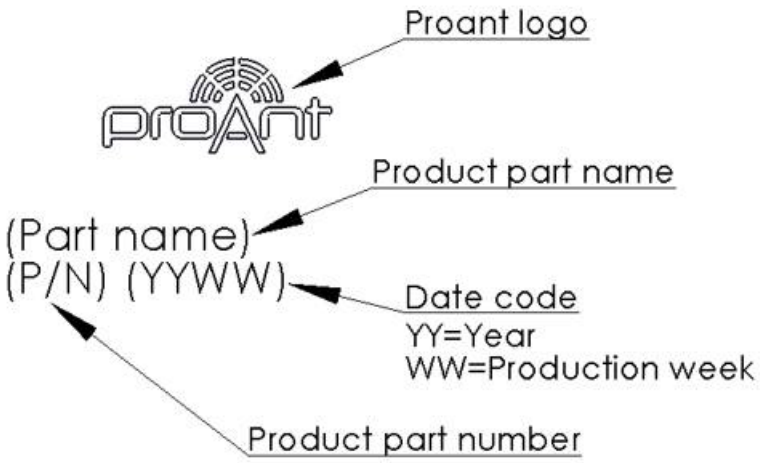
Abracon
PRO-OB-468
Product part number

YYWW
Date code
YY=Year
WW=Week



Example top marking

There will be a transition period for the part marking until production batches after 2222 (YYWW). Produced batches before 2222 are marked according to the below illustration.



Example top marking

OnBoard 2.4 GHz Mini SMD - Antenna

PRO-OB-607

Request Samples

Check Inventory

9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Features

- Ultra Compact
- Low Profile of 2 mm
- Mixed Linear Polarization
- Peak Gain of -0.6 dBi
- Surface Mount
- Durable-Shelf life of up to 10 years

Applications

- Wi-Fi/BT/BLE/ZigBee/ISM Applications
- IoT, M2M
  - Industrial
  - Infrastructure
  - Medical
- Remote Technology / Monitoring
- Network Devices
- Consumer Tracking
- Smart Home
- Smart Wearables

Product Image

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OnBoard 2.4 GHz Mini SMD - Antenna

PRO-OB-607

Request Samples | Check Inventory

9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification	Unit
Operating Frequency	2400 - 2497	MHz
Return Loss	< -6.3	dB
Polarization	Mixed Linear	-
Peak Gain	-0.6	dBi
Efficiency	> 23	%
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	9.90 x 4.30 x 2.00 mm
Evaluation board Dimension	48 x 18 mm
Mounting Type	Surface Mount

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +125°C
Storage Temperature	
Maximum Temperature	400°C
RoHS Compliance	Yes Compliant with EU directive 2011/65/EU and 2015/863
Shelf life	10 years
MSL	Level 1, unlimited

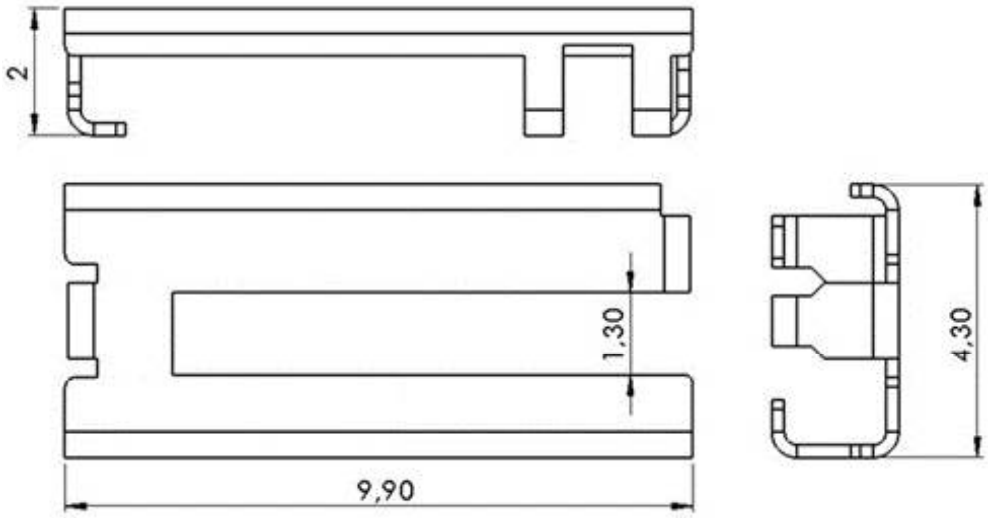
OnBoard 2.4 GHz Mini SMD - Antenna

PRO-OB-607

Request Samples | Check Inventory

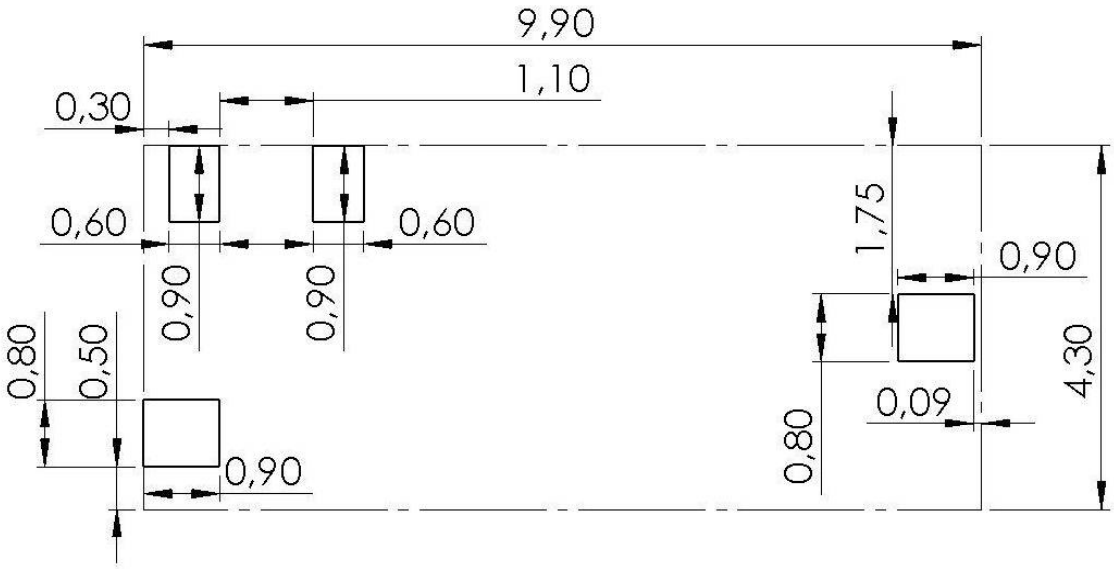
9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Product Dimensions



Unit : mm

Antenna pins and keep-out block



Unit : mm

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OnBoard 2.4 GHz Mini SMD - Antenna

PRO-OB-607

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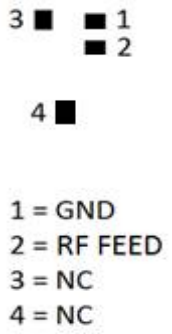
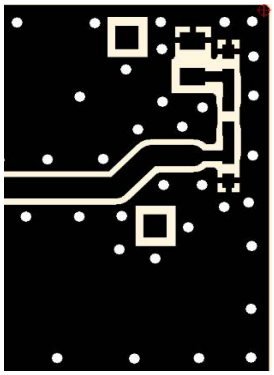
9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

PCB layout and antenna pin numbering

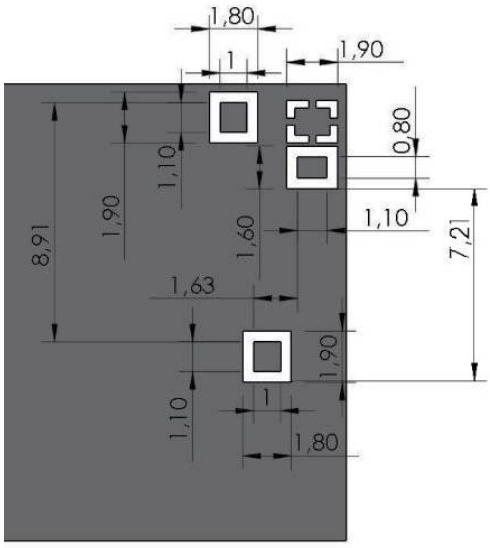
The antenna uses PIFA technology and should thus be mounted on a ground plane. If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that there is a ground clearance around the 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.



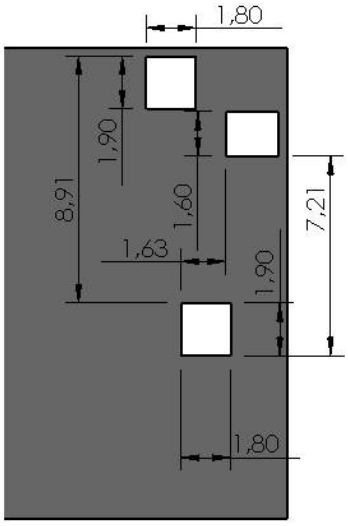
Pin configuration



PCB Layout (from evaluation board)



Top Layer



Bottom Layer (Clearance through all layer)

Unit: mm

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OnBoard 2.4 GHz Mini SMD - Antenna

PRO-OB-607

Request Samples | Check Inventory

9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup

The antenna measurements were all done in free space with the SMD 2400 Mini evaluation board (PRO-EB-609) that has a PCB size of 48 x 18 mm.

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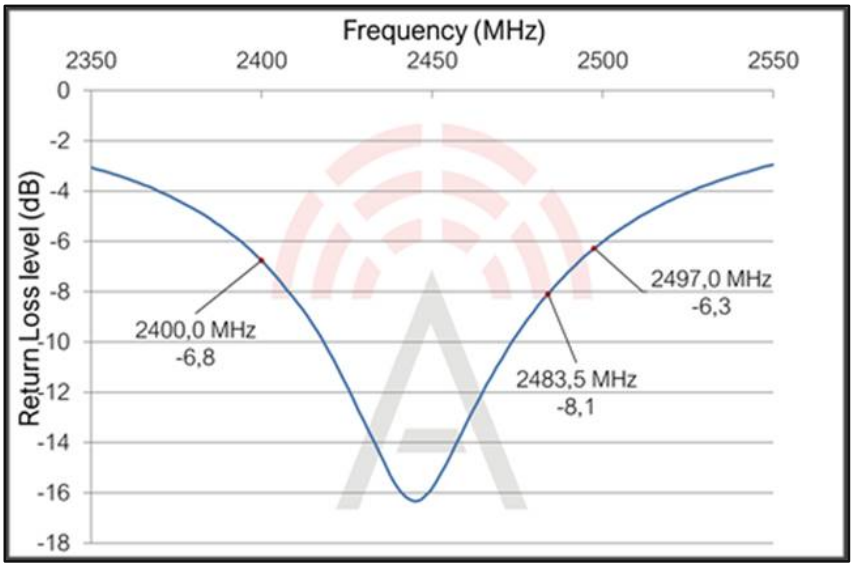
OnBoard 2.4 GHz Mini SMD - Antenna

PRO-OB-607

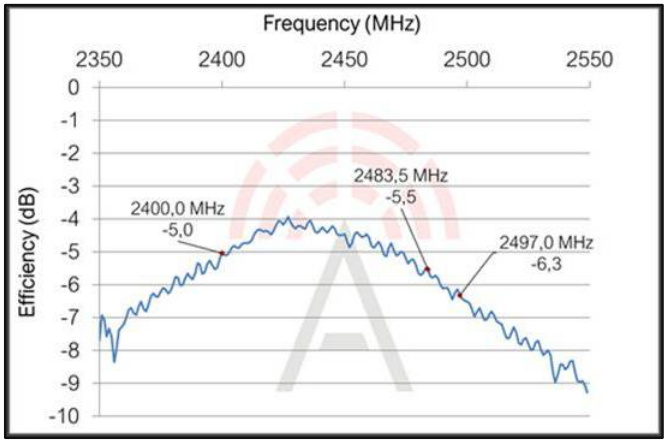
Request Samples | Check Inventory

9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

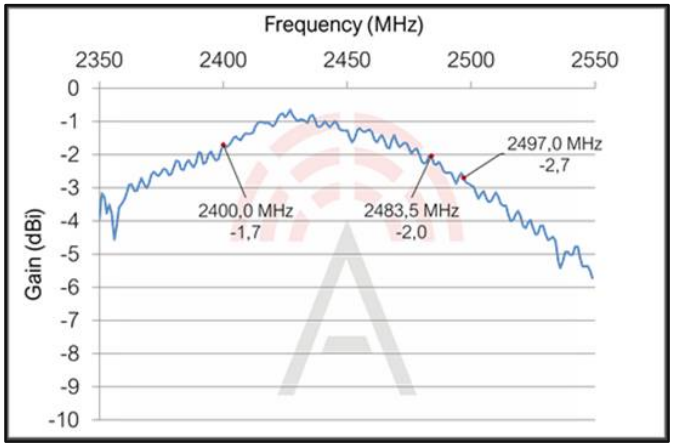
Reflection Characteristics – Return Loss



Total Radiation Efficiency



Maximum Radiation Gain



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Request Samples

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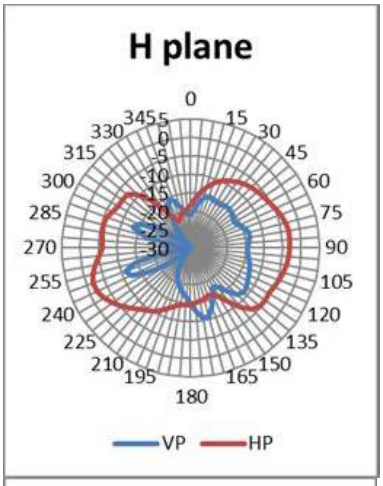
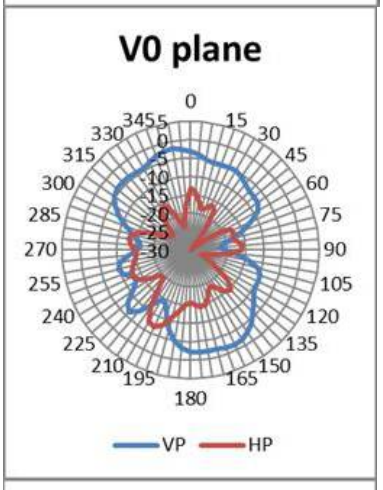
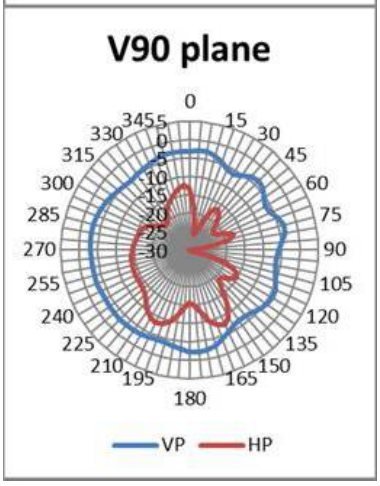
9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

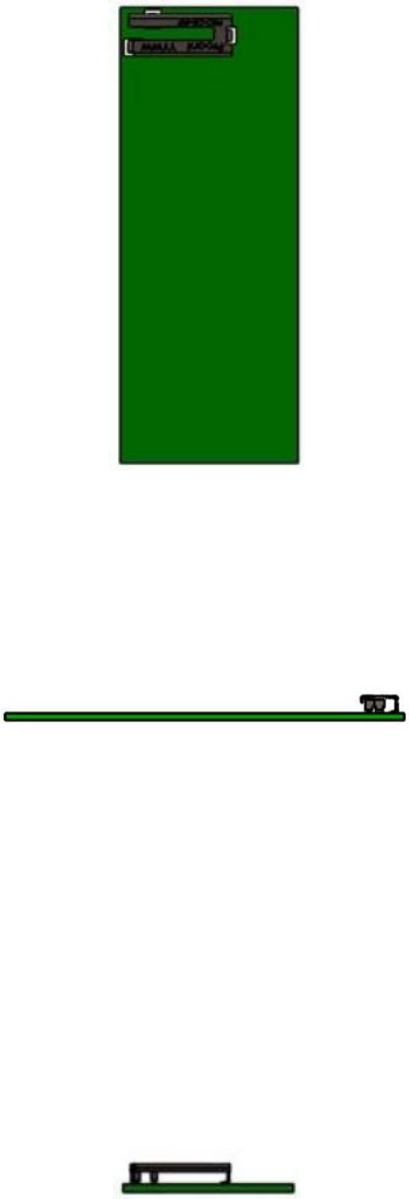
Radiation Characteristics – 2D Pattern (2400 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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ABRACON IS
ISO9001-2015
CERTIFIED

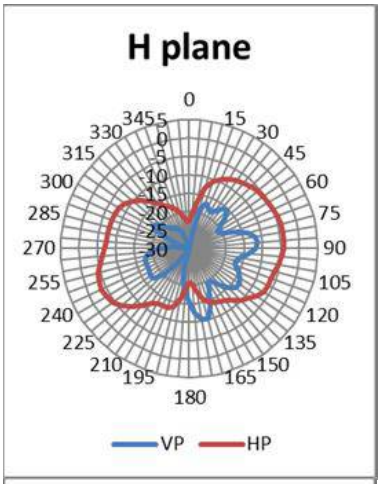
OnBoard 2.4 GHz Mini SMD - Antenna

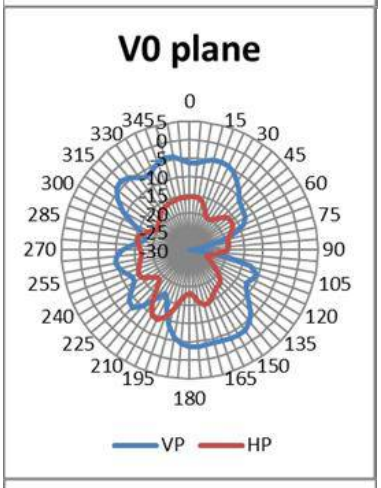
PRO-OB-607

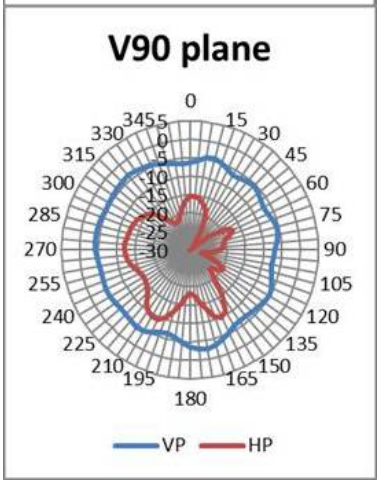
Request Samples | Check Inventory

9.90 x 4.30 x 2.00 mm
RoHS/RoHS II Compliant
MSL Level = 1

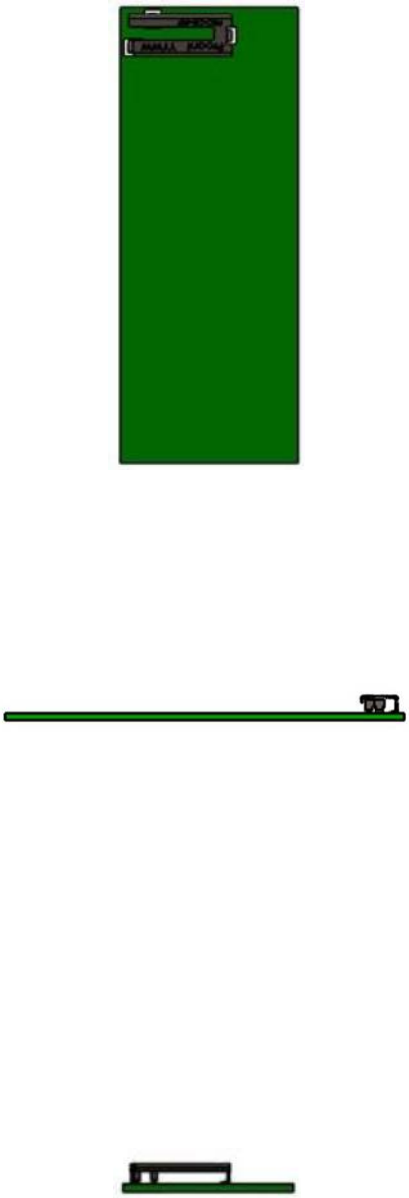
Radiation Characteristics – 2D Pattern (2497 MHz)







VP: Vertical Polarization
HP: Horisontal Polarization



Unit: dBi

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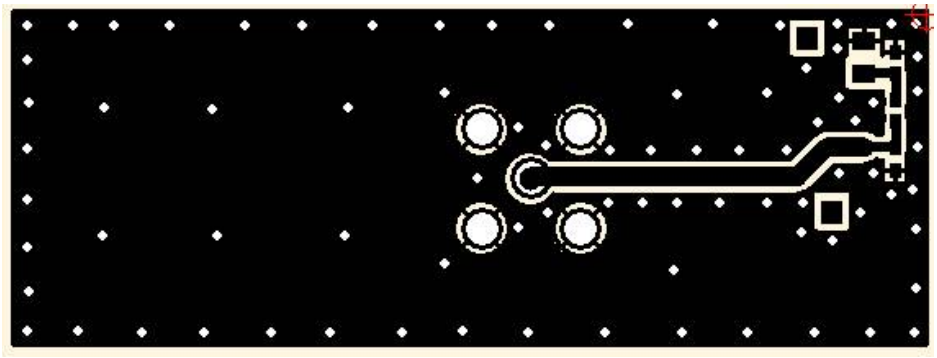
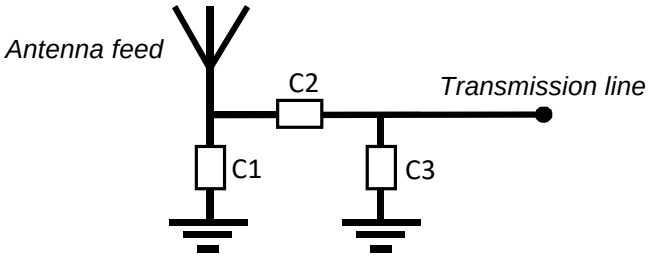
Evaluation Board Outline & Matching Circuit

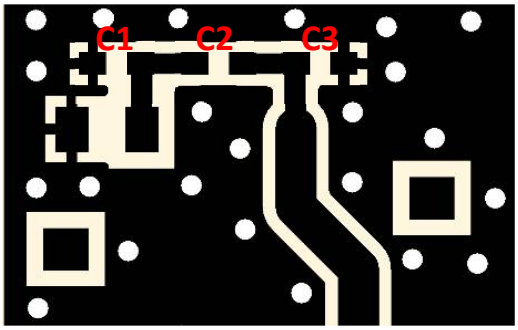
The evaluation board (PRO-EB-609) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 48 x 18 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations 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 2.4 GHz band. The component values for this setup are:

C1 = 0.4 pF C2 = 0.6 pF C3 = 1.1 pF

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

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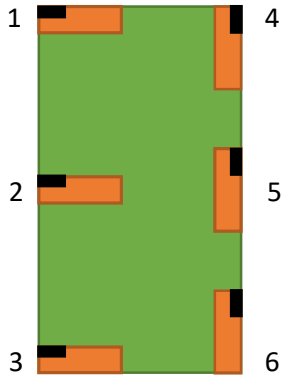
General Implementation Guidelines

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.

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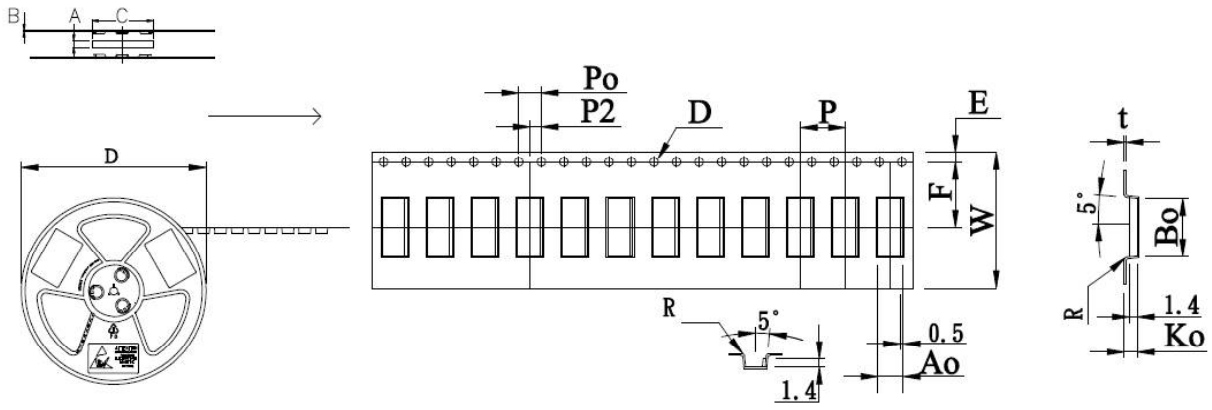
Packaging

The antenna is delivered on tape and reel according to following specifications. The quantity per 13" reel is 2500 pcs.

SPEC	13" REEL W: 24 mm Material: HIPS				
ITEM	A	B	C	D	Surface Resistivity
DIM	24.5 ± $^{+1.0}_{-0.1}$ mm	2.2 ± 0.2mm	100 ± 1.0 mm	330 ± 1.5mm	<= 10^{9-11} Ω/□
ALTERNATE					



ITEM	SPEC
W	$24.0^{+0.30}_{-0.30}$
Ao	$4.50^{+0.10}_{-0.10}$
Bo	$10.2^{+0.10}_{-0.10}$
Ko	$2.30^{+0.10}_{-0.10}$
P	$8.00^{+0.10}_{-0.10}$
F	$11.5^{+0.10}_{-0.10}$
E	$1.75^{+0.10}_{-0.10}$
Do	$1.50^{+0.10}_{-0.00}$
D1	$0.00^{+0.10}_{-0.10}$
Po	$4.00^{+0.10}_{-0.10}$
P2	$2.00^{+0.10}_{-0.10}$
t	$0.30^{+0.05}_{-0.05}$

Unit: mm (unless otherwise noted)

NOTE:

- 10 sprocket hole pitch cumulative tolerance.
- Carrier camber not to exceed 1mm in 250mm.
- Ao and Bo measured on a plane 0.35mm above the bottom of the pocket.
- Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
- All dimensions meet EIA-481-D requirements.
- Material: Blacknductivelystyrene
- Component load per 13" reel: 2500pec/20.5M (before & after 56 pcs)

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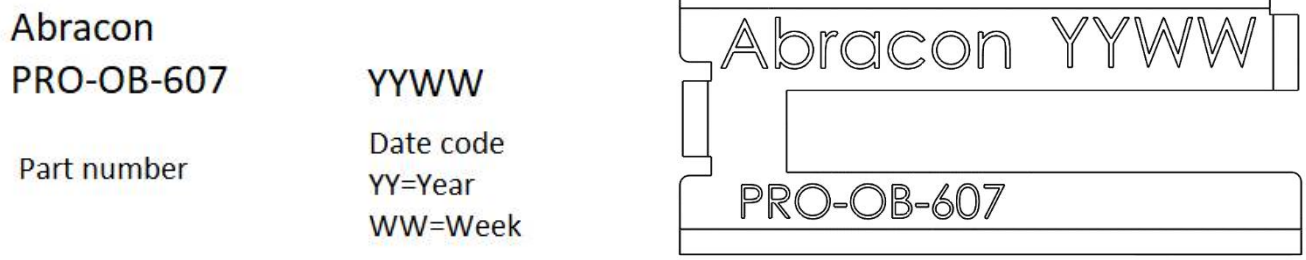
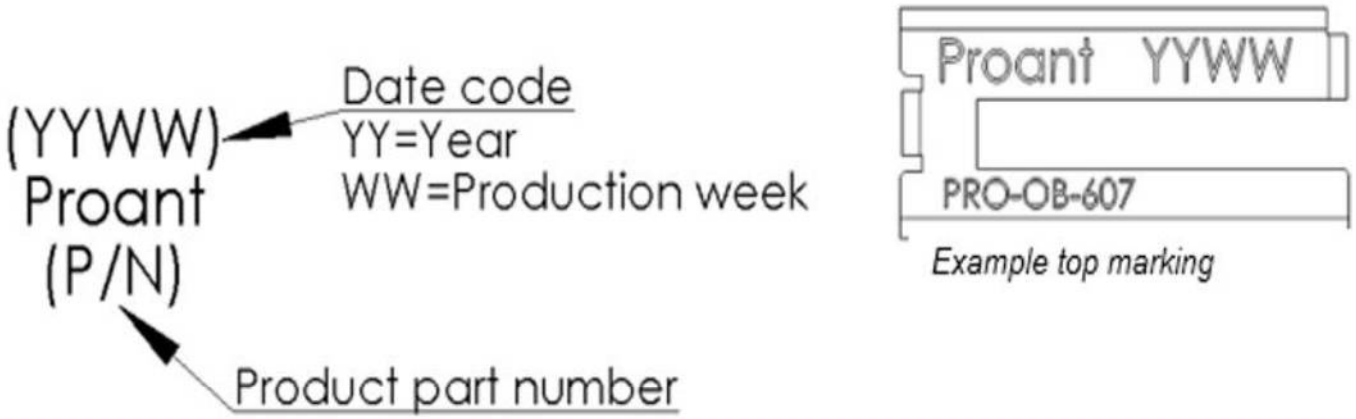
Part Marking

The top marking of the antenna is arranged according to the following illustration.



There will be a transition period for the part marking until production batches after 2222 (YYWW). Produced batches before 2222 are marked according to the below illustration.



Ordering Information

Part number	Part name	Details
PRO-OB-607	OnBoard SMD 2400 Mini	Antenna for 2.4 GHz ISM band.
PRO-EB-609	Evaluation board, Onboard SMD 2400 Mini	Evaluation board with PRO-OB-607 for WLAN/Wifi, Bluetooth, Zigbee, RFID, WirelessHART applications.

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