

Embedded LTE Chip Antenna



AANI-CH-0057

Request Samples



Check Inventory



40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

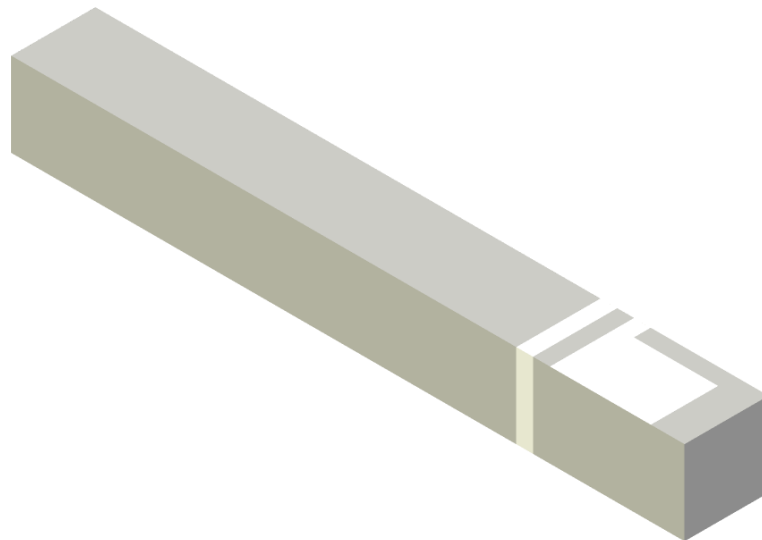
Features

- Ultra-wide band 698MHz ~ 2700MHz
- Compact & Low-Profile
- VSWR: ≤ 2.0
- Peak Gain: 4.5 dBi
- Efficiency: up to 70 %
- Surface Mount (SMD)
- High efficiency across cellular bands

Applications

- Internet of Things (IoT) devices
- LTE-M, Cat M, Cat M1, NB-IoT
- LTE CAT 1 up to CAT 20 supported
- CBRS and 5G bands supported
- Smart Home networking
- Networking & Telecommunication

Product Image



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RoHS/RoHS II Compliant

MSL Level = N/A

Electrical Specification

Parameter	Specification		Unit
Operating Frequency	698-960	1700-2700	MHz
VSWR (Typ.)	< 2.0		
Peak Gain	1.5	4.5	dBi
Efficiency (Maximum)	55	70	%
Impedance	50		Ω
Polarization	Linear		
Radiation Pattern (Azimuth)	Omni-directional		

Note : All test measurements were conducted on 120 x 45 mm. Performance of the chip antenna will vary relative to the ground plane size in use.

Mechanical Specification

Parameter	Specification
Dimensions	40 x 5 x 5 mm
Evaluation Board size	140 x 60 mm
Recommended Ground Clearance for Antenna	60 x 12 mm
Mounting Type	Surface Mount
Material(s)	Ceramic

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Relative Humidity	90% to 95%
RoHS Complaint	Yes

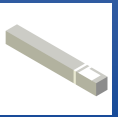


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40 x 5 x 5 mm

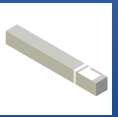
RoHS/RoHS II Compliant

MSL Level = N/A

Ordering Information

Part Number	Description
AANI-CH-0057	Embedded LTE Chip Antenna
AANI-CH-0057-EVB	Embedded LTE Chip Antenna Evaluation Board

Embedded LTE Chip Antenna



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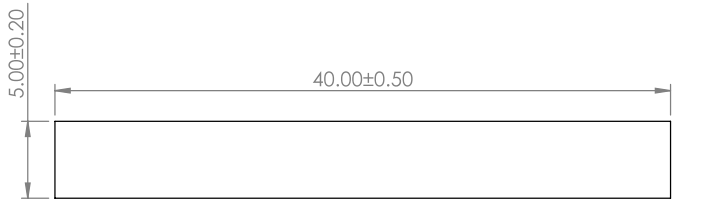


40 x 5 x 5 mm

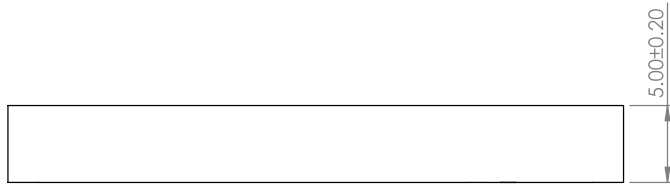
RoHS/RoHS II Compliant

MSL Level = N/A

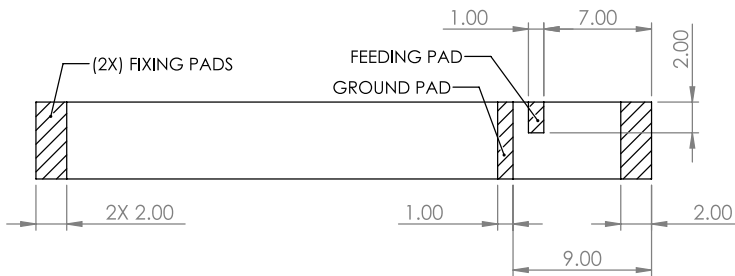
Product & Footprint & Land Pattern Dimensions



TOP VIEW

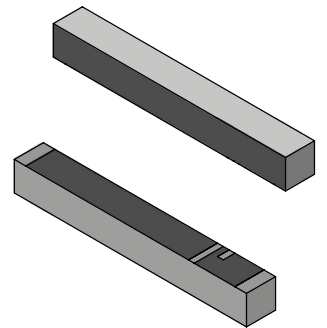
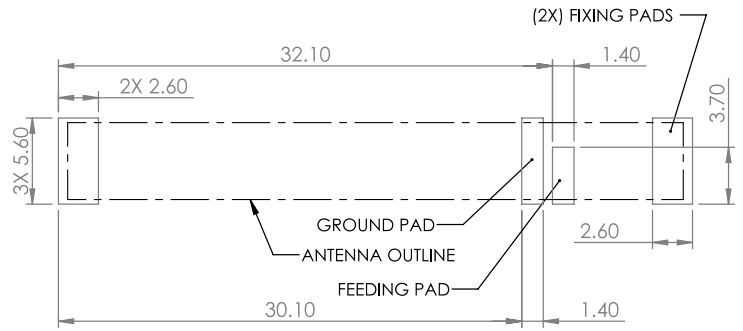


FRONT VIEW



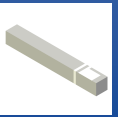
BOTTOM VIEW

Recommended Land Pattern



Unit: mm

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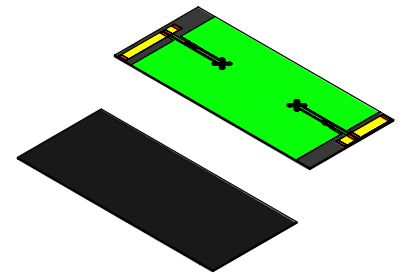
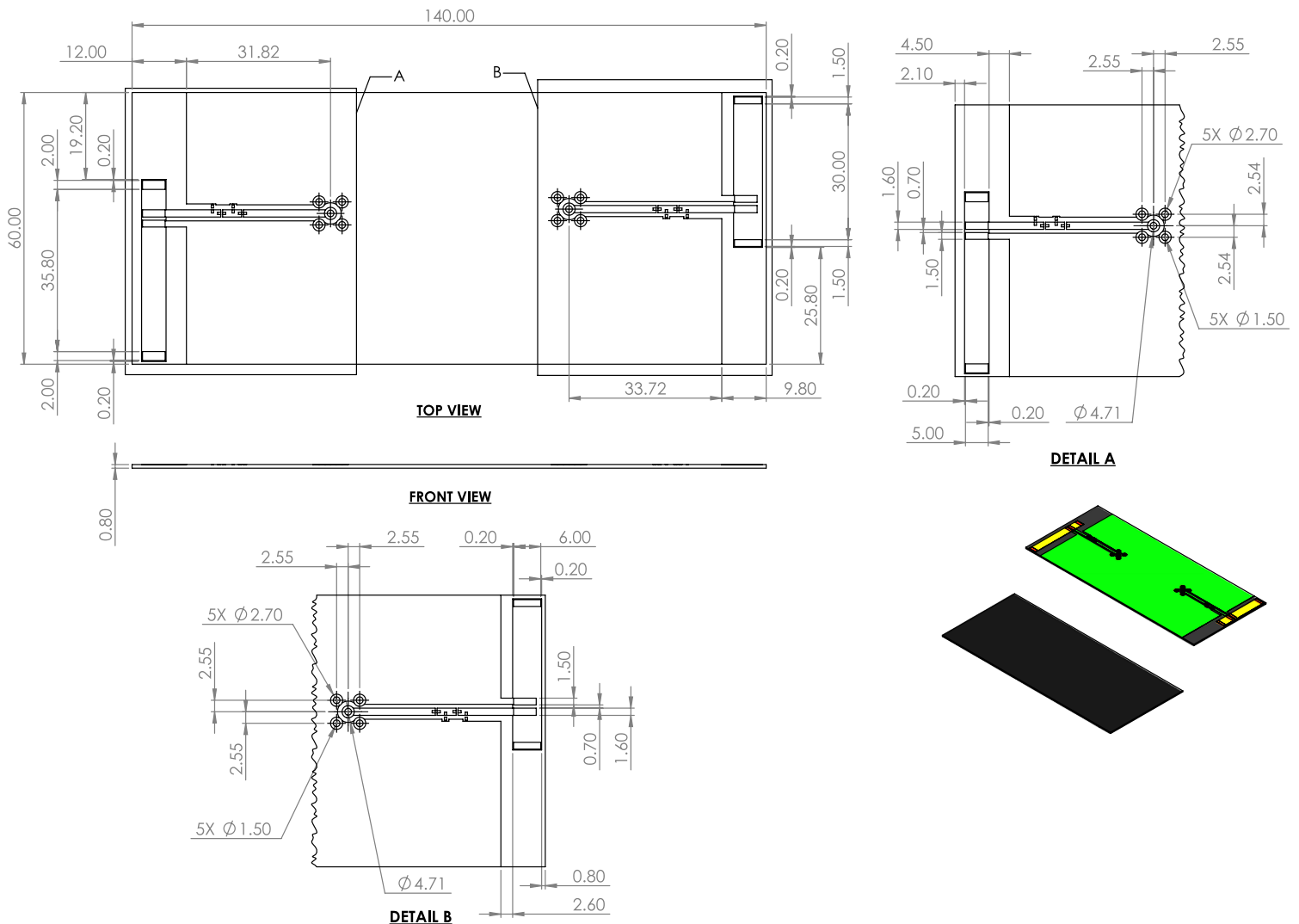


Check Inventory



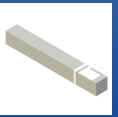
40 x 5 x 5 mm
RoHS/RoHS II Compliant
MSL Level = N/A

Evaluation Board Dimensions



Unit: mm

Embedded LTE Chip Antenna



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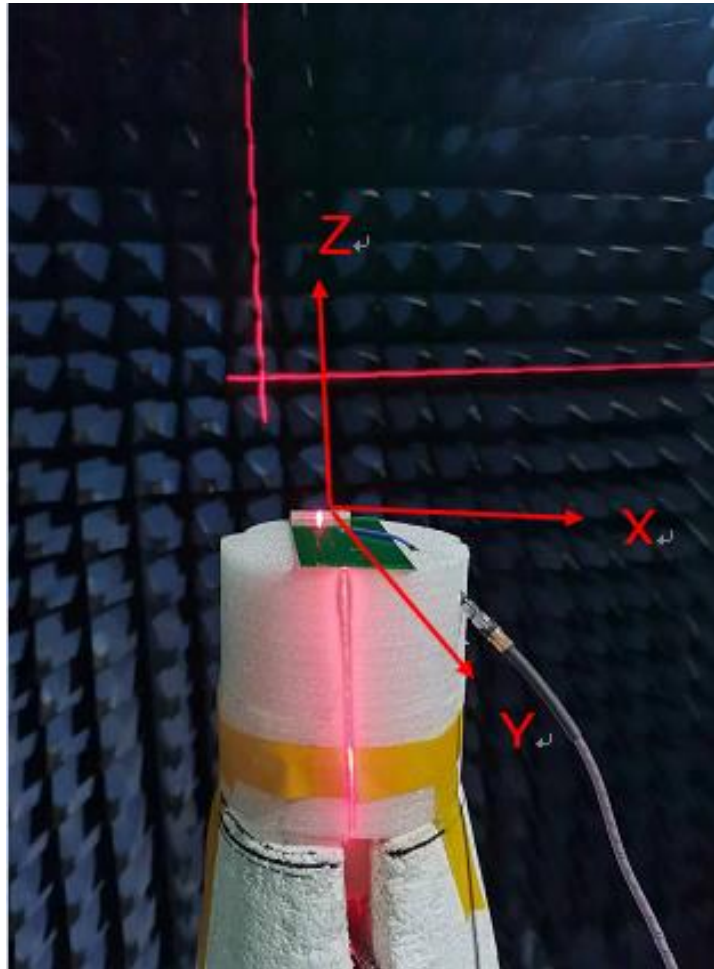


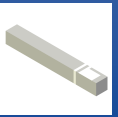
40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

Measurement Setup photo





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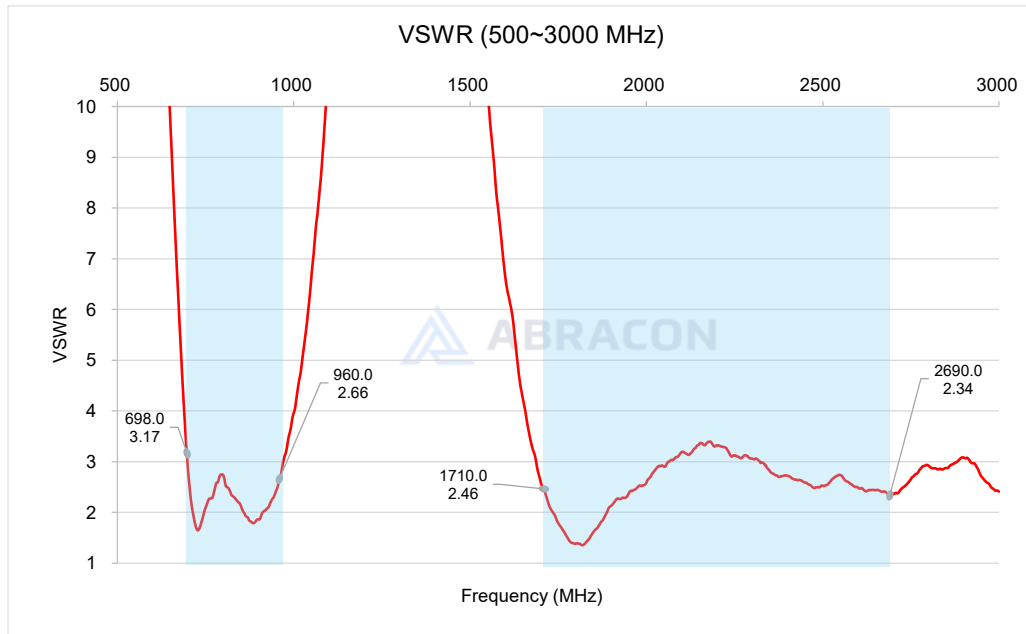
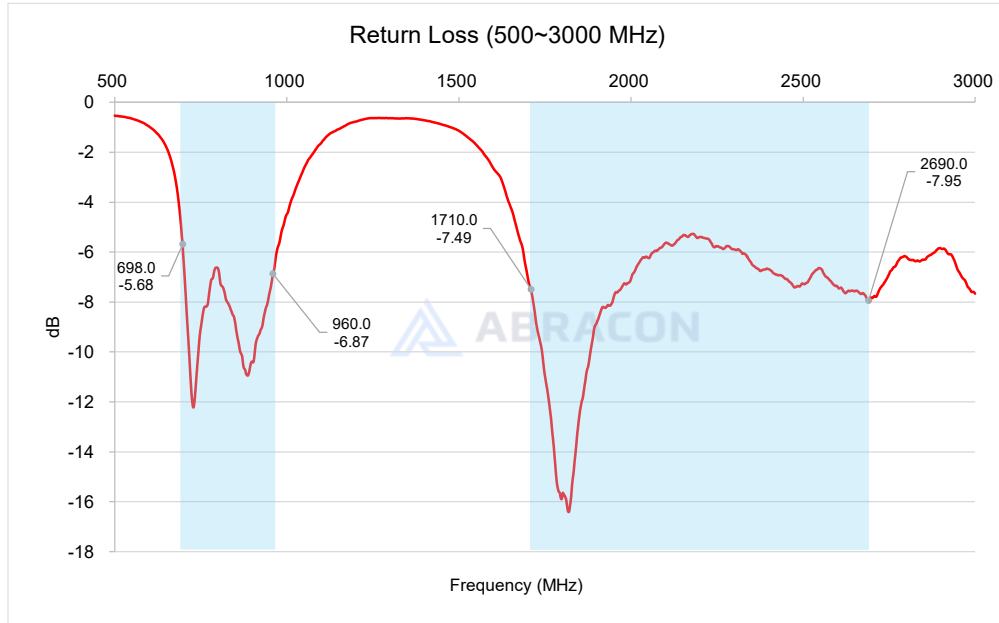


40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

Reflection Characteristics –Return Loss & VSWR



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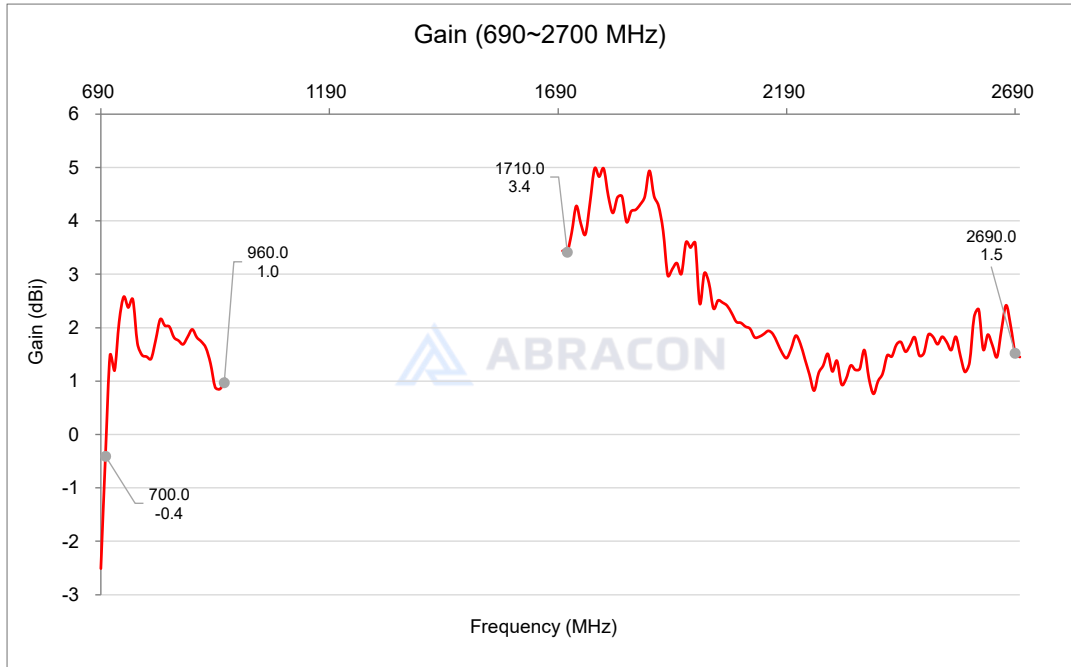


40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

Radiation Characteristics – Peak Gain



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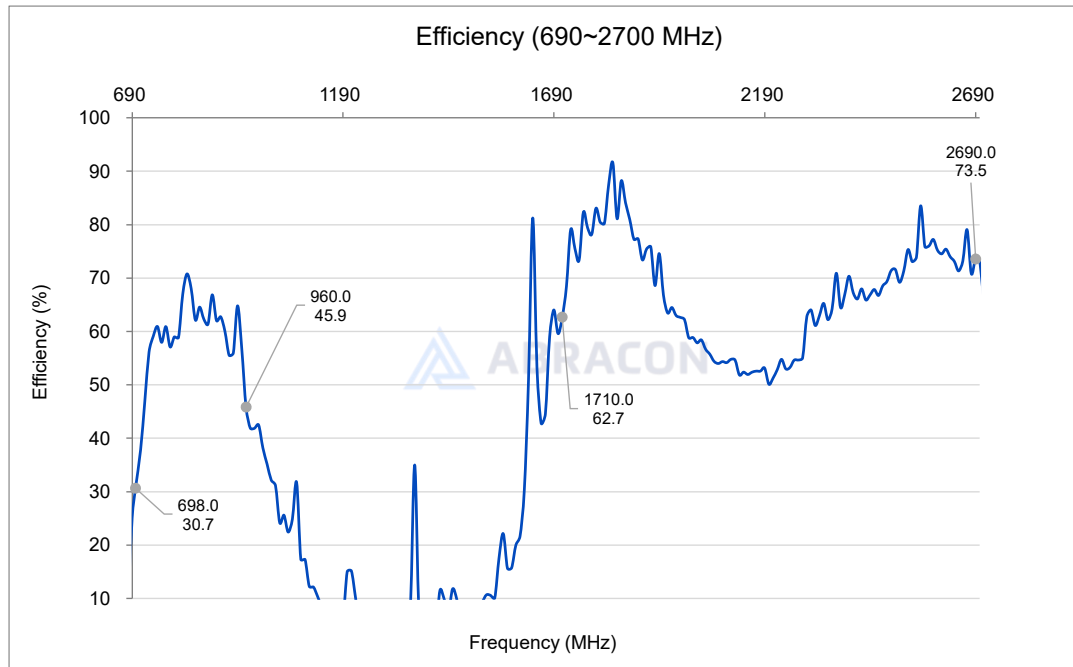


40 x 5 x 5 mm

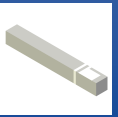
RoHS/RoHS II Compliant

MSL Level = N/A

Radiation Characteristics – Total Efficiency (%)



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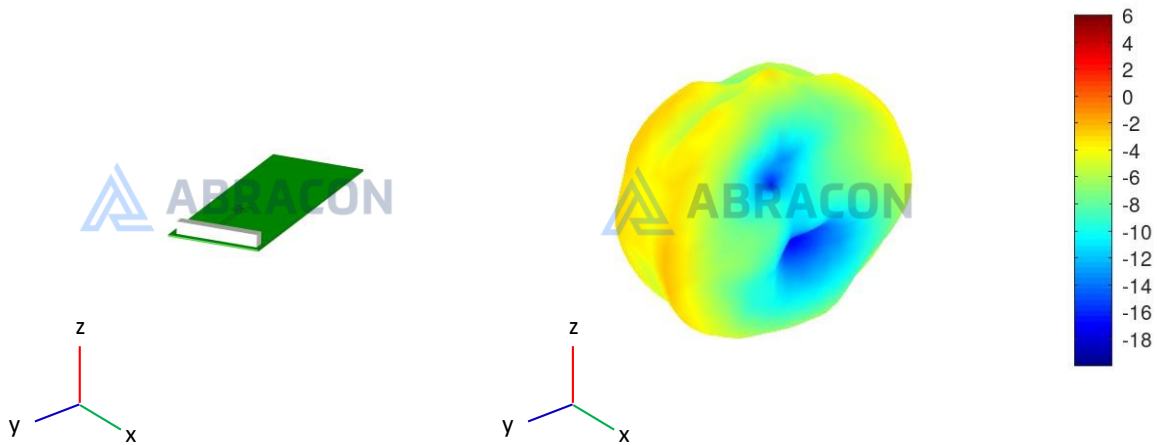
40 x 5 x 5 mm

RoHS/RoHS II Compliant

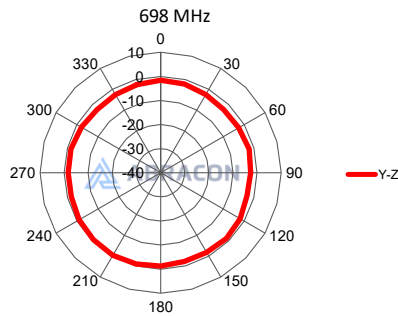
MSL Level = N/A

Radiation Characteristics – 3D & 2D Pattern

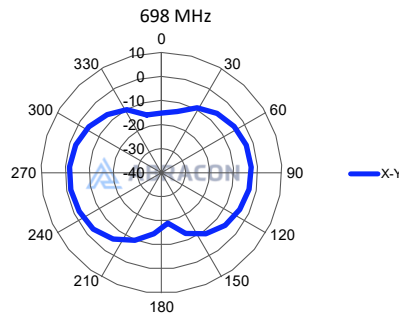
698MHz



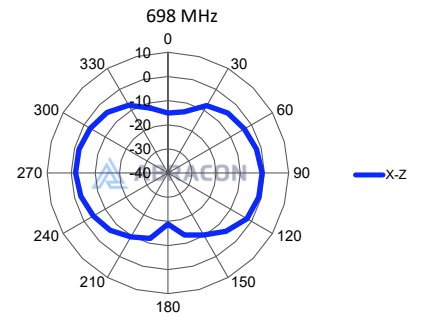
YZ plane



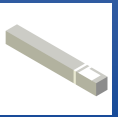
XY plane



XZ plane



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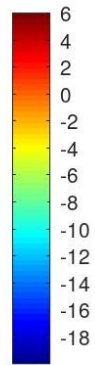
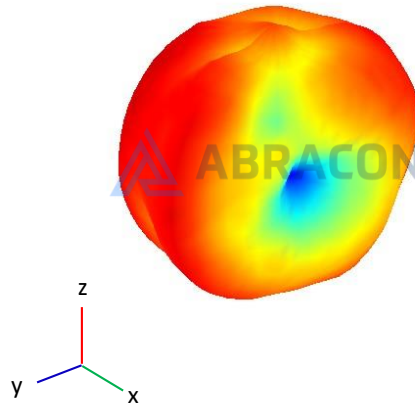
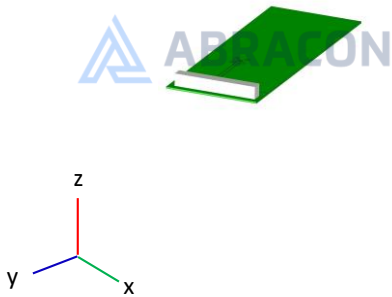


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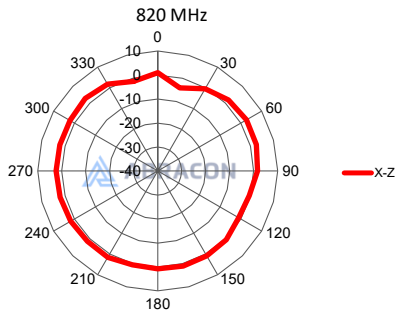


40 x 5 x 5 mm
RoHS/RoHS II Compliant
MSL Level = N/A

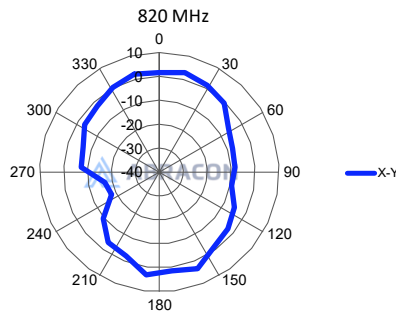
820MHz



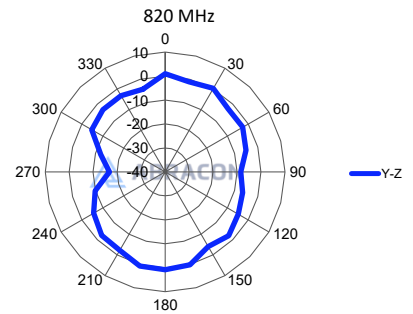
XZ plane



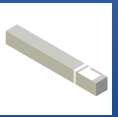
XY plane



YZ plane



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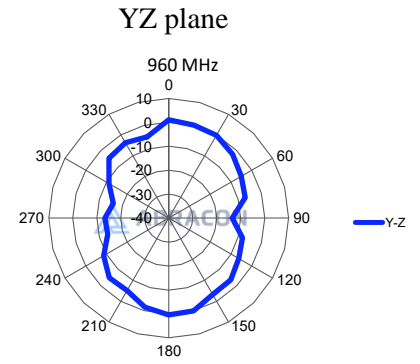
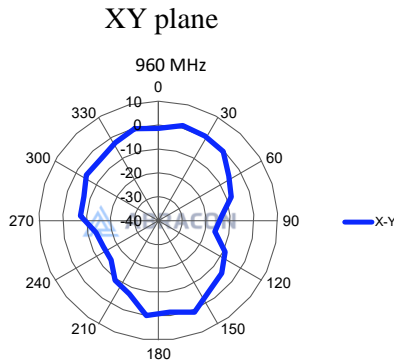
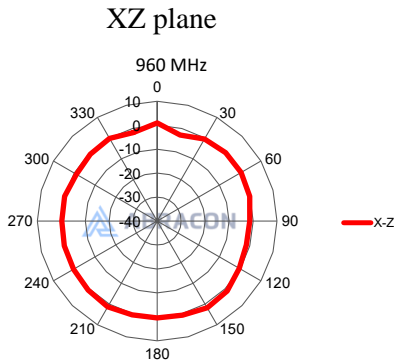
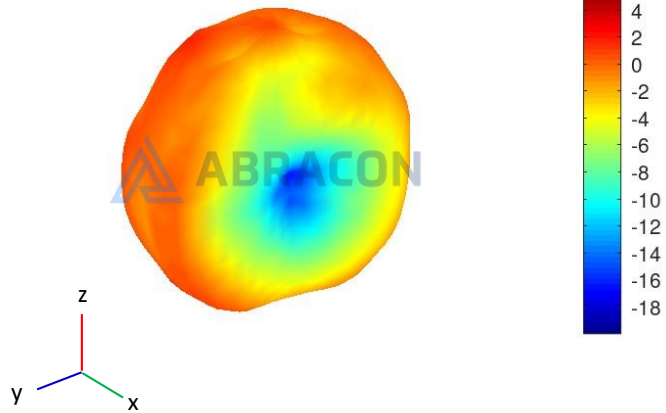
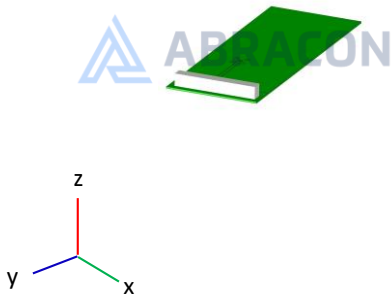


40 x 5 x 5 mm

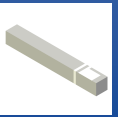
RoHS/RoHS II Compliant

MSL Level = N/A

960MHz



Embedded LTE Chip Antenna



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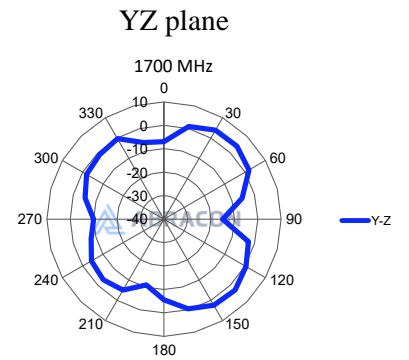
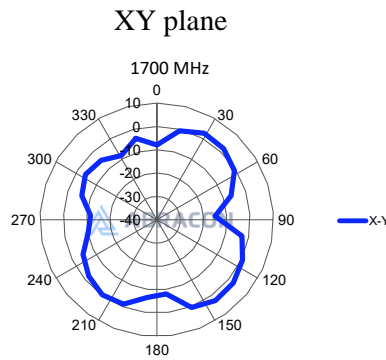
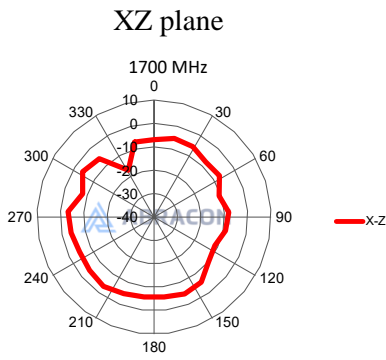
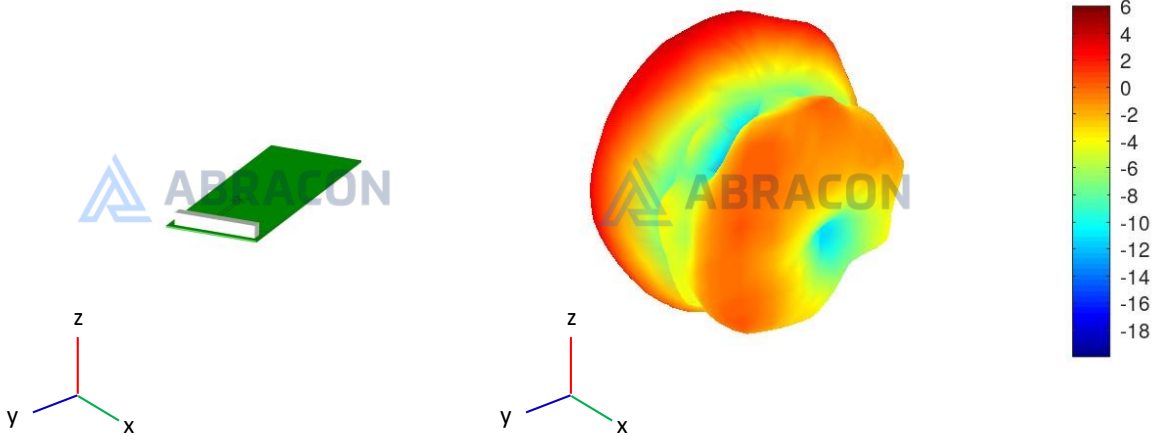


40 x 5 x 5 mm

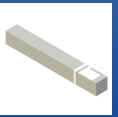
RoHS/RoHS II Compliant

MSL Level = N/A

1700MHz



Embedded LTE Chip Antenna



AANI-CH-0057

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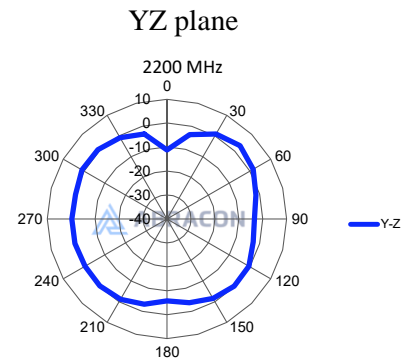
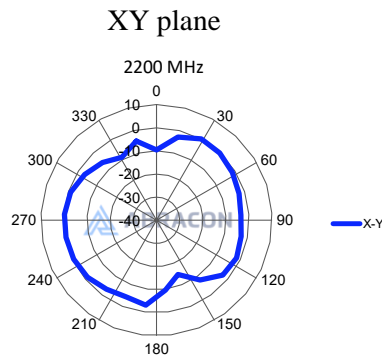
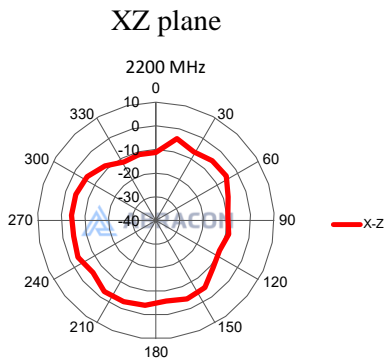
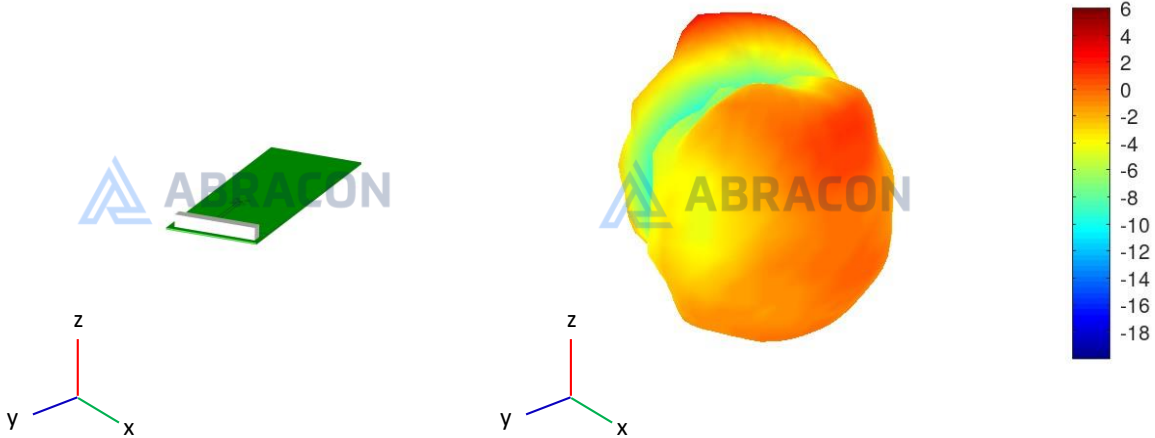


40 x 5 x 5 mm

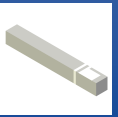
RoHS/RoHS II Compliant

MSL Level = N/A

2200MHz



Embedded LTE Chip Antenna



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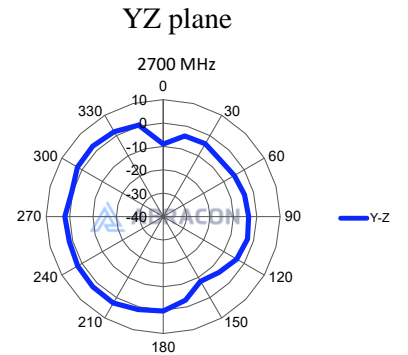
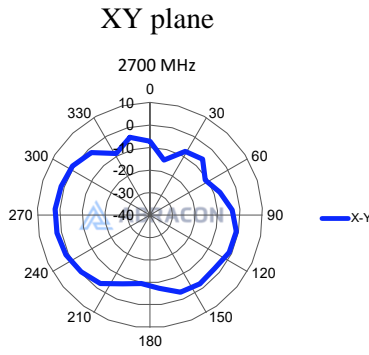
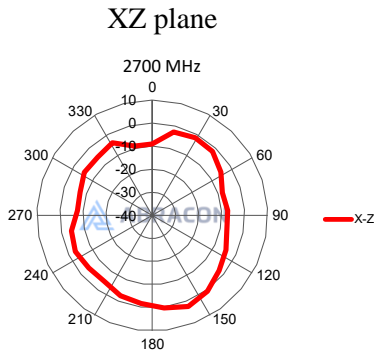
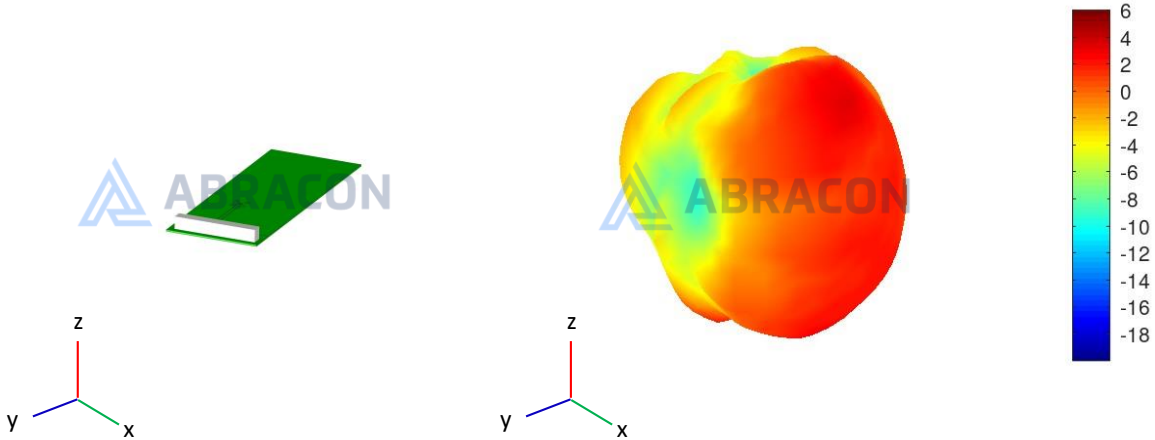


40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

2700MHz



Embedded LTE Chip Antenna



AANI-CH-0057

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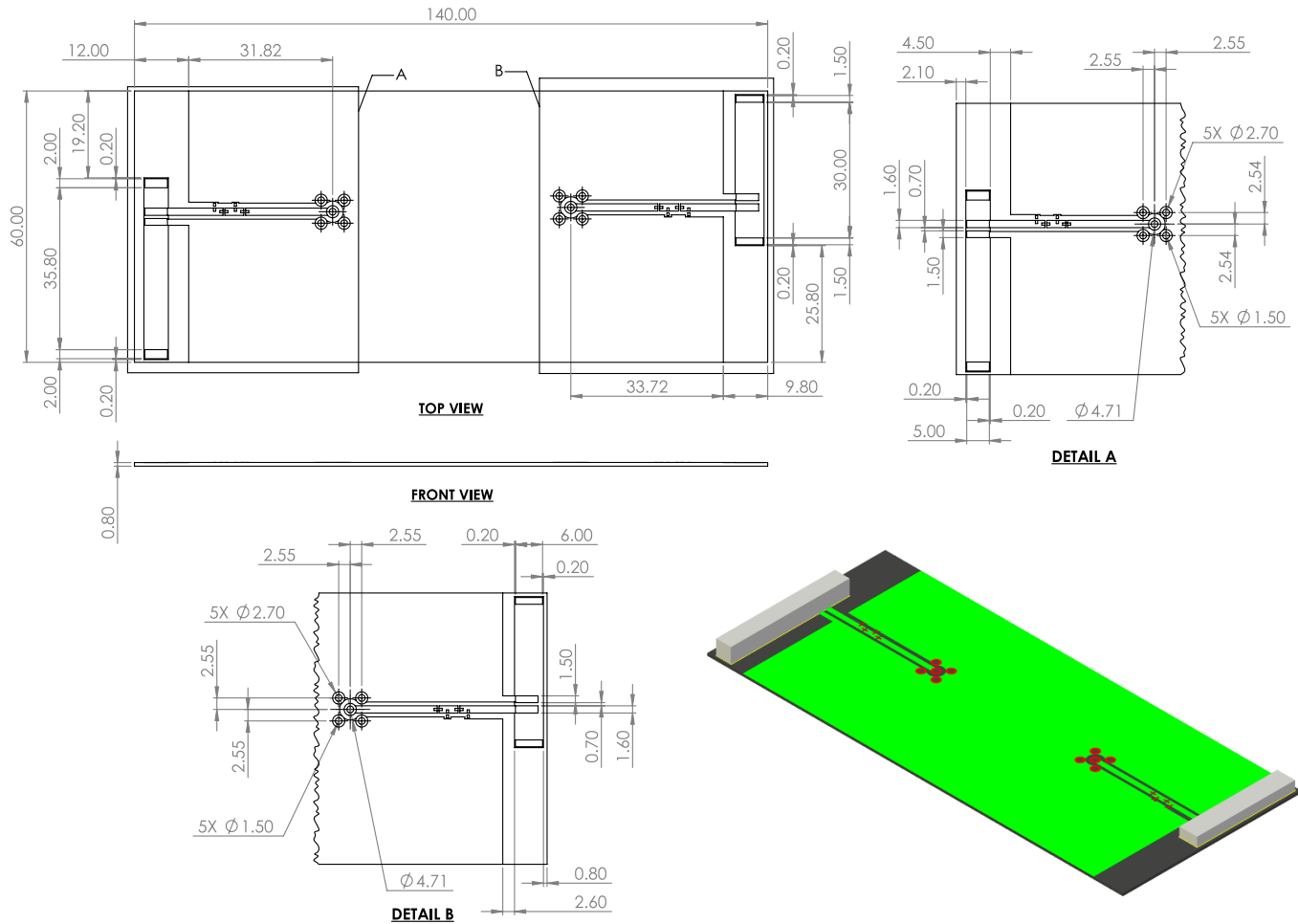
40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

Evaluation Board Outline & Matching Circuit

The evaluation board (<AANI-CH-0057-EVB>) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 140 x 60 mm. 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.



Unit: mm

Evaluation board outline

Embedded LTE Chip Antenna



AANI-CH-0057

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40 x 5 x 5 mm

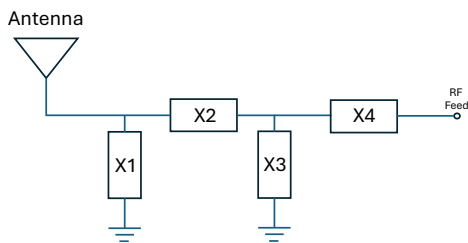
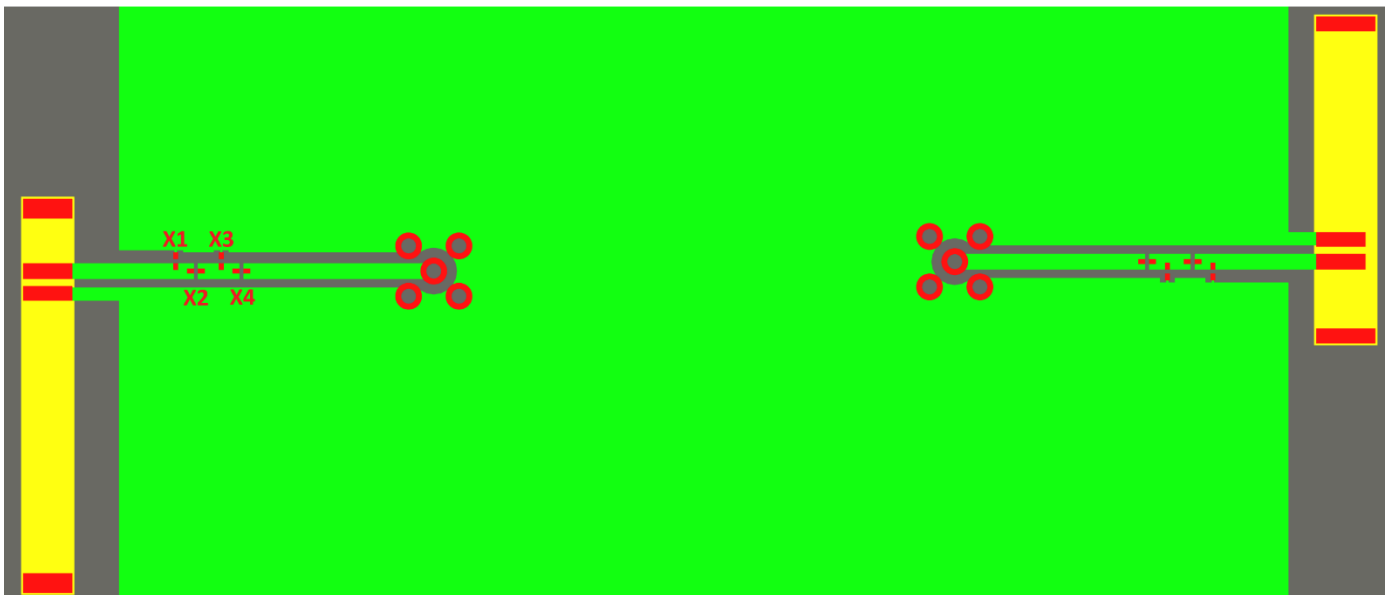
RoHS/RoHS II Compliant

MSL Level = N/A

The evaluation board has a matching circuit implemented next to the antenna. This is aimed to enable optimization possibilities for the user.

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

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.



Location	Description
X1	5.6 nH
X2	3.9 pF
X3	N/C
X4	0 ohm

Embedded LTE Chip Antenna



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Reflow Profile [JEDEC J-STD-020]

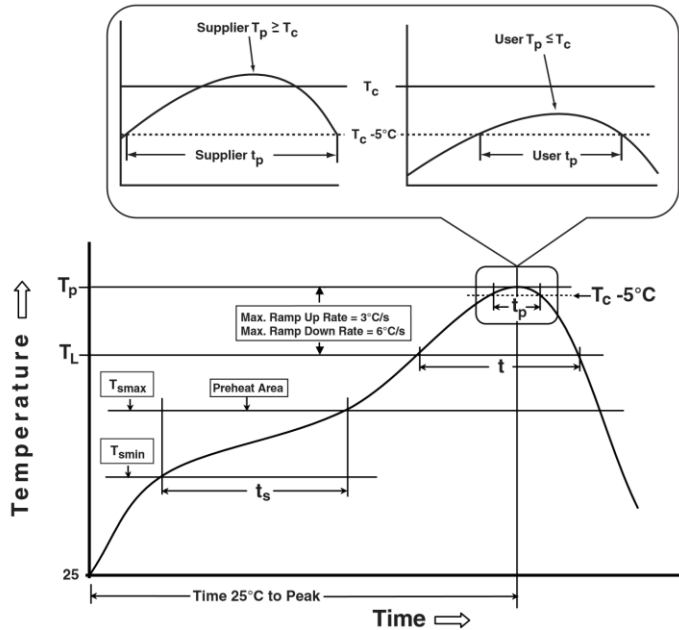


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

Table 2

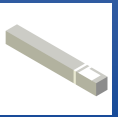
Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6mm	260°C	260°C	260°C
1.6mm - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	130°C
Temperature maximum (T_{smax})	150°C	175°C
Time (T_{smin} to T_{smax}) (t_s)	60 – 120 sec.	60 – 120 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at Liquidous (T_L)	60 – 150 sec.	60 – 150 sec.
Peak package body temperature (T_p)*	See Table 1	See Table 2
Time (T_p)** within 5°C of the specified classification temperature (T_c)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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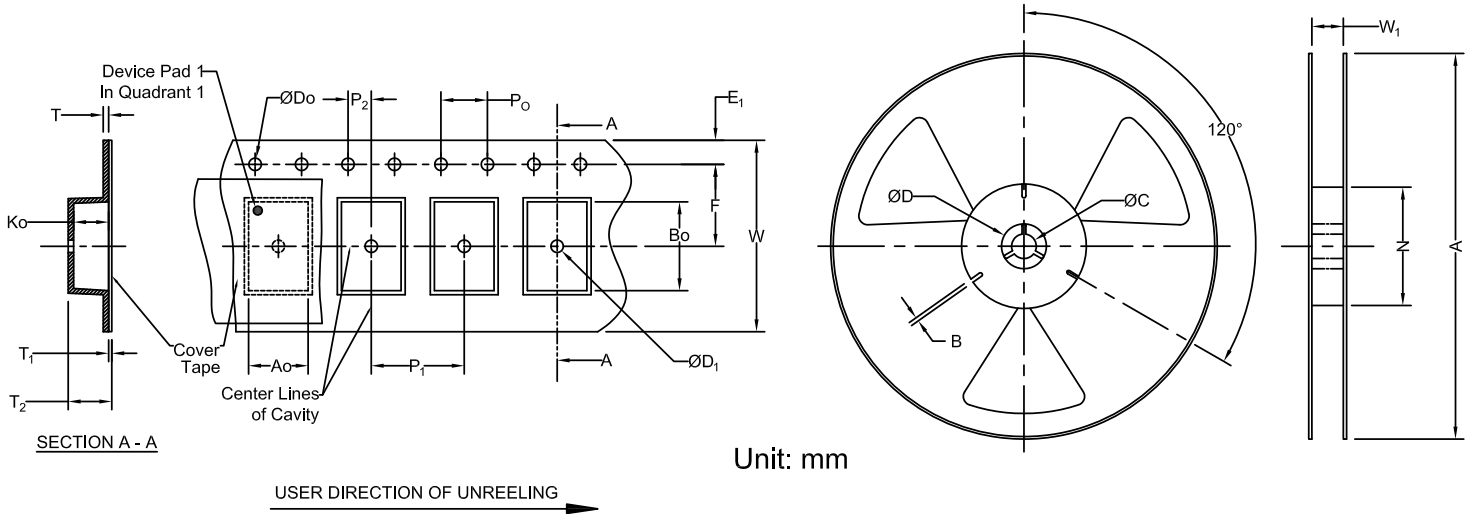
40 x 5 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

Packaging

Tape & Reel Dimension



Unit: mm

Carrier Tape Specifications (mm)									
Do	Ko	Bo	E ₁	P ₀	P ₂	F	P ₁	W	Reel Qty
1.50 ± 0.1	5.5 ± 0.1	41.2 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.1	26.2 ± 0.1	12.0 ± 0.1	56 ± 0.30	500

Reel Specifications (mm)	
A	W ₁
330 ± 1.5	57 ± 0.5

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