

LTE 5G Chip Antenna

AANI-CH-0002

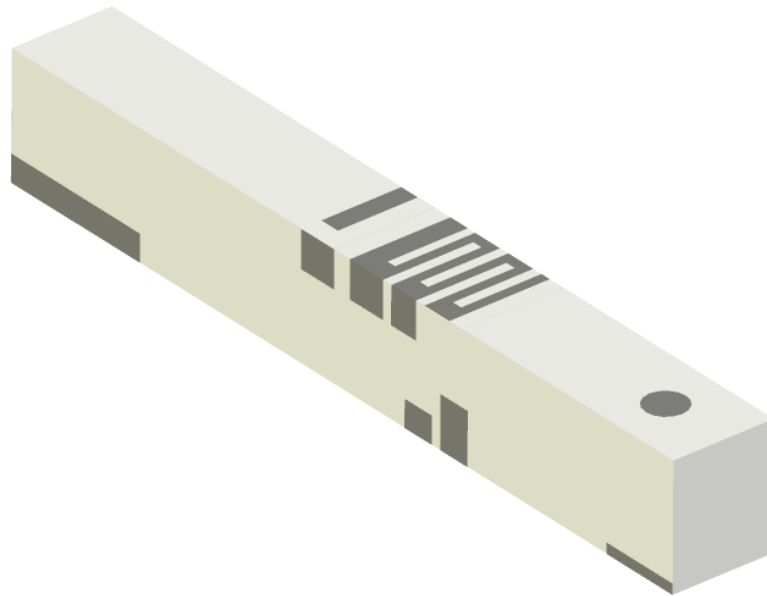
Features

- Ultra-wide band 600 MHz ~ 6 GHz
- Compact & Low-Profile
- VSWR: ≤ 2.0
- Peak Gain: 3.7 dBi
- Efficiency: up to 62%
- 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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Electrical Specification

Parameter	Specification			Unit
Operating Frequency	617-960	1710-2690	3300-6000	MHz
VSWR (Typ.)	< 2.0			
Peak Gain	0.4	3.7	3.6	dBi
Efficiency (Maximum)	56	62	48	%
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

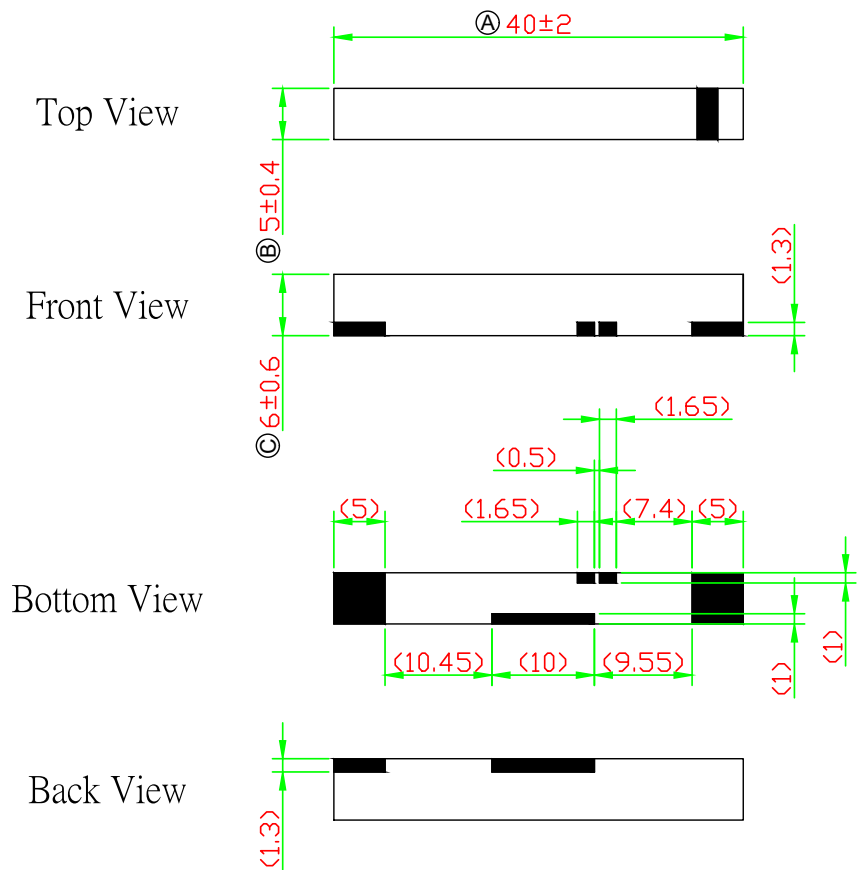
Parameter	Specification
Dimensions	40 x 6 x 5 mm
Evaluation Board size	120 x 45 mm
Solder Termination	Ag (Environmental-Friendly Pb-Free)

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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Product Dimensions & Footprint



Unit: mm

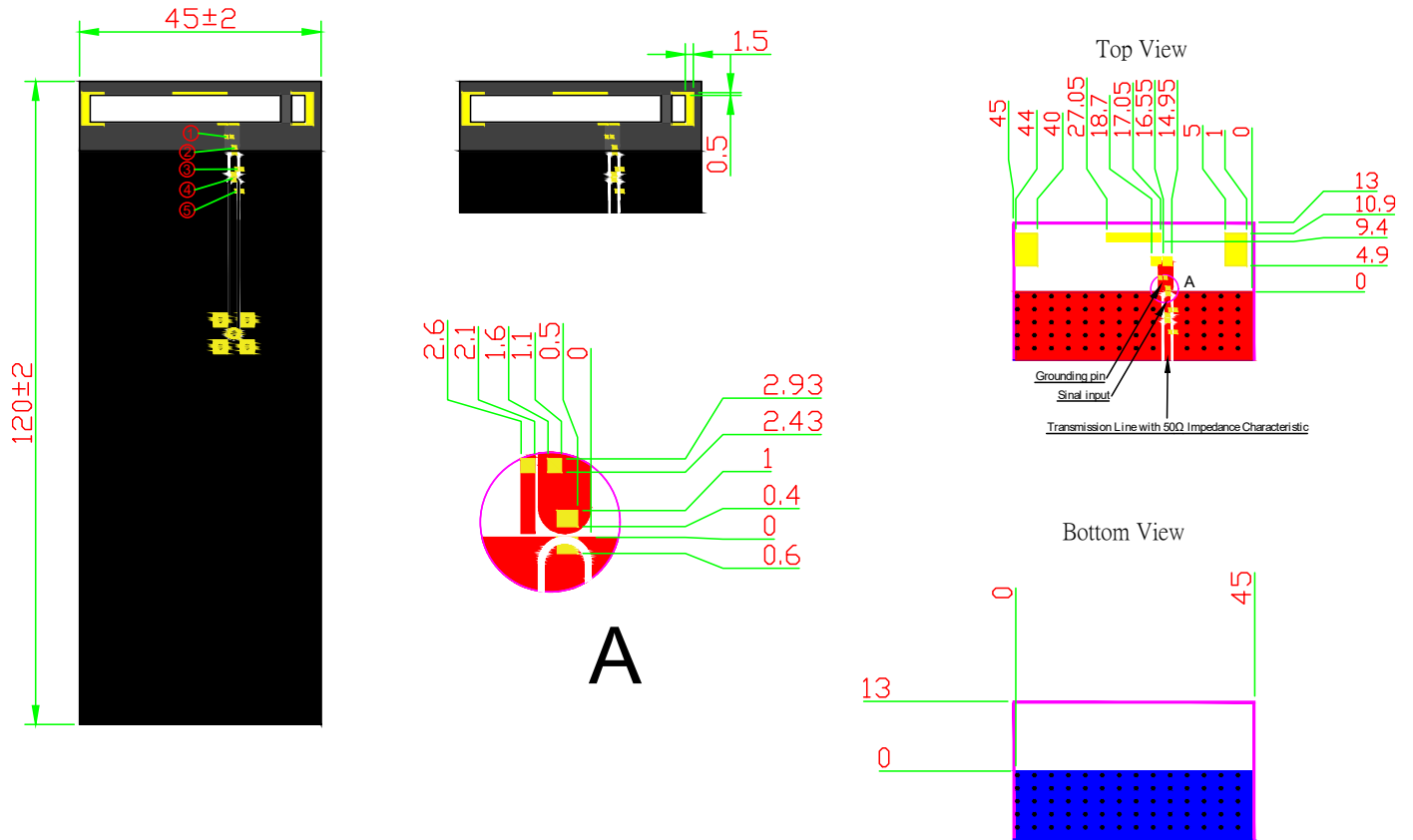


PIN	1	2	3~5
Soldering Pad	Tuning/Ground	Signal	Fixing

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Evaluation Board Dimensions



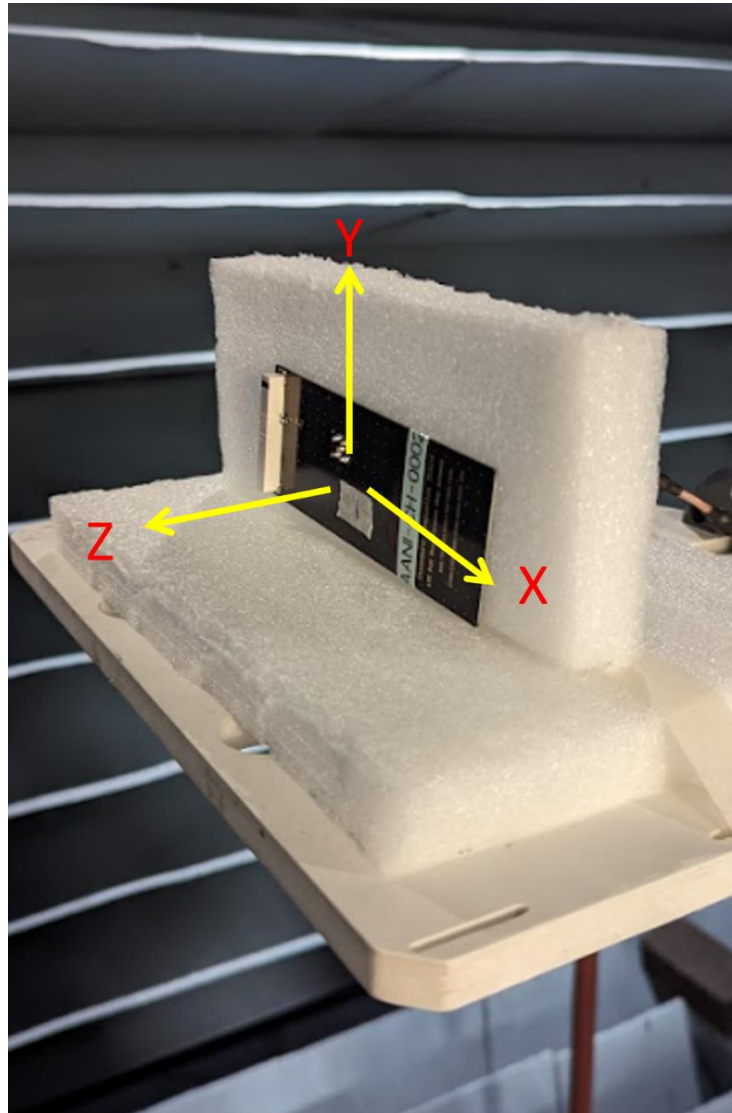
A

Unit: mm

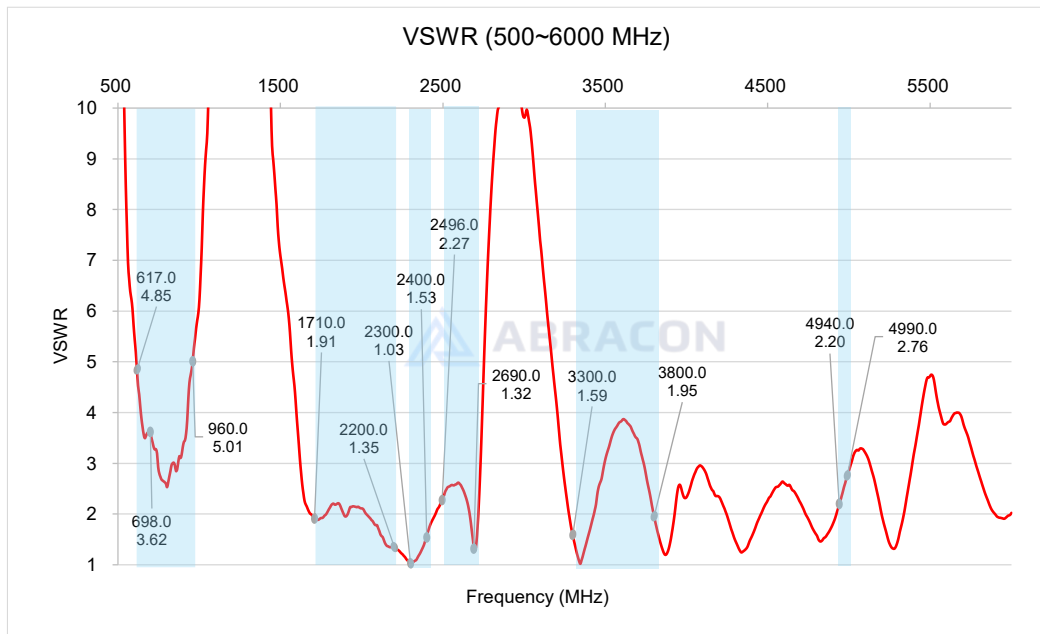
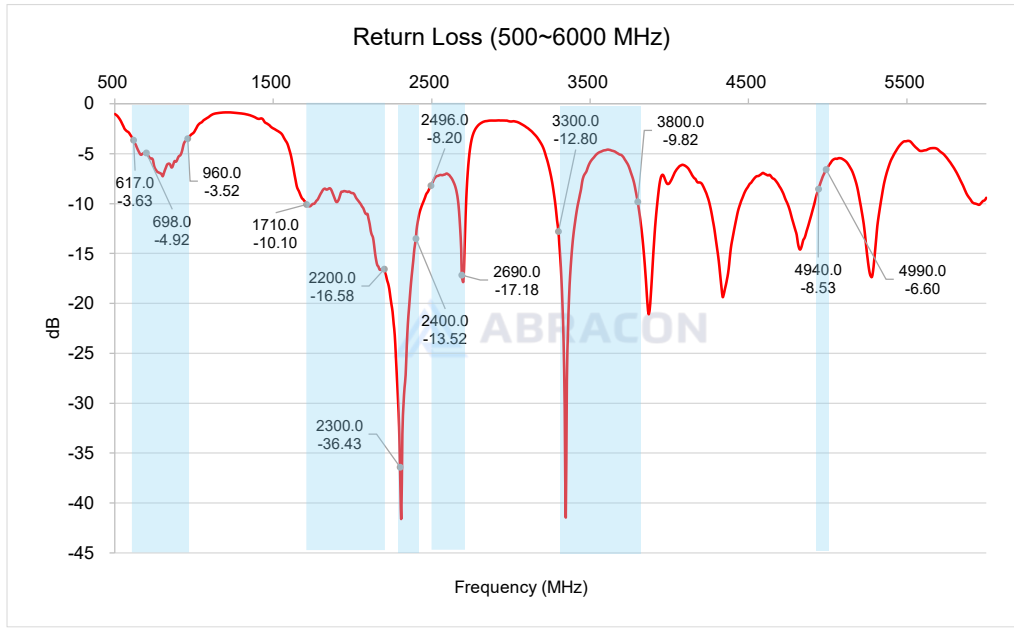
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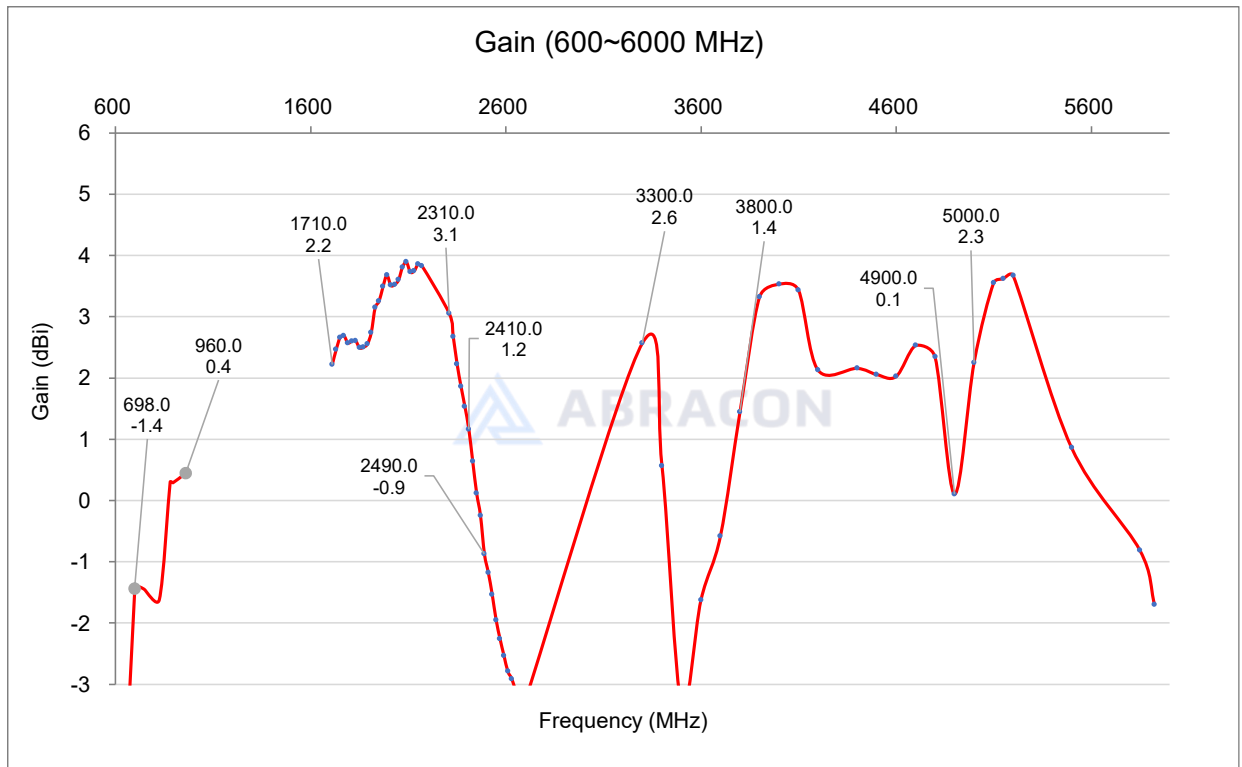
Measurement Setup photo



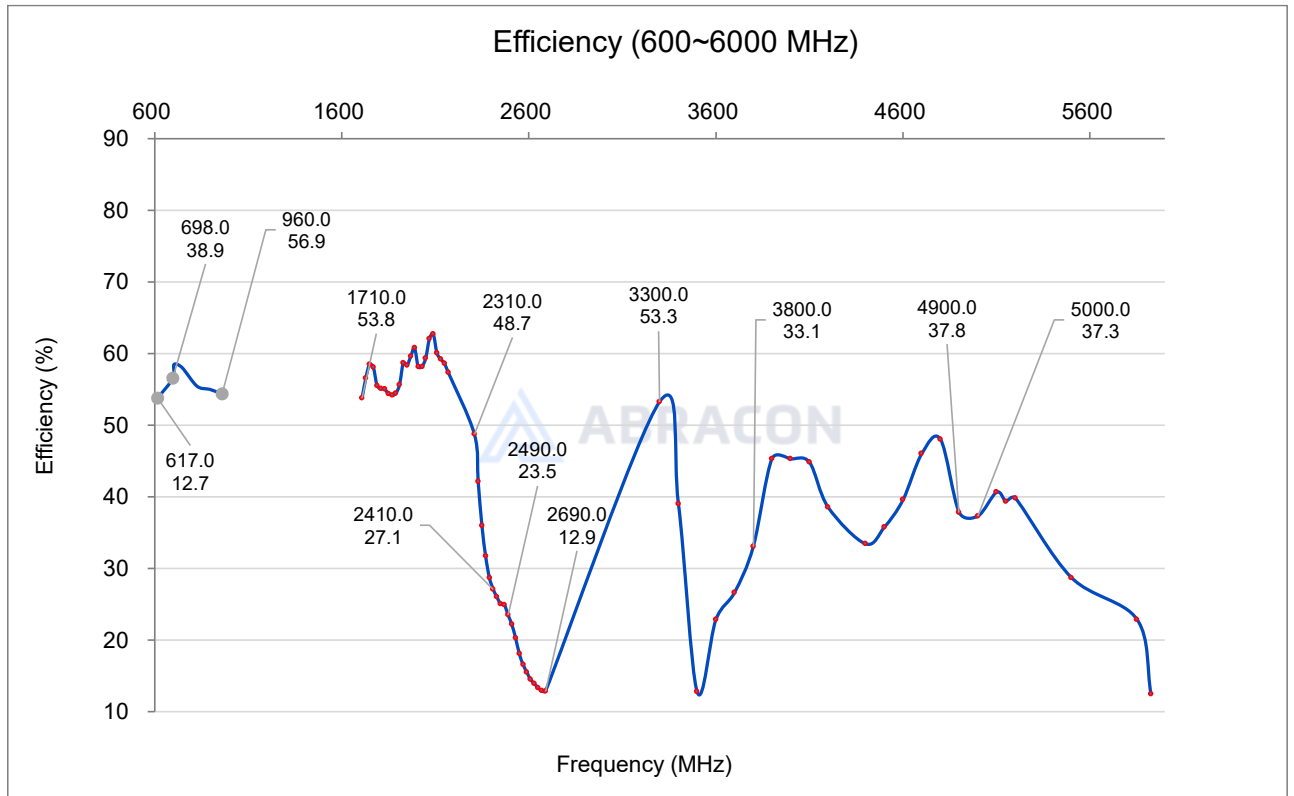
Reflection Characteristics –Return Loss & VSWR



Radiation Characteristics – Peak Gain



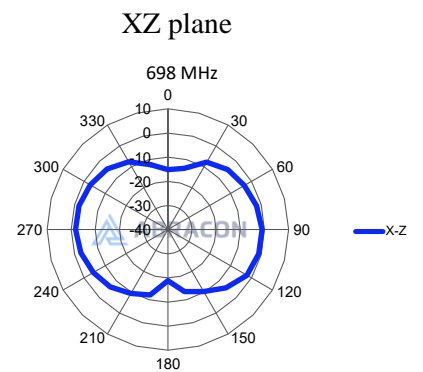
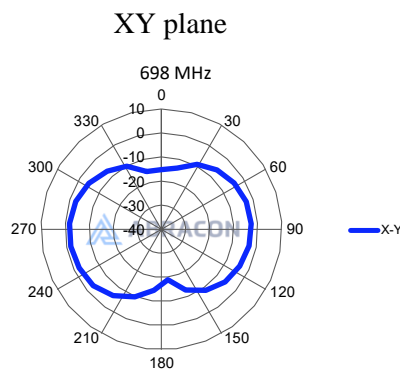
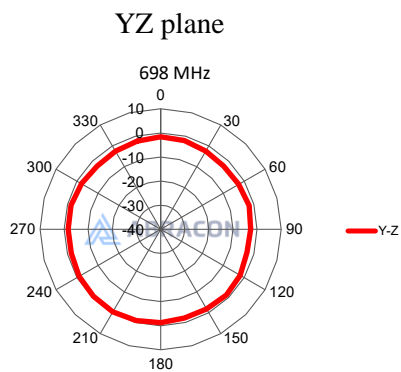
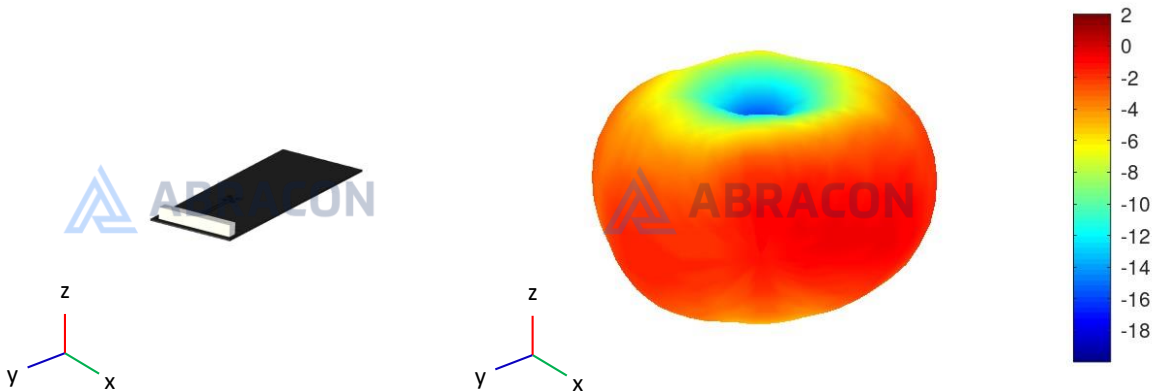
Radiation Characteristics – Total Efficiency (%)



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Radiation Characteristics – 3D & 2D Pattern

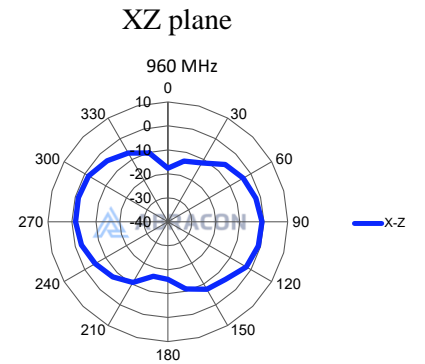
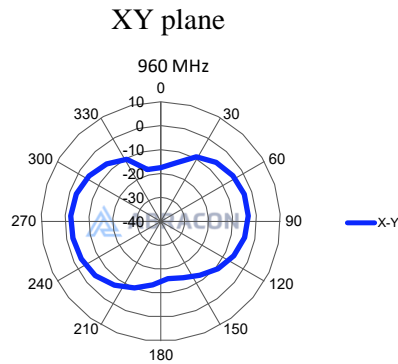
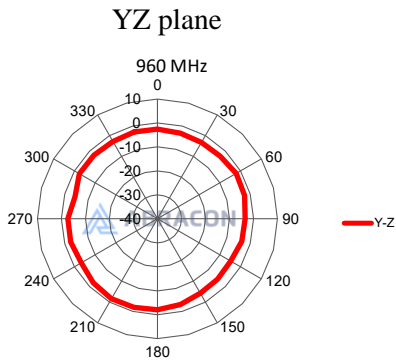
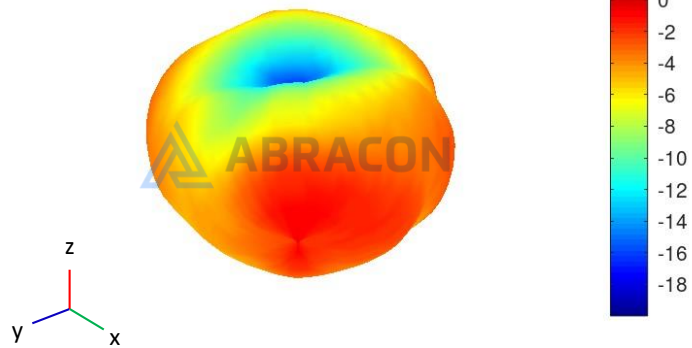
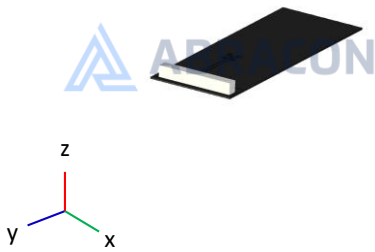
698MHz



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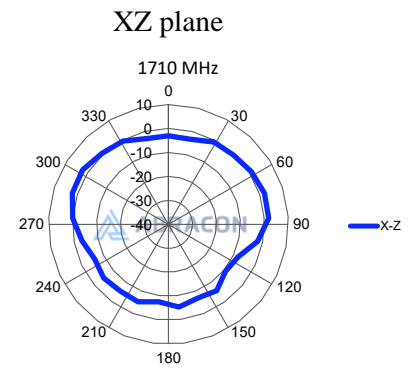
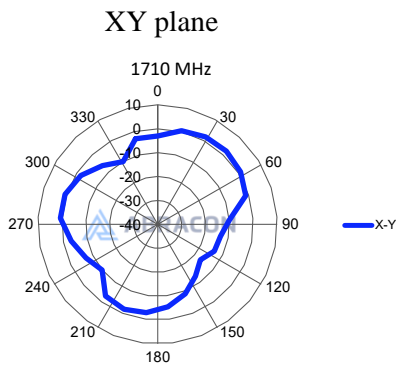
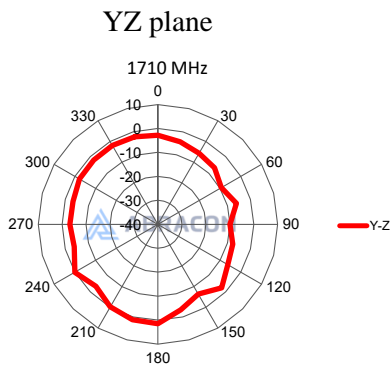
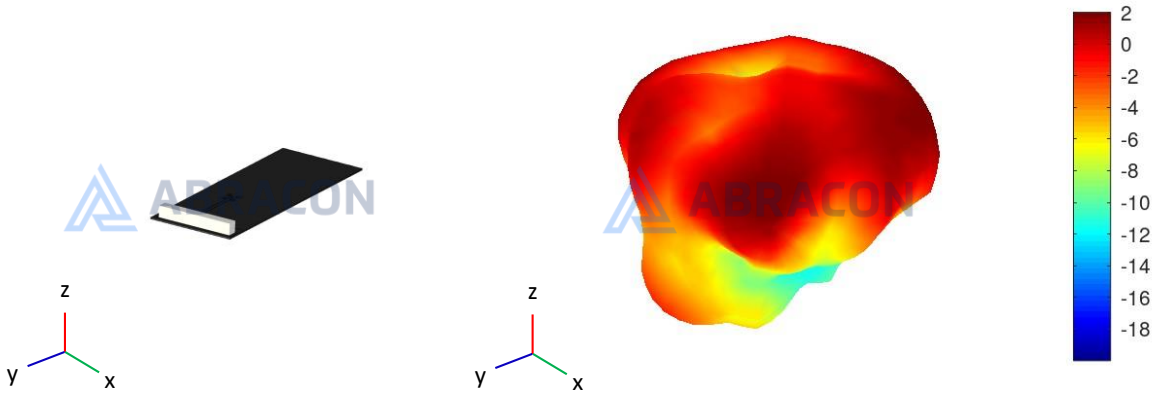
960MHz



LTE 5G Chip Antenna

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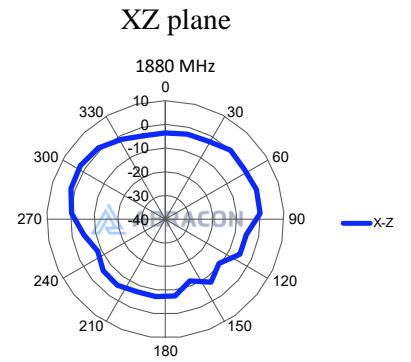
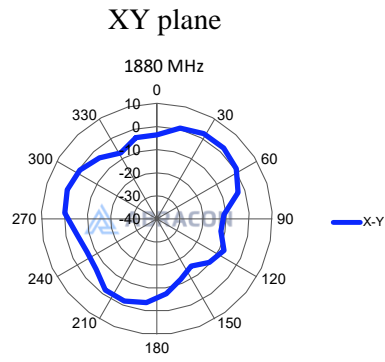
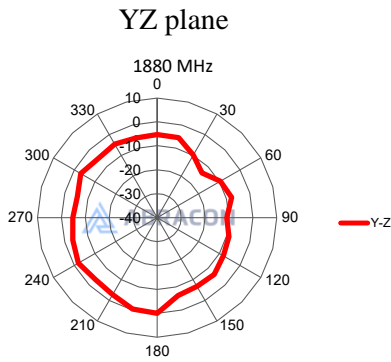
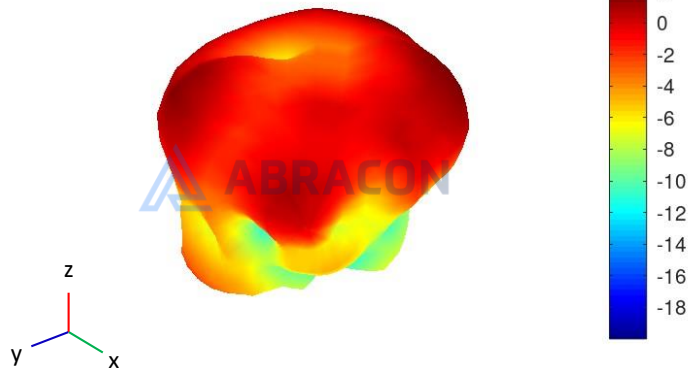
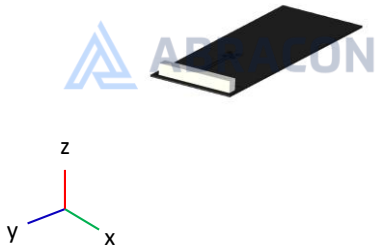
1710MHz



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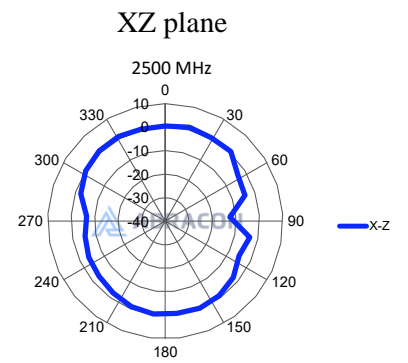
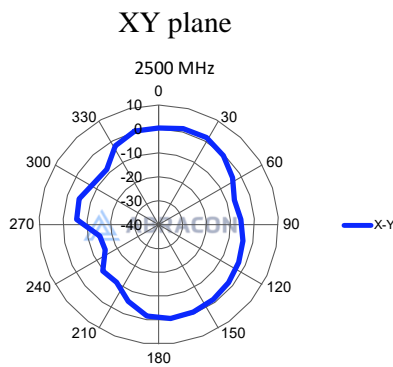
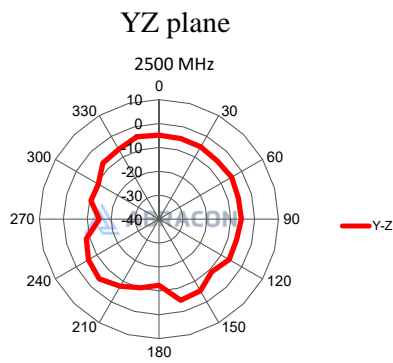
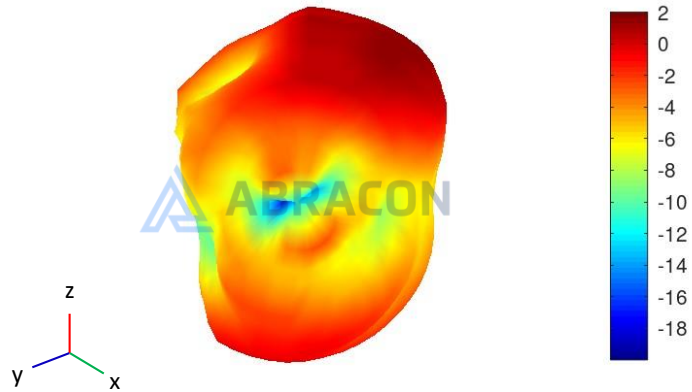
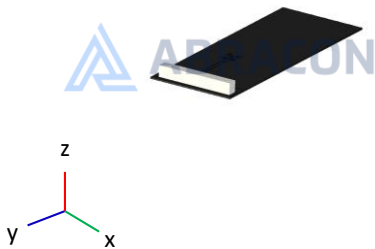
1880MHz



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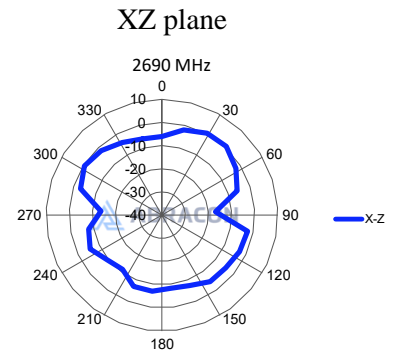
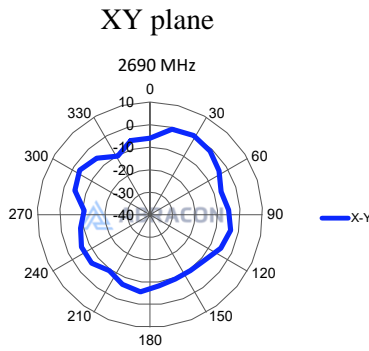
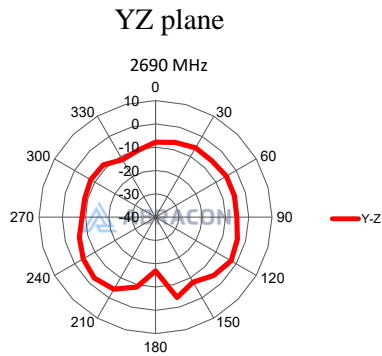
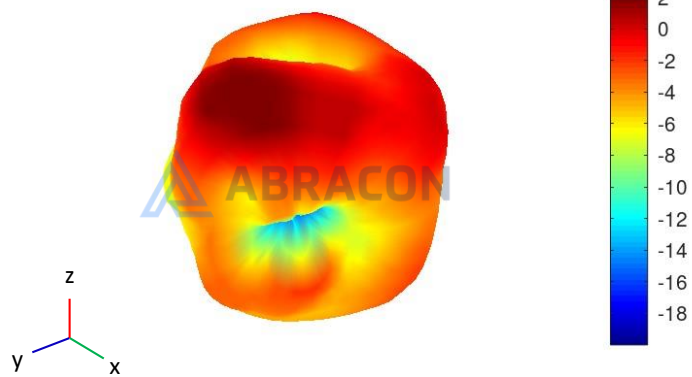
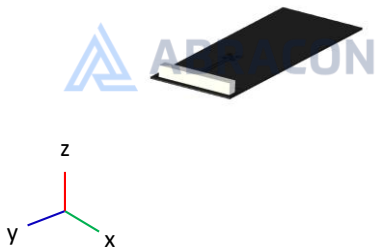
2500MHz



LTE 5G Chip Antenna

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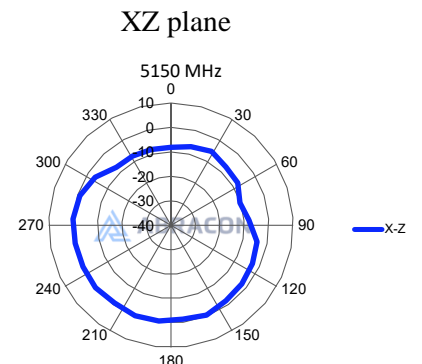
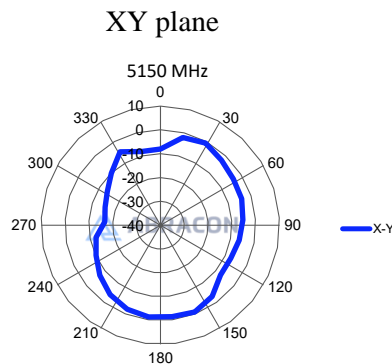
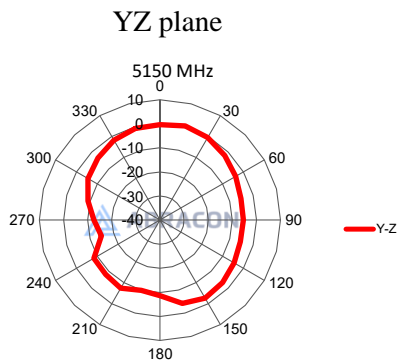
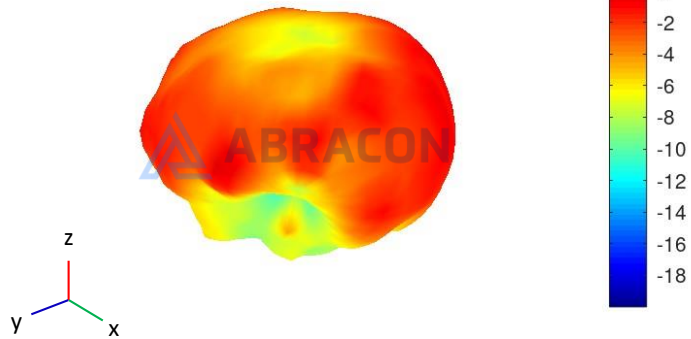
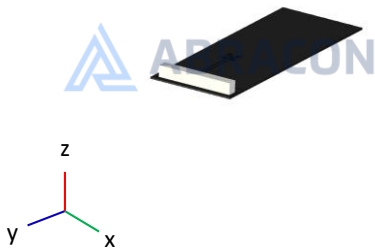
2690MHz



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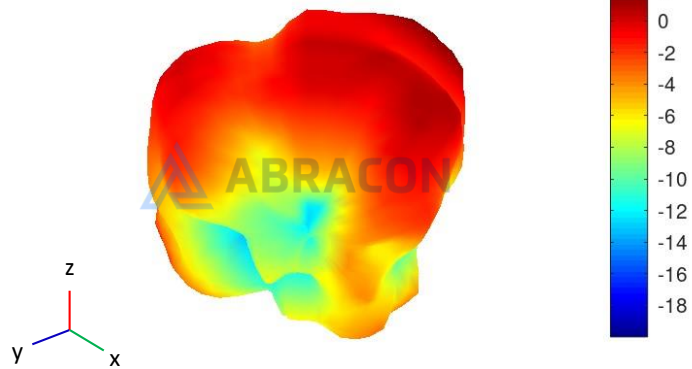
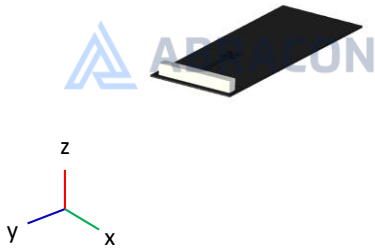
5150MHz



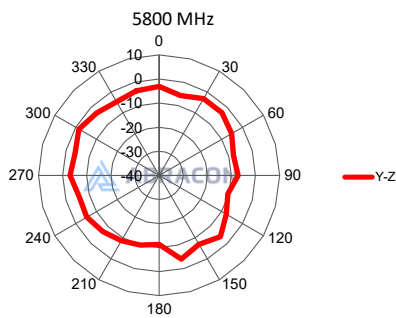
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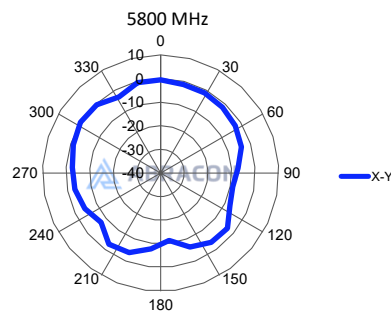
5800MHz



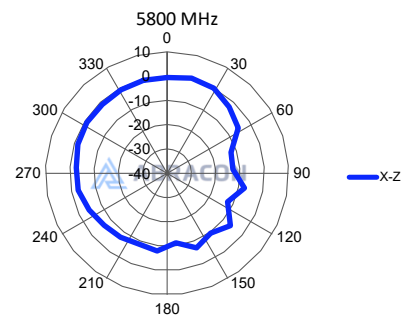
YZ plane



XY plane



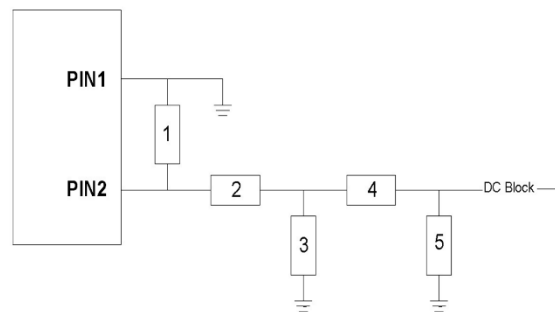
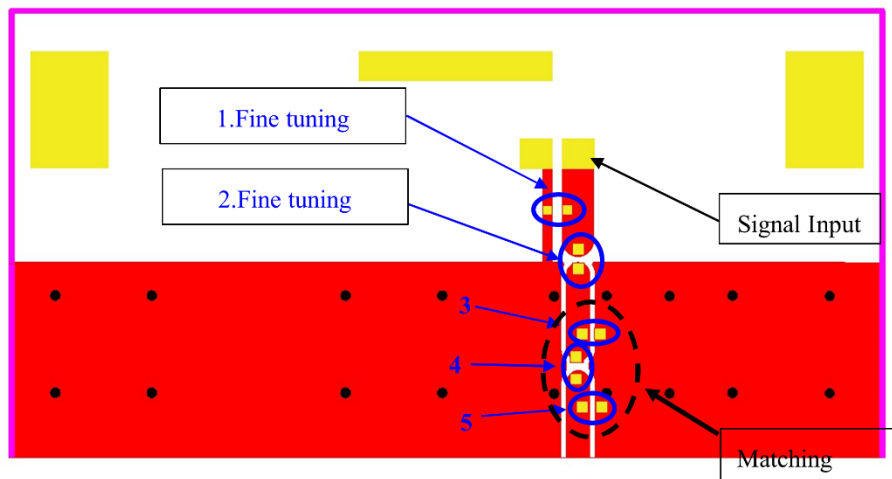
XZ plane



Evaluation Board Outline & Matching Circuit

The evaluation board (<ABB1245T>) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 120 x 45 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.

VI. Frequency tuning:



Evaluation board outline

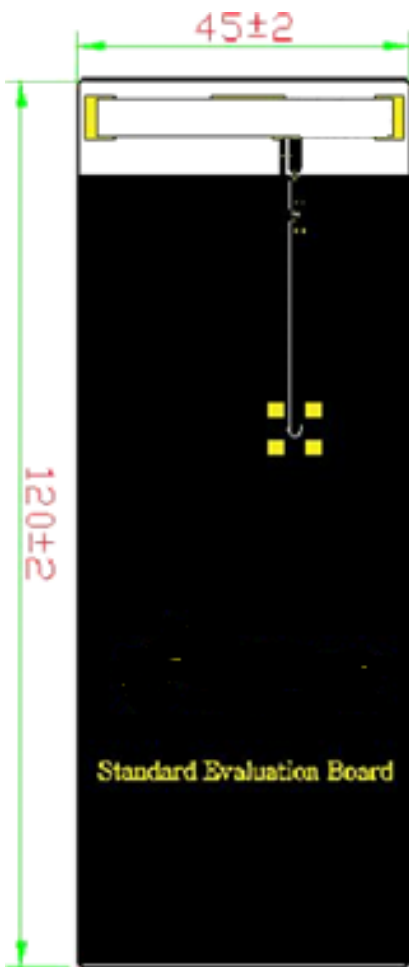
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The evaluation board has a matching circuit implemented next to the antenna. This is aimed to enable optimization possibilities for the user.

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.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	6.8 nH (0402)	MURATA	±0.1 nH
2	6.8 pF (0402)	MURATA	±0.05 pF
3	N/C	-	-
4	2 (0402)	-	-
5	N/C	-	-

Reflow Profile [JEDEC J-STD-020]

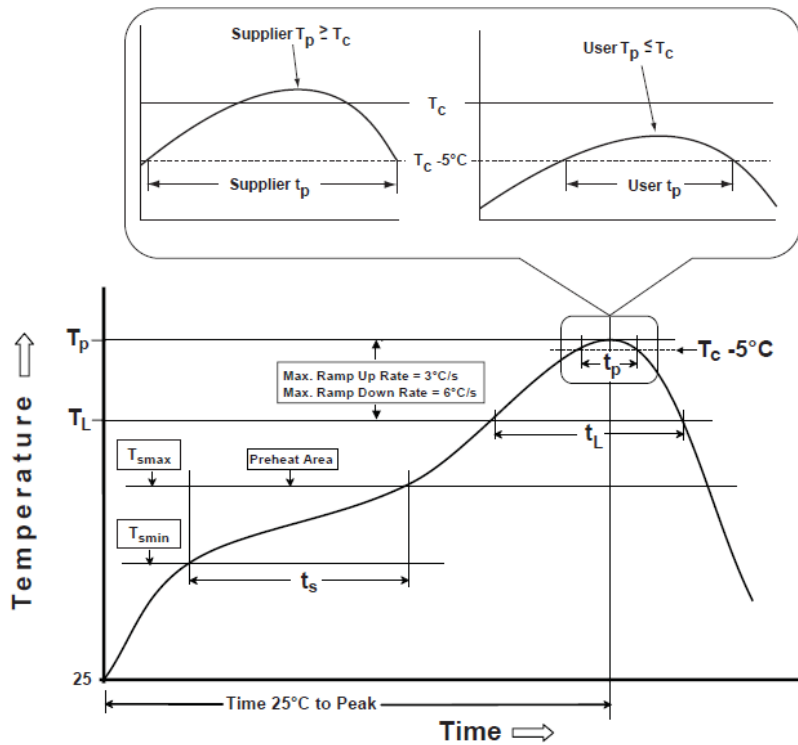


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5 mm	235 °C	220 °C
≥ 2.5 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
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smin} 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.

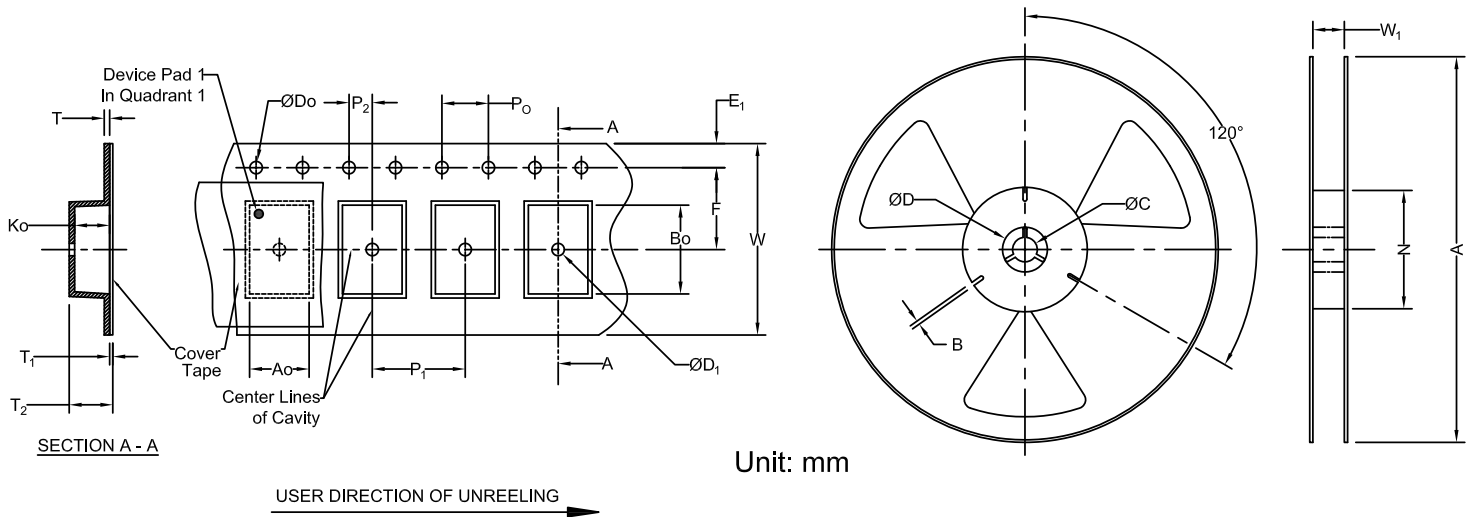
**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.

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Packaging

Tape & Reel Dimension



Carrier Tape Specifications (mm)

Do	D ₁	E ₁	P ₀	P ₂	F	P ₁	W	Reel Qty
1.50 ± 0.1	2.0 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.15	26.2 ± 0.15	16.0 ± 0.1	56 ± 0.30	600

Reel Specifications (mm)

A	W ₁
330 ± 1.5	57 ± 0.5

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REVISED: 04-20-23

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