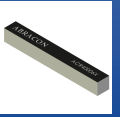


# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

Request Samples



Check Inventory



40 x 6 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

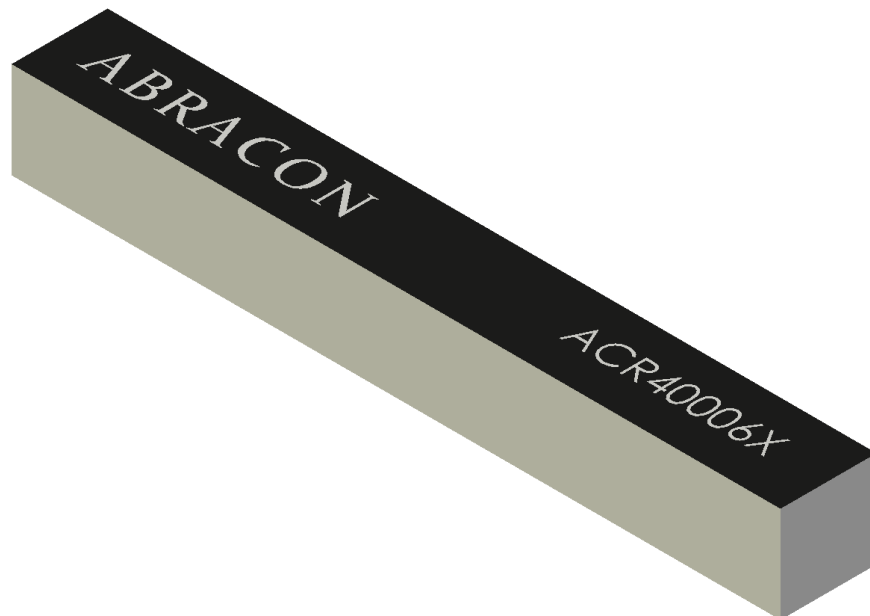
## Features

- Ultra-wide band 600 MHz ~ 6 GHz
- Compact & Low-Profile
- VSWR:  $\leq 2.0$
- Peak Gain: 3.7 dBi
- Efficiency: up to 60%
- Linear Polarization
- Surface Mount (SMD)
- High efficiency across cellular bands

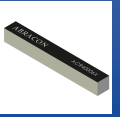
## Applications

- 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



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

Request Samples



Check Inventory



40 x 6 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

## Electrical Specification

Parameter	Specification			Unit
Operating Frequency	617-960	1710-2690	3300-6000	MHz
VSWR (Typ.)	< 2.0			
Peak Gain	0.4	3.7	3.5	dBi
Efficiency (Maximum)	56	60	48	%
Impedance	50			$\Omega$
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.

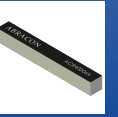
## Mechanical Specification

Parameter	Specification
Antenna Dimension	40 x 6 x 5 mm
Antenna Clearance Space	45 x 13 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%

# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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40 x 6 x 5 mm

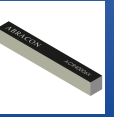
RoHS/RoHS II Compliant

MSL Level = N/A

## Ordering Information

Part Number	Description
ACR4006X	5G NR/ 4G/ LTE Ceramic Chip Antenna
ACR4006X-EVB	5G NR/ 4G/ LTE Ceramic Chip Antenna EVB

# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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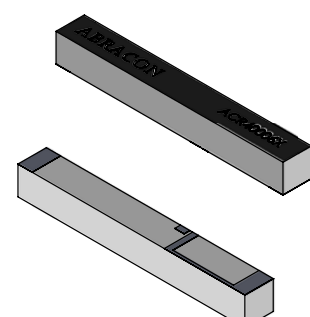
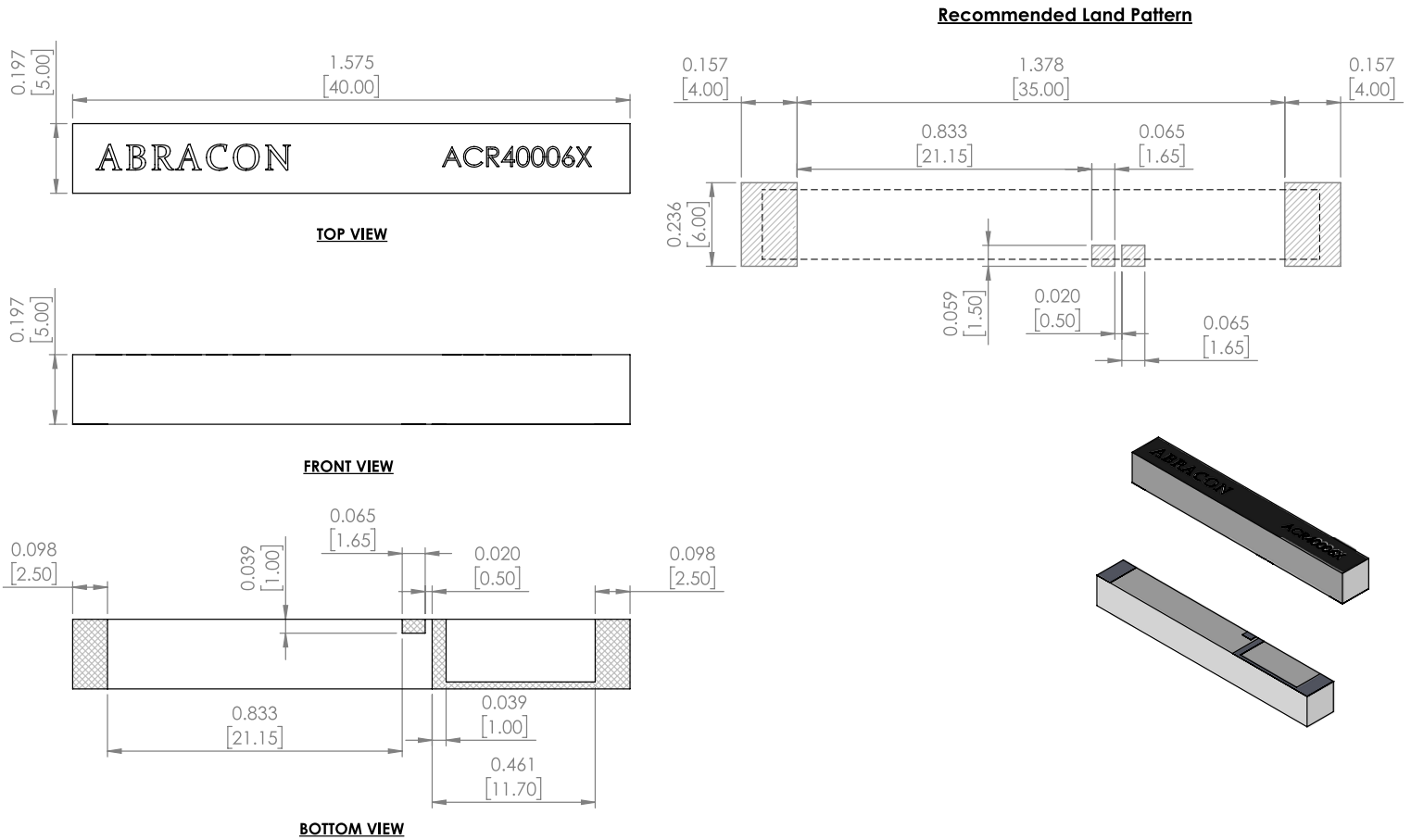


40 x 6 x 5 mm

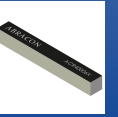
RoHS/RoHS II Compliant

MSL Level = N/A

## Product Dimensions



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

Request Samples



Check Inventory

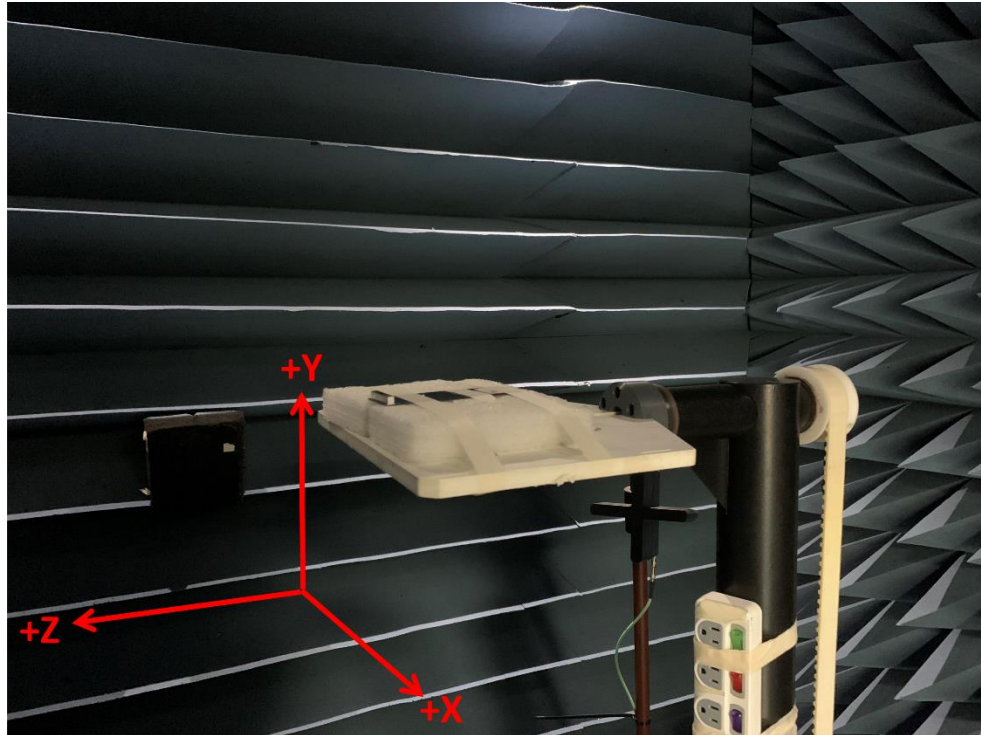


40 x 6 x 5 mm

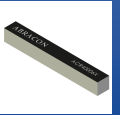
RoHS/RoHS II Compliant

MSL Level = N/A

## Measurement Setup photo



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

Request Samples



Check Inventory

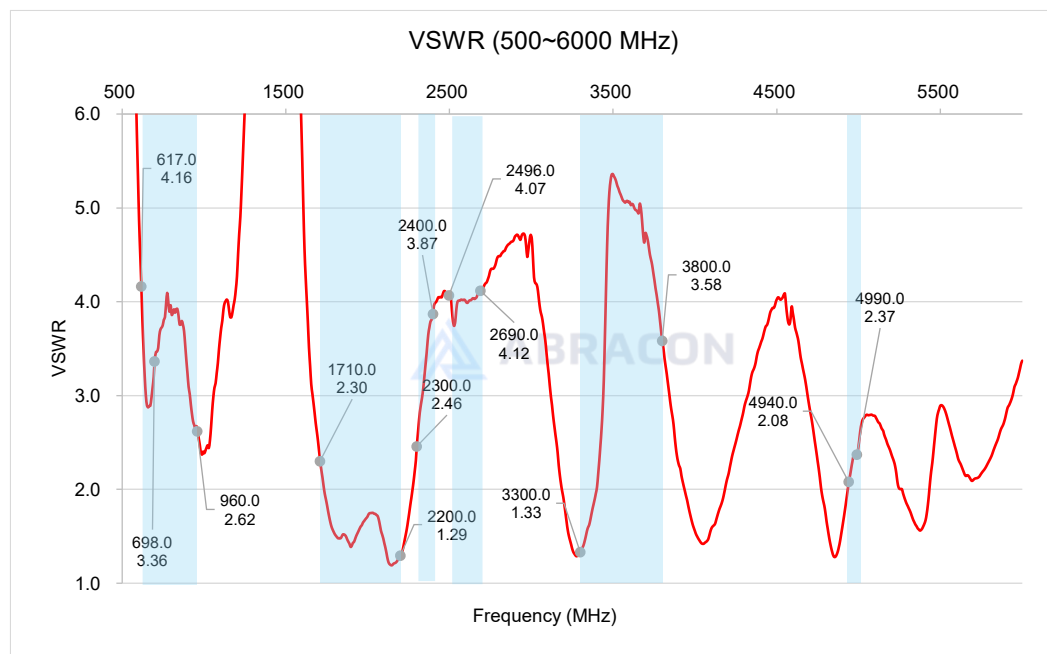
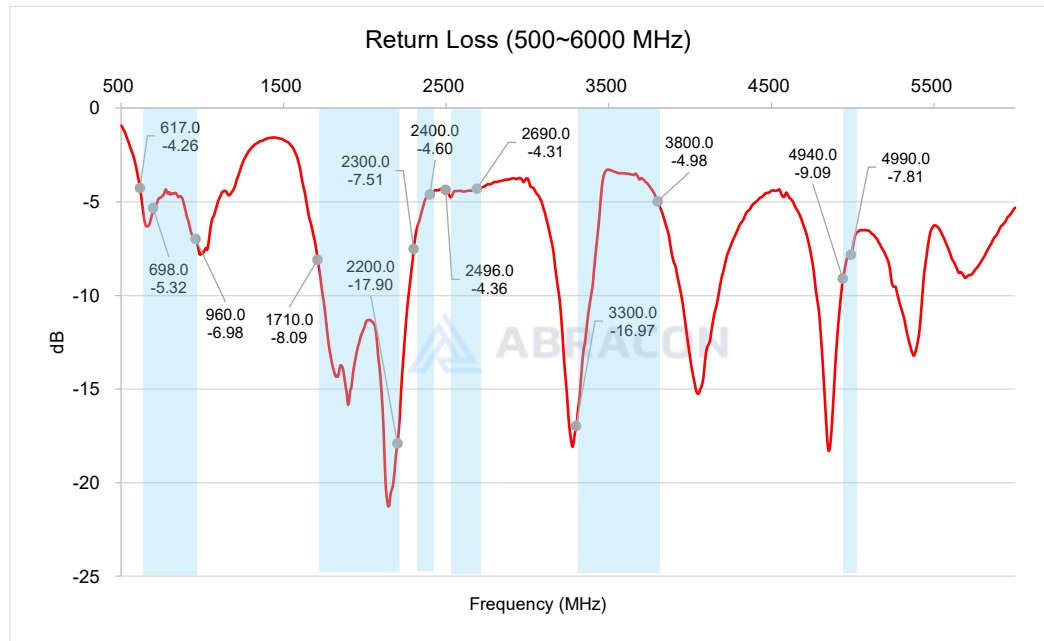


40 x 6 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

## Reflection Characteristics –Return Loss & VSWR

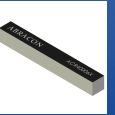


5101 Hidden Creek Ln Spicewood TX 78669  
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# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

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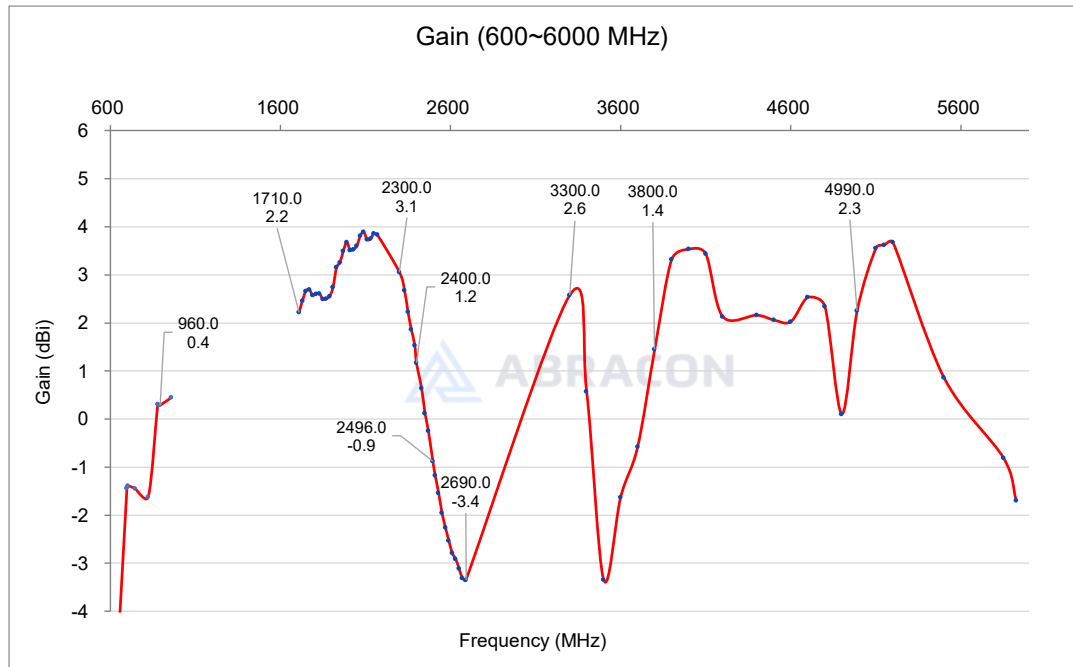


40 x 6 x 5 mm

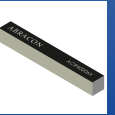
RoHS/RoHS II Compliant

MSL Level = N/A

## Radiation Characteristics – Peak Gain



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

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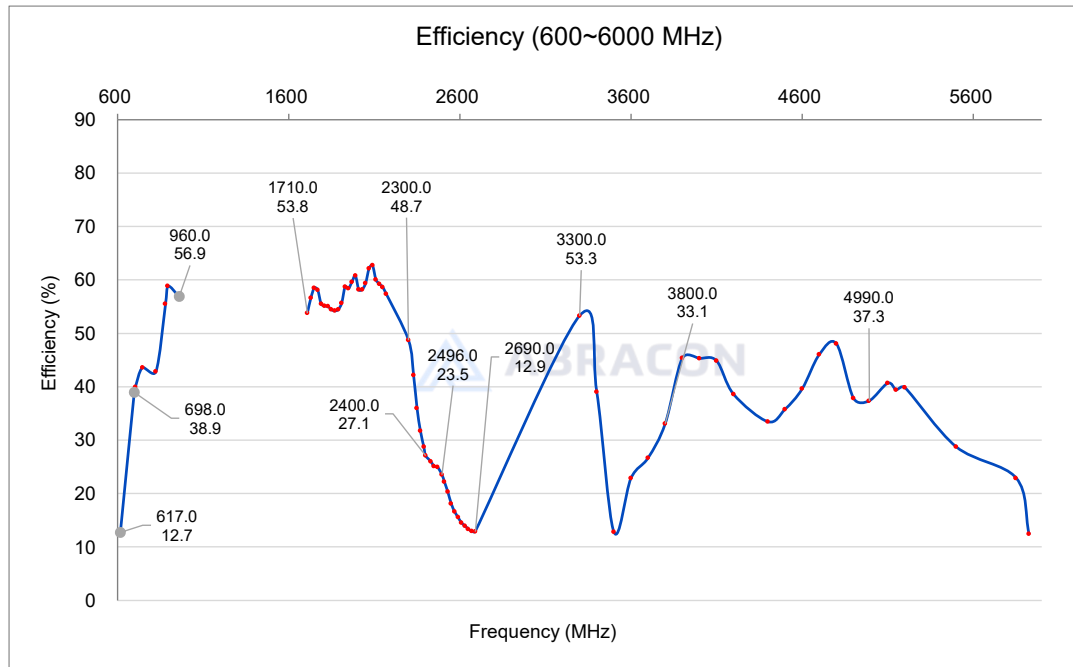


40 x 6 x 5 mm

RoHS/RoHS II Compliant

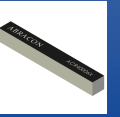
MSL Level = N/A

## Radiation Characteristics – Total Efficiency (%)





# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

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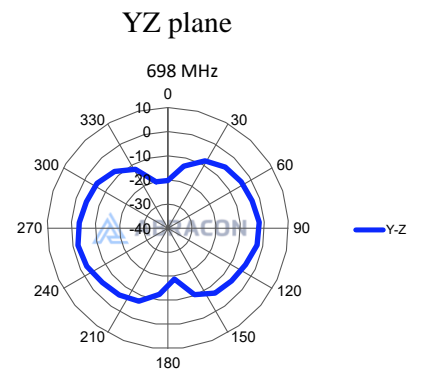
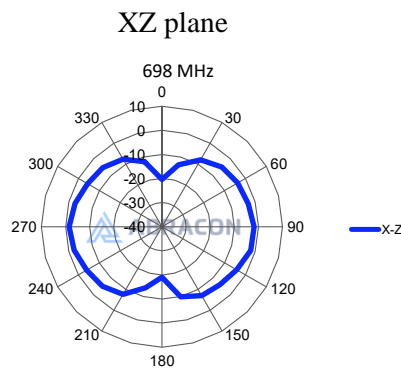
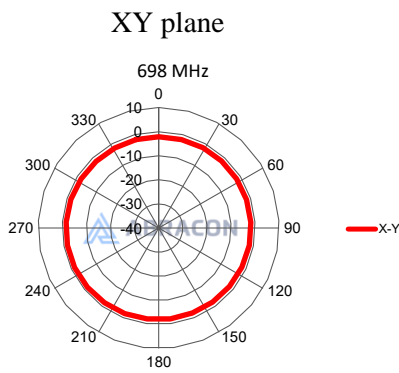
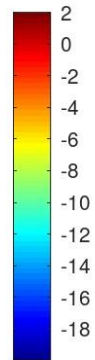
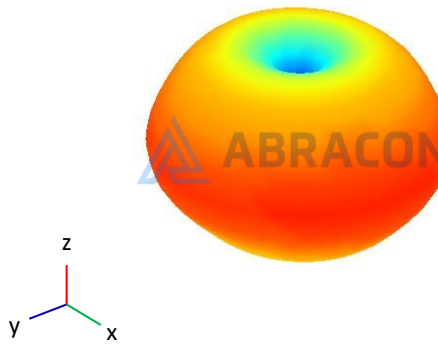
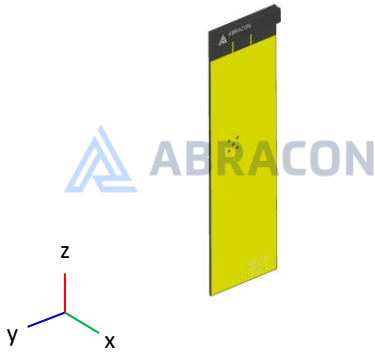
40 x 6 x 5 mm

RoHS/RoHS II Compliant

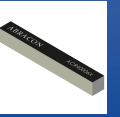
MSL Level = N/A

## Radiation Characteristics – 3D & 2D Pattern

698MHz



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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Check Inventory

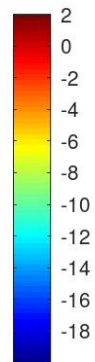
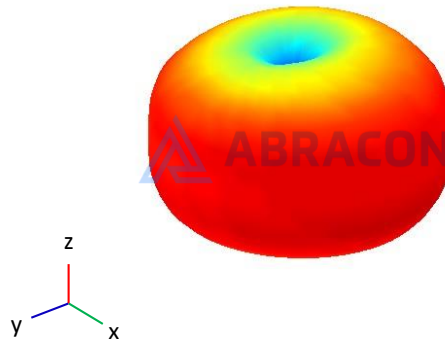
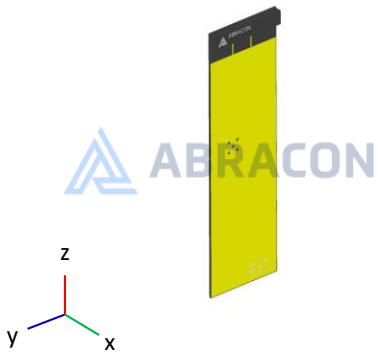


40 x 6 x 5 mm

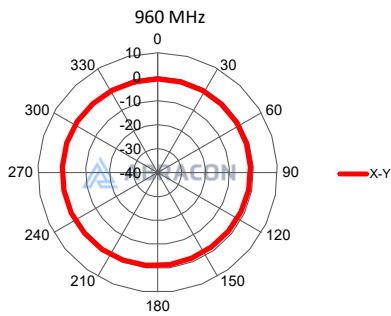
RoHS/RoHS II Compliant

MSL Level = N/A

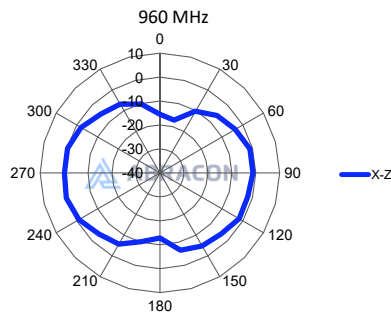
960MHz



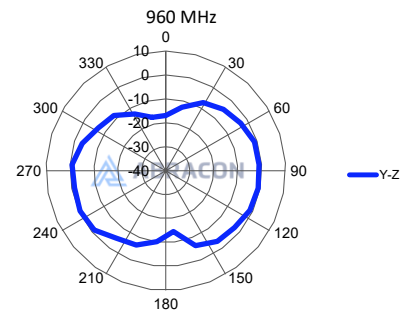
XY plane



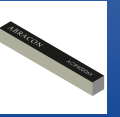
XZ plane



YZ plane



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

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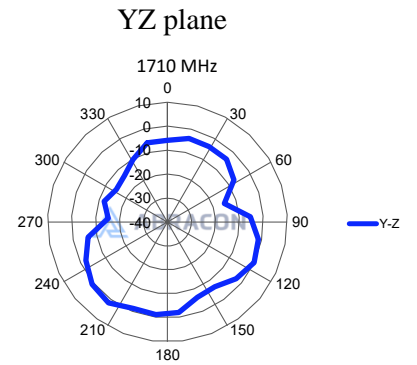
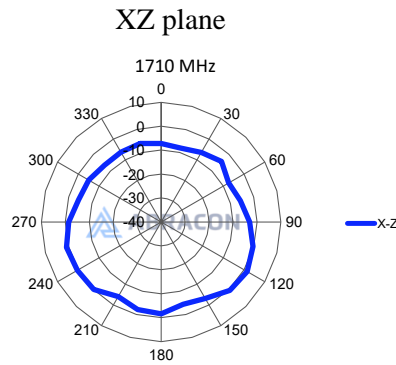
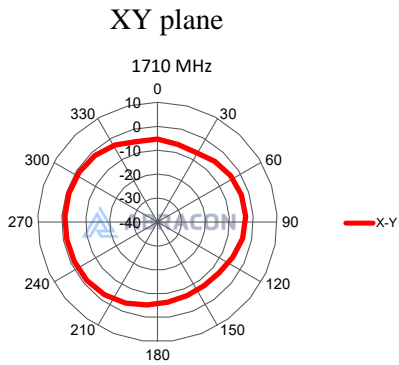
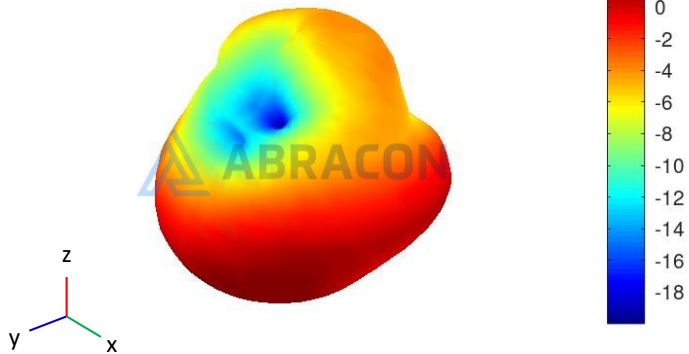
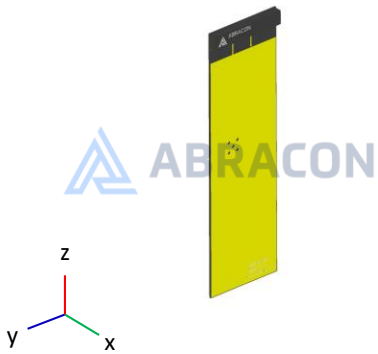


40 x 6 x 5 mm

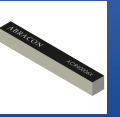
RoHS/RoHS II Compliant

MSL Level = N/A

1710MHz



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

Request Samples



Check Inventory

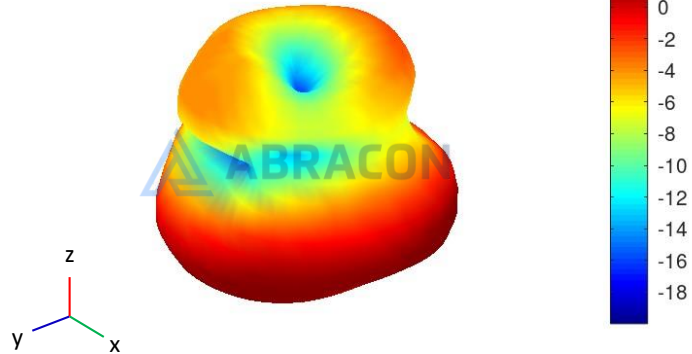
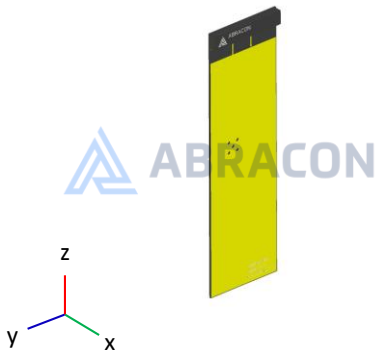


40 x 6 x 5 mm

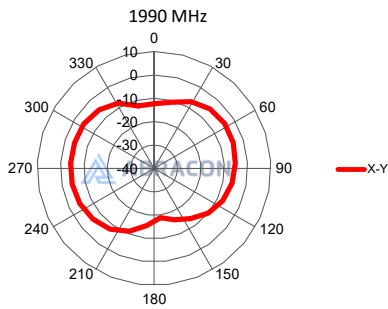
RoHS/RoHS II Compliant

MSL Level = N/A

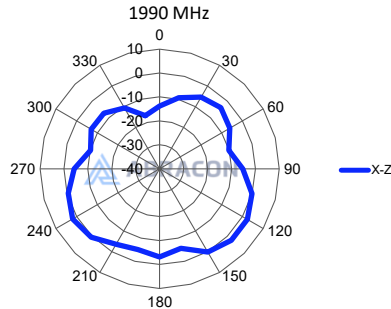
1990MHz



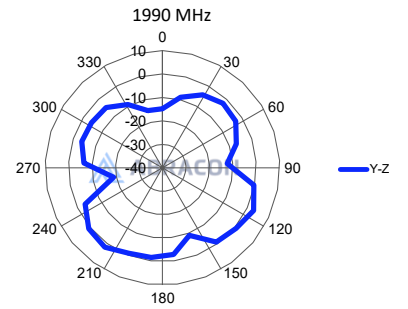
XY plane



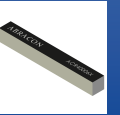
XZ plane



YZ plane



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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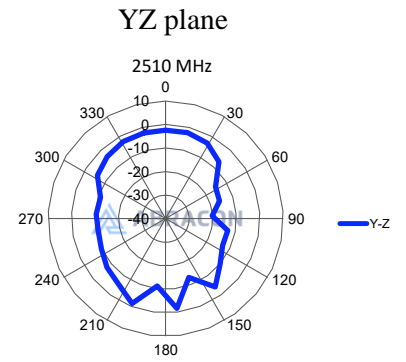
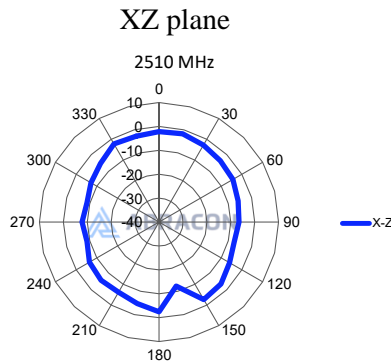
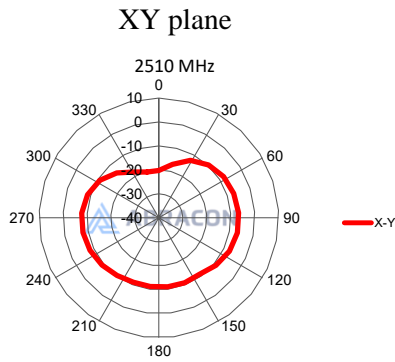
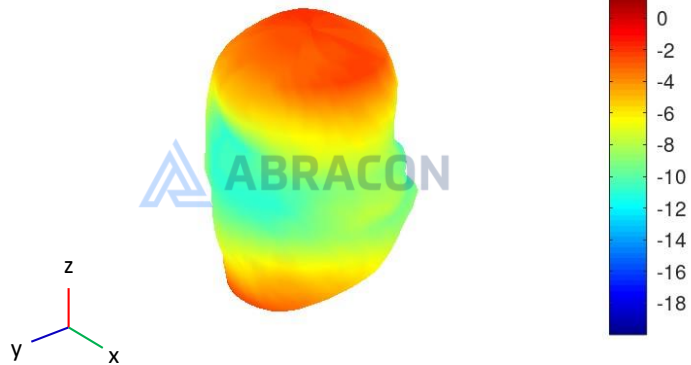


40 x 6 x 5 mm

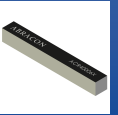
RoHS/RoHS II Compliant

MSL Level = N/A

2510MHz



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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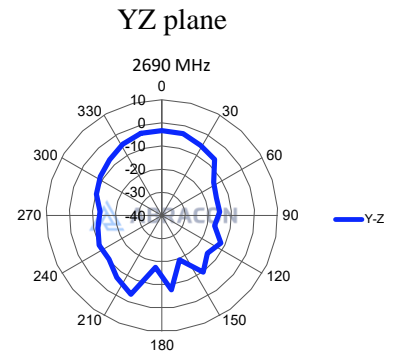
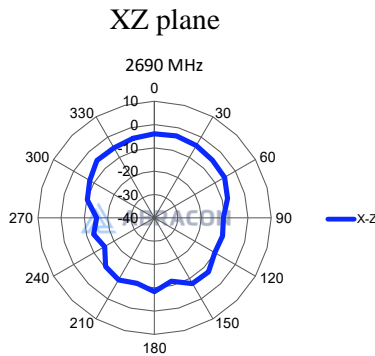
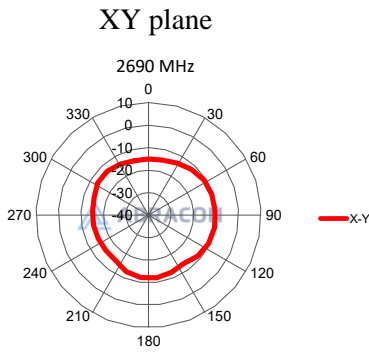
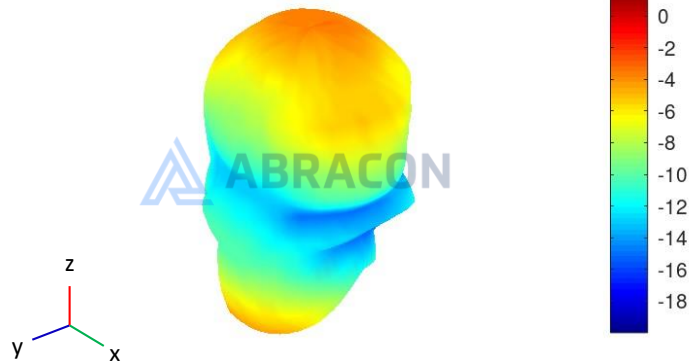
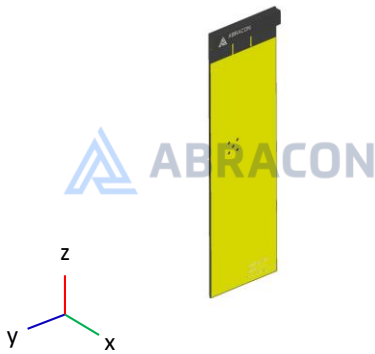


40 x 6 x 5 mm

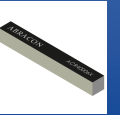
RoHS/RoHS II Compliant

MSL Level = N/A

2690MHz



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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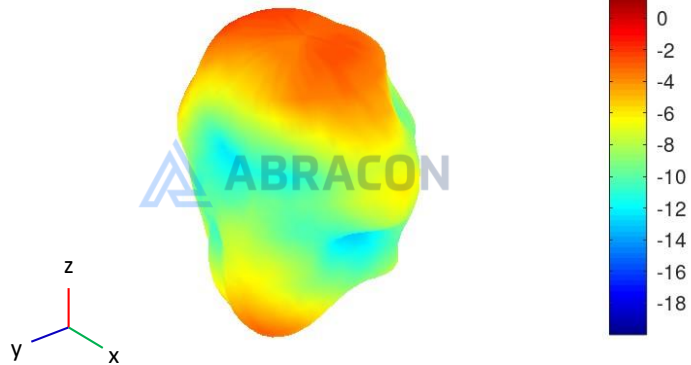
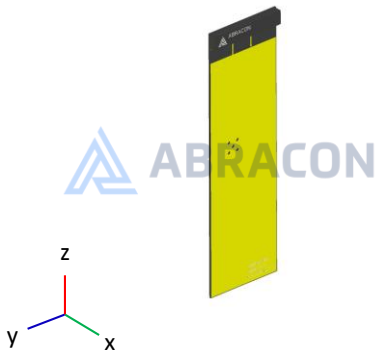


40 x 6 x 5 mm

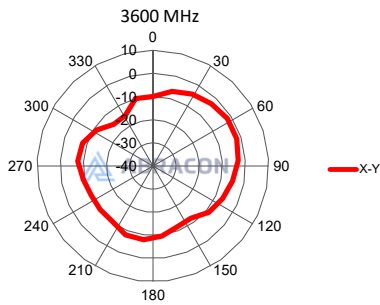
RoHS/RoHS II Compliant

MSL Level = N/A

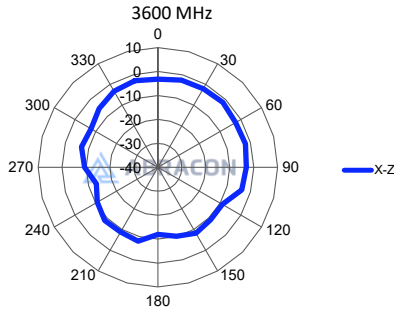
3600MHz



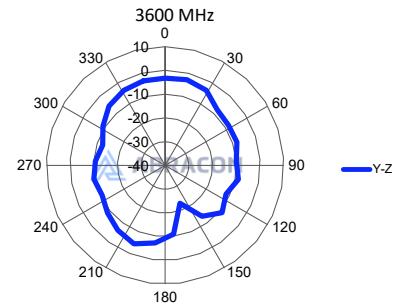
XY plane



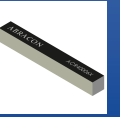
XZ plane



YZ plane



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

Request Samples



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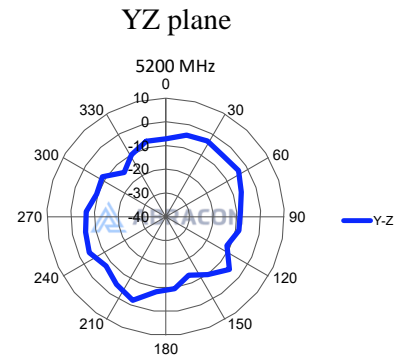
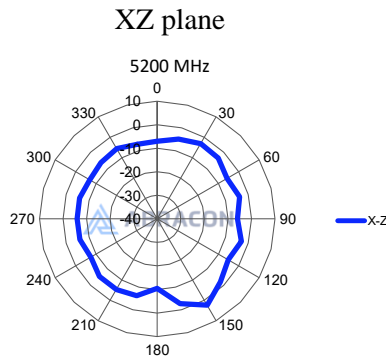
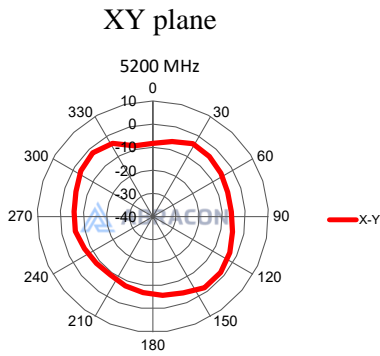
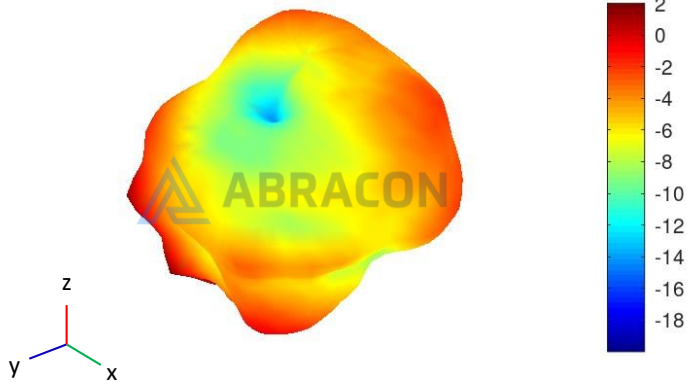
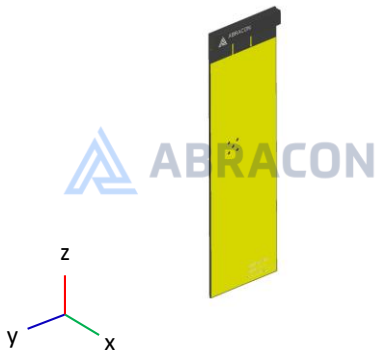


40 x 6 x 5 mm

RoHS/RoHS II Compliant

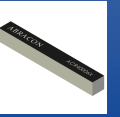
MSL Level = N/A

5200MHz





# 5G NR/ 4G/ LTE Ceramic Chip Antenna



ACR4006X

Request Samples



Check Inventory

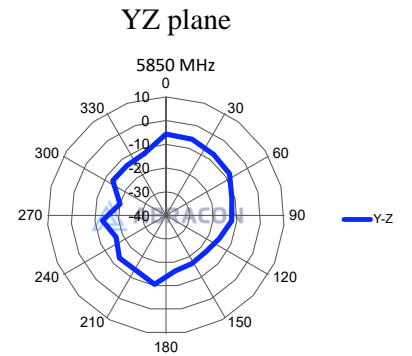
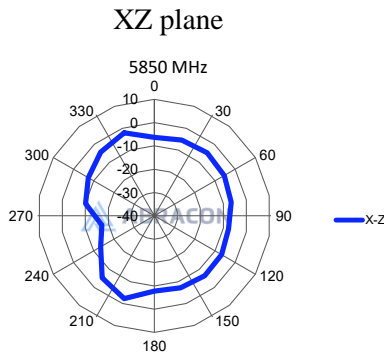
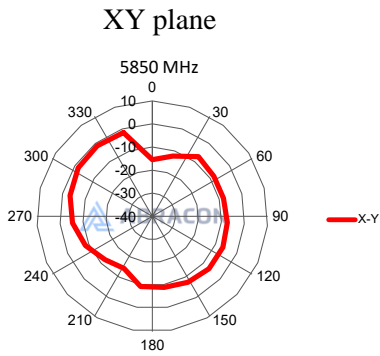
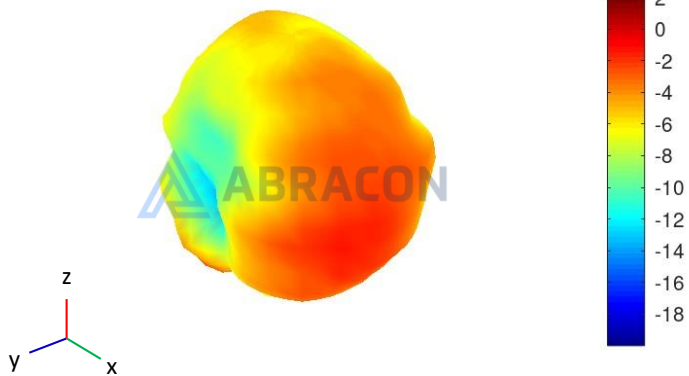
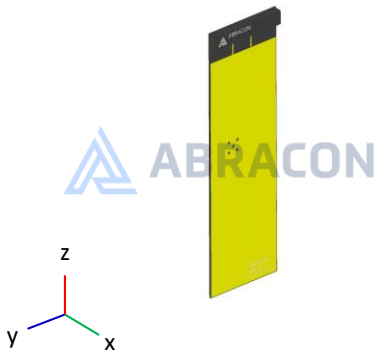


40 x 6 x 5 mm

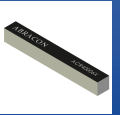
RoHS/RoHS II Compliant

MSL Level = N/A

5850MHz



# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

Request Samples



Check Inventory

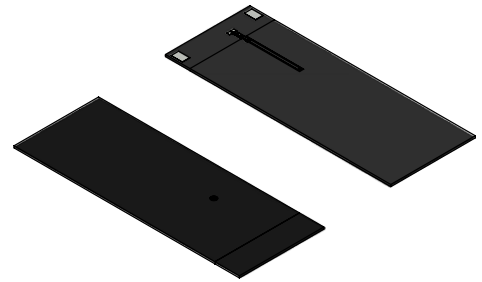
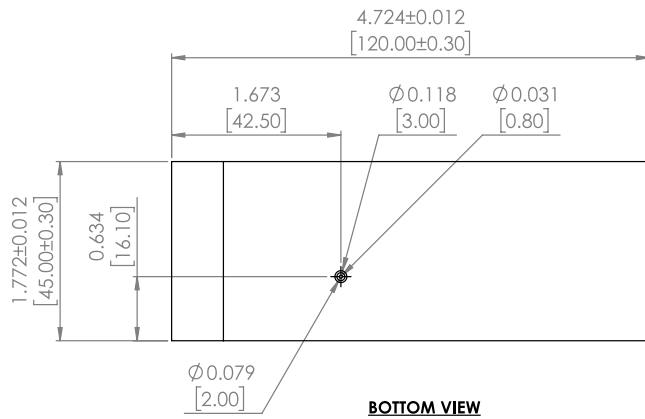
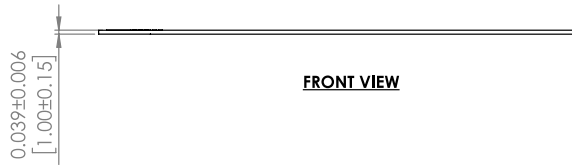
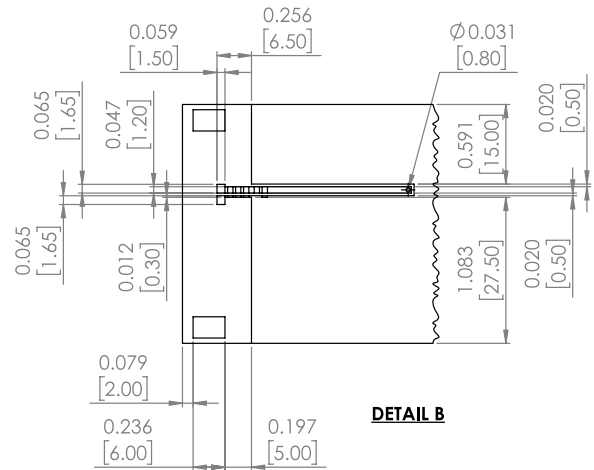
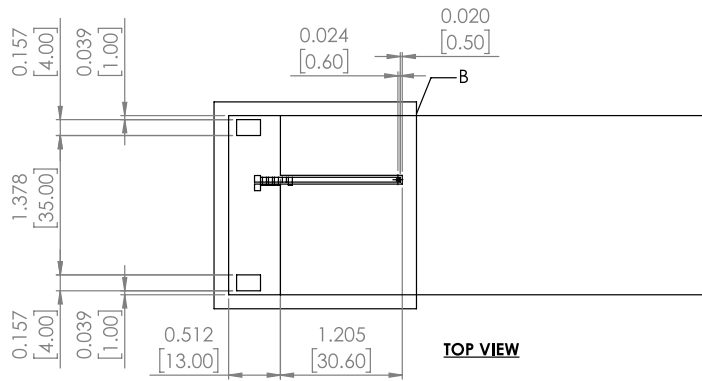


**40 x 6 x 5 mm**

**RoHS/RoHS II Compliant**

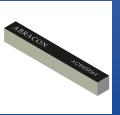
**MSL Level = N/A**

## Evaluation Board Dimensions



Unit: inches[mm]

# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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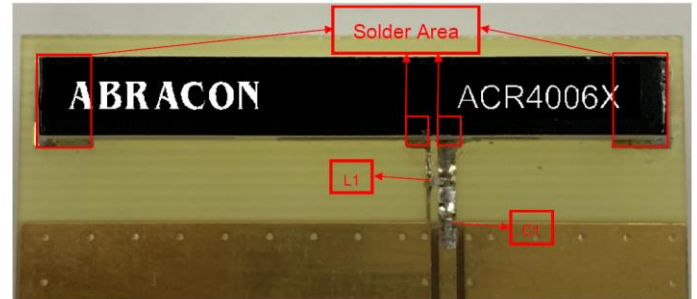
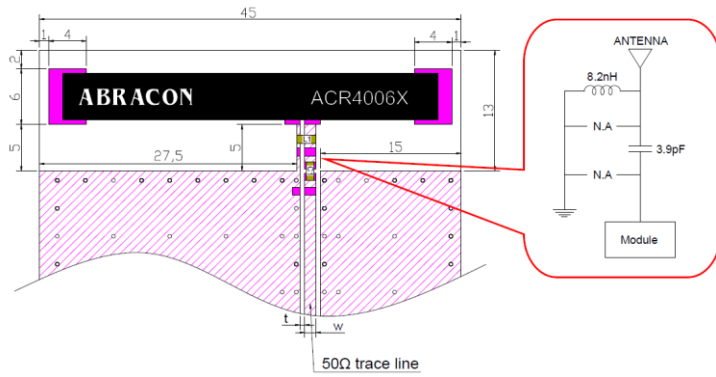


40 x 6 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

## Recommended Layout Dimensions & Matching Circuit

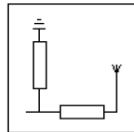


Circuit Symbol	Size	Description
L1	0402	8.2nH Inductor
C1	0402	3.9pF Capacitor

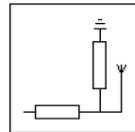
## Transmission Line and Matching

### Transmission line and matching

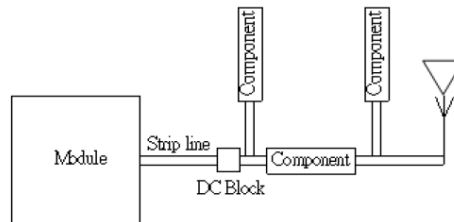
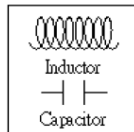
Typical config.1



Typical config.2

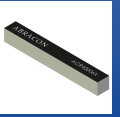


Component types



The matching network has to be individually designed using one, two or three components.

# 5G NR/ 4G/ LTE Ceramic Chip Antenna



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40 x 6 x 5 mm

RoHS/RoHS II Compliant

MSL Level = N/A

## Reflow Profile [JEDEC J-STD-020]

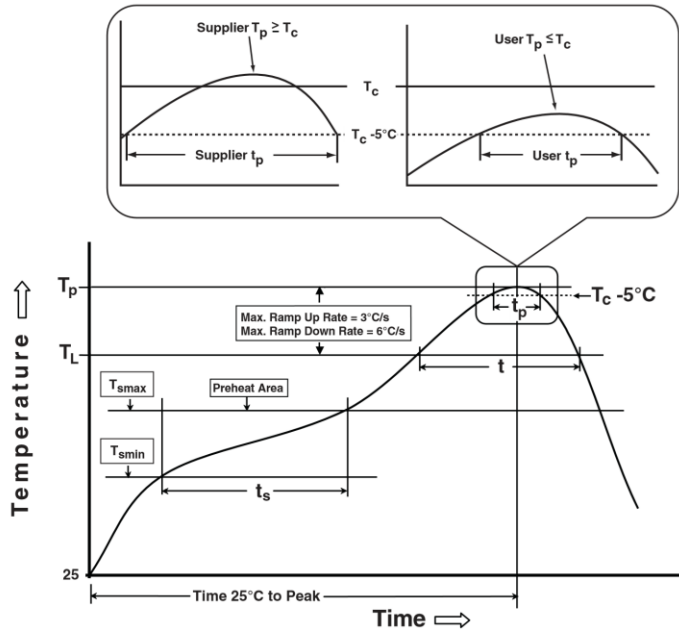


Table 1

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

Table 2

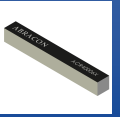
Pb-Free Process Classification Temperatures ( $T_c$ )			
Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350-2000	Volume $\text{mm}^3$ >2000
<1.6mm	260°C	260°C	260°C
1.6mm - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

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 ( $T_p$ )*	<b>See Table 1</b>	<b>See Table 2</b>
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.

# 5G NR/ 4G/ LTE Ceramic Chip Antenna



**ACR4006X**

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**40 x 6 x 5 mm**

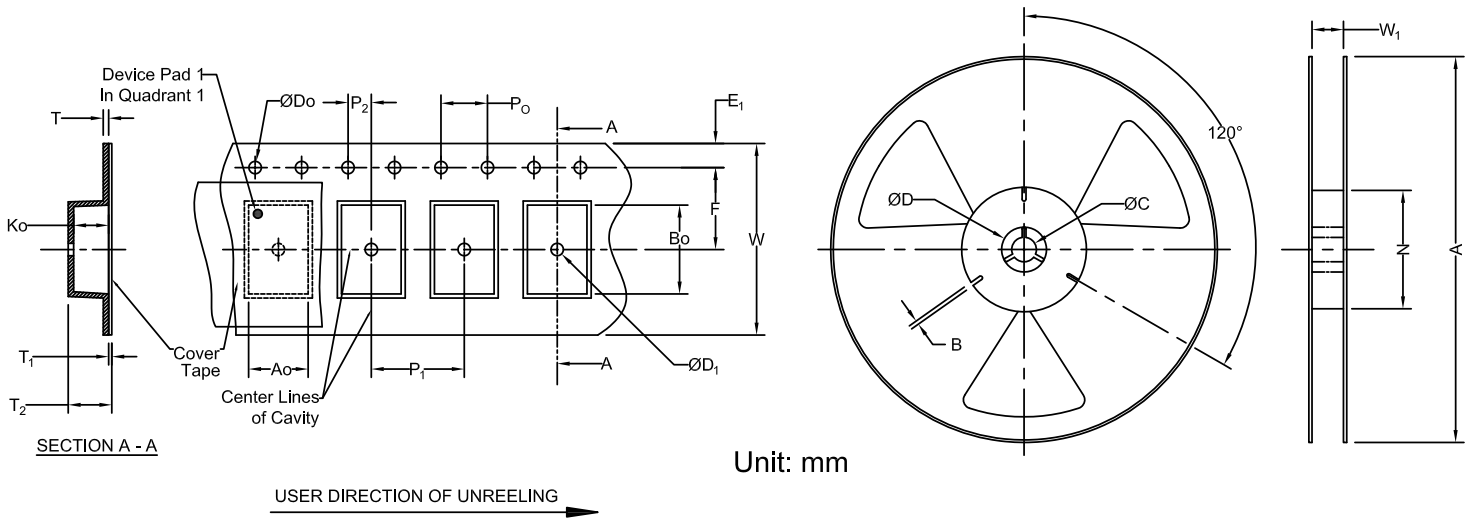
**RoHS/RoHS II Compliant**

**MSL Level = N/A**

## Packaging

1. Blister tape to IEC 286-3, polyester.
2. Number of pieces per tape: 450
3. Number of pieces per carton: 1350

## Tape & Reel Dimension



Unit: mm

### Carrier Tape Specifications (mm)

Do	K <sub>0</sub>	E <sub>1</sub>	P <sub>0</sub>	P <sub>2</sub>	T	F	P <sub>1</sub>	W	Reel Qty
1.50 ± 0.1	5.40 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.10	0.4 ± 0.05	26.2 ± 0.10	12.0 ± 0.1	56.0 ± 0.3	450

### Reel Specifications (mm)

A	W <sub>1</sub>	N	C
330 ± 1.0	56.0 ± 1.0	100 ± 1.0	13 ± 0.5

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