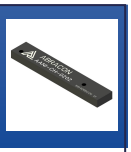
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Low Profile SMD LTE Chip Antenna



AANI-CH-0202

Request Samples | Check Inventory

40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Features

- Frequency Range: 698-960 / 1710-2690 MHz
- Compact & Low-Profile
- Peak Gain: 1.0 / 5.9 dBi
- Efficiency: 66 % / 80 %
- Surface Mount (SMD)

Applications

- Internet of Things (IoT) Devices
- LTE-M, Cat M, Cat M1, NB-IoT
- LTE CAT 1 up to CAT 20 Supported
- Smart Home Networking
- Networking & Telecommunication

Product Image



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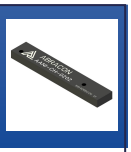
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Electrical Specification

Parameter	Specification		Unit
Operating Frequency	698-960	1710-2690	MHz
Return Loss	< -7.0	< - 9.5	dB
VSWR (Typ.)	< 2.6	< 2.0	:1
Peak Gain	1.0	5.9	dBi
Average Gain	0.25	3.75	
Minimum Total Efficiency	-2.9 (51)	-2.8 (53)	dB (%)
Average Total Efficiency	-2.3 (59)	-2.2 (60)	
Maximum Total Efficiency	-1.8 (66)	-1.0 (80)	
Impedance	50		Ω
Polarization	Linear		-
Radiation Pattern (Azimuth)	Omni-directional		-
Input Power	< 5		W

Note : All test measurements were conducted on 135 x 40 mm. Performance of the chip antenna will vary relative to the ground plane size in use.

Mechanical Specification

Parameter	Specification
Dimensions	40 x 7 x 3 mm
Mounting Type	Surface Mount
Antenna Clearance Space	40 x 14.7 mm
Evaluation Board size	135 x 40 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%
MSL Level	1
RoHS Complaint	Yes

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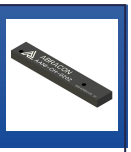
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Ordering Information

Part Number	Description
AANI-CH-0202	Low Profile SMD LTE Chip Antenna on Cut Tape
AANI-CH-0202-T	Low Profile SMD LTE Chip Antenna on Tape & Reel
AANI-CH-0202-EVB	Low Profile SMD LTE Chip Antenna Evaluation Board

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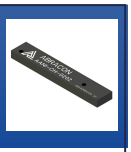
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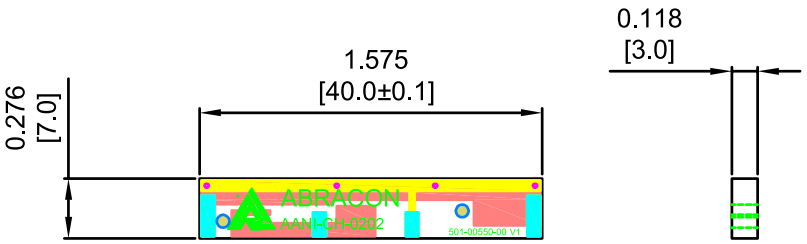


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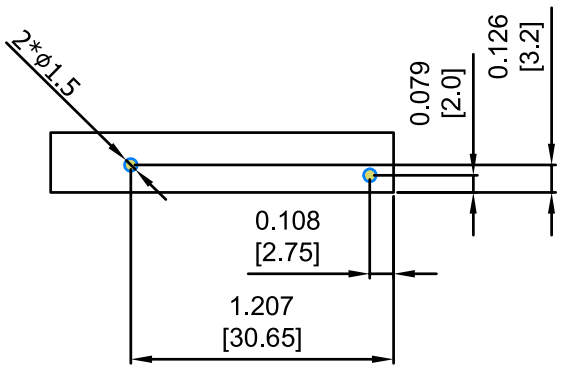
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Product Dimensions



TOP



Bottom

Unit: Inches[mm]

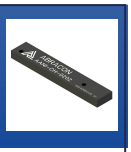
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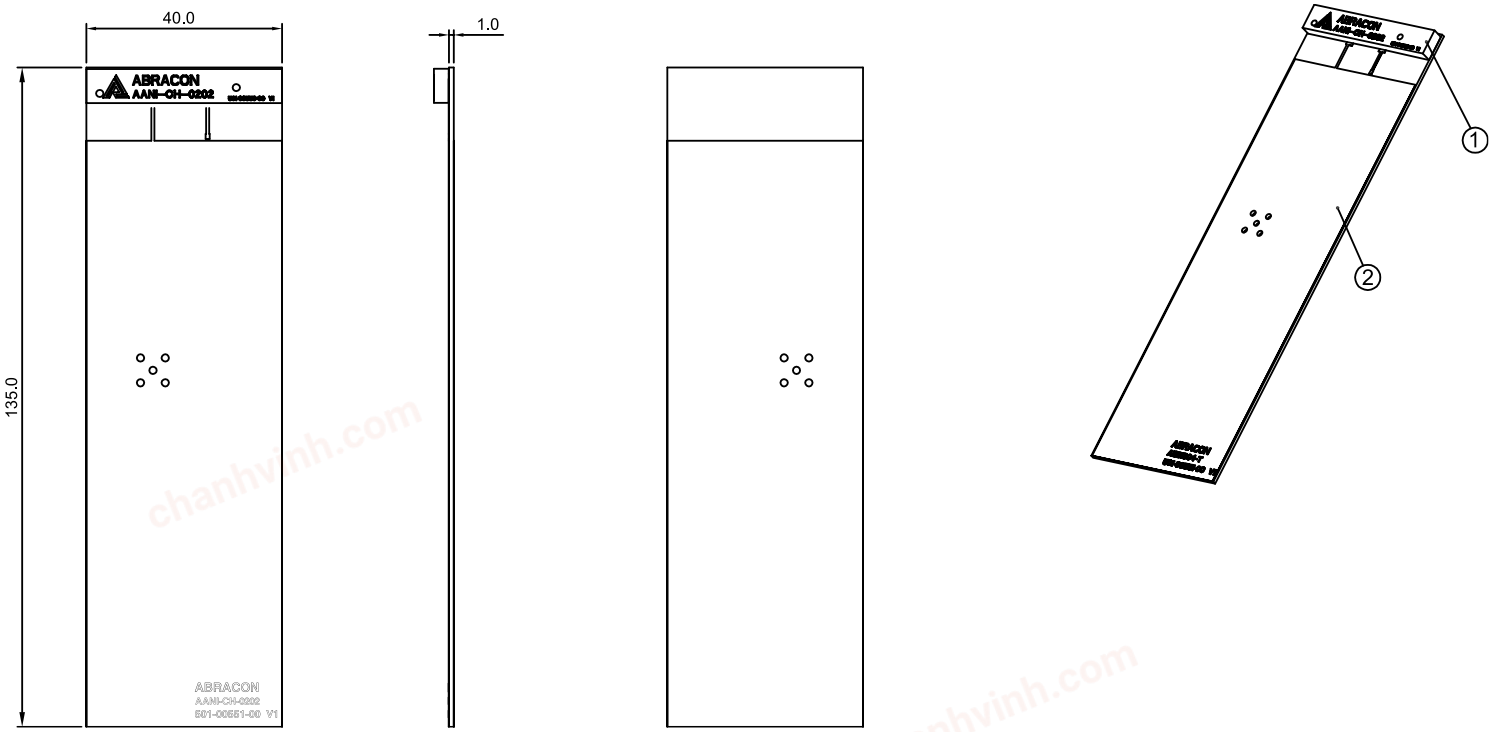


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Request Samples | Check Inventory

40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Evaluation Board Dimensions



Unit: mm

No.	Description
1	Antenna 40 x 7 x 3 mm
2	PCB 135 x 40 x 1 mm

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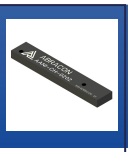
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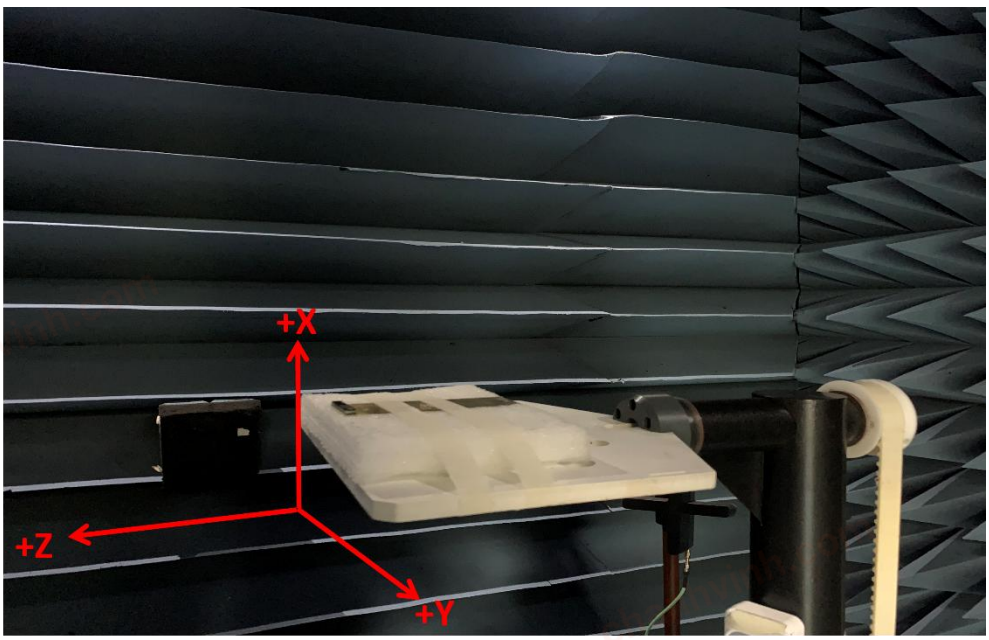


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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Measurement Setup photo



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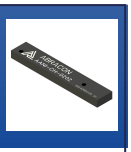
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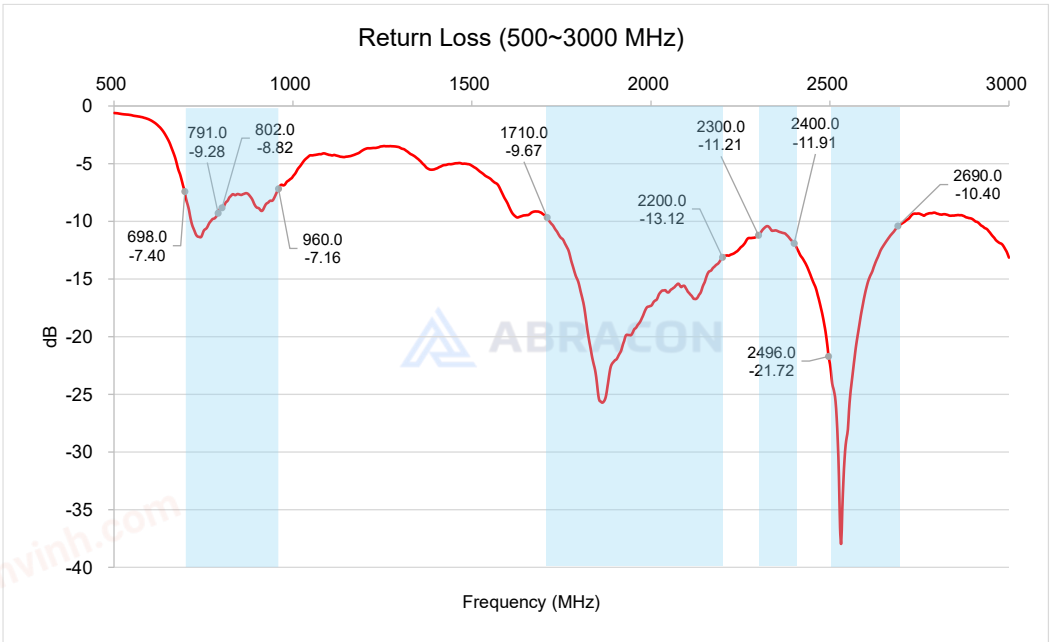


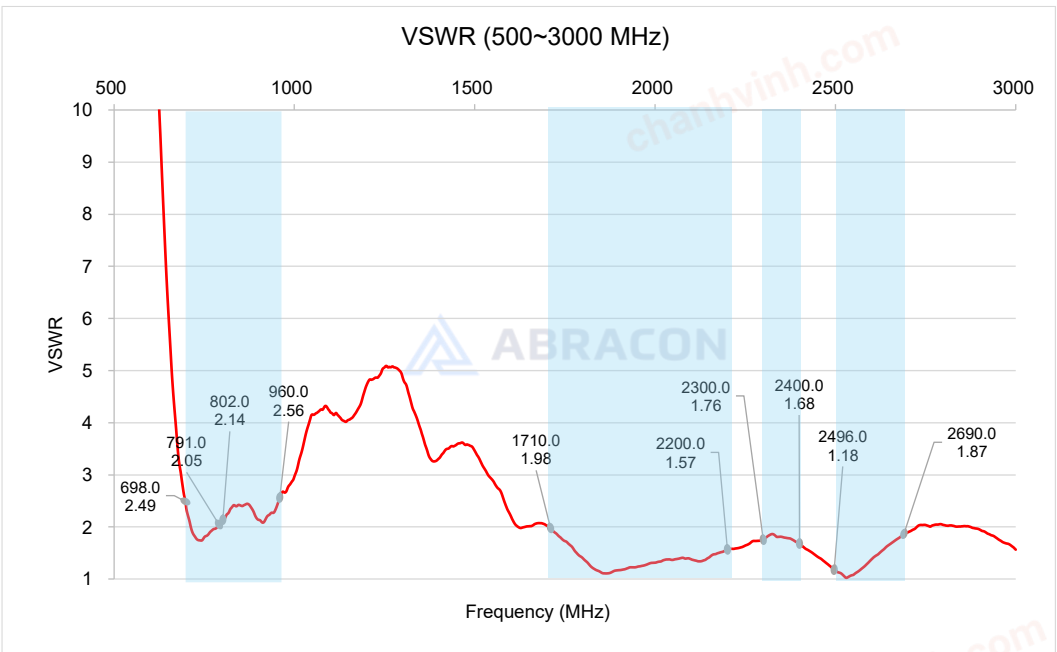
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Reflection Characteristics –Return Loss & VSWR





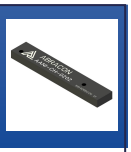
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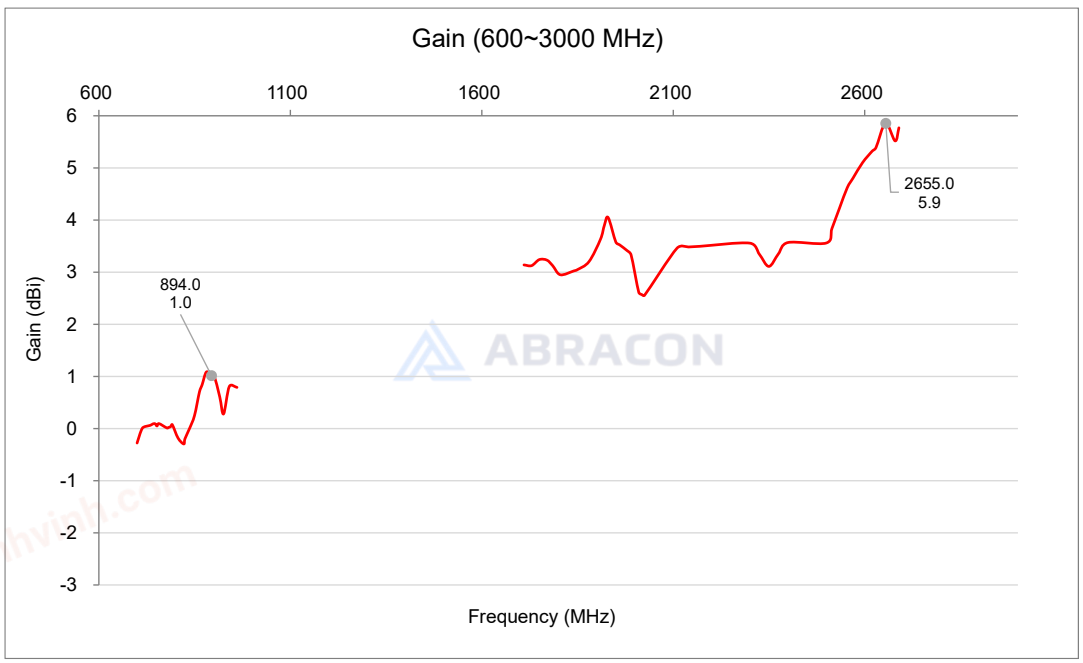


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40 x 7 x 3 mm
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MSL Level = 1

Radiation Characteristics – Peak Gain



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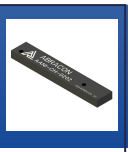
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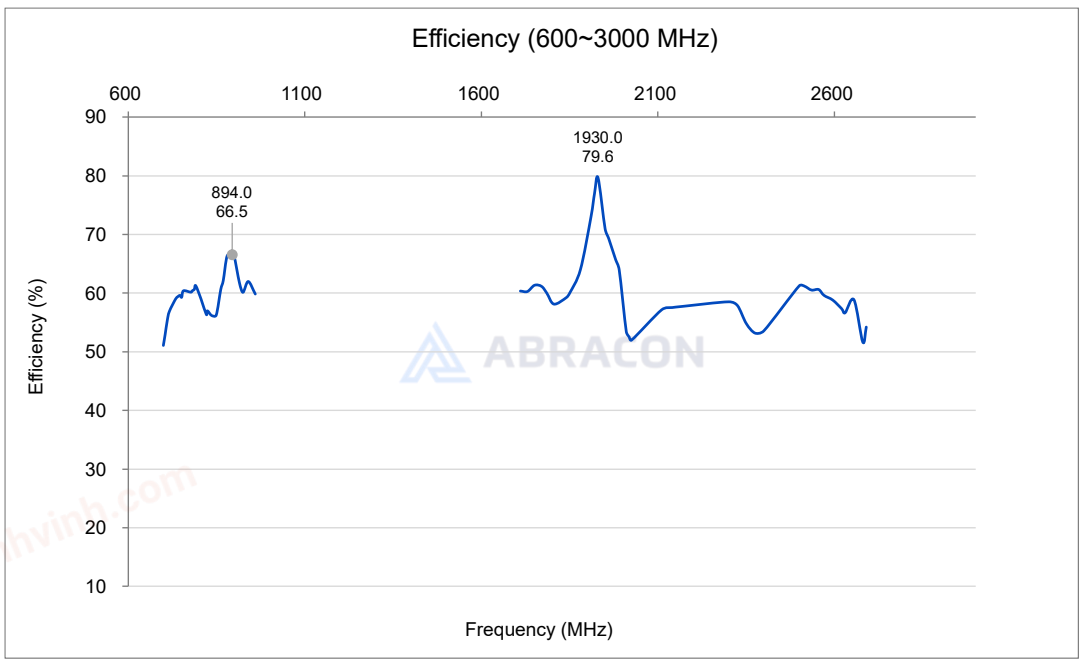


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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Radiation Characteristics – Total Efficiency (%)



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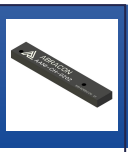
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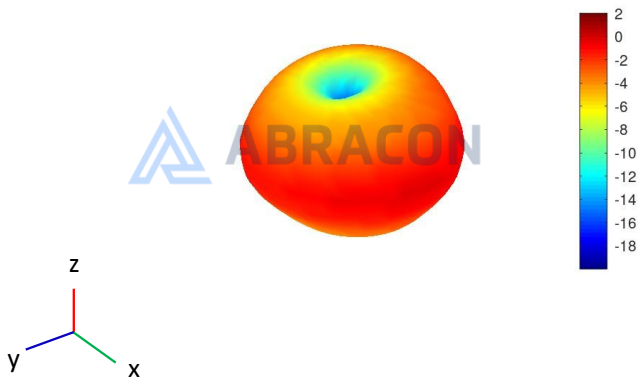
Request Samples | Check Inventory

40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

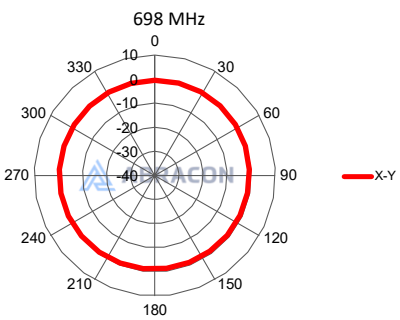
Radiation Characteristics – 3D & 2D Pattern

698MHz

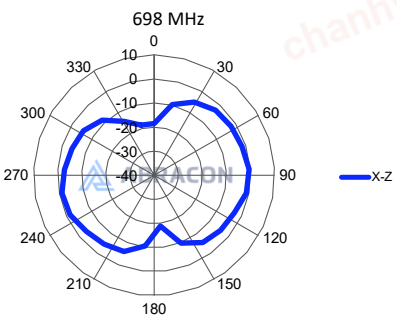




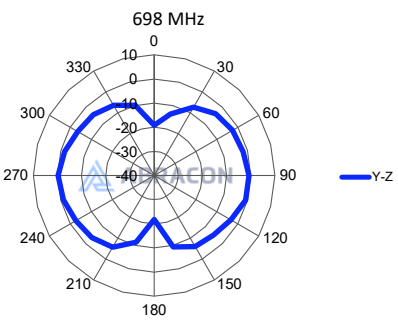
XY plane



XZ plane



YZ plane



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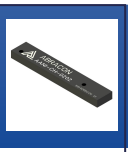
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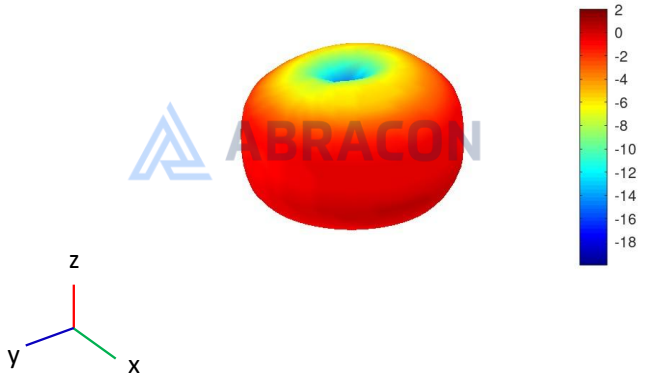
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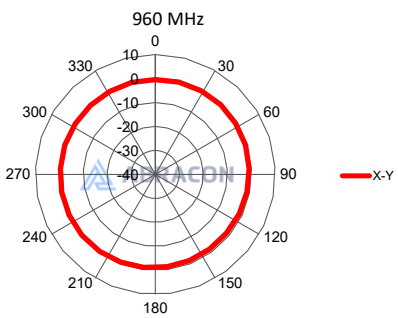
40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

960MHz

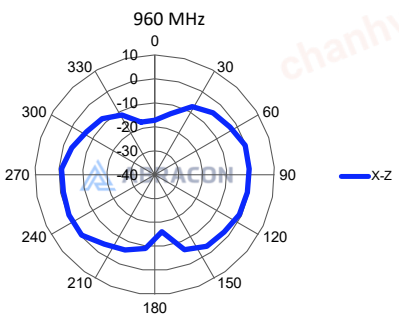




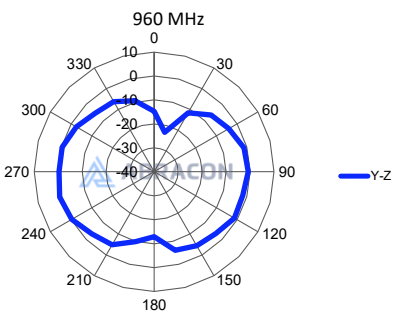
XY plane



XZ plane



YZ plane



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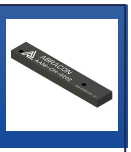
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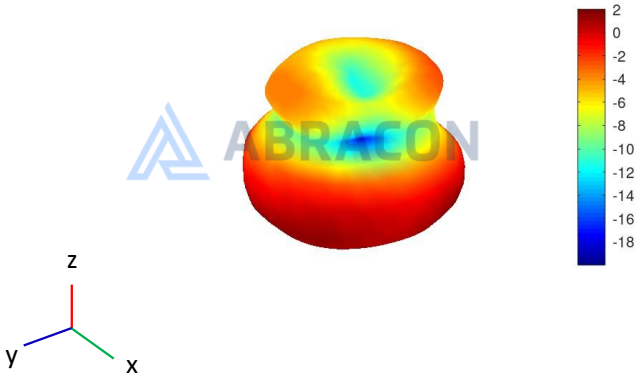
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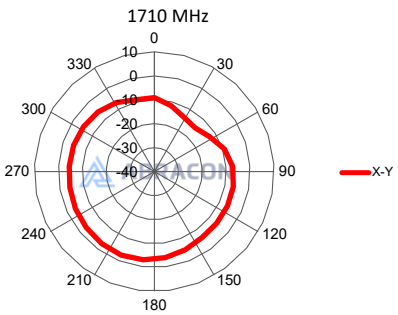
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RoHS/RoHS II Compliant
MSL Level = 1

1710MHz

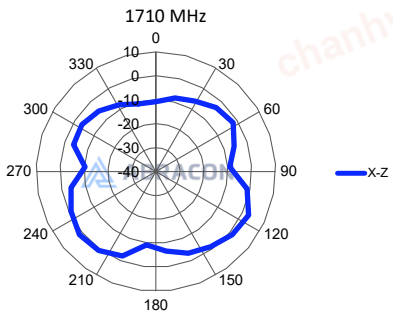




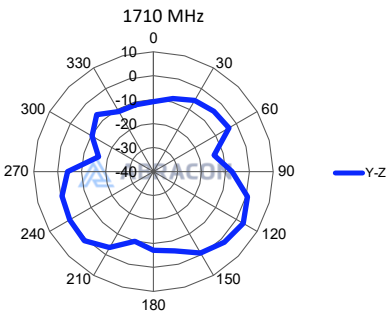
XY plane



XZ plane



YZ plane



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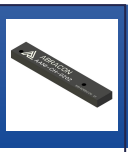
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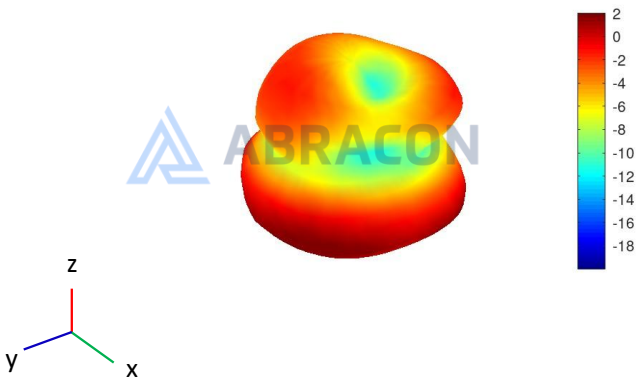
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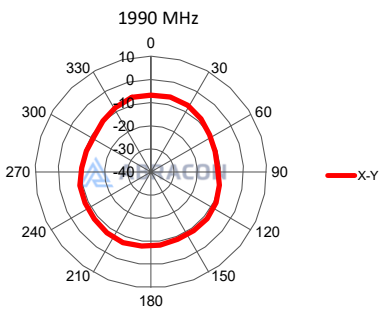
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RoHS/RoHS II Compliant
MSL Level = 1

1990MHz

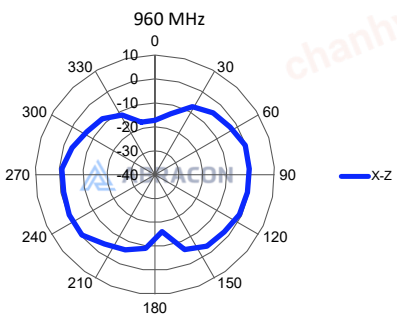




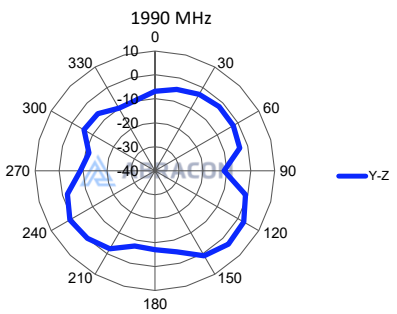
XY plane



XZ plane



YZ plane



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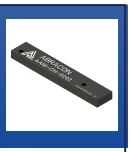
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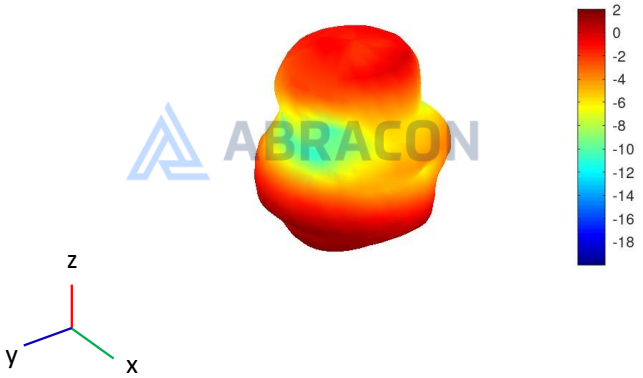
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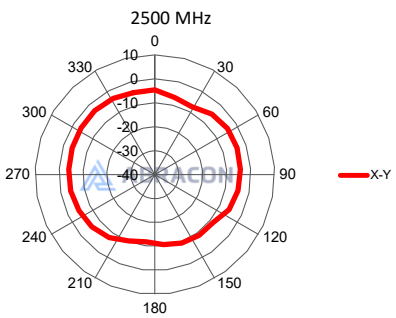
40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

2500MHz

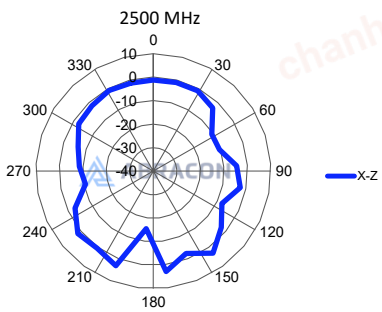




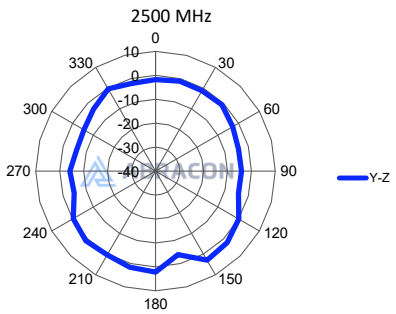
XY plane



XZ plane



YZ plane



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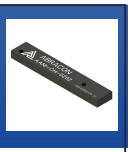
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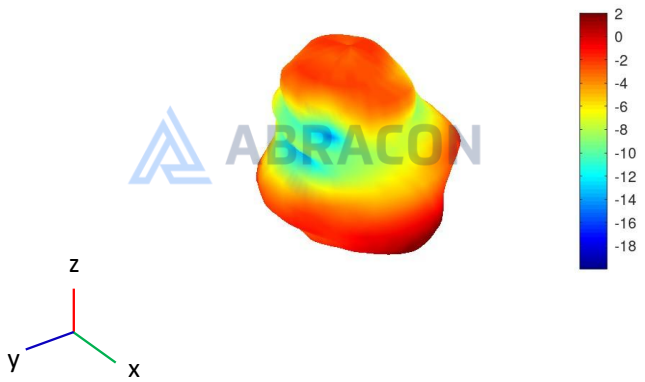
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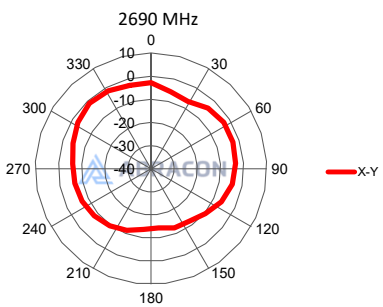
40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

2690MHz

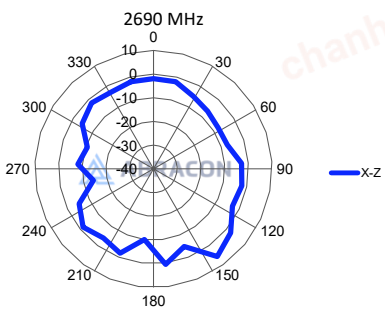




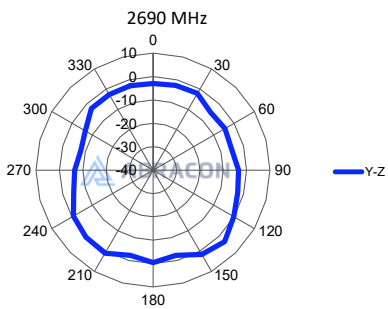
XY plane



XZ plane



YZ plane



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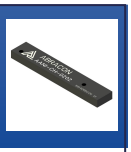
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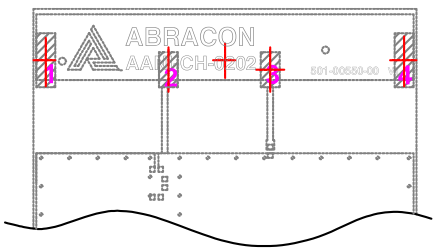
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

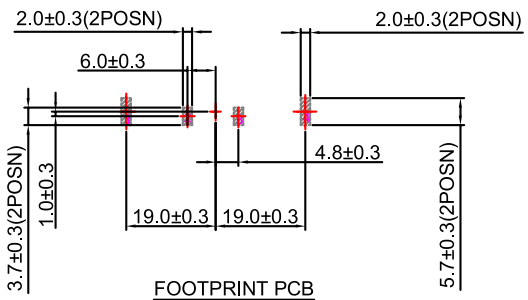
Evaluation Board Outline & Matching Circuit

The evaluation board is developed to showcase the performance of this chip antenna on a typical PCB and to simplify antenna testing and evaluation. It has a size of 135 x 40 mm. The performance could vary with different PCB sizes and Abracon can offer support to optimize the antenna for your specific application.

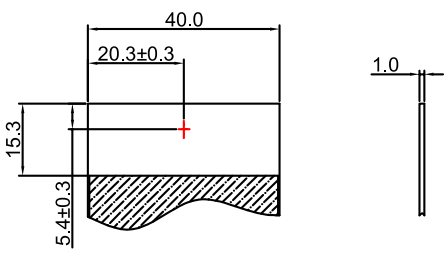


FOOTPRINT SOLDER PADS WITH PCB OUTLINE
SCALE 2:1

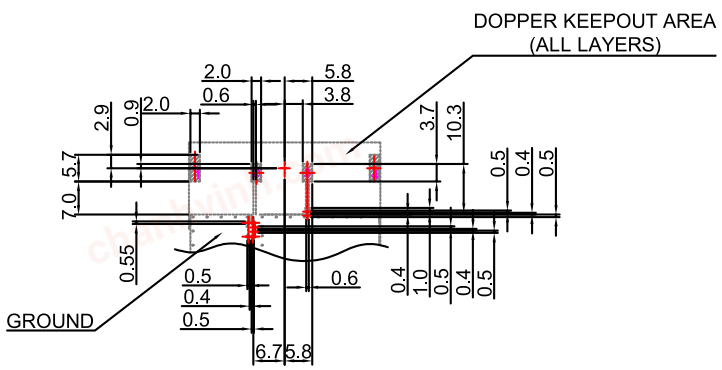
PIN	DESCRIPTION
1	PAD
2	Feed
3	GND
4	PAD



FOOTPRINT PCB
SCALE 1:1



GROUND CLEARANCE BOTTOM VIEW
(SILKSCREEN NOT SHOW)



GROUND CLEARANCE TOP VIEW
(SILKSCREEN NOT SHOW)

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

The standard tuning for the evaluation board is 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.

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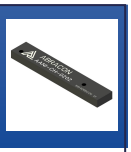
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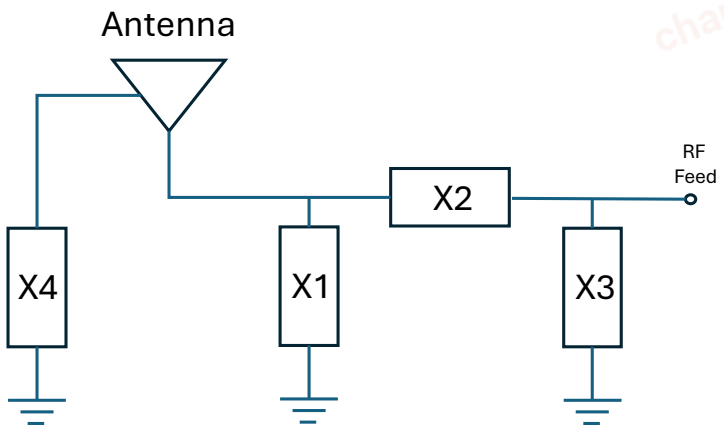
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1





Matching circuit

Location	X1	X2	X3	X4
Description	0.5pF	3.3nH	N/A	6.8nH
Part Number	0402N0R5A500CT	AIMC-0402-3N3ST	N/A	AIMC-0402-6N8ST
Manufacturer	WALSIN TECHNOLOGY	ABRACON	N/A	ABRACON

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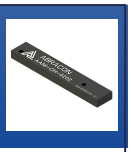
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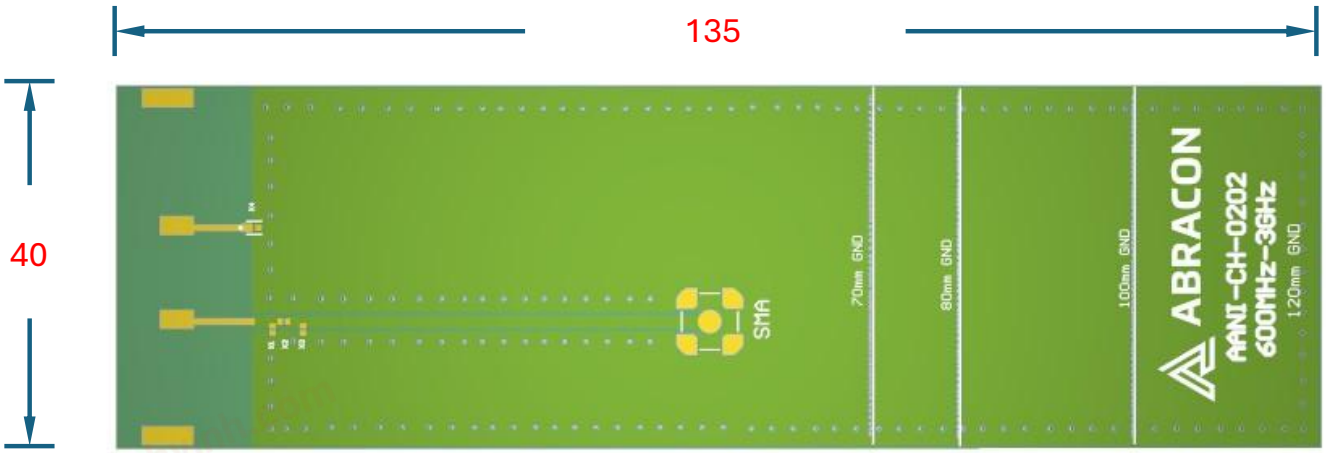
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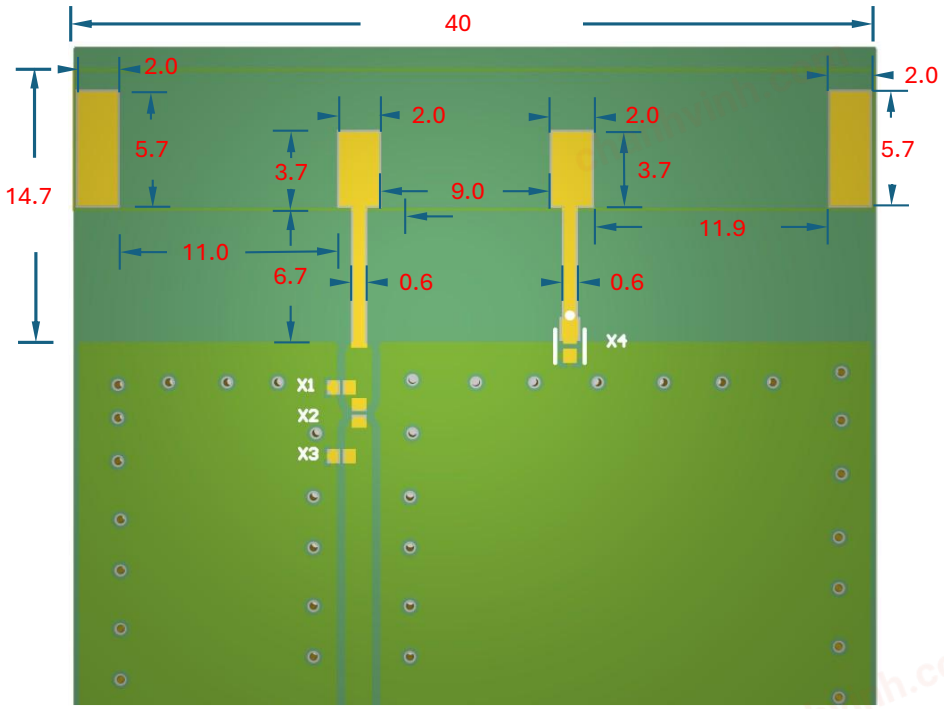
40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Recommended PCB layout

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 the ground clearance is respected through **all layers** of the PCB. It is recommended to implement a matching network to optimize the antenna impedance in your application.



Detailed view of antenna pads and antenna extension trace:



Unit: mm

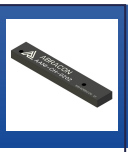
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RoHS/RoHS II Compliant
MSL Level = 1

Reflow Profile [JEDEC J-STD-020]

Solder paste: Sn/3.0Ag/0.5Cu

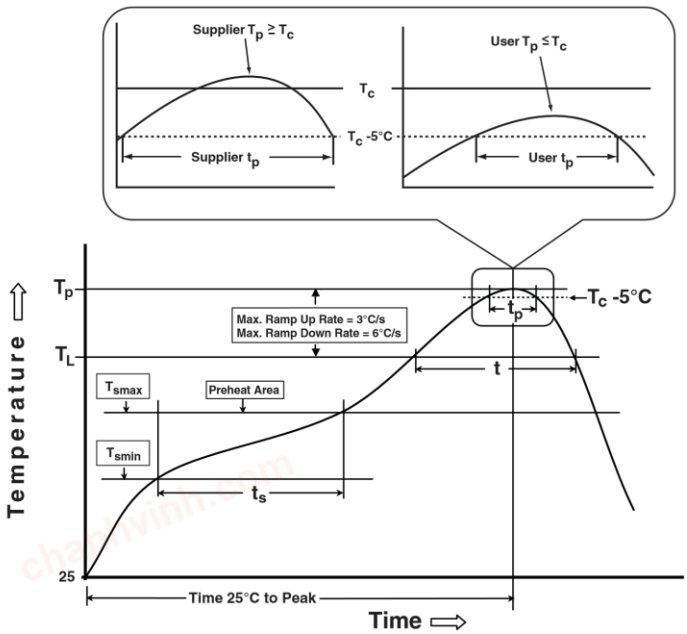


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≧350**
<2.5mm	235°C	220°C
≧2.5mm	220°C	220°C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	**Volume mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >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	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 – 120 sec.	60 – 90 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.	10 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.

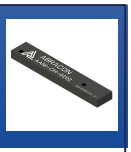
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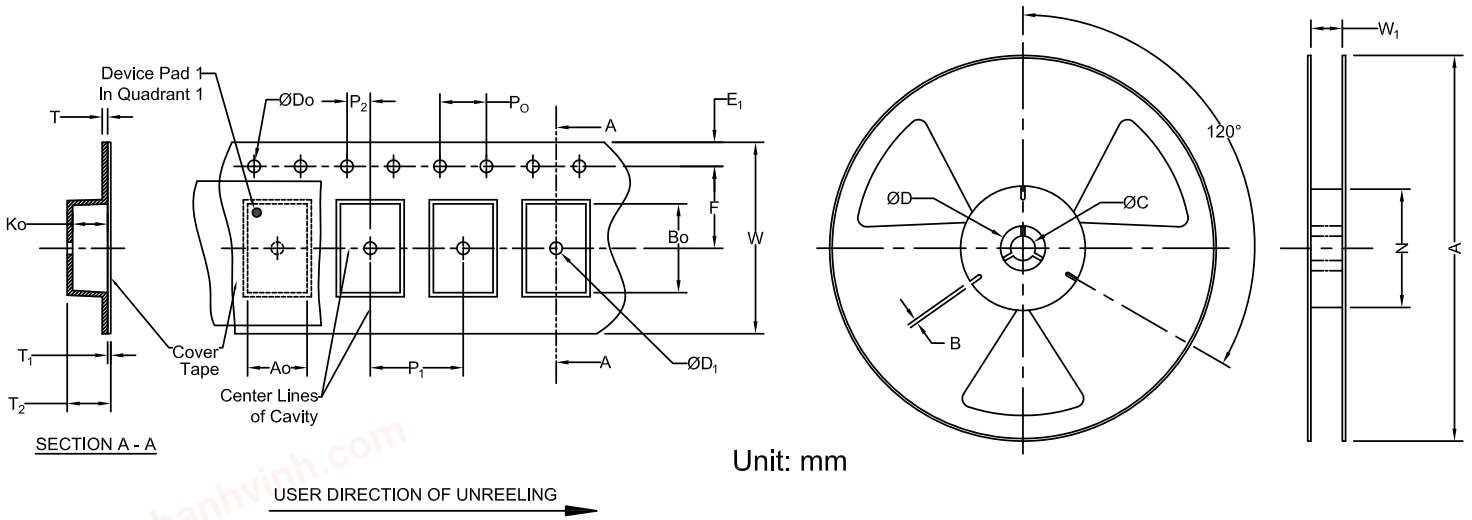
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40 x 7 x 3 mm
RoHS/RoHS II Compliant
MSL Level = 1

Packaging

Tape & Reel Dimension



Carrier Tape Specifications (mm)											
Do	K_0	E_1	P_0	P_2	T	F	P_1	W	A_0	B_0	Reel Qty
1.50 ± 0.1	3.80 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.10	0.3± 0.05	26.2 ± 0.10	12.0 ± 0.1	56.0 ± 0.10	7.3± 0.1	41± 0.1	1,000

Reel Specifications (mm)					
A	W_1	N	B	C	D
330 ± 1.0	62 ± 1.0	100 ± 1.0	2.0 ± 0.5	13 ± 0.5	20.2 min

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