



IoT Wireless Vibration sensor module

LoRa, BLE ANTENNA

Part Numbers: 2195912-1
 Manufacturer: TE Connectivity Ltd.
 Address:
 No. 21 Deshun Bei Road
 Huanhai Economic Development Zone
 Qingdao 266108
 China

FEATURES & BENEFITS

- LDS(Laser Direct Structuring) Antenna
- Ability to selectively and repeatably plate 3 dimensionally
 - Implementation of two antennas (LoRa & BLE) on one substrate
 - Ability to produce thin traces
 - Flexibility of pattern design without changing tool

SPECIFICATIONS

	Vibration Sensor		
Frequency Range (MHz)	863 to 870 MHz	902 to 928 MHz	2400 to 2480 MHz
Average Gain	63.4 %	54.0 %	31.5 %
Average Gain	-2.0dBi	-2.7dBi	-5.0dBi
Peak Gain[dB]	+0.47dBi	+0.30dBi	+0.17dBi
Target Frequency	868 MHz	915 MHz	2450 MHz
Target Frequency Gain	-2.0dBi	-2.9dBi	-5.2dBi
Feed Point Impedance	50 ohms unbalanced		
Polarization	Linear		
Size	Dia. 29.54 mm x 21.50 mm Height		
Weight	< 20.5 g		
Operating Temperature	-40 to +85°C		
Storage Temperature	-40 to +85°C		
Packaging Specification	Box		
Hazardous Materials	A certificate of conformance is available from the product page on TE website.		
Data measured Free Space condition			

RF DATA – Vibration Sensor condition

3D Chamber : Efficiency Measurement

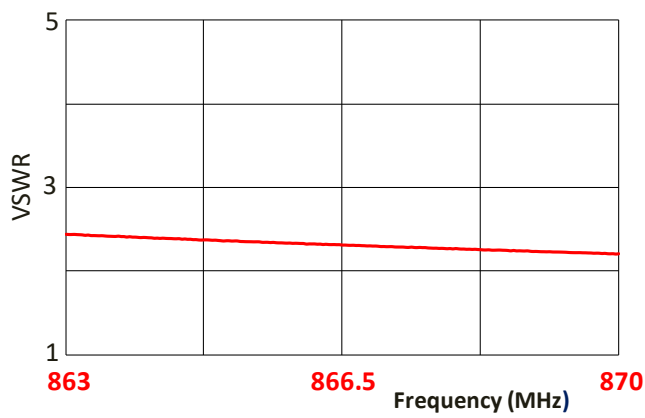
	1	2	3	4	5	6	7	8
Frequency [MHz]	863	864	865	866	867	868	869	870
Efficiency [dB]	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.9	-1.9
Efficiency [%]	63.6	62.8	62.8	63.2	63.5	62.8	64.6	64.7
Peak Gain [dB]	0.36	0.32	0.34	0.36	0.38	0.30	0.45	0.47

	1	2	3	4	5	6	7	8	9
Frequency [MHz]	902	905	909	912	915	918	922	925	928
Efficiency [dB]	-2.1	-2.3	-2.5	-2.7	-2.9	-2.9	-2.9	-2.9	-2.9
Efficiency [%]	61.1	58.7	56.3	53.9	51.5	51.3	51.1	51.0	50.8
Peak Gain [dB]	0.30	0.12	-0.07	-0.25	-0.43	-0.45	-0.46	-0.48	-0.49

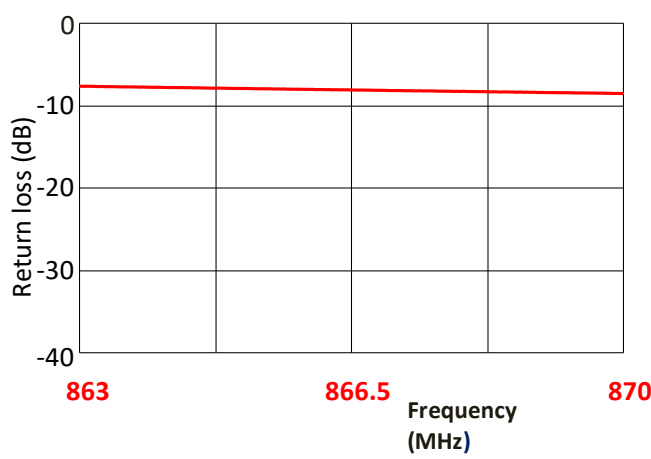
	1	2	3	4	5	6	7	8	9
Frequency [MHz]	2400	2410	2420	2430	2440	2450	2460	2470	2480
Efficiency [dB]	-4.5	-4.6	-4.8	-4.9	-5.0	-5.2	-5.3	-5.5	-5.6
Efficiency [%]	35.7	34.6	33.5	32.5	31.4	30.4	29.4	28.4	27.4
Peak Gain [dB]	0.17	0.09	0.01	-0.07	-0.16	-0.21	-0.27	-0.33	-0.39

RF DATA – Vibration Sensor condition

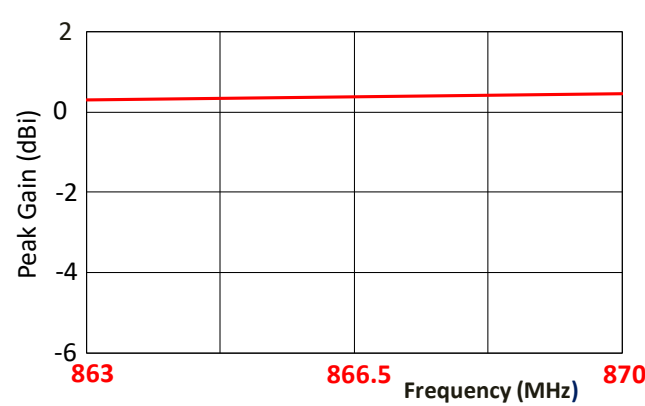
VSWR



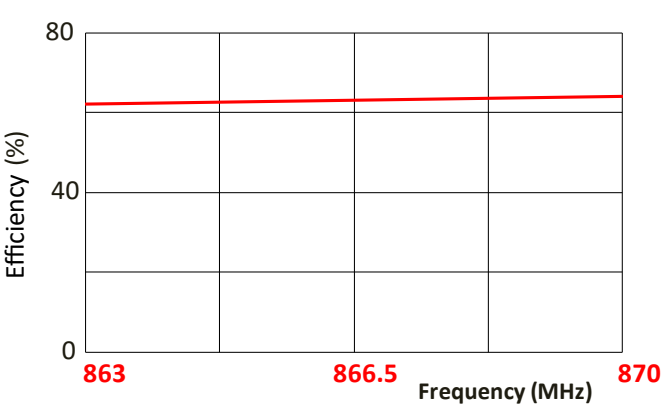
Return Loss



Peak Gain

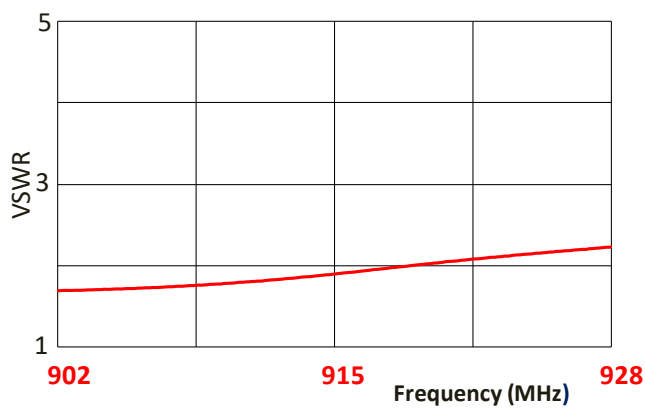


Efficiency

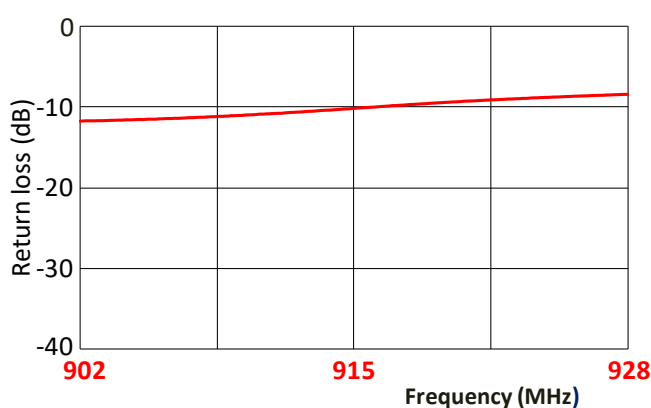


RF DATA – Vibration Sensor condition

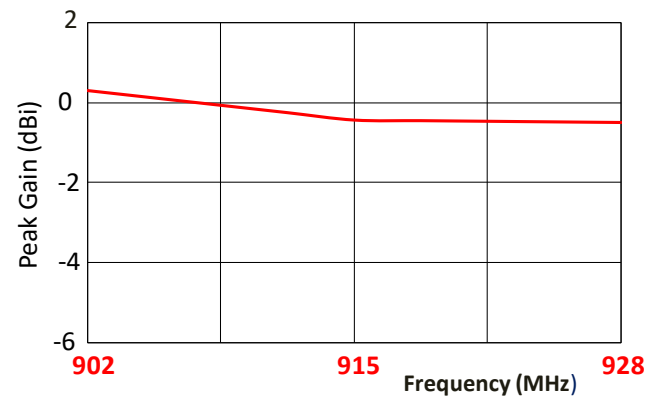
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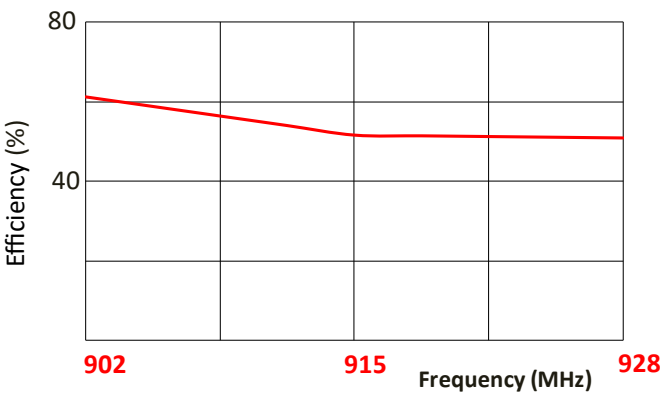
Return Loss



Peak Gain

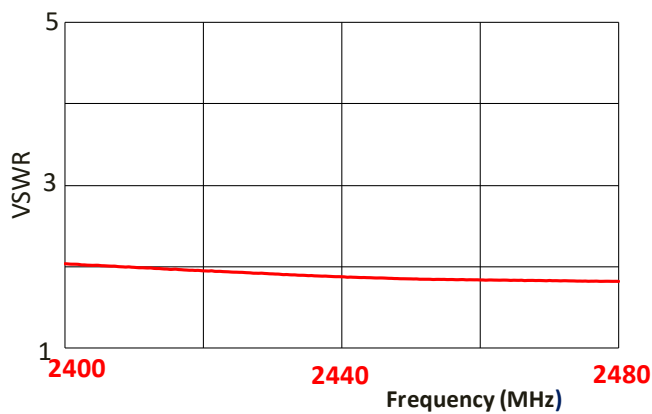


Efficiency

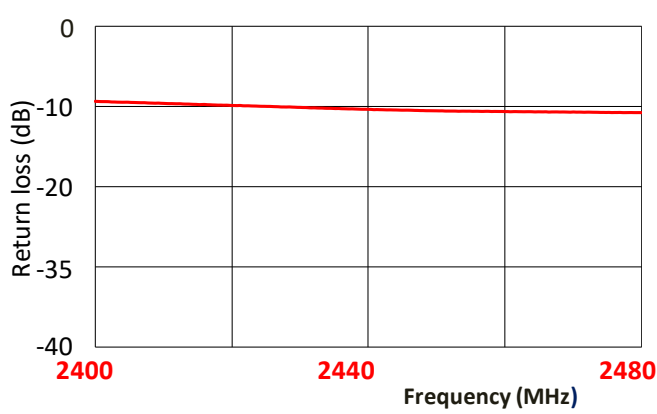


RF DATA – Vibration Sensor condition

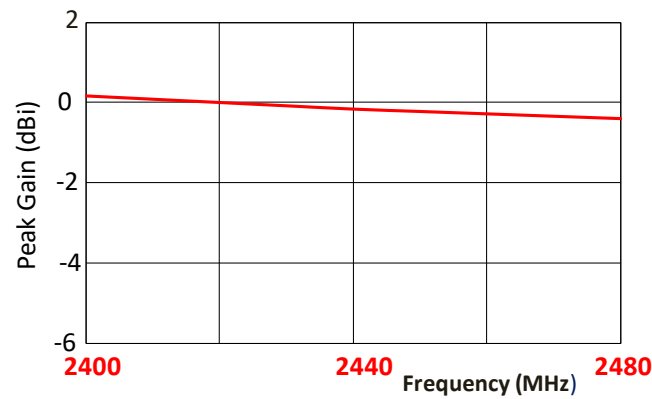
VSWR



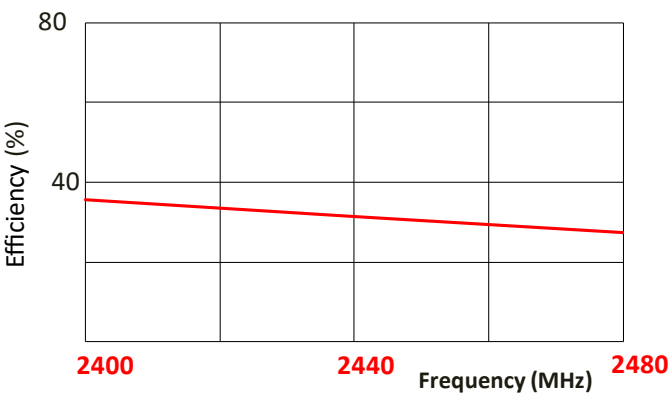
Return Loss



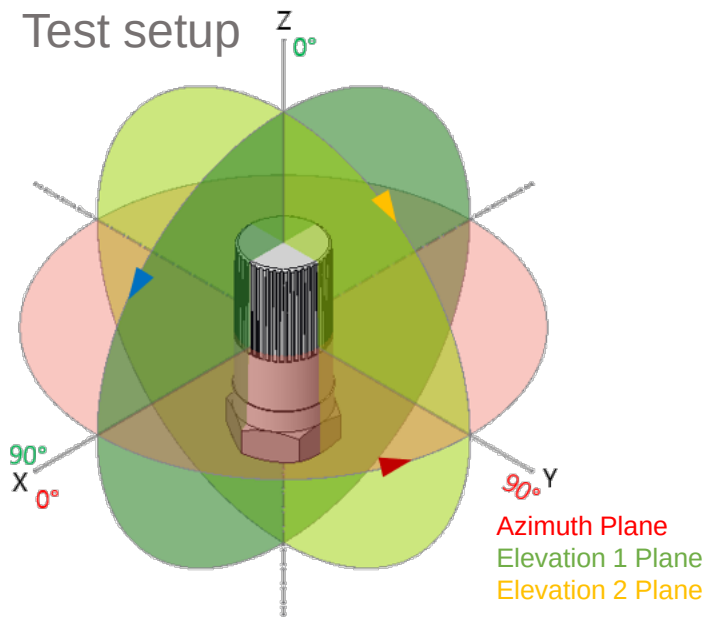
Peak Gain



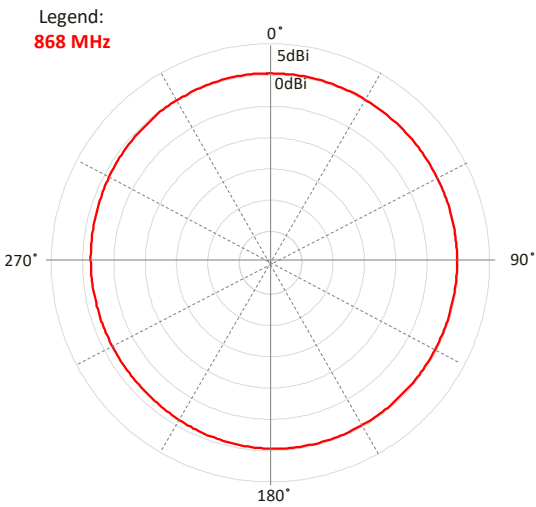
Efficiency



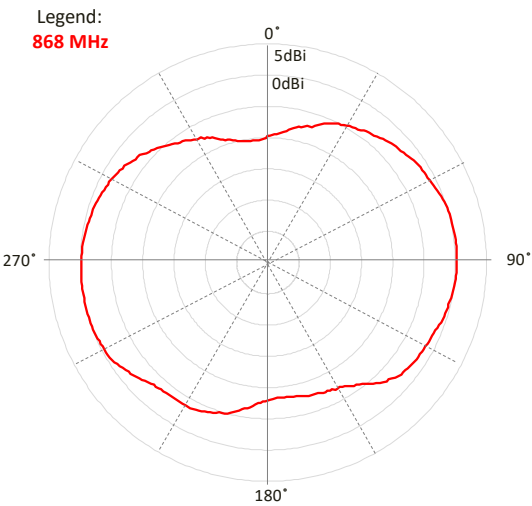
RADIATION PATTERN – Vibration Sensor condition



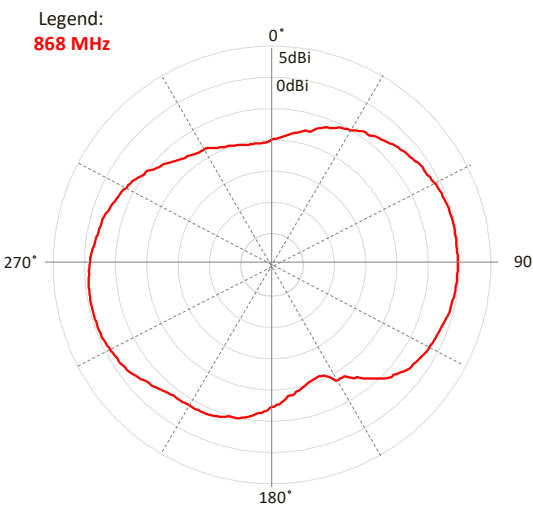
Azimuth



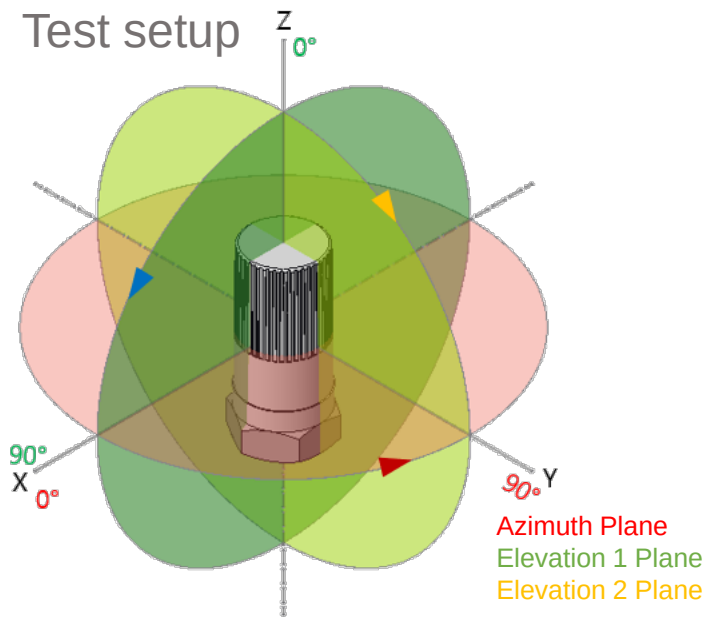
Elevation 1



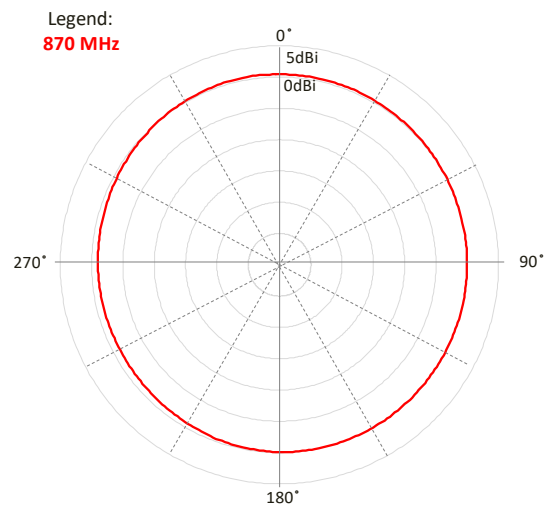
Elevation 2



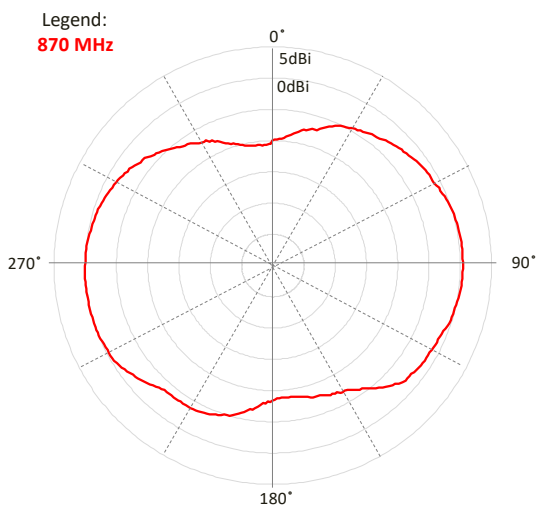
RADIATION PATTERN – Vibration Sensor condition (Peak Gain)



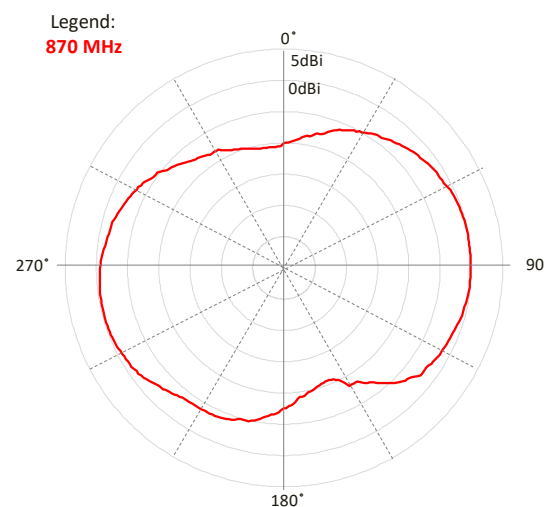
Azimuth



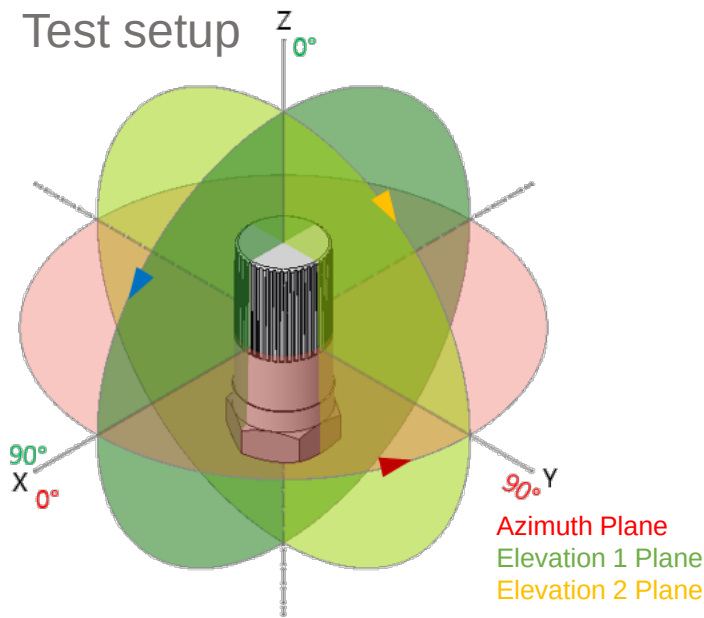
Elevation 1



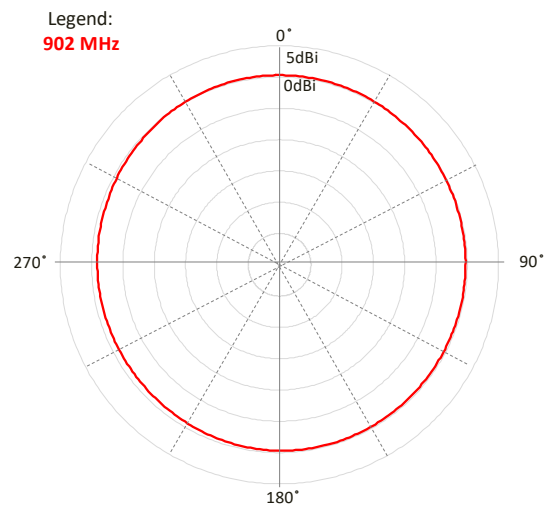
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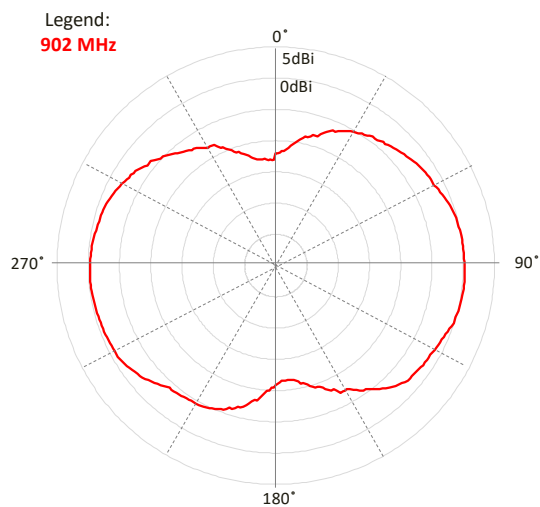
RADIATION PATTERN – Vibration Sensor condition (Peak Gain)



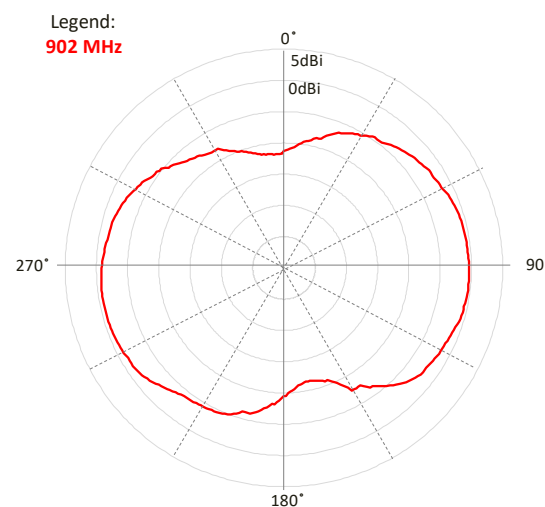
Azimuth



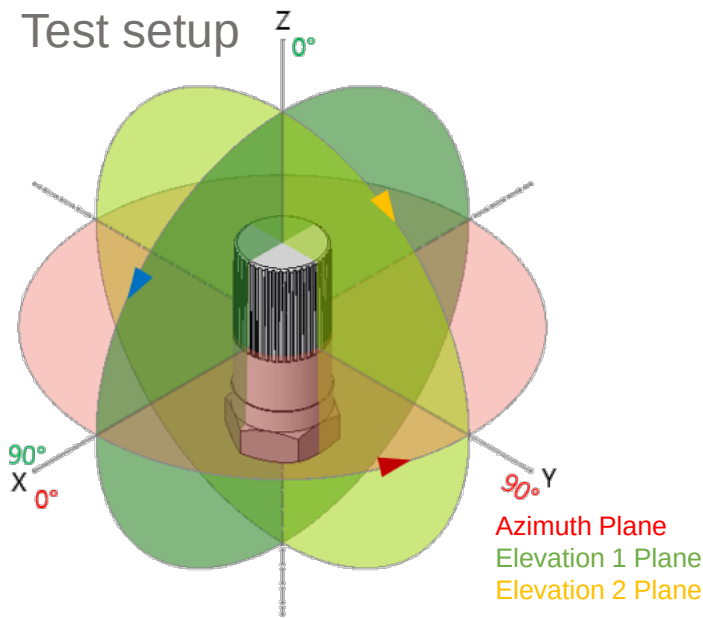
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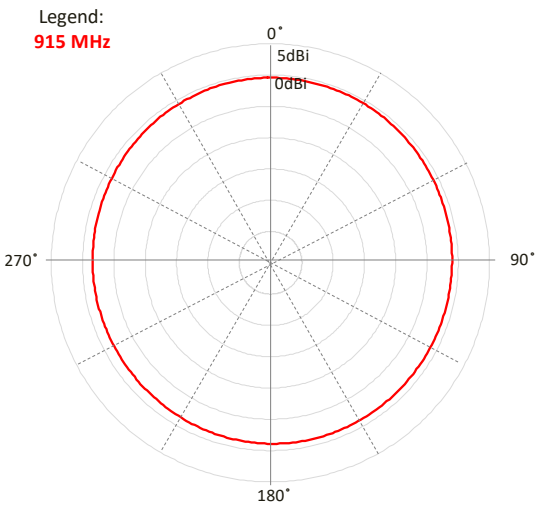
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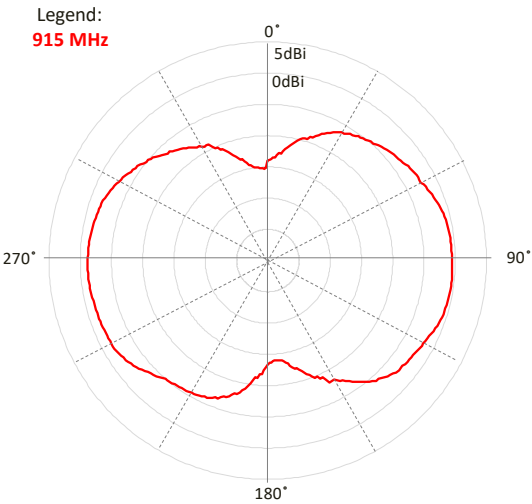
RADIATION PATTERN – Vibration Sensor condition



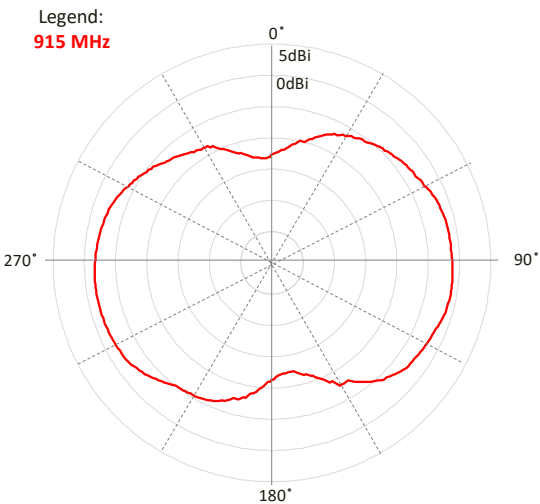
Azimuth



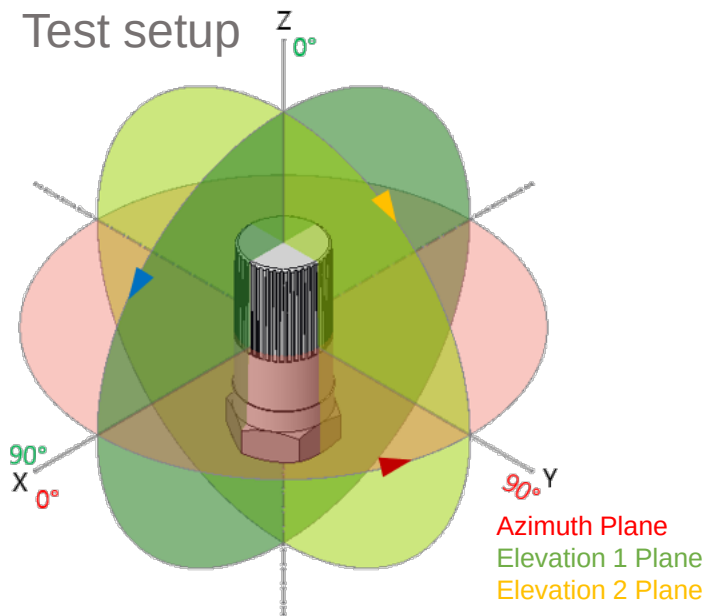
Elevation 1



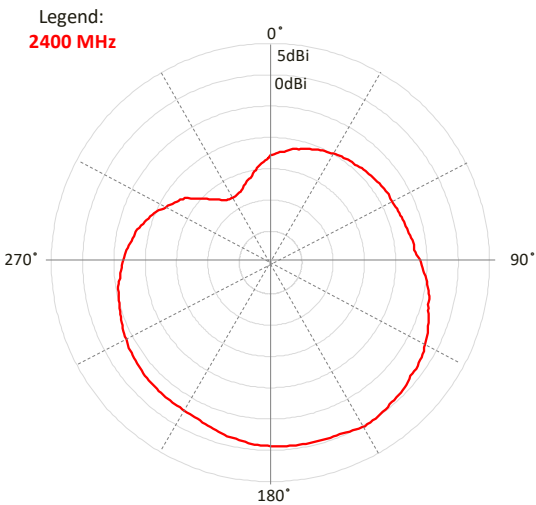
Elevation 2



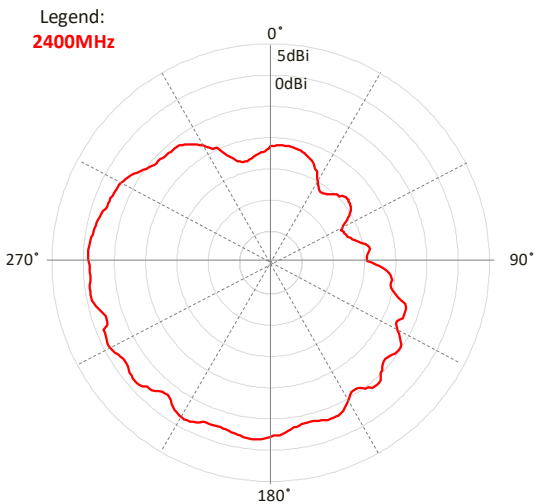
RADIATION PATTERN – Vibration Sensor condition (Peak Gain)



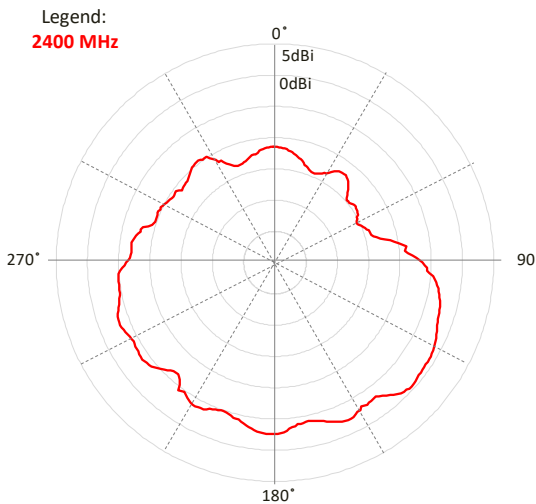
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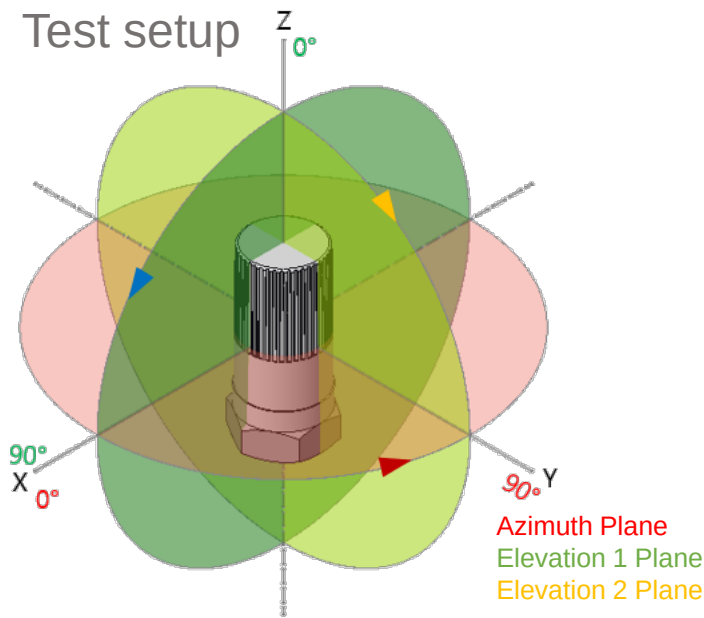
Elevation 1



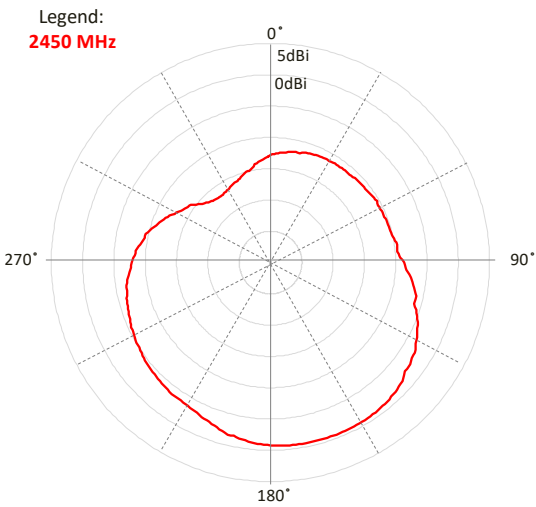
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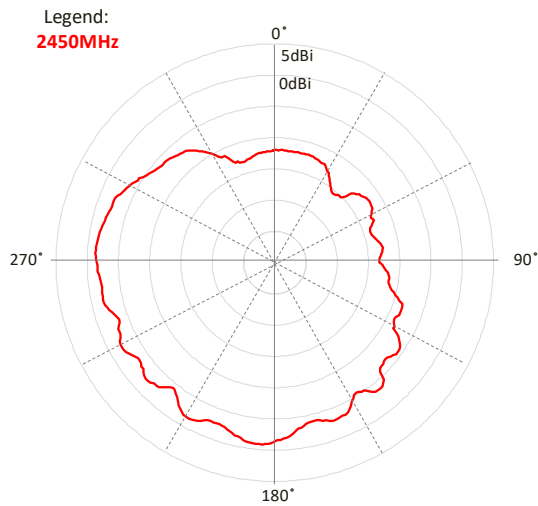
RADIATION PATTERN – Vibration Sensor condition



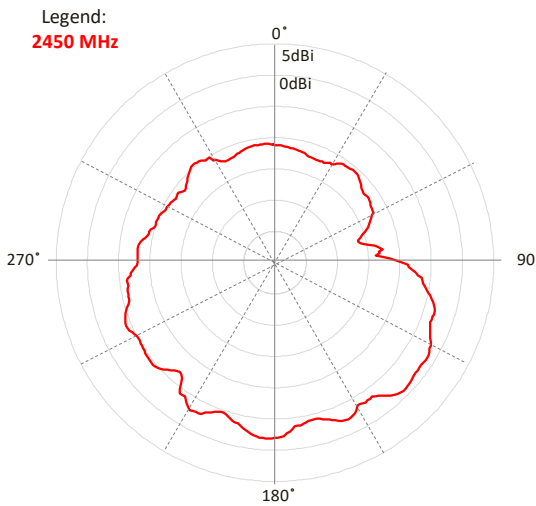
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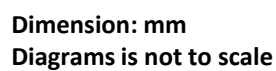
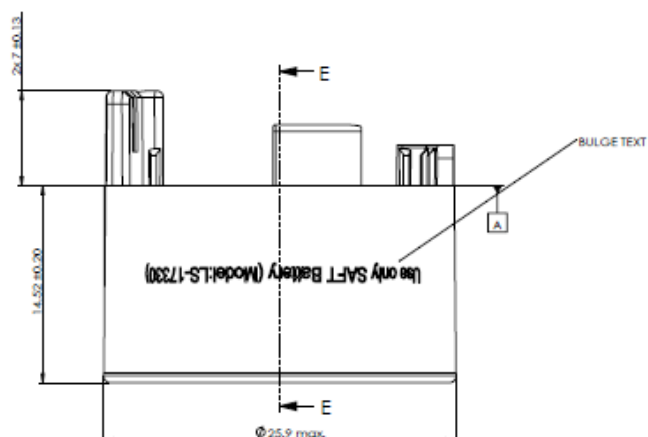
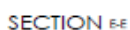
Elevation 1



Elevation 2



DIMENSIONS

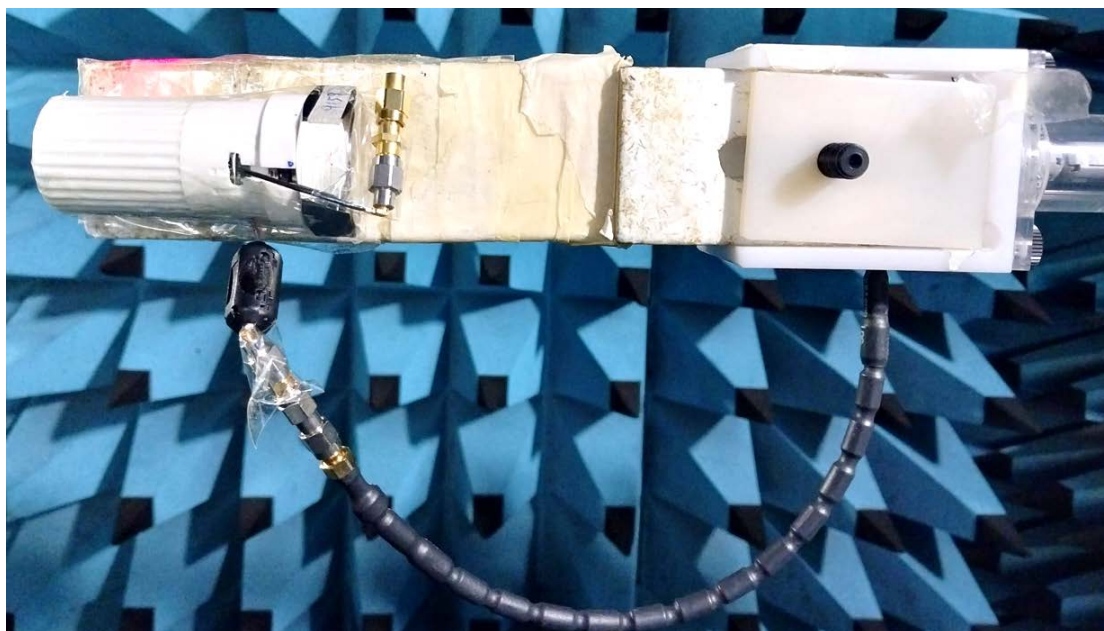
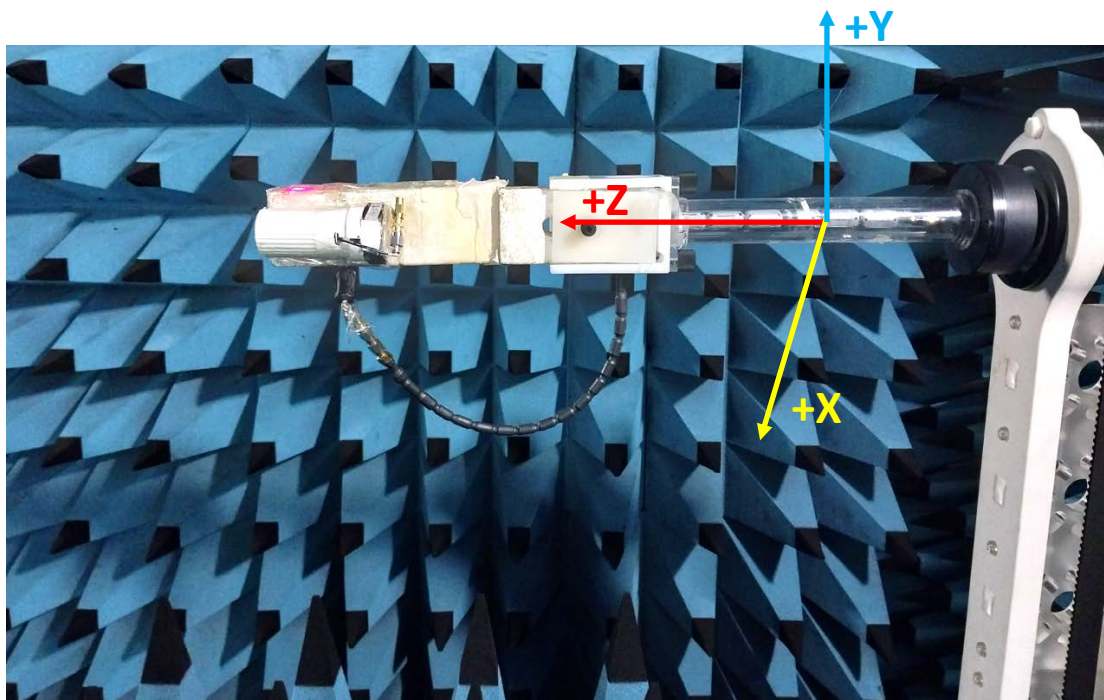


APPENDIX



Vibration sensor

Test condition – Free space / Orientation

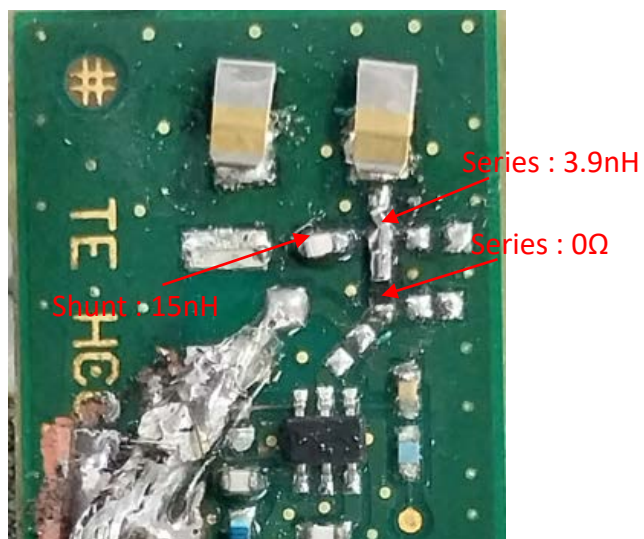


- Antenna measurement cables : Ferrite ring / 50 Ω Termination
- Chamber Measurement cable : With Ferrite rings

Matching circuit values

Vibration Sensor condition

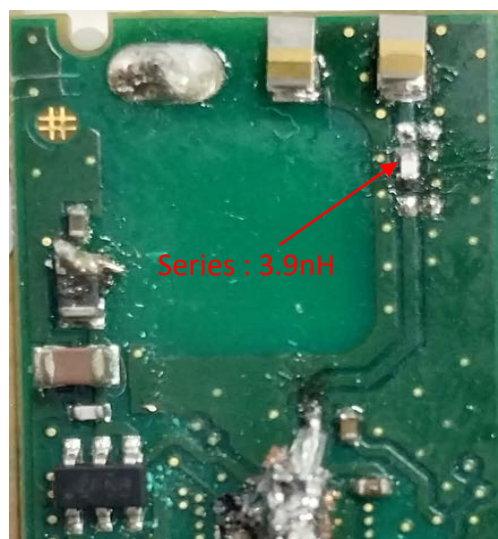
LoRa Antenna



Matching circuit values

Ant – Series 15pF – shunt 5.6nH – Series 0 Ω

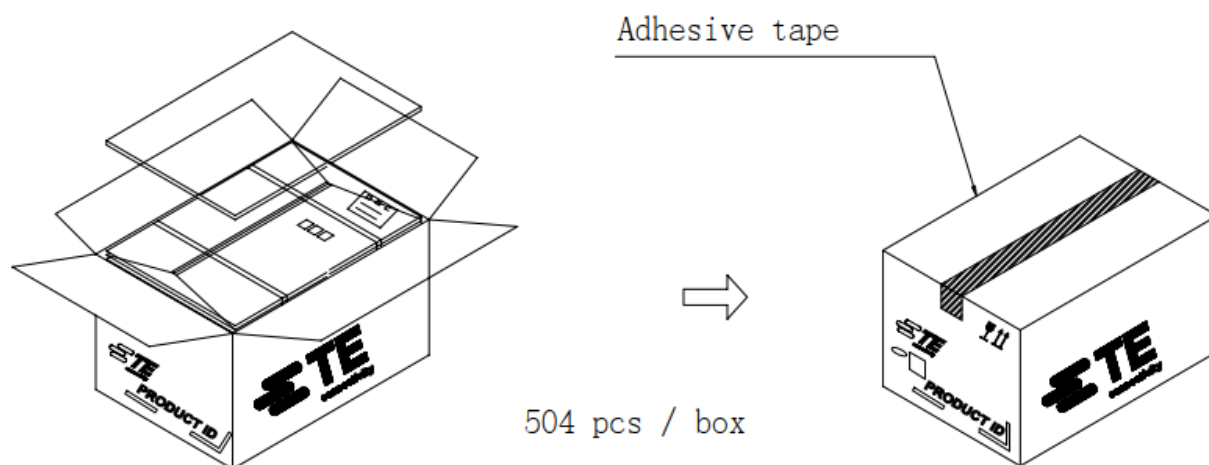
BLE Antenna



Matching circuit value

Ant – Series 3.9nH

PACKAGING



TE TECHNICAL SUPPORT CENTER

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