



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 repeatable 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

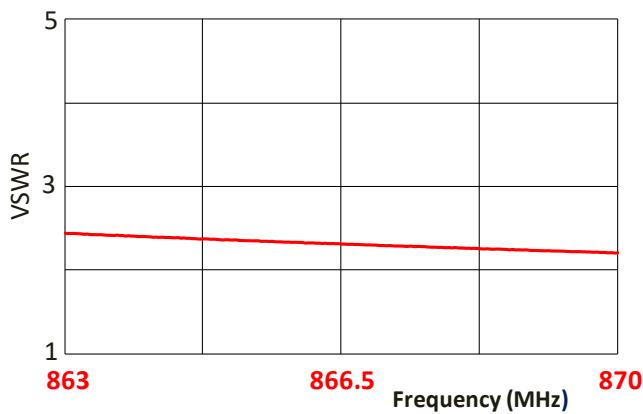
	1	2	3	4	5	6	7	8
Frequency [MHz]	863	864	865	866	867	868	869	870
Efficiency [dB]	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.9	-1.9
Efficiency [%]	63.6	62.8	62.8	63.2	63.5	62.8	64.6	64.7
Peak Gain [dB]	0.36	0.32	0.34	0.36	0.38	0.30	0.45	0.47

	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

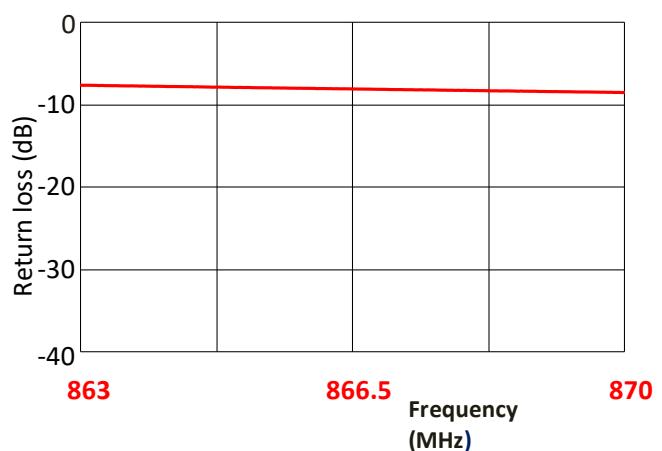
	1	2	3	4	5	6	7	8	9
Frequency [MHz]	2400	2410	2420	2430	2440	2450	2460	2470	2480
Efficiency [dB]	-4.5	-4.6	-4.8	-4.9	-5.0	-5.2	-5.3	-5.5	-5.6
Efficiency [%]	35.7	34.6	33.5	32.5	31.4	30.4	29.4	28.4	27.4
Peak Gain [dB]	0.17	0.09	0.01	-0.07	-0.16	-0.21	-0.27	-0.33	-0.39

RF DATA – Vibration Sensor condition

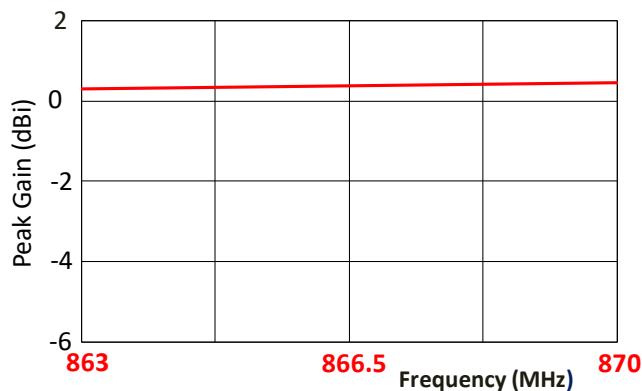
VSWR



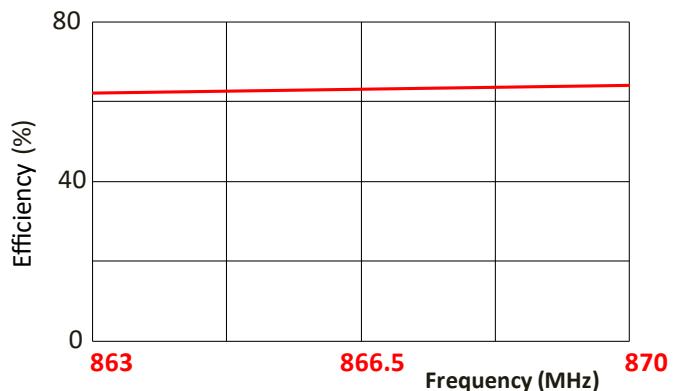
Return Loss



Peak Gain

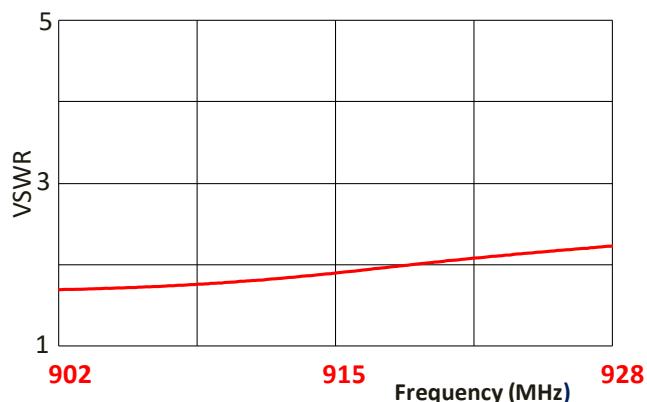


Efficiency

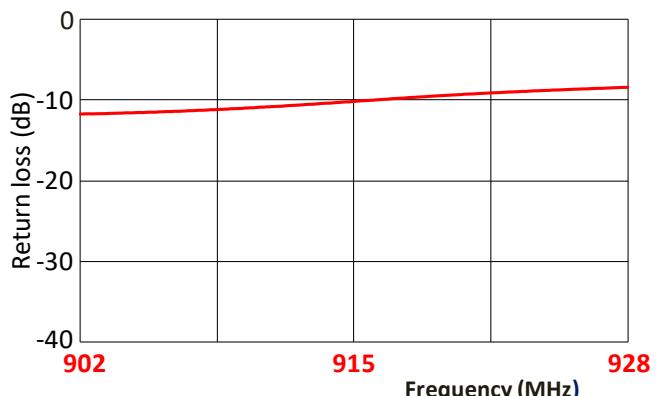


RF DATA – Vibration Sensor condition

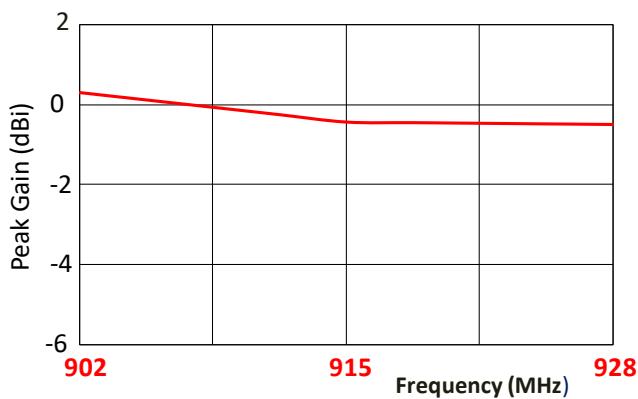
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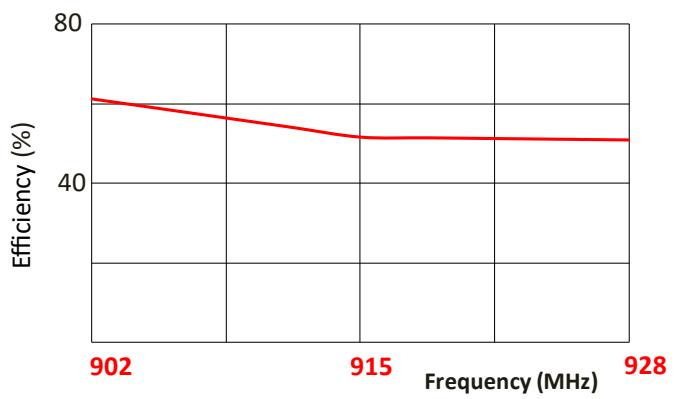
Return Loss



Peak Gain

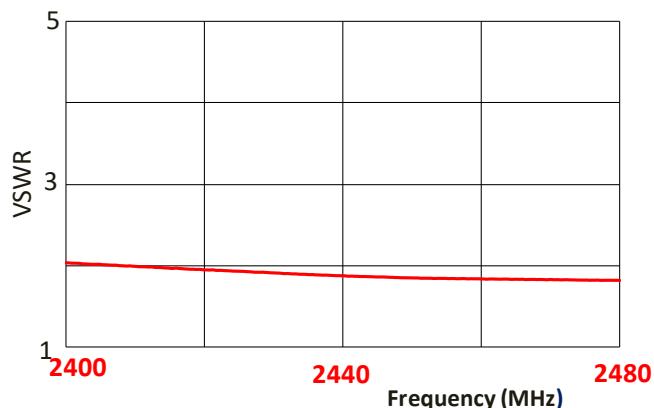


Efficiency

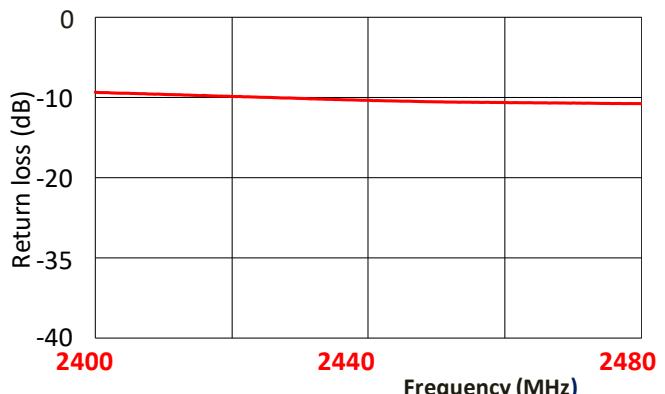


RF DATA – Vibration Sensor condition

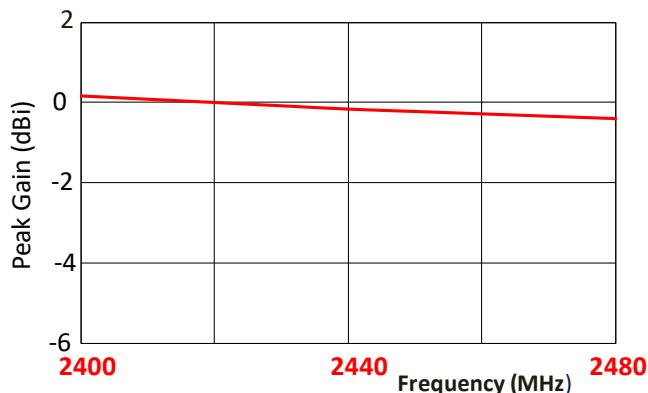
VSWR



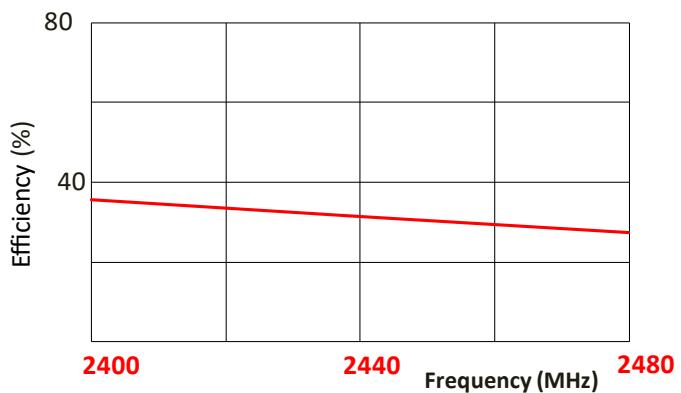
Return Loss



Peak Gain

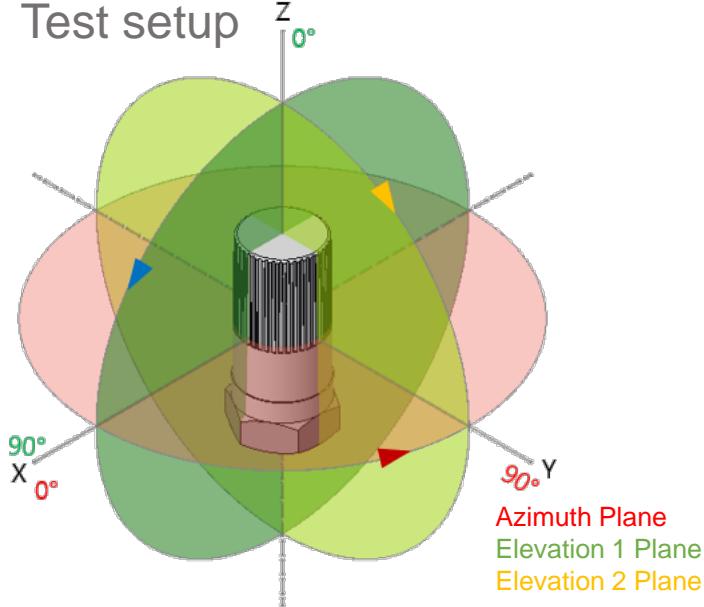


Efficiency

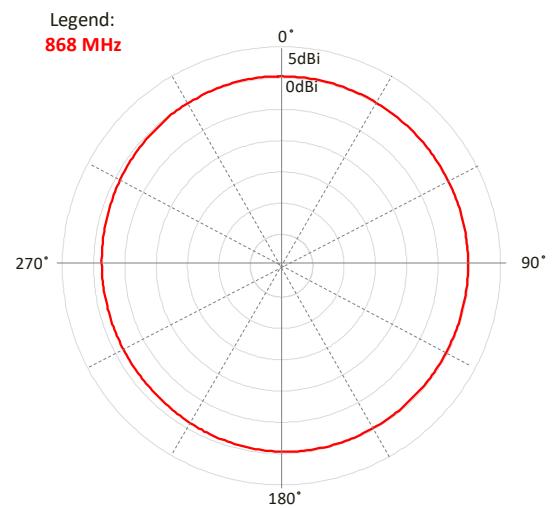


RADIATION PATTERN – Vibration Sensor condition

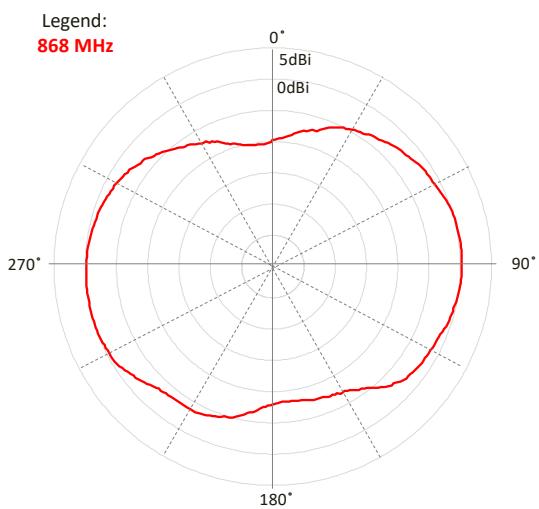
Test setup



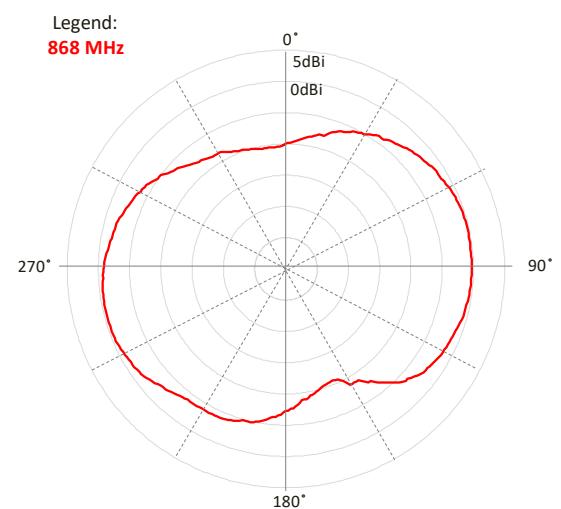
Azimuth



Elevation 1

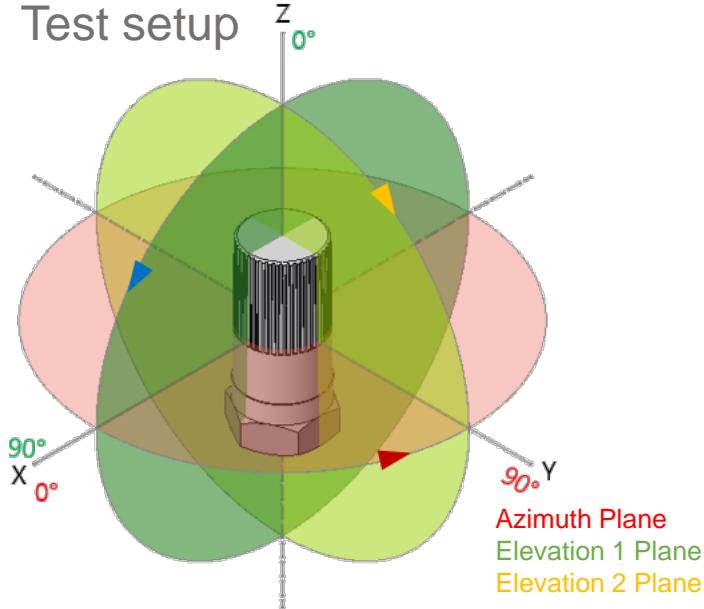


Elevation 2

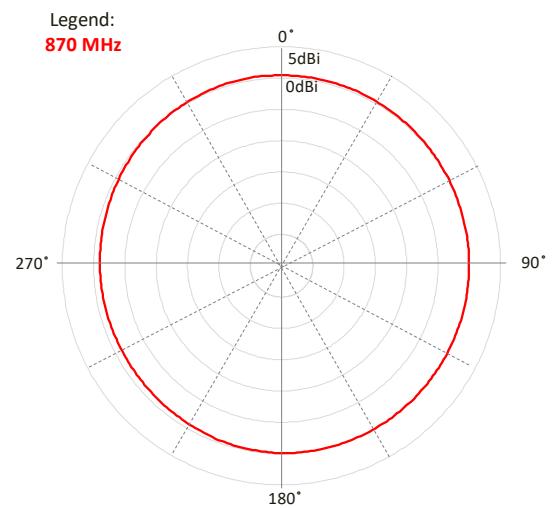


RADIATION PATTERN – Vibration Sensor condition (Peak Gain)

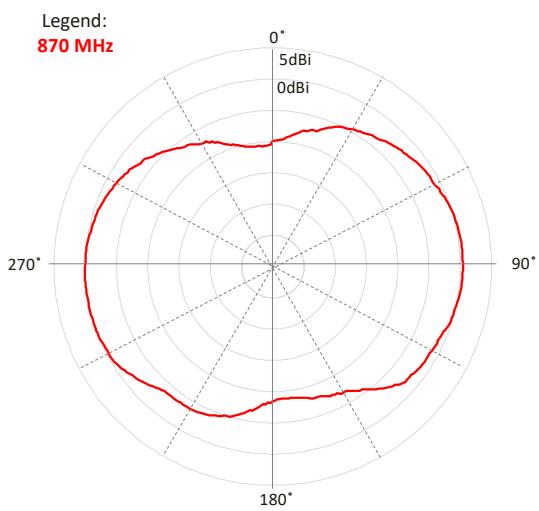
Test setup



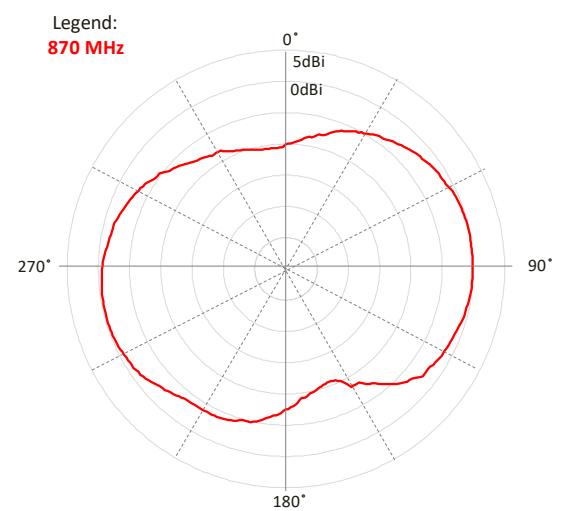
Azimuth



Elevation 1

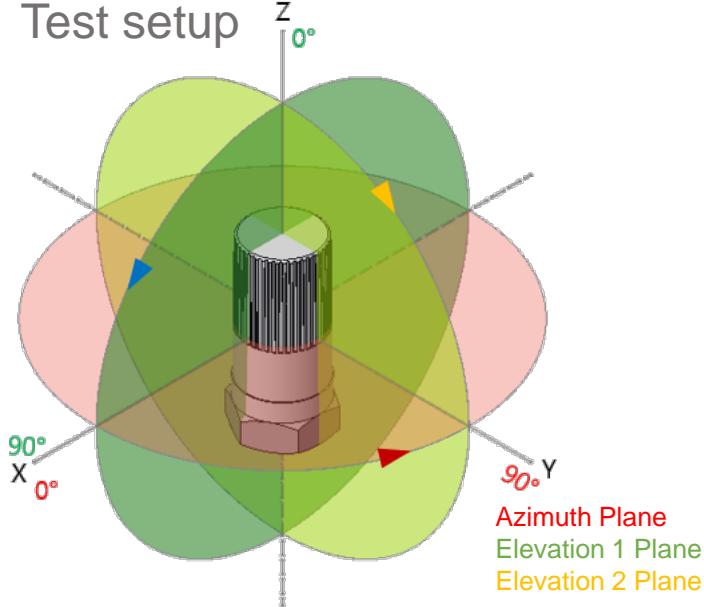


Elevation 2

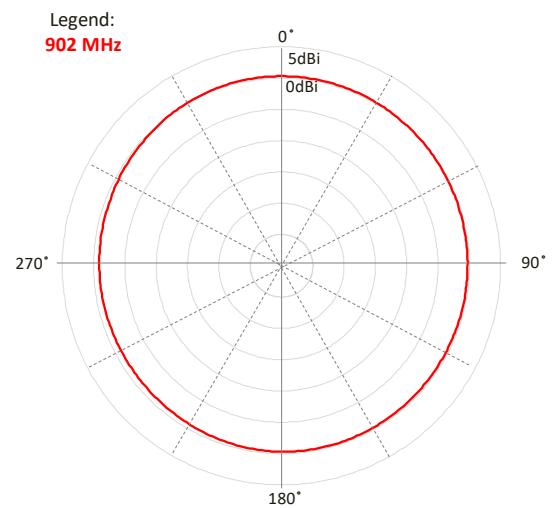


RADIATION PATTERN – Vibration Sensor condition (Peak Gain)

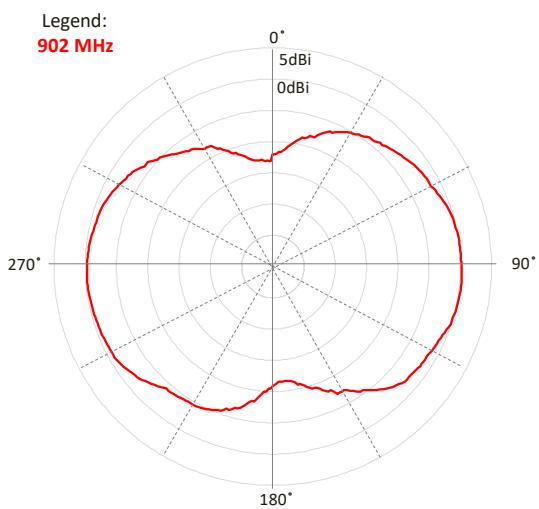
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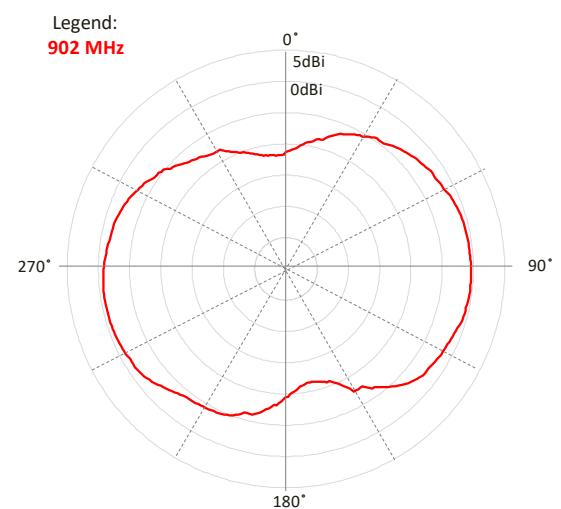
Azimuth



Elevation 1

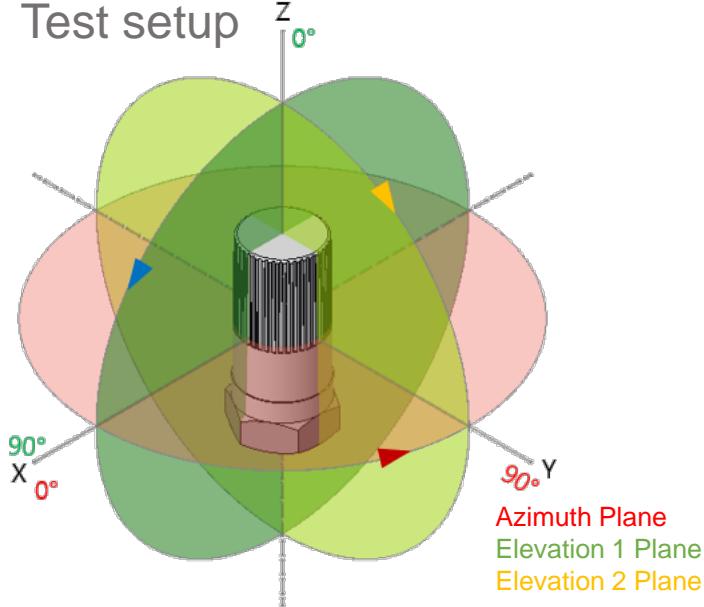


Elevation 2

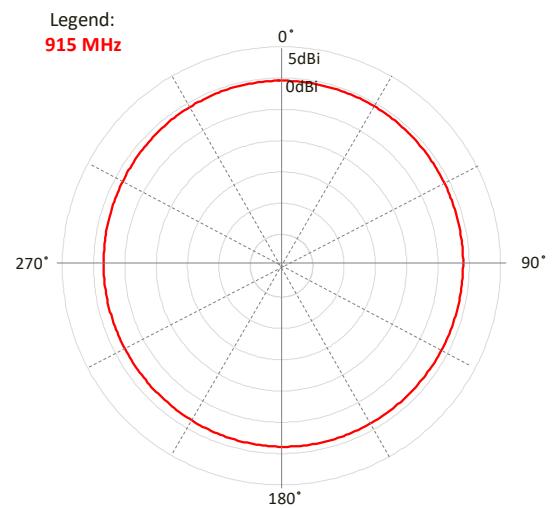


RADIATION PATTERN – Vibration Sensor condition

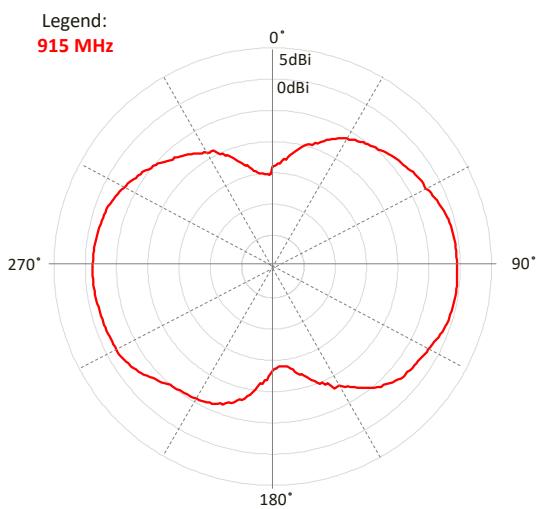
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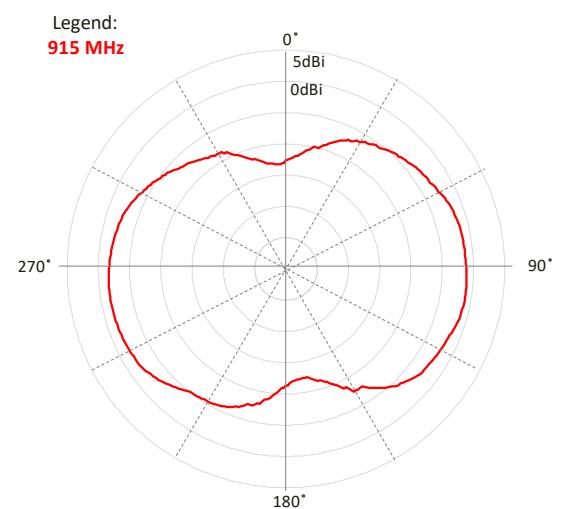
Azimuth



Elevation 1

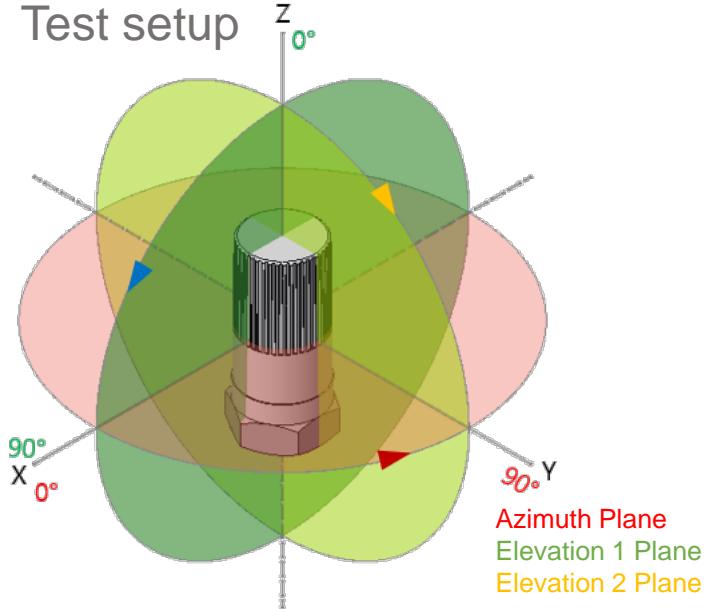


Elevation 2

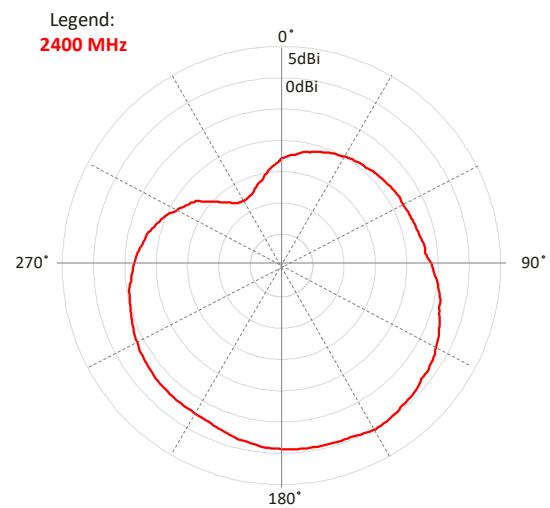


RADIATION PATTERN – Vibration Sensor condition (Peak Gain)

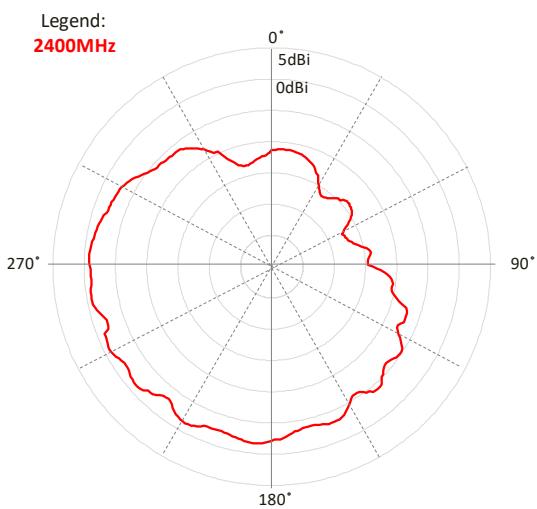
Test setup



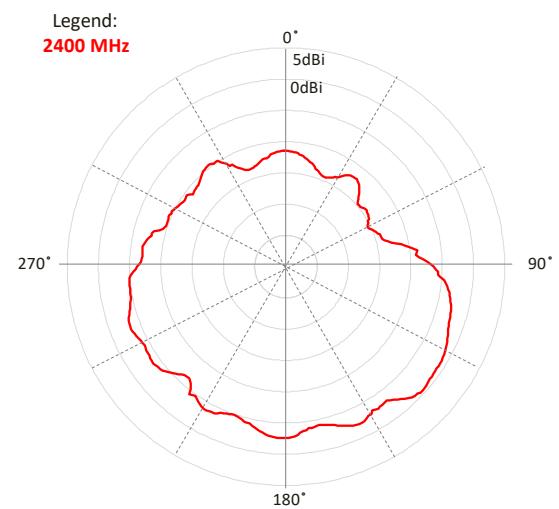
Azimuth



Elevation 1

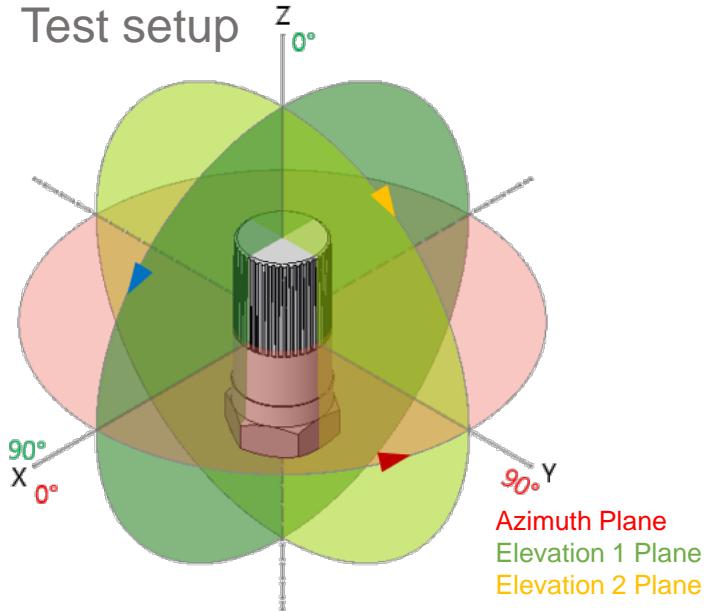


Elevation 2

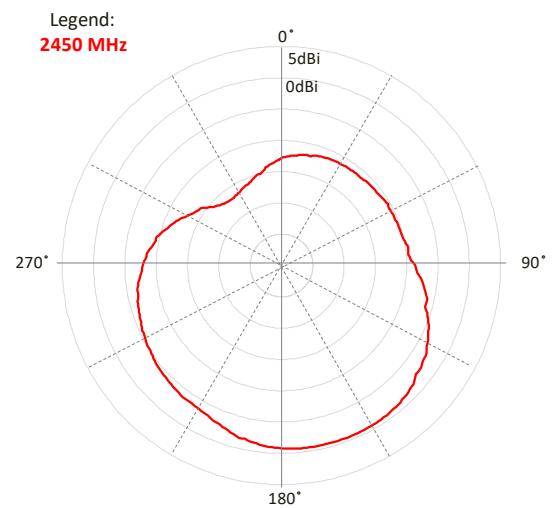


RADIATION PATTERN – Vibration Sensor condition

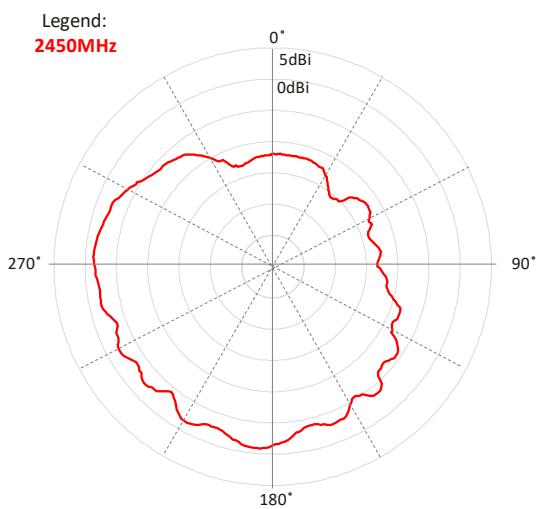
Test setup



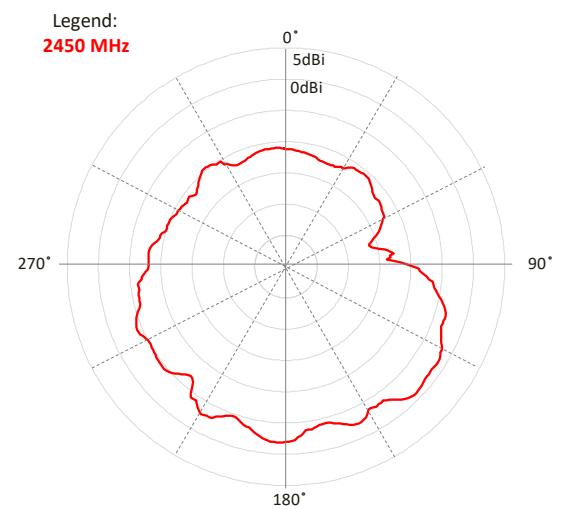
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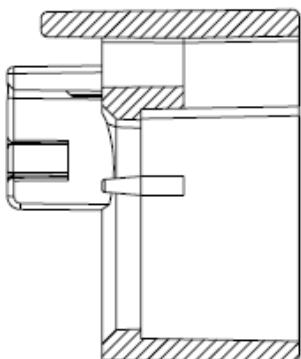
Elevation 1



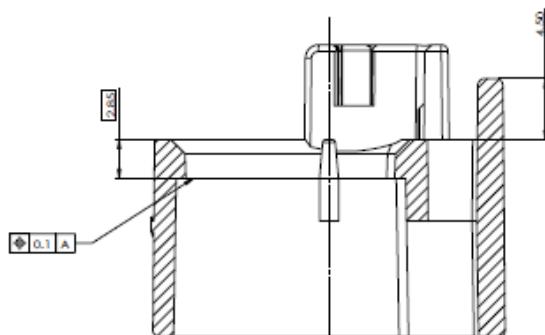
Elevation 2



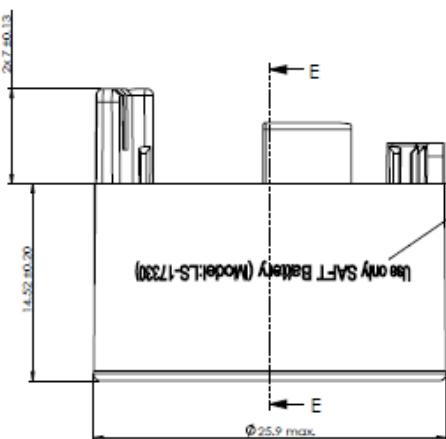
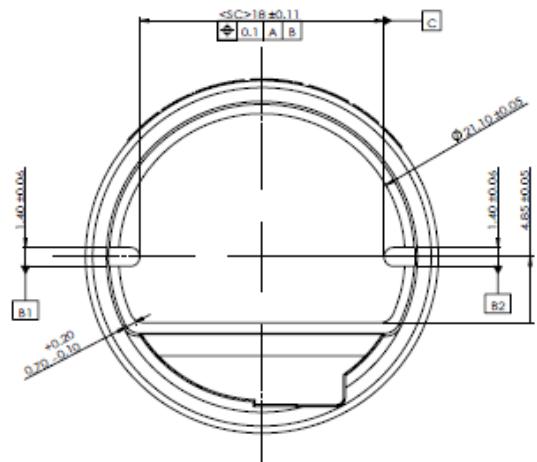
DIMENSIONS



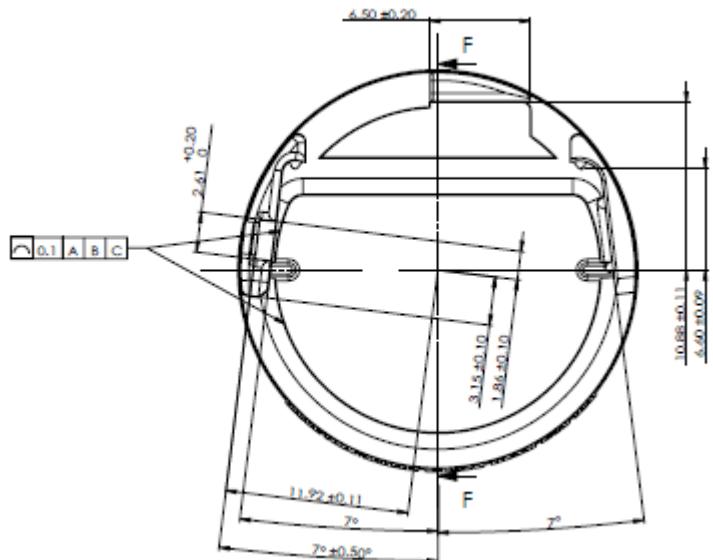
SECTION F-F



SECTION E-E



BULGE TEXT



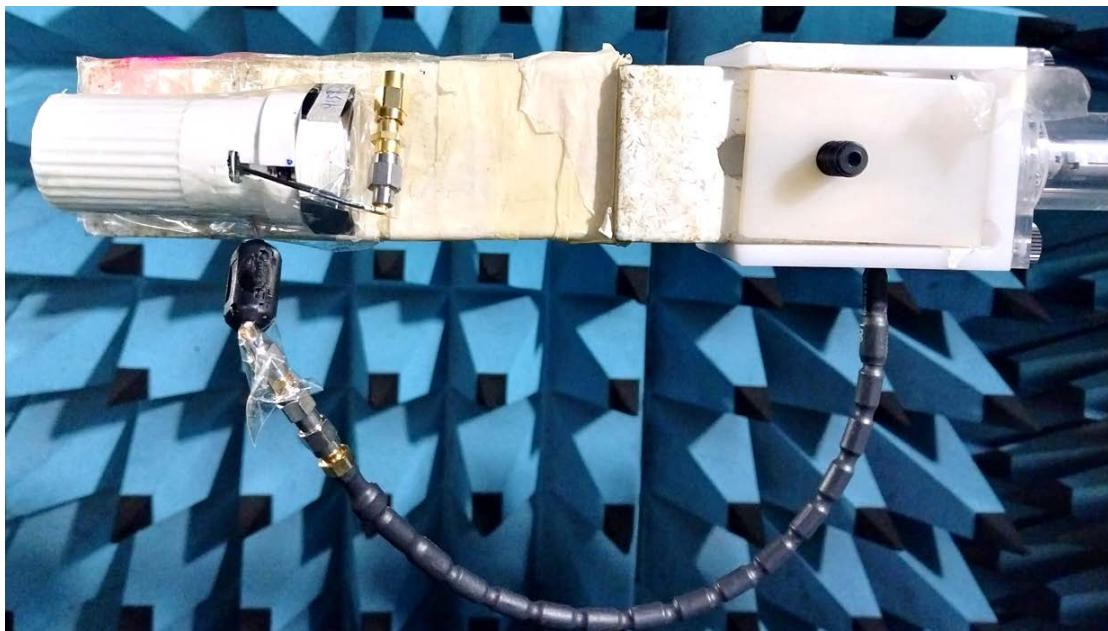
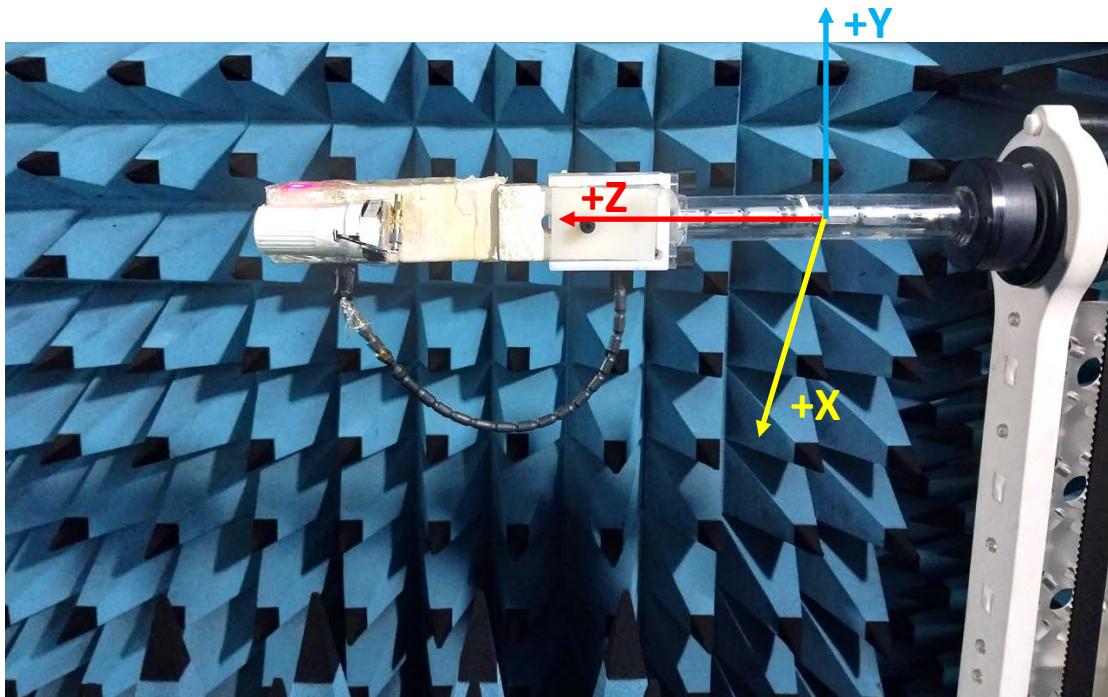
Dimension: mm
Diagrams is not to scale

APPENDIX



Vibration sensor

Test condition – Free space / Orientation

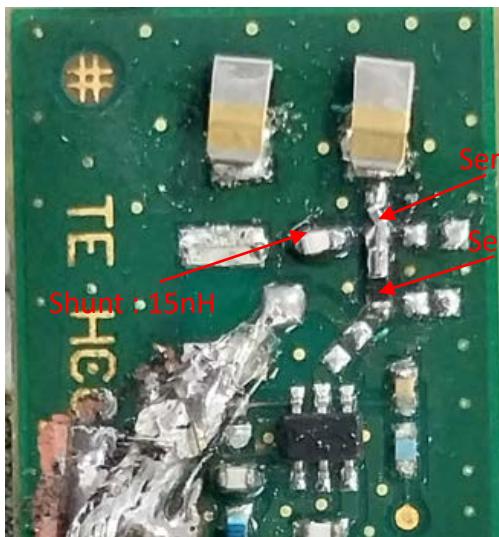


- Antenna measurement cables : Ferrite ring / $50\ \Omega$ Termination
- Chamber Measurement cable : With Ferrite rings

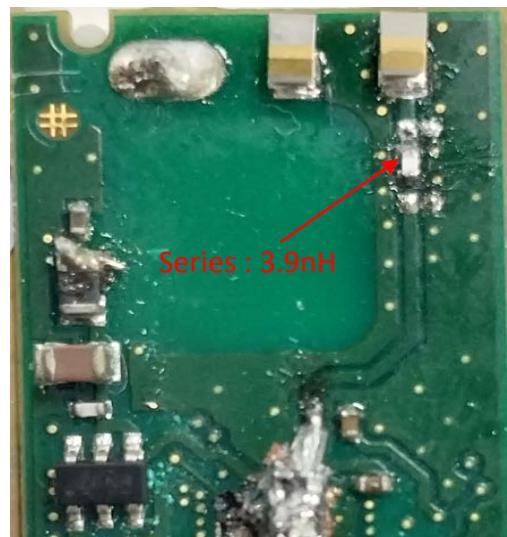
Matching circuit values

Vibration Sensor condition

LoRa Antenna



BLE Antenna



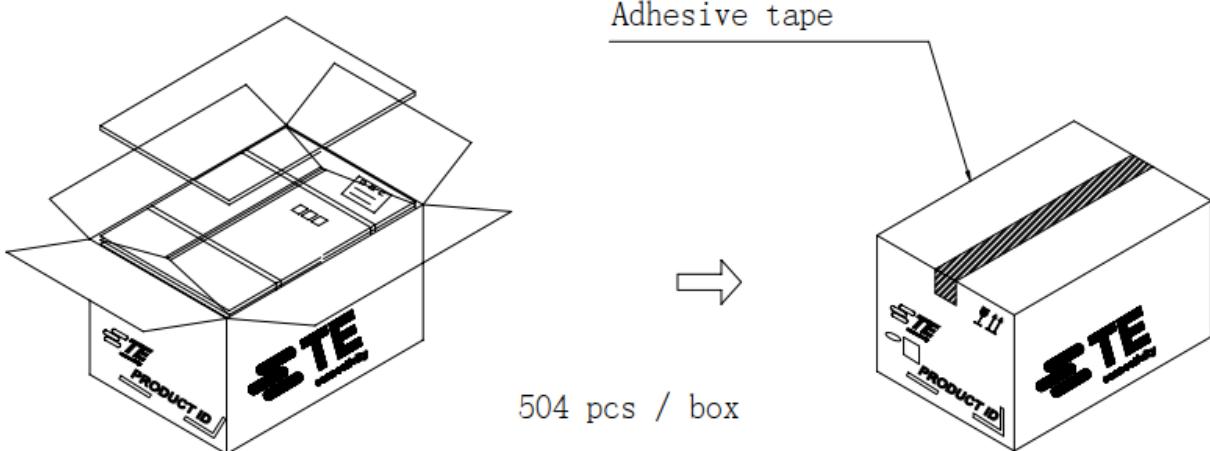
Matching circuit values

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

Matching circuit value

Ant – Series 3.9nH

PACKAGING



TE TECHNICAL SUPPORT CENTER

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Germany:	+49 (0) 6251-133-1999
UK:	+44 (0) 800-267666
France:	+33 (0) 1-3420-8686
Netherlands:	+31 (0) 73-6246-999
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12/2022