



NEXELEC

Antennas Performance Report

October 31 2024

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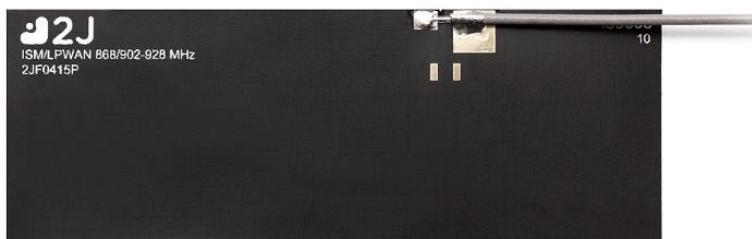
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2. Description of measured antennas:

- **Antenna 1 : 2JF0624P** measured inside customer device with 15cm micro-coaxial cable MC137 and with UFL connector. (2JF0624P-015MC137-UFL)



- **Antenna 2 : 2JF0415P** measured inside customer device with 16cm micro-coaxial cable MC137 and with UFL connector. (2JF0415P-016MC137-UFL)



- **Antenna 3 : 2JF0155P** measured inside customer device with 9cm AWG28 cable and with modified CONN HOUSING 2POS LK connector (2JF0155-009AWG28-C160 modified)



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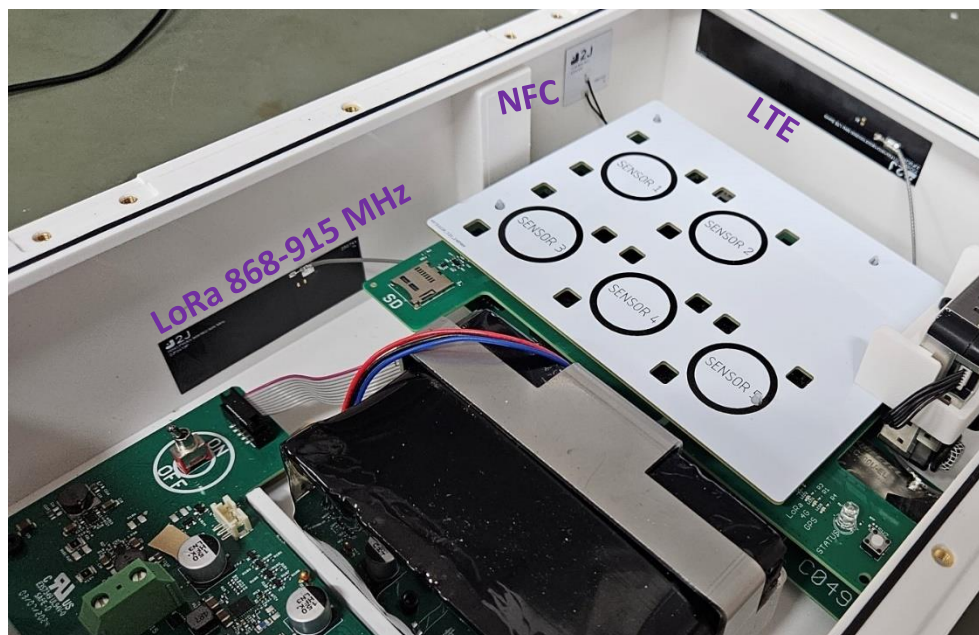
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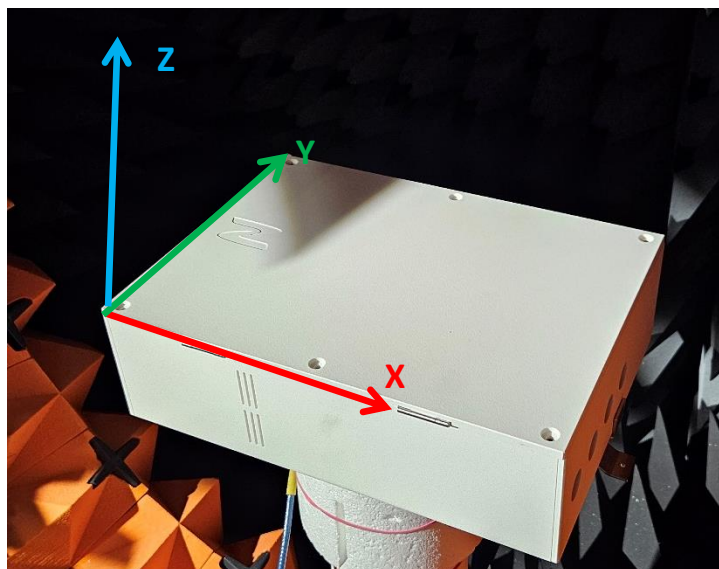
2.1. Antenna Mounting

2.1.1. Antennas Mounting inside Customer device



2.2. Measurement Setup

Antennas were measured inside customer device inside of Certified CTIA 3D Anechoic Chamber



Chamber Setup

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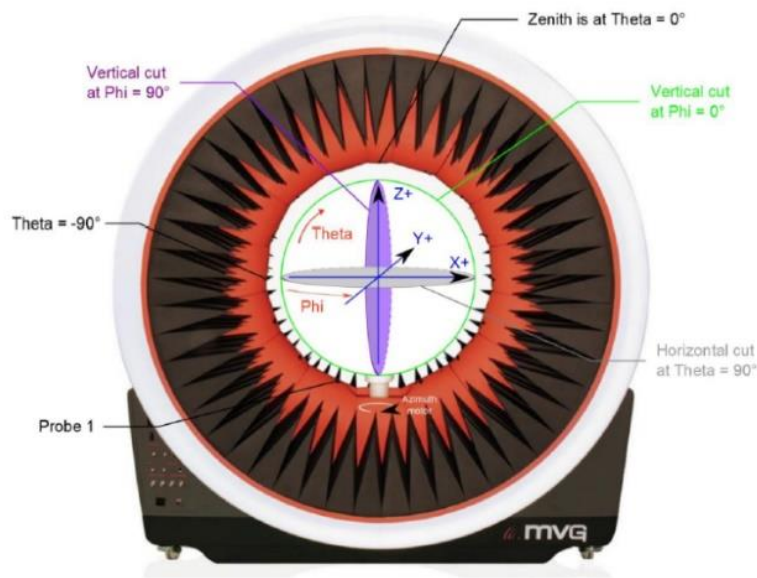
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OTA measurement coordinate system

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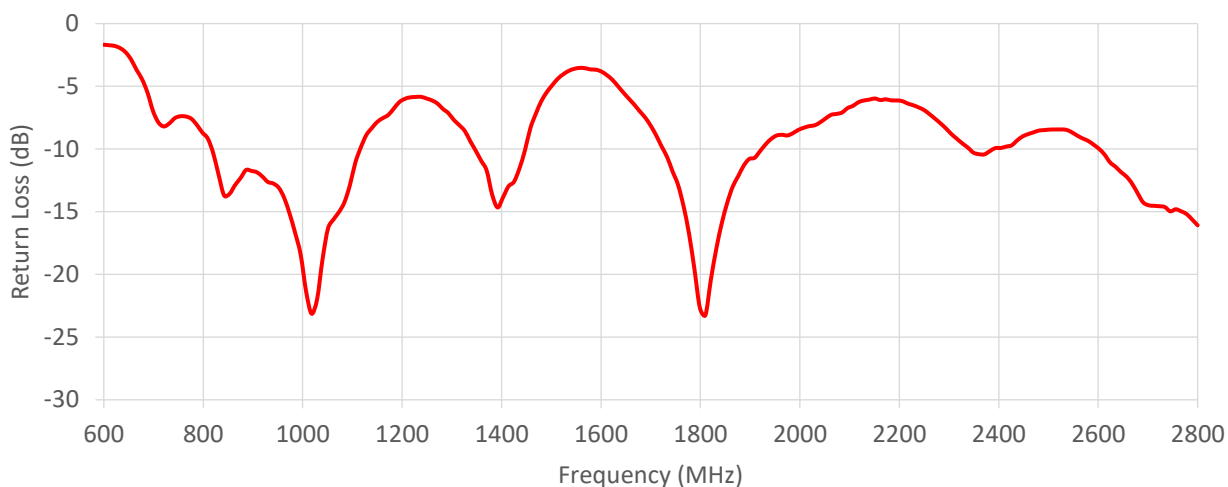
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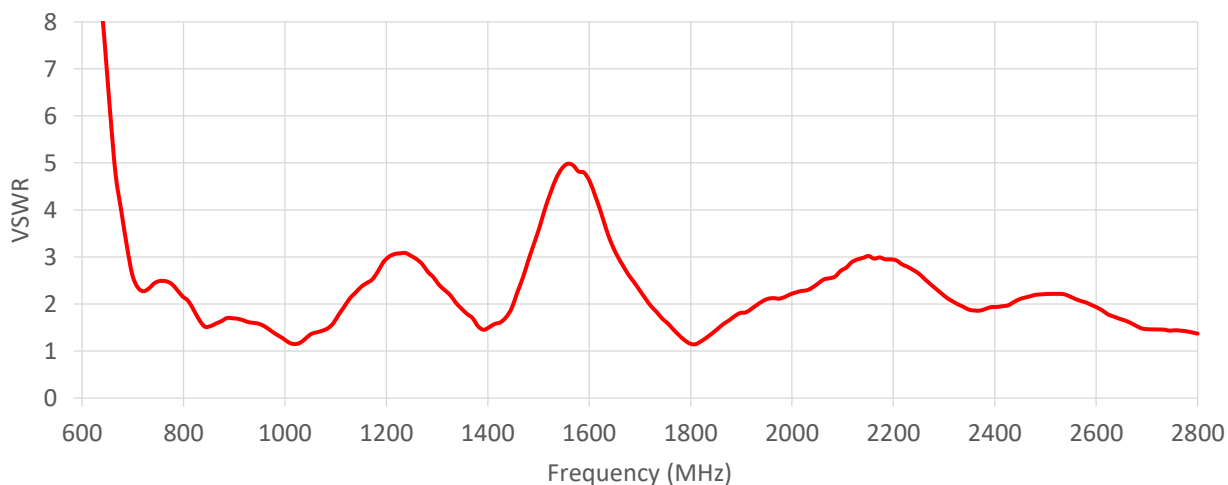
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2.3. Antenna 1: CELLULAR/LTE Performance

2.3.1. Return Loss



2.3.2. VSWR



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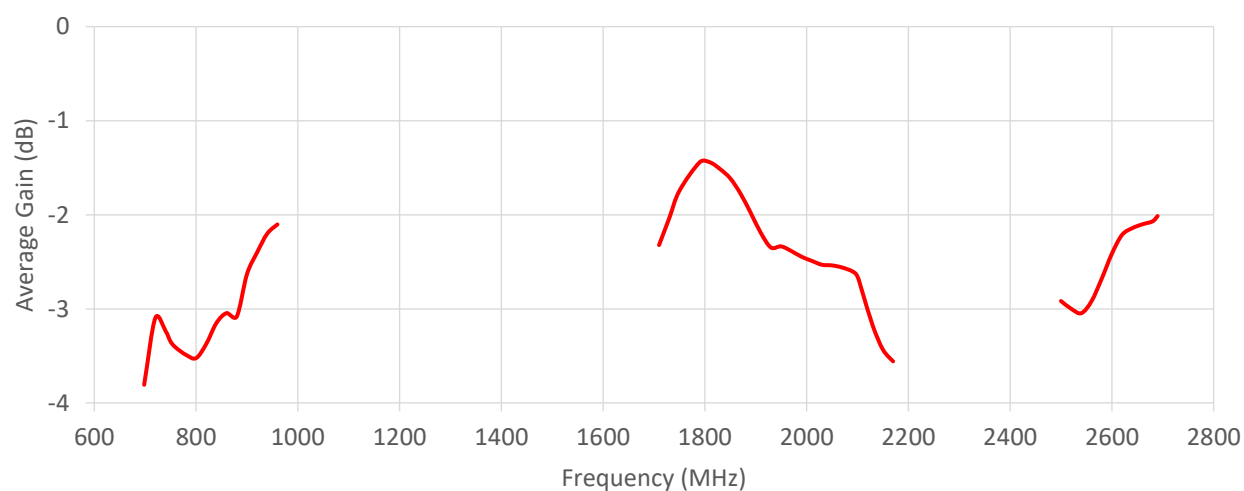
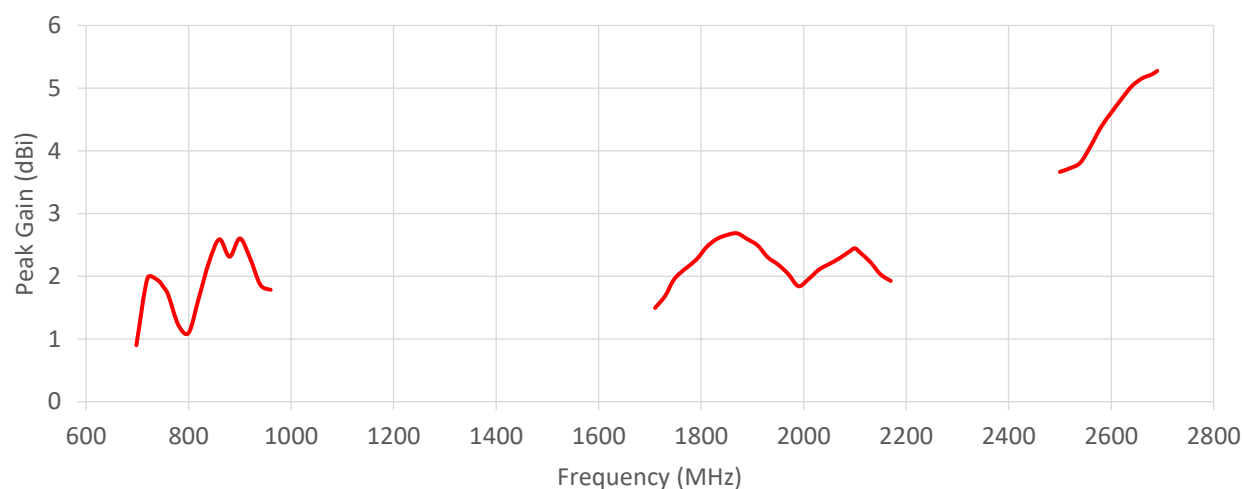
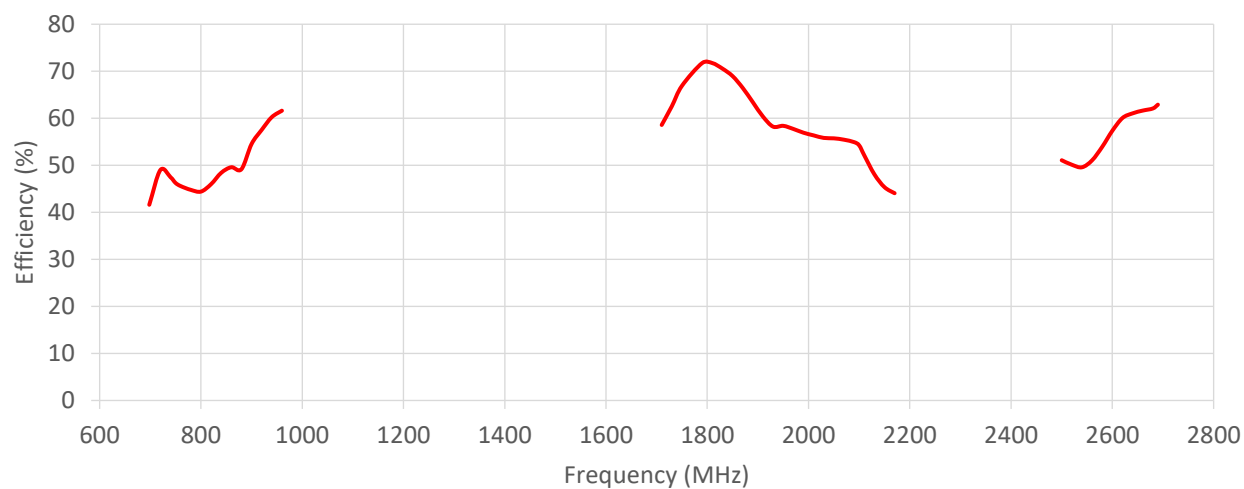
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2.3.3. OTA Performance



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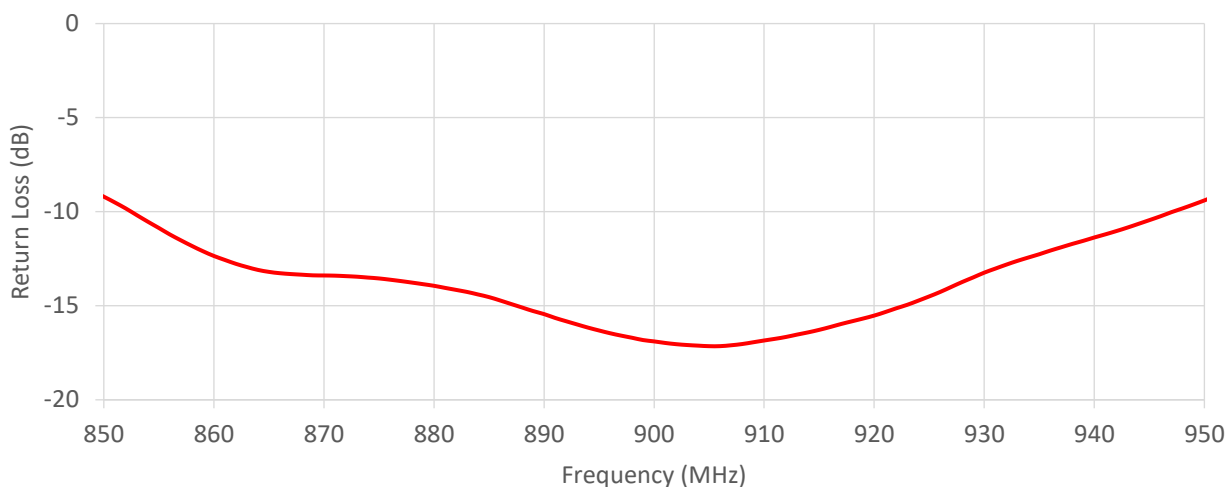
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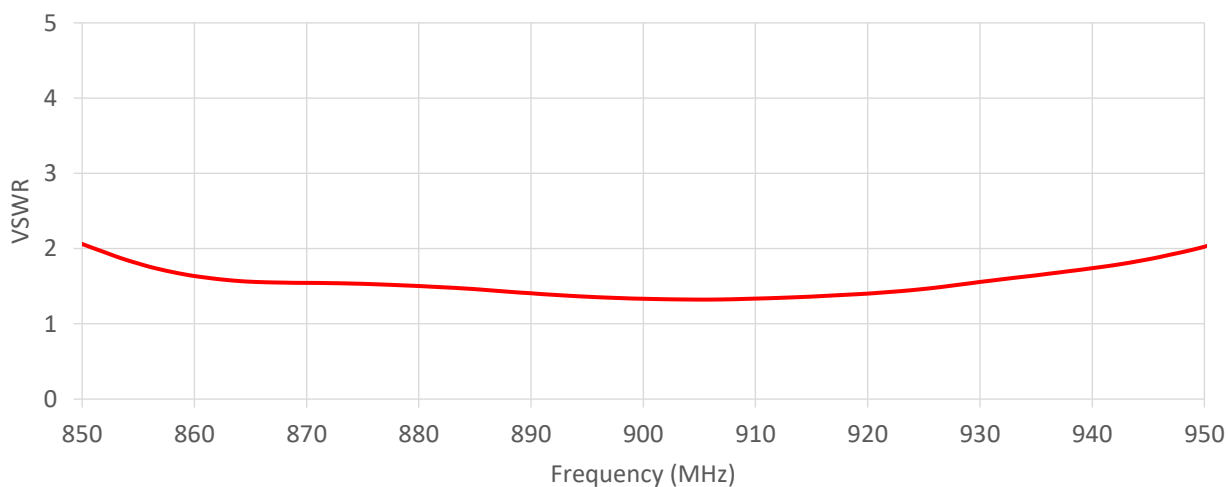
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2.4. Antenna 2: LoRa 868-915 MHz Performance

2.4.1. Return Loss



2.4.2. VSWR



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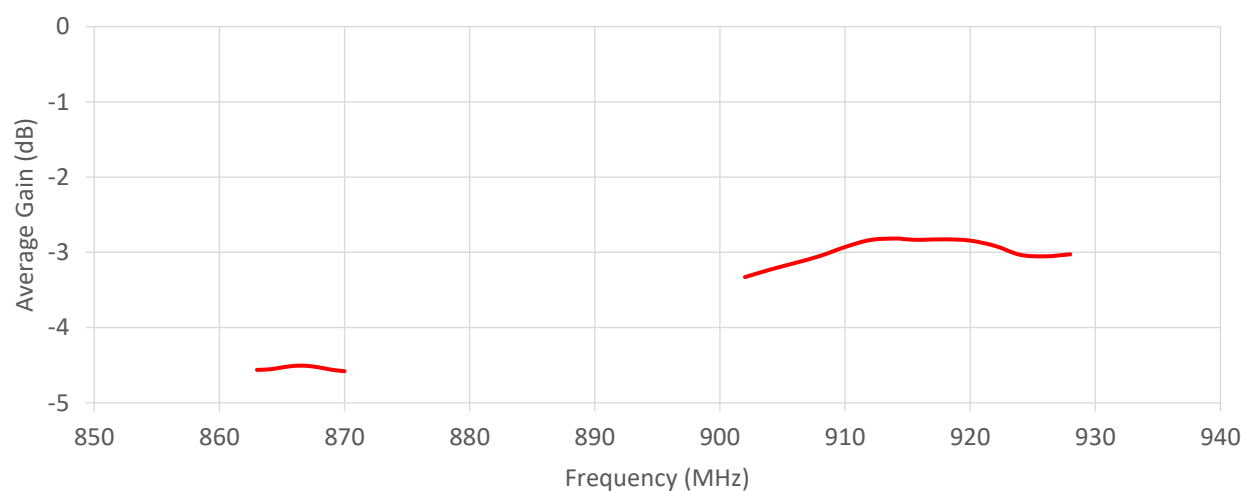
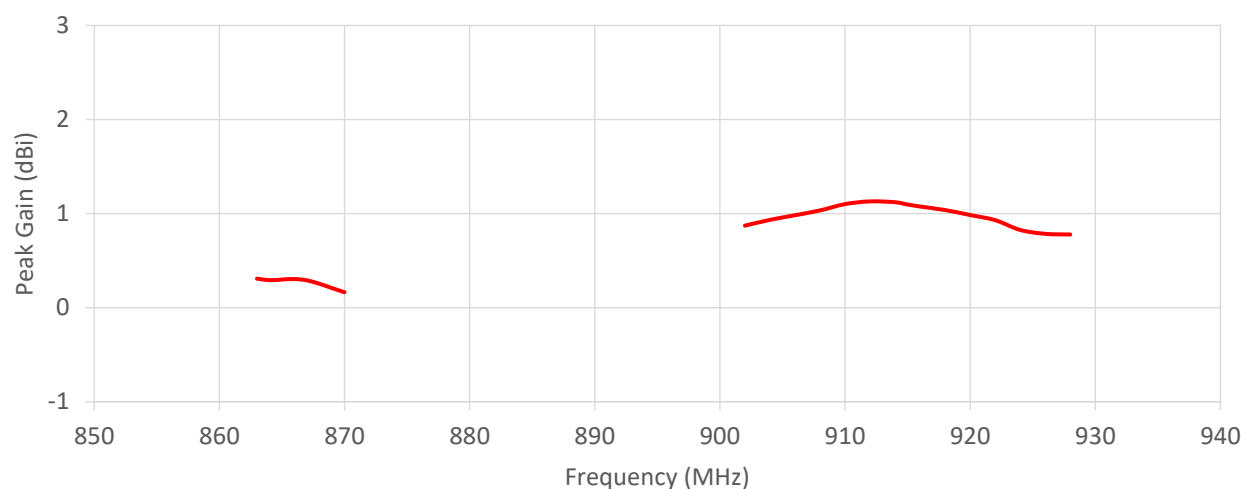
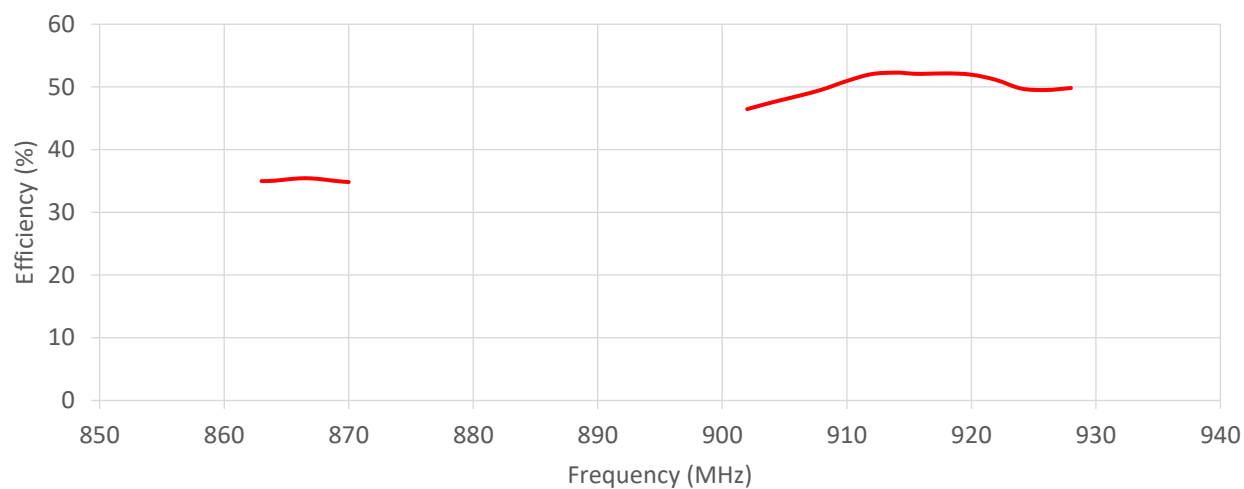
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2.4.3. OTA Performance



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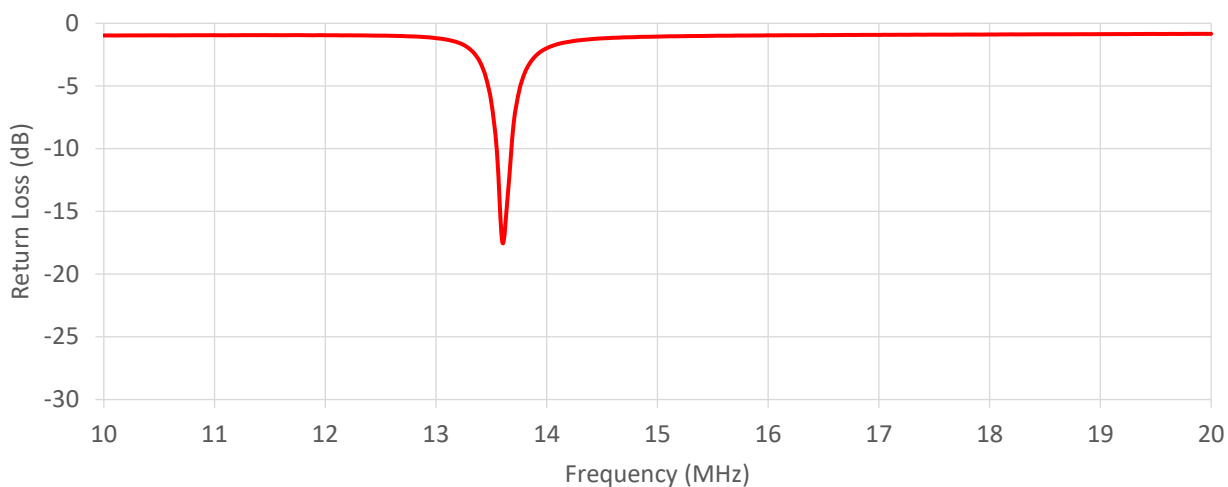
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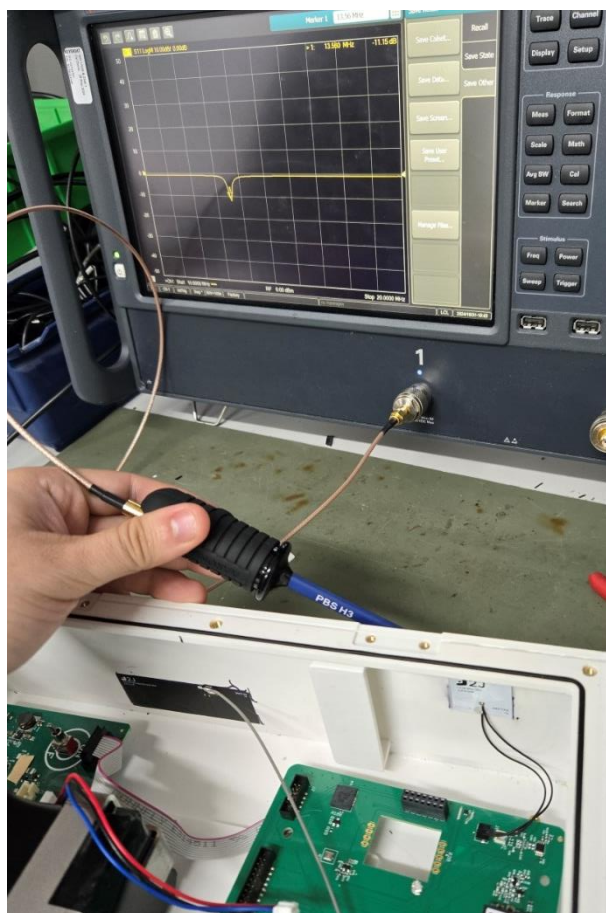
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2.5. Antenna 3: NFC 13.56MHz Performance



2.5.1. NFC Setup

Network analyser and a probe were used to measure the resonant frequency of the NFC antenna. The antenna was connected to a connector on the PCB with customer matching components on board. Components on the board do not need to be changed when using a cable length of 9cm.



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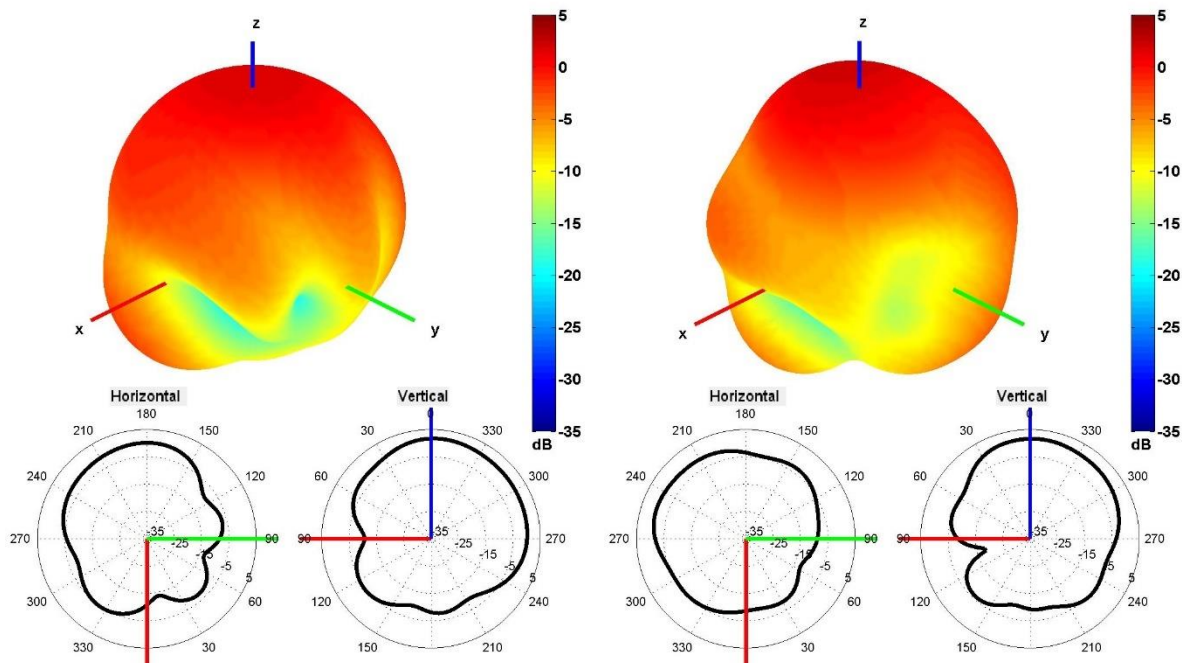
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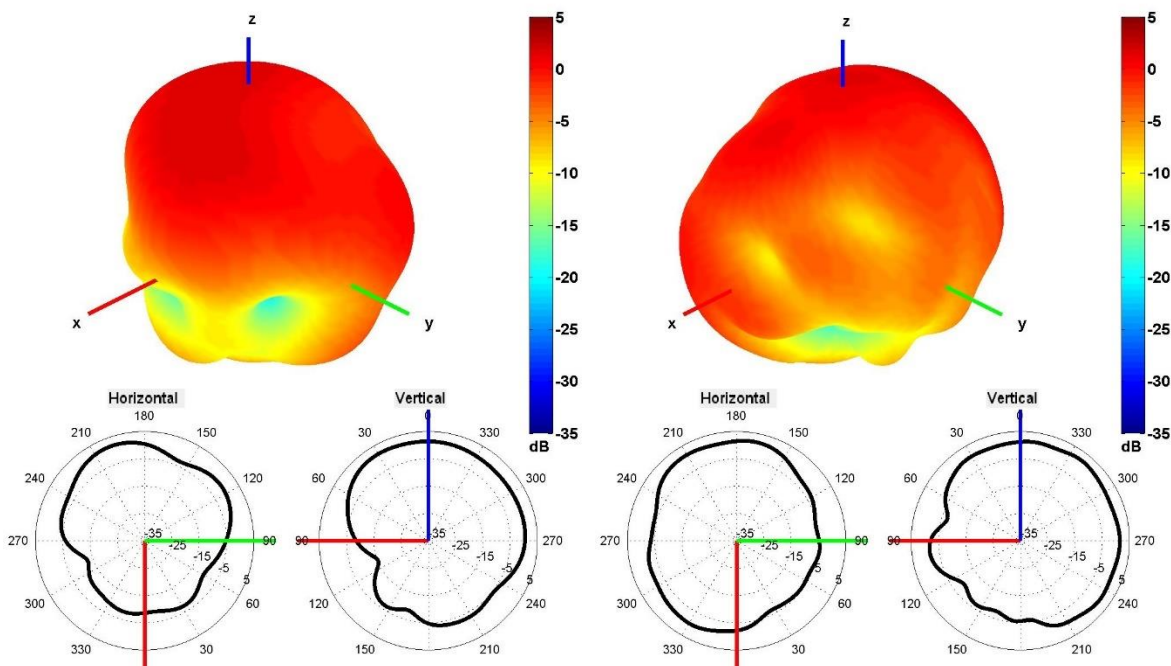
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2.6. Radiation Patterns

2.6.1. Antenna 1: CELLULAR/LTE



750 and 850 MHz Radiation pattern



940 and 1750 MHz Radiation pattern

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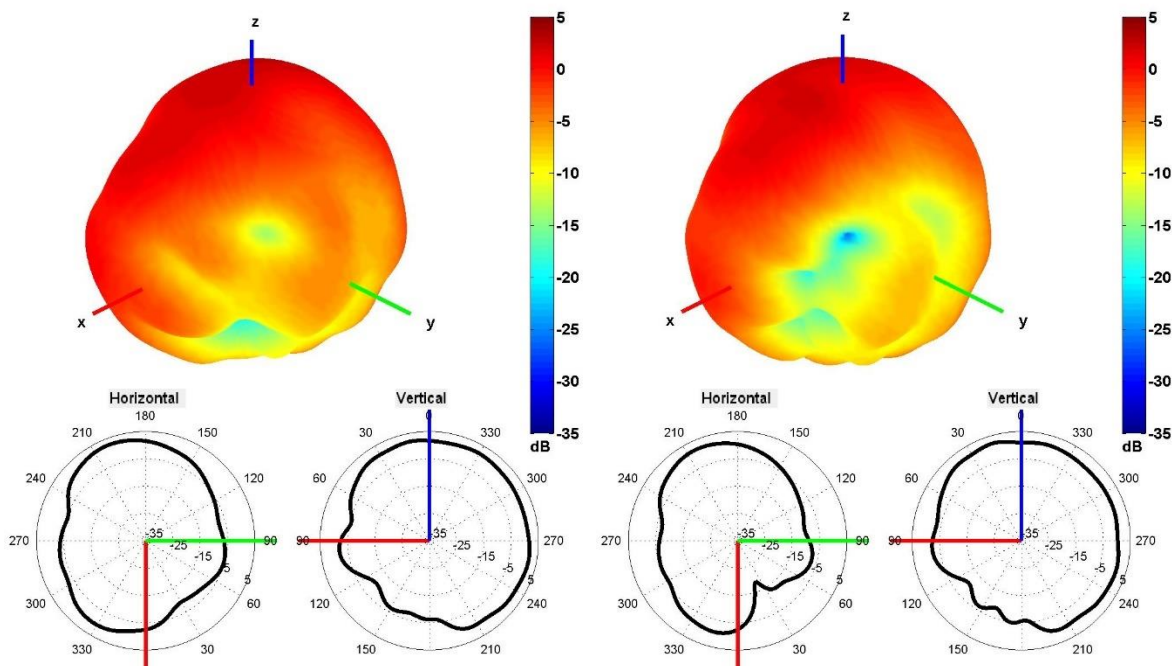
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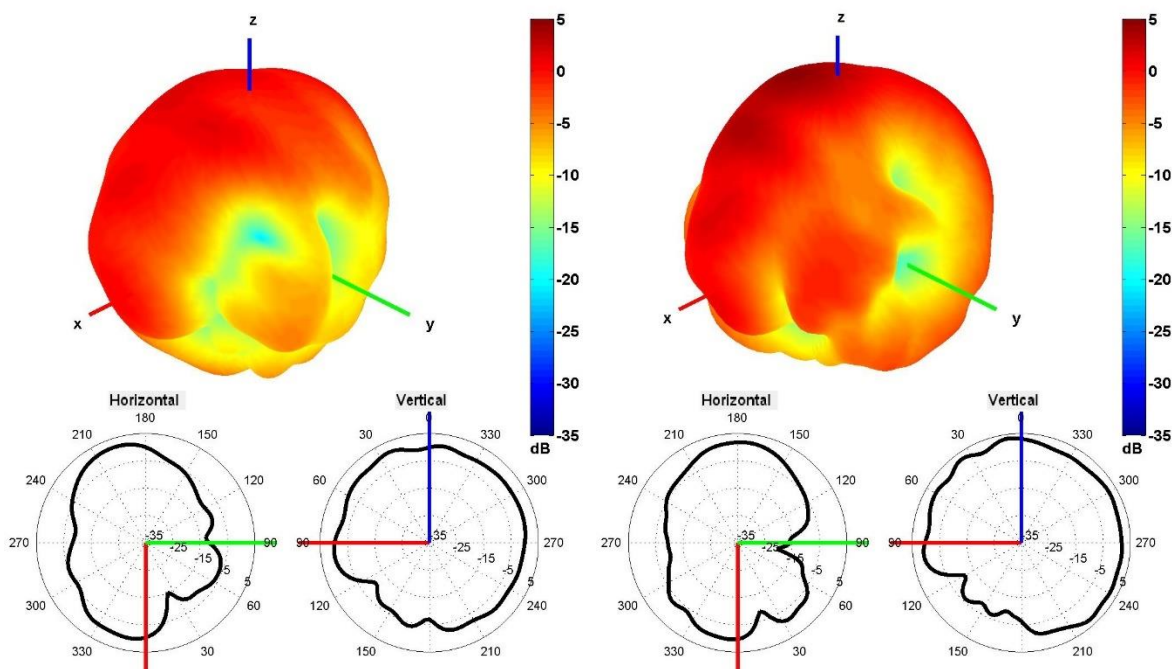
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1850 and 1950 MHz Radiation pattern



2100 and 2600 MHz Radiation pattern

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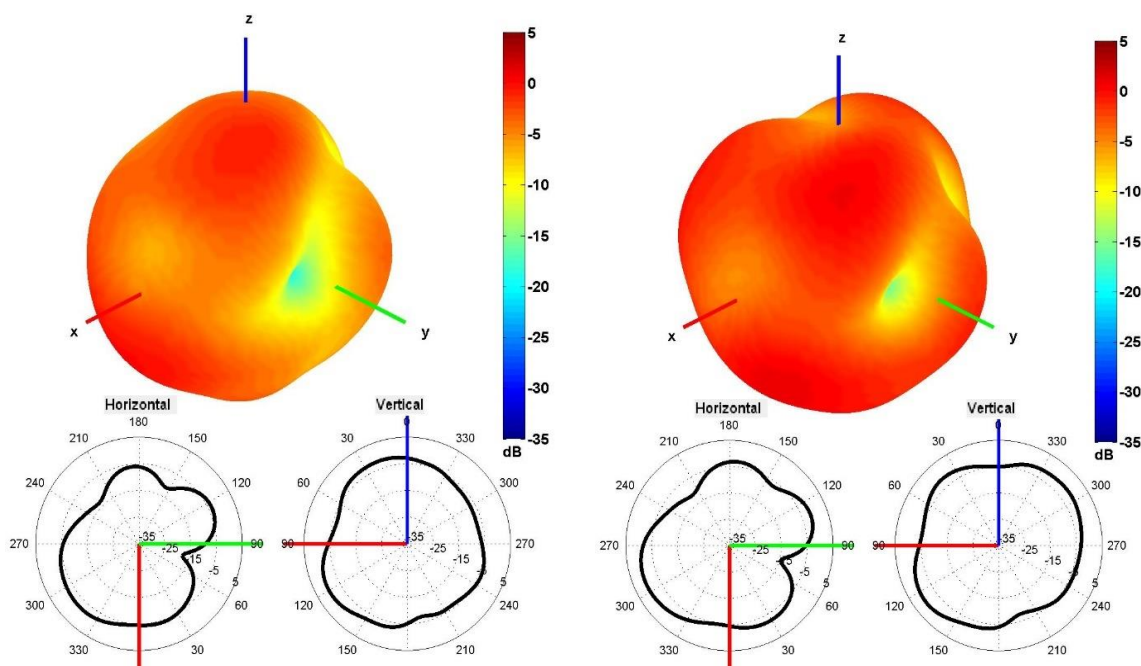
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2.6.2. Antenna 2: LoRa 868-915 MHz



868 and 915 MHz Radiation pattern

Antenna 1: CELLULAR/LTE

Frequency (MHz)	Peak Gain (dBi)
698	0.900036675
720	1.974294492
740	1.935264762
750	1.838695791
760	1.70751782
780	1.22173565
800	1.097321486
820	1.657316003
840	2.230754823
860	2.589441967
880	2.31199602
900	2.603369234
920	2.285185598
940	1.862668183
960	1.783964322

Frequency (MHz)	Peak Gain (dBi)
1710	1.494888424
1730	1.688539974
1750	1.978647538
1790	2.261227504
1810	2.461353102
1830	2.591896641
1850	2.656805782
1870	2.684735336
1890	2.592817175
1910	2.493677444
1930	2.302626901
1950	2.187905818
1970	2.035812769
1990	1.842139308
2010	1.95864071
2030	2.106643058
2050	2.195505781
2070	2.287527202
2090	2.398562223
2100	2.445666585
2110	2.379574938
2130	2.228516956
2150	2.030298468
2170	1.926187827

Frequency (MHz)	Peak Gain (dBi)
2500	3.66467002
2520	3.723960368
2540	3.811587931
2560	4.07561178
2580	4.376686587
2600	4.606435573
2620	4.824394474
2640	5.028788451
2660	5.153763885
2680	5.221691778
2690	5.276540062

Antenna 2: LoRa 868-915 MHz

Frequency (MHz)	Peak Gain (dBi)
863	0.308141036
864	0.291775619
865	0.298437089
866	0.303907756
867	0.28986737
868	0.252946939
869	0.207561558
870	0.163445988
902	0.87147027
904	0.93313624
906	0.98211013
908	1.03330912
910	1.10037813
912	1.12933766
914	1.12042811
915	1.09621131
916	1.07487166
918	1.03696346
920	0.98475902
922	0.92990819
924	0.82589812
926	0.78473365
928	0.77736726

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