Tri plus grupa d.o.o.
#2544 Alloy Leak Sensor
Antenna Matching and Efficiency Measurements
01/02/2023
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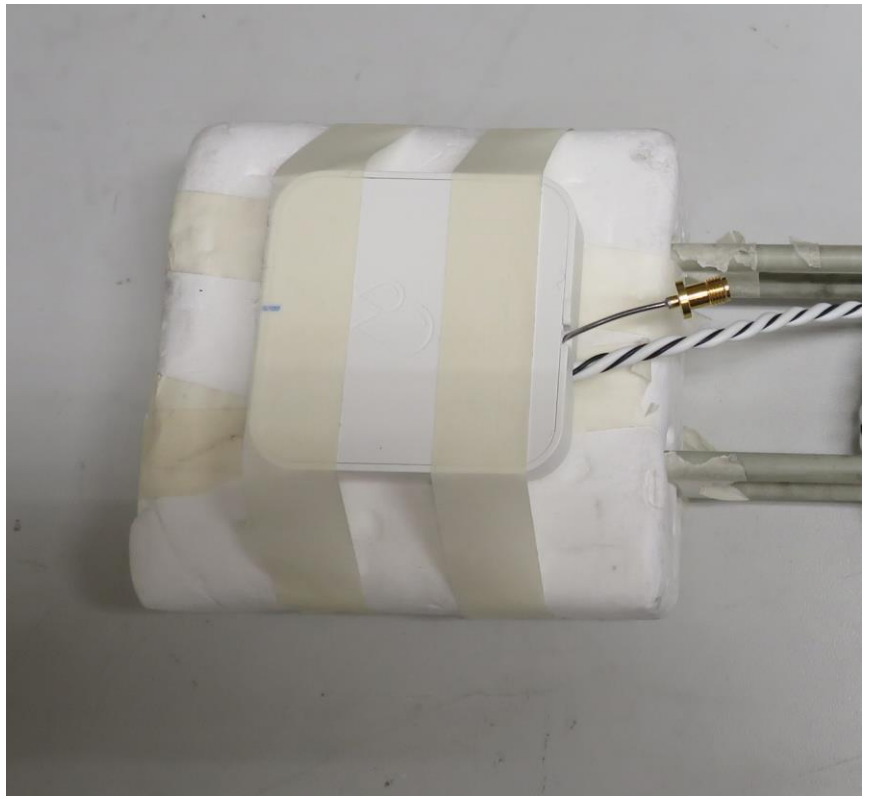
SUMMARY 1

- Tested device: Alloy Leak Sensor
- Tested antennas:
  - stamped metal 915MHz
- Antenna matching circuit was tuned for Sensor attached. After matching S11 and Efficiency were measured in free space with Sensor attached

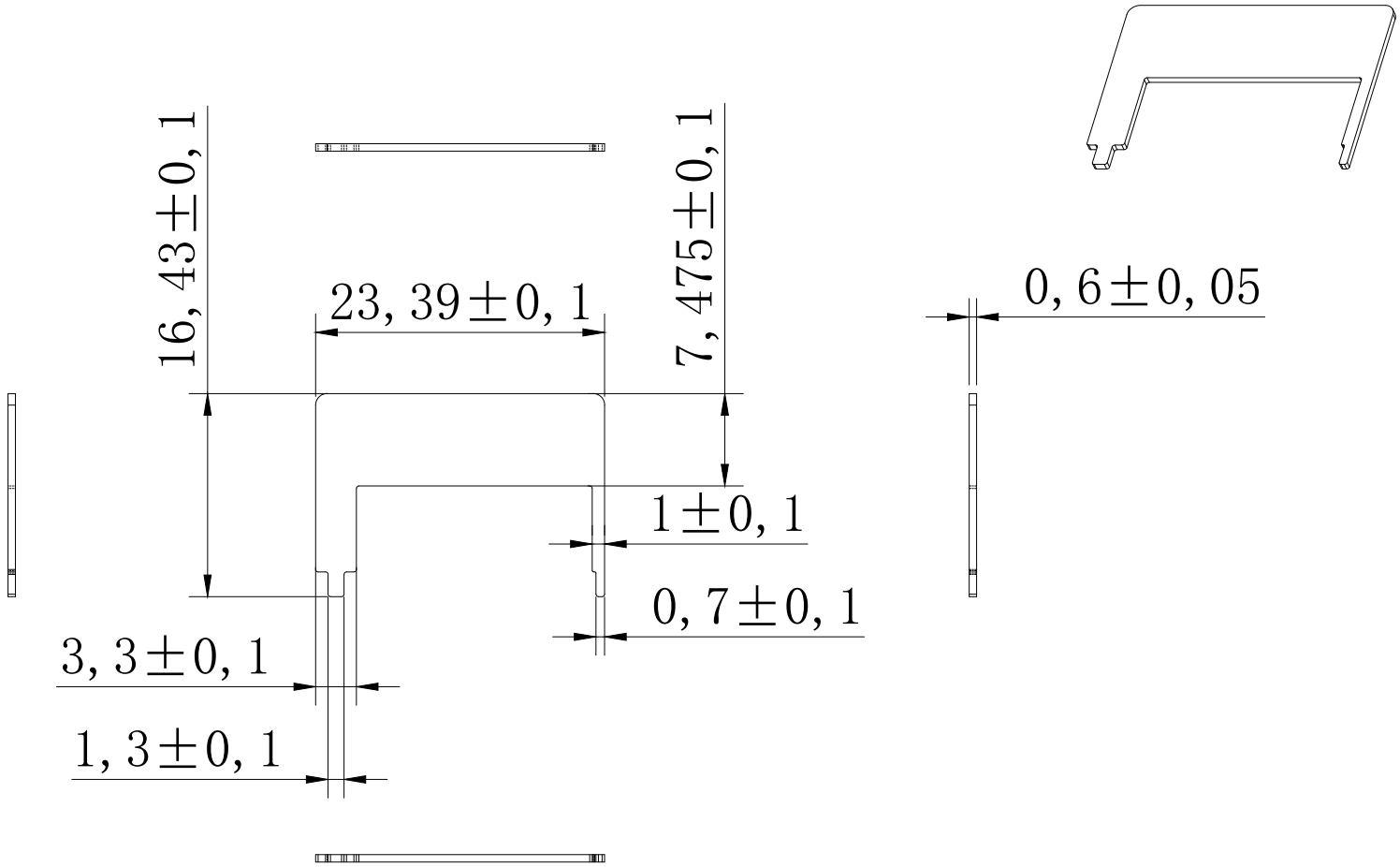


- Efficiency on 915MHz LoRa band is between -3.3dB – -4.3dB
- Gain on 915MHz LoRa band is between -0.24dBi – -0.54dBi
  - Peak gain -0.24dBi @ 914MHz

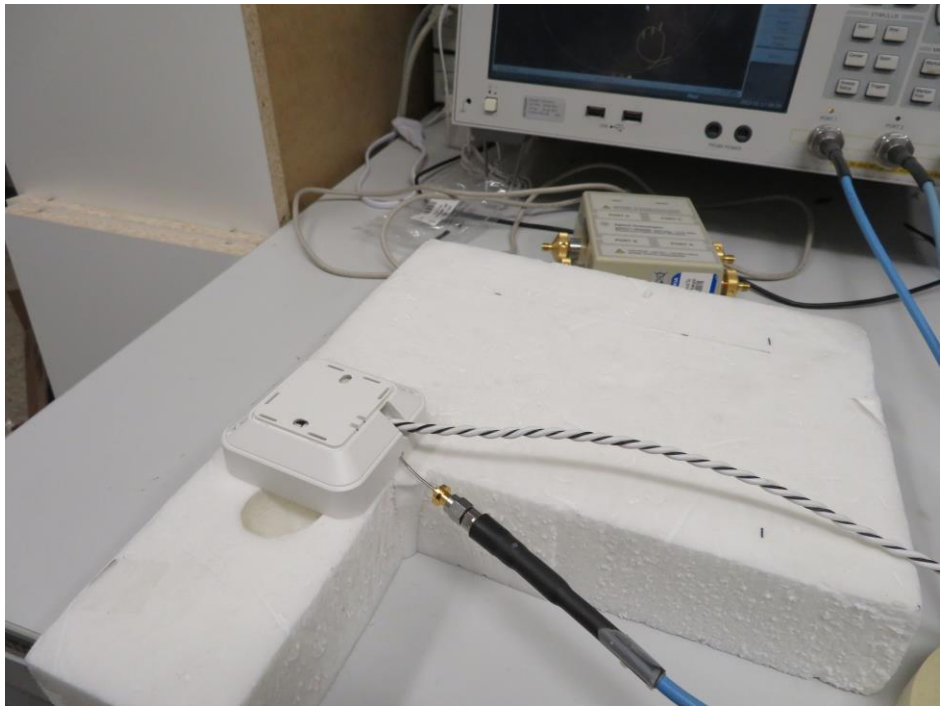
SUMMARY 2

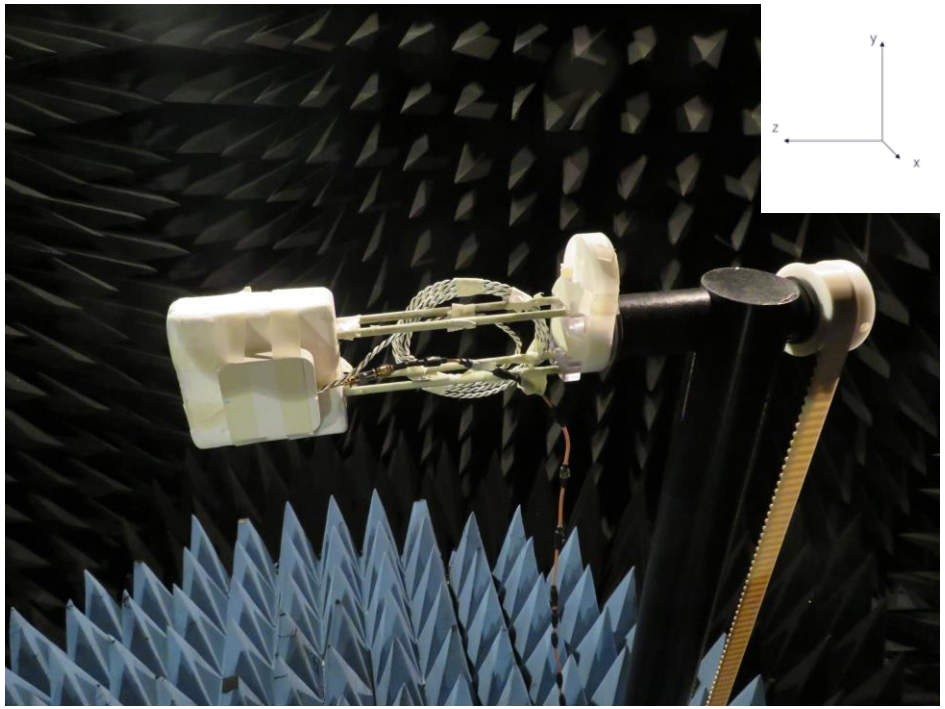
Device	Alloy Leak Sensor	
Efficiency	-3.3 – -4.3	dB
Frequency	902 – 928	MHz
Gain (Max/Typical)	-0.24 / -0.36	dBi

stamped metal Antenna



S11 AND EFFICIENCY MEASUREMENT SETUPS

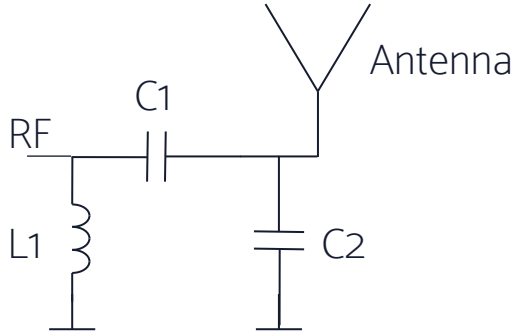




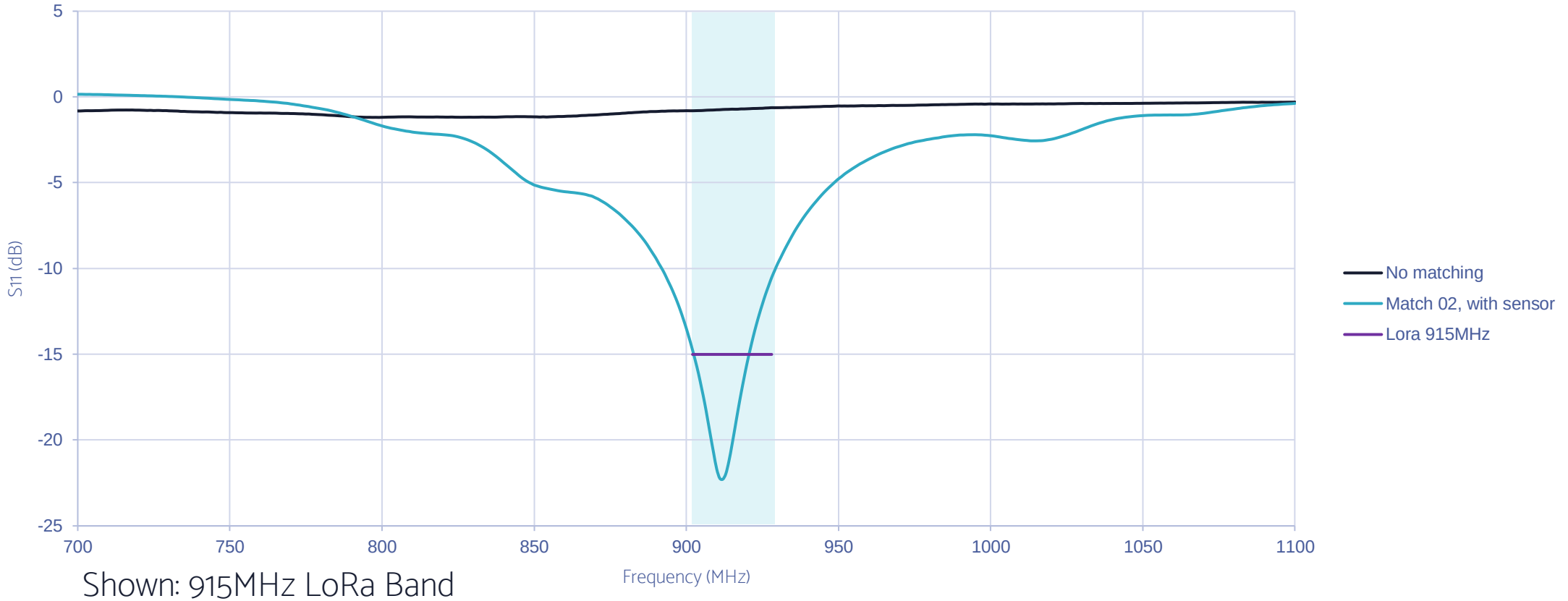
915MHz LoRa MATCHING CIRCUIT WITH SENSOR

- Using measurements and simulation we tuned LoRa antenna for 915MHz band with Sensor
- New matching components are as follow:

Component	Value	Murata part number
L1	13nH	LQW15AN13NG00
C1	3.5pF	GJM1555C1H3R3WB01
C2	2.2pF	GJM1555C1H2R2WB01

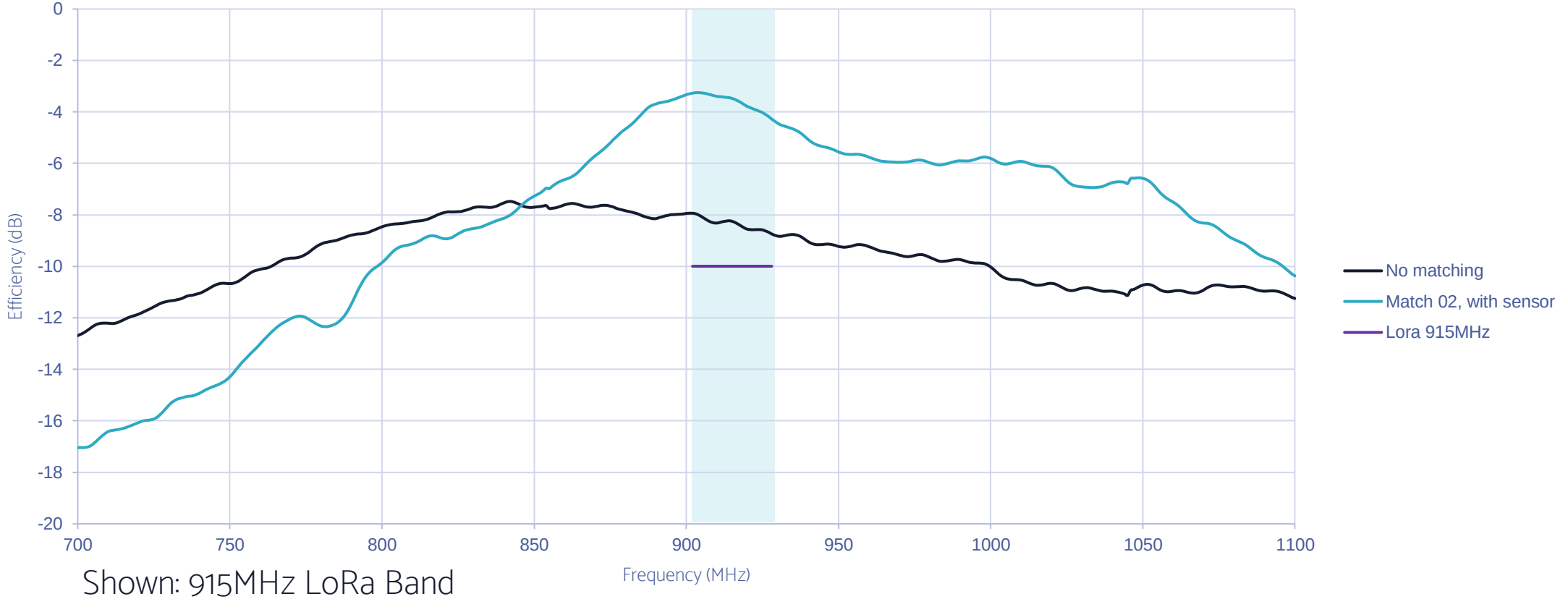


915MHz LoRa MEASURED S11



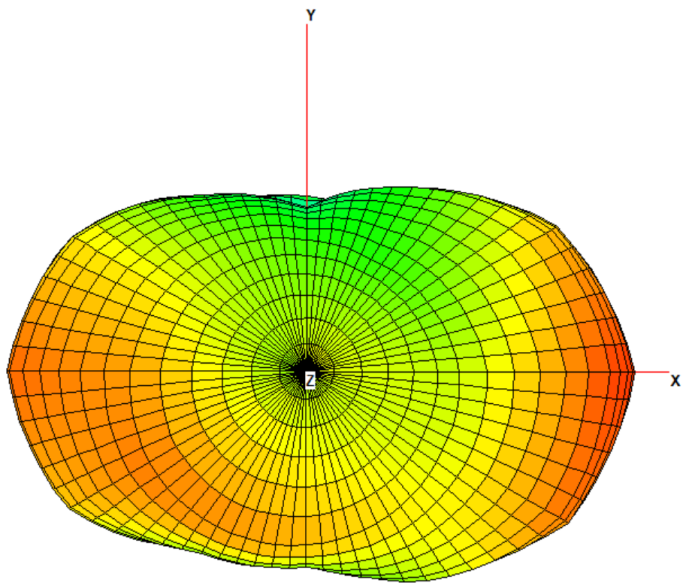
Shown: 915MHz LoRa Band

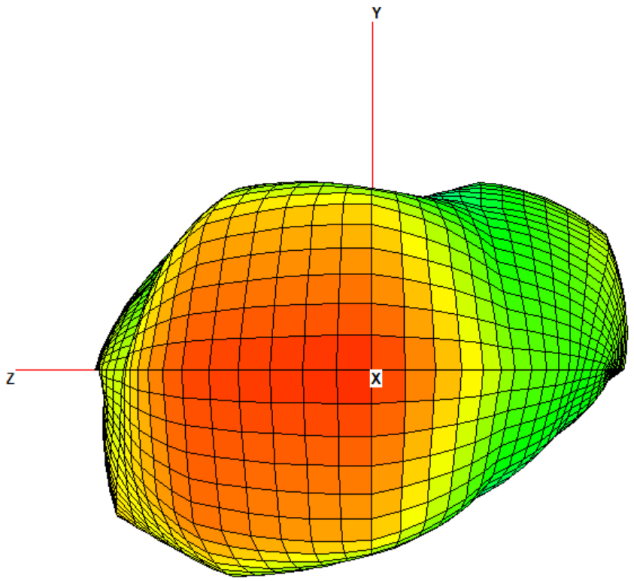
915MHz LoRa MEASURED EFFICIENCY

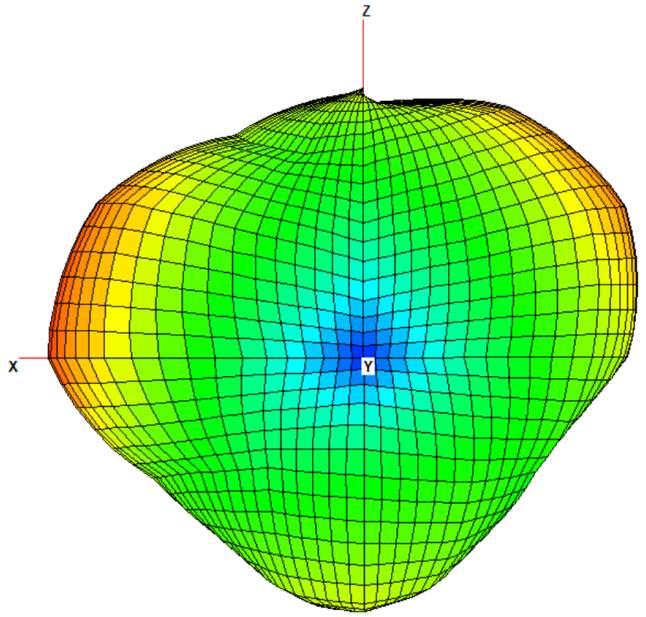


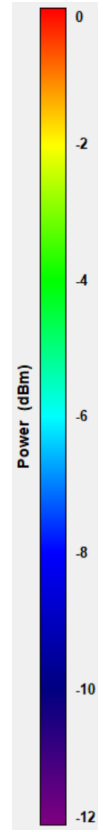
Shown: 915MHz LoRa Band

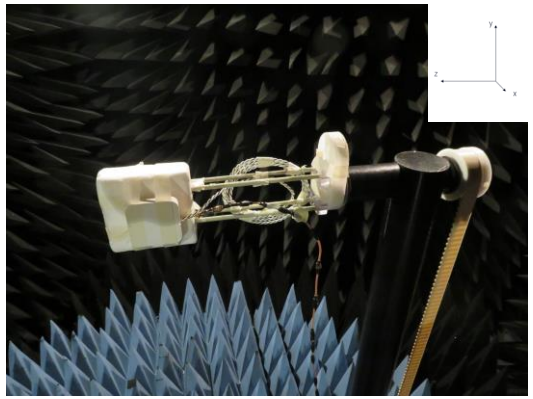
ANTENNA 3D PATTERNS, 915MHz



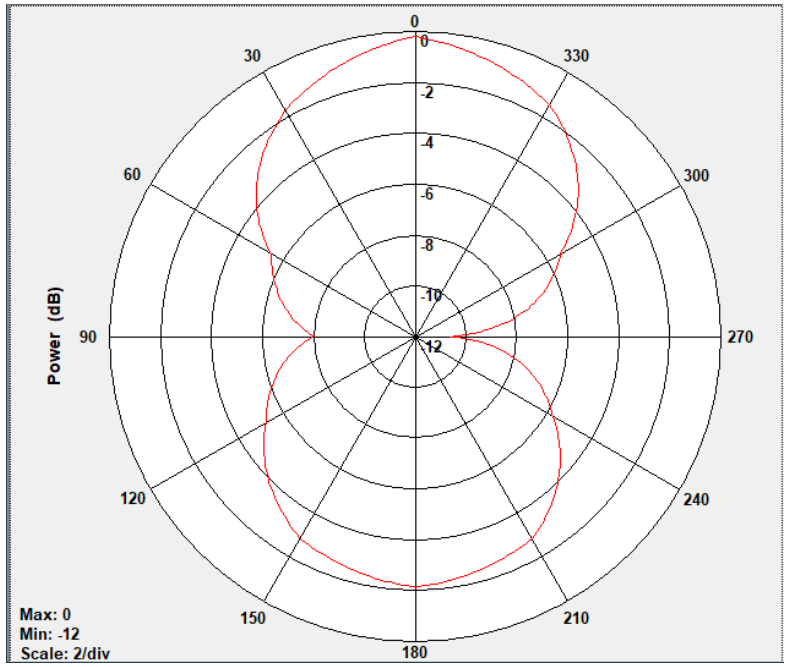




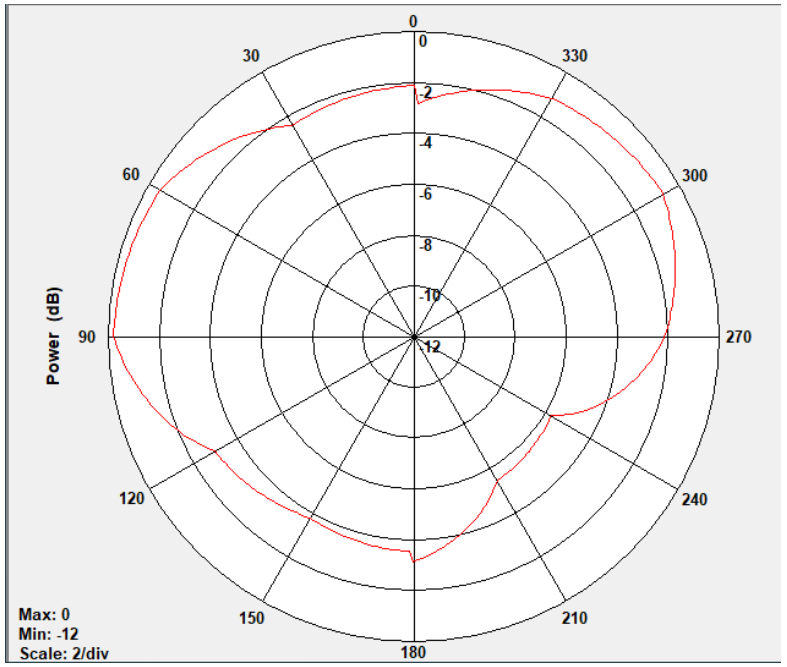




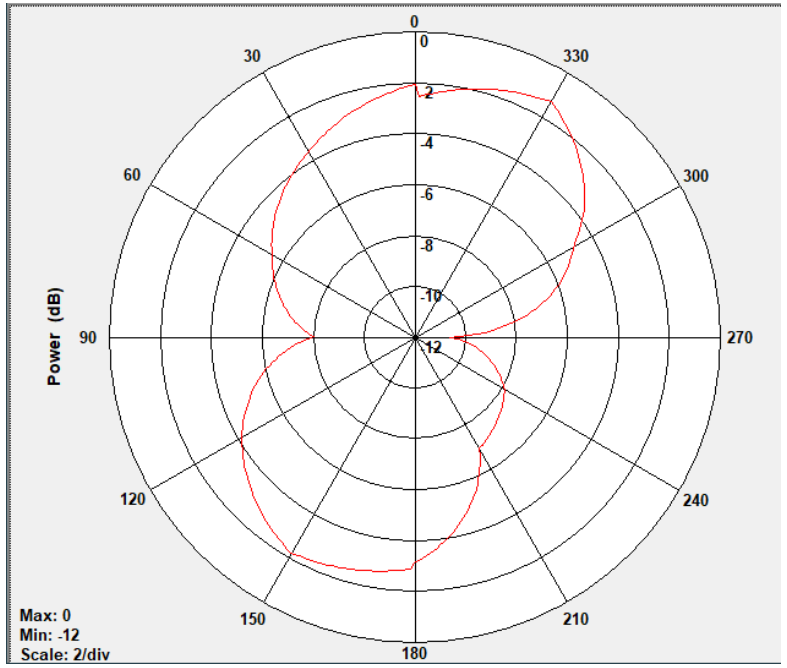
ANTENNA 2D PATTERNS, 915MHz



Theta 0 (XY-plane)



Phi 0 (ZX-plane)



Phi 90 (YZ-plane)