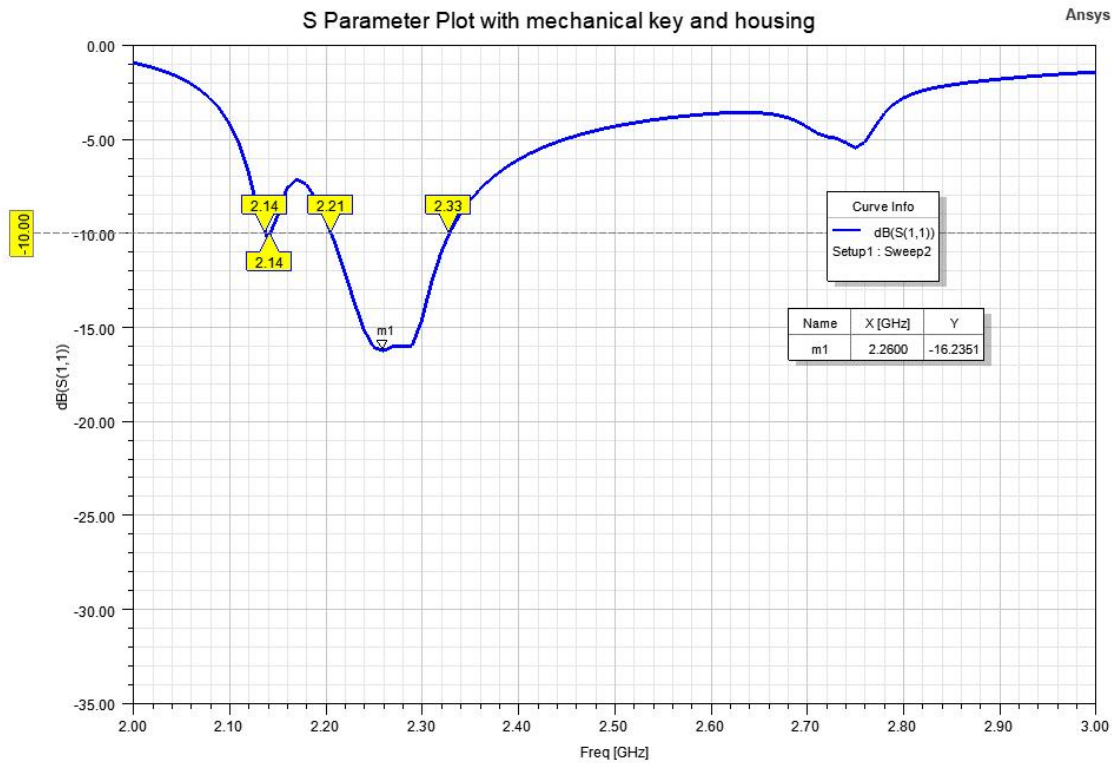
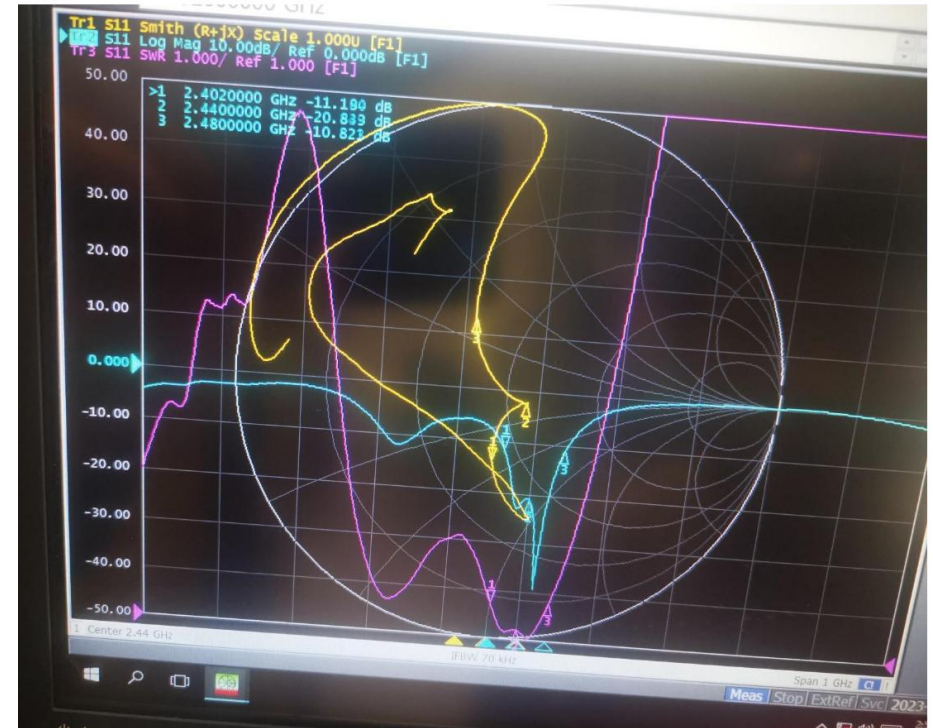


SIMULATION VS. MEASUREMENTS



Simulation

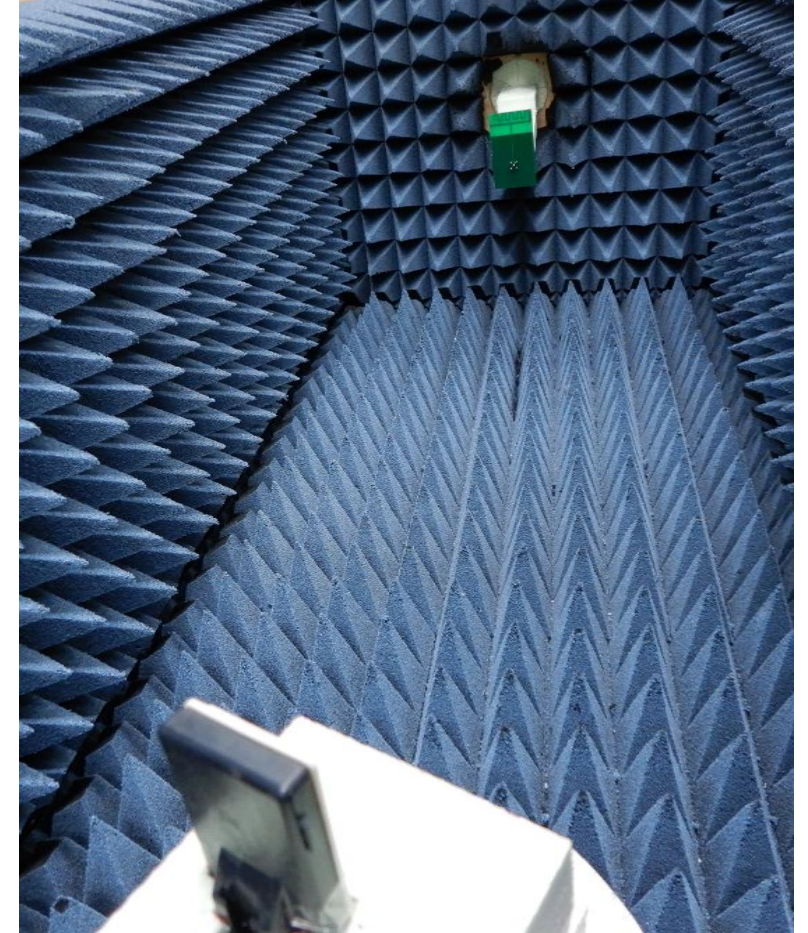
Comperable results => equal behavior



Measurement

MEASUREMENT SETUP

- Measurements are done inside a anachonic chamber.
- As reference a PCB antenna is used
- The measured parameter is S_{21} (mag) => 2 Port VNA
- The VNA is calibrated on the two feeding points of the antennas (reference and DUT)
- The antenna pattern of the xy -, xz -, yz -planes is calculated
- Stepsize => 3°



9/6/2023 |

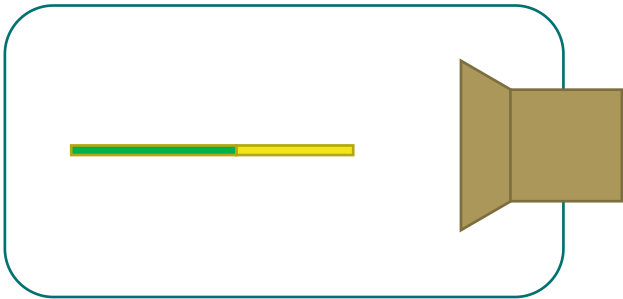
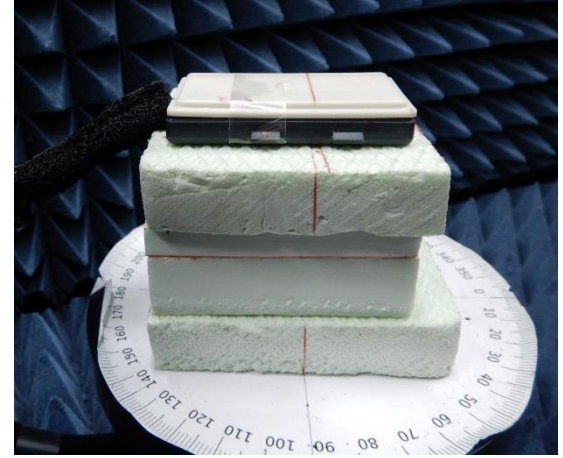
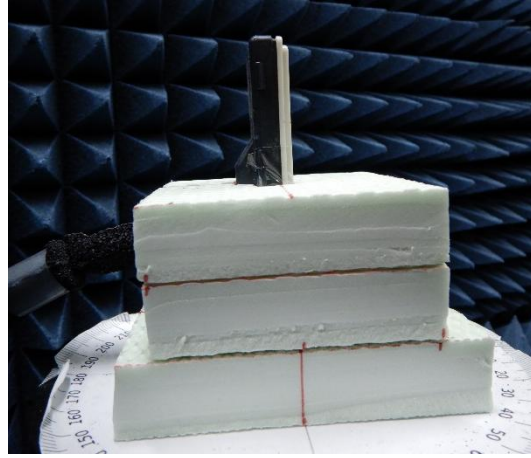
MARQUARDT


MARQUARDT

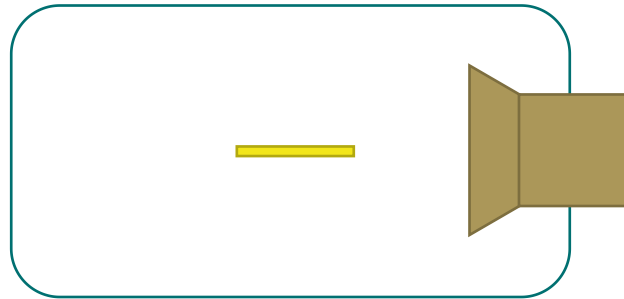
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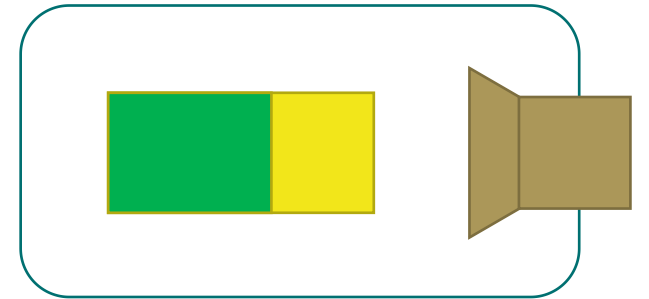
SAMPLE ORIENTATIONS



xz - plane

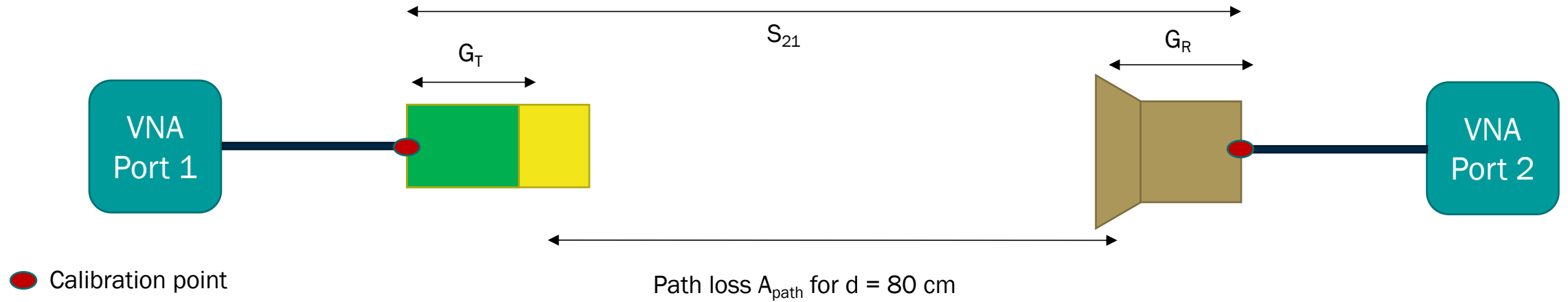


yz - plane



xy - plane

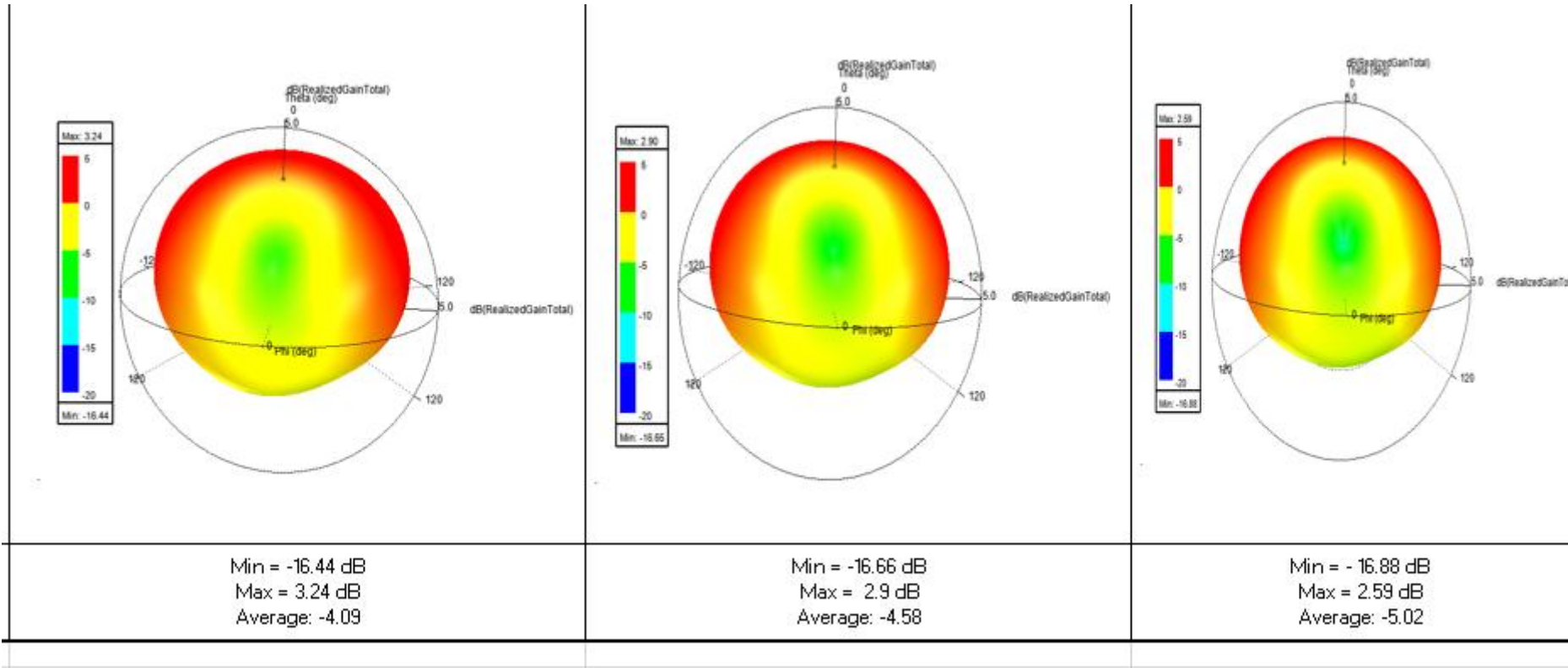
CALCULATION OF THE ANTENNA GAIN

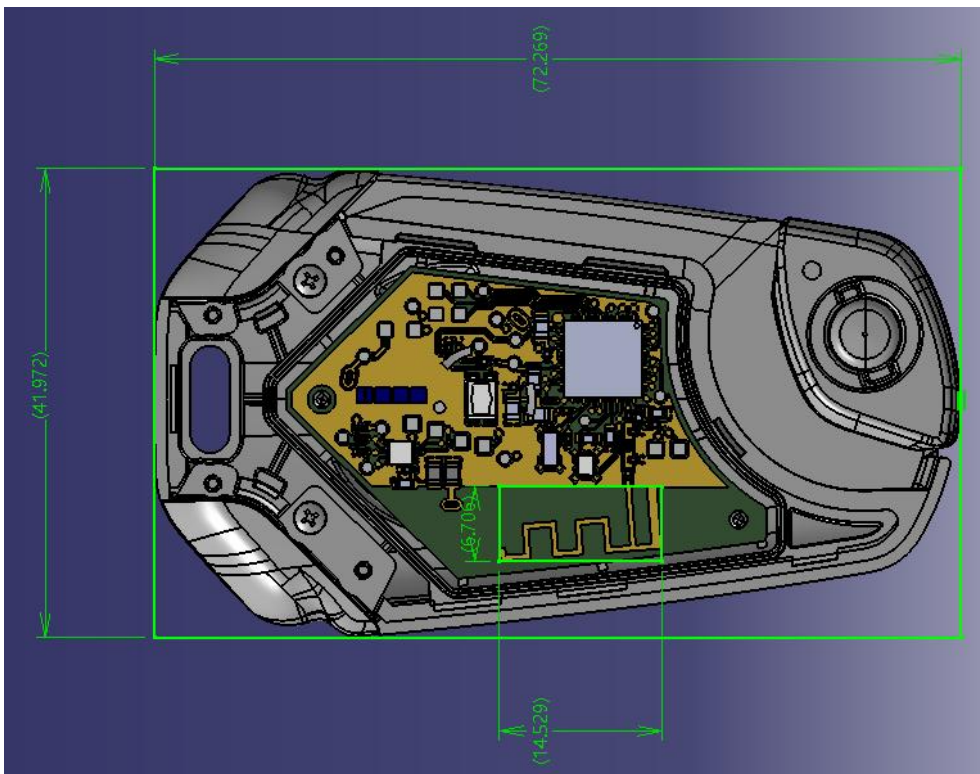


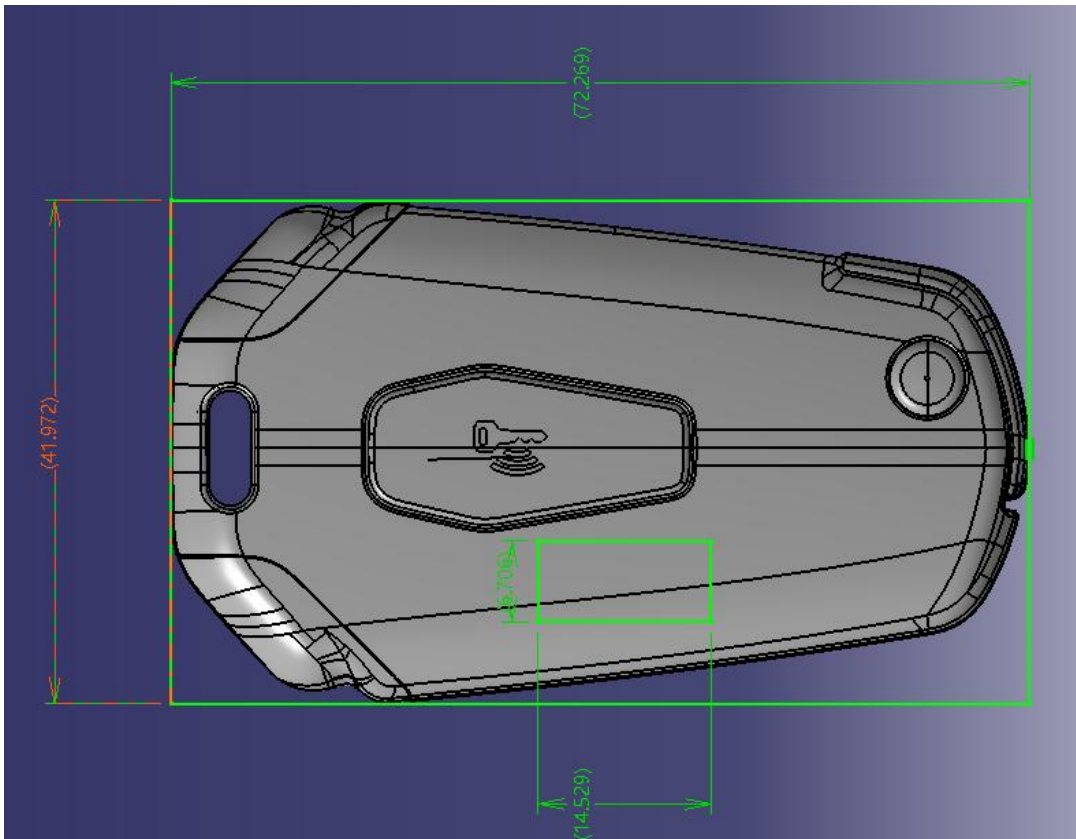
$$G_T = S_{21} - G_R - A_{path}$$

- A_{path} = Friis path loss
- S_{21} = measured with VNA
- G_R = gain of reference antenna

TOTAL GAIN







- Antenna Manufacturer: Marquardt GmbH
- Manufacturer Address: Schloss-str.16,78604 Rietheim-Weilheim,Germany
- Model: BLE: MQBANTK
- Antenna Type: PCB Antenna
- BLE Antenna Size: 14.529mm*6.706mm