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Antenna Registration Question 4:

EIRP calculations and Tx front-end description:

The front-end portion of the RN-520 Tx comprises of an integrated RF module from Qualcomm that includes 64 antenna pairs for both Horizontal and Vertical Polarizations for 2 MIMO layers. The modulated signal for this module is from the BB and low level SoC also from Qualcomm.

There are 8 RFIC' and each RFIC feeds an 8x8 phased array antenna that is integrated into the module. The Pin for each antenna feed is at + 5 dBm and each antenna patch gain is 5 dB.

In our application only 4 RFIC' are used for Tx.

The EIRP of the entire module is given as follows

$EIRP = 5 \text{ (antenna)} + 5 \text{ (PA)} + 3 \text{ (dual-pol)} + 10 \log (32 = \text{antennas used}) + 10 \log (32 = \text{PA pairs used}) \Rightarrow 43 \text{ dBm or } 20 \text{ Watts}$

The RN-520 will be mounted on a ceiling inside the office space in Fort Worth Texas with the coordinates listed in the form 442 application.

Question 4: Directional antenna information:

The 32 pair antennas in the Tx module generate a phased array beam with the following beam information and the beam is steered by SW both in horizontal and vertical pols as per the info below.

- a) Width of beam in degrees at half power points = 30 degrees
- b) Orientation in horizontal plane = +/- 60 deg from boresight
- c) Orientation in vertical plane = +/- 60 deg from boresight