**3GPP TSG-RAN WG4 Meeting #112Draft\_** **R4-2414284**

**Maastricht, Netherlands, 19th – 23rd August 2024**

**Agenda item:** 8.2.6

**Source:** Moderator (Qualcomm)

**Title:** WF for 15GHz UE parameters

**Document for:** Approval

# Sub-topic 1-1: UE Type

At last meeting the following agreement was captured in the WF (R4-2410741):

|  |
| --- |
| **Agreement:**   * For simulations, consider both options.   + FR1 like     - RX diversity gain: [0 or 5] dB assuming 4RX     - TX: 0dBi omnidirectional     - Max Power: 23 dBm, 26dBm   + FR2 like     - Two panels (one in each direction) 2x2 antenna       * 5dBi element gain. Array gain comes on top     - Power: 23 dBm as max TRP |

**Issue 3-1: UE Type assumption for comparison of FR1 Vs FR2 like UE performance**

* FFS the below options for UE types:
  + Option 1: Keep both FR1-like and FR2-like UEs in the assumptions as captured in RAN4#111 (R4-2410741).
  + Option 2:
    - FR1-like UE: Two discrete elements following Table 1-1 below with maximum-gain across elements selection criterion.
    - FR2-likUE: Two panels with 1x2 array at each panel following Table 1-2 below with maximum gain across panels critertion.
  + Option 3:
    - FR1-like UE: For 4Tx/4Rx, [5dB] gain for link of interest regardless the AoA, and 0dB for signals from all non-serving co-channel and adjacent-channel links regardless the AoA.
    - FR2-like UE: keep assumptoin in RAN4#111.

Table 1-1: FR1-like UE discrete antenna model

|  |  |
| --- | --- |
| Parameter | Values |
| Antenna element vertical radiation pattern (dB) |  |
| Antenna element horizontal radiation pattern (dB) |  |
| Combining method for 3D antenna element pattern (dB) |  |
| Maximum directional gain of an antenna element *GE,max* | 5 dBi |

Table 1-2: FR2-like UE antenna model

|  |  |
| --- | --- |
| Parameter | Values |
| Antenna element vertical radiation pattern (dB) |  |
| Antenna element horizontal radiation pattern (dB) |  |
| Combining method for 3D antenna element pattern (dB) |  |
| Maximum directional gain of an antenna element *GE,max* | 5 dBi |
| (Mg, Ng, M, N, P) | (1, 1, 1, 2, 2) |
| (dv, dh) | (0.5λ, 0.5λ) |
| UE orientation | Random orientation in the azimuth domain: uniformly distributed between -90 and 90 degrees\*  Fixed elevation: 90 degrees |
| NOTE: This is done to emulate two panels: the configuration is equivalent to 2 panels with 180 shift in horizontal orientation and UE orientation uniformly distributed in the azimuth domain between -180 and 180 degrees. | |

## Sub-topic 1-2 UE Output Power

At last meeting assumptions were made on UE max power of 23dBm and 26dBm.

**Issue 3-2: UE Output Power for both simulation and LS reply**

* FFS the different UE maximum output power:
  + Option 1: 23dBm
  + Option 2: 26dBm

## Sub-topic 1-3 UE noise factor in the LS reply

At last meeting the following agreement was captured in the WF (R4-2410741):

|  |
| --- |
| **Agreement:**   * 11dB for simulations. Actual noise factor for reply will be decided based on feasibility.   Note that RAN4 agreed on 13 dB for UE in 7.125 – 8400 MHz frequency range. |

**Issue 3-3: UE noise factor for both simulation and LS reply**

* FFS the below options:
  + Option 1: 11 dB i.e. follow simulation assumption (Nokia)
  + Option 2: 8 dB (Ericsson)
  + Option 3: More than 11 dB (MediaTek)

## Sub-topic 1-4: UE RF and Antenna parameter update to TR 38.922

Since the discussion on the UE beamforming feasibility is still ongoing, it is recommended to note R4-2411143 for this meeting and continue the discussion in the next two meetings.