**3GPP TSG-RAN WG4 Meeting #112** **R4-2434418**

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

**Agenda item:** 5.35

**Source:** Huawei, HiSilicon

**Title:** WF on introduction of new FR2 Power Class 8

**Document for:** Approval

1. Introduction

RAN4 discussed the introduction of a new FR2 power class for three meetings from RAN4#110bis till now. The opens issues and system simulation assumptions are captured to facilitate the discussion on the introduction of the new FR2 PC8 for the targeted scenarios.:

* Topic #1: Scenarios
* Topic #2: System simulation assumptions

# Scenarios

**Issue 1-1: Targeted scenarios and UE types**

* Scenarios:
  + FR2 network environment which mainly consists of LOS channel, such as stadium and hot spots
  + Use case:
    - 8K ultra-high resolution autostereoscopic 3D displays with max DL 300Mbps throughput
    - 8K cloud XR service with DL max 500Mbps throughput
* UE types:
  + UE architecture:
    - UE with single panel, dual polarization, 2x1 array, min peak EIRP of 16.4 dBm
  + Targeted bands: n257, n258 and n261
  + Supported UE channel bandwidths are up to 400 MHz for single carrier operation
  + Intra-band contiguous CA and UL-MIMO can be supported

1. System simulation assumptions

Interested companies can bring system simulation results for next RAN4#112bis meeting for the targeted scenario feasibility analysis.

Table 1: FR2 new PC8 UL/DL System Simulation Assumptions

|  |  |
| --- | --- |
| **Parameters** | **Value** |
| Scenario | UMa |
| Site layout |  |
| UE deployment | 100% Outdoor |
| Pathloss model | TR 38.901 Table 7.4.1-1: Pathloss models |
| LOS Propability | TR 38.901 Table 7.4.2-1 LOS probability |
| Traffic type | Full buffer |
| Scheduling type | Proportional Fair |
| CQI/MCS table | 256QAM |
| BS antenna heights (m) | 25 |
| UT antenna heights (m) | 1.5 |
| h\_E (m) | 1 |
| Number of UE | 10 per TRxP |
| SCS( kHz) | 120 |
| Carrier frequency (GHz) | 26 |
| Occupied channel bandwidth for PDSCH Per CC (MHz) | 200, 400 |
| Number of CC | 1 |
| occupied PRB Per CC | 132, 264 |
| ISD(m) | 150,100 |
| max layer | 2 |
| TDD pattern | DDDSU with S = 10:2:2 |
| DL Symbols with PDCCH | 1 |
| DM-RS configuration | Type 1: 1+1 (DL: Multiplexing with PDSCH, UL: Non- multiplexing with PUSCH) |
| xOverhead | 6 |
| Max transmission number | 4 |
| UL Codebook type | ULCB |
| DL codebook type | SRS based codebook selection |
| BS antenna radiation pattern [NOTE 1] | UPA, [m,n,p,mg,ng,mp,np] = [16,16,2,1,1, 2, 2]  [dh,dv] = [0.5λ, 0.5λ],  beam\_theta = [100:5:125]°  beam\_phi = [-55:5:55]°  polar\_angle = [45, -45]  gain\_pattern: General3D = { theta\_3db = 90.0°, phi\_3db = 90.0°, sla\_v = 25.0dB, a\_m\_db = 25.0dB, max\_element\_gain = 5.0dBi } |
| UE antenna radiation pattern [NOTE 1] | UPA = { [m, n, p, mg, ng, mp, np] = [2, 1, 2, 1, 1, 1, 1], [dh,dv] = [NA, 0.5λ,],  beam\_theta = [90.0]°, beam\_phi = [0.0]° }  polar\_angle = [0, 90]°  element gain pattern: General3D = { theta\_3db = 65.0°, phi\_3db = 65.0°, sla\_v = 30.0dB, a\_m = 30.0dB, max\_element\_gain = 8.0dBi } |
| UE EIRP (dBm) | 16.4 |
| BS EIRP (dBm) | 70 |
| Thermal noise density (dBm/Hz) | -174 |
| BS Noise figure (dB) | 7 |
| UE Noise figure (dB) | 10 |
| UE velocity | 3km/h |
| UL Power control parameter | P0=-86, alpha = 0.9 |
| Criteria for selection for serving TRxP | Maximizing RSRP with best analog beam pair, where the digital beamforming is not considered |
| Criteria for analog beam selection for serving TRxP | Select the best beam pair among the limited set of DFT analog beams, based on the criteria of maximizing receive power after beamforming. |
| Criteria for analog beam selection for interfering TRxP | Based on the analog beam selection according to scheduling results of non-serving TRxP |
| NOTE 1: Refer to ITU R-REP-M.2412-2017-PDF-E Table 9 and Table 10 | |

1. Reference
2. R4-2413227, Discussion on feasibility of FR2 UEs with low EIRP, RAN4#112, Qualcomm Incorporated
3. R4-2412784, Discussion on introduction of new FR2 PC, RAN4#112, Huawei, HiSilicon
4. R4-2413064, CR on introduction of new FR2 power class 8, RAN4#112, Huawei, HiSilicon