**3GPP TSG-RAN WG4 Meeting#113 [R4-2420390](http://10.10.10.10/ftp/RAN/RAN4/Inbox/R4-2420390.zip) ss**

**Orlando, USA, 18th – 22th Nov, 2024**

**Agenda item: 7.2.4.2**

**Source: ZTE Corporation**

**Title: Discussion on radio and antenna parameters for 14800 to 15350 MHz**

**Document for:** **Approval**

1. Introduction

In the latest ITU-R meeting, WP5D has sent one LS to RAN/RAN4 to request the Parameters of terrestrial component of IMT in the following frequency ranges for sharing and compatibility studies. During the RAN#103 meeting, the corresponding SID for WP5D reply LS [3] is approved to facilitate the technical discussions in RAN4. In this contribution, we would like to share the TP for 14800-15350MHz IMT BS antenna configuration.

1. Text proposal

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### 6.5.1 BS antenna characteristics

#### 6.5.1.1 Antenna model

Antenna model for AAS BS is described in clause 6.1.2.3.2.

#### 6.5.1.2 Antenna parameters

In Table 6.5.1.2-1, representable parameter sets relevant for an AAS base station operating within 14800 - 15350 MHz are provided.

**Table 6.5.1.2-1: Antenna array parameters**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Macro suburban** | **Macro urban** | **Micro urban** | **Small cell indoor/Indoor urban** |
| **1** | **Base station Antenna Characteristics** |
| 1.1 | Antenna pattern  | Table 3 | N/A |
| 1.2 | Element gain (dBi) (Note 2) | 6.4 | 6.4 | 6.4 | 5 |
| 1.3 | Horizontal/vertical 3 dB beam width of single element (degree)  | 90º for H65º for V | 90º for H65º for V | 90º for H65º for V | 90º for H90º for V |
| 1.4 | Horizontal/vertical front‑to‑back ratio (dB) | 30 for both H/V | 30 for both H/V | 30 for both H/V | 30 for both H/V |
| 1.5 | Antenna polarization  | Linear ±45º polarized sub-array | Linear ±45º polarized sub-array | Linear ±45º polarized sub-array | Linear ±45º polarized sub-array |
| 1.6 | Antenna array configuration (Row × Column) (Note 4) | 16x24  | 16x24 | 16x24 | 4x4 |
| 1.7 | Horizontal/Vertical radiating sub-array or element spacing (Note 5) | 0.5 of wavelength for H, 2.8 of wavelength for V | 0.5 of wavelength for H, 2.8 of wavelength for V | 0.5 of wavelength for H, 2.8 of wavelength for V | 0.5 of wavelength for H, 0.5 of wavelength for V |
| 1.7a | Number of element rows in sub-array | 4 | 4 | 4 | N/A |
| 1.7b | Vertical element separation in sub-array ($\_{}$) | 0.7 of wavelength for V | 0.7 of wavelength for V | 0.7 of wavelength for V | N/A |
| 1.7c | Pre-set sub-array down-tilt (degrees) (Note 6) | 3 | 3 | 3 | N/A |
| 1.8 | Array Ohmic loss (dB) (Note 2) | 2 | 2 | 2 | 2 |
| 1.9 | Conducted power (before Ohmic loss) per sub-array or element (dBm) (Note 3) | 17.15 | 17.15 | 7.15 | 7.95 |
| 1.10 | Base station horizontal coverage range (degrees) | ±60 | ±60 | ±60 | ±90 |
| 1.11 | Base station vertical coverage range (degrees) (Note 1) | 90-100 | 90-100 | 90-100 | 0-180 |
| 1.12 | Mechanical down-tilt (degrees) | 6 | 6 | 6 | N/A |
| 1.13 | Base station output power/sector (e.i.r.p.) (dBm) (Note 7) | 84.26 | 84.26 | 74.26 | 40.04 |

Note 1: The vertical coverage range is given in global coordinate system, i.e., 90° being at the horizon. This range includes the mechanical down-tilt given in row 1.12.

Note 2: The element gain in row 1.2 includes the loss given in row 1.8 and is per polarization.

Note 3: Conducted power values are per polarization. The conducted power per sub-array assumes 16 × 24 sub-arrays and 2 polarizations for the Macro Suburban, Macro Urban and Micro Urban cases; the conducted power per element assumes 4x4 elements for the Small cell indoor/ Indoor Urban case. This power is typical power, there is no upper limit for Wide Area Base station (For BS class definitions, see 3GPP TS 38.104 [1], § 4.4).

Note 4: 16 × 24 means there are 16 rows and 24 columns of radiating sub-arrays for Macro Suburban, Macro Urban and Micro Urban cases. 4x4 means there are 16 rows and 24 columns of radiating elements for Small cell indoor/ Indoor Urban case.

Note 5: For the case of 4 elements per sub-array, dv will be 2.8 wavelengths.

Note 6: The pre-set sub array down-tilt is a fixed design parameter for a base station. It is envisaged as a passive fixed (non-varying) electrical tilt within the sub-array elements.

Note 7: The base station e.i.r.p per sector is calculated as total power (including power from two orthogonal polarizations).

Note 8: Mechanical down-tilt is handled by a coordinate system transformation described in 3GPP TR 36.814 section A.2.1.6.2.

Note 9: $\_{}$ and $\_{}$ is the BS array antenna beam steering direction used in Table 3, they should be set so that the beam steering direction is within the vertical and horizontal coverage ranges in row 1.11 and row 1.10, respectively.

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