**3GPP TSG-RAN4 Meeting #116 R4-2509717**

**Bengaluru, India, Aug.25th – 29th, 2025**

Source: CMCC

Title: TP for TR 38.194 5.3 BS channel bandwidth and 5.4 Channel arrangement

Agenda Item: 7.22.2

Document for: Approval

# **Introduction**

This TP will focus on 5.3 BS channel bandwidth and 5.4 Channel arrangement.

# **Reference**

[1]

# Text Proposal

**----- Start of TP -----**

5.3 *BS channel bandwidth*

5.3.1 General

The *BS channel bandwidth* supports a single BS RF carrier in R2D link at the BS. [The placement of the UE channel bandwidth is flexible but can only be partially within the *BS channel bandwidth]*.

The relationship between the channel bandwidth, the guardband and the *transmission bandwidth* is shown in figure 5.3.1-1.



**Figure 5.3.1-1: Definition of channel bandwidth and *transmission bandwidth* for one BS channel**

5.3.2 *Transmission bandwidth*

The *transmission bandwidth* NRB for each *BS channel bandwidth* and subcarrier spacing is specified in table 5.3.2.-1 .

**Table 5.3.2-1: *Transmission bandwidth* NRB for FR1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SCS (kHz)** | **200****kHz** | **400****kHz** | **600****kHz** | **800****kHz** |
|  | NRB | NRB | NRB | NRB |
| 15 | 1 | 2 | 3 | 4 |

NOTE: All BS Tx and device Rx requirements are defined based on *transmission bandwidth* specified in table 5.3.2-1.

5.3.3 Minimum guardband and *transmission bandwidth*

The minimum guardband for each *BS channel bandwidth* and SCS is specified in table 5.3.3-1.

**Table 5.3.3-1: Minimum guardband (kHz) (FR1)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SCS (kHz)** | **200****kHz** | **400****kHz** | **600****kHz** | **800****kHz** |
| 15 | 10 | 20 | 30 | 40 |

The number of RBs configured in any *BS channel bandwidth* shall ensure that the minimum guardband specified in this clause is met.

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**Figure 5.3.3-1: BS PRB utilization**

5.3.4 RB alignment

For each BS *channel bandwidth*, *BS transmission bandwidth* must fulfil the minimum guardband requirement specified in clause 5.3.3.

~~[For each numerology, its common resource blocks are specified in clause 4.4.4.3 in [9], and the starting point of its~~ *~~transmission bandwidth configuration~~* ~~on the common resource block grid for a given channel bandwidth is indicated by an offset to “Reference point A” in the unit of the numerology.]~~

5.3.5 *BS channel bandwidth* per *operating band*

The requirements in this specification apply to the combination of *BS channel bandwidths*, SCS and *operating bands* shown in table 5.3.5-1 for FR1. The *transmission bandwidth configuration* in table 5.3.2-1 shall be supported for each of the *BS channel bandwidths* within the BS capability. The *BS channel bandwidths* are specified for the Tx path.

**Table 5.3.5-1: BS *channel bandwidths* and SCS per *operating band***

| **NR Band** | **SCS (kHz)** | ***BS channel bandwidth* (kHz)** |
| --- | --- | --- |
| **200** | **400** | **600** | **800** |
| n8 | 15 | 200 | 400 | 600 | 800 |

## 5.4 Channel arrangement

### 5.4.1 Channel raster

#### 5.4.1.1 NR-ARFCN and channel raster

The global frequency raster defines a set of *RF reference frequencies* FREF. The *RF reference frequency* is used in signalling to identify the position of RF channels and other elements. The granularity of the global frequency raster is ΔFGlobal.

*RF reference frequencies* are designated by an NR Absolute Radio Frequency Channel Number (NR-ARFCN) in the range [0…3279165] on the global frequency raster. The relation between the NR-ARFCN and the *RF reference frequency* FREF in MHz is given by the following equation, where FREF-Offs and NRef-Offs are given in table 5.4.1.1-1 and NREF is the NR-ARFCN.

 FREF = FREF-Offs + ΔFGlobal (NREF – NREF-Offs)

Table 5.4.1.1-1: NR-ARFCN parameters for the global frequency raster

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Range of frequencies (MHz) | ΔFGlobal (kHz) | FREF-Offs (MHz) | NREF-Offs | Range of NREF |
| 0 – 3000 | 5 | 0 | 0 | 0 – 599999 |

The *channel raster* defines a subset of *RF reference frequencies* that can be used to identify the RF channel position in the uplink and downlink. The *RF reference frequency* for an RF channel maps to a resource element on the carrier. For each *operating band*, a subset of frequencies from the global frequency raster are applicable for that band and forms a channel raster with a granularity ΔFRaster, which may be equal to or larger than ΔFGlobal.

The mapping between the *channel raster* and corresponding resource element is given in clause 5.4.1.2. The applicable entries for each *operating band* are defined in clause 5.4.1.3.

#### 5.4.1.2 Channel raster to resource element mapping

The mapping between the *RF reference frequency* on the channel raster and the corresponding resource element is given in table 5.4.1.2-1 and can be used to identify the RF channel position. The mapping depends on the total number of RBs that are allocated in the channel and applies to both UL and DL. The mapping must apply to at least one numerology supported by the BS.

Table 5.4.1.2-1: Channel Raster to Resource Element Mapping

|  |  |  |
| --- | --- | --- |
|  |  |  |
| Resource element index  | 0 | 6 |
| Physical resource block number  |  |  |

k,  and NRB are as defined in TS 38.211 [9].

#### 5.4.1.3 Channel raster entries for each *operating band*

The RF channel positions on the channel raster in each NR *operating band* are given through the applicable NR-ARFCN in table 5.4.1.3-1, using the channel raster to resource element mapping in clause 5.4.1.2.

Channel raster is defined with ΔFRaster = 2 × ΔFGlobal. In this case every 2th NR-ARFCN within the operating band are applicable for the channel raster within the operating band and the step size for the channel raster in Table 5.4.1.3‑1 is given as <2>.

Table 5.4.1.3-1: Applicable NR-ARFCN per operating band for enhanced channel raster

|  |  |  |  |
| --- | --- | --- | --- |
| NR operating band | ΔFRaster(kHz) | UplinkRange of NREF(First – <Step size> – Last) | DownlinkRange of NREF(First – <Step size> – Last) |
| n8 | 10 | 176000 – <2> – 183000 | 185000 – <2> – 192000 |
| NOTE 1: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. These channel numbers shall also be such that the minimum guard band for each channel bandwidth and SCS specified in Table 5.3.3-1 are met for carriers located at the upper or lower edge of an operating band. |

---End of changes---