**3GPP TSG-RAN WG4 Meeting #112 R4-2412823**

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

**Agenda item: 8.3.4**

**Source:** Moderator (OPPO)

**Title:** Topic summary for [112][121] NR\_SL\_ intraB\_CA\_ITS\_part1

**Document for:** Information

# Introduction

This summary includes system parameters, TX requirements and RX requirements for intra-band non-contiguous CA in ITS band.

# Topic #1: System Parameter

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company** | **Summary** |
| R4-2411651 | Meta Ireland | **TP on TR38.787: Operating bands and UE RF requirements for intra-band non-contiguous SL CA UE** |
| R4-2411650 | Meta Ireland | **TP on TR38.787 Updated Reference and Objectives for SL Intra-band CA in ITS spectrum** |
| R4-2412737 | OPPO | **TP on TR38.787 on system parameter for intra-band non-contiguous SL CA** |

## Open issues summary

### Sub-topic 2-1 General

#### Issue 2-1-1: Operating band

* Proposals
  + Proposal 1 (Meta):
* Table 5.1.2-1 Intra-band non-contiguous SL CA operating bands in FR1

|  |  |  |
| --- | --- | --- |
| NR intra-band non-contiguous SL CA operating Band | NR SL Operating Band | Interface |
| SL\_n47(2A) | n47 | PC5 |
| NOTE 1: The minimum requirements only apply for non simultaneous Tx/Rx between all carriers in n47 band. | | |

* + Proposal 2 (OPPO)
* Table 5.1.1-1: Intra-band contiguous CA operating bands for SL CA in FR1

|  |  |  |
| --- | --- | --- |
| NR SL CA Band | NR Band | Interface |
| SL\_n47 | n47 | PC5 |

* Moderator Recommendation:
  + Merge the table

Agreement: Merge two tables.

* Table 5.1.2-1 Intra-band non-contiguous SL CA operating bands in FR1

|  |  |  |
| --- | --- | --- |
| NR intra-band non-contiguous SL CA operating Band | NR SL Operating Band | Interface |
| SL\_n47(2A) | n47 | PC5 |
| NOTE 1: The minimum requirements only apply for non simultaneous Tx/Rx between all carriers in n47 band. | | |

* Table 5.1.1-1: Intra-band contiguous CA operating bands for SL CA in FR1

|  |  |  |
| --- | --- | --- |
| NR SL CA Band | NR Band | Interface |
| SL\_n47 | n47 | PC5 |

#### Issue 2-1-2: Channel bandwidth

* Proposals
  + Proposal: (Meta, OPPO)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sidelink CA configuration / Bandwidth combination set | | | | | | | |
| Sidelink CA configuration | Sidelink CA configuration for TX | Component carriers in order of increasing carrier frequency | | | | Maximum aggregated  bandwidth [MHz] | Bandwidth combination set |
| Channel bandwidths for carrier [MHz] | Channel bandwidths for carrier [MHz] | Channel bandwidths for carrier [MHz] | Channel bandwidths for carrier [MHz] |
| SL\_n47(2A) | SL\_n47(2A) | 10 | 10, 20 |  |  | 30 | 0 |

* Moderator Recommendation:
  + Agree on the proposal

Agreement:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sidelink CA configuration / Bandwidth combination set | | | | | | | |
| Sidelink CA configuration | Sidelink CA configuration for TX | Component carriers in order of increasing carrier frequency | | | | Maximum aggregated  bandwidth [MHz] | Bandwidth combination set |
| Channel bandwidths for carrier [MHz] | Channel bandwidths for carrier [MHz] | Channel bandwidths for carrier [MHz] | Channel bandwidths for carrier [MHz] |
| SL\_n47(2A) | SL\_n47(2A) | 10 | 10, 20 |  |  | 30 | 0 |

#### Issue 2-1-3: TP on TR38.787 Updated Reference and Objectives for SL Intra-band CA in ITS spectrum R4-2411650

* Moderator Recommendation:
  + Agree on the TP

# Topic #2: UE TX RF requirement

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company** | **Summary** |
| R4-2412014 | LG Electronics Finland | **Observation 1:** it is required that UE operates on channels that have maximum channel bandwidth of 10MHz  **Observation 2:** it is required that UE operates on channels with centre frequency listed above with +/-20ppm frequency error  **Observation 3:** The out-of-band domain is defined as ±250 % of the channel bandwidth, and then the out-of-band (OOB) domain for the 5 GHz ITS frequency band is 5 835 MHz to 5 855 MHz at the lower part and 5 925 MHz to 5 945 MHz at the higher part of the frequency band.  **Observation 4:** Maximum EIRP power density for UE emissions into the out-of-band domain is -30dBm/MHz.  **Observation 5:** Spectrum mask is defined for 10MHz channel bandwidth only  **Observation 6:** Spectrum mask is only applicable within 5855 to 5925MHz.  **Observation 7:** Considering the observations 3, 4, 5, 6 there is only one 10+10MHz UL NC-CA combination where IM3-products fall inside the band n47. In all other cases -30dBm/MHz OOB or spurious emission requirement needs to be met.  **Proposal 1:** It’s proposed that above mentioned observations are taken into account when Rel-19 side link RF requirements are discussed in RAN4- |
| R4-2412017 | LG Electronics Finland | Proposal 1: Define MPR to meet -13dBm/MHz and MPR to meet -30dBm/MHz as NR intra-band non-contiguous CA.Proposal 2: Define MPR to meet -25dBm/MHz on top of Proposal 1.Proposal 3: Consider B = (LCRB1\* 12\* SCS1 + LCRB2 \* 12 \* SCS2)/1,000 for PSSCH as NR intra-band non-contiguous CA.Proposal 4: Consider MPR evaluation scenario in Table 2-3.Proposal 5: Consider PC2 MPR in Table 2-10 for SL non-contiguous CA with 1x26dBm PA + 1LO. Table 2-10 : PSSCH/PSCCH MPR for SL non-contiguous CA with 1x26dBm PA + 1LO   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 0 ≤ B < 6.3 | 12.0 | 12.0 | 15.0 | | 6.3 ≤ B < 11.88 |  |  | 14.0 | | 11.88 ≤ B |  |  | 13.5 |  Proposal 6: Consider PC2 MPR in Table 2-11 for SL non-contiguous CA with 2x23dBm PA + 1LO. Table 2-11 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x23dBm PA + 1LO   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 0 ≤ B < 6.3 | 13.5 | 13.5 | 16.0 | | 6.3 ≤ B < 11.88 |  |  | 15.5 | | 11.88 ≤ B |  |  | 14.0 |  Proposal 7: Consider PC2 MPR in Table 2-12 for SL non-contiguous CA with 2x23dBm PA + 2LO. Table 2-12 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x23dBm PA + 2LO   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 0 ≤ B < 6.3 | 7.0 | 8.0 | 14.0 | | 6.3 ≤ B < 11.88 |  |  | 13.0 | | 11.88 ≤ B < 23.4 |  |  | 12.0 | | 23.4 ≤ B |  |  | 11.0 |  Proposal 8: Consider PC3 MPR in Table 2-21 for SL non-contiguous CA with 1x23dBm PA + 1LO. Table 2-21 : PSSCH/PSCCH MPR for SL non-contiguous CA with 1x23dBm PA + 1LO   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 0 ≤ B < 6.3 | 12.0 | 12.0 | 14.5 | | 6.3 ≤ B |  |  | 13.5 | |  |  |  |  |  Proposal 9: Consider PC3 MPR in Table 2-22 for SL non-contiguous CA with 2x20dBm PA + 1LO. Table 2-22 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x20dBm PA + 1LO   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 0 ≤ B < 6.3 | 13.5 | 13.5 | 16.0 | | 6.3 ≤ B < 11.88 |  |  | 15.5 | | 11.88 ≤ B |  |  | 15.0 |  Proposal 10: Consider PC3 MPR in Table 2-23 for SL non-contiguous CA with 2x20dBm PA + 2LO. Table 2-23 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x20dBm PA + 2LO   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 0 ≤ B < 6.3 | 7.5 | 8.5 | 14.5 | | 6.3 ≤ B < 11.88 |  |  | 13.5 | | 11.88 ≤ B < 23.4 |  |  | 12.5 | | 23.4 ≤ B |  |  | 11.5 |  Proposal 11: Consider PSFCH MPR evaluation scenario in Table 2-24.Proposal 12: Consider PC2 PSFCH MPR in Table 2-29 for SL non-contiguous CA. Table 2-29 : PC2 PSFCH MPR for SL non-contiguous CA   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 1x26dBm | 11.5 | 13.0 | 13.0 | | 2x23dBm + 1LO | 12.0 | 13.5 | 14.0 | | 2x23dBm + 2LO | 4.0 | 10.0 | 10.0 |  Proposal 13: Consider PC3 PSFCH MPR in Table 2-34 for SL non-contiguous CA. Table 2-34 : PC3 PSFCH MPR for SL non-contiguous CA   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 1x26dBm | 11.0 | 13.0 | 13.0 | | 2x23dBm + 1LO | 11.5 | 13.5 | 14.0 | | 2x23dBm + 2LO | 4.0 | 9.5 | 9.5 |  Proposal 14: Consider SSSB MPR evaluation scenario in Table 2-35.Proposal 15: Consider PC2 SSSB MPR in Table 2-40 for SL non-contiguous CA. Table 2-40 : PC2 SSSB MPR for SL non-contiguous CA   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 1x26dBm | 13.0 | 14.0 | 14.0 | | 2x23dBm + 1LO | 14.0 | 15.0 | 15.5 | | 2x23dBm + 2LO | 5.0 | 8.5 | 8.5 |  Proposal 16: Consider PC3 SSSB MPR in Table 2-45 for SL non-contiguous CA. Table 2-45 : PC3 SSSB MPR for SL non-contiguous CA   |  |  |  |  | | --- | --- | --- | --- | | B | MPR (dB) for IM3 frequency | | | |  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 | | 1x26dBm | 13.0 | 14.0 | 14.0 | | 2x23dBm + 1LO | 14.0 | 15.0 | 15.5 | | 2x23dBm + 2LO | 5.0 | 8.5 | 8.5 |  Proposal 17: Update wording to apply the existing requirement of configured output power to SL non-contiguous CA. |
| R4-2412733 | OPPO | **Proposal 1: For PC3 SL NC CA, for 1 PA 1LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**  **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**  **MA = 11; 0 ≤ B < 4.32**  **8; 4.32 ≤ B < 6.48**  **7.5; 6.48 ≤ B < 10.8**  **6; 10.8≤ B < 14.04**  **5.5; 14.04 ≤ B < 27**  **5; 27 ≤ B**  **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**  **MA = 13; 0 ≤ B < 4.32**  **10.5; 4.32 ≤ B < 6.48**  **10; 6.48 ≤ B < 10.8**  **9.5; 10.8≤ B < 14.04**  **8.5; 14.04 ≤ B < 27**  **8; 27 ≤ B**  **Proposal 2: For PC3 SL NC CA, for 2 PA 2 LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**  **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**  **MA = 9; 0 ≤ B < 4.32**  **6.5; 4.32 ≤ B < 6.48**  **7.5; 6.48 ≤ B < 10.8**  **6; 10.8≤ B < 14.04**  **6.5; 14.04 ≤ B < 27**  **5; 27 ≤ B**  **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**  **MA = 9; 0 ≤ B < 4.32**  **7; 4.32 ≤ B < 6.48**  **9.5; 6.48 ≤ B < 10.8**  **7; 10.8≤ B < 18.36**  **8.5; 18.36 ≤ B < 27**  **6.5; 27 ≤ B**  **Proposal 3: For PC2 SL NC CA, for 1 PA 1LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**  **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**  **MA = 11.5; 0 ≤ B < 4.32**  **9.5; 4.32 ≤ B < 6.48**  **[14]; 6.48 ≤ B < 10.8**  **8; 10.8≤ B < 14.04**  **6; 14.04 ≤ B < 27**  **5.5; 27 ≤ B**  **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**  **MA = 15; 0 ≤ B < 4.32**  **11.5; 4.32 ≤ B < 6.48**  **12.5; 6.48 ≤ B < 10.8**  **12; 10.8≤ B < 14.04**  **10; 14.04 ≤ B < 27**  **8.5; 27 ≤ B**  **Proposal 4: For PC2 SL NC CA, for 2 23dBm PA 2LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**  **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**  **MA = 9.5; 0 ≤ B < 4.32**  **7; 4.32 ≤ B < 6.48**  **7.5; 6.48 ≤ B < 10.8**  **5.5; 10.8≤ B < 18.36**  **7; 18.36≤ B < 27**  **5; 27 ≤ B**  **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**  **MA = 12.5; 0 ≤ B < 4.32**  **8.5; 4.32 ≤ B < 6.48**  **11; 6.48 ≤ B < 10.8**  **7.5; 10.8≤ B < 18.36**  **10; 18.36 ≤ B < 27**  **7; 27 ≤ B**  **Proposal 5: 34dBc image and 36dBc DC suppression is used for simulation for PC3 1LO case for intra-band non-contiguous Sidelink CA.**  **Proposal 6: 36dBc image and 45dBc DC suppression is used for simulation for PC2 1LO case for intra-band non-contiguous Sidelink CA.** |
| R4-2411651 | Meta Ireland | **TP on TR38.787: Operating bands and UE RF requirements for intra-band non-contiguous SL CA UE** |
| R4-2412739 | OPPO | **TP on TR38.787 to capture the intra-band non-contiguous SL CA simulation result** |

## Open issues summary

### Sub-topic 2-1 MPR/A-MPR simulation General

#### Issue 2-1-1: Simulation assumption

* Proposals
  + Proposal 1: 34dBc image and 36dBc DC suppression is used for simulation for PC3 1LO case for intra-band non-contiguous Sidelink CA.
  + Proposal 2: 36dBc image and 45dBc DC suppression is used for simulation for PC2 1LO case for intra-band non-contiguous Sidelink CA.
* Recommendation:
  + Align the simulation assumption
  + Consider the LO and image falling into the gap area for 1LO case

Skyworks: This issue has already been met. We did not explicitly define the image. It is possible to meet the improved image requirement.

LGE: We are OK with the proposal. Use the similar assumption as what companies want to use for simulation.

#### Issue 2-1-2: How to define the requirement

* Proposals
* Proposal 1: Define MPR to meet -13dBm/MHz and MPR to meet -30dBm/MHz as NR intra-band non-contiguous CA.
* Proposal 2: Define MPR to meet -25dBm/MHz on top of Proposal 1.
* Proposal 3: Consider B = (LCRB1\* 12\* SCS1 + LCRB2 \* 12 \* SCS2)/1,000 for PSSCH as NR intra-band non-contiguous CA.Recommendation:
* Recommendation:
  + Proposal 1 and 3 can be agreed based on submitted tdocs.
  + Proposal 2 needs further discuss

LGE: We would like to check proposal 2 in the next meeting.

Agreement:

* Define MPR to meet -13dBm/MHz and MPR to meet -30dBm/MHz as NR intra-band non-contiguous CA
* Consider B = (LCRB1\* 12\* SCS1 + LCRB2 \* 12 \* SCS2)/1,000 for PSSCH as NR intra-band non-contiguous CA

### Sub-topic 2-2 PC3 non-contiguou CA MPR

#### Issue 2-2-1: PSSCH/PSCCH with 1x23dBm PA + 1LO

* Proposals
  + Proposal 1 (LGE):

Table 2-21 : PSSCH/PSCCH MPR for SL non-contiguous CA with 1x23dBm PA + 1LO

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 0 ≤ B < 6.3 | 12.0 | 12.0 | 14.5 |
| 6.3 ≤ B |  |  | 13.5 |
|  |  |  |  |

* + Proposal 2 (OPPO):

**For PC3 SL NC CA, for 1 PA 1LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**

**To meet the -13dBm/MHz requirement, the MPR is proposed as below:**

**MA = 11; 0 ≤ B < 4.32**

**8; 4.32 ≤ B < 6.48**

**7.5; 6.48 ≤ B < 10.8**

**6; 10.8≤ B < 14.04**

**5.5; 14.04 ≤ B < 27**

**5; 27 ≤ B**

**To meet the -30dBm/MHz requirement, the MPR is proposed as below:**

**MA = 13; 0 ≤ B < 4.32**

**10.5; 4.32 ≤ B < 6.48**

**10; 6.48 ≤ B < 10.8**

**9.5; 10.8≤ B < 14.04**

**8.5; 14.04 ≤ B < 27**

* **8; 27 ≤ B**
* Moderator Recommendation:
  + Further consider the simulation results

#### Issue 2-2-2: PSSCH/PSCCH with 2x20dBm PA + 1LO

* Proposals
  + Proposal 1 (LGE):
  + Consider PC3 MPR in Table 2-21 for SL non-contiguous CA with 1x23dBm PA + 1LO.
* Table 2-22 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x20dBm PA + 1LO

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 0 ≤ B < 6.3 | 13.5 | 13.5 | 16.0 |
| 6.3 ≤ B < 11.88 |  |  | 15.5 |
| 11.88 ≤ B |  |  | 15.0 |

* Moderator Recommendation:
  + Further consider the simulation results

Agreement: use PSSCH/PSCCH with 2x20dBm PA for PC3 sidelink non-contiguous CA evaluation.

#### Issue 2-2-3: PSSCH/PSCCH with 2x20dBm PA + 2LO

* Proposals
  + Proposal 1 (LGE):
* Table 2-23 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x20dBm PA + 2LO

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 0 ≤ B < 6.3 | 7.5 | 8.5 | 14.5 |
| 6.3 ≤ B < 11.88 |  |  | 13.5 |
| 11.88 ≤ B < 23.4 |  |  | 12.5 |
| 23.4 ≤ B |  |  | 11.5 |

* + Proposal 2 (OPPO):
* **For PC3 SL NC CA, for 2 PA 2 LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**
* **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**
* **MA = 9; 0 ≤ B < 4.32**
* **6.5; 4.32 ≤ B < 6.48**
* **7.5; 6.48 ≤ B < 10.8**
* **6; 10.8≤ B < 14.04**
* **6.5; 14.04 ≤ B < 27**
* **5; 27 ≤ B**
* **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**
* **MA = 9; 0 ≤ B < 4.32**
* **7; 4.32 ≤ B < 6.48**
* **9.5; 6.48 ≤ B < 10.8**
* **7; 10.8≤ B < 18.36**
* **8.5; 18.36 ≤ B < 27**
* **6.5; 27 ≤ B**
* Moderator Recommendation:
  + Further consider the simulation results

### Sub-topic 2-3 PC2 non-contiguou CA MPR

#### Issue 2-3-1: PSSCH/PSCCH with 1x26dBm PA + 1LO

* Proposals
  + Proposal 1 (LGE):
* Table 2-10 : PSSCH/PSCCH MPR for SL non-contiguous CA with 1x26dBm PA + 1LO

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 0 ≤ B < 6.3 | 12.0 | 12.0 | 15.0 |
| 6.3 ≤ B < 11.88 |  |  | 14.0 |
| 11.88 ≤ B |  |  | 13.5 |

* + Proposal 2 (OPPO):
* **For PC2 SL NC CA, for 1 PA 1LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**
* **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**
  + **MA = 11.5; 0 ≤ B < 4.32**
* **9.5; 4.32 ≤ B < 6.48**
* **[14]; 6.48 ≤ B < 10.8**
* **8; 10.8≤ B < 14.04**
* **6; 14.04 ≤ B < 27**
* **5.5; 27 ≤ B**
* **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**
  + **MA = 15; 0 ≤ B < 4.32**
* **11.5; 4.32 ≤ B < 6.48**
* **12.5; 6.48 ≤ B < 10.8**
* **12; 10.8≤ B < 14.04**
* **10; 14.04 ≤ B < 27**
* **8.5; 27 ≤ B**
* Moderator Recommendation:
  + Further consider the simulation results

#### Issue 2-3-2: PSSCH/PSCCH with 2x23dBm PA + 1LO

* Proposals
  + Proposal 1 (LGE):
* Table 2-11 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x23dBm PA + 1LO

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 0 ≤ B < 6.3 | 13.5 | 13.5 | 16.0 |
| 6.3 ≤ B < 11.88 |  |  | 15.5 |
| 11.88 ≤ B |  |  | 14.0 |

* Moderator Recommendation:
  + Further consider the simulation results

#### Issue 2-3-3: PSSCH/PSCCH with 2x23dBm PA + 2LO

* Proposals
  + Proposal 1 (LGE):
* Table 2-12 : PSSCH/PSCCH MPR for SL non-contiguous CA with 2x23dBm PA + 2LO

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 0 ≤ B < 6.3 | 7.0 | 8.0 | 14.0 |
| 6.3 ≤ B < 11.88 |  |  | 13.0 |
| 11.88 ≤ B < 23.4 |  |  | 12.0 |
| 23.4 ≤ B |  |  | 11.0 |

* + Proposal 2 (OPPO):
* **For PC2 SL NC CA, for 2 23dBm PA 2LO architecture, the MPR to meet -13dBm/MHz and -30dBm/MHz are proposed as :**
* **To meet the -13dBm/MHz requirement, the MPR is proposed as below:**
* **MA = 9.5; 0 ≤ B < 4.32**
* **7; 4.32 ≤ B < 6.48**
* **7.5; 6.48 ≤ B < 10.8**
* **5.5; 10.8≤ B < 18.36**
* **7; 18.36≤ B < 27**
* **5; 27 ≤ B**
* **To meet the -30dBm/MHz requirement, the MPR is proposed as below:**
* **MA = 12.5; 0 ≤ B < 4.32**
* **8.5; 4.32 ≤ B < 6.48**
* **11; 6.48 ≤ B < 10.8**
* **7.5; 10.8≤ B < 18.36**
* **10; 18.36 ≤ B < 27**
* **7; 27 ≤ B**
* Moderator Recommendation:
  + Further consider the simulation results

### Sub-topic 2-4 PSFCH MPR

#### Issue 2-4-1: PC2 PSFCH MPR

* Proposals

Table 2-29 : PC2 PSFCH MPR for SL non-contiguous CA

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 1x26dBm | 11.5 | 13.0 | 13.0 |
| 2x23dBm + 1LO | 12.0 | 13.5 | 14.0 |
| 2x23dBm + 2LO | 4.0 | 10.0 | 10.0 |

* Moderator Recommendation:
  + Further consider the simulation results

#### Issue 2-4-2: PC3 PSFCH MPR

* Proposals
* Table 2-34 : PC3 PSFCH MPR for SL non-contiguous CA

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 1x26dBm | 11.0 | 13.0 | 13.0 |
| 2x23dBm + 1LO | 11.5 | 13.5 | 14.0 |
| 2x23dBm + 2LO | 4.0 | 9.5 | 9.5 |

* Moderator Recommendation:
  + Further consider the simulation results

### Sub-topic 2-5 S-SSB MPR

#### Issue 2-5-1: PC2 S-SSB MPR

* Proposals
* Table 2-40 : PC2 SSSB MPR for SL non-contiguous CA

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 1x26dBm | 13.0 | 14.0 | 14.0 |
| 2x23dBm + 1LO | 14.0 | 15.0 | 15.5 |
| 2x23dBm + 2LO | 5.0 | 8.5 | 8.5 |

* Moderator Recommendation:
  + Further consider the simulation results

#### Issue 2-5-2: PC3 S-SSB MPR

* Proposals
* Table 2-45 : PC3 SSSB MPR for SL non-contiguous CA

|  |  |  |  |
| --- | --- | --- | --- |
| B | MPR (dB) for IM3 frequency | | |
|  | SEMfreq\_-13 | SEMfreq\_-25 | SEfreq\_-30 |
| 1x26dBm | 13.0 | 14.0 | 14.0 |
| 2x23dBm + 1LO | 14.0 | 15.0 | 15.5 |
| 2x23dBm + 2LO | 5.0 | 8.5 | 8.5 |

* Moderator Recommendation:
  + Further consider the simulation results

### Sub-topic 2-6 Other TX requirements

#### Issue 2-6-1: Regulation related

* Proposals:
  + Proposal 1 (LGE): It’s proposed that above mentioned observations are taken into account when Rel-19 side link RF requirements are discussed in RAN4-
  + Proposal 2 (META): The EU regulation requirements to be captured under NS\_33
* Moderator Recommendation:
  + Recommend go with proposal 2
  + Further discuss how the regulation requirements to be applied under NS\_33 during the A-MPR simulation

#### Issue 2-6-2: TP to TR R4-2411651

* Proposals:
  + The proposed text in the TP for clause 6.2.1 and 6.2.2
* Moderator Recommendation:
  + For simulation assumption in 6.2.2, needs to together consider with issue 2-1-1

# Topic #3: UE RX RF requirement

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company** | **Summary** |
| R4-2411651 | Meta Ireland | TP on TR38.787: Operating bands and UE RF requirements for intra-band non-contiguous SL CA UE |
| R4-2412732 | OPPO | **Proposal 1: For intra-band non-contiguous CA REFSENS requirement, current requirement in TS 38.101-1 subclause 7.3E.2A.1 apply.**  **Proposal 2: For intra-band non-contiguous Sidelink CA maximum input level requirement, the the UE shall meet the requirements for each sub-block as specified in Table 7.4-1 in TS 38.101-1.**  **Proposal 3: For ACS requirement, below text is proposed:**  **“the UE shall meet the requirements for each sub-block as specified in clauses 7.5E for one component carrier per sub-block. The UE shall fulfil the minimum requirements all values of a single adjacent channel interferer in-gap and out-of-gap up to a –25 dBm interferer power while all sidelink carriers are active. For the lower range of test parameters (Case 1), the interferer power Pinterferer shall be set to the maximum of the levels given by the carriers of the respective sub-blocks as specified in Table 7.5E-2 for one component carrier per sub-block. The wanted signal power levels for the carriers of each sub-block shall then be adjusted relative to Pinterferer in accordance with the ACS requirement for each sub-block (Table 7.5E-1). For the upper range of test parameters (Case 2) for which the interferer power Pinterferer is -25 dBm (Table 7.5E-3) the wanted signal power levels for the carriers of each sub-block shall be adjusted relative to Pinterferer like for Case 1.”**  **Proposal 4, for in-band blocking requirement,**  **the UE shall meet the requirements for each sub -block as specified in clause 7.6E.2 for one component carrier per sub-block. The requirements apply for in-gap and out-of-gap interferers while all sidelink carriers are active.**  **Proposal 5, for out-of-band blocking requirement,**  **the UE shall meet the requirements for each sub-block as specified in clauses 7.6E.3 for one component carrier per sub-block, respectively. The requirements apply with all sidelink carriers active.**  **Proposal 6, for spurious response requirement,**  **the UE shall meet the requirements for each sub-block as specified in clauses 7.7E for one component carrier per sub-block, respectively. The requirements apply with all sidelink carriers active.**  **Proposal 7, for spurious response requirement,**  **the UE shall meet the requirements for each sub-block as specified in clauses 7.8E.2 for one component carrier per sub-block, respectively. The requirements apply with all sidelink carriers active.** |
| R4-2412735 | OPPO | TP on TR38.787 on RX requirement for intra-band non-contiguous SL CA |

### Sub-topic 3-1 RX requirements

#### Issue 3-1-1: REFSENS

* Proposals
  + Proposal 1 (Meta):
* For intra-band non-contiguous SL CA UE in n47, the reference sensitivity requirement specified in Table 7.3E.2-1 [3] shall apply for each sub-block with all carriers active. The requirement is applied for each sub-block reception when 2 sub-block transmissions are activated at the same time.
  + Proposal 2 (OPPO)
* For intra-band non-contiguous CA REFSENS requirement, current requirement in TS 38.101-1 subclause 7.3E.2A.1 apply.
* Recommendation:
  + Can be merged

#### Issue 3-1-2: Max input level

* Proposals
  + Proposal 1 (Meta):
* For intra-band non-contiguous SL CA, the maximum input level requirements in Section 7.4E.1 [3] will be applied to each sub-block. The throughput (>= 95% T-put) of each DL CC shall meet or exceed the minimum requirements for the specified reference measurement channel in A.7.3 and A.7.4.
  + Proposal 2 (OPPO)
* For intra-band non-contiguous Sidelink CA maximum input level requirement, the the UE shall meet the requirements for each sub-block as specified in Table 7.4-1 in TS 38.101-1.
* Recommendation:
  + Can be merged

#### Issue 3-1-3: ACS

* Proposals
  + Proposal 1 (Meta):
* For intra-band non-contiguous SL CA, the UE shall fulfil the minimum requirement specified in Table 7.5E.1-1 to Table 7.5E.1-3 [3] per sub-block where the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.7.2 while all DL carriers are active.
  + Proposal 2 (OPPO)
* For the ACS requirement, the UE shall meet the requirements for each sub-block as specified in clauses 7.5E in TS 38.101-1 for one component carrier per sub-block. The UE shall fulfil the minimum requirements all values of a single adjacent channel interferer in-gap and out-of-gap up to a –25 dBm interferer power while all sidelink carriers are active. For the lower range of test parameters (Case 1), the interferer power Pinterferer shall be set to the maximum of the levels given by the carriers of the respective sub-blocks as specified in Table 7.5E-2 in TS 38.101-1 for one component carrier per sub-block. The wanted signal power levels for the carriers of each sub-block shall then be adjusted relative to Pinterferer in accordance with the ACS requirement for each sub-block (Table 7.5E-1 in TS 38.101-1). For the upper range of test parameters (Case 2) for which the interferer power Pinterferer is -25 dBm (Table 7.5E-3 in TS 38.101-1) the wanted signal power levels for the carriers of each sub-block shall be adjusted relative to Pinterferer like for Case 1.
* Recommendation:
  + Can be merged

#### Issue 3-1-4: In-band blocking

* Proposals
  + Proposal 1 (Meta):
* To meet the in-band blocking requirements of the intra-band non-contiguous SL CA, the UE throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.7.2 with the test parameters defined in clause 7.6E.2.1 [3] per sub-block while all downlink carriers are active.

Proposal 2 (OPPO)

For in-band blocking requirement, the UE shall meet the requirements for each sub -block as specified in clause 7.6E.2 in TS 38.101-1for one component carrier per sub-block. The requirements apply for in-gap and out-of-gap interferers while all sidelink carriers are active.

* Recommendation:
  + Can be merged

#### Issue 3-1-5: Out-of-band blocking

* Proposals
  + Proposal 1 (Meta):
* To meet the Out-of-band blocking requirements of the intra-band non-contiguous SL CA, the UE throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.7.2 with test parameters defined in clause 7.6E.3.1 [3] per sub-block while all downlink carriers are active.
  + Proposal 2 (OPPO)
* For out-of-band blocking requirement, the UE shall meet the requirements for each sub-block as specified in clauses 7.6E.3 in TS 38.101-1 for one component carrier per sub-block, respectively. The requirements apply with all sidelink carriers active.
* Recommendation:
  + Can be merged

#### Issue 3-1-6: Spuruious response

* Proposals
  + Proposal 1 (Meta):
* For intra-band non-contiguous SL CA, the UE throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.7.2 with test parameters defined in clause 7.7E.1 [3] per sub-block while all downlink carriers are active.
  + Proposal 2 (OPPO)
* For spurious response requirement, the UE shall meet the requirements for each sub-block as specified in clauses 7.7E in TS 38.101-1for one component carrier per sub-block, respectively. The requirements apply with all sidelink carriers active.
* Recommendation:
  + Can be merged

#### Issue 3-1-7: Inter-modulation

* Proposals
  + Proposal 1 (Meta):
* For intra-band non-contiguous SL CA, the UE throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annex A.7.2 with test parameters defined in clause 7.8E.2.1 [3] per sub-block while all downlink carriers are active.
  + Proposal 2 (OPPO)
* For intermodulation characteristics, the UE shall meet the requirements for each sub-block as specified in clauses 7.8E.2 in TS 38.101-1 for one component carrier per sub-block, respectively. The requirements apply with all sidelink carriers active.
* Recommendation:
  + Can be merged