**3GPP TSG-WG4 Meeting #110 *R4-2401095***

**Athens, Greece, February 26 – March 01, 2024**

**Agenda item:** 8.22.5

**Source:** Moderator (Huawei)

**Title:** Topic summary for [110][136] NR\_SL\_enh2\_UERF\_part3

**Document for:** Information

# Introduction

This thread discuss the remaining issues for Sidelink CA in Rel-1. The contributions are in agenda 8.22.1.3, which includes:

* Topic #1: Remaining issues for sidelink CA
	1. Issue #1: Channel bandwidth for Sidelink CA
	2. Issue #2: PEMAX,CA for Sidelink CA
	3. Issue #3: MPR for Sidelink CA
* Topic #2: CRs

# Topic #1: Remaining issues for sidelink CA

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2400721 | Qualcomm Incorporated | The exact bandwidths supported for SL CA bandwidth combination of 20 MHz is not clearBrackets added around SL CA bandwidths for 20 MHz |
| R4-2400722 | Qualcomm Incorporated | Proposal: Allow PEMAX,CA, defined by IE, sl-maxTransPower-CA to be UE configurable  |
| R4-2401155 | LG Electronics  | For the total transmitted power PCMAX,PSSCH/PSCCH, the IE corresponding to pEMAX,CA is agreed as new IE of ‘*sl-maxTransPower-CA* ‘ in RAN2 (R2-2313605). The IE should apply to the requirement of SL CA configured transmitted power. |
| R4-2401156 | LG Electronics  | Add PSSCH/PSCCH MPR for non-contiguous RB allocation |
| R4-2401157 | LG Electronics  | Proposal 1: Specify PSSCH/PSCCH MPR for SL Contiguous CA with non-contiguous RB allocation in Table 2-1.Table 2-1 PSSCH/PSCCH MPR for SL Contiguous CA with Non-contiguous RB allocations

|  |  |
| --- | --- |
| **Modulation** | **MPR for bandwidth class B(dB)** |
|  | **Inner** | **Outer1** | **Outer2** |
| CP-OFDM | QPSK | ≤ 3.0 | ≤ 5.0 | ≤ 9.5 |
|  | 16QAM | ≤ 3.0 | ≤ 5.0 | ≤ 9.5 |
|  | 64QAM | ≤ 4.5 | ≤ 5.0 | ≤ 9.5 |
|  | 256QAM | ≤ 7.0 | ≤ 7.0 | ≤ 9.5 |

Proposal 2: Specify ’SLCA\_NS\_52’ for SL intra-band C-CA A-MPR as Table 2-2.

|  |  |
| --- | --- |
| Sidelink CA operating band | Value of additionalSpectrumEmission |
|  | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| SL\_n47 | SLCA\_NS\_01 |  | SLCA\_NS\_52 |  |  |  |  |  |
| NOTE: *additionalSpectrumEmission* corresponds to an information element of the same name defined in clause 6.3.2 of TS 38.331  |

Table 2-2: Mapping of network signaling labelProposal 3: For SL C-CA PSSCH/PSCCH A-MPR for contiguous RB allocation and non-contiguous RB allocation, consider Table 2-3 and Table 2-4 respectively.Table 2-3 SL CA NS\_52 PSSCH/PSCCH A-MPR for SL Contiguous CA with Contiguous RB allocations

|  |  |
| --- | --- |
| **Modulation** | **A-MPR for bandwidth class B(dB)** |
|  | **inner** | **outer** |
| CP-OFDM | QPSK | ≤ 7.0 | ≤ 8.5 |
|  | 16QAM | ≤ 7.0 | ≤ 8.5 |
|  | 64QAM | ≤ 7.0 | ≤ 8.5 |
|  | 256QAM | ≤ 7.0 | ≤ 8.5 |

Table 2-4 SL CA NS\_52 PSSCH/PSCCH A-MPR for SL Contiguous CA with Non-contiguous RB allocations

|  |  |
| --- | --- |
| Modulation | A-MPR for bandwidth class B(dB) |
| Inner | Outer1 | Outer2 |
| CP-OFDM | QPSK | ≤ 3.0 | ≤ 8.0 | ≤ 13.5 |
|  | 16QAM | ≤ 3.0 | ≤ 8.0 | ≤ 13.5 |
|  | 64QAM | ≤ 4.5 | ≤ 8.0 | ≤ 13.5 |
|  | 256QAM | ≤ 7.0 | ≤ 8.0 | ≤ 13.5 |

Proposal 4: For SL-CA NS\_52 PSFCH A-MPR, consider Table 2-5.

|  |  |
| --- | --- |
| Modulation | A-MPR for ratio (R) in bandwidth class B(dB) |
|  | R ≤0. 1 | 0.1 < R ≤ 0. 55 | 0.55 < R ≤ 1.0 |
| CP-OFDM | QPSK | ≤4.0 | ≤17.0 | ≤19.0 |
| Here, R = NGap/(NRB1+NRB2+ NGBchannel\_CC1+ NGBchannel\_CC2) |

Proposal 5: For SL-CA NS\_52 S-SSB A-MPR, consider Table 2-6.Here, Inner/Outer1/Outer2 RB allocation is refered with NR C-CA with non-contiguous RB allocationTable 2-6 SL CA NS\_52 S-SSB A-MPR for SL Contiguous CA

|  |
| --- |
| A-MPR for bandwidth class B(dB) |
| Inner | Outer1 | Outer2 |
| ≤ 9.0 | ≤ 13.0 | ≤ 16.5 |

 |
| R4-2401532 | vivo | Correct some typos and remove brackets for [20MHz] in Table 5.3E.1A. |
| R4-2401534 | vivo | 1. Change ‘10 log10 ∑ pEMAX,CA’to ‘10 log10 ∑ pEMAX,C’in PCMAX\_L and PCMAX\_H. 2. Add ‘PEMAX,CA’ in PCMAX\_L and PCMAX\_H.3. Update the IE for PEMAX,CA. |
| R4-2401806 | OPPO | 1, In subclause 6.2E.1.1A, contiguous is added.2, In subclause 6.2E.4A, the sum of IE *sl-maxTransPower* from each CC is deleted.3, In subclause 6.4E.2.4A, “This is same as NR intra-band CA UE” is deleted.4, In subcluase 6.5E.1.1A, CA is added into the title. |
| R4-2402411 | Huawei | Remove the channel bandwidth configuration of 20MHz+.., and 30MHz +30MHz in Table 5.3E.1A-1.Remove [with contiguous RB allocation] in the title of Table 6.2E.2.1A-1Correct the form of MPR for sidelink CA PSFCH transmissions |

## Open issues summary

#### **Issue 1: Channel bandwidth for Sidelink CA**

* Option 1: Brackets added around SL CA bandwidth for 20MHz
	+ QC

Table 5.3E.1A-1 NR SL intra-band contiguous CA operating bands for SL CA in FR1

|  |
| --- |
| **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\_n47B | SL\_n47B | 10 | 10, 20,30 |  |  | 70 | 0 |
|  |  | [20] | [20,30] |  |  |  |  |
|  |  | 30 | 30,40 |  |  |  |  |

* Option 2: Only the configuration of 10MHz+10MHz, and 30MHz+40MHz were requested by companies. The rest configurations may not be necessary. Remove the channel bandwidth configuration of 20MHz+.., and 30MHz +30MHz in Table 5.3E.1A-1
	+ HW

Table 5.3E.1A-1 NR SL intra-band contiguous CA operating bands for SL CA in FR1

|  |
| --- |
| **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\_n47B | SL\_n47B | 10 | 10 |  |  | 70 | 0 |
|  |  |  |  |  |  |  |  |
|  |  | 30 | 40 |  |  |  |  |

* Recommended WF
	+ TBA
* Option 3: Brackets removed around SL CA bandwidth for 20MHz
	+ Vivo
* Table 5.3E.1A-1 NR SL intra-band contiguous CA operating bands for SL CA in FR1

|  |
| --- |
| **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\_n47B | SL\_n47B | 10 | 10, 20,30 |  |  | 70 | 0 |
|  |  | 20 | 20,30 |  |  |  |  |
|  |  | 30 | 30,40 |  |  |  |  |

* Recommended WF
	+ TBA.

#### **Issue 2: PEMAX,CA for Sidelink CA**

* Proposal: Allow PEMAX,CA, defined by IE, sl-maxTransPower-CAto be UE configurable
	+ QC, LGE (R4-2401155), vivo(R4-2301534),
* Recommended WF
	+ Agree the proposal.

#### **Issue 3: MPR for SL CA**

* Option 1: Only specify SL CA with contiguous RB allocation for Rel-18
	+ HW
* Option 2: Specify SL CA with non-contiguous RB allocation for Rel-18
	+ LGE
* Recommended WF
	+ Capture the simulation evaluation in TR 38.786.
	+ TBA

# Topic #2: TPs and draftCRs

#### **Issue 1: Channel bandwidth for Sidelink CA**

Huawei CR R4-2402411

* Recommended WF
	+ Depends on the discussion outcome of issue 1 in section 1.2.

#### **Issue 2: PEMAX,CA for Sidelink CA**

LGE CR R4-2401155

Vivo CR R4-2301534

* Recommended WF
	+ Merged the two CRs with the consistent contents.

#### **Issue 3: MPR for SL CA**

LGE CR R4-2401156

Huawei CR R4-2402411

* Recommended WF
	+ Depends on the discussion outcome of issue 3 in section 1.2.

Vivo CR R4-2401533: Remove the bracket for the MPR value in Table 6.2F.2A.2-1.

#### **Issue 4: Others**

Vivo paper R4-2301535

* Moderator’s comment
	+ Further discuss the necessity.

OPPO CR R4-2301806

* Moderator’s comment
	+ Content in 6.2E.4A can be merged with the two CRs in Issue 2. For the rest editorial change, further discuss the necessity.