**3GPP TSG-RAN WG4 Meeting #109 R4-2318151**

**Chicago, US, November 13 – 17, 2023**

**Agenda item:** 8.30.6

**Source:** Moderator (Huawei)

**Title:** Topic summary for [109][145] NR\_SL\_enh2\_UERF\_part3

**Document for:** Information

# Introduction

This thread discuss the Sidelink CA in Rel-18 sidelink evolution. The contributions are in agenda 8.30.2.3, which includes:

* Topic #1: MPR/A-MPR for SL intra-band contiguous CA
* Topic #2: TPs and draftCRs

# Topic #1: MPR/A-MPR for SL intra-band contiguous CA

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2318808 | LG Electronics | **Proposal 1: Specify SL C-CA PSSCH/PSCCH MPR separately for both contiguous RB allocation and non-contiguous RB allocation.**  **Proposal 2: For SL C-CA PSSCH/PSCCH MPR for contiguous RB allocation, consider Table 2-1.**  **Table 2-1: PSSCH/PSCCH MPR for SL Contiguous CA with Contiguous RB allocations**   |  |  |  |  | | --- | --- | --- | --- | | **Modulation** | | **MPR for bandwidth class B(dB)** | | |  | | **inner** | **outer** | | CP-OFDM | QPSK | ≤ 3.0 | ≤ 5.0 | |  | 16QAM | ≤ 3.0 | ≤ 5.0 | |  | 64QAM | ≤ 4.5 | ≤ 5.0 | |  | 256QAM | ≤ 6.5 | ≤ 7.0 |   **Proposal 3: For SL C-CA PSSCH/PSCCH MPR for non-contiguous RB allocation, consider Table 2-2.**  **Table 2-2 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 4: For SL C-CA PSFCH MPR, consider Table 2-3.**  **Table 2-3 PSFCH MPR for SL Contiguous CA**   |  |  |  | | --- | --- | --- | | **MPR for ratio (R) in bandwidth class B(dB)** | | | | **R ≤ 0. 33** | **0.33 < R ≤ 0. 55** | **0.55 < R ≤ 1.0** | | ≤3.5 | ≤9.0 | ≤13.0 | | Here, R = NGap/(NRB1+NRB2+ NGBchannel\_CC1+ NGBchannel\_CC2) | | |   **Proposal 5: Consider Inner/Outer1/Outer2 RB allocation of NR C-CA with non-contiguous RB allocation for SL C-CA S-SSB MPR.**  **Proposal 6: For SL intra-band C-CA S-SSB MPR, consider Table 2-4.**  **Table 2-4 S-SSB MPR for SL Contiguous CA**   |  |  |  | | --- | --- | --- | | **MPR for bandwidth class B(dB)** | | | | **Inner** | **Outer1** | **Outer2** | | ≤3.5 | ≤9.0 | ≤13.0 |   **Proposal 7: Use ‘SLCA\_NS\_52’ for SL intra-band C-CA A-MPR as Table 2-5.**  **Proposal 8: Specify SL C-CA PSSCH/PSCCH A-MPR separately for both contiguous RB allocation and non-contiguous RB allocation.**  **Proposal 9: For SL-CA NS\_52 PSSCH/PSCCH A-MPR for contiguous RB allocation, consider Table 2-6.**  **Table 2-6 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 |   **Proposal 10: For SL-CA NS\_52 PSSCH/PSCCH A-MPR for non-contiguous RB allocation, consider Table 2-7.**  **Table 2-7 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 11: For SL-CA NS\_52 PSFCH A-MPR, consider Table 2-8.**  **Table 2-8 SL CA NS\_52 PSFCH A-MPR for SL Contiguous CA**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **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 12: Consider Inner/Outer1/Outer2 RB allocation of NR C-CA with non-contiguous RB allocation for SL C-CA S-SSB A-MPR.**  **Proposal 13: For SL-CA NS\_52 S-SSB A-MPR, consider Table 2-9.**  **Table 2-9 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 | |
| R4-2319504 | Huawei | *Proposal 1: MPR for SL CA PSFCH should be*   |  |  | | --- | --- | | R ≤ 0. 6 | 0.6 < R ≤ 1.0 | | 6.0 | 11.0 |   ***Proposal 2: Reuse the MPR of S-SSB defined in Rel-16 single cell V2X for SL CA.***   |  |  |  | | --- | --- | --- | | Channel | MPRS-SSB (dB) | | |  | Outer RB allocations | Inner RB allocations | | S-SSB | ≤ 6.0 | ≤ 2.5 | |

## Open issues summary

### Sub-topic 1-1: MPR requirements for intra-band contiguous SL CA

#### **Issue 1-1-1: PSFCH MPR simulation scenario and initial results for SL CA**

* + Option 1 (Huawei):

Table 1-1-1-1: PSFCH MPR simulation results for SL Contiguous CA

|  |  |
| --- | --- |
| 0< R ≤ 0. 6 | 0.6 < R ≤ 1.0 |
| 6.0 | 11.0 |

**Table 1-1-1-2: Evaluation scenarios and MPR for SL CA PSFCH (Huawei)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **Aggregated BW/**  **SCS/**  **RB number per BW** | **PSFCH RB on CC1+CC2/**  **RB index/** (NRB1+NRB2) | **Gap Ratio[2]**  ((NRB1+NRB2)\*SCS\*12+(GB1+ GB2))/ (BW1+BW2- (GB1+ GB2)) | **MPR** |
| 1 | 10MHz+10MHz /  30kHz/  24 | 23+0 (1+1) | 0.11 | **0** |
| 2 | 23+2 (1+3) | 0.15 | **0** |
| 3 | 23+4 | 0.19 | **0** |
| 4 | 23+6 | 0.23 | **0** |
| 5 | 23+8 | 0.26 | **0** |
| 6 | 23+10 | 0.30 | **0.5** |
| 7 | 23+12 | 0.34 | **0.6** |
| 8 | 23+14 | 0.38 | **3.5** |
| 9 | 23+16 | 0.42 | **3.5** |
| 10 | 23+18 | 0.46 | **3.5** |
| 11 | 23+20 | 0.5 | **3.6** |
| 12 | 23+22 | 0.53 | **3.9** |
| 13 | 0+0 | 0.55 | **5.5** |
| 14 | 0+2 | 0.59 | **5.6** |
| 15 | 0+4 | 0.63 | **5.4** |
| 16 | 0+6 | 0.67 | **5.2** |
| 17 | 0+8 | 0.7 | **5.7** |
| 18 | 0+10 | 0.75 | **5.6** |
| 19 | 0+12 | 0.78 | **9.1** |
| 20 | 0+14 | 0.82 | **10.2** |
| 21 | 0+16 | 0.86 | **10.2** |
| 22 | 0+18 | 0.9 | **10.2** |
| 23 | 0+20 | 0.93 | **10.2** |
| 24 | 0+22 | 0.98 | **10.2** |
| 25 | 0+23 | 1 | **10.3** |
| 26 | 20MHz+20MHz/  30kHz  51 | 50+0 (1+1) | 0.06 | **0** |
| 27 | 50+5 (1+6) | 0.11 | **0** |
| 28 | 50+10 (1+11) | 0.15 | **0** |
| 29 | 50+15 (1+16) | 0.2 | **0** |
| 30 | 50+20 (1+21) | 0.25 | **0.5** |
| 31 | 50+25 (1+26) | 0.3 | **0.8** |
| 32 | 50+30 (1+31) | 0.34 | **3.4** |
| 33 | 50+35 (1+36) | 0.39 | **3.4** |
| 34 | 50+40 (1+41) | 0.44 | **3.4** |
| 35 | 50+45 (1+46) | 0.48 | **4.1** |
| 36 | 0+0 (51+1) | 0.53 | **5.4** |
| 37 | 0+5 (51+6) | 0.58 | **5.7** |
| 38 | 0+10 (51+11) | 0.62 | **5.7** |
| 39 | 0+15 (51+16) | 0.67 | **9.8** |
| 40 | 0+20 (51+21) | 0.72 | **10** |
| 41 | 0+25 (51+26) | 0.76 | **10.2** |
| 42 | 0+30 (51+31) | 0.81 | **10.2** |
| 43 | 0+35 (51+36) | 0.86 | **10.2** |
| 44 | 0+40 (51+41) | 0.9 | **10.3** |
| 45 | 0+45 (51+46) | 0.95 | **10.3** |
| 46 | 0+50 (51+51) | 1.0 | **10.3** |

* + Option 2 (LGE)

Table 1-1-1-3: PSFCH MPR simulation results for SL Contiguous CA (LGE)

|  |  |  |
| --- | --- | --- |
| MPR for ratio (R) in bandwidth class B(dB) | | |
| R ≤ 0. 33 | 0.33 < R ≤ 0. 55 | 0.55 < R ≤ 1.0 |
| 1.31 | 6.91 | 11.16 |

**Table 1-1-1-4: SL contiguous CA MPR test scenarios (LGE)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Aggregated CBW | Scenario | CC1 | CC2 | SCS | R = NGap/(NRB1+NRB2+ NGBchannel\_CC1+ NGBchannel\_CC2) | MPR |
| 10MHz + 10MHz | 1 | 1RB0 | - | 15 |  | 2.66 |
| 2 | 1RB51 | - | 15 |  | 0.00 |
| 4 | 1RB0 | 1RB10 | 15 | 0.6185 | 6.91 |
| 5 | 1RB0 | 1RB20 | 15 | 0.7116 | 11.14 |
| 6 | 1RB0 | 1RB30 | 15 | 0.8046 | 11.14 |
| 7 | 1RB0 | 1RB40 | 15 | 0.8976 | 10.68 |
| 8 | 1RB0 | 1RB51 | 15 | 1.0 | 10.7 |
| 3 | 1RB0 | 1RB0 | 15 | 0.5255 | 6.71 |
| 9 | 1RB10 | 1RB0 | 15 | 0.4324 | 2.04 |
| 10 | 1RB20 | 1RB0 | 15 | 0.3394 | 0.84 |
| 11 | 1RB30 | 1RB0 | 15 | 0.2463 | 0.00 |
| 12 | 1RB40 | 1RB0 | 15 | 0.1533 | 0.00 |
| 13 | 1RB51 | 1RB0 | 15 | 0.0509 | 0.00 |
| 20MHz + 30MHz | 14 | 1RB0 | - | 30 |  | 1.59 |
| 15 | 1RB50 | - | 30 |  | 0.00 |
| 18 | 1RB0 | 1RB20 | 30 | 0.5742 | 5.40 |
| 19 | 1RB0 | 1RB30 | 30 | 0.6489 | 10.63 |
| 20 | 1RB0 | 1RB40 | 30 | 0.7236 | 11.08 |
| 21 | 1RB0 | 1RB50 | 30 | 0.7983 | 10.63 |
| 22 | 1RB0 | 1RB60 | 30 | 0.8730 | 10.63 |
| 23 | 1RB0 | 1RB70 | 30 | 0.9477 | 10.17 |
| 24 | 1RB0 | 1RB77 | 30 | 1.0 | 10.18 |
| 16 | 1RB0 | 1RB0 | 30 | 0.4248 | 6.37 |
| 17 | 1RB0 | 1RB10 | 30 | 0.4995 | 5.88 |
| 25 | 1RB10 | 1RB0 | 30 | 0.3501 | 2.04 |
| 26 | 1RB20 | 1RB0 | 30 | 0.2754 | 0.84 |
| 27 | 1RB30 | 1RB0 | 30 | 0.2007 | 0.00 |
| 28 | 1RB40 | 1RB0 | 30 | 0.1260 | 0.00 |
| 29 | 1RB50 | 1RB0 | 30 | 0.0513 | 0.00 |
| 20MHz + 40MHz | 30 | 1RB0 | - | 30 |  | 2.58 |
| 31 | 1RB50 | - | 30 |  | 0.00 |
| 32 | 1RB0 | 1RB0 | 30 | 0.3509 | 1.68 |
| 33 | 1RB0 | 1RB10 | 30 | 0.4127 | 6.39 |
| 34 | 1RB0 | 1RB20 | 30 | 0.4745 | 5.90 |
| 35 | 1RB0 | 1RB30 | 30 | 0.5363 | 5.90 |
| 36 | 1RB0 | 1RB40 | 30 | 0.5981 | 11.10 |
| 37 | 1RB0 | 1RB50 | 30 | 0.6600 | 10.64 |
| 38 | 1RB0 | 1RB60 | 30 | 0.7218 | 10.18 |
| 39 | 1RB0 | 1RB70 | 30 | 0.7836 | 9.71 |
| 40 | 1RB0 | 1RB80 | 30 | 0.8454 | 10.64 |
| 41 | 1RB0 | 1RB90 | 30 | 0.9073 | 11.10 |
| 42 | 1RB0 | 1RB100 | 30 | 0.9691 | 10.64 |
| 43 | 1RB0 | 1RB105 | 30 | 1.0 | 10.65 |
| 44 | 1RB10 | 1RB0 | 30 | 0.2890 | 1.22 |
| 45 | 1RB20 | 1RB0 | 30 | 0.2272 | 0.84 |
| 46 | 1RB30 | 1RB0 | 30 | 0.1654 | 0.00 |
| 47 | 1RB40 | 1RB0 | 30 | 0.1036 | 0.00 |
| 48 | 1RB50 | 1RB0 | 30 | 0.0417 | 0.00 |
| 30MHz + 40MHz | 49 | 1RB0 | - | 30 |  | 3.15 |
| 50 | 1RB77 | - | 30 |  | 0.00 |
| 53 | 1RB0 | 1RB20 | 30 | 0.5506 | 5.94 |
| 54 | 1RB0 | 1RB30 | 30 | 0.6035 | 11.14 |
| 55 | 1RB0 | 1RB40 | 30 | 0.6563 | 10.68 |
| 56 | 1RB0 | 1RB50 | 30 | 0.7092 | 9.75 |
| 57 | 1RB0 | 1RB60 | 30 | 0.7621 | 10.68 |
| 58 | 1RB0 | 1RB70 | 30 | 0.8150 | 10.68 |
| 59 | 1RB0 | 1RB80 | 30 | 0.8678 | 11.14 |
| 60 | 1RB0 | 1RB90 | 30 | 0.9207 | 10.68 |
| 61 | 1RB0 | 1RB100 | 30 | 0.9736 | 10.22 |
| 62 | 1RB0 | 1RB105 | 30 | 1.0000 | 11.16 |
| 51 | 1RB0 | 1RB0 | 30 | 0.4449 | 5.45 |
| 52 | 1RB0 | 1RB10 | 30 | 0.4977 | 6.42 |
| 63 | 1RB10 | 1RB0 | 30 | 0.3920 | 2.04 |
| 64 | 1RB20 | 1RB0 | 30 | 0.3391 | 2.04 |
| 65 | 1RB30 | 1RB0 | 30 | 0.2862 | 1.21 |
| 66 | 1RB40 | 1RB0 | 30 | 0.2334 | 1.21 |
| 67 | 1RB50 | 1RB0 | 30 | 0.1805 | 0.00 |
| 68 | 1RB60 | 1RB0 | 30 | 0.1276 | 0.00 |
| 69 | 1RB70 | 1RB0 | 30 | 0.0748 | 0.00 |
| 70 | 1RB77 | 1RB0 | 30 | 0.0377 | 0.00 |
| 20MHz + 20MHz | 71 | 1RB0 | - | 30 |  | 2.66 |
| 72 | 1RB51 | - | 30 |  | 0.00 |
| 74 | 1RB0 | 1RB10 | 30 | 0.6243 | 10.68 |
| 75 | 1RB0 | 1RB20 | 30 | 0.7182 | 10.68 |
| 76 | 1RB0 | 1RB30 | 30 | 0.8122 | 11.14 |
| 77 | 1RB0 | 1RB40 | 30 | 0.9061 | 10.68 |
| 78 | 1RB0 | 1RB50 | 30 | 1.0 | 10.70 |
| 73 | 1RB0 | 1RB0 | 30 | 0.5304 | 6.43 |
| 79 | 1RB10 | 1RB0 | 30 | 0.4365 | 2.48 |
| 80 | 1RB20 | 1RB0 | 30 | 0.3426 | 0.84 |
| 81 | 1RB30 | 1RB0 | 30 | 0.2486 | 0.00 |
| 82 | 1RB40 | 1RB0 | 30 | 0.1547 | 0.00 |
| 83 | 1RB50 | 1RB0 | 30 | 0.0608 | 0.00 |
| 10MHz + 30MHz | 84 | 1RB0 | - | 30 |  | 2.66 |
| 85 | 1RB23 | - | 30 |  | 0.00 |
| 89 | 1RB0 | 1RB30 | 30 | 0.5586 | 5.45 |
| 90 | 1RB0 | 1RB40 | 30 | 0.6525 | 10.22 |
| 91 | 1RB0 | 1RB50 | 30 | 0.7464 | 11.14 |
| 92 | 1RB0 | 1RB60 | 30 | 0.8403 | 10.68 |
| 93 | 1RB0 | 1RB70 | 30 | 0.9343 | 10.22 |
| 94 | 1RB0 | 1RB77 | 30 | 1.0 | 10.7 |
| 87 | 1RB0 | 1RB10 | 30 | 0.3707 | 2.14 |
| 88 | 1RB0 | 1RB20 | 30 | 0.4646 | 5.45 |
| 86 | 1RB0 | 1RB0 | 30 | 0.2768 | 1.31 |
| 95 | 1RB10 | 1RB0 | 30 | 0.1829 | 0.84 |
| 96 | 1RB20 | 1RB0 | 30 | 0.0890 | 0.00 |
| 97 | 1RB23 | 1RB0 | 30 | 0.0608 | 0.00 |

* Recommended WF
  + Capture the simulation evaluation for SL CA PSFCH above (in R4-2315532(LGE), R4-2319504 and R4-2315227(Huawei)) in TR 38.786

#### **Issue 1-1-2: PSFCH MPR for SL CA**



Figure 2-1: Parameters related to Ratio of R (LGE: R4-2318808)

* Proposals: For R=((NRB1+NRB2)\*SCS\*12+(GB1+ GB2))/ (BW1+BW2- (GB1+ GB2)), or

R = NGap/(NRB1+NRB2+ NGBchannel\_CC1+ NGBchannel\_CC2)

* + Option 1(LGE)

**Table 1-1-2-1: PSFCH MPR for SL CA**

|  |  |  |
| --- | --- | --- |
| MPR for ratio (R) in bandwidth class B(dB) | | |
| R ≤ 0. 33 | 0.33 < R ≤ 0. 55 | 0.55 < R ≤ 1.0 |
| ≤3.5 | ≤9.0 | ≤13.0 |
| Here, R = NGap/(NRB1+NRB2+ NGBchannel\_CC1+ NGBchannel\_CC2) | | |

* + Option 2 (Huawei):

**Table 1-1-2-2: PSFCH MPR for SL CA**

|  |  |
| --- | --- |
| 0< R ≤ 0. 6 | 0.6 < R ≤ 1.0 |
| 6.0 | 11.0 |

* Recommended WF
  + To average based on the simulation results and the proposed PSFCH MPR for SLCA

|  |  |  |
| --- | --- | --- |
| **MPR for ratio (R) in bandwidth class B(dB)** | | |
| **R ≤ 0. 3** | **0.3 < R ≤ 0. 5** | **0.5 < R ≤ 1.0** |
| ≤ 2.5 | ≤ 7.5 | ≤12.0 |

For R=((NRB1+NRB2)\*SCS\*12+(GB1+ GB2))/ (BW1+BW2- (GB1+ GB2))

LGE: we need change the frequency range.

Agreement:

* + To average based on the simulation results and the proposed PSFCH MPR for SLCA

|  |  |  |
| --- | --- | --- |
| **MPR for ratio (R) in bandwidth class B(dB)** | | |
| **R ≤ 0. 3** | **0.3 < R ≤ 0. 5** | **0.5 < R ≤ 1.0** |
| ≤ 2.5 | ≤ 7.5 | ≤12.0 |

For R=((NRB1+NRB2)\*SCS\*12+(GB1+ GB2))/ (BW1+BW2- (GB1+ GB2))

#### **Issue 1-1-3: S-SSB MPR simulation scenario and initial results for SL CA**

* + Option 1 (LGE)

Table 1-1-3-1: S-SSB MPR simulation results for SL Contiguous CA

|  |  |  |
| --- | --- | --- |
| MPR for bandwidth class B(dB) | | |
| Inner | Outer1 | Outer2 |
| 1.70 | 6.20 | 10.21 |

Table 1-1-3-2: SL contiguous CA MPR test scenarios

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Aggregated CBW | Scenario | CC1 | CC2 | SCS | Inner/Outer1/Outer2 RB allocation | MPR |
| 10MHz + 10MHz | 1 | 11RB0 | 11RB41 | 15 | Outer2 | 10.21 |
| 2 | 11RB18 | 11RB22 | 15 | Outer2 | 6.30 |
| 3 | 11RB20 | 11RB22 | 15 | Outer1 | 6.20 |
| 4 | 11RB33 | 11RB17 | 15 | Outer1 | 1.25 |
| 5 | 11RB35 | 11RB7 | 15 | Inner | 1.08 |
| 6 | 11RB41 | 11RB0 | 15 | Inner | 1.50 |
| 20MHz + 30MHz | 7 | 11RB0 | 11RB67 | 30 | Outer2 | 8.20 |
| 8 | 11RB15 | 11RB32 | 30 | Outer2 | 4.52 |
| 9 | 11RB15 | 11RB30 | 30 | Outer1 | 4.38 |
| 10 | 11RB33 | 11RB7 | 30 | Outer1 | 1.14 |
| 11 | 11RB34 | 11RB7 | 30 | Inner | 1.09 |
| 12 | 11RB40 | 11RB0 | 30 | Inner | 1.46 |
| 20MHz + 40MHz | 13 | 11RB0 | 11RB95 | 30 | Outer2 | 8.08 |
| 14 | 11RB4 | 11RB30 | 30 | Outer2 | 4.5 |
| 15 | 11RB15 | 11RB30 | 30 | Outer1 | 4.62 |
| 16 | 11RB33 | 11RB7 | 30 | Outer1 | 1.23 |
| 17 | 11RB34 | 11RB7 | 30 | Inner | 1.06 |
| 18 | 11RB40 | 11RB0 | 30 | Inner | 1.25 |
| 30MHz + 40MHz | 19 | 11RB0 | 11RB95 | 30 | Outer2 | 8.06 |
| 20 | 11RB4 | 11RB30 | 30 | Outer2 | 7.84 |
| 21 | 11RB15 | 11RB30 | 30 | Outer1 | 4.19 |
| 22 | 11RB47 | 11RB7 | 30 | Outer1 | 1.07 |
| 23 | 11RB48 | 11RB7 | 30 | Inner | 1.10 |
| 24 | 11RB67 | 11RB0 | 30 | Inner | 1.7 |
| 20MHz + 20MHz | 25 | 11RB0 | 11RB40 | 30 | Outer2 | 8.2 |
| 26 | 11RB4 | 11RB30 | 30 | Outer2 | 8.04 |
| 27 | 11RB28 | 11RB7 | 30 | Outer1 | 4.40 |
| 28 | 11RB33 | 11RB7 | 30 | Outer1 | 1.25 |
| 29 | 11RB34 | 11RB0 | 30 | Inner | 1.15 |
| 30 | 11RB40 | 11RB0 | 30 | Inner | 1.15 |
| 10MHz + 30MHz | 31 | 11RB0 | 11RB67 | 30 | Outer2 | 8.20 |
| 32 | 11RB7 | 11RB32 | 30 | Outer2 | 4.24 |
| 33 | 11RB7 | 11RB31 | 30 | Outer1 | 4.50 |
| 34 | 11RB13 | 11RB1 | 30 | Outer1 | 1.55 |
| 35 | 11RB13 | 11RB0 | 30 | Inner | 1.52 |

* Recommended WF
  + Capture the simulation evaluation for SL CA S-SSB above (in R4-2315532(LGE)) in TR 38.786.

#### **Issue 1-1-4: S-SSB MPR for SL CA**

* Proposals:
  + Option 1(LGE)

**Table 1-1-4-1: PSFCH MPR for SL CA**

|  |  |  |
| --- | --- | --- |
| MPR for bandwidth class B(dB) | | |
| Inner | Outer1 | Outer2 |
| 3.5 | 9.0 | 13.0 |

* + Option 2 (Huawei): Reuse the MPR of S-SSB defined in Rel-16 single cell V2X for SL CA, considering UE transmitting S-SS/PSBCH blocks on multiple carriers may not be widely used.

**Table 1-1-4-2: PSFCH MPR for SL CA**

|  |  |  |
| --- | --- | --- |
| Channel | MPRS-SSB (dB) | |
|  | Outer RB allocations | Inner RB allocations |
| S-SSB | ≤ 6.0 | ≤ 2.5 |

* Recommended WF
  + To average based on the proposed S-SS/PSBCH MPR for SLCA.

|  |  |  |
| --- | --- | --- |
| **Channel** | **MPR S-SSB (dB)** | |
| Outer RB allocations | Inner RB allocations |
| S-SSB | ≤ 7.5 | ≤ 3 |

Moderator: Huawei and LGE use different methodologies.

LGE: Suggest defining two tables.

Agreement:

* For single carrier

**Table 1-1-4-2: PSFCH MPR for SL CA**

|  |  |  |
| --- | --- | --- |
| Channel | MPRS-SSB (dB) | |
|  | Outer RB allocations | Inner RB allocations |
| S-SSB | ≤ 6.0 | ≤ 2.5 |

* For two SSB transmissions

**Table 1-1-4-1: PSFCH MPR for SL CA**

|  |  |  |
| --- | --- | --- |
| MPR for bandwidth class B(dB) | | |
| Inner | Outer1 | Outer2 |
| 3.5 | 9.0 | 13.0 |

#### **Issue 1-1-5: PSSCH/PSCCH MPR for SL CA**

*Background: RAN4#108bis R4-2317731 WF on NR\_SL\_enh2\_UERF\_part3.*

<Online Agreement>:

**Table: PSSCH/PSCCH MPR simulation results for SL Contiguous CA [with Contiguous RB allocations]**

|  |  |  |  |
| --- | --- | --- | --- |
| Modulation | | MPR for bandwidth class B(dB) | |
|  | | inner | outer |
| CP-OFDM | QPSK | ≤ 3.0 | ≤ 5.0 |
|  | 16QAM | ≤ 3.0 | ≤ 5.0 |
|  | 64QAM | ≤ 4.5 | ≤ 5.0 |
|  | 256QAM | ≤ 6.5 | ≤ 7.0 |

* Proposals:
  + Option 1(LGE) : Specify SL C-CA PSSCH/PSCCH MPR separately for both contiguous RB allocation and non-contiguous RB allocation

Table 2-1: PSSCH/PSCCH MPR for SL Contiguous CA with Contiguous RB allocations

|  |  |  |  |
| --- | --- | --- | --- |
| Modulation | | MPR for bandwidth class B(dB) | |
|  | | inner | outer |
| CP-OFDM | QPSK | ≤ 3.0 | ≤ 5.0 |
|  | 16QAM | ≤ 3.0 | ≤ 5.0 |
|  | 64QAM | ≤ 4.5 | ≤ 5.0 |
|  | 256QAM | ≤ 6.5 | ≤ 7.0 |

**Table 2-2 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 |

* + Option 2(Huawei in R4-2315227) : To specify MPR of SL CA based on the methodology of LTE intra-band CA with contiguous RB allocation only
* Recommended WF
  + Further discuss whether to specify the PSSCH/PSCCH MPR for SL Contiguous CA with Non-contiguous RB allocations in Rel-18.

### Sub-topic 1-2: A-MPR requirements for intra-band contiguous SL CA

*Background: RAN4#108bis R4-2317731 WF on NR\_SL\_enh2\_UERF\_part3.*

**A-MPR for SL CA**

<Online Agreement>: Consider NS\_52 for SL CA A-MPR

<Way Forward>: Encourage companies to check the FCC regulation, whether NS\_52 is regulated to be applied.

#### **Issue 1-2-1: Terminology for SL CA A-MPR**

* Proposal (LGE): Use ‘SLCA\_NS\_52’ for SL intra-band C-CA A-MPR.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | | | | | | | | |

* Moderator’s suggestion
  + Need to figure out whether NS\_52 is regulated by FCC, to be applied to V2X/Sidelink before specifying NS\_52 for SL CA.

Moderator: NS\_52 is not applicable until now. Companies should not capture it in the spec.

LGE: in the current existing specification, we have already had NS\_52. We can reuse the same approach to add the note.

Meta: FCC regulation is still pending on spurious emission requirement. RAN4 can wait for final decision from FCC.

Huawei: To capture the simulation results in the TR, after getting reply from FCC, we can capture TR in the TS.

LGE: We need the place holder to include A-MPR. Based on FCC, we can revise the requirement.

Meta: RAN4 has had agreement that RAN4 should wait for FCC. The specification is quite confusing if we add it in the spec. The regulation is not completed.

Agreement:

* Capture the simulation results and table in the TR.
* If the regulation is ready the requirement will be defined in the TS

#### **Issue 1-2-2: A-MPR value for SL CA**

* Proposal (LGE):

Table 1-2-2-1 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 1-2-2-2 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 |

**Table 1-2-2-3 SL CA NS\_52 PSFCH A-MPR for SL Contiguous CA**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |

**Table 1-2-2-4 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 |

* Moderator’s suggestion
  + Need to figure out whether NS\_52 is regulated by FCC, to be applied to V2X/Sidelink before specifying NS\_52 for SL CA.

# Topic #2: TPs and draftCRs

#### **Issue 3-1: TP in R4- 2318811 (LGE)**

6.3.1 Maximum output power for NR SL CA operation

6.3.2 UE maximum output power reduction for NR SL CA operation

6.3.3 UE additional maximum output power reduction for NR SL CA operation

* Recommended WF
  + TBA

#### **Issue 3-2: TP in R4-2319505 (Huawei): MPR for SL CA**

6.3.2 UE maximum output power reduction for NR SL CA operation

* Recommended WF
  + TBA

#### **Issue 3-3: draftCR in R4-2319506 (Huawei): MPR for SL CA**

6.2E.2.1A. MPR for sidelink CA operation

* Recommended WF
  + TBA

#### **Issue 3-4: draftCR in R4-2318809 (LGE)**

4.2 Applicability of minimum requirements

5.3E Channel bandwidth for V2X

6.2E Transmitter power for V2X

6.3E Output power dynamics for V2X

6.4E Transmit signal quality for V2X

6.5E Output RF spectrum emissions for V2X

* Recommended WF
  + TBA

#### **Issue 3-5:draftCR in R4- 2319001 (vivo): System parameters for SL CA**

5.2E Operating band for V2X

5.3E Channel bandwidth for V2X

5.4E Channel arrangement for V2X

* Recommended WF
  + TBA

#### **Issue 3-6: drafCR in R4- 23184476 (Meta)**

6.2E.4 Configured transmitted power for V2X

6.2E.4A Configured transmitted power for Sidelink CA

* Recommended WF
  + TBA

#### **Issue 3-7: draftCR in R4-2319931 (OPPO)**

6.2E.3.3A A-MPR for Power class 3 Sidelink CA operation by NS\_52

6.2E.4.1A Configured transmitted power for Sidelink CA operation

* Recommended WF
  + TBA