**3GPP TSG RAN meeting #102 RP-232786**

**Edinburgh, GB, December 11 – 15, 2023**

## Status Report to TSG

**Agenda item:** 9.3.1.5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** | NR sidelink evolution | | | | |
| included in this status report | Study Item:  No | Core part:  Yes | Performance part:  Yes | | Testing part:  No |
| **Acronym** | NR\_SL\_enh2 | | | | |
| **Unique ID** | 940097 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-230077 | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item:  mm/yyyy | Core part: 12/2023 | Performance part: 06/2024 | Testing part: mm/yyyy | |
| **Overall Completion level** | Study Item:  xx % | Core part:  100% | Performance Part:  15% | Testing part: xx % | |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |  |
| --- | --- | --- |
| **Leading WG** | | RAN1 |
| **Rapporteur** | **Name** | Kevin Lin |
| **Company** | OPPO |
| **Email** | Kevin.Lin@oppo.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.  
 One time unit (TU) corresponds to ~ 2 hours in the meeting.  
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.  
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

**NR sidelink CA operation**

* **Maintenance in RAN1#114bis**

**Agreement**

Text Proposal 1 (I) in Section 4.1.1 of R1-2309243 is endorsed for TS 38.213 clause 16.2.5.

**Agreement**

Text Proposal 2 (I) in Section 4.1.2 of R1-2309243 is endorsed for TS 38.213 clause 16.2.5.

**Agreement**

Endorse following higher layer parameters for NR SL CA:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or Cell-specific** |
| sl-SyncFreqList | Indicates a list of candidate carrier frequencies that can be used for the synchronisation of NR sidelink communication. | SEQUENCE (SIZE (1…maxNrofFreqSL-r16)) OF [ARFCN-ValueNR] | N/A | per cell | UE-specific or Cell-specific |
| sl-SyncTxDisabled | Indicates that the carrier, even though equipped with synchronisation resources, cannot be used as a synchronisation carrier frequency to transmit S-SSB. | ENUMERATED {true} | N/A | Per carrier | UE-specific or Cell-specific |
| sl-SyncTxMultiFreq | Indicates that the UE transmits S-SSB on multiple carrier frequencies for NR sidelink communication. If this field is absent, the UE transmits S-SSB only on the synchronisation carrier frequency. | ENUMERATED {true} | N/A | per cell | UE-specific or Cell-specific |

**Agreement**

Text Proposal 4 (I) in Section 4.1.3 of R1-2309243 is endorsed for TS 38.214 clause 8.1.4.

**Agreement**

Adopt following red changes to the value range of sl-SyncFreqList:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or Cell-specific** |
| sl-SyncFreqList | Indicates a list of candidate carrier frequencies that can be used for the synchronisation of NR sidelink communication. | SEQUENCE (SIZE (1…maxNrofFreqSL-r16)) OF ~~[ARFCN-ValueNR~~SL-FreqConfig-r16~~]~~ | N/A | per cell | UE-specific or Cell-specific |

* **Maintenance in RAN1#115**

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 3 (I) in Section 4.1.3 of R1-2312262 (for TS 38.213 clause 16.2.5), for clarification of ensuring the same power of PSFCH transmissions in SL CA, and the TP is not pursued in Rel-18.

**Agreement**

Text Proposal 4 (I) in Section 4.1.4 of R1-2312262 (for TS 38.213 clause 16.2.5) is endorsed.

**Agreement**

Text Proposal 5 (I) in Section 4.1.5 of R1-2312262 is endorsed for TS 38.213 clause 16.2.5.

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 6 (I) in Section 4.1.6 of R1-2312262 (for TS 38.213 clause 16.2.5), for clarification of SL resource allocation mode in SL CA, and the TP is not pursued in Rel-18.

**Agreement**

Text Proposal below is endorsed for TS 38.213 clause 16.2.5

* *Reason for change:*
* *It is not clear how to ensure alignment of PSFCH time resources across SL aggregated carriers.*
* *Summary of change:* 
  + *Clarify that a UE expects to be provided with a (pre)configuration to have time resource alignment for each of PSFCH transmissions on SL aggregated carriers.*
* *Consequences if not approved:*
* *It is ambiguous how time resources for PSFCH are aligned across SL aggregated carriers from the UE’s perspective.*

|  |
| --- |
| ---------------- Start of Text Proposal for TS 38.213 -----------------------------  16.2.5 SL Carrier Aggregation  <Unchanged part omitted>  If a UE would simultaneously transmit PSFCHs and receive PSFCHs on multiple carriers, the UE performs the procedures in Clause 16.2.4.2 by considering all the PSFCHs for transmission and all the PSFCHs for reception in order to determine either PSFCHs to transmit or PSFCHs to receive. If a UE would simultaneously transmit PSFCHs on multiple carriers, the UE performs the procedures for single carrier in Clause 16.2.3 by considering all the PSFCHs for transmission using a corresponding in order to determine PSFCHs to transmit and a corresponding power per PSFCH transmission. The UE expects to ~~determine~~ be provided with a (pre)configuration to ensure time resource alignment ~~a same time resource~~ and a same power for each of the PSFCH transmissions on those multiple carriers.  ---------------- End of Text Proposal for TS 38.213 ------------------------------ |

**NR Sidelink operation in FR1 unlicensed spectrum**

* **Maintenance in RAN1#114bis**

**Agreement**

RAN1 to provide the following response to RAN2’s questions in the received LS (R1-2308832/R2-2309157)

* *RAN1 response: SL-U RB set is indexed in the same manner as defined for NR-U in clause 7 of TS 38.214 for the purpose of C-LBT failure report, and the RB set index is unique within a SL BWP.*

**Agreement**

Draft LS reply in R1-2310433 is endorsed. Final LS R1-2310434.

**Agreement**

Update the following WA made in RAN1#113:

|  |
| --- |
| **Working assumption (RAN1#113)**  For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability   * Option 2: If transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation [when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource] ~~[with high L1 SL priority]~~, UE may prioritize/select resource(s) in the slot(s) for transmission.   + FFS: details of applying this prioritization, which layer to perform above prioritization behaviour, and if the reserved resource belongs to a MCSt, the COT initiating UE should be able to share the COT to cover the whole MCSt   + (pre)configuring enabling/disabling option 2 is supported * Option 1:   + UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource.     - The value of N can be selected from {0, 1, 2}     - The selection of the value of N is up to UE implementation       * FFS: unless (pre-)configured or indicated by UE reserved resource in SCI   + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.     - M is determined based on UE implementation (at least including 0)   + FFS: Which layer to perform above behaviour   + FFS: any restriction of M   + (pre)configuring enabling/disabling option 1 is supported * FFS: Whether the above high priority is determined according to a (pre)configured threshold * Note: both option1 and option2 are optional UE features |

**Agreement**

TP#5 in section 4.5 is endorsed for TS38.214 clause 8.1.4.

**Agreement**

Endorse the higher layer parameters below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| CPEStartingPositionsPSCCH-PSSCH-InitiateCOT | A set of selected indices that correspond to multiple candidate CPE starting positions to be used for PSCCH/PSSCH transmission when UE initiating a COT. The set of selected indices can be a full set or a subset of the indices of all candidate CPE starting positions specified in Table 5.3.1-3 [16, TS38.211], according to the SCS of the SL BWP. One or multiple of the selected indices is associated per L1 priority of PSSCH. One of the selected indices or a different candidate CPE starting position index is assigned as the default CPE starting position.  \* Note, it is up to RAN2 to decide on whether the same RRC parameter or a separate RRC parameter should be introduced for assigning the default CPE starting position for the case of UE initiating a COT for PSCCH/PSSCH transmission. | SEQUENCE (SIZE (1..N)) OF integer 1 to X | N/A | Per resource pool | UE-specific or Cell-specific |
| CPEStartingPositionsPSCCH-PSSCH-WithinCOT | A set of one or multiple selected indices that correspond to one or multiple candidate CPE starting positions to be used by UE for PSCCH/PSSCH transmission within a COT. By default, only one index (which is the default CPE starting position) is selected from the set of all candidate CPE starting positions specified in Table 5.3.1-3 [16, TS38.211], according to the SCS of the SL BWP. When multiple indices are selected, one or multiple of the selected indices is associated per L1 priority of PSSCH. One of the selected indices or a different candidate CPE starting position index is assigned as the default CPE starting position.  \* Note, it is up to RAN2 to decide on whether the same RRC parameter or a separate RRC parameter should be introduced for assigning the default CPE starting position for the case of PSCCH/PSSCH transmission within a COT. | SEQUENCE (SIZE (1..N)) OF integer 1 to X | N/A | Per resource pool | UE-specific or Cell-specific |
| CPEStartingPositionPSFCH | A CPE starting position within the GP symbol before PSFCH transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | INTEGER (1..X) | N/A | Per resource pool | UE-specific or Cell-specific |
| CPEStartingPositionS-SSB | A CPE starting position within the GP symbol before S-SSB transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | INTEGER (1..X) | N/A | Per SL BWP | UE-specific or Cell-specific |

**Agreement**

Endorse the higher layer parameters below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| type1-LBT-Blocking-Option2 | When enabled, if UE’s transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation [when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource], UE may prioritize/select resource(s) in the slot(s) for transmission. | {enabled, disabled} | N/A | Per resource pool | UE-specific or Cell-specific |
| type1-LBT-Blocking-Option1 | When enabled, UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource. UE may also avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource. The selection of the value N is up to UE implementation from {0, 1, 2}. M is determined based on UE implementation (at least including 0). | {enabled, disabled} | N/A | Per resource pool | UE-specific or Cell-specific |

**Agreement**

Remove the square brackets in the following TP for TS 37.213.

|  |
| --- |
| 4.5.4 Contention window adjustment procedures for SL transmissions  If a UE transmits a SL transmission(s) including PSSCH(s) using Type 1 channel access procedures associated with the channel access priority class on a channel and the SL transmission(s) is enabled with explicit HARQ-ACK feedback including ‘ACK’/‘NACK’, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures:  1) For every priority class set .  2) If a HARQ-ACK feedback corresponding to the PSSCH(s) for unicast SL transmission(s) in the reference duration for the latest channel occupancy initiated by the UE, is available:  - If the HARQ-ACK feedback includes only ‘ACK’, go to step 1; otherwise go to step 4.  3) If a HARQ-ACK feedback corresponding to the PSSCH(s) for groupcast SL transmission(s) in the *reference duration* for the latest channel occupancy initiated by the UE, is available:  - If HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2 is provided by higher layers:  - The UE calculates the ratio between the number of received ‘ACK’ in the HARQ-ACK feedback and ~~[~~the number of UE(s) from which the corresponding ‘ACK’/’NACK’ in the HARQ-ACK feedback is expected~~]~~. If the calculated ratio is equal to or larger than *HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2*, go to step 1; otherwise go to step 4.  - Otherwise:  - If the HARQ-ACK feedback includes at least an ‘ACK’,go to step 1; otherwise go to step 4. |

**Agreement**

In SCI format 1-A, if higher layer parameter *transmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured:

**Table X: 2nd-stage SCI formats for SL operation in shared spectrum**

|  |  |  |
| --- | --- | --- |
| **Value of 2nd-stage SCI format field** | **1 reserved bit (1st stage SCI)** | **2nd-stage SCI format** |
| 00 | 0 | SCI format 2-A (existing) |
| 1 | SCI format 2-A (COT-SI fields are provided) |
| 01 (Reserved) | 0 | Reserved |
| 1 | Reserved |
| 10 | 0 | SCI format 2-C (existing) |
| 1 | Reserved |
| 11 (Reserved) | 0 | Reserved |
| 1 | Reserved |

Note: it is up to the TS 38.212 spec editor on how to capture the above intention.

**Agreement**

Endorse the TP below for TS37.213

|  |  |
| --- | --- |
| ***Reason for change:*** | The current specification only mandates the UE to use the highest CAPC value among the associated CAPC values with the multiple TBs for performing the Type 1 channel access procedure. This does not include the case when S-SSB / PSFCH is transmitted within the same channel occupancy. |
|  |  |
| ***Summary of change:*** | It is clarified that within a channel occupancy initiated by Type 1 channel access procedure, the highest CAPC value among the associated CAPC values with the multiple SL transmissions is used for the Type 1 channel access procedure. |
|  |  |
| ***Consequences if not approved:*** | The cases of PSFCH and S-SSB transmissions and stop-resume transmissions are not considered when determining the CAPC value for Type 1 channel access procedure. |

|  |
| --- |
| **< Start of text proposal >** 4.5 Sidelink Channel access procedures A UE operating in sidelink resource allocation mode 1 or mode 2 and performing SL transmission(s) on channel(s) shall perform the procedures described in this clause for the UE to access the channel(s) on which the transmission(s) are performed.  **<Unchanged part omitted>**  When a UE applies Type 1 channel access procedure to initiate a channel occupancy for multiple SL transmissions over one slot or multiple consecutive slots, the highest CAPC value among the associated CAPC values with the multiple SL transmissions is used for performing the Type 1 channel access procedure.  **<End of text proposal>** |

**Agreement**

TP#3 Proposal v2 in section 4.3.2 of R1-2310292 is endorsed for TS37.213 clause 4.5.6.3

**Agreement**

After UE successfully performed a multi-channel access procedure for a set of RB sets,

* A channel occupancy is initiated for the set of RB sets and the UE can use the initiated channel occupancy for own subsequent transmissions (including all S-SSB, PSFCH, PSCCH/PSSCH) when the channel access procedures described in clause 4.5.6.3 is used.
* When a channel occupancy is initiated using the channel access procedures described in clause 4.5.6.3 to transmit SL transmission(s), the channel occupancy can be shared to other UEs when the initiating UE transmits PSCCH/PSSCH in the SL transmission(s), and the channel occupancy time of each channel is the same in this case.

**Agreement**

TP#7 in section 4.7 of R1-2310292 is endorsed for TS 38.214 clause 8.1.4.

**Agreement**

Update the WA made in RAN1#114bis as follows.

|  |
| --- |
| **Working assumption (RAN1#113)**  For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability   * Option 2: If transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission.   + FFS: details of applying this prioritization, and if the reserved resource belongs to a MCSt, the COT initiating UE should be able to share the COT to cover the whole MCSt * (pre)configuring enabling/disabling option 2 is supportedOption 1:   + UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource.     - The value of N can be selected from {0, 1, 2}     - The selection of the value of N is up to UE implementation       * FFS: unless (pre-)configured or indicated by UE reserved resource in SCI   + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.     - M is determined based on UE implementation (at least including 0)   + FFS: any restriction of M   + (pre)configuring enabling/disabling option 1 is supported * FFS: Whether the above high priority is determined according to a (pre)configured threshold * Note: both option1 and option2 are optional UE features |

**Agreement**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| type1-LBT-Blocking-Option2 | When enabled, if UE’s transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission. | {enabled, disabled} | N/A | Per resource pool | UE-specific or Cell-specific |

**Agreement**

For a UE transmitting CPE between two consecutive SL transmissions by the same UE, when the gap between the two transmissions before applying CPE is one symbol in 15kHz and up to two symbol(s) in 30kHz and 60kHz,

* At least when the first of the two transmissions is PSCCH/PSSCH/PSFCH and the latter of the two transmissions is PSFCH/S-SSB, the UE follows the (pre-)configured CPE starting position for the PSFCH/S-SSB.
* When the latter of the two transmissions is PSCCH/PSSCH,
  + the CPE starting position index from [4, TS 38.211] for the PSCCH/PSSCH transmission
    - In one symbol gap: the index is always 1
    - In two symbols gap: the index is always 3 in 30kHz and 2 in 60kHz

**Agreement**

For the autonomous update to the next higher allowed value when the same value is consecutively used for X times for generation of ,

* The (pre-)configuration provides 1 value for X among a value range of {1, 8, 16, 32, ‘infinity’}.
* This operation is restricted only to PSCCH/PSSCH transmission with HARQ feedback indicator in SCI-2 is set to disabled, regardless of PSFCH resources being configured in a resource pool.

**Agreement**

Regarding “*Within a slot including PSFCH, for each RB set, the (pre-)configured PRBs for PSFCH transmission on this RB set are divided into N different PRB sets (denoted as set#1, set#2, …, set#N), which are associated with N candidate PSFCH occasion(s)*”:

* use N bitmaps to indicate resource for N candidate PSFCH occasion(s), respectively
  + It shall be (pre-)configured such that N candidate PSFCH occasion(s) are associated with N different PRB sets

**Agreement**

Regarding frequency locations of S-SSB repetitions within anchor RB set:

* the S-SSB indicated by *sl-AbsoluteFrequencySSB* is the lowest S-SSB in anchor RB set

**Agreement**

Regarding frequency locations of S-SSB repetitions within a non-anchor RB set:

* the lowest S-SSB in the non-anchor RB set is indicated by new RRC parameters, where each RRC parameter corresponds to one non-anchor RB set

**Agreement**

Regarding PRBs within intra-cell guard band:

* Such PRBs are not used for PSFCH transmission
* Such PRBs are not used for S-SSB transmission

Note: spec impact (if any) can be discussed.

**Agreement**

* DCI format 3\_0 is updated to include the field of “*lowest index of the RB set allocation to the initial PSSCH transmission*”.
* For interlace RB-based PSSCH transmission, Sidelink configured grant Type 1 configuration provides a new RRC parameter *sl-StartRBsetCG-Type1* to indicate starting RB set index of *the initial PSSCH transmission* of the sidelink configured grant Type 1

**Agreement**

In “*Alt 2-3a: each PSFCH transmission occupies 1 dedicated interlace*”:

* The power for a PSFCH transmission is equally allocated over the occupied PRBs.

**Agreement**

TP#4-5 in Section 4.2.5 of R1-2310350 is endorsed for TS 38.213 clause 16.3.0.

**Agreement**

TP#1-1 in Section 4.2.1 of R1-2310350 is endorsed for TS 38.214 clause 7, and clause 8.1.4.

**Agreement**

For SL-U PHY, following higher layer parameters are endorsed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **row** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** |
| ~~1~~ | ~~startRBResourcePool~~ | ~~Indicates the lowest RB index in the resource pool with respect to the lowest RB index of a SL BWP.~~  ~~UE expects that the lowest RB in the resource pool is not within intra-cell guard band.~~ | ~~INTEGER (0..224)~~ | ~~N/A~~ | ~~Per resource pool~~ |
| 2 | numInterlacePerSubchannel | Indicates the number of interlaces per sub-channel within a resource pool, i.e. 1 sub-channel =K interlace(s). The applicable values are related to the subcarrier spacing as below: For SCS = 15 kHz: K=1 or 2 For SCS = 30 kHz: K=1 | ENUMERATED{1, 2} | N/A | Per resource pool |
| 3 | intraCellGuardBandsSL-List | List of intra-cell guard bands for operation with shared spectrum channel access. If not configured, the guard bands are defined according to 38.101-1 [15], see TS 38.214 [19], clause 7. For operation in licensed spectrum, this field is absent, and no UE action is required. | SEQUENCE (SIZE (1..maxSCSs)) OF IntraCellGuardBandsPerSCS-r16 | N/A | Per SL BWP |
| 4 | startingSymbolFirst | Indicates the location of 1st starting symbol within a slot | ENUMERATED {sym0, sym1, sym2, sym3, sym4, sym5, sym6} | sym0 | Per SL BWP |
| 5 | startingSymbolSecond | Indicates the location of 2nd starting symbol within a slot Note： o the number of symbols used for PSCCH/PSSCH transmission from 2nd starting symbol is not smaller than 6 o within a slot, the 2nd starting symbol is later than the 1st starting symbol • PSCCH/PSSCH transmission starting from 1st or 2nd starting symbol shall have the same ending symbol within a slot | ENUMERATED {sym3,sym4,sym5,sym6,sym7} | N/A | Per SL BWP |
| 6 | numRefSymbolLength | Indicates a reference number of symbols for TBS determination | ENUMERATED {sym7, sym8, sym9, sym10, sym11, sym12, sym13, sym14} | N/A | [Per SL BWP or per resource pool] |
| 7 | transmissionStructureForPSCCHandPSSCH | Indicate a SL-BWP is (pre-)configured with contiguous RB-based or interlace RB-based PSCCH/PSSCH transmission.  Note: Legacy PSCCH/PSSCH are applicable in region with no OCB requirement, or with OCB exemption | ENUMERATED {contigousRB, interlaceRB} | N/A | Per SL BWP |
| 8 | numRefPRBOfInterlace | Indicate reference number of PRBs of one interlace within 1 RB set | ENUMERATED {10, 11} | N/A | ~~[Per SL BWP or~~ per resource pool~~]~~ |
| ~~9~~ | ~~transmissionStructureForSSSB~~ | ~~Indicate use legacy S-SSB or repetition for S-SSB transmission. Note: Legacy S-SSB are applicable in region with no OCB requirement, or with OCB exemption.~~ | ~~ENUMERATED {nonRepetitionSSB, repetitionSSB}~~ | ~~N/A~~ | ~~Per SL BWP~~ |
| 10 | numOfSSSBrepetition | Indicate the number of S-SSB repetitions in frequency domain in one RB set  Note: Legacy S-SSB are applicable in region with no OCB requirement, or with OCB exemption. | INTEGER (2,3,…,9) | N/A | Per ~~SL BWP~~ RB set |
| 11 | gapBetweenSSSBrepetition | Indicate the gap between two adjacent S-SSB repetitions in frequency domain in one RB set, and the gap is between the lowest subcarrier of the upper PSBCH and the highest subcarrier of the lower PSBCH. | INTEGER([0], 1,2,3,…, 84) PRBs | N/A | Per ~~SL BWP~~ RB set |
| 12 | numOfAdditionalSSSBOccasion | Indicate the number of additional candidate S-SSB occasion(s) for each R16/R17 NR SL S-SSB slot | INTEGER (0,1,2,3,4) | [N/A or 0] | Per SL BWP |
| 13 | gapOfAdditionalSSSBOccasion | Indicate the gap between each R16/R17 NR SL S-SSB slot and its first corresponding additional candidate S-SSB occasion, and the gap between adjacent two additional candidate S-SSB occasion corresponding to a R16/R17 NR SL S-SSB slot | INTEGER (0,1,2,…,639) slot | N/A | Per SL BWP |
| 14 | transmissionStructureForPSFCH | Indicate each PSFCH transmission occupies "1 common interlace and K3 dedicated PRB(s)", or "1 dedicated interlace". | ENUMERATED {common interlace, dedicated interlace} | N/A | Per resource pool |
| 15 | numDedicatedPRBsForPSFCH | Indicates the value of K3 when each PSFCH transmission occupies "1 common interlace and K3 dedicated PRB(s)" | ENUMERATED {1,2,5} | N/A | Per resource pool |
| 16 | numPSFCHOccasions | Indicates one PSCCH/PSSCH transmission has N associated candidate PSFCH occasion(s) | ENUMERATED {1,2,3,4} | 1 | Per resource pool |
| 17 | PSFCHCommonInterlaceIndex | Indicate the index of common interlace to meet OCB requirements when transmissionStructureForPSFCH is set to common interlace, e.g., value 0 means interlace 0 is used as common interlace | INTEGER (0,1,2,...,9) | N/A | Per resource pool |
| 18 | SSSBPowerOffsetOfAnchorRBSet | Indicate the power offset for one S-SSB transmission on anchor RB set. anchor RB set refers to the RB set where S-SSB indicated by sl-AbsoluteFrequencySSB-r16 locates N is the number of S-SSB repetitions within the anchor RB set, W is the maximum total number of S-SSB repetitions on RB sets within the SL-BWP | EMUNERATED{{10lg(N), [10lg(N)+2, 10lg(N)+4, …,]10lg(W)}} | N/A | Per SL BWP |

**Working assumption**

* In “*Alt 1-1b: each PSFCH transmission occupies 1 common interlace and K3 dedicated PRB(s)*”:
  + Assume the UE transmits N PSFCH
    - Denote the final Tx power on one common PRB is P\_common
    - Denote the final Tx power on one dedicated PRB is P\_dedicated
    - P\_common <= P\_dedicated
      * (pre-)configure an offset between P\_common and P\_dedicated
  + Send an LS to RAN4 asking whether there is any difficulty for supporting the following cases
    - P\_common < P\_dedicated
    - P\_common = P\_dedicated

**Agreement**

The draft LS to RAN4 is endorsed in R1-2310594. Final LS in R1-2310595.

**Agreement**

For the contiguous RB-based PSCCH/PSSCH,

* For the case where the highest sub-channel of a candidate resource overlaps with a single RB set and intra-cell guardband PRBs
  + a reference number of PRBs of one sub-channel is used for TBS determination, and it is equal to the (pre-)configured sub-channel size.
    - TP#3-1 in Section 4.7.1 of R1-2310354 is endorsed for TS 38.214 clause 8.1.3.2.
  + Note: the above sub-channel “*cannot be used for PSCCH transmission, and can be used for PSSCH transmission*” as per previous agreement

**Agreement**

For SL-U PHY, following higher layer parameters are endorsed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **row** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** |
| 19 | sl-PSFCH-RB-SetList | The n-th value in the list indicates the set of PRBs that are actually used for PSFCH transmission and reception of n-th PSFCH occasion of a PSCCH/PSSCH transmission.  It shall be (pre-)configured such that N candidate PSFCH occasion(s) are associated with N different PRB sets. | FFS | N/A | Per resource pool |
| 20 | sl-AbsoluteFrequencySSBNonAnchorList | Each parameter in this list indicates the lowest S-SSB in a non-anchor RB set.  Note: anchor RB set refers to the RB set where S-SSB indicated by sl-AbsoluteFrequencySSB-r16 locates.  Note: NonAnchorRBsetsNum refers to the number of non-anchor RB sets within this SL BWP. | SEQUENCE (SIZE (1…NonAnchorRBsetsNum)) OF ARFCN-ValueNR | N/A | Per SL BWP |
| 21 | sl-StartRBsetCG-Type1 | Indicates starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 for interlace RB-based PSSCH transmission  Note: M is the number of RB sets within this [SL resource pool]. | INTEGER (0,1,2,...,M-1) | N/A | [Per Configured Grant] |

**Agreement**

Support:

* Alt A: R17 SL inter-UE coordination Scheme 2 (conflict indication) at least for *sl-PSFCH-Occasion* = '0' uses the same transmission scheme (Alt 1-1b and Alt 2-3a) as HARQ-ACK in R18 SL-U
  + For Alt 1-1b,
    - Alt A2: Common interlace index for conflict indication and HARQ-ACK within the same RB set are the same
  + Note: Alt 1-1b and Alt 2-3a in previous agreements are as below
    - Alt 1-1b: each PSFCH transmission occupies 1 common interlace and K3 dedicated PRB(s)
    - Alt 2-3a: each PSFCH transmission occupies 1 dedicated interlace

**Agreement**

TP#3-2 in Section 4.9.1 of R1-2310355 is endorsed for TS 38.213 clause 16.4.

**Agreement**

Adopt following red change to RAN1#114’s agreement:

|  |
| --- |
| Agreement  In “*one PSCCH/PSSCH transmission has N associated candidate PSFCH occasion(s)*”, regarding Rx UE behaviour on receiving PSFCH for a PSCCH/PSSCH transmission, support:   * For unicast:   + FFS: Monitor:     - Rx UE attempts to monitor candidate PSFCH occasion(s) until one PSFCH is detected or all candidate PSFCH occasion(s) are monitored.     - If one PSFCH is detected, Rx UE can omit monitoring following candidate PSFCH occasion(s).   + Report:     - If Rx UE receives PSFCH, Rx UE reports same value as a value of HARQ-ACK information that the UE determines from the PSFCH reception to higher layers~~, otherwise re-ports NACK to higher layer~~. * FFS: For groupcast option 1 (NACK only):   + FFS: Monitor:     - Rx UE attempts to monitor all candidate PSFCH occasions.     - If NACK is detected, Rx UE can omit monitoring following candidate PSFCH occasion(s).   + Report:     - If Rx UE does not detect any PSFCH in all candidate PSFCH occasions, Rx UE reports ACK to higher layers; otherwise, reports NACK to higher layers. * For groupcast option 2 (ACK/NACK):   + FFS: Monitor:     - Rx UE attempts to monitor PSFCH transmission occasions until PSFCH from all transmitters have been detected or all candidate PSFCH occasions are monitored.     - If Rx UE detects PSFCH from one PSFCH transmitter, it can omit PSFCH detection for following PSFCH transmission occasions for this PSFCH transmitter.   + Report:     - If ACK has been detected from at least one PSFCH occasion of each of all expected PSSCH receivers, Rx UE reports ACK to higher layers; otherwise, reports NACK to higher layers. |

**Agreement**

Adopt following red change to RAN1#114’s agreement:

|  |
| --- |
| Agreement  Regarding “*UE may transmit S-SSB repetition in more than one RB set*”:   * At least the power for S-SSB transmission on anchor RB set does not change due to the number of used RB sets   + On anchor RB set, there is a (pre-)configured offset to limit the maximum power as below (changes to legacy NR SL is marked in red)     - [dBm], where i is slot index as in legacy     - value range of is: {10lg(N), [10lg(N)+2, 10lg(N)+4, …],}   + On non-anchor RB set     - UE first allocates power to S-SSB repetitions on anchor RB set, assume the power of each S-SSB repetition is     - Then, UE allocates remaining power equally to other S-SSB repetitions on all other used RB sets, where , where and are converted to linear unit (i.e, Watt) in this formula     - ~~Note:~~ for both anchor RB set and non-anchor RB set transmission, the same DL pathloss is taken into account * M is the total number of RB sets within this SL-BWP, N is the number of S-SSB repetitions within the anchor RB set, W is the maximum total number of S-SSB repetitions on RB sets within the SL-BWP * Note: the above power for S-SSB transmission refers to power of one S-SSB repetition * UE at least attempts to transmit on anchor RB set   + Note: anchor RB set refers to the RB set where S-SSB indicated by *sl-AbsoluteFrequencySSB-r16* locates * For above Alts, is determined according to TS 38.101-1 for transmission of all S-SSB repetitions on all used RB sets |

**Agreement**

In “*one PSCCH/PSSCH transmission has N associated candidate PSFCH occasion(s)*”, regarding “*the minimum time gap Z=a+b between any two selected resources of a TB in case PSFCH is configured for this resource pool*”:

* Alt 2: Z = a’ + b, where
  + For unlicensed operation, a’ is defined as: a’ is the time gap between the end of the last symbol of a PSSCH transmission of the first resource and the start of the first symbol of the last corresponding PSFCH reception determined by *sl-MinTimeGapPSFCH* and *sl-PSFCH-Period* for the pool of resources; and
  + b remains the same as legacy NR SL
* Note: the meaning of a and b in legacy NR SL is
  + a is the time gap between the end of the last symbol of a PSSCH transmission of the first resource and the start of the first symbol of the corresponding PSFCH reception determined by *sl-MinTimeGapPSFCH* and *sl-PSFCH-Period* for the pool of resources
  + b is the time required for PSFCH reception and processing plus sidelink retransmission preparation including multiplexing of necessary physical channels and any TX-RX/RX-TX switching time.

**Agreement**

In “*one PSCCH/PSSCH transmission has N associated candidate PSFCH occasion(s)*”, regarding “*the reference slot n for PUCCH transmission to report HARQ in Mode 1*”:

* slot n is updated as the slot containing the last candidate PSFCH occasion
  + FFS: whether the specifications are already aligned with this
* **Maintenance in RAN1#115**

**Agreement**

Introduce the following new RRC parameter for the agreement on autonomous update to the next higher allowed value when the same value is consecutively used for X times for generation of .

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| CWSforPsschWithoutHarqAck | The latest CW\_p is autonomously increased to the next higher allowed value for every priority class p∈{1,2,3,4} if the same CW\_p ≠ CW\_(max,p) is consecutively used for general of N\_init in SL Type 1 LBT for a number of times indicated by this parameter. This operation is restricted only to PSCCH/PSSCH transmission(s) with "HARQ feedback enabled/disabled indicator" in the 2nd stage SCI set to disabled, regardless of PSFCH resources being configured in a resource pool. | {1, 8, 16, 32, ‘infinity’} | N/A | Per SL BWP | UE-specific or Cell-specific |

**Agreement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** |
| absenceOfAnyOtherTechnology | Presence of this field indicates absence on a long term basis (e.g. by level of regulation) of any other technology sharing the carrier; absence of this field indicates the potential presence of any other technology sharing the carrier, as specified in TS 37.213 [48] clauses ~~X.X.X~~ 4.5. | ENUMERATED {true} | N/A | Per cell / carrier |
| energyDetectionConfig | Indicates whether to use the maxEnergyDetectionThreshold or the energyDetectionThresholdOffset (see TS 37.213 [48], clause ~~X.X.X~~ 4.5.5). | CHOICE {maxEnergyDetectionThreshold, energyDetectionThresholdOffset} | N/A | ~~[~~Per cell / carrier~~]~~ |
| energyDetectionThresholdOffset | Indicates the offset to the default maximum energy detection threshold value. Unit in dB. Value -13 corresponds to -13dB, value -12 corresponds to -12dB, and so on (i.e. in steps of 1dB) as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.5. | INTEGER (-13..20) | N/A | ~~[~~Per cell / carrier~~]~~ |
| maxEnergyDetectionThreshold | Indicates the absolute maximum energy detection threshold value. Unit in dBm. Value -85 corresponds to -85 dBm, value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm) as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.5. | INTEGER (-85..-52) | N/A | ~~[~~Per cell / carrier~~]~~ |
| HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2 | Ratio threshold for contention window adjustment for SL groupcast option 2 as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.4. Unit is percentage. | ~~[~~INTEGER (10..100)~~]~~ | N/A | ~~[~~Per cell / carrier~~]~~ |
| CPEStartingPositionPSFCH | A CPE starting position within the GP symbol before PSFCH transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | ~~[~~INTEGER (1..X)~~]~~ | N/A | Per resource pool |
| CPEStartingPositionS-SSB | A CPE starting position within the GP symbol before S-SSB transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | ~~[~~INTEGER (1..X)~~]~~ | N/A | Per SL BWP |

**Agreement**

Confirm the below working assumption on Type 1 LBT blocking with following modifications.

|  |
| --- |
| **Working assumption (RAN1#114bis)**  For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability   * Option 2: If transmission in slot(s) at least before a reserved resource is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission.   + (pre)configuring enabling/disabling option 2 is supported * Option 1:   + UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource.     - The value of N can be selected from {0, 1, 2}     - The selection of the value of N is up to UE implementation   + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.     - The value of M can be selected from {0, 1, 2}     - M is determined based on UE implementation   + (pre)configuring enabling/disabling option 1 is supported * Note: both option1 and option2 are optional UE features |

**Agreement**

Confirm the working assumption with the following modifications

|  |
| --- |
| **Working assumption (RAN1#113)**  For UE-to-UE COT sharing in SL-U, a parameter “*ue-toUE-COT-SharingED-Threshold*” is (pre-)configured per SL carrier/cell to be used in the energy detection threshold adaptation procedure   * The UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy shall use the (pre-)configured “*ue-toUE-COT-SharingED-Threshold*” for accessing the channel(s). |

**Agreement**

**Modify higher layer parameter “*ue-toUE-COT-SharingED-Threshold*” according to the following.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Per (UE, cell, TRP, …)** | **Required for initial access or IDLE/INACTIVE** |
| ue-toUE-COT-SharingED-Threshold | ~~Maximum~~ The energy detection threshold that ~~the~~ is to be used by a UE to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy shall use this configured parameter for accessing the channel(s) ~~with another UE for SL transmission~~ as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.5 for sidelink channel access. Unit in dBm. Value -85 corresponds to -85 dBm, value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm). | ~~[~~INTEGER (-85..-52)~~]~~ | ~~[~~Per cell / carrier~~]~~ | ~~[~~UE-specific or Cell-specific~~]~~ |

**Agreement**

**The TP below for TS 37.213 is endorsed.**

|  |  |
| --- | --- |
| ***Reason for change:*** | Time required for the COT initiator to detect a responder UE’s PSFCH and S-SSB transmission(s) for resuming its own channel occupancy is expected to be longer than 1-symbol gap. In order for the initiator to resume using its own COT immediately after responder’s PSFCH and S-SSB, it is necessary to detect responder’s PSFCH and S-SSB transmissions based on an expected manner. |
|  |  |
| ***Summary of change:*** | To match the same wordings used in NR-U to resolve the “expected” behaviour. |
|  |  |
| ***Consequences if not approved:*** | The COT initiator UE cannot immediately resume transmission in its own COT using Type 2B and 2C channel access procedures after responder’s PSFCH and S-SSB transmissions. |

|  |
| --- |
| **< Start of text proposal >** 4.5.3 SL channel access procedures in a shared channel occupancy **<Unchanged part omitted>**  When a UE uses channel access procedures to initiate a channel occupancy to transmit SL transmission(s) and shares the corresponding channel occupancy with another UE that transmits a SL transmission(s), the UE that initiated the channel occupancy may transmit a SL transmission(s) within its channel occupancy that follows the SL transmission(s) from the other UE as the following.  - If the UE determines a transmission gap from the other UE’s SL transmission(s), the followings are applicable:  - If the transmission gap is at least , the UE can transmit the SL transmission on the channel after performing Type 2A channel access procedures as described in clause 4.5.2.1.  - If the transmission gap is , the UE can transmit the SL transmission on the channel after performing Type 2B channel access procedures as described in clause 4.5.2.2.  - If the transmission gap is up to , the UE can transmit the SL transmission on the channel after performing Type 2C channel access as described in clause 4.5.2.3.  - Otherwise, the UE can transmit the SL transmission on the channel after performing Type 2A channel access procedures as described in clause 4.5.2.1.  **<End of text proposal>** |

**Agreement**

**TP#7 in Section 4.7.1 of R1-2312250 for TS 38.214 is endorsed.**

**Agreement**

**Endorse the TP below for TS 37.213.**

|  |  |
| --- | --- |
| ***Reason for change:*** | Currently UE-to-UE COT sharing energy detection threshold is determined by a UE based on the UE’s transmit power. But a responder UE could use different transmit power to the power used by the COT initiator UE. |
|  |  |
| ***Summary of change:*** | The UE-to-UE COT sharing energy detection threshold that should be used by both the initiator UE and the responder UE should be (pre-)configured per carrier/cell.  A condition is added to clarify that the UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy shall use the (pre-)configured “*ue-toUE-COT-SharingED-Threshold*” for accessing the channel(s). |
|  |  |
| ***Consequences if not approved:*** | The responder’s UE transmit power may not complied to the “*ue-toUE-COT-SharingED-Threshold*” calculated based on initiator’s transmit power. |

**< Start of text proposal >**

**4.5.5 Energy detection threshold adaptation procedure**

**<Unchanged part omitted>**

If the higher layer parameter *sl-absenceOfAnyOtherTechnology-r1*8is not configured to a UE,the UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy as described in section 4.5.3 shall use the (pre-)configured “*ue-toUE-COT-SharingED-Threshold*” for accessing the channel(s).

For the case where a UE performs channel access procedures as described in clause 4.5.1 for SL transmission(s) and indicates channel occupancy sharing information, is set equal to the value provided by the higher layer parameter *ue-toUE-COT-SharingED-Threshold*.

**<End of text proposal>**

**Agreement**

TP#4 in Section 4.4.1 of R1-2312251 for TS 37.213 is endorsed.

**Agreement**

TP#3 in Section 4.3.1 of R1-2312251 for TS 37.213 is endorsed.

**Agreement**

TP#5 in Section 4.5.1 of R1-2312251 for TS 38.214 is endorsed.

**Agreement**

Endorse the TP below for **TS 37.213.**

|  |  |
| --- | --- |
| ***Reason for change:*** | In NR-U and LAA, channel access procedures are supported for consecutive UL transmissions and UL transmissions with multiple starting positions. Such behaviour is also a common understanding for SL-U operation. |
|  |  |
| ***Summary of change:*** | Added description to support UE performing channel access procedures for continuous SL transmissions and multiple starting positions in a slot. |
|  |  |
| ***Consequences if not approved:*** | Since the behaviour is captured for NR-U and LAA specification, if these are not captured for SL-U, it may be interpreted that these are not supported in SL-U. |

|  |
| --- |
| **< Start of text proposal >** 4.5 Sidelink Channel access procedures A UE operating in sidelink resource allocation mode 1 or mode 2 and performing SL transmission(s) on channel(s) shall perform the procedures described in this clause for the UE to access the channel(s) on which the transmission(s) are performed.  **<Unchanged part omitted>**  For contiguous SL transmission(s), the following are applicable:  - If a UE is scheduled or autonomous selected to transmit a set of SL transmissions using one or more selected SL grant(s), and  - if the UE cannot access the channel for a transmission in the set prior to the last transmission according to Type 1 or Type 2 SL channel access procedures, the UE shall attempt to transmit the next transmission according to Type 1 or Type 2 SL channel access procedures.  - if the UE cannot access the channel for a transmission in the set prior to the last transmission according to Type 2B SL channel access procedure, the UE shall attempt to transmit the next transmission according to Type 2A SL channel access procedure.  For SL transmission(s) with multiple starting positions in a slot, the following are applicable:  - If a UE intends to transmit PSCCH/PSSCH in sidelink resource allocation mode 1 or mode 2 using a Type 1 channel access procedure, and if the UE cannot access the channel for the transmission from the 1st starting symbol of a slot, the UE shall attempt to transmit PSCCH/PSSCH from the 2nd starting symbol in the same slot according to Type 1 channel access procedure. There is no limit on the number of attempts the UE can make using Type 1 channel access procedure.  - If a UE intends to transmit PSCCH/PSSCH in sidelink resource allocation mode 1 or mode 2 using a Type 2 channel access procedure, and if the UE cannot access the channel for the transmission from the 1st starting symbol of a slot, the UE may attempt to transmit PSCCH/PSSCH from the 2nd starting symbol in the same slot and according to Type 2 channel access procedure.  **<End of text proposal>** |

**Agreement**

TP#2 in Section 4.2.2 of R1-2312253 for TS 37.213 is endorsed.

**Agreement**

The TP below is endorsed for TS 37.213.

|  |
| --- |
| **< Start of text proposal >** 4.5.6 Channel access procedures for transmission(s) on multiple channels **<Unchanged part omitted>**  the followings are applicable:  - Type A or Type B procedures described in clause 4.5.6.1 and 4.5.6.2, respectively, can be used for accessing multiple channels only for PSFCH or S-SSB transmissions.  - A UE can access multiple channels on which SL transmissions are performed, according to the procedures described in clause 4.5.6.3. 4.5.6.1 Type A multi-channel access procedures for PSFCH or S-SSB transmissions The procedures described in this clause are applicable for PSFCH/S-SSB transmissions.  A UE shall perform channel access on each channel , according to the procedures described in clause 4.5.1, where is a set of channels on which the UE intends to transmit, and , and is the number of channels on which the UE intends to transmit.  The counter described in clause 4.5.1 is determined for each channel and is denoted as . is maintained according to clause 4.5.6.1.1 or 4.5.6.1.2.  **<Unchanged part omitted>** 4.5.6.2 Type B multi-channel access procedures for PSFCH or S-SSB transmissions The procedures described in this clause are applicable for PSFCH/S-SSB transmissions.  **<Unchanged part omitted>**  For the procedures in this clause, the channels of the set of channels selected by the UE for PSFCH transmissions, is a subset of the RB sets in the (pre-)configured sidelink resource pool. 4.5.6.2.1 Type B1 multi-channel access procedure A single value is maintained for the set of channels . 4.5.6.2.2 Type B2 multi-channel access procedure A value is maintained independently for each channel using the procedure described in clause 4.5.4.  For determining for channel , value of channel is used, where is the channel with largest among all channels in set .  **<End of text proposal>** |

|  |  |
| --- | --- |
| ***Reason for change:*** | Currently, the Type A and Type B multi-channel procedures are supported only for PSFCH transmissions, but not for other SL channels and signals. And the initiated channel occupancy cannot be used for any subsequent SL transmissions. |
|  |  |
| ***Summary of change:*** | To enable the support for S-SSB transmissions using Type A and Type B multi-channel access procedures, and enabling the support for own subsequent PSFCH and S-SSB transmissions within the initiated channel occupancy. |
|  |  |
| ***Consequences if not approved:*** | Type A and Type B multi-channel procedures are not supported for S-SSB transmissions, and the initiated channel occupancy cannot be used for any subsequent SL transmissions. |

**Agreement**

The TP below is endorsed for TS38.214

**< Start of text proposal >**

8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2

In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission. To trigger this procedure, in slot *n,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:

**<Unchanged part omitted>**

7a) If sidelink DRX active time of RX UE is provided by the higher layer and there is no candidate single-slot or multi-slot resource remained within the sidelink DRX active time in the set , the UE based on its implementation additionally selects and includes at least one candidate single-slot resource or at least one candidate multi-slot resource within the sidelink DRX active time in the set .

**<End of text proposal>**

**Agreement**

Support:

* R17 SL inter-UE coordination Scheme 2 (conflict indication) **for *sl-PSFCH-Occasion* = '1'** uses the same transmission scheme (Alt 1-1b and Alt 2-3a) as HARQ-ACK in R18 SL-U
  + For Alt 1-1b, common interlace index for conflict indication and HARQ-ACK within the same RB set are the same
  + Note: Alt 1-1b and Alt 2-3a in previous agreements are as below
    - Alt 1-1b: each PSFCH transmission occupies 1 common interlace and K3 dedicated PRB(s)
    - Alt 2-3a: each PSFCH transmission occupies 1 dedicated interlace

**Agreement**

Support:

* “*One PSCCH/PSSCH transmission has N associated candidate PSFCH occasion(s)*” applies to R17 SL inter-UE coordination Scheme 2 (conflict indication) for both *sl-PSFCH-Occasion* = '0' and *sl-PSFCH-Occasion* = '1', and applies to PSFCH format 0
  + UE behaviour of PSFCH transmission and reception on such N occasion(s) of IUC scheme 2 is the same as HARQ-ACK

**Agreement**

When UE intends to transmit PSFCH, after performing PSFCH prioritization:

* if LBT fails on all RB set(s) where the UE attempts to transmit PSFCH:
  + UE drops PSFCH transmission
    - No RAN1 specification impact
* if TypeA and TypeB LBT fails on part of RB set(s) where the UE attempts to transmit PSFCH:
  + The UE may transmit PSFCH on RB set(s) where LBT was successful

**Agreement**

When a UE does not support PSFCH transmission over non-contiguous RB sets, the following belongs to PSFCH prioritization:

* UE selects contiguous RB set(s) including PSFCH(s) with smallest SL priority value. If there are more than one contiguous RB set(s) including PSFCH(s) with the same smallest priority value, it is up to UE implementation to select one contiguous RB set among them.

**Agreement**

For SL-U PHY, following higher layer parameters are endorsed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **index** | **Parameter name in the text** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** |
| 3 | intraCellGuardBandsSL-List | List of intra-cell guard bands for operation with shared spectrum channel access. If not configured, the guard bands are defined according to 38.101-1 [15], see TS 38.214 [19], clause 7. For operation in licensed spectrum, this field is absent, and no UE action is required. | SEQUENCE (SIZE (1..maxSCSs)) OF IntraCellGuardBandsPerSCS-r16  FFS: whether to exclude 0 from the value range of  nrofCRBs. | N/A | Per SL BWP |
| 6 | numRefSymbolLength | Indicates a reference number of symbols for TBS determination | ENUMERATED {sym7, sym8, sym9, sym10, sym11, sym12, sym13, sym14} | N/A | Per resource pool |
| 11 | gapBetweenSSSBrepetition | Indicate the gap between two adjacent S-SSB repetitions in frequency domain in one RB set, and the gap is between the lowest subcarrier of the upper PSBCH and the highest subcarrier of the lower PSBCH. | INTEGER(1,2,3,…, 84) PRBs | N/A | Per RB set |
| 12 | numOfAdditionalSSSBOccasion | Indicate the number of additional candidate S-SSB occasion(s) for each R16/R17 NR SL S-SSB slot | INTEGER (0,1,2,3,4) | N/A | Per SL BWP |
| 18 | SSSBPowerOffsetOfAnchorRBSet | Indicate the power offset for one S-SSB transmission on anchor RB set. anchor RB set refers to the RB set where S-SSB indicated by sl-AbsoluteFrequencySSB-r16 locates N is the number of S-SSB repetitions within the anchor RB set, W is the maximum total number of S-SSB repetitions on RB sets within the SL-BWP | EMUNERATED{{10lg(N), 10lg(W)}} | N/A | Per SL BWP |
| 19 | sl-PSFCH-RB-SetList | The n-th value in the list indicates the set of PRBs that are actually used for PSFCH transmission and reception of n-th PSFCH occasion of a PSCCH/PSSCH transmission.  It shall be (pre-)configured such that N candidate PSFCH occasion(s) are associated with N different PRB sets.  PRBs within intra-cell guard band are not used for PSFCH transmission.  N is given by *numPSFCHOccasions*. | SEQUENCE (SIZE (1..N)) OF sl-PSFCH-RB-Set  Note: some companies think that signalling overhead can be optimized by RAN2 | N/A | Per resource pool |
| 21 | sl-StartRBsetCG-Type1 | Indicates starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 for interlace RB-based PSSCH transmission  Note: M is the number of RB sets within this SL resource pool. | INTEGER (0,1,2,...,M-1) | N/A | Per Configured Grant |
| 22 | sl-RB-SetPSFCHList | The n-th value in the list indicates the set of PRBs that are actually used for inter-UE coordination information transmission and reception in Scheme 2. It shall be (pre-)configured such that N candidate PSFCH occasion(s) are associated with N different PRB sets. PRBs within intra-cell guard band are not used for PSFCH transmission.  N is given by *numPSFCHOccasions*. | SEQUENCE (SIZE (1..N)) OF sl-RB-SetPSFCH  Note: some companies think that signalling overhead can be optimized by RAN2 | N/A | Per resource pool |
| 23 | PSFCHPowerOffset | Indicates the power offset between Tx power on one common PRB (P\_common) and Tx power on one dedicated PRB (P\_dedicated) when *transmissionStructureForPSFCH* is (pre-)configured as *common interlace*, i.e., P\_common = P\_dedicated - offset.  UE expects the same (pre-)configured value of PSFCHPowerOffset across all resource pools.  The unit is dB. | INTEGER (0,1,2,…,10)  Note: this value range may need to be updated based on RAN4 reply LS | N/A | Per resource pool |
|  |  |  |  |  |  |
| 24 | RBSetIndexOfResourcePool | For interlace RB based PSCCH/PSSCH, indicates the RB set index(s) included in the resource pool.  Contiguous RB sets are (pre-)configured for a resource pool.  is the (pre-)configured number of RB sets within the SL BWP.  is the number of RB sets within the resource pool. | SEQUENCE (SIZE (1..)) OF INTEGER (0..) | N/A | Per resource pool |
| ~~25~~ | ~~sl-NumRBSetOfResourcePool~~ | ~~Indicates the number of RB set(s) within one resource pool.~~ | ~~INTEGER (0,1,2,3,4,5)~~ | ~~N/A~~ | ~~Per resource pool~~ |
| 14 | transmissionStructureForPSFCH | Indicate each PSFCH transmission occupies "1 common interlace and K3 dedicated PRB(s)", or "1 dedicated interlace".  UE expects the same (pre-)configured value of transmissionStructureForPSFCH across all resource pools. | ENUMERATED {common interlace, dedicated interlace} | N/A | Per resource pool |
| 15 | numDedicatedPRBsForPSFCH | Indicates the value of K3 when each PSFCH transmission occupies "1 common interlace and K3 dedicated PRB(s)"  UE expects the same (pre-)configured value of numDedicatedPRBsForPSFCH across all resource pools. | ENUMERATED {1,2,5} | N/A | Per resource pool |

**Agreement**

Regarding “SL-U PSFCH occupies more than 1 PRB”:

* refers to the target power on one dedicated PRB for a PSFCH transmission.



**Agreement**

TP#5-2 in Section 4.1.8 of R1-2312328 is endorsed for TS 38.213 clause 16.1.

**Agreement**

TP#1-1 in Section 4.1.1 of R1-2312328 is endorsed for TS 38.214 Clause 8.

**Agreement**

The TP below is endorsed for TS 38.214 Clause 8.1.2.1.

|  |  |
| --- | --- |
| ***Reason for change:*** | 1. The starting symbol for PSCCH/PSSCH transmission in a slot with PSFCH symbols is unclear.  2. It’s inaccurate to say that UE shall not use the second starting symbol in slots with PSFCH symbols since there is only one candidate starting symbols for PSCCH/PSSCH transmission in such slots. |
|  |  |
| ***Summary of change:*** | 1. Clarify the starting symbol for transmission in a slot with PSFCH symbols.  2. Delete the sentence “The UE shall not use the second starting symbol in slots with PSFCH symbols”. |
|  |  |
| ***Consequences if not approved:*** | 1. The starting symbol for transmission in a slot with PSFCH symbols is undefined.  2. It’s unclear where to transmit PSCCH/PSSCH in slots with PSFCH symbols. |

------------------------ Start of Text Proposal for TS 38.214----------------------------

8.1.2.1 Resource allocation in time domain

The UE shall transmit the PSSCH in the same slot as the associated PSCCH.

The minimum resource allocation unit in the time domain is a slot.

The UE shall transmit the PSSCH in consecutive symbols within the slot, subject to the following restrictions:

- The UE shall not transmit PSSCH in symbols which are not configured for sidelink. A symbol is configured for sidelink, according to higher layer parameters *sl-StartSymbol* and *sl-LengthSymbols*, where *sl-StartSymbol* is the symbol index of the first symbol of *sl-LengthSymbols* consecutive symbols configured for sidelink.

- Within the slot, PSSCH resource allocation starts at symbol *sl-StartSymbol+1,* except when *startingSymbolFirst* and *startingSymbolSecond* are provided for a SL-BWP*.* If *startingSymbolFirst* and *startingSymbolSecond* are provided for the SL-BWP, there are 2 candidate starting symbols, given by *startingSymbolFirst* and *startingSymbolSecond* respectively, for PSSCH transmission for slots without PSFCH symbols; and there is 1 starting symbol, given by *startingSymbolFirst*, for PSSCH transmission for slots with PSFCH symbols. PSSCH resource allocation starts at the next symbol after each candidate starting symbol. In a slot, the UE may use the second candidate starting symbol, provided by *startingSymbolSecond*, only if it fails to access the channel prior to the first candidate starting symbol provided by *startingSymbolFirst.*

< Unchanged parts are omitted >

---------------------------------- End of Text Proposal ---------------------------------

**Agreement**

TP#3-1 in Section 4.1.3 of R1-2312328 is endorsed for TS 38.214 Clause 8.

**Conclusion**

RAN1 does not pursue specific enhancements to avoid COT interruption due to PSFCH occasion(s) in R18 NR SL.

**Conclusion**

Regarding “*UE may transmit S-SSB repetition in more than one RB set*”, no optimization in Rel-18 for reducing PAPR.

**Agreement**

When interlace RB based PSCCH/PSSCH transmission is used, R17 SL inter-UE coordination Scheme 1 (preferred/non-preferred resources) is supported

* SCI format 2C is updated to include RB set related information

**Conclusion**

Considering PSD limit in unlicensed spectrum regulation, a UE meets the PSD limits by UE implementation, e.g. by scaling down the power of SL transmissions or dropping some of the PSFCH transmissions, etc.

**Agreement**

For TS 38.213 Clause 16.2.0, adopt the following TP:

* “…, the UE equally allocates power remaining from , if any, for transmission of each S-SS/PSBCH block in all non-anchor RB-sets within the SL BWP”



|  |  |
| --- | --- |
| ***Reason for change:*** | When UE transmits S-SSB in more than one RB set, how to allocate remaining power from to non-anchor RB set(s) is unclear. |
|  |  |
| ***Summary of change:*** | Clarify that the UE equally allocates power remaining from , if any, for transmission of each S-SS/PSBCH block in all non-anchor RB-sets within the SL BWP” |
|  |  |
| ***Consequences if not approved:*** | When UE transmits S-SSB in more than one RB set, how to allocate remaining power from to non-anchor RB set(s) is unclear. |

**Agreement**

TP#3-2 in Section 4.1.4 of R1-2312531 is endorsed for TS 38.214 Clause 8.1.5.

**Agreement**

The TP below is endorsed for TS 38.213 Clause 16.5.

|  |  |
| --- | --- |
| ***Reason for change:*** | In SL-U, the “candidate” PSFCH transmission occasions are defined in TS 38.213. The current specification indicates the last PSFCH reception occasion is used as a reference slot in determining the PUCCH or PUSCH transmission slot for reporting sidelink HARQ-ACK information to gNB, which is not accurate. According to RAN1 #114bis agreement, the last “candidate” PSFCH reception occasion is used as a reference slot in determining the PUCCH or PUSCH transmission slot for reporting sidelink HARQ-ACK information to gNB. |
|  |  |
| ***Summary of change:*** | When *numPSFCHOccasion* is (pre-)configured, the last “candidate” PSFCH reception occasion is used as a reference slot in determining the PUCCH or PUSCH transmission slot for reporting sidelink HARQ-ACK information to gNB. |
|  |  |
| ***Consequences if not approved:*** | There is ambiguity on which PSFCH reception occasion is used as reference slot in determining the PUCCH or PUSCH transmission slot for reporting HARQ-ACK information to gNB. |

------------------------ Start of Text Proposal for TS 38.213---------------------------

**16.5 UE procedure for reporting HARQ-ACK on uplink**

\*\*\* Unchanged parts are omitted \*\*\*

A UE does not expect to be provided PUCCH resources or PUSCH resources to report HARQ-ACK information that start earlier than after the end of a last symbol of a last PSFCH reception occasion if *numPSFCHOccasions* is not (pre-)configured or of a last candidate PSFCH reception occasion if *numPSFCHOccasions* is (pre-)configured, from a number of PSFCH reception occasions if *numPSFCHOccasions* is not (pre-)configured or a number of candidate PSFCH reception occasions if *numPSFCHOccasions* is (pre-)configured, that the UE generates HARQ-ACK information to report in a PUCCH or PUSCH transmission, where



\*\*\* Unchanged parts are omitted \*\*\*

With reference to slots for PUCCH transmissions and for a number of PSFCH reception occasions if *numPSFCHOccasions* is not (pre-)configured or candidate PSFCH reception occasions if *numPSFCHOccasions* is (pre-)configured, ending in slot , the UE provides the generated HARQ-ACK information in a PUCCH transmission within slot , subject to the overlapping conditions in clause 9.2.5, where is a number of slots indicated by a PSFCH-to-HARQ feedback timing indicator field, if present, in a DCI format indicating a slot for PUCCH transmission to report the HARQ-ACK information, or is provided by *sl-PSFCH-ToPUCCH* for a transmission scheduled by a DCI format or for a SL configured grant type 2, or by *sl-PSFCH-ToPUCCH-CG-Type1* for a SL configured grant type 1. corresponds to a last slot for a PUCCH transmission that would overlap with the last PSFCH reception occasion if *numPSFCHOccasions* is not (pre-)configured or the last candidate PSFCH reception occasion if *numPSFCHOccasions* is (pre-)configured, assuming that the start of the sidelink frame is same as the start of the downlink frame [4, TS 38.211].



\*\*\* Unchanged parts are omitted \*\*\*

**Co-channel coexistence for LTE sidelink and NR sidelink**

* **Maintenance in RAN1#114bis**

**Agreement**

Text Proposal 1 (I) in Section 4.1.1 of R1-2309240 is endorsed for TS 38.214 clause 8.1.4.

**Agreement**

Text Proposal 3 (II) in Section 4.1.3 of R1-2309240 for TS 38.214 clause 8.1.4 is endorsed with the following change:

* The UE shall perform the procedures in 5LTE1, 5LTE3 and 6LTE based on the information for these LTE subframes which is known to the NR radio access at the latest *T* msec prior to slot *n*.

**Agreement**

Endorse the TP below

* Reason for change:
  + The agreement of “The starting symbol of the first of the overlapping NR SL slots is assumed to be aligned with the first symbol of the LTE SL subframe” is not specified.
* Summary of change:
  + The first symbol of the earlier overlapping NR SL slot and the first symbol of the overlapping LTE SL subframe are aligned in boundary.
* Consequences if not approved:
  + It may result in an AGC issue and performance degradation of LTE SL reception for the case when the SCS of NR SL is 30kHz.

|  |
| --- |
| ---------------- Start of Text Proposal for TS 38.214 -----------------------------  8. Physical sidelink shared channel related procedures  < Unchanged parts are omitted >  A UE is not expected to use the last PRBs in the resource pool.  In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink, for NR sidelink transmissions in 30kHz SCS, the UE expects that the start of the first symbol of the earlier overlapping NR SL slot is aligned with the start of the first symbol of the overlapping LTE SL subframe.  < Unchanged parts are omitted >  ---------------- End of Text Proposal for TS 38.214 ------------------------------ |

**Agreement**

Text Proposal 4-2 (I) in Section 4.1.4 of R1-2309240 is endorsed for TS 38.213 clause 16.7.

**Agreement**

To enable or disable the NR SL resource (re)selection with the dynamic resource pool sharing,

* Add following red changes to the description of sl-NRPSSCH-EUTRA-ThresRSRP-List:
  + *Indicates a list of 64 thresholds, and a threshold should be selected based on the priority in the decoded EUTRA SCI and the priority in the NR SCI to be transmitted. A NR SL resource is excluded if it is indicated or reserved by the decoded EUTRA SCI and EUTRA PSSCH RSRP in the associated data resource is above the threshold. If the field is present, the UE shall perform the dynamic co-channel coexistence of LTE sidelink and NR sidelink as specified in TS 38.214; otherwise it shall not perform it.*

**Agreement**

Endorse the TP below:

* Reason for change:
  + To align terminology between PHY and MAC specifications
* Summary of change:
  + In Step of 5LTE2, “LTE V2X” is replaced with “LTE V2X sidelink” in Step 5LTE2.
* Consequences if not approved:
  + No consistency between PHY and MAC specifications.

|  |
| --- |
| ---------------- Start of Text Proposal for TS 38.214 -----------------------------  8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2  < Unchanged parts are omitted >  5LTE2) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The UE shall exclude any candidate single-slot resource from the set if all the following conditions are met:  - the UE has a selected sidelink grant for LTE V2X sidelink according to [19, TS 36.321].  - the selected sidelink grant for LTE V2X sidelink determines the set of LTE resource blocks and LTE subframes which overlaps in time with for *j=*0, 1, …, ;  - the priority value associated with the selected sidelink grant for LTE V2X sidelink is lower than ; It is up to UE implementation whether or not to apply this exclusion step if the priority value associated with selected sidelink grant for LTE V2X sidelink is higher than or equal to .  < Unchanged parts are omitted >  ---------------- End of Text Proposal for TS 38.214 ------------------------------ |

**Agreement**

Text Proposal 7 (I) in Section 4.1.6 of R1-2309240 is endorsed for TS 38.214 clause 8.1.4.

**Agreement**

Text Proposal 2 (III) in Section 4.2.1 of R1-2309241 is endorsed for TS 38.214 clause 8.1.4.

* **Maintenance in RAN1#115**

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 2 (I) in Section 4.1.2 of R1-2312259 (for TS 38.214 clause 8.1.4) for capturing the information shared by the E-UTRA radio access, and the TP is not pursued in Rel-18.

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 3 (I) in Section 4.1.3 of R1-2312259 (for TS 38.214 clause 8.1.4), for the conditions under which NR SL candidate resource exclusion based on LTE SL own transmissions is performed in Step 5LTE2, and the TP is not pursued in Rel-18.

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 5 (I) in Section 4.1.4 of R1-2312259 (for TS 38.214 clause 8.1.4), for performing exclusion of NR SL candidate resource overlapping with LTE PSCCH resources for non-adjacent LTE PSCCH/PSSCH resources in Step 5LTE1, and the TP is not pursued in Rel-18.

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 6 (I) in Section 4.1.5 of R1-2312259 (for TS 38.214 clause 8.1.4), for clarification of LTE SCI format 1 being received by LTE SL module in Step 5LTE3, and the TP is not pursued in Rel-18.

**Conclusion**

There is no consensus in RAN1 to endorse Text Proposal 12 (I) in Section 4.1.11 of R1-2312259 (for TS 38.214 clause 8.1.4), for further enhancement of performing pre-emption of NR SL resources overlapping with LTE SL resources selected to be used by its own LTE SL module, and the TP is not pursued in Rel-18.

**Agreement**

Text Proposal 1 (II) in Section 4.2.1 of R1-2312260 is endorsed for TS 38.214 clause 8.1.4.

**Conclusion**

RAN1 does not pursue specific enhancement on alignment between reserved slots of NR SL and reserved subframes of LTE SL.

**Conclusion**

RAN1 does not pursue specific enhancement on alignment of SFN/DFN indices between LTE SL and NR SL for dynamic resource pool sharing.

**Conclusion**

RAN1 does not pursue specific enhancement on further exclusion of NR SL candidate resources of which PSFCH slots overlapping with its own LTE SL resources for dynamic resource pool sharing.

**Conclusion**

RAN1 does not pursue specific enhancement on Q formula to derive periodic LTE SL resources for dynamic resource pool sharing.

**NR sidelink enhancement in FR2 licensed spectrum**

* **Study completed in RAN1#114, no handling in Q4 2023.**

#### 2.2.2 Remaining Open issues

**None.**

## 2.2 RAN2

#### 2.2.1 Agreements

**Organizational**

* **Progress made in RAN2#123bis**

R2-2311497 Summary of [AT123bis][106][V2XSL] MAC detailed open issues (LG) LG

Proposal 1 (8/0): Condition for stopping the ongoing Random Access procedure in SL consistent LBT failure recovery similar to NR-U is introduced in SL-U. Detail wording on this UE procedure is discussed in MAC running CR discussion (“[POST123bis][105][V2X/SL] 38.321 running CR”).

Proposal 2 (8/0): UE behaviour related to Inter-UE LBT blocking is specified using NOTE-based approach.

Proposal 3 (1/4): UE behaviour for S-SSB transmission (i.e., whether the MAC entity performs LBT counting for S-SSB transmission in the RB set that does not belong to the resource pool(s).) is not specified in the MAC running CR.

Proposal 4 (2/3): How to specify the UE procedure for selecting the resource pool considering the packet-related HARQ attribute and PSFCH attribute of a pool(s) is discussed in detail in the Running CR discussion (“[POST123bis][105][V2X/SL] 38.321 running CR”).

Proposal 5 (option 3: 5, option 4: 4): The available SL carriers for SL RLF declaration are the carriers selected by UE among the carrier set configured by the network.

Proposal 6 (1/6): Proposal 8 (i.e., “When SL consistent LBT failure of a RB set has been cancelled, UE should stop the SL consistent LBT failure recovery timer associated with this RB set, if running”) in R2-2309814 is not agreed.

Proposal 10 (1/6): Proposal 13 (i.e., “Upon successful transmission of the SL consistent LBT failure MAC CE to the network, UE shall cancel all the triggered consistent LBT failure(s) in RB sets for which consistent LBT failure was indicated.”) in R2-2309814 is not agreed.

Proposal 11 (6/2): Proposal 10 (i.e., “For COT sharing, the selected LCH should have a CAPC smaller than or equal to the CAPC indicated in the COT sharing information.” and correspoiding TP) in R2-2309815 is agreed.

Proposal 12 (8/0): Proposal 9 (i.e., “As in NR-U, SL consistent LBT failure MAC CE may be mapped to zero or one SR configuration.”) in R2-2310143 is agreed.

Proposal 13 (0/8): Proposal 3 (i.e., “RAN2 to revise the running CR text covering exclusion of pools with C-LBT detected to state that the UE may select any pool of resources with at least one RB-set where C-LBT has not been detected.”) in R2-2310159 is not agreed.

Proposal 14 (7/1): UE should clear the selected sidelink grant and regenerate a new sidelink grant even if C-LBT failure detected in only some RB sets in the sidelink grant generated from the selected resource pool that spans multiple RB sets.

Proposal 16 (1/5): Proposal 2a (i.e., “Remove the separate MAC entity behaviors for “if single carrier frequency is used for NR sidelink” and “else (i.e. multiple carrier frequencies are used for NR sidelink)” in 5.22.1.1. Instead just add TX carrier selection procedure on top of common MAC entity behavior for each SL carrier.”) in R2-2310969 is not agreed.

Proposal 17 (5/0): Proposal 2b (i.e., “If proposal 2a is not agreed, it is proposed to change “is/are used” to “is/are configured” in “if single carrier frequency is used for NR sidelink” and “else (i.e. multiple carrier frequencies are used for NR sidelink”.”) in R2-2310969 is agreed.

Proposal 18: P3/4a/4b/5/6/7 (CA related suggestions) in R2-2310969 is discussed in MAC running CR discussion (“[POST123bis][105][V2X/SL] 38.321 running CR”).

Proposal 19 (0/8): Proposal 8 (i.e., “Remove new section 5.22.1.2c and instead simply add SL LBT failure indication reception as an additional condition into 5.22.1.2.”) in R2-2310969 is not agreed.

Proposal 20: SL-CA RLF related proposals (i.e., proposal 5 in R2-2309816, proposal 11/12 in R2-2310132, proposal 9 in R2-2310969) are discussed in MAC running CR discussion (“[POST123bis][105][V2X/SL] 38.321 running CR”).

=> All proposals are agreed.

R2-2311499 Summary on [AT123bis][108][V2X/SL] 38.306 running CR (Huawei)

Proposal 1: Remove per UE capability ca-Sidleink-r18 in current running 306/331 CRs.

Proposal 2: Remove Introduce sl-LBT-FailureDetectionRecovery-r18 as per UE capability.

Proposal 3: Introduce pdcp-DuplicationSRB-sidelink-r18 and pdcp-DuplicationDRB-sidelink-r18.

Proposal 4: No suffix for added value "rel18" for field AccessStratumReleaseSidelink-r16.

=> All proposals are agreed

R2-2311500 Running CR of TS 38.306 for Rel-18 SL evolution => Endorsed

R2-2311501 Running CR of TS 38.331 on UE capability for Rel-18 SL evolution => Endorsed

* **Progress made in RAN2#124**

RAN2 understands TX profile for CA/PDCP duplication is applied only to GC/BC.

R2-2313611 Summary of [AT124][109][V2X/SL] Rel-18 UE capability CR (Huawei)

Proposal 1: For higher layer UE capability signaling, RAN2 to define pdcp-DuplicationSRB-sidelink-r18 and pdcp-DuplicationDRB-sidelink-r18 as UE capability parameters for all cast types for Rel-18 SL evolution.

Proposal 2: For higher layer UE capability signaling to gNB, RAN2 to define sl-LBT-FailureDetectionRecovery-r18 as per UE and for all cast type for Rel-18 SL evolution.

Proposal 3: No need for RAN2 to introduce a further higher layer UE capability for NR SL communication with SL CA, other than RAN1 defined capability “47-v1, NR SL communication with SL CA”.

=> All proposals are agreed.

R2-2313612 Draft introduction of SL evolution for TS 38.306

=> Endorsed.

R2-2313613 Draft introduction of SL evolution UE capabilities for TS 38.331

=> Endorsed.

R2-2313614 Draft Rel-18 RAN2 TP for TR 37.985

=> Endorsed.

R2-2313615 LS on Rel-18 RAN2 TP for TR 37.985

=> Approved.

**WI is completed.**

**NR sidelink CA operation**

* **Progress made in RAN2#123bis**

**Agreements on PC5-RRC**

1. Confirm the working assumption “SL CA/PDCP duplication is applied to PC5-RRC after SL link is established”.

**Agreements on need of primary leg**

1. Not to define primary leg, RLC entity

2. PDCP control PDU is sent over one leg, RLC entity, determined by UE implementation.

**Agreements on duplicated PDU discard**

1. Duplicate PDU discard procedure applied to the Uu PDCP entity associated with AM RLC entities is reused for SL PDCP duplication in unicast.

**Agreements on PC5-RRC**

1. Include NR SL-CA-related capability into UECapabilityInformationSidelink message.

2. Include carrier configuration into RRCReconfigurationSidelink message.

3. If UE-A delivers RRCReconfigurationSidelink to UE-B including carrier configuration, it takes effect for the subsequent transmission from UE-A to UE-B for all SLRBs, after receiving RRCReconfigurationCompleteSidelink.

4. Legacy single carrier is used for PC5-S/PC5-RRC signaling exchange before receiving RRCReconfigurationCompleteSidelink.

**Agreements on SRBs**

1. SL PDCP duplication can be applied to SL-SRB3 only after receiving RRCReconfigurationCompleteSidelink.

2. SL PDCP duplication can be applied to SL-SRB1/2 only after receiving RRCReconfigurationCompleteSidelink.

3. Will not discuss the scenario that is related to SL relay.

**Agreements on Security**

1. Small LCID (between 1 to 19) among all LCIDs associated with PDCP entity is used in security handling for PDCP duplication.

**Agreements on CSI reporting MAC CE**

1. Working assumption: It is up to UE implementation in which carrier the UE sends CSI reporting MAC CE.

**Agreements on SL RLF**

1. In TX UE, per carrier “carrier failure” is introduced. If “carrier failure” is declared for a carrier, the carrier should be removed/released. The carrier (re)selection can be triggered. For UC, this carrier can be released via PC5 RRC reconfiguration.

**Agreements on CA/PDCP duplication configuration**

1. For STCH, if TX profile indicates backwards-incompatible, for RRC\_IDLE/RRC\_INACTIVE/OOC case, leave the decision of per-LCH carrier set for PDCP duplication to Tx UE implementation.

2. For STCH, if TX profile indicates backwards-incompatible, for RRC\_CONNECTED, dedicated-RRC provides per-LCH carrier set configuration

3. For STCH, if TX profile indicates backwards-incompatible, for RRC\_CONNECTED, for a SLRB configured with duplication, Tx UE uses duplication

4. For SCCH, at least for RRC\_IDLE/RRC\_INACTIVE/OOC cases, leave the decision of per-LCH carrier set for PDCP duplication to Tx UE implementation

5. For SCCH, add additional RLC leg configuration into specified SCCH configuration (w/o disable/enable flag), and leave the enable/disable decision of PDCP duplication to Tx UE implementation.

6. Include flow-to-carrier mapping for each destination into SUI message.

7. For STCH, if TX profile indicates backwards-incompatible, for RRC\_IDLE/RRC\_INACTIVE/OOC case, the Tx UE uses duplication based on SIB/Preconfiguration (e.g. if PDCP duplication is configured for the SLRB)

8. For STCH, if TX profile indicates backward compatible, leave it to UE implementation on whether to use single carrier transmission or PDCP duplication.

**Agreements on PC5-RRC**

1. For UC, include the PDCP duplication configuration into PC5-RRC, for SRB and DRB. For SRB, PDCP duplication configuration just indicates whether PDCP duplication is used or not.

**Agreements on PDCP duplication activation/deactivation SL MAC CE**

1. Not to define separate PDCP duplication activation/deactivation SL MAC CE (including Uu MAC CE).

* **Progress made in RAN2#124**

**Agreements on QoS flows mapping to carriers**

1. Intersection among QoS flow ids belonging to a SLRB is considered in LCP. RAN2 understand NW/upper layer provides appropriate intersections if the service wants CA/PDCP duplication.

R2-2313623 LS to SA2 on QoS to Carrier Mapping for SL CA => Approved

**Agreements on CSI reporting MAC CE:**

1. Working assumption (It is up to UE implementation in which carrier the UE sends CSI reporting MAC CE) is confirmed.

R2-2313621 LS on Sidelink CSI Reporting MAC-CE for SL-CA => Approved.

**Agreements on carrier set determination for SCCH (for RRC connected UE):**

1. NW configures carrier set, but if no carrier set in NW configuration, it’s up to UE implementation.

**Agreements on additional carrier determination for STCH in PDCP duplication:**

**1. When TX profile extension indicates backward-compatible and if the UE decides to use PDCP duplication, a) Leave it to UE implementation for RRC idle/inactive state and b) Dedicated-RRC provides per-LCH carrier set configuration for RRC connected state.**

**Agreements on TX UE’s determination of carrier set to be delivered to the RX UE:**

**1. Include simple normative text indicating TX UE determines the carrier configuration with the consideration of at least upper layer configuration, gNB configuration and both TX and RX UEs’ capabilities. Detailed wordings are relied on RRC CR rapporteur.**

**SUI enhancement:**

**1. Include per-carrier RLF information**

**2. Per-carrier RLF information is included as explicit information.**

**SUI enhancement:**

**1. Include TX profile extension information.**

**Per-carrier CBR measurement configuration:**

**1. Introduce frequency dimension (i.e. carrier index) for SL CBR measurement object configuration. How to capture it in RRC will be discussed in RRC CR implementation.**

**NR Sidelink operation in FR1 unlicensed spectrum**

* **Progress made in RAN2#123bis**

**Agreements on resource (re)selection:**

1. R2 not pursue the UE behavior of prioritizing the resources within a shared COT during resource selection step.

2. R2 not pursue the UE behavior of triggering a resource reselection upon reception of a usable shared COT.

3. MAC layer, based on UE implementation, decides whether to indicate a “number of consecutive slots for MCSt” larger than 1.

4. MAC layer, based on UE implementation, decides the value of “number of consecutive slots for MCSt”, as long as it meets the CAPC maximum COT duration requirement.

5. For a resource pool configured with PSFCH resource, UE can NOT select consecutive slots (i.e., MCSt) for transmissions of a single TB.

6. In case of MCSt, still rely on the legacy remaining PDB indication from MAC to PHY upon resource (re)selection.

**Agreements on resource (re)selection:**

1. R2 confirm the WA that UE may avoid selection of N consecutive resource(s) before a reserved resource of its own, if the two cannot constitute a MCSt transmission. Where the selection of N from {0,1,2} and the judgment of whether MCSt transmission is feasible are both up to UE implementation.

2. R2 confirm the WA that UE may avoid selection of N consecutive resource(s) after a reserved resource of its own, if the two cannot constitute a MCSt transmission. Where the selection of M (at least including 0). and the judgment of whether MCSt transmission is feasible are both up to UE implementation.

**Agreements on HARQ RTT:**

1. For Groupcast, Rx UEs start the sl-drx-HARQ-RTT-Timer for the corresponding Sidelink process in the first slot following the last PSFCH occasion for SL HARQ feedback.

**Agreements on the need of C-LBT failure indication to the peer UE:**

1. Not to introduce C-LBT failure indication to the peer UE

**Agreements on MCSt:**

1. RAN2 confirms that only Approach 1 and 2 are supported for MCSt in Rel-18 SL-U

**Agreements on MCSt:**

1. Working assumption: Trigger resource (re)selection if all initial transmission and retransmission within MCSt fail due to LBT failure. It should provide minimum specification change.

**Agreements on MCSt:**

1. No additional mechanism is needed to handle multiple TB case.

**Agreements on MCSt:**

1. For the subsequent slots in MCSt, LCP procedure for COT initiating UE is enhanced: the LCHs with lower or equal CAPC than the CAPC value used for LBT check for the first TB.

**Agreements on MCSt:**

1. Not to introduce reporting a “number of consecutive slots for MCSt” to the gNB

**Agreements on CG:**

1. Not support cross-CG period autonomous retransmission and asynchronous HARQ.

**Agreements on SL C-LBT failure cancellation:**

1. C-LBT-F cancellation based on UL C-LBT-F MAC-CE report does not apply to RRC\_CONNECTED mode-2 UE.

**Agreements on LBT type determination**

1. R2 not pursue specifying which layer to decide on LBT type

**Agreements on DTX based SL RLF:**

1. TX UE will not regard the SL transmission as SL DTX, when LBT failure is detected for its SL transmission.

2. the TX UE increases the DTX counter by one when it fails to detect the HARQ feedback on all the associated PSFCH resources. Stage 3 spec impact can be further checked.

* **Progress made in RAN2#124**

**Agreements on NACK only based HARQ feedback for GC:**

1. For SL-U, RAN2 confirms NACK-only HARQ feedback cannot be supported for groupcast.

2. Add (update) a note for the clarification into MAC. It is up to MAC CR rapporteur how to capture it as a note. Simple normative sentence is also added to 38.300 (up to 38.300 CR rapporteur).

**Agreements on MCSt resource (re)selection triggering:**

1. Working assumption (Trigger resource (re)selection if all initial transmission and retransmission within MCSt fail due to LBT failure. It should provide minimum specification change.) is confirmed.

2. For MCSt, during resource (re)selection, leave it to UE implementation, regarding whether to calculate HARQ retransmission number based on the number of MCSt transmissions, or the number of slot(s) within MCSt transmission.

**Agreements on E-LCP impact on MCSt:**

1. RAN2 to withdraw below RAN2 agreement (For the subsequent slots in MCSt, LCP procedure for COT initiating UE is enhanced: the LCHs with lower or equal CAPC than the CAPC value used for LBT check for the first TB.).

**MCSt (multiple TB case):**

1. For remaining slot(s) in case transmission is successful for one TB in MCSt (multiple TB case), the UE still performs retransmission for this TB in the remaining slot(s).

**MCSt (multiple TB case):**

1. Not introduce “For MCSt with multiple TB case, retransmit TB associated with dropped transmission due to LBT failure on next available MCSt resource, if TB sizes matches.”.

**Control plane**

* **Progress made in RAN2#124**

**RRC details:**

1. Upper layer indicate Tx profile per-flow. Send LS to SA2 and CT1 to inform RAN2 decision on granularity of Tx Profile to AS-layer.

2. The “legacy single carrier” in the NR SL CA context is the SL carrier configured by sl-FreqInfoList-r16/sl-FreqInfoToAddModList-r16.

3. For STCH in SL unicast, an RRC\_IDLE/INACTIVE/OoC UE use PDCP duplication, in case the SL-DRB is configured with PDCP duplication in SIB/pre-configuration, and if peer UE’s capability supports it. How to capture that can be up to running-CR discussion.

4. Rely on clause 16.9.Y of the Stage 2 TS 38.300 CR to clarify that “the additional frequency list for sidelink CA operation is only used for V2X case in this release”.

5. Confirm trigger condition in running CR for QoS flow to carrier mapping information reporting, but remove “sl-FreqInfoList/”.

6. If at least one QoS flow having Tx profile with value set to backwards compatible is mapped to the radio bearer, legacy carrier is used for transmission for this radio bearer, for RRC\_IDLE/RRC\_INACTIVE/OOC case. How to capture that is up to running-CR discussion.

**User plane**

* **Progress made in RAN2#124**

**PDCP details:**

1. As in LTE SL CA, configuration of two RLC entities for an SL PDCP entity is only used for PDCP duplication, but not used to support any other functionality (e.g. split bearer and related operation).

2. As in LTE SL PDCP duplication, if the transmitting PDCP entity is configured with PDCP duplication (i.e. configuration of two associated RLC entities), it shall activate and perform PDCP duplication until de-configuration/release of the additional RLC entity. No additional PDCP duplication activation/deactivation mechanism is supported.

**MAC details:**

1. SL DRX and IUC is not considered in resource selection of co-channel coexistence of LTE sidelink and NR sidelink until it becomes clear that SL DRX and IUC are supported in co-channel coexistence.

2. RAN2 agrees to capture UE behavior in the MAC as a NOTE or simple normative text, ensuring that the Mode 2 UE transmits the SL LBT failure MAC CE only once.

3. RAN2 confirm that UE cannot select any MCSt resources at all, even for the transmission of the “HARQ feedback disabled” TB, in a resource pool configured with PSFCH resource.

4. RAN2 agree to add a description that excludes RB set resources where SL C-LBT failure was detected in the random selection part of clause 5.22.1.1.

5. The per-LCH carrier set restriction is to be indicated from RRC-layer to MAC-layer, for LCP procedure.

**NR sidelink enhancement in FR2 licensed spectrum**

* **Progress made in RAN2#123bis**

For R18 SL-FR2 initial beam-pairing, no need for further study work at R2. => Agreed.

For R18 SL-FR2 beam management, no need for further study work at R2. => Agreed.

For R18 SL-FR2 beam-based RRM measurement report, no need for further study work at R2. => Agreed.

For R18 SL-FR2 beam failure detection, no need for further study work (also including whether TX based or RX based detection) at R2. => Agreed.

For R18 SL-FR2 beam failure report/handling, no need for further study work at R2. => Agreed.

**Agreement on SL-FR2**

1. Study for SL FR2 for Rel-18 is completed from RAN2 perspective

#### 2.2.2 Remaining Open issues

**None.**

## 2.3 RAN3

#### 2.3.1 Agreements

**NR sidelink CA operation**

* **Progress made in RAN3#122**

R3-237950 Introduction of SL CA over F1 interface ZTE Corporation, Nokia, Nokia Shanghai Bell, Samsung Electronics Co., Ltd, Philips International B.V., CATT, LG Electronics Inc., China Telecom, Intel Corporation, Qualcomm Inc., Sanechips

=> Agreed

#### 2.3.2 Remaining Open issues

None.

## 2.4 RAN4

#### 2.4.1 Agreements

**1) Core part:**

* The RF core part work for SL enh WI is completed.
* RAN4 RRM core part work of NR\_SL\_enh2 WI can be closed.
* **NR sidelink CA operation**
* **Progress made in RAN4#108bis**

**RF part (As captured in WF R4-2317731 WF on NR\_SL\_enh2\_UERF\_part3)**

**Issue 1-1: PEMAX,CA for SL CA**

<Way Forward>: Send LS to RAN2 to capture PEMAX,CA for SL CA.

**Issue 1-2: Configured trasmitted power for SL CA**

Option 4: OPPO

PCMAX\_L ≤ PCMAX ≤ PCMAX\_H

PCMAX\_L = MIN{10 log10 ∑ pEMAX,c - TC , PPowerClass,CA – MAX(MAX(MPR, A-MPR) + ΔTIB,c + TC, P-MPR), PRegulatory }

PCMAX\_H = MIN{10 log10 ∑ pEMAX,c , ,PPowerClass,CA, PRegulatory}

<Online Agreement>: Add PEMAX,CA based on Option 4.

**Issue 1-3: PSSCH/PSCCH MPR for SL CA**

<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 |

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

<Way Forward>: Encourage companies to bring simulation results for PSFCH and S-SSB MPR in SL CA.

Issue 1-5: 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.

**RRM part (As agreed in R4-2317375 WF on R18 NR SL RRM requirements (part 2))**

**Issue 1-1: Constraints on interruptions to WAN at SL carrier addition/release due to paging and SIB reception**

* + Option 1(Ericsson, LGE, OPPO, Nokia): Add the constraints on interruptions to WAN at SL carrier addition/release during WAN paging or system information reception
  + Option 2(Xiaomi, QC): Do not introduce constraints on interruptions to WAN at SL carrier addition/release during WAN paging or SIB reception.

Agreement:

FFS if interruptions to WAN at SL carrier addition/release is allowed during WAN paging or system information reception

FFS whether the scenario is valid that SL carrier addition/release can collide with WAN paging or SIB reception in RRC\_IDLE/RRC\_INACTIVE mode and whether LS is needed.

FFS if RLF and CBD should be protected.

* **Progress made in RAN4#109**

**RF part**

**None**

**RRM part (As agreed in WF R4-2321585 WF on R18 NR SL RRM requirements (part 2))**

Agreement:

* Introduce constraints on interruptions to WAN at SL carrier addition/release ONLY due to paging and SIB reception for UE in RRC\_IDLE/INACTIVE mode.
* Companies to further discuss on the RLF and CBD parts. Prepare the draft CR based on the agreed scenario for the interruption constraint in this meeting.
* **NR Sidelink operation in FR1 unlicensed spectrum**
* **Progress made in RAN4#108bis**

**RF part (As agreed in WF R4-2317720 WF on NR\_SL\_enh2\_UERF\_part1)**

**Sub-topic 2-1 Simulation assumption**

Agreement

* + The simulation scenarios are quite aligned.
  + No need to further discuss.
  + Focus on the MPR and A-MPR simulation results based on these scenarios.

**Issue 2-1-2: Simulation assumption for PSFCH**

Agreement:

* + With the above statement, it is suggested to add below text for simulation assumption:

Table 6 SL-U UE’s MPR simulation assumptions for PSFCH transmission

|  |  |
| --- | --- |
| Items | Assumption |
| Modulation for PSSCH | QPSK |
| PSFCH | ZC sequence |
| Structure of Slot | Baseline is follow RAN1 agreements |
| RB allocation | - Power per RB is same in PSFCH for all users  - Total power is 20dBm  - Single RB-set and multiple RB-sets will be considered based on RAN1 decision.  For single RB-set, RAN4 consider interlacing RBs for PSFCH  For multiple RB-sets, RAN4 considers both contiguous RB sets and non-contiguous RB sets.  - N gap from RBstart to RBend of interlaced transmission should meet at least 80% of channel bandwidth in a single RB-set [, Ngap = RBend – RBstart ].  - RB allocation method as NR SL legacy RB allocation is also considered. |

**Issue 2-1-4: SEM for SL-U with contiguous and non-contiguous RB-sets**

Agreement:

Capture the SEM as appendix in R4-2315542 into TR

**Issue 2-2-2: MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Table: SL-U MPR requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Pre-coding | Modulation | RB Allocation | |
|  |  | Full (dB) | Partial (dB) |

|  |  |  |  |
| --- | --- | --- | --- |
| CP-OFDM | QPSK | ≤ 3.5 | ≤ 3.5 |
| 16 QAM | ≤ 4.0 | ≤ 4.0 |
| 64 QAM | ≤ 5.5 | ≤ 5.5 |
| 256 QAM | TBD | TBD |
| NOTE 1: The average method will be used to derive the MPR values  NOTE 2: The wide band operation MPR will be further discussed next meeting. | | | |

**Issue 2-3-1: A-MPR simulatrion results for PSSCH/PSCCH:**

**Issue 2-3-1-1: NS\_31 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Capture the ranges in the table for NS\_31 A-MPR based on companies’ results and use it as the starting point to derive the values.

Consider different regions, i.e., inner and outer, when companies provide the simulation results next meeting.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pre-coding** | **Modulation** | **RB Allocation (Note 2)** | **RB Allocation (Note 3)** | |
|  |  | **Full/Partial** | **Full (dB)** | **Partial (dB)** |
| CP-OFDM | QPSK | See Table 6.2F.2-1 | ≤ [4.5~8.3] | ≤ [5.7~8.6] |
|  | 16 QAM | ≤ [4.5~8.0] | ≤ [5.8~9.0] |
|  | 64 QAM | ≤ [4.5~8.0] | ≤ [6.0~9.3] |
|  | 256 QAM | ≤ [5.6~8.0] | ≤ [5.9~9.5] |

**Issue 2-3-1-2: NS\_53 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Capture the ranges in the table for NS\_53 A-MPR based on companies’ results and use it as the starting point to derive the values.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pre-coding** | **Modulation** | **Channel bandwidth (Sub-band allocation) / RB Allocation** | | | | | | | | | |
| **20MHz** | | **40MHz** | | **60MHz** | | **80MHz** | | **100MHz** | |
| **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** |
| CP-OFDM | QPSK | ≤[7.5~9.0] | ≤[7.6~12.0] | ≤[6.5~7.0] | ≤ [7.3~8.5] | ≤[4.5~6.7] | ≤ [6.5~7.4] | ≤[4.0~6.4] | ≤ [5.5~7.4] | ≤[3.5~4.0] | ≤ [4.5] |
| 16 QAM | ≤ [7.5~9.0] | ≤[7.8~12.0] | ≤ [6.5~6.9] | ≤ [7.4~8.5] | ≤ [4.5~6.8] | ≤ [6.5~7.6] | ≤ [4.0~6.4] | ≤ [5.5~7.6] | ≤ [4.0] | ≤ [4.5] |
| 64 QAM | ≤ [7.5~9.0] | ≤[8.0~12.0] | ≤ [6.5~7.0] | ≤ [7.6~8.5] | ≤ [5.5~6.8] | ≤ [6.5~7.8] | ≤ [5.5~6.5] | ≤ [5.5~7.8] | ≤ [5.5] | ≤ [5.5] |
| 256 QAM | ≤ [7.5~9.0] | ≤[8.0~12.0] | ≤[7.0~9.0] | ≤ [7.5~8.5] | ≤ [6.8~9.0] | ≤ [7.0~7.7] | ≤ [6.6~9.0] | ≤ [7.0~7.7] | ≤ [7.0~9.0] | ≤ [7.0] |

**Issue 2-3-1-3: NS\_58 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Capture the ranges in the table for NS\_58 A-MPR based on companies’ results and use it as the starting point to derive the values.

Consider different regions, i.e., inner and outer, when companies provide the simulation results next meeting.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pre-coding** | **Modulation** | **RB Allocation (Note 2)** | **RB Allocation (Note 3)** | |
|  |  | **Full/Partial** | **Full (dB)** | **Partial (dB)** |
| CP-OFDM | QPSK | See Table 6.2F.2-1 | ≤ [3.5~5.9] | ≤[ 2.5~6.0] |
|  | 16 QAM | ≤ [4.0~5.8] | ≤ [3.0~6.2] |
|  | 64 QAM | ≤ [5.5~5.8] | ≤ [5.5~6.2] |
|  | 256 QAM | ≤[ 5.8~9.0] | ≤ [6.2~9.0] |

**Issue 2-3-1-4: NS\_60 A-MPR simulatrion results for PSSCH/PSCCH:**

Recommended WF:

For QPSK, 16QAM and 64QAM the numbers are aligned with OPPO, LGE while for 256QAM, it is averaged of OPPO and LGE number. They are marked as blue for better tracking.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | Channel bandwidth (Sub-band allocation) / RB Allocation | | | | | | | | | |
| 20MHz | | 40MHz | | 60MHz | | 80MHz | | 100MHz | |
| Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) |
| CP-OFDM | QPSK | ≤ [6.0] | ≤ [8.5] | ≤ [5.5] | ≤ [5.5] | ≤[ 5.0] | ≤ [5.5] | ≤ [4.5] | ≤ [5.5] | ≤ [4.5] | ≤ [5.5] |
| 16 QAM | ≤ [6.0] | ≤ [8.5] | ≤ [5.5] | ≤[ 5.5] | ≤ [5.0] | ≤ [5.5] | ≤[ 4.5] | ≤ [5.5] | ≤[ 4.5] | ≤ [5.5] |
| 64 QAM | ≤ [6.0] | ≤[ 8.5] | ≤[ 5.5] | ≤[ 5.5] | ≤ [5.5] | ≤ [5.5] | ≤ [5.5] | ≤[ 5.5] | ≤ [5.5] | ≤ [5.5] |
| 256 QAM | ≤ [7.0~9.0] | ≤[ 8.5] | ≤ [7.0~9.0] | ≤ [7.0] | ≤ [7.0~9.0] | ≤ [7.0] | ≤ [7.0~9.0] | ≤ [7.0] | ≤ [7.0~9.0] | ≤ [7.0] |

**Issue 2-3-1-5: NS\_61 A-MPR simulatrion results for PSSCH/PSCCH:**

Recommended WF:

For QPSK, 16QAM and 64QAM the numbers are aligned with OPPO, LGE while for 256QAM, it is averaged of OPPO and LGE number. They are marked as blue for better tracking.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | Channel bandwidth (Sub-band allocation) / RB Allocation | | | | | | | | | |
| 20MHz | | 40MHz | | 60MHz | | 80MHz | | 100MHz | |
| Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) |
| CP-OFDM | QPSK | ≤ [7.5] | ≤ [10.0] | ≤ [6.5] | ≤ [6.5] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤[ 6.0] | ≤ [6.0] |
| 16 QAM | ≤ [7.5] | ≤ [10.5] | ≤ [6.5] | ≤ [6.5] | ≤[ 6.0] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] |
| 64 QAM | ≤ [7.5] | ≤ [10.5] | ≤ [6.5] | ≤ [6.5] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤ [6.0] | ≤[ 6.0] |
| 256 QAM | ≤ [7.5~9.0] | ≤ [10.5] | ≤[7.0~9.0] | ≤[7.0~9.0] | ≤[7.0~9.0] | ≤ [7.0] | ≤[7.0~9.0] | ≤ [7.0] | ≤ [7.0] | ≤ [7.0] |

**RRM part (As agreed in WF R4-2317356 on R18 NR SL RRM requirements (part 1))**

**Issue 1-1: Specification structure**

<Agreement>

Define RRM requirements for sidelink unlicensed spectrum in clause 12 with suffix A with below example

|  |
| --- |
| 12.2A          UE Transmit Timing under CCA  12.3A          Initiation/Cease of SLSS Transmissions under CCA  12.4A          Selection / Reselection of Sidelink Synchronization Reference Source under CCA |

**Issue 1-2: The term of SyncRef UE is not available**

<Agreement>

The term SyncRef UE in SL-U is not available at the UE refers to when all the candidate S-SSB positions [monitored] in every S-SSB period are not available during the last 1280 ms; otherwise the SyncRef UE in SL-U is considered as available at the UE.

**Issue 2-1: Transmit timing error requirement**

< Agreement>

In R18, transmit timing requirements will be specified for 15kHz and 30kHz.

**Issue 3-1: Requirements for SyncRef UE as a synchronization reference source (x\_max)**

< Agreement>

Single value for x\_max = [4]

**Issue 4-1: Requirement for selection/reselection of SL synchronization reference source**

<Agreement>

Reuse existing requirement with adding condition below

“all the SSB periods are available during the Tdetect,SyncRef UE\_V2X seconds.”

The wording can be further polished in the CR wrok.

E.g.,

UE shall not drop any sidelink data transmission for the purpose of selection/reselection to the SyncRef UE. The UE shall be able to identify newly detectable intra-frequency SyncRef UE within Tdetect,SyncRef UE\_V2X seconds if the SyncRef UE meets the selection / reselection criterion defined in TS 38.331[2] and all the SSB periods are available during the Tdetect,SyncRef UE\_V2X seconds.

**Issue 4-2: Requirement for Tmeasure,PSBCH-RSRP (y\_max)**

<Agreement>

Single value for y\_max is specified.

y\_max = [2]

**Issue 4-3: Requirement when exceeding the maximum allowed LBT failures**

<FFS>

Option 1: Discuss UE behaviour when y exceeding y\_max for measuring the PSBCH-RSRP of the current selected SyncRef UE

**Issue 4-4: Requirements for fast sync SyncRef UE detection**

<FFS>

Option 1: Since both the sync SyncRef UE and async SyncRef UE detection times (1.6+*x*\*1.6; 8+*x*\*8 seconds) can be long with LBT failures of the newly detectable SyncRef UEs, we can speed up sync SyncRef UE search by allowing more SLSS Tx drop, e.g. allow 50% SLSS Tx drop and require 0.96+*x*\*0.96 seconds detection time when the following conditions are satisfied

*No detected SyncRef UE is available, or*

*The RSRP of the current SyncRef UE as sync source is lower than a threshold of z.*

*z* can follow the SLSS evaluation threshold, or a separately configured threshold.

Option 2: Open to discuss whether further updates are required with respect to RAN1 agreements on the number of additional SSB occasions in single RB set and more than one RB set

**Issue 4-5: Additional Tx dropping for SyncRef UE detection**

<FFS>

Option 1: When GNSS is the highest priority and the sync source SyncRef UE is not directly or indirectly synchronized to GNSS, or when gNB is the highest priority,

an SL-U UE should be allowed to drop SLSS transmission besides data transmission to search for new SyncRef UE, at least when the current synchronization source is weak or experiencing too many consecutive LBT failures.

in addition to allowing 6% data Tx dropping, allowing 30% SLSS Tx dropping and the requirement for sync SyncRef UE detection applies.

Option 2: When GNSS is the highest priority and the sync source SyncRef UE is not directly or indirectly synchronized to GNSS, or when gNB is the highest priority, reuse the legacy Tx dropping rate for Selection / Reselection of SL synchronization Reference source.

**Issue 5-1: SL-RSRP measurement requirement**

<Agreement>

The legacy requirements for L1 SL-RSRP measurement could be reused for SL-U based on NW configuration or pre-configuration.

**Issue 6-1: RSSI measurement**

<Agreement>

The legacy requirements for SL RSSI measurement could be reused for SL-U.

**Issue 7-1: Interruption requirements**

<Agreement>

The existing interruption requirements for legacy sidelink communications are reused

For common understanding in RAN4, on how to handle interruption requirements to WAN options like SL-DRX reconfiguration and MCSt configuration of SL transmission are already covered in the existing interruption requirements

**Issue 8-1: Impact on RRM requirement due to new S-SSB design**

<Agreement>

The legacy requirement will be reused for the case with repeated S-SSB in frequency domain.

FFS on the side condition with repetition.

For multiple RB sets, UE is assumed to measure S-SSB on anchor RB sets only.

* **Progress made in RAN4#109**

**RF part (As agreed in WF R4-2321766 WF on NR\_SL\_enh2\_UERF\_part1)**

**Sub-topic 2-2 MPR requirement**

**Issue 2-2-1: MPR requirement structure**

Agree on below Outer/Inner sub-band configuration

Table: Outer/Inner sub-band configuration for SL-U wideband operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Wideband operation channel bandwidth (MHz) | Contiguous sub-band configuration | | Non-contiguous sub-band configuration | |
| Outer | Inner | Outer | Inner |
| 40 | 11, 10, 01 | N/A | N/A | N/A |
| 60 | 111, 110, 011, 100, 001 | 010 | 101 | N/A |
| 80 | 1111, 1110, 0111, 1100, 0011, 1000, 0001 | 0110, 0100, 0010 | 1101, 1011, 1010, 0101, 1001 | N/A |
| 100 | 11111, 11110, 01111, 11100, 00111, 11000, 00011, 10000, 00001 | 01110, 01100, 00110, 01000, 00010, 00100 | 11011, 11010, 01011, 11001, 10011, 10101, 10110, 01101, 10100, 00101, 10010, 01001, 11101, 10111, 10001 | 01010 |
| NOTE 1: The sub-band configuration is represented as a bitmap where ‘1’ indicates that a sub-band is transmitted and ‘0’ indicates a sub-band is not transmitted. The bitmap is ordered with MSB mapped to the lowest frequency sub-band and LSB mapped to highest frequency sub-band within the wideband channel. | | | | |

**Issue 2-2-2: MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Agree on below table for MPR for PSSCH/PSCCH

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | Proposed MPR | | | |
|  |  | Outer RB set configuration5 | | Inner RB set configuration5 | |
|  |  | Full2 (dB) | Partial3 (dB) | Full2 (dB) | Partial3 (dB) |
| CP-OFDM | QPSK | ≤ 3.5 | ≤ 3.5 | ≤ 3.5 | ≤ 2 |
|  | 16 QAM | ≤ 4.0 | ≤ 4.0 | ≤ 4.0 | ≤ 3.0 |
|  | 64 QAM | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 |
|  | 256 QAM | ≤ 7.5 | ≤ 7.5 | ≤ 7.5 | ≤ 7.5 |

**Issue 2-2-4: MPR simulatrion results for S-SSBs:**

Agreement:

Agree on below table for MPR for S-SSB

|  |  |  |
| --- | --- | --- |
|  | **RB Allocation** | |
| **Outer RB set configuration** | **Inner RB set configuration** |
| Contiguous/Non-contiguous sub-band RB sets | ≤ 12.5 | ≤ 9.5 |
| NOTE 1: Outer sub-band configuration and inner sub-band configuration in issue 2-2-1 apply. | | |

**Sub-topic 2-3 A-MPR**

**Issue 2-3-1: A-MPR simulatrion results for PSSCH/PSCCH:**

**Issue 2-3-1-1: NS\_31 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Agree on below table for A-MPR for PSSCH/PSCCH for NS\_31

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | RB Allocation (Note 4) | | | | RB Allocation (Note 3) |
|  |  | Outer RB set configuration5 | | Inner RB set configuration5 | |
|  |  | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full/Partial |
| CP-OFDM | QPSK | ≤ 5.5 | ≤ 6.5 | ≤ 4.5 | ≤ 6.5 | Follow SL-U MPR table |
|  | 16 QAM | ≤ 5.5 | ≤ 7.0 | ≤ 4.5 | ≤ 7.0 |
|  | 64 QAM | ≤ 5.5 | ≤ 7.0 | ≤ 4.5 | ≤ 7.0 |
|  | 256 QAM | ≤ 7.5 | ≤ 7.5 | ≤ 7.5 | ≤ 7.5 |

**Issue 2-3-1-2: NS\_53 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Agree on below table for A-MPR for PSSCH/PSCCH for NS\_53

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pre-coding** | **Modulation** | **Channel bandwidth (Sub-band allocation) / RB Allocation** | | | | | | | | | |
| **20MHz** | | **40MHz** | | **60MHz** | | **80MHz** | | **100MHz** | |
| **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** | **Full (dB)** | **Partial (dB)** |
| CP-OFDM | QPSK | ≤ 9.0 | ≤ 12.0 | ≤ 6.5 | ≤ 8.5 | ≤ 4.5 | ≤ 6.5 | ≤ 4.0 | ≤ 5.5 | ≤ 4.0 | ≤ 4.5 |
| 16 QAM | ≤ 9.0 | ≤ 12.0 | ≤ 6.5 | ≤ 8.5 | ≤ 4.5 | ≤ 6.5 | ≤ 4.0 | ≤ 5.5 | ≤ 4.0 | ≤ 4.5 |
| *64 QAM* | ≤ 9.0 | ≤ 12.0 | ≤ 6.5 | ≤ 8.5 | ≤ 5.5 | ≤ 6.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 |
| 256 QAM | ≤ 9.0 | ≤ 12.0 | ≤ 8.0 | ≤ 8.5 | ≤ 8.0 | ≤ 7.0 | ≤ 8.0 | ≤ 7.0 | ≤ 8.0 | ≤ 7.0 |

**Issue 2-3-1-3: NS\_58 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Agree on below table for A-MPR for PSSCH/PSCCH for NS\_58

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | RB Allocation (Note 4) | | | |
|  |  | Outer RB set configuration5 | | Inner RB set configuration5 | |
|  |  | Full (dB)2 | Partial (dB)3 | Full (dB) 2 | Partial (dB) 3 |
| CP-OFDM | QPSK | ≤ 3.5 | ≤ 4.5 | ≤ 3.5 | ≤ 2.5 |
|  | 16 QAM | ≤ 4.0 | ≤ 4.5 | ≤ 4.0 | ≤ 3.0 |
|  | 64 QAM | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 |
|  | 256 QAM | ≤ 8.0 | ≤ 8.0 | ≤ 8.0 | ≤ 8.0 |

**Issue 2-3-1-4: NS\_60 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Agree on below table for A-MPR for PSSCH/PSCCH for NS\_60

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | Channel bandwidth (Sub-band allocation) / RB Allocation | | | | | | | | | |
| 20 MHz | | 40 MHz | | 60 MHz | | 80 MHz | | 100 MHz | |
| Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) |
| CP-OFDM | QPSK | ≤ 6.0 | ≤ 8.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.0 | ≤ 5.5 | ≤ 4.5 | ≤ 5.5 | ≤ 4.5 | ≤ 5.5 |
| 16 QAM | ≤ 6.0 | ≤ 8.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.0 | ≤ 5.5 | ≤ 4.5 | ≤ 5.5 | ≤ 4.5 | ≤ 5.5 |
| 64 QAM | ≤ 6.0 | ≤ 8.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 | ≤ 5.5 |
| 256 QAM | ≤ 8.0 | ≤ 8.5 | ≤8.0 | ≤ 7.0 | ≤ 8.0 | ≤ 7.0 | ≤ 8.0 | ≤ 7.0 | ≤ 8.0 | ≤ 7.0 |

**Issue 2-3-1-5: NS\_61 A-MPR simulatrion results for PSSCH/PSCCH:**

Agreement:

Agree on below table for A-MPR for PSSCH/PSCCH for NS\_61

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pre-coding | Modulation | Channel bandwidth (Sub-band allocation) / RB Allocation | | | | | | | | | |
| 20 MHz | | 40 MHz | | 60 MHz | | 80 MHz | | 100 MHz | |
| Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) | Full (dB) | Partial (dB) |
| CP-OFDM | QPSK | ≤ 7.5 | ≤ 10.0 | ≤ 6.5 | ≤ 6.5 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 |
| 16 QAM | ≤ 7.5 | ≤ 10.5 | ≤ 6.5 | ≤ 6.5 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 |
| 64 QAM | ≤ 7.5 | ≤ 10.5 | ≤ 6.5 | ≤ 6.5 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 | ≤ 6.0 |
| 256 QAM | ≤ 8 | ≤ 10.5 | ≤ 8 | ≤ 7.0 | ≤ 8 | ≤ 7.0 | ≤ 8 | ≤ 7.0 | ≤ 8.0 | ≤ 7.0 |

**Issue 2-3-3: A-MPR simulatrion results for S-SSB:**

**Issue 2-3-3-1: NS\_31 A-MPR simulatrion results for S-SSB:**

Agreement

Agree on below table for A-MPR for S-SSB for NS\_31

Table 2-55: NS\_31 S-SSB A-MPR for SL-U UE power class 5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | RB Allocation | | | |
| Outer RB set configuration | | Inner RB set configuration | |
| # of S-SSB repetition/RBset | > 2 | 2 | > 2 | 2 |
| Contiguous/Non-contiguous sub-band RB sets | ≤ 13.5 | ≤ 10.0 | ≤ 10.0 | ≤ 10.0 |
| NOTE 1: The A-MPR shall apply to all SCS in all active 20 MHz sub-bands contiguously or non-contiguously allocated in the channel.  NOTE 2: Applicable for 20 MHz channels centered at the nearest NR-ARFCN corresponding to 5180, 5200, 5220, 5280, 5300, 5320, 5500, 5520, 5540, 5560, 5580, 5600, 5620, 5640, 5660, 5680, 5745, 5765, 5785, and 5805 MHz.  NOTE 3: Applicable for all valid channels and bandwidths other than those enumerated in NOTE 2. | | | | |

**Issue 2-3-3-2: NS\_53 A-MPR simulatrion results for S-SSB:**

Agreement

Agree on below table for A-MPR for S-SSB for NS\_53

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RB set configuration** | **Channel bandwidth (Sub-band allocation) / RB Allocation** | | | | | | | | | |
| **20MHz** | | **40MHz** | | **60MHz** | | **80MHz** | | **100MHz** | |
| **# of S-SSB repetition/RBset** | > **2** | **2** | > **2** | **2** | > **2** | **2** | > **2** | **2** | > **2** | **2** |
| Contiguous/Non-contiguous | ≤13.5 | ≤17.5 | ≤13.5 | ≤17.5 | ≤13.5 | ≤14.5 | ≤13.5 | ≤14.5 | ≤13.5 | ≤13.5 |
| NOTE 1: The A-MPR shall apply to all SCS in all active 20 MHz sub-bands contiguously or non-contiguously allocated in the channel. | | | | | | | | | | |

**Issue 2-3-3-3: NS\_58 A-MPR simulatrion results for S-SSB:**

Agreement

Agree on below table for A-MPR for S-SSB for NS\_58

Table 2-63: NS\_58 S-SSB A-MPR for SL-U UE power class 5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | RB Allocation | | | |
| Outer RB set configuration | | Inner RB set configuration | |
| # of S-SSB repetition/RBset | > 2 | 2 | > 2 | 2 |
| Contiguous/Non-contiguous sub-band RB sets | ≤ 13.5 | ≤ 10.0 | ≤ 9.5 | ≤ 7.5 |
| NOTE 1: The A-MPR shall apply to all SCS in all active 20 MHz sub-bands contiguously or non-contiguously allocated in the channel.  NOTE 2: The A-MPR applies instead of MPR for 20 MHz channel centered at the nearest NR-ARFCN corresponding to 5955 MHz, 40 MHz channel at the nearest NR-ARFCN corresponding to 5965 MHz, 60 MHz channel at the nearest NR-ARFCN corresponding to 5975 MHz, and 80 MHz channel at the nearest NR-ARFCN corresponding to 5985 MHz. For all other channels, A-MPR is zero and MPR applies. | | | | |

**Issue 2-3-3-4: NS\_60 A-MPR simulatrion results for S-SSB:**

* Proposals

Agree on below table for A-MPR for S-SSB for NS\_60

Table 2-67: NS\_60 S-SSB A-MPR for SL-U UE power class 5

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RB set configuration** | **Channel bandwidth (Sub-band allocation) / RB Allocation** | | | | | | | | | |
| **20MHz** | | **40MHz** | | **60MHz** | | **80MHz** | | **100MHz** | |
| **# of S-SSB repetition/RBset** | > **2** | **2** | > **2** | **2** | > **2** | **2** | > **2** | **2** | > **2** | **2** |
| Contiguous/Non-contiguous | ≤13.5 | ≤14.5 | ≤13.5 | ≤14.5 | ≤13.5 | ≤13.5 | ≤13.5 | ≤13.5 | ≤13.5 | ≤13.5 |
| NOTE 1: The A-MPR shall apply to all SCS in all active 20 MHz sub-bands contiguously or non-contiguously allocated in the channel. | | | | | | | | | | |

**Issue 2-3-3-5: NS\_61 A-MPR simulatrion results for S-SSB:**

Proposals

Agree on below table for A-MPR for S-SSB for NS\_61

Table 2-71: NS\_61 S-SSB A-MPR for SL-U UE power class 5

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RB set configuration** | **Channel bandwidth (Sub-band allocation) / RB Allocation** | | | | | | | | | |
| **20MHz** | | **40MHz** | | **60MHz** | | **80MHz** | | **100MHz** | |
| **# of S-SSB repetition/RBset** | > **2** | **2** | > **2** | **2** | > **2** | **2** | > **2** | **2** | > **2** | **2** |
| Contiguous/Non-contiguous | ≤13.5 | ≤15.5 | ≤13.5 | ≤15.5 | ≤13.5 | ≤13.5 | ≤13.5 | ≤13.5 | ≤13.5 | ≤13.5 |
| NOTE 1: The A-MPR shall apply to all SCS in all active 20 MHz sub-bands contiguously or non-contiguously allocated in the channel. | | | | | | | | | | |

**Reply LS on PSFCH power control**

Agreement:

Below Reply LS is agreed:

|  |
| --- |
| The SL-U PSFCH MPR requirements do not limit the power control design for PSFCH transmission. It is up to RAN1.  RAN4 applies same SL-U PSFCH MPR requirements for all PSFCH transmissions, i.e, Alt 1-1b, Alt 2-3a, and NR SL legacy RB allocation method.  P\_common < P\_dedicated is feasible given that the evaluated MPR value is no higher than that for P\_common= P\_dedicated for all PSFCH transmissions with Alt 1-1b based on RAN4’s current understanding in Rel-18. |

Agreement: Update the simulation assupmtions for PSFCH power control under the section for Huawei’s simulation results in TR.

**Issue 1-1-1: UE feature list**

Agreement:

Include 45-1 and 45-2 in the RAN4 Rel-18 feature list

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 45.  NR\_SL\_enh2 | 45-1 | SL reception in intra-carrier guard band | Capability of reception in the non-zero intra-cell guardband between contiguous RB sets in SL wideband carrier operation wider than 20MHz when LBT is successful only in a subset of RB sets |  | **Yes** | **Yes** | UE cannot receive in the intra-cell guard band specified in 38.101-1 | **Per band** | **No** | **No** |  |  | Optional with capability signalling |
| 45-2 | Power class for sidelink CA | power class the UE supports when operating according to this band combination used for sidelink. If the field is absent, the UE supports the default power class. If this power class is higher than the power class that the UE supports on the individual bands of this band combination (*ue-PowerClassSidelink-r16* in *BandNR*), the latter determines maximum TX power available in each band. The UE sets the power class parameter only in band combinations that are applicable as specified in TS 38.101-1. |  | **Yes** | **Yes** | UE cannot transmit in proper power class as specified in 38.101-1 | **Per BC** | **No** | **No** |  |  | Optional with capability signalling |

**RRM part (As agreed in WF R4-2321353 WF on R18 NR SL RRM requirements (part 1))**

**Issue 1-1: When exceeding the maximum unavailable S-SSB periods (allowed LBT failures) during the evaluation**

<Agreement>

Clarify that UE is expected to reselect to a different reference resource as per TS38.331 when the requirements cannot be met due to that the number of LBT failures exceeds the maximum allowed LBT failures during the evaluation period, where the current SyncRefUE is considered as invalid.

**Issue 2-1: Condition for sync detection requirements**

< Agreement>

Revise the condition to meet sync detection requirements for selection/reselection sync reference source in SL-U

All S-SSB periods selected for selection/reselection to SyncRefUE are available during the Tdetect,SyncRef UE\_V2X seconds.

**Issue 2-2: Requirement when exceeding the maximum allowed LBT failures (for current SyncRef UE)**

< Agreement>

With the agreement under Issue 1-1, no need to discuss this issue

**Issue 2-3: Requirements for fast sync SyncRef UE detection**

< Agreement>

When gNB is the highest priority sync source, or when GNSS is the highest priority sync source and the source SyncRef UE is not synchronized directly or indirectly to GNSS, in addition to allowing 6% data Tx dropping, allowing 30% SLSS Tx dropping; only when UE is dropping 30% of SLSS Tx, the requirement for sync SyncRef UE detection applies

* + The additional dropping rate and requirements can be conditionally applied when one or all the following conditions are met:
    - No detected SyncRef UE is available, or
    - FFS the RSRP of the current SyncRef UE as sync source is lower than a threshold of z, or maximum LBT is reached during the evaluation for initialization/cease of SLSS transmission.
  + z can follow the SLSS evaluation threshold, or a separately configured threshold.
  + Only applicable when GNSS is not available and SL-U only.
  + UE is not mandated to perform sync search under this scenario.

**Issue 3-1: Definition for SL-RSSI measurement**

< Agreement>

For congestion control purpose, SL-RSSI measurements use the OFDM symbols starting from the next symbol of the 2nd candidate starting symbol.

RAN4 will send LS to RAN1 to address this revision.

**Issue 4-1: Side condition for sync detection**

<Agreement>

The side condition of SNR >= 0dB for SyncRef UE search and measurement is based on legacy 11RB S-SSBs

* **Co-channel coexistence for LTE sidelink and NR sidelink**
* **Progress made in RAN4#108bis**

**RF part (As agreed in WF R4-2317727 WF on NR\_SL\_enh2\_UERF\_part2)**

**Issue 2-1-1: RF requirement impact due to NR 2nd slot power limitation of RAN1 agreement for LTE SL and NR SL co-channel coexistence scenario)**

Proposals

Option 1: Define and clarify the related UE RF requirements (LGE) (R4-2315549)

Define Relative Power Tolerance requirement for NR V2X UE supporting co-channel coexistence with LTE V2X

Clarify the reference to sub-clause 6.2.4 in 6.2E.4.1 General

Clarify the sub-clause 6.2E.4.1 General and reference to clause 6.2.4

Option 2: Not define UE RF requirement and capture RAN1 constraint in TR (Oppo)

Option 3: If RAN4 is necessary to apply the RAN1 agreements in the configured Tx power, then we prefer to measure the 1st slot only for PUMAX,f,c. (Meta)

WF

Continue discussion on the related UE RF requirements in next meeting

**RRM part (As agreed in WF R4-2317375WF on R18 NR SL RRM requirements (part 2))**

**Issue 2-1: Applicability for LTE SL and NR SL co-channel co-existence**

Agreement:

* + The requirements for the UE capable of V2X sidelink communication when the UE is out of coverage or in coverage on the carrier used for V2X sidelink operation in section 12.1 in TS 38.133 apply when the UE is:

- configured in co-channel coexistence for LTE SL and NR SL operation with same carrier

* **NR sidelink con-current operation**
* **Progress made in RAN4#108bis**

**RF part (As agreed in WF R4-2317727 WF on NR\_SL\_enh2\_UERF\_part2)**

**Issue 1-1-1: MOP for Uu@Licensed and SL@Un-licensed**

Proposals

Option 1: Defines MOP per UE as the total transmitted power from each operating band (LGE, Meta)

Option 2: Define MOP per each operating band in Rel-18 (vivo)

Option 3: Use PC3 and the MOP limit for Rel-18 inter-band concurrent operation as PC5@unlicensed band and PC3@licensed band (Oppo)

WF

Defines MOP per UE as the total transmitted power from each operating band

**Issue 1-1-3: PCMAX,L & PCMAX,H of configured transmitted power**

Proposals

Option 1: Introduce the Ppowerclass,concurrent(Oppo)

PCMAX\_L (*p,q*) = min{10 log10 [pCMAX\_L,*c,NR*(*p*) + pCMAX\_L,*c,V2X*(*q*)] - ΔTIB,c, Ppowerclass,concurrent}

PCMAX\_H (*p,q*) = min{10 log10 [pCMAX\_H,*c,NR*(*p*) + pCMAX\_H,*c,V2X*(*q*)], Ppowerclass,concurrent}

Option 2: (LGE) : Introduce the Ppowerclass,concurrent and PEMAX,con-current ­

PCMAX\_L (p,q) = MIN {10log10 [pCMAX\_L,c,NR (p) + pCMAX\_L,c,SL(q)], PPowerClass,con-current, PEMAX,con-current}

PCMAX\_H (p,q) = MIN {10 log10 [pCMAX\_H,c,NR (p) + pCMAX\_H,c,SL(q)], PPowerClass,con-current, PEMAX,con-current}

Option 3: (Meta)

PCMAX\_L (*p,q*) = MIN {10log10 [pCMAX\_L,*c,NR* (*p*)+ pCMAX\_L,*c,SL* (*q*)], PPowerClass\_CA, PEMAX,CA}

PCMAX\_H (*p,q*) = MIN {10 log10 [pCMAX\_H,*c,NR*(*p*) + pCMAX\_H,*c,SL*(*q*)], PPowerClass\_CA, PEMAX,CA}

Option 4: (Huawei)

Reuse Rel-17 inter-band con-current Pcmax for V2X

WF

Reuse Rel-17 inter-band con-current Pcmax for V2X

**2) Performance part**

* **RRM performance part**
* **Progress made in RAN4#108bis**

Agree on updated work plan of test case design for R18 SL RRM performance part.

|  |
| --- |
| (1) 3GPP RAN4 #108-bis meeting (Oct, 2023)  • Discuss to achieve consensus on the updated work plan [RAN4]  • Initial discussion on the work splitting for test case design [RAN4]  (2) 3GPP RAN4 #109 meeting (Nov, 2023)  • Discuss and agree on the work splitting for test case design [RAN4]  • Initial discussion on configurations/parameters for test cases [RAN4]  (3) 3GPP RAN4 #110 meeting (Feb, 2024)  • Continue the discussion on the configurations/parameters for test cases [RAN4]  • Continue the discussion on draft test cases [RAN4]  • Draft CR for test cases for SL-CA and SL-U are expected  (4) 3GPP RAN4 #110bis meeting (Apr, 2024)  • Finalize the configurations/parameters for test cases [RAN4]  • Discuss and endorse/agree on the CRs of test cases [RAN4]  (5) 3GPP RAN4 #111 meeting (May, 2024)  • Discuss and finalize the remaining issue of test cases [RAN4]  • Endorse/agree on all CRs of test cases [RAN4] |

* + - **Agreement: RAN4 not to define new test case for co-channel coexistence for LTE SL and NR SL in R18.**
    - **Other agreements and open issues are captured in R4-2317375 WF on R18 NR SL RRM requirements (part 2)**
* **Progress made in RAN4#109**
  + - **Agreement: Collect views on the test case list in RAN4#109 and conclude on CR splitting in next meeting**
    - **Details are captured in R4-2321585 WF on R18 NR SL RRM requirements (part 2)**
* **UE demodulation performance:**
* **Progress made in RAN4#108bis**
  + - **The agreements and open issues are captured in R4-2316969 WF on UE demod perf for R18 NR SL**
    - **Agreed on work plan**

|  |  |
| --- | --- |
| **Meeting** | **Works** |
| RAN4#108-bis  (Oct.2023) | **Performance part**   * Discussion and approvement on work plan * Discussion on work scope and the list of performance test cases |
| RAN4#109  (Nov.2023) | **Performance part**   * Discussion and finalization on work scope and the list of performance test cases * Discussion on initial link simulation assumptions |
| RAN4#110  (Feb.2024) | **Performance part**   * Collection of initial simulation results * Update simulation assumptions for final performance requirements * Discussion and finalization on CR work split |
| RAN4#110-bis  (Apr.2024) | **Performance part**   * Collection of final simulation results * Finalization performance requirements based on collected simulation results * Submit draft CRs |
| RAN4#111  (May.2024) | **Performance part**   * Discussion and conclusion on remaining issues * Finalization draft CRs and approvement on Big CR based on the draft CRs * Completion Sidelink demodulation performance requirements |

**NR sidelink CA scenario**

*Way Forward:*

* Option 1: Consider defining PSSCH requirements for NR sidelink CA with the same performance metric as in LTE sidelink CA. (Nokia)
* Option 2: Define following tests for sidelink CA: (HW)
  + PSSCH performance requirements
  + HARQ buffer test
  + PSCCH decoding capability test
  + PSFCH decoding capability test
* Option 3: Consider CA scenario as work scope for demodulation performance. (LGE)

**NR sidelink unlicensed band scenario**

* + - **Agreement: Do not define requirement for PSBCH**

**Co-existence of NR sidelink and LTE sidelink scenario**

* + - **Agreement: For NR PSSCH performance in NR sidelink and LTE sidelink scenario, no need to consider co-existence scenario**
* **Progress made in RAN4#109**
  + - **The agreements and open issues are captured in R4-2321131 WF on UE demod perf for R18 NR SL**

#### 2.4.2 Remaining Open issues

Specify the following requirements

* UE demodulation performance requirements
* UE RRM performance requirements

**The open issues are captured in WF R4-2321585 for RRM perf part and WF R4-2321131 for UE demod perf**

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

**RAN1#114bis**

1. R1-2308832 LS on SL RB set index and LBT failure indication for PSFCH RAN2, CATT
2. R1-2309036 Draft LS reply on RB set index vivo
3. R1-2309119 About LS on SL RB set index and LBT failure indication for PSFCH ZTE, Sanechips, CAICT
4. R1-2309233 Discussion on LS on SL RB set index and LBT failure indication for PSFCH LG Electronics
5. R1-2309340 Draft reply LS on SL RB set index and LBT failure indication for PSFCH Samsung
6. R1-2309419 [Draft] Reply LS on SL RB set index and LBT failure indication for PSFCH xiaomi
7. R1-2309468 Discussion on LS from RAN2 on SL RB set index and LBT failure indication for PSFCH CATT, CICTCI
8. R1-2309469 Draft reply LS on SL RB set index and LBT failure indication for PSFCH CATT, CICTCI
9. R1-2309584 Discussion on SL RB set index OPPO
10. R1-2309585 Draft reply LS on SL RB set index and LBT failure indication for PSFCH OPPO
11. R1-2309755 Discussion on LS on SL RB set index and LBT failure indication for PSFCH Huawei, HiSilicon
12. R1-2309810 Discussion on RAN2 LS on SL RB Set Index and LBT Failure Indication for PSFCH Apple
13. R1-2309811 Draft Reply LS on SL RB Set Index and LBT Failure Inidcation for PSFCH Apple
14. R1-2309993 Discussion on RAN2 LS on SL RB set index and LBT failure indication for PSFCH MediaTek Inc.
15. R1-2310092 Discussion on LS on SL RB set index and LBT failure indication for PSFCH Lenovo
16. R1-2310217 [Draft] Reply LS on SL RB set index and LBT failure indication for PSFCH Ericsson
17. R1-2310218 Discussion on SL RB set index and LBT failure indication for PSFCH Ericsson
18. R1-2309586 Higher layer parameters list for Rel-18 NR sidelink evolution WI OPPO, Huawei, HiSilicon, LG Electronics
19. R1-2308839 Remaining issues for Channel Access Mechanism for SL-U Nokia, Nokia Shanghai Bell
20. R1-2308884 Maintenance of channel access mechanism and resource allocation for sidelink operation over unlicensed spectrum Huawei, HiSilicon
21. R1-2308944 Discussion on channel access mechanism for sidelink on unlicensed spectrum FUTUREWEI
22. R1-2308980 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum Spreadtrum Communications
23. R1-2309067 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum vivo
24. R1-2309112 Remaining issues for channel access mechanism for SL-U ZTE, Sanechips
25. R1-2309235 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum LG Electronics
26. R1-2309281 Remaining Issues on Channel Access of Sidelink on Unlicensed Spectrum NEC
27. R1-2309368 Remaining issues on channel access mechanism Samsung
28. R1-2309452 Remaining details on SL-U channel access mechanism xiaomi
29. R1-2309519 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum CATT, CICTCI
30. R1-2309587 On maintenance of SL-U channel access mechanism and resource allocation OPPO
31. R1-2309666 Maintenance on channel access mechanism for sidelink on unlicensed spectrum CMCC
32. R1-2309699 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum Lenovo
33. R1-2309701 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum ETRI
34. R1-2309717 Remaining issues of channel access mechanism for sidelink in unlicensed spectrum Transsion Holdings
35. R1-2309827 On remaining issues for sidelink channal access procedure for unlicensed spectrum Apple
36. R1-2309868 Sidelink channel access on unlicensed spectrum Panasonic
37. R1-2309932 Channel Access Mechanism for SL-U ITL
38. R1-2309934 Remaining issues for channel access on SL-U InterDigital, Inc.
39. R1-2309994 Discussion on remaining issue for channel access mechanism MediaTek Inc.
40. R1-2310029 Remaining issue on channel access mechanism in SL-U NTT DOCOMO, INC.
41. R1-2310102 Remaining issues on Channel access mechanism for NR sidelink evolution Sharp
42. R1-2310134 Channel Access Mechanism for Sidelink on Unlicensed Spectrum Qualcomm Incorporated
43. R1-2310212 On maintenance of channel access mechansim for SL-U Ericsson
44. R1-2310231 Remaining issues on channel access mechanism for SL-U WILUS Inc.
45. R1-2310433 Draft reply LS on SL RB set index and LBT failure indication for PSFCH Moderator (OPPO)
46. R1-2310434 Reply LS on SL RB set index and LBT failure indication for PSFCH RAN1, OPPO
47. R1-2310288 FL summary #1 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
48. R1-2310289 FL summary #2 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
49. R1-2310290 FL summary #3 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
50. R1-2310291 FL summary #4 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
51. R1-2310292 FL summary #5 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
52. R1-2310599 FL summary #6 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
53. R1-2310600 FL summary #7 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
54. R1-2310293 FL summary for AI 8.2.1.1: SL-U channel access mechanism (EOM) Moderator (OPPO)
55. R1-2308840 Remaining issues for Physical Channel Design Framework for SL-U Nokia, Nokia Shanghai Bell
56. R1-2308885 Maintenance of physical channel design for sidelink operation over unlicensed spectrum Huawei, HiSilicon
57. R1-2308945 Discussion on physical channel design for sidelink on unlicensed spectrum FUTUREWEI
58. R1-2308981 Remaining issues on Physical channel design for sidelink on unlicensed spectrum Spreadtrum Communications
59. R1-2309068 Remaining issues on physical channel design framework for sidelink on unlicensed spectrum vivo
60. R1-2309113 Remaining issues for physical layer structures and procedures for SL-U ZTE, Sanechips
61. R1-2309236 Remaining issues on physical channel design framework for sidelink on unlicensed spectrum LG Electronics
62. R1-2309272 Remaining issues on physical channel design framework NEC
63. R1-2309369 Remaining issues on physical channel design framework Samsung
64. R1-2309453 Remaining details on SL-U physical channel structures and procedures xiaomi
65. R1-2309520 Remaining issues on physical channel design framework for sidelink on unlicensed spectrum CATT, CICTCI
66. R1-2309588 On maintenance of SL-U PHY channel designs and procedures OPPO
67. R1-2309667 Maintenance on physical channel design framework for sidelink on unlicensed spectrum CMCC
68. R1-2309700 Remaining issues on physical layer design framework for sidelink on unlicensed spectrum Lenovo
69. R1-2309702 Remaining issues on physical channel design framework for SL-U ETRI
70. R1-2309718 Remaining issues of physical channel design for sidelink in unlicensed spectrum Transsion Holdings
71. R1-2309828 On Remaining Issues of Sidelink Physical Channel Design Framework for Unlicensed Spectrum Apple
72. R1-2309870 Physical channel design for sidelink on unlicensed spectrum Panasonic
73. R1-2309879 Discussion on channel design for SL-U ASUSTeK
74. R1-2309935 Remaining issues for SL U physical layer design InterDigital, Inc.
75. R1-2309995 Discussion on remaining issue for physical channel design framework MediaTek Inc.
76. R1-2310030 Remaining issue on channel design framework in SL-U NTT DOCOMO, INC.
77. R1-2310103 Remaining issues on physical channel design framework for NR sidelink evolution on unlicensed spectrum Sharp
78. R1-2310135 Physical Channel Design for Sidelink on Unlicensed Spectrum Qualcomm Incorporated
79. R1-2310213 On maintenance of physical channel design framework for SL-U Ericsson
80. R1-2310232 Remaining issues on PHY channel design for SL-U WILUS Inc.
81. R1-2310350 FL summary#1 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
82. R1-2310351 FL summary#2 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
83. R1-2310352 FL summary#3 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
84. R1-2310353 FL summary#4 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
85. R1-2310354 FL summary#5 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
86. R1-2310355 FL summary#6 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
87. R1-2308841 Remaining issues for Co-channel Coexistence for LTE Sidelink and NR Sidelink Nokia, Nokia Shanghai Bell
88. R1-2308886 Maintenance of co-channel coexistence for LTE sidelink and NR sidelink Huawei, HiSilicon
89. R1-2308982 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink Spreadtrum Communications
90. R1-2309069 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink vivo
91. R1-2309114 Maintenance on co-channel coexistence for LTE sidelink and NR sidelink ZTE, Sanechips
92. R1-2309237 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink LG Electronics
93. R1-2309370 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink Samsung
94. R1-2309521 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink CATT, CICTCI
95. R1-2309589 On maintenance of co-channel coexistence for LTE and NR SL OPPO
96. R1-2309703 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink ETRI
97. R1-2309778 Dynamic co-channel coexistence for LTE sidelink and NR sidelink TOYOTA InfoTechnology Center
98. R1-2309829 On Remaining Issues of Co-channel Coexistence Apple
99. R1-2309936 Remaining issues for Co-channel coexistence between LTE sidelink and NR sidelink InterDigital, Inc.
100. R1-2310031 Maintenance on co-channel coexistence for LTE sidelink and NR sidelink NTT DOCOMO, INC.
101. R1-2310104 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink Sharp
102. R1-2310136 Co-channel Coexistence Between LTE SL and NR SL Qualcomm Incorporated
103. R1-2310190 On remaining co-channel coexistence issues for LTE sidelink and NR sidelink Mitsubishi Electric RCE
104. R1-2310214 On maintenance of co-channel coexistence between LTE sidelink and NR sidelink Ericsson
105. R1-2310233 Remaining issue on co-channel coexistence for LTE sidelink and NR sidelink WILUS Inc.
106. R1-2309239 FL Summary #1 for AI 8.2.2: Co-channel coexistence for LTE sidelink and NR sidelink Moderator (LG Electronics)
107. R1-2309240 FL Summary #2 for AI 8.2.2: Co-channel coexistence for LTE sidelink and NR sidelink Moderator (LG Electronics)
108. R1-2309241 FL Summary #3 for AI 8.2.2: Co-channel coexistence for LTE sidelink and NR sidelink Moderator (LG Electronics)
109. R1-2308842 Remaining issues for Sidelink Carrier Aggregation for NR Nokia, Nokia Shanghai Bell
110. R1-2309070 Remaining issues on Rel-18 sidelink CA vivo
111. R1-2309115 Remaining issues for sidelink CA operation ZTE, Sanechips
112. R1-2309238 Remaining issues on sidelink CA operation LG Electronics
113. R1-2309371 Remaining issues on sidelink CA operation Samsung
114. R1-2309454 Remaining details on Sidelink CA operation xiaomi
115. R1-2309522 Maintenance on NR sidelink CA operation CATT, CICTCI
116. R1-2309562 Enhanced SL Operation in FR2 Quectel
117. R1-2309590 On maintenance of carrier aggregation in NR Sidelink evolution OPPO
118. R1-2309704 Remaining issues on sidelink CA operation ETRI
119. R1-2309744 Maintenance of sidelink CA operation Huawei, HiSilicon
120. R1-2309937 Remaining issues for Sidelink CA operation InterDigital, Inc.
121. R1-2310032 Maintenance on sidelink CA operation NTT DOCOMO, INC.
122. R1-2310105 Remaining issues on Carrier Aggregation for NR sidelink evolution Sharp
123. R1-2310137 NR Sidelink Carrier Aggregation Qualcomm Incorporated
124. R1-2310215 On maintenance of sidelink carrier aggregation operation Ericsson
125. R1-2309242 FL Summary #1 for AI 8.2.3: Sidelink CA operation Moderator (LG Electronics)
126. R1-2309243 FL Summary #2 for AI 8.2.3: Sidelink CA operation Moderator (LG Electronics)
127. R1-2309244 FL Summary #3 for AI 8.2.3: Sidelink CA operation Moderator (LG Electronics)

**RAN1#115**

1. R1-2310793 LS reply to RAN4 LS R4-2314351 RAN2, Ericsson
2. R1-2310806 LS on a capability of UE power class and IE on PEMAX,CA for SL CA RAN4, LG Electronics, OPPO
3. R1-2312148 Discussion on RAN4 LS on a capability of UE power class and IE on PEMAX,CA for SL CA Huawei, HiSilicon
4. R1-2311235 Higher layer parameters list for Rel-18 NR sidelink evolution WI OPPO, Huawei, HiSilicon, LG Electronics
5. R1-2310811 Remaining issues for Channel Access Mechanism for SL-U Nokia, Nokia Shanghai Bell
6. R1-2310824 Maintenance of sidelink unlicensed channel access FUTUREWEI
7. R1-2310851 Maintenance of channel access mechanism and resource allocation for sidelink operation over unlicensed spectrum Huawei, HiSilicon
8. R1-2311090 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum vivo
9. R1-2311161 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum Spreadtrum Communications
10. R1-2311236 On maintenance of SL-U channel access mechanism and resource allocation OPPO
11. R1-2311336 Maintenance on channel access mechanism for sidelink on unlicensed spectrum CATT, CICTCI
12. R1-2311400 Remaining details on SL-U channel access mechanism xiaomi
13. R1-2311414 Remaining Issues on Channel Access of Sidelink on Unlicensed Spectrum NEC
14. R1-2311515 Discussion on channel access mechanism for SL-U ZTE, Sanechips
15. R1-2311525 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum Sony
16. R1-2311563 Sidelink channel access on unlicensed spectrum Panasonic
17. R1-2311588 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum Lenovo
18. R1-2311619 Remaining issues on channel access mechanism in SL-U NTT DOCOMO, INC.
19. R1-2311679 On remaining issue for sidelink channal access for unlicensed spectrum Apple
20. R1-2311751 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum ETRI
21. R1-2311766 Remaining issues on Channel access mechanism for NR sidelink evolution Sharp
22. R1-2311795 Remaining issues of channel access mechanism for sidelink in unlicensed spectrum Transsion Holdings
23. R1-2311837 Remaining issues on channel access mechanism Samsung
24. R1-2311884 Remaining issues for channel access on SL-U InterDigital, Inc.
25. R1-2311975 Discussion on remaining issue for channel access mechanism MediaTek Inc.
26. R1-2312031 Channel Access Mechanism for Sidelink on Unlicensed Spectrum Qualcomm Incorporated
27. R1-2312121 Remaining issues on channel access mechanism for sidelink on unlicensed spectrum LG Electronics
28. R1-2312171 Remaining issues on channel access mechanism for SL-U WILUS Inc.
29. R1-2312248 FL summary #1 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
30. R1-2312249 FL summary #2 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
31. R1-2312250 FL summary #3 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
32. R1-2312251 FL summary #4 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
33. R1-2312252 FL summary #5 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
34. R1-2312253 FL summary #6 for AI 8.2.1.1: SL-U channel access mechanism Moderator (OPPO)
35. R1-2312254 FL summary for AI 8.2.1.1: SL-U channel access mechanism (EOM) Moderator (OPPO)
36. R1-2312666 [Draft] LS on re-evaluation and pre-emption checking for MCSt CATT, CICTCI, OPPO
37. R1-2310812 Remaining issues for Physical Channel Design Framework for SL-U Nokia, Nokia Shanghai Bell
38. R1-2310852 Maintenance of physical channel design for sidelink operation over unlicensed spectrum Huawei, HiSilicon
39. R1-2310969 Remaining issues on physical channel design of sidelink on unlicensed spectrum Quectel
40. R1-2311091 Remaining issues on physical channel design framework for sidelink on unlicensed spectrum vivo
41. R1-2311162 Remaining issues on Physical channel design for sidelink on unlicensed spectrum Spreadtrum Communications
42. R1-2311237 On maintenance of SL-U PHY channel designs and procedures OPPO
43. R1-2311337 Maintenance on physical channel design framework for sidelink on unlicensed spectrum CATT, CICTCI
44. R1-2311401 Remaining details on SL-U physical channel structures and procedures xiaomi
45. R1-2311425 Remaining issues on physical channel design framework NEC
46. R1-2311516 Discussion on physical layer structures and procedures for SL-U ZTE, Sanechips
47. R1-2311565 Physical channel design for sidelink on unlicensed spectrum Panasonic
48. R1-2311589 Remaining issues on physical layer design framework for sidelink on unlicensed spectrum Lenovo
49. R1-2311620 Remaining issues on channel design framework in SL-U NTT DOCOMO, INC.
50. R1-2311680 On Remaining Issues of Sidelink Physical Channel Design Framework for Unlicensed Spectrum Apple
51. R1-2311752 Remaining issues on physical channel design framework for SL-U ETRI
52. R1-2311767 Remaining issues on physical channel design framework for NR sidelink evolution on unlicensed spectrum Sharp
53. R1-2311796 Remaining issues of physical channel design for sidelink in unlicensed spectrum Transsion Holdings
54. R1-2311838 Remaining issues on physical channel design framework Samsung
55. R1-2311885 Remaining issues for SL U physical layer design InterDigital, Inc.
56. R1-2311976 Discussion on remaining issue for physical channel design framework MediaTek Inc.
57. R1-2312032 Physical Channel Design for Sidelink on Unlicensed Spectrum Qualcomm Incorporated
58. R1-2312122 Remaining issues on physical channel design framework for sidelink on unlicensed spectrum LG Electronics
59. R1-2312135 Discussion on channel design for SL-U ASUSTeK
60. R1-2312172 Remaining issues on PHY channel design for SL-U WILUS Inc.
61. R1-2312324 FL summary#1 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
62. R1-2312325 FL summary#2 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
63. R1-2312326 FL summary#3 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
64. R1-2312327 FL summary#4 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
65. R1-2312328 FL summary#5 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
66. R1-2312531 FL summary#6 for AI 8.2.1.2 SL-U physical channel design framework Moderator (Huawei)
67. R1-2310813 Remaining issues for Co-channel Coexistence for LTE Sidelink and NR Sidelink Nokia, Nokia Shanghai Bell
68. R1-2310853 Maintenance of co-channel coexistence for LTE sidelink and NR sidelink Huawei, HiSilicon
69. R1-2311092 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink vivo
70. R1-2311238 On maintenance of co-channel coexistence for LTE and NR SL OPPO
71. R1-2311338 Maintenance on co-channel coexistence for LTE sidelink and NR sidelink CATT, CICTCI
72. R1-2311517 Maintenance on co-channel coexistence for LTE sidelink and NR sidelink ZTE, Sanechips
73. R1-2311621 Maintenance on co-channel coexistence for LTE sidelink and NR sidelink NTT DOCOMO, INC.
74. R1-2311768 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink Sharp
75. R1-2311839 Remaining issues on co-channel coexistence for LTE sidelink and NR sidelink Samsung
76. R1-2311886 Remaining issues for Co-channel coexistence between LTE sidelink and NR sidelink InterDigital, Inc.
77. R1-2312259 FL Summary #1 for AI 8.2.2: Co-channel coexistence for LTE sidelink and NR sidelink Moderator (LG Electronics)
78. R1-2312260 FL Summary #2 for AI 8.2.2: Co-channel coexistence for LTE sidelink and NR sidelink Moderator (LG Electronics)
79. R1-2312261 FL Summary #3 for AI 8.2.2: Co-channel coexistence for LTE sidelink and NR sidelink Moderator (LG Electronics)
80. R1-2310814 Remaining issues for Sidelink Carrier Aggregation for NR Nokia, Nokia Shanghai Bell
81. R1-2310854 Maintenance of sidelink CA operation Huawei, HiSilicon
82. R1-2311093 Remaining issues on Rel-18 sidelink CA vivo
83. R1-2311239 On maintenance of carrier aggregation in NR Sidelink evolution OPPO
84. R1-2311518 Remaining issues for sidelink CA operation ZTE, Sanechips
85. R1-2311681 On Remaining Issue of Sidelink CA Operation Apple
86. R1-2311753 Remaining issues on sidelink CA operation ETRI
87. R1-2311769 Remaining issues on Carrier Aggregation for NR sidelink evolution Sharp
88. R1-2311840 Remaining issues on sidelink CA operation Samsung
89. R1-2311887 Remaining issues for Sidelink CA operation InterDigital, Inc.
90. R1-2312262 FL Summary #1 for AI 8.2.3: Sidelink CA operation Moderator (LG Electronics)
91. R1-2312263 FL Summary #2 for AI 8.2.3: Sidelink CA operation Moderator (LG Electronics)
92. R1-2312264 FL Summary #3 for AI 8.2.3: Sidelink CA operation Moderator (LG Electronics)
93. R1-2312494 LS on Sidelink CSI Reporting MAC-CE for SL-CA RAN2, OPPO

**RAN2#123bis**

1. R2-2311505 LS reply to RAN4 LS R4-2314351
2. R2-2309433 LS on resource selection for MCSt RAN1, OPPO
3. R2-2309451 LS on NR SL unlicensed LBT failures UE behavior RAN4, Ericsson
4. R2-2309506 Running CR of TS 38.331 for SL Evolution OPPO
5. R2-2309749 Running CR of TS 38.321 for SL Evolution LG Electronics Inc.
6. R2-2309750 Open issue list of stage 3 MAC running CR for R18 SL-Evo LG Electronics Inc.
7. R2-2311497 Summary of [AT123bis][106][V2XSL] MAC detailed open issues (LG) LG
8. R2-2309494 Running PDCP CR for NR Sidelink Evolution CATT
9. R2-2309495 PDCP open issue list for Rel-18 NR sidelink evolution CATT
10. R2-2310072 Discussion on UE capability for Rel-18 SL evolution Huawei, HiSilicon
11. R2-2310073 Running CR of TS 38.306 for Rel-18 SL evolution Huawei, HiSilicon
12. R2-2310074 Running CR of TS 38.331 on UE capability for Rel-18 SL evolution Huawei, HiSilicon
13. R2-2311499 Summary on [AT123bis][108][V2X/SL] 38.306 running CR (Huawei) Huawei
14. R2-2311500 Running CR of TS 38.306 for Rel-18 SL evolution Huawei, HiSilicon
15. R2-2311501 Running CR of TS 38.331 on UE capability for Rel-18 SL evolution Huawei, HiSilicon
16. R2-2309504 Work plan of R18 SL-Evo OPPO, LG
17. R2-2309505 Open Issue list for R18 SL-Evo OPPO, LG
18. R2-2309511 Summary of [POST123][511] Additional conditions to trigger resource (re)selection (OPPO) OPPO
19. R2-2311253 Discussion on resource allocation for MCSt and LCP enhancement for COT sharing CATT, CICTI
20. R2-2311253 Discussion on resource allocation for MCSt and LCP enhancement for COT sharing CATT, CICTCI
21. R2-2309497 Remaining issues on SL C-LBT failure handling CATT
22. R2-2309507 Discussion on C-LBT-F report to peer UE OPPO, MediaTek Inc., Xiaomi, vivo, NEC, Qualcomm, Samsung, CATT, TCL
23. R2-2309508 Left issues on SL-U OPPO
24. R2-2309638 Discussion on SL C-LBT failure and LCP enhancement Huawei, HiSilicon
25. R2-2309639 Impact on leftover issues for SL-U Huawei, HiSilicon
26. R2-2309718 Discussion on remaining issues of SL-U LG Electronics
27. R2-2309744 Remaining issues on SL LBT failure vivo
28. R2-2309745 Remaining issues on resource (re)selection and others for SLU vivo
29. R2-2309811 Discussion on LS on NR SL unlicensed LBT failures UE behavior LG Electronics
30. R2-2309814 Discussion on remaining issues on SL-U Xiaomi
31. R2-2309815 Discussion on resource allocation and enhanced LCP for SL-U Xiaomi
32. R2-2309867 Remaining issues on SL-U SHARP
33. R2-2309889 Discussion on resource (re)selection for MCSt regarding LBT failure ASUSTeK
34. R2-2309933 Discussion on resource (re)selection and other remaining issues for NR SL-U Lenovo
35. R2-2310005 Discussion on remaining issues of SL-U Spreadtrum Communications
36. R2-2310051 Discussion on remaining issues for SL-U ZTE, Sanechips
37. R2-2310052 Discussion on reporting C-LBT failure indication to the peer UE ZTE, Sanechips, InterDigital, Lenovo, Nokia
38. R2-2310091 Discussion on remaining issues of SL-U NEC
39. R2-2310131 Remaining aspects on SL-U Ericsson
40. R2-2310138 On HARQ DTX and multiple PSFCH occasions Nokia, Nokia Shanghai Bell
41. R2-2310143 Remaining details of SL LCP and SL consistent LBT procedure Lenovo
42. R2-2310159 Open issues on SL-U Nokia, Nokia Shanghai Bell
43. R2-2310162 Reporting Consistent LBT Failure to the Peer UE InterDigital
44. R2-2310163 Handling SL RLF due to LBT Failure InterDigital
45. R2-2310164 Mode 2 Resource Selection Considering LBT Impacts InterDigital
46. R2-2310236 Remaining issue on SL Consistent LBT failure TCL
47. R2-2310298 Remaining issues on SL-U Apple
48. R2-2310431 Remaining issue on SL DRX in SL-U ITL
49. R2-2310902 Discussion on remaining issues of SL-U Qualcomm
50. R2-2310969 MAC Issues for SL-U Samsung
51. R2-2310970 Remaining issues for SL-U Samsung
52. R2-2310971 Additional ID in COT sharing Samsung
53. R2-2311222 Left issues on SL-U OPPO
54. R2-2310128 Draft LS reply to LS R4-2314351 Ericsson
55. R2-2310129 discussion on RAN4 LS R4-2314351 Ericsson
56. R2-2309509 Discussion on SL-FR2 impact OPPO
57. R2-2309498 Discussion on Sidelink Operation on FR2 CATT
58. R2-2310053 Discussion on sidelink FR2 ZTE, CAICT, Sanechips
59. R2-2309716 Discussion on RAN2 aspects of SL-FR2 LG Electronics
60. R2-2309746 Discussion on RAN2 aspects for FR2 procedure vivo
61. R2-2309767 Discussion on SL-FR2 Huawei, HiSilicon
62. R2-2309806 Discussion on SL-FR2 impact to RAN2 Xiaomi
63. R2-2309934 Discussion on FR2 operation for NR SL Lenovo
64. R2-2310130 SL in FR2 Ericsson
65. R2-2310299 Discussion on RAN2 aspects of SL FR2 Apple
66. R2-2310463 Discussion on SL-FR2 aspects in RAN2 Nokia
67. R2-2310903 Discussion on SL FR2 Qualcomm
68. R2-2311502 Summary of [AT123bis][109][V2X/SL] RRC related open issues for CA/Duplication (OPPO) OPPO
69. R2-2309499 Discussion on NR Sidelink CA CATT
70. R2-2309510 Left issues on SL Carrier Aggregation OPPO
71. R2-2309717 Discussion on remaining issues of SL-CA enhancements LG Electronics
72. R2-2309747 Discussion on remaining issues on NR Sidelink CA vivo
73. R2-2309768 Discussion on SL CA enhancements Huawei, HiSilicon
74. R2-2309816 Discussion on carrier aggregation for NR sidelink Xiaomi
75. R2-2309902 SL RLF in SL CA Fujitsu
76. R2-2309935 Discussion on multi-carrier operation for NR SL Lenovo
77. R2-2310054 Discussion on sidelink CA ZTE, Sanechips
78. R2-2310092 Discussion on remaining issues of SL CA NEC
79. R2-2310094 Discussion on carrier selection procedure of running CR NEC
80. R2-2310132 Aspects of SL CA Ericsson
81. R2-2310165 Carrier Aggregation in NR SL for Unicast InterDigital
82. R2-2310300 Remaining issues on SL carrier mapping Apple, ZTE, Sanechips, Ericsson, InterDigital
83. R2-2310301 Remaining issues on SL CA Apple, Ericsson
84. R2-2310878 Remaining issues in support of sidelink CA Nokia, Nokia Shanghai Bell
85. R2-2310904 Discussion on Tx Profile for SL CA Qualcomm
86. R2-2310905 Discussion on remaining issues of SL CA Qualcomm
87. R2-2310972 Remaining issues for SL-CA Samsung
88. R2-2311056 Discussion on Tx Profile for SL CA Qualcomm, Apple
89. R2-2311115 Left issues on SL Carrier Aggregation OPPO

**RAN2#124**

1. R2-2311705 Reply LS on SL RB set index and LBT failure indication for PSFCH (R1-2310434; contact: OPPO)
2. R2-2311755 LS on a capability of UE power class and IE on PEMAX,CA for SL CA (R4-2317751; contact: LGE, OPPO)
3. R2-2311764 Reply LS on TX Profile for SL CA (S2-2311811; contact: LGE)
4. R2-2311787 Work plan of R18 SL-Evo OPPO, LG
5. R2-2311788 Per-WI Open Issue list for R18 SL-Evo OPPO, LG
6. R2-2311789 Stage-3 RRC Open Issue list for R18 SL-Evo OPPO, LG
7. R2-2311790 Introduction of Release-18 SL Evolution OPPO CR Rel-18 38.331
8. R2-2311955 Introduction of Release-18 SL Evolution in TS 38.321 LG Electronics France
9. R2-2312185 Introduction of NR Sidelink Evolution InterDigital CR Rel-18 38.300
10. R2-2311943 Introduction of Release-18 SL Evolution in TS 38.304 ZTE Corporation, Sanechips
11. R2-2311952 Introduction of NR sidelink PDCP duplication in TS 38.323 CATT
12. R2-2313041 Discussion on open issues of UE capabilities for Rel-18 SL evolution
13. R2-2313042 Draft introduction of SL evolution for TS 38.306 Huawei, HiSilicon
14. R2-2313043 Draft introduction of SL evolution UE capabilities for TS 38.331 Huawei, HiSilicon
15. R2-2313612 Draft introduction of SL evolution for TS 38.306 Huawei, HiSilicon
16. R2-2313613 Draft introduction of SL evolution UE capabilities for TS 38.331 Huawei, HiSilicon
17. R2-2313044 Draft Rel-18 RAN2 TP for TR 37.985 Huawei, HiSilicon
18. R2-2313045 Draft LS on Rel-18 RAN2 TP for TR 37.985 Huawei, HiSilicon
19. R2-2313614 Draft Rel-18 RAN2 TP for TR 37.985 Huawei, HiSilicon
20. R2-2313615 LS on Rel-18 RAN2 TP for TR 37.985 LS out
21. R2-2311791 Summary of [POST123bis][113][V2XSL] QoS flows mapping to carriers (OPPO) OPPO
22. R2-2312032 Discussion on remaining issues of SL-CA enhancement LG Electronics Inc.
23. R2-2313620 LS to SA2 on QoS to Carrier Mapping for SL CA LS out
24. R2-2313623 LS to SA2 on QoS to Carrier Mapping for SL CA LS out
25. R2-2313621 LS on Sidelink CSI Reporting MAC-CE for SL-CA LS out
26. R2-2311944 Discussion on NACK-only for SL-U ZTE Corporation, Ericsson, Xiaomi, Nokia, Nokia Shanghai Bell, vivo, Sanechips
27. R2-2311792 Left issues on SL-CA and SL-U OPPO
28. R2-2311793 Discussion on R4-2317751 OPPO
29. R2-2311803 Discussion on open issues of SL-U vivo
30. R2-2311804 Discussion on open issues of NR sidelink CA vivo
31. R2-2311998 Discussion on open issues for SL CA China Telecom
32. R2-2312037 Discussion on CSI reporting MAC CE for SL CA Huawei, HiSilicon, NEC, ASUSTek, Qualcomm
33. R2-2312100 Remaining open issues Lenovo
34. R2-2312177 Open Issues on SL-U InterDigital
35. R2-2312178 Open Issues on SL CA InterDigital
36. R2-2312216 Discussion on remaining issues of SL-U NEC
37. R2-2312217 Discussion on remaining issues of SL CA NEC
38. R2-2312251 Remaining issues for SL-U Huawei, HiSilicon
39. R2-2312325 Remaining issues on SL-U Apple
40. R2-2312326 Remaining issues on SL CA Apple
41. R2-2312431 Discussion on remaining issues on SL-U Xiaomi
42. R2-2312432 Discussion on remaining issues on SL CA Xiaomi
43. R2-2312514 Discussion on RAN4 LS R4-2317751 Ericsson
44. R2-2312515 Remaining aspects on SL-U Ericsson
45. R2-2312516 Aspects of SL CA Ericsson
46. R2-2312824 On SL-U open issues Nokia, Nokia Shanghai Bell
47. R2-2312928 Discussion on remaining issues of SL-U Qualcomm India Pvt Ltd
48. R2-2312930 Discussion on remaining issues of SL CA Qualcomm India Pvt Ltd
49. R2-2312994 Discussion on left issues for SL CA enhancements Huawei, HiSilicon
50. R2-2313025 7.15.2 Remaining issues for SL-U Samsung Electronics Co., Ltd discussion Rel-18 NR\_SL\_enh2
51. R2-2313026 7.15.2 Remaining issues for SL-CA Samsung Electronics Co., Ltd
52. R2-2313178 Open issues on SL-CA Nokia, Nokia Shanghai Bell
53. R2-2313266 Discussion on remaining issues for SL-U LG Electronics France
54. R2-2312184 Draft LS on QoS Flow to Carrier Mapping InterDigital
55. R2-2313313 Discussion on PEMAX,CA for NR SL CA LG Electronics Inc.
56. R2-2312183 Stage 2 Open Issues InterDigital
57. R2-2312218 Discussion on terminology alignment for SL-U and SL CA NEC
58. R2-2311805 Remaining issues for Control plane vivo
59. R2-2311941 Discussion on remaining FFS issues on control plane for SL evo ZTE Corporation, Sanechips
60. R2-2312050 Remaining CP open issues for NR SL CA CATT
61. R2-2312455 Stage-3 issues of control plane for NR SL Lenovo
62. R2-2313616 Summary of [AT124][111][V2X/SL] RRC details (OPPO) OPPO
63. R2-2312049 Finalization on remaining Stage-3 issues in TS 38.323 running CR CATT, CICTCI, Xiaomi, Apple, OPPO, LG Electronics Inc., vivo, Huawei, HiSilicon, NEC, MediaTek Inc.
64. R2-2312194 Open issue on stage-3 MAC running CR LG Electronics France
65. R2-2311876 Left issue on stage-3 MAC running-CR OPPO
66. R2-2311942 Discussion on remaining FFS issues on user plane for SL evo ZTE Corporation, Sanechips
67. R2-2312051 Remaining UP open issues for SL-U CATT
68. R2-2312179 MAC Stage 3 Issues InterDigital
69. R2-2312433 Further clarification on MAC CR Xiaomi
70. R2-2312456 Stage-3 issues of user plane for NR SL Lenovo
71. R2-2312788 UP issues for SL-U and SL-CA Nokia, Nokia Shanghai Bell
72. R2-2312933 Correction to LTE V2X and NR V2X Co-channel Qualcomm India Pvt Ltd
73. R2-2313027 MAC issues Samsung Electronics Co., Ltd
74. R2-2313154 Remaining issues on SL-U SHARP Corporation
75. R2-2313617 Summary of [AT124][112][V2X/SL] MAC details (LG) LG

**RAN3#122**

1. R3-237313 Discussion on sidelink CA ZTE Corporation
2. R3-237855 Introduction of SL CA over F1 interface ZTE Corporation
3. R3-237950 Introduction of SL CA over F1 interface ZTE Corporation, Nokia, Nokia Shanghai Bell, Samsung Electronics Co., Ltd, Philips International B.V., CATT, LG Electronics Inc., China Telecom, Intel Corporation, Qualcomm Inc., Sanechips

**RAN4#108bis**

1. R4-2315089 Discussion on work scope and test cases for SL evolution demodulation performance LG Electronics Inc.
2. R4-2315146 Work plan for Demodulation Performance of Rel-18 NR Sidelink Evolution LG Electronics Inc., OPPO
3. R4-2315151 Remaining RF requirements for inter-band concurrent operation between NR Uu @n78 and SL-U @n46 Meta Ireland
4. R4-2315152 TP for TR 38.786 on the Remaining RF requirements for inter-band concurrent SL-U operation Meta Ireland
5. R4-2315153 Remaining UE RF requirements for Intra-band contiguous SL CA in ITS spectrum Meta Ireland
6. R4-2315154 TP for TR 38.786 on the Remaining RF requirements for NR SL CA operation Meta Ireland
7. R4-2315155 Draft CR TS38.101-1 on NR SL CA RX requirements Meta Ireland
8. R4-2315226 Sidelink on a single unlicensed spectrum Huawei, HiSilicon
9. R4-2315227 MPR evaluation for sidelink CA Huawei, HiSilicon
10. R4-2315228 TP to TR38.786 sidelink CA Huawei, HiSilicon
11. R4-2315229 draftCR to 38.101-1 Tx requirements for SL CA Huawei, HiSilicon
12. R4-2315311 SL enhancement RRM discussion Qualcomm, Inc.
13. R4-2315312 SL enhancement demod discussion Qualcomm, Inc.
14. R4-2315423 Discussion on RRM core requirements for sidelink CA Xiaomi
15. R4-2315424 draftCR on interruptions to WAN due to sidelink carrier aggregation Xiaomi
16. R4-2315425 Discussion on RRM core requirements for SL unlicensed operation Xiaomi
17. R4-2315440 Discussion on MPR of SL-U Xiaomi
18. R4-2315525 draft CR on SL-U NR\_values LG Electronics
19. R4-2315526 Discussion on NR sidelink CA operation LG Electronics Inc.
20. R4-2315527 Discussion on NR sidelink unlicensed operation LG Electronics Inc.
21. R4-2315528 UE RF requirements of con-current operation on Uu and sidelink LG Electronics
22. R4-2315529 Draft CR on UE transmit timing for SL-U LG Electronics Inc.
23. R4-2315530 TP to TR on con-current operation on Uu and sidelink LG Electronics
24. R4-2315531 LS on supported SCS of S-SSB in SL unlicensed band LG Electronics Inc.
25. R4-2315532 UE RF requirements of SL CA LG Electronics
26. R4-2315533 Discussion on RRM performance for NR sidelink evolution LG Electronics Inc.
27. R4-2315534 LS on a capability of UE power class and IE on PEMAX,CA for SL CA LG Electronics
28. R4-2315535 Draft Big CR for RRM requirements for NR sidelinlk evolution LG Electronics Inc., OPPO
29. R4-2315536 TP for TR 38.786 on SLCA MPR and Configured transmitted power LG Electronics
30. R4-2315542 On Tx requirements for NR sidelink evolution LG Electronics Finland
31. R4-2315543 TP for TR 38.786 on the SL-U MPR and A-MPR LG Electronics Finland
32. R4-2315549 On Co-channel coexistence for LTE SL and NR SL LG Electronics Finland
33. R4-2315550 TP for TR 38.786 On Co-channel coexistence for LTE SL and NR SL LG Electronics Finland
34. R4-2315825 TP for TR 38.786: Addition of definitions and symbols to Chapter 3 vivo
35. R4-2315826 Draft CR on system parameters for SL unlicensed operation for single CC vivo
36. R4-2315827 Draft CR on Rx requirements for inter-band con-current operation vivo
37. R4-2315828 Further discussion on sidelink inter-band con-current operation vivo
38. R4-2315829 Further discussion on SL CA vivo
39. R4-2315934 Discussion on RRM core requirements for NR SL unlicensed operation Nokia, Nokia Shanghai Bell
40. R4-2315946 Discussion on NR sidelink evolution RRM performance requirements Nokia, Nokia Shanghai Bell
41. R4-2315963 TR38.786 v1.1.0 for SL evoluation OPPO
42. R4-2315986 General views on Rel-18 sidelink performance requirements Huawei,HiSilicon
43. R4-2316031 Discussion on RRM requirements for SL-U operations Huawei, HiSilicon
44. R4-2316032 DraftCR on interruption requirements for SL CA operations Huawei, HiSilicon
45. R4-2316033 Discussion on RRM test cases for R18 SL enhancement Huawei, HiSilicon
46. R4-2316119 on SL-U MPR simulation OPPO
47. R4-2316120 on SL-U A-MPR simulation OPPO
48. R4-2316121 TP to TR 38.786 on MPR and A-MPR OPPO
49. R4-2316122 draft CR 38.101-1 SL-U MPR A-MPR requirement OPPO
50. R4-2316123 on remaining issue for sidelink con-current operation OPPO
51. R4-2316124 TP to TR 38.786 on concurrent operation OPPO
52. R4-2316125 draft CR 38.101-1 SL-U inter-band concurrent operation OPPO
53. R4-2316126 on remaining issue for LTE and NR co-existence OPPO
54. R4-2316127 TP to TR 38.786 on LTE and NR co-existence OPPO
55. R4-2316128 on remaining issue for Sidelink CA OPPO
56. R4-2316129 TP to TR 38.786 on SL CA OPPO
57. R4-2316130 draft CR 38.101-1 SL CA OPPO
58. R4-2316185 On remaining RRM issues for SL-CA OPPO
59. R4-2316186 On RRM requirements for NR SL-U OPPO
60. R4-2316187 Draft CR on applicability for LTE SL and NR SL co-channel co-existence OPPO
61. R4-2316188 Work plan for RRM performance requirements of R18 SL OPPO, LG Electronics Inc.
62. R4-2316345 Discussions on RRM requirements for sidelink unlicensed Ericsson
63. R4-2316346 DraftCR: RRM requirements for initiation/cease of SLSS Transmissions with CCA Ericsson
64. R4-2316347 Discussions on RRM requirements for sidelink CA Ericsson
65. R4-2316348 Discussions on RRM performance requirements for sidelink Ericsson
66. R4-2316503 Draft CR on Selection / Reselection of Sidelink Synchronization Reference Source under CCA Nokia, Nokia Shanghai Bell
67. R4-2316638 NR Sidelink Evolution: UE Demodulation Performance Requirements Nokia, Nokia Shanghai Bell
68. R4-2316655 Discussion on RRM core requirements for SL unlicensed operation MediaTek Inc.
69. R4-2316725 RRM Core Requirements for NR Sidelink CA Nokia, Nokia Shanghai Bell
70. R4-2316726 Draft CR on Selection or Reselection of Synchronization Reference Source for Sidelink Carrier Aggregation Nokia, Nokia Shanghai Bell
71. R4-2316791 Sidelink PSSCH PSCCH MPR and A\_MPR in unlicensed spectrum Qualcomm Incorporated
72. R4-2316965 Offline meeting minutes for NR\_SL\_enh2\_demod LGE
73. R4-2316969 WF on NR\_SL\_enh2\_demod LGE
74. R4-2317217 Topic summary for [108-bis][225] NR\_SL\_enh2\_part1 Moderator (LGE)
75. R4-2317218 Topic summary for [108-bis][226] NR\_SL\_enh2\_part2 Moderator (OPPO)
76. R4-2317265 Topic summary for [108-bis][142] NR\_SL\_enh2\_UERF\_part1 Moderator (OPPO)
77. R4-2317266 Topic summary for [108-bis][143] NR\_SL\_enh2\_UERF\_part2 Moderator (LGE)
78. R4-2317267 Topic summary for [108-bis][144] NR\_SL\_enh2\_UERF\_part3 Moderator (Huawei)
79. R4-2317278 Ad-hoc minutes for NR\_SL\_enh2 WI Apple
80. R4-2317353 Draft CR on UE transmit timing for SL-U LG Electronics Inc.
81. R4-2317354 DraftCR: RRM requirements for initiation/cease of SLSS Transmissions with CCA Ericsson
82. R4-2317355 Draft CR on Selection / Reselection of Sidelink Synchronization Reference Source under CCA Nokia, Nokia Shanghai Bell
83. R4-2317356 WF on R18 NR SL RRM requirements (part 1) LGE
84. R4-2317361 draftCR on interruptions to WAN due to sidelink carrier aggregation Xiaomi
85. R4-2317362 DraftCR on interruption requirements for SL CA operations Huawei, HiSilicon
86. R4-2317363 Draft CR on Selection or Reselection of Synchronization Reference Source for Sidelink Carrier Aggregation Nokia, Nokia Shanghai Bell
87. R4-2317364 Draft CR on applicability for LTE SL and NR SL co-channel co-existence OPPO
88. R4-2317375 WF on R18 NR SL RRM requirements (part 2) OPPO
89. R4-2317415 Draft CR on Selection / Reselection of Sidelink Synchronization Reference Source under CCA Nokia, Nokia Shanghai Bell
90. R4-2317718 WF on NR\_SL\_enh2\_UERF\_part1 OPPO
91. R4-2317720 WF on NR\_SL\_enh2\_UERF\_part1 OPPO
92. R4-2317721 Draft CR on system parameters for SL unlicensed operation for single CC vivo
93. R4-2317722 TP for TR 38.786 on the SL-U MPR and A-MPR LG Electronics Finland
94. R4-2317723 TP to TR 38.786 on concurrent operation OPPO, Meta Ireland
95. R4-2317724 Draft CR on Rx requirements for inter-band con-current operation vivo, Meta
96. R4-2317725 draft CR 38.101-1 SL-U inter-band concurrent operation OPPO, Meta Ireland
97. R4-2317726 TP for TR 38.786 On Co-channel coexistence for LTE SL and NR SL LG Electronics Finland
98. R4-2317727 WF on NR\_SL\_enh2\_UERF\_part2 LGE
99. R4-2317728 TP for TR 38.786 on the Remaining RF requirements for NR SL CA operation Meta Ireland
100. R4-2317729 TP to TR38.786 sidelink CA Huawei, HiSilicon
101. R4-2317730 draftCR to 38.101-1 Tx requirements for SL CA Huawei, HiSilicon
102. R4-2317731 WF on NR\_SL\_enh2\_UERF\_part3 Huawei
103. R4-2317751 LS on a capability of UE power class and IE on PEMAX,CA for SL CA LG Electronics, OPPO
104. R4-2317957 Topic summary for [108bis][326] NR\_SL\_enh2\_demod Moderator(LGE)

**RAN4#109**

1. R4-2318149 Topic summary for [109][143] NR\_SL\_enh2\_UERF\_part1 Moderator (OPPO)
2. R4-2318150 Topic summary for [109][144] NR\_SL\_enh2\_UERF\_part2 Moderator (LGE)
3. R4-2318151 Topic summary for [109][145] NR\_SL\_enh2\_UERF\_part3 Moderator (Huawei)
4. R4-2318185 Topic summary for [109][229] NR\_SL\_enh2\_part1 Moderator (LGE)
5. R4-2318186 Topic summary for [109][230] NR\_SL\_enh2\_part2 Moderator (OPPO)
6. R4-2318220 Topic summary for [109][328] NR\_SL\_enh2\_demod Moderator (LGE)
7. R4-2318316 Draft CR for 38.101-1: SL-U RB set and intra-cell guard band determination CATT,CICTCI
8. R4-2318445 Draft CR to TS38.101-1 on UE RF requirements for SL-U features Meta Ireland, OPPO
9. R4-2318446 Draft CR to TS38.101-1 on operating band and system parameters for SL-U features Meta Ireland
10. R4-2318447 Draft CR on TS38.101-1 to update configured Tx power for SL-CA operation Meta Ireland
11. R4-2318806 Co-channel coexistence for LTE SL and NR SL Qualcomm Technologies Int
12. R4-2318807 draft CR on UE RF requirements of con-current operation on Uu and sidelink LG Electronics
13. R4-2318808 UE RF requirements of SL CA LG Electronics
14. R4-2318809 draft CR on SL CA UE RF requirements LG Electronics
15. R4-2318811 TP for TR 38.786 on SLCA MPR and A-MPR LG Electronics
16. R4-2318831 Discussion on NR sidelink CA operation LG Electronics Inc.
17. R4-2318832 Discussion on NR sidelink unlicensed operation LG Electronics Inc.
18. R4-2318833 Draft CR for RRM requirements for NR sidelink unlicensed operation LG Electronics Inc.
19. R4-2318839 Discussion on RRM performance for NR sidelink evolution LG Electronics Inc.
20. R4-2318840 Big CR for RRM requirements for NR sidelink evolution LG Electronics, OPPO
21. R4-2318870 Discussion on RRM core requirements for sidelink CA Xiaomi
22. R4-2318871 draftCR on interruptions to WAN due to sidelink carrier aggregation Xiaomi
23. R4-2318872 Discussion on RRM core requirements for SL unlicensed operation Xiaomi
24. R4-2318879 Discussion on MPR of SL-U Xiaomi
25. R4-2318937 SL enhancement RRM discussion (SL-U, SL-CA core and performance included) Qualcomm, Inc.
26. R4-2318938 SL enhancement demod discussion Qualcomm, Inc.
27. R4-2318995 Maintenance TP to TR 38.786 vivo
28. R4-2318996 Draft CR on introduction of definitions, symbols and abbreviations for SL evolution vivo
29. R4-2318997 Discussion on PSFCH power control vivo
30. R4-2318998 Draft reply LS on PSFCH power control vivo
31. R4-2318999 Draft CR on Rx requirements for SL-U single carrier operation vivo
32. R4-2319000 Draft CR on RF requirements for SL-U con-current operation vivo
33. R4-2319001 Draft CR on RF requirements for SL CA operation vivo
34. R4-2319170 On Tx requirements for NR sidelink evolution LG Electronics Finland
35. R4-2319236 draft CR on SL-U MPR and A-MPR (alt1) LG Electronics Finland
36. R4-2319237 draft CR on SL-U MPR and A-MPR (alt2) LG Electronics Finland
37. R4-2319252 Discussion on LS on PSFCH power control LG Electronics Finland
38. R4-2319253 Reply LS on PSFCH power control LG Electronics Finland
39. R4-2319258 on NR SL co-channel coexistence with LTE SL LG Electronics Finland
40. R4-2319263 TP for TR 38.786 on NR SL co-channel coexistence with LTE SL LG Electronics Finland
41. R4-2319265 Draft CR on NR SL co-channel coexistence with LTE SL LG Electronics Finland
42. R4-2319266 Discussion on work scope and test cases for SL evolution demodulation performance LG Electronics Inc.
43. R4-2319493 On remaining RRM issues for SL-CA OPPO
44. R4-2319494 Draft CR for RRM requirements for NR SL CA OPPO
45. R4-2319495 On RRM requirements for NR SL-U OPPO
46. R4-2319496 Discussion on test case design for R18 SL-CA and SL-U OPPO
47. R4-2319500 MPR for PSFCH and S-SSB for SL-U Huawei, HiSilicon
48. R4-2319501 On PSFCH power control Huawei, HiSilicon
49. R4-2319502 [draft]Reply LS on PSFCH power control Huawei, HiSilicon
50. R4-2319503 TP to TR38.786 updated MPR simulation assumptions for PSFCH transmission Huawei, HiSilicon
51. R4-2319504 On sidelink CA Huawei, HiSilicon
52. R4-2319505 TP to TR38.786 sidelink CA Huawei, HiSilicon
53. R4-2319506 draftCR to 38.101-1 Tx requirements for SL CA Huawei, HiSilicon
54. R4-2319632 Discussion on RRM core requirements for SL unlicensed operation MediaTek Inc.
55. R4-2319898 TR38.786 v1.2.0 for SL evolution OPPO
56. R4-2319924 remaining issue for SL-U MPR OPPO
57. R4-2319925 remaining issue for SL-U A-MPR OPPO
58. R4-2319926 DraftCR for SL-U OPPO
59. R4-2319927 on the remaining issue for the LTE NR SL coexistence OPPO
60. R4-2319928 TP on LTE NR SL co-existence OPPO
61. R4-2319929 DraftCR for LTE NR SL co-existence OPPO
62. R4-2319930 DraftCR for SL concurrent operation OPPO
63. R4-2319931 DraftCR for SL-CA OPPO
64. R4-2319932 Big CR for NR SL evoluation OPPO
65. R4-2319933 feature list discussion for SL enhancement OPPO
66. R4-2319934 on the PSFCH power issue of RAN1 LS OPPO
67. R4-2319969 Discussion on RRM open issues for R18 SL evolution Huawei, HiSilicon
68. R4-2319970 Discussion on RRM test cases for R18 SL evolution Huawei, HiSilicon
69. R4-2320048 LS reply on PSFCH power control Nokia, Nokia Shanghai Bell
70. R4-2320115 Discussion on RRM core requirements for NR SL unlicensed operation Nokia, Nokia Shanghai Bell
71. R4-2320117 Discussion on NR sidelink evolution RRM performance requirements Nokia, Nokia Shanghai Bell
72. R4-2320123 Discussions on remaining issues of sidelink RRM for unlicensed operation Ericsson
73. R4-2320124 DraftCR: RRM requirements for initiation/cease of SLSS Transmissions with CCA Ericsson
74. R4-2320125 Discussions on RRM requirements for sidelink CA Ericsson
75. R4-2320126 Discussions on RRM performance requirements for sidelink Ericsson
76. R4-2320195 Discussions on sidelink UE demodulation requirements Huawei,HiSilicon
77. R4-2320450 LS on SL-U RSSI measurement Nokia, Nokia Shanghai Bell
78. R4-2320584 NR Sidelink Evolution: UE Demodulation Performance Requirements Nokia, Nokia Shanghai Bell
79. R4-2320864 RRM Core Requirements for NR Sidelink CA Nokia, Nokia Shanghai Bell
80. R4-2321065 Ad-hoc meeting minutes for [109][328] NR\_SL\_enh2\_demod LGE
81. R4-2321131 WF on [109][328] NR\_SL\_enh2\_demod LGE
82. R4-2321336 Ad-hoc minutes on NR\_SL\_enh2 WI Apple
83. R4-2321352 Draft CR for RRM requirements for NR sidelink unlicensed operation LG Electronics Inc.
84. R4-2321353 WF on R18 NR SL RRM requirements (part 1) LGE
85. R4-2321354 Big CR for RRM requirements for NR sidelink evolution LG Electronics, OPPO
86. R4-2321473 DraftCR: RRM requirements for initiation/cease of SLSS Transmissions with CCA Ericsson
87. R4-2321535 LS on SL-U RSSI measurement Nokia, Nokia Shanghai Bell
88. R4-2321584 Draft CR for RRM requirements for NR SL CA OPPO
89. R4-2321585 WF on R18 NR SL RRM requirements (part 2) OPPO
90. R4-2321587 draftCR on interruptions to WAN due to sidelink carrier aggregation Xiaomi
91. R4-2321736 WF for NR\_SL\_enh2\_UERF\_part1 OPPO
92. R4-2321766 WF for NR\_SL\_enh2\_UERF\_part1 OPPO
93. R4-2321767 Reply LS on PSFCH power control Huawei, HiSilicon
94. R4-2321769 Draft CR for 38.101-1: SL-U RB set and intra-cell guard band determination CATT,CICTCI
95. R4-2321770 Draft CR to TS38.101-1 on operating band and system parameters for SL-U features Meta Ireland
96. R4-2321771 On Tx requirements for NR sidelink evolution LG Electronics Finland
97. R4-2321772 TP to TR38.786 updated MPR simulation assumptions for PSFCH transmission Huawei, HiSilicon
98. R4-2321773 draft CR on SL-U MPR and A-MPR (alt2) LG Electronics Finland
99. R4-2321774 DraftCR for SL-U OPPO
100. R4-2321775 Draft CR on NR SL co-channel coexistence with LTE SL LG Electronics Finland
101. R4-2321776 draft CR on UE RF requirements of con-current operation on Uu and sidelink LG Electronics
102. R4-2321777 Draft CR on RF requirements for SL-U con-current operation vivo
103. R4-2321778 TP for TR 38.786 on SLCA MPR and A-MPR LG Electronics
104. R4-2321779 TP to TR38.786 sidelink CA Huawei, HiSilicon
105. R4-2321780 Draft CR on RF requirements for SL CA operation Vivo
106. R4-2321781 draftCR to 38.101-1 Tx requirements for SL CA Huawei, HiSilicon
107. R4-2321782 DraftCR for SL-CA OPPO
108. R4-2321783 draft CR on SL CA UE RF requirements LG Electronics
109. R4-2321818 TP for TR 38.786 updated PSFCH MPR and A-MPR simulation results LGE

10.01.2022 minor adaptations for RAN #95e

04.10.2021 minor adaptations for RAN #94e

08.08.2021 minor adaptations for RAN #93e

17.05.2021 minor adaptations for RAN #92e

28.01.2021 minor adaptations for RAN #91e

09.11.2020 minor adaptations for RAN #90e

31.08.2020 minor adaptations for RAN #89e

20.04.2020 minor adaptations for RAN #88e

18.02.2020 minor adaptations for RAN #87e

14.11.2019 minor adaptations for RAN #86

18.08.2019 minor adaptations for RAN #85

12.05.2019 minor adaptations for RAN #84

27.02.2019 minor adaptations for RAN #83

21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template