**3GPP TSG RAN meeting #92e RP-21xxxx**

**Electronic Meeting, June 14-18, 2021**

## Status Report to TSG

**Agenda item:** 9.7.1.3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** |  | | | | |
| included in this status report | Study Item:  No | Core part:  Yes | Performance part:  Yes | | Testing part:  No |
| **Acronym** | NR\_SL\_enh | | | | |
| **Unique ID** | 860042 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-202846 | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item:  mm/yyyy | Core part: 03/2022 | Performance part: 09/2022 | Testing part: mm/yyyy | |
| **Overall Completion level** | Study Item:  xx % | Core part:  45% | Performance Part:  0% | 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** | | RAN WG1 |
| **Rapporteur** | **Name** | Seungmin Lee |
| **Company** | LG Electronics |
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## 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

**RAN1#104bis-e**

Regarding resource allocation for power saving, the following agreements and conclusion were made:

* Conclusion on resource selection window of periodic-based partial sensing operation
  + In periodic-based partial sensing,
    - It is not necessary to further discuss whether or not to introduce a threshold to re-define T1 and T2.
* Agreements on sensing occasions of periodic-based partial sensing operation
  + In periodic-based partial sensing,
    - For the set of Preserve values, down-select to one of the following in RAN1#105-e
      * Alt.1: Preserve corresponds to all values from the configured set *sl-ResourceReservePeriodList*
      * Alt.2: A set of Preserve values is (pre-)configured and includes up to the full set of values from the configured set *sl-ResourceReservePeriodList*
        + FFS if support multiple sets of Preserve values based on one or more metrics
        + FFS whether/how to restrict the set of values
    - For the k value, down-selection to one of the following in RAN1#105-e (further refinement of each of the alternatives is possible)
      * Alt 1: Option 1 as in RAN1#104-e
      * Alt 2: A modified Option 5 as in RAN1#104-e, where the modification is such that it also includes option 1
        + FFS how to (pre-)configure (e.g. including bitmap), whether a maximum number of k values is needed, and whether it can be up to UE implementation to select a k value based on the (pre-)configuration
      * FFS details, e.g., sensing before the resource (re)selection trigger or the first slot of the set of Y candidate slots subject to processing time restriction, etc.
    - Note: companies are encouraged to provide more evaluations
* Agreements on conditions for UE to perform periodic-based partial sensing operation
  + When periodic-based partial sensing is potentially performed by UE in a mode 2 Tx resource pool provided by higher layer, at least all of the followings are met:
    - Periodic reservation for another TB (*sl-MultiReserveResource*) is enabled for the resource pool
    - The resource pool is (pre-)configured to enable partial sensing
    - Partial sensing configured by higher layer in the UE

Regarding inter-UE coordination for mode 2 enhancements, the following agreements were made:

* Agreements on inter-UE coordination schemes
  + Support the following schemes of inter-UE coordination in Mode 2:
    - Inter-UE Coordination Scheme 1:
      * The coordination information sent from UE-A to UE-B is the set of resources preferred and/or non-preferred for UE-B’s transmission
        + FFS details including a possibility of down-selection between the preferred resource set and the non-preferred resource set, whether or not to include any additional information other than indicating time/frequency of the resources within the set in the coordination information
      * FFS condition(s) in which Scheme 1 is used
    - Inter-UE Coordination Scheme 2:
      * The coordination information sent from UE-A to UE-B is the presence of expected/potential and/or detected resource conflict on the resources indicated by UE-B’s SCI
        + FFS details including a possibility of down-selection between the expected/potential conflict and the detected resource conflict
      * FFS condition(s) in which Scheme 2 is used
* Agreements on conditions for UEs to be UE-A(s)/UE-B(s) for inter-UE coordination
  + Study further to determine the conditions for UEs to be UE-A(s)/UE-B(s) for inter-UE coordination:
    - Details include applicable scenario(s)/inter-UE coordination scheme(s)
    - E.g., only UE(s) among the intended receiver(s) of UE-B can be a UE-A, any UE can be a UE-A, high-layer configured, etc.
      * Including the possibility of being subject to certain conditions and/or capability
* Agreements on UE-B’s behaviour of using inter-UE coordination information
  + When UE-B receives the inter-UE coordination information from UE-A, consider at least one of the following options (with details FFS including possibly down-selecting/merging one or more of the options below, applicable scenario(s)/condition(s) for each option, UE behavior) for UE-B’s to take it into account in the resource (re)-selection for its own transmission
    - For scheme 1:
      * Option 1-1: UE-B’s resource(s) to be used for its transmission resource (re)-selection is based on both UE-B’s sensing result (if available) and the received coordination information
      * Option 1-2: UE-B’s resource(s) to be used for its transmission resource (re)-selection is based only on the received coordination information
      * Option 1-3: UE-B’s resource(s) to be re-selected based on the received coordination information
      * Option 1-4: UE-B’s resource(s) to be used for its transmission resource (re)-selection is based on the received coordination information
    - For scheme 2:
      * Option 2-1: UE-B can determine resource(s) to be re-selected based on the received coordination information
      * Option 2-2: UE-B can determine a necessity of retransmission based on the received coordination information

**RAN1#105-e**

Regarding resource allocation for power saving, the following agreements were made:

* Agreements on sensing occasions of periodic-based partial sensing operation
  + For the set of Preserve values in periodic-based partial sensing,
    - If no (pre-)configuration (i.e., by default), Preserve corresponds to all values from the (pre-)configured set *sl-ResourceReservePeriodList*.
    - Otherwise, a single set of Preserve values can be (pre-)configured, where the set of Preserve values are restricted to a subset of the (pre-)configured set *sl-ResourceReservePeriodList*
      * This is per mode 2 Tx resource pool (pre-)configuration
      * A UE by implementation may also monitor other *sl-ResourceReservePeriodList* values not part of the restricted subset
        + In particular, the UE may additionally monitor occasions corresponding to P\_RSVP\_Tx

FFS whether the monitoring can be mandatory

* + For the k value in periodic-based partial sensing for resource (re)selection,
    - By default, the UE monitors the most recent sensing occasion for a given reservation periodicity before the resource (re)selection trigger slot n or the first slot of the set of Y candidate slots subject to processing time restriction.
    - If (pre-)configured, UE additionally monitors periodic sensing occasions that correspond to a set of values which can be (pre-)configured with at least one value
      * (Working assumption) Possible values correspond to the most recent sensing occasion for a given reservation periodicity before the resource (re)selection trigger slot n or the first slot of the set of Y candidate slots, and the last periodic sensing occasion prior to the most recent one for the given reservation periodicity are included.
      * FFS: whether/which other values and details of the (pre-)configuration (e.g. max number of values or sensing occasions)
      * FFS: whether a value denotes a specific occasion to monitor or the earliest occasion to start the monitoring.
    - FFS relationship between periodic-based partial sensing occasions and SL-DRX
    - Note:
      * This is for the case when the resource (re)selection triggering slot n is expected by UE
  + In periodic-based partial sensing for resource (re)selection, the UE at least monitors in periodic sensing occasion(s) for a given reservation periodicity before the first slot of the selected Y candidate slots subject to processing time restriction for the identification of candidate resources.
    - The processing time restriction includes *Tproc,0SL* and *Tproc,1SL*.
    - Aspects relating to sensing during SL DRX are to be discussed separately
  + Relationship to re-evaluation and pre-emption operation for periodic-based partial sensing to be discussed separately
    - FFS details including whether monitoring of periodic sensing occasions between triggering slot n and the first slot of the selected Y candidate slots subject to processing time restriction is performed as part of resource (re)selection or re-evaluation and pre-emption checking
* Agreements on random resource selection
  + For random resource selection,
    - Reuse the maximum distance separation of 32 logical slots for a HARQ retransmission resource reserved by a prior SCI for the same TB, which was defined in R16 for full sensing operation.
    - SL HARQ feedback enabled transmission is supported (FFS applicable conditions if any)
      * The minimum HARQ feedback time gap (Z) shall be respected between any two selected resources of a TB where a HARQ feedback for the first of these resources is expected.
  + FFS the impact of resource collision when random resource selection is performed by a UE which does not perform sensing / re-evaluation and pre-emption checking in a resource pool with mixed RA schemes (e.g. for low priority or any priority transmissions).
    - Including study potential solution(s) if the impact is not negligible (e.g. threshold based, raising priority, minimum time gap, pattern based, a priori SCI reserving initial transmissions, resource pool partitioning, and etc.).
* Agreements on sensing occasions of contiguous partial sensing operation
  + In contiguous partial sensing for resource (re)selection, TA and TB values can be zero, positive or negative
    - TA and TB values or range depend on different operating scenarios or conditions (e.g., periodic/aperiodic traffic, predictability of triggering slot n, remaining PDB, re-evaluation/pre-emption checking, HARQ feedback, CBR/CR parameter, power saving, etc)
      * FFS details
    - FFS: details of how periodic-based partial sensing and contiguous partial sensing are used for re-evaluation and pre-emption checking. Including how to reduce UE’s power consumption (caused by additional sensing operation of re-evaluation/pre-emption) after its resource selection, with the considerations of different operating scenarios or conditions (e.g., pre-emption enabled/disabled, HARQ-ACK enabled/disabled, etc).

#### 2.1.2 Remaining Open issues

The followings are the remaining open issues:

* Physical layer aspects on resource allocation to reduce UE’s power consumption including;
  + Details of partial sensing based resource selection and random resource selection
  + Details and condition(s) in which re-evaluation and pre-emption can be performed by UEs performing sensing
  + Whether/how to support congestion control for power saving resource allocation schemes
  + Impacts of sidelink DRX on physical layer, if any
* Physical layer aspects on solution(s) on the enhancement(s) in mode 2 for enhanced reliability and reduced latency including
  + Details and condition(s) to which inter-UE coordination scheme is applied
  + Details of inter-UE coordination information and how/when it is generated and sent by UE-A
  + Details of UE-B’s behaviour on how/when it takes inter-UE coordination information into account in its resource (re)-selection

## 2.2 RAN2

#### 2.2.1 Agreements

**RAN2#113bis-e**

Regarding sidelink DRX, the following agreements and working assumptions were made:

* Agreements on details of SL DRX timer
  + The following parameters are supported as part of the SL DRX configuration for all cast types: sl-drx-StartOffset, sl-drx-Cycle, sl-drx-onDurationTimer, and sl-drx-SlotOffset.
  + The RX UE determines the symbol/slot/subframe associated with the start of the DRX cycle using the configured sl-drx-Cycle, sl-drx-StartOffset. FFS on details.
  + The RX UE starts the sl-drx-onDurationTimer after sl-drx-slotOffset from the beginning of the subframe.
  + The RX UE’s active time includes the time in which sl-drx-on-DurationTimer is running.
  + For unicast, the TX UE behaviors should be specified to keep aligned with the RX UE regarding the DRX Active time. FFS the specific Spec impacts needed at the TX side.
  + For unicast, the RX UE maintains a separate SL inactivity timer for each pair of src/dest L2 ID.
  + For unicast, the SL inactivity timer value may take into consideration the QoS. Whether any specification impacts are needed is FFS.
  + For unicast, RX UE starts/restarts the inactivity timer with the value configured for that pair of src/dest L2 ID.
  + For unicast, the RX UE (re)starts the inactivity timer upon reception of a new SL data transmission from the RX UE perspective for that pair of src/dest L2 ID.
  + For unicast, the RX UE (re)starts the inactivity timer based on information in SCI (SCI1+SCI2). FFS if the MAC layer can stop the inactivity timer.
  + For unicast, the RX UE (re)starts the inactivity timer in the first slot after SCI (SCI1+SCI2) reception.
  + For unicast, the TX UE maintains a timer corresponding to the SL Inactivity timer in the RX UE for each pair of src/dest L2 ID, and uses the timer as part of criterion for determining the allowable transmission time for the RX UE.
  + For unicast, the TX UE (re)starts its timer corresponding to the SL inactivity timer at the RX UE at the slot following an SCI transmission indicating a new data transmission. FFS the specific spec impacts needed at the TX side.
  + SL Inactivity timer is supported for groupcast. FFS on the scenarios where it is supported.
  + SL Inactivity timer is not supported for broadcast transmissions.
  + The RX UE is active on sidelink (monitors SCI1+SCI2) as long as at least one of the SL inactivity timers associated with unicast or groupcast (if supported) is running.
  + As a baseline, agreements 7-13 inclusive are applied to SL inactivity timer for groupcast, with the difference that “src/dest L2 ID pair” is replaced with “groupcast L2 destination ID or src/dest L2 id pair” (dependent on the conclusion of proposal 17). Any specific handling which may be needed for synchronization of inactivity timers for the groupcast case is FFS.
  + SL HARQ RTT timer and SL HARQ retransmission timer are maintained per SL HARQ process at the RX UE.
  + Working assumption: SL HARQ RTT timer can be derived from the retransmission resource timing when the SCI indicates a retransmission resource. FFS whether explicitly configured SL HARQ RTT timer may be still required. If big problem is identified next meeting, we can revisit it.
  + The value(s) of the SL HARQ RTT Timer, when explicitly configured and not determined via SCI (if agreed to do so), is determined by UE or NW implementation.
  + For unicast, sidelink retransmission timer can be supported for at least some cases of HARQ disabled transmissions. FFS whether HARQ RTT is supported or not.
  + For transmissions with HARQ feedback, the RX UE starts the SL HARQ RTT timer in the symbol/slot following the end of PSFCH transmission.
  + If the RX UE does not transmit PSFCH for a HARQ enabled transmission (e.g. due to UL/SL prioritization) the RX UE still starts the HARQ RTT timer in the symbol/slot following the end of PSFCH resource.
  + For cases where there is some uncertainty in the timing of a retransmission for a HARQ process (e.g. due to no retransmission resource indicated in the SCI, or possible reselection by the TX UE) the RX UE uses a configured retransmission timer.
  + Retransmission timer can be started upon expiry of the HARQ RTT timer.
  + The value(s) of the SL retransmission timer can be determined by UE or NW implementation.
  + The SL active time of the RX UE includes the time in which any of its applicable sl-drx-OnDuration(s), sl-DRXInactivityTimer(s), or sl-drx-RetransmissionTimer(s) are running.
  + Working assumption: The slots when the UE is expected CSI report following a CSI request is considered as SL active time.
  + RAN2 assumes LCP enhancements for ensuring a TX UE transmits data in the active time of an RX UE are needed. FFS on the resource (re)selection enhancements (e.g. limiting the resources to the active time for peer UE).
* Agreements on alignment between Uu DRX and SL DRX
  + Alignment of Uu DRX and SL DRX for unicast is supported. FFS on how alignment is achieved.
  + Alignment of Uu DRX and SL DRX for groupcast and broadcast is supported. FFS on whether new mechanisms are needed.
  + Alignment of Uu DRX and SL DRX for UE in RRC CONNECTED shall be a baseline.
  + The alignment of Uu DRX and SL DRX of the same UE shall be considered.

**RAN2#114-e**

Regarding sidelink DRX, the following agreements were made:

* Agreements on details of SL DRX configuration for SL unicast
  + In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other UE as Rx-UE, support signalling exchange including both 1) Signaling-1: signalling from RX-UE to TX-UE, and 2) Signaling-2: signalling from TX-UE to RX-UE.
  + For SL unicast, Tx-UE centric DRX configuration based on the assistance information from Rx-UE is agreed as baseline.
  + In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other as Rx-UE, signaling-1 (Rx->Tx) is carried via a new PC5-RRC message, from Rx-UE to Tx-UE.
  + In SL unicast, for DRX configuration of the direction where one UE as Tx-UE and the other as Rx-UE, signaling-2 (Tx->Rx) is carried via RRCReconfigurationSidelink, to deliver DRX configuration from Tx-UE to Rx-UE.
  + In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other UE as Rx-UE, when Tx-UE is in-coverage and in RRC\_CONNECTED state, Tx-UE may report the information received in signaling-1 (Rx->Tx) to the serving network.
  + In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other as Rx-UE, when Tx-UE is in-coverage and in RRC\_CONNECTED state, Tx-UE may obtain DRX configuration from dedicated RRC to generate signalling-2 (Tx->Rx).
  + In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other as Rx-UE, when Rx-UE is in-coverage and in RRC\_CONNECTED state, Rx-UE report the DRX configuration received in signalling-2 (Tx->Rx) to the serving network.
* Agreements on details of SL-specific DRX timer in Uu
  + SL-specific drx-onDurationTimer is not introduced in Uu.
  + SL-specific drx-InactivityTimer is not introduced in Uu.
  + For Tx UE configured with sidelink resource allocation mode 1, it should start or restart the Uu drx-InactivityTimer if the UE receives a PDCCH indicating a new SL transmission.
  + SL-specific drx-HARQ-RTT-Timer and SL-specific drx-RetransmissionTimer should be introduced in Uu, which are maintained based on sidelink process.
  + When sl-PUCCH-Config is configured, SL-specific drx-HARQ-RTT-Timer and SL-specific drx-RetransmissionTimer should be maintained for UE configured with sidelink resource allocation mode 1.
  + Adopt the following definitions of SL-specific drx-HARQ-RTT-Timer and drx-RetransmissionTimer (the detailed name of the timers can be further discussed):
    - drx-RetransmissionTimerSL (per Sidelink process): the maximum duration until a grant for SL retransmission is received;
    - drx-HARQ-RTT-TimerSL (per Sidelink process): the minimum duration before a SL retransmission grant is expected by the MAC entity.
  + When sl-PUCCH-Config is configured (and the PUCCH is transmitted), the UE should start the SL-specific drx-HARQ-RTT-Timer in Uu for the corresponding SL HARQ process in the first slot after the end of the corresponding transmission carrying the SL HARQ feedback via the PUCCH.
* Agreements on details of SL DRX configuration for SL groupcast/broadcast
  + WA: RAN2 assumes that the V2X layer of Rx UE passes the PC5 QoS parameters together with the corresponding destination layer-2 ID(s) for reception to the AS layer, as per TR 23.776 conclusion, and will further discuss SL DRX design based on this working assumption. RAN2 does not need to send LS to SA2 to clarify this issue.
  + For GC/BC, DRX cycle should take at least QoS requirement into consideration.
  + For GC/BC, DRX cycle(s) is configured per QoS profile. FFS on the need of down-select one DRX cycle from available DRX cycles for a specific L2 DST ID if UE has multiple QoS profiles for same DST L2 ID.
  + For GC/BC, DRX cycle is configured per QoS profile.
  + For GC/BC, RAN2 understands that sl-drx-startoffset does not take QoS requirement into consideration.
  + For GC/BC, For GC/BC, sl-drx-startoffset is set based on DST L2 ID.
* Agreements on alignment between Uu DRX and SL DRX
  + Alignment of Uu DRX and SL DRX for UE may comprise the full overlapping between Uu DRX and SL DRX in time.
  + Alignment of Uu DRX and SL DRX for UE may comprise the partial overlapping between Uu DRX and SL DRX in time.
  + For at least SL RX-UEs in RRC CONNECTED, the alignment of Uu DRX and SL DRX is up to gNB. FFS for SL TX-UE.
  + RAN2 to down-scope alignment of Uu DRX and SL DRX for UEs in RRC IDLE and RRC INACTIVE from Rel-17.
  + In case of Mode 1 scheduling, the alignment of Uu DRX of Tx UE and SL DRX of Rx UE shall be considered. FFS on how alignment is achieved.
* Agreement on geolocation based SL DRX operation
  + Geolocation based SL DRX is not supported in Rel-17.

#### 2.2.2 Remaining Open issues

The followings are the remaining open issues:

* Protocol layer aspects on resource allocation to reduce UE’s power consumption
* Protocol layer aspects on sidelink DRX for broadcast, groupcast, and unicast including;
  + Details of timer and configuration of sidelink DRX
  + Details of mechanism aiming to align sidelink DRX wake-up time among the UEs communicating with each other
  + Details of mechanism aiming to align sidelink DRX wake-up time with Uu DRX wake-up time in an in-coverage UE
* Protocol layer aspects on solution(s) on the enhancement(s) in mode 2 for enhanced reliability and reduced latency

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

**RAN4#98bis-e: RF**

RAN4 agreed 4 WFs and Draft TR Update for SL enhancements in Rel-17 as follows:

* New SL enhancement RF requirements:
  + Based on RAN4 agreed with 4 WFs and summary papers, we provide detail results as follows:
    - **Way forward on general principle for SL enhancements (R4-2105400)**
      * Issue 1-1-2: How to define new operating bands for SL enhancement in Rel-17
      * Agreements
        + Reuse suffix E to add new operating bands for SL enhancement. Also add general descriptions to cover all SL operation in suffix E in clause 4.3 in TS38.101-1.
      * Issue 1-1-3: Terminology of partially used licensed band
      * Agreements
        + Use the ‘intra-band con-current V2X operating bands’ instead of ‘licensed bands partially used for SL.
      * Issue 1-1-4: How to apply Release independent manner for public safety service, intra-band con-current operation and PC2 SL UE
      * Agreements
        + Option 2: SL enh. operation in Rel-17 will be supported from Rel-17, and other left over issues will be supported from Rel-16 as release independent principle.
      * Issue 1-2-1: Channel raster & Sync. Raster
      * Agreements
        + Option 1: Reuse the general channel raster and sync raster for NR Uu in Rel-16 for SL enhancement operation in licensed band.
      * Issue 1-2-2: Max. CBW for SL operation in licensed band for NR V2X
      * Agreements
        + Option 1: It is proposed that the max CBW for SL service for NR V2X in licensed band is limited to 40MHz
      * Issue 1-2-3: CBW for n14 SL operating band
      * Agreements
        + Option 1: It is suggested to support both 5MHz and 10MHz channel bandwidths in n14 for SL transmission.
    - Updated TR38.785 v0.1.0 was agreed (R4-2104969)
      * RAN4 agreed to revise TR skeleton using the terminology “intra-band con-current operation” for SL enh. In Rel-17.
      * RAN4 captured as following approved TPs
        + MPR/coexistence simulation assumptions for leftover issues.
        + Operating scenarios for NR SL enhancements in Rel-17.
        + CBW and system parameters for newly introduced SL bands
* Left over issue:
  + Supporting PC2 NR SL UE RF requirements
    - **Way forward on PC2 NR V2X (R4-2105407)**
      * Issue 1-1: Handling of SL-MIMO and TxD for NR V2X
      * Agreement
        + It is agreed to define the SL-MIMO and NR SL with TxD requirements respectively under the V2X suffix E and use same set of MPR for SL-MIMO and TxD.
      * Issue 1-3: Upper bound of power class for inter-band con-current HPUE and associated requirements
      * Agreement
        + Power control for V2X SL and Uu are separate therefore No upper bound of power class is needed for inter-band con-current operation.
      * Issue 3-1: Co-existence evaluation for Uu and SL
      * Agreement
        + It is agreed to conclude that with power control, Uu and SL can co-exist well in licensed band for PC2 V2X UE.
        + It is agreed to specify 31 dBc ACLR requirement for PC2 NR V2X UE based on co-existence study.
        + For regulatory aspect to allow high power UE, RAN4 need to check the regional regulatory requirements to allow PC2 V2X UE in licensed bands.
  + Supporting Intra-band con-current operation in licensed band
    - **Way forward on operating scenarios for SL and Uu operated in the same licensed band (R4-2105403)**
      * Issue 1-1-1: Whether to narrow down operating scenarios
      * Agreements

Focus on prioritization on operating scenarios including TDM and FDM.

* + - * + 1st priority: TDM
        + 2nd priority: FDM with adjacent carrier
        + 3rd priority: FDM with non-adjacent carrier
      * Issue 1-1-2: Other operating scenario
      * Agreements
        + Scenario 2 in R4-2106554 is not in Rel-17 SL enhancement WI scope. Inter-band con-current operation can be treated in Rel-17 basket WI of NR\_LTE\_V2X\_PC5\_combos.
      * Issue 1-1-3: Full duplex or half duplex
      * Agreements
        + Clarify the meaning of full duplex and half duplex for SL and Uu within the same licensed band together with operating scenarios.
      * Issue 1-2-1: TDM operating scenarios
      * Agreements
        + RAN4 allow TDM operation between spectrally partially used PC5 SL and Uu UL/DL operation in a licensed TDD band regardless of adjacent/ non-adjacent carrier (Option 1 as the majority view in 1st round).
      * Issue 1-3-3: Time mask
      * Agreements
        + Postpone until sync mechanism between SL and Uu is clear.
      * Issue 1-6-1: UE RF architecture
      * Agreements
        + Determine basic RF architecture for different operating scenarios. Other RF architecture is not precluded from implementation perspective.

1st priority: TDM (Single RF chain for Tx as baseline)

2nd priority: FDM with adjacent carrier (Separate RF chain as baseline)

3rd priority: FDM with non-adjacent carrier (Separate RF chain as baseline)

* + - **Way forward on synchronization issue for SL and Uu operated in the same licensed band (R4-2105404)**
      * Issue 2-2-1: SL synchronization reference source
      * Agreements
        + Option 2: RAN4 follow the existing RAN1 design on sync reference source.

**RAN4#99-e: RF**

RAN4 agreed 8 WFs, 1 LS and updated TR38.785 v0.2.0 for SL enhancements in Rel-17 as follows:

* New SL enhancement RF requirements:
  + Based on RAN4 agreed with 3 WFs and summary papers, we provide detail results as follows:
    - **WF on coexistence evaluation necessity in n14 (R4-2107863)**
      * Issue 2-1-1: Review the protection of Band 13 UE for LTE prose UE (both PC1and PC3) in Band 14
      * Agreements
        + Firstly, RAN4 need to study the different points between LTE Prose and NR PS to protect Band 13. Based on interested companies discussion paper, RAN4 conclude this issue in next RAN4 meeting.
      * Issue 2-2-2: Coexistence evaluation for NR SL UE in in-coverage NW with legacy LTE/ NR Uu operation
      * Agreements
        + RAN4 need to study the different points between LTE Prose and NR PS to protect legacy LTE/NR system in n14. Based on interested companies discussion paper, RAN4 conclude this issue in next RAN4 meeting.
    - **WF on Feasibility of DL frequency range in FDD band used for SL operation (R4-2107864)**
      * Issue 1-1-4: Feasibility of DL frequency range in FDD band used for SL transmission.
      * Agreements
        + Option 1: The DL part of FDD band is not allowed for SL transmission in out of coverage in LTE/NR licensed band.
        + However, the operating scenario will be further discussed in RAN Plenary to allow the specific operation in out-of coverage.
    - **WF on remaining issues for system parameters in NRSL\_enh\_Part1(R4-2108001)**
      * Issue 1-1-1: Operating bands & CBW for SL enhancement
      * Agreements
        + Option 2: same section will be used according to SL enh. operation
        + In section 5.1, PC2 V2X UE, the operating band and the related RF requirements will be captured.
        + In section 5.2, Intra-band con-current operating band and the related RF requirements will be captured
        + In section 7, SL enh operating band will be captured. Section 8 and section 9 will be captured the Tx and Rx requirements for SL enhancement.
      * Issue 1-1-3: Channel raster & sync. Raster in licensed band
      * Agreements
        + Option 2: Both Channel raster & synch raster for SL enhancement follows that for NR Uu.
    - **Updated TR38.785 v0.2.0 was agreed (R4-2111543)**
      * RAN4 captured as following approved TPs
        + TP on UE Rx RF requirement for NR SL enhancement
        + TP on channel bandwidth for newly introduced SL bands
        + TP for 38.785: synchronization reference source for SL enhancements
* Left over issue:
  + Supporting PC2 NR SL UE RF requirements
    - **Way forward on PC2 NR V2X (R4-2107872)**
      * Issue 1-2: Clarification of PC2 V2X operation scenarios
        + Scenarios and priority

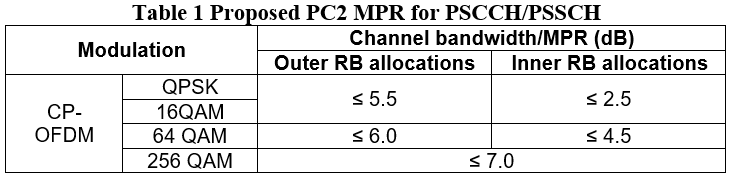
Single band + Single antenna: Single 26dBm architecture (1st priority)

Single band + Multi antenna: TXD, SL-MIMO (1st priority)

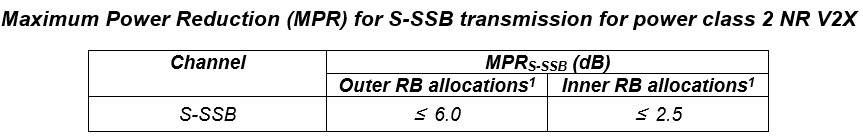
Inter-band concurrent operation (2nd priority)

Intra-band con-current operation (2nd priority)

* + - * Agreement
        + Agree with the scenarios and priorities.
        + The study of intra and inter-band concurrent operation also depends on the band combinations requested by operators.
      * Issue 3-1: Co-existence evaluation for licensed band
      * Agreement
        + The conclusion part of the co-existence study in the TR will be further discussed in next RAN4 meeting.
      * Issue 3-2: Co-existence study for n38 (SL) and adjacent band n7 (Uu)
      * Agreement
        + FFS based on further views captured in 2nd round summary
      * Issue 3-3: PEMAX,c for scenario of Uu and SL co-existence
      * Agreement
        + using ‘*sl-maxTxPower’* instead of ‘*maxTxPower’*
        + FFS whether wording of serving cell can be removed
    - **WF on MPR/A-MPR for PC2 NR V2X (R4-2107873)**
      * Issue 2-1-1: MPR for PSCCH and PSSCH
      * Agreements



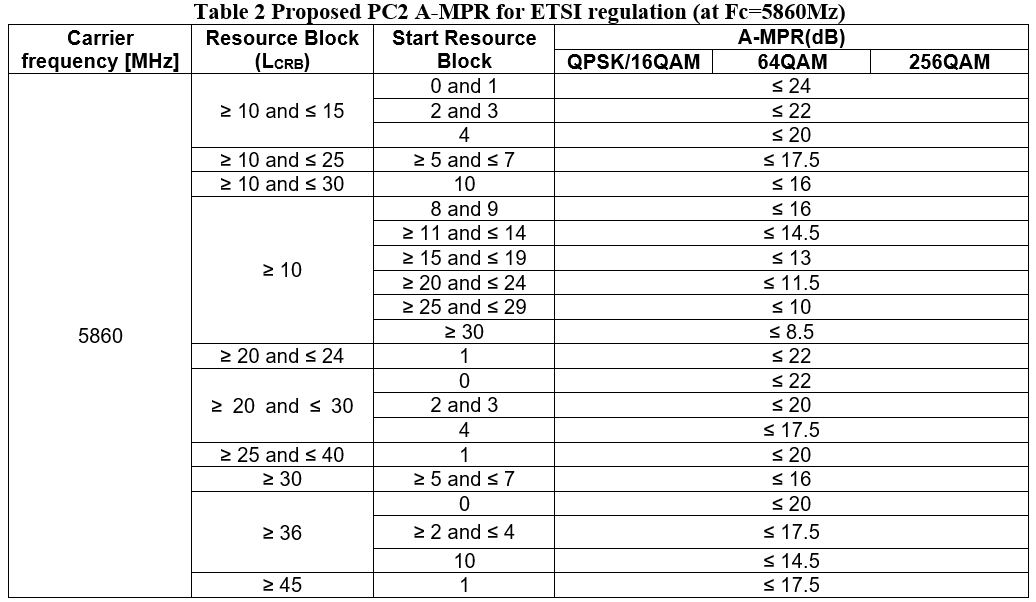
* + - * Issue 2-1-2: MPR for S-SSB transmission
      * Agreements

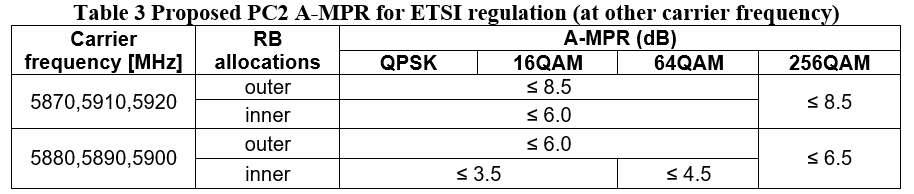


* + - * Issue 2-1-3: MPR for PSFCH transmission
      * Agreements

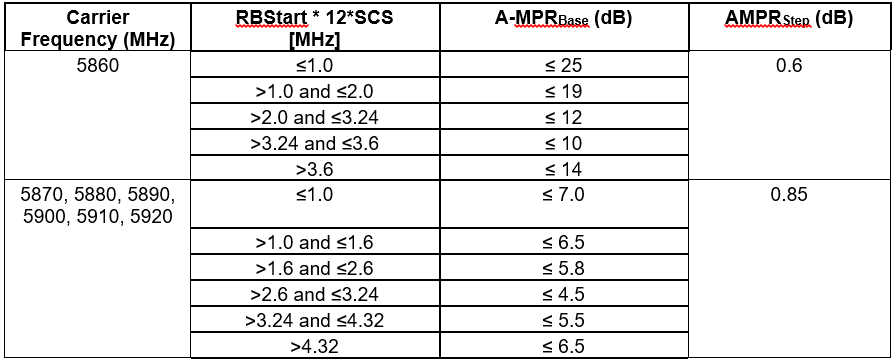
|  |
| --- |
| *For contiguous and non-contiguous allocation for simultaneous PSFCH transmission for NR V2X will be specified as follow*  *MPR\_PSFCH = CEIL {MA\_PSFCH, 0.5}*  *Where MA is defined as follows*  *MA\_PSFCH = 8.5 ; 0 ≤ NGap / NRB < 0.4*  *= 10 ; 0.4 ≤ NGap / NRB < 0.55*  *= 14 ; 0.55 ≤ NGap / NRB ≤ 1*  *Where*  *NGap is the gap RB amount between RBstart and RBend for contiguous and non-contiguous allocation simultaneous PSFCH transmission. (NGap = RBend - RBstart).*  *CEIL{MA, 0.5} means rounding upwards to closest 0.5dB.* |

* + - * Issue 2-2-1: A-MPR for PSCCH and PSSCH
      * Agreements

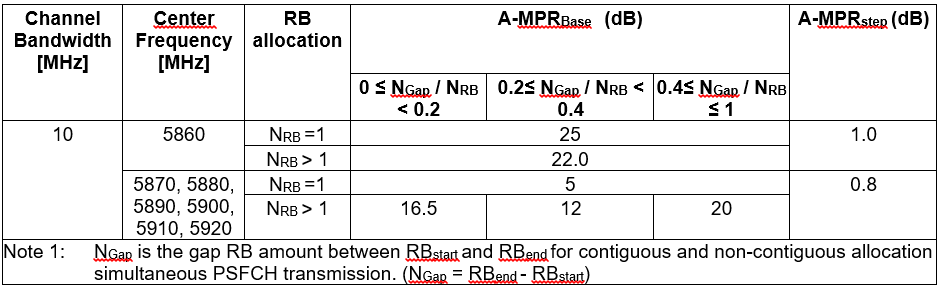




* + - * Issue 2-2-2: A-MPR for S-SSB
      * Agreements



* + - * Issue 2-2-3: A-MPR for PSFCH transmission
      * Agreements



* + - **CR was agreed as follow (R4-2107875)**
      * Remove ΔPPowerClass in the Pcmax formula
      * Remove ∆TRxSRS in the Pcmax formula
      * Remove PCMAX,S-SSB and PCMAX,PSFCH for explanation for maxTxPower
      * ‘*sl-maxTxPower’ used instead of ‘maxTxPower’*
  + Supporting Intra-band con-current operation in licensed band
    - **WF on operating scenarios for Uu and SL operating in the same license band (R4-2107868)**
      * Duplexer mode: Do not use duplex mode to describe intra-band con-current V2X operation. Use “con-current SL transmission and Uu transmission operation” and “con-current reception of SL and Uu transmission operation” terminology to separate the discussion of FDM operation between Uu and SL operating in a licensed band.
      * Intra-band con-current V2X operation with adjacent carrier for TDD band
        + Simultaneous NR UL Transmission and NR SL reception with adjacent carrier in TDD band are not allowed
      * Intra-band con-current V2X operation with adjacent carrier for FDD band
        + Deprioritize FDD band. FDD band can be studied once operator has request.
      * For TDM operation with same carrier and adjacent carrier, RAN4 agreed with 1st priority.
      * Timing alignment issue between NR SL and NR Uu in licensed band
      * RAN4 has different understanding of RAN1 specification. RAN4 agree to send LS (R4-2109036) to check the RAN1 view on the feasibility to reuse LTE prose Timing alignment for NR SL timing alignment with UL slot as follow
        + Option 1: To follow the Rel-16 agreement to align SL transmission timing with DL timing.
        + Option 2: To reconsider SL transmission timing to align with UL timing to mitigate the interference between Uu and SL, i.e.

SL transmission timing is aligned with Uplink timing when Uu and sidelink is TDMed/FDMed coexistence in the same band, including TDM coexistence within the same carrier or different carriers.

Otherwise, SL transmission timing is aligned with Downlink timing.

* + - **WF on synchronization synchronous operation for Uu and SL operating in the same licensed band (R4-2107869)**
      * Issue 2-1-2: SL transmission timing
        + Option 1: SL transmission timing to be aligned with UL timing of Uu.
        + Option 2: For sidelink transmissions,

SL transmission timing is aligned with Uplink timing when Uu and sidelink is TDMed coexistence in the same band, including TDM coexistence within the same carrier or different carriers.

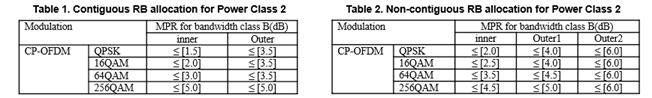
Otherwise, SL transmission timing is aligned with Downlink timing.

* + - * + Option 2a: For sidelink transmissions,

SL transmission timing is aligned with Uplink timing when Uu and sidelink is TDMed/FDMed coexistence in the same band, including TDM coexistence within the same carrier or different carriers.

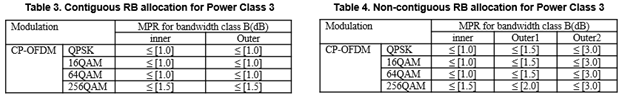
Otherwise, SL transmission timing is aligned with Downlink timing.

* + - * + Option 3: Only allow Uu UL transmission prior to SL reception and transmission, i.e. configure SL Rx/Tx slots to be located in the back of Uu UL Tx slots.
        + Option 4: Follow existing SL transmission timing aligned with DL timing of Uu.
      * Issue 2-3-1: LS on SL timing
      * Agreement:
        + Send LS to RAN1 to check their understanding about the timing issues
    - **WF on MPR for intra-ban con-current operation (R4-2107870)** 
      * Issue 3-2-1: Modulation order and RB allocation
      * Agreement:
        + Option 1: Define MPR for NR V2X intra-band con-current operation of SL PC5 and Uu taking configured Modulation Order and RB allocations into account.
        + The MPR requirements can be updated, if other companies provide the MPR results in next RAN4 meeting.
      * Issue 3-2-3: MPR for PC2 UE
      * Agreement:





* + - * Issue 3-2-4: MPR for PC3 UE
      * Agreement:





* + - **Sent LS on the synchronous operation between Uu and SL in TDD band n79 (R4-2111542)**

**RAN4#99-e: RRM**

RAN4 agreed RRM work plan and 1 WF on RRM impacts as follows:

* RRM work plan

|  |
| --- |
| 1. 3GPP RAN4 #99e meeting (May, 2021, 0.25TU, Core part)  * Discussions on :   + Work plan   + Impact on the existing RRM requirements due to new features introduced in Rel-17 * Agreement on :   + Consensus on the work plan   + Identification of impact on the existing RRM requirements due to new features introduced in Rel-17  1. 3GPP RAN4 #100e meeting (August, 2021, 1TU, Core part)  * Discussions on :   + RRM requirements related to new features introduced in Rel-17 * Agreement on :   + Technical aspects of RRM requirements related to new features introduced in Rel-17  1. 3GPP RAN4 #101e meeting (November, 2021, 1TU, Core part)  * Discussions on :   + RRM requirements related to new features introduced in Rel-17 * Agreement on :   + Remaining technical aspects of RRM requirements related to new features introduced in Rel-17   + Work split on draft CR responsible companies  1. 3GPP RAN4 #101bis-e meeting (January, 2022, 1TU, Core part)  * Discussions on :   + Remaining issues on RRM requirements related to new features introduced in Rel-17   + Draft CRs for corresponding RRM requirements * Agreement on :   + Conclusion on the remaining RRM requirements   + Draft CRs and Draft big CR  1. 3GPP RAN4 #102(e) meeting (February, 2022, 1TU/0.25TU, Core part/Performance part)  * Discussions on :   + Remaining issues on RRM requirements related to new features introduced in Rel-17   + Draft CRs   + List of Test Cases * Agreement on :   + Finalization on RRM core requirements   + Big CR   + List of Test Cases  1. 3GPP RAN4 #102bis meeting (April, 2022, 1TU, Performance part)  * Discussions on :   + Test cases on RRM requirements related to new features introduced in Rel-17 * Agreement on :   + Test cases on RRM requirements related to new features introduced in Rel-17   + Work split on draft CR for test cases responsible companies  1. 3GPP RAN4 #103 meeting (May, 2022, 1TU, Performance part)  * Discussions on :   + Remaining issues on test cases on RRM requirements related to new features introduced in Rel-17   + Draft CRs for test cases * Agreement on :   + Conclusion on the remaining test cases   + Draft CRs and Draft big CR  1. 3GPP RAN4 #104 meeting (August, 2022, 1TU, Performance part)  * Discussions on :   + Remaining issues on test cases on RRM requirements related to new features introduced in Rel-17   + Draft CRs * Agreement on :   + Finalization on RRM performance requirements   + Big CR |

* WF on RRM impacts
  + Impact due to new operating scenario
    - Impact on UE transmit timing requirements due to new operating scenario
      * Study the impact on UE transmit timing requirements due to new operating scenario
        + For intra-band con-current V2X operating bands in licensed band when NR Cell is configured as synchronization reference source

whether to reuse NTAoffset = 0 or not

whether to reuse Tx timing error requirement(Te) or not

* + - Impact on scheduling availability requirements due to new operating scenario
      * After conclusion in RF session on switching period length and switching location for TDM based intra-band con-current sidelink operation, study whether to introduce scheduling availability or not when UE is switching between SL and Uu
    - Impact on RRM performance requirements due to new operating scenario
      * Treat issue 2-1-3 in RRM performance part after RRM core requirement
    - Impact on RRM requirements for FDM based intra-band con-current SL operation
      * Further discuss based on the conclusion in RF session
  + Impact due to SL-DRX
    - Impact on initiation/cease of SLSS transmissions due to SL-DRX
      * Study initiation/cease of SLSS transmissions with SL-DRX
        + when SyncRef UE is synchronization reference source
        + when NR cell is synchronization reference source
        + when E-UTRAN cell is synchronization reference source
    - Impact on selection/reselection of V2X Synchronization Reference Source due to SL-DRX
      * Study the impacts on selection/reselection of V2X sync reference source due to SL-DRX including SyncRef UE identification time and PSBCH-RSRP measurement period
    - Impact on interruption due to SL-DRX
      * Study whether there is any impact on WAN due to SL-DRX
    - Impact on L1 SL-RSRP measurements due to SL-DRX
      * No impact
    - Impact on Congestion control measurements due to SL-DRX
      * No impact
  + Impact due to resource allocation enhancement
    - Impact on L1 SL-RSRP measurements due to resource allocation related to power consumption reduction
      * After RAN1’s conclusion, study the impact
    - Impact on L1 SL-RSRP measurements due to resource allocation related to inter-UE coordination
      * After RAN1’s conclusion, study the impact
    - How to design a test for partial sensing
      * Treat issue 2-3-3 in RRM performance part after completion of RRM core requirement
    - How to design a test for inter-UE coordination
      * Treat issue 2-3-4 in RRM performance part after completion of RRM core requirement
  + Impact due to Different Service Types
  + Impact on structure of specification
    - First identify the requirement that are impacted, and based on that RAN4 can discuss the specification structure
  + Baseline of SL RRM requirements
    - Consider Rel-16 NR V2X RRM requirements as baseline

#### 2.4.2 Remaining Open issues

**RF**:

RAN4 will study and specify the above leftover issues and new SL enhancement RF requirements based on operator requested SL operating bands.

* Define operating bands and related RF core requirements for SL enhancement operation
  + Further study the different points between LTE Prose and NR SL operation
  + Need to analyse whether or not necessity of coexistence evaluation in n14
* Define PC2 UE RF requirements in licensed band/unlicensed band
  + Based on PC2 coexistence evaluation in licensed band, RAN4 can specify PC2 UE RF requirements in licensed band
* For the intra-band con-current operation between NR SL and NR Uu operation in licensed band, RAN4 will specify related RF core requirements to support intra-band contiguous/non-contiguous con-current V2X operation in licensed band.

**RRM**:

RAN4 will study on RRM impacts based on the agreed WF.

* Impact due to new operating scenario
* Impact due to SL-DRX
* Impact due to resource allocation enhancement
* Impact due to Different Service Types

## 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 SA2

#### 3.1.0 SA2 eV2XARC\_Ph2 status – general

SA2 has progressed normative work on eV2XARC\_Ph2 (Architecture enhancements for 3GPP support of advanced V2X services – Phase 2) to specify support of QoS aware NR PC5 power efficiency for pedestrian UEs in TS 23.287 based on the conclusions defined in clause 7.2 of TR 23.776.

The completion level of eV2XARC\_Ph2 is 70%.

#### 3.1.1 Agreements with cross-TSG impacts

The three CRs to TS 23.287 were approved at SA2#145E (17 – 28 May, 2021): S2-2105136, S2-2105135, S2-2103932

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

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

Among the approved CRs to TS 23.287, S2-2105135 includes the following Editor's notes that have RAN2 dependencies.

*Editor's note: The PC5 DRX configuration will be determined by RAN WGs. Its detail (e.g. mapping information for PC5 DRX parameters) and the reference to RAN specification will be added when defined in RAN WGs.*

*Editor's note: For unicast when the UE is "not served by E-UTRA" and "not served by NR", whether the provisioned PC5 DRX configuration is needed is pending on RAN WG2 decision.*

*Editor's note: The reference to RAN specification and information taken into account in the AS layer will be finalized when the PC5 DRX operations are defined in RAN WGs.*

The exception sheet to shift completion date to SA#93 (September 2021) was also approved at SA2#145E: S2-2103934, including the following tasks within work which are not complete:

* Details of PC5 DRX configuration (e.g. mapping information for PC5 DRX parameters) by coordinating with RAN2.
* For unicast when the UE is "not served by E-UTRA" and "not served by NR", whether the provisioned PC5 DRX configuration is needed is pending on RAN2 decision.
* Whether the V2X layer exposes transmission schedule information to the V2X application layer and what is the content for the transmission schedule information based on the applied PC5 DRX information/parameters provided by the AS layer to the V2X layer to be defined in RAN2.

Further normative work to resolve the Editor's notes and the uncompleted task is expected in SA2#146E (16 – 27 August 2021) e.g., based on the RAN2 agreements on sidelink DRX made at RAN2#114-e (19 – 27 May 2021).

Related to the open issues with RAN2 dependencies described above, the issue(s) not yet agreed/finalized in RAN2 (e.g. the second bullet in the exception sheet) requires early decisions during RAN2#115-e for the successful completion of SA2 normative work on eV2XARC\_Ph2 in Q3 because SA2#146E and RAN2#115-e have fully overlapping dates.

## 3.2 CT WGs

#### 3.2.0 CT WGs eV2XARC\_Ph2 status – general

To progress stage-3 normative work on PC5 DRX operation as per stage-2 requirements, new WID on CT aspects of Architecture enhancements for 3GPP support of advanced V2X services – Phase 2 (eV2XARC\_Ph2) was agreed in CT1#130-e (20 – 28 May, 2021) - C1-213662.

## 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.

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

**RAN1#104bis-e**

1. R1-2102323 Sidelink resource allocation to reduce power consumption Huawei, HiSilicon
2. R1-2102324 Inter-UE coordination in sidelink resource allocation Huawei, HiSilicon
3. R1-2102361 Sidelink resource allocation for power saving Nokia, Nokia Shanghai Bell
4. R1-2102362 Inter-UE coordination in mode 2 sidelink resource allocation Nokia, Nokia Shanghai Bell
5. R1-2102411 Power saving mechanism in NR sidelink OPPO
6. R1-2102412 Inter-UE coordination in mode 2 of NR sidelink OPPO
7. R1-2102413 Wake up signal for NR sidelink OPPO
8. R1-2102467 Discussion on sidelink resource allocation for power saving Spreadtrum Communications
9. R1-2102468 Discussion on inter-UE coordination in sidelink resource allocation Spreadtrum Communications
10. R1-2102539 Resource allocation for sidelink power saving vivo
11. R1-2102540 Discussion on mode-2 enhancements vivo
12. R1-2102541 Other aspects on SL enhancements vivo
13. R1-2102575 Considerations on partial sensing in NR V2X CAICT
14. R1-2102576 Considerations on mode 2 enhancements CAICT
15. R1-2102606 Discussion on resource allocation for power saving CATT, GOHIGH
16. R1-2102607 Discussion on inter-UE coordination in mode 2 enhancement CATT, GOHIGH
17. R1-2102608 Considerations on other aspects of NR mode2 enhancements CATT, GOHIGH
18. R1-2102690 Discussion on Mode 2 enhancements MediaTek Inc.
19. R1-2102708 Discussion on sidelink power saving MediaTek Inc.
20. R1-2102719 Considerations on partial sensing and DRX in NR sidelink Fujitsu
21. R1-2102720 Considerations on inter-UE coordination for mode 2 enhancements Fujitsu
22. R1-2102780 Power consumption reduction for sidelink resource allocation FUTUREWEI
23. R1-2102781 Discussion on techniques for inter-UE coordination FUTUREWEI
24. R1-2102797 Discussion on resource allocation for power saving Zhejiang Lab
25. R1-2102798 Inter-UE coordination for mode 2 enhancements Zhejiang Lab
26. R1-2102811 NR Sidelink Resource Allocation for UE Power Saving Fraunhofer HHI, Fraunhofer IIS
27. R1-2102812 Resource Allocation Enhancements for Mode 2 Fraunhofer HHI, Fraunhofer IIS
28. R1-2102826 Inter-UE coordination for enhanced resource allocation Mitsubishi Electric RCE
29. R1-2102897 Discussion on resource allocation for power saving CMCC
30. R1-2102898 Discussion on enhancements for mode-2 resource allocation CMCC
31. R1-2102921 Discussion on the inter-UE coordination ZTE
32. R1-2102965 Discussion on sidelink resource allocation enhancement for power saving Xiaomi
33. R1-2102966 Discussion on inter-UE coordination Xiaomi
34. R1-2102967 Discssion on other design aspects for sidelink enhancement Xiaomi
35. R1-2103048 Sidelink power saving solutions Intel Corporation
36. R1-2103049 Inter-UE coordination solutions for sidelink resource allocation mode-2 Intel Corporation
37. R1-2103121 Discussion on Sidelink Resource Allocation for Power Saving Apple
38. R1-2103122 Discussion on Inter-UE Coordination Apple
39. R1-2103123 Network Assisted Resource Selection Apple
40. R1-2103184 Power Savings for Sidelink Qualcomm Incorporated
41. R1-2103185 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
42. R1-2103256 On Resource Allocation Enhacements Samsung
43. R1-2103257 On Resource Allocation for Power Saving Samsung
44. R1-2103258 On Inter-UE Coordination for Mode2 Enhancements Samsung
45. R1-2103259 On Sidelink Issues and RAN1 Impacts Samsung
46. R1-2103271 Inter-UE coordination for mode 2 enhancement ITL
47. R1-2103272 Discussion on Sidelink Resource Allocation for Power Saving Panasonic Corporation
48. R1-2103314 Discussion on sidelink resource allocation for power saving Sony
49. R1-2103315 Discussion on reliability and latency enhancements for mode 2 Sony
50. R1-2103331 Discussion on resource allocation for power saving ETRI
51. R1-2103332 Discussion on mode 2 enhancements ETRI
52. R1-2103378 Discussion on resource allocation for power saving LG Electronics
53. R1-2103379 Discussion on inter-UE coordination for Mode 2 enhancements LG Electronics
54. R1-2103392 Physical layer impacts of sidelink DRX Huawei, HiSilicon
55. R1-2103416 On Resource Allocation for Power Saving in NR Sidelink Convida Wireless
56. R1-2103417 On Inter-UE Coordination for Mode 2 Enhancements Convida Wireless
57. R1-2103483 Discussion on resource allocation for power saving Sharp
58. R1-2103484 Discussion on inter-UE coordination for Mode 2 enhancements Sharp
59. R1-2103517 Discussion on resource allocation for power saving NEC
60. R1-2103518 Discussion on mode 2 enhancements NEC
61. R1-2103537 Sidelink resource allocation for power saving InterDigital, Inc.
62. R1-2103538 On Inter-UE coordination for Mode 2 enhancement InterDigital, Inc.
63. R1-2103539 On gNB-designated resources for inter-UE coordination InterDigital, Inc.
64. R1-2103548 Sidelink resource allocation for power saving Lenovo, Motorola Mobility
65. R1-2103549 Discussion on inter-UE coordination for Mode 2 enhancements Lenovo, Motorola Mobility
66. R1-2103592 Discussion on sidelink resource allocation for power saving NTT DOCOMO, INC.
67. R1-2103593 Resource allocation for reliability and latency enhancements NTT DOCOMO, INC.
68. R1-2103605 Inter-UE coordination for Mode 2 enhancements Panasonic Corporation
69. R1-2103635 Discussion on resource allocation for power saving Hyundai Motors
70. R1-2103636 Discussion on mode 2 enhancements Hyundai Motors
71. R1-2103640 Discussion on partial sensing and SL DRX impact ASUSTeK
72. R1-2103648 Discussion on V2X mode 2 enhancements ASUSTeK
73. R1-2103663 Resource allocation for power saving with partial sensing in NR sidelink enhancement ITL
74. R1-2103704 Resource allocation procedures for power saving Ericsson
75. R1-2103705 Mode 2 enhancements using Inter-UE coordination Ericsson
76. R1-2103706 Additional considerations for resource allocation procedures Ericsson
77. R1-2103710 Discussion on resource allocation for power saving ZTE, Sanechips
78. R1-2103711 Discussion on remaining issues for sidelink evaluation methodology ZTE, Sanechips
79. R1-2104090 FL summary for AI 8.11.1.1 – resource allocation for power saving (1st check point) Moderator (OPPO)
80. R1-2104091 FL summary for AI 8.11.1.1 – resource allocation for power saving (2nd check point) Moderator (OPPO)
81. R1-2104092 FL summary for AI 8.11.1.1 – resource allocation for power saving (3rd check point) Moderator (OPPO)
82. R1-2104093 FL summary for AI 8.11.1.1 – resource allocation for power saving (final) Moderator (OPPO)
83. R1-2104103 Feature lead summary for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements Moderator (LG Electronics)
84. R1-2104148 Moderator summary of Email discussion/approval to reply LS in R1-2100021 Moderator (ZTE)

**RAN1#105-e**

1. R1-2104176 Sidelink resource allocation for power saving Nokia, Nokia Shanghai Bell
2. R1-2104177 Inter-UE coordination in mode 2 sidelink resource allocation Nokia, Nokia Shanghai Bell
3. R1-2104192 Power consumption reduction for sidelink resource allocation FUTUREWEI
4. R1-2104193 Discussion on techniques for inter-UE coordination FUTUREWEI
5. R1-2104236 Sidelink resource allocation to reduce power consumption Huawei, HiSilicon
6. R1-2104237 Inter-UE coordination in sidelink resource allocation Huawei, HiSilicon
7. R1-2104385 Resource allocation for sidelink power saving vivo
8. R1-2104386 Discussion on mode-2 enhancements vivo
9. R1-2104440 Discussion on sidelink resource allocation for power saving Spreadtrum Communications
10. R1-2104441 Discussion on inter-UE coordination in sidelink resource allocation Spreadtrum Communications
11. R1-2104457 Inter-UE Coordination for Mode 2 Enhancements Kyocera Corporation
12. R1-2104489 Discussion on resource allocation for power saving CATT, GOHIGH
13. R1-2104490 Discussion on inter-UE coordination in mode 2 enhancement CATT, GOHIGH
14. R1-2104560 NR Sidelink Resource Allocation for UE Power Saving Fraunhofer HHI, Fraunhofer IIS
15. R1-2104561 Resource Allocation Enhancements for Mode 2 Fraunhofer HHI, Fraunhofer IIS
16. R1-2104630 Discussion on resource allocation for power saving CMCC
17. R1-2104631 Discussoin on reliability and latency enhancements for mode-2 resource allocation CMCC
18. R1-2104693 Power Savings for Sidelink Qualcomm Incorporated
19. R1-2104694 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
20. R1-2104706 Discussion on resource allocation for power saving Zhejiang Lab
21. R1-2104707 Inter-UE coordination schemes in mode 2 Zhejiang Lab
22. R1-2104724 Considerations on partial sensing in NR V2X CAICT
23. R1-2104725 Considerations on mode 2 enhancements CAICT
24. R1-2104755 Power saving mechanisms in NR sidelink OPPO
25. R1-2104756 Inter-UE coordination in mode 2 of NR sidelink OPPO
26. R1-2104869 Sidelink resource allocation for power saving Lenovo, Motorola Mobility
27. R1-2104870 Discussion on inter-UE coordination for Mode 2 enhancements Lenovo, Motorola Mobility
28. R1-2104926 Sidelink Power Saving Schemes Intel Corporation
29. R1-2104927 Inter-UE Coordination Schemes for Sidelink Communication Intel Corporation
30. R1-2105066 Considerations on partial sensing and DRX in NR Sidelink Fujitsu
31. R1-2105067 Considerations on inter-UE coordination for mode 2 enhancements Fujitsu
32. R1-2105070 Discussion on Sidelink Resource Allocation for Power Saving Panasonic Corporation
33. R1-2105126 On Sidelink Resource Allocation for Power Saving Apple
34. R1-2105127 On Inter-UE Coordination Apple
35. R1-2105177 Discussion on sidelink resource allocation for power saving Sony
36. R1-2105178 Discussion on inter-UE coordination for Mode 2 enhancements Sony
37. R1-2105200 Discussion on the inter-UE coordination ZTE
38. R1-2105203 Consolidation of agreements on sidelink evaluation methodology update for power saving LG Electronics
39. R1-2105204 Discussion on resource allocation for power saving LG Electronics
40. R1-2105205 Discussion on inter-UE coordination for Mode 2 enhancements LG Electronics
41. R1-2105228 Discussion on resource allocation for power saving ETRI
42. R1-2105229 Discussion on inter-UE coordination for Mode 2 enhancements ETRI
43. R1-2105253 Discussion on resource allocation for power saving NEC
44. R1-2105254 Discussion on mode 2 enhancements NEC
45. R1-2105270 Inter-UE coordination for enhanced resource allocation Mitsubishi Electric RCE
46. R1-2105333 On Resource Allocation Enhacements Samsung
47. R1-2105334 On Resource Allocation for Power Saving Samsung
48. R1-2105335 On Inter-UE Coordination for Mode2 Enhancements Samsung
49. R1-2105380 Discussion on sidelink power saving MediaTek Inc.
50. R1-2105393 Discussion on Mode 2 enhancements MediaTek Inc.
51. R1-2105544 Discussion on sidelink resource allocation enhancement for power saving Xiaomi
52. R1-2105545 Discussion on inter-UE coordination Xiaomi
53. R1-2105598 NR SL Resource Allocation for Power Saving Convida Wireless
54. R1-2105599 NR SL Inter-UE Coordination for Mode 2 Enhancements Convida Wireless
55. R1-2105614 Discussion on resource allocation for power saving ZTE, Sanechips
56. R1-2105615 Discussion on resource allocation for power saving Hyundai Motors
57. R1-2105616 Discussion on inter-UE coordination for Mode 2 enhancements Hyundai Motors
58. R1-2105645 Discussion on resource allocation for power saving Sharp
59. R1-2105646 Discussion on inter-UE coordination for Mode 2 enhancements Sharp
60. R1-2105650 Inter-UE coordination for Mode 2 enhancements Panasonic Corporation
61. R1-2105651 Resource allocation for power saving with partial sensing in NR sidelink enhancement ITL
62. R1-2105659 Inter-UE coordination for mode 2 enhancements ITL
63. R1-2105674 Sidelink resource allocation for power saving InterDigital, Inc.
64. R1-2105675 On inter-UE coordination for Mode 2 enhancement InterDigital, Inc.
65. R1-2105718 Discussion on sidelink resource allocation for power saving NTT DOCOMO, INC.
66. R1-2105719 Resource allocation for reliability and latency enhancements NTT DOCOMO, INC.
67. R1-2105845 Discussion on partial sensing and SL DRX impact ASUSTeK
68. R1-2105848 Discussion on V2X mode 2 enhancements ASUSTeK
69. R1-2105866 Further discussion on power saving for sidelink ROBERT BOSCH GmbH
70. R1-2105881 Discussion on inter-UE coordination for sidelink mode-2 ROBERT BOSCH GmbH
71. R1-2105893 Resource allocation procedures for power saving Ericsson
72. R1-2105894 Feasibility and benefits of mode 2 enhancements for inter-UE coordination Ericsson
73. R1-2105982 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
74. R1-2106030 FL summary for AI 8.11.1.1 – resource allocation for power saving (1st check point) Moderator (OPPO)
75. R1-2106031 FL summary for AI 8.11.1.1 – resource allocation for power saving (2nd check point) Moderator (OPPO)
76. R1-2106032 FL summary for AI 8.11.1.1 – resource allocation for power saving (final check point) Moderator (OPPO)
77. R1-2106033 FL summary for AI 8.11.1.1 – resource allocation for power saving (final EOM) Moderator (OPPO)
78. R1-2106062 Feature lead summary for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements Moderator (LG Electronics)
79. R1-2106067 Resource allocation for sidelink power saving vivo
80. R1-2106098 Discussion on resource allocation for power saving LG Electronics
81. R1-2106122 Discussion on resource allocation for power saving ZTE, Sanechips
82. R1-2106135 Moderator Summary #1 of email discussion or approval to reply LS in R1-2100021 Moderator (ZTE)
83. R1-2106188 Feature lead summary#2 for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements Moderator (LG Electronics)
84. R1-2106200 Discussion on mode-2 enhancements vivo
85. R1-2106284 Feature lead summary#3 for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements Moderator (LG Electronics)
86. R1-2106338 Feature lead summary#4 for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements Moderator (LG Electronics)

**RAN2#113bis-e**

1. R2-2102660 Reply LS on geo-area confinement (S2-2101319; contact: LGE) SA2
2. R2-2102688 DRX Design for Sidelink Unicast CATT
3. R2-2102689 Further Study on DRX for Sidelink Groupcast/Broadcast CATT
4. R2-2102690 DRX Active Time Alignment between Uu and SL CATT
5. R2-2102691 Consideration on Resource Allocation Enhancements CATT
6. R2-2102746 Discussion on inter-UE coordination OPPO
7. R2-2102771 Further discussion on Sidelink DRX LG Electronics France
8. R2-2102772 Power efficient resource allocation LG Electronics France
9. R2-2102801 Summary of [POST113-e][703][V2X/SL] Details of Timer (InterDigital) InterDigital
10. R2-2102802 Further details on SL DRX Timers InterDigital
11. R2-2102803 On TX Centric vs RX Centric DRX Configuration Determination InterDigital
12. R2-2102804 Resource Allocation for eSL InterDigital
13. R2-2102805 Discussion on Uu DRX for SL UE InterDigital
14. R2-2102815 SL DRX Configuration Impact on RAN1 and RAN2 vivo
15. R2-2102816 SL DRX for Unicast vivo
16. R2-2102817 SL DRX for Groupcast and Broadcast vivo
17. R2-2102818 Discussion on inter-UE coordination for sidelink mode2 vivo
18. R2-2102848 Discussion on SL DRX impact on SL resource allocation mode 1 Sharp
19. R2-2102886 Discussion on DRX configuration OPPO
20. R2-2102887 Discussion on network involvement for SL related DRX OPPO
21. R2-2102888 Left issues on DRX mechanisms and granularity OPPO
22. R2-2102889 Summary of [POST113-e][704] TX UE centric or RX UE centric DRX configuration determination (OPPO) OPPO
23. R2-2102970 Resource allocation enhancement impact in RAN2 Xiaomi communications
24. R2-2102971 Discussion on sidelink DRX timer handling Xiaomi communications
25. R2-2102972 DRX coordination between Uu and Sidelink Xiaomi communications
26. R2-2102973 DRX coordination between TX and RX UE Xiaomi communications
27. R2-2102979 Discussion on Coordination between Uu DRX and SL DRX ZTE Corporation, Sanechips
28. R2-2102980 Discussion on sidelink DRX configuration for unicast ZTE Corporation, Sanechips
29. R2-2102981 Discussion on sidelink DRX configuration for groupcast and broadcast ZTE Corporation, Sanechips
30. R2-2102982 Discussion on inter-UE coordination ZTE Corporation, Sanechips
31. R2-2103003 General aspects of SL DRX Ericsson,Qualcomm Incorporated
32. R2-2103004 Alignment between SL DRX and Uu DRX Ericsson,Qualcomm Incorporated
33. R2-2103005 Interaction between partial sensing and DRX Ericsson
34. R2-2103011 NR SL DRX Fraunhofer IIS, Fraunhofer HHI
35. R2-2103040 Power Reduction for Sidelink Mode 2 Resource Allocation Fraunhofer IIS, Fraunhofer HHI
36. R2-2103041 Inter-UE Coordination for Sidelink Mode 2 Resource Allocation Fraunhofer IIS, Fraunhofer HHI
37. R2-2103068 On general SL DRX design Intel Corporation
38. R2-2103069 Discussion on SL DRX timers Intel Corporation
39. R2-2103070 On DRX wake-up time alignment Intel Corporation
40. R2-2103173 On resource allocation enhancement in Rel-17 NR eSL Huawei, HiSilicon
41. R2-2103174 Consideration on sidelink DRX for broadcast and groupcast Huawei, HiSilicon
42. R2-2103234 Discussion on HARQ RTT and Retransmission Timers for SL Unicast Spreadtrum Communications
43. R2-2103238 Discussion on resource allocation enhancement for NR sidelink Spreadtrum Communications
44. R2-2103287 Discussion on HARQ RTT and Retransmission Timer for SL DRX Fujitsu
45. R2-2103288 Alignment of sidelink DRX active time Fujitsu
46. R2-2103289 Dual-mode Configuration and Selection for NR Sidelink Fujitsu
47. R2-2103305 On the deciding entity of SL DRX configuration Nokia, Nokia Shanghai Bell
48. R2-2103306 Backward Compatibility Issue of SL DRX with Rel.16 Sidelink Nokia, Nokia Shanghai Bell
49. R2-2103400 Discussion on sidelink resource allocation enhancements Lenovo, Motorola Mobility
50. R2-2103401 SL DRX configuration for unicast Lenovo, Motorola Mobility
51. R2-2103462 Discussion on SL DRX active time for groupcast and broadcast ASUSTeK
52. R2-2103463 Discussion on MAC impact regarding Sidelink DRX ASUSTeK
53. R2-2103468 Geolocation for Sidelink DRX Nokia, Nokia Shanghai Bell, Fujitsu, Fraunhofer IIS, Fraunhofer HHI
54. R2-2103470 Coordination between Uu DRX and SL DRX Lenovo, Motorola Mobility
55. R2-2103478 SL DRX Timers Nokia, Nokia Shanghai Bell
56. R2-2103576 On detailed SL DRX model MediaTek Inc.
57. R2-2103577 On coordination between Uu DRX and SL DRX MediaTek Inc.
58. R2-2103578 Transmission of assistance information for Mode 2 enhancement MediaTek Inc.
59. R2-2103579 On SL sync search optimization MediaTek Inc.
60. R2-2103615 Discussion on Sidelink DRX Sony Europe B.V.
61. R2-2103617 Discusison on Sidelink sensing Sony Europe B.V.
62. R2-2103664 General principles for resource allocation enhancements for SL mode 2 Ericsson
63. R2-2103736 Resource Allocation Enhancements Intel Corporation
64. R2-2103741 DRX Configuration for Broadcast and Groupcast SL communication Lenovo, Motorola Mobility
65. R2-2103778 Discussion on Directional SL DRX for Unicast Qualcomm Finland RFFE Oy
66. R2-2103779 Discussion on SL DRX configuration for Groupcast & Broadcast Qualcomm Finland RFFE Oy
67. R2-2103780 Discussion on SL DRX Timers and Others Qualcomm Finland RFFE Oy
68. R2-2103852 Discussion on remaining issues on SL DRX Apple
69. R2-2103853 Discussion on RX-centric and Tx-centric in SL unicast DRX Apple, InterDigital Inc.
70. R2-2103854 Discussion on Inter-UE Coordination Apple
71. R2-2103855 Discussion on resource allocation for Pedestrian UE Apple
72. R2-2103889 Coordination between DL DRX and SL DRX Samsung
73. R2-2103891 SL DRX operation for groupcast/broadcast Samsung
74. R2-2103892 Transmission UE behaviours for SL DRX Samsung
75. R2-2103894 Rel-16 SCI information related to active time in SL DRX Samsung
76. R2-2103948 On Resource Allocation Mode 2 Enhancement for NR Sidelink Convida Wireless
77. R2-2103952 SL DRX Granularity Considerations Convida Wireless
78. R2-2103988 Resource allocation enhancements Samsung
79. R2-2104083 Remaining issues in which UE decides sidelink DRX configurations LGE, InterDigital, Huawei, ASUSTeK, Apple
80. R2-2104085 Inter-UE coordination for NR V2X LG Electronics Inc.
81. R2-2104113 Discussion on SL communication impact on Uu DRX Huawei, HiSilicon
82. R2-2104114 Consideration on the sidelink DRX for unicast Huawei, HiSilicon
83. R2-2104256 Consideration on sidelink DRX determination LG Electronics Inc.
84. R2-2104266 SL DRX enabled UE Mode 2 operation ITL
85. R2-2104285 Discussion on SL DRX configuration for Groupcast & Broadcast Qualcomm Finland RFFE Oy, Ericsson
86. R2-2104472 Summary of [706] Ericsson
87. R2-2104473 [AT113bis-e][707][V2X/SL] Uu DRX impact to support SL CATT
88. R2-2104474 [AT113bis-e][708][V2X/SL] DRX configuration for SL groupcast and broadcast ZTE

**RAN2#114-e**

1. R2-2104750 Leftover Issues on DRX for Sidelink Unicast CATT
2. R2-2104751 DRX Design for Sidelink Groupcast and Broadcast CATT
3. R2-2104752 [AT113bis-e][707][V2X/SL] Uu DRX Impact to Support SL CATT
4. R2-2104753 Impacts of SL DRX on Other Procedures CATT
5. R2-2104769 Discussion on network involvement for SL related DRX OPPO
6. R2-2104835 Discussion on DRX configuration and DRX timers OPPO
7. R2-2104836 Left issues on SL DRX RTT timer OPPO, Intel, Xiaomi communications
8. R2-2104841 Summary of [POST113-e][704] TX UE centric or RX UE centric DRX configuration determination (OPPO) OPPO
9. R2-2104865 Reviised Summary of [POST113-e][703][V2X/SL] Details of Timer (InterDigital) InterDigital
10. R2-2104866 Open Issues on SL DRX InterDigital
11. R2-2104867 On TX Centric vs RX Centric Approaches for DRX Configuration Determination InterDigital, Apple, Huawei
12. R2-2104868 Resource Allocation for eSL InterDigital
13. R2-2105023 Further discussion on SL DRX operation Intel Corporation
14. R2-2105024 On DRX wake-up time alignment Intel Corporation
15. R2-2105073 DRX Configuration for UC BC GC and its interaction with Sensing Lenovo, Motorola Mobility
16. R2-2105077 Discussion on SL DRX configuration ZTE Corporation, Sanechips
17. R2-2105078 Discussion on SL DRX timer ZTE Corporation, Sanechips
18. R2-2105079 Discussion on inter-UE coordination ZTE Corporation, Sanechips
19. R2-2105083 Consideration on the sidelink DRX for unicast Huawei, HiSilicon
20. R2-2105131 Discussion on RX-centric and Tx-centric in SL unicast DRX Apple, InterDigtal Inc.
21. R2-2105132 Discussion on remaining issues of SL DRX Apple
22. R2-2105133 Discussion on resource allocation enhacenmens Apple
23. R2-2105248 NR SL DRX Fraunhofer IIS, Fraunhofer HHI
24. R2-2105277 Discussion on co-existence with UEs not supporting SL DRX SHARP Corporation
25. R2-2105278 Discussion on SL DRX inactivity timer SHARP Corporation
26. R2-2105297 Further discussion on Sidelink DRX LG Electronics France
27. R2-2105351 SL DRX Configuration Impact on RAN1 and RAN2 vivo
28. R2-2105352 Left issues on SL DRX vivo
29. R2-2105353 Discussion on inter-UE coordination for sidelink mode2 vivo
30. R2-2105385 Discussion on active time regarding Sidelink DRX ASUSTeK
31. R2-2105400 Discussion on HARQ RTT and Retransmission Timer for SL DRX Fujitsu
32. R2-2105401 Alignment of sidelink DRX active time Fujitsu
33. R2-2105402 Dual-mode Configuration and Selection for NR Sidelink Fujitsu
34. R2-2105458 Coordination between Uu DRX and SL DRX Lenovo, Motorola Mobility
35. R2-2105467 Power efficient resource allocation and Inter-UE coordination LG Electronics France
36. R2-2105480 Discussion on sidelink DRX configuration Xiaomi communications
37. R2-2105484 DRX alignment between TX and RX UE Xiaomi communications
38. R2-2105485 Resource allocation enhancement impact in RAN2 Xiaomi communications
39. R2-2105493 Remaining aspects of SL DRX Ericsson
40. R2-2105494 Interaction between partial sensing and DRX Ericsson
41. R2-2105495 summary offline 706 Ericsson
42. R2-2105499 Inter-UE Coordination for Sidelink Mode 2 Resource Allocation Fraunhofer IIS, Fraunhofer HHI
43. R2-2105508 Power Reduction for Sidelink Mode 2 Resource Allocation Fraunhofer IIS, Fraunhofer HHI
44. R2-2105532 Remaining issues on DRX Timers for SL Spreadtrum Communications
45. R2-2105538 Discussion on resource allocation enhancement for NR sidelink Spreadtrum Communications
46. R2-2105553 Consideration on sidelink DRX for broadcast and groupcast Huawei, HiSilicon
47. R2-2105593 Discussion on SL communication impact on Uu DRX Huawei, HiSilicon
48. R2-2105707 Proposals for Sidelink DRX Sony
49. R2-2105708 Discusison on Sidelink sensing Sony
50. R2-2105733 Geolocation for Sidelink DRX Nokia, Nokia Shanghai Bell, Fujitsu, Fraunhofer IIS, Fraunhofer HHI
51. R2-2105775 General principles for resource allocation enhacements for SL mode 2 Ericsson
52. R2-2105824 Discussion on sidelink resource allocation enhancements Lenovo, Motorola Mobility
53. R2-2105902 Discussion on Directional SL DRX for Unicast Qualcomm Finland RFFE Oy
54. R2-2105904 Discussion on SL DRX configuration for Groupcast & Broadcast Qualcomm Finland RFFE Oy
55. R2-2105906 Discussion on SL DRX Timers and Others Qualcomm Finland RFFE Oy
56. R2-2105912 [AT113bis-e][708][V2X/SL] DRX configuration for SL CG and BG ZTE
57. R2-2105958 Further Issues on Sidelink Traffic Pattern for SL DRX Configuration Nokia, Nokia Shanghai Bell
58. R2-2106056 On the deciding entity of SL DRX configuration Nokia, Nokia Shanghai Bell
59. R2-2106067 Resource Allocation Enhancements for Reduced Power Consumption and Enhanced Reliability Intel Corporation
60. R2-2106073 Coordination between DL DRX and SL DRX Samsung Research America
61. R2-2106074 SL DRX operation for groupcast/broadcast Samsung Research America
62. R2-2106075 Resource allocation enhancements Samsung Research America
63. R2-2106172 SL DRX enabled UE Mode 2 operation ITL
64. R2-2106202 Remaining issues in which UE decides sidelink DRX configurations LGE, InterDigital, Huawei, ASUSTeK, Apple
65. R2-2106204 Consideration on SL DRX operation LG Electronics Inc.
66. R2-2106358 On Resource Allocation Mode 2 Enhancement for NR Sidelink Convida Wireless
67. R2-2106363 SL DRX Granularity Considerations Convida Wireless
68. R2-2106364 SL DRX Configuration: TX Centric or RX Centric Convida Wireless
69. R2-2106438 On detailed SL DRX model MediaTek Inc.
70. R2-2106439 On SL DRX timer operation MediaTek Inc.
71. R2-2106440 Transmission of assistance information for Mode 2 enhancement MediaTek Inc.
72. R2-2106441 On SL sync search optimization MediaTek Inc.
73. R2-2106623 [LS to RAN1 on TX-UE’s timing information] MCC

**RAN4#98bis-e**

1. R4-2105207 Email discussion summary for [98-bis-e][134] NRSL\_enh\_Part\_1 LG Electronics
2. R4-2104969 TR38.785 v0.1.0 TR Update for SL enhancement in Rel-17 LG Electronics
3. R4-2105471 Email discussion summary for [98-bis-e][134] NRSL\_enh\_Part\_1 LG Electronics
4. R4-2105208 Email discussion summary for [98-bis-e][135] NRSL\_enh\_Part\_2 CATT
5. R4-2105472 Email discussion summary for [98-bis-e][135] NRSL\_enh\_Part\_2 CATT
6. R4-2105209 Email discussion summary for [98-bis-e][136] NRSL\_enh\_Part\_3 Huawei
7. R4-2105473 Email discussion summary for [98-bis-e][136] NRSL\_enh\_Part\_3 Huawei
8. R4-2104528 General discussions on operating bands for SL transmission vivo
9. R4-2104533 TP for SL enhancements vivo
10. R4-2105400 Way forward on general principle for SL enhancements LG Electronics
11. R4-2106676 Discussion on Rel-16 NR V2X AMPR value for both NS\_33 and NS\_52 Huawei, HiSilicon
12. R4-2104529 Discussion on system parameters for newly introduced SL bands vivo
13. R4-2105401 TP on CBW and system parameters for newly introduced SL bands CATT
14. R4-2107305 On CBW for licensed band supporting NR V2X Huawei, HiSilicon
15. R4-2105402 TP on operating scenarios for NR SL enhancements in Rel-17 LG Electronics
16. R4-2104776 TP on UE Rx RF requirement for NR SL enhancement CATT
17. R4-2104970 RF requirements for partial used licensed band bewteen NR Uu and NR SL operation LG Electronics
18. R4-2105405 TP on MPR/coexistence simulation assumptions for leftover issues LG Electronics
19. R4-2105403 Way forward on operating scenarios for SL and Uu operated in the same licensed band CATT
20. R4-2105404 Way forward on synchronization issue for SL and Uu operated in the same licensed band Huawei, HiSilicon
21. R4-2106301 MPR for NR V2X intra-band con-current operation with Uu LG Electronics
22. R4-2104530 Further discussion on operation mode and core requirements for licensed bands partially used for SL vivo
23. R4-2104778 Discussion on FDM operation between SL and Uu CATT
24. R4-2106293 on FDM operation for partially used SL operation Xiaomi
25. R4-2106554 R17 V2X FDM operation OPPO
26. R4-2107241 FDM operation for partially used SL operation in licensed band Ericsson
27. R4-2107303 On FDM operation for SL and Uu in licensed bands Huawei, HiSilicon
28. R4-2104777 Discussion on TDM operation between SL and Uu CATT
29. R4-2106298 on TDM operation for partially used SL operation Xiaomi
30. R4-2107304 On TDM operation for SL and Uu in licensed bands Huawei, HiSilicon
31. R4-2104779 Discussion on synchronous operation between SL and Uu CATT
32. R4-2104919 Synchronization and timing reference for NR SL and general issues on SL enhancements Qualcomm Incorporated
33. R4-2106299 synchronous operation between NR Uu and NR SL in an operating band Xiaomi
34. R4-2106555 R17 V2X synchronization OPPO
35. R4-2107243 SL UE synchronization issue for licensed operation Ericsson
36. R4-2107302 On synchronous operation between Uu and SL Huawei, HiSilicon
37. R4-2105406 LS on synchronous operation between Uu and SL in licensed band CATT
38. R4-2105407 Way forward on PC2 NR V2X Huawei, HiSilicon
39. R4-2104531 Further discussion on HPUE for SL enhancements vivo
40. R4-2105000 NR V2X PC2 UE MPR and A-MPR simulation results for PSCCH/PSSCH in n47 LG Electronics
41. R4-2106295 on HPUE for V2X RF requirements Xiaomi
42. R4-2106673 Discussion on n47 PC2 MPR simulation results Huawei, HiSilicon
43. R4-2105408 Initial results for coexistence evaluation in n38 vivo
44. R4-2106675 Discussion on the SL adjacent coexistence simulation results for PC2 Huawei, Hisilicon
45. R4-2106296 on HPUE signalling issue Xiaomi
46. R4-2106674 Discussion on n47 PC2 AMPR simulation results Huawei, HiSilicon
47. R4-2107242 On PC2 power class V2X UE Ericsson

**RAN4#99-e**

1. R4-2107668 Email discussion summary for [99-e][142] NRSL\_enh\_Part\_1 LG Electronics
2. R4-2107952 Email discussion summary for [99-e][142] NRSL\_enh\_Part\_1 LG Electronics
3. R4-2107863 WF on coexistence evaluation necessity in n14 LG Electronics
4. R4-2107864 WF on Feasibility of DL frequency range in FDD band used for SL operation vivo
5. R4-2108001 WF on remaining issues for system parameters in NRSL\_enh\_Part1 LG Electronics
6. R4-2109691 TP on operating bands and channel arrangement for SL enhancement vivo
7. R4-2111543 TR38.785 v0.2.0 TR Update for SL enhancement in Rel-17 LG Electronics
8. R4-2107867 NR Sidelink in NR Band n14 and Coexistence Studies AT&T, FirstNet
9. R4-2109692 Discussion on system parameters for SL enhancement vivo
10. R4-2107866 TP on channel bandwidth for newly introduced SL bands CATT
11. R4-2111428 TP for 38.785: CBW for licensed band supporting NR V2X Huawei, Hisilicon
12. R4-2107865 TP on UE Rx RF requirement for NR SL enhancement CATT
13. R4-2107669 Email discussion summary for [99-e][143] NRSL\_enh\_Part\_2 CATT
14. R4-2107953 Email discussion summary for [99-e][143] NRSL\_enh\_Part\_2 CATT
15. R4-2107868 WF on operating scenarios for Uu and SL operating in the same license band CATT
16. R4-2107869 WF on synchronous operation for Uu and SL operating in the same licensed band Huawei, HiSilicon
17. R4-2111542 LS on synchronous operation between Uu and SL in TDD band n79 CATT
18. R4-2107870 WF on MPR for intra-band V2X con-current operation LG Electronics
19. R4-2109947 RF requirements for partial used licensed band bewteen NR Uu and NR SL operation LG Electronics
20. R4-2107871 TP on RF requirements for intra-band con-current V2X operation in licensed band LG Electronics
21. R4-2110025 on full half duplex and TDM FDM operation scenario for intra-band con-current operation Xiaomi
22. R4-2109034 Discussion on FDM operation between SL and Uu CATT
23. R4-2110024 on FDM intra-band concurrent operation Xiaomi
24. R4-2111187 FDM operation for partially used SL operation in licensed band Ericsson
25. R4-2109033 Discussion on TDM operation between SL and Uu CATT
26. R4-2110028 on TDM intra-band concurrent operation Xiaomi
27. R4-2109035 Discussion on synchronous operation between SL and Uu CATT
28. R4-2109380 Timing reference for NR SL on SL enhancements Qualcomm
29. R4-2109693 Further discussion on synchronization issues for intra-band V2X operation vivo
30. R4-2110026 on SL transmission timing Xiaomi
31. R4-2110834 R17 SL transmission timing OPPO
32. R4-2111189 SL UE synchronization issue for licensed operation Ericsson
33. R4-2111429 Further consideration on SL timing alignment Huawei, Hisilicon
34. R4-2109702 MPR for NR V2X intra-band con-current operation with Uu LG Electronics
35. R4-2111430 On synchronization reference source Huawei, Hisilicon
36. R4-2111431 TP for 38.785: synchronization reference source for SL enhancements Huawei, Hisilicon
37. R4-2107670 Email discussion summary for [99-e][144] NRSL\_enh\_Part\_3 Huawei
38. R4-2107954 Email discussion summary for [99-e][144] NRSL\_enh\_Part\_3 Huawei
39. R4-2107872 WF on PC2 NR V2X Huawei, Hisilicon
40. R4-2107873 WF on MPR/A-MPR for PC2 NR V2X LG Electronics
41. R4-2110398 Discussion on n47 PC2 MPR simulation results Huawei, Hisilicon
42. R4-2107875 CR for TS 38.101-1 update configured transmitted power for V2X (R16) Huawei, Hisilicon
43. R4-2111433 CR for TS 38.101-1 update configured transmitted power for V2X (R17) Huawei, Hisilicon
44. R4-2107874 TP on coexistence evaluation for PC2 SL UE in licensed band n38 vivo
45. R4-2111188 Co-channel co-existence between SL and Uu Ericsson
46. R4-2111434 Consideration on co-existence study for n38 (SL) and adjacent band n7 (Uu) Huawei, Hisilicon
47. R4-2109694 Further discussion on PC2 NR V2X vivo
48. R4-2110022 further discussion on HPUE signalling issue Xiaomi
49. R4-2110399 Discussion on n47 PC2 AMPR simulation results Huawei, Hisilicon
50. R4-2110833 R17 SL PC2 OPPO
51. R4-2111435 Consideration on specific HPUE power class capability for NR V2X Huawei, Hisilicon
52. R4-2111436 draft LS on new power class 2 capability for NR-V2X Huawei, Hisilicon
53. R4-2107668 Email discussion summary for [99-e][142] NRSL\_enh\_Part\_1 Moderator (LGE)
54. R4-2109068 Preliminary discussion on RRM requirements for Sidelink enhancement CATT
55. R4-2109704 Work Plan of RRM requirements for Rel-17 SL enhancement LG Electronics Polska
56. R4-2109715 Impact on RRM core requirements for NR SL enhancement LG Electronics Polska
57. R4-2109946 RRM impacts overview for sidelink enhancement vivo
58. R4-2110304 Discussion on RRM impacts for R17 NR V2X Huawei, HiSilicon
59. R4-2111107 On NR SL RRM Requirement Scope Qualcomm, Inc.
60. R4-2108352 WF on NR SL enhancements RRM requirements, LG Electronics