**3GPP TSG-RAN WG2 Meeting #124 *R2-2313XXX***

**Chicago, USA, November 13 - 17, 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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|  |
| ***Title:***  | Introduction of SL relay enhancement |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_SL\_relay\_enh-Core |  | ***Date:*** | 2023-11-23 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Introduction of Rel-18 SL relay enhancement capabilities |
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| ***Summary of change:*** | New UE capability parameters for U2U relay discovery/communication, L2 U2N relay service continuity and multi-path relay scenario 1 and scenario 2 are added as below:***supportedBandCombListPerBC-SL-U2URelayDiscovery, supportedBandCombinationListSL-U2URelayDiscovery***,***relayUE-U2UOperation-L2***, ***remoteUE-U2UOperation-L2***, ***L3 sidelink U2U relay operation***, ***L3 sidelink U2U remote UE operation***,***remoteUE-U2NOperation-L2***,***multipathRelayUE-PC5-L2***, ***multipathRemoteUE-PC5-L2***, ***multipathRelayUE-N3C***, ***multipathRemoteUE-N3C***, ***remoteUE-indirectPathAddChangeToIdleInactiveRelay***, ***pdcp-DuplicationMoreThanOneUuRLC*** Existing paramters (*supportedBandListSidelink-r16*, *sl-Reception-r16*, *sl-TransmissionMode1-r16*, *sl-TransmissionMode2-RandomResourceSelection-r17*, *sl-TransmissionMode2-PartialSensingr-17*) are updated to include *supportedBandCombinationListSL-U2URelayDiscovery-r18*.Annex presents the feature list for TR 38.822.  |
| ***Consequences if not approved:*** | Rel-18 sidelink relay feature is not completed |
|  |  |
| ***Clauses affected:*** | 4.2.7.1, 4.2.16.1.1, 4.2.16.1.2, 4.2.16.1.5, 4.2.16.1.6, 4.2.16.1.7, 5.9, A.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **x** |  |  Other core specifications  | TS/TR 38.331 ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

START OF CHANGES

#### 4.2.7.1 *BandCombinationList* parameters

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***bandEUTRA***Defines supported EUTRA frequency band by NR frequency band number, as specified in TS 36.101 [14]. | Band | Yes | N/A | N/A |
| ***bandList***Each entry of the list should include at least one bandwidth class for UL or DL. | BC | Yes | N/A | N/A |
| ***bandNR***Defines supported NR frequency band by NR frequency band number, as specified in TS 38.101-1 [2] and TS 38.101-2 [3]. | Band | Yes | N/A | N/A |
| ***ca-BandwidthClassDL-EUTRA***Defines for DL, the class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by the UE, as specified in TS 36.101 [14]. When all FeatureSetEUTRA-DownlinkId:s in the corresponding FeatureSetsPerBand are zero, this field is absent. | Band | No | N/A | N/A |
| ***ca-BandwidthClassDL-NR***Defines for DL, the class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by the UE, as specified in TS 38.101-1 [2] and TS 38.101-2 [3]. When all FeatureSetDownlinkId:s in the corresponding FeatureSetsPerBand are zero, this field is absent. For FR1, the value 'F' shall not be used as it is invalidated in TS 38.101-1 [2]. | Band | No | N/A | N/A |
| ***ca-BandwidthClassUL-EUTRA***Defines for UL, the class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by the UE, as specified in TS 36.101 [14]. When all FeatureSetEUTRA-UplinkId:s in the corresponding FeatureSetsPerBand are zero, this field is absent. | Band | No | N/A | N/A |
| ***ca-BandwidthClassUL-NR***Defines for UL, the class defined by the aggregated transmission bandwidth configuration and maximum number of component carriers supported by the UE, as specified in TS 38.101-1 [2] and TS 38.101-2 [3]. When all FeatureSetUplinkId:s in the corresponding FeatureSetsPerBand are zero, this field is absent. For FR1, the value 'F' shall not be used as it is invalidated in TS 38.101-1 [2]. | Band | No | N/A | N/A |
| ***ca-ParametersEUTRA***Contains the EUTRA part of band combination parameters for a given (NG)EN-DC/NE-DC band combination. | BC | No | N/A | N/A |
| ***ca-ParametersNR***Contains the NR band combination parameters for a given (NG)EN-DC/NE-DC and/or NR CA band combination. | BC | No | N/A | N/A |
| ***ca-ParametersNRDC***Indicates whether the UE supports NR-DC for the band combination. It contains the NR band combination parameters applicable across MCG and SCG. If the band combination includes both FR1 and FR2 bands, a UE indicating support for NR-DC shall support synchronous NR-DC configuration where all serving cells of the MCG are in FR1 and all serving cells of the SCG are in FR2. | BC | No | N/A | N/A |
| ***featureSetCombination***Indicates the feature set that the UE supports on the NR and/or MR-DC band combination by FeatureSetCombinationId. | BC | N/A | N/A | N/A |
| ***featureSetCombinationDAPS-r16***Indicates the feature set that the UE supports for DAPS handover on the NR band combination by FeatureSetCombinationId. A UE shall include this field if intra-frequency or inter-frequency DAPS handover is supported for this band combination. For a band entry where it indicates the support for intra-frequency DAPS handover, the UE shall include at least two CCs and shall support intra-frequency DAPS handover between any CC pair within the same band entry. If the number of CCs within a band combination is more than one and if inter-frequency DAPS handover is supported, UE shall support inter-frequency DAPS handover between every CC pair in the same or different band entries in the band combination, except for the CC pair within a band entry with bandwidth class A. A feature set including *intraFreqDAPS-r16* can only be referred to by *featureSetCombinationDAPS-r16*, not by *featureSetCombination*. A feature set without *intraFreqDAPS-r16* is only applied to inter-freq DAPS handover if it is referred to by *featureSetCombinationDAPS*. Both feature sets with and without *intraFreqDAPS-r16* can be referred to by the same *featureSetCombinationDAPS-r16*. | BC | N/A | N/A | N/A |
| ***intrabandConcurrentOperationPowerClass-r16***Indicates the power class, of a particular Uu band combination and the intra-band PC5 band combination(s) on which the UE supports transmission of PC5 simultaneous with Uu uplink (as indicated by *supportedTxBandCombListPerBC-Sidelink-r16*). The leading/leftmost value corresponds to the band combination of the particular Uu band combination and the first intra-band PC5 band combination included in *BandCombinationListSidelinkEUTRA-NR* which is indicated with value 1 by *supportedTxBandCombListPerBC-Sidelink-r16*, the next value corresponds to the band combination of the particular Uu band combination and the second intra-band PC5 band combination included in *BandCombinationListSidelinkEUTRA-NR* which is indicated with value 1 by *supportedTxBandCombListPerBC-Sidelink-r16* and so on. If this power class is higher than the power class that the UE supports on the individual Uu or PC5 interface of this band combination, the latter determines maximum TX power available in each interface. | BC | No | N/A | N/A |
| ***mrdc-Parameters***Contains the band combination parameters for a given (NG)EN-DC/NE-DC band combination. | BC | No | N/A | N/A |
| ***ne-DC-BC***Indicates whether the UE supports NE-DC for the band combination. | BC | No | N/A | N/A |
| ***powerClass, powerClass-v1610***Indicates power class the UE supports when operating according to this band combination. 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-PowerClass* 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 [2] and TS 38.101-3 [4]. This capability is not applicable to IAB-MT. | BC | No | N/A | FR1 only |
| ***powerClassNRPart-r16***Indicates NR part power class the UE supports when operating according to this band combination.This field only applies for MR-DC BCs containing only single CC or intra-band CA in NR side in this release. | BC | No | N/A | FR1 only |
| ***scalingFactorTxSidelink-r16, scalingFactorRxSidelink-r16***Indicates, for a particular Uu band combination, the scaling factor for the PC5 band combination(s) on which the UE supports transmission/reception of PC5 simultaneous with Uu uplink/downlink respectively (as indicated by *supportedTxBandCombListPerBC-Sidelink-r16* / *supportedRxBandCombListPerBC-Sidelink-r16*). The leading / leftmost value corresponds to the first band combination included in *BandCombinationListSidelinkEUTRA-NR* which is indicated with value 1 by *supportedTxBandCombListPerBC-Sidelink-r16* / *supportedRxBandCombListPerBC-Sidelink-r16*, the next value corresponds to the second band combination included in *BandCombinationListSidelinkEUTRA-NR* which is indicated with value 1 by *supportedTxBandCombListPerBC-Sidelink-r16* / *supportedRxBandCombListPerBC-Sidelink-r16* and so on. For each value of *ScalingFactorSidelink-r16*, value f0p4 indicates the scaling factor 0.4, f0p75 indicates 0.75, and so on. | BC | No | N/A | N/A |
| ***srs-SwitchingAffectedBandsListNR-r17***Indicates which other bands in the band combination are affected by the SRS switch and the dropping rules / timelines apply to the indicated bands when SRS carrier switching on target CC and other UL on source CC are overlapped in the same symbol. UE indicating support of this feature shall indicate support of *srs-CarrierSwitch*.NOTE: For each "source-target" pair (as indicated by *srs-SwitchingTimesListNR*), the UE can indicate which other bands in the band combination are affected by the SRS switch. | BC | No | N/A | N/A |
| ***SRS-SwitchingTimeNR***Indicates the interruption time on DL/UL reception within a NR band pair during the RF retuning for switching between a carrier on one band and another (PUSCH-less) carrier on the other band to transmit SRS. *switchingTimeDL/ switchingTimeUL*:n0us represents 0 us, n30us represents 30us, and so on. *switchingTimeDL/ switchingTimeUL* is mandatory present if switching between the NR band pair is supported, otherwise the field is absent. It is signalled per pair of bands per band combination. | FD | No | N/A | N/A |
| ***SRS-SwitchingTimeEUTRA***Indicates the interruption time on DL/UL reception within a EUTRA band pair during the RF retuning for switching between a carrier on one band and another (PUSCH-less) carrier on the other band to transmit SRS. *switchingTimeDL/ switchingTimeUL:* n0 represents 0 OFDM symbols, n0dot5 represents 0.5 OFDM symbols, n1 represents 1 OFDM symbol and so on. *switchingTimeDL/ switchingTimeUL* is mandatory present if switching between the EUTRA band pair is supported, otherwise the field is absent. It is signalled per pair of bands per band combination. | FD | No | N/A | N/A |
| ***srs-TxSwitch, srs-TxSwitch-v1610***Defines whether UE supports SRS for DL CSI acquisition as defined in clause 6.2.1.2 of TS 38.214 [12]. The capability signalling comprises of the following parameters:- *supportedSRS-TxPortSwitch* indicates SRS Tx port switching pattern supported by the UE, which is mandatory with capability signalling. The indicated UE antenna switching capability of ′xTyR′ corresponds to a UE, capable of SRS transmission on ′x′ antenna ports over total of ′y′ antennas, where ′y′ corresponds to all or subset of UE receive antennas, where 2T4R is two pairs of antennas. *supportedSRS-TxPortSwitch-v1610*, which is optional to report, indicates downgrading configuration of SRS Tx port switching pattern. If the UE indicates the support of downgrading configuration of SRS Tx port switching pattern using *supportedSRS-TxPortSwitch-v1610*, the UE shall report the values for this as below, based on what is reported in *supportedSRS-TxPortSwitch*.

|  |  |
| --- | --- |
| *supportedSRS-TxPortSwitch* | *supportedSRS-TxPortSwitch-v1610* |
| *t1r2* | *t1r1-t1r2* |
| *t1r4* | *t1r1-t1r2-t1r4* |
| *t2r4* | *t1r1-t1r2-t2r2-t2r4* |
| *t2r2* | *t1r1-t2r2* |
| *t4r4* | *t1r1-t2r2-t4r4* |
| *t1r4-t2r4* | *t1r1-t1r2-t2r2-t1r4-t2r4* |

- *txSwitchImpactToRx* indicates the lowest band entry number of the UL group (see *txSwitchWithAnotherBand*) that impacts the DL of this band entry;- *txSwitchWithAnotherBand* indicates the lowest band entry of the UL group, which is defined as band entries with UL (see NOTE) that impact each other's UL (i.e. SRS TX port switching on any of the cells in the group will impact UL on all the cells in the group). This parameter is absent if an UL group contains only one band entry.For *txSwitchImpactToRx* and *txSwitchWithAnotherBand*, value 1 means first entry, value 2 means second entry and so on. The UE may include *txSwitchImpactToRx* and *txSwitchWithAnotherBand* for a band entry even if *supportedSRS-TxPortSwitch* is set to 'notSupported' for that band entry. All DL and UL that switch together indicate the same entry number.The entry number is the band entry number in a band combination. The UE is restricted not to include fallback band combinations for the purpose of indicating different SRS antenna switching capabilities.NOTE: The band with UL includes a band associated with *FeatureSetUplinkId* set to 0 corresponding to the support of SRS-SwitchingTimeNR. | BC | FD | N/A | N/A |
| ***srs-AntennaSwitchingBeyond4RX-r17***Indicates whether the UE supports SRS Antenna switching for more than 4 Rx. The capability signalling comprises the following parameters:*-* *supportedSRS-TxPortSwitchBeyond4Rx-r17* indicates a combination of supported xTyRs. It includes 11-bit bitmap, where starting from the leading / leftmost bit (bit 0), each bit corresponds to {t1r1, t2r2, t1r2, t4r4, t2r4, t1r4, t2r6, t1r6, t4r8, t2r8, t1r8}. For any indicated value, x shall be equal to or smaller than the one associated with the largest y.*-* *entryNumberAffectBeyond4Rx-r17* indicates the entry number of the first-listed band with UL in the band combination that affects this DL.*-* *entryNumberSwitchBeyond4Rx-r17* indicates the entry number of the first-listed band with UL in the band combination that switches together with this UL.The UE indicating support of this shall indicate support of *srs-TxSwitch.*NOTE: If reported for the same values of xTyR in *supportedSRS-TxPortSwitchBeyond4Rx-r17* as reported with *supportedSRS-TxPortSwitch*/*supportedSRS-TxPortSwitch-v1610*, the reported values for *entryNumberAffectBeyond4Rx-r17* and *entryNumberSwitchBeyond4Rx-r17* are not valid. | BC | No | N/A | N/A |
| ***supportedBandwidthCombinationSet***Defines the supported bandwidth combination set for a band combination as defined in TS 38.101-1 [2], TS 38.101-2 [3] and TS 38.101-3 [4]. For NR SA CA, NR-DC, inter-band (NG)EN-DC without intra-band (NG)EN-DC component, inter-band NE-DC without intra-band NE-DC component and intra-band (NG)EN-DC/NE-DC with additional inter-band NR CA component, the field defines the bandwidth combinations for the NR part of the band combination. For intra-band (NG)EN-DC/NE-DC without additional inter-band NR and LTE CA component, the field indicates the supported bandwidth combination set applicable to intra-band (NG)EN-DC/NE-DC band combination. This field is not applicable to source and target cells in intra-frequency DAPS handover.Field encoded as a bit map, where bit N is set to "1" if UE supports Bandwidth Combination Set N for this band combination as defined in the TS 38.101-1 [2], TS 38.101-2 [3] and TS 38.101-3 [4]. The leading / leftmost bit (bit 0) corresponds to the Bandwidth Combination Set 0, the next bit corresponds to the Bandwidth Combination Set 1 and so on. It is mandatory if- the band combination has more than one NR carrier (at least one SCell in an NR cell group);- or is an intra-band (NG)EN-DC/NE-DC combination without additional inter-band NR and LTE CA component;- or both.The corresponding bits of Bandwidth Combination Set 4 and Bandwidth Combination Set 5 shall not both be set to "1" for the same band combination. | BC | CY | N/A | N/A |
| ***supportedBandwidthCombinationSetIntraENDC***Defines the supported bandwidth combination set for a band combination that allows configuration of at least one EUTRA serving cell and at least one NR serving cell in the same band, as defined in the TS 38.101-3 [4], table 5.3B.1.2-1 and table 5.3B.1.3-1.- For intra-band (NG)EN-DC with additional inter-band CA component(s) of LTE and/or NR, the field defines the bandwidth combinations for the intra-band (NG)EN-DC component.- For intra-band NE-DC with additional inter-band CA component(s) of LTE and/or NR, the field defines the bandwidth combinations for the intra-band NE-DC component.Field encoded as a bit map, where bit N is set to "1" if UE support Bandwidth Combination Set N for this band combination as defined in the TS 38.101-3 [4]. The leading / leftmost bit (bit 0) corresponds to the Bandwidth Combination Set 0, the next bit corresponds to the Bandwidth Combination Set 1 and so on.- It is mandatory if the band combination is an intra-band (NG)EN-DC/NE-DC combination supporting both UL and DL intra-band (NG)EN-DC/NE-DC parts with additional inter-band NR/LTE CA component.- It is optional if the band combination is an intra-band (NG)EN-DC/NE-DC combination without supporting UL in both the bands of the intra-band (NG)EN-DC/NE-DC UL part. If not included, the network assumes the UE supports BCS0 as defined in TS 38.101-3 [4], table 5.3B.1.2-1 and table 5.3B.1.3-1 for the intra-band (NG)EN-DC/NE-DC. | BC | CY | N/A | N/A |
| ***supportedTxBandCombListPerBC-Sidelink-r16, supportedRxBandCombListPerBC-Sidelink-r16***Indicates, for a particular Uu band combination, the PC5 band combination(s) on which the UE supports transmission/reception of PC5 simultaneously with Uu uplink/downlink respectively. The leading / leftmost bit (bit 0) corresponds to the first band combination included in *BandCombinationListSidelinkEUTRA-NR*, the next bit corresponds to the second band combination included in *BandCombinationListSidelinkEUTRA-NR* and so on. with value 1 indicating simultaneous transmission/reception is supported. | BC | No | N/A | N/A |
| ***supportedBandCombListPerBC-SL-RelayDiscovery-r17, supportedBandCombListPerBC-SL-NonRelayDiscovery-r17***Indicates, for a particular Uu band combination, the PC5 Relay discovery and non-Relay discovery band combination(s) on which the UE supports simultaneous transmission/reception of PC5 data (Relay discovery or non-Relay discovery) and Uu uplink/downlink respectively.The leading / leftmost bit (bit 0) corresponds to the first band combination included in *supportedBandCombinationListSL-RelayDiscovery-r17/supportedBandCombinationListSL-NonRelayDiscovery-r17*, the next bit corresponds to the second band combination included in *supportedBandCombinationListSL-RelayDiscovery-r17/supportedBandCombinationListSL-NonRelayDiscovery-r17* and so on. with value 1 indicating simultaneous transmission/reception is supported. | BC | No | N/A | N/A |
| ***supportedBandCombListPerBC-SL-U2URelayDiscovery-r18***Indicates, for a particular Uu band combination, the PC5 U2U relay discovery band combination(s) on which the UE supports simultaneous transmission/reception of PC5 data (U2U relay discovery) and Uu uplink/downlink respectively.The leading / leftmost bit (bit 0) corresponds to the first band combination included in *supportedBandCombinationListSL-U2URelayDiscovery-r18*, the next bit corresponds to the second band combination included in *supportedBandCombinationListSL-U2URelayDiscovery-r18* and so on with value 1 indicating simultaneous transmission/reception is supported. | BC | No | N/A | N/A |
| ***ULTxSwitchingBandPair-r16, ULTxSwitchingBandPair-v1700***Indicates UE supports dynamic UL 1Tx-2Tx switching in case of inter-band CA, SUL, and (NG)EN-DC, and UL 2Tx-2Tx switching in case of inter-band CA and SUL as defined in TS 38.214 [12], TS 38.101-1 [2] and TS 38.101-3 [4]. The capability signalling comprises of the following parameters:- *bandIndexUL1-r16* and *bandIndexUL2-r16* indicate the band pair on which UE supports dynamic UL Tx switching. *bandindexUL1*/*bandindexUL2* xx refers to the xxth band entry in the band combination. UE shall indicate support for 2-layer UL MIMO capabilities on one of the indicated two bands in each FeatureSet entry supporting UL 1Tx-2Tx switching and indicate support for 2-layer UL MIMO capabilities on both bands in each FeatureSet entry supporting UL 2T-2Tx switching, and only the band where UE supports 2-layer UL MIMO capability can work as carrier2 as defined in TS 38.101-1 [2] and TS 38.101-3 [4].- *uplinkTxSwitchingPeriod-r16* indicates the length of UL Tx switching period of 1Tx-2Tx switching per pair of UL bands per band combination when dynamic UL Tx switching is configured, as specified in TS 38.101-1 [2] and TS 38.101-3 [4]. UE shall not report the value n210us for EN-DC band combinations. n35us represents 35 us, n140us represents 140us, and so on, as specified in TS 38.101-1 [2] and TS 38.101-3 [4].- *uplinkTxSwitchingPeriod2T2T-r17* indicates the length of UL Tx switching period of 2Tx-2Tx switching per pair of UL bands per band combination when dynamic UL Tx switching is configured, as specified in TS 38.101-1 [2] and TS 38.101-3 [4]. n35us represents 35 us, n140us represents 140us, and so on, as specified in TS 38.101-1 [2] and TS 38.101-3 [4].- *uplinkTxSwitching-DL-Interruption-r16* indicates that DL interruption on the band will occur during UL Tx switching, as specified in TS 38.133 [5] and in TS 36.133 [27]. UE is not allowed to set this field for the band combination of SUL band+TDD band, for which no DL interruption is allowed.Field encoded as a bit map, where bit N is set to "1" if DL interruption on band N will occur during uplink Tx switching as specified in TS 38.133 [5] and in TS 36.133 [27]. The leading / leftmost bit (bit 0) corresponds to the first band of this band combination, the next bit corresponds to the second band of this band combination and so on. The capability is not applicable to the following band combinations, in which DL reception interruption is not allowed:- TDD+TDD CA with the same UL-DL pattern- TDD+TDD EN-DC with the same UL-DL pattern | BC | FD | N/A | FR1 only |
| ***uplinkTxSwitching-OptionSupport-r16***Indicates which option is supported for dynamic UL 1Tx-2Tx switching for inter-band UL CA and (NG)EN-DC. *switchedUL* represents option 1 as specified in TS 38.214 [12], *dualUL* represents option 2 as specified in TS 38.214 [12], *both* represents both option 1 and option2 as specified in TS 38.214 [12]. UE shall not report the value *both* for (NG)EN-DC case. The field is mandatory for inter-band UL CA and (NG)EN-DC case where UE supports dynamic UL 1Tx-2Tx switching. | BC | CY | N/A | FR1 only |
| ***uplinkTxSwitching-OptionSupport2T2T-r17***Indicates which option is supported for dynamic UL 2Tx-2Tx switching for inter-band UL CA. *switchedUL* represents option 1 as specified in TS 38.214 [12], *dualUL* represents option 2 as specified in TS 38.214 [12], *both* represents both option 1 and option2 as specified in TS 38.214 [12]. The field is mandatory for inter-band UL CA cases where UE supports dynamic UL 2Tx-2Tx switching. The UE indicating support of this feature shall indicate support of at least one common switching option between *uplinkTxSwitching-OptionSupport2T2T-r17* and *uplinkTxSwitching-OptionSupport-r16*. | BC | CY | N/A | FR1 only |
| ***uplinkTxSwitching-PowerBoosting-r16***Indicates the support of 3dB boosting on the maximum output power for UE transmission under the operation state in which 2-port transmission can be supported on carrier2 in case of inter-band UL CA case where UE supports dynamic UL Tx switching. A UE shall only indicate this capability in case the UE supports power class 3 for inter-band UL CA for the band combination as defined in TS 38.101-1 [2]. | BC | No | N/A | FR1 only |
| ***UplinkTxSwitchingBandParameters-v1700***Contains the UL Tx switching specific band parameters for a given band combination.The capability signalling comprises of the following parameters:- *bandIndex-r17* indicates a band on which UE supports dynamic UL Tx switching with another band in the band combination. *bandIndex* xx refers to the xxth band entry in the band combination.- *uplinkTxSwitching2T2T-PUSCH-TransCoherence-r17* indicates support of the uplink codebook subset for the carrier(s) on a band capable of two antenna connectors on which UE supports dynamic UL 2Tx-2Tx switching with another band in the band combination. UE indicating support of full coherent codebook subset shall also support non-coherent codebook subset. If this field is absent, the per BC UE capability reported in *uplinkTxSwitching-PUSCH-TransCoherence-r16* is applied, and if this field and *uplinkTxSwitching-PUSCH-TransCoherence-r16* are both absent, the UE capability reported in *pusch-TransCoherence* is applied when uplink Tx switching is triggered between last transmitted SRS and scheduled PUSCH transmission, as specified in TS 38.101-1 [2]. | BC | No | N/A | FR1 only |
| ***uplinkTxSwitching-PUSCH-TransCoherence-r16***Indicates support of the uplink codebook subset when uplink 1Tx-2Tx switching is triggered between last transmitted SRS and scheduled PUSCH transmission, as specified in TS 38.101-1 [2].UE indicating support of full coherent codebook subset shall also support non-coherent codebook subset.If the field is absent, the supported uplink codebook subset indicated by *pusch-TransCoherence* applies when the uplink switching is triggered between last transmitted SRS and scheduled transmission. | BC | No | N/A | FR1 only |

NEXT CHANGE

##### 4.2.16.1.1 Sidelink General Parameters

| Definitions for parameters | Per | M | FDD-TDD DIFF | **FR1-FR2**DIFF |
| --- | --- | --- | --- | --- |
| ***accessStratumReleaseSidelink-r16***Indicates the access stratum release for NR sidelink communication the UE supports as specified in TS 38.331 [9]. | UE | Yes | No | No |
| ***relayUE-Operation-L2-r17***Indicates whether NR L2 sidelink relay UE operation is supported by the UE. | UE | No | No | No |
| ***remoteUE-Operation-L2-r17***Indicates whether NR L2 sidelink remote UE operation is supported by the UE.  | UE | No | No | No |
| ***remoteUE-PathSwitchToIdleInactiveRelay-r17***Indicates whether L2 sidelink remote UE supports direct to indirect path switch with target relay in RRC\_IDLE or RRC\_INACTIVE state. | UE | No | No | No |
| ***relayUE-U2UOperation-L2-r18***Indicates whether L2 U2U sidelink relay UE operation is supported by the UE. | UE | No | No | No |
| ***remoteUE-U2UOperation-L2-r18***Indicates whether L2 U2U sidelink remote UE operation is supported by the UE.  | UE | No | No | No |
| ***remoteUE-U2NOperation-L2-r18***Indicates whether enhanced NR L2 U2N remote UE operation for indirect-to-indirect path switch and inter-gNB path switch is supported by the UE. | UE | No | No | No |
| ***multipathRelayUE-PC5-L2-r18***Indicates whether L2 multi-path relay UE operation using PC5 connection is supported by the UE. | UE | No | No | No |
| ***multipathRemoteUE-PC5-L2-r18***Indicates whether L2 multi-path remote UE operation using PC5 connection is supported by the UE. | UE | No | No | No |
| ***multipathRelayUE-N3C-r18***Indicates whether L2 multi-path relay UE operation using non-3GPP connection is supported by the UE. | UE | No | No | No |
| ***multipathRemoteUE-N3C-r18***Indicates whether L2 multi-path remote UE operation using non-3GPP connection is supported by the UE. | UE | No | No | No |
| ***remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18***Indicates whether L2 multi-path remote UE supports indirect path addition or indirect path change with target relay UE in RRC\_IDLE or RRC\_INACTIVE state. | UE | No | No | No |
| ***pdcp-DuplicationMoreThanOneUuRLC-r18***Indicates whether the UE supports PDCP duplication with more than one RLC entity over Uu interface in L2 multi-path. | UE | No | No | No |

Next Change

##### 4.2.16.1.5 Other PHY parameters

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***p0-OLPC-Sidelink-r17***Indicates whether the UE supports the use of P0 parameters (i.e. *dl-P0-PSSCH-PSCCH-r17, sl-P0-PSSCH-PSCCH-r17, dl-P0-PSBCH-r17, dl-P0-PSFCH-r17*) for sidelink open loop power control. | UE | No | No | No |
| ***supportedBandCombinationListSidelinkEUTRA-NR-r16***Defines the supported NR sidelink communication and/or V2X sidelink communication band combinations by the UE. A fallback band combination resulting from the reported sidelink band combination shall be supported by the UE. The UE does not include this field if the UE capability is requested by E-UTRAN (see TS 36.331 [17]) and the network request includes the field *eutra-nr-only*. | UE | No | No | No |
| ***supportedBandCombinationListSidelinkNR-r16***Defines the supported joint NR sidelink communication band combinations by the UE. A fallback band combination resulting from the reported sidelink band combination shall be supported by the UE. | UE | No | No | No |
| ***supportedBandCombinationListSL-NonRelayDiscovery-r17***Defines the supported band combinations of NR sidelink non-relay discovery message transmission and reception by the UE. | UE | No | No | No |
| ***supportedBandCombinationListSL-RelayDiscovery-r17***Defines the supported band combinations of NR sidelink relay discovery message transmission and reception by the UE. This parameter is used by the remote UE and relay UE, and for the case of L2 and L3 relay. | UE | No | No | No |
| ***supportedBandCombinationListSL-U2URelayDiscovery-r18***Defines the supported band combinations of NR U2U sidelink relay discovery message transmission and reception by the UE. This parameter is used by the remote UE and relay UE, and for the case of L2 and L3 relay. | UE | No | No | No |
| ***supportedBandListSidelink-r16***Indicates frequency bands supported for NR sidelink communications and parameters supported for each frequency band, as specified in 4.2.16.1.6.If a band is included in *supportedBandCombinationListSL-NonRelayDiscovery-r17,* *supportedBandCombinationListSL-RelayDiscovery-r17 or supportedBandCombinationListSL-U2URelayDiscovery-r18*, the band supports non-relay/relay NR sidelink discovery. | UE | No | No | No |

Next Change

##### 4.2.16.1.6 *BandSidelink* Parameters

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***sl-Reception-r16***Indicates whether receiving NR sidelink communication is supported. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can receive NR PSCCH/PSSCH.- *harq-RxProcessSidelink*, which indicates the number of sidelink HARQ processes across all links that the UE supports for NR PSSCH reception. Value n16 corresponds to 16, n24 corresponds to 24, and so on.- *pscch-RxSidelink*, which indicates the number of PSCCH that the supports for reception in a slot. Value value1 corresponds to floor (NRB /10 RBs), value2 corresponds to 2\*floor (NRB /10 RBs);- UE can attempt to decode NRB non-overlapping RBs per slot.- UE supports reception of PSSCH according to the 64QAM MCS table.- UE supports PT-RS reception in FR2.- *scs-CP-PatternRxSidelink*, which indicates the subcarrier spacing with normal CP and the corresponding channel bandwidth that the UE supports for NR sidelink communication reception. Value scs-15kHz corresponds to 15kHz, scs-30kHz corresponds to 30kHz, and so on. It is mandatory for UE to support reception using 30 kHz subcarrier spacing with normal CP in FR1, and 120 kHz subcarrier spacing with normal CP FR2. For FR1, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 and 100MHz. For FR2, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 50, 100 and 200MHz. This capability is not required to be signalled in a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory. For a band indicated with only the PC5 interface in 38.101-1 [2], Table 5.2E.1-1, UE supports reception using 30 kHz subcarrier spacing with normal CP in FR1, 120 kHz subcarrier spacing with normal CP in FR2.- *extendedCP-RxSidelink*, which indicates whether the UE supports 60 kHz subcarrier spacing with extended CP length for NR sidelink communication reception. This capability is not required to be signalled in a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.- UE supports 14-symbol SL slot with all DMRS patterns corresponding to number of PSSCH symbols = {12, 9} for slots with and without PSFCH. If UE signals support of extended CP, support 12-symbol SL slot with all DMRS patterns corresponding to number of PSSCH symbols = {10,7} for slots with and without PSFCH.NOTE 1: NRB is the number of RBs defined per channel bandwidth by RAN4 in TS 38.101-1 [2], Table 5.3.2-1 for FR1 and TS 38.101-2 [3], Table 5.3.2.-1 for FR2.NOTE 2: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1.Support of this feature is mandatory if UE supports NR sidelink.If a band is included in *supportedBandCombinationListSL-NonRelayDiscovery-r17,* *supportedBandCombinationListSL-RelayDiscovery-r17 or supportedBandCombinationListSL-U2URelayDiscovery-r18*, it indicates whether receiving non-relay/relay NR sidelink discovery is supported. | Band | CY | N/A | N/A |
| ***sl-TransmissionMode1-r16***Indicates whether transmitting NR sidelink mode 1 scheduled by Uu is supported. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit PSCCH/PSSCH using configured grant type 1. For NR sidelink mode 1 scheduled by NR Uu, UE can additionally transmit PSCCH/PSSCH using dynamic scheduling or configured grant type 2. Up to 8 configured grants can be configured for a UE.- *harq-TxProcessModeOneSidelink*, which indicates the number of sidelink HARQ processes across all links that the UE supports for NR PSSCH transmission using mode 1, including those for configured grants. Value n8 corresponds to 8, n16 corresponds to 16, and so on.- UE can transmit PSSCH according to the normal 64QAM MCS OFDM table.- UE supports PT-RS transmission in FR2.- For NR sidelink mode 1 scheduled by NR Uu, UE can monitor DCI format 3\_0 for NR sidelink dynamic scheduling and configured grant type 2 on the same carrier as sidelink.- *scs-CP-PatternTxSidelinkModeOne*, which indicates the subcarrier spacing with normal CP and the corresponding bandwidth that the UE supports for NR sidelink communication transmission using NR sidelink mode 1. Value scs-15kHz corresponds to 15kHz, scs-30kHz corresponds to 30kHz, and so on. For FR1, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 and 100MHz. For FR2, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 50, 100 and 200MHz. For a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, UE supports transmission using at least 30 kHz subcarrier spacing with normal CP in FR1, at least 120 kHz subcarrier spacing with normal CP in FR2. Otherwise, the reported subcarrier spacing with normal CP and the corresponding bandwidth that the UE supports shall be the same as reported for UL via *channelBWs-UL*.- *extendedCP-TxSidelink*, which indicates whether the UE supports 60 kHz subcarrier spacing with extended CP length for NR sidelink communication transmission using mode 1. For a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, the reported subcarrier spacing with normal CP and the corresponding bandwidth that the UE supports shall be the same as reported for UL via *channelBWs-UL*.- UE supports 14-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {12, 9} for slots with and without PSFCH. If UE signals support of extended CP, support 12-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {10,7} for slots with and without PSFCH.- UE supports downlink pathloss based open loop power control for NR sidelink mode 1 scheduled by NR Uu if the band is not indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is not supported.- *harq-ReportOnPUCCH*, which indicates whether UE supports reporting sidelink HARQ-ACK to gNB via PUCCH and PUSCH when it is operating in NR sidelink mode 1, for NR sidelink mode 1 scheduled by NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.NOTE: Random selection in the exceptional pool is supported.Support of this feature is mandatory if UE supports NR sidelink in licensed spectrum where gNB is operating on or managing that spectrum.If a band is included in *supportedBandCombinationListSL-NonRelayDiscovery-r17,* *supportedBandCombinationListSL-RelayDiscovery-r17 or supportedBandCombinationListSL-U2URelayDiscovery-r18*, it indicates whether receiving non-relay/relay NR sidelink discovery is supported. | Band | CY | N/A | N/A |
| ***sl-TransmissionMode2-r16***Indicates whether transmitting NR sidelink mode 2 is supported. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit PSCCH/PSSCH using NR sidelink mode 2 configured by NR Uu or preconfiguration.- *harq-TxProcessModeTwoSidelink*, which indicates the number of sidelink HARQ processes across all links that the UE supports for NR PSSCH transmission using mode 2. Value n8 corresponds to 8, n16 corresponds to 16.- UE can transmit PSSCH according to the normal 64QAM MCS table.- UE supports PT-RS transmission in FR2.- UE can perform mode 2 sensing and resource allocation operations- *scs-CP-PatternTxSidelinkModeTwo*, which indicates UE can transmit using the subcarrier spacing and CP length it reports in *sl-Reception-r16*. This capability is not required to be signalled in a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory. For a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, UE supports transmission using 30 kHz subcarrier spacing with normal CP in FR1, 120 kHz subcarrier spacing with normal CP in FR2.- UE supports 14-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {12, 9} for slots with and without PSFCH. If UE signals support of extended CP, support 12-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {10,7} for slots with and without PSFCH.- *dl-openLoopPC-Sidelink*, which indicates whether UE supports DL pathloss based open loop power control when mode 2 is configured by NR Uu, if the band is indicated with only the PC5 interface in TS38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.This field is only applicable if the UE supports *sl-Reception-r16*.NOTE 1: Random selection in the exceptional pool is supported.NOTE 2: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1.Support of this feature is mandatory if UE supports NR sidelink. | Band | CY | N/A | N/A |
| ***sync-Sidelink-r16***Indicates whether UE supports synchronization sources for NR sidelink. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can receive S-SSB in NR sidelink if it supports *sl-Reception-r16*.- UE can transmit S-SSB in NR sidelink if it supports *sl-TransmissionMode1-r16* or *sl-TransmissionMode2-r16*.- UE supports GNSS and SyncRef UE as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *GNSS* and *sl-NbAsSync* set to *false*.- *gNB-Sync*, which indicates whether UE can transmit or receive NR sidelink based on the synchronization to an gNB for NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.- *gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB*, which indicates whether UE additionally supports gNB, GNSS and SyncRef UE as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *gnbEnb* for NR Uu, if the band is indicated with only the PC5 interface in TS38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.- *gNB-GNSS-UE-SyncWithPriorityOnGNSS*, which indicates whether UE additionally supports gNB, GNSS and SyncRef UE as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *GNSS* and *sl-NbAsSync* set to true for NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.This field is only applicable if the UE supports at least one of *sl-Reception-r16*, *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1.Support of this feature is mandatory if UE supports NR sidelink. | Band | CY | N/A | N/A |
| ***congestionControlSidelink-r16***Indicates whether UE supports sidelink congestion control for NR sidelink. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- *cbr-ReportSidelink*, which indicates whether UE can report CBR measurement to gNB when operating in Mode 1 and mode 2, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.- UE can adjust its radio parameters based on CBR measurement and CRlimit.- *cbr-CR-TimeLimitSidelink*, which indicates the time within which UE can process CBR and CR. Value time1 corresponds to congestion process time of 2, 2, 4, 8 slots for 15, 30, 60, 120 kHz subcarrier spacing, and value time2 corresponds to congestion process time of 2, 4, 8, 16 slots for 15, 30, 60, 120 kHz subcarrier spacing.This field is only applicable if the UE supports *sl-Reception-r16* and at least one of *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*.Support of this feature is mandatory if UE supports NR sidelink. | Band | CY | N/A | N/A |
| ***sl-Tx-256QAM-r16***Indicates UE can transmit PSSCH according to the 256QAM MCS table.This field is only applicable if the UE supports at least one of *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*. | Band | No | N/A | FR1 only |
| ***sl-Rx-256QAM-r16***Indicates UE can receive PSSCH according to the 256QAM MCS table.This field is only applicable if the UE supports *sl-Reception-r16*. | Band | No | N/A | FR1 only |
| ***psfch-FormatZeroSidelink-r16***Indicates whether UE supports PSFCH format 0. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit and receive NR PSFCH format 0.- *psfch-RxNumber* which indicates the number of PSFCH(s) resources that the UE can receive in a slot. Value n5 corresponds to 5, n15 corresponds to 15, and so on.- *psfch-TxNumber* which indicates the number of PSFCH(s) resources that the UE can transmit in a slot. Value n4 corresponds to 4, n8 corresponds to 8, and so on.This field is only applicable if the UE supports at least one of *sl-Reception-r16* and *sl-TransmissionMode2-r16*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1.Support of this feature is mandatory if UE supports NR sidelink. | Band | CY | N/A | N/A |
| ***lowSE-64QAM-MCS-TableSidelink-r16***Indicates UE can transmit and receive PSSCH according to the low-spectral efficiency 64QAM MCS table.This field is only applicable if the UE supports at least one of *sl-Reception-r16*, *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*. | Band | No | N/A | N/A |
| ***csi-ReportSidelink-r16***Indicates UE supports Sidelink CSI report. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- *csi-RS-PortsSidelink*, which indicates the number of antenna port(s) up to which UE can transmit and receive sidelink CSI-RS with. Value p1 corresponds to 1, and value p2 corresponds to 2.- UE supports RI and CQI feedback on sidelink.This field is only applicable if the UE supports at least one of *sl-Reception-r16*, *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*.Support of this feature is mandatory if UE supports NR sidelink. | Band | CY | N/A | N/A |
| ***enb-Sync-Sidelink-r16***Indicates whether UE supports eNB type synchronization source for NR sidelink. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit or receive NR sidelink based on the synchronization to an eNB.- If UE supports *sync-Sidelink-r16*, UE additionally supports eNB, GNSS and SyncRef UE as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *gnbEnb*.- If UE supports *sync-Sidelink-r16*, UE additionally supports eNB, GNSS and SyncRef UE as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *GNSS* and *sl-NbAsSync* set to *true*.This field is only applicable if the UE supports at least one of *sl-Reception-r16*, *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*. | Band | No | N/A | N/A |
| ***rankTwoReception-r16***Indicates whether UE supports rank 2 PSSCH reception.This field is only applicable if the UE supports *sl-Reception-r16*. | Band | No | N/A | N/A |
| ***fewerSymbolSlotSidelink-r16***Indicates whether UE supports transmission/reception of SL slot configured with 7, 8, 9, 10, 11, 12, 13 consecutive symbols and all the corresponding DMRS patterns in a slot.This field is only applicable if the UE supports at least one of *sl-Reception-r16*, sl-*TransmissionMode1-r16* and *sl-TransmissionMode2-r16*. | Band | No | N/A | N/A |
| ***sl-openLoopPC-RSRP-ReportSidelink-r16***Indicates whether UE supports sidelink pathloss based open loop power control and RSRP report in case of unicast.This field is only applicable if the UE supports *sl-Reception-r16* and at least one of *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*.Support of this feature is mandatory if UE supports NR sidelink. | Band | CY | N/A | N/A |
| ***sl-TransmissionMode2-RandomResourceSelection-r17***Indicates transmitting NR sidelink mode 2 with random resource selection is supported. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit PSCCH/PSSCH using NR sidelink mode 2 with random resource selection configured by NR Uu or preconfiguration.- *harq-TxProcessModeTwoSidelink-r17*, which indicates the number of sidelink HARQ processes across all links that the UE supports for NR PSSCH transmission using mode 2. Value n8 corresponds to 8, n16 corresponds to 16.- UE can transmit PSSCH according to the normal 64QAM MCS table.- UE supports PT-RS transmission in FR2.- *scs-CP-PatternTxSidelinkModeTwo-r17*, which indicates the subcarrier spacing with normal CP and the corresponding bandwidth that the UE supports for NR sidelink communication transmission using NR sidelink mode 2 with random resource selection. Value scs-15kHz corresponds to 15kHz, scs-30kHz corresponds to 30kHz, and so on. For FR1, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 and 100MHz. For FR2, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 50, 100 and 200MHz.UE can transmit using the subcarrier spacing and CP length it reports in *sl-Reception-r16*. This capability is not required to be signalled in a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory. For a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, UE supports transmission using 30 kHz subcarrier spacing with normal CP in FR1, 120 kHz subcarrier spacing with normal CP in FR2.- *extendedCP-Mode2Random-r17*, which indicates whether the UE supports 60 kHz subcarrier spacing with extended CP length for NR sidelink communication transmission using mode 2 with random resource selection.- UE supports 14-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {12, 9} for slots with and without PSFCH. If UE signals support of extended CP, support 12-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {10,7} for slots with and without PSFCH.- *dl-openLoopPC-Sidelink-r17*, which indicates whether UE supports DL pathloss based open loop power control when mode 2 is configured by NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.UE supporting this feature shall support receiving NR sidelink of S-SSB or indicate support of *sync-Sidelink-r16* or *sync-Sidelink-v1710*.If a band is included in *supportedBandCombinationListSL-NonRelayDiscovery-r17,* *supportedBandCombinationListSL-RelayDiscovery-r17 or supportedBandCombinationListSL-U2URelayDiscovery-r18*, it indicates whether transmitting NR sidelink mode 2 with random resource selection is supported for non-relay/relay NR sidelink discovery.NOTE 1: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1.NOTE 2: If UE reports more than one features of *sl-TransmissionMode2-r16*, *sl-TransmissionMode2-PartialSensing-r17* and *sl-TransmissionMode2-RandomResourceSelection-r17*, the reported value of *harq-TxProcessModeTwoSidelink* in each feature is the total number of SL processes and the same among those features.NOTE 3 Random selection in the exceptional pool is supported. | Band | No | N/A | N/A |
| ***sync-Sidelink-v1710***Indicates whether UE supports synchronization sources for NR sidelink. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- *sync-GNSS-r17*, which indicates UE supports GNSS as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *GNSS* and *sl-NbAsSync* set to *false*. This capability is only required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1- *gNB-Sync-r17*, which indicates whether UE can transmit NR sidelink based on the synchronization to an gNB for NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, it is not required to be supported. Otherwise, it is mandatory.- *gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r17*, which indicates whether UE additionally supports gNB, GNSS as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *gnbEnb* for NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, it is not required to be supported. Otherwise, it is mandatory.- *gNB-GNSS-UE-SyncWithPriorityOnGNSS-r17*, which indicates whether UE additionally supports gNB, GNSS as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *GNSS* and *sl-NbAsSync* set to true for NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, it is not required to be supported. Otherwise, it is mandatory.- UE can transmit S-SSB in NR sidelink if it supports *sl-TransmissionMode1-r16* or *sl-TransmissionMode2-r16* or *sl-TransmissionMode2-PartialSensing-r17* or *sl-TransmissionMode2-RandomResourceSelection-r17*.- UE supports synchronization to a reference UE if it supports *sl-Reception-r16*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***enb-Sync-Sidelink-v1710***Indicates whether UE supports eNB type synchronization source for NR sidelink. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit NR sidelink based on the synchronization to an eNB.- If UE supports *sync-GNSS-r17*, UE additionally supports eNB, GNSS as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *gnbEnb*.- If UE supports *sync-GNSS-r17*, UE additionally supports eNB, GNSS as the synchronization reference according to the synchronization procedure with *sl-SyncPriority* set to *GNSS* and *sl-NbAsSync* set to *true*.This field is only applicable if the UE supports *sync-Sidelink-v1710.*NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***rx-IUC-Scheme1-PreferredMode2Sidelink-r17***Indicates whether UE supports reception of preferred resource set for NR sidelink for mode 2. If supported, this parameter indicates the support of the capabilities as follows:- UE can receive inter-UE coordination information of preferred resource set and use the received information in its own resource (re-)selection in NR sidelink mode 2.- UE can transmit an explicit request for inter-UE coordination information of preferred resource set only.UE supporting this feature shall support receiving NR sidelink of S-SSB or indicate support of *sync-Sidelink-r16* or *sync-Sidelink-v1710*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***rx-IUC-Scheme1-NonPreferredMode2Sidelink-r17***Indicates whether UE supports reception of non-preferred resource set for NR sidelink for mode 2. If supported, this parameter indicates the support of the capabilities as follows:- UE can receive inter-UE coordination information of non-preferred resource set and use the received information in its own resource (re-)selection in NR sidelink mode 2.- UE can transmit an explicit request for inter-UE coordination information of non-preferred resource set only.UE supporting this feature shall support receiving NR sidelink of S-SSB or indicate support of *sync-Sidelink-r16* or *sync-Sidelink-v1710*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***rx-IUC-Scheme2-Mode2Sidelink-r17***Indicates whether UE supports reception of inter-UE coordination scheme 2 for NR sidelink for mode 2. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can receive inter-UE coordination information of presence of expected/potential resource conflict and use the received information in its own resource re-selection in NR sidelink mode 2.- UE indicates the number of PSFCH(s) resources that the UE can receive in a slot. Value n5 corresponds to 5, n15 corresponds to 15, and so on.UE supporting this feature shall support receiving NR sidelink of S-SSB or indicate support of *sync-Sidelink-r16* or *sync-Sidelink-v1710*.NOTE 1: If UE reports more than one capability of *psfch-FormatZeroSidelink-r16*, *rx-sidelinkPSFCH-r17* and *rx-IUC-Scheme1-PreferredMode2Sidelink-r17*, the reported value of the number of PSFCH(s) resources in each capability is the total number and the same among those capabilities.NOTE 2: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***rx-IUC-Scheme1-SCI-r17***Indicates whether UE can receive Scheme 1 inter-UE coordination transmission over 2nd SCI that is used in addition to the MAC-CE carrying the same inter-UE coordination information in the same transmission.UE indicating support of this feature shall indicate support of at least one of *rx-IUC-Scheme1-Preferred-Mode2Sidelink-r17* and *rx-IUC-Scheme1-NonPreferred-Mode2Sidelink-r17*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***rx-IUC-Scheme1-SCI-ExplicitReq-r17***Indicates whether UE can receive an explicit request for inter-UE coordination information of both preferred resource set and non-preferred resource set over 2nd SCI that is used in addition to the MAC-CE carrying the explicit request in the same transmission. UE indicating support of this feature shall indicate support of *tx-IUC-Scheme1-Mode2Sidelink-r17*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***scheme2-ConflictDeterminationRSRP-r17***Indicates whether UE can determine a conflict for overlapping resource reservation between UE-B and another UE based on RSRP difference of the two reservations.UE indicating support of this feature shall indicate support of *tx-IUC-Scheme2-Mode2Sidelink-r17*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | Band | No | N/A | N/A |
| ***ue-PowerClassSidelink-r16***This parameter indicates the supported power class for this band used for sidelink. If the field is absent, the UE supports the default power class in TS 38.101-1 [2], Table 6.2E.1.2-2. | Band | No | N/A | N/A |

Next Change

##### 4.2.16.1.7 *BandCombinationListSidelinkEUTRA-NR* Parameters

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***tx-Sidelink-r16***Indicates whether the UE supports sidelink transmission on the band.For NR sidelink, this field is only applicable if the UE supports at least one of *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16* on the band. | Band | No | N/A | N/A |
| ***rx-Sidelink-r16***Indicates whether the UE supports sidelink reception on the band.For NR sidelink, this field is only applicable if the UE supports *sl-Reception-r16* on the band. | Band | No | N/A | N/A |
| ***sl-CrossCarrierScheduling-r16***Indicates whether the UE supports monitoring DCI format 3\_0 on a different carrier from sidelink for NR sidelink dynamic scheduling and configured grant type 2. If the UE indicates support for *sl-TransmissionMode1-r16* in a band indicated with only the PC5 interface in Table 5.2E.1-1 of TS 38.101-1 [2], the UE shall indicate that *sl-CrossCarrierScheduling-r16* is supported for a band combination with that band.For NR sidelink, this field is only applicable if the UE supports *sl-TransmissionMode1-r16* on the band. | Band | No | N/A | N/A |
| ***sl-TransmissionMode2-PartialSensing-r17***Indicates transmitting NR sidelink mode 2 with partial sensing is supported. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit PSCCH/PSSCH using NR sidelink mode 2 with partial sensing configured by NR Uu or preconfiguration.- *harq-TxProcessModeTwoSidelink-r17*, which indicates the number of sidelink HARQ processes across all links that the UE supports for NR PSSCH transmission using mode 2. Value n8 corresponds to 8, n16 corresponds to 16.- UE can transmit PSSCH according to the normal 64QAM MCS table.- UE supports PT-RS transmission in FR2.- UE can perform periodic-based partial sensing and resource allocation operation.- UE can perform contiguous partial sensing and resource allocation operation.- *scs-CP-PatternTxSidelinkModeTwo-r17*, the subcarrier spacing with normal CP and the corresponding bandwidth that the UE supports for NR sidelink communication transmission using NR sidelink mode 2 with partial sensing. Value scs-15kHz corresponds to 15kHz, scs-30kHz corresponds to 30kHz, and so on. For FR1, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 and 100MHz. For FR2, the bits in scs-XXkHz starting from the leading / leftmost bit indicate 50, 100 and 200MHz. This capability is not required to be signalled in a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory. For a band indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1, UE supports transmission using 30 kHz subcarrier spacing with normal CP in FR1, 120 kHz subcarrier spacing with normal CP in FR2.- *extendedCP-Mode2PartialSensing-r17*, which indicates whether the UE supports 60 kHz subcarrier spacing with extended CP length for NR sidelink communication transmission using mode 2 with partial sensing.- UE supports 14-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {12, 9} for slots with and without PSFCH. If UE signals support of extended CP, support 12-symbol SL slot with all DMRS patterns corresponding to the number of PSSCH symbols = {10,7} for slots with and without PSFCH.- *dl-openLoopPC-Sidelink-r17*, which indicates whether UE supports DL pathloss based open loop power control when mode 2 is configured by NR Uu, if the band is indicated with only the PC5 interface in TS 38.101-1 [2], Table 5.2E.1-1. Otherwise, it is mandatory.UE supporting this feature shall support receiving NR sidelink of S-SSB or indicate support of *sync-Sidelink-r16* or *sync-Sidelink-v1710*.If a band combination is included in *supportedBandCombinationListSL-NonRelayDiscovery-r17,* *supportedBandCombinationListSL-RelayDiscovery-r17 or* *supportedBandCombinationListSL-U2URelayDiscovery-r18*, it indicates whether transmitting NR sidelink mode 2 with partial sensing is supported for non-relay/relay NR sidelink discovery.NOTE 1: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1.NOTE 2: If UE reports more than one feature of *sl-TransmissionMode2-r16*, *sl-TransmissionMode2-PartialSensing-r17* and *sl-TransmissionMode2-RandomResourceSelection-r17*, the reported value of *harq-TxProcessModeTwoSidelink* in each FG is the total number of SL processes and the same among those FGs.NOTE 3: Random selection in the exceptional pool is supported. | FS | No | N/A | N/A |
| ***rx-sidelinkPSFCH-r17***Indicates whether UE can receive PSFCH with HARQ-ACK information in NR sidelink and also the maximum number of PSFCH(s) resources N in a slot. If UE reports more than one of *psfch-FormatZeroSidelink-r16*, *rx-sidelinkPSFCH-r17*and *rx-IUC-Scheme2-Mode2Sidelink-r17*, the reported value N is the total number and the same among *psfch-FormatZeroSidelink-r16*, *rx-sidelinkPSFCH-r17* and *rx-IUC-Scheme2-Mode2Sidelink-r17.*UE supporting this feature shall support receiving NR sidelink of S-SSB and at least one of *sl-TransmissionMode1-r16* or *sl-TransmissionMode2-r16* or *sl-TransmissionMode2-RandomResourceSelection-r17* or *sl-TransmissionMode2-PartialSensing-r17*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | FS | No | N/A | N/A |
| ***tx-IUC-Scheme1-Mode2Sidelink-r17***Indicates whether UE supports transmission of inter-UE coordination scheme 1 for NR sidelink for mode 2. If supported, this parameter indicates the support of the capabilities as follows:- UE can transmit inter-UE coordination information of preferred resource set/non-preferred resource set in NR sidelink mode 2.- UE can receive an explicit request for inter-UE coordination information of both preferred resource set and non-preferred resource set.UE supporting this feature shall support receiving NR sidelink of S-SSB or indicate support of *sync-Sidelink-r16* or *sync-Sidelink-v1710*.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | FS | No | N/A | N/A |
| ***tx-IUC-Scheme2-Mode2Sidelink-r17***Indicates whether UE supports transmission of inter-UE coordination scheme 2 for NR sidelink for mode 2. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:- UE can transmit inter-UE coordination information of presence of expected/potential resource conflict in NR sidelink mode 2.- UE can transmit up to M PSFCH(s) resources in a slot where M takes the values of {4, 8, 16}If UE reports both *psfch-FormatZeroSidelink-r16* and *tx-IUC-Scheme2-Mode2Sidelink-r17*, the reported value M is the total number and the same in both *psfch-FormatZeroSidelink-r16* and *tx-IUC-Scheme2-Mode2Sidelink-r17*.UE supporting this feature shall indicate support of *rx-IUC-Scheme2-Mode2Sidelink-r17* and indicate support at least one among *sync-Sidelink-r16*, *sync-Sidelink-v1710* and receiving NR sidelink of S-SSB.NOTE: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [2] Table 5.2E.1-1. | FS | No | N/A | N/A |

Next Change

## 5.9 Sidelink Relay Features

| Definitions for feature |
| --- |
| **L3 sidelink relay UE operation**It is optional for UE to support L3 sidelink relay UE operation as specified in TS 38.331 [9]. |
| **L3 sidelink remote UE operation**It is optional for UE to support L3 sidelink remote UE operation as specified in TS 38.331 [9]. |
| **L3 sidelink U2U relay UE operation**It is optional for UE to support L3 sidelink U2U relay UE operation as specified in TS 38.331 [9]. |
| **L3 sidelink U2U remote UE operation**It is optional for UE to support L3 sidelink U2U remote UE operation as specified in TS 38.331 [9]. |

Next Change

# A.4: Sidelink capabilities applicable to Uu and PC5

Annex A.4 specifies for each sidelink related capability, in which interface (i.e., *UECapabilityInformation* in Uu RRC and *UECapabilityInformation*Sidelink in PC5 RRC) a UE supporting sidelink shall report the concerned capability:

- *UECapabilityInformation*: the concerned sidelink capability is reported within *UECapabilityInformation*;

- *UECapabilityInformationSidelink*: the concerned sidelink capability is reported within *UECapabilityInformationSidelink;*

Table A.4-1: Sidelink capability reported in *UECapabilityInformation*/ *UECapabilityInformationSidelink*

|  |  |  |
| --- | --- | --- |
| Sidelink Parameter | *UECapabilityInformation* | *UECapabilityInformationSidelink* |
| accessStratumReleaseSidelink |  | X |
| outOfOrderDeliverySidelink |  | X |
| am-WithLongSN-Sidelink | X | X |
| um-WithLongSN-Sidelink | X | X |
| lcp-RestrictionSidelink | X |  |
| logicalChannelSR-DelayTimerSidelink | X |  |
| multipleSR-ConfigurationsSidelink | X |  |
| multipleConfiguredGrantsSidelink | X |  |
| supportedBandCombinationListSidelinkEUTRA-NR | X |  |
| supportedBandCombinationListSidelinkNR |  | X |
| gnb-ScheduledMode3SidelinkEUTRA  | X |  |
| gnb-ScheduledMode4SidelinkEUTRA  | X |  |
| sl-Reception | X | X |
| sl-TransmissionMode1 | X |  |
| sl-TransmissionMode2 | X |  |
| sl-TransmissionMode2-PartialSensing | X |  |
| sl-TransmissionMode2-RandomResourceSelection | X |  |
| sync-Sidelink | X |  |
| congestionControlSidelink | X |  |
| sl-Tx-256QAM | X | X |
| sl-Rx-256QAM | X | X |
| psfch-FormatZeroSidelink | X |  |
| lowSE-64QAM-MCS-TableSidelink | X | X |
| csi-ReportSidelink |  | X |
| enb-sync-Sidelink | X |  |
| rankTwoReception |  | X |
| fewerSymbolSlotSidelink | X |  |
| sl-openLoopPC-RSRP-ReportSidelink | X | X |
| rx-IUC-Scheme1-PreferredMode2Sidelink | X | X |
| rx-IUC-Scheme1-NonPreferredMode2Sidelink | X | X |
| rx-IUC-Scheme2-Mode2Sidelink | X | X |
| rx-IUC-Scheme1-SCI | X | X |
| tx-Sidelink | X |  |
| rx-Sidelink | X |  |
| ue-PowerClassSidelink | X |  |
| drx-OnSidelink | X | X |
| enhancedUuDRX-forSidelink | X |  |
| relayUE-Operation-L2 | X |  |
| remoteUE-Operation-L2 | X |  |
| remoteUE-PathSwitchToIdleInactiveRelay | X |  |
| supportedBandCombinationListSL-RelayDiscovery | X |  |
| supportedBandCombinationListSL-NonRelayDiscovery | X |  |
| rx-IUC-Scheme1-SCI-ExplicitReq | X | X |
| scheme2-ConflictDeterminationRSRP |  | X |
| tx-IUC-Scheme2-Mode2Sidelink | X | X |
| tx-IUC-Scheme1-Mode2Sidelink | X | X |
| rx-sidelinkPSFCH | X |  |
| p0-OLPC-Sidelink | X |  |
| supportedBandCombinationListSL-U2URelayDiscovery | X |  |
| relayUE-U2UOperation-L2 | X |  |
| remoteUE-U2UOperation-L2 | X |  |
| remoteUE-U2NOperation-L2 | X |  |
| multipathRelayUE-PC5-L2 | X |  |
| multipathRemoteUE-PC5-L2 | X |  |
| multipathRelayUE-N3C | X |  |
| multipathRemoteUE-N3C | X |  |
| remoteUE-IndirectPathAddChangeToIdleInactiveRelay | X |  |
| pdcp-DuplicationMoreThanOneUuRLC | X |  |

END OF CHANGES

# Annex: RAN2 UE capability feature list

According to the following agreements made in RAN2#116-e, RAN2 determined UE capabilities in the feature list format for TR 38.822 is included.

* Include an annex containing the RAN2 determined UE capabilities in the feature list format in the running UE capability CRs (similar to annex containing RAN2 agreements) for easy compilation into the TR38.822 in the later stage.
* For capabilities developed in R2, WIs will provide input to the mega CR.

### X.X.X NR\_SL\_relay\_enh

Table X.X.X-1: Layer-2 and Layer-3 feature list for NR\_SL\_relay\_enh

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Field name in TS 38.331 [2]** | **Parent IE in TS 38.331 [2]** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Note** | **Mandatory/Optional** |
| x | x-1 | Band combination list supporting transmission and reception of U2U relay discovery | Defines the supported band combinations of NR U2U sidelink relay discovery message transmission and reception by the UE. This parameter is used by the remote UE and relay UE, and for the case of L2 and L3 relay. |  | *supportedBandCombinationListSidelinkU2URelayDiscovery-r18* | *RF-Parameters* | No | No |  | Optional with capability signalling |
| x-2 | Basic NR U2U L2 sidelink relay UE operation | Indicates whether basic NR U2U L2 sidelink relay UE operation is supported by the UE. |  | *relayUE-U2UOperation-L2-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-3 | Basic NR L2 sidelink remote UE operation | Indicate whether basic NR U2U L2 sidelink remote UE operation is supported by the UE. |  | *remoteUE-U2UOperation-L2-r17* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-4 | NR L2 sidelink remote UE operation | Indicate whether enhanced NR U2N L2 sidelink remote UE operation for indirect-to-indirect path switch and inter-gNB path switch is supported by the UE. | 31-1, 31-4, 31-5, 31-6 | *remoteUE-U2NOperation-L2-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-5 | NR L2 multipath relay UE operation using PC5 connection | Indicates whether L2 multi-path relay UE operation using PC5 connection is supported by the UE. | 31-1, 31-6 | *multipathRelayUE-PC5-L2-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-6 | NR L2 multipath remote UE operation using PC5 connection | Indicates whether L2 multi-path remote UE operation using PC5 connection is supported by the UE. | 31-1, 31-6 | *multipathRemoteUE-PC5-L2-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-7 | NR L2 multipath relay UE operation using non-3GPP connection | Indicates whether L2 multi-path relay UE operation using non-3GPP connection is supported by the UE. |  | *multipathRelayUE-N3C-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-8 | NR L2 multipath remote UE operation using non-3GPP connection | Indicates whether L2 multi-path remote UE operation using non-3GPP connection is supported by the UE. |  | *multipathRemoteUE-N3C-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-9 | Indirect path addition/change to idle or inactive Relay UE | Indicates whether L2 multi-path remote UE supports indirect path addition or indirect path change with target relay UE in RRC\_IDLE or RRC\_INACTIVE state. | 31-1, 31-6 | *remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-10 | PDCP duplication with more than one Uu RLC | Indicates whether the UE supports PDCP duplication with more than one RLC entity over Uu interface in L2 multi-path |  | *pdcp-DuplicationMoreThanOneUuRLC-r18* | *SidelinkParametersNR-r17* | No | No |  | Optional with capability signalling |
| x-11 | UE supports simultaneous transmission/reception of PC5 data (U2U relay discovery) and Uu uplink/downlink respectively | Indicates, for a particular Uu band combination, the PC5 U2U Relay discovery band combination(s) on which the UE supports simultaneous transmission/reception of PC5 data (U2U relay discovery) and Uu uplink/downlink respectively. |  | *supportedBandCombListPerBC-SL-U2URelayDiscovery-r18* | *BandCombination-v1800* | No | No |  | Optional with capability signalling |
| x-12 | Support L3 sidelink U2U relay UE operation | It is optional for UE to support L3 sidelink U2U relay UE operation |  | *n/a* | *n/a* | n/a | n/a |  | Optional without capability signalling |
| x-13 | Support L3 sidelink U2U remote UE operation | It is optional for UE to support L3 sidelink U2U remote UE operation |  | *n/a* | *n/a* | n/a | n/a |  | Optional without capability signalling |