3GPP TSG-RAN WG2 #121bis electronic R2-20xxxxx

17- 26 April 2023

Agenda Item: 5.1.3.2

Source: ZTE, Sanechips

Title: Summary of offline [AT121bis-e][004][NR1516] UE cap (ZTE)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT121bis-e][004][NR1516] UE cap (ZTE)

Scope: Treat R2-2302437 (if needed), R2-2303660, R2-2303877, R2-2303878, R2-2303879, R2-2303880, R2-2303881, R2-2304161, R2-2304162, R2-2304163, R2-2304164, R2-2304165, R2-2304166  
Ph1: Determine agreeable parts. Ph2: For agreeable parts, if any, reflect these in agreeable CRs.

Intended outcome: Report, If applicable: In-Principle-Agreed CRs

Deadline: Schedule 1

**Contact from companies**

|  |  |
| --- | --- |
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| Ericsson | lian.araujo@ericsson.com |
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# Discussion

## 2.1 Part 1: Intended to determine agreeable parts

Part 1 discussion is focusing on reaching conclusion whether the proposals/CRs can be agreed in principle, and Part 2 discussion would then focus on detailed changes for those agreeable contributions.

### LS on the SRS antenna Switching

[R2-2302437](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2302437.zip) LS on clarification on impact of SRS antenna switching for TDD-FDD band combinations (R4-2303633; contact: Huawei) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN1 Cc:RAN2

RAN2 is CCed. Proposed Noted

For this LS, the Chairman proposed to be noted immediately for that RAN2 is CCed.

**Q1: Do companies agree with the chair’s proposal to Note this LS immediately?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | Yes |  |
| ZTE | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Xiaomi | Yes |  |
| OPPO | Yes |  |
| Apple | Yes |  |
|  |  |  |

### SRS Tx Switching Capability

[R2-2303660](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303660.zip) Handling of SRS Tx switching capability Ericsson discussion

|  |
| --- |
| [Proposal 1 RAN2 to confirm the following behaviour for the parameters *txSwitchImpactToRx* and *txSwitchWithAnotherBand* in *srs-TxSwitch*:](#_Toc131702722)  [Bands with UL that impact each other define a group (i.e. SRS TX switching on any of the cells will impact UL on all the cells in the group). All the band entries in the group will signal the same group identifier in *txSwitchWithAnotherBand*. The first-listed band entry number in the group shall be used as identifier for the group. An UL group with only one band entry is not signaled in *txSwitchWithAnotherBand*.](#_Toc131702723)  [For bands where the DL is impacted by an UL group with a single band entry, *txSwitchImpactToRx* shall indicate the band entry number of that UL band. For bands where the DL is impacted by an UL group with more than one band entry, *txSwitchImpactToRx* shall point to the UL group using the group identifier number (as defined by *txSwitchWithAnotherBand*).](#_Toc131702724)  [Proposal 2 The behaviour of *txSwitchImpactToRx* and *txSwitchWithAnotherBand* should be clarified in 38.306.](#_Toc131702725) |

**Q2: Do companies agree with the proposal 1 in the** [R2-2303660](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303660.zip)**?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | Yes | Proponent |
| ZTE | Yes | We agree with the clarification |
| Huawei, HiSilicon | Yes with comments | For the txSwitchImpactToRx, we would like to further confirm the understanding is the impact to DL band is brought by the srs tx switching behavior of the UL band with srs-TxSwitch capability, because the txSwitchImpactToRx may point to a first-listed UL band without srs tx switching capability. |
| Xiaomi | Yes |  |
| OPPO | Yes in general | Some question on the examples:  #4 example, I understand the txSwitchImpactToRx is set as “-” under band B is because band A doesn’t support SRS switch, then why should txSwitchWithAnotherBand of band B is “1” ? for #5 there is similar issue.  #6 example, the table implies band B and band C is a group. But what if band B and band C don’t impact each other while they can impact A? |

**Q3: Do companies agree with the proposal 2 in the** [R2-2303660](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303660.zip)**?**

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| **Company** | **Yes or No** | **Comments** |
| Ericsson | Yes | Proponent |
| ZTE | No | We think it can be clarified in the chairman note without spec change. |
| Huawei, HiSlicon | No | We think some clarification in the chairman note is enough because we see the proposal2 is aligned with the field description in current 38.306. No additional spec change is needed. |
| Xiaomi | Yes | No strong view. |
| OPPO | comment | We are fine to clarify. For example for following sentence:  *All DL and UL that switch together indicate the same entry number.*  I assume DL is just impacted but will not switch together, right? |

### Miscellaneous Correction on UE capability

[R2-2303877](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303877.zip) Miscellaneous Correction on UE capability-R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.20.0 0895 - F NR\_newRAT-Core

[R2-2303878](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303878.zip) Miscellaneous Correction on UE capability-R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.12.0 0896 - A NR\_newRAT-Core

[R2-2303879](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303879.zip) Miscellaneous Correction on UE capability-R17 ZTE Corporation, Sanechips CR Rel-17 38.306 17.4.0 0897 - A NR\_newRAT-Core

Two changes are included in the CRs, one is about the PUSCH MIMO transmission, and the other one is about the PDSCH RE resource mapping.

**Q4: Do companies agree with the first change in the** [R2-2303877](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303877.zip)/R2-2303878/R2-2303879?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | Yes | We are fine with the change – we understand both changes are editorial. |
| ZTE | Yes | Proponent  For the non-CB based parameters, we agree that it’s editorial, but for the CB-based parameters it’s F class correction, for that it’s not correct to describe the prerequisite ( *pusch-TransCoherence)* only for the first sub-element (maxNumberMIMO-LayersCB-PUSCH MIMO-LayersUL). |
| Huawei, HiSilicon | Yes |  |
| Xiaomi | Yes |  |
| CATT | Yes |  |
| OPPO | Yes but | We are fine with 1st change  For non-CB parameters, *mimo-NonCB-PUSCH* covering *maxNumberSRS-ResourcePerSet and maxNumberSimultaneousSRS-ResourceTx* are referred in other two places. So I wondering whether we should put these two under *mimo-NonCB-PUSCH*, which is similar to the 1st change. Otherwise people have to go back to 38822 to find the reference which is not so nice. |

**Q5: Do companies agree with the second change in the** [R2-2303877](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303877.zip)/R2-2303878/R2-2303879?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | Yes | We are fine with the change – we understand both changes are editorial. |
| ZTE | Yes | Proponent  According to RAN1 Feature 2-33a, the “bitmap” for the *“pdsch-RE-MappingFR1-PerSymbol/pdsch-RE-MappingFR1-PerSlot”* are different,   * For the *pdsch-RE-MappingFR1-PerSymbol,* it means the resources defined in the bitmap of the *rateMatchingResrcSetSemi-Static* and the *rateMatchingResrcSetDynamic* (5-26/27), * For the *pdsch-RE-MappingFR1-PerSlot,* it means the resources defined in the bitmap of the *rateMatchingResrcSetSemi-Static, rateMatchingResrcSetDynamic* and the *rateMatchingCtrlResrcSetDynamic*(5-26/27/27a).   Same issue also exists for the “*pdsch-RE-MappingFR2-PerSymbol/pdsch-RE-MappingFR2-PerSlot”*  In the current spec, it’s unclear what does the bitmap mean, and it’s also unclear on whether the same/different resources are defined for the p*dsch-RE-MappingFR1-PerSymbol and pdsch-RE-MappingFR1-PerSlot* |
| Huawei, HiSilicon | Yes | We agree with the intention, but we think there will be no issue in real network to use the bitmap. |
| Xiaomi | Yes |  |
| CATT | Yes |  |
| OPPO | Yes | We are fine with the intention |

### PDCCH Blind Detection

[R2-2303880](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303880.zip) Correction on PDCCH Blind Detection-R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.12.0 0898 - F NR\_L1enh\_URLLC

[R2-2303881](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303881.zip) Correction on PDCCH Blind Detection-R17 ZTE Corporation, Sanechips CR Rel-17 38.306 17.4.0 0899 - A NR\_L1enh\_URLLC

**Q6: Do companies agree with the change in the** R2-2303880/R2-2303881?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | Yes | We are fine with the change, we understand this change is also editorial. |
| ZTE | Yes | We think it’s F class correction, for that it will give restriction to the corresponding capabilities:   1. g.   If the UE reports pdcch-BlindDetectionCA-r16,  - Candidate values for pdcch-BlindDetectionMCG-UE-r16 is 1 to pdcch-BlindDetectionCA-r16-1  - Candidate values for pdcch-BlindDetectionSCG-UE-r16 is 1 to pdcch-BlindDetectionCA-r16-1  - - pdcch-BlindDetectionMCG-UE-r16 + pdcch-BlindDetectionSCG-UE-r16 >= pdcch-BlindDetectionCA-r16  .....  Further more, it also restricts to the NR-DC only.  We use the short wording “ as specified in clause 10 in TS 38.213 [11] for the NR-DC.” just for the simplicity. |
| Huawei, HiSilicon | No | We think it is clear enough in RAN1 spec, there will be no misunderstanding. The change is not essential to RAN2 spec. |
| Xiaomi | Yes |  |
| CATT | Yes | Fine to add the clarification to make the spec clearer. |
| OPPO | Yes | Fine to clarify. |
| Apple | No strong view | TS 38.213 clause 10 is already referenced in the second part of the existing capability description. If the CR is deemed necessary, then at least the title of the Rel-17 CR needs to be corrected from -r17 to -r16 as FG 11-2d is for Rel-16 only (assuming R2-2303881 is just the shadow CR of R2-2303880). Arguably the presence of MCG & SCG in the description would imply that the capabilities are for NR-DC (and therefore maybe it’s not essential), but the additional clarity does not hurt. |
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### Pusch Repetition TypeB

[R2-2304163](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304163.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-16 38.331 16.12.0 4059 - F NR\_L1enh\_URLLC-Core

[R2-2304164](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304164.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4060 - A NR\_L1enh\_URLLC-Core

**Q7: Do companies agree with the change in the** R2-2304163/R2-2304164?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | No | The CR coversheet states the following:  In 38.822, the pusch-RepetitionTypeB-r16 capability indicates the supported maximum number of PUSCH transmissions within a slot for all TB(s), with the candidate value of {2, 3, 4, 7, 8, 12}. Besides, the supported value should be separately reported for UE processing capability 1 and for UE processing capability 2 if the UE supports both processing capabilities. The processing capability 1 is mandatory supported without signalling, and the processing capability 2 is defined by pusch-ProcessingType2.  There seems to be some contradiction between the two highlighted sentences – if UE processing capability 1 is mandatory supported without signaling then there would be nothing to signal for UE processing capability 1 and only signaling for processing capability 2 is required, so some clarification seems needed.  Also if the yellow highlighted sentence above holds, then introduction of any new value for UE processing capability 1 lower than the one expected without capability signaling would be non-backwards compatible. |
| Huawei, HiSilicon | Yes(proponent) | As for the comments from Ericsson, it should be noticed that the pusch-repetitionTypeB is a different capability with pusch processing capability. Pusch processing cap1 is by default supported by RAN1 FG 5-1, and more values are optionally supported by pusch-ProcessingType1-DifferentTB-PerSlot. Pusch processing cap2 is optionally supported by pusch-ProcessingType2. According to 38.822 FG11-5, the component for pusch-repetitionTypeB should be separately reported for processing cap1 and cap2 if the UE supports both. However, there is only one value defined in current spec.  To ensure backward compatibility, we understand the legacy value is applicable for processing cap 1 if processing cap 2 is not supported, or the legacy value is applicable for both cap1 and cap2 if cap2 is supported by the UE, in this case, the legacy value should be a lower one taking both cap1 and cap2 into account. |
| Xiaomi | No strong view | Whether the LS to RAN1 is needed? |
| CATT | Yes |  |
| OPPO | Yes |  |
| Apple | Yes |  |
|  |  |  |

[R2-2304161](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304161.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-16 38.306 16.12.0 0901 - F NR\_L1enh\_URLLC-Core

[R2-2304162](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304162.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-17 38.306 17.4.0 0902 - A NR\_L1enh\_URLLC-Core

**Q7: Do companies agree with the change in the** R2-2304161/R2-2304162?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson |  | Similar comments as for Q6. |
| Huawei, HiSilicon | Yes(proponent) |  |
| Xiaomi | No strong view | Whether the LS to RAN1 is needed? |
| CATT | Yes |  |
| OPPO | Yes |  |
| Apple | Yes |  |
|  |  |  |

### NR-DC Capability

[R2-2304165](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304165.zip) Corrections on NR-DC capabilities Huawei, HiSilicon CR Rel-16 38.306 16.12.0 0903 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2304166](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304166.zip) Corrections on NR-DC capabilities Huawei, HiSilicon CR Rel-17 38.306 17.4.0 0904 - A LTE\_NR\_DC\_CA\_enh-Core

Two modifications were made for the *ca-parametersNRDC* and *asyncNRDC-r16* respectively in the CR.

**Q8: Do companies agree with the first change in the** [R2-2304165](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303877.zip)/R2-2304166?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson | No | We think the change is non backwards compatible since a current NW would expect the UE to support FR1-FR2 NR-DC as specified in 38.306. |
| ZTE | No? | We failed to understand the meaning of the CR. The two capabilities are defined as per-BC level, so it is obvious that the following statement applies only when the associated BC 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.” |
| Huawei, HiSilicon | Yes(proponent) | We think the NR-DC band combination defined in RAN4 is release independent, and the UE is allowed to support intra-FR NR-DC combinations only. For an intra-FR NR-DC combination, the ca-ParametersNRDC should also be signaled by the UE.  There will be no inter-operability issue with legacy NW because when only intra-FR NR-DC combination is supported, the band combination will only include intra-FR bands. There will be no misunderstanding from the legacy NW. We understand the prerequisite is to ensure the backward compatibility with legacy NW only when the band combination includes both FR1 and FR2 bands.  As for the comment from ZTE, we think we share the same understanding on the capability itself. But we should make it clear in the spec as the current text brings much ambiguity according to the comments from companies so far. |
| Xiaomi | Yes |  |
| CATT |  | We are fine to add the clarification to make the spec clearer, even we do not think this will cause real problem. |
| OPPO | No | The similar view as ZTE, the capability description is clear enough. |
| Apple | No | We do not think this is necessary. |
|  |  |  |

**Q9: Do companies agree with the second change in the** [R2-2304165](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303877.zip)/R2-2304166?

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Ericsson |  | Similar comments as for Q8. |
| ZTE |  | Similar comments as for Q8. |
| Huawei, HiSilicon | Yes(proponent) |  |
| Xiaomi | Yes |  |
| CATT |  | Similar comments as for Q8. |
| OPPO |  | Similar comments as for Q8. |
| Apple | No | Similar view as Ericsson. |
|  |  |  |

## 2.2 Part 2: Intended to progress discussion on agreeable parts

- To be updated after discussion on part 1 -

# 3 Conclusion

- To be updated after discussion on part 1 -

# 4 References

1. [R2-2302437](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2302437.zip) LS on clarification on impact of SRS antenna switching for TDD-FDD band combinations (R4-2303633; contact: Huawei) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN1 Cc:RAN2
2. [R2-2303660](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303660.zip) Handling of SRS Tx switching capability Ericsson discussion
3. [R2-2303877](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303877.zip) Miscellaneous Correction on UE capability-R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.20.0 0895 - F NR\_newRAT-Core
4. [R2-2303878](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303878.zip) Miscellaneous Correction on UE capability-R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.12.0 0896 - A NR\_newRAT-Core
5. [R2-2303879](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303879.zip) Miscellaneous Correction on UE capability-R17 ZTE Corporation, Sanechips CR Rel-17 38.306 17.4.0 0897 - A NR\_newRAT-Core
6. [R2-2303880](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303880.zip) Correction on PDCCH Blind Detection-R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.12.0 0898 - F NR\_L1enh\_URLLC
7. [R2-2303881](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2303881.zip) Correction on PDCCH Blind Detection-R17 ZTE Corporation, Sanechips CR Rel-17 38.306 17.4.0 0899 - A NR\_L1enh\_URLLC

1. [R2-2304161](C:\\Users\\mtk65284\\Documents\\3GPP\\tsg_ran\\WG2_RL2\\TSGR2_121bis-e\\Docs\\R2-2304161.zip" \o "C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304161.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-16 38.306 16.12.0 0901 - F NR\_L1enh\_URLLC-Core
2. [R2-2304162](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304162.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-17 38.306 17.4.0 0902 - A NR\_L1enh\_URLLC-Core
3. [R2-2304163](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304163.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-16 38.331 16.12.0 4059 - F NR\_L1enh\_URLLC-Core
4. [R2-2304164](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304164.zip) Correction on pusch-RepetitionTypeB capability Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4060 - A NR\_L1enh\_URLLC-Core
5. [R2-2304165](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304165.zip) Corrections on NR-DC capabilities Huawei, HiSilicon CR Rel-16 38.306 16.12.0 0903 - F LTE\_NR\_DC\_CA\_enh-Core
6. [R2-2304166](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_121bis-e\Docs\R2-2304166.zip) Corrections on NR-DC capabilities Huawei, HiSilicon CR Rel-17 38.306 17.4.0 0904 - A LTE\_NR\_DC\_CA\_enh-Core