3GPP TSG-RAN WG2 #113bis electronic R2-210xxxx

e-Meeting, 12 April – 20 April 2021

Agenda Item: 5.4.3

Source: ZTE, Sanechips

Title: Email discussion summary of ****[AT113bis-e][011][NR15] UE caps III (ZTE)****

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT113bis-e][011][NR15] UE caps III (ZTE)

Scope: Treat R2-2104185, R2-2104186, R2-2104187, R2-2104188, R2-2102618, R2-2103025, R2-2103026, R2-2102610, R2-2103759, R2-2103760,

Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

Intended outcome: Report and Agreed-in-principle CRs.

Deadline: Schedule A (Phase 1 deadline- **Wednesday April 14 1000 UTC)**

**Contact from companies**

|  |  |
| --- | --- |
| Company | Email |
| ZTE | li.wenting@zte.com.cn |
|  |  |

# 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.

### Intra-band and Inter-band EN-DC Capability

[R2-2104185](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104185.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104185.zip) Clarification on the Intra-band and Inter-band EN-DC Capabilities ZTE Corporation, Sanechips discussion Rel-15 NG\_RAN\_PRN-Core R2-2101562

[R2-2104186](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104186.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104186.zip) CR on the Intra-band and Inter-band EN-DC Capabilities-R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.13.0 0517 1 F NR\_newRAT-Core R2-2101563

[R2-2104187](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104187.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104187.zip) CR on the Intra-band and Inter-band EN-DC Capabilities-R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.4.0 0518 1 A NR\_newRAT-Core R2-2101564

[R2-2104188](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104188.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104188.zip) Draft LS on the Intra-band and Inter-band EN-DC Capabilities ZTE Corporation, Sanechips LS out Rel-15 NR\_newRAT-Core R2-2101565 To:RAN4

These 4 papers are on the Intra-band and Inter-band EN-DC Capabilities. The intention was to clarify the related (NG)EN-DC/NE-DC BC types for these capabilities. Before going to the detail of these capabilities, the proponent hope to give a clear clarification as below on theintra-band (NG)EN-DC/NE-DC combination (with or without additional inter-band NR/LTE CA component) and inter-band (NG)EN-DC/NE-DC combination.

In the last meeting, companies have achieved some consensus on the terminologies for the intra/inter-band (NG)EN-DC/NE-DC combination types in [Post113-e][009][NR15] EN-DC BCS (Nokia) [1]. However, it was only reflected in the field description of the *supportedBandwidthCombinationSetIntraENDC. E.g.*

* Type 1: Intra-band (NG)EN-DC/NE-DC combination without additional inter-band NR and LTE CA component, e.g. DC **41A\_n41A**
* Type 2: 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, e.g. *DC\_25A\_****41A\_n41A***
* Type 3: 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, e.g. *DC\_****25A****\_41A\_****n41A***
* Type 4: Inter-band (NG)EN-DC/NE-DC combination without Intra-band component, in short we call it as Inter-band (NG)EN-DC/NE-DC combination.

Obviously, theseterminologies shall be used consistently among all of the related intra/inter-band (NG)EN-DC/NE-DC combination capabilities. Before extending these terminologies to the field description of other capabilities, it’s better to give a clear definition (as the proposal 1 below) on theintra-band (NG)EN-DC/NE-DC combination (with or without additional inter-band NR/LTE CA component) and inter-band (NG)EN-DC/NE-DC combination either in the chairman note or in the spec, which would be helpful for the readers who didn’t attend the post email discussion of [Post113-e][009][NR15] EN-DC BCS (Nokia).

**Q1: Do companies generally agree with the proposal 1 in [2]?**

**Proposal 1: Ran2 confirm that the intra-band (NG)EN-DC/NE-DC combination (with or without additional inter-band NR/LTE CA component) in 38306 means the (NG)EN-DC/NE-DC band combinations that have the same band component at NR and Eutra side (irrespective of SPcell or Scell), for other cases, it would be defined as inter-band (NG)EN-DC/NE-DC combination.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agree** | **Include in the spec or chairman note?** | **Comments** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

In the following questions, the related (NG)EN-DC/NE-DC BC types for the Intra-band and Inter-band EN-DC Capabilities would be discussed. For discussion convenience, the below 5 BC types were defined.

* Type 1: Intra-band (NG)EN-DC/NE-DC combination without additional inter-band NR and LTE CA component, e.g. DC **41A\_n41A**
* Type 2: 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, e.g. *DC\_25A\_****41A\_n41A***
* Type 3: 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, e.g. *DC\_****25A****\_41A\_****n41A***
* Type 4: Inter-band (NG)EN-DC/NE-DC combination without Intra-band component, in short we call it as Inter-band (NG)EN-DC/NE-DC combination.
* Type 5: Inter-band (NG)EN-DC combination configurations where the frequency range of the E-UTRA band is a subset of the frequency range of the NR band, e.g., DC\_B42\_n77 and DC\_B42\_n78.

1. ***ul-TimingAlignmentEUTRA-NR/dualPA-Architecture/pa-PhaseDiscontinuityImpact***

| ***ul-TimingAlignmentEUTRA-NR***  Indicates whether to apply the same UL timing between NR and LTE for dynamic power sharing capable UE operating in a synchronous intra-band contiguous (NG)EN-DC. If this field is absent, UE shall be capable of handling a timing difference up to applicable MTTD requirements when operating in a synchronous intra-band contiguous (NG)EN-DC network, as specified in TS 38.133 [5]. If this capability is included in an inter-band (NG)EN-DC BC with an intra-band (NG)EN-DC BC part, this capability is used to indicate the restriction to the intra-band (NG)EN-DC BC part. | BC | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***dualPA-Architecture***  For an intra-band band combination, this field indicates the support of dual PAs. If absent in an intra-band band combination, the UE supports single PA for all the ULs in the intra-band band combination. For other band combinations, this field is not applicable. | BC | No | N/A | N/A |
| ***pa-PhaseDiscontinuityImpacts***  Indicates incapability motivated by impacts of PA phase discontinuity with overlapping transmissions with non-aligned starting or ending times or hop boundaries across carriers for intra-band (NG)EN-DC/NE-DC, intra-band CA and FDM based ULSUP. | FS | No | N/A | N/A |

**Q2: Do companies agree with the proposal 2 as below in [2]?**

**Proposal 2: The *ul-TimingAlignmentEUTRA-NR/* *ul-dualPA-Architecture/ pa-PhaseDiscontinuityImpacts* is for the Type 1/2 BC, and not for the Type 3/4 BC.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree**  **(Yes or No)** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

**Q2.1: Do companies generally agree with the related intention/modification on these 3 capabilities in the CRs [3][4]?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agree Intention**  **(Yes or No)** | **Agree Modifications**  **(Yes or No)** | **Comments** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Q3: Do companies agree with the proposal 3 as below in [2]?**

**Proposal 3: Confirm with Ran 4 whether the *ul-TimingAlignmentEUTRA-NR* *ul-dualPA-Architecture/ pa-PhaseDiscontinuityImpacts* shall be adopted for the Type 5 BC.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

1. ***asyncIntraBandENDC***

| ***asyncIntraBandENDC***  Indicates whether the UE supports asynchronous FDD-FDD intra-band (NG)EN-DC with MRTD and MTTD as specified in clause 7.5 and 7.6 of TS 38.133 [5]. If asynchronous FDD-FDD intra-band (NG)EN-DC is not supported, the UE supports only synchronous FDD-FDD intra-band (NG)EN-DC. | BC | No | FDD only | FR1 only |
| --- | --- | --- | --- | --- |

**Q4: Do companies agree that the *asyncIntraBandENDC* is only for Type 1/2 BC?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

**Q4.1: Do companies generally agree with the related modification on this capability in the CRs [3][4]?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree**  **(Yes or No)** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

1. ***simultaneousRxTxInterBandENDC***

| ***simultaneousRxTxInterBandENDC***  Indicates whether the UE supports simultaneous transmission and reception in TDD-TDD and TDD-FDD inter-band (NG)EN-DC/NE-DC. It is mandatory for certain TDD-FDD and TDD-TDD band combinations defined in TS 38.101-3 [4]. | BC | CY | N/A | N/A |
| --- | --- | --- | --- | --- |

**Q5: Do companies agree that the s*imultaneousRxTxInterBandENDC* is for Type 2/3/4 (not for type 1)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

**Q5.1: Do companies generally agree with the related intention/ modification on this capability in the CRs [3][4]?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agree Intention**  **(Yes or No)** | **Agree Modifications**  **(Yes or No)** | **Comments** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Q6: Do companies agree to send a LS to RAN4 to confirm whether the *simultaneousRxTxInterBandENDC* is needed also for the type 5 BC?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

### 2.1.2 Cross-Carrier Operation

[R2-2102618](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2102618.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2102618.zip) LS on Interpretation of UE Features in Case of Cross-Carrier Operation (R1-2102085; contact: ZTE) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2

Moved from 5.1

[R2-2103025](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103025.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103025.zip) CR on UE capability in case of Cross-Carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-15 38.306 15.13.0 0544 - F NR\_newRAT-Core

[R2-2103026](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103026.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103026.zip) CR on UE capability in case of Cross-Carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-16 38.306 16.4.0 0545 - A NR\_newRAT-Core

**Q7: Do companies generally agree with these 2 CRs?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree**  **(Yes or No)** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

### 2.1.3 Simultaneous CSI-RS resources

[R2-2102610](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2102610.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2102610.zip) Reply LS on the use of simultaneous CSI-RS resources and ports (R1-2101962; contact: Ericsson) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2

Moved from 5.1

[R2-2103759](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103759.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103759.zip) Correction to the use of simultaneous CSI-RS resources Ericsson, Nokia CR Rel-15 38.306 15.13.0 0552 - F NR\_newRAT-Core

[R2-2103760](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103760.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103760.zip) Correction to the use of simultaneous CSI-RS resources Ericsson, Nokia CR Rel-16 38.306 16.4.0 0553 - A NR\_newRAT-Core

**Q8: Do companies generally agree with these 2 CRs?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree**  **(Yes or No)** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |

## 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. R2-2102215 Summary of [Post113-e][009][NR15] EN-DC BCS (Nokia) Nokia, Nokia Shanghai Bell
2. [R2-2104185](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104185.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104185.zip) Clarification on the Intra-band and Inter-band EN-DC Capabilities ZTE Corporation, Sanechips discussion Rel-15 NG\_RAN\_PRN-Core R2-2101562
3. [R2-2104186](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104186.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104186.zip) CR on the Intra-band and Inter-band EN-DC Capabilities-R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.13.0 0517 1 F NR\_newRAT-Core R2-2101563
4. [R2-2104187](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104187.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104187.zip) CR on the Intra-band and Inter-band EN-DC Capabilities-R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.4.0 0518 1 A NR\_newRAT-Core R2-2101564
5. [R2-2104188](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2104188.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2104188.zip) Draft LS on the Intra-band and Inter-band EN-DC Capabilities ZTE Corporation, Sanechips LS out Rel-15 NR\_newRAT-Core R2-2101565 To:RAN4
6. [R2-2102618](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2102618.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2102618.zip) LS on Interpretation of UE Features in Case of Cross-Carrier Operation (R1-2102085; contact: ZTE) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2 Moved from 5.1
7. [R2-2103025](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103025.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103025.zip) CR on UE capability in case of Cross-Carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-15 38.306 15.13.0 0544 - F NR\_newRAT-Core
8. [R2-2103026](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103026.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103026.zip) CR on UE capability in case of Cross-Carrier operation ZTE Corporation, Sanechips, Ericsson CR Rel-16 38.306 16.4.0 0545 - A NR\_newRAT-Core
9. [R2-2102610](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2102610.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2102610.zip) Reply LS on the use of simultaneous CSI-RS resources and ports (R1-2101962; contact: Ericsson) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2 Moved from 5.1
10. [R2-2103759](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103759.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103759.zip) Correction to the use of simultaneous CSI-RS resources Ericsson, Nokia CR Rel-15 38.306 15.13.0 0552 - F NR\_newRAT-Core
11. [R2-2103760](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_113bis-e\\Docs\\R2-2103760.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_113bis-eDocsR2-2103760.zip) Correction to the use of simultaneous CSI-RS resources Ericsson, Nokia CR Rel-16 38.306 16.4.0 0553 - A NR\_newRAT-Core