**3GPP TSG-RAN WG4 Meeting #104-e R4-22xxxxx**

**Electronic Meeting, Aug 15 - Aug 26, 2022**

**Agenda item:** 9.3.1

**Source:** Moderator (Huawei, HiSilicon)

**Title:** Email discussion summary for [104-e][105] NR\_RF\_FR1\_enh\_maintenance

**Document for:** Information

# Introduction

Thread [105] includes following topics:

1. Topic #1: Reply LS on clarification of *dualPA-Architecture* capability
2. Topic #2: Correction CR to RF requirements of NR\_RF\_FR1\_enh

List of candidate target of email discussion for 1st round and 2nd round

* 1st round:
	+ Reply LS on *dualPA-Architecture* capability
		- Try to reach consensus on the reply to RAN2 raised questions
	+ Correction CR
		- Agree the CR if no controversial issues
* 2nd round:
	+ Make conclusion of the reply LS and correction CR if not closed in 1st round discussion

It is appreciated that the delegates for this topic put their contact information in the table below.

**Contact information**

|  |  |  |
| --- | --- | --- |
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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)

# Topic #1: Reply LS on clarification of *dualPA-Architecture* capability

## Companies’ contributions summary

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| **T-doc number** | **T-doc name** | **Company** | **Proposals / Observations** |
| [**R4-2211980**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211980.zip) | Clarification of dualPA-Architecture capability | Nokia, Nokia Shanghai Bell | ***Observation 1: From Rel-17 UL DC location mechanism perspective, if the number of DC locations of the UE with dualPA-Architecture is one or zero, network has to assume that there is an UL DC location at default or two UL DC locations at the respective default. It’s noted that for all the cases the UE has two DC locations.******Observation 2: If there is a case that a UE with dualPA-Architecture does not always have two UL DC locations and does not report one UL DC location, the situation may make network confused since the network assumes that one of the UL DC locations is at default location, i.e., no offset, and the UE does not report them.******Proposal: If it is a common understanding that there is a case mentioned in observation 2, then, the information should be shared with RAN2 and ask them to address the issue in observation 2, e.g., at least UE has to report the number of UL DC locations (or CC-groups) whenever it’s instructed to repot UL DC location(s).******Observation 3: RAN2 spec changes only for dualPA-Architecture for intra-band CA is required at this moment of time.*** |
| [**R4-2212016**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212016.zip) | Reply LS to RAN2 on clarification of dualPA-Architecture capability | Samsung | ***Response to Q1: If taken the required change from RAN4 (i.e., the reporting of dualPA-Architecture also indicates the support of dual-LO) into consideration, A UE supporting dualPA-Architecture for a BC is supposed to always report two DC location for the BC.*** ***Response to Q2: The required change from RAN4 is also applicable to the latter one (i.e., the intra-band BC part of (NG)EN-DC/NE-DC).*** |
| [**R4-2212735**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212735.zip) | DRAFT LS reply on clarification of dualPA-Architecture capability | ZTE Corporation | ***Response to Q1:******In terms of the previous agreements in RAN4 below:*** * ***It’s mandatory for Rel-17 DC location reporting to be able to report two default DC locations for 2 LO case.***
* ***dualPA-Architecture means two PAs and two LOs for FR1, and also indicate two LOs for FR2***

***Combined with the above,*** ***if a UE supporting dualPA-Architecture for a BC, it always reports two DC locations for the BC, which means it is not left to UE implementation.******If a UE not supporting dualPA-Architecture for a BC, it supports single PA and single LO, which means one default DC location for the BC.******Response to Q2:*** ***The meanings of ‘dualPA-Architecture ’ are the same across RAN4 specs of 38.101-1/2/3, i.e. two PAs and two LOs. Therefore, the required change from RAN4 is also applicable to the latter one*** |
| [**R4-2212794**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212794.zip) | Discussion and reply LS on dualPA-Architecture capability clarification | vivo | ***Observation 1: Both 2 DC locations need to be reported for reliably removing the carrier leakage and image.******Observation 2: The 2LO clarification is also reasonable for intra-band ENDC.*** |
| [**R4-2213194**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213194.zip) | Reply to LS R2-2206428 on dualPA-Architecture capability | Skyworks Solutions Inc. | ***Proposal for answering R2-2206428 LS:**** ***Answer to question 1: RAN4 requested clarification on dualPA-Architecture is compatible with RAN2 agreements on not mandating two DC locations to be reported.***
* ***Answer to question 2: dualPA-Architecture implies dual-LO for both NRCA and ENDC, but it is sufficient that the RAN4 requested clarification be applied to NR CA only***
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| [**R4-2213315**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213315.zip) | R17 Reply LS on dualPA-architecture capability change | OPPO | ***Observation 1: dualPA-Architecture capability was introduced in Rel-15 to indicate whether this UE using two PA to support intra-band UL CA with each PA supporting one CC, and this inherently can indicate the number of LOs to support this band combination.******Observation 2: UE with dualPA-Architecture capability for an intra band combination can report at most 2DC locations, UE without dualPA-Architecture capability can report at most 1DC location.******Observation 3: UE need to report at least one DC location no matter one or two LOs implemented when received request from NW. And in the case of UE with two LOs, UE can choose to report only one DC location for example in the case of LO leakage is low, etc.******Proposal 1: It is proposed to confirm RAN2 understanding on the UE DC location reporting behavior:******Observation 4: RAN4 define PC2 intra-band CA combination requirements based on LO numbers, and no such differentiation is needed for intra-band EN-DC up to now.******Proposal 2: The capability description change is only needed for intra-band UL CA, i.e. the former one.*** |
| [**R4-2213739**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213739.zip) | Discussion on the LS reply on the clarification of dualPA-Architecture capability | Huawei, HiSilicon | ***Proposal 1: Confirm that the RAN2 agreements for Rel-16 DC location report during RAN2#117 are aligned with RAN4 required change in R4-2206503.*** ***Proposal 2: Confirm that the required change in R4-2206503 is also applicable to MR-DC case.******Proposal 3: Adopt the draft LS reply to R2-2206428 in Annex.******Answer to Question 1: The required change from RAN4 is compatible with the RAN2.******Answer to Question 2: Also applicable to the intra-band (NG)EN-DC/NE-DC case.*** |
| [**R4-2214042**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214042.zip) | Discussion on reply on dual PA LS | Qualcomm Incorporated | ***Observation 1: DualPA capability does not provide any new information in rel-16 context.******Observation 2: Coupling dualPA with two DC locations makes the dualPA redundant since UE can declare same information by declaring two DC locations****And proposed:****Proposal: Reply RAN2 as follows: “The agreement RAN2 made is correct. It is up to UE to choose to report DC location(s) independent of indicating dualPA caopability. However, RAN4 confirms that if UE declares dualPA and chooses to report DC location, it is expected to report two DC locations.”*** |

## Open issues summary

### Sub-topic 1-1: Answer to the LS Q1 related to DC location

***Q1:*** *During RAN2#117, RAN2 had made the following agreement for the DC location report*

* *[032] It is left to UE implementation whether a UE supporting dualPA-Architecture for a BC always reports two DC locations for the BC.*
* *[032] A UE not supporting dualPA-Architecture for a BC always reports one DC location for the BC. Whether to change the specification can be discussed at next meeting.*

*Is the required change from RAN4 (i.e., the reporting of dualPA-Architecture also indicates the support of dual-LO) compatible with the RAN2 agreement above (i.e., the reporting of dualPA-Architecture does not mandate the UE to report two DC locations for the BC)?*

* ***Option 1: A UE supporting dualPA-Architecture for a BC is supposed to always report two DC location for the BC (Samsung, ZTE, vivo)***
* ***Option 2: RAN4 confirms RAN2’s understanding, i.e. it is up to UE to choose to report DC location(s) independent of indicating dualPA caopability (Skyworks, OPPO, HW, QC)***
* ***Option 3: If there is a case that a UE with dualPA-Architecture does not always have two UL DC locations and does not report one UL DC location, some clarification to RAN2 is needed, e.g. at least UE has to report the number of UL DC locations (or CC-groups) whenever it’s instructed to repot UL DC location(s) (Nokia)***

***Moderator’s recommendation:***

* Recommended WF
	+ TBA based on 1st round discussion

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| **Company** | **Comments** |
| Samsung | In our view two things need more clarification.1. At first glance RAN2’ agreements seem ambiguous. Not quite sure whether the pre-condition of RAN2’ two agreements is “When UE indicates both *dualPA-Architecture and DC locations simultaneously* ”Seems Option1 and Option2 are not contradict with each other, Option2 emphasizes that two capabilities are independent which we also agree since both two are not mandatory (In Rel-16/17), while Option1 emphasizes that when both two are indicated simultaneously, UE is expected to always report two DC location.1. Is “always” equivalent to “mandatory”?

In our view, they are not equivalent, “always” literally means “is expected/ is able to”, but not “mandatory”, thus “always” does not preclude UE reporting one DC location.With above consideration, we propose a more comprehensive response(derived from our proposal and Qualcomm’s proposal):Reporting DC location(s) is up to UE implementation which is independent with indicating *dualPA-Architecture* capability*.* When both DC location(s) and *dualPA-Architecture* are reported, A UE supporting *dualPA-Architecture* for a BC is expected to always report two DC locations for the BC. |
| Nokia | We need to consider both Rel-16 and Rel-17 since *dualPA-Architecture*. For Rel-16, in any case, the second UL DC location report is an option feature of Rel-16 UL DC location signaling so that if actually, there is no UL DC location on the second carrier, no need to report it.For Rel-17, if *dualPA-Architecture* doesn’t mean the number of UL DC location is two, there may be a problem since in case UL DC location(s) is at a default position(s), the UE doesn’t need to report the UL DC location(s), but actually the number of UL DC location is one, the network may misunderstand that there is an UL DC even if it doesn’t exist and UL resource may become in vain. At least RAN2 should know the potential issue, though how to resolve this is up to RAN2.  |
| OPPO | We support Option 2. And the reasons are below:If UE indicate supporting dualPA-Architecture for an intra-band CA combination, it means this UE implement with two LOs corresponding to two DC locations, but it is up to UE implementation whether this UE will report one DC location or two DC locations. If UE doesn’t indicate support dualPA-Architecture for an intra-band CA combination, it means this UE implement with one LO thus one DC location.Regarding the potential issue pointed by Nokia:In Rel-17 if UE support dualPA-Architecture it also means two DC location, and when only report one DC offset, how to interpret the other DC location can be two approaches:Option 1: The other DC offset is 0, i.e. the default DC locationOption 2: The other DC location is unknownOur preference is Option 2, i.e. if no report of the 2nd DC offset, then it means the DC location is unknown. And if the 2nd DC location is the default location, then UE need to report offset = 0. This can make it clear. It should be noticed that the default DC location is just a reference location to report DC offset, it is not necessarily mean the DC location when UE doesn’t report the exact location. |
| Qualcomm | Agree with Samsungs proposal. But worth to consider that for intra-band UL CA, then TxD needs to always conform to the dualPA=0 MPRs since it can only report one DC location. For oppos view and support on option 2, why would we need to do the change in ran2 then, the original LS (R4-2206503) said:“For band combinations with single-band with UL CA, this field indicates the support of dual PA and dual LO frequencies for FR1, or dual LO frequencies for FR2. “ But if UE does not need to report this second LO even in case it report the dualPA, why this information is needed in network side or TE? Especially since UE can use *secondPA-TxDirectCurrent* to indicate it has second LO.As overall comment, the dualPA causes a lot of confusion without really providing much. Only use is to indicate different intra-band UL CA MPR in Rel-17 onwards. Maybe a way forward is to re think this more and reply to ran2 that: ***the use of dualPA is what it is in the specifications right now, to choose between two MPR tables and nothing more.***  |
| Huawei | We think dualPA-Architecture is more relevant to distinguish different requirements, while the support of dualPA-Architecture is merely allowing UE to report up to 2 DC locations (by singlePA-TxDirectCurrent and secondPA-TxDirectCurrent). From this point of view, we can confirm RAN2 understanding, i.e. it up to UE to choose to report DC location(s) independent of indicating dualPA capability. The updated proposal by Samsung is ok for us. |
| Skyworks | We believe the answer should cover the following aspects:A UE reporting dualPA-Architecture supports 2LOA UE reporting dualPA-Architecture is not mandated to report two DC, but if the UE reports DC it should be two DCA UE not reporting dualPA-Architecture supports 1LOA UE not reporting dualPA-Architecture is not mandated to report one DC (if carrier and image are low enough but anyhow if not within the operator spectrum it is useless), but if the UE reports DC it should be one DC |
| Apple | Option 2*dualPA-Architecture* IE was introduced in Rel-16 which was for the purpose of differentiating two different UE architectures on supporting intra-band UL CA. As the two architectures would result in different MPR requirements, the IE is essential mainly from compliance test perspective. Though the *dualPA-Architecture* IE is indeed aligned with the UE Tx architecture with two LOs where each LO upconverts the corresponding carrier, it was not intended to use as an indicator for UE to report two UL DC locations. The Rel-16 UL DC location signaling design by itself already supports up to two DC locations without referencing the *dualPA-Architecture* IE. Therefore, in our view the UL DC location reporting should be independent from *dualPA-Architecture* IE.  |
| ZTE | Our understanding for the LS is that how to report DC location in the cases of the following two cases:1. UE supports dualPA-Architecture2. UE not supports dualPA-ArchitectureFor the case 1, supporting dualPA-Architecture means two PAs and two LOs, then two DC shall be reported.For the case 2, not supporting dualPA-Architecture means one PA and one LO, then one DC should be reported.If decouple the dualPA-Architecture and DC location reporting, as we know, the sinallings themselves are optional which of course up to UE implementation to decide how to report DC location.The updated proposal from Samsung is also fine to us. |
| vivo | We agree with the DC location reporting is decoupled with dualPA-Architecture IE. Our concern here is in previous LS for R17 DC location reporting, we have informed RAN2 “the exact DC location must be known”, so we afraid if NW expect 2 LO information from UE based on *dualPA-Architecture IE* but only one LO information is reported, it may cause misunderstanding at NW. Considering RAN2 still working on R17 DC location signalling, we can accept Samsung’s proposal and further clarify as follows to make it clear:“For R17 DC location reporting scheme, if UE support *dualPA-Architecture* but only one DC location is reported, it means the other DC location is unknown rather than the offset is 0.” |

### Sub-topic 1-2: Answer to the LS Q2 on applicability to intra-band DC combination

***Q2****: In RAN2 specification, there are two dualPA-Architecture as follows: Where the former one is reported for the intra-band CA part of NR, while the latter one is for the intra-band BC part of (NG)EN-DC/NE-DC.*

*Is the required change also applicable to the latter one, or only applicable to the former one?*

* ***Option 1: RAN2 spec changes only for dualPA-Architecture for intra-band CA is required at this moment of time (Nokia, OPPO)***
* ***Option 2: The required change from RAN4 is also applicable to the latter one (i.e., the intra-band BC part of (NG)EN-DC/NE-DC) (Samsung, ZTE, vivo, HW)***
* ***Option 3: dualPA-Architecture implies dual-LO for both NRCA and ENDC, but it is sufficient that the RAN4 requested clarification be applied to NR CA only (Skyworks)***
* ***Option 4: No direct coupling between the dualPA-Architecture capability and DC location reporting (QC)***

***Moderator’s recommendation:***

* Recommended WF
	+ TBA based on 1st round discussion

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| **Company** | **Comments** |
| Samsung | Option 2We agree that the required change can be applied to ENDC, but not necessarily (not a must). However, these two signaling are with totally the same name, is weird they have different definition. Therefore we suggest to unify them, at least there is no harm. |
| Nokia | At least in terms of UL DC location perspective, *dualPA-Architecture* for MR-DC doesn’t look necessary at this moment. LTE carrier doesn’t have any measures to tell where the DC location is. |
| OPPO | Option 1.Agree with Nokia comment. The RAN4 LS to RAN2 on clarification of dualPA-Architecture is for the purpose of how many LO is used for a UE and then mapping to the corresponding requirements.For the EN-DC/NE-DC, though dualPA-Architecture can be used to indicate one LO or two LO is used, there is no need to do that at least from RAN4 requirement point of view. If changed, the purpose of doing that is unclear. |
| Qualcomm | Agree with Nokia, LTE does not do anything with the information. Also good pint from Samsung, strange we have two entries in the 38.306. I suppose they are the same field and signalled per band combo. And, as commented in 1-1, our view is that this is not needed at all except for distinguishing MPR for intraband UL CA since there is no need to first tell that UE has two LOs and then separately signal the location of the second LO. What if UE gives different info on dualPA and *secondPA-TxDirectCurrent*?  |
| Huawei | According to further clarifications, we also agree that if the question by RAN2 on *dualPA-Architecture* for DC is relevant to DC location, then it is not appropriate to extend to LTE carrier. In that sense, we are fine to clarify that the required change by RAN2 is applicable for NR CA only for the moment. |
| Skyworks | As discussed in our paper the change is applicable to ENDC but is not essential because there is no requirement that needs to distinguished.  |
| Apple | Option 4If the intention of *dualPA-Architecture* IE is to be used as a requirement for reporting two UL DC locations in Rel-17, why the issue is discussed in this forum but not in the UL DC location email thread. So in our view we should only use *dualPA-Architecture* IE to differentiate MPR requirements for intra-band UL CA, but not an indicator that the UE is expected to report two UL DC locations. On the other hand, we should also be cautious on using the wording “mandate” for UL DC location reporting. In our view, UE should always be allowed to not report UL DC location if it sees no need for gNB to assist on DC removal to improve signal quality, irrespective of whether *dualPA-Architecture* IE is indicated or not. |
| ZTE | If the common understanding is ‘Reporting DC location(s) is up to UE implementation which is independent with indicating *dualPA-Architecture* capability*.*’ which is stated in issue 1-1, then we can interpret this issue is whether *dualPA-Architecture* can be also applied to intra-band ENDC without considering the DC location report.*dualPA-Architecture* means two PAs and two LOs, we think it is also true for intra-band ENDC. So it may be clear like this: (Considering both Option 2 and 4.)*The dualPA-Architecture capability and DC location reporting are independent, the required change from RAN4 is also applicable to the latter one (i.e., the intra-band BC part of (NG)EN-DC/NE-DC),*  |
| vivo | We agree that the DC location reporting and *dualPA-Architecture* IE should be decoupled, and we think even though LTE does not need this information, it can make spec look more uniform and avoid unnecessary misleading. ZTE’s proposal is OK for us. |

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary**  |
| **Sub-topic#1** | Sub-topic 1-1: Answer to the LS Q1 related to DC location*Tentative agreements:*The signaling of *dualPA-Architecture* was introduced to distinguish the UE architectures, which is used in the specification for differentiate the applicable requirements for intra-band UL non-contiguous CA. Supporting *dualPA-Architecture* means 2LO, but the capability can be decoupled from DC location reporting. *Candidate options:*Most companies agree that *dualPA-Architecture* is for the purpose to differentiate applicable requirements in the current specification, which should not be closely coupled with DC location reporting signaling. Two companies commented that support *dualPA-Architecture* means two LO, if only one DC location is reported, it could cause some potential ambiguity for the NW expectation. *Recommendations for 2nd round:*Further discuss based on the content of draft LS. Sub-topic 1-2: Answer to the LS Q2 on applicability to intra-band DC combination*Tentative agreements:**Candidate options:*Option 1: Nokia, OPPO, QC, HW, Skyworks Option 2: Samsung, ZTE, vivoOption 4: Apple, ZTEThe views from companies are still divided. After clarification during the discussion, slightly more companies prefer option 1 as there is nothing to do for DC location reporting for the LTE carrier. *Recommendations for 2nd round:*Further discuss based on the content of draft LS.  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-22xxxxx | Samsung | Reply LS to RAN2 on clarification of dualPA-Architecture capability |

### draft reply LS

If any comments for the revised reply LS, please provide them here during 2nd round discussion.

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| **Company** | **Comments** |
| OPPO | *dualPA-Architecture* IE is always be indicated “support” or “absent” by UE to indicate how many PAs (and inherently how many LOs) it used to support an intra-band CA.When UE have two PA/two LO, whether UE report one DC or two DC is up to UE.When UE have one PA/one DC, and it report *dualPA-Architecture* = absent, then this UE DC location should report less than or equal to one.This is aligned with RAN2 agreement. And it may not be proper to say DC location report and dualPA-Architecture capability are independent, they are connected somehow.Proposed changes as below: |
| Skyworks | Regarding reporting DC we do not agree that it means that UE reports one or 2 DC location as the UE may report none. We also do not see the point of reporting only one DC if Dual PA is supported. The reason why a UE may not report DC is not because it is unknown (the UE knows) but rather that the level is too low for DC reporting to the BS to be useful, but in this case it is likely it is the case or not for both DC. At this point it may be better to mention that dualPA implies two DC location but DC location reporting or not is UE choice. |
| Samsung | To OPPO: Q1: UE may not report any DC location when dualPA IE is either “support” or “absent”. “Reporting DC location” and “dualPA architecture” should be decoupled”, dualPA architecture is not expected to be an indicator to report how many DC locations. Although when “DC location” and “dual PA” are indicated simultaneously, UE is expected to always report two DC locations， but if the level is low and useless to BS, UE could still report one. Hence we do not feel like remove the first sentence and adding below ones is quite accurate.In addition, do we really need to mention two Los corresponds to two DC locations, is it common understanding?Q2: We do not feel adding this is necessary. Does RAN2 really care how RAN4 define RF requirements? To vivo: We do not feel this is necessary.Since in previous LS to RAN2, we already informed them “exact DC location must be known”, we shall be careful to guide them how to interpret “unknown” when RAN4 has no unified understanding yet. |
| Apple | Thanks to Samsung for leading this LS. We have added a few minor editorial changes to the draft LS v05. |
| Qualcomm | We are not ready agree that UE can report dualPA and report location only for one LO. If that would be the case, why did ran4 send earlier LS to ask to change the dualPA description to mean UE had two LOs. Having a capability to say UE has two LOs and method to report the location of the both LOs but then reporting only one is just non-sense and if some company really wants this, they they should bring in a technical paper explaining what benefits will that bring? And why this kind of capability structure is needed. We can say this but then we should change ran4 agreement that dualPA means two LOs and inform ran2 about that. New version in here [R4-22xxxx Reply LS to RAN2 on clarification of dualPA-Architecture capability\_v06\_Apple\_QC.docx](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_104-e/Inbox/Drafts/%5B104-e%5D%5B105%5D%20NR_RF_FR1_enh_maintenance/Round2/LS/R4-22xxxx%20Reply%20LS%20to%20RAN2%20on%20clarification%20of%20dualPA-Architecture%20capability_v06_Apple_QC.docx) |
| Nokia | We have a similar view with Qualcomm. In addition, at least Rel-17 DC location signaling needs to be tied with *dualPA-Architecture*. Otherwise, gNB can be confused if it doesn’t receive two DC locations.For release 16, RAN2 spec somehow tie this DC location reporting scheme with dualPA.***singlePA-TxDirectCurrent***The uplink Tx Direct Current location for the UE which support single PA for this uplink carrier aggregation. For the UEs which support dual PA for this uplink carrier aggregation, this field is for reporting the uplink Tx Direct Current location of the first PA.  |

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

***Moderator’s summary:***

The revised LS is agreeable according on 2nd round discussion.

https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/TSGR4\_104-e/Inbox/Drafts/%5B104-e%5D%5B105%5D%20NR\_RF\_FR1\_enh\_maintenance/Round2/LS/Final%20draft%20R4-2214924%20Reply%20LS%20to%20RAN2%20on%20clarification%20of%20dualPA-Architecture%20capability.docx

# Topic #2: Correction CR to RF requirements of NR\_RF\_FR1\_enh

## Companies’ contributions summary

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| **T-doc number** | **T-doc name** | **Company** | **Proposals / Observations** |
| [**R4-2213364**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213364.zip) | Correction to RF requirements of NR\_RF\_FR1\_enh | Huawei, HiSilicon |  |

## Open issues summary

### Sub-topic 2-1: correction CR

***Summary of the changes:***

1. ***To remove the restrictions on configuring UL MIMO for SUL bands in clause 4.3.Correcting the references across the intra-band requirements***
2. ***Making following changes to intra-band CA requirements***
* ***Adding PC2 references in A-MPR NS\_04 requirements***
* ***Aligning the title for CA with UL-MIMO requirements***
* ***In 6.4H.1.2, adding description of only RB allocation on PCC***
* ***In 6.4H.1.2.1, EVM is measured per layer.***

***Moderator’s recommendation:***

* Recommended WF
	+ Check if the proposed changes in the CR is agreeable in 1st round discussion

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| **Company** | **Comments** |
| Nokia | We can see Table 6.2A.2.4-2, but it seems it doesn’t actually exist in the spec. Can we address this as well in this CR? |
| Huawei | Thanks Nokia for the comment. This is a mistake introduced since Rel-16. A Rel-16 maintenance CR R4-2213362 in this meeting aims to fix this problem. |
|  |  |

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | Company A |
| Company B |
|  |
|  | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| **Sub-topic#2-1** | ***Correction CR to RF requirements of NR\_RF\_FR1\_enh****Tentative agreements:**After further clarification, the correction CR is agreeable.* *Candidate options:**Recommendations for 2nd round:**No further discussion in 2nd round.*  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2213364](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213364.zip)** | Huawei | R4-2213364 is revised to merge R4-2212567. The draft is available at below link address.https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/TSGR4\_104-e/Inbox/Drafts/%5B104-e%5D%5B105%5D%20NR\_RF\_FR1\_enh\_maintenance/Round2/revise\_R4-2213364%20NR\_RF\_FR1\_enh\_38101-1\_intra-band%20CA.docx |

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

1. Recommendations for Tdocs
	1. 1st round

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
|  | WF on … | YYY |  |
|  | LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
| R4-22xxxxx | Reply LS to RAN2 on clarification of dualPA-Architecture capability | Samsung |  |

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| [**R4-2211980**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211980.zip) |  | Clarification of dualPA-Architecture capability | Nokia, Nokia Shanghai Bell | Noted |  |
| [**R4-2212016**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212016.zip) | R4-22xxxxx | Reply LS to RAN2 on clarification of dualPA-Architecture capability | Samsung | Revised |  |
| [**R4-2212735**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212735.zip) |  | DRAFT LS reply on clarification of dualPA-Architecture capability | ZTE Corporation | Noted |  |
| [**R4-2212794**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212794.zip) |  | Discussion and reply LS on dualPA-Architecture capability clarification | vivo | Noted |  |
| [**R4-2213194**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213194.zip) |  | Reply to LS R2-2206428 on dualPA-Architecture capability | Skyworks Solutions Inc. | Noted |  |
| [**R4-2213315**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213315.zip) |  | R17 Reply LS on dualPA-architecture capability change | OPPO | Noted |  |
| [**R4-2213739**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213739.zip) |  | Discussion on the LS reply on the clarification of dualPA-Architecture capability | Huawei, HiSilicon | Noted |  |
| [**R4-2214042**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214042.zip) |  | Discussion on reply on dual PA LS | Qualcomm Incorporated | Noted |  |
| [**R4-2213364**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213364.zip) | R4-22xxxxx | Correction to RF requirements of NR\_RF\_FR1\_enh | Huawei, HiSilicon | Revised | *merge the content of overlapping CR* *R4-2212567 in thread [103]* |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents
	1. 2nd round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-22xxxxx |  | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-22xxxxx |  | LS on … | ZZZ | Agreeable, Revised, Noted |  |
| R4-2214924 |  | Reply LS to RAN2 on clarification of dualPA-Architecture capability | Samsung | Agreeable | revised from [R4-2212016](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212016.zip) |
| R4-2215116 |  | Correction to RF requirements of NR\_RF\_FR1\_enh | Huawei, HiSilicon | Agreeable | Revised from R4-2213364 and merge content in R4-2212567 |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents