

RAN4

3GPP TSG-RAN WG4 Meeting #99-e

Electronic meeting, May 19-27, 2021

R4-211zzzz

Agenda Item: 8.2.2, 8.2.3

Source: Moderator (Nokia)

Document for: Information

1 Topic#1: BS Core requirements

BS Core requirements are discussed under Topic#1.

1.1 Companies' contributions summary

Table 1: Companies' contributions summary

T-doc number	Company	Proposals / Observations
R4-2110089	Ericsson	CR to 38.104: Introduction of n262

1.2 Companies view's collection for 1st round

1.2.1 CR comments collection

Feedback Form 1: Comments to R4-2110089

--

1.3 Summary for 1st round

1.3.1 CR

Table 2: CR/TP summary

CR number	CR status update recommendation
R4-2110089	Revised (CR cover sheet issue)

2 Topic#2: BS conformance testing

BS conformance requirements are discussed under Topic#2.

2.1 Companies' contributions summary

Table 3: Companies' contributions summary

T-doc number	Company	Proposals / Observations
R4-2110088	Ericsson, Nokia, T-Mobile USA, DISH Network	Rx measurement uncertainties
R4-2110480	Keysight Technologies UK Ltd, Rohde & Schwarz	Rx measurement uncertainties and test tolerances
R4-2111218	Nokia, Nokia Shanghai Bell	TP to TR 38.847 on Rx uncertainties
R4-2111465	Huawei	Draft CR to 38.141-2: Introduction of n262
R4-2111463	Huawei	Consideration of TR 37.941 and correction of the MU contributors for the FR2 TE

2.2 Open issues summary

Table 4: Summary of Rx MU

Rx test	38.141-2 24.25-29.5 GHz [dB]	38.141-2 37-40 GHz [dB]	Ericsson, Nokia, T-Mobile USA, DISH Network R4-2110088 [dB]	Keysight, Ro- hde&Schwarz R4-2110480 [dB]
Reference sensitivity	2.4	2.4	[2.5]	3.6
ACS	3.4	3.4	[3.5]	5.1
IBB	3.4	3.4	[3.5]	5.1
OOBB	4.1	4.1	[4.2]	5.6
Rx IM	3.9	3.9	[4.0]	5.5
In-channel selectivity	3.4	3.4	[3.5]	5.1

2.3 Companies views' collection for 1st round

2.3.1 Rx MU

Indicate company preference on Rx MU proposals:

Option 1: R4-2110088 (Ericsson, Nokia, T-Mobile USA, DISH Network)

Option 2: R4-2110480 (Keysight, Rohde&Schwarz)

Option 3: other proposal

Feedback Form 2: Company preference on Rx MU proposals

1 – Nokia Germany

Option 1, we are fine to keep [] until August meeting for final confirmation to complete Performance part by September 2021

2 – Keysight Technologies UK Ltd

Keysight:

Option 2

MU budget calculation in TR37.941 assumes calibration process described in the same TR document, which is true.

What we are raising as difficulty for n262, 47.2-48.1GHz frequency range, there is currently no vector signal generator in this frequency range, but also uncertainty increases in this range of frequency of signal generation.

I'd like to emphasize the point we captured in our contribution, even CW signal generator (which available today in market), uncertainty starts to noticeably increase starting from around 45GHz and continuously increases towards over 50GHz. And, for modulated signal, we also need to add uncertainty contributed by flatness over modulation bandwidth etc. which also increases towards higher frequency ranges.

As current MU budget table uses TE uncertainty as well as other OTA terms including calibration related terms, and which is based on assumption with good calibration, with increase of TE term itself, new proposed values are calculated. And, for TE term value, TE vender input should be taken.

Again, these are very real estimate.

3 – Keysight Technologies UK Ltd

Keysight:

One thing to note,

I found FR2 Rx OOB MU calculation math (defined in TR37.941) has error and proposed correction CR for 38.141-2 in 302 discussion thread (BS conformance). Once it's agreed, we can reduce Rx OOB MU value which has largest total system MU value. We should wait to see 1st round of 302.

(discussion paper for describing math error is R4-2111504, CRs are R4-2111505 for R15, also Cat A as well)

4 – Ericsson Limited

Option 1

Even at 47GHz, using a mixer, we still think we could better MU values than option 2, very close to those for 43GHz.

Not sure how we could progress on this if the option of keeping values in [] is even not acceptable.

5 – T-Mobile USA Inc.

Option 1

6 – ROHDE & SCHWARZ

Option 2 (R4-2110480). At this time with utilization of mixer impossible to achieve better MU values in 48GHz range.

7 – Huawei Technologies Sweden AB

1. Lets wait for clarification of the FR2 Rx OOB MU and the resulting reduction of the MU - there was error in the TR37.941 calculations, indeed.

2. If the above does not allow to reach consensus, we may need to investigate other options, e.g. A: extension of the WI, B: clarification on the timeline of 47GHz signal generator availability on market, C: more detailed descriptions and analyses on the calibration procedures (which were seen as solution to the problem).

We understand companies preferring to have lower MU but TE vendors feedback shall be respected. We should also bear in mind that there is 52-71GHz work ongoing, where the MU issue is expected to be even larger.

8 – Keysight Technologies UK Ltd

One additional comment on our 2nd comment which is about FR2 Rx OOB correction. for this 47GHz discussion, in our tdoc (R4-2110480) which follows current math and proposing 5.6. With correction, this number becomes 4.6 as proposal value.

So far (regarding with FR2 Rx OOB MU correction), one supporting comment and one suggestion to see if other Rx test has similar issue.

9 – Keysight Technologies UK Ltd

For comment from Huawei, we also agree that we also need to seek some reasonable resolution.

One idea I found during reviewing math defined in TR37.941 is, wanted signal TE (modulated signal) MU term is, the same value, also used for modulated interferer signal. if my understanding is correct, current FR2 test has max 50MHz mod BW (as max) on all modulated interferer. which could possibly reduce a bit on TE MU term for modulated interferer signal. (additional contribution by modulation is different by modulation BW, wider is larger) This could further reduce total system MU.

We are happy to further investigate such possibility.

2.3.2 Other document comments collection

Feedback Form 3: Comments to R4-2111218

1 – Keysight Technologies UK Ltd

This needs to wait for Rx MU value discussion come to conclusion.

Feedback Form 4: Comments to R4-2111465

1 – Nokia Germany

Proposed changes are not related to this Work Item, it is proposed to provide such CR under maintenance agenda

2 – Huawei Technologies Sweden AB

This CR to 38.141-2 is an updated version based on the Endorsed CR from previous meeting. There are additional corrections to the frequency range in MU tables. There is no need to go to Maintenance agenda as the 47GHz WI is ongoing.

Rapporteur of TS 38.141-2 asks to incorporate those additional corrections in the final version of the CR, once RX MU is finalized. This Draft CR is proposed to be Endorsed.

3 – Huawei Technologies Sweden AB

After double-checking the Draft CR again, we would be also fine to take out all the corrections not related to the 47GHz text (and cover them separately as TS38.141-2 maintenance). Still, There are some corrections to the 47GHz text in this Draft CR.

Feedback Form 5: Comments to R4-2111463

1 – Nokia Germany

Proposal 1 can be considered, proposal 2 is not related to this WI

2 – Keysight Technologies UK Ltd

For Proposal 2, we are fine with TE value table for freq range to extend for 43.5G in TR37.941, but it's also true that Nokia's comment? this is not related with this WI.

3 – Huawei Technologies Sweden AB

The above is ok. Proposal 2 was proposed here as OTA BS testing WI was not included in the agenda for this meeting. We can come back to Proposal 2 next meeting in other agenda item for TR37.941.

2.4 Summary for 1st round

2.4.1 Rx MU

There is still no consensus on proposed numbers for Rx MU. Four companies support numbers proposed in R4-2110088, two companies support numbers proposed in R4-2110480. It is proposed to discuss further how to progress this work in the second round.

2.4.2 Other documents

Table 5: Document summary

Document number	Document status update recommendation
R4-2111218	Return to
R4-2111465	Noted
R4-2111463	Noted, proposal 1 can be considered in the WF

2.5 Companies views' collection for 2nd round

Feedback Form 6: Comments to WF on Rx MU for n262

<p>1 – Keysight Technologies UK Ltd</p> <p>With no agreement made to proceed with proposed value by R4-2110088, we need to disagree with proposed value in draft WF even with making it tentative by placing [].</p> <p>Please understand that we all are seeking possible reduction of larger MU value however, at the same time, we need to be realistic and come up feasible solution. We have serious concern that there is no actual measurement system solution to meet proposed value by R4-2110088.</p> <p>For WF this time, I don't believe we can have numbers in WF document based on current discussion.</p> <p>We provided feedback comment in 1st round to propose, further review on currently defined mathematics and MU budget in TR37.941 against actual test condition of FR2 Rx test to seek for realistic MU value for possible further value reduction.</p> <p>Also to mention, TE vender's input shall be taken for Test Equipment MU terms.</p> <p>Version of WF uploaded as draft2.</p>
<p>2 – Nokia Germany</p> <p>TE vendor's input was taken into account in proposed values where numbers were increased by 0.1dB (similar to Tx). Unfortunately, the proposal to increase MU up to 1.7dB (comparing to 43.5 GHz) is not acceptable.</p>
<p>3 – Ericsson Limited</p> <p>We share the same view than Nokia.</p> <p>Such MU values would make the requirements meaningless, RAN4 would not be credible anymore defining any MU.</p> <p>We are still convinced MU proposals from TE vendors could be highly improved and appreciate their proposal on reconsidering current math approach.</p>

2.6 Summary for 2nd round

No agreement on Rx MU values, final numbers to be agreed in RAN4#100-e.

3 Recommendations for Tdocs

3.1 1st round

Existing documents:

Table 6: 1st round Tdoc recommendation

Tdoc number	Source	Recommendation
R4-2110089	Ericsson	Revised
R4-2110088	Ericsson, Nokia, T-Mobile USA, DISH Network	Noted
R4-2110480	Keysight Technologies UK Ltd, Rohde & Schwarz	Noted
R4-2111218	Nokia, Nokia Shanghai Bell	Return to
R4-2111465	Huawei	Noted
R4-2111463	Huawei	Noted

New Tdocs:

Table 7: New Tdocs

	Title	Source
#1	WF on Rx MU for n262	Nokia, Nokia Shanghai Bell

3.2 2nd round

Table 8: 2nd round Tdoc recommendation

Tdoc number	Source	Recommendation
R4-2111218	Nokia, Nokia Shanghai Bell	Noted
R4-2108608	Nokia, Nokia Shanghai Bell	Agreed
R4-2108741	Ericsson	Agreed