**3GPP TSG-RAN WG4 Meeting # 110 R4-2401085**

Greece, Athens, February 26 – March 1, 2024

**Agenda item:** 8.13.9

**Source:** Moderator (Huawei)

**Title:** Topic summary for [109][133] NR\_ATG\_UERF\_part2

**Document for:** Information

# Introduction

This agenda item will handle all contributions related to NR ATG UE RF requirements with the following sub-topics.

1. ATG UE RF requirements

The other TPs and draft CRs will be treated online. It’s encouraged for companies to prepare the comments and send them offline to contact experts as soon as possible.

# Topic #1: ATG UE RF requirements

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2400146**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2400146.zip) | CAICT | CR for 38.101-1 UL power in 7.5J Adjacent channel selectivity for ATG FR1 R18 |
| [**R4-2400230**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2400230.zip) | China Mobile International Ltd | CR for 38101-1 to update ATG related signaling name |
| [**R4-2400826**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2400826.zip) | CMCC | (NR\_ATG-Core) Discussion on 1024QAM for ATG UE Rx  **Observation 1: Based on the link budget calculation results, 30 dB SNR could be achieved and 1024QAM for ATG UE Rx could be supported.**  **Proposal 1: 1024QAM should be set as an optional feature that is supported by the specifications under the vendor declaration for ATG UE Rx.**  **Proposal 2: Max input level for ATG 1024 QAM is specified in Table 7.4J-1.**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Rx Parameter | Units | ATG UE Types | | Reference measurement channel | | Omni-directional antenna: receiver characteristics specified at the antenna connector(s) | Antenna array: receiver characteristics specified at transceiver array boundary (TAB) connectors | | Power in Transmission Bandwidth Configuration | dBm | -42 | -30 | A.3.2.3 or A.3.3.3 for 64 QAM | |  |  | -44 | -32 | A.3.2.4 or A.3.3.4 for 256 QAM | |  |  | -46 | -34 | A.3.2.5 or A.3.3.5 for 1024 QAM | | The applicable channel bandwidths | MHz | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 | | | | NOTE 1: The transmitter shall be set to 4 dB below PCMAX\_L,f,c at the minimum uplink configuration specified in Table 7.3.2-3 with PCMAX\_L,f,c as defined in clause 6.2J.2. | | | | |   **Proposal 3: The tolerance for applicable values of ATG PCMAX,f,c could be specified in Table 6.2J.2-1.**  Table 6.2J.2-1: PCMAX tolerance   |  |  | | --- | --- | | PCMAX,f,c (dBm) | Tolerance T(PCMAX,f,c) (dB) | | 23 < PCMAX,c ≤ 40 | 2.0 | | 21 ≤ PCMAX,c ≤ 23 | 2.0 | | 20 ≤ PCMAX,c < 21 | 2.5 | | 19 ≤ PCMAX,c < 20 | 3.5 | | 18 ≤ PCMAX,c < 19 | 4.0 | | 13 ≤ PCMAX,c < 18 | 5.0 | | 8 ≤ PCMAX,c < 13 | 6.0 | | -40 ≤ PCMAX,c < 8 | 7.0 | |
| [**R4-2401590**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2401590.zip) | Ericsson | Draft CR Correction of 38.101-1 to FRC reference channel for ATG UE maximum input level |
| [**R4-2401591**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2401591.zip) | Ericsson | Discussion on ATG UE RF 1024 QAM  **Proposal 1 DL 1024 QAM should be supported for ATG UE as optional.**  **Proposal 2 Add correction to the FRC reference channel measurement in the maximum input level table.** |
| [**R4-2401876**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2401876.zip) | CMCC | (NR\_ATG-Core) CR for TR 38.876 to update frequency error, configured transmitted power, SEM and transmit intermodulation |
| [**R4-2402055**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402055.zip) | Huawei, HiSilicon | CR for TR 38.876 to maintain the Tx RF requirements for ATG UE |
| [**R4-2402056**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402056.zip) | Huawei, HiSilicon | CR for TS 38.101-1 to maintain ATG UE RF requirements |
| [**R4-2402057**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402057.zip) | Huawei, HiSilicon | Discussion on ATG UE supporting 1024QAM  **Proposal 1: the following two options are listed to address this 1024QAM issue for ATG UE.**  **Option 1: 1024QAM can be supported by ATG UE optionally since Rel-18.**  **Option 2: 1024QAM is not supported by ATG UE in Rel-18, but whether to support 1024QAM for ATG UE can be discussed in future release.** |
| [**R4-2402509**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402509.zip) | ZTE Corporation | (NR\_ATG-Core)Maintenance CR for TS 38.101-1: ATG UE RF requirements |
| [**R4-2402510**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402510.zip) | ZTE Corporation | Discussion on the applicability of 1024QAM for ATG UE  **Proposal 1:** propose not to consider the maximum input power and other related demod requirement of 1024QAM for ATG UE. |
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## Open issues summary

*Before f2f meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1 Remaining issues

*Sub-topic description:*

*Open issues and candidate options before f2f meeting:*

**Issue 1-1-1: Discussion on whether to introduce DL 1024QAM for ATG UE**

* **Proposal:** 
  + Option 1: DL 1024QAM can be supported by ATG UE optionally since Rel-18.
    - Option 1a: The maximum input level for 1024QAM is same as 256QAM (-44dBm for Omni-directional, -32dBm for antenna array)
    - Option 1b: The maximum input level for 1024QAM is lower than 256QAM (-46dBm for Omni-directional, -34dBm for antenna array)
  + Option 2: DL 1024QAM is not supported by ATG UE in Rel-18, but whether to support DL 1024QAM for ATG UE can be discussed in future release.
  + Option 3: not to consider the maximum input power and other related demod requirement of 1024QAM for ATG UE.
* Recommended WF
  + TBA

**Issue 1-1-2: Discussion on the applicable tolerance requirements for ATG PCMAX,f,c**

* **Proposal:** 
  + Option 1: The tolerance for applicable values of ATG PCMAX,f,c could be specified in Table 6.2J.2-1.
* Table 6.2J.2-1: PCMAX tolerance

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| --- | --- |
| PCMAX,f,c (dBm) | Tolerance T(PCMAX,f,c) (dB) |
| 23 < PCMAX,c ≤ 40 | 2.0 |
| 21 ≤ PCMAX,c ≤ 23 | 2.0 |
| 20 ≤ PCMAX,c < 21 | 2.5 |
| 19 ≤ PCMAX,c < 20 | 3.5 |
| 18 ≤ PCMAX,c < 19 | 4.0 |
| 13 ≤ PCMAX,c < 18 | 5.0 |
| 8 ≤ PCMAX,c < 13 | 6.0 |
| -40 ≤ PCMAX,c < 8 | 7.0 |

* Recommended WF
  + TBA

### Sub-topic 1-2 CRs and TPs

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| **CR number** | **Comments collection** |
| [**R4-2400146**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2400146.zip) | CR for 38.101-1 UL power in 7.5J Adjacent channel selectivity for ATG FR1 R18 (CAICT) |
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| [**R4-2400230**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2400230.zip) | CR for 38101-1 to update ATG related signaling name (CMCC) |
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| [**R4-2401590**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2401590.zip) | Draft CR Correction of 38.101-1 to FRC reference channel for ATG UE maximum input level (Ericsson) |
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| [**R4-2401876**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2401876.zip) | (NR\_ATG-Core) CR for TR 38.876 to update frequency error, configured transmitted power, SEM and transmit intermodulation (CMCC) |
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| [**R4-2402055**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402055.zip) | CR for TR 38.876 to maintain the Tx RF requirements for ATG UE (Huawei, HiSilicon) |
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| [**R4-2402056**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402056.zip) | CR for TS 38.101-1 to maintain ATG UE RF requirements(Huawei, HiSilicon) |
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| [**R4-2402509**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2402509.zip) | (NR\_ATG-Core) Maintenance CR for TS 38.101-1: ATG UE RF requirements (ZTE) |
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