3GPP TSG-RAN WG4 Meeting # 100-e R4-2115642

Electronic Meeting, 16– 27 August, 2021

**Source:** Huawei, HiSilicon

**Title:** WF on NTN UE RF requirement

**Agenda Item:** 9.13.4

**Document for:** Approval

# Background

In RAN4#100e, companies provides some contributions [1][2][3][4] to trigger the initial discussion for NTN UE requirements. Transmitter and receiver requirements for handheld NTN UE were discussed in the 1st round discussion generally. In this paper, we’d like to summary the outcomes after the discussions.

# Way forward for Tx requirements

1. **UE maximum output power**

UE power class can be defined as below.

|  |  |  |
| --- | --- | --- |
| NR band | Class 3 (dBm) | Tolerance (dB) |
| nX | 23 | ±2 |

1. **UE maximum output power reduction**

MPR, A-MPR requirements should be further evaluated after ACLR/SEM is defined.

1. **Configured transmitted power**

The configured transmitted power requirement in 38.101 is used as the starting point for NTN UE

1. **Minimum output power & transmit OFF power**

Option 1: The requirement in 38.101-1 is reused for NTN FR1.

Option 2: the minimum output power is determined by system level simulation.

1. **Transmit ON/OFF time mask**

The requirement frame work can be reused. Further check whether some adaption is needed.

1. **Transmit modulation quality**

The current requirement is reused for NTN UE for the same modulation scheme.

- FFS whether UL 64QAM and 256QAM should be excluded.

1. **Output RF spectrum emissions**

- Wait co-existence simulation results to determine SEM/ACLR

- Further check if NTN UE would be a satellite device or not and the compliance, e.g. DRC 74-01.

1. **Tx intermodulation**

FFS whether this requirement is needed considering the NTN UE operating scenario.

# Way forward for Rx requirements

1. **Reference sensitivity**

Option 1: FFS on which band requirement to be reused, the FRC, SNR etc

Option 2: Sensitivity = -174dBm(kT) + 10\*log(RX BW) + NF + SNR +IM – diversity gain can be reused to specify the REFSENS

1. **Maximum input level**

Further evaluation is needed considering minimum CL between satellite and UE.

1. **ACS**

Wait for the co-existence study.

1. **Out-of band blocking**

Current requirement can be reused.

1. **Spurious response**

Current requirement can be reused.

1. **Intermodulation characteristics**

FFS

1. **Rx spurious emissions**

- Use the 38.101-1 requirement as the starting point.

- Further check whether NTN UE would be a satellite device and the compliance, e.g. DRC 74-01.

# References

[1] R4-2113297 Discussion on UE RF requirements for NR to support non-terrestrial networks, Xiaomi

[2] R4-2111933 Discussion on UE Tx RF requirements for NTN, CATT

[3] R4-2113429 General discussion on NTN UE RF requirements, Huawei, HiSilicon

[4] R4-2111934 Discussion on UE Rx RF requirements for NTN, CATT