**3GPP TSG-WG RAN4 Meeting #97-e *R4-2016884***

**Electronic meeting, 2nd – 13th November, 2020**

**Source:** Nokia, Nokia Shanghai Bell

**Title:** TP to TR 38.847: BS RF requirements

**Agenda Item:** 10.28.2

**Document for:** Approval

# Introduction

During RAN4#96-e, document [1] with the following proposal was approved:

**Proposal 1: Introduce the following step frequencies for defining the radiated Tx/Rx spurious emission limits for n262:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operating band | Fstep,1 (GHz) | Fstep,2 (GHz) | Fstep,3 (GHz) | Fstep,4 (GHz) | Fstep,5 (GHz) | Fstep,6 (GHz) |
| n257 | 18 | 23.5 | 25 | 31 | 32.5 | 41.5 |
| n258 | 18 | 21 | 22.75 | 29 | 30.75 | 40.5 |
| n259 | 23.5 | 35.5 | 38 | 45 | 47.5 | 59.5 |
| n260 | 25 | 34 | 35.5 | 41.5 | 43 | 52 |
| n261 | 18 | 25.5 | 26.0 | 29.85 | 30.35 | 38.35 |
| n262 | 37.2 | 45.2 | 45.7 | 49.7 | 50.2 | 58.2 |

This document provided text proposal to TR 38.847 on n262 BS requirements.

# Text proposal

8.2.4 BS conformance aspects

On top of generic FR2 BS test requirements, the following 38.141-2 transmitter test requirements changes are expected due to introduction of n262:

1. Update test requirements for radiated transmit power/TRP measurement results range/measured mean EIRP spectral density

|  |  |  |
| --- | --- | --- |
|  | Normal test environment | Extreme test environment |
| *BS type 1-H* | f ≤ 3 GHz: ± 3.3 dB | N/A |
| 3 GHz < f ≤ 6 GHz: ± 3.5 dB |
| *BS type 1-O* | f  ≤ 3 GHz: ± 3.3 dB | f  ≤ 3 GHz: ± 5.2 dB |
| 3 GHz < f ≤ 6 GHz: ± 3.5 dB | 3 GHz < f ≤ 4.2 GHz: ± 5.3 dB |
| 4.2 GHz < f ≤ 6 GHz: ± 5.3 dB |
| *BS type 2-O* | 24.15 GHz < f ≤ 29.5 GHz: ± 5.1 dB  37 GHz < f ≤ [48.2] GHz: ± 5.4 dB  … | 24.15 GHz < f ≤ 29.5 GHz: ± 7.6 dB   1. GHz < f ≤ [48.2] GHz: ± 7.8 dB |

- within +5.4 dB and –5.4 dB of the manufacturer's declared *rated carrier TRP* Prated,c,TRP for carrier frequency 37 GHz < f ≤ [48.2] GHz.

The measured mean EIRP spectral density according to subclause 6.5.2.4.2 shall be less than -32.7 + Prated,c,EIRP- Prated,c,TRP dBm/MHz for carrier frequency 37 GHz < f ≤ [48.2] GHz, where Prated,c,EIRP is the value declared for the *reference beam direction pair* (D.8) for the beam identifier (D.3) which provides the highest intended EIRP.

1. Define maximum OTA test system uncertainty for FR2 OTA transmitter tests to be applicable up to 48.2GHz

|  |  |
| --- | --- |
| Subclause | Maximum OTA Test System uncertainty |
| 6.2 Radiated transmit power | Normal condition:  ±1.7 dB (24.25 – 29.5 GHz)  ±2.0 dB (37 – 43.5 GHz)  ±2.2 dB (43.5 – 48.2 GHz) |
|  | Extreme condition:  ±3.1 dB (24.25 – 29.5 GHz)  ±3.3 dB (37 – 43.5 GHz)  ±3.5 dB (43.5 – 48.2 GHz) |
| 6.3 OTA base station output power | ±2.1 dB (24.25 – 29.5 GHz)  ±2.4 dB (37 – 43.5 GHz)  ±2.6 dB (43.5 – 48.2 GHz) |
| 6.4.2 OTA RE power control dynamic range | N/A |
| 6.4.3 OTA total power dynamic range | ±0.4 dB |
| 6.5.1 OTA transmitter OFF power | ±2.9 dB (24.25 – 29.5 GHz)  ±3.3 dB (37 – 43.5 GHz)  ±[3.5-3.6] dB (43.5 – 48.2 GHz) |
| 6.5.2 OTA transmitter transient period | N/A |
| 6.6.2 OTA frequency error | ±12 Hz |
| 6.6.3 OTA modulation quality | 1% |
| 6.6.4 OTA time alignment error | ±25 ns |
| 6.7.2 OTA occupied bandwidth | 600 kHz |
| 6.7.3 OTA ACLR | Relative ACLR:  ±2.3 dB (24.25 – 29.5 GHz)  ±2.6 dB (37 – 43.5 GHz)  ±2.8 dB (43.5 – 48.2 GHz)  Absolute ACLR:  ±2.7 dB (24.25 – 29.5 GHz)  ±2.7 dB (37 – 43.5 GHz)  ±[2.7-2.9] dB (43.5 – 48.2 GHz) |
| 6.7.4 OTA operating band unwanted emissions | ±2.7 dB (24.25 – 29.5 GHz)  ±2.7 dB (37 – 43.5 GHz)  ±[2.7-2.9] dB (43.5 – 48.2 GHz) |
| 6.7.5.2 OTA transmitter spurious emissions, mandatory requirements | ±2.3 dB, 30 MHz ≤ f ≤ 6 GHz  ±2.7 dB, 6 GHz < f ≤ 40 GHz  ±5.0 dB, 40 GHz < f ≤ 60 GHz |
| 6.7.5.4 OTA transmitter spurious emissions, additional requirements | ±2.3 dB, 30 MHz ≤ f ≤ 6 GHz  ±2.7 dB, 6 GHz < f ≤ 40 GHz  ±5.0 dB, 40 GHz < f ≤ 60 GHz |
| NOTE: Test system uncertainty values are applicable for normal condition unless otherwise stated. | |

On top of generic FR2 BS test requirements, the following 38.141-2 receiver test requirements changes are expected due to introduction of n262:

1. Introduction of step frequencies for defining the radiated Rx spurious emission limits for n262

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operating band | Fstep,1 (GHz) | Fstep,2 (GHz) | Fstep,3 (GHz) | Fstep,4 (GHz) | Fstep,5 (GHz) | Fstep,6 (GHz) |
| n257 | 18 | 23.5 | 25 | 31 | 32.5 | 41.5 |
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| n260 | 25 | 34 | 35.5 | 41.5 | 43 | 52 |
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| n262 | 37.2 | 45.2 | 45.7 | 49.7 | 50.2 | 58.2 |

1. Define maximum OTA test system uncertainty for FR2 OTA receiver tests to be applicable up to 48.2GHz

|  |  |
| --- | --- |
| Subclause | Maximum OTA Test System uncertainty |
| 7.3 OTA reference sensitivity level | ±2.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±2.4 dB, 37 GHz < f ≤ [48.2] GHz |
| 7.5.1 OTA adjacent channel selectivity | ±3.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.4 dB, 37 GHz < f ≤ [48.2] GHz |
| 7.5.2 In-band blocking (General) | ±3.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.4 dB, 37 GHz < f ≤ [48.2] GHz |
| 7.6 OTA out-of-band blocking | ±4.1 dB |
| 7.7 OTA receiver spurious emissions | ±2.5 dB, 30 MHz ≤ f ≤ 6 GHz  ±2.7 dB, 6 GHz < f ≤ 40 GHz  ±5.0 dB, 40 GHz < f ≤ 60 GHz |
| 7.8 OTA receiver intermodulation | ±3.9 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.9 dB, 37 GHz < f ≤ [48.2] GHz |
| 7.9 OTA in-channel selectivity | ±3.4 dB, 24.25 GHz < f ≤ 29.5 GHz  ±3.4 dB, 37 GHz < f ≤ [48.2] GHz |
| NOTE: Test system uncertainty values are applicable for normal condition unless otherwise stated. | |

# Conclusion

This contribution provides the text proposal on summary of expected changes to 38.104 and 38.141-2. It is proposed to agree on this text proposal.

# Reference

[1] R4-2011412 BS RF requirements for 47 GHz band, Nokia, RAN4#96e