**3GPP TSG RAN WG5 Meeting #93-e draft\_R5-217762**

**Electronic Meeting, November 8 – 19, 2021**

**3GPP TSG RAN Meeting #94-e RP-21xxxx**

**Electronic Meeting, December 6 - 17, 2021**

**Source: CMCC**

**Title: New WID - UE Conformance Test Aspects - LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39**

**Document for: Endorsement**

**Agenda Item: 7.4.1**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: UE Conformance - LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39

## Acronym: DSS\_LTE\_B34\_NR\_Bn34\_LTE\_B39\_NR\_Bn39-UEConTest

## Unique identifier:

|  |  |
| --- | --- |
| **This WID includes a Testing part** | **X** |
| **and it addresses the following 3GPP work area:** | **Radio Access** | **X** |
| **Core Network** |  |
| **Services** |  |

Potential target Release: Rel-17.

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  |  |  |  |  |
| **No** | X | X | X | X | X |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a

|  |  |
| --- | --- |
|  | Feature |
| X | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| [DSS\_LTE\_B34\_NR\_Bn34\_LTE\_B39\_NR\_Bn39](https://www.3gpp.org/DynaReport/WiSpec--920072.htm%22%20%5Ct%20%22https%3A//www.3gpp.org/DynaReport/_blank) | RAN4 | [92](https://www.3gpp.org/DynaReport/GanttChart-Level-2.htm%22%20%5Cl%20%22bm911012%22%20%5Ct%20%22_blank)0072 | [LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39](https://www.3gpp.org/DynaReport/WiCr--920072.htm%22%20%5Ct%20%22https%3A//www.3gpp.org/DynaReport/_blank) |
| [DSS\_LTE\_B34\_NR\_Bn34\_LTE\_B39\_NR\_Bn39-Core](https://www.3gpp.org/DynaReport/WiSpec--920172.htm%22%20%5Ct%20%22https%3A//www.3gpp.org/DynaReport/_blank) | RAN4 | [92](https://www.3gpp.org/DynaReport/GanttChart-Level-2.htm%22%20%5Cl%20%22bm911012%22%20%5Ct%20%22_blank)0172 | [Core part:](https://www.3gpp.org/DynaReport/WiCr--911112.htm%22%20%5Ct%20%22_blank) [LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39](https://www.3gpp.org/DynaReport/WiCr--920172.htm%22%20%5Ct%20%22https%3A//www.3gpp.org/DynaReport/_blank) |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
|  |  |  |
|  |  |  |
|  |  |  |

## 3 Justification

2010- 2025 MHz was widely deployed as TD-SCDMA in China before, and started to refarm to LTE Band 34 in recent years. LTE Band 39 (1880-1920 MHz) is a widely deployed TDD band in China. There are also 5G NR band n34 and band n39, which has been specified in Rel-15. Enabling co-existence of existing LTE deployment along with a NR addition in same band is essential to allow operators to refarm the existing LTE band 34 and n39, and improve the spectrum efficiency.

#### 3.1 DSS requirements for n34 and n39 NR band

For resource block level spectrum sharing, frequency alignment between LTE and NR is necessary to avoid inter-subcarrier interference. Following three features are needed for band 34 and 39 spectrum sharing.

1. 100 kHz channel raster support

As shown in the following table, 100 kHz channel raster is supported for n34 and n39 in Rel-15.

Referred from TS38.101-1 Table 5.4.2.3-1: Applicable NR-ARFCN per operating band

|  |  |  |  |
| --- | --- | --- | --- |
| NR Operating Band | ΔFRaster (kHz)  | UplinkRange of NREF(First – <Step size> – Last) | DownlinkRange of NREF(First – <Step size> – Last) |
| ~ omitted ~ |
| n34 | 100 | 402000 – <20> – 405000 | 402000 – <20> – 405000 |
| n39 | 100 | 376000 – <20> – 384000 | 376000 – <20> – 384000 |
| ~ omitted ~ |

The NR band n34 and n39 already complies to this requirement.

1. 30 KHz SS block SCS support

In RAN4 #96-e meeting, RAN4 already agreed to add 30KHz SSB pattern case C in addition to 15KHz SSB for n34 and n39 from Rel-15 (R4-2011682).

Referred from TS38.101-1 Table 5.4.3.3-1: Applicable SS raster entries per operating band

|  |  |  |  |
| --- | --- | --- | --- |
| NR Operating Band | SS Block SCS | SS Block pattern 1 | Range of GSCN(First – <Step size> – Last) |
| ~ omitted ~ |
| n34 | 15 kHz | Case A | NOTE 5 |
| 30 kHz | Case C | 5036 – <1> – 5050 |
| n39 | 15 kHz | Case A | NOTE 6 |
| 30 kHz | Case C | 4712 – <1> – 4789 |
| ~ omitted ~ |
| NOTE 1: SS Block pattern is defined in clause 4.1 in TS 38.213 [8].NOTE 2: The applicable SS raster entries are GSCN = {6432, 6443, 6457, 6468, 6479, 6493, 6507, 6518, 6532, 6543}.NOTE 3: The following GSCN are allowed for operation in band n46: GSCN = {8996, 9010, 9024, 9038, 9051, 9065, 9079, 9093, 9107, 9121, 9218, 9232, 9246, 9260, 9274, 9288, 9301, 9315, 9329, 9343, 9357, 9371, 9385, 9402, 9416, 9430, 9444, 9458, 9472, 9485, 9499, 9513}.NOTE 4: The following GSCN are allowed for operation in band n96: GSCN = {9548, 9562, 9576, 9590, 9603, 9617,9631, 9645, 9659, 9673, 9687, 9701, 9714, 9728, 9742, 9756, 9770, 9784, 9798, 9812, 9826, 9840, 9853, 9867, 9881, 9895, 9909, 9923, 9937, 9951, 9964, 9978, 9992, 10006, 10020, 10034, 10048, 10062, 10076, 10090, 10103, 10117, 10131, 10145, 10159, 10173, 10187, 10201, 10214, 10228, 10242, 10256, 10270, 10284, 10298, 10312, 10325, 10339, 10353{.NOTE 5: The applicable SS raster entries are GSCN = {5032, 5043, 5054}NOTE 6: The applicable SS raster entries are GSCN = {4707, 4715, 4718, 4729, 4732, 4743, 4747, 4754, 4761, 4768, 4772, 4782, 4786, 4793} |

The NR band n34 and n39 already complies to this requirement.

1. UL 7.5kHz frequency shift for 15KHz data SCS

In section 5.4.2.1 of TS38.101-1 inclusion of band n34 and n39 for the list of bands supporting UL 7.5 kHz shift is required for 15 kHz SCS. DSS with 15 kHz SCS gives better spectral efficiency using RE level rate matching than RB level rate matching.

Given above justifications, spectrum sharing for b34/n34 and b39/n39 would be necessary and the following requirements should be supported for n34 and n39 from Rel-15.

1. UL 7.5 kHz frequency shift for 15 KHz SCS operation.

The completion level of the 3GPP Rel-17 work item on LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39 has achieved 100% at RP#93-e (Sep-2021). There is a need to introduce an associated RAN5 work item to enable UE conformance testing for LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39 UEs

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The work item aims to enable spectrum sharing conformance testing for B34/n34 and B39/n39.

* Introduce UL 7.5kHz frequency shift conformance testing for 15kHz SCS operation from Rel-15

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Remarks |
|  |  |  |  |  |  |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TS 38.521-1 | Updated Channel raster for TDD DSS in Band 34/n34 and Band 39/n39 | TSG RAN#98-e(Dec-22) |  |
| TS 38.522 | Updated applicability for TDD DSS in Band 34/n34 and Band 39/n39 | TSG RAN#98-e(Dec-22) |  |

## 6 Work item Rapporteur(s)

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## 7 Work item leadership

RAN5

## 8 Aspects that involve other WGs

None

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| CMCC |
| Huawei |
| HiSilicon |
| ZTE |
| Ericsson |
| CATT |