**3GPP TSG-RAN5 Meeting #95-e R5-223316**

**Electronic Meeting, 9th May – 20th May 2022**

**3GPP TSG RAN Meeting #96 RP-22xxxx**

**Budapest, Hungary, 6th June – 9th June 2022**

**Source: MediaTek Inc., Qualcomm**

**Title: New WID on UE Conformance – UE power saving enhancements for NR**

**Document for: Endorsment**

**Agenda Item: 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 – UE power saving enhancements for NR

## Acronym: NR\_UE\_pow\_sav\_enh\_plus\_CT-UEConTest

## Unique identifier:

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

Potential target Release: Rel-17

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  |  |  |  |  |
| **No** | 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) |
| NR\_UE\_pow\_sav\_enh | RAN2 | 860047 | UE power saving enhancements for NR |
| NR\_UE\_pow\_sav\_enh-Core | RAN2 | 860147 | Core part: UE power saving enhancements for NR |
| NR\_UE\_pow\_sav\_enh-Perf | RAN4 | 860247 | Perf. part: UE power saving enhancements for NR |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 880044 | Stage-3 5GS NAS protocol development 17 general aspects | Only the CT CRs (and the functionality introduced by them) indicated in the objectives are relevant for this RAN5 WI. |

## 3 Justification

User experience is key to 5G/NR success, not only in terms of experienced data rates and latency but also importantly UE power consumption. UE Power saving enhancements are therefore vital to the success of 5G/NR. In Rel-16, several useful power saving schemes were specified, including power saving signal/DCI as enhancement to connected-mode DRX (cDRX), additional adaptations to maximum MIMO layer number, SCell dormancy behaviour and cross-slot scheduling as enhancements to BWP framework, RRM relaxation as enhancements for idle/inactive-mode power consumption, and UE assistance information.

In Rel-17, additional enhancements were required to address outstanding issues in Rel-16, including idle/inactive-mode power consumption in NR SA deployments, considering both eMBB UEs and Reduced Capability NR Devices, connected-mode power consumption with FR2 deployments, etc.

At the RP#86 meeting, the WI UE power saving enhancements for NR with 2 sub-WIs Core part and Perf. part has been introduced into 3GPP, and the overall completion of the core part of UE power saving enhancements has already achieved 100% at the RP#95 meeting in March 2022. The Perf. part of UE power saving enhancements WI is expected to complete at RP#97 in Sep 2022.

To fulfil the strong demand of low power consumption 5G devices, it is proposed to introduce an associated RAN5 work item to enable UE conformance test for power saving enhancements in NR devices.

## 4 Objective

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

The objective of this WI is to enable UE conformance testing:

* For the corresponding Rel-17 UE power saving enhancements WI listed under clause 2.2, including the following areas:
* Protocol test case for UE power saving enhancements
* RRM test cases for UE power saving enhancements, and
* For the related functionality introduced by the below CT CRs:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Plenary TDoc | Title | TS | CR | WID |
| CP-213211 | Paging Early Indication with Paging Subgrouping Assistance | 24.501 | 3803 | NR\_UE\_pow\_sav\_enh, 5GProtoc17 |
| CP-213252 | Paging Subgrouping | 24.501 | 3786 | NR\_UE\_pow\_sav\_enh, 5GProtoc17 |
| CP-220283 | Paging Subgrouping updates in Registration and UE Configuration Update procedure | 24.501 | 3896 | NR\_UE\_pow\_sav\_enh, 5GProtoc17 |
| CP-220283 | Paging subgroup handling during Emergency PDU session | 24.501 | 4055 | NR\_UE\_pow\_sav\_enh, 5GProtoc17 |

## 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 38.508-1 | Definition of common test environment for Rel-17 UE power saving enhancements test cases | TSG RAN#99(March-23) |  |
| TS 38.508-2 | Introduction of common implementation conformance statement (ICS) for Rel-17 UE power saving enhancements test cases | TSG RAN#99(March-23) |  |
| TS 38.522 | Applicability statements of the Rel-17 UE power saving enhancements RF & RRM test cases | TSG RAN#102(December-23) |  |
| TS 38.523-1 | Introduction of protocol test cases for Rel-17 UE power saving enhancements | TSG RAN#99(March-23) |  |
| TS 38.523-2 | Applicability statements Rel-17 UE power saving enhancements test cases. | TSG RAN#99(March-23) |  |
| TS 38.523-3 | Introduction of test model Rel-17 UE power saving enhancements test cases | TSG RAN#101(September-23) | Progress of TTCN development of the new protocol test cases is tracked in MCC TF160 reports to RAN5/RAN. |
| TS 38.533 | Introduction of RRM test cases Rel-17 UE power saving enhancements | TSG RAN#102(December-23) |  |
| TR 38.903 | Derivation of test tolerances and measurement uncertainty Rel-17 UE power saving enhancements test cases | TSG RAN#102(December-23) |  |

## 6 Work item Rapporteur(s)

Eniko Sokondar (MediaTek)

eniko.sokondar@mediatek.com

Vijay Balasubramanian (Qualcomm)

vijayb@qti.qualcomm.com

## 7 Work item leadership

RAN5

## 8 Aspects that involve other WGs

None

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| AT&T |
| CMCC |
| China Unicom |
| Ericsson |
| Hisilicon |
| Huawei |
| MediaTek |
| NTTDOCOMO,INC. |
| Qualcomm |
| Verizon |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |