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Technical Specification

KT PyeongChang 5G Special Interest Group (KT 5G-SIG); KT 5th Generation Radio Access; Physical Layer; Physical layer measurements (Release 1)

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Ericsson, Intel Corp., Nokia, Qualcomm Technologies Inc., Samsung Electronics & KT

Document History

Version	Date	Change
1.0	2016-04-19	First Draft Version
1.1	2016-07-13	Pre-final Version After 7th P5G Plenary Meeting

Contents

Foreword

This Technical Specification has been produced by the KT PyeongChang 5G Special Interest Group (KT 5G-SIG).

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1 Scope

The present document contains the description and definition of the measurements done at the UE and network in order to support operation in idle mode (for standalone) and connected mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

[1]   TS 5G.211: "5G Radio Access (5G RA); Physical channel and modulation".

[2]   TS 5G.212: "5G Radio Access (5G RA); Multiplexing and channel coding".

[3]   TS 5G.212: "5G Radio Access (5G RA); Multiplexing and channel coding".

[4]   TS 5G.321: "5G Radio Access (5G RA); Medium Access Control (MAC) protocol specification".

[5]   TS 5G.331: "5G Radio Access (5G RA); Radio Resource Control (RRC) protocol specification".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905.

BRSRP   Beam Reference Signal Received Power

4 Control of UE/5GRAN measurements

In this chapter the general measurement control concept of the higher layers is briefly described to provide an understanding on how L1 measurements are initiated and controlled by higher layers.

In the L1 measurement definitions, see chapter 5, there is a measurement in the UE (the messages for these will be described in the 5G-MAC Protocol [4] or 5G-RRC Protocol [5]).

To initiate a specific measurement, the 5GRAN transmits a '5G-RRC connection reconfiguration message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), see [5].

When the reporting criteria are fulfilled the UE shall answer with a 'measurement report message' to the 5GRAN including the measurement ID and the results.

5　　Measurement capabilities for 5GRA

In this chapter the physical layer measurements reported to higher layers are defined.

5.1　　UE measurement capabilities

The structure of the table defining a UE measurement quantity is shown below.

Column field	Comment
Definition	Contains the definition of the measurement.
Applicable for	States in which state(s) it shall be possible to perform this measurement. The following terms are used in the tables: 　　5G-RRC_IDLE (for standalone); 　　5G-RRC_CONNECTED; Intra-frequency appended to the 5G-RRC state: 　　Shall be possible to perform in the corresponding 5G-RRC state on an intra-frequency cell;

5.1.1　　Beam Reference Signal Received Power (BRSRP)

Definition	Beam reference signal received power (BRSRP), is defined as the linear average over the power contributions (in [W]) of the resource elements that carry beam-specific reference signals within the considered measurement frequency bandwidth. For BRSRP determination the beam-specific reference signals according to 5G 36.211 [1] shall be used. The reference point for the BRSRP shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding BRSRP of any of the individual diversity branches.
Applicable for	5G-RRC_IDLE intra-frequency (for standalone), 5G-RRC_CONNECTED intra-frequency,

NOTE 1:　The number of resource elements within the considered measurement frequency bandwidth and within the measurement period that are used by the UE to determine BRSRP is left up to the UE implementation with the limitation that corresponding measurement accuracy requirements have to be fulfilled.

NOTE 2:　The power per resource element is determined from the energy received during the useful part of the symbol, excluding the CP.