**3GPP TSG RAN WG1 Meeting #103-e R1-200zzzz**

**E-meeting, October 26th – November 13th, 2020**

**Source: Moderator (vivo, Qualcomm)**

**Title: Collection of evaluation results on supporting NR from 52.6 GHz to 71 GHz**

**Agenda item: 8.2.3**

**Document for: Discussion and decision**

# Introduction

In this contribution, we summarize the collection of evaluation results in the Study Item (SI) of supporting NR from 52.6 GHz to 71 GHz in RAN1 #103-e.

Section 2 contains the collection of evaluation results submitted based on the agreed templates from RAN1#102-e. The structure of section 2 is based on Annex B of TR 38.808.

# 2. Annex B: Evaluations results

## B.1 Link level evaluation results

### B.1.1 Evaluation results for PDSCH/PUSCH

#### B.1.1.1 Source 1 [65]

Table B.1.1.1-1: SNR in dB achieving PDSCH BLER of 10% or 1% with CPE compensation for PN model set 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 480 kHz/1.6 GHz | 960KHz / 1.6 GHz | 960KHz /2GHz |
| R1-2007984 / Source 1 | 7 | TDL-A, 5ns | 3.1/5.5 | 2.9/5.3 | 2.8/5.1 | 2.2/3.7 | 2.2/3.9 | 2.1/3.8 |
| TDL-A, 10ns | 2.6/4.6 | 2.4/4.5 | 2.5/4.3 | 2.1/3.4 | 2.2/3.7 | 2.2/3.6 |
| TDL-A, 20ns | 2.3/4.0 | 2.3/3.9 | 2.5/4.2 | 2.2/3.6 | 2.4/3.8 | 2.4/3.7 |
| TDL-A, 40 ns | 2.2/3.7 | 2.4/3.9 | 2.7/4.3 | 2.5/3.8 | 2.8/4.2 | 2.8/4.2 |
| CDL-B, 20ns | 2.6/5 | 2.3/4.6 | 2.3/4.6 | 1.7/3.2 | 1.7/3.2 | 1.7/3.2 |
| CDL-B, 50ns | 1.8/3.4 | 1.8/3.2 | 1.9/3.4 | 1.7/2.9 | 1.8/3 | 1.8/3 |
| CDL-D, 20ns | 0.3/1.5 | 0.2/1.4 | 0.1/1.2 | 0.2/1.3 | 0.2/1.4 | 0.2/1.4 |
| CDL-D, 30ns | 0.3/1.5 | 0.2/1.4 | 0/1.2 | 0.2/1.4 | 0.2/1.4 | 0.2/1.4 |
| 16 | TDL-A, 5ns | 11.8/14.3 | 11.3/13.88 | 11.0/13.4 | 10.5/12.4 | 10.0/11.9 | 10.0/11.8 |
| TDL-A, 10ns | 11.3/13.5 | 10.8/13.0 | 10.6/12.6 | 10.3/11.9 | 9.8/11.4 | 9.9/11.3 |
| TDL-A, 20ns | 11.0/12.9 | 10.5/12.3 | 10.3/12.0 | 10.2/11.6 | 9.9/11.2 | 9.9/11.3 |
| TDL-A, 40 ns | 10.8/12.5 | 10.4/11.9 | 10.4/11.9 | 10.5/11.7 | 10.8/12.4 | 11.0/12.7 |
| CDL-B, 20ns | 11.2/13.8 | 10.7/13 | 10.5/13.0 | 10.0/11.7 | 9.4/10.9 | 9.4/10.9 |
| CDL-B, 50ns | 10.5/12.3 | 10.0/11.7 | 9.9/11.5 | 9.8/11.2 | 9.4/10.5 | 9.5/10.7 |
| CDL-D, 20ns | 8.7/9.9 | 8.2/9.4 | 8.0/9.2 | 8.3/9.6 | 7.8/9.0 | 7.9/9.1 |
| CDL-D, 30ns | 8.7/9.6 | 8.2/9.4 | 8.0/9.2 | 8.3/9.6 | 7.8/8.9 | 7.9/9.1 |
| 22 | TDL-A, 5ns | -/- \*Note | -/- \*Note | 17.2/19.7 | 21.1/- \*Note | 16.1/18.2 | 16.3/18.6 |
| TDL-A, 10ns | -/- \*Note | -/- \*Note | 16.8/20.0 | 21.3/- \*Note | 15.9/17.8 | 16.1/18.3 |
| TDL-A, 20ns | -/- \*Note | -/- \*Note | 16.6/19.6 | 21.4/- \*Note | 16.1/18.0 | 16.3/18.6 |
| TDL-A, 40 ns | -/- \*Note | -/- \*Note | 16.7/20.1 | 22/- \*Note | 20.7/- \*Note | 21.6/- \*Note |
| CDL-B, 20ns | -/- \*Note | -/- \*Note | 16.7/20.4 | 21.4/- \*Note | 15.4/17.5 | 15.8/18.1 |
| CDL-B, 50ns | -/- \*Note | -/- \*Note | 16.2/19.5 | 21.5/- \*Note | 15.5/17.4 | 15.9/18.3 |
| CDL-D, 20ns | 21.8/- \*Note | 17.4/- \*Note | 14.0/15.8 | 17.0/- \*Note | 13.6/15.0 | 13.9/15.5 |
| CDL-D, 30ns | 21.8/- \*Note | 17.4/- \*Note | 13.9/15.8 | 16.9/- \*Note | 13.5/14.9 | 13.9/15.5 |
| Additional report/notes:   1. PN model set 1: BS: Ex2 BS and UE: Ex2 UE (c.f. Section 3.3.1 of R1-2007982) 2. CPE compensation 3. Normal CP 4. antenna configuration for CDL model   Configuration 2:  - (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  - (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. PTRS: K=2, L=1 2. DMRS configuration: 2 DMRS symbols at (2,11) 3. No TRS, No CSI-RS   The effective CR for MCS22, MCS16, and MCS 7 are 0.685, 0.678, and 0.539, respectively.  \*Note: missing values indicate that required SNR for 10%/1% BLER is either >22 dB or Inf (due to error floor) | | | | | | | |

Table B.1.1.1-2: SNR in dB achieving PDSCH BLER of 10% or 1% with ICI compensation for PN model set 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 480 kHz/1.6 GHz | 960KHz / 1.6 GHz | 960KHz /2GHz |
| R1-2007984 / Source 1 | 7 | TDL-A, 5ns | 3.2/5.6 | 3.2/5.6 | 3.3/3.9 | 2.3/4.3 | 2.4/4 | 2.4/4 |
| TDL-A, 10ns | 2.7/4.7 | 2.7/4.9 | 2.9/3.6 | 2.2/4.0 | 2.4/3.8 | 2.4/3.8 |
| TDL-A, 20ns | 2.4/4.0 | 2.5/4.1 | 3.0/4.7 | 2.3/3.6 | 2.7/4.1 | 2.6/4.0 |
| TDL-A, 40 ns | 2.3/3.8 | 2.6/4.1 | 3.2/4.8 | 2.6/3.9 | 3.0/4.5 | 3.0/4.5 |
| CDL-B, 20ns | 2.6/5.1 | 2.5/4.8 | 2.8/5.1 | 1.8/3.3 | 2.0/3.5 | 2.0/3.5 |
| CDL-B, 50ns | 1.9/3.5 | 2.0/3.4 | 2.4/3.9 | 1.8/3.0 | 2.1/3.3 | 2.1/3.3 |
| CDL-D, 20ns | 0.4/1.5 | 0.4/1.6 | 0.6/1.7 | 0.3/1.5 | 0.5/1.7 | 0.5/1.7 |
| CDL-D, 30ns | 0.3/1.5 | 0.4/1.6 | 0.5/1.7 | 0.3/1.5 | 0.5/1.7 | 0.5/1.7 |
| 16 | TDL-A, 5ns | 11.3/13.7 | 11.0/13.4 | 11.2/13.6 | 10.0/11.7 | 10.1/13.4 | 10.0/13.4 |
| TDL-A, 10ns | 10.8/12.9 | 10.5/12.6 | 10.7/12.7 | 9.8/11.3 | 9.9/11.4 | 9.9/11.3 |
| TDL-A, 20ns | 10.4/12.2 | 10.2/11.9 | 10.4/12.1 | 9.7/11.0 | 10.0/11.3 | 10.0/11.3 |
| TDL-A, 40 ns | 10.2/11.8 | 10.0/11.5 | 10.6/11.9 | 10.0/11.1 | 10.9/12.4 | 11.0/12.5 |
| CDL-B, 20ns | 10.6/14.0 | 10.3/12.7 | 10.6/13.1 | 9.5/11.0 | 9.4/11 | 9.5/11 |
| CDL-B, 50ns | 9.9/11.6 | 9.7/11.2 | 10.0/11.6 | 9.3/10.5 | 9.5/10.6 | 9.5/10.7 |
| CDL-D, 20ns | 8.2/9.4 | 8.0/9.1 | 8.2/9.3 | 7.9/9.1 | 7.9/9.1 | 8.0/9.2 |
| CDL-D, 30ns | 8.2/9.4 | 8.0/9.1 | 8.1/9.3 | 7.9/9.1 | 7.9/9 | 8.0/9.1 |
| 22 | TDL-A, 5ns | 18.5/- | 17.0/19.6 | 16.3/18.7 | 16.1/18.0 | 15.6/17.4 | 15.5/17.3 |
| TDL-A, 10ns | 18.2/21.3 | 16.5.18.7 | 15.8/17.8 | 15.8/17.5 | 15.4/16.9 | 15.3/16.8 |
| TDL-A, 20ns | 17.8/20.6 | 16.2/18.1 | 15.5/17.2 | 15.6/17 | 15.5/16.9 | 15.5/16.9 |
| TDL-A, 40 ns | 17.5/20.6 | 16.0/17.6 | 15.7/17.2 | 15.7/17.1 | 19.3/- \*Note | 19.4/- \*Note |
| CDL-B, 20ns | 18.2/- | 16.5/19.1 | 15.7/18.2 | 15.7/17.6 | 14.8/16.5 | 14.9/16.5 |
| CDL-B, 50ns | 17.5 /20.8 | 15.8/17.6 | 15.0/16.7 | 15.2/16.6 | 14.8/16.1 | 14.9/16.4 |
| CDL-D, 20ns | 14.7/16.4 | 13.7/15.0 | 13.2/14.5 | 13.5/14.9 | 13.1/14.3 | 13.3/14.5 |
| CDL-D, 30ns | 14.7/16.4 | 13.7/15.0 | 13.2/14.5 | 13.5/14.9 | 13.0/14.3 | 13.3/14.5 |
| Additional report/notes:   1. PN model set 1: BS: Ex2 BS and UE: Ex2 UE (c.f. Section 3.3.1 of R1-2007982) 2. ICI compensation (c.f. Section 3.3.2 of R1-2007982) 3. Normal CP 4. antenna configuration for CDL model   Configuration 2:  - (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  - (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. PTRS: K=2, L=1 2. DMRS configuration: 2 DMRS symbols at (2,11) 3. No TRS, No CSI-RS 4. The effective CR for MCS22, MCS16, and MCS 7 are 0.685, 0.678, and 0.539, respectively.   \*Note: missing values indicate that required SNR for 10%/1% BLER is either >22 dB or Inf (due to error floor) | | | | | | | |

Table B.1.1.1-3: SNR in dB achieving PDSCH BLER of 10% or 1% with CPE compensation for PN model set 2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 480 kHz/1.6 GHz | 960KHz / 1.6 GHz |
| R1-2007984 / Source 1 | 16 | TDL-A, 10ns | 10.6/12.7 | 10.5/12.6 | 10.6/12.6 | 10.1/11,5 | 10.0/11.5 |
| TDL-A, 40ns | 10.1/11.58 | 10.1/11.5 | 10.3/11.7 | 10.1/11.4 | 11.2/12.9 |
| 22 | TDL-A, 10ns | 17.8/20.3 | 17.3/19.7 | 16.5/18.7 | 17.6/20.3 | 16.9/18.9 |
| TDL-A, 40ns | 17.2/19.0 | 16.8/18.5 | 16.4/18.1 | 17.7/20.8 | -/- \*Note |
| Additional report/notes:   1. PN model set 2: BS: Ex2 BS and UE: R4-2011494 (c.f. Section 3.3.1 of R1-2007982) 2. CPE compensation 3. Normal CP 4. PTRS: K=2, L=1 5. DMRS configuration: 2 DMRS symbols at (2,11) 6. No TRS, No CSI-RS 7. The effective CR for MCS22, MCS16, and MCS 7 are 0.685, 0.678, and 0.539, respectively.   \*Note: missing values indicate that required SNR for 10%/1% BLER is either >22 dB or Inf (due to error floor) | | | | | | | |

Table B.1.1.1-4: SNR in dB achieving PDSCH BLER of 10% or 1% with ICI compensation for PN model set 2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 480 kHz/1.6 GHz | 960KHz / 1.6 GHz |
| R1-2007984 / Source 1 | 16 | TDL-A, 10ns | 10.6/12.7 | 10.5/12.6 | 10.8/12.8 | 10.0/11.4 | 10.0/11.5 |
| TDL-A, 40ns | 10.1/11.6 | 10.1/11.6 | 10.6/12.0 | 10.0/11.2 | 11.2/12.9 |
| 22 | TDL-A, 10ns | 17.4/19.7 | 17.0/19.2 | 16.4/18.4 | 16.4/18.0 | 15.9/17.4 |
| TDL-A, 40ns | 16.8/18.4 | 16.4/18.0 | 16.2/17.8 | 16.3/17.8 | 21.0/- \*Note |
| Additional report/notes:   1. PN model set 2: BS: Ex2 BS and UE: R4-2011494 (c.f. Section 3.3.1 of R1-2007982) 2. ICI compensation (c.f. Section 3.3.2 of R1-2007982) 3. Normal CP 4. PTRS: K=2, L=1 5. DMRS configuration: 2 DMRS symbols at (2,11) 6. No TRS, No CSI-RS 7. The effective CR for MCS22, MCS16, and MCS 7 are 0.685, 0.678, and 0.539, respectively.   \*Note: missing values indicate that required SNR for 10%/1% BLER is either >22 dB or Inf (due to error floor) | | | | | | | |

Table B.1.1.1-5: SNR in dB achieving PDSCH BLER of 10% or 1% with CPE compensation for PN model set 3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 480 kHz/1.6 GHz | 960KHz / 1.6 GHz |
| R1-2007984 / Source 1 | 16 | TDL-A, 10ns | 10.6/12.7 | 10.5/12.6 | 10.5/12.6 | 10.0/11.5 | 10.0/11.4 |
| TDL-A, 40ns | 10.1//11.6 | 10.0/11.5 | 10.3/11.7 | 10.0/11.3 | 11.2/12.9 |
| 22 | TDL-A, 10ns | 17.8/20.4 | 17.3/19.7 | 16.4/18.6 | 17.4/20.5 | 16.6/18.6 |
| TDL-A, 40ns | 17.3/19.1 | 16.8/18.6 | 16.3/18.0 | 17.6/21.3 | -/- \*Note |
| Additional report/notes:   1. PN model set 3: PN model: BS: R4-2010176 DM=0 dB and UE: R4-2010176 DM=5 dB (c.f. Section 3.3.1 of R1-2007982) 2. CPE compensation 3. Normal CP 4. PTRS: K=2, L=1 5. DMRS configuration: 2 DMRS symbols at (2,11) 6. No TRS, No CSI-RS 7. The effective CR for MCS22, MCS16, and MCS 7 are 0.685, 0.678, and 0.539, respectively.   \*Note: missing values indicate that required SNR for 10%/1% BLER is either >22 dB or Inf (due to error floor) | | | | | | | |

Table B.1.1.1-6: SNR in dB achieving PDSCH BLER of 10% or 1% with ICI compensation for PN model set 3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 480 kHz/1.6 GHz | 960KHz / 1.6 GHz |
| R1-2007984 / Source 1 | 16 | TDL-A, 10ns | 10.6/12.7 | 10.6/12.7 | 10.6/12.7 | 10.0/11.3 | 10.0/11.7 |
| TDL-A, 40ns | 10.1/11.6 | 10.1/11.6 | 10.4/11.8 | 10.0/11.2 | 11.2/12.8 |
| 22 | TDL-A, 10ns | 17.3/19.6 | 16.8/19.0 | 16.2/18.2 | 16.2/17.8 | 15.7/17.1 |
| TDL-A, 40ns | 16.7/18.4 | 16.3/17.8 | 16.1/17.7 | 16.1/17.6 | 20.2/- \*Note |
| Additional report/notes:   1. PN model set 3: BS: R4-2010176 DM=0 dB and UE: R4-2010176 DM=5 dB (c.f. Section 3.3.1 of R1-2007982) 2. ICI compensation (c.f. Section 3.3.2 of R1-2007982) 3. Normal CP 4. PTRS: K=2, L=1 5. DMRS configuration: 2 DMRS symbols at (2,11) 6. No TRS, No CSI-RS 7. The effective CR for MCS22, MCS16, and MCS 7 are 0.685, 0.678, and 0.539, respectively.   \*Note: missing values indicate that required SNR for 10%/1% BLER is either >22 dB or Inf (due to error floor) | | | | | | | |

Table B.1.1.1-7: SNR in dB achieving PUSCH BLER of 10% or 1% with PN compensation for PN model set 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /2GHz |
| R1-2007984 / Source 1 | 7 | TDL-A, 5ns | 3.3/5.6 | 3.0/5.0 | 3.0/5.0 | 3.1/4.6 |
| TDL-A, 10ns | 3.1/5.1 | 3.0/4.6 | 2.9/4.6 | 3.2/4.6 |
| 16 | TDL-A, 5ns | 11.2/13.6 | 10.5/12.5 | 10.4/12.4 | 10.2/11.7 |
| TDL-A, 10ns | 10.6/12.7 | 10.2/11.8 | 10.2/11.8 | 10.2/11.5 |
| 22 | TDL-A, 5ns | 17.3/20.1 | 16.5/19.1 | 16.0/18.3 | 15.5/17.2 |
| TDL-A, 10ns | 17.0/19.4 | 16.2/19.0 | 15.7/17.8 | 15.4/16.8 |
| Additional report/notes:   1. PN model set 1: BS: Ex2 BS and UE: Ex2 UE (c.f. Section 3.3.1 of R1-2007982) 2. PN compensation 3. Normal CP 4. PUSCH waveform: DFT-S-OFDM 5. PTRS: Ng = 8, Ns = 4, L =1 6. DMRS configuration: 2 DMRS symbols at (2,11) | | | | | | |

#### B.1.1.2 Source 2 [72]

Table B.1.1.2-1: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1% for CP-OFDM

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120 kHz  @400 MHz | | 240 kHz  @400 MHz | | 480 kHz  @400 MHz | | 960 kHz  @400 MHz |
| PHN | CPE | ICI | CPE | ICI | CPE | ICI | CPE |
| R1-2009610 / Source 2 | 7 | CDL-B, 20ns | 2/4.8 | -- | 2/4.8 | -- | 2/4.8 | -- | 2/4.8 |
| CDL-B, 50ns | 2.9/4.2 | -- | 2.6/4.2 | -- | 2.7/4.2 | -- | 2.6/3.9 |
| CDL-D, 20ns | -0.7/0 | -- | -0.4/0.3 | -- | -0.1/0.6 | -- | -0.3/0.3 |
| CDL-D, 30ns | -1.4/-1 | -- | -1.2/-1 | -- | -1.6/-1.4 | -- | -1.7/-1.7 |
| 16 | CDL-B, 20ns | 10.5/12.5 | -- | 10/12.3 | -- | 11.8/12 | -- | 10.7/11.9 |
| CDL-B, 50ns | 11.2/12.6 | -- | 11.2/13.4 | -- | 11.6/14.0 | -- | 11.9/13.3 |
| CDL-D, 20ns | 6.8/7.4 | -- | 7.2/7.9 | -- | 7.3/7.9 | -- | 7.1/7.6 |
| CDL-D, 30ns | 7/7.2 | -- | 6.8/7.1 | -- | 6.7/6.8 | -- | 6.6/6.8 |
| 22 | CDL-B, 20ns | NAN | 16.8/20 | NAN | 15.3/17.2 | 17/-- | 17/19 | 15.7/18 |
| CDL-B, 50ns | NAN | 16.8/18.1 | NAN | 15.8/18.2 | 18/26 | 16.9/19.1 | 18.4/20.8 |
| CDL-D, 20ns | NAN | 11.9/12.7 | NAN | 12.3/13.0 | 13.7/-- | 12.6/13.3 | 12.5/13.1 |
| CDL-D, 30ns | NAN | 12.5/12.9 | NAN | 11.8/12.4 | 13.2/14.8 | -- | 12.1/12.5 |
| Additional report/notes:   1. CP type:   NCP   1. antenna configuration for CDL model:   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PDSCH:   CP-OFDM   1. PTRS configuration:   K=2 in frequency domain, L=1 in time domain   1. DMRS configuration   1/2 in frequency in each port   1. any optional or other assumption/parameters used not as in the baseline:   PN model: Example 2 phase noise model scaling to 60 GHz in 38.803 | | | | | | | | |

**Table B.1.1.2-2: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1% for CP-OFDM and MCS28**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /Source | MCS | Channel | 120 kHz  @400 MHz | 240 kHz  @400 MHz | | 480 kHz  @400 MHz | 960 kHz  @400 MHz | |
| ICI-11 | ICI-9 | ICI-5 | ICI-7 | CPE | ICI-3 |
| R1-2009610 / Source 2 | 28 | CDL-B, 20ns | 26.2/30 | 24.3/28.8 | 25.5/33.7 | 25.1/28.8 | NAN/NAN | 25.3/30.5 |
| CDL-B, 50ns | 24.7/28.8 | 25.5/29.7 | 25.5/NAN | 25.0/29.5 | NAN/NAN | NAN/NAN |
| CDL-D, 20ns | 19.3/20.7 | 19.6/21.2 | 20.1/22.4 | 19.7/21 | 26/NAN | 19.7/21.4 |
| CDL-D, 30ns | 19.3/20.7 | 19.6/21.3 | 20.1/22.4 | 19.8/21 | 26/NAN | 19.8/21.2 |
| Additional report/notes:   1. CP type:   NCP   1. antenna configuration for CDL model:   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PDSCH:   CP-OFDM   1. PTRS configuration:   K=2 in frequency domain, L=1 in time domain   1. DMRS configuration   1/2 in frequency in each port   1. any optional or other assumption/parameters used not as in the baseline:   PN model: Example 2 phase noise model scaling to 60 GHz in 38.803 | | | | | | | |

**Table B.1.1.2-3: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1% for CP-OFDM and 960 kHz with different CP length**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /Source | MCS | PHN | Channel | 960 kHz @400 MHz | |
| NCP | ECP |
| R1-2009610 / Source 2 | 22 | CPE | CDL-D, 50ns | 17.7/20 | 17.3/19 |
| 24 | CPE | CDL-D, 50ns | 21/27.4 | 19.6/21.8 |
| 26 | ICI-3 | CDL-D, 50ns | 24.9/NAN | 22.2/24.8 |
| Additional report/notes:   1. CP type:   NCP and ECP   1. antenna configuration for CDL model:   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PDSCH:   CP-OFDM   1. PTRS configuration:   K=2 in frequency domain, L=1 in time domain   1. DMRS configuration   1/2 in frequency in each port   1. any optional or other assumption/parameters used not as in the baseline:   PN model: Example 2 phase noise model scaling to 60 GHz in 38.803 | | | | |

**Table B.1.1-4: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1% for CP-OFDM with optional phase noise model and MCS22 when only CPE compensation is used**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /Source | MCS | Channel | 120 kHz@400 MHz | 240 kHz@400 MHz | 480 kHz@400 MHz | 960 kHz@400 MHz |
| R1-2009610 / Source 2 | 22 | CDL-B, 20ns | 18.4/21.3 | 17.3/19.8 | 16.4/19 | 15.7/18.2 |
| CDL-D, 20ns | 13.1/13.9 | 12.9/13.6 | 12.6/13.3 | 12.3/12.9 |
| Additional report/notes:   1. CP type:   NCP   1. antenna configuration for CDL model:   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PDSCH:   CP-OFDM   1. PTRS configuration:   K=2 in frequency domain, L=1 in time domain   1. DMRS configuration   1/2 in frequency in each port   1. any optional or other assumption/parameters used not as in the baseline:   PN model:  BS: Example 2 phase noise model for BS scaling to 60 GHz in 38.803  UE: an optional phase noise model defined in R4-2011494 | | | | | |

**Table B.1.1.2-5: SINR in dB achieving PUSCH BLER of 10% /1% for CP-OFDM and different PTRS patterns at MCS22**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /Source | MCS | Channel | Rel-15 PTRS | Block PTRS with Rel15 sequence | Block PTRS with new sequence |
| R1-2009610 / Source 2 | 22 | CDL-B, 20ns | 17.7/21.9 | 17.8/22.6 | 17.2/21.5 |
| CDL-D, 20ns | 13.9/14.8 | 14.2/15.4 | 13.6/14.5 |
|  | Additional report/notes:   1. CP type:   NCP   1. antenna configuration for CDL model:   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PDSCH:   CP-OFDM   1. PTRS configuration:   Rel-15: K=4 in frequency domain, L=1 in time domain  Block-PTRS: block number-1, block size-16,17   1. DMRS configuration   1/2 in frequency in each port   1. any optional or other assumption/parameters used not as in the baseline:   PN model: Example 2 phase noise model scaling to 60 GHz in 38.803  PTRS sequence: when block size is 17, a new sequence which has constant module at both frequency domain and time domain for block PTRS is used | | | |

**Table B.1.1.2-6: SINR in dB achieving PUSCH BLER of 10% /1% for DFT-s-OFDM**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120 kHz  @400 MHz | 240 kHz  @400 MHz | 480 kHz  @400 MHz | 960 kHz  @400 MHz |
| R1-2009610 / Source 2 | 7 | CDL-B, 20ns | 3.0/4.3 | 2.4/4.4 | 3.2/5.0 | 2.8/4.7 |
| CDL-B, 50ns | 3.0/4.4 | 2.9/5.1 | 2.8/5.6 | 3.3/5.5 |
| CDL-D, 20ns | -0.4/0.2 | -0.2/0.5 | -0.5/0.3 | -0.1/0.4 |
| CDL-D, 30ns | -0.4/0.2 | -0.2/0.5 | -0.5/0.3 | -0.1/0.4 |
| 16 | CDL-B, 20ns | 12.1/13.7 | 11.1/13.8 | 12.2/15.4 | 12.5/15.5 |
| CDL-B, 50ns | 12.6/14.9 | 11.6/14.4 | 12.2/15.2 | 14.1/16.1 |
| CDL-D, 20ns | 7.0/7.6 | 7.5/8.1 | 7.3/8.0 | 8.1/8.6 |
| CDL-D, 30ns | 7.0/7.6 | 7.5/8.1 | 7.3/8.0 | 8.1/8.5 |
| 22 | CDL-B, 20ns | 20.9/NAN | 17.4/20.6 | 19.1/22.7 | 18.4/21.4 |
| CDL-B, 50ns | 21.4/NAN | 18.0/21.2 | 18.8/22.2 | 19.7/21.9 |
| CDL-D, 20ns | 14.7/NAN | 13.4/14.4 | 13.2/14.3 | 13.4/13.8 |
| CDL-D, 30ns | 14.7/NAN | 13.4/14.4 | 13.2/14.3 | 13.4/13.8 |
| Additional report/notes:   1. CP type:   NCP   1. antenna configuration for CDL model:   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PUSCH:   DFT-s-OFDM   1. PTRS configuration:   L=1 in time domain, and \* are:  8\*4 for 120 kHz  8\*4 for 240 kHz  4\*4 for 480 kHz  4\*2 for 960 kHz   1. DMRS configuration:   1/2 in frequency in each port   1. any optional or other assumption/parameters used not as in the baseline:   PN model: Example 2 phase noise model scaling to 60 GHz in 38.803 | | | | | |

#### B.1.1.3 Source 3 [30]

Table B.1.1.3-1: CINR in dB achieving PDSCH iBLER of 10% ∕ 1%: 1 DMRS symbol

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2008615 / Source 3 | 7 | TDL-A, 5ns | -1.3/0.8 | -1.2/0.8 | -0.9/1.0 | -0.1/2.2 | -1.3/0.2 |
| TDL-A, 10ns | -1.4/0.2 | -1.4/0.2 | -1.0/0.7 | 0.2/1.9 | -0.9/0.4 |
| TDL-A, 20ns | -1.4/0.6 | -1.1/0.8 | 0.2/1.5 | 0.9/2.5 | 0.4/1.0 |
| CDL-B, 20ns (Cfg. 1) | -7.3/0.5 | -7.4/0.5 | -7.3/1.0 | -6.8/1.7 | -7.2/1.2 |
| CDL-B, 50ns (Cfg. 1) | -7.4/0.6 | -7.2/1.1 | -7.0/1.6 | -6.1/3.3 | -6.5/2.9 |
| CDL-D, 20ns (Cfg. 1) | -17.3/-11.1 | -17.3/-10.9 | -17.3/-10.9 | -17.0/-10.4 | -17.4/-11.1 |
| CDL-D, 30ns (Cfg. 1) | -17.3/-11.1 | -17.3/-11.0 | -17.3/-10.9 | -16.8/-10.4 | -17.4/-11.1 |
| CDL-B, 20ns (Cfg. 2) | -1.0/5.5 | -1.1/5.8 | -1.0/6.3 | -0.4/7.2 | -0.6/6.6 |
| CDL-B, 50ns (Cfg. 2) | -0.8/5.6 | -0.6/6.4 | -0.4/7.0 | 0.7/9.0 | 0.4/8.7 |
| CDL-D, 20ns (Cfg. 2) | -5.4/0.5 | -5.3/0.9 | -5.4/0.9 | -5.0/1.6 | -5.5/0.8 |
| CDL-D, 30ns (Cfg. 2) | -5.4/0.6 | -5.3/0.9 | -5.3/1.0 | -5.0/1.7 | -5.4/1.1 |
| 16 | TDL-A, 5ns | 6.6/8.6 | 6.5/8.6 | 6.6/8.6 | 6.9/9.1 | 6.3/7.9 |
| TDL-A, 10ns | 6.4/7.9 | 6.4/7.9 | 6.7/8.7 | 7.1/9.0 | 6.7/8.0 |
| TDL-A, 20ns | 6.0/7.8 | 6.3/7.9 | 6.8/8.3 | 7.9/9.8 | 7.4/8.7 |
| CDL-B, 20ns (Cfg. 1) | 1.1/8.3 | 1.0/8.5 | 1.2/8.7 | 1.2/8.9 | 0.8/8.8 |
| CDL-B, 50ns (Cfg. 1) | 1.2/8.7 | 1.1/8.8 | 1.2/9.3 | 1.6/11.9 | 1.3/12.0 |
| CDL-D, 20ns (Cfg. 1) | -9.0/-2.9 | -9.1/-3.3 | -9.1/-3.3 | -9.1/-3.5 | -9.5/-3.4 |
| CDL-D, 30ns (Cfg. 1) | -8.9/-3.2 | -9.1/-3.3 | -9.1/-3.4 | -9.2/-3.4 | -9.5/-3.6 |
| CDL-B, 20ns (Cfg. 2) | 7.2/13.4 | 7.2/13.6 | 7.6/14.0 | 7.6/14.5 | 7.6/14.3 |
| CDL-B, 50ns (Cfg. 2) | 7.6/13.9 | 7.6/14.1 | 8.1/14.9 | 9.0/19.0 | 8.8/19.0 |
| CDL-D, 20ns (Cfg. 2) | 2.9/8.5 | 2.8/8.4 | 2.9/8.7 | 2.9/8.7 | 2.6/8.5 |
| CDL-D, 30ns (Cfg. 2) | 3.0/8.7 | 2.9/8.5 | 2.9/8.8 | 2.9/8.8 | 2.6/8.7 |
| 22 | TDL-A, 5ns | 13.2/15.1 | 12.5/14.7 | 11.8/13.8 | 12.0/14.1 | 11.6/13.0 |
| TDL-A, 10ns | 13.4/15.4 | 12.3/14.3 | 11.9/13.7 | 12.3/14.0 | 11.9/13.5 |
| TDL-A, 20ns | 13.2/15.6 | 12.7/14.6 | 12.3/14.3 | 13.4/15.0 | 13.1/14.5 |
| CDL-B, 20ns (Cfg. 1) | 7.7/15.3 | 7.1/14.8 | 6.4/13.9 | 6.5/14.0 | 6.4/14.1 |
| CDL-B, 50ns (Cfg. 1) | 7.6/15.5 | 7.1/15.0 | 6.7/14.8 | 7.1/− | 7.2/− |
| CDL-D, 20ns (Cfg. 1) | -3.0/2.9 | -3.5/2.6 | -4.0/1.9 | -4.1/1.7 | -4.1/1.7 |
| CDL-D, 30ns (Cfg. 1) | -3.1/2.9 | -3.5/2.5 | -4.0/1.9 | -4.1/1.8 | -4.2/1.7 |
| CDL-B, 20ns (Cfg. 2) | 13.8/20.5 | 12.9/20.1 | 12.7/19.4 | 12.9/20.0 | 13.0/20.2 |
| CDL-B, 50ns (Cfg. 2) | 14.1/21.1 | 13.8/20.8 | 13.5/21.0 | 14.9/− | 15.0/− |
| CDL-D, 20ns (Cfg. 2) | 8.8/14.8 | 8.6/14.6 | 8.4/14.4 | 8.3/14.6 | 8.2/14.4 |
| CDL-D, 30ns (Cfg. 2) | 9.0/14.9 | 8.9/14.9 | 8.5/14.6 | 8.3/14.6 | 8.3/14.6 |
| Additional report/notes:   1. CP type: NCP 2. antenna configuration for CDL model: Config 1 and Config 2 3. waveform in case of PUSCH 4. PTRS configuration: (K=4, L=1) 5. DMRS configuration: 1 DMRS, front loaded 6. any optional or other assumption/parameters used not as in the baseline: CPE compensation | | | | | | |

Table B.1.1.3-2: CINR in dB achieving PDSCH iBLER of 10% ∕ 1%: 2 DMRS symbol

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2008615 / Source 3 | 7 | TDL-A, 5ns | -1.4/0.8 | -1.5/0.8 | -1.4/1.0 | -0.2/1.7 | -1.6/0.4 |
| TDL-A, 10ns | -1.8/0.5 | -1.7/0.5 | -1.4/0.7 | -0.1/1.4 | -1.4/0.5 |
| TDL-A, 20ns | -1.8/0.2 | -1.5/0.5 | -1.2/0.8 | 0.2/1.6 | -1.2/0.7 |
| CDL-B, 20ns (Cfg. 1) | -7.5/0.3 | -7.6/0.4 | -7.6/0.6 | -7.1/1.2 | -7.6/0.6 |
| CDL-B, 50ns (Cfg. 1) | -7.6/0.3 | -7.5/0.4 | -7.3/0.8 | -6.5/2.3 | -7.1/1.7 |
| CDL-D, 20ns (Cfg. 1) | -17.4/-11.2 | -17.4/-11.2 | -17.4/-11.2 | -17.0/-10.5 | -17.5/-11.3 |
| CDL-D, 30ns (Cfg. 1) | -17.4/-11.3 | -17.4/-11.2 | -17.5/-11.1 | -17.1/-10.5 | -17.5/-11.4 |
| CDL-B, 20ns (Cfg. 2) | -1.2/5.1 | -1.3/5.5 | -1.2/5.8 | -0.7/6.6 | -0.7/5.9 |
| CDL-B, 50ns (Cfg. 2) | -1.0/5.4 | -0.8/5.6 | -0.7/6.3 | -0.1/7.8 | -0.4/7.5 |
| CDL-D, 20ns (Cfg. 2) | -5.5/0.5 | -5.5/0.7 | -5.5/0.8 | -5.0/1.5 | -5.6/0.7 |
| CDL-D, 30ns (Cfg. 2) | -5.6/0.6 | -5.4/0.7 | -5.5/0.8 | -5.1/1.5 | -5.4/0.8 |
| 16 | TDL-A, 5ns | 6.2/8.6 | 6.3/8.0 | 6.3/8.3 | 6.7/8.9 | 5.9/7.4 |
| TDL-A, 10ns | 6.1/7.9 | 6.0/7.8 | 6.4/7.9 | 6.7/8.7 | 6.1/7.5 |
| TDL-A, 20ns | 5.9/7.5 | 6.2/7.8 | 6.7/7.9 | 7.0/8.8 | 6.4/7.7 |
| CDL-B, 20ns (Cfg. 1) | 0.9/8.0 | 0.7/7.8 | 1.0/7.9 | 1.2/8.1 | 0.5/8.00 |
| CDL-B, 50ns (Cfg. 1) | 1.0/8.2 | 0.8/8.2 | 0.9/8.5 | 1.7/10.8 | 1.1/11.2 |
| CDL-D, 20ns (Cfg. 1) | -9.2/-3.5 | -9.3/-3.5 | -9.3/-3.5 | -9.3/-3.5 | -9.6/-3.7 |
| CDL-D, 30ns (Cfg. 1) | -9.2/-3.5 | -9.3/-3.6 | -9.3/-3.4 | -9.3/-3.5 | -9.6/-3.7 |
| CDL-B, 20ns (Cfg. 2) | 7.0/13.2 | 6.9/13.3 | 7.2/13.6 | 7.3/14.0 | 7.1/13.7 |
| CDL-B, 50ns (Cfg. 2) | 7.3/13.6 | 7.4/13.6 | 7.6/14.3 | 8.5/17.8 | 8.3/18.1 |
| CDL-D, 20ns (Cfg. 2) | 2.7/8.3 | 2.7/8.3 | 2.8/8.4 | 2.8/8.5 | 2.5/8.2 |
| CDL-D, 30ns (Cfg. 2) | 2.8/8.5 | 2.7/8.4 | 2.8/8.5 | 2.8/8.6 | 2.4/8.3 |
| 22 | TDL-A, 5ns | 13.1/15.8 | 12.4/14.9 | 11.6/13.6 | 11.7/13.9 | 11.4/12.9 |
| TDL-A, 10ns | 13.0/15.7 | 12.3/14.3 | 11.5/13.2 | 11.7/13.7 | 11.6/12.9 |
| TDL-A, 20ns | 12.9/15.5 | 12.5/14.8 | 11.9/13.4 | 12.5/14.0 | 12.4/13.9 |
| CDL-B, 20ns (Cfg. 1) | 7.8/15.2 | 7.1/14.7 | 6.1/13.5 | 6.0/13.6 | 6.3/13.9 |
| CDL-B, 50ns (Cfg. 1) | 7.7/15.3 | 7.1/14.9 | 6.2/13.9 | 6.6/− | 6.9/− |
| CDL-D, 20ns (Cfg. 1) | -2.9/2.9 | -3.4/2.6 | -4.1/1.7 | -4.2/1.7 | -4.1/1.7 |
| CDL-D, 30ns (Cfg. 1) | -2.9/2.9 | -3.3/2.7 | -4.1/1.7 | -4.2/1.6 | -4.1/1.7 |
| CDL-B, 20ns (Cfg. 2) | 13.8/20.5 | 13.2/19.3 | 12.5/19.1 | 12.5/19.3 | 12.8/19.6 |
| CDL-B, 50ns (Cfg. 2) | 14.0/20.9 | 13.6/20.4 | 12.8/19.9 | 14.2/− | 14.7/− |
| CDL-D, 20ns (Cfg. 2) | 9.0/14.9 | 8.8/14.9 | 8.2/14.0 | 8.1/14.3 | 8.3/14.5 |
| CDL-D, 30ns (Cfg. 2) | 9.2/15.2 | 9.0/15.1 | 8.3/14.1 | 8.1/14.3 | 8.3/15.0 |
| Additional report/notes:   1. CP type: NCP 2. antenna configuration for CDL model: Config 1 and Config 2 3. waveform in case of PUSCH 4. PTRS configuration: (K=4, L=1) 5. DMRS configuration: 2 DMRSs, (2, 11) 6. any optional or other assumption/parameters used not as in the baseline: CPE compensation | | | | | | |

Table B.1.1.3-3: CINR in dB achieving PUSCH iBLER of 10% ∕ 1%: 1 DMRS symbol

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2008615 / Source 3 | 7 | TDL-A, 5ns | 2.5/5.7 | 2.3/5.6 | 2.1/5.2 | 1.9/4.8 | 2.9/5.6 |
| TDL-A, 10ns | 2.8/5.7 | 2.7/5.6 | 2.6/5.5 | 2.6/5.0 | 3.4/5.8 |
| TDL-A, 20ns | 3.0/5.7 | 3.0/5.6 | 3.1/5.7 | 3.3/5.5 | 4.0/6.5 |
| CDL-B, 20ns (Cfg. 1) | -4.4/4.9 | -4.6/4.8 | -4.6/4.7 | -4.7/4.7 | -3.5/5.3 |
| CDL-B, 50ns (Cfg. 1) | -4.0/4.9 | -3.8/4.9 | -3.8/5.1 | -3.8/6.1 | -3.1/6.8 |
| CDL-D, 20ns (Cfg. 1) | -15.3/-8.5 | -15.2/-8.6 | -15.5/-9.1 | -15.9/-9.2 | -15.4/-8.8 |
| CDL-D, 30ns (Cfg. 1) | -15.2/-8.4 | -15.4/-8.7 | -15.4/-9.0 | -16.0/-9.3 | -15.4/-8.8 |
| CDL-B, 20ns (Cfg. 2) | 2.0/10.3 | 2.2/10.3 | 2.1/10.2 | 1.9/9.9 | 2.0/9.9 |
| CDL-B, 50ns (Cfg. 2) | 2.0/10.3 | 2.3/9.9 | 2.5/10.6 | 2.9/12.0 | 2.6/11.7 |
| CDL-D, 20ns (Cfg. 2) | -3.3/3.6 | -3.4/3.4 | -3.4/3.1 | -3.9/2.9 | -3.5/3.6 |
| CDL-D, 30ns (Cfg. 2) | -3.4/3.6 | -3.5/3.0 | -3.5/3.2 | -4.0/2.8 | -3.5/3.5 |
| 16 | TDL-A, 5ns | 8.8/11.8 | 8.3/11.3 | 8.1/11.2 | 8.4/11.4 | 9.0/11.2 |
| TDL-A, 10ns | 9.5/12.0 | 8.8/11.2 | 8.7/11.0 | 9.1/11.6 | 9.6/11.2 |
| TDL-A, 20ns | 9.8/12.0 | 8.9/11.3 | 9.1/11.0 | 10.3/12.5 | 10.5/12.0 |
| CDL-B, 20ns (Cfg. 1) | 3.5/11.6 | 2.9/10.9 | 2.8/11.0 | 3.2/11.5 | 3.6/11.8 |
| CDL-B, 50ns (Cfg. 1) | 3.7/11.7 | 3.2/11.3 | 3.2/11.6 | 3.6/16.0 | 3.9/15.8 |
| CDL-D, 20ns (Cfg. 1) | -8.4/-2.5 | -9.1/-3.2 | -9.2/-3.3 | -9.0/-3.2 | -8.9/-2.9 |
| CDL-D, 30ns (Cfg. 1) | -8.4/-2.5 | -9.1/-3.1 | -9.2/-3.3 | -9.0/-3.1 | -9.0/-3.0 |
| CDL-B, 20ns (Cfg. 2) | 10.1/16.9 | 9.5/16.5 | 9.3/16.4 | 9.9/17.1 | 10.3/17.0 |
| CDL-B, 50ns (Cfg. 2) | 10.4/16.7 | 10.1/16.5 | 10.1/17.1 | 11.3/27.9 | 11.3/− |
| CDL-D, 20ns (Cfg. 2) | 3.5/9.4 | 3.0/8.9 | 3.0/8.8 | 3.1/9.1 | 3.2/9.1 |
| CDL-D, 30ns (Cfg. 2) | 3.6/9.4 | 3.2/9.0 | 2.9/9.0 | 3.1/9.0 | 3.2/9.6 |
| 22 | TDL-A, 5ns | 15.8/20.4 | 13.7/17.1 | 13.3/16.5 | 13.4/16.7 | 14.6/16.5 |
| TDL-A, 10ns | 16.6/21.2 | 14.5/17.5 | 13.9/16.6 | 14.4/16.7 | 14.9/16.9 |
| TDL-A, 20ns | 17.0/21.7 | 14.8/17.5 | 14.5/16.8 | 15.9/18.0 | 16.3/17.9 |
| CDL-B, 20ns (Cfg. 1) | 10.4/18.5 | 8.8/16.7 | 8.5/16.4 | 8.7/17.0 | 9.3/17.3 |
| CDL-B, 50ns (Cfg. 1) | 10.7/18.6 | 9.2/16.9 | 8.9/17.3 | 9.4/− | 9.6/− |
| CDL-D, 20ns (Cfg. 1) | -1.9/3.9 | -3.6/2.3 | -3.9/1.9 | -3.9/1.9 | -3.7/2.4 |
| CDL-D, 30ns (Cfg. 1) | -2.1/3.9 | -3.5/2.4 | -3.9/1.9 | -3.9/2.1 | -3.6/2.3 |
| CDL-B, 20ns (Cfg. 2) | 17.1/24.4 | 15.3/22.2 | 15.1/21.9 | 15.4/22.7 | 15.9/22.1 |
| CDL-B, 50ns (Cfg. 2) | 17.4/24.3 | 15.8/22.2 | 15.7/23.2 | 17.7/− | 18.1/− |
| CDL-D, 20ns (Cfg. 2) | 10.1/16.2 | 8.7/14.6 | 8.5/14.8 | 8.6/15.2 | 8.9/15.2 |
| CDL-D, 30ns (Cfg. 2) | 10.3/16.6 | 8.9/15.0 | 8.6/14.8 | 8.7/15.1 | 8.9/15.8 |
| Additional report/notes:   1. CP type: NCP 2. antenna configuration for CDL model: Config 1 and Config 2 3. waveform in case of PUSCH: DFT-s-OFDM 4. PTRS configuration: (Ng=4, Ns=4, L=1) 5. DMRS configuration: 1 DMRS, front loaded 6. any optional or other assumption/parameters used not as in the baseline | | | | | | |

Table B.1.1.3-4: CINR in dB achieving PUSCH iBLER of 10% ∕ 1%: 2 DMRS symbol

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2008615 / Source 3 | 7 | TDL-A, 5ns | 2.2/5.3 | 1.8/5.4 | 1.3/4.0 | 1.5/4.3 | 2.4/5.2 |
| TDL-A, 10ns | 2.5/5.4 | 2.1/5.1 | 1.7/4.3 | 2.0/4.5 | 2.8/5.4 |
| TDL-A, 20ns | 2.8/5.3 | 2.4/4.9 | 1.9/4.0 | 2.4/4.8 | 3.1/5.7 |
| CDL-B, 20ns (Cfg. 1) | -4.7/4.5 | -5.0/4.1 | -5.4/3.7 | -5.3/4.0 | -4.0/4.6 |
| CDL-B, 50ns (Cfg. 1) | -4.2/4.6 | -4.4/4.3 | -4.9/4.0 | -4.4/4.9 | -3.9/6.1 |
| CDL-D, 20ns (Cfg. 1) | -15.4/-9.0 | -15.7/-9.1 | -16.2/-9.6 | -16.0/-9.5 | -15.6/-9.1 |
| CDL-D, 30ns (Cfg. 1) | -15.4/-8.8 | -15.7/-9.0 | -16.3/-9.5 | -16.1/-9.4 | -15.5/-9.0 |
| CDL-B, 20ns (Cfg. 2) | 1.9/10.1 | 1.8/9.5 | 1.1/8.8 | 1.4/9.5 | 2.3/9.9 |
| CDL-B, 50ns (Cfg. 2) | 1.9/9.8 | 2.0/9.4 | 1.5/9.1 | 2.1/10.6 | 2.8/11.6 |
| CDL-D, 20ns (Cfg. 2) | -3.6/3.2 | -3.6/2.6 | -4.3/2.2 | -4.1/2.5 | -3.6/3.2 |
| CDL-D, 30ns (Cfg. 2) | -3.7/3.4 | -3.9/3.2 | -4.4/2.3 | -4.2/2.6 | -3.7/3.3 |
| 16 | TDL-A, 5ns | 8.9/11.9 | 8.0/11.4 | 7.9/10.8 | 8.1/10.9 | 8.7/10.8 |
| TDL-A, 10ns | 9.3/12.0 | 8.6/11.0 | 8.8/10.8 | 8.6/10.9 | 9.0/10.9 |
| TDL-A, 20ns | 9.5/11.7 | 8.9/10.9 | 8.8/10.8 | 9.2/11.3 | 9.6/10.9 |
| CDL-B, 20ns (Cfg. 1) | 3.6/11.6 | 2.9/11.0 | 2.9/10.8 | 2.9/11.1 | 3.1/11.2 |
| CDL-B, 50ns (Cfg. 1) | 3.7/11.7 | 3.2/11.0 | 3.1/11.2 | 3.1/13.9 | 3.3/14.7 |
| CDL-D, 20ns (Cfg. 1) | -8.4/-2.4 | -9.0/-3.0 | -9.1/-3.1 | -9.2/-3.3 | -9.2/-3.1 |
| CDL-D, 30ns (Cfg. 1) | -8.4/-2.4 | -9.0/-2.9 | -9.0/-3.2 | -9.2/-3.2 | -9.2/-3.2 |
| CDL-B, 20ns (Cfg. 2) | 10.2/17.2 | 9.5/16.5 | 9.3/16.2 | 9.4/16.5 | 9.7/16.4 |
| CDL-B, 50ns (Cfg. 2) | 10.4/16.8 | 9.8/16.2 | 10.0/16.7 | 10.5/22.1 | 10.6/23.9 |
| CDL-D, 20ns (Cfg. 2) | 3.6/9.4 | 3.1/8.9 | 3.1/8.9 | 2.9/8.8 | 3.1/9.0 |
| CDL-D, 30ns (Cfg. 2) | 3.8/9.6 | 3.3/8.9 | 3.0/8.9 | 2.9/8.9 | 3.1/9.1 |
| 22 | TDL-A, 5ns | 15.4/18.9 | 13.6/17.1 | 12.9/16.1 | 12.9/16.0 | 14.2/16.4 |
| TDL-A, 10ns | 16.1/19.1 | 14.2/16.9 | 13.7/15.9 | 13.7/16.1 | 14.6/16.5 |
| TDL-A, 20ns | 16.3/19.2 | 14.7/16.8 | 14.0/16.1 | 14.8/17.3 | 15.6/17.2 |
| CDL-B, 20ns (Cfg. 1) | 10.3/18.2 | 8.9/16.7 | 8.2/16.1 | 8.3/16.5 | 9.1/16.8 |
| CDL-B, 50ns (Cfg. 1) | 10.4/18.3 | 9.1/16.7 | 8.6/16.6 | 8.9/− | 9.5/− |
| CDL-D, 20ns (Cfg. 1) | -2.1/3.7 | -3.4/2.5 | -4.1/1.8 | -4.1/1.8 | -3.6/2.4 |
| CDL-D, 30ns (Cfg. 1) | -2.0/3.8 | -3.5/2.5 | -4.1/1.8 | -4.0/1.9 | -3.6/2.4 |
| CDL-B, 20ns (Cfg. 2) | 16.8/23.9 | 15.3/22.1 | 14.8/21.5 | 15.0/22.0 | 15.7/22.5 |
| CDL-B, 50ns (Cfg. 2) | 17.1/23.7 | 15.8/21.9 | 15.2/22.4 | 16.9/− | 17.5/− |
| CDL-D, 20ns (Cfg. 2) | 10.1/16.2 | 8.8/14.7 | 8.3/14.5 | 8.4/14.7 | 9.0/15.0 |
| CDL-D, 30ns (Cfg. 2) | 10.4/16.1 | 9.0/15.2 | 8.4/14.6 | 8.5/14.9 | 9.0/15.6 |
| Additional report/notes:   1. CP type: NCP 2. antenna configuration for CDL model: Config 1 and Config 2 3. waveform in case of PUSCH: DFT-s-OFDM 4. PTRS configuration: (Ng=4, Ns=4, L=1) 5. DMRS configuration: 2 DMRS, (2, 11) 6. any optional or other assumption/parameters used not as in the baseline | | | | | | |

#### B.1.1.4 Source 4 [60]

Table B.1.1.4-1: SINR in dB achieving CP-OFDM PDSCH BLER of 10% /1% for NCP

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007654 / Source 4 | 7 | TDL-A, 5ns | 1.8/  3.6 | 1.8/  3.6 | 1.8/  3.8 | 2.2/  4.2 | 1.5/  2.8 |
| TDL-A, 10ns | 1.7/  2.9 | 1.7/  2.9 | 1.8/  3.1 | 2.9/  4.3 | 2.4/  3.6 |
| TDL-A, 20ns | 1.4/  2.8 | 1.4/  2.8 | 2.4/  3.7 | 4.2/  5.2 | 3.6/  4.4 |
| TDL-A, 40ns | 1.5/  2.6 | 2.4/  3.4 | 3.8/  4.9 | 6.9/  7.8 | 6.5/  7.4 |
| 16 | TDL-A, 5ns | 10.3/  12.2 | 10/  11.7 | 9.9/  11.7 | 10/  11.7 | 9.4/  10.4 |
| TDL-A, 10ns | 10.1/  11.5 | 9.7/  11.2 | 9.7/  11.2 | 10.5/  11.9 | 10.3/  11.2 |
| TDL-A, 20ns | 10/  11.4 | 9.8/  10.9 | 10.5/  11.6 | 11.6/  12.9 | 11.1/  11.8 |
| TDL-A, 40ns | 10/  11.3 | 10.6/  11.7 | 11.5/  12.5 | 14.4/  16.6 | 13.7/  14.9 |
| 22 | TDL-A, 5ns |  | 19.8/ | 16/  18.8 | 15.1/  17.1 | 15.2/  17.3 |
| TDL-A, 10ns |  | 19.9/ | 16/  18.5 | 15.9  17.2 | 16.4/  18.2 |
| TDL-A, 20ns |  | 20/ | 16.8/  19.1 | 17.1/  18.8 | 17.5/  20 |
| TDL-A, 40ns |  | 21/ | 18.2/  21 |  |  |
| Additional report/notes:   1. CP type: NCP 2. Waveform: CP-OFDM waveform for PDSCH 3. PTRS configuration: K=2, L=1 4. DMRS configuration: Type 1 DMRS 5. Precoder: random precoder 6. No TRS, No CSI-RS | | | | | | |

Table B.1.1.4-2: SINR in dB achieving CP-OFDM PDSCH BLER of 10% /1% for ECP

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007654 / Source 4 | 7 | TDL-A, 5ns | 1.9/  3.7 | 1.9/  3.7 | 1.9/  3.9 | 2.4/  4.4 | 1.4/  2.6 |
| TDL-A, 10ns | 1.7/  3.1 | 1.7/  3.1 | 1.9/  3.4 | 3.1/  4.5 | 2.3/  3.5 |
| TDL-A, 20ns | 1.6/  2.9 | 1.7/  2.9 | 2.6/  3.7 | 4.3/  5.4 | 3.5/  4.6 |
| TDL-A, 40ns | 1.6/  2.8 | 2.5/  3.5 | 4/  4.9 | 7/  8 | 6.2/  7 |
| 16 | TDL-A, 5ns | 10.1/  12.2 | 9.9/  11.6 | 9.8/  11.6 | 9.9/  11.6 | 9.3/  10.3 |
| TDL-A, 10ns | 10/  11.5 | 9.6/  11.1 | 9.5/  10.9 | 10.3/  11.7 | 10.3/  12.2 |
| TDL-A, 20ns | 9.7/  11.3 | 9.6/  10.8 | 10.4/  11.3 | 11.4/  12.8 | 11.1/  11.8 |
| TDL-A, 40ns | 9.9/  11.2 | 10.5/  11.5 | 11.3/  12.2 | 13.8/  15.9 | 13.5/  14.5 |
| 22 | TDL-A, 5ns | 23.5/ | 18.5/ | 15.9/  18.5 | 15/  17 | 18.5/ |
| TDL-A, 10ns | 24.5/ | 18.9/ | 15.8/  18.2 | 15.7/  17.1 | 16/  17.8 |
| TDL-A, 20ns | 25/ | 19/ | 16.6/  19 | 16.7/  18.1 | 17/  19 |
| TDL-A, 40ns | 26/ | 19.9/ | 17.8/  20.3 |  |  |
| Additional report/notes:   1. CP type: ECP 2. Waveform: CP-OFDM waveform for PDSCH 3. PTRS configuration: K=2, L=1 4. DMRS configuration: Type 1 DMRS 5. Precoder: random precoder 6. No TRS, No CSI-RS | | | | | | |

Table B.1.1.4-3: SINR in dB achieving DFT-S-OFDM PUSCH BLER of 10% /1% for NCP

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007654 / Source 4 | 7 | TDL-A, 5ns | 5.5/  8.9 | 5.5/  8.5 | 6.4/  9.8 | 6.5/  9.9 | 4.8/  6.7 |
| TDL-A, 10ns | 5.1/  7.8 | 5.1/  7.8 | 6.1/  8.6 | 6.2/  9 | 4.8/  6.4 |
| TDL-A, 20ns | 5/  7 | 5/  7 | 6/  8.4 | 6.3/  8.8 | 4.6/  6.2 |
| TDL-A, 40ns | 5/  6.6 | 5/  6.6 | 6.2/  8.1 | 7.5/  10.1 | 5.4/  7.2 |
| 16 | TDL-A, 5ns | 12.2/  15.7 | 12.2/  15.2 | 12.3/  15.3 | 12.5/  15.7 | 11.5/  13.4 |
| TDL-A, 10ns | 11.8/  14.5 | 11.8/  14.5 | 11.9/  14.4 | 12.3/  15 | 11.5/  13.3 |
| TDL-A, 20ns | 11.7/  14.1 | 11.8/  14.1 | 11.9/  14.2 | 13.8/  15 | 11.9/  13.4 |
| TDL-A, 40ns | 11.8/  13.8 | 12/  13.8 | 12.5/  14.4 | 17/ | 15.5/  22 |
| 22 | TDL-A, 5ns | 18.7/  25 | 18.2/  22 | 17.4/  20.5 | 17.4/  20.7 | 17.3/  20 |
| TDL-A, 10ns | 18.5/  23 | 18.3/  21.7 | 17/  19.7 | 17.5/  20 | 17.8/  20.3 |
| TDL-A, 20ns | 19.5/ | 19.4/ | 17.2/  19.5 | 18.5/  21.5 | 19/  22.7 |
| TDL-A, 40ns | 20.4/ | 20.6/ | 18.4/  21.1 |  |  |
| Additional report/notes:   1. CP type: NCP 2. Waveform: DFT-S-OFDM waveform for PUSCH 3. PTRS configuration:  * 400MHz: SCS120: chunk5; SCS240: chunk4; SCS480: chunk3; SCS960: chunk1 * 2GHz: SCS480: chunk5; SCS960: chunk4   (chunk1: 2\*2, chunk2: 2\*4, chunk3: 4\*2, chunk4: 4\*4, chunk5: 8\*4);  occupy symbol index: 2-13   1. DMRS configuration: Type 1 DMRS 2. Precoder: random precoder 3. No TRS, No CSI-RS | | | | | | |

Table B.1.1.4-4: SINR in dB achieving DFT-S-OFDM PUSCH BLER of 10% /1% for ECP

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007654 / Source 4 | 7 | TDL-A, 5ns | 5.1/  8.6 | 5.2/  8.3 | 6.1/  9.1 | 6.6/  9.8 | 4.7/  6.8 |
| TDL-A, 10ns | 5/  7.5 | 5/  7.4 | 5.9/  8.3 | 6.1/  9 | 4.8/  6.5 |
| TDL-A, 20ns | 4.8/  6.9 | 4.8/  6.8 | 5.6/  7.9 | 6.5/  8.8 | 4.5/  6.1 |
| TDL-A, 40ns | 4.8/  6.5 | 4.8/  6.5 | 5.9/  7.7 | 7.3/  9.9 | 5.3/  7 |
| 16 | TDL-A, 5ns | 12/  15.4 | 12/  15.2 | 12.1/  15.2 | 12.3/  15.6 | 11.3/  13.5 |
| TDL-A, 10ns | 11.7/  14.4 | 11.7/  14.4 | 11.9/  14.4 | 12.3/  14.9 | 11.5/  13.2 |
| TDL-A, 20ns | 11.6/  13.8 | 11.7/  13.9 | 11.9/  14 | 12.7/  14.9 | 11.6/  13.3 |
| TDL-A, 40ns | 11.5/  13.5 | 11.8/  13.6 | 12.3/  14.3 | 16.8/  25 | 14.1/  17.5 |
| 22 | TDL-A, 5ns | 18.4/  24 | 18/  21.7 | 17.3/  20.4 | 17.4/  20.6 | 17.5/  20.3 |
| TDL-A, 10ns | 18/  22.5 | 18/  21.3 | 17/  19.6 | 17.3/  20 | 18/  20.9 |
| TDL-A, 20ns | 19/  25 | 19/ | 17.1/  19.4 | 18.1/  21 | 18.5/  22.3 |
| TDL-A, 40ns | 19.5/ | 20.2/ | 18/  20.5 |  |  |
| Additional report/notes:   1. CP type: ECP 2. Waveform: DFT-S-OFDM waveform for PUSCH 3. PTRS configuration:  * 400MHz: SCS120: chunk5; SCS240: chunk4; SCS480: chunk3; SCS960: chunk1 * 2GHz: SCS960: chunk4   (chunk1:2\*2, chunk2:2\*4, chunk3:4\*2, chunk4:4\*4, chunk5:8\*4);  occupy symbol index: 2-11   1. DMRS configuration: Type 1 DMRS 2. Precoder: random precoder 3. No TRS, No CSI-RS | | | | | | |

#### B.1.1.5 Source 5 [64]

Table B.1.1.5-1: SINR in dB achieving PDSCH BLER of 10% /1%（with PN & CPE compensation）

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz |
| R1-2009450/ Source 5 | 7 | TDL-A, 5ns | 7.5/13.4 | 7.1/13.5 | 6.7/12.5 | 6.6/12 |
| TDL-A, 10ns | 5.2/11.4 | 5.0/10.9 | 5.6/10.0 | 5.5/9.6 |
| TDL-A, 20ns | 5.8/9.7 | 4.8/10.6 | 4.6/10.2 | 4.5/10.2 |
| CDL-B, 20ns | 8.2/10.6 | 8.0/10.3 | 7.7/9.5 | 7.7/9.4 |
| CDL-B, 50ns | 8.0/10.7 | 7.8/10.5 | 7.7/10.3 | 7.6/9.5 |
| 16 | TDL-A, 5ns | 17.1/28.8 | 14.6/23.5 | 14.8/22.3 | 14.7/21.7 |
| TDL-A, 10ns | 17.2/- | 14.8/23.5 | 15.5/23.1 | 15.5/22.6 |
| TDL-A, 20ns | 18.8/- | 16.1/26.1 | 16.4/24.9 | 16.4/24.6 |
| CDL-B, 20ns | 17.9/22.4 | 16.2/19.2 | 16.3/18.5 | 16.8/19.0 |
| CDL-B, 50ns | 17.6/21.4 | 16.3/18.4 | 16.6/18.8 | 16.8/18.9 |
| 22 | TDL-A, 5ns | -/- | -/- | 21.6/30.2 | 20.4/27.4 |
| TDL-A, 10ns | -/- | -/- | 22.5/32.2 | 21.0/28.5 |
| TDL-A, 20ns | -/- | 31.1/- | 24.2/- | 22.7/31.7 |
| CDL-B, 20ns | -/- | 25.8/- | 21.9/25.3 | 21.1/23.5 |
| CDL-B, 50ns | -/- | 25.0/30.7 | 22.1/24.8 | 21.9/23.9 |
| Additional report/notes:   1. CP type: Normal CP 2. antenna configuration for CDL model: Config.1 3. waveform in case of PUSCH: CP-OFDM 4. PTRS configuration: (K=2, L=1) 5. DMRS configuration: 2 DMRS (2,11) 6. any optional or other assumption/parameters used not as in the baseline:   Actual transmission RB number is 8/4/2/1 for SCS 120kHz/240kHz/480kHz/960kHz | | | | | |

Table B.1.1.5-2: SINR in dB achieving PDSCH BLER of 10% /1%（without PN）

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz |
| R1-2009450/ Source 5 | 7 | CDL-B, 20ns | 7.7/9.2 | 7.4/9.0 | 7.4/9.0 | 7.4/9.0 |
| 16 | TDL-A, 5ns | 12.0/16.6 | 11.5/16.4 | 11.6/16.1 | 11.6/16.3 |
| CDL-B, 20ns | 14.5/15.7 | 14.4/15.7 | 14.3/15.6 | 14.3/15.6 |
| 22 | TDL-A, 5ns | 16.4/21.0 | 16.2/20.8 | 16.1/21.0 | 16.3/21.1 |
| CDL-B, 20ns | 18.4/20.2 | 18.2/19.5 | 18.2/19.5 | 18.2/19.5 |
| Additional report/notes:   1. CP type: Normal CP 2. antenna configuration for CDL model: Config.1 3. waveform in case of PUSCH: CP-OFDM 4. PTRS configuration: (K=2, L=1) 5. DMRS configuration: 2 DMRS (2,11) 6. any optional or other assumption/parameters used not as in the baseline:   Actual transmission RB number is 8/4/2/1 for SCS 120kHz/240kHz/480kHz/960kHz  Note: This table is for calibration only. | | | | | |

Table B.1.1.5-3: SINR in dB achieving PUSCH BLER of 10% /1%（with PN & PN compensation）

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz |
| R1-2009450/ Source 5 | 7 | TDL-A, 5ns | 4.2/7.8 | 3.8/7.6 | 4.6/8 | 4.6/8.5 |
| TDL-A, 10ns | 3.6/6 | 3.9/7.4 | 4/7.3 | 4.4/7.7 |
| 16 | TDL-A, 5ns | 13.3/17.3 | 12.6/16.6 | 13/16.9 | 13.1/17.3 |
| TDL-A, 10ns | 12.8/16 | 12.7/16.4 | 12.8/16.4 | 12.9/16.2 |
| 22 | TDL-A, 5ns | 19.8/25.4 | 18.5/23.2 | 18.2/22.8 | 18.3/22.4 |
| TDL-A, 10ns | 20.5/27.9 | 19.4/24.8 | 18.7/24.2 | 18.7/23 |
| Additional report/notes:   1. CP type: Normal CP 2. waveform in case of PUSCH: DFT-S-OFDM 3. PTRS configuration: (Ng = 8, Ns = 4, L = 1) 4. DMRS configuration: 2 DMRS (2,11) 5. any optional or other assumption/parameters used not as in the baseline:   Actual transmission RB number is 48/24/12/6 for SCS 120kHz/240kHz/480kHz/960kHz | | | | | |

#### B.1.1.6 Source 6 [68]

Table B.1.1.6-1: SNR in dB achieving PDSCH BLER of 10% or 1% with CPE compensation for PN model set 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz |
| R1-2009615 / Source 6 | 7 | TDL-A, 5ns | 2.96/ 5.1 | 2.77/ 4.8 | 3/ 5.14 | 3.4/ 5.7 |
| TDL-A, 10ns | 2.6/ 4.6 | 2.5/ 4.4 | 2.9/ 4.8 | 3.3/ 5.56 |
| TDL-A, 20ns | 2.5/ 4.5 | 2.5/ 4.4 | 3 /4.8 | 3.5/ 5.35 |
| CDL-B, 20ns | -21.7/ -19.1 | -21.8/ -19.1 | -21.7/ -18.6 | -21.6/ -19 |
| CDL-B, 50ns | -22.2/ -19.5 | -22.1/ -19.5 | -21.9/ -19.5 | -21.8/ -19 |
| 16 | TDL-A, 5ns | 11.9/ 14.4 | 11.2/ 13.6 | 11/ 13.1 | 11/ 13.3 |
| TDL-A, 10ns | 11.7/14.1 | 11/ 13.2 | 10.9/12.8 | 11.1/ 13 |
| TDL-A, 20ns | 11.5/ 13.5 | 11/ 12.8 | 10.9/12.5 | 11.5/ 13.5 |
| CDL-B, 20ns | -12.8/ -9.56 | -13.4/ -10 | -13.7/ -11.1 | -13.9/ -10.7 |
| CDL-B, 50ns | -13.2/ -10.2 | -13.5/ -10.8 | -14.1/ -11.4 | -14.0/ -11.3 |
| 22 | TDL-A, 5ns | inf | inf | 19.8/ inf | 17.3/ 19.7 |
| TDL-A, 10ns | inf | inf | 20/ inf | 17.3/ 19.7 |
| TDL-A, 20ns | inf | inf | 20.2/ inf | 19.1/ 22.3 |
| CDL-B, 20ns | inf | inf | -4/inf | -7.4/-4.1 |
| CDL-B, 50ns | inf | inf | -4.3/ inf | -7.8/-4.6 |
| Additional report/notes:   1. PN model set 1: BS: Ex2 BS and UE: Ex2 UE 2. CPE compensation 3. Normal CP 4. antenna configuration for CDL model   Configuration 1:  - (Mg,Ng,M,N,P) = (1,1,8,16,2) BS with (0.5 dv, 0.5 dH)  - (Mg,Ng,M,N,P) = (1,1,4,4,2) UE with (0.5 dv, 0.5 dH)   1. PTRS: K=4, L=1 2. DMRS configuration: 1 DMRS symbol at (2) 3. No TRS, No CSI-RS | | | | | | |

Table B.1.1.6-2: SNR in dB achieving PDSCH BLER of 10% or 1% with ICI compensation for PN model set 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz |
| R1-2009615 / Source 6 | 22 | TDL-A, 5ns | inf | 18.2/ 21.4 | 18.1/20.4 | 19.8/ 22.4 |
| TDL-A, 10ns | inf | 18.1/ 20.8 | 18.1/20.3 | 19.1/ 21.5 |
| TDL-A, 20ns | inf | 18/ 20.5 | 18.3/ 20.3 | 22.8/ - |
| CDL-B, 20ns | inf | -6.6/ -3.2 | -6.6 / -3.2 | -5.1/ -1.7 |
| CDL-B, 50ns | inf | -6.7/ -3.2 | -6.8/ -3.9 | -5.2/ -1.9 |
| Additional report/notes:   1. PN model set 1: BS: Ex2 BS and UE: Ex2 UE 2. ICI compensation with 3 taps 3. Normal CP 4. antenna configuration for CDL model   Configuration 1:  - (Mg,Ng,M,N,P) = (1,1,8,16,2) BS with (0.5 dv, 0.5 dH)  - (Mg,Ng,M,N,P) = (1,1,4,4,2) UE with (0.5 dv, 0.5 dH)   1. PTRS: K=4, L=1 2. DMRS configuration: 1 DMRS symbol at (2) 3. No TRS, No CSI-RS | | | | | | |

Table B.1.1.6-3: SNR in dB achieving PUSCH BLER of 10% or 1% with CPE compensation for PN model set 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz |
| R1-2009615 / Source 6 | 7 | TDL-A, 5ns | 7.7/ 10.8 | 7.43/10.6 | 7.7/ 10.25 | 7.8/ 10.3 |
| TDL-A, 10ns | 7.6/ 10.1 | 7.54/9.9 | 7.68/10.26 | 7.8/ 10.6 |
| TDL-A, 20ns | 7.5/ 9.7 | 7.4/ 9.56 | 7.8/ 9.7 | 8.2/ 10.4 |
| CDL-B, 20ns | -16.9/ -13.1 | -16.9/ -13.2 | -16.9/ -13.1 | -16.9/ -13.6 |
| CDL-B, 50ns | -17 /-14 | -17.3/ -14.3 | -17 / -13.7 | -17 / -14.2 |
| 16 | TDL-A, 5ns | 16.7/ 20.5 | 15.7/ 18.5 | 15.3/18.4 | 15.5/ 18.2 |
| TDL-A, 10ns | 16.6/20 | 15.7/18.3 | 15.4/ 18.1 | 15.6/ 18.3 |
| TDL-A, 20ns | 17/ 20.7 | 15.8/ 18.1 | 15.6/ 18 | 16.2/18.8 |
| CDL-B, 20ns | -8 /-4.3 | -9/-4.7 | -9.3/ -5 | -9/ -5.66 |
| CDL-B, 50ns | -8 /-4.9 | -8.84/ -5.66 | -9.4/ -6.2 | -9.2/ -5.7 |
| 22 | TDL-A, 5ns | inf | inf | 26.3/Inf | 22.8/26.2 |
| TDL-A, 10ns | inf | inf | 27/ Inf | 23.3/26 |
| TDL-A, 20ns | inf | inf | 28/- | 27.2/Inf |
| CDL-B, 20ns | inf | inf | 1.1/Inf | -1.9/ 1.76 |
| CDL-B, 50ns | inf | inf | 1.8/Inf | -1.65/ 1.7 |
| Additional report/notes:   1. PN model set 1: BS: Ex2 BS and UE: Ex2 UE 2. CPE compensation 3. Normal CP 4. antenna configuration for CDL model   Configuration 1:  - (Mg,Ng,M,N,P) = (1,1,8,16,2) BS with (0.5 dv, 0.5 dH)  - (Mg,Ng,M,N,P) = (1,1,4,4,2) UE with (0.5 dv, 0.5 dH)   1. PTRS: K=4, L=1 2. DMRS configuration: 1 DMRS symbol at (2) 3. No TRS, No CSI-RS | | | | | | |

#### B.1.1.7 Source 7 [62]

Table B.1.1.7-1: SINR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007928 / Source 7 | 7 | TDL-A, 5ns | 3.2/ 6 | 3.1/5.6 | 3.1/5.8 | 3.2/5.4 | 1.9/3.4 |
| TDL-A, 10ns | 2.7/4.7 | 2.6/4.7 | 2.6/4.6 | 2.6/4.9 | 2/3.2 |
| TDL-A, 20ns | 2.3/4.2 | 2.3/4.1 | 2.4/4.2 | 2.6/4.5 | 1.8/3.1 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 11.9/14.6 | 11.4/14 | 11/13.3 | 10.9/13.4 | 9.9/11.4 |
| TDL-A, 10ns | 11.2/13.4 | 10.7/13 | 10.3/12.2 | 10.3/12.5 | 9.8/11.2 |
| TDL-A, 20ns | 11.1/13.3 | 10.4/12.1 | 10.1/11.9 | 10.4/12.5 | 9.9/11.5 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | inf/inf | inf/inf | 17.5/20.9 | 16.2/18.6 | 16.2/19.0 |
| TDL-A, 10ns | inf/inf | inf/inf | 17.1/20.7 | 16.1/18.2 | 16.1/18.2 |
| TDL-A, 20ns | inf/inf | inf/inf | 16.8/19.3 | 16.1/17.9 | 16.3/18.8 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| Additional report/notes:   1. CP type normal 2. antenna configuration for CDL model 3. waveform in case of PUSCH 4. PTRS configuration every 2nd RB (CPE compensation) 5. DMRS configuration front-loaded 6. any optional or other assumption/parameters used not as in the baseline | | | | | | |

Table B.1.1.7-2: SINR in dB achieving PDSCH BLER of 10% /1% with ICI u=1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz  /400MHz | 240KHz  /400MHz | 480KHz  /400MHz | 960KHz  /400MHz | 960KHz  /2GHz |
| R1-2007928 / Source 7 | 7 | TDL-A, 5ns | 3.3/ 5.8 | 3.3/6.1 | 3.7/6.4 | 4.4/7.3 | 2.2/3.8 |
| TDL-A, 10ns | 2.6/4.5 | 2.7/5.1 | 3.3/5.7 | 4.0/6.2 | 2.2/3.8 |
| TDL-A, 20ns | 2.4/4.2 | 2.5/4.4 | 2.9/5.3 | 3.9/6.4 | 2.1/3.4 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 11.2/14.1 | 11.1/13.2 | 11.1/13.4 | 11.4/13.9 | 9.9/11.7 |
| TDL-A, 10ns | 10.6/13.0 | 10.3/12.4 | 10.4/12.1 | 11.0/13.0 | 9.8/11.5 |
| TDL-A, 20ns | 10.1/12.3 | 9.9/11.8 | 10.1/12.0 | 11.1/13.3 | 9.7/11.2 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | 19.9/inf | 16.9/19.9 | 16.4/18.6 | 16.5/19.0 | 15.1/ 16.8 |
| TDL-A, 10ns | 19.3/inf | 16.4/18.7 | 16.0/17.9 | 16.2/18.5 | 15.2/16.9 |
| TDL-A, 20ns | 19.0/inf | 16.1/17.9 | 15.6/17.7 | 16.3/18.4 | 15.0/16.7 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| Additional report/notes:   1. CP type normal 2. antenna configuration for CDL model 3. waveform in case of PUSCH 4. PTRS configuration every 2nd RB (ICI compensation,u=1) 5. DMRS configuration front-loaded 6. any optional or other assumption/parameters used not as in the baseline | | | | | | |

Table B.1.1.7-3: SINR in dB achieving PDSCH BLER of 10% /1% with ICI u=2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz  /400MHz | 240KHz  /400MHz | 480KHz  /400MHz | 960KHz  /400MHz | 960KHz  /2GHz |
| R1-2007928 / Source 7 | 7 | TDL-A, 5ns | 3.4/ 6.0 | 3.5/6.2 | 4.3/7.0 | 5.3/8.3 | 2.4/4.2 |
| TDL-A, 10ns | 2.7/5.0 | 3.1/5.2 | 3.7/6.1 | 5.0/7.6 | 2.3/3.8 |
| TDL-A, 20ns | 2.5/4.5 | 2.8/4.8 | 3.7/5.6 | 4.9/8.1 | 2.3/4.0 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 11.0/13.7 | 11.1/13.6 | 11.3/14.0 | 12.2/15.4 | 10.1/11.9 |
| TDL-A, 10ns | 10.2/12.7 | 10.7/13.1 | 10.8/13.1 | 11.8/14.2 | 10.0/11.9 |
| TDL-A, 20ns | 10.1/12.2 | 10.1/12.2 | 10.6/12.4 | 11.7/14.1 | 9.8/11.4 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | 18.1/21.7 | 16.6/19.4 | 16.4/18.8 | 17.1/20.0 | 15.1/17.3 |
| TDL-A, 10ns | 17.4/20.5 | 16.3/18.6 | 16.1/18.3 | 16.6/19.1 | 15.2/16.8 |
| TDL-A, 20ns | 17.1/19.8 | 15.9/17.5 | 16.0/17.8 | 16.9/19.3 | 15.1/16.7 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| Additional report/notes:   1. CP type normal 2. antenna configuration for CDL model 3. waveform in case of PUSCH 4. PTRS configuration every 2nd RB (ICI compensation,u=2) 5. DMRS configuration front-loaded 6. any optional or other assumption/parameters used not as in the baseline | | | | | | |

Table B.1.1.7-4: SINR in dB achieving PDSCH BLER of 10% /1% with ICI u=3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz  /400MHz | 240KHz  /400MHz | 480KHz  /400MHz | 960KHz  /400MHz | 960KHz  /2GHz |
| R1-2007928 / Source 7 | 7 | TDL-A, 5ns | 3.6/6.1 | 3.9/6.5 | 4.8/7.6 | 6.5/9.7 | 2.6/4.5 |
| TDL-A, 10ns | 2.9/5.1 | 3.2/5.2 | 4.3/6.8 | 6.2/8.8 | 2.6/4.4 |
| TDL-A, 20ns | 2.6/4.5 | 3.1/5.0 | 4.0/6.2 | 6.2/9.1 | 2.5/4.2 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 11.2/13.9 | 11.0/14.3 | 11.6/14.1 | 13.1/16.1 | 10.2/12.2 |
| TDL-A, 10ns | 10.4/12.8 | 10.5/13.3 | 11.2/13.6 | 12.9/15.5 | 10.1/11.8 |
| TDL-A, 20ns | 10.0/12.1 | 10.3/12.4 | 11.0/13.0 | 12.9/15.7 | 10.0/11.6 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | 17.5/21.6 | 16.6/19.5 | 16.8/19.5 | 18.2/21.0 | 15.2/16.7 |
| TDL-A, 10ns | 17.1/19.8 | 16.2/18.1 | 16.4/18.5 | 17.6/20.3 | 15.3/16.9 |
| TDL-A, 20ns | 16.7/19.1 | 15.9/17.5 | 16.2/18.3 | 18.2/21.0 | 15.2/16.9 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| Additional report/notes:   1. CP type normal 2. antenna configuration for CDL model 3. waveform in case of PUSCH 4. PTRS configuration every 2nd RB (ICI compensation,u=3) 5. DMRS configuration front-loaded 6. any optional or other assumption/parameters used not as in the baseline | | | | | | |

#### B.1.1.8 Source 8 [59]

Table B.1.1.8-1: SNR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007560 / Source 8 | 7 | TDL-A, 5ns | 3/ 5.2 | 3.2/ 5.17 | 3.2/5.22 | 3.7/5.9 | 2.4/ 3.9 |
| TDL-A, 10ns | 2.6/ 4.5 | 2.7/ 4.7 | 2.7/ 4.7 | 3.5/5.5 | 2.4/ 3.9 |
| TDL-A, 20ns | 2.4/ 3.9 | 2.6/ 4.1 | 3.1/ 4.5 | 4/ 5.9 | 2.4/ 3.8 |
| TDL-A, 40ns | 2.4/3.9 | 2.6/4.4 | 3.8/5.4 | 5.1/7 |  |
| CDL-B, 20ns | 4.9/5.9 | 5.2/6.1 | 6/6.8 | 5.2/6.2 | 5/6.2 |
| CDL-B, 50ns | 5.1/7 | 5.3/6.8 | 7/8.3 | 7.8/8.9 | 7.5/8.7 |
| 16 | TDL-A, 5ns | 11.2/ 14.4 | 11.2/ 14.2 | 10.9/ 13.5 | 11 /13.8 | 10.9/ 12.8 |
| TDL-A, 10ns | 10.8/ 13 | 10.8/ 13 | 10.5/ 12.5 | 11/13.7 | 10.9/ 12.9 |
| TDL-A, 20ns | 10.7/ 12.6 | 10.7/ 12.6 | 10.7/ 12.6 | 11.5/ 13.8 | 10.5/ 12.3 |
| TDL-A, 40ns | 10.8/12.7 | 10.9/12.8 | 11/12.8 | 13/15.1 |  |
| CDL-B, 20ns | 13/14.5 | 12.3/12.9 | 13.1/13.8 | 12/12.7 | 12.3/13.2 |
| CDL-B, 50ns | 13.2/14.5 | 13.7/15.5 | 14.7/15.6 | 18/19.7 | 18.1/20.9 |
| 22 | TDL-A, 5ns | 27/ -  *\*Note* | 20/-  *\*Note* | 18/33 | 17.8 / 26.8 | 24/-  *\*Note* |
| TDL-A, 10ns | -/-  *\*Note* | 25.2/-  *\*Note* | 19.1/-  *\*Note* | 18.5/ 33 | -/-  *\*Note* |
| TDL-A, 20ns | -/-  *\*Note* | -/-  *\*Note* | 23.5/-  *\*Note* | 20/-  *\*Note* | -/-  *\*Note* |
| TDL-A, 40ns | -/-  *\*Note* | -/-  *\*Note* | 27/-  *\*Note* | -/-  *\*Note* |  |
| ***TDL-A, 40ns (ECP)*** | ***-/-***  *\*Note* | ***-/-***  *\*Note* | ***24/-***  *\*Note* | ***22.5/-***  *\*Note* |  |
| CDL-B, 20ns | -/-  *\*Note* | -/-  *\*Note* | 21.2/25.8 | 17.4/18.4 | 19.3/21.8 |
| CDL-B, 50ns | -/-  *\*Note* | -/ -  *\*Note* | -/-  *\*Note* | -/-  *\*Note* | -/-  *\*Note* |
| ***CDL-B, 50ns (ECP)*** |  |  | ***21.4/26.1*** | ***19.1/21.4*** | ***21.4/25.3*** |
| Additional report/notes:   1. CP type: NCP (all), ECP (TDL-A 40ns, CDL-B 50ns) 2. antenna configuration for CDL model: Configuration 2   (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. waveform in case of PUSCH: NA 2. PTRS configuration: L=1, K=4 3. DMRS configuration: Type 1, front loaded, no data multiplexing 4. any optional or other assumption/parameters used not as in the baseline   -PN model: Example 2 from 38.803 phase noise model (gNB, UE) scaled to 60 GHz  -CPE compensation  -No TRS, no CSI-RS  *\*Note: The values are missing since the required SNR for 10%/1% BLER is either very high or the BLER target is not reachable due to error floor*. | | | | | | |

#### B.1.1.9 Source 9 [25]

Table B.1.1.9-1: LLS template: SINR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /400MHz (ICI) |
| R1-2008457 / Source 9 | 7 | TDL-A, 5ns | 0/2 | 0/2.25 | 0.25/2.75 | 0.25/2.75 |  |
| TDL-A, 10ns | 0.25/2.25 | 0/2 | 0.25/2 | 0.75/2.75 |  |
| TDL-A, 20ns | 0.5/2.25 | 0.5/2.25 | 0.75/2.5 | 1.25/5 |  |
| 16 | TDL-A, 5ns | 9.25/12 | 8.75/11.25 | 8.25/10.5 | 8.25/10.75 |  |
| TDL-A, 10ns | 9.5/12 | 8.75/11.5 | 9.25/12 | 8.75/11 |  |
| TDL-A, 20ns | 9.5/11.5 | 9.25/11.25 | 9/10.75 | 11/17 |  |
| 22 | TDL-A, 5ns | Inf/Inf | 28/Inf | 15.5/22 | 14.25/16.75 | 14.5/16.75 |
| TDL-A, 10ns | Inf/Inf | Inf/Inf | 16.5/22 | 17/22 | 14.5/17 |
| TDL-A, 20ns | Inf/Inf | 23.5/Inf | 20/[29] | Inf/ Inf | 17/ [24] |
| Additional report/notes:   1. CP type : Normal 2. antenna configuration for CDL model : N/A 3. waveform in case of PDSCH : CP-OFDM 4. PTRS configuration :    1. CPE Estimation: (K = 2, L = 1)    2. ICI Estimation: (K = 2 every 4 RBs, L = 1) 5. DMRS configuration : 2 DMRS symbols at (2,11) 6. the higher layer parameter 7. Antenna Configuration : 2 x 2 8. Numbers in brackets are extrapolated estimates | | | | | | |

Table B.1.1.9-2: SINR in dB achieving PUSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /400MHz (ICI) |
| R1-2008457 / Source 9 | 7 | TDL-A, 5ns | 1.25 / 3.75 | 0.75 / 2.75 | 0.75 / 2.5 | 0.75 / 2.5 |  |
| TDL-A, 10ns | 1.4 / 3.25 | 1 / 3 | 1 / 2.75 | 1.8 / 3 |  |
| TDL-A, 20ns | 1.5 / 4 | 1.25 / 4 | 2 / 4 | 2.5 / 6 |  |
| 16 | TDL-A, 5ns | 9.5 / 12.5 | 8.75 / 11.5 | 8.75 / 11.5 | 8.75 / 11 |  |
| TDL-A, 10ns | 9.75 / 12.25 | 9 / 11.25 | 9.25 / 10.75 | 9.5 / 12.25 |  |
| TDL-A, 20ns | 10 / 12.5 | 9.5 /11.5 | 10 /12.5 | [27] /Inf |  |
| 22 | TDL-A, 5ns | [22.5] / Inf | 14.75 /1 8.25 | 14.5/17.25 | 14/17 |  |
| TDL-A, 10ns | Inf / Inf | 15 / 18.5 | 16 / 18 | 20.5 / 22.5 |  |
| TDL-A, 20ns | 23 / Inf | 15.5 / 19 | 21 / Inf | Inf / Inf |  |
| Additional report/notes:   1. CP type : Normal 2. antenna configuration for CDL model : N/A 3. waveform in case of PDSCH : DFT-S-OFDM 4. PTRS configuration : DFT-S-OFDM: (Ng = 8, Ns = 4, L = 1) 5. DMRS configuration : 2 DMRS symbols at (2,11) 6. the higher layer parameter 7. Antenna Configuration : 2 x 2 8. Numbers in brackets are extrapolated estimates | | | | | | |

#### B.1.1.10 Source 10 [67]

Table B.1.1.10-1: SINR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2008873 / Source 10 | 7 | TDL-A, 5ns | 4.53/6.89 | 4.66/7.24 | 5.75/8.32 | 6.24/8.47 | 2.65/4.08 |
| TDL-A, 10ns | 2.79/5.42 | 2.95/5.76 | 3.99/6.06 | 4.40/6.97 | 2.51/4.27 |
| TDL-A, 20ns | 2.83/4.91 | 3.27/5.49 | 4.01/5.95 | 4.47/6.67 | 3.00/3.88 |
| 16 | TDL-A, 5ns | 11.77/14.46 | 11.09/13.69 | 11.70/13.55 | 12.18/13.90 | 9.85/12.34 |
| TDL-A, 10ns | 11.41/13.08 | 10.18/12.74 | 10.38/12.27 | 10.67/12.55 | 10.13/11.61 |
| TDL-A, 20ns | 10.99/12.40 | 10.10/12.19 | 10.21/12.39 | 11.16/13.19 | 10.24/10.96 |
| 22 | TDL-A, 5ns | 23.44/NaN | 19.39/NaN | 17.81/20.81 | 17.15/21.12 | 15.73/19.37 |
| TDL-A, 10ns | 23.72/NaN | 18.27/NaN | 16.74/19.62 | 16.11/17.74 | 15.87/18.84 |
| TDL-A, 20ns | 24.28/NaN | 18.83/NaN | 16.62/19.39 | 16.41/18.28 | 16.65/19.02 |
| Additional report/notes:   1. Normal CP 2. CPE compensation only 3. PTRS configuration: symbol 3-13, K=4, L=1 4. DMRS configuration: symbol 2 5. NaN in the table refers to a large SINR value exceeding the range of interest (i.e., >25 dB) | | | | | | |

Table B.1.1.10-2: SINR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz  New pattern  No comp | 120KHz /400MHz  New pattern  CPE comp | 120KHz /400MHz  New pattern  ICI comp | 120KHz /400MHz  R15 pattern  CPE comp |
| R1-2008873 / Source 10 | 22 | TDL-A, 5ns | NaN/NaN | 22.71/NaN | 18.79/22.05 | 23.45/NaN |
| TDL-A, 10ns | NaN/NaN | 22.68/NaN | 17.65/21.49 | 23.81/NaN |
| Additional report/notes:   1. Normal CP 2. PTRS configuration: Rel-15 pattern: K=4, L=1; new pattern: 1 RB in 50 RB chunk 3. DMRS configuration: symbol 2 4. NaN in the table refers to a large SINR value exceeding the range of interest (i.e., >25 dB) | | | | | |

Table B.1.1.10-3: SINR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 240KHz /400MHz  New pattern  No comp | 240KHz /400MHz  New pattern  CPE comp | 240KHz /400MHz  New pattern  ICI comp | 240KHz /400MHz  R15 pattern  CPE comp |
| R1-2008873 / Source 10 | 22 | TDL-A, 5ns | NaN/NaN | 19.25/NaN | 17.11/19.98 | 19.41/NaN |
| TDL-A, 10ns | NaN/NaN | 18.76/NaN | 16.20/19.16 | 18.29/NaN |
| Additional report/notes:   1. Normal CP 2. PTRS configuration: Rel-15 pattern: K=4, L=1; new pattern: 1 RB in 50 RB chunk 3. DMRS configuration: symbol 2 4. NaN in the table refers to a large SINR value exceeding the range of interest (i.e., >25 dB) | | | | | |

#### B.1.1.11 Source 11 [27]

Table B.1.1.11-1: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2008501/ Source 11 | 7 | TDL-A, 5ns | <6.0/6.5 |  |  | 6.0/8.0 |  |
| TDL-A, 10ns | <6.0/<6.0 |  |  | <6.0/7.5 |  |
| TDL-A, 20ns | <6.0/<6.0 |  |  | 6.0/7.5 |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 14.0/16.5 |  |  | 14.5/17.0 |  |
| TDL-A, 10ns | 13.5/15.5 |  |  | 14.5/16.5 |  |
| TDL-A, 20ns | 13.0/15.0 |  |  | 14.5/16.5 |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | 23.0/29.0 |  |  | 20.0/22.5 |  |
| TDL-A, 10ns | 23.0/29.5 |  |  | 19.5/22.5 |  |
| TDL-A, 20ns | 23.0/30.0 |  |  | 21.5/25.0 |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| Additional report/notes:   1. CP type: Normal 2. Channel: TDL 2 x 2 3. PN Model: TR38.803 Example 2 UE profile. 4. PDSCH SLIV: S=2, L=12 5. Transmission rank: 1 (wideband, fixed precoding) 6. PTRS configuration: K=4, L=1 7. DMRS configuration: single DMRS symbol (front loaded) 8. Additional Notes:    1. A 3-tap ICI equalizer is assumed at the receiver side.    2. The SNR is defined per RX antenna (i.e., pre-combining)    3. SNR simulation range from 6dB to 30dB | | | | | | |

#### B.1.1.12 Source 12 [5]

Table B.1.1.12-1: SNR in dB achieving PDSCH BLER of 10% or 1% with ICI Compensation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007549 / Source 12 | 7 | TDL-A, 5ns | 1.5 / 4.1 | 1.6 / 4.3 | 1.6 / 4.0 | 1.5 / 4.0 | -/- |
| TDL-A, 10ns | 1.0 / 3.2 | 1.0 / 3.2 | 1.2 / 3.4 | 1.2 / 3.3 | -/- |
| TDL-A, 20ns | 0.4 / 2.1 | 0.5 / 2.2 | 1.0 / 1.6 | 1.0 / 1.6 | -/- |
| CDL-B, 20ns | -/- | -/- | -/- | -/- | -/- |
| CDL-B, 50ns | -/- | -/- | -/- | -/- | -/- |
| CDL-D, 20ns | -/- | -/- | -/- | -/- | -/- |
| CDL-D, 30ns | -/- | -/- | -/- | -/- | -/- |
| 16 | TDL-A, 5ns | 10.0/12.2 | 9.9/12.1 | 9.8/12.1 | 9.5/11.9 | -/- |
| TDL-A, 10ns | 9.4/11.6 | 9.3/11.6 | 9.3/11.7 | 9.3/11.7 | -/- |
| TDL-A, 20ns | 9.0/10.8 | 9.1/10.5 | 9.5/11.5 | 10.2/13.2 | 10.2/12.4 |
| TDL-A, 40ns | 8.7/10.0 | 9.5/11.1 | 10.7/12.6 | 9.4/11.0  ECP | -/- |
| CDL-B, 20ns | -/- | -/- | -/- | -/- | -/- |
| CDL-B, 50ns | -/- | -/- | -/- | -/- | -/- |
| CDL-D, 20ns | -/- | -/- | -/- | -/- | -/- |
| CDL-D, 30ns | -/- | -/- | -/- | -/- | -/- |
| 22 | TDL-A, 5ns | 16.2/19.0 | 15.8/18.1 | 15.5/17.8 | 16.0/19.3 | -/- |
| TDL-A, 10ns | 15.7/17.9 | 15.2/17.5 | 15.3/18.2 | 15.5/18.2 | 14.7/15.9 |
| TDL-A, 20ns | 14.6/16.3 | 14.5/16.5 | 14.7/16.7 | 15.2/16.6 ECP | -/- |
| TDL-A, 40ns | 15.0/16.7 | 15.5/17.9 | 15.3/17.1ECP | 15.3/17.1 ECP | -/- |
| CDL-B, 20ns | -/- | -/- | -/- | -/- | -/- |
| CDL-B, 50ns | -9.8/-8.4 | -10/-8.6 | -9.4/-7.9 | -9.5/-8.1 ECP | -/- |
| CDL-D, 20ns | -/- | -/- | -/- | -/- | -/- |
| CDL-D, 30ns | -20.3/-19.0 | -20.5/-19.7 | -20.6/-19.8 | -19.8/-18.6 | -/- |
| Additional report/notes:   1. CP type: Normal, Extended (ECP) 2. Antenna configuration for TDL-A model 2x2 3. Antenna configuration for CDL model   Configuration 2:  - (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  - (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)   1. Realistic channel estimation 2. Waveform in case of PUSCH N/A 3. PTRS configuration: (K = 2, L = 1) 4. DMRS configuration: 2 Symbols per slot 5. *ICI Compensation with {1,3,5,7} FD filter taps for {960 kHz, 480kHz, 240 kHz, 120 kHz} SCS* | | | | | | |

#### B.1.1.13 Source 13 [29]

Table B.1.1.13-1: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2009062 / Source 13 | 7 | TDL-A, 5ns | -1.23 / 0.97 | -1.26 / 0.55 | -1.15 / 0.70 | NCP:  -0.59 / 1.56  ECP:  -0.58 / 1.21 | NCP:  -1.31 / 0.02  ECP:  -1.43 / 0.00 |
| TDL-A, 10ns | -1.58 / -0.14 | -1.56 / -0.07 | -1.19 / 0.60 | NCP:  -0.52 / 1.33  ECP:  -0.52 / 1.20 | NCP:  -0.94 / 0.03  ECP:  -0.90 / 0.03 |
| TDL-A, 20ns | -1.60 / -0.37 | -1.40 / 0.01 | -0.86 / 0.04 | NCP:  -0.29 / 1.70  ECP:  -0.20 / 1.51 | NCP:  -0.83 / 0.04  ECP:  -0.94 / 0.51 |
| TDL-A, 40ns | -1.44 / -0.13 | -1.00 / 0.03 | -0.29 / 0.06 | NCP:  0.38 / 2.00  ECP:  0.44 / 2.00 | NCP:  0.13 / 1.36  ECP:  0.03 / 1.01 |
| CDL-B, 20ns | -8.55 / -6.40 | -8.71 / -7.00 | -8.67 / -6.80 | NCP:  -8.14 / -6.31  ECP:  -8.03 / -6.06 | NCP:  -8.18 / -6.19  ECP:  -8.26 / -6.05 |
| CDL-B, 50ns | -8.74 / -6.92 | -8.61 / -6.70 | -8.38 / -6.27 | NCP:  -7.67 / -5.36  ECP:  -7.47 / -5.53 | NCP:  -7.48 / -5.32  ECP:  -7.45 / -5.21 |
| CDL-D, 20ns | -23.03 / -22.93 | -23.00 / -22.93 | -23.19 / -22.93 | NCP:  -22.99 / -22.93  ECP:  -22.99 / -22.92 | NCP:  -22.99 / -22.92  ECP:  -22.98 / -22.91 |
| CDL-D, 30ns | -23.00 / -22.93 | -23.00 / -22.93 | -23.19 / -22.94 | NCP:  -22.99 / -23.93  ECP:  -22.99 / -22.92 | NCP:  -22.99 / -23.92  ECP:  -22.98 / -22.91 |
| 16 | TDL-A, 5ns | 6.79 / 8.94 | 6.83 / 8.71 | 7.20 / 9.64 | NCP:  8.13 / 11.09  ECP:  7.52 / 10.50 | NCP:  8.30 / 15.27  ECP:  7.97 / 12.42 |
| TDL-A, 10ns | 6.42 / 8.00 | 6.62 / 8.01 | 7.32 / 9.30 | NCP:  8.18 / 11.15  ECP:  7.74 / 10.00 | NCP:  8.88 / 15.59  ECP:  8.62 / 13.06 |
| TDL-A, 20ns | 6.59 / 8.01 | 6.93 / 8.03 | 7.65 / 9.59 | NCP:  8.40 / 11.32  ECP:  8.02 / 9.91 | NCP:  9.16 / 18.00  ECP:  8.87 / 13.54 |
| TDL-A, 40ns | 6.74 / 8.01 | 7.45 / 9.19 | 8.03 / 10.15 | NCP:  9.35 / 13.20  ECP:  8.58 / 10.89 | NCP:  10.09 / x  ECP:  9.58 / 16.95 |
| CDL-B, 20ns | -0.31 / 1.62 | -0.54 / 1.51 | -0.17 / 2.33 | NCP:  0.19 / 2.66  ECP:  -0.13 / 2.45 | NCP:  1.22 / 9.31  ECP:  0.88 / 5.00 |
| CDL-B, 50ns | -0.20 / 1.68 | -0.38 / 1.84 | 0.12 / 2.28 | NCP:  0.89 / 3.74  ECP:  0.50 / 3.00 | NCP:  1.96 / 15.00  ECP:  1.63 / 6.45 |
| CDL-D, 20ns | -14.97 / -14.90 | -14.97 / -14.90 | -14.97 / -14.90 | NCP:  -14.96 / -14.90  ECP:  -14.96 / -14.90 | NCP:  -14.33 / -13.38  ECP:  -14.27 / -13.29 |
| CDL-D, 30ns | -14.97 / --14.90 | -14.97 / -14.90 | -14.97 / --14.90 | NCP:  -14.96 / -14.90  ECP:  -14.96 / -14.90 | NCP:  -14.26 / -13.23  ECP:  -14.29 / -13.37 |
| 22 | TDL-A, 5ns | 17.38 / x | 18.52 / x | 23.84 / x | NCP:  25.11 / x  ECP:  22.00 / x | NCP:  x / x  ECP:  x / x |
| TDL-A, 10ns | 18.48 / x | 19.66 / x | 30.32 / x | NCP:  30.79 / x  ECP:  26.24 / x | NCP:  x / x  ECP:  x / x |
| TDL-A, 20ns | 18.66 / x | 20.22 / x | x / x | NCP:  x / x  ECP:  x / x | NCP:  x / x  ECP:  x / x |
| TDL-A, 40ns | 19.87 / x | 22.64 / x | x / x | NCP:  x / x  ECP:  x / x | NCP:  x / x  ECP:  x / x |
| CDL-B, 20ns | 12.36 / x | 15.35 / x | 31.00 / x | NCP:  29.32 / x  ECP:  22.31 / x | NCP:  x / x  ECP:  x / x |
| CDL-B, 50ns | 13.74 / x | 15.78 / | x / x | NCP:  x / x  ECP:  40.00 / x | NCP:  x / x  ECP:  x / x |
| CDL-D, 20ns | -6.94 / -0.05 | -7.21 / -1.00 | -7.34 / x | NCP:  -7.34 / x  ECP:  -7.27 / x | NCP:  x / x  ECP:  x / x |
| CDL-D, 30ns | -6.68 / x | -7.32 / -2.40 | -7.24 / x | NCP:  -7.29 / x  ECP:  -7.20 / x | NCP:  x / x  ECP:  x / x |
| Additional report/notes:   1. CP type:    1. For 960 kHz, ECP is also investigated in addition to normal CP. 2. antenna configuration for CDL model    1. Antenna configuration: (1,1,8,16,2) 3. PTRS configuration    1. K = 2, L = 1 4. DMRS configuration    1. 1 symbol front-loaded DMRS   Note: “x” in the table means the target BLER level cannot be reached. | | | | | | |

#### B.1.1.14 Source 14 [16]

Table B.1.1.14-1: SINR in dB achieving PDSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2009379 / Source 14 | 7 | TDL-A, 5ns | 3.13 / 5.37 | 2.76 / 5.23 | 2.68 / 4.99 | 2.80 / 5.20 | 2.12 / 3.92 |
| TDL-A, 10ns | 2.56 / 4.55 | 2.23 / 4.26 | 2.20 / 4.24 | 2.42 / 4.56 | 2.04 / 3.56 |
| TDL-A, 20ns | 2.18 / 3.96 | 2.05 / 3.83 | 2.01 / 3.83 | 2.23 / 4.11 | 2.01 / 3.42 |
| CDL-B, 20ns | 15.56/17.65 | 15.17/ 17.36 | 15.01/ 17.11 | 15.20/ 17.32 | 14.85/ 16.60 |
| CDL-B, 50ns | 15.37/ 17.33 | 15.26/ 17.11 | 15.18/ 17.22 | 15.33/ 17.24 | 15.19/ 16.79 |
| CDL-D, 20ns | 4.75/ 5.73 | 4.69/ 5.60 | 4.56/ 5.44 | 4.70/ 5.63 | 4.90/ 5.91 |
| CDL-D, 30ns | 4.75/ 5.74 | 4.70/ 5.62 | 4.60/ 5.46 | 4.75/ 5.67 | 4.93/ 5.95 |
| 16 | TDL-A, 5ns | 11.79 / 14.38 | 11.60 / 14.08 | 11.58 / 14.11 | 11.88 / 14.66 | 10.17 / 12.07 |
| TDL-A, 10ns | 11.32 /13.53 | 11.07 / 13.20 | 11.30 / 13.58 | 11.98 /15.24 | 10.36 / 12.27 |
| TDL-A, 20ns | 11.16 / 13.36 | 10.90 / 12.97 | 11.36 / 14.03 | 13.87 / NA | 12.17 / 16.32 |
| CDL-B, 20ns | 24.71/ 27.26 | 24.52/ 26.91 | 24.60/ 27.56 | 25.23/ 28.47 | 23.46/ 25.64 |
| CDL-B, 50ns | 24.76/ 27.24 | 24.55/ 26.86 | 24.87/ 28.04 | 25.86/29.74 | 24.11/ 26.76 |
| CDL-D, 20ns | 12.94/14.15 | 12.51/ 13.54 | 12.29/ 12.9 | 12.16/ 12.9 | 12.03/ 12.97 |
| CDL-D, 30ns | 12.95/ 14.17 | 12.53/ 13.51 | 12.32/ 13.2 | 12.19/13.1 | 12.08/13.00 |
| 22 | TDL-A, 5ns | NA / NA | NA / NA | 17.90 / 22.80 | 17.49/20.92 | 17.20 / 21.28 |
| TDL-A, 10ns | NA / NA | NA / NA | 18.40 / 23.00 | 19.19 / NA | 19.62 / NA |
| TDL-A, 20ns | NA / NA | NA / NA | 20.95 / NA | NA / NA | NA / NA |
| CDL-B, 20ns | NA/NA | NA/NA | 31.35/ 38.23 | 30.53/34.15 | 30.62/ 36.28 |
| CDL-B, 50ns | NA/NA | NA/NA | 32/NA | 33.27/ NA | 34.84/ NA |
| CDL-D, 20ns | NA/NA | 22.54/ NA | 18.25/ 19.94 | 17.31/ 18.33 | 18.25/ 20.33 |
| CDL-D, 30ns | NA/NA | 22.67/ NA | 18.36/20.07 | 17.46/ 18.47 | 18.44/ 20.38 |
| First and second entry corresponds to SNR required to meet 10% and 1% BLER.  NA refers to PDSCH performance that were not able to achieve 10% or 1% BLER  Additional report/notes:   1. CP type: Normal CP 2. antenna configuration for CDL model: Antenna configuration 2 3. PTRS configuration: (K=4, L=1) PTRS per K number of PRBs, and PTRS every L number of OFDM symbols 4. DMRS configuration: Type 1 DMRS 5. any optional or other assumption/parameters used not as in the baseline: For the SNR of CDL models, beamforming gain of Tx and Rx was added, where beamforming gain was computed as ‘10·log10( #elements) [dB] + antenna element beam gain [dBi]’ | | | | | | |

Table B.1.1.14-2: SINR in dB achieving PDSCH BLER of 10% /1% (without DMRS OCC)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2009379 / Source 14 | 7 | TDL-A, 5ns | 3.13 / 5.37 | 2.76 / 5.23 | 2.68 / 4.99 | 2.80 / 5.20 | 2.12 / 3.92 |
| TDL-A, 10ns | 2.56 / 4.55 | 2.23 / 4.26 | 2.20 / 4.24 | 2.42 / 4.56 | 2.04 / 3.56 |
| TDL-A, 20ns | 2.18 / 3.96 | 2.05 / 3.83 | 2.01 / 3.83 | 2.23 / 4.11 | 2.01 / 3.42 |
| CDL-B, 20ns | 5.48 / 7.58 | 5.10 / 7.29 | 4.94 / 7.04 | 5.13 / 7.25 | 4.78 / 6.52 |
| CDL-B, 50ns | 5.30 / 7.26 | 5.19 / 7.04 | 5.11 / 7.15 | 5.26 / 7.17 | 5.12 / 6.72 |
| CDL-D, 20ns | 3.64 / 4.61 | 3.57 / 4.52 | 3.45 / 4.35 | 3.50 / 4.35 | 3.64 / 4.59 |
| CDL-D, 30ns | 3.63 / 4.60 | 3.57 / 4.53 | 3.47 / 4.38 | 3.51 / 4.36 | 3.66 / 4.64 |
| 16 | TDL-A, 5ns | 11.79 / 14.38 | 11.60 / 14.08 | 11.61 / 14.15 | 11.87 / 14.58 | 10.08 / 11.87 |
| TDL-A, 10ns | 11.32 /13.53 | 11.07 / 13.20 | 11.17 / 13.20 | 11.44 / 14.08 | 9.87 / 11.35 |
| TDL-A, 20ns | 11.16 / 13.36 | 10.90 / 12.97 | 10.76 / 12.60 | 11.12 / 13.35 | 9.79 / 11.32 |
| CDL-B, 20ns | 24.71/ 27.26 | 24.52/ 26.91 | 24.70/ 27.99 | 25.25/28.51 | 23.41/ 25.63 |
| CDL-B, 50ns | 24.76/ 27.24 | 24.55/ 26.86 | 24.87/ 27.94 | 25.53/ 29.16 | 23.66/ 25.72 |
| CDL-D, 20ns | 12.94/14.15 | 12.51/ 13.54 | 12.29/ NA | 12.16/ NA | 12.05/12.99 |
| CDL-D, 30ns | 12.95/ 14.17 | 12.53/ 13.51 | 12.24/ NA | 12.12/ NA | 12.01/12.95 |
| 22 | TDL-A, 5ns | NA / NA | NA / NA | 17.75 / 21.81 | 16.93 / 19.65 | 16.54 / 19.66 |
| TDL-A, 10ns | NA / NA | NA / NA | 17.80 / 20.00 | 16.48 / 18.95 | 16.45 / 19.71 |
| TDL-A, 20ns | NA / NA | NA / NA | 17.12 / 21.66 | 16.48 / 18.83 | 16.74 / 20.72 |
| CDL-B, 20ns | NA/NA | NA/NA | 31.35/ 38.83 | 30.20/ 33.41 | 30.2/ 33.4 |
| CDL-B, 50ns | NA/NA | NA/NA | 31.38/ 38.60 | 30.4/34.1 | 30.42/ 34.15 |
| CDL-D, 20ns | NA/NA | 22.54/ NA | 18.33/ 20.10 | 17.39/ 18.40 | 18.33/ 20.10 |
| CDL-D, 30ns | NA/NA | 22.67/ NA | 18.29/19.95 | 17.38/ 18.40 | 18.37/ 20.54 |
| First and second entry corresponds to SNR required to meet 10% and 1% BLER.  NA refers to PDSCH performance that were not able to achieve 10% or 1% BLER  Additional report/notes:   1. CP type: Normal CP 2. antenna configuration for CDL model: Antenna configuration 2 3. PTRS configuration: (K=4, L=1) PTRS per K number of PRBs, and PTRS every L number of OFDM symbols 4. DMRS configuration: Type 1 DMRS 5. any optional or other assumption/parameters used not as in the baseline: Frequency domain OCC for DMRS was disabled. For the SNR of CDL models, beamforming gain of Tx and Rx was added, where beamforming gain was computed as ‘10·log10( #elements) [dB] + antenna element beam gain [dBi]’. | | | | | | |

Table B.1.1.14-3: SINR in dB achieving PDSCH BLER of 10% /1% (Rank 2 without DMRS OCC)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2009379 / Source 14 | 7 | TDL-A, 1ns |  |  |  |  |  |
| TDL-A, 5ns |  |  |  |  |  |
| TDL-A, 20ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 1ns | 23.81/ NA | 20.80/ NA | 19.8/25 | 19.5/24.5 |  |
| TDL-A, 5ns | 21.1/NA | 19.35/ NA | 18.5/20.9 | 18.2/20.9 |  |
| TDL-A, 20ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns | 16.22/17.26 | 16.21/17.47 | 15.54/ 16.54 | 15.50/ 16.52 |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 1ns |  |  |  |  |  |
| TDL-A, 5ns |  |  |  |  |  |
| TDL-A, 20ns |  |  |  |  |  |
| CDL-B, 20ns | NA/NA | NA/NA | 24.73/ NA | 21.75/ 26.46 |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| First and second entry corresponds to SNR required to meet 10% and 1% BLER.  NA refers to PDSCH performance that were not able to achieve 10% or 1% BLER  Additional report/notes:   1. CP type: Normal CP 2. antenna configuration for CDL model: Antenna configuration 2 3. PTRS configuration: (K=4, L=1) PTRS per K number of PRBs, and PTRS every L number of OFDM symbols 4. DMRS configuration: Type 1 DMRS 5. any optional or other assumption/parameters used not as in the baseline: Frequency domain OCC for DMRS was disabled. For the SNR of CDL models, beamforming gain of Tx and Rx was added, where beamforming gain was computed as ‘10·log10( #elements) [dB] + antenna element beam gain [dBi]’. Transmission Rank 2 was used. | | | | | | |

#### B.1.1.15 Source 15 [71]

Table B.1.1.15-1: SINR in dB achieving PDSCH BLER of 10%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2009157 / Source 15 | 7 | TDL-A, 5ns | 4.8 | 4.3 | 3.6 | 2.6 | 2.7 |
| TDL-A, 10ns | 4.4 | 4.0 | 3.6 | 3.0 | 2.4 |
| TDL-A, 20ns | 4.0 | 3.7 | 3.4 | 3.1 | 2.9 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 13.3 | 12.6 | 11.4 | 10.7 | 10.6 |
| TDL-A, 10ns | 13.0 | 12.3 | 11.4 | 10.4 | 10.2 |
| TDL-A, 20ns | 12.7 | 12.1 | 11.2 | 11.8 | 11.4 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | N/A | N/A | 19.3 | 16.5 | 17.5 |
| TDL-A, 10ns | N/A | N/A | 19.5 | 17.1 | 17.3 |
| TDL-A, 20ns | N/A | N/A | 19.8 | 27.4 | 29.8 |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| CDL-B, 20ns |  |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |  |
| Additional report/notes:   1. Realistic CPE compensation and CE 2. PT-RS config K = 2, L = 1 | | | | | | |

#### B.1.1.16 Source 16 [61]

Table B.1.1.16-1: SINR in dB achieving PDSCH/PUSCH BLER of 10% /1%

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | MCS | Channel | 120KHz /400MHz | 240KHz /400MHz | 480KHz /400MHz | 960KHz /400MHz | 960KHz /2GHz |
| R1-2007792 / Source 16 | 7 | TDL-A, 5ns | 3.1 /5.2 | 3.3 /4.6 | 3.0 /4.6 | 3.6 /5.3 | 2.1 /2.7 |
| TDL-A, 10ns | 2.6 /4.3 | 2.6 /4.2 | 2.8 /4.5 | 3.1 /4.5 | 2.1 /2.7 |
| TDL-A, 20ns | 2.4 /3.6 | 2.5 /4.1 | 2.6 /4.2 | 3.1 /4.6 | 2.2 /2.7 |
| CDL-B, 20ns | 4.6 /9.5 | 4.4 /10.2 | 4.5 /10.1 | 4.7 /10.4 | 4.3 /10.2 |
| CDL-B, 50ns | 4.6 /9.6 | 4.6 /10.2 | 4.9 /10.9 | 5.2 /11.0 | 4.8 /11.0 |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 16 | TDL-A, 5ns | 11.8 /13.9 | 11.4 /13.6 | 11.0 /13.0 | 11.8 /13.8 | 10.1 /11.2 |
| TDL-A, 10ns | 11.2 /12.9 | 11.0 /12.7 | 10.6 /12.2 | 11.0 /12.6 | 10.1 /10.8 |
| TDL-A, 20ns | 10.8 /12.3 | 10.6 /12.1 | 10.3 /11.5 | 10.8 /12.4 | 10.1 /10.7 |
| CDL-B, 20ns | 12.6 /18.4 | 13.2 /18.8 | 12.6 /18.1 | 12.6 /18.2 | 12.8 /18.8 |
| CDL-B, 50ns | 12.6 /18.4 | 13.3 /18.8 | 12.9 /18.5 | 13.2 /22.4 | 13.6 /22.7 |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |  |
| 22 | TDL-A, 5ns | n/a /n/a | 25.6 /n/a | 18.7 /23.3 | 18.0 /20.1 | 17.0 /20.3 |
| TDL-A, 10ns | n/a /n/a | 27.0 /n/a | 18.1 /22.5 | 17.0 /19.0 | 17.0 /20.1 |
| TDL-A, 20ns | n/a /n/a | 27.4 /n/a | 17.8 /22.1 | 17.0 /18.6 | 17.3 /21.2 |
| CDL-B, 20ns | n/a /n/a | 29.5 /n/a | 19.1 /25.8 | 17.5 /23.1 | 18.8 /27.4 |
| CDL-B, 50ns | n/a /n/a | n/a /n/a | 19.5 /n/a | 19.6 /n/a | 21.7 /n/a |
| CDL-D, 20ns |  |  |  |  |  |
| CDL-D, 50ns |  |  |  |  |  |
| - CP type: short CP  - Antenna configuration for CDL model: (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH) for BS and (Mg,Ng,M,N,P) = (1,1,2,2,2) with (0.5 dv, 0.5 dH) for UE  - PTRS configuration: K = 2, L = 1  - DMRS configuration: Type-1 DM-RS with 1 front-loaded DM-RS and 1 additional DM-RS symbol at (2,11) symbol index | | | | | | |

### B.1.2 Evaluation results for PSS/SSS

#### B.1.2.1 Source 1 [65]

Table B.1.2.1-1: SINR in dB achieving cell ID detection probability of 90% by one-shot detection from PSS/SSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Source 1 | TDL-A, 5ns | -5.4 | -5.3 | -5.1 | -4.8 |
| TDL-A, 10ns | -5.4 | -5.4 | -4.8 | -4.4 |
| TDL-A, 20ns | -5.4 | -4.9 | -4.3 | -4.3 |
| TDL-A, 40ns | -5.1 | -4.6 | -4.1 | -4.0 |
| CDL-B, 20ns |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |
| Additional report/notes:   1. frequency offset: 10ppm 2. the number and granularity of the frequency locations: -x...x, with granularity SCS/2 where x=ceil(freq\_error/SCS)\*SCS for coarse search followed by refinement using hypothesis bi-section 3. antenna configuration for CDL model: N/A 4. any optional or other assumption/parameters used not as in the baseline: Medium antenna correlation. Every 4th SSB use one of the following precoders sqrt(1/2) [1 1], [1 j], [1 -1] and [1 -j]. 5. false alarm rate: 1% 6. criteria for PSS detection success: Correct cell ID and frequency offset estimate error is less than SCS/4. 7. Simulation duration: 5000 SS/PBCH blocks | | | | |

Table B.1.2.1-2: SINR in dB achieving PBCH BLER of 10%, using 1 transmission.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Source 1 | TDL-A, 5ns | -5.0 | -5.3 | -5.2 | -4.7 |
| TDL-A, 10ns | -5.3 | -5.3 | -4.9 | -4.1 |
| TDL-A, 20ns | -5.3 | -5.0 | -4.4 | -4.1 |
| TDL-A, 40ns | -5.0 | -4.5 | -4.3 | -3.9 |
| CDL-B, 20ns |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |
| Additional report/notes:   1. Single PBCH transmission 2. Table shows SINR required for 10% PBCH BLER 3. frequency offset: 10ppm 4. the number and granularity of the frequency locations: -x...x, with granularity SCS/2 where x=ceil(freq\_error/SCS)\*SCS for coarse search followed by refinement using hypothesis bi-section 5. antenna configuration for CDL model: N/A 6. any optional or other assumption/parameters used not as in the baseline: Medium antenna correlation. Every 4th SSB use one of the following precoders sqrt(1/2) [1 1], [1 j], [1 -1] and [1 -j]. 7. false alarm rate: 1% 8. criteria for PSS detection success: Correct cell ID and frequency offset estimate error is less than SCS/4.   Simulation duration: 5000 SS/PBCH blocks | | | | |

Table B.1.2.1-3: SINR in dB achieving PBCH BLER of 10%, using 4 transmissions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Source 1 | TDL-A, 5ns | -10.4 | -10.4 | -10.2 | -9.8 |
| TDL-A, 10ns | -10.3 | -10.3 | -9.9 | -9.5 |
| TDL-A, 20ns | -10.0 | -10.0 | -9.6 | -8.9 |
| TDL-A, 40ns | -9.9 | -9.6 | -9.0 | -8.3 |
| CDL-B, 20ns |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |
| Additional report/notes:   1. 4 PBCH transmissions 2. Table shows SINR required for 10% PBCH BLER 3. frequency offset: 10ppm 4. the number and granularity of the frequency locations: -x...x, with granularity SCS/2 where x=ceil(freq\_error/SCS)\*SCS for coarse search followed by refinement using hypothesis bi-section 5. antenna configuration for CDL model: N/A 6. any optional or other assumption/parameters used not as in the baseline: Medium antenna correlation. Every 4th SSB use one of the following precoders sqrt(1/2) [1 1], [1 j], [1 -1] and [1 -j]. 7. false alarm rate: 1% 8. criteria for PSS detection success: Correct cell ID and frequency offset estimate error is less than SCS/4.   Simulation duration: 5000 SS/PBCH blocks | | | | |

Table B.1.2.1-4: Link budget for PBCH, 1 transmission, TDL-A 3km/h 20ns, using no FDM with RMSI (SSB/CORESET 0 multiplexing pattern 1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R1-2007984 / Source 1 | Number of Tx tries | 1 tx-try | 1 tx-try | 1 tx-try | 1 tx-try |
| Delay Spread [ns] | 20 | 20 | 20 | 20 |
| SCS [kHz] | 120 | 240 | 480 | 960 |
| Bandwidth [MHz] | 28.8 | 57.6 | 115.2 | 230.4 |
| Noise level [dBm] 1) | -89.4 | -86.4 | -83.4 | -80.4 |
| Required SNR [dB] 2) | -5.3 | -5.0 | -4.4 | -4.1 |
| Tx antenna gain [dBi] 3) | 20 | 20 | 20 | 20 |
| Rx antenna gain [dBi] 3) | 6 | 6 | 6 | 6 |
| Max Tx power (according to regulations) [dBm] 4) | 17.6 | 20.0 | 20.0 | 20.0 |
| Transmit Power [dBm] 5) | 17.6 | 20.0 | 20.0 | 20.0 |
| Maximum coupling loss (MCL) [dB] 6) | 112.3 | 111.4 | 107.8 | 104.5 |
| Maximum isotropic loss (MIL) [dB] 7) | 138.3 | 137.4 | 133.8 | 130.5 |
| Table shows link budget for PBCH, 1 transmission, TDL-A 3km/h 20ns, using no FDM with RMSI (SSB/CORESET 0 multiplexing pattern 1)  1) Over used subcarriers, assuming a noise figure of 10 dB and thermal noise spectral density of  -174 dBm/Hz. 2) SNR required to have 10% BLER for 1Tx/Rx x-pol pair. 3) Element gain + beamforming gain. Assumes Antenna Configuration 2 in the link level evaluation assumptions in TR 38.808 for BS and UE. For BS, 20 dBi antenna gain is used: (10\*log10(4x8) + 5 (element gain) = 20. For the UE, 6 dBi gain is used which assumes that the UE uses wider beams during initial access for SSB reception (reduction from 11 dBi). 4) Considering ETSI/FCC EIRP limit of 40 dBm, ETSI BRAN (EIRP) PSD limits of 23 dB/MHz, FCC conducted power limit of 27 dBm above 100 MHz and with proportionally reduced power below 100 MHz. 5) Equals Max Tx power (according to regulations) 6) MCL (Max Tx power) (noise level) (required SNR) 7) MIL MCL (Tx antenna gain) (Rx antenna gain) | | | | |

#### B.1.2.2 Source 3 [30]

Table B.1.2.2-1: CINR in dB achieving PSS detection probability of 90%: one-shot, 5ppm

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008615 / Source 3 | TDL-A, 5ns | -1.0 | -1.5 | -1.2 | 0.0 |
| TDL-A, 10ns | -0.9 | -1.2 | -0.2 | 0.3 |
| TDL-A, 20ns | -0.5 | -0.9 | 0.7 | 0.6 |
| CDL-B, 20ns (Cfg. 1) | -6.6 | -7.1 | -6.6 | -5.8 |
| CDL-B, 50ns (Cfg. 1) | -6.5 | -6.5 | -6.2 | -5.1 |
| CDL-D, 20ns (Cfg. 1) | -19.9 | -20.1 | -20.3 | -19.9 |
| CDL-D, 30ns (Cfg. 1) | -19.8 | -20.1 | -20.2 | -20.1 |
| CDL-B, 20ns (Cfg. 2) | -0.8 | -0.8 | -0.5 | 0.6 |
| CDL-B, 50ns (Cfg. 2) | -0.5 | -0.5 | 0.5 | 1.7 |
| CDL-D, 20ns (Cfg. 2) | -7.7 | -8.2 | -8.3 | -7.8 |
| CDL-D, 30ns (Cfg. 2) | -7.9 | -8.2 | -8.3 | -7.8 |
| Additional report/notes:   1. Frequency offset: 5ppm 2. the number and granularity of the frequency locations: 3. antenna configuration for CDL model: Config 1 and Config 2 4. any optional or other assumption/parameters used not as in the baseline 5. false alarm rate: less than 1% 6. criteria for PSS detection success: residual timing error within a range of and a residual frequency error within a range of | | | | |

Table B.1.2.2-2: CINR in dB achieving PSS detection probability of 90%: one-shot, 10ppm

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008615 / Source 3 | TDL-A, 5ns | -1.2 | -1.2 | -1.0 | -0.3 |
| TDL-A, 10ns | -1.3 | -1.0 | 0.0 | -0.2 |
| TDL-A, 20ns | -0.7 | -0.3 | 0.6 | -0.2 |
| CDL-B, 20ns (Cfg. 1) | -7.2 | -6.5 | -6.8 | -6.3 |
| CDL-B, 50ns (Cfg. 1) | -6.8 | -6.1 | -6.0 | -5.4 |
| CDL-D, 20ns (Cfg. 1) | -20.1 | -19.7 | -20.3 | -20.5 |
| CDL-D, 30ns (Cfg. 1) | -20.1 | -19.7 | -20.2 | -20.5 |
| CDL-B, 20ns (Cfg. 2) | -1.2 | -0.5 | -0.3 | 0.2 |
| CDL-B, 50ns (Cfg. 2) | -1.1 | 0.0 | 0.2 | 1.2 |
| CDL-D, 20ns (Cfg. 2) | -7.9 | -7.6 | -8.2 | -8.3 |
| CDL-D, 30ns (Cfg. 2) | -7.9 | -7.8 | -8.2 | -8.2 |
| Additional report/notes:   1. Frequency offset: 10ppm 2. the number and granularity of the frequency locations: 3. antenna configuration for CDL model: Config 1 and Config 2 4. any optional or other assumption/parameters used not as in the baseline 5. false alarm rate: less than 1% 6. criteria for PSS detection success: residual timing error within a range of and a residual frequency error within a range of | | | | |

Table B.1.2.2-3: CINR in dB achieving PBCH BLER of 10% ∕ 1%

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008615 / Source 3 | TDL-A, 5ns | -6.3/-1.3 | -6.4/-2.3 | -6.1/-2.1 | -6.1/-2.2 |
| TDL-A, 10ns | -6.3/-2.3 | -6.3/-2.1 | -6.1/-2.2 | -6.4/-3.0 |
| TDL-A, 20ns | -6.1/-1.8 | -5.9/-1.9 | -6.4/-3.2 | -6.7/-4.0 |
| CDL-B, 20ns (Cfg. 1) | -12.8/-5.3 | -12.4/-5.5 | -12.2/-5.3 | -12.0/-5.3 |
| CDL-B, 50ns (Cfg. 1) | -12.6/-5.6 | -12.2/-5.4 | -11.7/-4.9 | -11.3/-4.3 |
| CDL-D, 20ns (Cfg. 1) | -25.2/-20.2 | -25.1/-20.2 | -25.2/-20.1 | -25.2/-20.3 |
| CDL-D, 30ns (Cfg. 1) | -25.1/-20.1 | -25.2/-20.3 | -25.2/-20.1 | -25.2/-20.2 |
| CDL-B, 20ns (Cfg. 2) | -7.0/-0.3 | -6.8/-0.5 | -6.5/-0.7 | -6.1/-0.5 |
| CDL-B, 50ns (Cfg. 2) | -6.6/-0.8 | -6.4/-0.9 | -5.7/-0.2 | -4.9/ 0.7 |
| CDL-D, 20ns (Cfg. 2) | -13.0/ -7.9 | -13.2/-7.7 | -12.9/-7.5 | -12.6/-7.1 |
| CDL-D, 30ns (Cfg. 2) | -12.9/-7.9 | -13.0/-7.6 | -12.7/-7.2 | -12.5/-6.5 |
| Additional report/notes:   1. frequency offset: 5ppm 2. antenna configuration for CDL model: Config 1 and Config 2 3. any optional or other assumption/parameters used not as in the baseline: genie PSS/SSS | | | | |

#### B.1.2.3 Source 4 [60]

Table B.1.2.3-1: SINR in dB achieving cell ID detection probability of 90% by one-shot detection from PSS/SSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007654 / Source 4 | TDL-A, 5ns | -5.5 | -5.8 | -5.8 | -6.2 |
| TDL-A, 10ns | -5.6 | -5.9 | -5.9 | -5.8 |
| TDL-A, 20ns | -5.6 | -6 | -6 | -5.8 |
| TDL-A, 40ns | -5.4 | -5.4 | -5.4 | -5.8 |
| Additional report/notes:   1. frequency offset：10ppm 2. the number and granularity of the frequency locations:  * Number (coarse search branch): SCS120:22, SCS240:11, SCS480:6, SCS960:3 * Granularity: , where is defined by the number of coarse search branch  1. CP type: NCP | | | | |

Table B.1.2.3-2: SINR in dB achieving PBCH BLER of 10%, using 1 transmission

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007654 / Source 4 | TDL-A, 5ns | -4.3 | -5.0 | -5.0 | -5.2 |
| TDL-A, 10ns | -4.0 | -5.0 | -5.0 | -4.0 |
| TDL-A, 20ns | -4.9 | -5.1 | -5.1 | -3.0 |
| TDL-A, 40ns | -5.0 | -4.0 | -4.0 | 0 |
| Additional report/notes:   1. frequency offset：10ppm 2. the number and granularity of the frequency locations:  * Number (coarse search branch): SCS120:22, SCS240:11, SCS480:6, SCS960:3 * Granularity: , where is defined by the number of coarse search branch  1. CP type: NCP 2. Single PBCH transmission | | | | |

#### B.1.2.4 Source 6 [68]

Table B.1.2.4-1: SINR in dB achieving cell ID detection probability of 90% by one-shot detection from PSS/SSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009615 / Source 6 | TDL-A, 5ns | -3.29/-7.32 | -2.5/-7.42 | -2.45/-7.26 | -4.13/-6.92 |
| TDL-A, 10ns | -3.15/-7.31 | -2.67/-7.26 | -2.25/-6.91 | -4.08/-6.54 |
| TDL-A, 20ns | -3.28/-7.16 | -1.9/-6.89 | -2.21/-6.46 | -3.1/-6.31 |
| Additional report/notes: SINR (x/y) means SINR with 10 ppm/ SINR with 0 ppm   1. frequency offset: 10ppm/0ppm 2. carrier frequency: 60GHz 3. the number and granularity of the frequency locations: -x...x, with granularity SCS/2 where x=frequency offset\*carrier frequency 4. antenna configuration for CDL model: N/A 5. false alarm rate: 1% 6. Criteria for PSS detection success: the PSS detection is regarded as successful if PSS sequence index is detected correctly and the residual timing error is within [-Tcp/2, -Tcp/2] and the residual frequency error is within [-SCS/4, +SCS/4]. The reported results are the performance of PSS+SSS, the criteria for detection success is when the cell ID is corrected detected. 7. Simulation duration: 2000 SS/PBCH blocks | | | | |

#### B.1.2.5 Source 9 [25]

Table B.1.2.5-1: LLS template: SINR in dB achieving cell ID detection probability of 90% by one-shot detection from PSS/SSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008457 / Source 9 | TDL-A, 5ns | -4 | -5.5 | -5.5 | -1 |
| TDL-A, 10ns | -5.5 | -5 | -4 | -1 |
| TDL-A, 20ns | -5.5 | -6.5 | -4 | 0 |
| Additional report/notes:   1. frequency offset : none 2. antenna configuration for CDL model : N/A | | | | |

Table B.1.2.5-2: LLS template: SINR in dB achieving PBCH BLER of 10%

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008457 / Source 9 | TDL-A, 5ns | -6 | -6.5 | -6.5 | -5.9 |
| TDL-A, 10ns | -5 | -6 | -6 | -5.8 |
| TDL-A, 20ns | -7.5 | -8 | -7.5 | -8 |
| Additional report/notes: | | | | |

#### B.1.2.6 Source 13 [29]

Table B.1.2.6-1: SINR in dB achieving cell ID detection probability of 90% by one-shot detection from PSS/SSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009062 / Source 13 | TDL-A, 5ns | 4.1 | 2.8 | 1.9 | 2.9 |
| TDL-A, 10ns | 2.4 | 1.9 | 2.4 | 3.8 |
| TDL-A, 20ns | 1.7 | 2.8 | 3.6 | 4.6 |
| CDL-B, 20ns | -6.3 | -7.2 | -6.9 | -4.9 |
| CDL-B, 50ns | -5.8 | -6.0 | -5.3 | -4.1 |
| CDL-D, 20ns | -9.8 | -11.4 | -11.3 | -11.7 |
| CDL-D, 30ns | -9.6 | -10.4 | -10.8 | -12.4 |
| Additional report/notes:   1. frequency offset: +/- 0.5 ppm at gNB, +/- 5 ppm at UE 2. the number and granularity of the frequency locations: -1.5\*SCS to 1.5 SCS, with the granularity less than SCS/2 (IFO and FFO are estimated) 3. antenna configuration for CDL model: N/A 4. any optional or other assumption/parameters used not as in the baseline 5. false alarm rate: less than 1 % 6. criteria for PSS detection success: correct cell ID | | | | |

#### B.1.2.7 Source 14 [16]

Table B.1.2.7-1: LLS template: SINR in dB achieving cell ID detection probability of 90% by one-shot detection from PSS/SSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009379/ Source 14 | TDL-A, 5ns | -8.98 / -3.62 | -8.97 / -4.00 | -8.97 / -4.77 | -8.76 / -4.88 |
| TDL-A, 10ns | -8.94 / -3.97 | -8.88 / -4.72 | -8.72 / -4.96 | -8.42 / -4.68 |
| TDL-A, 20ns | -8.83 / -4.72 | -8.68 / -4.84 | -8.39 / -4.63 | -8.30 / -4.81 |
| CDL-B, 20ns | - | - | - | - |
| CDL-B, 50ns | - | - | - | - |
| CDL-D, 20ns | - | - | - | - |
| CDL-D, 30ns | - | - | - | - |
| Values are represented in X / Y, where X and Y corresponds to SNR in dB achieving 90% and 99% detection success, respectively.  Additional report/notes:   1. frequency offset: initial CFO 5ppm 2. the number and granularity of the frequency locations: initial frequency offset estimation using PSS based on multiple hypothesis testing in units of ¼ subcarriers. 3. antenna configuration for CDL model: N/A 4. any optional or other assumption/parameters used not as in the baseline 5. false alarm rate: < 0.1% for PSS detection, < 0.1% for SSS detection 6. criteria for PSS detection success: If SSS was successfully detected with the PSS ID (NID2) and timing obtained from detected PSS, then PSS is declared successful. | | | | |

### B.1.3 Evaluation results for PRACH

#### B.1.3.1 Source 1 [65]

Table B.1.3.1-1: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability, for PRACH format A3 (L = 139/571/1151 refers to the PRACH sequence length)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Source 1 | TDL-A, 5ns | –7.3 / ≤0.1% (L=139) –14.5 / ≤0.1% (L=571) –17.6 / ≤0.1% (L=1151) |  | –9.4 / ≤0.1% (L=139) –15.4 / ≤0.1% (L=571) | –9.1 / ≤0.1% (L=139) |
| TDL-A, 10ns | –7.9 / ≤0.1% (L=139) –14.6 / ≤0.1% (L=571) –17.5 / ≤0.1% (L=1151) |  | –9.4 / ≤0.1% (L=139) –15.7 / ≤0.1% (L=571) | –8.6 / ≤0.1% (L=139) |
| TDL-A, 20ns | –8.5 / ≤0.1% (L=139) –14.4 / ≤0.1% (L=571) –17.6 / ≤0.1% (L=1151) |  | –8.9 / ≤0.1% (L=139) –15.8 / ≤0.1% (L=571) | –8.4 / ≤0.1% (L=139) |
| TDL-A, 40ns | –8.4 / ≤0.1% (L=139) –14.6 / ≤0.1% (L=571) –17.9 / ≤0.1% (L=1151) |  | –8.5 / ≤0.1% (L=139) –15.3 / ≤0.1% (L=571) | –6.8 / ≤0.1% (L=139) |
| Additional report/notes:  1. PRACH format A3 (L = 139/571/1151 refers to the PRACH sequence length)  2. No cyclic shifts  3. Random propagation round-trip time, uniformly distributed over [0, 380 ns] (corresponding to ISD 100 m).  4. Delay estimation tolerance is ± 0.5 × PUSCH CP (with PUSCH SCS assumed same as PRACH SCS).  5. The receiver structure in R1-1609672 is used, with *N*NC = 1.  6. The detection threshold was selected to yield a maximum false-alarm probability of 0.1% across all SNRs. | | | | |

Table B.1.3.1-2: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability, for PRACH format B4 (L = 139/571/1151 refers to the PRACH sequence length)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Source 1 | TDL-A, 5ns | –9.6 / ≤0.1% (L=139) –16.7 / ≤0.1% (L=571) –20.0 / ≤0.1% (L=1151) |  | –11.8 / ≤0.1% (L=139) –17.9 / ≤0.1% (L=571) | –12.0 / ≤0.1% (L=139) |
| TDL-A, 10ns | –10.2 / ≤0.1% (L=139) –16.7 / ≤0.1% (L=571) –19.6 / ≤0.1% (L=1151) |  | –11.8 / ≤0.1% (L=139) –18.1 / ≤0.1% (L=571) | –11.4 / ≤0.1% (L=139) |
| TDL-A, 20ns | –10.8 / ≤0.1% (L=139) –16.3 / ≤0.1% (L=571) –19.7 / ≤0.1% (L=1151) |  | –11.4 / ≤0.1% (L=139) –18.3 / ≤0.1% (L=571) | –11.3 / ≤0.1% (L=139) |
| TDL-A, 40ns | –10.8 / ≤0.1% (L=139) –16.3 / ≤0.1% (L=571) –19.4 / ≤0.1% (L=1151) |  | –11.3 / ≤0.1% (L=139) –17.8 / ≤0.1% (L=571) | –9.2 / ≤0.1% (L=139) |
| Additional report/notes:  1. PRACH format B4 (L = 139/571/1151 refers to the PRACH sequence length)  2. No cyclic shifts  3. Random propagation round-trip time, uniformly distributed over [0, 380 ns] (corresponding to ISD 100 m).  4. Delay estimation tolerance is ± 0.5 × PUSCH CP (with PUSCH SCS assumed same as PRACH SCS).  5. The receiver structure in R1-9609672 is used, with *N*NC = 1 for all cases except for 120 kHz with L = 571 or L = 1151, where *N*NC = 2 is used.  6. The detection threshold was selected to yield a maximum false-alarm probability of 0.1% across all SNRs. | | | | |

Table B.1.3.1-3: PRACH link budgets for format B4, delay spread 20 ns, and max RTT 380 ns with UE-specific power limits

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R1-2007984 / Source 1 | **Parameter** | **Value** | | | | | |
| PRACH format | B4 | B4 | B4 | B4 | B4 | B4 |
| SCS [kHz] | 120 | 120 | 120 | 480 | 480 | 960 |
| Sequence length L | 139 | 571 | 1151 | 139 | 571 | 139 |
| Delay spread [ns] | 20 | 20 | 20 | 20 | 20 | 20 |
| Max RTT [ns] | 380 | 380 | 380 | 380 | 380 | 380 |
| Frequency occupancy [MHz] | 16.68 | 68.52 | 138.12 | 66.72 | 274.08 | 133.44 |
| Noise level [dBm] 1) | -94.78 | -88.64 | -85.60 | -88.76 | -82.62 | -85.75 |
| Required SNR [dB] 2) | -10.8 | -16.3 | -19.7 | -11.4 | -18.3 | -11.3 |
| Tx (UE) antenna gain [dBi] 3) | 6 | 6 | 6 | 6 | 6 | 6 |
| Rx (gNB) antenna gain [dBi] 3) | 20 | 20 | 20 | 20 | 20 | 20 |
| Max Tx power according to regulations [dBm] 4) | 19.22 | 25.36 | 27.00 | 25.24 | 27.00 | 27.00 |
| Tx power backoff based on CM [dB] 5) | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Max UE conducted power (backed off) [dBm] 6) | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 |
| Max Tx power based on UE EIRP [dBm] 7) | 19 | 19 | 19 | 19 | 19 | 19 |
| Tx power [dBm] 8) | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 |
| Maximum coupling loss (MCL) [dB] 9) | 124.3 | 123.6 | 124.0 | 118.9 | 119.6 | 115.7 |
| Maximum isotropic loss (MIL) [dB] 10) | 150.3 | 149.6 | 150.0 | 144.9 | 145.6 | 141.7 |
| Table shows PRACH link budgets for format B4, delay spread 20 ns, and max RTT 380 ns with UE-specific power limits  1) Over used subcarriers, assuming a noise figure of 7 dB and thermal noise spectral density of -174 dBm/Hz. 2) SNR required to have 1% misdetection rate, from Table B.1.3.1-2. 3) Element gain + beamforming gain. Assumes Antenna Configuration 2 in the link level evaluation assumptions in TR 38.808 for BS and UE. For BS, 20 dBi antenna gain is used: (10\*log10(4x8) + 5 (element gain) = 20. For the UE, 6 dBi gain is used which assumes that the UE uses wider beams during initial access for PRACH transmission (reduction from 11 dBi). 4) Considering ETSI/FCC EIRP limit of 40 dBm, ETSI BRAN (EIRP) PSD limits of 23 dB/MHz, FCC conducted power limit of 27 dBm above 100 MHz and with proportionally reduced power below 100 MHz. 5) Backoff from max UE conducted power, based on 95th percentile cubic metric (CM), which according to R1-1912714 is 2.3 dB for all supported Zadoff-Chu sequence lengths (L = 139/571/1151). 6) UE conducted power limit 21 dBm minus Tx power backoff based on CM. 7) UE EIRP limit of 25 dBm minus Tx antenna gain. 8) Minimum of max Tx power according to regulations, max UE conducted power, and max Tx power based on UE EIRP. 9) MCL (Tx power) (noise level) (required SNR) 10) MIL MCL (Tx antenna gain) (Rx antenna gain) | | | | | | |

Table B.1.3.1-4: PRACH link budgets for format B4, delay spread 20 ns, max RTT 380 ns, without UE-specific power limits

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R1-2007984 / Source 1 | **Parameter** | **Value** | | | | | |
| PRACH format | B4 | B4 | B4 | B4 | B4 | B4 |
| SCS [kHz] | 120 | 120 | 120 | 480 | 480 | 960 |
| Sequence length L | 139 | 571 | 1151 | 139 | 571 | 139 |
| Delay spread [ns] | 20 | 20 | 20 | 20 | 20 | 20 |
| Max RTT [ns] | 380 | 380 | 380 | 380 | 380 | 380 |
| Frequency occupancy [MHz] | 16.68 | 68.52 | 138.12 | 66.72 | 274.08 | 133.44 |
| Noise level [dBm] 1) | -94.78 | -88.64 | -85.60 | -88.76 | -82.62 | -85.75 |
| Required SNR [dB] 2) | -10.8 | -16.3 | -19.7 | -11.4 | -18.3 | -11.3 |
| Tx (UE) antenna gain [dBi] 3) | 6 | 6 | 6 | 6 | 6 | 6 |
| Rx (gNB) antenna gain [dBi] 3) | 20 | 20 | 20 | 20 | 20 | 20 |
| Max Tx power according to regulations [dBm] 4) | 19.22 | 25.36 | 27.00 | 25.24 | 27.00 | 27.00 |
| Tx power [dBm] 5) | 19.22 | 25.36 | 27.00 | 25.24 | 27.00 | 27.00 |
| Maximum coupling loss (MCL) [dB] 6) | 124.8 | 130.3 | 132.3 | 125.4 | 127.9 | 124.0 |
| Maximum isotropic loss (MIL) [dB] 7) | 150.8 | 156.3 | 158.3 | 151.4 | 153.9 | 150.0 |
| Table shows PRACH link budgets for format B4, delay spread 20 ns, max RTT 380 ns, without UE-specific power limits  1) Over used subcarriers, assuming a noise figure of 7 dB and thermal noise spectral density of -174 dBm/Hz. 2) SNR required to have 1% misdetection rate, from B.1.3.1-2. 3) Element gain + beamforming gain, same value as for SSB. Assumes Antenna Configuration 2 in the link level evaluation assumptions in TR 38.808 for BS and UE. For BS, 20 dBi antenna gain is used: (10\*log10(4x8) + 5 (element gain) = 20. For the UE, 6 dBi gain is used which assumes that the UE uses wider beams during initial access for PRACH transmission (reduction from 11 dBi). 4) Considering ETSI/FCC EIRP limit of 40 dBm, ETSI BRAN (EIRP) PSD limits of 23 dB/MHz, FCC conducted power limit of 27 dBm above 100 MHz and with proportionally reduced power below 100 MHz. 5) Equals max Tx power according to regulations. Assumes UE is not limited by 21 dBm conducted power or 25 dBm EIRP. 6) MCL (Tx power) (noise level) (required SNR) 7) MIL MCL (Tx antenna gain) (Rx antenna gain) | | | | | | |

#### B.1.3.2 Source 2 [72]

**Table B.1.3.2-1: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability 1‰**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Format | Channel | 120 kHz | 240 kHz | 480 kHz | 960 kHz |
| R1-2009610 / Source 2 | A1 | CDL-B, 20ns | -6.920/1‰ | -7.820/1‰ | -7.829/1‰ | -8.234/1‰ |
| CDL-B, 50ns | -7.842/1‰ | -8.258/1‰ | -8.652/1‰ | -8.917/1‰ |
| CDL-D, 20ns | -6.740/1‰ | -6.740/1‰ | -6.740/1‰ | -6.728/1‰ |
| CDL-D, 30ns | -6.740/1‰ | -6.740/1‰ | -6.740/1‰ | -6.728/1‰ |
| A2 | CDL-B, 20ns | -9.836/1‰ | -10.860/1‰ | -10.739/1‰ | -11.030/1‰ |
| CDL-B, 50ns | -10.777/1‰ | -11.079/1‰ | -11.558/1‰ | -11.955/1‰ |
| CDL-D, 20ns | -9.529/1‰ | -9.523/1‰ | -9.526/1‰ | -9.526/1‰ |
| CDL-D, 30ns | -9.529/1‰ | -9.523/1‰ | -9.526/1‰ | -9.526/1‰ |
| Additional report/notes:  1. PRACH format: A1/A2  2. values of : 137  3. antenna configuration for CDL model:  (Mg,Ng,M,N,P) = (1,1,4,8,2) BS with (0.5 dv, 0.5 dH)  (Mg,Ng,M,N,P) = (1,1,2,2,2) UE with (0.5 dv, 0.5 dH)  4. any optional or other assumption/parameters used not as in the baseline  PN model: Example 2 phase noise model scaling to 60 GHz in 38.803 | | | | | |

#### B.1.3.3 Source 3 [30]

Table B.1.3.3-1: CINR in dB achieving PRACH preamble misdetection probability of 1% ∕ false alarm:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008615 / Source 3 | TDL-A, 5ns | -5.00|<0.1% | -5.52|<0.1% | -6.34|<0.1% | -6.15|<0.1% |
| TDL-A, 10ns | -6.00|<0.1% | -6.01|<0.1% | -6.28|<0.1% | -6.00|<0.1% |
| TDL-A, 20ns | -6.13|<0.1% | -6.00|<0.1% | -6.00|<0.1% | -6.00|<0.1% |
| CDL-B, 20ns (Cfg. 1) | -5.23|<0.1% | -5.45|<0.1% | -5.68|<0.1% | -6.12|<0.1% |
| CDL-B, 50ns (Cfg. 1) | -5.76|<0.1% | -6.06|<0.1% | -6.22|<0.1% | -5.87|<0.1% |
| CDL-D, 20ns (Cfg. 1) | -22.78|<0.1% | -22.97|<0.1% | -22.87|<0.1% | -22.96|<0.1% |
| CDL-D, 30ns (Cfg. 1) | -22.82|<0.1% | -22.93|<0.1% | -22.86|<0.1% | -22.97|<0.1% |
| CDL-B, 20ns (Cfg. 2) | -0.65|<0.1% | -0.45|<0.1% | -0.33|<0.1% | 0.00|<0.1% |
| CDL-B, 50ns (Cfg. 2) | 0.03|<0.1% | 0.42|<0.1% | -0.18|<0.1% | 1.22|<0.1% |
| CDL-D, 20ns (Cfg. 2) | -10.70|<0.1% | -10.64|<0.1% | -10.67|<0.1% | -10.58|<0.1% |
| CDL-D, 30ns (Cfg. 2) | -10.68|<0.1% | -10.62|<0.1% | -10.48|<0.1% | -10.64|<0.1% |
| Additional report/notes:   1. PRACH format: A3, 2. value of : 46 (zeroCorrelationZoneConfig = 14) for CDL, 19 (zeroCorrelationZoneConfig = 10) for TDL 3. antenna configuration for CDL model: Config 1 and Config 2 4. any optional or other assumption/parameters used not as in the baseline | | | | |

Table B.1.3.3-2: CINR in dB achieving PRACH preamble misdetection probability of 1% ∕ false alarm

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008615 / Source 3 | TDL-A, 5ns | -12.47|<0.1% | -12.50|<0.1% | -12.29|<0.1% | -12.55|<0.1% |
| TDL-A, 10ns | -12.56|<0.1% | -12.22|<0.1% | -12.54|<0.1% | -12.93|<0.1% |
| TDL-A, 20ns | -12.12|<0.1% | -12.35|<0.1% | -13.02|<0.1% | -12.33|<0.1% |
| CDL-B, 20ns (Cfg. 1) | -12.06|<0.1% | -12.33|<0.1% | -12.64|<0.1% | -11.07|<0.1% |
| CDL-B, 50ns (Cfg. 1) | -11.43|<0.1% | -11.45|<0.1% | -10.70|<0.1% | -10.28|<0.1% |
| CDL-D, 20ns (Cfg. 1) | -28.05|<0.1% | -28.08|<0.1% | -28.05|<0.1% | -28.03|<0.1% |
| CDL-D, 30ns (Cfg. 1) | -28.05|<0.1% | -28.08|<0.1% | -28.06|<0.1% | -28.03|<0.1% |
| CDL-B, 20ns (Cfg. 2) | -5.64|<0.1% | -5.46|<0.1% | -5.42|<0.1% | -5.00|<0.1% |
| CDL-B, 50ns (Cfg. 2) | -5.45|<0.1% | -5.28|<0.1% | -4.60|<0.1% | -3.47|<0.1% |
| CDL-D, 20ns (Cfg. 2) | -15.81|<0.1% | -15.85|<0.1% | -15.93|<0.1% | -15.76|<0.1% |
| CDL-D, 30ns (Cfg. 2) | -15.82|<0.1% | -15.88|<0.1% | -15.95|<0.1% | -15.77|<0.1% |
| Additional report/notes:   1. PRACH format: A3, 2. value of : 190 (zeroCorrelationZoneConfig = 14) for CDL, 51 (zeroCorrelationZoneConfig = 10) for TDL 3. antenna configuration for CDL model: Config 1 and Config 2 4. any optional or other assumption/parameters used not as in the baseline | | | | |

#### B.1.3.4 Source 4 [60]

Table B.1.3.4-1: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007654 / Source 4 | TDL-A, 5ns | -2.9/0.0071 | -3.5/0.0038 | -3.7/0.0026 | -3.2/0.0020 |
| TDL-A, 10ns | -3.5/0.0071 | -4.2/0.0038 | -3.8/0.0026 | -2.9/0.0020 |
| TDL-A, 20ns | -4.4/0.0071 | -4.4/0.0038 | -3.5/0.0026 | -2.7/0.0020 |
| TDL-A, 40ns | -4.7/0.0071 | -3.9/0.0038 | -3.2/0.0026 | -1.8/0.0020 |
| Additional report/notes:  1. PRACH format：A1  2. values of ：  SCS 120KHz:8, SCS 240KHz:15, SCS 480KHz:34, SCS 960KHz:69  3.Time advance：  SCS 120KHz: random in 0-82, SCS 240KHz: random in 0-163, SCS 480KHz: random in 0-325, SCS 960KHz: random in 0-649. | | | | |

#### B.1.3.5 Source 5 [64]

Table B.1.3.5-1: LLS template: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009450/ Source 5 | TDL-A, 5ns | -3.9/≤0.1% | -4.9/≤0.1% | -5.4/≤0.1% | -5.4/≤0.1% |
| TDL-A, 10ns | -5.0/≤0.1% | -5.2/≤0.1% | -5.2/≤0.1% | -5.0/≤0.1% |
| TDL-A, 20ns | -5.3/≤0.1% | -5.3/≤0.1% | -5.0/≤0.1% | -5.1/≤0.1% |
| Additional report/notes:  1. PRACH format:A1  2. L\_RA=139 | | | | |

#### B.1.3.6 Source 6 [68]

Table B.1.3.6-1: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability, for PRACH format A1 (L = 139 refers to the PRACH sequence length)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 60KHz | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009615/ Source 6 | TDL-A, 5ns | -4.7/0.5‰ | -5/0.47‰ | -5.8/0.52‰ | -6.4/0.35‰ | -6.4/0.14‰ |
| TDL-A, 10ns | -5/ 0.49‰ | -5.86/0.44‰ | -6.5/0.55‰ | -6.1/0.53‰ | -5.6/0.14‰ |
| TDL-A, 20ns | -5.2/0.51‰ | -6.1/0.49‰ | -6.4/0.58‰ | -5.1/0.47‰ | Inf(note) |
| CDL-B, 20ns | -17.2/0.33‰ | -16.2/0.54‰ | -16.7/0.36‰ | -17.6/0.53‰ | -19.1/0.14‰ |
| CDL-B, 50ns | -16.6/0.41‰ | -16.5/0.68‰ | -17.9/0.38‰ | -19.6/0.47‰ | -20.2/0.14‰ |
| Additional report/notes:  1. PRACH format A1 (L = 139 refers to the PRACH sequence length)  2. No cyclic shifts  4. Delay estimation tolerance is ± 0.5 × PUSCH CP (with PUSCH SCS assumed same as PRACH SCS).  5. The detection threshold was selected to yield a maximum false-alarm probability of 0.1% across all SNRs and the actual false-alarm rate is reported in the table.  Note: infinity SNR is observed when the above mentioned detection criteria; while -6.2 dB SNR is observed if the criteria does not take into account timing error. | | | | | |

#### B.1.3.7 Source 7 [62]

Table B.1.3.7-1: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007928 / Source 7 | TDL-A, 5ns | -9.6 | -9.5 | -9.4 | -9.9 |
| TDL-A, 10ns | -10.3 | -10.1 | -9.8 | -9.8 |
| TDL-A, 20ns | -9.5 | -8.9 | -8.8 | -9.5 |
| CDL-B, 20ns |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |
| Additional report/notes:  1. PRACH format A3, L=139  2. Ncs={13,13,69,69} for each SCS, TDL-A,20ns with 240kHz also with Ncs=69.  3. antenna configuration for CDL model  4. Agreed PN model used in TX and RX side. Time offset assumption of 0-0.385us corresponding to ISD of 0-100m. False alarm probability of 0.1%. | | | | |

#### B.1.3.8 Source 13 [29]

Table B.1.3.8-1: LLS template: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009062 / Source 13 | TDL-A, 5ns | 1.1/<0.001 | 0.4/<0.001 | 0.2/<0.001 | -0.3/<0.001 |
| TDL-A, 10ns | 0.8/<0.001 | 0.8/<0.001 | -0.4/<0.001 | -1.2/<0.001 |
| TDL-A, 20ns | 1.4/<0.001 | 0.3/<0.001 | -0.8/<0.001 | -0.2/<0.001 |
| CDL-B, 20ns |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |
| Additional report/notes:  1. PRACH format: A1  2. values of : No cyclic shift  3. antenna configuration for CDL model: N/A  4. any optional or other assumption/parameters used not as in the baseline  - #loops for each combination of SCS and DS: 1000 | | | | |

#### B.1.3.9 Source 14 [16]

Table B.1.3.9-1: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009379/ Source 14 | TDL-A, 5ns | -8.27 dB  / <0.1% FA | -8.57 dB  / <0.1% FA | -9.12 dB  / <0.1% FA | -8.42 dB  / <0.1% FA |
| TDL-A, 10ns | -8.66 dB  / <0.1% FA | -9.15 dB  / <0.1% FA | -8.66 dB  / <0.1% FA | -7.19 dB  / <0.1% FA |
| TDL-A, 20ns | -8.92 dB  / <0.1% FA | -8.37 dB  / <0.1% FA | -7.25 dB  / <0.1% FA | -8.74 dB  / <0.1% FA |
| CDL-B, 20ns | - | - | - | - |
| CDL-B, 50ns | - | - | - | - |
| CDL-D, 20ns | - | - | - | - |
| CDL-D, 30ns | - | - | - | - |
| Additional report/notes:  1. PRACH format: A2 with sequence length 139  2. values of : Ncs = {34, 69, 0, 0} for {120, 240, 480, 960 kHz}  3. antenna configuration for CDL model: N/A  4. any optional or other assumption/parameters used not as in the baseline | | | | |

Table B.1.3.9-2: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009379/ Source 14 | TDL-A, 5ns | -3.99 dB  / <0.1% FA | -6.40 dB  / <0.1% FA | -9.17 dB  / <0.1% FA | -10.48 dB  / <0.1% FA |
| TDL-A, 10ns | -4.46 dB  / <0.1% FA | -7.10 dB  / <0.1% FA | -8.73 dB  / <0.1% FA | -9.39 dB  / <0.1% FA |
| TDL-A, 20ns | -4.90 dB  / <0.1% FA | -6.47 dB  / <0.1% FA | -7.55 dB  / <0.1% FA | -10.65 dB  / <0.1% FA |
| CDL-B, 20ns | - | - | - | - |
| CDL-B, 50ns | - | - | - | - |
| CDL-D, 20ns | - | - | - | - |
| CDL-D, 30ns | - | - | - | - |
| Additional report/notes:  1. PRACH format: sequence length 139, symbol repetition {1,2,4,8} for {120, 240, 480, 960 kHz}, Tested with fixed 1.96 GHz bandwidth.  2. values of : Ncs = {34, 69, 0, 0} for {120, 240, 480, 960 kHz}  3. antenna configuration for CDL model: N/A  4. any optional or other assumption/parameters used not as in the baseline | | | | |

Table B.1.3.9-3: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2009379/ Source 14 | TDL-A, 5ns | -15.12 / <0.1% FA | -14.74 / <0.1% FA | -14.48 / <0.1% FA | -15.28 / <0.1% FA |
| TDL-A, 10ns | -14.80 / <0.1% FA | -14.59 / <0.1% FA | -15.30 / <0.1% FA | -15.25 / <0.1% FA |
| TDL-A, 20ns | -14.49 / <0.1% FA | -15.20 / <0.1% FA | -15.35 / <0.1% FA | -15.16 / <0.1% FA |
| CDL-B, 20ns | - | - | - | - |
| CDL-B, 50ns | - | - | - | - |
| CDL-D, 20ns | - | - | - | - |
| CDL-D, 30ns | - | - | - | - |
| Additional report/notes:  1. PRACH format: A2 with sequence length 571  2. values of : Ncs = {114, 285, 0, 0} for {120, 240, 480, 960 kHz}  3. antenna configuration for CDL model: N/A  4. any optional or other assumption/parameters used not as in the baseline | | | | |

Table B.1.3.9-4: SINR in dB achieving PRACH preamble misdetection probability of 1% and corresponding false alarm probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2008805 / Source 14 | TDL-A, 5ns | -17.69 / <0.1% FA | -17.39/ <0.1% FA | -17.98 / <0.1% FA | -18.19 / <0.1% FA |
| TDL-A, 10ns | -17.56 / <0.1% FA | -18.14 / <0.1% FA | -18.03 / <0.1% FA | -17.58 / <0.1% FA |
| TDL-A, 20ns | -18.15 / <0.1% FA | -18.24 / <0.1% FA | -18.69 / <0.1% FA | -17.97 / <0.1% FA |
| CDL-B, 20ns |  |  |  |  |
| CDL-B, 50ns |  |  |  |  |
| CDL-D, 20ns |  |  |  |  |
| CDL-D, 30ns |  |  |  |  |
| Additional report/notes:  1. PRACH format: A2 with sequence length 1151  2. values of : Ncs = {230, 575, 0, 0} for {120, 240, 480, 960 kHz}  3. antenna configuration for CDL model: N/A  4. any optional or other assumption/parameters used not as in the baseline | | | | |

## B.2 System level evaluation results

### B.2.1 RSRP distribution

#### B.2.1.1 Source 1 [65]

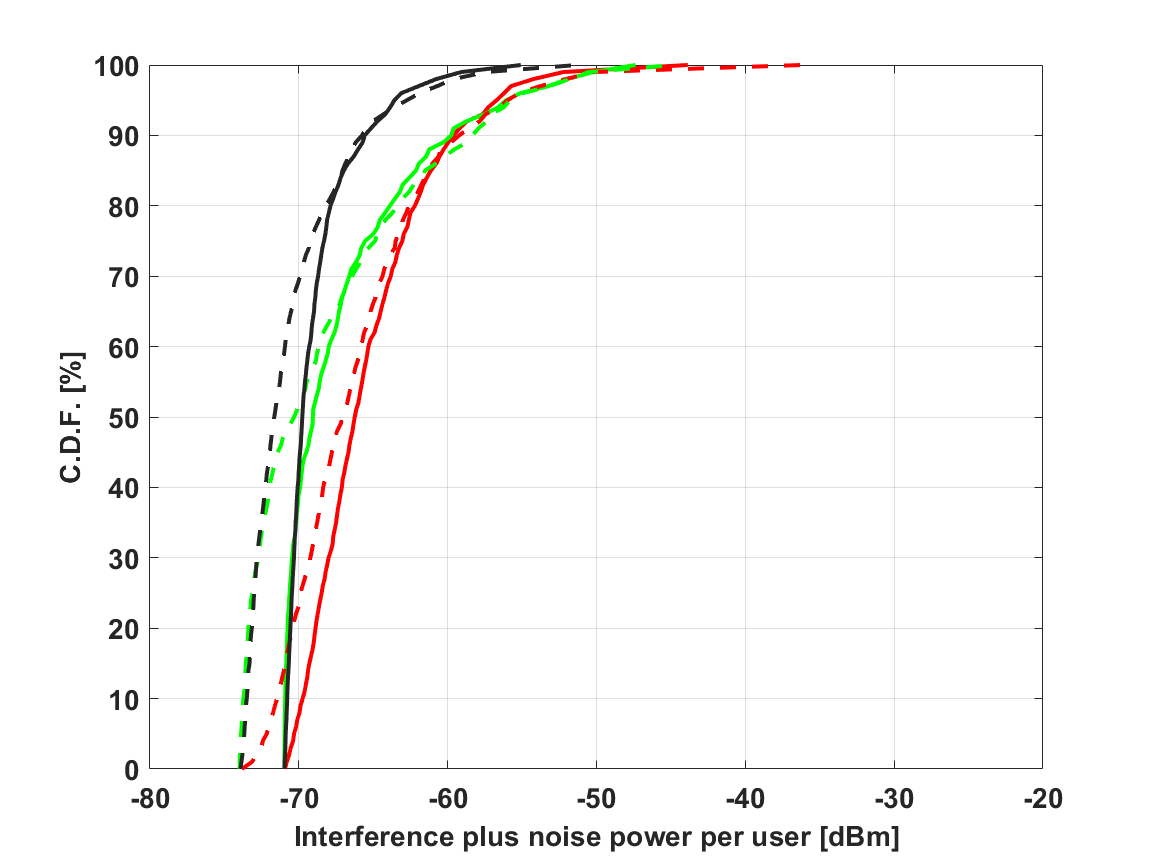
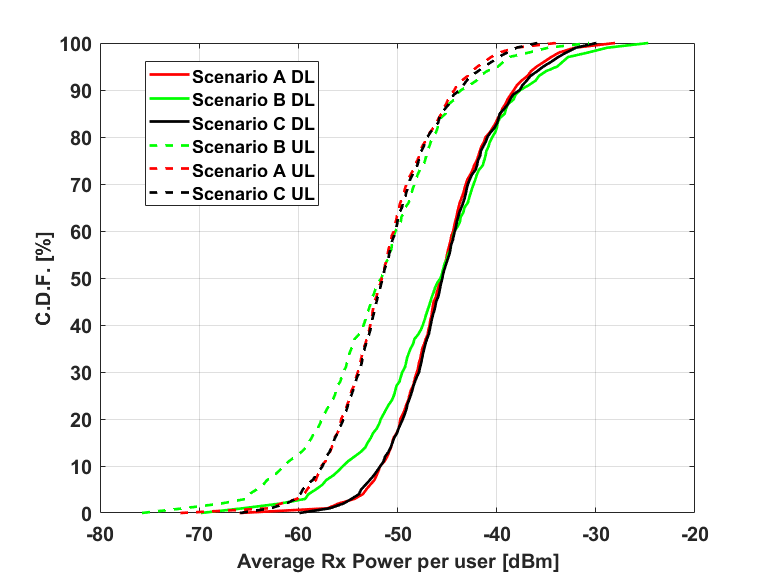


Figure B.2.1.1-1. (a) Received Power (serving BS to UE link) and (b) interference per User in indoor Scenario A, B, and C when buffer occupancy is high (~55%).

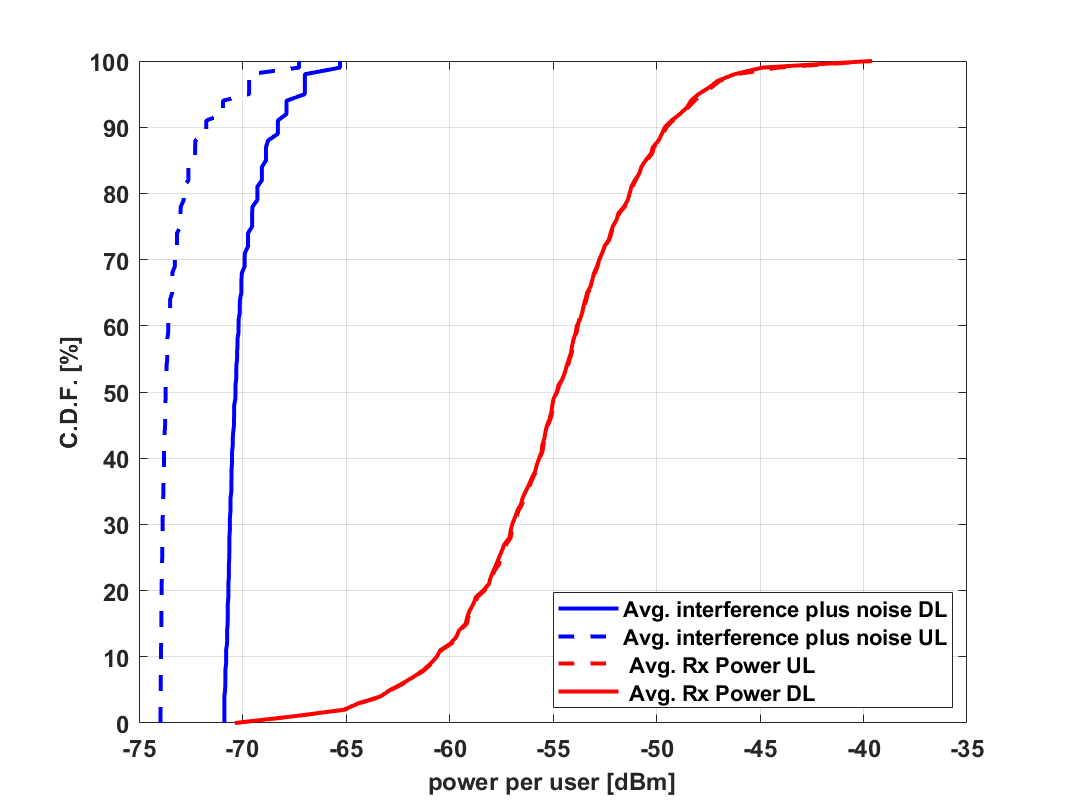


Figure B.2.1.1-2. Received Power (serving BS to UE link) and interference per user in outdoor scenario B (1 Site) when buffer occupancy is high.

#### B.2.1.2 Source 2 [72]

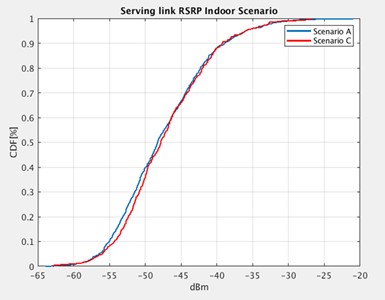


Figure B.2.1.2-1. Serving link RSRP of Indoor scenario-A/C

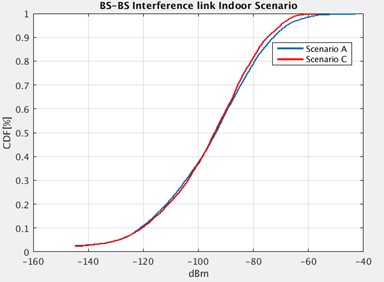


Figure B.2.1.2-2. BS-to-BS interference link RSRP of Indoor scenario-A/C

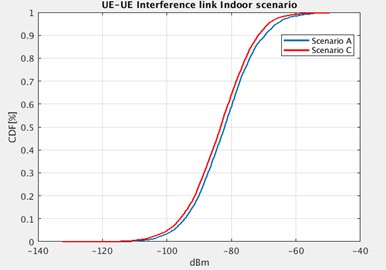


Figure B.2.1.2-3. UE-to-UE interference link RSRP of Indoor scenario-A/C

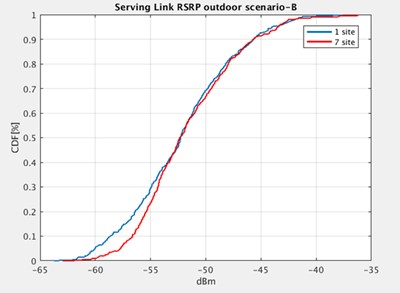


Figure B.2.1.2-4. Serving link RSRP of outdoor scenario-B

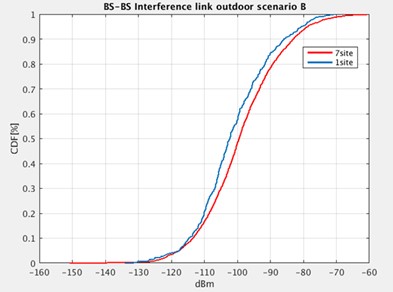


Figure B.2.1.2-5. BS-to-BS interference link RSRP of Indoor scenario-B

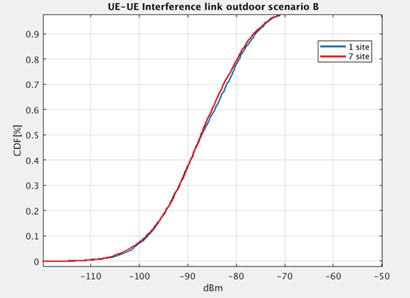


Figure B.2.1.2-6. UE-to-UE interference link RSRP of Indoor scenario-B

#### B.2.1.3 Source 3 [56]



Figure B.2.1.3-1. Downlink serving Cell RSRP Distributions for Indoor scenarios

#### B.2.1.4 Source 4 [37]

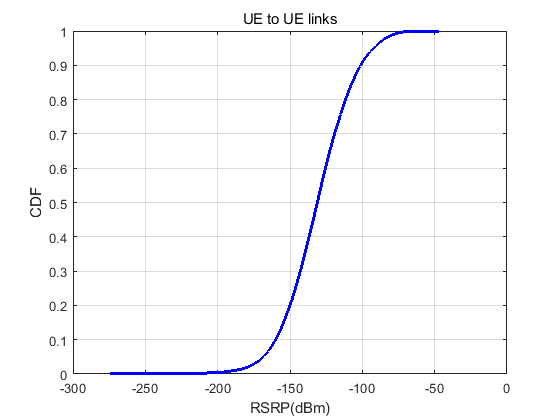
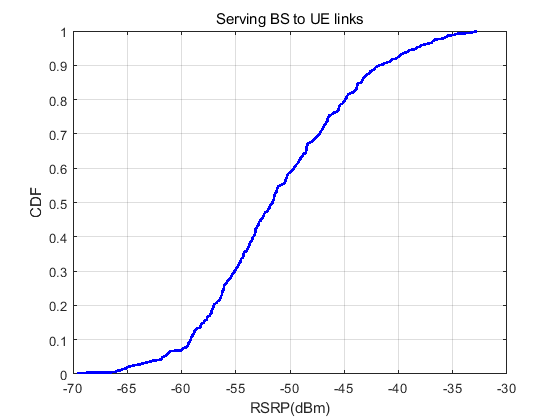
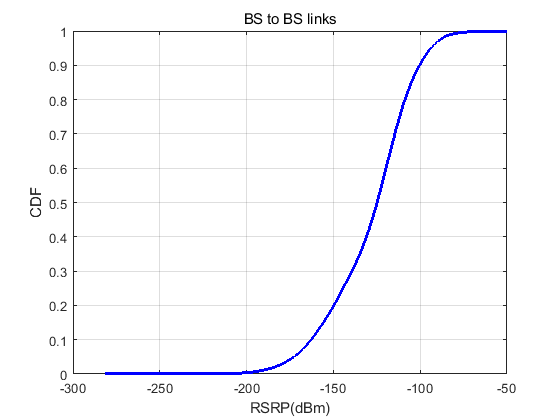
**

Figure B.2.1.4-1 RSRP CDF

#### B.2.1.5 Source 5 [64]



Figure B.2.1.5-1. RSRP distribution for Indoor Scenario A

#### B.2.1.6 Source 6 [68]

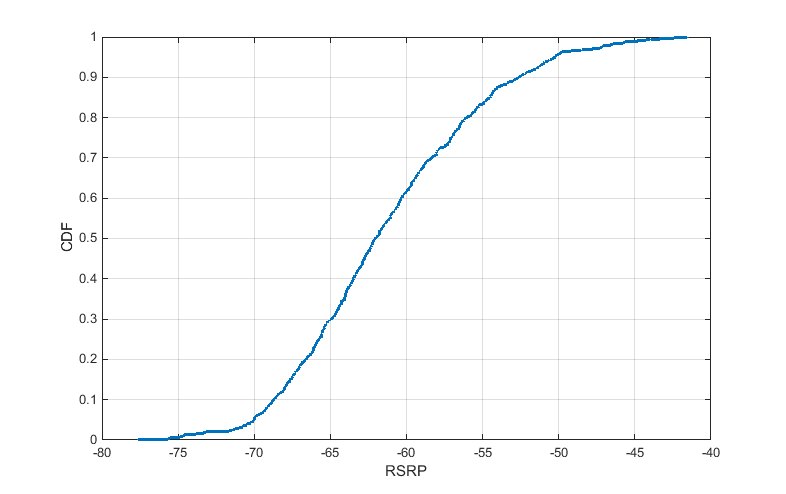


Figure B.2.1.6-1. RSRP distribution

#### B.2.1.7 Source 10 [67]



Figure B.2.1.7-1. RSRP CDF

#### B.2.1.8 Source 14 [43]



Figure B.2.1.8-1. DL Geometry of Indoor A scenario



Figure B.2.1.8-2. RSRP of BS to BS links and (non-serving) BS to UE links for Indoor A scenario

Figure B.2.1.8-3. RSRP of (serving or non-serving) BS to UE link for Indoor A scenario



Figure B.2.1.8-4. Accumulative RSRP of (non-serving) BS to UE links for Indoor A scenario



Figure B.2.1.8-5. RSRP of UE to (serving) BS for Indoor A scenario



Figure B.2.1.8-6. RSRP of UE to (non-serving) BS links for Indoor A scenario. The BS is using regular beamforming intended to receive signals from its own UEs (denoted as Dir CCA), or omnidirectional beamforming (denoted as Omni CCA)



Figure B.2.1.8-7. RSRP of UE to UE links for Indoor A scenario. The UE is using regular beamforming intended to receive signals from its own BS (denoted as Dir CCA), or omnidirectional beamforming (denoted as Omni CCA)



Figure B.2.1.8-8. DL Geometry of Indoor A scenario with non-ceiling mounted BS



Figure B.2.1.8-9. RSRP of BS to BS links and (non-serving) BS to UE links for Indoor A scenario with non-ceiling mounted BS



Figure B.2.1.8-10. RSRP of (serving or non-serving) BS to UE link for Indoor A scenario with non-ceiling mounted BS



Figure B.2.1.8-11. Accumulative RSRP of (non-serving) BS to UE links for Indoor A scenario with non-ceiling mounted BS



Figure B.2.1.8-12. RSRP of UE to (serving) BS for Indoor A scenario with non-ceiling mounted BS



Figure B.2.1.8-13. RSRP of UE to (non-serving) BS links for Indoor A scenario with non-ceiling mounted BS. The BS is using regular beamforming intended to receive signals from its own UEs (denoted as Dir CCA), or omnidirectional beamforming (denoted as Omni CCA)

Figure B.2.1.8-14. RSRP of UE to UE links for Indoor A scenario with non-ceiling mounted BS. The UE is using regular beamforming intended to receive signals from its own BS (denoted as Dir CCA), or omnidirectional beamforming (denoted as Omni CCA)

### B.2.2 Indoor scenario A

#### B.2.2.1 Source 1 [65]

Table B.2.2.1-1. System level evaluation results for scenario A, with/without LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /Source | Cases | | Case 1: no LBT | | | Case 2: ED -47dBm | | | Case 3: ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5566 | 3889 | 2448 | 5451 | 3518 | 2310 | 5201 | 3250 | 2007 |
| 50%ile | 9244 | 7380 | 5670 | 8851 | 7057 | 5356 | 8840 | 6583 | 4813 |
| 95%ile | 11219 | 10363 | 9247 | 10778 | 9882 | 8542 | 10739 | 9543 | 7780 |
| mean | 9002 | 7358 | 5877 | 8627 | 7019 | 5473 | 8595 | 6618 | 4929 |
| DL delay (s) | 5%ile | 0.019 | 0.020 | 0.023 | 0.020 | 0.021 | 0.025 | 0.020 | 0.022 | 0.028 |
| 50%ile | 0.024 | 0.032 | 0.042 | 0.025 | 0.033 | 0.045 | 0.025 | 0.036 | 0.050 |
| 95%ile | 0.038 | 0.058 | 0.090 | 0.039 | 0.063 | 0.097 | 0.040 | 0.066 | 0.112 |
| mean | 0.026 | 0.036 | 0.049 | 0.027 | 0.038 | 0.053 | 0.027 | 0.040 | 0.059 |
| UL UPT (Mbps) | 5%ile | 1869 | 1139 | 493 | 1718 | 960 | 487 | 1727 | 836 | 342 |
| 50%ile | 3409 | 2570 | 1835 | 3197 | 2361 | 1667 | 3130 | 1994 | 1236 |
| 95%ile | 4741 | 4199 | 3592 | 4419 | 3856 | 3314 | 4337 | 3444 | 2727 |
| mean | 3392 | 2659 | 1968 | 3183 | 2426 | 1810 | 3120 | 2088 | 1375 |
| UL delay (s) | 5%ile | 0.045 | 0.050 | 0.059 | 0.048 | 0.055 | 0.063 | 0.049 | 0.062 | 0.077 |
| 50%ile | 0.064 | 0.090 | 0.130 | 0.069 | 0.098 | 0.142 | 0.071 | 0.123 | 0.197 |
| 95%ile | 0.113 | 0.202 | 0.405 | 0.121 | 0.231 | 0.415 | 0.122 | 0.273 | 0.602 |
| mean | 0.072 | 0.107 | 0.179 | 0.076 | 0.119 | 0.188 | 0.078 | 0.146 | 0.261 |
| Arrival rate (files/s) | | 0.47 | 1.53 | 2.45 | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.94 |
| BO | | 0.10 | 0.34 | 0.54 | 0.11 | 0.37 | 0.57 | 0.11 | 0.41 | 0.62 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario A) with the same settings, report only for OP A; case 1: no-LBT, case 2: LBT with ED = -47dBm, case 3: LBT with ED = -68dBm  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.2.1-2. System level evaluation results for scenario A with Receiver assisted LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /Source | Cases | | Case 1: no LBT | | | Case 2: RAL ED -47dBm | | | Case 3: RAL ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5574 | 3830 | 2396 | 5426 | 3561 | 2385 | 5415 | 3573 | 2227 |
| 50%ile | 9250 | 7319 | 5607 | 8845 | 6971 | 5317 | 8880 | 6678 | 4936 |
| 95%ile | 11220 | 10326 | 9205 | 10776 | 9827 | 8674 | 10748 | 9417 | 8209 |
| mean | 9008 | 7303 | 5822 | 8629 | 6951 | 5484 | 8630 | 6660 | 5146 |
| DL delay (s) | 5%ile | 0.019 | 0.020 | 0.023 | 0.020 | 0.021 | 0.025 | 0.020 | 0.022 | 0.026 |
| 50%ile | 0.024 | 0.032 | 0.042 | 0.025 | 0.033 | 0.045 | 0.025 | 0.035 | 0.049 |
| 95%ile | 0.038 | 0.059 | 0.091 | 0.039 | 0.063 | 0.096 | 0.039 | 0.066 | 0.103 |
| mean | 0.026 | 0.036 | 0.050 | 0.027 | 0.038 | 0.053 | 0.027 | 0.040 | 0.056 |
| UL UPT (Mbps) | 5%ile | 1871 | 1116 | 469 | 1741 | 1016 | 527 | 1664 | 888 | 329 |
| 50%ile | 3413 | 2541 | 1808 | 3194 | 2362 | 1697 | 3175 | 2064 | 1287 |
| 95%ile | 4742 | 4181 | 3569 | 4411 | 3881 | 3364 | 4363 | 3513 | 2839 |
| mean | 3395 | 2635 | 1943 | 3182 | 2437 | 1839 | 3144 | 2150 | 1441 |
| UL delay (s) | 5%ile | 0.045 | 0.050 | 0.060 | 0.048 | 0.055 | 0.062 | 0.048 | 0.061 | 0.074 |
| 50%ile | 0.064 | 0.091 | 0.132 | 0.069 | 0.097 | 0.140 | 0.069 | 0.119 | 0.195 |
| 95%ile | 0.112 | 0.206 | 0.413 | 0.120 | 0.225 | 0.410 | 0.121 | 0.255 | 0.591 |
| mean | 0.072 | 0.109 | 0.181 | 0.076 | 0.118 | 0.186 | 0.078 | 0.140 | 0.256 |
| Arrival rate (files/s) | | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 | 1.00 | 0.98 | 0.94 |
| BO | | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.57 | 0.11 | 0.40 | 0.62 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario A) with the same settings, report only for OP A; case 1: no-LBT, case 2: receiver assisted LBT with ED = -47dBm, case 3: receiver assisted LBT with ED = -68dBm  Receiver assisted LBT: the LBT procedure is evaluated at the receiver instead of transmitter. The LBT result is assumed to be available instantly at the transmitter without accounting any overhead for exchanging this information between the transmitter and the receiver (refer to section 2.1.4 in R1-2007983 for more details).  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DLCOT sharing when traffic in both directions  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.2.1-3. System level evaluation results for scenario A with Dynamic LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: Dynamic LBT ED -47dBm | | | Case 3: Dynamic LBT ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5574 | 3830 | 2396 | 5644 | 3743 | 2522 | 5542 | 3713 | 2141 |
| 50%ile | 9250 | 7319 | 5607 | 9228 | 7295 | 5705 | 9166 | 7079 | 5371 |
| 95%ile | 11220 | 10326 | 9205 | 11223 | 10314 | 9083 | 11221 | 10192 | 8835 |
| mean | 9008 | 7303 | 5822 | 8997 | 7301 | 5831 | 8960 | 7108 | 5518 |
| DL delay (s) | 5%ile | 0.019 | 0.020 | 0.023 | 0.019 | 0.020 | 0.024 | 0.019 | 0.020 | 0.024 |
| 50%ile | 0.024 | 0.032 | 0.042 | 0.024 | 0.032 | 0.042 | 0.024 | 0.034 | 0.046 |
| 95%ile | 0.038 | 0.059 | 0.091 | 0.037 | 0.060 | 0.091 | 0.039 | 0.065 | 0.103 |
| mean | 0.026 | 0.036 | 0.050 | 0.026 | 0.036 | 0.049 | 0.026 | 0.038 | 0.054 |
| UL UPT (Mbps) | 5%ile | 1871 | 1116 | 469 | 1863 | 1134 | 581 | 1860 | 1066 | 434 |
| 50%ile | 3413 | 2541 | 1808 | 3432 | 2564 | 1900 | 3387 | 2398 | 1618 |
| 95%ile | 4742 | 4181 | 3569 | 4724 | 4191 | 3643 | 4670 | 3944 | 3212 |
| mean | 3395 | 2635 | 1943 | 3408 | 2646 | 2026 | 3369 | 2487 | 1727 |
| UL delay (s) | 5%ile | 0.045 | 0.050 | 0.060 | 0.045 | 0.050 | 0.058 | 0.045 | 0.054 | 0.066 |
| 50%ile | 0.064 | 0.091 | 0.132 | 0.064 | 0.091 | 0.124 | 0.065 | 0.098 | 0.152 |
| 95%ile | 0.112 | 0.206 | 0.413 | 0.112 | 0.194 | 0.349 | 0.114 | 0.213 | 0.468 |
| mean | 0.072 | 0.109 | 0.181 | 0.071 | 0.108 | 0.165 | 0.072 | 0.116 | 0.205 |
| Arrival rate (files/s) | | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.97 | 1.00 | 0.99 | 0.95 |
| BO | | 0.10 | 0.35 | 0.55 | 0.10 | 0.35 | 0.55 | 0.10 | 0.36 | 0.58 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario A) with the same settings, report only for OP A; case 1: no-LBT, case 2: Dynamic LBT with ED = -47dBm, case 3: Dynamic LBT with ED = -68dBm  Dynamic LBT: a node operates without LBT unless the receiver experiences a failure in reception due to a drop in SINR, which reflects a presence of interferer. Only then, the node switches to LBT. Besides, when the LBT is switched on, the RAL described in section 2.1.4 of R1-2007983 is used  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.2.1-4. System level evaluation results for scenario A with directional LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: directional LBT ED -47dBm | | | Case 3: directional LBT ED-47+X dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5574 | 3830 | 2396 | 5294 | 3497 | 2365 | 5321 | 3537 | 2274 |
| 50%ile | 9250 | 7319 | 5607 | 8849 | 6924 | 5256 | 8836 | 6948 | 5337 |
| 95%ile | 11220 | 10326 | 9205 | 10780 | 9816 | 8494 | 10768 | 9867 | 8609 |
| mean | 9008 | 7303 | 5822 | 8638 | 6914 | 5449 | 8613 | 6925 | 5461 |
| DL delay (s) | 5%ile | 0.019 | 0.020 | 0.023 | 0.020 | 0.021 | 0.025 | 0.020 | 0.021 | 0.025 |
| 50%ile | 0.024 | 0.032 | 0.042 | 0.025 | 0.034 | 0.046 | 0.025 | 0.034 | 0.045 |
| 95%ile | 0.038 | 0.059 | 0.091 | 0.040 | 0.064 | 0.097 | 0.040 | 0.066 | 0.098 |
| mean | 0.026 | 0.036 | 0.050 | 0.027 | 0.038 | 0.053 | 0.027 | 0.038 | 0.053 |
| UL UPT (Mbps) | 5%ile | 1871 | 1116 | 469 | 1733 | 1008 | 529 | 1716 | 1028 | 481 |
| 50%ile | 3413 | 2541 | 1808 | 3206 | 2342 | 1674 | 3225 | 2360 | 1683 |
| 95%ile | 4742 | 4181 | 3569 | 4453 | 3881 | 3370 | 4447 | 3841 | 3342 |
| mean | 3395 | 2635 | 1943 | 3193 | 2435 | 1813 | 3194 | 2427 | 1811 |
| UL delay (s) | 5%ile | 0.045 | 0.050 | 0.060 | 0.048 | 0.054 | 0.063 | 0.048 | 0.055 | 0.065 |
| 50%ile | 0.064 | 0.091 | 0.132 | 0.068 | 0.099 | 0.143 | 0.068 | 0.099 | 0.142 |
| 95%ile | 0.112 | 0.206 | 0.413 | 0.119 | 0.218 | 0.409 | 0.119 | 0.219 | 0.424 |
| mean | 0.072 | 0.109 | 0.181 | 0.076 | 0.118 | 0.185 | 0.076 | 0.118 | 0.188 |
| Arrival rate (files/s) | | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.97 | 1.00 | 0.99 | 0.96 |
| BO | | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.57 | 0.11 | 0.37 | 0.58 |
| Additional report/notes:  1. LBT procedure and parameters: directional LBT, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario A) with the same settings, report only for OP A; case 1: no-LBT, case 2: directional LBT with ED = -47dBm, case 3: directional LBT with ED = -47+x dBm (i.e., -47+15dBm at gNB, -47+6dBm at UE)  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DLCOT sharing when traffic in both directions  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.2.1-5. System level evaluation results for scenario A, with mixed LBT configuration

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT  **(OpA )** | | | Case 2: ED -47dBm  **(OpB)** | | | Case 3: mixed configuration | | | | | |
| (**Op A** , no LBT ) | | | (**Op B**, -47dBm ) | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5574 | 3830 | 2396 | 5072 | 3434 | 2204 | 5662 | 3761 | 2455 | 5106 | 3552 | 2219 |
| 50%ile | 9250 | 7319 | 5607 | 8787 | 6893 | 5292 | 9218 | 7378 | 5574 | 8796 | 6929 | 5238 |
| 95%ile | 11220 | 10326 | 9205 | 10793 | 9829 | 8587 | 11222 | 10295 | 9071 | 10774 | 9845 | 8585 |
| mean | 9008 | 7303 | 5822 | 8562 | 6869 | 5435 | 9009 | 7324 | 5780 | 8553 | 6900 | 5427 |
| DL delay (s) | 5%ile | 0.019 | 0.020 | 0.023 | 0.020 | 0.021 | 0.025 | 0.019 | 0.020 | 0.023 | 0.020 | 0.021 | 0.025 |
| 50%ile | 0.024 | 0.032 | 0.042 | 0.025 | 0.034 | 0.045 | 0.024 | 0.032 | 0.043 | 0.025 | 0.034 | 0.046 |
| 95%ile | 0.038 | 0.059 | 0.091 | 0.041 | 0.065 | 0.102 | 0.037 | 0.058 | 0.090 | 0.041 | 0.064 | 0.101 |
| mean | 0.026 | 0.036 | 0.050 | 0.027 | 0.038 | 0.053 | 0.026 | 0.036 | 0.050 | 0.027 | 0.038 | 0.053 |
| UL UPT (Mbps) | 5%ile | 1871 | 1116 | 469 | 1641 | 961 | 414 | 1901 | 1081 | 526 | 1673 | 999 | 477 |
| 50%ile | 3413 | 2541 | 1808 | 3186 | 2326 | 1638 | 3409 | 2546 | 1827 | 3198 | 2365 | 1683 |
| 95%ile | 4742 | 4181 | 3569 | 4399 | 3844 | 3338 | 4732 | 4171 | 3661 | 4382 | 3895 | 3404 |
| mean | 3395 | 2635 | 1943 | 3151 | 2406 | 1778 | 3397 | 2631 | 1962 | 3161 | 2439 | 1832 |
| UL delay (s) | 5%ile | 0.045 | 0.050 | 0.060 | 0.048 | 0.054 | 0.063 | 0.045 | 0.050 | 0.057 | 0.048 | 0.053 | 0.062 |
| 50%ile | 0.064 | 0.091 | 0.132 | 0.069 | 0.100 | 0.146 | 0.064 | 0.091 | 0.132 | 0.069 | 0.099 | 0.139 |
| 95%ile | 0.112 | 0.206 | 0.413 | 0.124 | 0.231 | 0.458 | 0.111 | 0.205 | 0.389 | 0.123 | 0.221 | 0.411 |
| mean | 0.072 | 0.109 | 0.181 | 0.077 | 0.120 | 0.201 | 0.071 | 0.108 | 0.174 | 0.077 | 0.119 | 0.187 |
| Arrival rate (files/s) | | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 | 0.46 | 1.57 | 2.48 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 |
| BO | | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.57 | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.58 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario A); case 1: no-LBT for both OPs, case 2: LBT with ED = -47dBm for both OPs, case 3: no LBT for OP A, LBT with ED = -47dBm for OP B  4. Other metric(s) and definition if reported: no  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | | | | |

#### B.2.2.2 Source 2 [72]

Table B.2.2.2-1. System level evaluation results for indoor scenario A (no-LBT and omni-directional LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | no-LBT | | | omni-directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 2690.3 | 1015.6 | 222.3 | 2527.9 | 881.7 | 158.8 |
| 50%ile | 6635.8 | 4431.6 | 3385.4 | 6137.7 | 4068.8 | 3062.5 |
| 95%ile | 9477.6 | 9469.3 | 9404.3 | 8949.0 | 8837.5 | 8628.6 |
| mean | 6381.8 | 4819.0 | 3818.9 | 5943.5 | 4404.3 | 3439.1 |
| DL delay (s) | 5%ile | 0.0228 | 0.0228 | 0.0229 | 0.0241 | 0.0244 | 0.0250 |
| 50%ile | 0.0325 | 0.0485 | 0.0634 | 0.0352 | 0.0530 | 0.0698 |
| 95%ile | 0.0801 | 0.2059 | 0.7516 | 0.0867 | 0.2492 | 1.0180 |
| mean | 0.0396 | 0.0743 | 0.1751 | 0.0430 | 0.0882 | 0.2161 |
| UL UPT (Mbps) | 5%ile | 2817.4 | 1027.9 | 304.2 | 2606.0 | 839.2 | 185.6 |
| 50%ile | 6949.9 | 4798 | 3802.7 | 6527.9 | 4358.4 | 3372.2 |
| 95%ile | 10637 | 10118 | 9111.1 | 9982.3 | 9243.3 | 8536.7 |
| mean | 6771.0 | 5046.4 | 4165.3 | 6320.3 | 4602.4 | 3726.3 |
| UL delay (s) | 5%ile | 0.0203 | 0.0211 | 0.0236 | 0.0216 | 0.0225 | 0.0251 |
| 50%ile | 0.0311 | 0.0448 | 0.0564 | 0.0331 | 0.0493 | 0.0634 |
| 95%ile | 0.0764 | 0.2034 | 0.5975 | 0.0837 | 0.2500 | 0.8877 |
| mean | 0.0375 | 0.0728 | 0.1613 | 0.0410 | 0.0867 | 0.2029 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.64% | 99.49% | 97.37% | 99.69% | 99.44% | 96.69% |
| 𝜌UL | | 99.68% | 99.45% | 97.89% | 99.65% | 99.32% | 96.91% |
| BO | | 12.94% | 42.34% | 57.72% | 13.81% | 45.13% | 60.60% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (scenario A) with the same settings, case1: No LBT; case 2: omni-directional LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. Rank 1 transmission. BS to UE: InH open office channel, ftp3 file size = 27Mbyte. | | | | | | | |

Table B.2.2.2-2. System level evaluation results for indoor scenario A (directional LBT and receiver assisted LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | directional LBT | | | receiver-assisted LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 2507.1 | 874.7 | 154.7 | 2587.9 | 994.5 | 242.7 |
| 50%ile | 6129.2 | 4038.4 | 3031.0 | 6170.7 | 4181.1 | 3187.9 |
| 95%ile | 8956.3 | 8827.5 | 8625.3 | 8959.2 | 8852.4 | 8690.1 |
| mean | 5931.7 | 4382.4 | 3432.0 | 5991.0 | 4516.8 | 3582.2 |
| DL delay (s) | 5%ile | 0.0241 | 0.0244 | 0.0250 | 0.0241 | 0.0244 | 0.0248 |
| 50%ile | 0.0351 | 0.0530 | 0.0707 | 0.0352 | 0.0515 | 0.0673 |
| 95%ile | 0.0858 | 0.2411 | 0.9853 | 0.0838 | 0.2237 | 0.7022 |
| mean | 0.0427 | 0.0857 | 0.2087 | 0.0424 | 0.0819 | 0.1971 |
| UL UPT (Mbps) | 5%ile | 2606.0 | 836.3 | 181.8 | 2698.8 | 938.8 | 275.2 |
| 50%ile | 6528.8 | 4351.0 | 3369.3 | 6621.1 | 4490.5 | 3537.3 |
| 95%ile | 9985.1 | 9250.1 | 8531.0 | 9990.1 | 9469.4 | 8631.4 |
| mean | 6317.1 | 4594.3 | 3724.6 | 6396.9 | 4750.6 | 3868.7 |
| UL delay (s) | 5%ile | 0.0216 | 0.0230 | 0.0252 | 0.0216 | 0.0224 | 0.0248 |
| 50%ile | 0.0330 | 0.0494 | 0.0634 | 0.0329 | 0.0481 | 0.0605 |
| 95%ile | 0.0824 | 0.2490 | 0.8331 | 0.0815 | 0.2332 | 0.7032 |
| mean | 0.0405 | 0.0880 | 0.1989 | 0.0402 | 0.0808 | 0.1831 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.62% | 99.41% | 96.81% | 99.69% | 99.47% | 96.90% |
| 𝜌UL | | 99.66% | 99.33% | 96.98% | 99.66% | 99.34% | 97.21% |
| BO | | 13.82% | 45.20% | 60.57% | 13.81% | 44.89% | 60.35% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (scenario A) with the same settings, case1: directional LBT; case 2: receiver-assisted LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. Rank 1 transmission. BS to UE: InH open office channel, ftp3 file size = 27Mbyte. | | | | | | | |

Table B.2.2.2-3. System level evaluation results for indoor scenario A (receiver-only directional LBT)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | receiver-only directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 2809.9 | 1206.1 | 370.2 |
| 50%ile | 6586.1 | 4563.2 | 3591.4 |
| 95%ile | 9481.1 | 9475.2 | 9441.4 |
| mean | 6431.9 | 4943.0 | 3982.5 |
| DL delay (s) | 5%ile | 0.0228 | 0.0228 | 0.0229 |
| 50%ile | 0.0330 | 0.0471 | 0.0598 |
| 95%ile | 0.0783 | 0.1827 | 0.5443 |
| mean | 0.0395 | 0.0698 | 0.1610 |
| UL UPT (Mbps) | 5%ile | 2932.9 | 1139.2 | 356.9 |
| 50%ile | 7009.0 | 4947.9 | 3901.2 |
| 95%ile | 10621 | 10276 | 9203.9 |
| mean | 6838.1 | 5198.1 | 4277.9 |
| UL delay (s) | 5%ile | 0.0203 | 0.0207 | 0.0231 |
| 50%ile | 0.0310 | 0.0435 | 0.0549 |
| 95%ile | 0.0748 | 0.1881 | 0.5590 |
| mean | 0.0374 | 0.0685 | 0.1530 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.71% | 99.54% | 97.55% |
| 𝜌UL | | 99.68% | 99.47% | 97.95% |
| BO | | 12.96% | 42.14% | 57.46% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (scenario A) with the same settings, case1: receiver-only directional LBT(No random back off before dl/ul data grant);  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. Rank 1 transmission. BS to UE: InH open office channel, ftp3 file size = 27Mbyte. | | | | |

Table B.2.2.2-4. System level evaluation results for indoor scenario A (InH mixed, no-LBT and omni-directional LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | no-LBT | | | omni-directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 346.9 | 150.2 | 62.9 | 339.6 | 145.6 | 60.7 |
| 50%ile | 1141.5 | 764.6 | 597.5 | 1077.0 | 726.0 | 578.8 |
| 95%ile | 1851.6 | 1848.6 | 1841.6 | 1786.7 | 1768.5 | 1751.1 |
| mean | 1105.3 | 846.8 | 701.5 | 1057.6 | 805.6 | 669.1 |
| DL delay (s) | 5%ile | 0.0346 | 0.0353 | 0.0404 | 0.0361 | 0.0371 | 0.0421 |
| 50%ile | 0.0543 | 0.0811 | 0.1034 | 0.0574 | 0.0858 | 0.1080 |
| 95%ile | 0.2901 | 0.7812 | 1.7303 | 0.3024 | 0.8198 | 1.7773 |
| mean | 0.1062 | 0.2269 | 0.3583 | 0.1086 | 0.2320 | 0.3627 |
| UL UPT (Mbps) | 5%ile | 279.7 | 123.7 | 46.8 | 271.3 | 108.8 | 37.5 |
| 50%ile | 1071.6 | 753.1 | 590.5 | 1018 | 697.7 | 554.5 |
| 95%ile | 1973.5 | 1969.3 | 1943.5 | 1886.5 | 1865.4 | 1825.6 |
| mean | 1076.8 | 846.3 | 701.9 | 1021.9 | 792.7 | 659.9 |
| UL delay (s) | 5%ile | 0.0325 | 0.0346 | 0.0391 | 0.0342 | 0.0366 | 0.0415 |
| 50%ile | 0.0573 | 0.0823 | 0.1054 | 0.0603 | 0.0897 | 0.1121 |
| 95%ile | 0.4021 | 1.1329 | 2.2083 | 0.4133 | 1.2521 | 2.4032 |
| mean | 0.1378 | 0.2777 | 0.4186 | 0.1446 | 0.2981 | 0.4457 |
| Arrival rate (files/s) | | 0.25 | 0.6 | 0.8 | 0.25 | 0.6 | 0.8 |
| 𝜌DL | | 99.37% | 97.46% | 94.91% | 99.33% | 97.43% | 94.77% |
| 𝜌UL | | 98.15% | 96.48% | 93.69% | 98.11% | 96.23% | 93.12% |
| BO | | 20.19% | 45.88% | 58.88% | 21.01% | 47.36% | 59.9% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (scenario A) with the same settings, case1: no-LBT; case 2: omni-directional LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 400MHz, SCS = 120kHz. Rank 1 transmission. BS to UE: InH mixed office channel, ftp3 file size = 8Mbyte. | | | | | | | |

Table B.2.2.2-5. System level evaluation results for indoor scenario A (InH mixed, directional LBT and receiver assisted LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | directional LBT | | | receiver-assisted LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 332.5 | 145.6 | 59.7 | 350.1 | 165.6 | 76.05 |
| 50%ile | 1072.7 | 729.1 | 573.7 | 1067.2 | 753.9 | 624.6 |
| 95%ile | 1787.5 | 1770.5 | 1751.1 | 1784.7 | 1770.2 | 1759.3 |
| mean | 1056.1 | 805.5 | 668.31 | 1057.5 | 821.0 | 699.1 |
| DL delay (s) | 5%ile | 0.0361 | 0.0370 | 0.0421 | 0.0361 | 0.0369 | 0.0406 |
| 50%ile | 0.0576 | 0.0856 | 0.1078 | 0.0583 | 0.0814 | 0.1000 |
| 95%ile | 0.3016 | 0.8349 | 1.7601 | 0.2941 | 0.6925 | 1.4098 |
| mean | 0.1104 | 0.2334 | 0.3629 | 0.1045 | 0.2196 | 0.3192 |
| UL UPT (Mbps) | 5%ile | 261.1 | 108.7 | 38.2 | 273.7 | 114.2 | 44.23 |
| 50%ile | 1016.5 | 699.4 | 557.0 | 1025.8 | 723.6 | 594.1 |
| 95%ile | 1885.7 | 1862.6 | 1819.1 | 1887.3 | 1867.5 | 1843.5 |
| mean | 1021.7 | 790.9 | 659.8 | 1032.6 | 810.4 | 684.9 |
| UL delay (s) | 5%ile | 0.0343 | 0.0367 | 0.0416 | 0.0342 | 0.0361 | 0.0404 |
| 50%ile | 0.0605 | 0.0890 | 0.1118 | 0.0599 | 0.0855 | 0.1039 |
| 95%ile | 0.4228 | 1.2325 | 2.3873 | 0.4007 | 1.0162 | 2.0620 |
| mean | 0.1452 | 0.2970 | 0.4438 | 0.1371 | 0.2713 | 0.4056 |
| Arrival rate (files/s) | | 0.25 | 0.6 | 0.8 | 0.25 | 0.6 | 0.8 |
| 𝜌DL | | 99.33% | 97.43% | 94.81% | 99.38% | 97.44% | 95.35% |
| 𝜌UL | | 98.11% | 96.32% | 93.18% | 98.25% | 96.54% | 93.70% |
| BO | | 21.04% | 47.4% | 59.8% | 21.24% | 47.41% | 59.83% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (scenario A) with the same settings, case1: directional LBT; case 2: receiver-assisted LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 400MHz, SCS = 120kHz. Rank 1 transmission. BS to UE: InH mixed office channel, ftp3 file size = 8Mbyte. | | | | | | | |

Table B.2.2.2-6. System level evaluation results for indoor scenario A (InH Mixed, receiver-only directional LBT)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | receiver-only directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 375.9 | 188.5 | 97.9 |
| 50%ile | 1146.4 | 822.5 | 677.0 |
| 95%ile | 1892.6 | 1890.1 | 1885.8 |
| mean | 1134.2 | 894.7 | 759.0 |
| DL delay (s) | 5%ile | 0.0339 | 0.0341 | 0.0380 |
| 50%ile | 0.0544 | 0.0750 | 0.0912 |
| 95%ile | 0.2647 | 0.5887 | 1.1616 |
| mean | 0.0975 | 0.1950 | 0.2849 |
| UL UPT (Mbps) | 5%ile | 289.3 | 130.9 | 53.9 |
| 50%ile | 1059.6 | 733.6 | 640.8 |
| 95%ile | 1973.2 | 1968.8 | 1957.5 |
| mean | 1090.8 | 863.8 | 733.9 |
| UL delay (s) | 5%ile | 0.0325 | 0.0340 | 0.0380 |
| 50%ile | 0.0558 | 0.0795 | 0.0960 |
| 95%ile | 0.3791 | 0.9621 | 1.8669 |
| mean | 0.1295 | 0.2605 | 0.3765 |
| Arrival rate (files/s) | | 0.25 | 0.6 | 0.8 |
| 𝜌DL | | 99.41% | 97.80% | 96.02% |
| 𝜌UL | | 98.34% | 96.62% | 94.30% |
| BO | | 20.3% | 45.43% | 58.06% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (scenario A) with the same settings, case1: receiver-only directional LBT(No random back off before dl/ul data grant);  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 400MHz, SCS = 120kHz. Rank 1 transmission. BS to UE: InH mixed office channel, ftp3 file size = 8Mbyte. | | | | |

#### B.2.2.3 Source 3 [56]

Table B.2.2.3-1. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: -47dBM@gNB, Dynamic TDD  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, | | | Case 2: -67dBM@gNB,  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators  Omni Listening | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6381 | 3753 | 758 | 6176 | 3738 | 781 |
| 50%ile | 11297 | 8593 | 4511 | 11335 | 8607 | 4841 |
| 95%ile | 13685 | 12550 | 10440 | 13661 | 12503 | 10659 |
| mean | 10738 | 8387 | 4992 | 10734 | 8420 | 5170 |
| DL delay (s) | 5%ile | 1.22 | 1.428 | 1.919 | 1.226 | 1.422 | 1.87 |
| 50%ile | 1.712 | 2.525 | 5.854 | 1.712 | 2.48 | 5.472 |
| 95%ile | 3.406 | 6.704 | 83.257 | 3.362 | 6.698 | 47.683 |
| mean | 1.942 | 3.172 | 24.875 | 1.944 | 3.111 | 20.491 |
| UL UPT (Mbps) | 5%ile | 4997 | 3438 | 935 | 4921 | 3506 | 972 |
| 50%ile | 8755 | 6996 | 4086 | 8731 | 7023 | 4281 |
| 95%ile | 10395 | 9591 | 8161 | 10372 | 9575 | 8316 |
| mean | 8407 | 6826 | 4300 | 8397 | 6841 | 4450 |
| UL delay (s) | 5%ile | 1.597 | 1.791 | 2.357 | 1.604 | 1.806 | 2.287 |
| 50%ile | 2.091 | 2.921 | 6.543 | 2.099 | 2.881 | 6.041 |
| 95%ile | 3.822 | 6.702 | 37.443 | 3.872 | 6.7 | 36.987 |
| mean | 2.292 | 3.418 | 12.621 | 2.299 | 3.394 | 11.065 |
| Arrival rate (files/s) | | 10 | 15 | 20 | 10 | 15 | 20 |
| 𝜌DL | | 0.999 | 0.999 | 0.984 | 0.999 | 0.999 | 0.985 |
| 𝜌UL | | 0.999 | 0.999 | 0.994 | 0.999 | 0.999 | 0.995 |
| BO | | 0.18 | 0.33 | 0.508 | 0.18 | 0.326 | 0.502 |
| Additional report/notes: Case 1 and Case 2:   1. LBT procedure and parameters: Baseline LBT Procedure at gNB: 8us+(1-3)\*5us, at the gNB. Only gNBs perform extended CCA. 2. All Results with 2 operator Indoor scenario. Main assumptions provided in Column header and Table 1. Omni Directional LBT with specified thresholds. 3. No COT sharing from UL to DL. 4. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

Table B.2.2.3-2. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 3: -67dBM@gNB, Rx Assist  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, Omni Listening | | | Case 4: -72dBM@gNB, Rx Assist  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators Omni Listening | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6275 | 3713 | 851 | 6368 | 3855 | 1146 |
| 50%ile | 11237 | 8686 | 5063 | 11235 | 8751 | 5497 |
| 95%ile | 13473 | 12340 | 10634 | 13480 | 12444 | 10730 |
| mean | 10631 | 8364 | 5340 | 10670 | 8492 | 5719 |
| DL delay (s) | 5%ile | 1.239 | 1.442 | 1.844 | 1.231 | 1.425 | 1.799 |
| 50%ile | 1.719 | 2.464 | 5.203 | 1.69 | 2.429 | 4.489 |
| 95%ile | 3.355 | 6.728 | 43.559 | 3.326 | 6.33 | 26.962 |
| mean | 1.948 | 3.153 | 19.907 | 1.931 | 3.054 | 12.928 |
| UL UPT (Mbps) | 5%ile | 5023 | 3443 | 1132 | 5066 | 3521 | 1343 |
| 50%ile | 8740 | 7035 | 4438 | 8724 | 7142 | 4726 |
| 95%ile | 10362 | 9580 | 8331 | 10328 | 9614 | 8390 |
| mean | 8408 | 6850 | 4593 | 8405 | 6881 | 4796 |
| UL delay (s) | 5%ile | 1.603 | 1.8 | 2.272 | 1.609 | 1.8 | 2.245 |
| 50%ile | 2.084 | 2.862 | 5.932 | 2.093 | 2.838 | 5.189 |
| 95%ile | 3.861 | 6.806 | 30.388 | 3.773 | 6.608 | 21.325 |
| mean | 2.29 | 3.368 | 9.494 | 2.292 | 3.316 | 7.919 |
| Arrival rate (files/s) | | 10 | 15 | 20 | 10 | 15 | 20 |
| 𝜌DL | | 0.999 | 0.999 | 0.987 | 0.999 | 0.999 | 0.993 |
| 𝜌UL | | 0.999 | 0.999 | 0.996 | 0.999 | 0.999 | 0.997 |
| BO | | 0.18 | 0.331 | 0.5 | 0.179 | 0.325 | 0.504 |
| Additional report/notes: Case 3 and Case 4:   1. LBT procedure and parameters: ECCA based Contention at gNB: 8us+(1-3)\*5us, at the gNB. 2. Rx-Assistance: Silencing signals sent by gNB and UE after winning the medium. Only gNBs perform extended CCA. 3. All results are for 2 operator Indoor office scenarios. Main Setup described in the column header and Table 1. 4. Only gNBs perform extended CCA. No COT sharing from UL to DL. 5. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling 1 user.COT with beam persistence | | | | | | | |

Table B.2.2.3-3. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 5: -67dBM@gNB, Tx Sensing  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, Directional Sensing | | | Case 6: -72dBM@gNB, Tx Sensing  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators Directional Sensing | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6133 | 3698 | 791 | 6212 | 3710 | 874 |
| 50%ile | 11328 | 8385 | 4730 | 11344 | 8503 | 4888 |
| 95%ile | 13610 | 12535 | 10512 | 13632 | 12465 | 10476 |
| mean | 10725 | 8301 | 5038 | 10722 | 8347 | 5143 |
| DL delay (s) | 5%ile | 1.23 | 1.436 | 1.944 | 1.237 | 1.445 | 1.889 |
| 50%ile | 1.715 | 2.547 | 5.659 | 1.718 | 2.595 | 5.524 |
| 95%ile | 3.452 | 6.646 | 81.718 | 3.393 | 6.992 | 52.664 |
| mean | 1.949 | 3.21 | 22.175 | 1.946 | 3.205 | 21.199 |
| UL UPT (Mbps) | 5%ile | 4999 | 3466 | 1001 | 5030 | 3454 | 996 |
| 50%ile | 8726 | 6979 | 4169 | 8779 | 6989 | 4296 |
| 95%ile | 10363 | 9573 | 8298 | 10373 | 9575 | 8255 |
| mean | 8397 | 6809 | 4357 | 8409 | 6798 | 4411 |
| UL delay (s) | 5%ile | 1.606 | 1.812 | 2.292 | 1.602 | 1.806 | 2.312 |
| 50%ile | 2.082 | 2.912 | 6.481 | 2.071 | 2.89 | 6.168 |
| 95%ile | 3.881 | 6.662 | 36.804 | 3.858 | 6.578 | 33.331 |
| mean | 2.301 | 3.412 | 11.291 | 2.287 | 3.407 | 10.714 |
| Arrival rate (files/s) | | 10 | 15 | 20 | 10 | 15 | 20 |
| 𝜌DL | | 0.999 | 0.999 | 0.986 | 0.999 | 0.999 | 0.986 |
| 𝜌UL | | 0.999 | 0.999 | 0.995 | 0.999 | 0.999 | 0.995 |
| BO | | 0.18 | 0.334 | 0.518 | 0.18 | 0.333 | 0.496 |
| Additional report/notes: Case 5 and Case 6:   1. LBT procedure and parameters: Baseline LBT Procedure at gNB: 8us+(1-3)\*5us, at the gNB. Only gNBs perform extended CCA 2. All Results with 2 operator Indoor scenario. Main assumptions provided in Column header and Table 1. Directional LBT – Energy Detection in the direction of UE to serve, with same beam as the transmission beam. 3. Only gNBs perform extended CCA. No COT sharing from UL to DL. 4. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

Table B.2.2.3-4. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 7: -67dBM@gNB, Rx Assistance  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, Directional Sensing | | | Case 8: -72dBM@gNB, , Rx Assistance  (Mg,Ng,M,N,P) = (1,1,4,8,2) with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators Directional Sensing | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6136 | 3692 | 874 | 6139 | 3809 | 1148 |
| 50%ile | 11231 | 8642 | 4954 | 11270 | 8782 | 5675 |
| 95%ile | 13448 | 12371 | 10582 | 13498 | 12450 | 10806 |
| mean | 10605 | 8346 | 5312 | 10687 | 8510 | 5783 |
| DL delay (s) | 5%ile | 1.24 | 1.43 | 1.859 | 1.238 | 1.448 | 1.819 |
| 50%ile | 1.729 | 2.478 | 5.159 | 1.692 | 2.434 | 4.455 |
| 95%ile | 3.463 | 6.799 | 52.919 | 3.466 | 6.218 | 29.454 |
| mean | 1.957 | 3.174 | 18.912 | 1.93 | 3.016 | 13.05 |
| UL UPT (Mbps) | 5%ile | 4990 | 3485 | 1206 | 5088 | 3556 | 1335 |
| 50%ile | 8758 | 7055 | 4383 | 8765 | 7116 | 4783 |
| 95%ile | 10351 | 9612 | 8236 | 10350 | 9620 | 8455 |
| mean | 8405 | 6836 | 4566 | 8399 | 6916 | 4860 |
| UL delay (s) | 5%ile | 1.602 | 1.792 | 2.338 | 1.608 | 1.799 | 2.223 |
| 50%ile | 2.079 | 2.867 | 5.735 | 2.08 | 2.802 | 4.957 |
| 95%ile | 3.906 | 6.877 | 30.671 | 3.766 | 6.4 | 23.645 |
| mean | 2.295 | 3.384 | 9.428 | 2.299 | 3.261 | 8.354 |
| Arrival rate (files/s) | | 10 | 15 | 20 | 10 | 15 | 20 |
| 𝜌DL | | 0.999 | 0.999 | 0.988 | 0.999 | 0.999 | 0.994 |
| 𝜌UL | | 0.999 | 0.999 | 0.996 | 0.999 | 0.999 | 0.997 |
| BO | | 0.18 | 0.329 | 0.495 | 0.179 | 0.326 | 0.497 |
| Additional report/notes: Case 7 and Case 8:   1. LBT procedure and parameters: ECCA based Contention at gNB: 8us+(1-3)\*5us, at the gNB. 2. Rx-Assistance: Silencing signals sent by gNB and UE after winning the medium. Only gNBs perform extended CCA. 3. Directional LBT – Sensing done at gNB in the direction of the intended UE, with same beam as the transmission beam. All results are for 2 operator Indoor office scenarios. Main Setup described in the column header and Table 1. 4. Only gNBs perform extended CCA. No COT sharing from UL to DL. 5. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

Table B.2.2.3-5. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cases | | Case 9: -47dBM@gNB, **Tx Sensing**  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, **Omni** Sensing | | | Case10: -67dBM@gNB, , **Tx Sensing**  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators **Omni** Sensing | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6576 | 4888 | 1848 | 6635 | 4929 | 1997 |
| 50%ile | 11495 | 10028 | 5942 | 11428 | 10011 | 6094 |
| 95%ile | 13400 | 12560 | 10568 | 13382 | 12576 | 10522 |
| mean | 10892 | 9474 | 6139 | 10860 | 9467 | 6178 |
| DL delay (s) | 5%ile | 1.258 | 1.394 | 1.875 | 1.261 | 1.394 | 1.853 |
| 50%ile | 1.627 | 2.006 | 3.9 | 1.635 | 2.022 | 3.859 |
| 95%ile | 3.1 | 4.438 | 15.855 | 3.229 | 4.351 | 14.397 |
| mean | 1.853 | 2.352 | 6.46 | 1.857 | 2.353 | 6.204 |
| UL UPT (Mbps) | 5%ile | 7106 | 5859 | 2909 | 7040 | 5796 | 2915 |
| 50%ile | 9406 | 8610 | 6309 | 9416 | 8613 | 6369 |
| 95%ile | 10297 | 9812 | 8582 | 10281 | 9838 | 8533 |
| mean | 9126 | 8344 | 6125 | 9124 | 8340 | 6151 |
| UL delay (s) | 5%ile | 1.615 | 1.734 | 2.129 | 1.613 | 1.725 | 2.149 |
| 50%ile | 1.86 | 2.141 | 3.439 | 1.861 | 2.141 | 3.443 |
| 95%ile | 2.733 | 3.569 | 10.374 | 2.739 | 3.556 | 9.89 |
| mean | 1.985 | 2.32 | 4.523 | 1.984 | 2.32 | 4.389 |
| Arrival rate (files/s) | | 15 | 20 | 30 | 15 | 20 | 30 |
| 𝜌DL | | 0.999 | 1 | 0.997 | 0.999 | 1 | 0.998 |
| 𝜌UL | | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 |
| BO | | 0.232 | 0.338 | 0.56 | 0.231 | 0.338 | 0.569 |
| Additional report/notes: Case 9 and Case 10:   1. LBT procedure and parameters: Baseline LBT Procedure at gNB: 8us+(1-3)\*5us, at the gNB. Only gNBs perform extended CCA. 2. All Results with 2 operator Indoor scenario. Main assumptions provided in Column header and Table 1. Omni Directional LBT with specified thresholds. 3. No COT sharing from UL to DL. 4. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

Table B.2.2.3-6. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cases | | Case 11 -67dBM@gNB, **Tx Sensing**  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, **Directional**  Sensing | | | Case12: -72dBM@gNB, **Tx Sensing**  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators **Directional**  Sensing | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6369 | 4880 | 1971 | 6644 | 4834 | 2003 |
| 50%ile | 11443 | 10011 | 6033 | 11446 | 9933 | 6041 |
| 95%ile | 13377 | 12579 | 10475 | 13341 | 12519 | 10518 |
| mean | 10853 | 9468 | 6156 | 10841 | 9414 | 6152 |
| DL delay (s) | 5%ile | 1.264 | 1.392 | 1.843 | 1.27 | 1.397 | 1.903 |
| 50%ile | 1.632 | 2.014 | 3.932 | 1.64 | 2.041 | 3.897 |
| 95%ile | 3.179 | 4.328 | 14.559 | 3.164 | 4.359 | 14.482 |
| mean | 1.859 | 2.348 | 6.579 | 1.864 | 2.372 | 6.193 |
| UL UPT (Mbps) | 5%ile | 7070 | 5837 | 2947 | 7146 | 5716 | 2900 |
| 50%ile | 9422 | 8604 | 6272 | 9409 | 8582 | 6296 |
| 95%ile | 10286 | 9818 | 8570 | 10280 | 9815 | 8573 |
| mean | 9126 | 8337 | 6133 | 9122 | 8321 | 6152 |
| UL delay (s) | 5%ile | 1.615 | 1.73 | 2.157 | 1.618 | 1.73 | 2.162 |
| 50%ile | 1.859 | 2.144 | 3.493 | 1.861 | 2.137 | 3.491 |
| 95%ile | 2.81 | 3.495 | 9.853 | 2.764 | 3.72 | 9.7 |
| mean | 1.984 | 2.326 | 4.435 | 1.984 | 2.332 | 4.332 |
| Arrival rate (files/s) | | 15 | 20 | 30 | 15 | 20 | 30 |
| 𝜌DL | | 0.999 | 1 | 0.997 | 0.999 | 1 | 0.997 |
| 𝜌UL | | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 |
| BO | | 0.232 | 0.337 | 0.565 | 0.231 | 0.338 | 0.554 |
| Additional report/notes: Case 11 and Case 12:   1. LBT procedure and parameters: Baseline LBT Procedure at gNB: 8us+(1-3)\*5us, at the gNB. Only gNBs perform extended CCA 2. All Results with 2 operator Indoor scenario. Main assumptions provided in Column header and Table 1. Directional LBT – Energy Detection in the direction of UE to serve, with same beam as the transmission beam. 3. Only gNBs perform extended CCA. No COT sharing from UL to DL. 4. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

Table B.2.2.3-7. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cases | | Case 13: -67dBM@gNB, **Rx Assistance**  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, **Omni** Sensing | | | Case14: -72dBM@gNB, **Rx Assistance**  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators **Omni** Sensing | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6526 | 4771 | 2133 | 6523 | 5001 | 2347 |
| 50%ile | 11384 | 9959 | 6366 | 11381 | 10040 | 6746 |
| 95%ile | 13214 | 12429 | 10545 | 13169 | 12359 | 10641 |
| mean | 10755 | 9429 | 6362 | 10764 | 9491 | 6675 |
| DL delay (s) | 5%ile | 1.272 | 1.409 | 1.833 | 1.286 | 1.416 | 1.799 |
| 50%ile | 1.628 | 2.002 | 3.63 | 1.623 | 1.966 | 3.312 |
| 95%ile | 3.208 | 4.331 | 12.167 | 3.153 | 4.227 | 11.129 |
| mean | 1.866 | 2.33 | 5.678 | 1.856 | 2.302 | 5.038 |
| UL UPT (Mbps) | 5%ile | 7036 | 5738 | 2997 | 7092 | 5748 | 3242 |
| 50%ile | 9414 | 8592 | 6479 | 9396 | 8616 | 6591 |
| 95%ile | 10283 | 9853 | 8648 | 10265 | 9813 | 8634 |
| mean | 9132 | 8358 | 6283 | 9121 | 8344 | 6408 |
| UL delay (s) | 5%ile | 1.615 | 1.724 | 2.105 | 1.618 | 1.733 | 2.107 |
| 50%ile | 1.853 | 2.141 | 3.262 | 1.865 | 2.12 | 3.184 |
| 95%ile | 2.76 | 3.572 | 9.22 | 2.735 | 3.507 | 7.599 |
| mean | 1.98 | 2.306 | 4.126 | 1.979 | 2.309 | 3.851 |
| Arrival rate (files/s) | | 15 | 20 | 30 | 15 | 20 | 30 |
| 𝜌DL | | 0.999 | 1 | 0.998 | 0.999 | 1 | 0.998 |
| 𝜌UL | | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 |
| BO | | 0.231 | 0.338 | 0.564 | 0.232 | 0.334 | 0.553 |
| Additional report/notes: Case 13 and Case 14:   1. LBT procedure and parameters: ECCA based Contention at gNB: 8us+(1-3)\*5us, at the gNB. 2. Rx-Assistance: Silencing signals sent by gNB and UE after winning the medium. Only gNBs perform extended CCA. 3. All results are for 2 operator Indoor office scenarios. Main Setup described in the column header and Table 1. 4. Only gNBs perform extended CCA. No COT sharing from UL to DL. 5. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

Table B.2.2.3-8. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cases | | Case 15: -67dBM@gNB, Rx Assistance  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators, Directional Sensing | | | Case 16: -72dBM@gNB, Rx Assistance  (Mg,Ng,M,N,P) = **(1,1,8,16,2)** with (0.5 dv, 0.5 dH), 2Mbytes, 2 Operators Directional Sensing | | |
| R1-2009362 / Source 3 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6443 | 4782 | 2134 | 6752 | 5076 | 2408 |
| 50%ile | 11399 | 10083 | 6367 | 11400 | 10152 | 6836 |
| 95%ile | 13200 | 12406 | 10584 | 13162 | 12364 | 10668 |
| mean | 10759 | 9443 | 6378 | 10807 | 9514 | 6704 |
| DL delay (s) | 5%ile | 1.276 | 1.394 | 1.829 | 1.284 | 1.412 | 1.8 |
| 50%ile | 1.62 | 1.991 | 3.594 | 1.618 | 1.945 | 3.275 |
| 95%ile | 3.179 | 4.415 | 12.388 | 3.093 | 4.215 | 10.824 |
| mean | 1.861 | 2.328 | 5.809 | 1.844 | 2.29 | 4.734 |
| UL UPT (Mbps) | 5%ile | 7010 | 5810 | 3013 | 7098 | 5882 | 3220 |
| 50%ile | 9411 | 8625 | 6454 | 9419 | 8644 | 6648 |
| 95%ile | 10290 | 9838 | 8654 | 10260 | 9838 | 8644 |
| mean | 9134 | 8363 | 6282 | 9122 | 8370 | 6444 |
| UL delay (s) | 5%ile | 1.613 | 1.733 | 2.112 | 1.615 | 1.729 | 2.095 |
| 50%ile | 1.86 | 2.132 | 3.286 | 1.857 | 2.119 | 3.143 |
| 95%ile | 2.739 | 3.577 | 9.195 | 2.704 | 3.499 | 7.806 |
| mean | 1.975 | 2.302 | 4.15 | 1.976 | 2.293 | 3.819 |
| Arrival rate (files/s) | | 15 | 20 | 30 | 15 | 20 | 30 |
| 𝜌DL | | 0.999 | 1 | 0.998 | 0.999 | 1 | 0.999 |
| 𝜌UL | | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 |
| BO | | 0.23 | 0.336 | 0.571 | 0.228 | 0.335 | 0.551 |
| Additional report/notes: Case 15 and Case 16:   1. LBT procedure and parameters: ECCA based Contention at gNB: 8us+(1-3)\*5us, at the gNB. 2. Rx-Assistance: Silencing signals sent by gNB and UE after winning the medium. Only gNBs perform extended CCA. 3. Directional LBT – Sensing done at gNB in the direction of the intended UE, with same beam as the transmission beam. All results are for 2 operator Indoor office scenarios. Main Setup described in the column header and Table 1. 4. Only gNBs perform extended CCA. No COT sharing from UL to DL. 5. Common: DL-UL Traffic:50:50, FTP Model 3, 2MB file.{SCS,BW=960Khz,2GHz},{[k1,k2,k3]=[12,0,32] NR slots}, COT duration 0.25ms, Multi-user scheduling -1 user per COT with beam persistence. | | | | | | | |

#### B.2.2.4 Source 4 [37]

Table B.2.2.4-1. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases (scenario A) | | no LBT | | | omni-directional LBT | | | directional LBT | | |
| R1-2007653 / Source 4 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 2855.02 | 1781.36 | 314.07 | 2852.51 | 1915.01 | 489.35 | 2283.13 | 1606.05 | 414.88 |
| 50%ile | 9403.74 | 7295.97 | 3215.40 | 9261.99 | 7443.08 | 3722.77 | 8917.87 | 6844.76 | 3601.45 |
| 95%ile | 15368.94 | 13972.57 | 10753.71 | 15796.49 | 13935.58 | 10900.44 | 15813.50 | 13931.07 | 10892.34 |
| mean | 9533.10 | 7691.84 | 4148.07 | 9539.51 | 7744.95 | 4485.14 | 9372.87 | 7444.27 | 4442.28 |
| DL delay (s) | 5%ile | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 50%ile | 0.02 | 0.03 | 0.08 | 0.02 | 0.03 | 0.08 | 0.02 | 0.03 | 0.07 |
| 95%ile | 0.12 | 0.22 | 0.76 | 0.13 | 0.21 | 0.67 | 0.13 | 0.22 | 0.62 |
| mean | 0.04 | 0.06 | 0.19 | 0.04 | 0.06 | 0.18 | 0.04 | 0.06 | 0.17 |
| UL UPT (Mbps) | 5%ile | 1154.55 | 743.61 | 174.68 | 953.56 | 683.63 | 219.10 | 986.52 | 583.05 | 181.54 |
| 50%ile | 5533.82 | 4394.30 | 2467.35 | 5297.09 | 4041.75 | 2142.84 | 4985.30 | 3782.74 | 2062.24 |
| 95%ile | 14673.77 | 12899.08 | 9980.28 | 14754.13 | 12027.72 | 9256.56 | 14280.57 | 12204.77 | 9029.75 |
| mean | 6629.05 | 5401.71 | 3392.04 | 6308.31 | 5007.02 | 3123.04 | 6070.00 | 4927.91 | 3022.04 |
| UL delay (s) | 5%ile | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 |
| 50%ile | 0.01 | 0.02 | 0.02 | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.03 |
| 95%ile | 0.17 | 0.26 | 0.69 | 0.32 | 0.36 | 0.66 | 0.33 | 0.37 | 0.66 |
| mean | 0.06 | 0.08 | 0.18 | 0.08 | 0.11 | 0.19 | 0.09 | 0.10 | 0.19 |
| Arrival rate (files/s) | | 0.60 | 1.00 | 1.80 | 0.60 | 1.00 | 1.80 | 0.60 | 1.00 | 1.80 |
| 𝜌DL | | 1.00 | 0.99 | 0.94 | 1.00 | 1.00 | 0.96 | 0.98 | 0.96 | 0.92 |
| 𝜌UL | | 0.93 | 0.89 | 0.84 | 0.93 | 0.89 | 0.83 | 0.92 | 0.86 | 0.80 |
| BO | | 0.22 | 0.40 | 0.73 | 0.27 | 0.45 | 0.75 | 0.29 | 0.46 | 0.76 |
| Additional report/notes:  1. LBT procedure and parameters  The LBT procedure is based on the draft v2.1.20 of EN 302 567, generating a random back off counter that is decreasing upon CCA succeeds and channel is considered as available when the counter becomes 0. The difference lies in that only one category is defined for 60GHz band here instead of 4 categories in 5GHz.   |  |  | | --- | --- | | **Parameter** | **Value** | | ED threshold | -47dBm | | CCA slot length | 5us | | Maximum Channel Occupancy Time | 2ms | | Contention Window Size | [0,3] | |  | 1 | |  | 8us |   2. any assumptions/parameters used not as in the agreed baseline  3. Details of case: e.g., single or two operators; no-LBT, omni-directional LBT, directional LBT schemes etc.   * no LBT: without LBT scheme * omni-directional LBT: A transmission node listens to the channel using an omni-directional antenna and then performs transmission in any direction to the reception node(s). * directional LBT: A transmission node listens to the channel using an directional antenna and then performs transmission in this direction to the reception node(s).   4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation  UE can share gNB’s initiated COT without LBT gap and transmit uplink signals. | | | | | | | | | | |

Table B.2.2.4-2. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases (scenario A) | | receiver-assisted omni-directional LBT | | | receiver-assisted directional LBT | | |
| R1-2007653 / Source 4 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 2821.80 | 1901.38 | 439.18 | 2681.82 | 1700.56 | 271.17 |
| 50%ile | 9257.08 | 7343.11 | 3761.23 | 9028.41 | 7077.76 | 3635.26 |
| 95%ile | 15801.13 | 14102.28 | 11123.56 | 15532.99 | 14000.36 | 11180.96 |
| mean | 9548.47 | 7762.27 | 4504.13 | 9384.98 | 7619.36 | 4489.52 |
| DL delay (s) | 5%ile | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 50%ile | 0.02 | 0.03 | 0.08 | 0.02 | 0.03 | 0.07 |
| 95%ile | 0.13 | 0.22 | 0.63 | 0.12 | 0.22 | 0.67 |
| mean | 0.04 | 0.06 | 0.17 | 0.04 | 0.06 | 0.17 |
| UL UPT (Mbps) | 5%ile | 956.07 | 694.68 | 239.10 | 925.43 | 671.77 | 179.49 |
| 50%ile | 5228.97 | 4261.81 | 2413.70 | 5179.68 | 3879.64 | 2088.79 |
| 95%ile | 14238.00 | 12111.56 | 9187.09 | 14444.61 | 11873.55 | 8891.43 |
| mean | 6181.77 | 5029.66 | 3151.09 | 6120.56 | 4926.70 | 3076.43 |
| UL delay (s) | 5%ile | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 |
| 50%ile | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.02 |
| 95%ile | 0.33 | 0.37 | 0.67 | 0.32 | 0.40 | 0.65 |
| mean | 0.09 | 0.10 | 0.19 | 0.09 | 0.11 | 0.18 |
| Arrival rate (files/s) | | 0.60 | 1.00 | 1.80 | 0.60 | 1.00 | 1.80 |
| 𝜌DL | | 1.00 | 1.00 | 0.96 | 0.98 | 0.97 | 0.90 |
| 𝜌UL | | 0.93 | 0.89 | 0.83 | 0.91 | 0.88 | 0.79 |
| BO | | 0.27 | 0.44 | 0.75 | 0.28 | 0.45 | 0.76 |
| Additional report/notes:  1. LBT procedure and parameters  The LBT procedure is based on the draft v2.1.20 of EN 302 567, generating a random back off counter that is decreasing upon CCA succeeds and channel is considered as available when the counter becomes 0. The difference lies in that only one category is defined for 60GHz band here instead of 4 categories in 5GHz.   |  |  | | --- | --- | | **Parameter** | **Value** | | ED threshold | -47dBm | | CCA slot length | 5us | | Maximum Channel Occupancy Time | 2ms | | Contention Window Size | [0,3] | |  | 1 | |  | 8us |   2. any assumptions/parameters used not as in the agreed baseline  3. Details of case: e.g., single or two operators; no-LBT, omni-directional LBT, directional LBT schemes etc.   * receiver-assisted omni-directional LBT: A transmission node listens to the channel using an omni-directional antenna, and then send out RTS in omni-direction, and then performs transmission in the directions to the reception node(s) which send out CTS. * receiver-assisted directional LBT: A transmission node listens to the channel using an directional antenna, and then send out RTS in this dirction, and then performs transmission in the direction to the reception node(s) which send out CTS.   4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation  UE can share gNB’s initiated COT without LBT gap and transmit uplink signals. | | | | | | | |

#### B.2.2.5 Source 5 [64]

Table B.2.2.5-1. System level evaluation results for coexistence interference analysis with CCA=-68dBm

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1：Omni vs Omni | | Case2:Omni vs Directional | |
| Operator1 | Operator2 | Operator1 | Operator2 |
| R1-2009450/ Source 5 | Traffic load  Metrics | | medium load  35%~50% BO | | medium load  35%~50% BO | |
| DL UPT (Mbps) | 5%ile | 3033.1213 | 2287.0171 | 2828.5513 | 3060.1575 |
| 50%ile | 9441.7471 | 8566.0156 | 9444.8320 | 10166.2471 |
| 95%ile | 16029.5293 | 14801.7207 | 16146.0420 | 17572.2949 |
| mean | 10065.5078 | 8785.5869 | 10001.9004 | 10481.0479 |
| DL delay (s) | 5%ile | 0.010 | 0.011 | 0.010 | 0.010 |
| 50%ile | 0.024 | 0.029 | 0.024 | 0.021 |
| 95%ile | 0.175 | 0.181 | 0.184 | 0.117 |
| mean | 0.050 | 0.055 | 0.052 | 0.038 |
| Arrival rate (files/s) | | 2 | 2 | 2 | 2 |
| 𝜌DL | | 100% | 100% | 100% | 100% |
| BO | | 30.253% | 35.013% | 31.050% | 28.234% |
| Additional report/notes:   1. LBT procedure and parameters   Refer to Section A.2 in R1-2009450. Subcarrier spacing is 960KHz;  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;   1. any assumptions/parameters used not as in the agreed baseline   3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  Case1：. two operators,Omni(Operator1) vs Omni(Operator2);  Case2：. two operators,Omni(Operator1) vs Directional(Operator2)  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only,No COT sharing | | | | | |

Table B.2.2.5-2. performance of different LBT mode of various traffic load with CCA=-62dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | LBT mode | | omni | | | directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 3546.6826 | 3033.7112 | 975.4548 | 3547.0242 | 3110.3704 | 1207.0940 |
| 50%ile | 11305.6396 | 10783.6074 | 7088.4458 | 11371.8018 | 10765.0527 | 8245.8027 |
| 95%ile | 18089.7539 | 18282.6270 | 15489.9375 | 18654.7754 | 18886.9160 | 16380.3154 |
| mean | 11196.8545 | 10566.7207 | 8016.2710 | 11427.4307 | 10969.6787 | 8994.2236 |
| DL delay (s) | 5%ile | 0.010 | 0.010 | 0.011 | 0.010 | 0.010 | 0.011 |
| 50%ile | 0.020 | 0.021 | 0.032 | 0.020 | 0.020 | 0.027 |
| 95%ile | 0.072 | 0.109 | 0.589 | 0.070 | 0.099 | 0.429 |
| mean | 0.028 | 0.036 | 0.122 | 0.027 | 0.033 | 0.109 |
| Arrival rate (files/s) | | 1.25 | 2 | 3.5 | 1.25 | 2 | 3.5 |
| 𝜌DL | | 100% | 100% | 100% | 100% | 100% | 100% |
| BO | | 14.746% | 25.491% | 56.031% | 14.312% | 24.300% | 50.851 % |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2007967. Subcarrier spacing is 960KHz;  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only,No COT sharing | | | | | | | |

Table B.2.2.5-3. performance of different LBT mode of various traffic load with CCA=-68dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | LBT mode | | omni | | | directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 3100.9858 | 1712.3741 | 245.2404 | 3312.4214 | 2718.2942 | 723.0867 |
| 50%ile | 10191.9561 | 8506.4385 | 4438.5952 | 11147.1846 | 9503.4453 | 5792.6738 |
| 95%ile | 16638.7871 | 14970.9316 | 12214.0654 | 17476.5605 | 16888.0996 | 13832.0059 |
| mean | 10046.3867 | 8758.2285 | 5320.7637 | 10966.8721 | 9989.6123 | 6762.5283 |
| DL delay (s) | 5%ile | 0.010 | 0.011 | 0.013 | 0.010 | 0.011 | 0.012 |
| 50%ile | 0.023 | 0.028 | 0.061 | 0.020 | 0.023 | 0.042 |
| 95%ile | 0103 | 0.206 | 1.667 | 0.078 | 0.125 | 1.009 |
| mean | 0.035 | 0.061 | 0.330 | 0.029 | 0.040 | 0.205 |
| Arrival rate (files/s) | | 1.25 | 2 | 3.5 | 1.25 | 2 | 3.5 |
| 𝜌DL | | 100% | 100% | 100% | 100% | 100% | 99.89% |
| BO | | 17.327% | 33.466 % | 70.039% | 15.260% | 27.308% | 63.559 % |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450. Subcarrier spacing is 960KHz;  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation: DL Only,No COT sharing | | | | | | | |

Table B.2.2.5-4. performance of different LBT mode of various traffic load with CCA=-62dBm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc / Source | Cases | | Omni | Direc |
| R1-2009450/ Source 5 | load  Metrics | | High load  above 55% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 787.1970 | 963.5551 |
| 50%ile | 3211.0288 | 3474.2285 |
| 95%ile | 5875.3906 | 5062.0288 |
| mean | 3295.7209 | 3390.7334 |
| DL delay (s) | 5%ile | 0.011 | 0.011 |
| 50%ile | 0.023 | 0.020 |
| 95%ile | 0.214 | 0.150 |
| mean | 0.074 | 0.046 |
| UL UPT (Mbps) | 5%ile | 36.0758 | 38.0263 |
| 50%ile | 505.9953 | 660.0948 |
| 95%ile | 3232.8450 | 3326.7085 |
| mean | 898.5682 | 1108.8021 |
| UL delay (s) | 5%ile | 0.014 | 0.014 |
| 50%ile | 0.075 | 0.065 |
| 95%ile | 1.479 | 1.444 |
| mean | 0.280 | 0.249 |
| Arrival rate(files/s) | | 9 | 9 |
| 𝜌DL | | 100% | 100% |
| 𝜌UL | | 94.51% | 94.38% |
| BO | | 70.97% | 67.34% |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2007967. Subcarrier spacing is 960KHz;  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  File size = 8M Bytes  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation  No COT sharing | | | |

Table B.2.2.5-5. performance of different LBT mode of various traffic load with CCA=-68dBm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Omni | Direc |
| R1-2009450/ Source 5 | load  Metrics | | High load  above 55% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 497.3786 | 939.2247 |
| 50%ile | 2311.2671 | 3370.9375 |
| 95%ile | 5017.5645 | 6728.2817 |
| mean | 2579.0989 | 3340.2598 |
| DL delay (s) | 5%ile | 0.010 | 0.007 |
| 50%ile | 0.039 | 0.023 |
| 95%ile | 0.444 | 0.175 |
| mean | 0.109 | 0.052 |
| UL UPT (Mbps) | 5%ile | 32.0786 | 36.4840 |
| 50%ile | 454.0096 | 581.5397 |
| 95%ile | 2869.6545 | 3244.2061 |
| mean | 896.6053 | 1040.3958 |
| UL delay (s) | 5%ile | 0.016 | 0.014 |
| 50%ile | 0.094 | 0.090 |
| 95%ile | 1.661 | 1.653 |
| mean | 0.478 | 0.490 |
| Arrival rate(files/s) | | 9 | 9 |
| 𝜌DL | | 100% | 100% |
| 𝜌UL | | 93.89% | 94.61% |
| BO | | 78.63% | 71.22% |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450. Subcarrier spacing is 960KHz;  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  File size = 8M Bytes  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation  No COT sharing | | | |

Table B.2.2.5-6. Different bandwidth performance of different LBT mode of various traffic load with CCA=-62dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel bandwidth | | 400M | | | | | |
| LBT scheme | | omni | | | Directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 1300.0225 | 1059.2625 | 168.9819 | 1308.3411 | 1121.9795 | 256.5734 |
| 50%ile | 3168.2114 | 2788.5532 | 1287.3207 | 3255.4275 | 2917.9692 | 1516.7057 |
| 95%ile | 4915.9663 | 4500.5015 | 3472.9429 | 4915.9663 | 4731.4634 | 3670.7224 |
| mean | 3225.4819 | 2822.2759 | 1521.6208 | 3303.8604 | 2985.5891 | 1784.7135 |
| DL delay (s) | 5%ile | 0.042 | 0.042 | 0.051 | 0.042 | 0.040 | 0.048 |
| 50%ile | 0.072 | 0.083 | 0.176 | 0.084 | 0.077 | 0.145 |
| 95%ile | 0.190 | 0.347 | 3.177 | 0.176 | 0.292 | 2.434 |
| mean | 0.087 | 0.125 | 0.677 | 0.084 | 0.111 | 0.523 |
| Arrival rate (files/s) | | 0.3125 | 0.625 | 1.25 | 0.3125 | 0.625 | 1.25 |
| 𝜌DL | | 100% | 100% | 99.68% | 100% | 100% | 99.60% |
| BO | | 12.014% | 28.063% | 73.959% | 11.580% | 26.050% | 69.711% |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450.  Subcarrier spacing is 960KHz for 2GHz bandwidth  Subcarrier spacing is 120KHz for 400MHz bandwidth  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only, No COT sharing | | | | | | | |

Table B.2.2.5-7. Different bandwidth performance of different LBT mode of various traffic load with CCA=-62dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel bandwidth | | 2000M | | | | | |
| LBT scheme | | omni | | | Directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 3546.6826 | 3033.7112 | 975.4548 | 3547.0242 | 3110.3704 | 1207.0940 |
| 50%ile | 11305.6396 | 10783.6074 | 7088.4458 | 11371.8018 | 10765.0527 | 8245.8027 |
| 95%ile | 18089.7539 | 18282.6270 | 15489.9375 | 18654.7754 | 18886.9160 | 16380.3154 |
| mean | 11196.8545 | 10566.7207 | 8016.2710 | 11427.4307 | 10969.6787 | 8994.2236 |
| DL delay (s) | 5%ile | 0.010 | 0.010 | 0.011 | 0.010 | 0.010 | 0.011 |
| 50%ile | 0.020 | 0.021 | 0.032 | 0.020 | 0.020 | 0.027 |
| 95%ile | 0.072 | 0.109 | 0.589 | 0.070 | 0.099 | 0.429 |
| mean | 0.028 | 0.036 | 0.122 | 0.027 | 0.033 | 0.109 |
| Arrival rate (files/s) | | 1.25 | 2 | 3.5 | 1.25 | 2 | 3.5 |
| 𝜌DL | | 100% | 100% | 100% | 100% | 100% | 100% |
| BO | | 14.746% | 25.491% | 56.031% | 14.312% | 24.300% | 50.851 % |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450.  Subcarrier spacing is 960KHz for 2GHz bandwidth  Subcarrier spacing is 120KHz for 400MHz bandwidth  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only, No COT sharing | | | | | | | |

Table B.2.2.5-8. Different bandwidth performance of different LBT mode of various traffic load with CCA=-68dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel bandwidth | | 400M | | | | | |
| LBT Scheme | | omni | | | Directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 1286.4290 | 890.3098 | 117.3812 | 1315.3109 | 1081.5392 | 170.7861 |
| 50%ile | 2783.8201 | 2449.9802 | 905.8357 | 3156.8037 | 2763.4055 | 1337.1993 |
| 95%ile | 4840.3359 | 4338.0054 | 3084.9612 | 5019.1318 | 4531.5996 | 3379.1458 |
| mean | 3013.2285 | 2488.6345 | 1211.7831 | 3192.3352 | 2785.3354 | 1497.6672 |
| DL delay (s) | 5%ile | 0.042 | 0.042 | 0.050 | 0.042 | 0.042 | 0.052 |
| 50%ile | 0.078 | 0.097 | 0.255 | 0.072 | 0.084 | 0.173 |
| 95%ile | 0.221 | 0.459 | 4.668 | 0.197 | 0.344 | 3.096 |
| mean | 0.097 | 0.156 | 0.981 | 0.089 | 0.124 | 0.626 |
| Arrival rate (files/s) | | 0.3125 | 0.625 | 1.25 | 0.3125 | 0.625 | 1.25 |
| 𝜌DL | | 100% | 100% | 99.95% | 100% | 100% | 99.83% |
| BO | | 13.128% | 32.639% | 80.403% | 12.282% | 28.292% | 73.553% |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450.  Subcarrier spacing is 960KHz for 2GHz bandwidth  Subcarrier spacing is 120KHz for 400MHz bandwidth  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only, No COT sharing | | | | | | | |

Table B.2.2.5-9. Different bandwidth performance of different LBT mode of various traffic load with CCA=-68dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel bandwidth | | 2000M | | | | | |
| LBT Scheme | | omni | | | Directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 3100.9858 | 1712.3741 | 245.2404 | 3312.4214 | 2718.2942 | 723.0867 |
| 50%ile | 10191.9561 | 8506.4385 | 4438.5952 | 11147.1846 | 9503.4453 | 5792.6738 |
| 95%ile | 16638.7871 | 14970.9316 | 12214.0654 | 17476.5605 | 16888.0996 | 13832.0059 |
| mean | 10046.3867 | 8758.2285 | 5320.7637 | 10966.8721 | 9989.6123 | 6762.5283 |
| DL delay (s) | 5%ile | 0.010 | 0.011 | 0.013 | 0.010 | 0.011 | 0.012 |
| 50%ile | 0.023 | 0.028 | 0.061 | 0.020 | 0.023 | 0.042 |
| 95%ile | 0103 | 0.206 | 1.667 | 0.078 | 0.125 | 1.009 |
| mean | 0.035 | 0.061 | 0.330 | 0.029 | 0.040 | 0.205 |
| Arrival rate (files/s) | | 1.25 | 2 | 3.5 | 1.25 | 2 | 3.5 |
| 𝜌DL | | 100% | 100% | 100% | 100% | 100% | 99.89% |
| BO | | 17.327% | 33.466 % | 70.039% | 15.260% | 27.308% | 63.559 % |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450.  Subcarrier spacing is 960KHz for 2GHz bandwidth  Subcarrier spacing is 120KHz for 400MHz bandwidth  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: two operators; omni-directional LBT, directional LBT schemes; Indoor Scenario A  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only, No COT sharing | | | | | | | |

#### B.2.2.6 Source 7 [62]

Table B.2.2.6-1. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1  (DL:UL 50:50, No-LBT) | | | Case 2  (DL:UL 50:50, Omni-LBT) | | |
| R1-2007928 / Source 7 | Traffic load  Metrics | | Low load | Medium load | High load | Low load | Medium load | High load |
| DL UPT (Mbps) | 5%ile | 2362 | 1187 | 631 | 2344 | 987 | 490 |
| 50%ile | 9137 | 5266 | 3083 | 8720 | 4391 | 2313 |
| 95%ile | 19548 | 16680 | 13333 | 18462 | 14979 | 11405 |
| mean | 9857 | 6843 | 4444 | 9280 | 5767 | 3544 |
| DL delay (ms) | 5%ile | 11 | 13 | 16 | 12 | 14 | 19 |
| 50%ile | 24 | 41 | 70 | 25 | 49 | 93 |
| 95%ile | 91 | 181 | 341 | 92 | 219 | 440 |
| mean | 34 | 61 | 111 | 35 | 74 | 143 |
| UL UPT (Mbps) | 5%ile | 1528 | 870 | 508 | 1484 | 682 | 342 |
| 50%ile | 4080 | 3198 | 2246 | 4041 | 2723 | 1721 |
| 95%ile | 7654 | 6968 | 6175 | 9643 | 6704 | 5456 |
| mean | 4297 | 3527 | 2723 | 4207 | 3107 | 2218 |
| UL delay (ms) | 5%ile | 28 | 31 | 35 | 22 | 32 | 40 |
| 50%ile | 53 | 68 | 96 | 53 | 79 | 125 |
| 95%ile | 141 | 247 | 424 | 144 | 317 | 630 |
| mean | 65 | 94 | 146 | 66 | 112 | 189 |
| Arrival rate (files/s) | | 1.5 | 2.75 | 4 | 1.5 | 2.75 | 4 |
| BO | | 25% | 54% | 78% | 25% | 58% | 82% |
| Additional report/notes:   1. LBT Procedures: No-LBT, Omni-LBT and Directional LBT 2. Cases:    1. Case 1: No-LBT, DL:UL 50:50    2. Case-2: Omni-LBT, DL:UL 50:50 | | | | | | | |

Table B.2.2.6-2. System level evaluation results for indoor scenario A

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 3  (No-LBT, DL:UL 100:0) | | | Case 4  (Omni-LBT, DL:UL 100:0) | | | Case 5  (Directional-LBT,  DL:UL 100:0) | | |
| R1-2007928 / Source 7 | Traffic load  Metrics | | Low load | Medium Load | High Load | Low Load | Medium Load | High Load | Low Load | Medium Load | High Load |
| DL UPT (Mbps) | 5%ile | 2627 | 902 | 412 | 2388 | 861 | 350 | 2748 | 1050 | 395 |
| 50%ile | 9630 | 5859 | 3022 | 8675 | 4954 | 2466 | 9122 | 5352 | 2669 |
| 95%ile | 19548 | 17116 | 13723 | 17575 | 15021 | 11576 | 17955 | 15201 | 12067 |
| mean | 10204 | 7072 | 4455 | 9178 | 6076 | 3669 | 9596 | 6441 | 3930 |
| DL delay (ms) | 5%ile | 11 | 13 | 16 | 12 | 14 | 19 | 12 | 14 | 18 |
| 50%ile | 22 | 37 | 72 | 25 | 44 | 88 | 24 | 40 | 81 |
| 95%ile | 82 | 239 | 524 | 90 | 251 | 617 | 78 | 205 | 546 |
| mean | 31 | 69 | 139 | 35 | 77 | 166 | 31 | 65 | 151 |
| Arrival rate (files/s) | | 2.0 | 3.5 | 5.0 | 2.0 | 3.5 | 5.0 | 2.0 | 3.5 | 5.0 |
| BO | | 23.4% | 56% | 84.4% | 26.2% | 57.5% | 89.3% | 24.1% | 58 | 92.2% |
| Additional report/notes:   1. LBT Procedures: No-LBT, Omni-LBT and Directional LBT 2. Cases:   Case 1: No-LBT, DL:UL 100:0  Case 2: Omni-LBT, DL:UL 100:0  Case 3: Directional-LBT, DL:UL 100:0 | | | | | | | | | | |

#### B.2.2.7 Source 10 [67]

Table B.2.2.7-1: System level evaluation results for scenario Indoor-A

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: omni-directional LBT | | | Case 3: directional LBT | | |
| R1-2008873 / Source 10 | Traffic  load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 3693.6 | 2131.4 | 1387.1 | 3420.3 | 1903.6 | 1288.3 | 3606.2 | 2184.3 | 1639.7 |
| 50%ile | 7720.5 | 6641.6 | 4006.2 | 7462.8 | 6370.2 | 3822.1 | 7646.8 | 6801.9 | 4579.4 |
| 95%ile | 14264.1 | 14208.3 | 14031.9 | 13595.5 | 13472.0 | 13039.9 | 14196.5 | 14355.6 | 14156.4 |
| mean | 8002.7 | 7161.2 | 5248.9 | 7643.7 | 6897.7 | 4573.9 | 7894.3 | 7197.6 | 5431.5 |
| DL delay (s) | 5%ile | 0.015 | 0.017 | 0.019 | 0.015 | 0.017 | 0.020 | 0.015 | 0.017 | 0.018 |
| 50%ile | 0.030 | 0.038 | 0.050 | 0.033 | 0.042 | 0.053 | 0.030 | 0.037 | 0.046 |
| 95%ile | 0.063 | 0.078 | 0.095 | 0.064 | 0.080 | 0.097 | 0.064 | 0.076 | 0.090 |
| mean | 0.033 | 0.040 | 0.051 | 0.036 | 0.044 | 0.055 | 0.034 | 0.038 | 0.047 |
| UL UPT (Mbps) | 5%ile | 1189.4 | 465.8 | 277.2 | 1125.1 | 401.5 | 246.0 | 1135.4 | 485.4 | 295.3 |
| 50%ile | 2850.8 | 1748.4 | 927.7 | 2413.5 | 1687.9 | 882.6 | 2813.2 | 1791.0 | 977.9 |
| 95%ile | 5698.3 | 5466.0 | 5125.8 | 5537.3 | 5348.2 | 5011.1 | 5613.9 | 5495.2 | 5213.8 |
| mean | 2436.7 | 1734.0 | 1029.5 | 2297.6 | 1627.7 | 922.6 | 2404.5 | 1783.4 | 1174.2 |
| UL delay (s) | 5%ile | 0.032 | 0.041 | 0.054 | 0.032 | 0.042 | 0.055 | 0.032 | 0.041 | 0.051 |
| 50%ile | 0.068 | 0.102 | 0.143 | 0.070 | 0.107 | 0.146 | 0.069 | 0.100 | 0.141 |
| 95%ile | 0.150 | 0.205 | 0.296 | 0.152 | 0.209 | 0.301 | 0.150 | 0.202 | 0.291 |
| mean | 0.089 | 0.117 | 0.152 | 0.091 | 0.120 | 0.158 | 0.090 | 0.114 | 0.146 |
| Arrival rate (files/s) | | 0.4 | 0.8 | 1.2 | 0.4 | 0.8 | 1.2 | 0.4 | 0.8 | 1.2 |
| 𝜌DL | | 0.99 | 0.99 | 0.98 | 0.99 | 0.98 | 0.98 | 0.99 | 0.99 | 0.98 |
| 𝜌UL | | 0.98 | 0.97 | 0.97 | 0.98 | 0.96 | 0.96 | 0.99 | 0.98 | 0.98 |
| BO | | 0.15 | 0.44 | 0.74 | 0.17 | 0.48 | 0.80 | 0.15 | 0.43 | 0.71 |
| Additional report/notes:  1. LBT procedure and parameters are following ETSI 302 567 v2.1.20  2. Details of cases:   * Case 1: Indoor-A with two operators, no-LBT * Case 2: Indoor-A with two operators, omni-directional LBT * Case 3: Indoor-A with two operators, directional LBT   3. No COT sharing  4. Other parameters to report:   * Carrier frequency: 60 GHz * Carrier bandwidth: 2 GHz * Numerology: 960 kHz SCS with NCP | | | | | | | | | | |

#### B.2.2.8 Source 14 [43]

Table B.2.2.8-1. System level evaluation results for scenario A – ceiling mounted BS with UE antenna configuration 1

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1 – No LBT | | | Case 2- Omnidirectional LBT | | | Case 3 – Directional LBT | | |
| R1-2009380 / Source 14 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 1845.98 | 145.03 | 11.19 | 1777.43 | 306.52 | 22.50 | 1805.80 | 303.72 | 24.20 |
| 50%ile | 3948.45 | 1046.90 | 139.50 | 3726.00 | 1436.33 | 271.95 | 3734.81 | 1458.00 | 279.46 |
| 95%ile | 5515.98 | 3324.67 | 1266.04 | 5232.62 | 3489.01 | 2019.97 | 5245.49 | 3509.15 | 2114.95 |
| mean | 3825.71 | 1318.04 | 312.44 | 3645.17 | 1583.18 | 534.07 | 3654.78 | 1610.66 | 555.41 |
| DL delay (s) | 5%ile | 2.44 | 3.52 | 8.23 | 2.55 | 3.31 | 5.42 | 2.55 | 3.25 | 5.27 |
| 50%ile | 4.16 | 20.56 | 107.48 | 4.42 | 14.97 | 80.12 | 4.39 | 14.64 | 78.31 |
| 95%ile | 23.72 | 261.08 | 914.64 | 24.56 | 207.20 | 633.62 | 28.31 | 201.36 | 618.27 |
| mean | 14.51 | 64.95 | 229.45 | 14.67 | 48.13 | 157.72 | 14.90 | 46.88 | 153.69 |
| UL UPT (Mbps) | 5%ile | 1707.51 | 753.06 | 259.23 | 1575.48 | 641.62 | 110.19 | 1580.44 | 634.25 | 111.42 |
| 50%ile | 3335.97 | 2276.75 | 1206.79 | 3238.31 | 2057.99 | 1036.17 | 3242.91 | 2068.98 | 1038.76 |
| 95%ile | 4927.06 | 4101.46 | 3196.89 | 4799.78 | 3905.39 | 3085.83 | 4794.81 | 3926.98 | 2996.54 |
| mean | 3335.50 | 2309.04 | 1386.55 | 3256.26 | 2108.08 | 1243.09 | 3256.74 | 2120.66 | 1235.71 |
| UL delay (s) | 5%ile | 2.83 | 3.14 | 4.00 | 2.88 | 3.27 | 4.08 | 2.88 | 3.25 | 4.09 |
| 50%ile | 4.75 | 7.25 | 15.66 | 4.84 | 8.22 | 18.16 | 4.84 | 8.19 | 18.27 |
| 95%ile | 15.58 | 129.83 | 142.22 | 20.56 | 142.59 | 180.02 | 18.75 | 142.39 | 179.56 |
| mean | 13.08 | 25.21 | 36.37 | 14.17 | 28.67 | 46.34 | 13.88 | 28.40 | 46.56 |
| Arrival rate (files/s) | | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 𝜌DL | | 0.99 | 0.96 | 0.75 | 0.99 | 0.98 | 0.86 | 0.99 | 0.98 | 0.87 |
| 𝜌UL | | 1 | 1 | 0.99 | 1 | 1 | 0.98 | 1 | 1 | 0.98 |
| BO | | 35 | 67 | 84 | 35 | 67 | 84 | 35 | 67 | 84 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED threshold= - 48 dBm, CWS=15.  2. Details of case: 2 operators (scenario A) with ceiling mounted gNB and same setting, case1: No LBT, case2: Omni-directional LBT, case3: directional LBT.  3. Details of COT sharing if used in evaluation: MCOT=5ms, No COT sharing used.  4. Other parameters: Frequency 60 GHz, BW = 2GHz, SCS=960 KHz, UE Antenna Configuration 1 (Mg,Ng,M,N,P) = (1,2,2,2,2), ftp3 file size=2Mbytes. | | | | | | | | | | |

Table B.2.2.8-2. System level evaluation results for scenario A –ceiling mounted BS with UE antenna configuration 2

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1 – No LBT | | | Case 2- Omnidirectional LBT | | | Case 3 – Directional LBT | | |
| R1-2009380 / Source 14 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 2410.86 | 950.39 | 76.70 | 2216.86 | 986.97 | 129.99 | 2381.97 | 932.67 | 135.56 |
| 50%ile | 4988.44 | 3117.29 | 881.57 | 4767.26 | 2913.59 | 1069.25 | 4774.78 | 2978.08 | 1101.74 |
| 95%ile | 5909.11 | 5045.98 | 3211.02 | 5674.06 | 4849.88 | 3432.80 | 5688.90 | 4871.51 | 3485.26 |
| mean | 4715.32 | 3071.41 | 1175.69 | 4497.91 | 2911.48 | 1351.03 | 4525.39 | 2933.17 | 1371.26 |
| DL delay (s) | 5%ile | 2.36 | 2.48 | 3.25 | 2.44 | 2.61 | 3.03 | 2.42 | 2.61 | 3.03 |
| 50%ile | 2.91 | 5.47 | 31.73 | 3.03 | 5.77 | 27.61 | 3.03 | 5.69 | 27.27 |
| 95%ile | 41.19 | 143.09 | 295.42 | 44.83 | 144.17 | 239.44 | 35.55 | 143.33 | 231.83 |
| mean | 14.64 | 26.42 | 78.62 | 14.93 | 26.84 | 67.09 | 14.21 | 26.72 | 65.64 |
| UL UPT (Mbps) | 5%ile | 2444.1 | 1167.5 | 843.2 | 2229.7 | 1104.6 | 706.6 | 2166.3 | 1070.6 | 628.6 |
| 50%ile | 4685.5 | 3784.8 | 2307.0 | 4620.5 | 3527.0 | 1999.2 | 4610.6 | 3515.2 | 1949.6 |
| 95%ile | 5300.5 | 4788.8 | 4138.7 | 5239.9 | 4721.5 | 3949.1 | 5234.5 | 4712.4 | 3926.4 |
| mean | 4455.1 | 3413.0 | 2369.5 | 4376.4 | 3267.2 | 2135.5 | 4365.1 | 3256.5 | 2081.5 |
| UL delay (s) | 5%ile | 2.63 | 2.7 | 2.87 | 2.6 | 2.7 | 2.9 | 2.67 | 2.7 | 2.97 |
| 50%ile | 3.33 | 4.3 | 7.38 | 3.3 | 4.5 | 9.1 | 3.38 | 4.6 | 9.64 |
| 95%ile | 22.69 | 129.4 | 130.34 | 24.0 | 134.9 | 137.8 | 27.80 | 133.2 | 142.14 |
| mean | 13.27 | 22.1 | 28.73 | 13.5 | 23.7 | 31.8 | 13.89 | 23.7 | 33.26 |
| Arrival rate (files/s) | | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 𝜌DL | | 0.99 | 0.99 | 0.95 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 | 0.97 |
| 𝜌UL | | 1 | 1 | 0.99 | 1 | 1 | 0.98 | 1 | 1 | 0.98 |
| BO | | 35 | 64 | 83 | 35 | 64 | 83 | 35 | 64 | 83 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED threshold= - 48 dBm, CWS=15.  2. Details of case: 2 operators (scenario A) with ceiling mounted gNB and same setting, case1: No LBT, case2: Omni-directional LBT, case3: directional LBT.  3. Details of COT sharing if used in evaluation: MCOT=5ms, No COT sharing used.  4. Other parameters: Frequency 60 GHz, BW = 2GHz, SCS=960 KHz, UE Antenna Configuration 2 (Mg,Ng,M,N,P) = (1,2,4,4,2), ftp3 file size=2Mbytes. | | | | | | | | | | |

Table B.2.2.8-3. System level evaluation results for scenario A – non-ceiling mounted BS with UE antenna configuration 2

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1 – No LBT | | | Case 2- Omnidirectional LBT | | | Case 3 – Directional LBT | | |
| R1-2009380 / Source 14 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 2489.86 | 1193.92 | 204.20 | 2306.31 | 1051.88 | 216.99 | 2405.16 | 1043.66 | 264.96 |
| 50%ile | 5205.24 | 3624.00 | 1620.08 | 4998.94 | 3379.49 | 1501.38 | 5030.37 | 3407.05 | 1642.74 |
| 95%ile | 5969.25 | 5326.55 | 4028.82 | 5734.06 | 4992.53 | 3790.01 | 5764.38 | 5052.36 | 3875.32 |
| mean | 4921.53 | 3480.37 | 1805.75 | 4732.19 | 3236.06 | 1688.56 | 4764.90 | 3248.37 | 1796.90 |
| DL delay (s) | 5%ile | 2.36 | 2.42 | 2.78 | 2.42 | 2.53 | 2.91 | 2.42 | 2.53 | 2.89 |
| 50%ile | 2.87 | 4.47 | 16.14 | 2.94 | 4.89 | 18.78 | 2.94 | 4.84 | 16.36 |
| 95%ile | 51.95 | 143.30 | 184.86 | 52.08 | 145.00 | 194.47 | 46.50 | 148.09 | 184.36 |
| mean | 14.88 | 25.34 | 48.36 | 14.95 | 26.30 | 52.79 | 14.54 | 27.06 | 48.76 |
| UL UPT (Mbps) | 5%ile | 2097.28 | 1113.5 | 838.14 | 2007.27 | 1036.2 | 799.88 | 1951.70 | 995.5 | 740.68 |
| 50%ile | 4830.23 | 3963.6 | 2416.94 | 4747.42 | 3808.6 | 2132.90 | 4733.81 | 3788.7 | 2117.29 |
| 95%ile | 5366.37 | 4931.5 | 4380.69 | 5303.91 | 4820.6 | 4229.17 | 5304.49 | 4803.3 | 4187.98 |
| mean | 4558.31 | 3554.1 | 2483.97 | 4481.93 | 3382.6 | 2310.29 | 4468.98 | 3362.9 | 2286.96 |
| UL delay (s) | 5%ile | 2.61 | 2.67 | 2.81 | 2.66 | 2.7 | 2.87 | 2.66 | 2.73 | 2.88 |
| 50%ile | 3.25 | 4.05 | 6.81 | 3.31 | 4.25 | 8.06 | 3.31 | 4.30 | 8.27 |
| 95%ile | 50.19 | 135.6 | 136.31 | 51.66 | 143.91 | 141.42 | 53.33 | 143.14 | 142.72 |
| mean | 14.63 | 23.3 | 30.36 | 14.97 | 25.57 | 32.73 | 14.97 | 25.45 | 33.05 |
| Arrival rate (files/s) | | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 𝜌DL | | 0.99 | 0.99 | 0.98 | 0.99 | 0.99 | 0.98 | 0.99 | 0.99 | 0.99 |
| 𝜌UL | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.98 | 1 |
| BO | | 34 | 59 | 74 | 34 | 59 | 74 | 34 | 59 | 74 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED threshold= - 48 dBm, CWS=15.  2. Details of case: 2 operators (scenario A) with non-ceiling mounted gNB and same setting, case1: No LBT, case2: Omni-directional LBT, case3: directional LBT.  3. Details of COT sharing if used in evaluation: MCOT=5ms, No COT sharing used.  4. Other parameters: Frequency 60 GHz, BW = 2GHz, SCS=960 KHz, UE Antenna Configuration 2 (Mg,Ng,M,N,P) = (1,2,4,4,2), ftp3 file size=2Mbytes | | | | | | | | | | |

### B.2.3 Indoor scenario B

#### B.2.3.1 Source 1 [65]

Table B.2.3.1-1. System level evaluation results for scenario B, with/without LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: ED -47dBm | | | Case 3: ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5985 | 4816 | 3791 | 5692 | 4554 | 3681 | 5698 | 4427 | 3317 |
| 50%ile | 8011 | 6452 | 5082 | 7637 | 6109 | 4849 | 7665 | 5799 | 4421 |
| 95%ile | 10675 | 9374 | 7848 | 10288 | 8935 | 7474 | 10254 | 8533 | 6892 |
| mean | 8748 | 7294 | 5895 | 8350 | 6924 | 5638 | 8327 | 6633 | 5138 |
| DL delay (s) | 5%ile | 0.021 | 0.025 | 0.034 | 0.021 | 0.027 | 0.035 | 0.021 | 0.029 | 0.039 |
| 50%ile | 0.022 | 0.030 | 0.042 | 0.024 | 0.031 | 0.043 | 0.024 | 0.033 | 0.050 |
| 95%ile | 0.047 | 0.067 | 0.100 | 0.049 | 0.069 | 0.102 | 0.049 | 0.072 | 0.116 |
| mean | 0.029 | 0.040 | 0.058 | 0.030 | 0.042 | 0.059 | 0.030 | 0.044 | 0.068 |
| UL UPT (Mbps) | 5%ile | 2076 | 1643 | 1254 | 1944 | 1518 | 1152 | 1921 | 1443 | 989 |
| 50%ile | 2904 | 2338 | 1767 | 2710 | 2169 | 1648 | 2698 | 2018 | 1399 |
| 95%ile | 4392 | 3790 | 3240 | 4179 | 3550 | 2996 | 4134 | 3312 | 2534 |
| mean | 3361 | 2783 | 2209 | 3165 | 2583 | 2060 | 3125 | 2390 | 1749 |
| UL delay (s) | 5%ile | 0.051 | 0.066 | 0.085 | 0.053 | 0.070 | 0.096 | 0.054 | 0.081 | 0.120 |
| 50%ile | 0.058 | 0.087 | 0.114 | 0.061 | 0.086 | 0.124 | 0.063 | 0.102 | 0.153 |
| 95%ile | 0.142 | 0.255 | 0.349 | 0.155 | 0.228 | 0.363 | 0.156 | 0.268 | 0.434 |
| mean | 0.081 | 0.134 | 0.179 | 0.087 | 0.125 | 0.192 | 0.088 | 0.148 | 0.232 |
| Arrival rate (files/s) | | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.97 | 1.00 | 0.99 | 0.95 |
| BO | | 0.10 | 0.35 | 0.55 | 0.10 | 0.37 | 0.57 | 0.11 | 0.38 | 0.61 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario B) with the same settings, report only for OP A; case 1: no-LBT, case 2: LBT with ED = -47dBm, case 3: LBT with ED = -68dBm  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.3.1-2. System level evaluation results for scenario B with receiver assisted LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: RAL ED -47dBm | | | Case 3: RAL ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5985 | 4816 | 3791 | 5717 | 4593 | 3704 | 5767 | 4492 | 3577 |
| 50%ile | 8011 | 6452 | 5082 | 7674 | 6068 | 4843 | 7534 | 5977 | 4699 |
| 95%ile | 10675 | 9374 | 7848 | 10284 | 8923 | 7474 | 10280 | 8767 | 7084 |
| mean | 8748 | 7294 | 5895 | 8364 | 6898 | 5623 | 8342 | 6791 | 5437 |
| DL delay (s) | 5%ile | 0.021 | 0.025 | 0.034 | 0.021 | 0.027 | 0.035 | 0.021 | 0.028 | 0.037 |
| 50%ile | 0.022 | 0.030 | 0.042 | 0.024 | 0.032 | 0.043 | 0.024 | 0.032 | 0.044 |
| 95%ile | 0.047 | 0.067 | 0.100 | 0.049 | 0.070 | 0.102 | 0.048 | 0.071 | 0.105 |
| mean | 0.029 | 0.040 | 0.058 | 0.030 | 0.042 | 0.059 | 0.030 | 0.043 | 0.061 |
| UL UPT (Mbps) | 5%ile | 2076 | 1643 | 1254 | 1946 | 1511 | 1154 | 1932 | 1416 | 981 |
| 50%ile | 2904 | 2338 | 1767 | 2715 | 2164 | 1681 | 2715 | 1955 | 1387 |
| 95%ile | 4392 | 3790 | 3240 | 4177 | 3502 | 2917 | 4096 | 3312 | 2549 |
| mean | 3361 | 2783 | 2209 | 3168 | 2562 | 2046 | 3124 | 2386 | 1744 |
| UL delay (s) | 5%ile | 0.051 | 0.066 | 0.085 | 0.053 | 0.071 | 0.098 | 0.055 | 0.079 | 0.121 |
| 50%ile | 0.058 | 0.087 | 0.114 | 0.061 | 0.086 | 0.123 | 0.063 | 0.096 | 0.154 |
| 95%ile | 0.142 | 0.255 | 0.349 | 0.152 | 0.225 | 0.353 | 0.154 | 0.250 | 0.417 |
| mean | 0.081 | 0.134 | 0.179 | 0.086 | 0.126 | 0.190 | 0.088 | 0.139 | 0.227 |
| Arrival rate (files/s) | | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.97 | 1.00 | 0.99 | 0.96 |
| BO | | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.57 | 0.11 | 0.39 | 0.60 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario B) with the same settings, report only for OP A; case 1: no-LBT, case 2: receiver assisted LBT with ED = -47dBm, case 3: receiver assisted LBT with ED = -68dBm  Receiver assisted LBT: the LBT procedure is evaluated at the receiver instead of transmitter. The LBT result is assumed to be available instantly at the transmitter without accounting any overhead for exchanging this information between the transmitter and the receiver (refer to section 2.1.4 in R1-2007983 for more details).  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DLCOT sharing when traffic in both directions  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.3.1-3. System level evaluation results for scenario B with dynamic LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: Dynamic LBT ED -47dBm | | | Case 3: Dynamic LBT ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5985 | 4816 | 3791 | 6049 | 4837 | 3799 | 6062 | 4734 | 3674 |
| 50%ile | 8011 | 6452 | 5082 | 7934 | 6424 | 5051 | 7934 | 6342 | 4958 |
| 95%ile | 10675 | 9374 | 7848 | 10701 | 9340 | 7845 | 10682 | 9042 | 7625 |
| mean | 8748 | 7294 | 5895 | 8731 | 7259 | 5882 | 8743 | 7105 | 5716 |
| DL delay (s) | 5%ile | 0.021 | 0.025 | 0.034 | 0.021 | 0.026 | 0.034 | 0.021 | 0.027 | 0.036 |
| 50%ile | 0.022 | 0.030 | 0.042 | 0.023 | 0.030 | 0.042 | 0.022 | 0.032 | 0.045 |
| 95%ile | 0.047 | 0.067 | 0.100 | 0.046 | 0.068 | 0.100 | 0.045 | 0.069 | 0.109 |
| mean | 0.029 | 0.040 | 0.058 | 0.029 | 0.041 | 0.058 | 0.029 | 0.042 | 0.063 |
| UL UPT (Mbps) | 5%ile | 2076 | 1643 | 1254 | 2084 | 1647 | 1266 | 2066 | 1622 | 1211 |
| 50%ile | 2904 | 2338 | 1767 | 2941 | 2358 | 1781 | 2927 | 2264 | 1716 |
| 95%ile | 4392 | 3790 | 3240 | 4460 | 3861 | 3271 | 4385 | 3721 | 3081 |
| mean | 3361 | 2783 | 2209 | 3394 | 2803 | 2271 | 3359 | 2700 | 2117 |
| UL delay (s) | 5%ile | 0.051 | 0.066 | 0.085 | 0.050 | 0.064 | 0.084 | 0.051 | 0.067 | 0.092 |
| 50%ile | 0.058 | 0.087 | 0.114 | 0.057 | 0.079 | 0.111 | 0.058 | 0.081 | 0.120 |
| 95%ile | 0.142 | 0.255 | 0.349 | 0.142 | 0.235 | 0.330 | 0.142 | 0.213 | 0.342 |
| mean | 0.081 | 0.134 | 0.179 | 0.080 | 0.125 | 0.173 | 0.081 | 0.118 | 0.179 |
| Arrival rate (files/s) | | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.97 | 1.00 | 0.99 | 0.96 |
| BO | | 0.10 | 0.35 | 0.55 | 0.10 | 0.35 | 0.55 | 0.10 | 0.36 | 0.56 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario B) with the same settings, report only for OP A; case 1: no-LBT, case 2: Dynamic LBT with ED = -47dBm, case 3: Dynamic LBT with ED = -68dBm  Dynamic LBT : a node operates without LBT unless the receiver experiences a failure in reception due to a drop in SINR, which reflects a presence of interferer. Only then, the node switches to LBT. Besides, when the LBT is switched on, the RAL described in section 2.1.4 of R1-2007983 is used  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.3.1-4. System level evaluation results for scenario B with directional LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: directional LBT ED -47dBm | | | Case 3: directional LBT ED-47+X dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5985 | 4816 | 3791 | 5757 | 4508 | 3574 | 5758 | 4532 | 3530 |
| 50%ile | 8011 | 6452 | 5082 | 7643 | 5985 | 4684 | 7652 | 6005 | 4742 |
| 95%ile | 10675 | 9374 | 7848 | 10260 | 8957 | 7527 | 10267 | 8901 | 7487 |
| mean | 8748 | 7294 | 5895 | 8369 | 6880 | 5581 | 8376 | 6867 | 5571 |
| DL delay (s) | 5%ile | 0.021 | 0.025 | 0.034 | 0.021 | 0.027 | 0.036 | 0.021 | 0.027 | 0.036 |
| 50%ile | 0.022 | 0.030 | 0.042 | 0.024 | 0.032 | 0.043 | 0.024 | 0.032 | 0.043 |
| 95%ile | 0.047 | 0.067 | 0.100 | 0.048 | 0.074 | 0.106 | 0.048 | 0.073 | 0.108 |
| mean | 0.029 | 0.040 | 0.058 | 0.030 | 0.043 | 0.061 | 0.030 | 0.043 | 0.062 |
| UL UPT (Mbps) | 5%ile | 2076 | 1643 | 1254 | 1936 | 1507 | 1095 | 1936 | 1508 | 1094 |
| 50%ile | 2904 | 2338 | 1767 | 2717 | 2112 | 1622 | 2716 | 2119 | 1593 |
| 95%ile | 4392 | 3790 | 3240 | 4161 | 3548 | 2993 | 4155 | 3571 | 2970 |
| mean | 3361 | 2783 | 2209 | 3159 | 2556 | 2033 | 3155 | 2563 | 2019 |
| UL delay (s) | 5%ile | 0.051 | 0.066 | 0.085 | 0.053 | 0.071 | 0.092 | 0.053 | 0.069 | 0.093 |
| 50%ile | 0.058 | 0.087 | 0.114 | 0.061 | 0.090 | 0.124 | 0.062 | 0.087 | 0.124 |
| 95%ile | 0.142 | 0.255 | 0.349 | 0.155 | 0.253 | 0.395 | 0.155 | 0.252 | 0.385 |
| mean | 0.081 | 0.134 | 0.179 | 0.087 | 0.135 | 0.199 | 0.087 | 0.134 | 0.199 |
| Arrival rate (files/s) | | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 |
| BO | | 0.10 | 0.35 | 0.55 | 0.10 | 0.37 | 0.57 | 0.10 | 0.37 | 0.57 |
| Additional report/notes:  1. LBT procedure and parameters: directional LBT, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario B) with the same settings, report only for OP A; case 1: no-LBT, case 2: directional LBT with ED = -47dBm, case 3: directional LBT with ED = -47+x dBm (i.e., -47+15dBm at gNB, -47+6dBm at UE)  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.3.1-5. System level evaluation results for scenario B with mixed LBT configurations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT  (OpA ) | | | Case 2: ED -47dBm  (OpB) | | |
|
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5985 | 4816 | 3791 | 5794 | 4612 | 3656 |
| 50%ile | 8011 | 6452 | 5082 | 7619 | 6012 | 4740 |
| 95%ile | 10675 | 9374 | 7848 | 10250 | 8830 | 7401 |
| mean | 8748 | 7294 | 5895 | 8408 | 6880 | 5577 |
| DL delay (s) | 5%ile | 0.021 | 0.025 | 0.034 | 0.021 | 0.027 | 0.035 |
| 50%ile | 0.022 | 0.030 | 0.042 | 0.023 | 0.032 | 0.043 |
| 95%ile | 0.047 | 0.067 | 0.100 | 0.049 | 0.072 | 0.105 |
| mean | 0.029 | 0.040 | 0.058 | 0.031 | 0.043 | 0.061 |
| UL UPT (Mbps) | 5%ile | 2076 | 1643 | 1254 | 1987 | 1579 | 1192 |
| 50%ile | 2904 | 2338 | 1767 | 2742 | 2181 | 1653 |
| 95%ile | 4392 | 3790 | 3240 | 4132 | 3564 | 2986 |
| mean | 3361 | 2783 | 2209 | 3180 | 2609 | 2092 |
| UL delay (s) | 5%ile | 0.051 | 0.066 | 0.085 | 0.054 | 0.069 | 0.093 |
| 50%ile | 0.058 | 0.087 | 0.114 | 0.061 | 0.084 | 0.116 |
| 95%ile | 0.142 | 0.255 | 0.349 | 0.153 | 0.248 | 0.347 |
| mean | 0.081 | 0.134 | 0.179 | 0.087 | 0.129 | 0.185 |
| Arrival rate (files/s) | | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.96 |
| BO | | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.57 |
|  | Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario B); case 1: no-LBT for both OPs, case 2: LBT with ED = -47dBm for both OPs  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | |

Table B.2.3.1-6. System level evaluation results for scenario B with mixed LBT configurations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 3: mixed configuration | | | | | |
| (Op A , no LBT ) | | | (Op B, -47dbm ) | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 6084 | 4923 | 3856 | 5640 | 4499 | 3581 |
| 50%ile | 7922 | 6429 | 5034 | 7582 | 5983 | 4831 |
| 95%ile | 10764 | 9375 | 7841 | 10273 | 8900 | 7527 |
| mean | 8790 | 7289 | 5894 | 8363 | 6848 | 5634 |
| DL delay (s) | 5%ile | 0.020 | 0.025 | 0.034 | 0.021 | 0.027 | 0.035 |
| 50%ile | 0.022 | 0.030 | 0.041 | 0.023 | 0.032 | 0.043 |
| 95%ile | 0.046 | 0.067 | 0.097 | 0.053 | 0.079 | 0.112 |
| mean | 0.029 | 0.040 | 0.057 | 0.031 | 0.045 | 0.062 |
| UL UPT (Mbps) | 5%ile | 2110 | 1639 | 1279 | 1975 | 1570 | 1170 |
| 50%ile | 2923 | 2329 | 1781 | 2777 | 2247 | 1703 |
| 95%ile | 4447 | 3825 | 3262 | 4165 | 3642 | 3035 |
| mean | 3388 | 2773 | 2241 | 3204 | 2666 | 2107 |
| UL delay (s) | 5%ile | 0.050 | 0.064 | 0.084 | 0.053 | 0.067 | 0.087 |
| 50%ile | 0.058 | 0.082 | 0.112 | 0.060 | 0.082 | 0.114 |
| 95%ile | 0.141 | 0.222 | 0.322 | 0.160 | 0.257 | 0.383 |
| mean | 0.080 | 0.121 | 0.173 | 0.087 | 0.130 | 0.189 |
| Arrival rate (files/s) | | 0.42 | 1.59 | 2.65 | 0.42 | 1.59 | 2.65 |
| 𝜌DL | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 |
| 𝜌UL | | 1.00 | 0.99 | 0.96 | 1.00 | 0.99 | 0.97 |
| BO | | 0.10 | 0.36 | 0.54 | 0.11 | 0.37 | 0.57 |
|  | Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: 2 operators (scenario B); case 3: no LBT for OP A, LBT with ED = -47dBm for OP B  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | |

### B.2.4 Indoor scenario C

#### B.2.4.1 Source 1 [65]

Table B.2.4.1-1. System level evaluation results for scenario C, with/ without LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: ED -47dBm | | | Case 3: ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5736 | 4324 | 3083 | 5503 | 3993 | 2783 | 5475 | 3988 | 2651 |
| 50%ile | 9409 | 7759 | 6148 | 9095 | 7460 | 5892 | 9122 | 7335 | 5737 |
| 95%ile | 11217 | 10635 | 9494 | 10800 | 10224 | 9018 | 10804 | 10097 | 8884 |
| mean | 9186 | 7747 | 6317 | 8837 | 7367 | 5952 | 8849 | 7300 | 5853 |
| DL delay (s) | 5%ile | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| 50%ile | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 |
| 95%ile | 0,04 | 0,05 | 0,08 | 0,04 | 0,06 | 0,09 | 0,04 | 0,06 | 0,09 |
| mean | 0,03 | 0,03 | 0,05 | 0,03 | 0,04 | 0,05 | 0,03 | 0,04 | 0,05 |
| UL UPT (Mbps) | 5%ile | 2016 | 1392 | 882 | 1879 | 1289 | 847 | 1868 | 1206 | 729 |
| 50%ile | 3598 | 2911 | 2255 | 3371 | 2690 | 2051 | 3348 | 2596 | 1907 |
| 95%ile | 4770 | 4367 | 3856 | 4495 | 4054 | 3622 | 4430 | 3987 | 3381 |
| mean | 3540 | 2931 | 2321 | 3321 | 2705 | 2155 | 3286 | 2625 | 2007 |
| UL delay (s) | 5%ile | 0,04 | 0,05 | 0,05 | 0,05 | 0,05 | 0,06 | 0,05 | 0,05 | 0,06 |
| 50%ile | 0,06 | 0,08 | 0,11 | 0,06 | 0,09 | 0,12 | 0,07 | 0,09 | 0,14 |
| 95%ile | 0,10 | 0,17 | 0,28 | 0,11 | 0,17 | 0,28 | 0,11 | 0,19 | 0,33 |
| mean | 0,07 | 0,09 | 0,14 | 0,07 | 0,10 | 0,14 | 0,07 | 0,11 | 0,16 |
| Arrival rate (files/s) | | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 |
| 𝜌DL | | 1,00 | 1,00 | 0,99 | 1,00 | 0,99 | 0,99 | 1,00 | 1,00 | 0,99 |
| 𝜌UL | | 1,00 | 0,99 | 0,95 | 1,00 | 0,98 | 0,95 | 1,00 | 0,99 | 0,94 |
| BO | | 0,10 | 0,35 | 0,55 | 0,11 | 0,37 | 0,57 | 0,11 | 0,37 | 0,58 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: single operator (scenario C); case 1: no-LBT, case 2: LBT with ED = -47dBm, case 3: LBT with ED = -68dBm  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both direction  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.4.1-2. System level evaluation results for scenario C with receiver assisted LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: RAL ED -47dBm | | | Case 3: RAL ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5736 | 4324 | 3083 | 5503 | 3993 | 2783 | 5520 | 3854 | 2712 |
| 50%ile | 9409 | 7759 | 6148 | 9095 | 7460 | 5892 | 9004 | 7348 | 5750 |
| 95%ile | 11217 | 10635 | 9494 | 10800 | 10224 | 9018 | 10782 | 9908 | 8533 |
| mean | 9186 | 7747 | 6317 | 8837 | 7367 | 5952 | 8801 | 7277 | 5834 |
| DL delay (s) | 5%ile | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,03 |
| 50%ile | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 |
| 95%ile | 0,04 | 0,05 | 0,08 | 0,04 | 0,06 | 0,09 | 0,04 | 0,06 | 0,09 |
| mean | 0,03 | 0,03 | 0,05 | 0,03 | 0,04 | 0,05 | 0,03 | 0,04 | 0,05 |
| UL UPT (Mbps) | 5%ile | 2016 | 1392 | 882 | 1879 | 1289 | 847 | 1908 | 1259 | 810 |
| 50%ile | 3598 | 2911 | 2255 | 3371 | 2690 | 2051 | 3367 | 2616 | 1985 |
| 95%ile | 4770 | 4367 | 3856 | 4495 | 4054 | 3622 | 4458 | 3968 | 3449 |
| mean | 3540 | 2931 | 2321 | 3321 | 2705 | 2155 | 3302 | 2652 | 2079 |
| UL delay (s) | 5%ile | 0,04 | 0,05 | 0,05 | 0,05 | 0,05 | 0,06 | 0,05 | 0,05 | 0,06 |
| 50%ile | 0,06 | 0,08 | 0,11 | 0,06 | 0,09 | 0,12 | 0,07 | 0,09 | 0,13 |
| 95%ile | 0,10 | 0,17 | 0,28 | 0,11 | 0,17 | 0,28 | 0,11 | 0,18 | 0,32 |
| mean | 0,07 | 0,09 | 0,14 | 0,07 | 0,10 | 0,14 | 0,07 | 0,10 | 0,16 |
| Arrival rate (files/s) | | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 |
| 𝜌DL | | 1,00 | 1,00 | 0,99 | 1,00 | 0,99 | 0,99 | 1,00 | 1,00 | 0,99 |
| 𝜌UL | | 1,00 | 0,99 | 0,95 | 1,00 | 0,98 | 0,95 | 1,00 | 0,99 | 0,95 |
| BO | | 0,10 | 0,35 | 0,55 | 0,11 | 0,37 | 0,57 | 0,11 | 0,38 | 0,57 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: single operator (scenario C); case 1: no-LBT, case 2: receiver assisted LBT with ED = -47dBm, case 3: receiver assisted LBT with ED = -68dBm  Receiver assisted LBT: the LBT procedure is evaluated at the receiver instead of transmitter. The LBT result is assumed to be available instantly at the transmitter without accounting any overhead for exchanging this information between the transmitter and the receiver (refer to section 2.1.4 in R1-2007983 for more details).  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.4.1-3. System level evaluation results for scenario C with dynamic LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: Dynamic LBT ED -47dBm | | | Case 3: Dynamic LBT ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5736 | 4324 | 3083 | 5758 | 4201 | 2943 | 5659 | 4000 | 2910 |
| 50%ile | 9409 | 7759 | 6148 | 9472 | 7718 | 6253 | 9464 | 7680 | 6048 |
| 95%ile | 11217 | 10635 | 9494 | 11231 | 10394 | 9183 | 11234 | 10513 | 9232 |
| mean | 9186 | 7747 | 6317 | 9211 | 7639 | 6265 | 9164 | 7591 | 6135 |
| DL delay (s) | 5%ile | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| 50%ile | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 |
| 95%ile | 0,04 | 0,05 | 0,08 | 0,04 | 0,06 | 0,09 | 0,04 | 0,06 | 0,09 |
| mean | 0,03 | 0,03 | 0,05 | 0,03 | 0,03 | 0,05 | 0,03 | 0,03 | 0,05 |
| UL UPT (Mbps) | 5%ile | 2016 | 1392 | 882 | 2017 | 1373 | 888 | 1971 | 1308 | 784 |
| 50%ile | 3598 | 2911 | 2255 | 3627 | 2899 | 2236 | 3589 | 2855 | 2136 |
| 95%ile | 4770 | 4367 | 3856 | 4778 | 4411 | 3887 | 4755 | 4293 | 3734 |
| mean | 3540 | 2931 | 2321 | 3552 | 2940 | 2347 | 3522 | 2870 | 2228 |
| UL delay (s) | 5%ile | 0,04 | 0,05 | 0,05 | 0,04 | 0,05 | 0,05 | 0,04 | 0,05 | 0,06 |
| 50%ile | 0,06 | 0,08 | 0,11 | 0,06 | 0,08 | 0,11 | 0,06 | 0,08 | 0,12 |
| 95%ile | 0,10 | 0,17 | 0,28 | 0,10 | 0,16 | 0,27 | 0,10 | 0,17 | 0,28 |
| mean | 0,07 | 0,09 | 0,14 | 0,07 | 0,09 | 0,14 | 0,07 | 0,09 | 0,14 |
| Arrival rate (files/s) | | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 |
| 𝜌DL | | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 |
| 𝜌UL | | 1,00 | 0,99 | 0,95 | 1,00 | 0,99 | 0,96 | 1,00 | 0,99 | 0,95 |
| BO | | 0,10 | 0,35 | 0,55 | 0,10 | 0,36 | 0,55 | 0,10 | 0,36 | 0,56 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: single operator (scenario C); case 1: no-LBT, case 2: Dynamic LBT with ED = -47dBm, case 3: Dynamic LBT with ED = -68dBm  Dynamic LBT: a node operates without LBT unless the receiver experiences a failure in reception due to a drop in SINR, which reflects a presence of interferer. Only then, the node switches to LBT. Besides, when the LBT is switched on, the RAL described in section 2.1.4 of R1-2007983 is used  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both direction  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

Table B.2.4.1-4. System level evaluation results for scenario C with directional LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: directional LBT ED -47dBm | | | Case 3: directional LBT ED-47+X dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 5736 | 4324 | 3083 | 5597 | 4045 | 2748 | 5597 | 4061 | 2795 |
| 50%ile | 9409 | 7759 | 6148 | 9109 | 7348 | 5801 | 9106 | 7363 | 5826 |
| 95%ile | 11217 | 10635 | 9494 | 10812 | 10036 | 8709 | 10812 | 10032 | 8709 |
| mean | 9186 | 7747 | 6317 | 8863 | 7281 | 5834 | 8863 | 7287 | 5856 |
| DL delay (s) | 5%ile | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| 50%ile | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 | 0,02 | 0,03 | 0,04 |
| 95%ile | 0,04 | 0,05 | 0,08 | 0,04 | 0,06 | 0,09 | 0,04 | 0,06 | 0,09 |
| mean | 0,03 | 0,03 | 0,05 | 0,03 | 0,04 | 0,05 | 0,03 | 0,04 | 0,05 |
| UL UPT (Mbps) | 5%ile | 2016 | 1392 | 882 | 1893 | 1211 | 695 | 1893 | 1211 | 694 |
| 50%ile | 3598 | 2911 | 2255 | 3394 | 2667 | 1996 | 3395 | 2660 | 1998 |
| 95%ile | 4770 | 4367 | 3856 | 4485 | 4055 | 3492 | 4485 | 4106 | 3589 |
| mean | 3540 | 2931 | 2321 | 3331 | 2691 | 2081 | 3332 | 2698 | 2101 |
| UL delay (s) | 5%ile | 0,04 | 0,05 | 0,05 | 0,05 | 0,05 | 0,06 | 0,05 | 0,05 | 0,06 |
| 50%ile | 0,06 | 0,08 | 0,11 | 0,06 | 0,09 | 0,13 | 0,06 | 0,09 | 0,13 |
| 95%ile | 0,10 | 0,17 | 0,28 | 0,11 | 0,19 | 0,32 | 0,11 | 0,19 | 0,31 |
| mean | 0,07 | 0,09 | 0,14 | 0,07 | 0,10 | 0,16 | 0,07 | 0,10 | 0,16 |
| Arrival rate (files/s) | | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 | 0,49 | 1,79 | 3,04 |
| 𝜌DL | | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 |
| 𝜌UL | | 1,00 | 0,99 | 0,95 | 1,00 | 0,99 | 0,95 | 1,00 | 0,99 | 0,95 |
| BO | | 0,10 | 0,35 | 0,55 | 0,11 | 0,37 | 0,58 | 0,10 | 0,37 | 0,58 |
| Additional report/notes:  1. LBT procedure and parameters: directional LBT, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: no  3. Details of case: single operator (scenario C); case 1: no-LBT, case 2: directional LBT with ED = -, case 3: directional LBT with ED = -47+x dBm (i.e., -47+15dBm at gNB, -47+6dBm at UE)  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

#### B.2.4.2 Source 2 [72]

Table B.2.4.2-1. System level evaluation results for indoor scenario C (no-LBT and omni-directional LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | no-LBT | | | omni-directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 2712.1 | 1271.5 | 585.9 | 2478.7 | 1136.6 | 474.6 |
| 50%ile | 6542.7 | 4481.1 | 4029.6 | 6091.8 | 4458.6 | 3595.8 |
| 95%ile | 9478.1 | 9472.7 | 9459.5 | 8954.3 | 8848.7 | 8715.9 |
| mean | 6383.1 | 5130.7 | 4346.5 | 5945.0 | 4722.5 | 3913.9 |
| DL delay (s) | 5%ile | 0.0228 | 0.0228 | 0.0228 | 0.0241 | 0.0244 | 0.0247 |
| 50%ile | 0.0329 | 0.0442 | 0.0534 | 0.0354 | 0.0481 | 0.0598 |
| 95%ile | 0.0792 | 0.1646 | 0.3375 | 0.0865 | 0.1870 | 0.4128 |
| mean | 0.0396 | 0.0636 | 0.1125 | 0.0427 | 0.0706 | 0.1309 |
| UL UPT (Mbps) | 5%ile | 3004.4 | 1470.8 | 801.5 | 2748.7 | 1271.5 | 551.6 |
| 50%ile | 6947.7 | 5450.4 | 4476.4 | 6508.5 | 4898.4 | 3944.6 |
| 95%ile | 10637 | 10594 | 9402.1 | 10014 | 9792.6 | 8676.5 |
| mean | 6835.8 | 5534.8 | 4759.1 | 6376.1 | 5058.1 | 4232.4 |
| UL delay (s) | 5%ile | 0.0203 | 0.0204 | 0.0227 | 0.0215 | 0.0220 | 0.0248 |
| 50%ile | 0.0311 | 0.0394 | 0.0481 | 0.0331 | 0.0438 | 0.0544 |
| 95%ile | 0.0719 | 0.1422 | 0.2501 | 0.0786 | 0.1671 | 0.3530 |
| mean | 0.0366 | 0.0573 | 0.0951 | 0.0395 | 0.0661 | 0.1228 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.69% | 99.52% | 98.91% | 99.65% | 99.44% | 98.71% |
| 𝜌UL | | 99.80% | 99.54% | 99.01% | 99.79% | 99.47% | 98.53% |
| BO | | 12.75% | 38.75% | 52% | 13.60% | 41.32% | 55.23% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 1 operators (scenario C), case1: no-LBT; case 2: omni-directional LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. Rank 1 transmission. BS to UE: InH open office channel, ftp3 file size = 27Mbyte. | | | | | | | |

Table B.2.4.2-2. System level evaluation results for indoor scenario C (directional LBT and receiver assisted LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | directional LBT | | | receiver-assisted LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 2487.3 | 1128.1 | 462.6 | 2558.2 | 1209.5 | 561.7 |
| 50%ile | 6069.5 | 4452.3 | 3588.1 | 6119.3 | 4564.6 | 3801.1 |
| 95%ile | 8955.1 | 8838.9 | 8732.4 | 8959.9 | 8860 | 8761.1 |
| mean | 5931.7 | 4711.4 | 3892.5 | 5995.4 | 4826.2 | 4078.2 |
| DL delay (s) | 5%ile | 0.0241 | 0.0244 | 0.0247 | 0.0241 | 0.0243 | 0.0246 |
| 50%ile | 0.0355 | 0.0482 | 0.0599 | 0.0353 | 0.0471 | 0.0565 |
| 95%ile | 0.0867 | 0.1884 | 0.4249 | 0.0834 | 0.1738 | 0.3608 |
| mean | 0.0427 | 0.0705 | 0.1315 | 0.0420 | 0.0669 | 0.1214 |
| UL UPT (Mbps) | 5%ile | 2786.3 | 1266.3 | 558.5 | 2864.9 | 1353.5 | 619.5 |
| 50%ile | 6510.4 | 4914.7 | 3943.5 | 6562.9 | 5096.8 | 4128.0 |
| 95%ile | 10006 | 9819.6 | 8623.7 | 10020 | 9805.7 | 8768.0 |
| mean | 6376.3 | 5050.6 | 4229.1 | 6443.4 | 5180.5 | 4374.5 |
| UL delay (s) | 5%ile | 0.0216 | 0.0219 | 0.0249 | 0.0215 | 0.0220 | 0.0244 |
| 50%ile | 0.0331 | 0.0437 | 0.0545 | 0.0329 | 0.0422 | 0.0520 |
| 95%ile | 0.0775 | 0.1666 | 0.3475 | 0.0754 | 0.1562 | 0.3143 |
| mean | 0.0395 | 0.0662 | 0.1225 | 0.0388 | 0.0622 | 0.1122 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.64% | 99.44% | 98.71% | 99.65% | 99.44% | 98.78% |
| 𝜌UL | | 99.79% | 99.48% | 98.55% | 99.79% | 99.49% | 98.72% |
| BO | | 13.60% | 41.31% | 55.25% | 13.64% | 41.33% | 55.20% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 1 operators (scenario C), case1: directional LBT; case 2: receiver-assisted LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. Rank 1 transmission. BS to UE: InH open office channel, ftp3 file size = 27Mbyte. | | | | | | | |

#### B.2.4.3 Source 5 [64]

Table B.2.4.3-1. single operator performance of different LBT mode of various traffic load with CCA=-68dBm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | LBT mode | | omni | | | directional | | |
| R1-2009450/ Source 5 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 2753.1533 | 711.4508 | 56.8123 | 2794.9436 | 1093.1202 | 107.4513 |
| 50%ile | 11980.9873 | 10158.8506 | 8452.8770 | 12696.9189 | 11023.2432 | 9319.9990 |
| 95%ile | 21861.1777 | 18747.8184 | 17432.8926 | 22533.1016 | 21525.3809 | 20521.2188 |
| mean | 11620.6953 | 9689.7852 | 8216.0859 | 11983.1641 | 10961.0996 | 9795.4639 |
| DL delay (s) | 5%ile | 0.009 | 0.010 | 0.010 | 0.009 | 0.009 | 0.009 |
| 50%ile | 0.022 | 0.029 | 0.032 | 0.020 | 0.022 | 0.026 |
| 95%ile | 0.128 | 1.437 | 4.216 | 0.116 | 0.334 | 4.489 |
| mean | 0.040 | 0.588 | 0.897 | 0.037 | 0.283 | 0.656 |
| Arrival rate (files/s) | | 2 | 3.5 | 5 | 2 | 3.5 | 5 |
| 𝜌DL | | 99.83% | 99.07% | 99.04% | 98.98% | 99.14% | 100% |
| BO | | 29.417% | 65.342% | 81.175% | 34.901 % | 60.136 % | 70.984% |
| Additional report/notes:  1.LBT procedure and parameters  Refer to Section A.2 in R1-2009450. Subcarrier spacing is 960KHz;  LBT procedure align with v2.1.20 of EN 302 567;  CWmax=10;  2.any assumptions/parameters used not as in the agreed baseline  3. Details of case: single operators; omni-directional LBT, directional LBT schemes; Indoor Scenario C  4. Other metric(s) and definition if reported  5. Details of COT sharing if used in evaluation:DL Only, No COT sharing | | | | | | | |

#### B.2.4.4 Source 6 [68]

Table B.2.4.4-1. System level evaluation results for indoor scenario C, without LBT

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc/ source | Cases | | Case 1（Scenario C） | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009615/ Source 6 | DL UPT (Mbps) | 5%ile | 641.7 | 208.39 | 112.84 |
| 50%ile | 920.144 | 732.81 | 549.18 |
| 95%ile | 2443.25 | 1715.76 | 1237.39 |
| mean | 1089.23 | 755.14 | 566.22 |
| DL delay (s) | 5%ile | 0.102 | 0.141 | 0.174 |
| 50%ile | 0.24 | 0.324 | 0.478 |
| 95%ile | 0.343 | 1.409 | 2.78 |
| mean | 0.234 | 0.486 | 0.907 |
| Arrival rate (files/s) | | 0.6 | 1.2 | 1.8 |
| 𝜌DL | | 0.977 | 0.887 | 0.839 |
| BO | | 13.13% | 38.68% | 61.56% |
| Additional report/notes:   |  |  | | --- | --- | | Carrier Frequency | 60GHz | | Bandwidth | 400MHz | | Subcarrier Spacing | 120kHz | | Channel Model | InH Open Office model | | BS antenna Array configuration | (Mg, Ng,M, N, P) = (1, 1, 4, 8, 2), dH = dV = 0.5 λ | | UE antenna Array configuration | (Mg, Ng,M, N, P) = (1, 2, 2, 2, 2), dH = dV = 0.5 λ | | BS antenna pattern | Antenna power pattern given in Table A.2.1-7 of TR38.802 for ceiling mount  (with exception of antenna element gain) | | UE antenna pattern | Antenna power pattern given in Table A.2.1-8 of TR38.802 | | Traffic Model | FTP Model 3 (27Mbyte file) | | UE Receiver | MMSE-IRC | | RSRP condition | UE with RSRP below a -71 dBm + 10 log10( bandwidth/2GHz ) are not considered in simulation and not counted toward UE distribution count | | RANK adaptation | 1 or 2 | | | | | |

#### B.2.4.5 Source 13 [29]

Table B.2.4.5-1. System level evaluation results for scenario

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cases | | Case 1: Indoor-C Scenario  (2GHz CBW) | | | Case 2: Indoor-C Scenario  (400MHz CBW) | | |
| R1-2009062 / Source 13 | Traffic load  Metrics | | Low load | Medium load | High load | Low load | Medium load | High load |
| DL UPT (Mbps) | 5%ile | 4842 | 2722 | 1175 | 1354 | 618 | 280 |
| 50%ile | 10402 | 7727 | 5254 | 3053 | 1870 | 1191 |
| 95%ile | 15275 | 15275 | 13382 | 3053 | 3053 | 3053 |
| mean | 10161 | 8044 | 6080 | 2611 | 1926 | 1408 |
| DL delay (ms) | 5%ile | 14 | 14 | 16 | 71 | 71 | 71 |
| 50%ile | 21 | 28 | 41 | 71 | 115 | 181 |
| 95%ile | 45 | 79 | 183 | 160 | 350 | 771 |
| mean | 24 | 36 | 68 | 90 | 150 | 275 |
| UL UPT (Mbps) | 5%ile | 489 | 223 | 172 | 283 | 132 | 62 |
| 50%ile | 1203 | 665 | 517 | 511 | 357 | 245 |
| 95%ile | 1947 | 1539 | 1597 | 723 | 626 | 590 |
| mean | 1176 | 760 | 656 | 514 | 369 | 284 |
| UL delay (ms) | 5%ile | 104 | 138 | 133 | 295 | 345 | 366 |
| 50%ile | 179 | 325 | 417 | 423 | 601 | 881 |
| 95%ile | 413 | 934 | 1254 | 761 | 1616 | 3498 |
| mean | 220 | 416 | 522 | 447 | 759 | 1267 |
| Arrival rate (files/s) | | 48 | 192 | 288 | 9.6 | 48 | 72 |
| 𝜌DL | | 100% | 100% | 100% | 100% | 100% | 100% |
| 𝜌UL | | 100% | 100% | 100% | 100% | 100% | 99.9% |
| BO | | 8% | 35% | 53% | 6% | 31% | 51% |

#### B.2.4.6 Source 15 [71]

Table B.2.4.6-1. System level evaluation results for scenario indoor-C

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1  No-LBT | | | Case 2  Omni-LBT | | |
| R1-2009157 / Source 15 | Traffic load  Metrics | | Low load | Medium load | High load | Low load | Medium load | High load |
| DL UPT (Mbps) | 5%ile | 12.3 | 13.13 | 4.9 | 12.2 | 13.6 | 5.0 |
| 50%ile | 23.4 | 21.7 | 8.0 | 20.1 | 21.8 | 7.5 |
| 95%ile | 34.1 | 30.1 | 12.9 | 32.6 | 30 | 12.9 |
| mean | 23.1 | 21.7 | 8.28 | 22.3 | 21.8 | 8.0 |
| DL delay (ms) | 5%ile | 0.23 | 0.25 | 0.18 | 0.23 | 0.25 | 0.18 |
| 50%ile | 0.32 | 0.31 | 0.2 | 0.33 | 0.31 | 0.2 |
| 95%ile | 0.44 | 0.35 | 0.24 | 0.44 | 0.36 | 0.24 |
| mean | 0.33 | 0.3 | 0.2 | 0.34 | 0.31 | 0.2 |
| UL UPT (Mbps) | 5%ile | 6.7 | 5.8 | 2.8 | 6.4 | 3.9 | 2.8 |
| 50%ile | 7.3 | 6.5 | 3.3 | 6.8 | 7.1 | 3.3 |
| 95%ile | 8.0 | 7.4 | 5.1 | 7.3 | 7.4 | 5.1 |
| mean | 7.3 | 6.6 | 3.5 | 6.9 | 6.2 | 3.5 |
| UL delay (ms) | 5%ile | 0.25 | 0.26 | 0.2 | 0.25 | 0.24 | 0.21 |
| 50%ile | 0.27 | 0.26 | 0.25 | 0.27 | 0.27 | 0.25 |
| 95%ile | 0.28 | 0.27 | 0.28 | 0.28 | 0.3 | 0.28 |
| mean | 0.27 | 0.26 | 0.25 | 0.27 | 0.27 | 0.25 |
| Arrival rate (files/s) | | 200 DL/UL | 1250 DL/500 UL | 1400 DL/667 UL | 200 DL/UL | 1250 DL/500 UL | 1400 DL/667 UL |
| BO(%) | | 12 | 43 | 71.7 |  |  |  |
| Additional report/notes:   1. SCS = 480 kHz, BW = 400 MHz. file size = 0.5 MB 2. LBT Procedures: No-LBT, Omni-LBT with -47 dBm ED 3. All channels (gNB-UE, gNB-gNB, UE-UE) InH-Open office. | | | | | | | |

### B.2.5 Outdoor scenario B

#### B.2.5.1 Source 1 [65]

Table B.2.5.1-1. System level evaluation results for outdoor B, with/without LBT

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | Case 1: no LBT | | | Case 2: ED -47dBm | | | Case 3: ED-68 dBm | | |
| R1-2007984 / Source 1 | Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| DL UPT (Mbps) | 5%ile | 2324 | 1691 | 1196 | 2167 | 1646 | 1173 | 2189 | 1665 | 1186 |
| 50%ile | 5632 | 4694 | 3759 | 5338 | 4421 | 3535 | 5396 | 4418 | 3472 |
| 95%ile | 8365 | 7152 | 6155 | 7932 | 6904 | 5846 | 8026 | 7009 | 5888 |
| mean | 5749 | 4820 | 3951 | 5472 | 4570 | 3691 | 5493 | 4595 | 3676 |
| DL delay (s) | 5%ile | 0.023 | 0.026 | 0.031 | 0.024 | 0.028 | 0.034 | 0.024 | 0.029 | 0.035 |
| 50%ile | 0.038 | 0.049 | 0.069 | 0.041 | 0.052 | 0.074 | 0.040 | 0.052 | 0.074 |
| 95%ile | 0.074 | 0.101 | 0.162 | 0.076 | 0.106 | 0.177 | 0.075 | 0.110 | 0.189 |
| mean | 0.044 | 0.059 | 0.088 | 0.046 | 0.063 | 0.095 | 0.046 | 0.063 | 0.097 |
| UL UPT (Mbps) | 5%ile | 1363 | 1089 | 832 | 1287 | 988 | 735 | 1271 | 1003 | 727 |
| 50%ile | 2958 | 2599 | 2189 | 2779 | 2432 | 1986 | 2786 | 2385 | 1953 |
| 95%ile | 4171 | 3744 | 3367 | 3877 | 3522 | 3091 | 3899 | 3481 | 3064 |
| mean | 3022 | 2655 | 2260 | 2842 | 2480 | 2065 | 2841 | 2443 | 2021 |
| UL delay (s) | 5%ile | 0.048 | 0.053 | 0.059 | 0.051 | 0.056 | 0.064 | 0.051 | 0.058 | 0.068 |
| 50%ile | 0.073 | 0.087 | 0.112 | 0.078 | 0.095 | 0.130 | 0.078 | 0.097 | 0.129 |
| 95%ile | 0.124 | 0.165 | 0.258 | 0.134 | 0.185 | 0.283 | 0.131 | 0.183 | 0.297 |
| mean | 0.080 | 0.101 | 0.139 | 0.086 | 0.109 | 0.152 | 0.086 | 0.110 | 0.157 |
| Arrival rate (files/s) | | 0.36 | 1.34 | 2.32 | 0.36 | 1.34 | 2.32 | 0.36 | 1.34 | 2.32 |
| 𝜌DL | | 0.999 | 0.997 | 0.987 | 0.999 | 0.996 | 0.989 | 1.000 | 0.997 | 0.989 |
| 𝜌UL | | 0.999 | 0.993 | 0.978 | 0.999 | 0.993 | 0.981 | 0.998 | 0.993 | 0.979 |
| BO | | 0.100 | 0.350 | 0.550 | 0.105 | 0.368 | 0.570 | 0.105 | 0.366 | 0.569 |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm or -68dBm, CWS: CW\_min = CW\_max = 3  2. any assumptions/parameters used not as in the agreed baseline: single site, UMi street canyon channel & PL model from TR38.901  3. Details of case: 2 operators (scenario B) with the same settings, report only for OP A; case 1: no-LBT, case 2: LBT with ED = -47dBm, case 3: LBT with ED = -68dBm  5. Details of COT sharing if used in evaluation: 0.5ms COT for DL, 0.25ms COT for UL, DL COT sharing when traffic in both directions.  6. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz. | | | | | | | | | | |

#### B.2.5.2 Source 2 [72]

Table B.2.5.2-1. System level evaluation results for outdoor scenario B (1 site, no-LBT and omni-directional LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | no-LBT | | | omni-directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 1717.8 | 571.6 | 114.3 | 1650.1 | 465.4 | 82.3 |
| 50%ile | 4271.6 | 3191.9 | 2307.5 | 3986.2 | 2871.9 | 1985.4 |
| 95%ile | 7548.5 | 7296.0 | 7053.1 | 7115.3 | 6746.6 | 6462.0 |
| mean | 4543.2 | 3467.8 | 2746.8 | 4242.6 | 3131.2 | 2434.7 |
| DL delay (s) | 5%ile | 0.0584 | 0.0292 | 0.0306 | 0.0301 | 0.0317 | 0.0329 |
| 50%ile | 0.0506 | 0.0673 | 0.0919 | 0.0540 | 0.0746 | 0.1069 |
| 95%ile | 0.1236 | 0.3558 | 1.0587 | 0.1294 | 0.4282 | 1.3218 |
| mean | 0.0589 | 0.1096 | 0.2430 | 0.0631 | 0.1278 | 0.3009 |
| UL UPT (Mbps) | 5%ile | 2771.4 | 861.9 | 223.1 | 2582.3 | 694.0 | 115.5 |
| 50%ile | 6935.2 | 4863.5 | 3648.8 | 6475.1 | 4332.3 | 3097.7 |
| 95%ile | 10570 | 9542.9 | 9058.7 | 9824.7 | 8894.9 | 8501.6 |
| mean | 6574.7 | 5028.7 | 4045.6 | 6142.3 | 4546.0 | 3540.6 |
| UL delay (s) | 5%ile | 0.0204 | 0.0223 | 0.0238 | 0.0219 | 0.0239 | 0.0252 |
| 50%ile | 0.0311 | 0.0443 | 0.0586 | 0.0333 | 0.0497 | 0.0692 |
| 95%ile | 0.0779 | 0.2433 | 0.7830 | 0.0830 | 0.2974 | 1.0580 |
| mean | 0.0385 | 0.0772 | 0.1719 | 0.0416 | 0.0912 | 0.2261 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.66% | 99.07% | 96.74% | 99.61% | 98.85% | 95.26% |
| 𝜌UL | | 99.80% | 99.40% | 97.19% | 99.78% | 99.22% | 96.05% |
| BO | | 15.86% | 47.41% | 61.76% | 16.92% | 50.47% | 64.82% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (outdoor scenario B, 1 site with wrapped around) with the same settings, case1: no-LBT; case 2: omni-directional LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz, Rank 1 transmission. ftp3 file size = 27Mbyte. | | | | | | | |

Table B.2.5.2-2. System level evaluation results for outdoor scenario B (1 site, directional LBT and receiver assisted LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | directional LBT | | | receiver-assisted LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 1654.3 | 479.9 | 77.5 | 1642.2 | 468.6 | 81.5 |
| 50%ile | 3980.2 | 2843.3 | 1936.8 | 3978.3 | 2878.8 | 2035.3 |
| 95%ile | 7110.6 | 6722.2 | 6445.0 | 7060.1 | 6709.4 | 6435.9 |
| mean | 4227.9 | 3119.4 | 2413.8 | 4207.0 | 3152.7 | 2464.7 |
| DL delay (s) | 5%ile | 0.0302 | 0.0318 | 0.0330 | 0.0305 | 0.0318 | 0.0331 |
| 50%ile | 0.0542 | 0.0752 | 0.1089 | 0.0542 | 0.0742 | 0.1041 |
| 95%ile | 0.1289 | 0.4167 | 1.3588 | 0.1307 | 0.4221 | 1.3624 |
| mean | 0.0632 | 0.1275 | 0.3056 | 0.0633 | 0.1284 | 0.2997 |
| UL UPT (Mbps) | 5%ile | 2581.5 | 679.19 | 117.2 | 2580.8 | 701.0 | 133.3 |
| 50%ile | 6478.3 | 4323.7 | 3093.7 | 6486.2 | 4413.9 | 3213.7 |
| 95%ile | 9838.3 | 8912.6 | 8516.8 | 9880.6 | 8910.9 | 8504.7 |
| mean | 6138.7 | 4537.8 | 3550.8 | 6165.1 | 4589.3 | 3604.5 |
| UL delay (s) | 5%ile | 0.0219 | 0.0240 | 0.0253 | 0.0219 | 0.0236 | 0.0252 |
| 50%ile | 0.0333 | 0.0498 | 0.0691 | 0.0333 | 0.0488 | 0.0666 |
| 95%ile | 0.0837 | 0.3032 | 1.0907 | 0.0833 | 0.2950 | 1.0840 |
| mean | 0.0416 | 0.0923 | 0.2282 | 0.0415 | 0.0890 | 0.2253 |
| Arrival rate (files/s) | | 0.4 | 1.2 | 1.6 | 0.4 | 1.2 | 1.6 |
| 𝜌DL | | 99.61% | 98.86% | 95.08% | 99.61% | 98.84% | 95.25% |
| 𝜌UL | | 99.79% | 99.18% | 96.03% | 99.78% | 99.23% | 96.39% |
| BO | | 16.93% | 50.45% | 64.81% | 16.97% | 50.58% | 64.90% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (outdoor scenario B, 1 site with wrapped around) with the same settings, case1: directional LBT; case 2: receiver-assisted LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz, Rank 1 transmission. ftp3 file size = 27Mbyte. | | | | | | | |

Table B.2.5.2-3. System level evaluation results for outdoor scenario B (7 site, no-LBT and omni-directional LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | no-LBT | | | omni-directional LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 1456.9 | 909.7 | 229.5 | 1294.1 | 749.5 | 180.6 |
| 50%ile | 4252.2 | 3809.4 | 2996.6 | 3962.8 | 3390.4 | 2687.2 |
| 95%ile | 7472.9 | 7389.9 | 7142.7 | 7027.2 | 6877.8 | 6682.8 |
| mean | 4460.8 | 3887.5 | 3258.4 | 4144.6 | 3558.5 | 2947.9 |
| DL delay (s) | 5%ile | 0.0288 | 0.0293 | 0.0303 | 0.0306 | 0.0314 | 0.0325 |
| 50%ile | 0.0510 | 0.0588 | 0.0722 | 0.0548 | 0.0654 | 0.0807 |
| 95%ile | 0.1440 | 0.2349 | 0.5771 | 0.1557 | 0.2664 | 0.6798 |
| mean | 0.0625 | 0.0904 | 0.1567 | 0.0678 | 0.1022 | 0.1808 |
| UL UPT (Mbps) | 5%ile | 2603.7 | 1349.6 | 346.4 | 2288.2 | 1147.3 | 248.2 |
| 50%ile | 6936.5 | 5628.5 | 4358.9 | 6455.4 | 5204.2 | 3836.5 |
| 95%ile | 10518 | 9156.1 | 9053.4 | 9688.7 | 8694.4 | 8515.9 |
| mean | 6452.0 | 5610.1 | 4637.2 | 6013.1 | 5151.1 | 4177.2 |
| UL delay (s) | 5%ile | 0.0209 | 0.0235 | 0.0238 | 0.0224 | 0.0248 | 0.0252 |
| 50%ile | 0.0312 | 0.0385 | 0.0492 | 0.0339 | 0.0421 | 0.0556 |
| 95%ile | 0.0869 | 0.1573 | 0.4317 | 0.0944 | 0.1796 | 0.5169 |
| mean | 0.0414 | 0.0597 | 0.1131 | 0.0447 | 0.0675 | 0.1317 |
| Arrival rate (files/s) | | 0.4 | 0.8 | 1.4 | 0.4 | 0.8 | 1.4 |
| 𝜌DL | | 98.79% | 98.59% | 96.37% | 98.68% | 98.39% | 95.55% |
| 𝜌UL | | 99.27% | 99.14% | 96.83% | 99.26% | 98.88% | 95.81% |
| BO | | 16.04% | 35.34% | 57.44% | 17.11% | 35.40% | 60.35% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (outdoor scenario B, 7 site) with the same settings, case1: no-LBT; case 2: omni-directional LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz, Rank 1 transmission. ftp3 file size = 27Mbyte. | | | | | | | |

Table B.2.5.2-4. System level evaluation results for outdoor scenario B (7 site, directional LBT and receiver assisted LBT)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Cases | | directional LBT schemes | | | receiver-assisted LBT | | |
| Traffic load  Metrics | | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO | Low load  10%~25% BO | Medium load  35%~50% BO | High load  above 55% BO |
| R1-2009610 / Source 2 | DL UPT (Mbps) | 5%ile | 1286.7 | 750.8 | 179.2 | 1385.6 | 743.9 | 198.2 |
| 50%ile | 3934.1 | 3258.1 | 2643.7 | 3926.1 | 3299.0 | 2705 |
| 95%ile | 7085.9 | 6762.7 | 6671.5 | 6938.1 | 6748.1 | 6514 |
| mean | 4109.5 | 3485.6 | 2934.1 | 4110.0 | 3520.0 | 2933.3 |
| DL delay (s) | 5%ile | 0.0301 | 0.0315 | 0.0317 | 0.0306 | 0.0316 | 0.0327 |
| 50%ile | 0.0548 | 0.0656 | 0.0798 | 0.0546 | 0.0643 | 0.0787 |
| 95%ile | 0.1482 | 0.2616 | 0.6793 | 0.1527 | 0.2618 | 0.6499 |
| mean | 0.0672 | 0.1009 | 0.1808 | 0.0670 | 0.0996 | 0.1757 |
| UL UPT (Mbps) | 5%ile | 2126.9 | 1082.2 | 245.9 | 2285.2 | 1091.7 | 274.1 |
| 50%ile | 6214.7 | 5064.6 | 3816.0 | 6363.7 | 5151.7 | 3903.9 |
| 95%ile | 8849.0 | 8607.6 | 8455.1 | 9595.1 | 8640.3 | 8491.6 |
| mean | 5873.7 | 5085.0 | 4157.8 | 5947.3 | 5124.8 | 4216.9 |
| UL delay (s) | 5%ile | 0.0242 | 0.0248 | 0.0263 | 0.0223 | 0.0247 | 0.0252 |
| 50%ile | 0.0343 | 0.0423 | 0.0576 | 0.0336 | 0.0417 | 0.0544 |
| 95%ile | 0.0975 | 0.1876 | 0.5191 | 0.0916 | 0.1835 | 0.5068 |
| mean | 0.0458 | 0.0686 | 0.1359 | 0.0445 | 0.0681 | 0.1290 |
| Arrival rate (files/s) | | 0.4 | 0.8 | 1.4 | 0.4 | 0.8 | 1.4 |
| 𝜌DL | | 98.45% | 98.83% | 95.85% | 98.63% | 98.37% | 95.49% |
| 𝜌UL | | 99.13% | 98.80% | 95.93% | 99.31% | 98.89% | 96.01% |
| BO | | 17.51% | 35.84% | 61.15% | 17.32% | 35.93% | 60.93% |
| Additional report/notes:  1. LBT procedure and parameters: LBT based on ETSI EN 302 567 v2.1.20, ED thresholds -47dBm for BBU, -32dBm for UE, CWS: CW\_min = CW\_max = 127  2. Details of case: 2 operators (outdoor scenario B, 7 site) with the same settings, case1: directional LBT; case 2: receiver-assisted LBT  3. Details of COT sharing if used in evaluation: MCOT = 5ms, No COT sharing for DL/UL data transmission.  4. Other parameters: Frequency 60GHz, BW = 2GHz, SCS = 960kHz, Rank 1 transmission. ftp3 file size = 27Mbyte. | | | | | | | |

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