# Annex B: Evaluations results (Ericsson)

## B.1 Link level evaluation results

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

#### B.1.1.1 Evaluation results for PDSCH

Table 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 / Ericsson | 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 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 / Ericsson | 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 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 / Ericsson | 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 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 / Ericsson | 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 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 / Ericsson | 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 (ref **Error! Reference source not found.**) 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 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 / Ericsson | 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 (ref **Error! Reference source not found.**) 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) | | | | | | |

#### B.1.1.2 Evaluation results for PUSCH with DFT-s-OFDM

Table 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 / Ericsson | 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.1.2 Evaluation results for PSS/SSS

#### B.1.2.1 Evaluation results for PSS/SSS

Table 8: 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 / Ericsson | 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** | | | | |

#### B.1.2.2 Evaluation results for PBCH

Table 9: SINR in dB achieving PBCH BLER of 10%, using 1 transmission.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Ericsson | 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 10: SINR in dB achieving PBCH BLER of 10%, using 4 transmissions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tdoc /  Source | Channel | 120KHz | 240KHz | 480KHz | 960KHz |
| R1-2007984 / Ericsson | 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** | | | | |

#### B.1.2.3 Link Budget for PBCH

Table 11: Link budget for PBCH, 1 transmission, TDL-A 3km/h 20ns, using no FDM with RMSI (SSB/CORESET 0 multiplexing pattern 1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R1-2007984 / Ericsson | 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 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.1.3 Evaluation results for PRACH

#### B.1.3.1 Evaluation results for PRACH

Table 12: 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 / Ericsson | 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 13: 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 / Ericsson | 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. | | | | |

#### B.1.3.2 Link budget for PRACH

Table 14: PRACH link budgets for format B4, delay spread 20 ns, and max RTT 380 ns with UE-specific power limits

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R1-2007984 / Ericsson | **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 13. 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 15: PRACH link budgets for format B4, delay spread 20 ns, max RTT 380 ns, without UE-specific power limits

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R1-2007984 / Ericsson | **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 Table 13. 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.2 System level evaluation results

### B.2.1 System level evaluation results for indoor scenario A

Table 16: 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 / Ericsson | 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 17: 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 / Ericsson | 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 18: 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 / Ericsson | 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 19: 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 / Ericsson | 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 20: 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 / Ericsson | 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 System level evaluation results for indoor scenario B

Table 21: 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 / Ericsson | 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 22: 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 / Ericsson | 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 23: 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 / Ericsson | 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 24: 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 / Ericsson | 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 25: System level evaluation results for scenario B with mixed LBT configurations

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 / Ericsson | 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 | 5985 | 4816 | 3791 | 5794 | 4612 | 3656 | 6084 | 4923 | 3856 | 5640 | 4499 | 3581 |
| 50%ile | 8011 | 6452 | 5082 | 7619 | 6012 | 4740 | 7922 | 6429 | 5034 | 7582 | 5983 | 4831 |
| 95%ile | 10675 | 9374 | 7848 | 10250 | 8830 | 7401 | 10764 | 9375 | 7841 | 10273 | 8900 | 7527 |
| mean | 8748 | 7294 | 5895 | 8408 | 6880 | 5577 | 8790 | 7289 | 5894 | 8363 | 6848 | 5634 |
| DL delay (s) | 5%ile | 0.021 | 0.025 | 0.034 | 0.021 | 0.027 | 0.035 | 0.020 | 0.025 | 0.034 | 0.021 | 0.027 | 0.035 |
| 50%ile | 0.022 | 0.030 | 0.042 | 0.023 | 0.032 | 0.043 | 0.022 | 0.030 | 0.041 | 0.023 | 0.032 | 0.043 |
| 95%ile | 0.047 | 0.067 | 0.100 | 0.049 | 0.072 | 0.105 | 0.046 | 0.067 | 0.097 | 0.053 | 0.079 | 0.112 |
| mean | 0.029 | 0.040 | 0.058 | 0.031 | 0.043 | 0.061 | 0.029 | 0.040 | 0.057 | 0.031 | 0.045 | 0.062 |
| UL UPT (Mbps) | 5%ile | 2076 | 1643 | 1254 | 1987 | 1579 | 1192 | 2110 | 1639 | 1279 | 1975 | 1570 | 1170 |
| 50%ile | 2904 | 2338 | 1767 | 2742 | 2181 | 1653 | 2923 | 2329 | 1781 | 2777 | 2247 | 1703 |
| 95%ile | 4392 | 3790 | 3240 | 4132 | 3564 | 2986 | 4447 | 3825 | 3262 | 4165 | 3642 | 3035 |
| mean | 3361 | 2783 | 2209 | 3180 | 2609 | 2092 | 3388 | 2773 | 2241 | 3204 | 2666 | 2107 |
| UL delay (s) | 5%ile | 0.051 | 0.066 | 0.085 | 0.054 | 0.069 | 0.093 | 0.050 | 0.064 | 0.084 | 0.053 | 0.067 | 0.087 |
| 50%ile | 0.058 | 0.087 | 0.114 | 0.061 | 0.084 | 0.116 | 0.058 | 0.082 | 0.112 | 0.060 | 0.082 | 0.114 |
| 95%ile | 0.142 | 0.255 | 0.349 | 0.153 | 0.248 | 0.347 | 0.141 | 0.222 | 0.322 | 0.160 | 0.257 | 0.383 |
| mean | 0.081 | 0.134 | 0.179 | 0.087 | 0.129 | 0.185 | 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 | 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 | 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 | 0.97 |
| BO | | 0.10 | 0.35 | 0.55 | 0.11 | 0.37 | 0.57 | 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 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  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.2.3 System level evaluation results for indoor scenario C

Table 26: 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 / Ericsson | 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 27: 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 / Ericsson | 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 28: 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 / Ericsson | 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 29: 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 / Ericsson | 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 System level evaluation results for outdoor scenario B

Table 30: 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 / Ericsson | 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 RSRP distribution

Note: companies are encouraged to also submit RSRP distribution (e.g. serving BS to UE links, BS-to-BS links, UE-to-UE links) for the evaluated scenario in SLS.

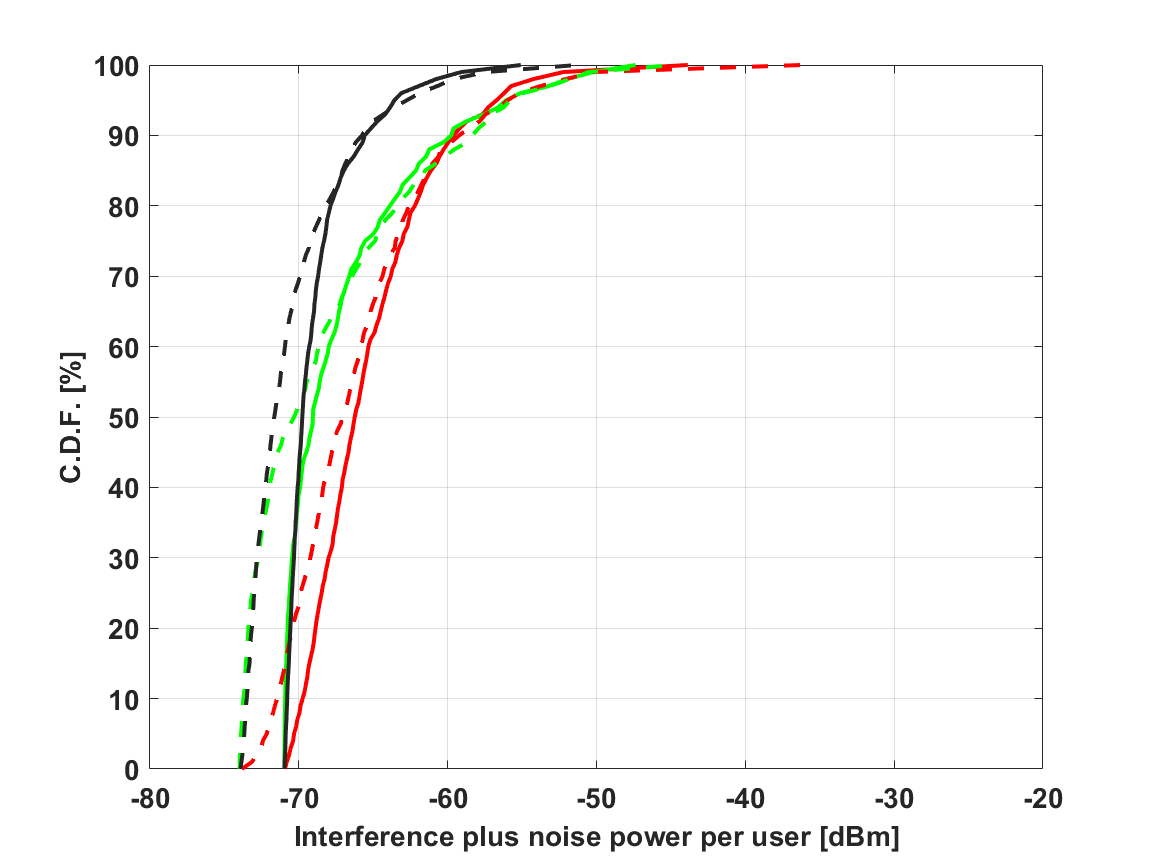
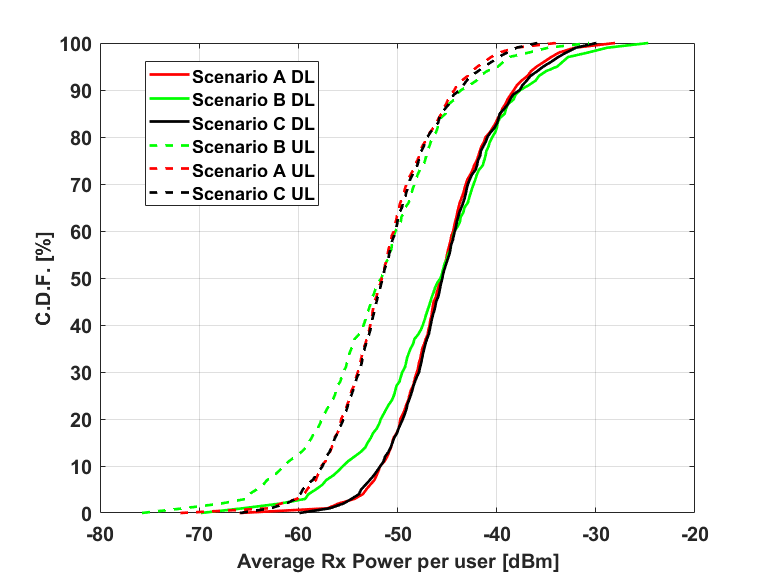


Figure : (a) Received Power (serving BS to UE link) and (b) interference per User in indoor Scenario A, B, and C when buffer occupancy is high (~55%)

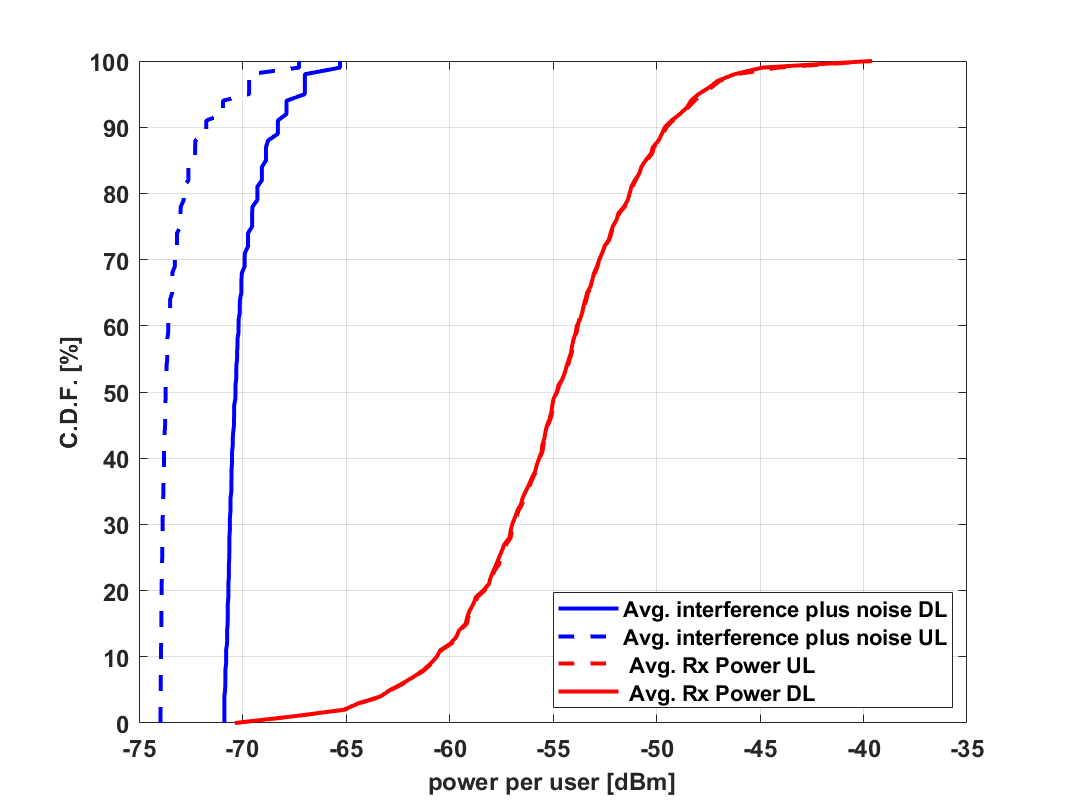


Figure 2: Received Power (serving BS to UE link) and interference per user in outdoor scenario B (1 Site) when buffer occupancy is high