# 7 Evaluations

7.1 Coverage evaluations

For an evaluation scenario:

- For each link *i*,

- Step 1: Obtain the required SINR for the physical channels under target scenarios and service/reliability requirements if Budget-Alt2 is used for this link *i*.

- Step 2: Obtain the receiver sensitivity using the method Budget-Alt1 (if a predefined threshold is assumed to derive the receiver sensitivity) or Budget-Alt2 (if no predefined threshold is assumed to derive the receiver sensitivity). See Clause 4.3.1 for the Budget definition.

- Step 3: Obtain the coverage performance for link *i* based on the receiver sensitivity from step 2 and link budget template.

- The coverage results for each link are provided.

### 7.1.0 General descriptions

### 7.1.1 Link budget for D1T1

#### 7.1.1.1 Device 1

##### 7.1.1.1.1 Collection of the results

###### 7.1.1.1.1.1 [1kbps]

Table 7.1.1.1.1.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 1, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [215] | 19.77 | 61.1 | 0.1 | 1-1 | Budget-Alt1 | 1 | 33 | -30 | 0.9 | 6 | 96 | 1000 | 81.2 | non-coherent | 900 | 1016 |
| 20 | 87.14 | 1012 |
| 400 | 78.26 | 1020 |
| 1-2 | 96 | 48 | 1017 |
| 20 | 51.51 | 1013 |
| 400 | 46.26 | 1021 |
| [193] | 36.59 | 67.1 | 1-1 | 0.8 | -36 | 0 | 96 | 135.85 | coherent | 40 |
| 6 | 99 | 35 |
| 1-2 | 0 | 80.13 | 41 |
| 6 | 58.29 | 36 |
| [201] | 26.58 | 63.92 | 0.01 | 1 | 20 | 150 | 26.58 | non-coherent | 18 |
| 26.65 | 63.95 | 1-1 | 26.65 | 17 |
| 27.29 | 64.17 | 1-2 | 27.29 | 23 |
| 27.36 | 64.2 | 1-1 | 27.36 | 22 |
| [203] | 12.88 | 58.1 | 0.43 | 24 | 26.41 | coherent | 70 |
| 0.83 | 96 | 22.94 | 60 |
| 1.02 | 400 | 19.3 | 80 |
| 1-2 | 0.43 | 20 | 26.32 | 71 |
| 0.83 | 96 | 22.86 | 61 |
| 1.02 | 400 | 19.23 | 81 |
| 17.79 | 60.69 | 33 | 17.79 | 76 |
| 19.36 | 61.4 | 1-1 | 19.36 | 75 |
| 21.2 | 62.19 | 1-2 | 0.83 | 96 | 21.2 | 56 |
| 23 | 62.9 | 1-1 | 23 | 55 |
| 23.52 | 63.1 | 0.43 | 20 | 26.48 | 65 |
| 1-2 | 24.44 | 66 |
| [192] | 14.43 | 58.1 | 1-1 | 24 | 27.34 | 284 |
| 0.83 | 96 | 22.04 | 287 |
| 1.02 | 400 | 17.39 | 290 |
| 0.1 | 0.43 | 20 | 36.5 | 266 |
| 0.83 | 96 | 33.56 | 269 |
| 1.02 | 400 | 27.19 | 272 |
| 17.44 | 59.9 | 0.01 | 33 | 17.44 | 254 |
| 22.09 | 62.15 | 0.83 | 96 | 22.09 | 251 |
| 24.4 | 63.1 | 0.43 | 20 | 27.41 | 248 |
| 0.1 | 36.6 | 230 |
| 0.83 | 96 | 33.64 | 233 |
| 1.02 | 400 | 27.26 | 236 |
| [202] | 12.05 | 56.39 | 1.07 | -30 | 96 | 12.05 | non-coherent | 145 |
| 14.43 | 58.1 | 0.01 | 0.7 | 20 | 29.92 | 133 |
| 0.1 | 1.07 | 96 | 23.01 | 142 |
| 0.96 | 20 | 17.5 | 139 |
| 29.53 | 136 |
| [195] | 5.52 | 53.1 | 1-2 | 1.14 | 26 | -36 | 96 | 161 | 15.96 | 1055 |
| 1.06 | 400 | 14.95 | 1059 |
| 16.57 | 60.1 | 1-1 | 1.14 | 33 | 96 | 27.72 | 1054 |
| 1.06 | 400 | 26.26 | 1058 |
| [198] | 5.6 | 49.1 | 1-2 | 1.14 | 23 | -30 | 6(OOK) | 96 | 1000 | 38.69 | coherent | 6 |
| 0(BPSK) | 65.45 | 14 |
| 16.03 | 59.1 | 1-1 | 33 | 6(OOK) | 65.46 | 1 |
| 0(BPSK) | 110.73 | 9 |
| 1-2 | 6(OOK) | 38.69 | 2 |
| 0(BPSK) | 65.45 | 10 |
| [197] | 15.79 | 58.96 | 0.01 | 1 | -36 | 6 | 20 |  | 15.79 | non-coherent | 323 |
| 24.69 | 63.21 | 0.1 | 24.69 | 319 |
| 26.71 | 63.96 | 0.01 | 1-1 | 26.71 | 322 |
| 27.11 | 64.1 | 0.1 | 41.76 | 318 |
| [209] | 5.6 | 49.1 | 0.01 | 24 | -30 | 0 | 96 | 140 | 19.44 | coherent | 1350 |
| 1-2 | 19.1 | 1351 |
| 0.1 | 1-1 | 36.54 | 1390 |
| 1-2 | 35.89 | 1391 |
| 7.39 | 51.74 | 0.01 | 33 | 120 | 7.39 | 1336 |
| 7.4 | 51.75 | 1-1 | 7.4 | 1335 |
| 9.67 | 54.3 | 4.7 | 140 | 14.02 | 1340 |
| 1-2 | 12.81 | 1341 |
| 0.1 | 1-1 | 26.35 | 1380 |
| 1-2 | 24.07 | 1381 |
| 13.15 | 57.22 | 0.01 | 0.9 | 13.15 | 1321 |
| 13.89 | 57.74 | 0.1 | 120 | 13.89 | 1376 |
| 13.9 | 57.75 | 1-1 | 13.9 | 1375 |
| 14.39 | 58.08 | 0.01 | 140 | 14.39 | 1320 |
| 14.43 | 58.1 | 1000 | 40.72 | 1325 |
| 170 | 40.55 | 1330 |
| 1-2 | 1000 | 24.07 | 1326 |
| 170 | 24.06 | 1331 |
| 0.1 | 1-1 | 140 | 39.29 | 1360 |
| 1000 | 76.51 | 1365 |
| 170 | 76.21 | 1370 |
| 1-2 | 140 | 35.89 | 1361 |
| 1000 | 45.23 | 1366 |
| 170 | 45.21 | 1371 |
| 19.1 | 60.77 | 0.01 | -36 | 140 | 19.1 | 1346 |
| 19.99 | 61.2 | 38 | -30 | 19.99 | 1356 |
| 20.91 | 61.63 | 1-1 | 33 | -36 | 20.91 | 1345 |
| 21.09 | 61.71 | 38 | -30 | 21.09 | 1355 |
| 24.4 | 63.1 | 0.1 | 39.63 | 1395 |
| 1-2 | 37.57 | 1396 |
| 27.11 | 64.1 | 1-1 | 33 | -36 | 39.29 | 1385 |
| 1-2 | 35.89 | 1386 |
| [190] | 4.09 | 46.1 | 0.01 | 1-1 | 0.96 | 24 | -30 | 20 | 150 | 126.3 | 1434 |
| 6 | 57.87 | 1436 |
| 1-2 | 0 | 41.99 | 1435 |
| 6 | 22.46 | 1437 |
| 16.03 | 59.1 | 1-1 | 33 | 0 | 126.3 | 1430 |
| 6 | 57.87 | 1432 |
| 1-2 | 0 | 41.99 | 1431 |
| 6 | 22.46 | 1433 |
| [213] | 6.89 | 54.1 | 0.65 | 24 | -36 |  | 848 |
| 1.25 | 96 | 858 |
| 1.67 | 400 | 868 |
| 0.53 | 20 | 908 |
| 0.9 | 96 | 918 |
| 1.09 | 400 | 928 |
| 0.1 | 0.65 | 20 | 843 |
| 1.25 | 96 | 853 |
| 1.67 | 400 | 863 |
| 0.53 | 20 | 903 |
| 0.9 | 96 | 913 |
| 1.09 | 400 | 923 |
| 6.9 | 1.65 | 20 | 963 |
| 1.43 | 96 | 968 |
| 19.32 | 61.39 | 0.01 | 1-1 | 1.67 | 33 | 400 | 867 |
| 23.75 | 63.19 | 1.25 | 96 | 857 |
| 25.99 | 63.99 | 1.09 | 400 | 927 |
| 27.32 | 64.44 | 0.65 | 20 | 847 |
| 28.56 | 64.84 | 0.1 | 1.67 | 400 | 862 |
| 32.77 | 66.09 | 0.01 | 0.9 | 96 | 917 |
| 0.1 | 1.25 | 852 |
| 36.54 | 67.09 | 0.01 | 0.53 | 20 | 907 |
| 36.59 | 67.1 | 0.1 | 0.65 | 842 |
| 0.53 | 902 |
| 0.9 | 96 | 912 |
| 1.09 | 400 | 922 |
| 36.6 | 1.65 | 20 | 962 |
| 1.43 | 96 | 967 |
| [211] | 12.31 | 56.59 | 0.01 | 1 | -30 | 400 | 140 | 12.31 | non-coherent | 1105 |
| 14.4 | 58.1 | 20 | 150 | 20.95 | 1103 |
| 0.1 | 1000 | 62.99 | 1102 |
| 400 | 140 | 15.2 | 1104 |
| [205] | 36.59 | 67.1 | 1.14 | -36 | 96 | 1000 | 79.42 | 1044 |
| 1-2 | 46.65 | 1045 |
| D1T1-A2 | [215] | 14.35 | 58.05 | 1 | -30 | 400 | 140 | 14.35 | 1033 |
| 14.37 | 58.06 | 1-1 | 14.37 | 1032 |
| 14.89 | 58.4 | 1-2 | 96 | 14.89 | 1029 |
| 14.9 | 58.41 | 1-1 | 14.9 | 1028 |
| 15.97 | 59.07 | 1-2 | 20 | 15.97 | 1025 |
| 15.99 | 59.08 | 1-1 | 15.99 | 1024 |
| [193] | 16.99 | 60.31 | 1-2 | 0.8 | -36 | 96 | 16.99 | coherent | 38 |
| 17.02 | 60.32 | 1-1 | 17.02 | 37 |
| 24.08 | 63.31 | 1-2 | 0 | 24.08 | 43 |
| 24.11 | 63.32 | 1-1 | 24.11 | 42 |
| [201] | 15.9 | 59.04 | 0.01 | 1-2 | 1 | 6 | 20 | 15.9 | non-coherent | 20 |
| 15.91 | 1-1 | 15.91 | 19 |
| 16.33 | 59.29 | 16.33 | 24 |
| 1-2 | 25 |
| [203] | 10.17 | 56.4 | 1.02 | 400 | 10.17 | coherent | 78 |
| 10.29 | 56.48 | 24 | 10.29 | 83 |
| 10.3 | 56.49 | 1-1 | 33 | 10.3 | 77 |
| 24 | 82 |
| 12.55 | 57.9 | 1-2 | 0.83 | 33 | 96 | 12.55 | 58 |
| 12.68 | 57.98 | 24 | 12.68 | 63 |
| 12.69 | 57.99 | 1-1 | 33 | 12.69 | 57 |
| 24 | 62 |
| 12.88 | 58.1 | 0.43 | 20 | 14.9 | 72 |
| 1-2 | 73 |
| 14.75 | 59.15 | 33 | 14.75 | 68 |
| 14.91 | 59.24 | 1-1 | 14.91 | 67 |
| [192] | 10.4 | 54.99 | 1.02 | 400 | 10.4 | 255 |
| 24 | 291 |
| 13.18 | 57.24 | 0.83 | 33 | 96 | 13.18 | 252 |
| 24 | 288 |
| 14.43 | 58.1 | 0.43 | 20 | 16.34 | 285 |
| 0.1 | 21.82 | 267 |
| 0.83 | 96 | 20.06 | 270 |
| 1.02 | 400 | 16.26 | 273 |
| 16.26 | 59.24 | 33 | 237 |
| 16.35 | 59.29 | 0.01 | 0.43 | 20 | 16.35 | 249 |
| 20.07 | 61.24 | 0.1 | 0.83 | 96 | 20.07 | 234 |
| 21.83 | 62.04 | 0.43 | 20 | 21.83 | 231 |
| [202] | 7.16 | 51.44 | 1.07 | -30 | 96 | 7.16 | non-coherent | 146 |
| 10.41 | 54.99 | 0.96 | 20 | 10.41 | 140 |
| 13.68 | 57.59 | 1.07 | 96 | 13.68 | 143 |
| 14.43 | 58.1 | 0.01 | 0.7 | 20 | 17.79 | 134 |
| 0.1 | 0.96 | 17.56 | 137 |
| [195] | 5.52 | 53.1 | 1-2 | 1.14 | 26 | -36 | 96 | 159 | 15.93 | 1057 |
| 1.06 | 400 | 14.93 | 1061 |
| 16.57 | 60.1 | 1-1 | 1.14 | 33 | 96 | 27.3 | 1056 |
| 1.06 | 400 | 25.93 | 1060 |
| [198] | 5.6 | 49.1 | 1-2 | 1.14 | 23 | -30 | 6(OOK) | 96 | 140 | 22.96 | coherent | 7 |
| 0(BPSK) | 38.83 | 15 |
| 16.03 | 59.1 | 1-1 | 33 | 6(OOK) | 23.46 | 3 |
| 0(BPSK) | 39.69 | 11 |
| 1-2 | 6(OOK) | 22.96 | 4 |
| 0(BPSK) | 38.83 | 12 |
| [197] | 11.76 | 56.15 | 0.01 | 1 | -36 | 6 | 20 | 11.76 | non-coherent | 325 |
| 12.54 | 56.77 | 1-1 | 12.54 | 324 |
| 18.38 | 60.4 | 0.1 | 1-2 | 18.38 | 321 |
| 19.61 | 61.02 | 1-1 | 19.61 | 320 |
| [209] | 1.53 | 36.75 | 0.01 | -30 | 0 | 96 | 90 | 1.53 | coherent | 1337 |
| 1-2 | 1338 |
| 2.87 | 42.75 | 0.1 | 1-1 | 2.87 | 1377 |
| 1-2 | 1378 |
| 2.93 | 42.95 | 0.01 | 1-1 | 4.7 | 110 | 2.93 | 1342 |
| 1-2 | 1343 |
| 3.01 | 43.2 | 1-1 | 0.9 | 3.01 | 1322 |
| 1-2 | 1323 |
| 4.37 | 46.75 | 1-1 | -36 | 4.37 | 1347 |
| 24 | -30 | 1352 |
| 38 | 1357 |
| 1-2 | 33 | -36 | 1348 |
| 24 | -30 | 1353 |
| 38 | 1358 |
| 5.51 | 48.95 | 0.1 | 1-1 | 33 | 4.7 | 5.51 | 1382 |
| 1-2 | 1383 |
| 5.6 | 49.1 | 1-1 | 24 | 0.9 | 8.22 | 1392 |
| 1-2 | 1393 |
| 8.22 | 52.75 | 1-1 | 33 | 1362 |
| -36 | 1387 |
| 38 | -30 | 1397 |
| 1-2 | 33 | 1363 |
| -36 | 1388 |
| 38 | -30 | 1398 |
| 14.43 | 58.1 | 0.01 | 1-1 | 33 | 140 | 20.91 | 1332 |
| 1000 | 40.72 | 1327 |
| 1-2 | 140 | 19.1 | 1333 |
| 1000 | 24.07 | 1328 |
| 0.1 | 1-1 | 140 | 39.29 | 1372 |
| 1000 | 76.51 | 1367 |
| 1-2 | 140 | 35.89 | 1373 |
| 1000 | 45.23 | 1368 |
| [190] | 4.09 | 46.1 | 0.01 | 1-1 | 0.96 | 24 | 20 | 140 | 75.12 | 1442 |
| 6 | 40.18 | 1444 |
| 1-2 | 0 | 72.25 | 1443 |
| 6 | 38.65 | 1445 |
| 16.03 | 59.1 | 1-1 | 33 | 0 | 75.12 | 1438 |
| 6 | 40.18 | 1440 |
| 1-2 | 0 | 72.25 | 1439 |
| 6 | 38.65 | 1441 |
| [213] | 6.89 | 54.1 | 0.65 | 24 | -36 |  | 850 |
| 1.25 | 96 | 860 |
| 1.67 | 400 | 870 |
| 0.53 | 20 | 910 |
| 0.9 | 96 | 920 |
| 1.09 | 400 | 930 |
| 0.1 | 0.65 | 20 | 845 |
| 1.25 | 96 | 855 |
| 1.67 | 400 | 865 |
| 0.53 | 20 | 905 |
| 0.9 | 96 | 915 |
| 1.09 | 400 | 925 |
| 6.9 | 1.65 | 20 | 965 |
| 1.43 | 96 | 970 |
| 10.16 | 56.4 | 0.01 | 1-1 | 1.67 | 33 | 400 | 869 |
| 13.05 | 58.2 | 1.25 | 96 | 859 |
| 14.46 | 59 | 1.09 | 400 | 929 |
| 15.3 | 59.45 | 0.65 | 20 | 849 |
| 16.07 | 59.85 | 0.1 | 1.67 | 400 | 864 |
| 18.67 | 61.1 | 0.01 | 0.9 | 96 | 919 |
| 0.1 | 1.25 | 854 |
| 20.98 | 62.1 | 0.01 | 0.53 | 20 | 909 |
| 21.35 | 62.25 | 0.1 | 1.09 | 400 | 924 |
| 21.47 | 62.3 | 0.65 | 20 | 844 |
| 23.5 | 63.1 | 1.43 | 96 | 969 |
| 24 | 63.3 | 1.65 | 20 | 964 |
| 26.31 | 64.1 | 0.9 | 96 | 914 |
| 28.29 | 64.75 | 0.53 | 20 | 904 |
| [211] | 12.85 | 57 | 0.01 | 1 | -30 | 96 | 130 | 12.85 | non-coherent | 1101 |
| 13.9 | 57.75 | 0.1 | 13.9 | 1100 |
| 14.4 | 54.35 | 9.72 | 1098 |
| 52.45 | 0.01 | 7.96 | 1099 |
| [205] | 13.09 | 58.22 | 0.1 | 1-2 | 1.14 | -36 | 140 | 13.09 | 1047 |
| 13.11 | 58.23 | 1-1 | 13.11 | 1046 |
| D1T1-B | [215] | 19.77 | 61.1 | 1-4 | 1 | -30 | 1000 | 10 | 1038 |
| 20 | 1036 |
| 400 | 1040 |
| [193] | 36.59 | 67.1 | 0.8 | -36 | 0 | 96 | coherent | 44 |
| 6 | 39 |
| [201] | 25.66 | 63.59 | 0.01 | 1 | 20 | 150 | 25.66 | non-coherent | 21 |
| 26.34 | 63.84 | 26.34 | 26 |
| [203] | 12.88 | 58.1 | 0.43 | 24 | 10 | coherent | 74 |
| 0.83 | 96 | 64 |
| 1.02 | 400 | 84 |
| 23.52 | 63.1 | 0.43 | 33 | 20 | 69 |
| 0.83 | 96 | 59 |
| 1.02 | 400 | 79 |
| [192] | 14.43 | 58.1 | 0.43 | 24 | 20 | 27.25 | 286 |
| 0.83 | 96 | 21.97 | 289 |
| 1.02 | 400 | 17.34 | 292 |
| 0.1 | 0.43 | 20 | 36.39 | 268 |
| 0.83 | 96 | 33.45 | 271 |
| 1.02 | 400 | 27.11 | 274 |
| 16.18 | 59.19 | 0.01 | 33 | 16.18 | 256 |
| 20.5 | 61.44 | 0.83 | 96 | 20.5 | 253 |
| 24.4 | 63.1 | 0.43 | 20 | 25.42 | 250 |
| 0.1 | 33.95 | 232 |
| 0.83 | 96 | 31.21 | 235 |
| 1.02 | 400 | 25.29 | 238 |
| [202] | 10.2 | 54.8 | 1.07 | -30 | 96 | 10.2 | non-coherent | 147 |
| 14.43 | 58.1 | 0.01 | 0.7 | 20 | 25.32 | 135 |
| 0.1 | 1.07 | 96 | 19.47 | 144 |
| 0.96 | 20 | 24.99 | 138 |
| 14.81 | 141 |
| [198] | 5.6 | 49.1 | 1.14 | 23 | 6(OOK) | 96 | 1000 | 10 | coherent | 8 |
| 0(BPSK) | 16 |
| 16.03 | 59.1 | 33 | 6(OOK) | 5 |
| 0(BPSK) | 13 |
| [209] | 1.91 | 38.88 | 0.01 | 1 | 0 | 110 | 1339 |
| 5.6 | 49.1 | 24 | 130 | 1354 |
| 0.1 | 1394 |
| 6.42 | 50.4 | 0.01 | 33 | 4.7 | 1344 |
| 6.75 | 50.88 | 0.1 | 0.9 | 110 | 1379 |
| 6.76 | 50.9 | 0.01 | 130 | 1324 |
| 9.67 | 54.3 | 0.1 | 4.7 | 1384 |
| 14.27 | 58 | 0.01 | -36 | 0.9 | 1349 |
| 14.43 | 58.1 | -30 | 1000 | 1329 |
| 160 | 1334 |
| 0.1 | 1000 | 1369 |
| 130 | 1364 |
| 160 | 1374 |
| 14.91 | 58.42 | 0.01 | 38 | 130 | 1359 |
| 24.4 | 63.1 | 0.1 | 1399 |
| 27.11 | 64.1 | 33 | -36 | 1389 |
| [190] | 4.09 | 46.1 | 0.01 | 0.96 | 24 | -30 | 20 | 150 | 20 | 1448 |
| 6 | 1449 |
| 16.03 | 59.1 | 33 | 0 | 1446 |
| 6 | 1447 |
| [213] | 6.89 | 54.1 | 0.65 | 24 | -36 | 5 | 851 |
| 1.25 | 96 | 861 |
| 1.67 | 400 | 871 |
| 0.53 | 20 | 911 |
| 0.9 | 96 | 921 |
| 1.09 | 400 | 931 |
| 0.1 | 0.65 | 20 | 846 |
| 1.25 | 96 | 856 |
| 1.67 | 400 | 866 |
| 0.53 | 20 | 906 |
| 0.9 | 96 | 916 |
| 1.09 | 400 | 926 |
| 6.9 | 1.65 | 20 | 966 |
| 1.43 | 96 | 971 |
| [205] | 36.59 | 67.1 | 1.14 | 33 | 1000 | 10 | non-coherent | 1048 |

Figure 7.1.1.1.1.1-1



###### 7.1.1.1.1.2 [5-7kbps]

Table 7.1.1.1.1.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 1, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [215] | 19.77 | 61.1 | 0.1 | 1-1 | Budget-Alt1 | 5 | 33 | -30 | 0.9 | 6 | 96 | 1000 | 73.28 | non-coherent | 900 | 1018 |
| 20 | 79.7 | 1014 |
| 400 | 69.17 | 1022 |
| 1-2 | 96 | 43.32 | 1019 |
| 20 | 47.11 | 1015 |
| 400 | 40.89 | 1023 |
| [193] | 36.59 | 67.1 | 1-1 | 6 | -36 | 0 | 96 | 88.83 | coherent | 50 |
| 6 | 64.65 | 45 |
| 1-2 | 0 | 52.25 | 51 |
| 6 | 37.85 | 46 |
| [201] | 21.21 | 61.77 | 150 | 21.21 | non-coherent | 28 |
| 21.26 | 61.8 | 1-1 | 21.26 | 27 |
| 23.99 | 62.95 | 23.99 | 32 |
| [192] | 14.43 | 58.1 | 0.01 | 3 | 24 | 20 | 25.91 | coherent | 293 |
| 4.7 | 96 | 24.72 | 296 |
| 5.8 | 400 | 23.95 | 299 |
| 0.1 | 3 | 20 | 34.24 | 275 |
| 4.7 | 96 | 33.53 | 278 |
| 5.8 | 400 | 32.32 | 281 |
| 24.38 | 63.09 | 0.01 | 33 | 24.38 | 263 |
| 24.4 | 63.1 | 3 | 20 | 26.38 | 257 |
| 4.7 | 96 | 25.16 | 260 |
| 0.1 | 3 | 20 | 34.85 | 239 |
| 4.7 | 96 | 34.13 | 242 |
| 5.8 | 400 | 32.89 | 245 |
| [202] | 12.37 | 56.16 | 5.36 | -30 | 96 | 12.37 | non-coherent | 157 |
| 14.43 | 58.1 | 20.93 | 154 |
| 4.81 | 20 | 22.88 | 148 |
| 17.05 | 151 |
| [195] | 5.52 | 53.1 | 1-2 | 5.08 | 26 | -36 | 400 | 169 | 11.49 | 1067 |
| 5.49 | 96 | 11.5 | 1063 |
| 16.57 | 60.1 | 1-1 | 5.08 | 33 | 400 | 18.81 | 1066 |
| 5.49 | 96 | 18.83 | 1062 |
| [194] | 21.98 | 62.11 | 0.01 | 1-2 | 7 | 400 | 155 | 21.98 | coherent | 112 |
| 23.77 | 62.85 | 1-1 | 23.77 | 110 |
| 24.81 | 63.26 | 1-2 | 96 | 24.81 | 107 |
| 20 | 102 |
| 26.82 | 64 | 1-1 | 96 | 26.82 | 105 |
| 20 | 100 |
| 28 | 64.41 | 0.1 | 1-2 | 400 | 28 | 97 |
| 30.11 | 65.1 | 1-1 | 96 | 35.44 | 90 |
| 20 | 39.17 | 85 |
| 400 | 30.27 | 95 |
| 1-2 | 96 | 32.78 | 92 |
| 20 | 36.22 | 87 |
| [210] | 17.8 | 60.1 | 0.01 | 1-1 | 4.67 | 0 | 96 | 1000 |  | 225 |
| 1-2 | 226 |
| [197] | 13.85 | 57.71 | 5 | 6 | 20 |  | 13.85 | non-coherent | 311 |
| 21.65 | 61.96 | 0.1 | 21.65 | 303 |
| 23.42 | 62.71 | 0.01 | 1-1 | 23.42 | 310 |
| 27.11 | 64.1 | 0.1 | 36.62 | 302 |
| [209] | 5.09 | 48.2 | 0.01 | 7 | -30 | 0 | 96 | 120 | 5.09 | coherent | 1255 |
| 48.19 | 1-2 | 1256 |
| 5.6 | 49.1 | 1-1 | 24 | 140 | 13.39 | 1270 |
| 1-2 | 13.15 | 1271 |
| 0.1 | 1-1 | 23.37 | 1310 |
| 1-2 | 22.96 | 1311 |
| 8.82 | 53.42 | 0.01 | 33 | 4.7 | 8.82 | 1261 |
| 8.88 | 53.49 | 0.1 | 0.9 | 120 | 8.88 | 1296 |
| 8.89 | 53.5 | 1-1 | 8.89 | 1295 |
| 9.65 | 54.28 | 0.01 | 4.7 | 140 | 9.65 | 1260 |
| 9.67 | 54.3 | 0.1 | 16.85 | 1300 |
| 1-2 | 15.4 | 1301 |
| 13.15 | 57.22 | 0.01 | 0.9 | 13.15 | 1241 |
| -36 | 1266 |
| 13.76 | 57.65 | 38 | -30 | 13.76 | 1276 |
| 14.39 | 58.08 | 1-1 | 33 | 14.39 | 1240 |
| -36 | 1265 |
| 14.43 | 58.1 | -30 | 1000 | 28.03 | 1245 |
| 170 | 27.92 | 1250 |
| 1-2 | 1000 | 16.57 | 1246 |
| 170 | 16.56 | 1251 |
| 0.1 | 1-1 | 140 | 25.13 | 1280 |
| 1000 | 48.94 | 1285 |
| 170 | 48.75 | 1290 |
| 1-2 | 140 | 22.96 | 1281 |
| 1000 | 28.93 | 1286 |
| 170 | 28.92 | 1291 |
| 14.52 | 58.16 | 0.01 | 1-1 | 38 | 140 | 14.52 | 1275 |
| 22.96 | 62.52 | 0.1 | 1-2 | 33 | -36 | 22.96 | 1306 |
| 24.03 | 62.95 | 38 | -30 | 24.03 | 1316 |
| 24.4 | 63.1 | 1-1 | 25.35 | 1315 |
| 25.13 | 63.38 | 33 | -36 | 25.13 | 1305 |
| [190] | 4.09 | 46.1 | 0.01 | 6.43 | 24 | -30 | 150 | 62 | 818 |
| 53.79 | 820 |
| 47.01 | 1406 |
| 45.92 | 1408 |
| 6 | 32.47 | 822 |
| 20.12 | 1410 |
| 1-2 | 0 | 24.07 | 819 |
| 20.88 | 821 |
| 15.63 | 1407 |
| 17.83 | 1409 |
| 6 | 12.61 | 823 |
| 7.81 | 1411 |
| 7.81 | 52.26 | 33 | 1405 |
| 12.61 | 56.82 | 12.61 | 817 |
| 15.63 | 58.86 | 0 | 15.63 | 1401 |
| 16.03 | 59.1 | 1-1 | 62 | 812 |
| 53.79 | 814 |
| 47.01 | 1400 |
| 45.92 | 1402 |
| 6 | 32.47 | 816 |
| 20.12 | 1404 |
| 1-2 | 0 | 24.07 | 813 |
| 20.88 | 815 |
| 17.83 | 1403 |
| [213] | 6.89 | 54.1 | 3.41 | 24 | -36 | 6 | 20 |  | 938 |
| 4.89 | 96 | 948 |
| 5.72 | 400 | 958 |
| 3.87 | 20 | 878 |
| 5.77 | 96 | 888 |
| 6.99 | 400 | 898 |
| 0.1 | 3.41 | 20 | 933 |
| 4.89 | 96 | 943 |
| 5.72 | 400 | 953 |
| 3.87 | 20 | 873 |
| 6.99 | 400 | 893 |
| 27.44 | 64.47 | 0.01 | 1-1 | 33 | 897 |
| 29.97 | 65.27 | 5.77 | 96 | 887 |
| 32.9 | 66.12 | 3.87 | 20 | 877 |
| 34.18 | 66.47 | 0.1 | 6.99 | 400 | 892 |
| 36.09 | 66.97 | 0.01 | 5.72 | 957 |
| 36.59 | 67.1 | 3.41 | 20 | 937 |
| 4.89 | 96 | 947 |
| 0.1 | 3.41 | 20 | 932 |
| 4.89 | 96 | 942 |
| 5.72 | 400 | 952 |
| 3.87 | 20 | 872 |
| [212] | 8.94 | 53.55 | 0.01 | 1-2 | Budget Alt1 | 7 | 24 | 96 | 140 | 8.94 | non-coherent | 1007 |
| 8.95 | 53.56 | 1-1 | 8.95 | 1006 |
| 8.97 | 53.58 | 1-2 | 33 | -30 | 8.97 | 1003 |
| 8.99 | 53.6 | 1-1 | 8.99 | 1002 |
| 11.03 | 55.55 | 1-2 | 24 | -36 | 11.03 | coherent | 987 |
| 11.04 | 55.56 | 1-1 | 11.04 | 986 |
| 11.07 | 55.58 | 1-2 | 33 | -30 | 11.07 | 983 |
| 11.09 | 55.6 | 1-1 | 11.09 | 982 |
| 11.57 | 56 | 0.1 | 24 | -36 | 16.82 | non-coherent | 996 |
| 21.99 | coherent | 976 |
| 1-2 | 16.8 | non-coherent | 997 |
| 21.97 | coherent | 977 |
| 16.85 | 59.58 | 33 | -30 | 16.85 | non-coherent | 993 |
| 16.89 | 59.6 | 1-1 | 16.89 | 992 |
| 19.57 | 61 | 22.08 | coherent | 972 |
| 1-2 | 22.04 | 973 |
| [199] | 9.47 | 54.1 | Budget-Alt1 | 5.9 | 23 | -36 | 0 | 17.97 | 127 |
| 19.11 | 60.77 | 1-1 | 33 | 19.11 | 130 |
| [191] | 3.68 | 45.1 | 0.01 | 5 | 24 | -30 | 6 | 20 |  |  | non-coherent | 801 |
| 1-2 | 802 |
| 6.31 | 50.23 | 33 | -40 | 96 | 692 |
| 24 | 746 |
| 6.65 | 50.73 | 1-1 | 745 |
| 6.91 | 51.1 | -36 | 20 | 782 |
| 1-2 | 783 |
| 6.93 | 51.13 | 33 | -40 | 96 | 476 |
| 24 | 530 |
| 7.21 | 51.5 | 33 | 400 | 386 |
| 24 | 440 |
| 7.31 | 51.63 | 1-1 | 96 | 529 |
| 7.5 | 51.88 | 1-2 | 33 | 400 | 494 |
| 24 | 548 |
| 7.6 | 52 | 1-1 | 439 |
| 7.91 | 52.38 | 547 |
| 1-2 | 33 | 20 | 674 |
| 24 | 728 |
| 7.99 | 52.48 | 33 | 458 |
| 24 | 512 |
| 8.09 | 52.6 | 33 | 96 | 584 |
| 24 | 638 |
| 8.18 | 52.7 | 33 | 368 |
| 24 | 422 |
| 8.33 | 52.88 | 1-1 | 20 | 727 |
| 8.42 | 52.98 | 511 |
| 8.53 | 53.1 | 96 | 637 |
| 8.62 | 53.2 | 421 |
| 8.69 | 53.28 | 0.1 | 1-2 | 33 | 683 |
| 24 | 737 |
| 9.16 | 53.78 | 1-1 | 736 |
| 9.35 | 53.98 | 1-2 | 33 | 467 |
| 24 | 521 |
| 9.47 | 54.1 | 1-1 | 33 | -30 | 20 | 792 |
| 1-2 | 793 |
| 9.5 | 54.13 | -40 | 400 | 485 |
| 24 | 539 |
| 9.86 | 54.48 | 1-1 | 96 | 520 |
| 10.02 | 54.63 | 400 | 538 |
| 10.2 | 54.8 | 0.01 | 1-2 | 33 | 20 | 350 |
| 566 |
| 24 | 404 |
| 620 |
| 10.34 | 54.93 | 0.1 | 33 | 449 |
| 665 |
| 24 | 503 |
| 719 |
| 10.52 | 55.1 | 0.01 | 1-1 | 403 |
| 619 |
| 0.1 | 96 | 412 |
| 628 |
| 20 | 394 |
| 502 |
| 610 |
| 718 |
| 400 | 430 |
| 1-2 | 33 | 377 |
| 24 | 96 | 413 |
| 629 |
| 20 | 395 |
| 611 |
| 400 | 431 |
| 10.67 | 55.23 | 0.01 | 1-1 | 33 | 96 | 691 |
| 11.39 | 55.85 | 0.1 | 1-2 | 575 |
| 11.57 | 56 | 359 |
| 11.73 | 56.13 | 0.01 | 1-1 | 475 |
| 12.19 | 56.5 | 400 | 385 |
| 12.69 | 56.88 | 493 |
| 13.12 | 57.2 | 0.1 | 1-2 | -36 | 20 | 774 |
| -40 | 341 |
| 557 |
| 13.37 | 57.38 | 0.01 | 1-1 | 673 |
| 13.51 | 57.48 | 457 |
| 13.69 | 57.6 | 96 | 583 |
| 13.83 | 57.7 | 367 |
| 14.7 | 58.28 | 0.1 | 682 |
| 15.82 | 58.98 | 466 |
| 16.08 | 59.13 | 400 | 484 |
| 17.25 | 59.8 | 0.01 | 20 | 349 |
| 565 |
| 17.49 | 59.93 | 0.1 | 448 |
| 664 |
| 17.8 | 60.1 | -36 | 773 |
| -40 | 400 | 376 |
| 19.26 | 60.85 | 96 | 574 |
| 19.57 | 61 | 358 |
| 22.2 | 62.2 | 20 | 340 |
| 556 |
|  |  | 0.01 | 400 | 601 |
| 709 |
| 24 | 655 |
| 763 |
| 1-2 | 33 | 602 |
| 710 |
| 24 | 656 |
| 764 |
| 0.1 | 1-1 | 33 | 592 |
| 700 |
| 24 | 646 |
| 754 |
| 1-2 | 33 | 593 |
| 701 |
| 24 | 647 |
| 755 |
| [207] | 6.91 | 51.1 | 0.01 | 1-1 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 55.84 | 185 |
| 1-2 | 55.71 | 187 |
| 0.1 | 1-1 | 58.49 | 195 |
| 1-2 | 58.35 | 197 |
| 11.22 | 55.71 | 0.01 | 33 | 55.71 | 186 |
| 12.36 | 56.63 | 1-1 | 56.63 | 184 |
| 14.82 | 58.35 | 0.1 | 1-2 | 58.35 | 196 |
| 16.32 | 59.27 | 1-1 | 59.27 | 194 |
| [211] | 4.6 | 41.3 | Budget-Alt1 | 6.4 | 24 | -30 | 4.7 | 150 | 9.72 | 1107 |
| 5 | 48.1 | 0.01 | 1-2 | 5.7 | 23 | 0.9 | 400 | 15.42 | 1087 |
| 0.1 | 13.74 | 1088 |
| 1000 | 28.18 | 1086 |
| 45.84 | 0.01 | 130 | 3.98 | 1089 |
| 6.35 | 50.3 | 1-1 | 6.4 | 33 | 4.7 | 96 | 6.35 | 1085 |
| 6.42 | 50.4 | 6.42 | 1083 |
| 6.98 | 51.19 | 0.9 | 140 | 6.98 | 1081 |
| 7.24 | 51.55 | 0.1 | 4.7 | 130 | 7.24 | 1084 |
| 7.44 | 51.8 | 7.44 | 1082 |
| 12.19 | 56.5 | 0.01 | 0.9 | 150 | 12.19 | 1079 |
| 14.4 | 58.1 | 0.1 | 16.8 | 1080 |
| 1000 | 40.72 | 1078 |
| 21.3 | 65.1 | 38 | 42.92 | 1106 |
| [200] | 5.96 | 56.63 | 0.01 | 1-2 | 7.5 | 33 | -36 | 400 |  | 5.96 | 2000 | 1189 |
| 1191 |
| 6.23 | 57.05 | 96 | 6.23 | 1185 |
| 1187 |
| 6.44 | 57.37 | 0.1 | 400 | 6.44 | 1188 |
| 1190 |
| 6.52 | 57.49 | 0.01 | 20 | 6.52 | 1181 |
| 1183 |
| 6.77 | 57.84 | 0.1 | 96 | 6.77 | 1184 |
| 1186 |
| 7.32 | 58.58 | 20 | 7.32 | 1180 |
| 1182 |
| 10.09 | 61.63 | 0.01 | 1-1 | 400 | 10.09 | 1177 |
| 1179 |
| 10.54 | 62.05 | 96 | 10.54 | 1173 |
| 1175 |
| 10.9 | 62.37 | 0.1 | 400 | 10.9 | 1176 |
| 1178 |
| 11.04 | 62.49 | 0.01 | 20 | 11.04 | 1169 |
| 1171 |
| 11.45 | 62.84 | 0.1 | 96 | 11.45 | 1172 |
| 1174 |
| 12.36 | 56.63 | 0.01 | 1-2 | 400 | 12.36 | 900 | 1129 |
| 1131 |
| 12.38 | 63.58 | 0.1 | 1-1 | 20 | 12.38 | 2000 | 1168 |
| 1170 |
| 12.92 | 57.05 | 0.01 | 1-2 | 96 | 12.92 | 900 | 1125 |
| 1127 |
| 13.36 | 57.37 | 0.1 | 400 | 13.36 | 1128 |
| 1130 |
| 13.54 | 57.5 | 0.01 | 20 | 13.54 | 1121 |
| 1123 |
| 14.04 | 57.84 | 0.1 | 96 | 14.04 | 1124 |
| 1126 |
| 15.17 | 58.58 | 20 | 15.17 | 1120 |
| 1122 |
| 20.92 | 61.63 | 0.01 | 1-1 | 400 | 20.92 | 1117 |
| 1119 |
| 21.86 | 62.05 | 96 | 21.86 | 1113 |
| 1115 |
| 22.6 | 62.37 | 0.1 | 400 | 22.6 | 1116 |
| 1118 |
| 22.91 | 62.5 | 0.01 | 20 | 22.91 | 1109 |
| 1111 |
| 23.75 | 62.84 | 0.1 | 96 | 23.75 | 1112 |
| 1114 |
| 25.66 | 63.58 | 20 | 25.66 | 1108 |
| 1110 |
| [214] | 4.09 | 46.1 | 0.01 | 1-4 | 5 | 23 | -30 | 140 | 17.71 | 180 |
| 0.1 | 19.67 | 168 |
| 4.54 | 47.1 | 0.01 | 1-1 | 24 | 17.73 | 176 |
| 0.1 | 19.69 | 164 |
| 11.69 | 56.1 | 0.01 | 33 | 17.79 | 172 |
| 0.1 | 19.76 | 160 |
| [205] | 26.92 | 64.3 | 1-2 | 6.86 | -36 | 96 | 1000 | 26.92 | 1050 |
| 36.59 | 67.1 | 1-1 | 46.4 | 1049 |
| [196] | 21.7 | 62 | 6 | -30 |  | 6(OOK) | 21.7 | 1234 |
| 5 | 20 | 1228 |
| 6.4 | 96 | 1231 |
| 6.6 | 400 | 1237 |
| D1T1-A2 | [215] | 12.68 | 56.87 | 1-2 | 5 | 0.9 | 6 | 140 | 12.67 | 1035 |
| 12.7 | 56.98 | 1-1 | 12.7 | 1034 |
| 13.43 | 57.42 | 1-2 | 96 | 13.43 | 1031 |
| 13.45 | 57.43 | 1-1 | 13.45 | 1030 |
| 14.61 | 58.22 | 1-2 | 20 | 14.61 | 1027 |
| 14.63 | 58.23 | 1-1 | 14.63 | 1026 |
| [193] | 16.59 | 60.11 | 1-2 | 6 | -36 | 96 | 16.59 | coherent | 48 |
| 16.73 | 60.18 | 1-1 | 16.73 | 47 |
| 23.54 | 63.11 | 1-2 | 0 | 23.54 | 53 |
| 23.73 | 63.18 | 1-1 | 23.73 | 52 |
| [201] | 12.69 | 56.89 | 6 | 12.69 | non-coherent | 29 |
| 1-2 | 30 |
| 14.32 | 58.04 | 1-1 | 14.32 | 33 |
| [192] | 14.43 | 58.1 | 0.01 | 3 | 24 | 20 | 16.77 | coherent | 294 |
| 4.7 | 96 | 15.99 | 297 |
| 5.8 | 400 | 15.49 | 300 |
| 0.1 | 3 | 20 | 22.15 | 276 |
| 4.7 | 96 | 21.69 | 279 |
| 5.8 | 400 | 20.91 | 282 |
| 15.53 | 58.8 | 0.01 | 33 | 15.53 | 264 |
| 16.03 | 59.1 | 4.7 | 96 | 16.03 | 261 |
| 16.81 | 59.55 | 3 | 20 | 16.81 | 258 |
| 20.96 | 61.65 | 0.1 | 5.8 | 400 | 20.96 | 246 |
| 21.75 | 62 | 4.7 | 96 | 21.75 | 243 |
| 22.21 | 62.2 | 3 | 20 | 22.21 | 240 |
| [202] | 7.36 | 51.64 | 5.36 | -30 | 96 | 7.36 | non-coherent | 158 |
| 10.14 | 54.69 | 4.81 | 20 | 10.14 | 152 |
| 12.44 | 56.64 | 5.36 | 96 | 12.44 | 155 |
| 13.61 | 57.49 | 4.81 | 20 | 13.61 | 149 |
| [195] | 5.52 | 53.1 | 1-2 | 5.08 | 26 | -36 | 400 | 167 | 11.25 | 1069 |
| 5.49 | 96 | 11.26 | 1065 |
| 16.57 | 60.1 | 1-1 | 5.08 | 33 | 400 | 17.12 | 1068 |
| 5.49 | 96 | 17.14 | 1064 |
| [194] | 9.81 | 54.43 | 0.01 | 1-2 | 7 | 400 | 138 | 9.81 | coherent | 113 |
| 9.83 | 54.45 | 1-1 | 9.83 | 111 |
| 11.07 | 55.58 | 1-2 | 96 | 11.07 | 108 |
| 20 | 103 |
| 11.09 | 55.6 | 1-1 | 96 | 11.09 | 106 |
| 20 | 101 |
| 12.49 | 56.73 | 0.1 | 1-2 | 400 | 12.49 | 98 |
| 12.51 | 56.75 | 1-1 | 12.51 | 96 |
| 14.62 | 58.23 | 1-2 | 96 | 14.62 | 93 |
| 14.65 | 58.25 | 1-1 | 14.65 | 91 |
| 16.16 | 59.18 | 1-2 | 20 | 16.16 | 88 |
| 16.19 | 59.2 | 1-1 | 16.19 | 86 |
| [210] | 16.36 | 59.3 | 0.01 | 1-2 | 4.67 | 0 | 96 | 140 |  | 228 |
| 16.83 | 59.57 | 1-1 | 227 |
| [197] | 10.31 | 54.9 | 1-2 | 5 | 6 | 20 | 10.31 | non-coherent | 313 |
| 11 | 55.52 | 1-1 | 11 | 312 |
| 16.11 | 59.15 | 0.1 | 1-2 | 16.11 | 305 |
| 17.19 | 59.77 | 1-1 | 17.19 | 304 |
| [209] | 1.05 | 33.2 | 0.01 | 7 | -30 | 0 | 96 | 90 | 1.05 | coherent | 1257 |
| 1-2 | 1258 |
| 1.84 | 38.5 | 0.1 | 1-1 | 1.84 | 1297 |
| 1-2 | 1298 |
| 2.02 | 39.4 | 0.01 | 1-1 | 4.7 | 110 | 2.02 | 1262 |
| 1-2 | 1263 |
| 3.01 | 43.2 | 1-1 | 0.9 | 3.01 | 1242 |
| -36 | 1267 |
| 24 | -30 | 1272 |
| 38 | 1277 |
| 1-2 | 33 | 1243 |
| -36 | 1268 |
| 24 | -30 | 1273 |
| 38 | 1278 |
| 3.53 | 44.7 | 0.1 | 1-1 | 33 | 4.7 | 3.53 | 1302 |
| 1-2 | 1303 |
| 5.26 | 48.5 | 1-1 | 0.9 | 5.26 | 1282 |
| -36 | 1307 |
| 24 | -30 | 1312 |
| 38 | 1317 |
| 1-2 | 33 | 1283 |
| -36 | 1308 |
| 24 | -30 | 1313 |
| 38 | 1318 |
| 13.15 | 57.22 | 0.01 | 33 | 140 | 13.15 | 1253 |
| 14.39 | 58.08 | 1-1 | 14.39 | 1252 |
| 14.43 | 58.1 | 1000 | 28.03 | 1247 |
| 1-2 | 16.57 | 1248 |
| 0.1 | 1-1 | 140 | 25.13 | 1292 |
| 1000 | 48.94 | 1287 |
| 1-2 | 140 | 22.96 | 1293 |
| 1000 | 28.93 | 1288 |
| [185] | 5.44 | 48.82 | 0.01 | 1-1 | 7.5 | 6 | 140 | 5.44 | non-coherent | 811 |
| 9.2 | 53.82 | 0.1 | 9.2 | 810 |
| [190] | 4.09 | 46.1 | 0.01 | 6.43 | 24 | 0 | 36.76 | coherent | 830 |
| 31.9 | 832 |
| 27.96 | 1418 |
| 31.89 | 1420 |
| 6 | 19.26 | 834 |
| 13.97 | 1422 |
| 1-2 | 0 | 36.02 | 831 |
| 31.26 | 833 |
| 26.89 | 1419 |
| 30.67 | 1421 |
| 6 | 18.87 | 835 |
| 13.44 | 1423 |
| 13.44 | 57.42 | 33 | 1417 |
| 13.97 | 57.79 | 1-1 | 13.97 | 1416 |
| 16.03 | 59.1 | 0 | 36.76 | 824 |
| 31.9 | 826 |
| 27.96 | 1412 |
| 31.89 | 1414 |
| 6 | 19.26 | 828 |
| 1-2 | 0 | 36.02 | 825 |
| 31.26 | 827 |
| 26.89 | 1413 |
| 30.67 | 1415 |
| 6 | 18.87 | 829 |
| [213] | 6.89 | 54.1 | 3.41 | 24 | -36 | 20 |  | 940 |
| 4.89 | 96 | 950 |
| 5.72 | 400 | 960 |
| 3.87 | 20 | 880 |
| 5.77 | 96 | 890 |
| 6.99 | 400 | 900 |
| 0.1 | 3.41 | 20 | 935 |
| 4.89 | 96 | 945 |
| 5.72 | 400 | 955 |
| 3.87 | 20 | 875 |
| 6.99 | 400 | 895 |
| 15.56 | 59.59 | 0.01 | 1-1 | 33 | 899 |
| 17.16 | 60.39 | 5.77 | 96 | 889 |
| 18.98 | 61.24 | 3.87 | 20 | 879 |
| 19.77 | 61.59 | 0.1 | 6.99 | 400 | 894 |
| 20.95 | 62.09 | 0.01 | 5.72 | 959 |
| 22.83 | 62.84 | 4.89 | 96 | 949 |
| 23.89 | 63.24 | 3.41 | 20 | 939 |
| 26.57 | 64.19 | 0.1 | 3.87 | 874 |
| 29.2 | 65.04 | 5.72 | 400 | 954 |
| 31.19 | 65.64 | 4.89 | 96 | 944 |
| 32.77 | 66.09 | 3.41 | 20 | 934 |
| [212] | 8.94 | 53.55 | 0.01 | 1-2 | Budget Alt1 | 7 | 24 | 96 | 8.94 | non-coherent | 1009 |
| 8.95 | 53.56 | 1-1 | 8.95 | 1008 |
| 8.97 | 53.58 | 1-2 | 33 | -30 | 8.97 | 1005 |
| 8.99 | 53.6 | 1-1 | 8.99 | 1004 |
| 11.03 | 55.55 | 1-2 | 24 | -36 | 11.03 | coherent | 989 |
| 11.04 | 55.56 | 1-1 | 11.04 | 988 |
| 11.07 | 55.58 | 1-2 | 33 | -30 | 11.07 | 985 |
| 11.09 | 55.6 | 1-1 | 11.09 | 984 |
| 11.57 | 56 | 0.1 | 24 | -36 | 16.82 | non-coherent | 998 |
| 21.99 | coherent | 978 |
| 1-2 | 16.8 | non-coherent | 999 |
| 21.97 | coherent | 979 |
| 16.85 | 59.58 | 33 | -30 | 16.85 | non-coherent | 995 |
| 16.89 | 59.6 | 1-1 | 16.89 | 994 |
| 19.57 | 61 | 22.08 | coherent | 974 |
| 1-2 | 22.04 | 975 |
| [199] | 9.47 | 54.1 | Budget-Alt1 | 5.9 | 23 | -36 | 0 | 17.97 | 128 |
| 19.11 | 60.77 | 1-1 | 33 | 19.11 | 131 |
| [191] | 3.68 | 45.1 | 0.01 | 5 | 24 | -30 | 6 | 20 |  |  | non-coherent | 803 |
| 805 |
| 807 |
| 1-2 | 804 |
| 806 |
| 808 |
| 3.73 | 45.23 | 33 | -40 | 96 | 698 |
| 24 | 752 |
| 3.93 | 45.73 | 1-1 | 751 |
| 4.1 | 46.13 | 1-2 | 33 | 482 |
| 24 | 536 |
| 4.26 | 46.5 | 33 | 400 | 392 |
| 24 | 446 |
| 4.32 | 46.63 | 1-1 | 96 | 535 |
| 4.43 | 46.88 | 1-2 | 33 | 400 | 500 |
| 24 | 554 |
| 4.49 | 47 | 1-1 | 445 |
| 4.67 | 47.38 | 553 |
| 1-2 | 33 | 20 | 680 |
| 24 | 734 |
| 4.72 | 47.48 | 33 | 464 |
| 24 | 518 |
| 4.78 | 47.6 | 33 | 96 | 590 |
| 24 | 644 |
| 4.83 | 47.7 | 33 | 374 |
| 24 | 428 |
| 4.93 | 47.88 | 1-1 | 20 | 733 |
| 4.98 | 47.98 | 517 |
| 5.04 | 48.1 | 96 | 643 |
| 5.09 | 48.2 | 427 |
| 5.14 | 48.28 | 0.1 | 1-2 | 33 | 689 |
| 24 | 743 |
| 5.39 | 48.73 | 0.01 | 33 | 696 |
| 24 | 750 |
| 5.41 | 48.78 | 0.1 | 1-1 | 742 |
| 5.53 | 48.98 | 1-2 | 33 | 473 |
| 24 | 527 |
| 5.62 | 49.13 | 33 | 400 | 491 |
| 24 | 545 |
| 5.68 | 49.23 | 0.01 | 1-1 | 96 | 749 |
| 5.83 | 49.48 | 0.1 | 526 |
| 5.92 | 49.63 | 0.01 | 1-2 | 33 | 480 |
| 24 | 534 |
| 0.1 | 1-1 | 400 | 544 |
| 5.98 | 49.73 | 0.01 | 1-2 | 33 | 96 | 694 |
| 24 | 748 |
| 6.03 | 49.8 | 33 | 20 | 356 |
| 572 |
| 24 | -36 | 789 |
| -40 | 410 |
| 626 |
| 6.11 | 49.93 | 0.1 | 33 | 455 |
| 671 |
| 24 | 509 |
| 725 |
| 6.16 | 50 | 0.01 | 33 | 400 | 390 |
| 24 | 444 |
| 6.22 | 50.1 | 0.1 | 33 | 383 |
| 24 | 437 |
| 6.24 | 50.13 | 0.01 | 1-1 | 96 | 533 |
| 6.31 | 50.23 | 33 | 697 |
| 24 | 747 |
| 6.35 | 50.3 | -36 | 20 | 788 |
| -40 | 409 |
| 625 |
| 6.41 | 50.38 | 1-2 | 33 | 400 | 498 |
| 24 | 552 |
| 6.44 | 50.43 | 0.1 | 1-1 | 20 | 508 |
| 724 |
| 6.49 | 50.5 | 0.01 | 400 | 443 |
| 6.56 | 50.6 | 0.1 | 436 |
| 6.58 | 50.63 | 0.01 | 1-2 | 33 | 96 | 478 |
| 24 | 532 |
| 6.73 | 50.85 | 0.1 | 33 | 581 |
| 24 | 635 |
| 6.75 | 50.88 | 0.01 | 1-1 | 400 | 551 |
| 1-2 | 33 | 20 | 678 |
| 24 | 732 |
| 6.82 | 50.98 | 33 | 462 |
| 24 | 516 |
| 6.84 | 51 | 33 | 400 | 388 |
| 24 | 442 |
| 0.1 | 33 | 96 | 365 |
| 24 | 419 |
| 6.91 | 51.1 | 0.01 | 1-1 | -36 | 20 | 784 |
| 786 |
| 1-2 | 33 | -40 | 96 | 588 |
| 24 | -36 | 20 | 785 |
| 787 |
| -40 | 96 | 642 |
| 6.93 | 51.13 | 1-1 | 33 | 481 |
| 24 | 531 |
| 6.98 | 51.2 | 1-2 | 33 | 372 |
| 24 | 426 |
| 7.09 | 51.35 | 0.1 | 1-1 | 634 |
| 7.12 | 51.38 | 0.01 | 20 | 731 |
| 1-2 | 33 | 400 | 496 |
| 24 | 550 |
| 7.19 | 51.48 | 1-1 | 20 | 515 |
| 7.21 | 51.5 | 33 | 400 | 391 |
| 24 | 441 |
| 0.1 | 96 | 418 |
| 7.28 | 51.6 | 0.01 | 641 |
| 7.36 | 51.7 | 425 |
| 7.42 | 51.78 | 0.1 | 1-2 | 33 | 687 |
| 24 | 741 |
| 7.5 | 51.88 | 0.01 | 1-1 | 33 | 400 | 499 |
| 24 | 549 |
| 1-2 | 33 | 20 | 676 |
| 24 | 730 |
| 7.58 | 51.98 | 33 | 460 |
| 24 | 514 |
| 7.68 | 52.1 | 33 | 96 | 586 |
| 24 | 640 |
| 7.76 | 52.2 | 33 | 370 |
| 24 | 424 |
| 0.1 | 33 | -30 | 20 | 799 |
| -36 | 780 |
| -40 | 347 |
| 563 |
| 24 | 401 |
| 617 |
| 7.82 | 52.28 | 1-1 | 96 | 740 |
| 7.91 | 52.38 | 0.01 | 33 | 20 | 679 |
| 24 | 729 |
| 7.99 | 52.48 | 33 | 463 |
| 24 | 513 |
| 0.1 | 1-2 | 33 | 96 | 471 |
| 24 | 525 |
| 8.09 | 52.6 | 0.01 | 1-1 | 33 | 589 |
| 24 | 639 |
| 8.12 | 52.63 | 0.1 | 1-2 | 33 | 400 | 489 |
| 24 | 543 |
| 8.18 | 52.7 | 0.01 | 1-1 | 33 | 96 | 373 |
| 24 | 423 |
| 0.1 | 20 | 400 |
| 616 |
| 8.25 | 52.78 | 1-2 | 33 | 96 | 685 |
| 24 | 739 |
| 8.42 | 52.98 | 1-1 | 524 |
| 8.55 | 53.13 | 400 | 542 |
| 8.69 | 53.28 | 33 | 96 | 688 |
| 24 | 738 |
| 8.71 | 53.3 | 0.01 | 1-2 | 33 | 20 | 354 |
| 570 |
| 24 | 408 |
| 624 |
| 8.83 | 53.43 | 0.1 | 33 | 453 |
| 669 |
| 24 | 507 |
| 723 |
| 8.87 | 53.48 | 33 | 96 | 469 |
| 24 | 523 |
| 8.99 | 53.6 | 33 | 400 | 381 |
| 24 | 435 |
| 9.02 | 53.63 | 33 | 487 |
| 24 | 541 |
| 9.11 | 53.73 | 0.01 | 1-1 | 33 | 96 | 695 |
| 9.18 | 53.8 | 24 | 20 | 407 |
| 623 |
| 9.3 | 53.93 | 0.1 | 506 |
| 722 |
| 9.35 | 53.98 | 33 | 96 | 472 |
| 24 | 522 |
| 9.47 | 54.1 | 33 | -30 | 20 | 794 |
| 796 |
| 798 |
| 24 | -40 | 400 | 434 |
| 1-2 | 33 | -30 | 20 | 795 |
| 797 |
| 9.5 | 54.13 | 1-1 | -40 | 400 | 490 |
| 24 | 540 |
| 9.67 | 54.3 | 0.01 | 1-2 | 33 | 20 | 352 |
| 568 |
| 24 | 406 |
| 622 |
| 9.73 | 54.35 | 0.1 | 33 | 96 | 579 |
| 24 | 633 |
| 9.81 | 54.43 | 33 | 20 | 451 |
| 667 |
| 24 | 505 |
| 721 |
| 9.88 | 54.5 | 33 | 96 | 363 |
| 24 | 417 |
| 9.98 | 54.6 | 33 | 400 | 379 |
| 24 | 433 |
| 10.02 | 54.63 | 0.01 | 1-1 | 33 | 96 | 479 |
| 10.12 | 54.73 | 693 |
| 10.2 | 54.8 | 20 | 355 |
| 571 |
| 24 | 405 |
| 621 |
| 10.25 | 54.85 | 0.1 | 96 | 632 |
| 10.34 | 54.93 | 33 | 20 | 454 |
| 670 |
| 24 | 504 |
| 720 |
| 10.41 | 55 | 0.01 | 33 | 400 | 389 |
| 0.1 | 24 | 96 | 416 |
| 10.52 | 55.1 | 33 | 400 | 382 |
| 24 | 96 | 414 |
| 630 |
| 20 | 396 |
| 398 |
| 612 |
| 614 |
| 400 | 432 |
| 1-2 | 96 | 415 |
| 631 |
| 20 | 397 |
| 399 |
| 613 |
| 615 |
| 10.8 | 55.35 | 33 | 96 | 577 |
| 10.84 | 55.38 | 0.01 | 1-1 | 400 | 497 |
| 10.98 | 55.5 | 0.1 | 1-2 | 96 | 361 |
| 11.13 | 55.63 | 0.01 | 1-1 | 477 |
| 11.21 | 55.7 | 0.1 | 1-2 | -36 | 20 | 778 |
| -40 | 345 |
| 561 |
| 11.39 | 55.85 | 1-1 | 96 | 580 |
| 11.42 | 55.88 | 0.01 | 20 | 677 |
| 11.54 | 55.98 | 461 |
| 11.57 | 56 | 400 | 387 |
| 0.1 | 96 | 364 |
| 11.69 | 56.1 | 0.01 | 587 |
| 11.81 | 56.2 | 371 |
| 12.04 | 56.38 | 400 | 495 |
| 12.45 | 56.7 | 0.1 | 1-2 | -36 | 20 | 776 |
| -40 | 343 |
| 559 |
| 12.56 | 56.78 | 1-1 | 96 | 686 |
| 12.69 | 56.88 | 0.01 | 20 | 675 |
| 12.82 | 56.98 | 459 |
| 12.99 | 57.1 | 96 | 585 |
| 13.12 | 57.2 | 369 |
| 0.1 | -36 | 20 | 779 |
| -40 | 346 |
| 562 |
| 13.51 | 57.48 | 96 | 470 |
| 13.73 | 57.63 | 400 | 488 |
| 13.95 | 57.78 | 96 | 684 |
| 14.73 | 58.3 | 0.01 | 20 | 353 |
| 569 |
| 14.93 | 58.43 | 0.1 | 452 |
| 668 |
| 15.01 | 58.48 | 96 | 468 |
| 15.2 | 58.6 | 400 | 380 |
| 15.25 | 58.63 | 486 |
| 16.37 | 59.3 | 0.01 | 20 | 351 |
| 567 |
| 16.45 | 59.35 | 0.1 | 96 | 578 |
| 16.59 | 59.43 | 20 | 450 |
| 666 |
| 16.71 | 59.5 | 96 | 362 |
| 16.89 | 59.6 | 400 | 378 |
| 17.8 | 60.1 | -36 | 20 | 775 |
| 777 |
| 18.28 | 60.35 | -40 | 96 | 576 |
| 18.57 | 60.5 | 360 |
| 18.96 | 60.7 | 20 | 344 |
| 560 |
| 21.06 | 61.7 | 342 |
| 558 |
|  |  | 0.01 | 400 | 603 |
| 605 |
| 607 |
| 711 |
| 713 |
| 715 |
| 24 | 657 |
| 659 |
| 661 |
| 765 |
| 767 |
| 769 |
| 1-2 | 33 | 604 |
| 606 |
| 608 |
| 712 |
| 714 |
| 716 |
| 24 | 658 |
| 660 |
| 662 |
| 766 |
| 768 |
| 770 |
| 0.1 | 1-1 | 33 | 598 |
| 594 |
| 596 |
| 702 |
| 704 |
| 706 |
| 24 | 648 |
| 650 |
| 652 |
| 756 |
| 758 |
| 760 |
| 1-2 | 33 | 597 |
| 599 |
| 595 |
| 703 |
| 705 |
| 707 |
| 24 | 649 |
| 651 |
| 653 |
| 757 |
| 759 |
| 761 |
| [207] | 6.91 | 51.1 | 0.01 | 1-1 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 55.84 | 189 |
| 1-2 | 55.71 | 191 |
| 0.1 | 1-1 | 58.49 | 199 |
| 1-2 | 58.35 | 201 |
| 11.22 | 55.71 | 0.01 | 33 | 55.71 | 190 |
| 12.36 | 56.63 | 1-1 | 56.63 | 188 |
| 14.82 | 58.35 | 0.1 | 1-2 | 58.35 | 200 |
| 16.32 | 59.27 | 1-1 | 59.27 | 198 |
| [211] | 4.13 | 46.2 | 0.01 | Budget-Alt1 | 6.4 | -30 | 130 | 4.13 | 1073 |
| 4.28 | 46.55 | 4.28 | 1071 |
| 5 | 48.1 | 5.7 | 23 | 400 | 5.66 | 1091 |
| 0.1 | 7.09 | 1090 |
| 5.9 | 49.6 | 6.4 | 33 | 96 | 5.9 | 1072 |
| 6.06 | 49.85 | 6.06 | 1070 |
| 9.47 | 54.1 | 0.01 | 9.47 | 1077 |
| 9.57 | 54.2 | 9.57 | 1075 |
| 10.8 | 55.35 | 0.1 | 10.8 | 1076 |
| 11.09 | 55.6 | 11.09 | 1074 |
| [200] | 4.23 | 53.37 | 0.01 | 1-2 | 7.5 | -36 | 400 | 140 | 4.23 | 2000 | 1213 |
| 1215 |
| 4.42 | 53.79 | 96 | 4.42 | 1209 |
| 1211 |
| 4.45 | 53.85 | 1-1 | 400 | 4.45 | 1201 |
| 1203 |
| 4.57 | 54.1 | 0.1 | 1-2 | 4.57 | 1212 |
| 1214 |
| 4.63 | 54.22 | 0.01 | 20 | 4.63 | 1205 |
| 1207 |
| 4.65 | 54.27 | 1-1 | 96 | 4.65 | 1197 |
| 1199 |
| 4.8 | 54.57 | 0.1 | 1-2 | 4.8 | 1208 |
| 1210 |
| 4.81 | 54.58 | 1-1 | 400 | 4.81 | 1202 |
| 1200 |
| 4.87 | 54.7 | 0.01 | 20 | 4.87 | 1193 |
| 1195 |
| 5.05 | 55.05 | 0.1 | 96 | 5.05 | 1196 |
| 1198 |
| 5.19 | 55.31 | 1-2 | 20 | 5.19 | 1204 |
| 1206 |
| 5.46 | 55.79 | 1-1 | 5.46 | 1192 |
| 1194 |
| 8.77 | 53.37 | 0.01 | 1-2 | 400 | 8.77 | 900 | 1153 |
| 1155 |
| 9.16 | 53.79 | 96 | 9.16 | 1149 |
| 1151 |
| 9.23 | 53.85 | 1-1 | 400 | 9.23 | 1141 |
| 1143 |
| 9.47 | 54.1 | 0.1 | 1-2 | 9.47 | 1152 |
| 1154 |
| 9.6 | 54.23 | 0.01 | 20 | 9.6 | 1145 |
| 1147 |
| 9.64 | 54.27 | 1-1 | 96 | 9.64 | 1137 |
| 1139 |
| 9.96 | 54.58 | 0.1 | 1-2 | 9.96 | 1148 |
| 1150 |
| 9.97 | 1-1 | 400 | 9.97 | 1140 |
| 1142 |
| 10.1 | 54.71 | 0.01 | 20 | 10.1 | 1133 |
| 1135 |
| 10.48 | 55.06 | 0.1 | 96 | 10.48 | 1136 |
| 1138 |
| 10.76 | 55.31 | 1-2 | 20 | 10.76 | 1144 |
| 1146 |
| 11.32 | 55.79 | 1-1 | 11.32 | 1132 |
| 1134 |
| [214] | 4.09 | 46.1 | 0.01 | 1-4 | 5 | 23 | -30 | 120 | 6.22 | 181 |
| 0.1 | 6.91 | 169 |
| 40.51 | 130 | 11.68 | 170 |
| 38.51 | 0.01 | 10.52 | 182 |
| 4.54 | 47.1 | 1-1 | 24 | 120 | 6.22 | 177 |
| 0.1 | 130 | 11.68 | 166 |
| 40.51 | 120 | 6.91 | 165 |
| 38.51 | 0.01 | 130 | 10.52 | 178 |
| 6.22 | 50.1 | 33 | 120 | 6.22 | 173 |
| 6.91 | 51.1 | 0.1 | 6.91 | 161 |
| 10.52 | 38.51 | 0.01 | 130 | 10.52 | 174 |
| 11.69 | 40.51 | 0.1 | 11.69 | 162 |
| [205] | 11.08 | 57 | 1-2 | 6.86 | -36 | 96 | 140 | 11.08 | 1052 |
| 11.19 | 57.07 | 1-1 | 11.19 | 1051 |
| [196] | 9.31 | 53.93 | 6.4 | -30 |  | 6(OOK) | 21.7 | 1232 |
| 10 | 54.63 | 6 | 1235 |
| 6.6 | 400 | 1238 |
| 11.7 | 56.13 | 5 | 20 | 1229 |
| D1T1-B | [215] | 19.77 | 61.1 | 1-4 | 0.9 | 6 | 96 | 1000 | 10 | 1039 |
| 20 | 1037 |
| 400 | 1041 |
| [193] | 36.59 | 67.1 | 6 | -36 | 0 | 96 | coherent | 54 |
| 6 | 49 |
| [201] | 20.47 | 61.44 | 150 | 20.47 | non-coherent | 31 |
| 23.1 | 62.59 | 23.1 | 34 |
| [192] | 14.43 | 58.1 | 0.01 | 3 | 24 | 20 | 25.39 | coherent | 295 |
| 4.7 | 96 | 24.22 | 298 |
| 5.8 | 400 | 23.46 | 301 |
| 0.1 | 3 | 20 | 33.55 | 277 |
| 4.7 | 96 | 32.85 | 280 |
| 5.8 | 400 | 31.66 | 283 |
| 17.97 | 60.19 | 0.01 | 33 | 17.97 | 265 |
| 18.55 | 60.49 | 4.7 | 96 | 18.55 | 262 |
| 19.45 | 60.94 | 3 | 20 | 19.45 | 259 |
| 24.25 | 63.04 | 0.1 | 5.8 | 400 | 24.25 | 247 |
| 24.4 | 63.1 | 3 | 20 | 25.69 | 241 |
| 4.7 | 96 | 25.16 | 244 |
| [202] | 9.94 | 54.29 | 4.81 | -30 | 20 | 14.43 | non-coherent | 153 |
| 10.47 | 51.24 | 5.36 | 96 | 10.47 | 159 |
| 14.43 | 57.09 | 4.81 | 20 | 19.37 | 150 |
| 56.24 | 5.36 | 96 | 17.71 | 156 |
| [194] | 24.16 | 63.01 | 0.01 | 7 | -36 | 400 | 155 | 20 | coherent | 114 |
| 30.11 | 65.1 | 96 | 109 |
| 20 | 104 |
| 0.1 | 96 | 94 |
| 20 | 89 |
| 400 | 99 |
| [210] | 17.8 | 60.1 | 0.01 | 4.67 | 0 | 96 | 1000 | 229 |
| [209] | 0.91 | 31.78 | 7 | -30 | 110 | 10 | 1259 |
| 2.76 | 42.38 | 0.1 | 1299 |
| 3.04 | 43.3 | 0.01 | 4.7 | 130 | 1264 |
| 5.6 | 49.1 | 24 | 0.9 | 1274 |
| 0.1 | 1314 |
| 6.76 | 50.9 | 0.01 | 33 | 1244 |
| -36 | 1269 |
| 7.07 | 51.32 | 38 | -30 | 1279 |
| 9.27 | 53.9 | 0.1 | 33 | 4.7 | 1304 |
| 14.43 | 58.1 | 0.01 | 0.9 | 1000 | 1249 |
| 160 | 1254 |
| 0.1 | 1000 | 1289 |
| 130 | 1284 |
| 160 | 1294 |
| 20.62 | 61.5 | -36 | 130 | 1309 |
| 21.55 | 61.92 | 38 | -30 | 1319 |
| [190] | 4.09 | 46.1 | 0.01 | 6.43 | 24 | 150 | 20 | 839 |
| 840 |
| 1427 |
| 1428 |
| 6 | 841 |
| 1429 |
| 16.03 | 59.1 | 33 | 0 | 836 |
| 837 |
| 1424 |
| 1425 |
| 6 | 838 |
| 1426 |
| [213] | 6.89 | 54.1 | 3.41 | 24 | -36 | 20 | 5 | 941 |
| 4.89 | 96 | 951 |
| 5.72 | 400 | 961 |
| 3.87 | 20 | 881 |
| 5.77 | 96 | 891 |
| 6.99 | 400 | 901 |
| 0.1 | 3.41 | 20 | 936 |
| 4.89 | 96 | 946 |
| 5.72 | 400 | 956 |
| 3.87 | 20 | 876 |
| 6.99 | 400 | 896 |
| [212] | 7.99 | 52.48 | 0.01 | Budget Alt1 | 7 | 96 | 140 | 10 | non-coherent | 1011 |
| 11.57 | 56 | coherent | 991 |
| 0.1 | 981 |
| non-coherent | 1001 |
| 16.09 | 59.14 | 0.01 | 33 | -30 | 5 | 1010 |
| 19.57 | 61 | coherent | 990 |
| 0.1 | 980 |
| non-coherent | 1000 |
| [199] | 9.47 | 54.1 | Budget-Alt1 | 5.9 | 23 | -36 | 0 | coherent | 129 |
| 27.11 | 64.1 | 33 | 132 |
| [191] | 3.68 | 45.1 | 0.01 | 5 | 24 | -30 | 6 | 20 |  | 10 | non-coherent | 809 |
| 3.98 | 45.84 | 33 | -40 | 96 | 699 |
| 24 | 753 |
| 4.81 | 47.64 | 33 | 483 |
| 24 | 537 |
| 5.19 | 48.39 | 33 | 400 | 393 |
| 24 | 447 |
| 5.63 | 49.14 | 33 | 501 |
| 24 | 555 |
| 6.25 | 50.14 | 33 | 20 | 681 |
| 24 | 735 |
| 6.38 | 50.34 | 33 | 465 |
| 24 | 519 |
| 6.55 | 50.59 | 33 | 96 | 591 |
| 24 | 645 |
| 6.69 | 50.79 | 33 | 375 |
| 24 | 429 |
| 6.91 | 51.1 | -36 | 20 | 790 |
| 7.55 | 51.94 | 0.1 | 33 | -40 | 96 | 690 |
| 24 | 744 |
| 8.75 | 53.34 | 33 | 474 |
| 24 | 528 |
| 9.03 | 53.64 | 33 | 400 | 492 |
| 24 | 546 |
| 9.47 | 54.1 | 33 | -30 | 20 | 800 |
| 10.4 | 54.99 | 0.01 | -40 | 357 |
| 573 |
| 24 | 411 |
| 627 |
| 10.52 | 55.1 | 0.1 | 96 | 420 |
| 636 |
| 20 | 402 |
| 510 |
| 618 |
| 726 |
| 400 | 438 |
| 10.68 | 55.24 | 33 | 20 | 456 |
| 672 |
| 11.07 | 55.59 | 400 | 384 |
| 12.97 | 57.09 | 96 | 582 |
| 13.38 | 57.39 | 366 |
| 17.22 | 59.79 | -36 | 20 | 781 |
| -40 | 348 |
| 564 |
|  |  | 0.01 | 400 | 609 |
| 717 |
| 24 | 663 |
| 771 |
| 0.1 | 33 | 600 |
| 708 |
| 24 | 654 |
| 762 |
| [207] | 6.91 | 51.1 | 0.01 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 5 | 193 |
| 0.1 | 203 |
| 12.2 | 56.51 | 0.01 | 33 | 192 |
| 16.11 | 59.15 | 0.1 | 202 |
| [211] | 3.3 | 44.1 | 0.01 | Budget-Alt1 | 5.7 | 23 | -30 | 0 | 400 | 7.99 | 1093 |
| 0.1 | 12.82 | 1092 |
| 5.6 | 49.1 | 0.01 | 5.5 | 26 | 20 | 14.82 | 1095 |
| 6.81 | 1097 |
| 0.1 | 25.88 | 1094 |
| 12.14 | 1096 |
| [200] | 5.96 | 56.63 | 0.01 | 7.5 | 33 | -36 | 6 | 400 |  | 10 | 2000 | 1225 |
| 1227 |
| 6.23 | 57.05 | 96 | 1221 |
| 1223 |
| 6.44 | 57.37 | 0.1 | 400 | 1224 |
| 1226 |
| 6.52 | 57.49 | 0.01 | 20 | 1217 |
| 1219 |
| 6.77 | 57.84 | 0.1 | 96 | 1220 |
| 1222 |
| 7.32 | 58.58 | 20 | 1216 |
| 1218 |
| 12.36 | 56.63 | 0.01 | 400 | 900 | 1167 |
| 1165 |
| 12.92 | 57.05 | 96 | 1163 |
| 1161 |
| 13.36 | 57.37 | 0.1 | 400 | 1164 |
| 1166 |
| 13.54 | 57.5 | 0.01 | 20 | 1159 |
| 1157 |
| 14.04 | 57.84 | 0.1 | 96 | 1160 |
| 1162 |
| 15.17 | 58.58 | 20 | 1158 |
| 1156 |
| [214] | 4.09 | 46.1 | 0.01 | 5 | 23 | -30 | 140 | 20 | 183 |
| 0.1 | 171 |
| 4.54 | 47.1 | 0.01 | 1-1 | 24 | 179 |
| 0.1 | 167 |
| 11.69 | 56.1 | 0.01 | 33 | 175 |
| 0.1 | 163 |
| [205] | 36.59 | 67.1 | 1-4 | 6.86 | -36 | 96 | 1000 | 10 | 1053 |
| [196] | 21.7 | 62 | 6 | -30 |  | 6(OOK) | 4.04 | 1236 |
| 5 | 20 | 1230 |
| 6.4 | 96 | 1233 |
| 6.6 | 400 | 1239 |

Figure 7.1.1.1.1.2-1



###### 7.1.1.1.1.3 other data rate

7.1.1.1.1.3.1 [48 - 60 kbps]

Table 7.1.1.1.1.3.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 1, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [197] | 10.1 | 54.71 | 0.01 | 1-2 | Budget-Alt1 | 55 | 33 | -36 | 0.9 | 6 | 96 |  | 10.1 | non-coherent | 900 | 315 |
| 16.21 | 59.21 | 0.1 | 16.21 | 307 |
| 17.09 | 59.71 | 0.01 | 1-1 | 17.09 | 314 |
| 27.11 | 64.1 | 0.1 | 27.42 | 306 |
| [199] | 7.76 | 52.2 | 1-2 | 44.8 | 23 | 1000 | 7.76 | 115 |
| 13.12 | 57.2 | 1-1 | 33 | 13.12 | 118 |
| [207] | 6.91 | 51.1 | 0.01 | Budget-Alt-1 | 56 | 24 | 140 | 53.36 | 205 |
| 1-2 | 53.23 | 207 |
| 0.1 | 1-1 | 56.1 | 215 |
| 1-2 | 55.96 | 217 |
| 8.64 | 53.23 | 0.01 | 33 | 53.23 | 206 |
| 9.52 | 54.15 | 1-1 | 54.15 | 204 |
| 11.52 | 55.96 | 0.1 | 1-2 | 55.96 | 216 |
| 12.69 | 56.88 | 1-1 | 56.88 | 214 |
| D1T1-A2 | [197] | 7.52 | 51.9 | 0.01 | 1-2 | Budget-Alt1 | 55 | 7.52 | 317 |
| 8.02 | 52.52 | 1-1 | 8.02 | 316 |
| 12.07 | 56.4 | 0.1 | 1-2 | 12.07 | 309 |
| 12.88 | 57.02 | 1-1 | 12.88 | 308 |
| [199] | 7.76 | 52.2 | 1-2 | 44.8 | 23 | 1000 | 7.76 | 116 |
| 13.12 | 57.2 | 1-1 | 33 | 13.12 | 119 |
| [207] | 6.91 | 51.1 | 0.01 | Budget-Alt-1 | 56 | 24 | 140 | 53.36 | 209 |
| 1-2 | 53.23 | 211 |
| 0.1 | 1-1 | 56.1 | 219 |
| 1-2 | 55.96 | 221 |
| 8.64 | 53.23 | 0.01 | 33 | 53.23 | 210 |
| 9.52 | 54.15 | 1-1 | 54.15 | 208 |
| 11.52 | 55.96 | 0.1 | 1-2 | 55.96 | 220 |
| 12.69 | 56.88 | 1-1 | 56.88 | 218 |
| D1T1-B | [199] | 9.47 | 54.1 | 1-4 | Budget-Alt1 | 44.8 | 23 | 1000 | 5 | 117 |
| 12.03 | 56.38 | 33 | 120 |
| [207] | 6.91 | 51.1 | 0.01 | Budget-Alt-1 | 56 | 24 | 140 | 213 |
| 0.1 | 223 |
| 9.4 | 54.03 | 0.01 | 33 | 212 |
| 12.53 | 56.76 | 0.1 | 222 |

Figure 7.1.1.1.1.3.1-1



7.1.1.1.1.3.2 others

Table 7.1.1.1.1.3.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 1, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [199] | 9.47 | 54.1 | 0.1 | 1-2 | Budget-Alt1 | 15.6 | 23 | -36 | 0.9 | 6 | 96 | 140 | 9.72 | non-coherent | 900 | 121 |
| 84 | 0 | 9.51 | coherent | 124 |
| D1T1-A2 | [185] | 4.9 | 47.82 | 0.01 | 1-1 | 15 | 33 | -30 | 6 | 4.9 | non-coherent | 1043 |
| 8.46 | 53.02 | 0.1 | 8.46 | 1042 |
| [199] | 9.47 | 54.1 | 1-2 | 15.6 | 23 | -36 | 9.72 | 122 |
| 84 | 0 | 9.51 | coherent | 125 |
| D1T1-B | 1-4 | 15.6 | 6 | 5 | non-coherent | 123 |
| 84 | 0 | coherent | 126 |

Figure 7.1.1.1.1.3.2-1



##### 7.1.1.1.2 Observations

For Device 1 and D1T1, it is observed that the maximum achievable coverage is as follows,

Note the following assumptions are made for the observations (per agreed mandatory assumptions)

- R2D Tx Power (R2D[1E]): 23 or 24 or 33 dBm (M)

- Number of receive antenna elements / TxRU / chains (D2R[2A]): 2 (M)

- Reference data rate ([0m]): 1 kbps (M) or 5 - 7 kbps (M)

- Carrier frequency ([0C]): 900MHz (M)

- Topology/Pathloss model ([0D]): InF-DH NLOS

- R2D Budget-Alt1, D2R Budget-Alt2

Table 7.1.1.1.2

|  |  |  |  |
| --- | --- | --- | --- |
| Device 1 | D1T1-A1 | D1T1-A2 | D1T1-B |
| R2D Tx power 33dBm, R2D Rx sensitivity of -36dBm | [16.32 ~ 36.6] meters. (15: [197]:27.11, [199]:19.11, [193]:36.59, [200]:25.66, [207]:16.32, [191]:17.8, [201]:26.65, [192]:24.4, [203]:23.52, [205]:36.59, [210]:17.8, [209]:27.11, [194]:30.11, [213]:36.6, [195]:16.57) | [8.22 ~ 32.77] meters. (15: [197]:19.61, [199]:19.11, [193]:24.11, [200]:11.32, [207]:16.32, [191]:17.8, [201]:15.91, [192]:22.21, [203]:14.91, [205]:13.11, [210]:16.83, [209]:8.22, [194]:16.19, [213]:32.77, [195]:16.57) | [15.17 ~ 36.59] meters. (12: [199]:27.11, [193]:36.59, [200]:15.17, [207]:16.11, [191]:17.22, [201]:25.66, [192]:24.4, [203]:23.52, [205]:36.59, [210]:17.8, [209]:27.11, [194]:30.11) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity of -36dBm | [6.9 ~ 14.43] meters. (7: [199]:9.47, [207]:6.91, [191]:6.91, [192]:14.43, [203]:12.88, [212]:11.57, [213]:6.9) | [6.9 ~ 14.43] meters. (7: [199]:9.47, [207]:6.91, [191]:6.91, [192]:14.43, [203]:12.88, [212]:11.57, [213]:6.9) | [6.9 ~ 14.43] meters. (7: [199]:9.47, [207]:6.91, [191]:6.91, [192]:14.43, [203]:12.88, [212]:11.57, [213]:6.9) |
| R2D Tx power 33dBm, R2D Rx sensitivity of -30dBm | [9.47 ~ 21.7] meters. (10: [215]:19.77, [191]:9.47, [212]:19.57, [211]:14.4, [190]:16.03, [202]:14.43, [209]:14.43, [214]:11.69, [196]:21.7, [198]:16.03) | [9.47 ~ 19.57] meters. (10: [215]:15.99, [191]:9.47, [212]:19.57, [211]:14.4, [190]:16.03, [202]:14.43, [209]:14.43, [214]:11.69, [196]:11.7, [198]:16.03) | [9.47 ~ 21.7] meters. (9: [215]:19.77, [191]:9.47, [212]:19.57, [190]:16.03, [202]:14.43, [209]:14.43, [214]:11.69, [196]:21.7, [198]:16.03) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity of -30dBm | [3.68 ~ 5.6] meters. (6: [191]:3.68, [211]:5, [190]:4.09, [209]:5.6, [214]:4.54, [198]:5.6) | [3.68 ~ 5.6] meters. (6: [191]:3.68, [211]:5, [190]:4.09, [209]:5.6, [214]:4.54, [198]:5.6) | [3.3 ~ 5.6] meters. (6: [191]:3.68, [211]:3.3, [190]:4.09, [209]:5.6, [214]:4.54, [198]:5.6) |
| D2R BLER 10% and data rate ~1kbps | [14.4 ~ 36.6] meters. (11: [197]:27.11, [215]:19.77, [193]:36.59, [192]:24.4, [205]:36.59, [211]:14.4, [202]:14.43, [209]:27.11, [198]:16.03, [213]:36.6, [195]:16.57) | [13.11 ~ 28.29] meters. (11: [197]:19.61, [215]:15.99, [193]:24.11, [192]:21.83, [205]:13.11, [211]:14.4, [202]:14.43, [209]:14.43, [198]:16.03, [213]:28.29, [195]:16.57) | [6.9 ~ 36.59] meters. (8: [215]:19.77, [193]:36.59, [192]:24.4, [205]:36.59, [202]:14.43, [209]:27.11, [198]:16.03, [213]:6.9) |
| D2R BLER 10% and data rate 5~7kbps | [11.69 ~ 36.59] meters. (19: [197]:27.11, [199]:32.33, [215]:19.77, [193]:36.59, [200]:25.66, [207]:16.32, [191]:22.2, [201]:21.26, [192]:24.4, [205]:36.59, [212]:19.57, [211]:14.4, [202]:14.43, [209]:25.13, [214]:11.69, [194]:30.11, [196]:21.7, [213]:36.59, [195]:16.57) | [11.09 ~ 32.77] meters. (19: [197]:17.19, [199]:32.33, [215]:14.63, [193]:23.73, [200]:11.32, [207]:16.32, [191]:21.06, [201]:12.69, [192]:22.21, [205]:11.19, [212]:19.57, [211]:11.09, [202]:13.61, [209]:14.43, [214]:11.69, [194]:16.19, [196]:11.7, [213]:32.77, [195]:16.57) | [3.3 ~ 41.28] meters. (17: [199]:41.28, [215]:19.77, [193]:36.59, [200]:15.17, [207]:16.11, [191]:17.22, [201]:20.47, [192]:24.4, [205]:36.59, [212]:19.57, [211]:3.3, [202]:14.43, [209]:20.62, [214]:11.69, [194]:30.11, [196]:21.7, [213]:6.89) |
| D2R BLER 1% and data rate ~1kbps | [14.4 ~ 36.54] meters. (9: [197]:26.71, [201]:26.65, [192]:24.4, [203]:23.52, [211]:14.4, [190]:16.03, [202]:14.43, [209]:20.91, [213]:36.54) | [12.54 ~ 20.98] meters. (9: [197]:12.54, [201]:15.91, [192]:16.35, [203]:14.91, [211]:14.4, [190]:16.03, [202]:14.43, [209]:14.43, [213]:20.98) | [6.89 ~ 25.66] meters. (7: [201]:25.66, [192]:24.4, [203]:23.52, [190]:16.03, [202]:14.43, [209]:14.43, [213]:6.89) |
| D2R BLER 1% and data rate 5~7kbps | [11.09 ~ 36.59] meters. (13: [197]:23.42, [200]:22.91, [207]:12.36, [191]:17.25, [192]:24.4, [212]:11.09, [211]:12.19, [210]:17.8, [190]:16.03, [209]:14.43, [214]:11.69, [194]:26.82, [213]:36.59) | [9.57 ~ 23.89] meters. (13: [197]:11, [200]:10.1, [207]:12.36, [191]:16.37, [192]:16.81, [212]:11.09, [211]:9.57, [210]:16.83, [190]:16.03, [209]:14.43, [214]:10.52, [194]:11.09, [213]:23.89) | [3.3 ~ 30.11] meters. (12: [200]:13.54, [207]:12.2, [191]:10.4, [192]:19.45, [212]:19.57, [211]:3.3, [210]:17.8, [190]:16.03, [209]:14.43, [214]:11.69, [194]:30.11, [213]:6.89) |
| D2R coherent receiver | [16.03 ~ 36.6] meters. (11: [199]:32.33, [193]:36.59, [192]:24.4, [203]:23.52, [212]:19.57, [210]:17.8, [190]:16.03, [209]:27.11, [194]:30.11, [198]:16.03, [213]:36.6) | [14.43 ~ 32.77] meters. (11: [199]:32.33, [193]:24.11, [192]:22.21, [203]:14.91, [212]:19.57, [210]:16.83, [190]:16.03, [209]:14.43, [194]:16.19, [198]:16.03, [213]:32.77) | [6.9 ~ 41.28] meters. (11: [199]:41.28, [193]:36.59, [192]:24.4, [203]:23.52, [212]:19.57, [210]:17.8, [190]:16.03, [209]:27.11, [194]:30.11, [198]:16.03, [213]:6.9) |
| D2R non-coherent receiver | [11.69 ~ 36.59] meters. (13: [197]:27.11, [215]:19.77, [200]:25.66, [207]:16.32, [191]:22.2, [201]:26.65, [205]:36.59, [212]:16.89, [211]:14.4, [202]:14.43, [214]:11.69, [196]:21.7, [195]:16.57) | [11.32 ~ 21.06] meters. (13: [197]:19.61, [215]:15.99, [200]:11.32, [207]:16.32, [191]:21.06, [201]:15.91, [205]:13.11, [212]:16.89, [211]:14.4, [202]:14.43, [214]:11.69, [196]:11.7, [195]:16.57) | [3.3 ~ 36.59] meters. (11: [215]:19.77, [200]:15.17, [207]:16.11, [191]:17.22, [201]:25.66, [205]:36.59, [212]:19.57, [211]:3.3, [202]:14.43, [214]:11.69, [196]:21.7) |
| CW cancellation capability < 130dB | [13.9 ~ 13.9] meters. (1: [209]:13.9) | [6.91 ~ 8.22] meters. (2: [209]:8.22, [214]:6.91) | [6.75 ~ 6.75] meters. (1: [209]:6.75) |
| CW cancellation capability >=130dB and < 140dB | [7.44 ~ 7.44] meters. (1: [211]:7.44) | [11.69 ~ 16.19] meters. (3: [211]:14.4, [214]:11.69, [194]:16.19) | [27.11 ~ 27.11] meters. (1: [209]:27.11) |
| CW cancellation capability >=140dB and < 150dB | [11.69 ~ 32.33] meters. (6: [199]:32.33, [207]:16.32, [212]:19.57, [211]:14.4, [209]:27.11, [214]:11.69) | [11.32 ~ 32.77] meters. (18: [197]:19.61, [199]:32.33, [215]:15.99, [193]:24.11, [200]:11.32, [207]:16.32, [201]:15.91, [192]:22.21, [203]:14.91, [205]:13.11, [212]:19.57, [210]:16.83, [190]:16.03, [202]:14.43, [209]:14.43, [196]:11.7, [198]:16.03, [213]:32.77) | [3.3 ~ 41.28] meters. (5: [199]:41.28, [207]:16.11, [212]:19.57, [211]:3.3, [214]:11.69) |
| CW cancellation capability >=150dB | [14.4 ~ 36.6] meters. (16: [215]:19.77, [193]:36.59, [201]:26.65, [192]:24.4, [203]:23.52, [205]:36.59, [211]:14.4, [210]:17.8, [190]:16.03, [202]:14.43, [209]:14.43, [194]:30.11, [196]:21.7, [198]:16.03, [213]:36.6, [195]:16.57) | [14.43 ~ 16.57] meters. (2: [209]:14.43, [195]:16.57) | [6.9 ~ 36.59] meters. (14: [215]:19.77, [193]:36.59, [201]:25.66, [192]:24.4, [203]:23.52, [205]:36.59, [210]:17.8, [190]:16.03, [202]:14.43, [209]:14.43, [194]:30.11, [196]:21.7, [198]:16.03, [213]:6.9) |
| R2D Tx EIRP power < 30dBm, | R2D Rx sensitivity of -36dBm  [6.9 ~ 11.57] meters. (5: [199]:9.47, [207]:6.91, [191]:6.91, [212]:11.57, [213]:6.9)  R2D Rx sensitivity of -30dBm  [3.68 ~ 5.6] meters. (6: [191]:3.68, [211]:5, [190]:4.09, [209]:5.6, [214]:4.54, [198]:5.6) | R2D Rx sensitivity of -36dBm  [6.9 ~ 11.57] meters. (5: [199]:9.47, [207]:6.91, [191]:6.91, [212]:11.57, [213]:6.9)  R2D Rx sensitivity of -30dBm  [3.68 ~ 5.6] meters. (6: [191]:3.68, [211]:5, [190]:4.09, [209]:5.6, [214]:4.54, [198]:5.6) | R2D Rx sensitivity of -36dBm  [6.9 ~ 11.57] meters. (5: [199]:9.47, [207]:6.91, [191]:6.91, [212]:11.57, [213]:6.9)  R2D Rx sensitivity of -30dBm  [3.3 ~ 5.6] meters. (6: [191]:3.68, [211]:3.3, [190]:4.09, [209]:5.6, [214]:4.54, [198]:5.6) |
| R2D Tx EIRP power >=30dBm and <35dBm | R2D Rx sensitivity of -36dBm  [12.88 ~ 17.8] meters. (6: [207]:16.32, [191]:17.8, [192]:14.43, [203]:12.88, [210]:17.8, [195]:16.57)  R2D Rx sensitivity of -30dBm  [9.47 ~ 11.69] meters. (2: [191]:9.47, [214]:11.69) | R2D Rx sensitivity of -36dBm  [12.88 ~ 17.8] meters. (6: [207]:16.32, [191]:17.8, [192]:14.43, [203]:12.88, [210]:16.83, [195]:16.57)  R2D Rx sensitivity of -30dBm  [9.47 ~ 11.69] meters. (2: [191]:9.47, [214]:11.69) | R2D Rx sensitivity of -36dBm  [12.88 ~ 17.8] meters. (5: [207]:16.11, [191]:17.22, [192]:14.43, [203]:12.88, [210]:17.8)  R2D Rx sensitivity of -30dBm  [9.47 ~ 11.69] meters. (2: [191]:9.47, [214]:11.69) |
| R2D Tx EIRP power >=35dBm | R2D Rx sensitivity of -36dBm  [19.11 ~ 36.6] meters. (11: [197]:27.11, [199]:19.11, [193]:36.59, [200]:25.66, [201]:26.65, [192]:24.4, [203]:23.52, [205]:36.59, [209]:27.11, [194]:30.11, [213]:36.6)  R2D Rx sensitivity of -30dBm  [14.4 ~ 21.7] meters. (8: [215]:19.77, [212]:19.57, [211]:14.4, [190]:16.03, [202]:14.43, [209]:14.43, [196]:21.7, [198]:16.03) | R2D Rx sensitivity of -36dBm  [8.22 ~ 32.77] meters. (11: [197]:19.61, [199]:19.11, [193]:24.11, [200]:11.32, [201]:15.91, [192]:22.21, [203]:14.91, [205]:13.11, [209]:8.22, [194]:16.19, [213]:32.77)  R2D Rx sensitivity of -30dBm  [11.7 ~ 19.57] meters. (8: [215]:15.99, [212]:19.57, [211]:14.4, [190]:16.03, [202]:14.43, [209]:14.43, [196]:11.7, [198]:16.03) | R2D Rx sensitivity of -36dBm  [15.17 ~ 36.59] meters. (9: [199]:27.11, [193]:36.59, [200]:15.17, [201]:25.66, [192]:24.4, [203]:23.52, [205]:36.59, [209]:27.11, [194]:30.11)  R2D Rx sensitivity of -30dBm  [14.43 ~ 21.7] meters. (7: [215]:19.77, [212]:19.57, [190]:16.03, [202]:14.43, [209]:14.43, [196]:21.7, [198]:16.03) |
| FEC code (1/2, 1/3, 1/4) | [14.43 ~ 36.6] meters. (11: [193]:36.59, [207]:16.32, [192]:24.4, [203]:23.52, [205]:36.59, [210]:17.8, [190]:16.03, [202]:14.43, [209]:27.11, [194]:30.11, [213]:36.6) | [13.11 ~ 32.77] meters. (11: [193]:24.11, [207]:16.32, [192]:22.21, [203]:14.91, [205]:13.11, [210]:16.83, [190]:16.03, [202]:14.43, [209]:14.43, [194]:16.19, [213]:32.77) | [6.9 ~ 36.59] meters. (11: [193]:36.59, [207]:16.11, [192]:24.4, [203]:23.52, [205]:36.59, [210]:17.8, [190]:16.03, [202]:14.43, [209]:27.11, [194]:30.11, [213]:6.9) |
| without FEC | [11.69 ~ 36.59] meters. (14: [197]:27.11, [199]:32.33, [215]:19.77, [200]:25.66, [191]:22.2, [201]:26.65, [212]:19.57, [211]:14.4, [190]:16.03, [214]:11.69, [196]:21.7, [198]:16.03, [213]:36.59, [195]:16.57) | [11.32 ~ 32.33] meters. (14: [197]:19.61, [199]:32.33, [215]:15.99, [200]:11.32, [191]:21.06, [201]:15.91, [212]:19.57, [211]:14.4, [190]:16.03, [214]:11.69, [196]:11.7, [198]:16.03, [213]:26.57, [195]:16.57) | [3.3 ~ 41.28] meters. (12: [199]:41.28, [215]:19.77, [200]:15.17, [191]:17.22, [201]:25.66, [212]:19.57, [211]:3.3, [190]:16.03, [214]:11.69, [196]:21.7, [198]:16.03, [213]:6.89) |
| OOK | [11.69 ~ 36.6] meters. (19: [197]:27.11, [215]:19.77, [200]:25.66, [207]:16.32, [191]:22.2, [201]:26.65, [192]:24.4, [203]:23.52, [205]:36.59, [212]:19.57, [211]:14.4, [190]:16.03, [202]:14.43, [214]:11.69, [194]:30.11, [196]:21.7, [198]:16.03, [213]:36.6, [195]:16.57) | [11.32 ~ 32.77] meters. (19: [197]:19.61, [215]:15.99, [200]:11.32, [207]:16.32, [191]:21.06, [201]:15.91, [192]:22.21, [203]:14.91, [205]:13.11, [212]:19.57, [211]:14.4, [190]:16.03, [202]:14.43, [214]:11.69, [194]:16.19, [196]:11.7, [198]:16.03, [213]:32.77, [195]:16.57) | [3.3 ~ 36.59] meters. (17: [215]:19.77, [200]:15.17, [207]:16.11, [191]:17.22, [201]:25.66, [192]:24.4, [203]:23.52, [205]:36.59, [212]:19.57, [211]:3.3, [190]:16.03, [202]:14.43, [214]:11.69, [194]:30.11, [196]:21.7, [198]:16.03, [213]:6.9) |
| BPSK | [16.03 ~ 36.6] meters. (7: [199]:32.33, [193]:36.59, [210]:17.8, [190]:16.03, [209]:27.11, [198]:16.03, [213]:36.6) | [14.43 ~ 32.33] meters. (7: [199]:32.33, [193]:24.11, [210]:16.83, [190]:16.03, [209]:14.43, [198]:16.03, [213]:23.5) | [6.9 ~ 41.28] meters. (7: [199]:41.28, [193]:36.59, [210]:17.8, [190]:16.03, [209]:27.11, [198]:16.03, [213]:6.9) |
| MSK | [16.03 ~ 16.03] meters. (1: [190]:16.03) | [16.03 ~ 16.03] meters. (1: [190]:16.03) | [16.03 ~ 16.03] meters. (1: [190]:16.03) |

#### 7.1.1.2 Device 2a

##### 7.1.1.2.1 Collection of the results

###### 7.1.1.2.1.1 [1kbps]

Table 7.1.1.2.1.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 2a, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [215] | 56.59 | 71.1 | 0.1 | 1-1 | Budget-Alt1 | 1 | 33 | -40 | 0.9 | 6 | 96 | 1000 | 137.4 | non-coherent | 900 | 1005 |
| 20 | 145.44 | 1001 |
| 400 | 133 | 1009 |
| 1-2 | 96 | 81.22 | 1006 |
| 20 | 85.97 | 1002 |
| 400 | 78.62 | 1010 |
| [193] | 95.51 | 76.1 | 1-1 | 0.8 | -45 | 0 | 96 | 253.22 | coherent | 42 |
| 6 | 184.66 | 37 |
| 1-2 | 0 | 149.6 | 43 |
| 6 | 109.04 | 38 |
| [201] | 44.97 | 68.92 | 0.01 | 1 | -40 | 20 | 150 | 44.97 | non-coherent | 18 |
| 45.09 | 68.95 | 1-1 | 45.09 | 17 |
| 46.17 | 69.17 | 1-2 | 46.17 | 23 |
| 46.29 | 69.2 | 1-1 | 46.29 | 22 |
| [203] | 31.38 | 65.69 | 1-2 | 1.02 | -45 | 400 | 31.38 | coherent | 78 |
| 33.72 | 66.35 | 24 | 33.72 | 83 |
| 33.83 | 66.38 | 1-1 | 33.83 | 82 |
| 33.92 | 66.4 | 33 | 33.92 | 77 |
| 36.59 | 67.1 | 0.43 | 24 | 20 | 45.54 | 72 |
| 0.83 | 96 | 39.81 | 62 |
| 1-2 | 0.43 | 20 | 45.39 | 73 |
| 0.83 | 96 | 39.68 | 63 |
| 36.95 | 67.19 | 33 | 36.95 | 58 |
| 39.91 | 67.9 | 1-1 | 39.91 | 57 |
| 42.29 | 68.44 | 1-2 | 0.43 | 20 | 42.29 | 68 |
| 45.66 | 69.15 | 1-1 | 45.66 | 67 |
| [192] | 35.34 | 66.62 | 1.02 | 24 | 400 | 160 | 35.34 | 297 |
| 35.97 | 66.79 | 33 | 35.97 | 261 |
| 37.16 | 67.1 | 0.43 | 24 | 20 | 74.94 | 291 |
| 0.83 | 96 | 54.96 | 294 |
| 0.1 | 0.43 | 20 | 101.66 | 273 |
| 0.83 | 96 | 89.61 | 276 |
| 1.02 | 400 | 71.86 | 279 |
| 55.94 | 70.99 | 0.01 | 0.83 | 33 | 96 | 55.94 | 258 |
| 62.86 | 72.1 | 0.43 | 20 | 76.28 | 255 |
| 0.1 | 103.48 | 237 |
| 0.83 | 96 | 91.21 | 240 |
| 1.02 | 400 | 73.14 | 243 |
| [202] | 20.9 | 61.39 | 0.01 | 1.07 | -40 | 96 | 150 | 20.9 | non-coherent | 147 |
| 35.97 | 66.79 | 0.96 | 20 | 35.97 | 141 |
| 39.33 | 67.64 | 0.1 | 1.07 | 96 | 39.33 | 144 |
| 41.28 | 68.1 | 0.01 | 0.7 | 20 | 50.62 | 135 |
| 0.1 | 0.96 | 54.77 | 138 |
| [195] | 11.24 | 57.1 | 1-2 | 1.14 | 26 | 96 | 151 | 32.69 | 1044 |
| 1.06 | 400 | 30.16 | 1048 |
| 26.32 | 64.1 | 1-1 | 1.14 | 33 | 96 | 47.72 | 1043 |
| 1.06 | 400 | 45.09 | 1047 |
| [198] | 27.11 | 1-2 | 1.14 | 23 | -45 | 6(OOK) | 96 | 1000 | 65.45 | coherent | 6 |
| 0(BPSK) | 110.73 | 14 |
| 65.5 | 72.48 | 33 | 6(OOK) | 65.45 | 2 |
| 77.58 | 74.1 | 1-1 | 110.73 | 1 |
| 0(BPSK) | 187.31 | 9 |
| 1-2 | 110.73 | 10 |
| [197] | 21.22 | 61.77 | 0.01 | 1-1 | 1 | 6 | 20 | 140 | 21.22 | non-coherent | 331 |
| 26.71 | 63.96 | 1-2 |  | 26.71 | 330 |
| 33.17 | 66.02 | 0.1 | 1-1 | 140 | 33.17 | 327 |
| 41.76 | 68.21 | 1-2 |  | 41.76 | 326 |
| 45.19 | 68.96 | 0.01 | 1-1 | 45.19 | 329 |
| 69.83 | 73.1 | 0.1 | 70.64 | 325 |
| [209] | 13.46 | 57.44 | 0.01 | 1-2 | -40 | 0 | 96 | 120 | 13.46 | coherent | 1309 |
| 13.47 | 57.45 | 1-1 | 13.47 | 1308 |
| 16.03 | 59.1 | 24 | 140 | 35.4 | 1323 |
| 1-2 | 34.78 | 1324 |
| 0.1 | 1-1 | 61.81 | 1363 |
| 1-2 | 60.72 | 1364 |
| 23.32 | 62.67 | 0.01 | 33 | 4.7 | 23.32 | 1314 |
| 23.49 | 62.74 | 0.1 | 0.9 | 120 | 23.49 | 1349 |
| 23.52 | 62.75 | 1-1 | 23.52 | 1348 |
| 25.53 | 63.53 | 0.01 | 4.7 | 140 | 25.53 | 1313 |
| 27.68 | 64.3 | 0.1 | 44.57 | 1353 |
| 1-2 | 40.72 | 1354 |
| 34.78 | 66.47 | 0.01 | 0.9 | 34.78 | 1294 |
| -45 | 1319 |
| 36.4 | 66.9 | 38 | -40 | 36.4 | 1329 |
| 38.07 | 67.33 | 1-1 | 33 | 38.07 | 1293 |
| -45 | 1318 |
| 38.4 | 67.41 | 38 | -40 | 38.4 | 1328 |
| 41.28 | 68.1 | 33 | 1000 | 74.14 | 1298 |
| 170 | 73.84 | 1303 |
| 1-2 | 1000 | 43.82 | 1299 |
| 170 | 43.81 | 1304 |
| 0.1 | 1-1 | 140 | 66.46 | 1333 |
| 1000 | 129.43 | 1338 |
| 170 | 128.92 | 1343 |
| 1-2 | 140 | 60.72 | 1334 |
| 1000 | 76.51 | 1339 |
| 170 | 76.48 | 1344 |
| 60.72 | 71.77 | -45 | 140 | 60.72 | 1359 |
| 63.56 | 72.2 | 38 | -40 | 63.56 | 1369 |
| 66.46 | 72.63 | 1-1 | 33 | -45 | 66.46 | 1358 |
| 67.04 | 72.71 | 38 | -40 | 67.04 | 1368 |
| [190] | 19.78 | 61.1 | 0.01 | 0.96 | 24 | -45 | 20 | 150 | 183 | 1407 |
| 6 | 97.9 | 1409 |
| 1-2 | 0 | 71.04 | 1408 |
| 6 | 38 | 1410 |
| 38 | 67.31 | 33 | 1406 |
| 71.04 | 73.26 | 0 | 71.04 | 1404 |
| 77.58 | 74.1 | 1-1 | 183 | 1403 |
| 6 | 97.9 | 1405 |
| [213] | 23.52 | 63.1 | 1-2 | 0.65 | 24 |  | 847 |
| 1.25 | 96 | 857 |
| 1.67 | 400 | 867 |
| 0.53 | 20 | 907 |
| 0.9 | 96 | 917 |
| 1.09 | 400 | 927 |
| 0.1 | 0.65 | 20 | 842 |
| 1.25 | 96 | 852 |
| 1.67 | 400 | 862 |
| 0.53 | 20 | 902 |
| 0.9 | 96 | 912 |
| 1.09 | 400 | 922 |
| 33.86 | 66.39 | 0.01 | 1-1 | 1.67 | 33 | 866 |
| 41.15 | 68.19 | 1.25 | 96 | 856 |
| 44.85 | 68.99 | 1.09 | 400 | 926 |
| 47.07 | 69.44 | 0.65 | 20 | 846 |
| 49.13 | 69.84 | 0.1 | 1.67 | 400 | 861 |
| 56.14 | 71.09 | 0.01 | 0.9 | 96 | 916 |
| 0.1 | 1.25 | 851 |
| 62.44 | 72.09 | 0.01 | 0.53 | 20 | 906 |
| 63.45 | 72.24 | 0.1 | 1.09 | 400 | 921 |
| 63.78 | 72.29 | 0.65 | 20 | 841 |
| 77.2 | 74.09 | 0.9 | 96 | 911 |
| 82.7 | 74.74 | 0.53 | 20 | 901 |
| [211] | 41.3 | 68.1 | 0.01 | 1 | -40 | 1000 | 46.95 | non-coherent | 1074 |
| 400 | 1076 |
| 0.1 | 20 | 59.48 | 1073 |
| 400 | 57.94 | 1075 |
| [205] | 56.22 | 71.1 | 1.14 | 96 | 134.64 | 1033 |
| 1-2 | 79.42 | 1034 |
| D1T1-A2 | [215] | 24.38 | 63.09 | 1 | 400 | 140 | 24.38 | 1022 |
| 24.41 | 63.1 | 1-1 | 24.41 | 1021 |
| 25.19 | 63.4 | 1-2 | 96 | 25.19 | 1018 |
| 25.22 | 63.41 | 1-1 | 25.22 | 1017 |
| 26.67 | 63.94 | 1-2 | 20 | 26.67 | 1014 |
| 26.7 | 63.95 | 1-1 | 26.7 | 1013 |
| [193] | 33.26 | 66.22 | 1-2 | 0.8 | -45 | 96 | 33.26 | coherent | 40 |
| 33.3 | 66.23 | 1-1 | 33.3 | 39 |
| 45.99 | 69.22 | 1-2 | 0 | 45.99 | 45 |
| 46.05 | 69.23 | 1-1 | 46.05 | 44 |
| [201] | 26.9 | 64.04 | 0.01 | 1-2 | 1 | -40 | 6 | 20 | 26.9 | non-coherent | 20 |
| 26.91 | 1-1 | 26.91 | 19 |
| 27.62 | 64.29 | 1-2 | 27.62 | 25 |
| 27.63 | 1-1 | 27.63 | 24 |
| [203] | 19.36 | 61.4 | 1-2 | 1.02 | -45 | 400 | 19.36 | coherent | 80 |
| 19.54 | 61.48 | 24 | 19.54 | 85 |
| 19.55 | 61.49 | 1-1 | 33 | 19.55 | 79 |
| 24 | 84 |
| 23 | 62.9 | 1-2 | 0.83 | 33 | 96 | 23 | 60 |
| 23.22 | 62.99 | 1-1 | 24 | 23.22 | 64 |
| 62.98 | 1-2 | 65 |
| 23.23 | 62.99 | 1-1 | 33 | 23.23 | 59 |
| 26.48 | 64.15 | 1-2 | 0.43 | 20 | 26.48 | 70 |
| 26.72 | 64.23 | 24 | 26.72 | 75 |
| 26.73 | 64.24 | 1-1 | 33 | 26.73 | 69 |
| 24 | 74 |
| [192] | 13.67 | 57.59 | 1.02 | 33 | 400 | 13.67 | 262 |
| 24 | 298 |
| 21.26 | 61.79 | 0.83 | 33 | 96 | 21.26 | 259 |
| 24 | 295 |
| 27.79 | 64.34 | 0.1 | 1.02 | 400 | 27.79 | 280 |
| 27.8 | 33 | 27.8 | 244 |
| 28.99 | 64.74 | 0.01 | 0.43 | 24 | 20 | 28.99 | 292 |
| 29 | 33 | 29 | 256 |
| 34.66 | 66.44 | 0.1 | 0.83 | 24 | 96 | 34.66 | 277 |
| 34.67 | 33 | 34.67 | 241 |
| 37.16 | 67.1 | 0.43 | 24 | 20 | 39.32 | 274 |
| 39.33 | 67.64 | 33 | 39.33 | 238 |
| [202] | 12.12 | 56.44 | 0.01 | 1.07 | -40 | 96 | 12.12 | non-coherent | 148 |
| 21.38 | 61.84 | 0.96 | 20 | 21.38 | 142 |
| 23.38 | 62.69 | 0.1 | 1.07 | 96 | 23.38 | 145 |
| 30.09 | 65.09 | 0.01 | 0.7 | 20 | 30.09 | 136 |
| 32.56 | 65.84 | 0.1 | 0.96 | 32.56 | 139 |
| [195] | 11.24 | 57.1 | 1-2 | 1.14 | 26 | 96 | 149 | 32.21 | 1046 |
| 1.06 | 400 | 29.79 | 1050 |
| 26.32 | 64.1 | 1-1 | 1.14 | 33 | 96 | 44.71 | 1045 |
| 1.06 | 400 | 42.48 | 1049 |
| [198] | 27.11 | 1-2 | 1.14 | 23 | -45 | 6(OOK) | 96 | 140 | 38.83 | coherent | 7 |
| 0(BPSK) | 65.69 | 15 |
| 38.8 | 67.52 | 33 | 6(OOK) | 38.83 | 4 |
| 39.7 | 67.73 | 1-1 | 39.69 | 3 |
| 65.7 | 72.52 | 1-2 | 0(BPSK) | 65.69 | 12 |
| 67.1 | 72.73 | 1-1 | 67.14 | 11 |
| [197] | 19.89 | 61.15 | 0.01 | 1-2 | 1 | 6 | 20 | 19.89 | non-coherent | 332 |
| 31.09 | 65.4 | 0.1 | 31.09 | 328 |
| [209] | 2.78 | 42.45 | 0.01 | 1-1 | -40 | 0 | 96 | 90 | 2.78 | coherent | 1310 |
| 1-2 | 1311 |
| 4.86 | 47.75 | 0.1 | 1-1 | 4.86 | 1350 |
| 1-2 | 1351 |
| 5.34 | 48.65 | 0.01 | 1-1 | 4.7 | 110 | 5.34 | 1315 |
| 1-2 | 1316 |
| 7.96 | 52.45 | 1-1 | 0.9 | 7.96 | 1295 |
| -45 | 1320 |
| 24 | -40 | 1325 |
| 38 | 1330 |
| 1-2 | 33 | 1296 |
| -45 | 1321 |
| 24 | -40 | 1326 |
| 38 | 1331 |
| 9.32 | 53.95 | 0.1 | 1-1 | 33 | 4.7 | 9.32 | 1355 |
| 1-2 | 1356 |
| 13.9 | 57.75 | 1-1 | 0.9 | 13.9 | 1335 |
| -45 | 1360 |
| 24 | -40 | 1365 |
| 38 | 1370 |
| 1-2 | 33 | 1336 |
| -45 | 1361 |
| 24 | -40 | 1366 |
| 38 | 1371 |
| 34.78 | 66.47 | 0.01 | 33 | 140 | 34.78 | 1306 |
| 38.07 | 67.33 | 1-1 | 38.07 | 1305 |
| 41.28 | 68.1 | 1000 | 74.14 | 1300 |
| 1-2 | 43.82 | 1301 |
| 0.1 | 1-1 | 140 | 66.46 | 1345 |
| 1000 | 129.43 | 1340 |
| 1-2 | 140 | 60.72 | 1346 |
| 1000 | 76.51 | 1341 |
| [190] | 19.78 | 61.1 | 0.01 | 1-1 | 0.96 | 24 | -45 | 20 | 140 | 127.07 | 1415 |
| 6 | 67.98 | 1417 |
| 1-2 | 0 | 122.22 | 1416 |
| 6 | 65.38 | 1418 |
| 65.38 | 72.47 | 33 | 1414 |
| 67.98 | 72.84 | 1-1 | 67.98 | 1413 |
| 77.58 | 74.1 | 0 | 127.07 | 1411 |
| 1-2 | 122.22 | 1412 |
| [213] | 15.09 | 59.34 | 1.67 | 24 | 6 | 400 |  | 869 |
| 18.76 | 61.14 | 1.25 | 96 | 859 |
| 19.34 | 61.4 | 1-1 | 1.67 | 33 | 400 | 868 |
| 20.59 | 61.94 | 1-2 | 1.09 | 24 | 929 |
| 21.69 | 62.39 | 0.65 | 20 | 849 |
| 22.7 | 62.79 | 0.1 | 1.67 | 400 | 864 |
| 23.52 | 63.1 | 0.01 | 0.53 | 20 | 909 |
| 0.9 | 96 | 919 |
| 0.1 | 0.65 | 20 | 844 |
| 1.25 | 96 | 854 |
| 0.53 | 20 | 904 |
| 0.9 | 96 | 914 |
| 1.09 | 400 | 924 |
| 23.79 | 63.2 | 0.01 | 1-1 | 1.25 | 33 | 96 | 858 |
| 26.02 | 64 | 1.09 | 400 | 928 |
| 27.36 | 64.45 | 0.65 | 20 | 848 |
| 28.6 | 64.85 | 0.1 | 1.67 | 400 | 863 |
| 32.81 | 66.1 | 0.01 | 0.9 | 96 | 918 |
| 0.1 | 1.25 | 853 |
| 36.58 | 67.1 | 0.01 | 0.53 | 20 | 908 |
| 37.18 | 67.25 | 0.1 | 1.09 | 400 | 923 |
| 37.39 | 67.3 | 0.65 | 20 | 843 |
| 45.39 | 69.1 | 0.9 | 96 | 913 |
| 48.66 | 69.75 | 0.53 | 20 | 903 |
| [211] | 21.84 | 62.04 | 0.01 | 1 | -40 | 96 | 21.84 | non-coherent | 1072 |
| 26.81 | 63.99 | 0.1 | 26.81 | 1071 |
| [205] | 23.85 | 63.22 | 1-2 | 1.14 | 23.85 | 1036 |
| 23.88 | 63.23 | 1-1 | 23.88 | 1035 |
| D1T1-B | [215] | 56.59 | 71.1 | 1-4 | 1 | 1000 | 10 | 1027 |
| 20 | 1025 |
| 400 | 1029 |
| [193] | 95.51 | 76.1 | 0.8 | -45 | 0 | 96 | coherent | 46 |
| 6 | 41 |
| [201] | 43.4 | 68.59 | 0.01 | 1 | -40 | 20 | 150 | 43.4 | non-coherent | 21 |
| 44.56 | 68.84 | 44.56 | 26 |
| [203] | 36.59 | 67.1 | 0.43 | 24 | -45 | 10 | coherent | 76 |
| 0.83 | 96 | 66 |
| 1.02 | 400 | 86 |
| 62.53 | 72.1 | 0.43 | 33 | 20 | 71 |
| 0.83 | 96 | 61 |
| 1.02 | 400 | 81 |
| [192] | 26.52 | 63.89 | 160 | 26.52 | 263 |
| 34.62 | 66.43 | 24 | 34.62 | 299 |
| 37.16 | 67.1 | 0.43 | 20 | 73.42 | 293 |
| 0.83 | 96 | 53.84 | 296 |
| 0.1 | 0.43 | 20 | 99.6 | 275 |
| 0.83 | 96 | 87.79 | 278 |
| 1.02 | 400 | 70.4 | 281 |
| 41.24 | 68.09 | 0.01 | 0.83 | 33 | 96 | 41.24 | 260 |
| 53.92 | 70.64 | 0.1 | 1.02 | 400 | 53.92 | 245 |
| 56.23 | 71.04 | 0.01 | 0.43 | 20 | 56.23 | 257 |
| 62.86 | 72.1 | 0.1 | 76.28 | 239 |
| 0.83 | 96 | 67.24 | 242 |
| [202] | 17.25 | 59.8 | 0.01 | 1.07 | -40 | 150 | 17.25 | non-coherent | 149 |
| 30.44 | 65.2 | 0.96 | 20 | 30.44 | 143 |
| 33.29 | 66.05 | 0.1 | 1.07 | 96 | 33.29 | 146 |
| 41.28 | 68.1 | 0.01 | 0.7 | 20 | 42.84 | 137 |
| 0.1 | 0.96 | 46.35 | 140 |
| [198] | 27.11 | 64.1 | 1.14 | 23 | -45 | 6(OOK) | 96 | 1000 | 10 | coherent | 8 |
| 0(BPSK) | 16 |
| 77.58 | 74.1 | 33 | 6(OOK) | 5 |
| 0(BPSK) | 13 |
| [209] | 6.34 | 50.28 | 0.01 | 1 | -40 | 0 | 110 | 1312 |
| 16.03 | 59.1 | 24 | 130 | 1327 |
| 0.1 | 1367 |
| 19.31 | 60.88 | 33 | 110 | 1352 |
| 21.28 | 61.8 | 0.01 | 4.7 | 130 | 1317 |
| 27.68 | 64.3 | 0.1 | 1357 |
| 41.28 | 68.1 | 0.01 | 0.9 | 1000 | 1302 |
| 130 | 1297 |
| 160 | 1307 |
| 0.1 | 1000 | 1342 |
| 130 | 1337 |
| 160 | 1347 |
| 47.31 | 69.4 | 0.01 | -45 | 130 | 1322 |
| 49.45 | 69.82 | 38 | -40 | 1332 |
| 69.83 | 73.1 | 0.1 | 33 | -45 | 1362 |
| 38 | -40 | 1372 |
| [190] | 19.78 | 61.1 | 0.01 | 0.96 | 24 | -45 | 20 | 150 | 20 | 1421 |
| 6 | 1422 |
| 77.58 | 74.1 | 33 | 0 | 1419 |
| 6 | 1420 |
| [213] | 23.52 | 63.1 | 0.65 | 24 | 5 | 850 |
| 1.25 | 96 | 860 |
| 1.67 | 400 | 870 |
| 0.53 | 20 | 910 |
| 0.9 | 96 | 920 |
| 1.09 | 400 | 930 |
| 0.1 | 0.65 | 20 | 845 |
| 1.25 | 96 | 855 |
| 1.67 | 400 | 865 |
| 0.53 | 20 | 905 |
| 0.9 | 96 | 915 |
| 1.09 | 400 | 925 |
| [205] | 56.22 | 71.1 | 1.14 | 33 | -40 | 96 | 1000 | 10 | non-coherent | 1037 |

Figure 7.1.1.2.1.1-1



###### 7.1.1.2.1.2 [5-7kbps]

Table 7.1.1.2.1.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 2a, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [215] | 56.59 | 71.1 | 0.1 | 1-1 | Budget-Alt1 | 5 | 33 | -40 | 0.9 | 6 | 96 | 1000 | 122.95 | non-coherent | 900 | 1007 |
| 20 | 136.79 | 1003 |
| 400 | 118.27 | 1011 |
| 1-2 | 96 | 72.68 | 1008 |
| 20 | 80.86 | 1004 |
| 400 | 69.91 | 1012 |
| [193] | 73.89 | 73.67 | 6 | -45 | 96 | 73.89 | coherent | 48 |
| 95.51 | 76.1 | 1-1 | 0 | 171.89 | 52 |
| 6 | 125.31 | 47 |
| 1-2 | 0 | 101.48 | 53 |
| [201] | 35.87 | 66.77 | -40 | 6 | 150 | 35.87 | non-coherent | 28 |
| 35.97 | 66.8 | 1-1 | 35.97 | 27 |
| 40.48 | 67.92 | 1-2 | 40.48 | 33 |
| 40.59 | 67.95 | 1-1 | 40.59 | 32 |
| [192] | 37.16 | 67.1 | 0.01 | 3 | 24 | -45 | 20 | 160 | 57.32 | coherent | 300 |
| 4.7 | 96 | 55.25 | 303 |
| 5.8 | 400 | 52.98 | 306 |
| 0.1 | 3 | 20 | 76.54 | 282 |
| 4.7 | 96 | 74.56 | 285 |
| 5.8 | 400 | 70 | 288 |
| 55.35 | 70.89 | 0.01 | 33 | 55.35 | 270 |
| 57.73 | 71.29 | 4.7 | 96 | 57.73 | 267 |
| 59.9 | 71.64 | 3 | 20 | 59.9 | 264 |
| 62.86 | 72.1 | 0.1 | 79.98 | 246 |
| 4.7 | 96 | 77.9 | 249 |
| 5.8 | 400 | 73.14 | 252 |
| [202] | 21.15 | 61.26 | 0.01 | 5.36 | -40 | 96 | 150 | 21.15 | non-coherent | 159 |
| 28.84 | 64.21 | 4.81 | 20 | 28.84 | 153 |
| 36.16 | 66.36 | 0.1 | 5.36 | 96 | 36.16 | 156 |
| 38.92 | 67.06 | 4.81 | 20 | 38.92 | 150 |
| [195] | 11.24 | 57.1 | 1-2 | 5.08 | 26 | 400 | 159 | 23.83 | 1056 |
| 5.49 | 96 | 23.11 | 1052 |
| 26.32 | 64.1 | 1-1 | 5.08 | 33 | 400 | 36.66 | 1055 |
| 5.49 | 96 | 35.61 | 1051 |
| [194] | 37.19 | 67.11 | 0.01 | 1-2 | 7 | -45 | 400 | 155 | 37.19 | coherent | 114 |
| 40.21 | 67.85 | 1-1 | 40.21 | 112 |
| 41.97 | 68.26 | 1-2 | 96 | 41.97 | 109 |
| 20 | 104 |
| 45.38 | 69 | 1-1 | 96 | 45.38 | 107 |
| 20 | 102 |
| 47.36 | 69.41 | 0.1 | 1-2 | 400 | 47.36 | 99 |
| 51.21 | 70.15 | 1-1 | 51.21 | 97 |
| 55.45 | 70.91 | 1-2 | 96 | 55.45 | 94 |
| 59.96 | 71.65 | 1-1 | 59.96 | 92 |
| 61.28 | 71.86 | 1-2 | 20 | 61.28 | 89 |
| 66.25 | 72.6 | 1-1 | 66.25 | 87 |
| [210] | 44.06 | 68.72 | 0.01 | 1-2 | 4.67 | 0 | 96 | 1000 |  | 228 |
| Budget-Alt2 | -67.45 | 233 |
| 45.86 | 69.1 | 1-1 | Budget-Alt1 | -45 | 227 |
| 74.54 | 73.72 | Budget-Alt2 | -67.45 | 232 |
| [197] | 18.6 | 60.52 | Budget-Alt1 | 5 | -45 | 6 | 20 | 140 | 18.6 | non-coherent | 319 |
| 23.42 | 62.71 | 1-2 |  | 23.42 | 318 |
| 29.09 | 64.77 | 0.1 | 1-1 | 140 | 9.09 | 311 |
| 36.62 | 66.96 | 1-2 |  | 36.62 | 310 |
| 39.62 | 67.71 | 0.01 | 1-1 | 39.62 | 317 |
| 61.94 | 71.96 | 0.1 | 61.94 | 309 |
| [209] | 8.61 | 53.19 | 0.01 | 1-2 | 7 | -40 | 0 | 96 | 120 | 8.61 | coherent | 1229 |
| 8.62 | 53.2 | 1-1 | 8.62 | 1228 |
| 14.92 | 58.42 | 1-2 | 4.7 | 140 | 14.92 | 1234 |
| 15.03 | 58.49 | 0.1 | 0.9 | 120 | 15.03 | 1269 |
| 15.04 | 58.5 | 1-1 | 15.04 | 1268 |
| 16.03 | 59.1 | 0.01 | 24 | 140 | 22.64 | 1243 |
| 1-2 | 22.25 | 1244 |
| 0.1 | 1-1 | 39.53 | 1283 |
| 1-2 | 38.84 | 1284 |
| 16.33 | 59.28 | 0.01 | 1-1 | 33 | 4.7 | 16.33 | 1233 |
| 22.25 | 62.22 | 1-2 | 0.9 | 22.25 | 1214 |
| -45 | 1239 |
| 23.29 | 62.65 | 38 | -40 | 23.29 | 1249 |
| 24.35 | 63.08 | 1-1 | 33 | 24.35 | 1213 |
| -45 | 1238 |
| 24.56 | 63.16 | 38 | -40 | 24.56 | 1248 |
| 26.05 | 63.72 | 0.1 | 1-2 | 33 | 4.7 | 26.05 | 1274 |
| 27.68 | 64.3 | 1-1 | 28.51 | 1273 |
| 28.02 | 64.41 | 0.01 | 1-2 | 0.9 | 170 | 28.02 | 1224 |
| 28.03 | 64.42 | 1000 | 28.03 | 1219 |
| 38.84 | 67.52 | 0.1 | 140 | 38.84 | 1254 |
| -45 | 1279 |
| 40.65 | 67.95 | 38 | -40 | 40.65 | 1289 |
| 41.28 | 68.1 | 0.01 | 1-1 | 33 | 1000 | 47.42 | 1218 |
| 170 | 47.23 | 1223 |
| 0.1 | 140 | 42.51 | 1253 |
| 1000 | 82.79 | 1258 |
| 170 | 82.46 | 1263 |
| 1-2 | 1000 | 48.94 | 1259 |
| 170 | 48.92 | 1264 |
| 42.51 | 68.38 | 1-1 | -45 | 140 | 42.51 | 1278 |
| 42.88 | 68.46 | 38 | -40 | 42.88 | 1288 |
| [190] | 13.21 | 57.26 | 0.01 | 1-2 | 6.43 | 33 | -45 | 6 | 150 | 13.21 | 1378 |
| 24 | 1384 |
| 19.78 | 61.1 | 1-1 | 0 | 104.88 | 817 |
| 91 | 819 |
| 68.11 | 1379 |
| 77.68 | 1381 |
| 6 | 54.94 | 821 |
| 34.03 | 1383 |
| 1-2 | 0 | 40.71 | 818 |
| 35.32 | 820 |
| 26.44 | 1380 |
| 30.15 | 1382 |
| 6 | 21.33 | 822 |
| 21.33 | 61.82 | 33 | 816 |
| 26.44 | 63.86 | 0 | 26.44 | 1374 |
| 30.15 | 65.11 | 30.15 | 1376 |
| 34.03 | 66.26 | 1-1 | 6 | 34.03 | 1377 |
| 35.32 | 66.62 | 1-2 | 0 | 35.32 | 814 |
| 40.71 | 67.97 | 40.71 | 812 |
| 54.94 | 70.82 | 1-1 | 6 | 54.94 | 815 |
| 68.11 | 72.86 | 0 | 68.11 | 1373 |
| 77.58 | 74.1 | 104.88 | 811 |
| 91 | 813 |
| 77.68 | 1375 |
| [213] | 23.52 | 63.1 | 1-2 | 3.41 | 24 | 6 | 20 |  | 937 |
| 3.87 | 877 |
| 5.77 | 96 | 887 |
| 6.99 | 400 | 897 |
| 0.1 | 3.41 | 20 | 932 |
| 3.87 | 872 |
| 5.77 | 96 | 882 |
| 6.99 | 400 | 892 |
| 47.25 | 69.47 | 0.01 | 1-1 | 33 | 896 |
| 51.48 | 70.27 | 5.77 | 96 | 886 |
| 56.36 | 71.12 | 3.87 | 20 | 876 |
| 58.5 | 71.47 | 0.1 | 6.99 | 400 | 891 |
| 69.34 | 73.07 | 5.77 | 96 | 881 |
| 69.71 | 73.12 | 0.01 | 3.41 | 20 | 936 |
| 77.09 | 74.07 | 0.1 | 3.87 | 871 |
| 94.25 | 75.97 | 3.41 | 931 |
| [212] | 15.12 | 58.55 | 0.01 | 1-2 | Budget Alt1 | 7 | 24 | -40 | 96 | 140 | 15.12 | non-coherent | 997 |
| 15.14 | 58.56 | 1-1 | 15.14 | 996 |
| 15.17 | 58.58 | 1-2 | 33 | 15.17 | 992 |
| 15.2 | 58.6 | 1-1 | 15.2 | 991 |
| 16.03 | 59.1 | 24 | 18.68 | coherent | 976 |
| 1-2 | 18.66 | 977 |
| 0.1 | 1-1 | 37.2 | 966 |
| 28.45 | non-coherent | 986 |
| 1-2 | 37.16 | coherent | 967 |
| 28.42 | non-coherent | 987 |
| 18.72 | 60.58 | 0.01 | 33 | 18.72 | coherent | 972 |
| 18.76 | 60.6 | 1-1 | 18.76 | 971 |
| 28.51 | 64.58 | 0.1 | 1-2 | 28.51 | non-coherent | 982 |
| 28.57 | 64.6 | 1-1 | 28.57 | 981 |
| 37.28 | 67.13 | 1-2 | 37.28 | coherent | 962 |
| 37.35 | 67.15 | 1-1 | 37.35 | 961 |
| [199] | 14.43 | 58.1 | 1-2 | Budget-Alt1 | 5.9 | 23 | 0 | 30.4 | 129 |
| [191] | 10.52 | 55.1 | 0.01 | 1-1 | 5 | 24 | 6 | 20 |  |  | non-coherent | 800 |
| 1-2 | 801 |
| 10.67 | 55.23 | 33 | -50 | 96 | 691 |
| 24 | 745 |
| 11.24 | 55.73 | 1-1 | 744 |
| 11.73 | 56.13 | 1-2 | 33 | 475 |
| 24 | 529 |
| 12.19 | 56.5 | 33 | 400 | 385 |
| 24 | 439 |
| 12.36 | 56.63 | 1-1 | 96 | 528 |
| 12.69 | 56.88 | 1-2 | 33 | 400 | 493 |
| 24 | 547 |
| 12.85 | 57 | 1-1 | 438 |
| 13.37 | 57.38 | 546 |
| 1-2 | 33 | 20 | 673 |
| 24 | 727 |
| 13.51 | 57.48 | 33 | 457 |
| 24 | 511 |
| 13.69 | 57.6 | 33 | 96 | 583 |
| 24 | 637 |
| 13.83 | 57.7 | 33 | 367 |
| 24 | 421 |
| 14.1 | 57.88 | 1-1 | 20 | 726 |
| 14.24 | 57.98 | 510 |
| 14.43 | 58.1 | 96 | 636 |
| 14.58 | 58.2 | 420 |
| 14.7 | 58.28 | 0.1 | 1-2 | 33 | 682 |
| 24 | 736 |
| 15.49 | 58.78 | 1-1 | 735 |
| 15.82 | 58.98 | 1-2 | 33 | 466 |
| 24 | 520 |
| 16.08 | 59.13 | 33 | 400 | 484 |
| 24 | 538 |
| 16.68 | 59.48 | 1-1 | 96 | 519 |
| 16.94 | 59.63 | 400 | 537 |
| 17.25 | 59.8 | 0.01 | 1-2 | 33 | 20 | 349 |
| 565 |
| 24 | -45 | 782 |
| -50 | 403 |
| 619 |
| 17.49 | 59.93 | 0.1 | 33 | 448 |
| 664 |
| 24 | 502 |
| 718 |
| 17.8 | 60.1 | 0.01 | 1-1 | -45 | 781 |
| 0.1 | 1-2 | 33 | -50 | 400 | 376 |
| 24 | 430 |
| 18.05 | 60.23 | 0.01 | 1-1 | 33 | 96 | 690 |
| 18.18 | 60.3 | 24 | 20 | 402 |
| 618 |
| 18.43 | 60.43 | 0.1 | 501 |
| 717 |
| 18.76 | 60.6 | 400 | 429 |
| 19.26 | 60.85 | 1-2 | 33 | 96 | 574 |
| 24 | 628 |
| 19.57 | 61 | 33 | 358 |
| 24 | 412 |
| 19.84 | 61.13 | 0.01 | 1-1 | 33 | 474 |
| 20.3 | 61.35 | 0.1 | 24 | 627 |
| 20.62 | 61.5 | 0.01 | 33 | 400 | 384 |
| 0.1 | 24 | 96 | 411 |
| 21.46 | 61.88 | 0.01 | 33 | 400 | 492 |
| 22.2 | 62.2 | 0.1 | 1-2 | -40 | 20 | 792 |
| -45 | 773 |
| -50 | 340 |
| 556 |
| 24 | 394 |
| 610 |
| 22.62 | 62.38 | 0.01 | 1-1 | 33 | 672 |
| 22.86 | 62.48 | 456 |
| 23.15 | 62.6 | 96 | 582 |
| 23.4 | 62.7 | 366 |
| 0.1 | 24 | 20 | 393 |
| 609 |
| 24.87 | 63.28 | 33 | 96 | 681 |
| 26.77 | 63.98 | 465 |
| 27.11 | 64.1 | -40 | 20 | 791 |
| 27.19 | 64.13 | -50 | 400 | 483 |
| 29.18 | 64.8 | 0.01 | 20 | 348 |
| 564 |
| 29.58 | 64.93 | 0.1 | 447 |
| 663 |
| 30.11 | 65.1 | 400 | 375 |
| 32.59 | 65.85 | 96 | 573 |
| 33.1 | 66 | 357 |
| 37.55 | 67.2 | -45 | 20 | 772 |
| -50 | 339 |
| 555 |
|  |  | 0.01 | 400 | 600 |
| 708 |
| 24 | 654 |
| 762 |
| 1-2 | 33 | 601 |
| 709 |
| 24 | 655 |
| 763 |
| 0.1 | 1-1 | 33 | 591 |
| 699 |
| 24 | 645 |
| 753 |
| 1-2 | 33 | 592 |
| 700 |
| 24 | 646 |
| 754 |
| [207] | 10.52 | 55.1 | 0.01 | 1-1 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 60.84 | 187 |
| 1-2 | 60.71 | 189 |
| 0.1 | 1-1 | 63.49 | 197 |
| 1-2 | 63.35 | 199 |
| 18.98 | 60.71 | 0.01 | 33 | 60.71 | 188 |
| 20.9 | 61.63 | 1-1 | 61.63 | 186 |
| 25.06 | 63.35 | 0.1 | 1-2 | 63.35 | 198 |
| 27.11 | 64.1 | 1-1 | 64.27 | 196 |
| [211] | 17.85 | 60.12 | 0.01 | Budget-Alt1 | 6.4 | 4.7 | 1000 | 17.85 | 1066 |
| 25.51 | 63.52 | 0.1 | 25.51 | 1065 |
| 26.61 | 63.92 | 0.01 | 0.9 | 26.61 | 1064 |
| 38.05 | 67.32 | 0.1 | 38.05 | 1063 |
| [200] | 10.09 | 61.63 | 0.01 | 1-2 | 7.5 | -45 | 400 |  | 10.09 | 2000 | 1164 |
| 1162 |
| 10.54 | 62.05 | 96 | 10.54 | 1160 |
| 1158 |
| 10.9 | 62.37 | 0.1 | 400 | 10.9 | 1163 |
| 1161 |
| 11.04 | 62.49 | 0.01 | 20 | 11.04 | 1154 |
| 1156 |
| 11.45 | 62.84 | 0.1 | 96 | 11.45 | 1159 |
| 1157 |
| 12.38 | 63.58 | 20 | 12.38 | 1153 |
| 1155 |
| 17.06 | 66.63 | 0.01 | 1-1 | 400 | 17.06 | 1150 |
| 1152 |
| 17.84 | 67.05 | 96 | 17.84 | 1146 |
| 1148 |
| 18.44 | 67.37 | 0.1 | 400 | 18.44 | 1149 |
| 1151 |
| 18.67 | 67.49 | 0.01 | 20 | 18.67 | 1142 |
| 1144 |
| 19.37 | 67.84 | 0.1 | 96 | 19.37 | 1145 |
| 1147 |
| 20.92 | 61.63 | 0.01 | 1-2 | 400 | 20.92 | 900 | 1102 |
| 1104 |
| 20.94 | 68.58 | 0.1 | 1-1 | 20 | 20.94 | 2000 | 1141 |
| 1143 |
| 21.86 | 62.05 | 0.01 | 1-2 | 96 | 21.86 | 900 | 1098 |
| 1100 |
| 22.6 | 62.37 | 0.1 | 400 | 22.6 | 1101 |
| 1103 |
| 22.91 | 62.5 | 0.01 | 20 | 22.91 | 1094 |
| 1096 |
| 23.75 | 62.84 | 0.1 | 96 | 23.75 | 1099 |
| 1097 |
| 25.66 | 63.58 | 20 | 25.66 | 1093 |
| 1095 |
| 35.38 | 66.63 | 0.01 | 1-1 | 400 | 35.38 | 1090 |
| 1092 |
| 36.98 | 67.05 | 96 | 36.98 | 1086 |
| 1088 |
| 38.23 | 67.37 | 0.1 | 400 | 38.23 | 1089 |
| 1091 |
| 38.75 | 67.5 | 0.01 | 20 | 38.75 | 1082 |
| 1084 |
| 40.18 | 67.84 | 0.1 | 96 | 40.18 | 1085 |
| 1087 |
| 43.41 | 68.58 | 20 | 43.41 | 1081 |
| 1083 |
| [214] | 2.52 | 41.49 | 0.01 | 1-4 | Budget-Alt2 | 5 | 23 | -25.39 | 140 | 17.71 | 182 |
| 2.79 | 42.49 | 1-1 | 24 | 17.73 | 178 |
| 7.2 | 51.49 | 33 | 17.79 | 174 |
| 9.1 | 53.72 | 0.1 | 1-4 | 23 | -37.62 | 19.67 | 170 |
| 10.11 | 54.72 | 1-1 | 24 | 19.69 | 166 |
| 19.76 | 61.09 | 33 | 19.76 | 162 |
| [205] | 46.42 | 69.31 | 1-2 | Budget-Alt1 | 6.86 | -40 | 96 | 1000 | 46.42 | 1039 |
| 56.22 | 71.1 | 1-1 | 79.03 | 1038 |
| [196] | 55.5 | 70.91 | 6.4 | -45 |  | 6(OOK) | 55.5 | 1204 |
| 57.6 | 71.26 | 6 | 57.6 | 1207 |
| 6.6 | 400 | 1210 |
| 62 | 71.96 | 5 | 20 | 62 | 1201 |
| D1T1-A2 | [215] | 21.68 | 61.97 | 1-2 | -40 | 0.9 | 6 | 400 | 140 | 21.68 | 1024 |
| 21.71 | 61.98 | 1-1 | 21.71 | 1023 |
| 22.54 | 62.34 | 1-2 | 96 | 22.54 | 1020 |
| 22.57 | 62.35 | 1-1 | 22.57 | 1019 |
| 25.08 | 63.36 | 1-2 | 20 | 25.08 | 1016 |
| 25.11 | 63.37 | 1-1 | 25.11 | 1015 |
| [193] | 33.79 | 66.37 | 1-2 | 6 | -45 | 96 | 33.79 | coherent | 50 |
| 34.05 | 66.44 | 1-1 | 34.05 | 49 |
| 46.72 | 69.37 | 1-2 | 0 | 46.72 | 55 |
| 47.07 | 69.44 | 1-1 | 47.07 | 54 |
| [201] | 21.46 | 61.89 | -40 | 6 | 21.46 | non-coherent | 29 |
| 1-2 | 30 |
| 24.22 | 63.04 | 1-1 | 24.22 | 34 |
| 1-2 | 35 |
| [192] | 28.21 | 64.48 | 0.01 | 1-1 | 5.8 | 24 | -45 | 400 | 28.21 | coherent | 307 |
| 28.29 | 64.5 | 33 | 28.29 | 271 |
| 29.43 | 64.88 | 4.7 | 24 | 96 | 29.43 | 304 |
| 29.5 | 64.9 | 33 | 29.5 | 268 |
| 30.53 | 65.23 | 3 | 24 | 20 | 30.53 | 301 |
| 30.61 | 65.25 | 33 | 30.61 | 265 |
| 37.16 | 67.1 | 0.1 | 24 | 40.76 | 283 |
| 4.7 | 96 | 39.71 | 286 |
| 5.8 | 400 | 37.28 | 289 |
| 37.37 | 67.15 | 33 | 37.37 | 253 |
| 39.81 | 67.75 | 4.7 | 96 | 39.81 | 250 |
| 40.87 | 68 | 3 | 20 | 40.87 | 247 |
| [202] | 12.57 | 56.74 | 0.01 | 5.36 | -40 | 96 | 12.57 | non-coherent | 160 |
| 17.15 | 59.69 | 4.81 | 20 | 17.15 | 154 |
| 21.5 | 61.84 | 0.1 | 5.36 | 96 | 21.5 | 157 |
| 23.14 | 62.54 | 4.81 | 20 | 23.14 | 151 |
| [195] | 11.24 | 57.1 | 1-2 | 5.08 | 26 | 400 | 157 | 23.42 | 1058 |
| 5.49 | 96 | 22.72 | 1054 |
| 26.32 | 64.1 | 1-1 | 5.08 | 33 | 400 | 33.65 | 1057 |
| 5.49 | 96 | 32.67 | 1053 |
| [194] | 16.59 | 59.43 | 0.01 | 1-2 | 7 | -45 | 400 | 138 | 16.59 | coherent | 115 |
| 16.62 | 59.45 | 1-1 | 16.62 | 113 |
| 18.72 | 60.58 | 1-2 | 96 | 18.72 | 110 |
| 20 | 105 |
| 18.76 | 60.6 | 1-1 | 96 | 18.76 | 108 |
| 20 | 103 |
| 21.13 | 61.73 | 0.1 | 1-2 | 400 | 21.13 | 100 |
| 21.17 | 61.75 | 1-1 | 21.17 | 98 |
| 24.74 | 63.23 | 1-2 | 96 | 24.74 | 95 |
| 24.79 | 63.25 | 1-1 | 24.79 | 93 |
| 27.34 | 64.18 | 1-2 | 20 | 27.34 | 90 |
| 27.39 | 64.2 | 1-1 | 27.39 | 88 |
| [210] | 27.67 | 64.3 | 0.01 | 1-2 | 4.67 | 0 | 96 | 140 |  | 230 |
| Budget-Alt2 | -67.45 | 235 |
| 28.48 | 64.57 | 1-1 | Budget-Alt1 | -45 | 229 |
| Budget-Alt2 | -67.45 | 234 |
| [197] | 17.44 | 59.9 | 1-2 | Budget-Alt1 | 5 | -45 | 6 | 20 | 17.44 | non-coherent | 320 |
| 27.26 | 64.15 | 0.1 | 27.26 | 312 |
| [209] | 1.78 | 38.2 | 0.01 | 1-1 | 7 | -40 | 0 | 96 | 90 | 1.78 | coherent | 1230 |
| 1-2 | 1231 |
| 3.11 | 43.5 | 0.1 | 1-1 | 3.11 | 1270 |
| 1-2 | 1271 |
| 3.42 | 44.4 | 0.01 | 1-1 | 4.7 | 110 | 3.42 | 1235 |
| 1-2 | 1236 |
| 5.09 | 48.2 | 1-1 | 0.9 | 5.09 | 1215 |
| -45 | 1240 |
| 24 | -40 | 1245 |
| 38 | 1250 |
| 1-2 | 33 | 1216 |
| -45 | 1241 |
| 24 | -40 | 1246 |
| 38 | 1251 |
| 5.96 | 49.7 | 0.1 | 1-1 | 33 | 4.7 | 5.96 | 1275 |
| 1-2 | 1276 |
| 8.89 | 53.5 | 1-1 | 0.9 | 8.89 | 1255 |
| -45 | 1280 |
| 24 | -40 | 1285 |
| 38 | 1290 |
| 1-2 | 33 | 1256 |
| -45 | 1281 |
| 24 | -40 | 1286 |
| 38 | 1291 |
| 22.25 | 62.22 | 0.01 | 33 | 140 | 22.25 | 1226 |
| 24.35 | 63.08 | 1-1 | 24.35 | 1225 |
| 28.03 | 64.42 | 1-2 | 1000 | 28.03 | 1221 |
| 38.84 | 67.52 | 0.1 | 140 | 38.84 | 1266 |
| 41.28 | 68.1 | 0.01 | 1-1 | 1000 | 47.42 | 1220 |
| 0.1 | 140 | 42.51 | 1265 |
| 1000 | 82.79 | 1260 |
| 1-2 | 48.94 | 1261 |
| [185] | 9.2 | 53.82 | 0.01 | 1-1 | 7.5 | 6 | 140 | 9.2 | non-coherent | 810 |
| 15.57 | 58.82 | 0.1 | 15.57 | 809 |
| [190] | 19.78 | 61.1 | 0.01 | 6.43 | 24 | -45 | 0 | 62.19 | coherent | 829 |
| 53.96 | 831 |
| 47.3 | 1391 |
| 53.94 | 1393 |
| 6 | 32.57 | 833 |
| 23.63 | 1395 |
| 1-2 | 0 | 60.94 | 830 |
| 52.87 | 832 |
| 45.49 | 1392 |
| 51.88 | 1394 |
| 6 | 31.92 | 834 |
| 22.73 | 1396 |
| 22.73 | 62.42 | 33 | 1390 |
| 23.63 | 62.79 | 1-1 | 23.63 | 1389 |
| 31.92 | 65.65 | 1-2 | 31.92 | 828 |
| 32.57 | 65.85 | 1-1 | 32.57 | 827 |
| 45.49 | 69.02 | 1-2 | 0 | 45.49 | 1386 |
| 47.3 | 69.39 | 1-1 | 47.3 | 1385 |
| 51.88 | 70.27 | 1-2 | 51.88 | 1388 |
| 52.87 | 70.45 | 52.87 | 826 |
| 53.94 | 70.64 | 1-1 | 53.94 | 1387 |
| 53.96 | 70.65 | 53.96 | 825 |
| 60.94 | 71.8 | 1-2 | 60.94 | 824 |
| 62.19 | 72 | 1-1 | 62.19 | 823 |
| [213] | 20.82 | 62.03 | 1-2 | 6.99 | 24 | 6 | 400 |  | 899 |
| 22.82 | 62.83 | 5.77 | 96 | 889 |
| 23.52 | 63.1 | 3.41 | 20 | 939 |
| 3.87 | 879 |
| 0.1 | 3.41 | 934 |
| 3.87 | 874 |
| 5.77 | 96 | 884 |
| 6.99 | 400 | 894 |
| 27.78 | 64.59 | 0.01 | 1-1 | 33 | 898 |
| 30.35 | 65.39 | 5.77 | 96 | 888 |
| 33.31 | 66.24 | 3.87 | 20 | 878 |
| 34.61 | 66.59 | 0.1 | 6.99 | 400 | 893 |
| 41.15 | 68.19 | 5.77 | 96 | 883 |
| 41.37 | 68.24 | 0.01 | 3.41 | 20 | 938 |
| 45.82 | 69.19 | 0.1 | 3.87 | 873 |
| 56.14 | 71.09 | 3.41 | 933 |
| [212] | 15.12 | 58.55 | 0.01 | 1-2 | Budget Alt1 | 7 | 24 | -40 | 96 | 15.12 | non-coherent | 999 |
| 15.14 | 58.56 | 1-1 | 15.14 | 998 |
| 15.17 | 58.58 | 1-2 | 33 | 15.17 | 994 |
| 15.2 | 58.6 | 1-1 | 15.2 | 993 |
| 16.03 | 59.1 | 24 | 18.68 | coherent | 978 |
| 1-2 | 18.66 | 979 |
| 0.1 | 1-1 | 37.2 | 968 |
| 28.45 | non-coherent | 988 |
| 1-2 | 37.16 | coherent | 969 |
| 28.42 | non-coherent | 989 |
| 18.72 | 60.58 | 0.01 | 33 | 18.72 | coherent | 974 |
| 18.76 | 60.6 | 1-1 | 18.76 | 973 |
| 28.51 | 64.58 | 0.1 | 1-2 | 28.51 | non-coherent | 984 |
| 28.57 | 64.6 | 1-1 | 28.57 | 983 |
| 37.28 | 67.13 | 1-2 | 37.28 | coherent | 964 |
| 37.35 | 67.15 | 1-1 | 37.35 | 963 |
| [199] | 14.43 | 58.1 | 1-2 | Budget-Alt1 | 5.9 | 23 | 0 | 30.4 | 130 |
| [191] | 6.31 | 50.23 | 0.01 | 5 | 33 | -50 | 6 |  |  | non-coherent | 697 |
| 24 | 751 |
| 6.65 | 50.73 | 1-1 | 750 |
| 6.93 | 51.13 | 1-2 | 33 | 481 |
| 24 | 535 |
| 7.21 | 51.5 | 33 | 400 | 391 |
| 24 | 445 |
| 7.31 | 51.63 | 1-1 | 96 | 534 |
| 7.5 | 51.88 | 1-2 | 33 | 400 | 499 |
| 24 | 553 |
| 7.6 | 52 | 1-1 | 444 |
| 7.91 | 52.38 | 552 |
| 1-2 | 33 | 20 | 679 |
| 24 | 733 |
| 7.99 | 52.48 | 33 | 463 |
| 24 | 517 |
| 8.09 | 52.6 | 33 | 96 | 589 |
| 24 | 643 |
| 8.18 | 52.7 | 33 | 373 |
| 24 | 427 |
| 8.33 | 52.88 | 1-1 | 20 | 732 |
| 8.42 | 52.98 | 516 |
| 8.53 | 53.1 | 96 | 642 |
| 8.62 | 53.2 | 426 |
| 8.69 | 53.28 | 0.1 | 1-2 | 33 | 688 |
| 24 | 742 |
| 9.11 | 53.73 | 0.01 | 33 | 695 |
| 24 | 749 |
| 9.16 | 53.78 | 0.1 | 1-1 | 741 |
| 9.35 | 53.98 | 1-2 | 33 | 472 |
| 24 | 526 |
| 9.5 | 54.13 | 33 | 400 | 490 |
| 24 | 544 |
| 9.6 | 54.23 | 0.01 | 1-1 | 96 | 748 |
| 9.86 | 54.48 | 0.1 | 525 |
| 10.02 | 54.63 | 0.01 | 1-2 | 33 | 479 |
| 24 | 533 |
| 0.1 | 1-1 | 400 | 543 |
| 10.12 | 54.73 | 0.01 | 1-2 | 33 | 96 | 693 |
| 24 | 747 |
| 10.2 | 54.8 | 33 | 20 | 355 |
| 571 |
| 24 | -40 | 807 |
| -45 | 788 |
| -50 | 409 |
| 625 |
| 10.34 | 54.93 | 0.1 | 33 | 454 |
| 670 |
| 24 | 508 |
| 724 |
| 10.41 | 55 | 0.01 | 33 | 400 | 389 |
| 24 | 443 |
| 10.52 | 55.1 | 1-1 | -40 | 20 | 802 |
| 804 |
| 806 |
| 1-2 | 803 |
| 805 |
| 0.1 | 33 | -50 | 400 | 382 |
| 24 | 436 |
| 10.56 | 55.13 | 0.01 | 1-1 | 96 | 532 |
| 10.67 | 55.23 | 33 | 696 |
| 24 | 746 |
| 10.75 | 55.3 | -45 | 20 | 787 |
| -50 | 408 |
| 624 |
| 10.84 | 55.38 | 1-2 | 33 | 400 | 497 |
| 24 | 551 |
| 10.89 | 55.43 | 0.1 | 1-1 | 20 | 507 |
| 723 |
| 10.98 | 55.5 | 0.01 | 400 | 442 |
| 11.09 | 55.6 | 0.1 | 435 |
| 11.13 | 55.63 | 0.01 | 1-2 | 33 | 96 | 477 |
| 24 | 531 |
| 11.39 | 55.85 | 0.1 | 33 | 580 |
| 24 | 634 |
| 11.42 | 55.88 | 0.01 | 1-1 | 400 | 550 |
| 1-2 | 33 | 20 | 677 |
| 24 | 731 |
| 11.54 | 55.98 | 33 | 461 |
| 24 | 515 |
| 11.57 | 56 | 33 | 400 | 387 |
| 24 | 441 |
| 0.1 | 33 | 96 | 364 |
| 24 | 418 |
| 11.69 | 56.1 | 0.01 | 33 | 587 |
| 24 | 641 |
| 11.73 | 56.13 | 1-1 | 33 | 480 |
| 24 | 530 |
| 11.81 | 56.2 | 1-2 | 33 | 371 |
| 24 | 425 |
| 12 | 56.35 | 0.1 | 1-1 | 633 |
| 12.04 | 56.38 | 0.01 | 20 | 730 |
| 1-2 | 33 | 400 | 495 |
| 24 | 549 |
| 12.17 | 56.48 | 1-1 | 20 | 514 |
| 12.19 | 56.5 | 33 | 400 | 390 |
| 24 | 440 |
| 0.1 | 96 | 417 |
| 12.32 | 56.6 | 0.01 | 640 |
| 12.45 | 56.7 | 424 |
| 12.56 | 56.78 | 0.1 | 1-2 | 33 | 686 |
| 24 | 740 |
| 12.69 | 56.88 | 0.01 | 1-1 | 33 | 400 | 498 |
| 24 | 548 |
| 1-2 | 33 | 20 | 675 |
| 24 | 729 |
| 12.82 | 56.98 | 33 | 459 |
| 24 | 513 |
| 12.99 | 57.1 | 33 | 96 | 585 |
| 24 | 639 |
| 13.12 | 57.2 | 33 | 369 |
| 24 | 423 |
| 0.1 | 33 | -40 | 20 | 798 |
| -45 | 779 |
| -50 | 346 |
| 562 |
| 24 | 400 |
| 616 |
| 13.23 | 57.28 | 1-1 | 96 | 739 |
| 13.37 | 57.38 | 0.01 | 33 | 20 | 678 |
| 24 | 728 |
| 13.51 | 57.48 | 33 | 462 |
| 24 | 512 |
| 0.1 | 1-2 | 33 | 96 | 470 |
| 24 | 524 |
| 13.69 | 57.6 | 0.01 | 1-1 | 33 | 588 |
| 24 | 638 |
| 13.73 | 57.63 | 0.1 | 1-2 | 33 | 400 | 488 |
| 24 | 542 |
| 13.83 | 57.7 | 0.01 | 1-1 | 33 | 96 | 372 |
| 24 | 422 |
| 0.1 | 20 | 399 |
| 615 |
| 13.95 | 57.78 | 1-2 | 33 | 96 | 684 |
| 24 | 738 |
| 14.24 | 57.98 | 1-1 | 523 |
| 14.47 | 58.13 | 400 | 541 |
| 14.7 | 58.28 | 33 | 96 | 687 |
| 24 | 737 |
| 14.73 | 58.3 | 0.01 | 1-2 | 33 | 20 | 353 |
| 569 |
| 24 | -45 | 786 |
| -50 | 407 |
| 623 |
| 14.93 | 58.43 | 0.1 | 33 | 452 |
| 668 |
| 24 | 506 |
| 722 |
| 15.01 | 58.48 | 33 | 96 | 468 |
| 24 | 522 |
| 15.2 | 58.6 | 33 | 400 | 380 |
| 24 | 434 |
| 15.25 | 58.63 | 33 | 486 |
| 24 | 540 |
| 15.41 | 58.73 | 0.01 | 1-1 | 33 | 96 | 694 |
| 15.53 | 58.8 | 24 | -45 | 20 | 785 |
| -50 | 406 |
| 622 |
| 15.74 | 58.93 | 0.1 | 505 |
| 721 |
| 15.82 | 58.98 | 33 | 96 | 471 |
| 24 | 521 |
| 16.03 | 59.1 | 400 | 433 |
| 16.08 | 59.13 | 33 | 489 |
| 24 | 539 |
| 16.37 | 59.3 | 0.01 | 1-2 | 33 | 20 | 351 |
| 567 |
| 24 | -45 | 784 |
| -50 | 405 |
| 621 |
| 16.45 | 59.35 | 0.1 | 33 | 96 | 578 |
| 24 | 632 |
| 16.59 | 59.43 | 33 | 20 | 450 |
| 666 |
| 24 | 504 |
| 720 |
| 16.71 | 59.5 | 33 | 96 | 362 |
| 24 | 416 |
| 16.89 | 59.6 | 33 | 400 | 378 |
| 24 | 432 |
| 16.94 | 59.63 | 0.01 | 1-1 | 33 | 96 | 478 |
| 17.12 | 59.73 | 692 |
| 17.25 | 59.8 | 20 | 354 |
| 570 |
| 24 | -45 | 783 |
| -50 | 404 |
| 620 |
| 17.34 | 59.85 | 0.1 | 96 | 631 |
| 17.49 | 59.93 | 33 | 20 | 453 |
| 669 |
| 24 | 503 |
| 719 |
| 17.62 | 60 | 0.01 | 33 | 400 | 388 |
| 0.1 | 24 | 96 | 415 |
| 17.8 | 60.1 | 33 | 400 | 381 |
| 24 | 431 |
| 18.28 | 60.35 | 1-2 | 33 | 96 | 576 |
| 24 | 630 |
| 18.33 | 60.38 | 0.01 | 1-1 | 33 | 400 | 496 |
| 18.57 | 60.5 | 0.1 | 1-2 | 96 | 360 |
| 24 | 414 |
| 18.82 | 60.63 | 0.01 | 1-1 | 33 | 476 |
| 18.96 | 60.7 | 0.1 | 1-2 | -40 | 20 | 796 |
| -45 | 777 |
| -50 | 344 |
| 560 |
| 24 | 398 |
| 614 |
| 19.26 | 60.85 | 1-1 | 33 | 96 | 579 |
| 24 | 629 |
| 19.32 | 60.88 | 0.01 | 33 | 20 | 676 |
| 19.53 | 60.98 | 460 |
| 19.57 | 61 | 400 | 386 |
| 0.1 | 96 | 363 |
| 24 | 413 |
| 19.78 | 61.1 | 0.01 | 33 | 586 |
| 19.98 | 61.2 | 370 |
| 0.1 | 24 | 20 | 397 |
| 613 |
| 20.37 | 61.38 | 0.01 | 33 | 400 | 494 |
| 21.06 | 61.7 | 0.1 | 1-2 | -40 | 20 | 794 |
| -45 | 775 |
| -50 | 342 |
| 558 |
| 24 | 396 |
| 612 |
| 21.24 | 61.78 | 1-1 | 33 | 96 | 685 |
| 21.46 | 61.88 | 0.01 | 20 | 674 |
| 21.69 | 61.98 | 458 |
| 21.97 | 62.1 | 96 | 584 |
| 22.2 | 62.2 | 368 |
| 0.1 | -40 | 20 | 797 |
| -45 | 778 |
| -50 | 345 |
| 561 |
| 24 | 395 |
| 611 |
| 22.86 | 62.48 | 33 | 96 | 469 |
| 23.23 | 62.63 | 400 | 487 |
| 23.6 | 62.78 | 96 | 683 |
| 24.92 | 63.3 | 0.01 | 20 | 352 |
| 568 |
| 25.26 | 63.43 | 0.1 | 451 |
| 667 |
| 25.4 | 63.48 | 96 | 467 |
| 25.72 | 63.6 | 400 | 379 |
| 25.8 | 63.63 | 485 |
| 27.11 | 64.1 | -40 | 20 | 793 |
| 795 |
| 27.68 | 64.3 | 0.01 | -50 | 350 |
| 566 |
| 27.83 | 64.35 | 0.1 | 96 | 577 |
| 28.06 | 64.43 | 20 | 449 |
| 665 |
| 28.27 | 64.5 | 96 | 361 |
| 28.57 | 64.6 | 400 | 377 |
| 30.92 | 65.35 | 96 | 575 |
| 31.41 | 65.5 | 359 |
| 32.08 | 65.7 | -45 | 20 | 776 |
| -50 | 343 |
| 559 |
| 35.63 | 66.7 | -45 | 774 |
| -50 | 341 |
| 557 |
|  |  | 0.01 | 400 | 602 |
| 604 |
| 606 |
| 710 |
| 712 |
| 714 |
| 24 | 656 |
| 658 |
| 660 |
| 764 |
| 766 |
| 768 |
| 1-2 | 33 | 603 |
| 605 |
| 607 |
| 711 |
| 713 |
| 715 |
| 24 | 657 |
| 659 |
| 661 |
| 765 |
| 767 |
| 769 |
| 0.1 | 1-1 | 33 | 593 |
| 597 |
| 595 |
| 701 |
| 703 |
| 705 |
| 24 | 647 |
| 649 |
| 651 |
| 755 |
| 757 |
| 759 |
| 1-2 | 33 | 598 |
| 594 |
| 596 |
| 702 |
| 704 |
| 706 |
| 24 | 648 |
| 650 |
| 652 |
| 756 |
| 758 |
| 760 |
| [207] | 10.52 | 55.1 | 0.01 | 1-1 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 60.84 | 191 |
| 1-2 | 60.71 | 193 |
| 0.1 | 1-1 | 63.49 | 201 |
| 1-2 | 63.35 | 203 |
| 18.98 | 60.71 | 0.01 | 33 | 60.71 | 192 |
| 20.9 | 61.63 | 1-1 | 61.63 | 190 |
| 25.06 | 63.35 | 0.1 | 1-2 | 63.35 | 202 |
| 27.11 | 64.1 | 1-1 | 64.27 | 200 |
| [211] | 11.81 | 56.19 | 0.01 | Budget-Alt1 | 6.4 | 11.81 | 1060 |
| 14.4 | 58.1 | 5.7 | 23 | 400 | 16.11 | 1068 |
| 0.1 | 20.19 | 1067 |
| 16.88 | 59.59 | 6.4 | 33 | 96 | 16.88 | 1059 |
| 27.09 | 64.09 | 0.01 | 27.09 | 1062 |
| 30.9 | 65.34 | 0.1 | 30.9 | 1061 |
| [200] | 7.15 | 58.37 | 0.01 | 1-2 | 7.5 | -45 | 400 | 7.15 | 2000 | 1186 |
| 1188 |
| 7.48 | 58.79 | 96 | 7.48 | 1184 |
| 1182 |
| 7.53 | 58.85 | 1-1 | 400 | 7.53 | 1176 |
| 1174 |
| 7.73 | 59.1 | 0.1 | 1-2 | 7.73 | 1185 |
| 1187 |
| 7.83 | 59.22 | 0.01 | 20 | 7.83 | 1180 |
| 1178 |
| 7.87 | 59.27 | 1-1 | 96 | 7.87 | 1170 |
| 1172 |
| 8.12 | 59.57 | 0.1 | 1-2 | 8.12 | 1181 |
| 1183 |
| 8.13 | 59.58 | 1-1 | 400 | 8.13 | 1173 |
| 1175 |
| 8.24 | 59.7 | 0.01 | 20 | 8.24 | 1168 |
| 1166 |
| 8.54 | 60.05 | 0.1 | 96 | 8.54 | 1169 |
| 1171 |
| 8.78 | 60.31 | 1-2 | 20 | 8.78 | 1177 |
| 1179 |
| 9.24 | 60.79 | 1-1 | 9.24 | 1167 |
| 1165 |
| 14.83 | 58.37 | 0.01 | 1-2 | 400 | 14.83 | 900 | 1126 |
| 1128 |
| 15.5 | 58.79 | 96 | 15.5 | 1122 |
| 1124 |
| 15.61 | 58.85 | 1-1 | 400 | 15.61 | 1114 |
| 1116 |
| 16.03 | 59.1 | 0.1 | 1-2 | 16.03 | 1125 |
| 1127 |
| 16.25 | 59.23 | 0.01 | 20 | 16.25 | 1118 |
| 1120 |
| 16.31 | 59.27 | 1-1 | 96 | 16.31 | 1110 |
| 1112 |
| 16.85 | 59.58 | 0.1 | 1-2 | 16.85 | 1121 |
| 1123 |
| 16.86 | 1-1 | 400 | 16.86 | 1113 |
| 1115 |
| 17.09 | 59.71 | 0.01 | 20 | 17.09 | 1106 |
| 1108 |
| 17.73 | 60.06 | 0.1 | 96 | 17.73 | 1109 |
| 1111 |
| 18.2 | 60.31 | 1-2 | 20 | 18.2 | 1117 |
| 1119 |
| 19.15 | 60.79 | 1-1 | 19.15 | 1105 |
| 1107 |
| [214] | 2.52 | 41.49 | 0.01 | 1-4 | Budget-Alt2 | 5 | 23 | -25.39 | 130 | 10.52 | 184 |
| 120 | 6.22 | 183 |
| 2.79 | 42.49 | 1-1 | 24 | 130 | 10.52 | 180 |
| 120 | 6.22 | 179 |
| 6.22 | 50.1 | 33 | 175 |
| 6.91 | 51.1 | 0.1 | -37.62 | 6.91 | 163 |
| 24 | 167 |
| 1-4 | 23 | 171 |
| 7.2 | 51.49 | 0.01 | 1-1 | 33 | -25.39 | 130 | 10.52 | 176 |
| 9.1 | 53.72 | 0.1 | 1-4 | 23 | -37.62 | 11.68 | 172 |
| 10.11 | 54.72 | 1-1 | 24 | 168 |
| 11.69 | 56.1 | 33 | 11.69 | 164 |
| [205] | 20.75 | 62 | 1-2 | Budget-Alt1 | 6.86 | -40 | 96 | 140 | 20.75 | 1041 |
| 20.92 | 62.07 | 1-1 | 20.92 | 1040 |
| [196] | 33 | 65.9 | 6.4 | -45 |  | 6(OOK) | 33 | 1205 |
| 34.2 | 66.21 | 6 | 34.2 | 1208 |
| 6.6 | 400 | 1211 |
| 37 | 67.05 | 5 | 20 | 37 | 1202 |
| D1T1-B | [215] | 56.59 | 71.1 | 1-4 | -40 | 0.9 | 6 | 96 | 1000 | 10 | 1028 |
| 20 | 1026 |
| 400 | 1030 |
| [193] | 95.51 | 76.1 | 6 | -45 | 0 | 96 | coherent | 56 |
| 6 | 51 |
| [201] | 34.62 | 66.44 | -40 | 150 | 34.62 | non-coherent | 31 |
| 39.07 | 67.59 | 39.07 | 36 |
| [192] | 34.08 | 66.28 | 0.01 | 5.8 | -45 | 400 | 160 | 34.08 | coherent | 272 |
| 35.54 | 66.68 | 4.7 | 96 | 35.54 | 269 |
| 36.87 | 67.03 | 3 | 20 | 36.87 | 266 |
| 37.16 | 67.1 | 24 | 54.78 | 302 |
| 4.7 | 96 | 52.8 | 305 |
| 5.8 | 400 | 50.62 | 308 |
| 0.1 | 3 | 20 | 73.14 | 284 |
| 4.7 | 96 | 71.24 | 287 |
| 5.8 | 400 | 66.89 | 290 |
| 45.03 | 68.93 | 33 | 45.03 | 254 |
| 47.96 | 69.53 | 4.7 | 96 | 47.96 | 251 |
| 49.24 | 69.78 | 3 | 20 | 49.24 | 248 |
| [202] | 17.9 | 56.34 | 0.01 | 5.36 | -40 | 96 | 150 | 17.9 | non-coherent | 161 |
| 24.41 | 59.29 | 4.81 | 20 | 24.41 | 155 |
| 30.6 | 61.44 | 0.1 | 5.36 | 96 | 30.6 | 158 |
| 32.94 | 62.14 | 4.81 | 20 | 32.94 | 152 |
| [194] | 69.15 | 73.01 | 0.01 | 7 | -45 | 400 | 155 | 20 | coherent | 116 |
| 77.58 | 74.1 | 96 | 111 |
| 20 | 106 |
| 0.1 | 96 | 96 |
| 20 | 91 |
| 400 | 101 |
| [210] | 45.86 | 69.1 | 0.01 | 4.67 | 0 | 96 | 1000 | 231 |
| 97.07 | 76.23 | Budget-Alt2 | -67.45 | 236 |
| [209] | 2.59 | 41.78 | Budget-Alt1 | 7 | -40 | 110 | 10 | 1232 |
| 7.9 | 52.38 | 0.1 | 1272 |
| 8.71 | 53.3 | 0.01 | 4.7 | 130 | 1237 |
| 16.03 | 59.1 | 24 | 0.9 | 1247 |
| 0.1 | 1287 |
| 19.36 | 60.9 | 0.01 | 33 | 1217 |
| -45 | 1242 |
| 20.23 | 61.32 | 38 | -40 | 1252 |
| 26.53 | 63.9 | 0.1 | 33 | 4.7 | 1277 |
| 41.28 | 68.1 | 0.01 | 0.9 | 1000 | 1222 |
| 160 | 1227 |
| 0.1 | 1000 | 1262 |
| 130 | 1257 |
| 160 | 1267 |
| 59 | 71.5 | -45 | 130 | 1282 |
| 61.67 | 71.92 | 38 | -40 | 1292 |
| [190] | 19.78 | 61.1 | 0.01 | 6.43 | 24 | -45 | 150 | 20 | 838 |
| 839 |
| 1400 |
| 1401 |
| 6 | 840 |
| 1402 |
| 49.25 | 69.78 | 33 | 1399 |
| 77.58 | 74.1 | 0 | 1397 |
| 1398 |
| 835 |
| 836 |
| 6 | 837 |
| [213] | 23.52 | 63.1 | 3.41 | 24 | 20 | 5 | 940 |
| 3.87 | 880 |
| 5.77 | 96 | 890 |
| 6.99 | 400 | 900 |
| 0.1 | 3.41 | 20 | 935 |
| 3.87 | 875 |
| 5.77 | 96 | 885 |
| 6.99 | 400 | 895 |
| [212] | 16.03 | 59.1 | 0.01 | Budget Alt1 | 7 | -40 | 96 | 140 | 10 | 980 |
| non-coherent | 1000 |
| 0.1 | coherent | 970 |
| non-coherent | 990 |
| 46.04 | 69.14 | 0.01 | 33 | 5 | 995 |
| 50.94 | 70.1 | coherent | 975 |
| 0.1 | 965 |
| non-coherent | 985 |
| [199] | 14.43 | 58.1 | Budget-Alt1 | 5.9 | 23 | 0 | coherent | 131 |
| [191] | 10.52 | 55.1 | 0.01 | 5 | 24 | 6 | 20 |  | 10 | non-coherent | 808 |
| 11.38 | 55.84 | 33 | -50 | 96 | 698 |
| 24 | 752 |
| 13.75 | 57.64 | 33 | 482 |
| 24 | 536 |
| 14.86 | 58.39 | 33 | 400 | 392 |
| 24 | 446 |
| 16.1 | 59.14 | 33 | 500 |
| 24 | 554 |
| 17.8 | 60.1 | -45 | 20 | 789 |
| 17.89 | 60.14 | 33 | -50 | 680 |
| 24 | 734 |
| 18.27 | 60.34 | 33 | 464 |
| 24 | 518 |
| 18.73 | 60.59 | 33 | 96 | 590 |
| 24 | 644 |
| 19.13 | 60.79 | 33 | 374 |
| 24 | 428 |
| 21.61 | 61.94 | 0.1 | 33 | 689 |
| 24 | 743 |
| 25.04 | 63.34 | 33 | 473 |
| 24 | 527 |
| 25.84 | 63.64 | 33 | 400 | 491 |
| 24 | 545 |
| 27.11 | 64.1 | 33 | -40 | 20 | 799 |
| 29.75 | 64.99 | 0.01 | -50 | 356 |
| 572 |
| 24 | 410 |
| 626 |
| 30.11 | 65.1 | 0.1 | 96 | 419 |
| 635 |
| 20 | 401 |
| 509 |
| 617 |
| 725 |
| 400 | 437 |
| 30.58 | 65.24 | 33 | 20 | 455 |
| 671 |
| 31.69 | 65.59 | 400 | 383 |
| 37.1 | 67.09 | 96 | 581 |
| 38.29 | 67.39 | 365 |
| 45.86 | 69.1 | -45 | 20 | 780 |
| 49.28 | 69.79 | -50 | 347 |
| 563 |
|  |  | 0.01 | 400 | 608 |
| 716 |
| 24 | 662 |
| 770 |
| 0.1 | 33 | 599 |
| 707 |
| 24 | 653 |
| 761 |
| [207] | 10.52 | 55.1 | 0.01 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 5 | 195 |
| 0.1 | 205 |
| 20.64 | 61.51 | 0.01 | 33 | 194 |
| 27.11 | 64.1 | 0.1 | 204 |
| [211] | 9.5 | 54.1 | 0.01 | Budget-Alt1 | 5.7 | 23 | 400 | 24.33 | 1070 |
| 0.1 | 39.05 | 1069 |
| 16 | 59.1 | 0.01 | 5.5 | 26 | 20 | 45.14 | 1078 |
| 20.73 | 1080 |
| 0.1 | 78.81 | 1077 |
| 36.97 | 1079 |
| [200] | 10.09 | 61.63 | 0.01 | 7.5 | 33 | -45 | 400 |  | 10 | 2000 | 1198 |
| 1200 |
| 10.54 | 62.05 | 96 | 1194 |
| 1196 |
| 10.9 | 62.37 | 0.1 | 400 | 1197 |
| 1199 |
| 11.04 | 62.49 | 0.01 | 20 | 1190 |
| 1192 |
| 11.45 | 62.84 | 0.1 | 96 | 1193 |
| 1195 |
| 12.38 | 63.58 | 20 | 1189 |
| 1191 |
| 20.92 | 61.63 | 0.01 | 400 | 900 | 1138 |
| 1140 |
| 21.86 | 62.05 | 96 | 1134 |
| 1136 |
| 22.6 | 62.37 | 0.1 | 400 | 1137 |
| 1139 |
| 22.91 | 62.5 | 0.01 | 20 | 1130 |
| 1132 |
| 23.75 | 62.84 | 0.1 | 96 | 1133 |
| 1135 |
| 25.66 | 63.58 | 20 | 1129 |
| 1131 |
| [214] | 2.52 | 41.49 | 0.01 | Budget-Alt2 | 5 | 23 | -25.39 | 140 | 20 | 185 |
| 2.79 | 42.49 | 1-1 | 24 | 181 |
| 7.2 | 51.49 | 33 | 177 |
| 9.1 | 53.72 | 0.1 | 1-4 | 23 | -37.62 | 173 |
| 10.11 | 54.72 | 1-1 | 24 | 169 |
| 18.58 | 60.5 | 33 | 165 |
| [205] | 56.22 | 71.1 | 1-4 | Budget-Alt1 | 6.86 | -40 | 96 | 1000 | 10 | 1042 |
| [196] | 105 | 77 | 6 | -45 |  | 6(OOK) | 5 | 1209 |
| 5 | 20 | 1203 |
| 6.4 | 96 | 1206 |
| 6.6 | 400 | 1212 |

Figure 7.1.1.2.1.2-1



###### 7.1.1.2.1.3 other data rate

7.1.1.2.1.3.1 [48 - 60 kbps]

Table 7.1.1.2.1.3.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 2a, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [197] | 13.57 | 57.52 | 0.01 | 1-1 | Budget-Alt1 | 55 | 33 | -45 | 0.9 | 6 | 96 | 140 | 13.57 | non-coherent | 900 | 323 |
| 17.09 | 59.71 | 1-2 |  | 17.09 | 322 |
| 21.78 | 62.02 | 0.1 | 1-1 | 140 | 21.78 | 315 |
| 27.42 | 64.21 | 1-2 |  | 27.42 | 314 |
| 28.9 | 64.71 | 0.01 | 1-1 | 28.9 | 321 |
| 46.39 | 69.21 | 0.1 | 46.39 | 313 |
| [199] | 13.12 | 57.2 | 1-2 | 44.8 | 23 | -40 | 1000 | 13.12 | 117 |
| 22.2 | 62.2 | 1-1 | 33 | 22.2 | 120 |
| [207] | 10.52 | 55.1 | 0.01 | Budget-Alt-1 | 56 | 24 | 140 | 58.36 | 207 |
| 1-2 | 58.23 | 209 |
| 0.1 | 1-1 | 61.1 | 217 |
| 1-2 | 60.96 | 219 |
| 14.62 | 58.23 | 0.01 | 33 | 58.23 | 208 |
| 16.11 | 59.15 | 1-1 | 59.15 | 206 |
| 19.49 | 60.96 | 0.1 | 1-2 | 60.96 | 218 |
| 21.47 | 61.88 | 1-1 | 61.88 | 216 |
| D1T1-A2 | [197] | 12.72 | 56.9 | 0.01 | 1-2 | Budget-Alt1 | 55 | -45 | 12.72 | 324 |
| 20.42 | 61.4 | 0.1 | 20.42 | 316 |
| [199] | 13.12 | 57.2 | 44.8 | 23 | -40 | 1000 | 13.12 | 118 |
| 22.2 | 62.2 | 1-1 | 33 | 22.2 | 121 |
| [207] | 10.52 | 55.1 | 0.01 | Budget-Alt-1 | 56 | 24 | 140 | 58.36 | 211 |
| 1-2 | 58.23 | 213 |
| 0.1 | 1-1 | 61.1 | 221 |
| 1-2 | 60.96 | 223 |
| 14.62 | 58.23 | 0.01 | 33 | 58.23 | 212 |
| 16.11 | 59.15 | 1-1 | 59.15 | 210 |
| 19.49 | 60.96 | 0.1 | 1-2 | 60.96 | 222 |
| 21.47 | 61.88 | 1-1 | 61.88 | 220 |
| D1T1-B | [199] | 14.43 | 58.1 | 1-4 | Budget-Alt1 | 44.8 | 23 | 1000 | 5 | 119 |
| 34.44 | 66.38 | 33 | 122 |
| [207] | 10.52 | 55.1 | 0.01 | Budget-Alt-1 | 56 | 24 | 140 | 215 |
| 0.1 | 225 |
| 15.9 | 59.03 | 0.01 | 33 | 214 |
| 21.2 | 61.76 | 0.1 | 224 |

Figure 7.1.1.2.1.3.1-1



7.1.1.2.1.3.2 others

Table 7.1.1.2.1.3.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 2a, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-A1 | [199] | 14.43 | 58.1 | 0.1 | 1-2 | Budget-Alt1 | 15.6 | 23 | -40 | 0.9 | 6 | 96 | 140 | 16.44 | non-coherent | 900 | 123 |
| 84 | 0 | 16.09 | coherent | 126 |
| D1T1-A2 | [185] | 8.28 | 52.82 | 0.01 | 1-1 | 15 | 33 | 6 | 8.28 | non-coherent | 1032 |
| 14.31 | 58.02 | 0.1 | 14.31 | 1031 |
| [199] | 14.43 | 58.1 | 1-2 | 15.6 | 23 | 16.44 | 124 |
| 84 | 0 | 16.09 | coherent | 127 |
| D1T1-B | 1-4 | 15.6 | 6 | 5 | non-coherent | 125 |
| 84 | 0 | coherent | 128 |

Figure 7.1.1.2.1.3.2-1



##### 7.1.1.2.2 Observations

For Device 2a and D1T1, it is observed that the maximum achievable coverage is as follows,

Note the following assumptions are made for the observations (per agreed mandatory assumptions)

- R2D Tx Power (R2D[1E]): 23 or 24 or 33 dBm (M)

- Number of receive antenna elements / TxRU / chains (D2R[2A]): 2 (M)

- Reference data rate ([0m]): 1 kbps (M) or 5 - 7 kbps (M)

- Carrier frequency ([0C]): 900MHz (M)

- Topology/Pathloss model ([0D]): InF-DH NLOS

- R2D Budget-Alt1, D2R Budget-Alt2

Table 7.1.1.2.2

|  |  |  |  |
| --- | --- | --- | --- |
| Device 2a | D1T1-A1 | D1T1-A2 | D1T1-B |
| R2D Tx power 33dBm, R2D Rx sensitivity <= -45dBm | [37.55 ~ 95.51] meters. (13: [197]:69.83, [193]:95.51, [200]:43.41, [191]:37.55, [192]:62.86, [203]:45.66, [210]:45.86, [190]:77.58, [209]:66.46, [194]:66.25, [196]:62, [198]:77.58, [213]:94.25) | [13.9 ~ 77.58] meters. (13: [197]:31.09, [193]:47.07, [200]:19.15, [191]:35.63, [192]:40.87, [203]:26.73, [210]:28.48, [190]:77.58, [209]:13.9, [194]:27.39, [196]:37, [198]:67.1, [213]:56.14) | [25.66 ~ 105] meters. (11: [193]:95.51, [200]:25.66, [191]:49.28, [192]:62.86, [203]:62.53, [210]:45.86, [190]:77.58, [209]:69.83, [194]:77.58, [196]:105, [198]:77.58) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity <= -45dBm | [19.78 ~ 37.16] meters. (6: [191]:23.4, [192]:37.16, [203]:36.59, [190]:19.78, [198]:27.11, [213]:23.52) | [19.78 ~ 37.16] meters. (6: [191]:22.2, [192]:37.16, [203]:26.73, [190]:19.78, [198]:27.11, [213]:23.52) | [19.78 ~ 37.16] meters. (6: [191]:30.11, [192]:37.16, [203]:36.59, [190]:19.78, [198]:27.11, [213]:23.52) |
| R2D Tx power 33dBm, R2D Rx sensitivity >=-40dBm | [26.32 ~ 56.59] meters. (10: [215]:56.59, [207]:27.11, [191]:27.11, [201]:45.09, [205]:56.22, [212]:37.35, [211]:41.3, [202]:41.28, [209]:41.28, [195]:26.32) | [23.88 ~ 41.28] meters. (10: [215]:26.7, [207]:27.11, [191]:27.11, [201]:26.91, [205]:23.88, [212]:37.35, [211]:30.9, [202]:32.56, [209]:41.28, [195]:26.32) | [27.11 ~ 56.59] meters. (8: [215]:56.59, [207]:27.11, [191]:27.11, [201]:43.4, [205]:56.22, [212]:50.94, [202]:41.28, [209]:41.28) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity >= -40dBm | [10.52 ~ 16.03] meters. (5: [199]:14.43, [207]:10.52, [191]:10.52, [212]:16.03, [209]:16.03) | [10.52 ~ 16.03] meters. (6: [199]:14.43, [207]:10.52, [191]:10.52, [212]:16.03, [211]:14.4, [209]:13.9) | [9.5 ~ 16.03] meters. (6: [199]:14.43, [207]:10.52, [191]:10.52, [212]:16.03, [211]:9.5, [209]:16.03) |
| D2R BLER 10% and data rate ~1kbps | [26.32 ~ 95.51] meters. (11: [197]:69.83, [215]:56.59, [193]:95.51, [192]:62.86, [205]:56.22, [211]:41.3, [202]:41.28, [209]:66.46, [198]:77.58, [213]:82.7, [195]:26.32) | [23.88 ~ 67.1] meters. (11: [197]:31.09, [215]:26.7, [193]:46.05, [192]:39.33, [205]:23.88, [211]:26.81, [202]:32.56, [209]:41.28, [198]:67.1, [213]:48.66, [195]:26.32) | [23.52 ~ 95.51] meters. (8: [215]:56.59, [193]:95.51, [192]:62.86, [205]:56.22, [202]:41.28, [209]:69.83, [198]:77.58, [213]:23.52) |
| D2R BLER 10% and data rate 5~7kbps | [14.43 ~ 95.51] meters. (18: [197]:61.94, [199]:14.43, [215]:56.59, [193]:95.51, [200]:43.41, [207]:27.11, [191]:37.55, [201]:35.97, [192]:62.86, [205]:56.22, [212]:37.35, [211]:38.05, [202]:38.92, [209]:42.51, [194]:66.25, [196]:62, [213]:94.25, [195]:26.32) | [14.43 ~ 56.14] meters. (18: [197]:27.26, [199]:14.43, [215]:25.11, [193]:47.07, [200]:19.15, [207]:27.11, [191]:35.63, [201]:21.46, [192]:40.87, [205]:20.92, [212]:37.35, [211]:30.9, [202]:23.14, [209]:41.28, [194]:27.39, [196]:37, [213]:56.14, [195]:26.32) | [9.5 ~ 105] meters. (16: [199]:14.43, [215]:56.59, [193]:95.51, [200]:25.66, [207]:27.11, [191]:49.28, [201]:34.62, [192]:49.24, [205]:56.22, [212]:50.94, [211]:9.5, [202]:32.94, [209]:59, [194]:77.58, [196]:105, [213]:23.52) |
| D2R BLER 1% and data rate ~1kbps | [41.28 ~ 77.58] meters. (9: [197]:45.19, [201]:45.09, [192]:62.86, [203]:45.66, [211]:41.3, [190]:77.58, [202]:41.28, [209]:41.28, [213]:62.44) | [19.89 ~ 77.58] meters. (9: [197]:19.89, [201]:26.91, [192]:29, [203]:26.73, [211]:21.84, [190]:77.58, [202]:30.09, [209]:41.28, [213]:36.58) | [23.52 ~ 77.58] meters. (7: [201]:43.4, [192]:56.23, [203]:62.53, [190]:77.58, [202]:41.28, [209]:47.31, [213]:23.52) |
| D2R BLER 1% and data rate 5~7kbps | [18.76 ~ 77.58] meters. (13: [197]:39.62, [200]:38.75, [207]:20.9, [191]:29.18, [192]:59.9, [212]:18.76, [211]:26.61, [210]:45.86, [190]:77.58, [202]:28.84, [209]:41.28, [194]:45.38, [213]:69.71) | [17.09 ~ 62.19] meters. (13: [197]:17.44, [200]:17.09, [207]:20.9, [191]:27.68, [192]:30.61, [212]:18.76, [211]:27.09, [210]:28.48, [190]:62.19, [202]:17.15, [209]:41.28, [194]:18.76, [213]:41.37) | [9.5 ~ 77.58] meters. (12: [200]:22.91, [207]:20.64, [191]:29.75, [192]:37.16, [212]:50.94, [211]:9.5, [210]:45.86, [190]:77.58, [202]:24.41, [209]:41.28, [194]:77.58, [213]:23.52) |
| D2R coherent receiver | [14.43 ~ 95.51] meters. (11: [199]:14.43, [193]:95.51, [192]:62.86, [203]:45.66, [212]:37.35, [210]:45.86, [190]:77.58, [209]:66.46, [194]:66.25, [198]:77.58, [213]:94.25) | [14.43 ~ 77.58] meters. (11: [199]:14.43, [193]:47.07, [192]:40.87, [203]:26.73, [212]:37.35, [210]:28.48, [190]:77.58, [209]:41.28, [194]:27.39, [198]:67.1, [213]:56.14) | [14.43 ~ 95.51] meters. (11: [199]:14.43, [193]:95.51, [192]:62.86, [203]:62.53, [212]:50.94, [210]:45.86, [190]:77.58, [209]:69.83, [194]:77.58, [198]:77.58, [213]:23.52) |
| D2R non-coherent receiver | [26.32 ~ 69.83] meters. (12: [197]:69.83, [215]:56.59, [200]:43.41, [207]:27.11, [191]:37.55, [201]:45.09, [205]:56.22, [212]:28.57, [211]:41.3, [202]:41.28, [196]:62, [195]:26.32) | [19.15 ~ 37] meters. (12: [197]:31.09, [215]:26.7, [200]:19.15, [207]:27.11, [191]:35.63, [201]:26.91, [205]:23.88, [212]:28.57, [211]:30.9, [202]:32.56, [196]:37, [195]:26.32) | [9.5 ~ 105] meters. (10: [215]:56.59, [200]:25.66, [207]:27.11, [191]:49.28, [201]:43.4, [205]:56.22, [212]:50.94, [211]:9.5, [202]:41.28, [196]:105) |
| CW cancellation capability < 130dB | [23.52 ~ 23.52] meters. (1: [209]:23.52) | [13.9 ~ 13.9] meters. (1: [209]:13.9) | [19.31 ~ 19.31] meters. (1: [209]:19.31) |
| CW cancellation capability >=130dB and < 140dB | [NaN ~ NaN] meters. (0: ) | [27.39 ~ 27.39] meters. (1: [194]:27.39) | [69.83 ~ 69.83] meters. (1: [209]:69.83) |
| CW cancellation capability >=140dB and < 150dB | [14.43 ~ 66.46] meters. (5: [197]:33.17, [199]:14.43, [207]:27.11, [212]:37.35, [209]:66.46) | [14.43 ~ 77.58] meters. (20: [197]:31.09, [199]:14.43, [215]:26.7, [193]:47.07, [200]:19.15, [207]:27.11, [201]:26.91, [192]:40.87, [203]:26.73, [205]:23.88, [212]:37.35, [211]:30.9, [210]:28.48, [190]:77.58, [202]:32.56, [209]:41.28, [196]:37, [198]:67.1, [213]:56.14, [195]:26.32) | [9.5 ~ 50.94] meters. (4: [199]:14.43, [207]:27.11, [212]:50.94, [211]:9.5) |
| CW cancellation capability >=150dB | [26.32 ~ 95.51] meters. (16: [215]:56.59, [193]:95.51, [201]:45.09, [192]:62.86, [203]:45.66, [205]:56.22, [211]:41.3, [210]:45.86, [190]:77.58, [202]:41.28, [209]:41.28, [194]:66.25, [196]:62, [198]:77.58, [213]:94.25, [195]:26.32) | [26.32 ~ 41.28] meters. (2: [209]:41.28, [195]:26.32) | [23.52 ~ 105] meters. (14: [215]:56.59, [193]:95.51, [201]:43.4, [192]:62.86, [203]:62.53, [205]:56.22, [210]:45.86, [190]:77.58, [202]:41.28, [209]:41.28, [194]:77.58, [196]:105, [198]:77.58, [213]:23.52) |
| R2D Tx EIRP power < 30dBm, | R2D Rx sensitivity of -45dBm  [19.78 ~ 27.11] meters. (4: [191]:23.4, [190]:19.78, [198]:27.11, [213]:23.52)  R2D Rx sensitivity of -40dBm  [10.52 ~ 16.03] meters. (5: [199]:14.43, [207]:10.52, [191]:10.52, [212]:16.03, [209]:16.03) | R2D Rx sensitivity of -45dBm  [19.78 ~ 27.11] meters. (4: [191]:22.2, [190]:19.78, [198]:27.11, [213]:23.52)  R2D Rx sensitivity of -40dBm  [10.52 ~ 16.03] meters. (6: [199]:14.43, [207]:10.52, [191]:10.52, [212]:16.03, [211]:14.4, [209]:13.9) | R2D Rx sensitivity of -45dBm  [19.78 ~ 30.11] meters. (4: [191]:30.11, [190]:19.78, [198]:27.11, [213]:23.52)  R2D Rx sensitivity of -40dBm  [9.5 ~ 16.03] meters. (6: [199]:14.43, [207]:10.52, [191]:10.52, [212]:16.03, [211]:9.5, [209]:16.03) |
| R2D Tx EIRP power >=30dBm and <35dBm | R2D Rx sensitivity of -45dBm  [36.59 ~ 45.86] meters. (4: [191]:37.55, [192]:37.16, [203]:36.59, [210]:45.86)  R2D Rx sensitivity of -40dBm  [26.32 ~ 27.11] meters. (3: [207]:27.11, [191]:27.11, [195]:26.32) | R2D Rx sensitivity of -45dBm  [26.73 ~ 37.16] meters. (4: [191]:35.63, [192]:37.16, [203]:26.73, [210]:28.48)  R2D Rx sensitivity of -40dBm  [26.32 ~ 27.11] meters. (3: [207]:27.11, [191]:27.11, [195]:26.32) | R2D Rx sensitivity of -45dBm  [36.59 ~ 49.28] meters. (4: [191]:49.28, [192]:37.16, [203]:36.59, [210]:45.86)  R2D Rx sensitivity of -40dBm  [27.11 ~ 27.11] meters. (2: [207]:27.11, [191]:27.11) |
| R2D Tx EIRP power >=35dBm | R2D Rx sensitivity of -45dBm  [43.41 ~ 95.51] meters. (11: [197]:69.83, [193]:95.51, [200]:43.41, [192]:62.86, [203]:45.66, [190]:77.58, [209]:66.46, [194]:66.25, [196]:62, [198]:77.58, [213]:94.25)  R2D Rx sensitivity of -40dBm  [37.35 ~ 56.59] meters. (7: [215]:56.59, [201]:45.09, [205]:56.22, [212]:37.35, [211]:41.3, [202]:41.28, [209]:41.28) | R2D Rx sensitivity of -45dBm  [13.9 ~ 77.58] meters. (11: [197]:31.09, [193]:47.07, [200]:19.15, [192]:40.87, [203]:26.73, [190]:77.58, [209]:13.9, [194]:27.39, [196]:37, [198]:67.1, [213]:56.14)  R2D Rx sensitivity of -40dBm  [23.88 ~ 41.28] meters. (7: [215]:26.7, [201]:26.91, [205]:23.88, [212]:37.35, [211]:30.9, [202]:32.56, [209]:41.28) | R2D Rx sensitivity of -45dBm  [25.66 ~ 105] meters. (9: [193]:95.51, [200]:25.66, [192]:62.86, [203]:62.53, [190]:77.58, [209]:69.83, [194]:77.58, [196]:105, [198]:77.58)  R2D Rx sensitivity of -40dBm  [41.28 ~ 56.59] meters. (6: [215]:56.59, [201]:43.4, [205]:56.22, [212]:50.94, [202]:41.28, [209]:41.28) |
| FEC code (1/2, 1/3, 1/4) | [27.11 ~ 95.51] meters. (11: [193]:95.51, [207]:27.11, [192]:62.86, [203]:45.66, [205]:56.22, [210]:45.86, [190]:77.58, [202]:41.28, [209]:66.46, [194]:66.25, [213]:94.25) | [23.88 ~ 77.58] meters. (11: [193]:47.07, [207]:27.11, [192]:40.87, [203]:26.73, [205]:23.88, [210]:28.48, [190]:77.58, [202]:32.56, [209]:41.28, [194]:27.39, [213]:56.14) | [23.52 ~ 95.51] meters. (11: [193]:95.51, [207]:27.11, [192]:62.86, [203]:62.53, [205]:56.22, [210]:45.86, [190]:77.58, [202]:41.28, [209]:69.83, [194]:77.58, [213]:23.52) |
| without FEC | [14.43 ~ 77.58] meters. (13: [197]:69.83, [199]:14.43, [215]:56.59, [200]:43.41, [191]:37.55, [201]:45.09, [212]:37.35, [211]:41.3, [190]:77.58, [196]:62, [198]:77.58, [213]:77.09, [195]:26.32) | [14.43 ~ 67.1] meters. (13: [197]:31.09, [199]:14.43, [215]:26.7, [200]:19.15, [191]:35.63, [201]:26.91, [212]:37.35, [211]:30.9, [190]:62.19, [196]:37, [198]:67.1, [213]:45.82, [195]:26.32) | [9.5 ~ 105] meters. (11: [199]:14.43, [215]:56.59, [200]:25.66, [191]:49.28, [201]:43.4, [212]:50.94, [211]:9.5, [190]:77.58, [196]:105, [198]:77.58, [213]:23.52) |
| OOK | [26.32 ~ 94.25] meters. (18: [197]:69.83, [215]:56.59, [200]:43.41, [207]:27.11, [191]:37.55, [201]:45.09, [192]:62.86, [203]:45.66, [205]:56.22, [212]:37.35, [211]:41.3, [190]:77.58, [202]:41.28, [194]:66.25, [196]:62, [198]:77.58, [213]:94.25, [195]:26.32) | [19.15 ~ 67.98] meters. (18: [197]:31.09, [215]:26.7, [200]:19.15, [207]:27.11, [191]:35.63, [201]:26.91, [192]:40.87, [203]:26.73, [205]:23.88, [212]:37.35, [211]:30.9, [190]:67.98, [202]:32.56, [194]:27.39, [196]:37, [198]:39.7, [213]:56.14, [195]:26.32) | [9.5 ~ 105] meters. (16: [215]:56.59, [200]:25.66, [207]:27.11, [191]:49.28, [201]:43.4, [192]:62.86, [203]:62.53, [205]:56.22, [212]:50.94, [211]:9.5, [190]:77.58, [202]:41.28, [194]:77.58, [196]:105, [198]:77.58, [213]:23.52) |
| BPSK | [14.43 ~ 95.51] meters. (6: [199]:14.43, [193]:95.51, [210]:45.86, [190]:77.58, [209]:66.46, [198]:77.58) | [14.43 ~ 77.58] meters. (6: [199]:14.43, [193]:47.07, [210]:28.48, [190]:77.58, [209]:41.28, [198]:67.1) | [14.43 ~ 95.51] meters. (6: [199]:14.43, [193]:95.51, [210]:45.86, [190]:77.58, [209]:69.83, [198]:77.58) |
| MSK | [77.58 ~ 77.58] meters. (1: [190]:77.58) | [53.96 ~ 53.96] meters. (1: [190]:53.96) | [77.58 ~ 77.58] meters. (1: [190]:77.58) |

#### 7.1.1.3 Device 2b

##### 7.1.1.3.1 Collection of the results

###### 7.1.1.3.1.1 [1kbps]

Table 7.1.1.3.1.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 2b, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-C | [215] | 33.45 | 66.1 | 0.1 |  | Budget-Alt1 | 1 | 24 | -45 | 0.9 | 0 | 96 | N/A |  | non-coherent | 900 | 357 |
| 20 | 353 |
| 400 | 361 |
| 86.17 | 75.1 | 33 | 96 | 356 |
| 20 | 352 |
| 400 | 360 |
| [193] | 95.51 | 76.1 | 0.8 | N/A | 96 | 272 |
| [201] | 56.53 | 71.1 | 0.01 | 1 | -40 |  | 20 |  | 5 |
| 544.73 | 92.65 | Budget-Alt2 | -61.55 | 6 |
| [203] | 36.59 | 67.1 | Budget-Alt1 | 0.43 | 24 | -45 | N/A | N/A | coherent | 15 |
| 16 |
| 0.83 | 96 | 11 |
| 12 |
| 1.02 | 400 | 19 |
| 20 |
| 62.53 | 72.1 | 0.43 | 33 | 20 | 13 |
| 14 |
| 0.83 | 96 | 9 |
| 10 |
| 1.02 | 400 | 17 |
| 18 |
| [192] | 37.16 | 67.1 | 0.1 | 0.43 | 24 | - | 20 | - | non-coherent | 292 |
| 298 |
| 0.83 | 96 | 293 |
| 299 |
| 1.04 | 400 | 294 |
| 300 |
| 62.86 | 72.1 | 0.43 | 33 | 20 | 280 |
| 286 |
| 0.83 | 96 | 281 |
| 287 |
| 1.04 | 400 | 282 |
| 288 |
| [202] | 41.28 | 68.1 | 0.01 | 0.7 | -40 | N/A | 20 | N/A | 34 |
| 1.07 | 96 | 38 |
| 0.96 | 20 | 36 |
| 0.1 | 1.07 | 96 | 37 |
| 0.96 | 20 | 35 |
| [195] | 221.91 | 84.1 | 1.14 | -60 | 0 | 96 |  | 304 |
| 1.06 | 400 | 305 |
| [198] | 27.11 | 64.1 | 1.14 | 23 | -45 |  | 96 | N/A | coherent | 2 |
| 4 |
| 77.58 | 74.1 | 33 | 1 |
| 3 |
| [209] | 16.03 | 59.1 | 0.01 | 1 | 24 | -40 | 0 | 342 |
| 0.1 | 350 |
| 27.68 | 64.3 | 0.01 | 33 | 4.7 | 340 |
| 0.1 | 348 |
| 41.28 | 68.1 | 0.01 | 0.9 | 337 |
| 338 |
| 336 |
| 339 |
| 0.1 | 345 |
| 346 |
| 344 |
| 347 |
| 69.83 | 73.1 | 0.01 | -45 | 341 |
| 38 | -40 | 343 |
| 0.1 | 33 | -45 | 349 |
| 38 | -40 | 351 |
| [190] | 19.78 | 61.1 | 0.01 | 0.96 | 24 | -45 |  | 20 |  | 372 |
| 373 |
| 77.58 | 74.1 | 33 | 370 |
| 371 |
| [213] | 69.53 | 73.1 | 0.65 | 24 | -55 | 6 | 207 |
| 0.53 | 235 |
| 0.1 | 0.65 | 203 |
| 1.25 | 96 | 211 |
| 0.53 | 20 | 231 |
| 0.9 | 96 | 239 |
| 273.88 | 86.1 | 0.01 | 0.65 | 33 | 20 | 206 |
| 0.53 | 234 |
| 0.1 | 0.65 | 202 |
| 1.25 | 96 | 210 |
| 0.53 | 20 | 230 |
| 0.9 | 96 | 238 |
| 1186.2 | 100.04 | 0.01 | Budget-Alt2 | 0.65 | -91.14 | 20 | 204 |
| 1678.22 | 103.34 | 0.1 | 1.25 | -99.34 | 96 | 208 |
| 2070.97 | 105.34 | 0.01 | 0.53 | -91.14 | 20 | 232 |
| 2159.92 | 105.74 | 0.1 | 0.65 | -100.71 | 200 |
| 2229.14 | 106.04 | 0.01 | 24 | -91.14 | 205 |
| 3120.14 | 109.24 | 0.53 | 233 |
| 3153.72 | 109.34 | 0.1 | 1.25 | -99.34 | 96 | 209 |
| 0.9 | 33 | 236 |
| 3615.63 | 110.64 | 0.53 | -100.71 | 20 | 228 |
| 4058.94 | 111.74 | 0.65 | 24 | 201 |
| 5926.47 | 115.34 | 0.9 | -99.34 | 96 | 237 |
| 6794.49 | 116.64 | 0.53 | -100.71 | 20 | 229 |
| [211] | 11.76 | 55.9 | 0.01 | Budget-Alt1 | 1 | 23 | -45 | 0 | 400 | 0 | 154.28 | non-coherent | 315 |
| 0.1 | 200.67 | 314 |

Figure 7.1.1.3.1.1-1

###### 7.1.1.3.1.2 [5~7kbps]

Table 7.1.1.3.1.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 2b, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-C | [215] | 33.45 | 66.1 | 0.1 |  | Budget-Alt1 | 5 | 24 | -45 | 0.9 | 0 | 96 | N/A |  | non-coherent | 900 | 359 |
| 20 | 355 |
| 400 | 363 |
| 86.17 | 75.1 | 33 | 96 | 358 |
| 20 | 354 |
| 400 | 362 |
| [193] | 95.51 | 76.1 | 6 | N/A | 96 | 273 |
| [201] | 56.53 | 71.1 | -40 |  |  | 7 |
| 544.73 | 92.65 | Budget-Alt2 | -61.55 | 8 |
| [192] | 37.16 | 67.1 | Budget-Alt1 | 3 | 24 | -45 | - | 20 | - | 295 |
| 301 |
| 4.7 | 96 | 296 |
| 302 |
| 5.8 | 400 | 297 |
| 303 |
| 62.86 | 72.1 | 3 | 33 | 20 | 283 |
| 289 |
| 4.7 | 96 | 284 |
| 290 |
| 5.8 | 400 | 285 |
| 291 |
| [202] | 41.28 | 68.1 | 0.01 | 5.36 | -40 | N/A | 96 | N/A | 42 |
| 4.81 | 20 | 40 |
| 0.1 | 5.36 | 96 | 41 |
| 4.81 | 20 | 39 |
| [195] | 221.91 | 84.1 | 5.08 | -60 | 0 | 400 |  | 307 |
| 5.49 | 96 | 306 |
| [194] |  | 105.54 | Budget-Alt2 | 7 | -87.95 | 6 | 20 | N/A | coherent | 21 |
| 103.64 | -86.85 | 96 | 22 |
| 100.64 | -85.05 | 400 | 23 |
| 98.34 | 0.01 | -83.45 | 96 | 25 |
| -85.15 | 20 | 24 |
| 96.04 | -80.95 | 400 | 26 |
| [210] | 45.86 | 69.1 | Budget-Alt1 | 4.67 | -45 | 0 | 96 | 47 |
| 586.45 | 93.34 | Budget-Alt2 | -79.45 | 46 |
| [209] | 16.03 | 59.1 | Budget-Alt1 | 7 | 24 | -40 | 326 |
| 0.1 | 334 |
| 27.68 | 64.3 | 0.01 | 33 | 4.7 | 324 |
| 0.1 | 332 |
| 41.28 | 68.1 | 0.01 | 0.9 | 320 |
| 321 |
| 322 |
| 323 |
| 0.1 | 329 |
| 330 |
| 328 |
| 331 |
| 69.83 | 73.1 | 0.01 | -45 | 325 |
| 38 | -40 | 327 |
| 0.1 | 33 | -45 | 333 |
| 38 | -40 | 335 |
| [190] | 19.78 | 61.1 | 0.01 | 6.43 | 24 | -45 |  |  | 367 |
| 368 |
| 369 |
| 199 |
| 197 |
| 198 |
| 77.58 | 74.1 | 33 | 365 |
| 366 |
| 364 |
| 194 |
| 195 |
| 196 |
| [213] | 69.53 | 73.1 | 3.41 | 24 | -55 | 6 | 20 | 247 |
| 4.89 | 96 | 255 |
| 3.87 | 20 | 219 |
| 5.77 | 96 | 227 |
| 0.1 | 3.41 | 20 | 243 |
| 4.89 | 96 | 251 |
| 3.87 | 20 | 215 |
| 5.77 | 96 | 223 |
| 273.88 | 86.1 | 0.01 | 3.41 | 33 | 20 | 246 |
| 4.89 | 96 | 254 |
| 3.87 | 20 | 218 |
| 5.77 | 96 | 226 |
| 0.1 | 3.41 | 20 | 242 |
| 4.89 | 96 | 250 |
| 3.87 | 20 | 214 |
| 5.77 | 96 | 222 |
| 506.14 | 91.94 | 0.01 | Budget-Alt2 | -85.45 | 224 |
| 605.21 | 93.64 | 3.87 | -86.5 | 20 | 216 |
| 847.29 | 96.84 | 4.89 | -85.45 | 96 | 252 |
| 912.01 | 97.54 | 0.1 | 5.77 | -97.1 | 220 |
| 921.65 | 97.64 | 0.01 | 3.41 | -86.5 | 20 | 244 |
| 951.19 | 97.94 | 5.77 | 24 | -85.45 | 96 | 225 |
| 1125.45 | 99.54 | 0.1 | 3.87 | 33 | -98.1 | 20 | 212 |
| 1137.35 | 99.64 | 0.01 | 24 | -86.5 | 217 |
| 1526.69 | 102.44 | 0.1 | 4.89 | 33 | -97.1 | 96 | 248 |
| 1592.27 | 102.84 | 0.01 | 24 | -85.45 | 253 |
| 1678.22 | 103.34 | 0.1 | 3.41 | 33 | -98.1 | 20 | 240 |
| 1713.88 | 103.54 | 5.77 | 24 | -97.1 | 96 | 221 |
| 1731.99 | 103.64 | 0.01 | 3.41 | -86.5 | 20 | 245 |
| 2114.98 | 105.54 | 0.1 | 3.87 | -98.1 | 213 |
| 2868.97 | 108.44 | 4.89 | -97.1 | 96 | 249 |
| 3153.72 | 109.34 | 3.41 | -98.1 | 20 | 241 |
| [212] | 27.11 | 64.1 | 0.01 | Budget-Alt1 | 7 | -45 | N//A | 96 | N/A | 259 |
| non-coherent | 263 |
| 0.1 | coherent | 257 |
| non-coherent | 261 |
| 86.18 | 75.1 | 0.01 | 33 | coherent | 258 |
| non-coherent | 262 |
| 0.1 | coherent | 256 |
| non-coherent | 260 |
| 348.52 | 88.39 | 0.01 | Budget-Alt2 | 24 | -69.29 | coherent | 267 |
| non-coherent | 271 |
| 762.76 | 95.84 | 33 | 270 |
| 1107.93 | 99.39 | coherent | 266 |
| 1381.67 | 101.49 | 0.1 | 24 | -82.39 | 265 |
| non-coherent | 269 |
| 2992.21 | 108.84 | 33 | 268 |
| 4392.25 | 112.49 | coherent | 264 |
| [199] | 24.4 | 63.1 | Budget-Alt1 | 5.9 | 23 | -45 | N/A | 32 |
| 69.83 | 73.1 | 33 | 33 |
| [191] | 7.64 | 52.06 | 5 | -50 | 0 | 400 | non-coherent | 126 |
| 102 |
| 24 | 108 |
| 132 |
| 9.94 | 54.56 | 33 | 96 | 124 |
| 24 | 130 |
| 10.15 | 54.76 | 33 | 100 |
| 24 | 106 |
| 15.3 | 58.66 | 33 | 20 | 122 |
| 24 | 128 |
| 15.46 | 58.76 | 33 | 98 |
| 24 | 104 |
| 16.81 | 59.56 | 33 | 400 | 125 |
| 101 |
| 24 | 107 |
| 131 |
| 20.32 | 61.36 | 33 | 96 | 123 |
| 24 | 129 |
| 20.75 | 61.56 | 33 | 136 |
| 99 |
| 24 | 105 |
| 142 |
| 21.87 | 62.06 | 33 | 112 |
| 24 | 118 |
| 25.88 | 63.66 | 33 | 400 | 114 |
| 24 | 120 |
| 26.99 | 64.06 | 33 | 20 | 121 |
| 97 |
| 24 | 127 |
| 103 |
| 30.11 | 65.1 | 96 | 56 |
| 68 |
| 69 |
| 141 |
| 57 |
| 117 |
| 80 |
| 81 |
| 92 |
| 93 |
| 20 | 54 |
| 55 |
| 115 |
| 116 |
| 139 |
| 140 |
| 66 |
| 67 |
| 79 |
| 90 |
| 91 |
| 78 |
| 400 | 70 |
| 58 |
| 59 |
| 119 |
| 71 |
| 30.3 | 65.16 | 33 | 20 | 134 |
| 30.94 | 65.36 | 110 |
| 36.23 | 66.86 | 61 |
| Budget-Alt2 | -69.45 | 159 |
| 24 | 165 |
| 40.67 | 67.96 | Budget-Alt1 | 33 | -50 | 96 | 135 |
| 41.53 | 68.16 | 111 |
| 41.97 | 68.26 | 400 | 113 |
| 48.12 | 69.56 | 20 | 109 |
| 133 |
| 64.6 | 72.36 | 96 | 87 |
| 77.58 | 74.1 | 50 |
| 51 |
| 62 |
| 63 |
| 86 |
| 74 |
| 75 |
| 20 | 48 |
| 49 |
| 60 |
| 84 |
| 85 |
| 72 |
| 73 |
| 400 | 52 |
| 53 |
| 64 |
| 65 |
| 78.06 | 74.16 | Budget-Alt2 | -66.45 | 96 | 161 |
| 24 | 167 |
| 101.53 | 76.66 | 33 | -69.45 | 20 | 183 |
| 24 | 189 |
| 108.61 | 77.3 | 33 | -66.45 | 96 | 149 |
| 24 | 155 |
| 122.68 | 78.46 | 33 | -77.95 | 184 |
| 24 | 190 |
| 137.55 | 79.55 | -64.45 | 400 | 156 |
| 168 |
| 142.14 | 79.86 | 33 | -79.25 | 96 | 160 |
| 24 | 166 |
| 146.69 | 80.16 | 33 | -64.45 | 400 | 162 |
| 168.9 | 81.5 | -69.45 | 20 | 147 |
| 171 |
| 24 | 153 |
| 177 |
| 173.57 | 81.76 | 33 | -80.85 | 158 |
| 182 |
| 24 | 164 |
| 188 |
| 179.9 | 82.1 | 33 | -64.45 | 400 | 150 |
| 210.63 | 83.6 | -77.95 | 96 | 172 |
| 24 | 178 |
| 217.38 | 83.9 | 33 | -79.25 | 148 |
| 24 | 154 |
| 222 | 84.1 | 33 | -80.85 | 20 | 146 |
| 279.78 | 86.3 | 170 |
| 24 | 152 |
| 176 |
|  |  | Budget-Alt1 | 33 | -50 | 400 | 137 |
| 138 |
| 88 |
| 89 |
| 76 |
| 77 |
| 24 | 143 |
| 144 |
| 82 |
| 83 |
| 94 |
| 95 |
| Budget-Alt2 | 33 |  | 96 | 173 |
| 185 |
| 400 | 163 |
| 151 |
| 174 |
| 175 |
| 186 |
| 187 |
| 24 | 96 | 179 |
| 191 |
| 400 | 157 |
| 169 |
| 180 |
| 181 |
| 192 |
| 193 |
| [207] | 655.59 | 94.4 | 0.01 | Budget-Alt-2 | 7 | -99.09 | 6 | 96 |  | 43 |
| [211] | 11.76 | 55.9 | Budget-Alt1 | 6.4 | 23 | -45 | 0 | 0 | 162.61 | 309 |
| 5.7 | 400 | 186.43 | 311 |
| 5.5 | 20 | 190.39 | 313 |
| 0.1 | 6.4 | 96 | 305.58 | 308 |
| 5.7 | 400 | 247.63 | 310 |
| 5.5 | 20 | 297.65 | 312 |
| [214] | 2.52 | 41.49 | 0.01 | Budget-Alt2 | 5 | -25.39 | 6 | N/A |  | 279 |
| 2.79 | 42.49 | 24 | 278 |
| 7.2 | 51.49 | 33 | 277 |
| 9.1 | 53.72 | 0.1 | 23 | -37.62 | 276 |
| 10.11 | 54.72 | 24 | 275 |
| 26.05 | 63.72 | 33 | 274 |
| [196] | 142 | 79.84 | Budget-Alt1 | 6.4 | -85 |  | 6(OOK) | 96 | 317 |
| 153 | 80.54 | 6 | 318 |
| 6.6 | 400 | 319 |
| 179 | 82.04 | 5 | 20 | 316 |

Figure 7.1.1.3.1.2-1



###### 7.1.1.3.1.3 other data rate

7.1.1.3.1.3.1 [48 - 60 kbps]

Table 7.1.1.3.1.3.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 2b, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-C | [199] | 24.4 | 63.1 | 0.1 |  | Budget-Alt1 | 44.8 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 27 |
| 64.18 | 72.3 | 33 | 28 |
| [207] | 389.18 | 89.44 | 0.01 | Budget-Alt-2 | 56 | 24 | -94.6 | 6 |  | 44 |
| 691.7 | 94.91 | 0.1 | -100.22 | 45 |

Figure 7.1.1.3.1.3.1-1



7.1.1.3.1.3.2 others

Table 7.1.1.3.1.3.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 2b, D1T1, InF-DH NLOS | | | | | | | | | | | | | | | | |  |
| **Header columns description:** (1a) Distance, min(R2D, D2R) (1b) MPL, min(R2D, D2R) (2) BLER (3) CW case. (See TR38.XXX section YYY) (4) Budget Alternative 1 or 2. (See TR38.XXX section YYY) (5) D2R data rate (kbps). (Refer to [0m] in LLS table, also see editors' notes [info-D2R-datarate] in link budget table) (6) TxPower [dBm]. (See R2D[1E] in link budget table) | | | | | | | | | (7) R2D Receiver sensitivity [dBm]. (See R2D[2L] in link budget table) (8) On Object Penalty [dB] (See R2D[2H] in link budget table) (9) Backscatter loss [dB] (See [1H] in link budget table) (10) message size for D2R [bit]  (11) CW cancellation [dB] (See D2R[2K] in link budget table) (12) CW2D distance [m] (See D2R[1E3] in link budget table) (13) D2R coherent or non-coherent receiver (14) Carrier frequency (MHz) (15) Row indices in the spreadsheet (row 1 corresponds to row 6 in spreadsheet) | | | | | | | |  |
| **DxTx-Y** | **Source** | **(1a) Distance** | **(1b) MPL** | **(2)BLER** | **(3)CW** | **(4)Alt** | **(5)kbps** | **(6)TxPwr** | **(7)R2DSens** | **(8)OOP** | **(9)BSL** | **(10)bit** | **(11)CW** | **(12)CW2D** | **(13)** | **(14)** | **(15)index** |
| D1T1-C | [199] | 24.4 | 63.1 | 0.1 |  | Budget-Alt1 | 15.6 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 29 |
| 84 | coherent | 30 |
| 31 |

Figure 7.1.1.3.1.3.2-1



##### 7.1.1.3.2 Observations

For Device 2b and D1T1, it is observed that the maximum achievable coverage

Note the following assumptions are made for the observations (per agreed mandatory assumptions)

- R2D Tx Power (R2D[1E]): 23 or 24 or 33 dBm (M)

- Number of receive antenna elements / TxRU / chains (D2R[2A]): 2 (M)

- Reference data rate ([0m]): 1 kbps (M) or 5 - 7 kbps (M)

- Carrier frequency ([0C]): 900MHz (M)

- Topology/Pathloss model ([0D]): InF-DH NLOS

- R2D Budget-Alt1 or Budget-Alt2, D2R Budget-Alt2

Table 7.1.1.3.2

|  |  |  |
| --- | --- | --- |
| Device 2b | D1T1-C (Budget-Alt1) | D1T1-C (Budget-Alt2) |
| R2D Tx power 33dBm, R2D Rx sensitivity <= -45dBm | [45.86 ~ 273.88] meters. (14: [199]:69.83, [215]:86.17, [193]:95.51, [191]:77.58, [192]:62.86, [203]:62.53, [212]:86.18, [210]:45.86, [190]:77.58, [209]:69.83, [196]:179, [198]:77.58, [213]:273.9, [195]:221.9) | [279.78 ~ 4392.25] meters. (5: [191]:279.8, [201]:544.7, [212]:4392, [210]:586.5, [213]:3616) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity <= -45dBm | [19.78 ~ 69.53] meters. (9: [199]:24.4, [215]:33.45, [191]:30.11, [192]:37.16, [203]:36.59, [212]:27.11, [190]:19.78, [198]:27.11, [213]:69.53) | [279.78 ~ 6794.49] meters. (4: [207]:655.6, [191]:279.8, [212]:1382, [213]:6794) |
| R2D Tx power 33dBm, R2D Rx sensitivity >=-40dBm | [41.28 ~ 56.53] meters. (3: [201]:56.53, [202]:41.28, [209]:41.28) | [26.05 ~ 26.05] meters. (1: [214]:26.05) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity >= -40dBm | [16.03 ~ 16.03] meters. (1: [209]:16.03) | [10.11 ~ 10.11] meters. (1: [214]:10.11) |
| D2R BLER 10% and data rate ~1kbps | [41.28 ~ 273.88] meters. (7: [215]:86.17, [193]:95.51, [192]:62.86, [202]:41.28, [209]:69.83, [198]:77.58, [213]:273.9) | [6794.49 ~ 6794.49] meters. (1: [213]:6794) |
| D2R BLER 10% and data rate 5~7kbps | [41.28 ~ 273.88] meters. (12: [199]:69.83, [215]:86.17, [193]:95.51, [191]:77.58, [201]:56.53, [192]:62.86, [212]:86.18, [202]:41.28, [209]:69.83, [196]:179, [213]:273.9, [195]:221.9) | [26.05 ~ 4392.25] meters. (5: [191]:279.8, [201]:544.7, [212]:4392, [214]:26.05, [213]:3154) |
| D2R BLER 1% and data rate ~1kbps | [41.28 ~ 273.88] meters. (6: [201]:56.53, [203]:62.53, [190]:77.58, [202]:41.28, [209]:69.83, [213]:273.9) | [544.73 ~ 3120.14] meters. (2: [201]:544.7, [213]:3120) |
| D2R BLER 1% and data rate 5~7kbps | [41.28 ~ 273.88] meters. (6: [212]:86.18, [210]:45.86, [190]:77.58, [202]:41.28, [209]:69.83, [213]:273.9) | [7.2 ~ 1731.99] meters. (5: [207]:655.6, [212]:1108, [210]:586.5, [214]:7.2, [213]:1732) |
| D2R coherent receiver | [45.86 ~ 273.88] meters. (8: [199]:69.83, [203]:62.53, [212]:86.18, [210]:45.86, [190]:77.58, [209]:69.83, [198]:77.58, [213]:273.9) | [586.45 ~ 6794.49] meters. (3: [212]:4392, [210]:586.5, [213]:6794) |
| D2R non-coherent receiver | [41.28 ~ 221.91] meters. (9: [215]:86.17, [193]:95.51, [191]:77.58, [201]:56.53, [192]:62.86, [212]:86.18, [202]:41.28, [196]:179, [195]:221.9) | [26.05 ~ 2992.21] meters. (5: [207]:655.6, [191]:279.8, [201]:544.7, [212]:2992, [214]:26.05) |
| R2D Tx EIRP power < 30dBm, | R2D Rx sensitivity <=-45dBm  [19.78 ~ 69.53] meters. (7: [199]:24.4, [215]:33.45, [191]:30.11, [212]:27.11, [190]:19.78, [198]:27.11, [213]:69.53)  R2D Rx sensitivity of -40dBm  [16.03 ~ 16.03] meters. (1: [209]:16.03) | R2D Rx sensitivity <=-45dBm  [279.78 ~ 6794.49] meters. (4: [207]:655.6, [191]:279.8, [212]:1382, [213]:6794)  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| R2D Tx EIRP power >=30dBm and <35dBm | R2D Rx sensitivity <=-45dBm  [36.59 ~ 221.91] meters. (5: [191]:77.58, [192]:37.16, [203]:36.59, [210]:45.86, [195]:221.9)  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity <=-45dBm  [36.59 ~ 221.91] meters. (5: [191]:77.58, [192]:37.16, [203]:36.59, [210]:45.86, [195]:221.9)  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| R2D Tx EIRP power >=35dBm | R2D Rx sensitivity <=-45dBm  [62.53 ~ 273.88] meters. (11: [199]:69.83, [215]:86.17, [193]:95.51, [192]:62.86, [203]:62.53, [212]:86.18, [190]:77.58, [209]:69.83, [196]:179, [198]:77.58, [213]:273.9)  R2D Rx sensitivity of -40dBm  [41.28 ~ 56.53] meters. (3: [201]:56.53, [202]:41.28, [209]:41.28) | R2D Rx sensitivity <=-45dBm  [544.73 ~ 4392.25] meters. (3: [201]:544.7, [212]:4392, [213]:3616)  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| FEC code (1/2, 1/3, 1/4) | [41.28 ~ 273.88] meters. (8: [193]:95.51, [192]:62.86, [203]:62.53, [210]:45.86, [190]:77.58, [202]:41.28, [209]:69.83, [213]:273.9) | [586.45 ~ 6794.49] meters. (3: [207]:655.6, [210]:586.5, [213]:6794) |
| without FEC | [56.53 ~ 273.88] meters. (10: [199]:69.83, [215]:86.17, [191]:77.58, [201]:56.53, [212]:86.18, [190]:77.58, [196]:179, [198]:77.58, [213]:273.9, [195]:221.9) | [26.05 ~ 4392.25] meters. (5: [191]:279.8, [201]:544.7, [212]:4392, [214]:26.05, [213]:4059) |
| OOK | [41.28 ~ 273.88] meters. (13: [215]:86.17, [193]:95.51, [191]:77.58, [201]:56.53, [192]:62.86, [203]:62.53, [212]:86.18, [190]:77.58, [202]:41.28, [196]:179, [198]:77.58, [213]:273.9, [195]:221.9) | [26.05 ~ 6794.49] meters. (6: [207]:655.6, [191]:279.8, [201]:544.7, [212]:4392, [214]:26.05, [213]:6794) |
| BPSK | [45.86 ~ 77.58] meters. (5: [199]:69.83, [210]:45.86, [190]:77.58, [209]:69.83, [198]:77.58) | [586.45 ~ 586.45] meters. (1: [210]:586.5) |
| MSK | [77.58 ~ 77.58] meters. (1: [190]:77.58) | [NaN ~ NaN] meters. (0: ) |