### 7.1.2 Link Budget for D2T2

#### 7.1.2.1 Device 1

##### 7.1.2.1.1 Collection of the results

###### 7.1.2.1.1.1 [1kbps]

Table 7.1.2.1.1.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 1, D2T2, InF-DL 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** |
| D2T2-A1 | [215] | 4.47 | 40.9 | 0.1 | 2-2 | Budget-Alt1 | 1 | 23 | -30 | 0.9 | 6 | 96 | 140 | 10.92 | non-coherent | 900 | 907 |
| 11.04 | 931 |
| 20 | 11.33 | 899 |
| 11.43 | 923 |
| 400 | 10.6 | 915 |
| 10.74 | 939 |
| [201] | 6.13 | 47.9 | 0.01 | -36 | 20 | 130 | 7.77 | 13 |
| 17 |
| [203] | 6.35 | 46.36 | 1.02 | 400 | 140 | 6.35 | coherent | 83 |
| 6.58 | 46.9 | 0.43 | 20 | 7.91 | 73 |
| 0.83 | 96 | 7 | 63 |
| [202] | 1.98 | 28.3 | 0.96 | -30 | 20 | 100 | 1.98 | non-coherent | 151 |
| 2.25 | 30.22 | 1.07 | 96 | 2.25 | 155 |
| 2.66 | 32.85 | 0.7 | 20 | 2.66 | 139 |
| 0.1 | 1.07 | 96 | 3.29 | 147 |
| 3.51 | 37.15 | 0.96 | 20 | 3.51 | 143 |
| [195] | 6.58 | 46.9 | 1.14 | -36 | 96 | 150 | 10.08 | 985 |
| 1.06 | 400 | 9.63 | 993 |
| [198] | 4.47 | 40.9 | 1.14 | -30 | 6(OOK) | 96 | 1000 | 11.41 | coherent | 1 |
| 0(BPSK) | 15.76 | 9 |
| 0.95 | 6(OOK) | 20 | 10.5 | 6 |
| [210] | 7.17 | 53.9 | 0.58 | 26 | -40 | 0 | 96 |  | 285 |
| [197] | 6.58 | 46.9 | 0.01 | 1 | 23 | -36 | 6 | 20 |  | 7.79 | non-coherent | 353 |
| 0.1 | 10.24 | 349 |
| [190] | 4.47 | 40.9 | 0.01 | 0.96 | -30 | 0 | 150 | 24.77 | coherent | 1159 |
| 6 | 17.15 | 1160 |
| D2T2-A2 | [215] | 0.1 | 1 | 96 | 120 | 5.9 | non-coherent | 909 |
| 5.96 | 933 |
| 20 | 6.12 | 901 |
| 400 | 5.73 | 917 |
| 5.8 | 941 |
| [201] | 4.26 | 44.5 | 0.01 | -36 | 20 | 5.64 | 14 |
| 4.92 | 45.85 | 6.15 | 18 |
| [203] | 4.75 | 41.84 | 1.02 | 400 | 130 | 4.75 | coherent | 84 |
| 5.23 | 43.34 | 0.83 | 96 | 5.23 | 64 |
| 5.91 | 45.24 | 0.43 | 20 | 5.91 | 74 |
| [195] | 6.58 | 46.9 | 0.1 | 1.14 | 96 | 151 | 5.52 | non-coherent | 986 |
| 1.06 | 400 | 5.43 | 994 |
| [198] | 4.47 | 40.9 | 1.14 | -30 | 6(OOK) | 96 | 120 | 5.53 | coherent | 2 |
| 0(BPSK) | 7.63 | 10 |
| 0.95 | 6(OOK) | 20 | 5.08 | 7 |
| [210] | 6.85 | 53.4 | 0.58 | 26 | -40 | 0 | 96 |  | 286 |
| [197] | 4.96 | 46.9 | 0.01 | 1 | 23 | -36 | 6 | 20 | 140 | 4.96 | non-coherent | 354 |
| 6.58 | 0.1 | 7.76 | 350 |
| [190] | 4.47 | 40.9 | 0.01 | 0.96 | -30 | 0 | 120 | 12.02 | coherent | 1163 |
| 6 | 8.32 | 1164 |
| D2T2-B | [215] | 0.1 | 2-3 | 1 | 96 | 140 | 10 | non-coherent | 911 |
| 935 |
| 20 | 903 |
| 927 |
| 400 | 919 |
| 943 |
| 2-4 | 96 | 913 |
| 937 |
| 20 | 905 |
| 929 |
| 400 | 921 |
| 945 |
| [201] | 6.13 | 47.9 | 0.01 | 2-3 | -36 | 20 | 130 | 7.77 | 15 |
| 8.48 | 19 |
| 2-4 | 8.47 | 20 |
| 7.77 | 16 |
| [203] | 4.04 | 39.33 | 1.02 | 400 | 140 | 10 | coherent | 87 |
| 4.31 | 40.34 | 2-3 | 86 |
| 4.32 | 40.38 | 85 |
| 4.9 | 42.33 | 2-4 | 0.83 | 96 | 67 |
| 5.23 | 43.34 | 2-3 | 66 |
| 5.25 | 43.38 | 65 |
| 6.26 | 46.13 | 2-4 | 0.43 | 20 | 77 |
| 6.58 | 46.9 | 2-3 | 75 |
| 76 |
| [202] | 1.07 | 18.71 | 2-4 | 1.07 | -30 | 96 | 100 | 5 | non-coherent | 157 |
| 1.35 | 22.36 | 0.96 | 20 | 153 |
| 1.5 | 23.96 | 0.7 | 141 |
| 0.1 | 1.07 | 96 | 149 |
| 2.61 | 32.56 | 0.96 | 20 | 145 |
| [195] | 6.58 | 46.9 | 2-3 | 1.14 | -36 | 96 | 150 | 987 |
| 1.06 | 400 | 995 |
| 2-4 | 1.14 | 96 | 988 |
| 1.06 | 400 | 996 |
| [198] | 4.47 | 40.9 | 2-3 | 1.14 | -30 | 6(OOK) | 96 | 1000 | 10 | coherent | 3 |
| 0(BPSK) | 11 |
| 0.95 | 6(OOK) | 20 | 5 |
| 2-4 | 1.14 | 96 | 4 |
| 0(BPSK) | 12 |
| 0.95 | 6(OOK) | 20 | 8 |
| [210] | 7.17 | 53.9 | 2-3 | 0.58 | 26 | -40 | 0 | 96 | 287 |
| 2-4 | 288 |
| [190] | 4.47 | 40.9 | 0.01 | 2-3 | 0.96 | 23 | -30 | 20 | 150 | 1167 |
| 6 | 1169 |
| 2-4 | 0 | 1168 |
| 6 | 1170 |

Figure 7.1.2.1.1.1-1



Table 7.1.2.1.1.1-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 1, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [215] | 4.54 | 45.1 | 0.1 | 2-2 | Budget-Alt1 | 1 | 23 | -30 | 0.9 | 6 | 96 | 140 | 27.17 | non-coherent | 900 | 955 |
| 20 | 28.52 | 947 |
| 400 | 26.19 | 963 |
| [193] | 13.61 | 51.1 | 0.8 | -36 | 0 | 96 | 1000 | 135.81 | coherent | 48 |
| 6 | 91.1 | 43 |
| [201] | 15.55 | 52.1 | 0.01 | 1 | 20 | 130 | 27.99 | non-coherent | 21 |
| 35.33 | 25 |
| [203] | 13.61 | 51.1 | 0.43 | 140 | 44.23 | coherent | 78 |
| 0.83 | 96 | 41.38 | 68 |
| 1.02 | 400 | 35.74 | 88 |
| [192] | 1.1 | 38.97 | 321 |
| 0.43 | 20 | 46.96 | 315 |
| 0.83 | 96 | 44.52 | 318 |
| 0.1 | 1.1 | 400 | 52.93 | 303 |
| 0.43 | 20 | 61.28 | 297 |
| 0.83 | 96 | 58.49 | 300 |
| [202] | 3.92 | 41.75 | 0.01 | 0.96 | -30 | 20 | 100 | 3.92 | non-coherent | 152 |
| 4.88 | 43.4 | 1.07 | 96 | 4.88 | 156 |
| 5.54 | 44.35 | 0.7 | 20 | 5.54 | 140 |
| 0.1 | 1.07 | 96 | 6.21 | 148 |
| 5.62 | 44.45 | 0.96 | 20 | 5.62 | 144 |
| 13.61 | 51.1 | 0.01 | 1.07 | -36 | 96 | 120 | 4.88 | 181 |
| 0.96 | 20 | 3.92 | 179 |
| 0.1 | 1.07 | 96 | 6.21 | 177 |
| 0.96 | 20 | 5.62 | 175 |
| 23.18 | 55.1 | 0.01 | 1.07 | -40 | 96 | 140 | 4.88 | 197 |
| 0.96 | 20 | 3.92 | 195 |
| 0.1 | 1.07 | 96 | 6.21 | 193 |
| 0.96 | 20 | 5.62 | 191 |
| [195] | 13.61 | 51.1 | 1.14 | -36 | 96 | 150 | 48.55 | 981 |
| 1.06 | 400 | 44.8 | 989 |
| [197] | 0.01 | 1 | 20 |  | 35.06 | 355 |
| 0.1 | 45.75 | 351 |
| [209] | 3.69 | 41.3 | 0.01 | -30 | 4.7 | 0 | 96 | 120 | 11.41 | coherent | 1099 |
| 0.1 | 14.38 | 1123 |
| 4.83 | 45.1 | 0.01 | 0.9 | 100 | 5.96 | 1096 |
| 6.09 | 0.1 | 7.52 | 1120 |
| 6.12 | 0.01 | 150 | 44.3 | 1093 |
| 1000 | 44.99 | 1090 |
| 120 | 17.01 | 1105 |
| 1087 |
| 0.1 | 150 | 55.83 | 1117 |
| 1000 | 56.7 | 1114 |
| 120 | 21.44 | 1111 |
| 1129 |
| 9.13 | 48.1 | 0.01 | 26 | 17.04 | 1108 |
| 0.1 | 21.48 | 1132 |
| 13.61 | 51.1 | 0.01 | 23 | -36 | 17.01 | 1102 |
| 0.1 | 21.44 | 1126 |
| [190] | 6.12 | 45.1 | 0.01 | 0.96 | -30 | 20 | 130 | 218.26 | 1161 |
| 6 | 98.21 | 1162 |
| [213] | 7.33 | 46.45 | 1.67 | -36 | 400 |  | 810 |
| 9.07 | 48.05 | 1.25 | 96 | 804 |
| 11.22 | 49.65 | 0.65 | 20 | 798 |
| 0.1 | 1.67 | 400 | 807 |
| 12.65 | 50.55 | 1.25 | 96 | 801 |
| 13.61 | 51.1 | 0.01 | 0.53 | 20 | 834 |
| 0.9 | 96 | 840 |
| 1.09 | 400 | 846 |
| 0.1 | 0.65 | 20 | 795 |
| 0.53 | 831 |
| 0.9 | 96 | 837 |
| 1.09 | 400 | 843 |
| [211] | 6.12 | 45.1 | 0.01 | 1 | -30 | 96 | 1000 | 37.24 | non-coherent | 1024 |
| 400 | 20.89 | 1026 |
| 0.1 | 96 | 40.29 | 1023 |
| 400 | 22.01 | 1025 |
| [205] | 13.61 | 51.1 | 1.14 | -36 | 96 | 83.22 | 971 |
| D2T2-A2 | [215] | 4.54 | 45.1 | 1 | -30 | 120 | 9.77 | 957 |
| 20 | 10.26 | 949 |
| 400 | 9.42 | 965 |
| [193] | 13.61 | 51.1 | 0.8 | -36 | 0 | 96 | 23.67 | coherent | 49 |
| 6 | 15.88 | 44 |
| [201] | 14.44 | 51.55 | 0.01 | 1 | 20 | 14.44 | non-coherent | 22 |
| 15.55 | 52.1 | 18.23 | 26 |
| [203] | 13.61 | 51.1 | 0.43 | 130 | 24.25 | coherent | 79 |
| 0.83 | 96 | 22.68 | 69 |
| 1.02 | 400 | 19.59 | 89 |
| [192] | 1.1 | 21.37 | 322 |
| 0.43 | 20 | 25.74 | 316 |
| 0.83 | 96 | 24.41 | 319 |
| 0.1 | 1.1 | 400 | 29.02 | 304 |
| 0.43 | 20 | 33.59 | 298 |
| 0.83 | 96 | 32.06 | 301 |
| [195] | 1.14 | 151 | 14.02 | non-coherent | 982 |
| 1.06 | 400 | 13.73 | 990 |
| [197] | 0.01 | 1 | 20 | 140 | 28.48 | 356 |
| 0.1 | 37.17 | 352 |
| [209] | 1 | 32.7 | 0.01 | -30 | 0 | 96 | 70 | 1.23 | coherent | 1097 |
| 1.26 | 34.9 | 0.1 | 1.55 | 1121 |
| 1.92 | 38.9 | 0.01 | 4.7 | 90 | 2.36 | 1100 |
| 2.41 | 41.1 | 0.1 | 2.98 | 1124 |
| 2.86 | 42.7 | 0.01 | 0.9 | 3.53 | 1088 |
| 1106 |
| -36 | 1103 |
| 26 | -30 | 1109 |
| 3.6 | 44.9 | 0.1 | 23 | 4.44 | 1112 |
| 1130 |
| -36 | 1127 |
| 26 | -30 | 1133 |
| 6.12 | 45.1 | 0.01 | 23 | 1000 | 44.99 | 1091 |
| 120 | 17.01 | 1094 |
| 0.1 | 1000 | 56.7 | 1115 |
| 120 | 21.44 | 1118 |
| [190] | 0.01 | 0.96 | 20 | 113.55 | 1165 |
| 6 | 51.09 | 1166 |
| [213] | 3.79 | 41.49 | 1.67 | -36 | 400 |  | 811 |
| 4.69 | 43.09 | 1.25 | 96 | 805 |
| 5.8 | 44.69 | 0.65 | 20 | 799 |
| 0.1 | 1.67 | 400 | 808 |
| 6.54 | 45.59 | 1.25 | 96 | 802 |
| 7.83 | 46.94 | 0.65 | 20 | 796 |
| 10.85 | 49.39 | 0.01 | 1.09 | 400 | 847 |
| 11.9 | 50.09 | 0.9 | 96 | 841 |
| 12.72 | 50.59 | 0.53 | 20 | 835 |
| 13.61 | 51.1 | 0.1 | 832 |
| 0.9 | 96 | 838 |
| 1.09 | 400 | 844 |
| [205] | 1.14 | 96 | 14.51 | non-coherent | 972 |
| D2T2-B | [215] | 4.54 | 45.1 | 2-3 | 1 | -30 | 140 | 10 | 959 |
| 20 | 951 |
| 400 | 967 |
| 2-4 | 96 | 961 |
| 20 | 953 |
| 400 | 969 |
| [193] | 13.61 | 51.1 | 2-3 | 0.8 | -36 | 0 | 96 | 1000 | coherent | 50 |
| 6 | 45 |
| 2-4 | 0 | 51 |
| 52 |
| 6 | 47 |
| 46 |
| [201] | 15.55 | 52.1 | 0.01 | 2-3 | 1 | 20 | 130 | 28.01 | non-coherent | 23 |
| 35.36 | 27 |
| 2-4 | 27.99 | 24 |
| 35.33 | 28 |
| [203] | 13.61 | 51.1 | 2-3 | 0.43 | 140 | 10 | coherent | 80 |
| 81 |
| 0.83 | 96 | 70 |
| 71 |
| 1.02 | 400 | 90 |
| 91 |
| 2-4 | 0.43 | 20 | 82 |
| 0.83 | 96 | 72 |
| 1.02 | 400 | 92 |
| [192] | 1.1 | 323 |
| 0.43 | 20 | 317 |
| 0.83 | 96 | 320 |
| 0.1 | 1.1 | 400 | 305 |
| 0.43 | 20 | 299 |
| 0.83 | 96 | 302 |
| [202] | 3.47 | 40.82 | 0.01 | 0.96 | -30 | 20 | 100 | 5 | non-coherent | 154 |
| 5.38 | 44.12 | 1.07 | 96 | 158 |
| 6.12 | 45.1 | 0.7 | 20 | 142 |
| 0.1 | 1.07 | 96 | 150 |
| 0.96 | 20 | 146 |
| 13.61 | 51.1 | 0.01 | 1.07 | -36 | 96 | 120 | 182 |
| 0.96 | 20 | 180 |
| 0.1 | 1.07 | 96 | 178 |
| 0.96 | 20 | 176 |
| 23.18 | 55.1 | 0.01 | 1.07 | -40 | 96 | 140 | 198 |
| 0.96 | 20 | 196 |
| 0.1 | 1.07 | 96 | 194 |
| 0.96 | 20 | 192 |
| [195] | 13.61 | 51.1 | 2-3 | 1.14 | -36 | 96 | 150 | 983 |
| 1.06 | 400 | 991 |
| 2-4 | 1.14 | 96 | 984 |
| 1.06 | 400 | 992 |
| [209] | 2.01 | 39.38 | 0.01 | 1 | -30 | 0 | 96 | 90 | coherent | 1098 |
| 3.2 | 43.78 | 0.1 | 1122 |
| 3.69 | 41.3 | 0.01 | 4.7 | 110 | 1101 |
| 0.1 | 1125 |
| 6.12 | 45.1 | 0.01 | 0.9 | 140 | 1095 |
| 1000 | 1092 |
| 110 | 1089 |
| 1107 |
| 0.1 | 140 | 1119 |
| 1000 | 1116 |
| 110 | 1113 |
| 1131 |
| 9.13 | 48.1 | 0.01 | 26 | 1110 |
| 0.1 | 1134 |
| 13.61 | 51.1 | 0.01 | 23 | -36 | 1104 |
| 0.1 | 1128 |
| [190] | 6.12 | 45.1 | 0.01 | 2-3 | 0.96 | -30 | 20 | 130 | 10 | 1171 |
| 6 | 1173 |
| 2-4 | 0 | 1172 |
| 6 | 1174 |
| [213] | 20.29 | 54.1 | 0.65 | 26 | -36 | 5 | 800 |
| 1.25 | 96 | 806 |
| 1.67 | 400 | 812 |
| 0.53 | 20 | 836 |
| 0.9 | 96 | 842 |
| 1.09 | 400 | 848 |
| 0.1 | 0.65 | 20 | 797 |
| 1.25 | 96 | 803 |
| 1.67 | 400 | 809 |
| 0.53 | 20 | 833 |
| 0.9 | 96 | 839 |
| 1.09 | 400 | 845 |
| [205] | 13.61 | 51.1 | 2-3 | 1.14 | 23 | 96 | 1000 | 10 | non-coherent | 973 |
| 2-4 | 975 |
| 974 |

Figure 7.1.2.1.1.1-2



###### 7.1.2.1.1.2 [5~7kbps]

Table 7.1.2.1.1.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 1, D2T2, InF-DL 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** |
| D2T2-A1 | [215] | 4.47 | 40.9 | 0.1 | 2-2 | Budget-Alt1 | 5 | 23 | -30 | 0.9 | 6 | 96 | 140 | 10.3 | non-coherent | 900 | 932 |
| 10.25 | 908 |
| 20 | 10.72 | 900 |
| 10.89 | 924 |
| 400 | 10 | 940 |
| 9.83 | 916 |
| [201] | 6.13 | 47.9 | 6 | -36 | 96 | 130 | 7.38 | 31 |
| [202] | 1.98 | 28.3 | 0.01 | 5.36 | -30 | 100 | 1.98 | 171 |
| 2.06 | 28.9 | 4.81 | 20 | 2.06 | 167 |
| 2.86 | 34 | 0.1 | 5.36 | 96 | 2.96 | 163 |
| 2.92 | 34.3 | 4.81 | 20 | 2.92 | 159 |
| [195] | 6.58 | 46.9 | 5.08 | -36 | 400 | 150 | 8.98 | 1009 |
| 5.49 | 96 | 8.78 | 1001 |
| [210] | 3.81 | 0.01 | 4.67 | 0 | 1000 |  | coherent | 277 |
| [197] | 6.42 | 46.51 | 5 | 6 | 20 |  | 6.42 | non-coherent | 341 |
| 6.58 | 46.9 | 0.1 | 8.44 | 333 |
| [190] | 4.47 | 40.9 | 0.01 | 6.43 | -30 | 0 | 96 | 150 | 14.32 | coherent | 1136 |
| 16.72 | 675 |
| 15.48 | 676 |
| 13.38 | 1135 |
| 6 | 10.93 | 677 |
| 6.25 | 1137 |
| [212] | 4.74 | 41.8 | Budget Alt1 | 7 | 140 | 9.11 | 875 |
| 8.01 | non-coherent | 891 |
| 0.1 | 13.9 | coherent | 867 |
| 11.79 | non-coherent | 883 |
| 8.12 | 50.16 | 0.01 | 26 | -36 | 8.12 | 895 |
| 8.46 | 50.8 | 9.24 | coherent | 879 |
| 0.1 | 14.09 | 871 |
| 11.96 | non-coherent | 887 |
| [199] | 3.81 | 46.9 | Budget-Alt1 | 5.9 | 23 | 0 | 120 | 4.05 | coherent | 131 |
| [191] | 3.87 | 38.65 | 0.01 | 5 | -40 | 6 | 400 |  |  | non-coherent | 535 |
| 4.27 | 40.18 | 96 | 631 |
| 4.47 | 40.9 | 0.1 | -30 | 20 | 669 |
| 4.85 | 42.18 | 0.01 | -40 | 619 |
| 4.92 | 42.38 | 547 |
| 42.4 | 96 | 523 |
| 595 |
| 4.93 | 42.43 | 559 |
| 5.35 | 43.68 | 400 | 571 |
| 5.6 | 44.4 | 20 | 583 |
| 5.64 | 44.5 | 511 |
| 6.27 | 46.15 | 0.1 | 400 | 529 |
| 6.28 | 46.18 | 96 | 625 |
| 6.58 | 46.9 | -36 | 20 | 656 |
| 6.7 | 47.18 | -40 | 96 | 553 |
| 400 | 565 |
| 6.92 | 47.68 | 20 | 541 |
| 613 |
| 7.25 | 48.4 | 96 | 589 |
| 7.3 | 48.5 | 517 |
| 8.09 | 50.1 | 20 | 577 |
| 8.12 | 50.15 | 505 |
|  |  | 0.01 | 400 | 607 |
| 643 |
| 0.1 | 601 |
| 637 |
| [207] | 6.58 | 46.9 | 0.01 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 52.21 | 245 |
| 47.2 | 213 |
| 0.1 | 54.85 | 253 |
| 52.13 | 221 |
| [200] | 4.21 | 0.01 | Budget-Alt1 | 7.5 |  | 4.75 | 2000 | 752 |
| 754 |
| 20 | 4.9 | 748 |
| 750 |
| 400 | 4.58 | 757 |
| 758 |
| 0.1 | 96 | 5.02 | 751 |
| 753 |
| 20 | 5.26 | 747 |
| 749 |
| 400 | 4.87 | 755 |
| 756 |
| 6.58 | 0.01 | 96 | 7.44 | 900 | 704 |
| 706 |
| 20 | 7.67 | 700 |
| 702 |
| 400 | 7.22 | 709 |
| 710 |
| 0.1 | 96 | 7.86 | 703 |
| 705 |
| 20 | 8.24 | 699 |
| 701 |
| 400 | 7.62 | 707 |
| 708 |
| [214] | 4.47 | 40.9 | 0.01 | 1-4 | 5 | -30 | 20 | 130 | 6.39 | 210 |
| 120 | 3.79 | 211 |
| 0.1 | 130 | 7.13 | 207 |
| [196] | 3.45 | 45.8 | 2-2 | 6 | 26 |  | 6(OOK) | 96 | 1000 | 3.45 | 1033 |
| 5 | 20 | 1027 |
| 6.4 | 96 | 1030 |
| 6.6 | 400 | 1036 |
| D2T2-A2 | [215] | 4.47 | 40.9 | 5 | 23 | 0.9 | 6 | 96 | 120 | 5.54 | 910 |
| 5.56 | 934 |
| 20 | 5.79 | 902 |
| 5.88 | 926 |
| 400 | 5.31 | 918 |
| 5.4 | 942 |
| [201] | 3.53 | 42.75 | 6 | -36 | 96 | 5.04 | 29 |
| 3.91 | 43.7 | 5.35 | 32 |
| [195] | 6.58 | 46.9 | 5.08 | 400 | 151 | 5.54 | 1010 |
| 5.49 | 96 | 5.42 | 1002 |
| [210] | 3.64 | 46.39 | 0.01 | 4.67 | 0 | 120 |  | coherent | 278 |
| [197] | 3.62 | 44.95 | 5 | 6 | 20 | 140 | 3.62 | non-coherent | 342 |
| 5.66 | 46.9 | 0.1 | 5.66 | 334 |
| [190] | 3.03 | 34.89 | 0.01 | 6.43 | -30 | 96 | 120 | 3.03 | coherent | 1143 |
| 4.47 | 40.9 | 0 | 6.49 | 1141 |
| 6.95 | 1142 |
| 7.53 | 681 |
| 6.97 | 682 |
| 6 | 4.92 | 683 |
| [212] | 4.74 | 41.8 | Budget Alt1 | 7 | 140 | 9.11 | 876 |
| 8.01 | non-coherent | 892 |
| 0.1 | 13.9 | coherent | 868 |
| 11.79 | non-coherent | 884 |
| 8.12 | 50.16 | 0.01 | 26 | -36 | 8.12 | 896 |
| 8.46 | 50.8 | 9.24 | coherent | 880 |
| 0.1 | 14.09 | 872 |
| 11.96 | non-coherent | 888 |
| [199] | 3.81 | 46.9 | Budget-Alt1 | 5.9 | 23 | 0 | 120 | 4.05 | coherent | 132 |
| [191] | 2.8 | 33.65 | 0.01 | 5 | -40 | 6 | 400 |  |  | non-coherent | 538 |
| 3.09 | 35.18 | 96 | 634 |
| 3.51 | 37.15 | 400 | 537 |
| 3.52 | 37.18 | 20 | 622 |
| 3.56 | 37.38 | 550 |
| 3.57 | 37.4 | 96 | 526 |
| 598 |
| 37.43 | 562 |
| 3.74 | 38.15 | 400 | 536 |
| 3.87 | 38.68 | 96 | 633 |
| 400 | 574 |
| 4.06 | 39.4 | 20 | 586 |
| 4.08 | 39.5 | 514 |
| 4.13 | 39.68 | 96 | 632 |
| 4.41 | 40.68 | 20 | 621 |
| 4.46 | 40.88 | 549 |
| 4.47 | 40.9 | 96 | 525 |
| 597 |
| 0.1 | -30 | 20 | 670 |
| 671 |
| 672 |
| 4.48 | 40.93 | 0.01 | -40 | 96 | 561 |
| 4.54 | 41.15 | 0.1 | 400 | 532 |
| 4.55 | 41.18 | 96 | 628 |
| 4.7 | 41.68 | 0.01 | 20 | 620 |
| 4.76 | 41.88 | 548 |
| 4.77 | 41.9 | 96 | 524 |
| 596 |
| 4.78 | 41.93 | 560 |
| 4.85 | 42.18 | 400 | 573 |
| 0.1 | 96 | 556 |
| 400 | 568 |
| 5.01 | 42.68 | 20 | 544 |
| 616 |
| 5.09 | 42.9 | 0.01 | 585 |
| 5.12 | 43 | 513 |
| 5.18 | 43.18 | 400 | 572 |
| 5.25 | 43.4 | 0.1 | 96 | 592 |
| 5.29 | 43.5 | 520 |
| 5.42 | 43.9 | 0.01 | 20 | 584 |
| 5.46 | 44 | 512 |
| 5.69 | 44.65 | 0.1 | 400 | 531 |
| 5.7 | 44.68 | 96 | 627 |
| 5.86 | 45.1 | 20 | 580 |
| 5.88 | 45.15 | -36 | 659 |
| -40 | 508 |
| 6.07 | 45.65 | 400 | 530 |
| 6.08 | 45.68 | 96 | 555 |
| 626 |
| 400 | 567 |
| 6.28 | 46.18 | 20 | 543 |
| 615 |
| 6.49 | 46.68 | 96 | 554 |
| 400 | 566 |
| 6.58 | 46.9 | -36 | 20 | 657 |
| 658 |
| -40 | 96 | 591 |
| 6.62 | 47 | 519 |
| 6.7 | 47.18 | 20 | 542 |
| 614 |
| 7.02 | 47.9 | 96 | 590 |
| 7.07 | 48 | 518 |
| 7.34 | 48.6 | 20 | 579 |
| 7.37 | 48.65 | 507 |
| 7.83 | 49.6 | 578 |
| 7.86 | 49.65 | 506 |
|  |  | 0.01 | 400 | 608 |
| 609 |
| 610 |
| 644 |
| 645 |
| 646 |
| 0.1 | 602 |
| 603 |
| 604 |
| 638 |
| 639 |
| 640 |
| [207] | 6.58 | 46.9 | 0.01 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 52.21 | 247 |
| 47.2 | 215 |
| 0.1 | 54.85 | 255 |
| 52.13 | 223 |
| [211] | 1.74 | 38 | 0.01 | Budget-Alt1 | 6.4 | -30 | 120 | 1.74 | 1016 |
| 1.81 | 38.35 | 1.81 | 1014 |
| 2.49 | 40.9 | 0.1 | 2.49 | 1015 |
| 2.56 | 2.56 | 1013 |
| [200] | 1.99 | 35.32 | 0.01 | 7.5 | -36 | 400 | 2.77 | 2000 | 769 |
| 770 |
| 2.07 | 35.91 | 96 | 2.88 | 764 |
| 766 |
| 2.12 | 36.27 | 0.1 | 400 | 2.95 | 767 |
| 768 |
| 2.13 | 36.38 | 0.01 | 20 | 2.97 | 760 |
| 762 |
| 2.19 | 36.76 | 0.1 | 96 | 3.04 | 763 |
| 765 |
| 2.29 | 37.48 | 20 | 3.18 | 759 |
| 761 |
| 3.15 | 35.46 | 0.01 | 400 | 4.37 | 900 | 721 |
| 722 |
| 3.24 | 35.92 | 96 | 4.51 | 716 |
| 718 |
| 3.32 | 36.29 | 0.1 | 400 | 4.61 | 719 |
| 720 |
| 3.34 | 36.39 | 0.01 | 20 | 4.64 | 712 |
| 714 |
| 3.42 | 36.77 | 0.1 | 96 | 4.76 | 715 |
| 717 |
| 3.59 | 37.49 | 20 | 4.99 | 711 |
| 713 |
| [214] | 4.47 | 40.9 | 1-4 | 5 | -30 | 4.24 | 208 |
| [196] | 2.01 | 41.82 | 2-2 | 6.4 | 26 |  | 6(OOK) | 96 | 130 | 3.45 | 1031 |
| 2.57 | 42.52 | 6 | 1034 |
| 6.6 | 400 | 1037 |
| 2.94 | 44.02 | 5 | 20 | 1028 |
| D2T2-B | [215] | 4.47 | 40.9 | 2-3 | 23 | 0.9 | 6 | 96 | 140 | 10 | 912 |
| 936 |
| 20 | 904 |
| 928 |
| 400 | 920 |
| 944 |
| 2-4 | 96 | 938 |
| 914 |
| 20 | 906 |
| 930 |
| 400 | 946 |
| 922 |
| [201] | 6.02 | 47.72 | 2-3 | 6 | -36 | 96 | 130 | 6.94 | 30 |
| 6.13 | 47.9 | 7.38 | 33 |
| 2-4 | 34 |
| [202] | 0.83 | 14.86 | 0.01 | 5.36 | -30 | 100 | 5 | 173 |
| 0.9 | 16.06 | 4.81 | 20 | 169 |
| 1.07 | 18.71 | 0.1 | 161 |
| 1.74 | 26.26 | 5.36 | 96 | 165 |
| [195] | 6.58 | 46.9 | 2-3 | 5.08 | -36 | 400 | 150 | 1011 |
| 5.49 | 96 | 1003 |
| 2-4 | 5.08 | 400 | 1012 |
| 5.49 | 96 | 1004 |
| [210] | 3.81 | 0.01 | 2-3 | 4.67 | 0 | 1000 | 10 | coherent | 279 |
| 2-4 | 280 |
| [190] | 3.91 | 38.81 | 6.43 | -30 | 6 | 150 | 1152 |
| 4.12 | 39.62 | 2-3 | 1151 |
| 4.47 | 40.9 | 0 | 687 |
| 689 |
| 1147 |
| 1149 |
| 6 | 691 |
| 2-4 | 0 | 688 |
| 690 |
| 1148 |
| 1150 |
| 6 | 692 |
| [212] | 4.74 | 41.8 | 2-3 | Budget Alt1 | 7 | 140 | 5 | 877 |
| non-coherent | 893 |
| 2-4 | coherent | 878 |
| non-coherent | 894 |
| 0.1 | 2-3 | coherent | 869 |
| non-coherent | 885 |
| 2-4 | coherent | 870 |
| non-coherent | 886 |
| 6.48 | 46.66 | 0.01 | 2-3 | 26 | -36 | 10 | 897 |
| 6.59 | 46.93 | 2-4 | 898 |
| 8.39 | 50.66 | 2-3 | coherent | 881 |
| 8.46 | 50.8 | 2-4 | 882 |
| 0.1 | 2-3 | 873 |
| non-coherent | 889 |
| 2-4 | coherent | 874 |
| non-coherent | 890 |
| [199] | 3.31 | 45.35 | Budget-Alt1 | 5.9 | 23 | 0 | 120 | 5 | coherent | 133 |
| 3.32 | 45.39 | 2-3 | 137 |
| [191] | 1.49 | 23.92 | 0.01 | 2-4 | 5 | -40 | 6 | 400 |  | 10 | non-coherent | 540 |
| 1.82 | 26.97 | 96 | 636 |
| 2.36 | 30.97 | 20 | 624 |
| 2.42 | 31.42 | 96 | 528 |
| 600 |
| 31.37 | 20 | 552 |
| 2.43 | 31.47 | 96 | 564 |
| 2.85 | 33.92 | 2-3 | 400 | 539 |
| 2.86 | 33.97 | 2-4 | 576 |
| 3.14 | 35.42 | 20 | 588 |
| 3.18 | 35.62 | 516 |
| 3.47 | 36.97 | 2-3 | 96 | 635 |
| 3.93 | 38.92 | 0.1 | 2-4 | 400 | 534 |
| 3.95 | 38.97 | 96 | 630 |
| 4.47 | 40.9 | 2-3 | -30 | 20 | 673 |
| 2-4 | 674 |
| 4.49 | 40.97 | 0.01 | 2-3 | -40 | 623 |
| 0.1 | 2-4 | 96 | 558 |
| 400 | 570 |
| 4.61 | 41.37 | 0.01 | 2-3 | 20 | 551 |
| 4.62 | 41.42 | 96 | 527 |
| 599 |
| 4.64 | 41.47 | 563 |
| 4.79 | 41.97 | 0.1 | 2-4 | 20 | 546 |
| 618 |
| 5.26 | 43.42 | 96 | 594 |
| 5.33 | 43.62 | 522 |
| 5.45 | 43.97 | 0.01 | 2-3 | 400 | 575 |
| 5.98 | 45.42 | 20 | 587 |
| 6.06 | 45.62 | 515 |
| 6.55 | 46.82 | 0.1 | 2-4 | 582 |
| 6.58 | 46.9 | 2-3 | -36 | 660 |
| 2-4 | 661 |
| 6.59 | 46.92 | -40 | 510 |
| 7.5 | 48.92 | 2-3 | 400 | 533 |
| 7.52 | 48.97 | 96 | 629 |
| 8.52 | 50.9 | 521 |
| 557 |
| 593 |
| 20 | 545 |
| 509 |
| 581 |
| 617 |
| 400 | 569 |
|  |  | 0.01 | 611 |
| 647 |
| 2-4 | 612 |
| 648 |
| 0.1 | 2-3 | 605 |
| 641 |
| 2-4 | 606 |
| 642 |
| [207] | 6.58 | 46.9 | 0.01 | 2-3 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 217 |
| 249 |
| 2-4 | 5 | 219 |
| 251 |
| 0.1 | 2-3 | 10 | 225 |
| 257 |
| 2-4 | 5 | 227 |
| 259 |
| [200] | 4.21 | 0.01 | 2-3 | Budget-Alt1 | 7.5 |  | 10 | 2000 | 776 |
| 778 |
| 20 | 772 |
| 774 |
| 400 | 781 |
| 782 |
| 2-4 | 96 | 788 |
| 790 |
| 20 | 784 |
| 786 |
| 400 | 793 |
| 794 |
| 0.1 | 2-3 | 96 | 775 |
| 777 |
| 20 | 771 |
| 773 |
| 400 | 779 |
| 780 |
| 2-4 | 96 | 787 |
| 789 |
| 20 | 783 |
| 785 |
| 400 | 792 |
| 791 |
| 6.58 | 0.01 | 2-3 | 96 | 900 | 728 |
| 730 |
| 20 | 724 |
| 726 |
| 400 | 733 |
| 734 |
| 2-4 | 96 | 740 |
| 742 |
| 20 | 736 |
| 738 |
| 400 | 745 |
| 746 |
| 0.1 | 2-3 | 96 | 727 |
| 729 |
| 20 | 723 |
| 725 |
| 400 | 731 |
| 732 |
| 2-4 | 96 | 739 |
| 741 |
| 20 | 735 |
| 737 |
| 400 | 743 |
| 744 |
| [214] | 4.47 | 40.9 | 0.01 | 1-4 | 5 | -30 | 20 | 130 | 212 |
| 0.1 | 209 |
| [196] | 3.45 | 45.8 | 2-4 | 6 | 26 |  | 6(OOK) | 96 | 1000 | 3.45 | 1035 |
| 5 | 20 | 1029 |
| 6.4 | 96 | 1032 |
| 6.6 | 400 | 1038 |

Figure 7.1.2.1.1.2-1



Table 7.1.2.1.1.2-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 1, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [215] | 4.54 | 45.1 | 0.1 | 2-2 | Budget-Alt1 | 5 | 23 | -30 | 0.9 | 6 | 96 | 140 | 22.86 | non-coherent | 900 | 956 |
| 20 | 24.69 | 948 |
| 400 | 21.91 | 964 |
| [193] | 13.61 | 51.1 | 6 | -36 | 0 | 96 | 1000 | 82.71 | coherent | 58 |
| 6 | 55.48 | 53 |
| [201] | 15.55 | 52.1 | 130 | 28.74 | non-coherent | 35 |
| 32.19 | 39 |
| [192] | 13.61 | 51.1 | 0.01 | 3 | 20 | 140 | 34.42 | coherent | 324 |
| 4.7 | 96 | 34.65 | 327 |
| 5.8 | 400 | 32.63 | 330 |
| 0.1 | 3 | 20 | 45.52 | 306 |
| 4.7 | 96 | 45.21 | 309 |
| 5.8 | 400 | 43.73 | 312 |
| [202] | 2.67 | 38.85 | 0.01 | 4.81 | -30 | 20 | 100 | 2.67 | non-coherent | 168 |
| 2.85 | 39.35 | 5.36 | 96 | 2.85 | 172 |
| 3.74 | 41.4 | 0.1 | 3.74 | 164 |
| 3.84 | 41.6 | 4.81 | 20 | 3.84 | 160 |
| 10.01 | 48.79 | 0.01 | -36 | 120 | 2.67 | 187 |
| 10.69 | 49.29 | 5.36 | 96 | 2.85 | 189 |
| 13.61 | 51.1 | 0.1 | 3.74 | 185 |
| 4.81 | 20 | 3.84 | 183 |
| 23.18 | 55.1 | 0.01 | 5.36 | -40 | 96 | 140 | 2.85 | 205 |
| 4.81 | 20 | 2.67 | 203 |
| 0.1 | 5.36 | 96 | 3.74 | 201 |
| 4.81 | 20 | 3.84 | 199 |
| [195] | 13.61 | 51.1 | 5.08 | -36 | 400 | 150 | 37.48 | 1005 |
| 5.49 | 96 | 36.82 | 997 |
| [194] | 12.15 | 50.25 | 0.01 | 7 | 400 | 130 | 8.17 | coherent | 108 |
| 13.61 | 51.1 | 96 | 8.74 | 105 |
| 20 | 9.75 | 102 |
| 0.1 | 96 | 10.71 | 96 |
| 20 | 12.19 | 93 |
| 400 | 10.11 | 99 |
| [210] | 0.01 | 4.67 | 0 | 96 | 1000 |  | 281 |
| 0.1 | 289 |
| 55 | 293 |
| [197] | 51.1 | 0.01 | 5 | 6 | 20 |  | 22 | non-coherent | 343 |
| 0.1 | 29.68 | 335 |
| [209] | 3.09 | 43.45 | 0.01 | 7 | -30 | 0 | 96 | 100 | 3.82 | coherent | 1048 |
| 3.69 | 41.3 | 4.7 | 120 | 7.3 | 1051 |
| 0.1 | 9.2 | 1075 |
| 3.9 | 45.1 | 0.9 | 100 | 4.81 | 1072 |
| 6.12 | 0.01 | 150 | 28.34 | 1045 |
| 1000 | 28.78 | 1042 |
| 120 | 10.88 | 1057 |
| 1039 |
| 0.1 | 150 | 35.71 | 1069 |
| 1000 | 36.27 | 1066 |
| 120 | 13.71 | 1063 |
| 1081 |
| 8.82 | 51.1 | 0.01 | -36 | 10.88 | 1054 |
| 8.83 | 48.1 | 26 | -30 | 10.9 | 1060 |
| 9.13 | 0.1 | 13.74 | 1084 |
| 11.11 | 51.1 | 23 | -36 | 13.71 | 1078 |
| [190] | 6.12 | 45.1 | 0.01 | 6.43 | -30 | 130 | 87.7 | 678 |
| 73.77 | 679 |
| 60.02 | 1138 |
| 72.79 | 1139 |
| 6 | 39.2 | 680 |
| 23.02 | 1140 |
| [213] | 11.2 | 49.64 | 6.99 | -36 | 400 |  | 828 |
| 12.29 | 50.34 | 5.77 | 96 | 822 |
| 13.61 | 51.1 | 3.41 | 20 | 852 |
| 4.89 | 96 | 858 |
| 5.72 | 400 | 864 |
| 3.87 | 20 | 816 |
| 0.1 | 3.41 | 849 |
| 4.89 | 96 | 855 |
| 5.72 | 400 | 861 |
| 3.87 | 20 | 813 |
| 5.77 | 96 | 819 |
| 6.99 | 400 | 825 |
| [199] | 5.9 | 0 | 96 | 120 | 21.75 | 134 |
| [191] | 6.12 | 45.1 | 5 | -30 | 6 | 20 |  |  | non-coherent | 663 |
| 7.48 | 46.6 | 0.01 | -40 | 96 | 451 |
| 9.76 | 48.6 | 20 | 439 |
| 13.61 | 51.1 | 0.1 | -36 | 650 |
| 16.62 | 52.6 | -40 | 96 | 445 |
| 18.19 | 53.28 | 0.01 | 487 |
| 20.97 | 54.35 | 0.1 | 20 | 433 |
| 21.06 | 54.38 | 96 | 481 |
| 23.18 | 55.1 | 0.01 | 379 |
| 415 |
| 20 | 367 |
| 403 |
| 475 |
| 400 | 391 |
| 427 |
| 0.1 | 96 | 373 |
| 409 |
| 20 | 361 |
| 397 |
| 469 |
| 400 | 385 |
| 421 |
|  |  | 0.01 | 463 |
| 499 |
| 0.1 | 457 |
| 493 |
| [207] | 13.61 | 51.1 | 0.01 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 56.41 | 246 |
| 51.4 | 214 |
| 0.1 | 59.05 | 254 |
| 56.33 | 222 |
| [205] | Budget-Alt1 | 6.86 | 1000 | 39.92 | 976 |
| D2T2-A2 | [215] | 4.54 | 45.1 | 5 | -30 | 120 | 8.22 | 958 |
| 20 | 8.88 | 950 |
| 400 | 7.88 | 966 |
| [193] | 13.61 | 51.1 | 6 | -36 | 0 | 96 | 24.12 | coherent | 59 |
| 6 | 16.18 | 54 |
| [201] | 14.83 | 51.75 | 14.83 | non-coherent | 36 |
| 15.55 | 52.1 | 16.61 | 40 |
| [192] | 13.61 | 51.1 | 0.01 | 3 | 20 | 130 | 24.3 | coherent | 325 |
| 4.7 | 96 | 24.46 | 328 |
| 5.8 | 400 | 23.04 | 331 |
| 0.1 | 3 | 20 | 32.13 | 307 |
| 4.7 | 96 | 31.92 | 310 |
| 5.8 | 400 | 30.87 | 313 |
| [195] | 5.08 | 151 | 13.85 | non-coherent | 1006 |
| 5.49 | 96 | 13.6 | 998 |
| [194] | 6.28 | 45.29 | 0.01 | 7 | 400 | 120 | 5.93 | coherent | 109 |
| 7.23 | 46.34 | 96 | 6.35 | 106 |
| 9.06 | 48.04 | 20 | 7.09 | 103 |
| 9.75 | 48.59 | 0.1 | 400 | 7.34 | 100 |
| 10.99 | 49.49 | 96 | 7.78 | 97 |
| 13.61 | 51.1 | 20 | 8.85 | 94 |
| [210] | 12.56 | 50.49 | 4.67 | 0 | 96 |  | 294 |
| 12.72 | 50.59 | 0.01 | 282 |
| 13.61 | 52.6 | 0.1 | 290 |
| [197] | 51.1 | 0.01 | 5 | 6 | 20 | 140 | 17.88 | non-coherent | 344 |
| 0.1 | 24.12 | 336 |
| [209] | 0.64 | 28.45 | 0.01 | 7 | -30 | 0 | 96 | 70 | 0.79 | coherent | 1049 |
| 0.8 | 30.65 | 0.1 | 0.99 | 1073 |
| 1.23 | 34.65 | 0.01 | 4.7 | 90 | 1.51 | 1052 |
| 1.54 | 36.85 | 0.1 | 1.91 | 1076 |
| 1.83 | 38.45 | 0.01 | 0.9 | 2.26 | 1040 |
| 1058 |
| -36 | 1055 |
| 26 | -30 | 1061 |
| 2.3 | 40.65 | 0.1 | 23 | 2.84 | 1064 |
| 1082 |
| -36 | 1079 |
| 26 | -30 | 1085 |
| 6.12 | 45.1 | 0.01 | 23 | 1000 | 28.78 | 1043 |
| 120 | 10.88 | 1046 |
| 0.1 | 1000 | 36.27 | 1067 |
| 120 | 13.71 | 1070 |
| [190] | 0.01 | 6.43 | 45.36 | 684 |
| 38.15 | 685 |
| 31.22 | 1144 |
| 37.87 | 1145 |
| 6 | 20.27 | 686 |
| 11.98 | 1146 |
| [213] | 6.08 | 45.05 | 6.99 | -36 | 400 |  | 829 |
| 6.68 | 45.75 | 5.77 | 96 | 823 |
| 7.99 | 47.1 | 3.87 | 20 | 817 |
| 8.15 | 47.25 | 0.1 | 6.99 | 400 | 826 |
| 8.83 | 47.85 | 5.77 | 96 | 820 |
| 11 | 49.5 | 3.87 | 20 | 814 |
| 13.52 | 51.05 | 0.01 | 5.72 | 400 | 865 |
| 13.61 | 51.1 | 3.41 | 20 | 853 |
| 4.89 | 96 | 859 |
| 0.1 | 3.41 | 20 | 850 |
| 4.89 | 96 | 856 |
| 5.72 | 400 | 862 |
| [199] | 5.9 | 0 | 96 | 21.75 | 135 |
| [191] | 3.84 | 41.6 | 0.01 | 5 | -40 | 6 |  |  | non-coherent | 454 |
| 5.02 | 43.6 | 20 | 442 |
| 6.12 | 45.1 | 96 | 453 |
| 0.1 | -30 | 20 | 664 |
| 665 |
| 666 |
| 7 | 46.1 | 0.01 | -40 | 96 | 452 |
| 7.99 | 47.1 | 20 | 441 |
| 8.54 | 47.6 | 0.1 | 96 | 448 |
| 9.13 | 48.1 | 0.01 | 20 | 440 |
| 9.35 | 48.28 | 96 | 490 |
| 10.78 | 49.35 | 0.1 | 20 | 436 |
| 10.82 | 49.38 | 96 | 484 |
| 11.96 | 50.13 | 0.01 | 400 | 430 |
| 12.04 | 50.18 | 96 | 418 |
| 12.12 | 50.23 | 20 | 478 |
| 12.2 | 50.28 | 406 |
| 12.36 | 50.38 | 0.1 | 400 | 424 |
| 12.87 | 50.68 | 96 | 412 |
| 12.95 | 50.73 | 20 | 472 |
| 13.04 | 50.78 | 400 |
| 13.61 | 51.1 | 0.01 | 400 | 394 |
| 0.1 | -36 | 20 | 651 |
| 652 |
| 653 |
| -40 | 96 | 447 |
| 14.16 | 51.4 | 0.01 | 382 |
| 14.74 | 51.7 | 0.1 | 400 | 388 |
| 14.9 | 51.78 | 0.01 | 96 | 489 |
| 15.04 | 51.85 | 20 | 370 |
| 15.55 | 52.1 | 0.1 | 96 | 446 |
| 15.65 | 52.15 | 376 |
| 17.02 | 52.78 | 0.01 | 488 |
| 17.18 | 52.85 | 0.1 | 20 | 364 |
| 435 |
| 17.25 | 52.88 | 96 | 483 |
| 19.06 | 53.63 | 0.01 | 400 | 429 |
| 19.18 | 53.68 | 96 | 417 |
| 19.31 | 53.73 | 20 | 477 |
| 19.44 | 53.78 | 405 |
| 19.62 | 53.85 | 0.1 | 434 |
| 19.7 | 53.88 | 96 | 482 |
| 400 | 423 |
| 20.5 | 54.18 | 96 | 411 |
| 20.64 | 54.23 | 20 | 471 |
| 20.78 | 54.28 | 399 |
| 21.68 | 54.6 | 0.01 | 400 | 393 |
| 21.77 | 54.63 | 428 |
| 21.91 | 54.68 | 96 | 416 |
| 22.06 | 54.73 | 20 | 476 |
| 22.21 | 54.78 | 404 |
| 22.51 | 54.88 | 0.1 | 400 | 422 |
| 22.57 | 54.9 | 0.01 | 96 | 381 |
| 23.18 | 55.1 | 380 |
| 20 | 368 |
| 369 |
| 400 | 392 |
| 0.1 | 96 | 374 |
| 375 |
| 410 |
| 20 | 362 |
| 363 |
| 398 |
| 470 |
| 400 | 386 |
| 387 |
|  |  | 0.01 | 464 |
| 465 |
| 466 |
| 502 |
| 500 |
| 501 |
| 0.1 | 458 |
| 459 |
| 460 |
| 496 |
| 494 |
| 495 |
| [207] | 13.61 | 51.1 | 0.01 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 56.41 | 248 |
| 51.4 | 216 |
| 0.1 | 59.05 | 256 |
| 56.33 | 224 |
| [211] | 6.12 | 45.1 | 0.01 | Budget-Alt1 | 6.4 | -30 | 120 | 6.38 | 1018 |
| 0.1 | 7.28 | 1017 |
| [205] | 11.64 | 49.93 | 6.86 | -36 | 11.64 | 977 |
| D2T2-B | [215] | 4.54 | 45.1 | 2-3 | 5 | -30 | 140 | 10 | 960 |
| 20 | 952 |
| 400 | 968 |
| 2-4 | 96 | 962 |
| 20 | 954 |
| 400 | 970 |
| [193] | 13.61 | 51.1 | 2-3 | 6 | -36 | 0 | 96 | 1000 | coherent | 60 |
| 6 | 55 |
| 2-4 | 0 | 61 |
| 62 |
| 6 | 56 |
| 57 |
| [201] | 15.55 | 52.1 | 2-3 | 130 | 28.77 | non-coherent | 37 |
| 32.22 | 41 |
| 2-4 | 28.74 | 38 |
| 32.19 | 42 |
| [192] | 13.61 | 51.1 | 0.01 | 3 | 20 | 140 | 10 | coherent | 326 |
| 4.7 | 96 | 329 |
| 5.8 | 400 | 332 |
| 0.1 | 3 | 20 | 308 |
| 4.7 | 96 | 311 |
| 5.8 | 400 | 314 |
| [202] | 1.6 | 35.02 | 0.01 | 4.81 | -30 | 20 | 100 | 5 | non-coherent | 170 |
| 1.83 | 36.02 | 5.36 | 96 | 174 |
| 3.16 | 40.12 | 0.1 | 166 |
| 3.33 | 40.52 | 4.81 | 20 | 162 |
| 13.61 | 51.1 | 0.01 | 5.36 | -36 | 96 | 120 | 190 |
| 4.81 | 20 | 188 |
| 0.1 | 5.36 | 96 | 186 |
| 4.81 | 20 | 184 |
| 23.18 | 55.1 | 0.01 | 5.36 | -40 | 96 | 140 | 206 |
| 4.81 | 20 | 204 |
| 0.1 | 5.36 | 96 | 202 |
| 4.81 | 20 | 200 |
| [195] | 13.61 | 51.1 | 2-3 | 5.08 | -36 | 400 | 150 | 1007 |
| 5.49 | 96 | 999 |
| 2-4 | 5.08 | 400 | 1008 |
| 5.49 | 96 | 1000 |
| [194] | 8.01 | 47.11 | 0.01 | 7 | 400 | 130 | 10 | coherent | 110 |
| 10.59 | 49.21 | 96 | 107 |
| 13.61 | 51.1 | 20 | 104 |
| 0.1 | 96 | 98 |
| 20 | 95 |
| 400 | 101 |
| [210] | 0.01 | 2-3 | 4.67 | 0 | 96 | 1000 | 283 |
| 2-4 | 284 |
| 0.1 | 296 |
| 56.6 | 2-3 | 295 |
| 53.4 | 291 |
| 54.2 | 2-4 | 292 |
| [209] | 0.82 | 30.88 | 0.01 | 7 | -30 | 90 | 5 | 1050 |
| 1.31 | 35.28 | 0.1 | 1074 |
| 3.03 | 41.3 | 0.01 | 4.7 | 110 | 1053 |
| 3.69 | 0.1 | 1077 |
| 6.12 | 45.1 | 0.01 | 0.9 | 140 | 1047 |
| 1000 | 1044 |
| 110 | 1059 |
| 1041 |
| 0.1 | 140 | 1071 |
| 1000 | 1068 |
| 110 | 1065 |
| 1083 |
| 6.75 | 48.1 | 0.01 | 26 | 1062 |
| 50.87 | 23 | -36 | 1056 |
| 9.13 | 48.1 | 0.1 | 26 | -30 | 1086 |
| 10.71 | 51.1 | 23 | -36 | 1080 |
| [190] | 6.12 | 45.1 | 0.01 | 2-3 | 6.43 | -30 | 130 | 10 | 693 |
| 695 |
| 1153 |
| 1155 |
| 6 | 697 |
| 1157 |
| 2-4 | 0 | 694 |
| 696 |
| 1154 |
| 1156 |
| 6 | 698 |
| 1158 |
| [213] | 20.29 | 54.1 | 3.41 | 26 | -36 | 20 | 5 | 854 |
| 4.89 | 96 | 860 |
| 5.72 | 400 | 866 |
| 3.87 | 20 | 818 |
| 5.77 | 96 | 824 |
| 6.99 | 400 | 830 |
| 0.1 | 3.41 | 20 | 851 |
| 4.89 | 96 | 857 |
| 5.72 | 400 | 863 |
| 3.87 | 20 | 815 |
| 5.77 | 96 | 821 |
| 6.99 | 400 | 827 |
| [199] | 13.61 | 51.1 | 2-3 | 5.9 | 23 | 0 | 96 | 120 | 138 |
| 2-4 | 136 |
| [191] | 5.59 | 44.42 | 0.01 | 5 | -40 | 6 |  | 10 | non-coherent | 456 |
| 6.12 | 45.1 | 0.1 | 2-3 | -30 | 20 | 667 |
| 2-4 | 668 |
| 9.52 | 48.42 | 0.01 | -40 | 444 |
| 13.61 | 51.1 | 0.1 | 2-3 | -36 | 654 |
| 2-4 | 655 |
| 21.16 | 54.42 | 0.01 | 2-3 | -40 | 96 | 455 |
| 23.18 | 55.1 | 383 |
| 419 |
| 491 |
| 20 | 371 |
| 407 |
| 443 |
| 479 |
| 400 | 395 |
| 431 |
| 2-4 | 96 | 384 |
| 420 |
| 492 |
| 20 | 372 |
| 408 |
| 480 |
| 400 | 396 |
| 432 |
| 0.1 | 2-3 | 96 | 377 |
| 413 |
| 449 |
| 485 |
| 20 | 365 |
| 401 |
| 437 |
| 473 |
| 400 | 389 |
| 425 |
| 2-4 | 96 | 378 |
| 414 |
| 450 |
| 486 |
| 20 | 366 |
| 402 |
| 438 |
| 474 |
| 400 | 390 |
| 426 |
|  |  | 0.01 | 2-3 | 467 |
| 503 |
| 2-4 | 468 |
| 504 |
| 0.1 | 2-3 | 461 |
| 497 |
| 2-4 | 462 |
| 498 |
| [207] | 13.61 | 51.1 | 0.01 | 2-3 | Budget-Alt-1 | 7 | -36 | 96 | 140 | 218 |
| 250 |
| 2-4 | 5 | 220 |
| 252 |
| 0.1 | 2-3 | 10 | 226 |
| 258 |
| 2-4 | 5 | 228 |
| 260 |
| [211] | 6.12 | 45.1 | 0.01 | Budget-Alt1 | 5.7 | -30 | 0 | 400 | 130 | 21.11 | 1020 |
| 5.5 | 20 | 24.98 | 1022 |
| 0.1 | 5.7 | 400 | 120 | 8.78 | 1019 |
| 5.5 | 20 | 130 | 30.82 | 1021 |
| [205] | 13.61 | 51.1 | 2-3 | 6.86 | -36 | 6 | 96 | 1000 | 10 | 978 |
| 2-4 | 980 |
| 979 |

Figure 7.1.2.1.1.2-2



###### 7.1.2.1.1.3 other data rate

7.1.2.1.1.3.1 [48 - 60 kbps]

Table 7.1.2.1.1.3.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 1, D2T2, InF-DL 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** |
| D2T2-A1 | [197] | 5.73 | 44.76 | 0.01 | 2-2 | Budget-Alt1 | 55 | 23 | -36 | 0.9 | 6 | 96 |  | 5.73 | non-coherent | 900 | 345 |
| 6.58 | 46.9 | 0.1 | 7.79 | 337 |
| [199] | 2.93 | 44 | 44.8 | 1000 | 2.93 | 111 |
| [207] | 5.63 | 44.49 | 0.01 | Budget-Alt-1 | 56 | 140 | 44.49 | 229 |
| 6.58 | 46.9 | 49.73 | 261 |
| 0.1 | 52.46 | 269 |
| 49.51 | 237 |
| D2T2-A2 | [197] | 3.01 | 43.2 | 0.01 | Budget-Alt1 | 55 | 3.01 | 346 |
| 4.96 | 46.9 | 0.1 | 4.96 | 338 |
| [199] | 2.93 | 44 | 44.8 | 1000 | 2.93 | 112 |
| [207] | 5.63 | 44.49 | 0.01 | Budget-Alt-1 | 56 | 140 | 44.49 | 231 |
| 6.58 | 46.9 | 49.73 | 263 |
| 0.1 | 52.46 | 271 |
| 49.51 | 239 |
| D2T2-B | [199] | 2.96 | 44.09 | 2-4 | Budget-Alt1 | 44.8 | 1000 | 5 | 113 |
| 3.81 | 46.9 | 2-3 | 117 |
| [207] | 5.63 | 44.49 | 0.01 | 2-4 | Budget-Alt-1 | 56 | 140 | 235 |
| 6.05 | 45.59 | 2-3 | 10 | 233 |
| 6.58 | 46.9 | 265 |
| 2-4 | 5 | 267 |
| 0.1 | 2-3 | 10 | 241 |
| 273 |
| 2-4 | 5 | 243 |
| 275 |

Figure 7.1.2.1.1.3.1-1



Table 7.1.2.1.1.3.1-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 1, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [197] | 13.61 | 51.1 | 0.01 | 2-2 | Budget-Alt1 | 55 | 23 | -36 | 0.9 | 6 | 96 |  | 19.91 | non-coherent | 900 | 347 |
| 0.1 | 25.98 | 339 |
| [199] | 44.8 | 1000 | 13.7 | 114 |
| [207] | 9.87 | 48.69 | 0.01 | Budget-Alt-1 | 56 | 140 | 48.69 | 230 |
| 13.61 | 51.1 | 53.93 | 262 |
| 0.1 | 56.66 | 270 |
| 53.71 | 238 |
| D2T2-A2 | [197] | 0.01 | Budget-Alt1 | 55 | 16.18 | 348 |
| 0.1 | 21.11 | 340 |
| [199] | 44.8 | 1000 | 13.7 | 115 |
| [207] | 9.87 | 48.69 | 0.01 | Budget-Alt-1 | 56 | 140 | 48.69 | 232 |
| 13.61 | 51.1 | 53.93 | 264 |
| 0.1 | 56.66 | 272 |
| 53.71 | 240 |
| D2T2-B | [199] | 2-3 | Budget-Alt1 | 44.8 | 1000 | 5 | 118 |
| 2-4 | 116 |
| [207] | 9.87 | 48.69 | 0.01 | Budget-Alt-1 | 56 | 140 | 236 |
| 11.43 | 49.79 | 2-3 | 10 | 234 |
| 13.61 | 51.1 | 266 |
| 2-4 | 5 | 268 |
| 0.1 | 2-3 | 10 | 242 |
| 274 |
| 2-4 | 5 | 276 |
| 244 |

Figure 7.1.2.1.1.3.1-2



7.1.2.1.1.3.2 others

Table 7.1.2.1.1.3.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 1, D2T2, InF-DL 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** |
| D2T2-A1 | [199] | 2.35 | 41.52 | 0.1 | 2-2 | Budget-Alt1 | 84 | 23 | -36 | 0.9 | 0 | 96 | 120 | 2.35 | coherent | 900 | 125 |
| 2.39 | 41.72 | 15.6 | 6 | 2.39 | non-coherent | 119 |
| D2T2-A2 | 2.35 | 41.52 | 84 | 0 | 2.35 | coherent | 126 |
| 2.39 | 41.72 | 15.6 | 6 | 2.39 | non-coherent | 120 |
| D2T2-B | 1.11 | 33.25 | 2-4 | 84 | 0 | 5 | coherent | 127 |
| 1.15 | 33.65 | 15.6 | 6 | non-coherent | 121 |

Figure 7.1.2.1.1.3.2-1



Table 7.1.2.1.1.3.2-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 1, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [199] | 9.79 | 48.62 | 0.1 | 2-2 | Budget-Alt1 | 84 | 23 | -36 | 0.9 | 0 | 96 | 120 | 9.79 | coherent | 900 | 128 |
| 10.26 | 48.97 | 15.6 | 6 | 10.26 | non-coherent | 122 |
| D2T2-A2 | 9.79 | 48.62 | 84 | 0 | 9.79 | coherent | 129 |
| 10.26 | 48.97 | 15.6 | 6 | 10.26 | non-coherent | 123 |
| D2T2-B | 13.61 | 51.1 | 2-4 | 5 | 124 |
| 84 | 0 | coherent | 130 |

Figure 7.1.2.1.1.3.2-2



##### 7.1.2.1.2 Observations

For Device 1 and D2T2, it is observed that the maximum achievable coverage for InH-Office LOS

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

- R2D Tx Power (R2D[1E]): 23 (M)

- Number of receive antenna elements / TxRU / chains (D2R[2A]): 1(M)

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

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

- Topology/Pathloss model ([0D]): InH-Office LOS

- R2D Budget-Alt1, D2R Budget-Alt2

Table 7.1.2.1.2

|  |  |  |  |
| --- | --- | --- | --- |
| Device 1 | D2T2-A1 | D2T2-A2 | D2T2-B |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity of -36dBm | [13.61 ~ 15.55] meters. (14: [197]:13.61, [199]:13.61, [193]:13.61, [191]:13.61, [201]:15.55, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [202]:13.61, [209]:13.61, [194]:13.61, [213]:13.61, [195]:13.61) | [3.6 ~ 14.83] meters. (13: [197]:13.61, [199]:13.61, [193]:13.61, [191]:13.61, [201]:14.83, [192]:13.61, [203]:13.61, [205]:13.61, [210]:12.56, [209]:3.6, [194]:13.61, [213]:13.61, [195]:13.61) | [13.61 ~ 15.55] meters. (12: [199]:13.61, [193]:13.61, [191]:13.61, [201]:15.55, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [202]:13.61, [209]:13.61, [194]:13.61, [195]:13.61) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity of -30dBm | [4.54 ~ 6.12] meters. (6: [215]:4.54, [191]:6.12, [211]:6.12, [190]:6.12, [202]:5.62, [209]:6.12) | [4.54 ~ 6.12] meters. (5: [215]:4.54, [191]:6.12, [211]:6.12, [190]:6.12, [209]:6.12) | [4.54 ~ 6.12] meters. (6: [215]:4.54, [191]:6.12, [211]:6.12, [190]:6.12, [202]:6.12, [209]:6.12) |
| D2R BLER 10% and data rate ~1kbps | [4.54 ~ 23.18] meters. (10: [197]:13.61, [215]:4.54, [193]:13.61, [192]:13.61, [205]:13.61, [211]:6.12, [202]:23.18, [209]:13.61, [213]:13.61, [195]:13.61) | [4.54 ~ 13.61] meters. (8: [197]:13.61, [215]:4.54, [193]:13.61, [192]:13.61, [205]:13.61, [209]:6.12, [213]:13.61, [195]:13.61) | [4.54 ~ 23.18] meters. (7: [215]:4.54, [193]:13.61, [192]:13.61, [205]:13.61, [202]:23.18, [209]:13.61, [195]:13.61) |
| D2R BLER 10% and data rate 5~7kbps | [4.54 ~ 23.18] meters. (14: [197]:13.61, [199]:13.61, [215]:4.54, [193]:13.61, [191]:23.18, [201]:15.55, [192]:13.61, [205]:13.61, [210]:13.61, [202]:23.18, [209]:11.11, [194]:13.61, [213]:13.61, [195]:13.61) | [4.54 ~ 23.18] meters. (14: [197]:13.61, [199]:13.61, [215]:4.54, [193]:13.61, [191]:23.18, [201]:14.83, [192]:13.61, [205]:11.64, [211]:6.12, [210]:12.56, [209]:6.12, [194]:13.61, [213]:13.61, [195]:13.61) | [4.54 ~ 23.18] meters. (13: [199]:13.61, [215]:4.54, [193]:13.61, [191]:23.18, [201]:15.55, [192]:13.61, [205]:13.61, [211]:6.12, [210]:13.61, [202]:23.18, [209]:10.71, [194]:13.61, [195]:13.61) |
| D2R BLER 1% and data rate ~1kbps | [6.12 ~ 23.18] meters. (9: [197]:13.61, [201]:15.55, [192]:13.61, [203]:13.61, [211]:6.12, [190]:6.12, [202]:23.18, [209]:13.61, [213]:13.61) | [6.12 ~ 14.44] meters. (7: [197]:13.61, [201]:14.44, [192]:13.61, [203]:13.61, [190]:6.12, [209]:6.12, [213]:12.72) | [6.12 ~ 23.18] meters. (6: [201]:15.55, [192]:13.61, [203]:13.61, [190]:6.12, [202]:23.18, [209]:13.61) |
| D2R BLER 1% and data rate 5~7kbps | [6.12 ~ 23.18] meters. (8: [197]:13.61, [191]:23.18, [192]:13.61, [190]:6.12, [202]:23.18, [209]:8.82, [194]:13.61, [213]:13.61) | [6.12 ~ 23.18] meters. (8: [197]:13.61, [191]:23.18, [192]:13.61, [211]:6.12, [190]:6.12, [209]:6.12, [194]:9.06, [213]:13.61) | [6.12 ~ 23.18] meters. (7: [191]:23.18, [192]:13.61, [211]:6.12, [190]:6.12, [202]:23.18, [209]:6.75, [194]:13.61) |
| D2R coherent receiver | [6.12 ~ 13.61] meters. (9: [199]:13.61, [193]:13.61, [192]:13.61, [203]:13.61, [210]:13.61, [190]:6.12, [209]:13.61, [194]:13.61, [213]:13.61) | [6.12 ~ 13.61] meters. (9: [199]:13.61, [193]:13.61, [192]:13.61, [203]:13.61, [210]:12.56, [190]:6.12, [209]:6.12, [194]:13.61, [213]:13.61) | [6.12 ~ 13.61] meters. (8: [199]:13.61, [193]:13.61, [192]:13.61, [203]:13.61, [210]:13.61, [190]:6.12, [209]:13.61, [194]:13.61) |
| D2R non-coherent receiver | [4.54 ~ 23.18] meters. (8: [197]:13.61, [215]:4.54, [191]:23.18, [201]:15.55, [205]:13.61, [211]:6.12, [202]:23.18, [195]:13.61) | [4.54 ~ 23.18] meters. (7: [197]:13.61, [215]:4.54, [191]:23.18, [201]:14.83, [205]:13.61, [211]:6.12, [195]:13.61) | [4.54 ~ 23.18] meters. (7: [215]:4.54, [191]:23.18, [201]:15.55, [205]:13.61, [211]:6.12, [202]:23.18, [195]:13.61) |
| CW cancellation capability < 120dB | [5.62 ~ 6.09] meters. (2: [202]:5.62, [209]:6.09) | [3.6 ~ 3.6] meters. (1: [209]:3.6) | [6.12 ~ 13.61] meters. (2: [202]:6.12, [209]:13.61) |
| CW cancellation capability < 140dB | [6.12 ~ 15.55] meters. (7: [199]:13.61, [201]:15.55, [190]:6.12, [202]:13.61, [209]:13.61, [194]:13.61, [213]:13.61) | [4.54 ~ 14.83] meters. (13: [199]:13.61, [215]:4.54, [193]:13.61, [201]:14.83, [192]:13.61, [203]:13.61, [205]:13.61, [211]:6.12, [210]:12.56, [190]:6.12, [209]:6.12, [194]:13.61, [213]:13.61) | [6.12 ~ 15.55] meters. (6: [199]:13.61, [201]:15.55, [211]:6.12, [190]:6.12, [202]:13.61, [194]:13.61) |
| CW cancellation capability >=140dB | [4.54 ~ 23.18] meters. (10: [215]:4.54, [193]:13.61, [192]:13.61, [203]:13.61, [205]:13.61, [211]:6.12, [210]:13.61, [202]:23.18, [209]:6.12, [195]:13.61) | [6.12 ~ 13.61] meters. (3: [197]:13.61, [209]:6.12, [195]:13.61) | [4.54 ~ 23.18] meters. (9: [215]:4.54, [193]:13.61, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [202]:23.18, [209]:6.12, [195]:13.61) |
| R2D Tx EIRP power < 30dBm, | R2D Rx sensitivity of -36dBm  [13.61 ~ 15.55] meters. (14: [197]:13.61, [199]:13.61, [193]:13.61, [191]:13.61, [201]:15.55, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [202]:13.61, [209]:13.61, [194]:13.61, [213]:13.61, [195]:13.61)  R2D Rx sensitivity of -30dBm  [4.54 ~ 6.12] meters. (6: [215]:4.54, [191]:6.12, [211]:6.12, [190]:6.12, [202]:5.62, [209]:6.12) | R2D Rx sensitivity of -36dBm  [3.6 ~ 14.83] meters. (13: [197]:13.61, [199]:13.61, [193]:13.61, [191]:13.61, [201]:14.83, [192]:13.61, [203]:13.61, [205]:13.61, [210]:12.56, [209]:3.6, [194]:13.61, [213]:13.61, [195]:13.61)  R2D Rx sensitivity of -30dBm  [4.54 ~ 6.12] meters. (5: [215]:4.54, [191]:6.12, [211]:6.12, [190]:6.12, [209]:6.12) | R2D Rx sensitivity of -36dBm  [13.61 ~ 15.55] meters. (12: [199]:13.61, [193]:13.61, [191]:13.61, [201]:15.55, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [202]:13.61, [209]:13.61, [194]:13.61, [195]:13.61)  R2D Rx sensitivity of -30dBm  [4.54 ~ 6.12] meters. (6: [215]:4.54, [191]:6.12, [211]:6.12, [190]:6.12, [202]:6.12, [209]:6.12) |
| R2D Tx EIRP power >=30dBm and <35dBm | R2D Rx sensitivity of -36dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -30dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -36dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -30dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -36dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -30dBm  [NaN ~ NaN] meters. (0: ) |
| R2D Tx EIRP power >=35dBm | R2D Rx sensitivity of -36dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -30dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -36dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -30dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -36dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -30dBm  [NaN ~ NaN] meters. (0: ) |
| FEC code (1/2, 1/3, 1/4) | [6.12 ~ 23.18] meters. (10: [193]:13.61, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [190]:6.12, [202]:23.18, [209]:13.61, [194]:13.61, [213]:13.61) | [6.12 ~ 13.61] meters. (9: [193]:13.61, [192]:13.61, [203]:13.61, [205]:13.61, [210]:12.56, [190]:6.12, [209]:6.12, [194]:13.61, [213]:13.61) | [6.12 ~ 23.18] meters. (9: [193]:13.61, [192]:13.61, [203]:13.61, [205]:13.61, [210]:13.61, [190]:6.12, [202]:23.18, [209]:13.61, [194]:13.61) |
| without FEC | [4.54 ~ 23.18] meters. (9: [197]:13.61, [199]:13.61, [215]:4.54, [191]:23.18, [201]:15.55, [211]:6.12, [190]:6.12, [213]:13.61, [195]:13.61) | [4.54 ~ 23.18] meters. (9: [197]:13.61, [199]:13.61, [215]:4.54, [191]:23.18, [201]:14.83, [211]:6.12, [190]:6.12, [213]:11, [195]:13.61) | [4.54 ~ 23.18] meters. (7: [199]:13.61, [215]:4.54, [191]:23.18, [201]:15.55, [211]:6.12, [190]:6.12, [195]:13.61) |
| OOK | [4.54 ~ 23.18] meters. (13: [197]:13.61, [215]:4.54, [191]:23.18, [201]:15.55, [192]:13.61, [203]:13.61, [205]:13.61, [211]:6.12, [190]:6.12, [202]:23.18, [194]:13.61, [213]:13.61, [195]:13.61) | [4.54 ~ 23.18] meters. (12: [197]:13.61, [215]:4.54, [191]:23.18, [201]:14.83, [192]:13.61, [203]:13.61, [205]:13.61, [211]:6.12, [190]:6.12, [194]:13.61, [213]:13.61, [195]:13.61) | [4.54 ~ 23.18] meters. (11: [215]:4.54, [191]:23.18, [201]:15.55, [192]:13.61, [203]:13.61, [205]:13.61, [211]:6.12, [190]:6.12, [202]:23.18, [194]:13.61, [195]:13.61) |
| BPSK | [6.12 ~ 13.61] meters. (5: [199]:13.61, [193]:13.61, [210]:13.61, [190]:6.12, [209]:13.61) | [6.12 ~ 13.61] meters. (5: [199]:13.61, [193]:13.61, [210]:12.56, [190]:6.12, [209]:6.12) | [6.12 ~ 13.61] meters. (5: [199]:13.61, [193]:13.61, [210]:13.61, [190]:6.12, [209]:13.61) |
| MSK | [6.12 ~ 6.12] meters. (1: [190]:6.12) | [6.12 ~ 6.12] meters. (1: [190]:6.12) | [6.12 ~ 6.12] meters. (1: [190]:6.12) |

#### 7.1.2.2 Device 2a

##### 7.1.2.2.1 Collection of the results

###### 7.1.2.2.1.1 [1kbps]

Table 7.1.2.2.1.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 2a, D2T2, InF-DL 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** |
| D2T2-A1 | [215] | 8.52 | 50.9 | 0.1 | 2-2 | Budget-Alt1 | 1 | 23 | -30 | 0.9 | 6 | 96 | 140 | 15.13 | non-coherent | 900 | 948 |
| 20 | 15.57 | 940 |
| 400 | 14.73 | 956 |
| -40 | 96 | 15.08 | 924 |
| 20 | 15.61 | 916 |
| 400 | 14.78 | 932 |
| [201] | 9.09 | 51.9 | 0.01 | 20 | 130 | 10.72 | 13 |
| 11.7 | 17 |
| [203] | 8.77 | 51.36 | 1.02 | -45 | 400 | 140 | 8.77 | coherent | 85 |
| 9.66 | 52.86 | 0.83 | 96 | 9.66 | 65 |
| 10.92 | 54.76 | 0.43 | 20 | 10.92 | 75 |
| [202] | 3.13 | 35.4 | 1.07 | -40 | 96 | 100 | 3.13 | non-coherent | 160 |
| 3.65 | 37.75 | 0.96 | 20 | 3.65 | 156 |
| 3.68 | 37.9 | 0.7 | 3.68 | 144 |
| 4.54 | 41.15 | 0.1 | 1.07 | 96 | 4.54 | 152 |
| 5.15 | 43.1 | 0.96 | 20 | 5.15 | 148 |
| [195] | 8.52 | 50.9 | 1.14 | 96 | 140 | 14.46 | 1002 |
| 1.06 | 400 | 14.51 | 1010 |
| [198] | 11.76 | 55.9 | 1.14 | -45 | 6(OOK) | 96 | 1000 | 15.76 | coherent | 1 |
| 0(BPSK) | 21.75 | 9 |
| 0.95 | 6(OOK) | 20 | 14.49 | 6 |
| [210] | 11.26 | 58.9 | 0.58 | 26 | 0 | 96 |  | 298 |
| 35.48 | 73.02 | Budget-Alt2 | -67.45 | 302 |
| [197] | 10.75 | 54.51 | 0.01 | Budget-Alt1 | 1 | 23 | -45 | 6 | 20 |  | 10.75 | non-coherent | 370 |
| 11.76 | 55.9 | 0.1 | 14.14 | 366 |
| [190] | 0.01 | 0.96 | 0 | 150 | 34.2 | coherent | 1176 |
| 6 | 23.68 | 1177 |
| D2T2-A2 | [215] | 7.96 | 49.84 | 0.1 | 1 | -30 | 400 | 120 | 7.96 | non-coherent | 958 |
| 7.98 | 49.9 | -40 | 7.98 | 934 |
| 8.14 | 50.21 | 96 | 8.14 | 926 |
| 8.17 | 50.26 | -30 | 8.17 | 950 |
| 8.41 | 50.7 | 20 | 8.41 | 942 |
| 8.43 | 50.75 | -40 | 8.43 | 918 |
| [201] | 7.27 | 49.5 | 0.01 | 7.78 | 14 |
| 8.4 | 50.85 | 8.49 | 18 |
| [203] | 6.56 | 46.84 | 1.02 | -45 | 400 | 130 | 6.56 | coherent | 86 |
| 7.22 | 48.34 | 0.83 | 96 | 7.22 | 66 |
| 8.16 | 50.24 | 0.43 | 20 | 8.16 | 76 |
| [195] | 8.52 | 50.9 | 0.1 | 1.14 | -40 | 96 | 141 | 7.92 | non-coherent | 1003 |
| 1.06 | 400 | 8.18 | 1011 |
| [198] | 7 | 47.89 | 0.95 | -45 | 6(OOK) | 20 | 120 | 7.01 | coherent | 7 |
| 7.6 | 49.19 | 1.14 | 96 | 7.63 | 2 |
| 10.5 | 54.19 | 0(BPSK) | 10.53 | 10 |
| [210] | 10.76 | 58.4 | 0.58 | 26 | 0 |  | 299 |
| Budget-Alt2 | -67.45 | 303 |
| [197] | 8.39 | 52.95 | 0.01 | Budget-Alt1 | 1 | 23 | -45 | 6 | 20 | 140 | 8.39 | non-coherent | 371 |
| 11.76 | 55.9 | 0.1 | 13.12 | 367 |
| [190] | 11.49 | 55.54 | 0.01 | 0.96 | 120 | 11.49 | coherent | 1181 |
| 11.76 | 55.9 | 0 | 16.6 | 1180 |
| D2T2-B | [215] | 8.52 | 50.9 | 0.1 | 2-3 | 1 | -30 | 6 | 96 | 140 | 10 | non-coherent | 952 |
| 20 | 944 |
| 400 | 960 |
| -40 | 96 | 928 |
| 20 | 920 |
| 400 | 936 |
| 2-4 | -30 | 96 | 954 |
| 20 | 946 |
| 400 | 962 |
| -40 | 96 | 930 |
| 20 | 922 |
| 400 | 938 |
| [201] | 9.09 | 51.9 | 0.01 | 2-3 | 20 | 130 | 10.73 | 15 |
| 11.7 | 19 |
| 2-4 | 10.72 | 16 |
| 11.7 | 20 |
| [203] | 7.7 | 49.33 | 1.02 | -45 | 400 | 140 | 10 | coherent | 89 |
| 8.22 | 50.34 | 2-3 | 88 |
| 8.24 | 50.38 | 87 |
| 9.34 | 52.33 | 2-4 | 0.83 | 96 | 69 |
| 9.97 | 53.34 | 2-3 | 68 |
| 10 | 53.38 | 67 |
| 11.76 | 55.9 | 0.43 | 20 | 77 |
| 78 |
| 2-4 | 79 |
| [202] | 2.08 | 29.06 | 1.07 | -40 | 96 | 100 | 5 | non-coherent | 162 |
| 2.82 | 33.76 | 0.96 | 20 | 158 |
| 2.88 | 34.06 | 0.7 | 146 |
| 4.37 | 40.56 | 0.1 | 1.07 | 96 | 154 |
| 5.62 | 44.46 | 0.96 | 20 | 150 |
| [195] | 8.52 | 50.9 | 2-3 | 1.14 | 96 | 140 | 1004 |
| 1.06 | 400 | 1012 |
| 2-4 | 1.14 | 96 | 1005 |
| 1.06 | 400 | 1013 |
| [198] | 11.76 | 55.9 | 2-3 | 1.14 | -45 | 6(OOK) | 96 | 1000 | 10 | coherent | 3 |
| 0(BPSK) | 11 |
| 0.95 | 6(OOK) | 20 | 5 |
| 2-4 | 1.14 | 96 | 4 |
| 0(BPSK) | 12 |
| 0.95 | 6(OOK) | 20 | 8 |
| [210] | 11.26 | 58.9 | 2-3 | 0.58 | 26 | 0 | 96 | 300 |
| 2-4 | 301 |
| 60.71 | 81.35 | 2-3 | Budget-Alt2 | -67.45 | 304 |
| 2-4 | 305 |
| [190] | 11.76 | 55.9 | 0.01 | 2-3 | Budget-Alt1 | 0.96 | 23 | -45 | 20 | 150 | 1184 |
| 6 | 1186 |
| 2-4 | 0 | 1185 |
| 6 | 1187 |

Figure 7.1.2.2.1.1-1

Table 7.1.2.2.1.1-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 2a, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [215] | 13.25 | 55.1 | 0.1 | 2-2 | Budget-Alt1 | 1 | 23 | -30 | 0.9 | 6 | 96 | 140 | 46.29 | non-coherent | 900 | 972 |
| 20 | 48.89 | 964 |
| 400 | 44.76 | 980 |
| [193] | 45.09 | 60.1 | 0.8 | -45 | 0 | 96 | 1000 | 295.86 | coherent | 50 |
| 6 | 198.46 | 45 |
| [201] | 26.48 | 56.1 | 0.01 | 1 | -40 | 20 | 130 | 54.45 | non-coherent | 21 |
| 68.73 | 25 |
| [203] | 45.09 | 60.1 | 0.43 | -45 | 140 | 86.04 | coherent | 80 |
| 0.83 | 96 | 80.5 | 70 |
| 1.02 | 400 | 69.54 | 90 |
| [192] | 1.1 | 76.83 | 338 |
| 0.43 | 20 | 96.99 | 332 |
| 0.83 | 96 | 90.14 | 335 |
| 0.1 | 1.1 | 400 | 105.05 | 320 |
| 0.43 | 20 | 128.26 | 314 |
| 0.83 | 96 | 119.21 | 317 |
| [202] | 7.99 | 47.1 | 0.01 | 0.96 | -40 | 20 | 100 | 7.99 | non-coherent | 157 |
| 9.63 | 48.5 | 1.07 | 96 | 9.63 | 161 |
| 10.78 | 49.35 | 0.7 | 20 | 10.78 | 145 |
| 11.52 | 49.85 | 0.1 | 0.96 | 11.52 | 149 |
| 12.07 | 50.2 | 1.07 | 96 | 12.07 | 153 |
| 30.22 | 57.09 | 0.01 | 0.96 | -45 | 20 | 120 | 7.99 | 184 |
| 36.41 | 58.49 | 1.07 | 96 | 9.63 | 186 |
| 43.58 | 59.84 | 0.1 | 0.96 | 20 | 11.52 | 180 |
| 45.09 | 60.1 | 0.01 | 1.07 | 96 | 140 | 9.63 | 202 |
| 0.96 | 20 | 7.99 | 200 |
| 0.1 | 1.07 | 96 | 12.07 | 198 |
| 120 | 182 |
| 0.96 | 20 | 140 | 11.52 | 196 |
| [195] | 23.18 | 55.1 | 1.14 | -40 | 96 | 98.29 | 998 |
| 1.06 | 400 | 88.92 | 1006 |
| [197] | 45.09 | 60.1 | 0.01 | 1 | -45 | 20 |  | 68.2 | 372 |
| 0.1 | 89 | 368 |
| [209] | 13.98 | 51.3 | 0.01 | -40 | 4.7 | 0 | 96 | 120 | 55.29 | coherent | 1116 |
| 0.1 | 71.55 | 1140 |
| 18.61 | 53.45 | 0.01 | 0.9 | 100 | 24.28 | 1113 |
| 23.18 | 55.1 | 150 | 359 | 1110 |
| 1000 | 371.49 | 1107 |
| 120 | 91.69 | 1104 |
| 91.52 | 1122 |
| 0.1 | 150 | 398.49 | 1134 |
| 1000 | 406.33 | 1131 |
| 120 | 118.64 | 1128 |
| 1146 |
| 100 | 31.48 | 1137 |
| 34.55 | 58.1 | 0.01 | 26 | 120 | 91.71 | 1125 |
| 0.1 | 118.88 | 1149 |
| 45.09 | 60.1 | 0.01 | 23 | -45 | 91.69 | 1119 |
| 0.1 | 118.64 | 1143 |
| [190] | 0.01 | 0.96 | 20 | 130 | 424.61 | 1178 |
| 6 | 191.06 | 1179 |
| [213] | 14.26 | 51.45 | 1.67 | 400 |  | 827 |
| 17.64 | 53.05 | 1.25 | 96 | 821 |
| 21.83 | 54.65 | 0.65 | 20 | 815 |
| 0.1 | 1.67 | 400 | 824 |
| 24.6 | 55.55 | 1.25 | 96 | 818 |
| 29.45 | 56.9 | 0.65 | 20 | 812 |
| 40.8 | 59.35 | 0.01 | 1.09 | 400 | 863 |
| 44.78 | 60.05 | 0.9 | 96 | 857 |
| 45.09 | 60.1 | 0.53 | 20 | 851 |
| 0.1 | 848 |
| 0.9 | 96 | 854 |
| 1.09 | 400 | 860 |
| [211] | 23.18 | 55.1 | 0.01 | 1 | -40 | 96 | 1000 | 35.72 | non-coherent | 1041 |
| 400 | 20.03 | 1043 |
| 0.1 | 96 | 38.65 | 1040 |
| 400 | 21.12 | 1042 |
| [205] | 1.14 | 96 | 161.89 | 988 |
| D2T2-A2 | [215] | 13.25 | 1 | -30 | 120 | 16.66 | 974 |
| 20 | 17.59 | 966 |
| 400 | 16.11 | 982 |
| [193] | 34.6 | 58.11 | 0.8 | -45 | 96 | 34.6 | coherent | 46 |
| 45.09 | 60.1 | 0 | 51.57 | 51 |
| [201] | 26.48 | 56.1 | 0.01 | 1 | -40 | 6 | 20 | 28.1 | non-coherent | 22 |
| 35.47 | 26 |
| [203] | 38.12 | 58.84 | 1.02 | -45 | 400 | 130 | 38.12 | coherent | 91 |
| 44.13 | 59.94 | 0.83 | 96 | 44.13 | 71 |
| 45.09 | 60.1 | 0.43 | 20 | 47.17 | 81 |
| [192] | 42.12 | 59.59 | 1.1 | 400 | 42.12 | 339 |
| 45.09 | 60.1 | 0.43 | 20 | 53.17 | 333 |
| 0.83 | 96 | 49.42 | 336 |
| 0.1 | 1.1 | 400 | 57.59 | 321 |
| 0.43 | 20 | 70.32 | 315 |
| 0.83 | 96 | 65.35 | 318 |
| [195] | 23.18 | 55.1 | 1.14 | -40 | 141 | 28.38 | non-coherent | 999 |
| 1.06 | 400 | 27.25 | 1007 |
| [197] | 45.09 | 60.1 | 0.01 | 1 | -45 | 20 | 140 | 55.41 | 373 |
| 0.1 | 72.31 | 369 |
| [209] | 2.53 | 38.45 | 0.01 | -40 | 0 | 96 | 70 | 3.3 | coherent | 1114 |
| 3.28 | 40.4 | 0.1 | 4.27 | 1138 |
| 5.77 | 44.65 | 0.01 | 4.7 | 90 | 7.53 | 1117 |
| 7.48 | 46.6 | 0.1 | 9.76 | 1141 |
| 9.56 | 48.45 | 0.01 | 0.9 | 12.48 | 1105 |
| 1123 |
| -45 | 1120 |
| 26 | -40 | 1126 |
| 12.4 | 50.4 | 0.1 | 23 | 16.18 | 1129 |
| 1147 |
| -45 | 1144 |
| 26 | -40 | 1150 |
| 23.18 | 55.1 | 0.01 | 23 | 1000 | 371.49 | 1108 |
| 120 | 91.69 | 1111 |
| 0.1 | 1000 | 406.33 | 1132 |
| 120 | 118.64 | 1135 |
| [190] | 45.09 | 60.1 | 0.01 | 0.96 | -45 | 20 | 220.91 | 1182 |
| 6 | 99.4 | 1183 |
| [213] | 7.37 | 46.49 | 1.67 | 400 |  | 828 |
| 9.12 | 48.09 | 1.25 | 96 | 822 |
| 11.29 | 49.69 | 0.65 | 20 | 816 |
| 0.1 | 1.67 | 400 | 825 |
| 12.72 | 50.59 | 1.25 | 96 | 819 |
| 15.23 | 51.94 | 0.65 | 20 | 813 |
| 21.1 | 54.39 | 0.01 | 1.09 | 400 | 864 |
| 23.16 | 55.09 | 0.9 | 96 | 858 |
| 24.75 | 55.59 | 0.53 | 20 | 852 |
| 26.81 | 56.19 | 0.1 | 1.09 | 400 | 861 |
| 29.82 | 56.99 | 0.9 | 96 | 855 |
| 31.66 | 57.44 | 0.53 | 20 | 849 |
| [205] | 23.18 | 55.1 | 1.14 | -40 | 96 | 28.22 | non-coherent | 989 |
| D2T2-B | [215] | 13.25 | 2-3 | 1 | -30 | 140 | 10 | 976 |
| 20 | 968 |
| 400 | 984 |
| 2-4 | 96 | 978 |
| 20 | 970 |
| 400 | 986 |
| [193] | 45.09 | 60.1 | 2-3 | 0.8 | -45 | 0 | 96 | 1000 | coherent | 52 |
| 6 | 47 |
| 2-4 | 0 | 53 |
| 54 |
| 6 | 48 |
| 49 |
| [201] | 26.48 | 56.1 | 0.01 | 2-3 | 1 | -40 | 20 | 130 | 54.5 | non-coherent | 23 |
| 68.79 | 27 |
| 2-4 | 54.45 | 24 |
| 68.73 | 28 |
| [203] | 45.09 | 60.1 | 2-3 | 0.43 | -45 | 140 | 10 | coherent | 82 |
| 83 |
| 0.83 | 96 | 72 |
| 73 |
| 1.02 | 400 | 92 |
| 93 |
| 2-4 | 0.43 | 20 | 84 |
| 0.83 | 96 | 74 |
| 1.02 | 400 | 94 |
| [192] | 1.1 | 340 |
| 0.43 | 20 | 334 |
| 0.83 | 96 | 337 |
| 0.1 | 1.1 | 400 | 322 |
| 0.43 | 20 | 316 |
| 0.83 | 96 | 319 |
| [202] | 14.4 | 51.52 | 0.01 | 0.96 | -40 | 20 | 100 | 5 | non-coherent | 159 |
| 20.9 | 54.32 | 1.07 | 96 | 163 |
| 23.18 | 55.1 | 0.7 | 20 | 147 |
| 0.1 | 1.07 | 96 | 155 |
| 0.96 | 20 | 151 |
| 45.09 | 60.1 | 0.01 | 1.07 | -45 | 96 | 140 | 203 |
| 120 | 187 |
| 0.96 | 20 | 140 | 201 |
| 120 | 185 |
| 0.1 | 1.07 | 96 | 140 | 199 |
| 120 | 183 |
| 0.96 | 20 | 140 | 197 |
| 120 | 181 |
| [195] | 23.18 | 55.1 | 2-3 | 1.14 | -40 | 96 | 140 | 1000 |
| 1.06 | 400 | 1008 |
| 2-4 | 1.14 | 96 | 1001 |
| 1.06 | 400 | 1009 |
| [209] | 13.21 | 50.88 | 0.01 | 1 | 0 | 96 | 90 | coherent | 1115 |
| 13.98 | 51.3 | 4.7 | 110 | 1118 |
| 0.1 | 1142 |
| 22.2 | 54.78 | 0.9 | 90 | 1139 |
| 23.18 | 55.1 | 0.01 | 140 | 1112 |
| 1000 | 1109 |
| 110 | 1106 |
| 1124 |
| 0.1 | 140 | 1136 |
| 1000 | 1133 |
| 110 | 1130 |
| 1148 |
| 34.55 | 58.1 | 0.01 | 26 | 1127 |
| 0.1 | 1151 |
| 45.09 | 60.1 | 0.01 | 23 | -45 | 1121 |
| 0.1 | 1145 |
| [190] | 0.01 | 2-3 | 0.96 | 20 | 130 | 10 | 1188 |
| 6 | 1190 |
| 2-4 | 0 | 1189 |
| 6 | 1191 |
| [213] | 67.21 | 63.1 | 0.65 | 26 | 5 | 817 |
| 1.25 | 96 | 823 |
| 1.67 | 400 | 829 |
| 0.53 | 20 | 853 |
| 0.9 | 96 | 859 |
| 1.09 | 400 | 865 |
| 0.1 | 0.65 | 20 | 814 |
| 1.25 | 96 | 820 |
| 1.67 | 400 | 826 |
| 0.53 | 20 | 850 |
| 0.9 | 96 | 856 |
| 1.09 | 400 | 862 |
| [205] | 23.18 | 55.1 | 2-3 | 1.14 | 23 | -40 | 96 | 1000 | 10 | non-coherent | 990 |
| 2-4 | 991 |
| 992 |

Figure 7.1.2.2.1.1-2



###### 7.1.2.2.1.2 [5~7kbps]

Table 7.1.2.2.1.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 2a, D2T2, InF-DL 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** |
| D2T2-A1 | [215] | 8.52 | 50.9 | 0.1 | 2-2 | Budget-Alt1 | 5 | 23 | -30 | 0.9 | 6 | 96 | 140 | 14.15 | non-coherent | 900 | 949 |
| 20 | 15.09 | 941 |
| 400 | 13.74 | 957 |
| -40 | 96 | 14.08 | 925 |
| 20 | 15.03 | 917 |
| 400 | 13.75 | 933 |
| [201] | 9.09 | 51.9 | 6 | 96 | 130 | 10.18 | 33 |
| 9.58 | 29 |
| [202] | 2.82 | 33.75 | 0.01 | 5.36 | 100 | 2.82 | 176 |
| 2.83 | 33.8 | 4.81 | 20 | 2.83 | 172 |
| 3.97 | 39.05 | 0.1 | 5.36 | 96 | 3.97 | 168 |
| 4.04 | 39.35 | 4.81 | 20 | 4.04 | 164 |
| [195] | 8.52 | 50.9 | 5.08 | 400 | 140 | 12.43 | 1026 |
| 5.49 | 96 | 12.16 | 1018 |
| [210] | 8.59 | 55.9 | 0.01 | 4.67 | -45 | 0 | 1000 |  | coherent | 282 |
| 18.7 | 64.52 | Budget-Alt2 | -67.45 | 286 |
| [197] | 8.86 | 51.51 | Budget-Alt1 | 5 | -45 | 6 | 20 |  | 8.86 | non-coherent | 358 |
| 11.65 | 55.76 | 0.1 | 11.65 | 350 |
| [190] | 8.63 | 51.1 | 0.01 | 6.43 | 96 | 150 | 8.63 | coherent | 1154 |
| 11.76 | 55.9 | 0 | 19.77 | 1153 |
| 21.37 | 693 |
| 23.09 | 692 |
| 18.47 | 1152 |
| 6 | 15.08 | 694 |
| [212] | 9.03 | 51.8 | Budget Alt1 | 7 | -40 | 140 | 9.11 | 892 |
| 8.01 | non-coherent | 908 |
| 0.1 | 13.9 | coherent | 884 |
| 11.79 | non-coherent | 900 |
| 10.96 | 54.8 | 0.01 | 26 | 8.12 | 912 |
| 9.24 | coherent | 896 |
| 0.1 | 14.09 | 888 |
| 11.96 | non-coherent | 904 |
| [199] | 5.47 | 50.9 | Budget-Alt1 | 5.9 | 23 | 0 | 120 | 6.36 | coherent | 136 |
| [191] | 5.34 | 43.65 | 0.01 | 5 | -50 | 6 | 400 |  |  | non-coherent | 552 |
| 5.89 | 45.18 | 96 | 648 |
| 6.7 | 47.18 | 20 | 636 |
| 6.79 | 47.38 | 564 |
| 6.8 | 47.4 | 96 | 540 |
| 612 |
| 6.81 | 47.43 | 576 |
| 7.38 | 48.68 | 400 | 588 |
| 7.73 | 49.4 | 20 | 600 |
| 7.78 | 49.5 | 528 |
| 8.52 | 50.9 | 0.1 | -40 | 522 |
| 686 |
| 8.66 | 51.15 | -50 | 400 | 546 |
| 8.67 | 51.18 | 96 | 642 |
| 9.25 | 52.18 | 570 |
| 400 | 582 |
| 9.56 | 52.68 | 20 | 558 |
| 630 |
| 10.01 | 53.4 | 96 | 606 |
| 10.07 | 53.5 | 534 |
| 11.17 | 55.1 | 20 | 594 |
| 11.21 | 55.15 | -45 | 673 |
|  |  | 0.01 | -50 | 400 | 624 |
| 660 |
| 0.1 | 618 |
| 654 |
| [207] | 8.52 | 50.9 | 0.01 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 57.21 | 250 |
| 52.2 | 218 |
| 0.1 | 59.85 | 258 |
| 57.13 | 226 |
| [200] | 6.32 | 53.2 | 0.01 | Budget-Alt1 | 7.5 | -45 | 400 |  | 6.32 | 2000 | 774 |
| 775 |
| 6.56 | 53.79 | 96 | 6.56 | 769 |
| 771 |
| 6.72 | 54.15 | 0.1 | 400 | 6.72 | 772 |
| 773 |
| 6.77 | 54.26 | 0.01 | 20 | 6.77 | 765 |
| 767 |
| 6.93 | 54.64 | 0.1 | 96 | 6.93 | 768 |
| 770 |
| 7.26 | 55.36 | 20 | 7.26 | 764 |
| 766 |
| 9.97 | 53.34 | 0.01 | 400 | 9.97 | 900 | 726 |
| 727 |
| 10.28 | 53.81 | 96 | 10.28 | 721 |
| 723 |
| 10.52 | 54.17 | 0.1 | 400 | 10.52 | 724 |
| 725 |
| 10.59 | 54.27 | 0.01 | 20 | 10.59 | 717 |
| 719 |
| 10.85 | 54.65 | 0.1 | 96 | 10.85 | 720 |
| 722 |
| 11.37 | 55.38 | 20 | 11.37 | 716 |
| 718 |
| [214] | 2.56 | 32.28 | 0.01 | 1-4 | Budget-Alt2 | 5 | -21.38 | 130 | 6.41 | 215 |
| 6.02 | 45.51 | 0.1 | -34.61 | 7.16 | 212 |
| [196] | 9.68 | 57.22 | 2-2 | Budget-Alt1 | 6.4 | 26 | -45 |  | 6(OOK) | 96 | 1000 | 9.68 | 1047 |
| 10 | 58.33 | 5 | 20 | 10 | 1044 |
| 57.57 | 6 | 96 | 1050 |
| 6.6 | 400 | 1053 |
| D2T2-A2 | [215] | 7.42 | 48.76 | 5 | 23 | -30 | 0.9 | 6 | 120 | 7.42 | 959 |
| 7.43 | 48.78 | -40 | 7.43 | 935 |
| 7.61 | 49.15 | 96 | 7.61 | 927 |
| 7.65 | 49.23 | -30 | 7.65 | 951 |
| 8.12 | 50.16 | -40 | 20 | 8.12 | 919 |
| 8.15 | 50.22 | -30 | 8.15 | 943 |
| [201] | 6.03 | 47.75 | 6 | -40 | 96 | 6.95 | 30 |
| 6.68 | 48.7 | 7.39 | 34 |
| [195] | 8.52 | 50.9 | 5.08 | 400 | 141 | 7.67 | 1027 |
| 5.49 | 96 | 7.5 | 1019 |
| [210] | 5.72 | 51.39 | 0.01 | 4.67 | -45 | 0 | 120 |  | coherent | 283 |
| Budget-Alt2 | -67.45 | 287 |
| [197] | 6.12 | 49.95 | Budget-Alt1 | 5 | -45 | 6 | 20 | 140 | 6.12 | non-coherent | 359 |
| 9.57 | 54.2 | 0.1 | 9.57 | 351 |
| [190] | 4.19 | 39.89 | 0.01 | 6.43 | 96 | 120 | 4.19 | coherent | 1160 |
| 6.8 | 47.39 | 6.8 | 700 |
| 8.96 | 51.69 | 0 | 8.96 | 1158 |
| 9.59 | 52.74 | 9.59 | 1159 |
| 9.63 | 52.79 | 9.63 | 699 |
| 10.4 | 53.99 | 10.4 | 698 |
| [212] | 9.03 | 51.8 | Budget Alt1 | 7 | -40 | 6 | 140 | 9.11 | 893 |
| 8.01 | non-coherent | 909 |
| 0.1 | 13.9 | coherent | 885 |
| 11.79 | non-coherent | 901 |
| 10.96 | 54.8 | 0.01 | 26 | 8.12 | 913 |
| 9.24 | coherent | 897 |
| 0.1 | 14.09 | 889 |
| 11.96 | non-coherent | 905 |
| [199] | 5.47 | 50.9 | Budget-Alt1 | 5.9 | 23 | 0 | 120 | 6.36 | coherent | 137 |
| [191] | 3.87 | 38.65 | 0.01 | 5 | -50 | 6 | 400 |  |  | non-coherent | 555 |
| 4.27 | 40.18 | 96 | 651 |
| 4.85 | 42.18 | 20 | 639 |
| 42.15 | 400 | 554 |
| 4.92 | 42.38 | 20 | 567 |
| 42.4 | 96 | 543 |
| 615 |
| 4.93 | 42.43 | 579 |
| 5.17 | 43.15 | 400 | 553 |
| 5.35 | 43.68 | 96 | 650 |
| 400 | 591 |
| 5.6 | 44.4 | 20 | 603 |
| 5.64 | 44.5 | 531 |
| 5.7 | 44.68 | 96 | 649 |
| 6.08 | 45.68 | 20 | 638 |
| 6.16 | 45.88 | 566 |
| 6.17 | 45.9 | 96 | 542 |
| 614 |
| 6.18 | 45.93 | 578 |
| 6.27 | 46.15 | 0.1 | 400 | 549 |
| 6.28 | 46.18 | 96 | 645 |
| 6.49 | 46.68 | 0.01 | 20 | 637 |
| 6.57 | 46.88 | 565 |
| 6.58 | 46.9 | 96 | 541 |
| 613 |
| 6.59 | 46.93 | 577 |
| 6.7 | 47.18 | 400 | 590 |
| 0.1 | 96 | 573 |
| 400 | 585 |
| 6.92 | 47.68 | 20 | 561 |
| 633 |
| 7.02 | 47.9 | 0.01 | 602 |
| 7.07 | 48 | 530 |
| 7.15 | 48.18 | 400 | 589 |
| 7.25 | 48.4 | 0.1 | 96 | 609 |
| 7.3 | 48.5 | 537 |
| 7.49 | 48.9 | 0.01 | 20 | 601 |
| 7.54 | 49 | 529 |
| 7.86 | 49.65 | 0.1 | 400 | 548 |
| 7.87 | 49.68 | 96 | 644 |
| 8.09 | 50.1 | 20 | 597 |
| 8.12 | 50.15 | -40 | 689 |
| -45 | 676 |
| -50 | 525 |
| 8.38 | 50.65 | 400 | 547 |
| 8.4 | 50.68 | 96 | 572 |
| 643 |
| 400 | 584 |
| 8.52 | 50.9 | -40 | 20 | 687 |
| 688 |
| 8.67 | 51.18 | -50 | 560 |
| 632 |
| 8.96 | 51.68 | 96 | 571 |
| 400 | 583 |
| 9.09 | 51.9 | 96 | 608 |
| 9.15 | 52 | 536 |
| 9.25 | 52.18 | 20 | 559 |
| 631 |
| 9.69 | 52.9 | 96 | 607 |
| 9.75 | 53 | 535 |
| 10.14 | 53.6 | 20 | 596 |
| 10.17 | 53.65 | -45 | 675 |
| -50 | 524 |
| 10.82 | 54.6 | 595 |
| 10.85 | 54.65 | -45 | 674 |
| -50 | 523 |
|  |  | 0.01 | 400 | 625 |
| 626 |
| 627 |
| 661 |
| 662 |
| 663 |
| 0.1 | 619 |
| 620 |
| 621 |
| 655 |
| 656 |
| 657 |
| [207] | 8.52 | 50.9 | 0.01 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 57.21 | 252 |
| 52.2 | 220 |
| 0.1 | 59.85 | 260 |
| 57.13 | 228 |
| [211] | 2.95 | 43 | 0.01 | Budget-Alt1 | 6.4 | 120 | 2.95 | 1033 |
| 3.06 | 43.35 | 3.06 | 1031 |
| 4.21 | 46.4 | 0.1 | 4.21 | 1032 |
| 4.33 | 46.65 | 4.33 | 1030 |
| [200] | 2.75 | 40.32 | 0.01 | 7.5 | -45 | 400 | 3.82 | 2000 | 786 |
| 787 |
| 2.86 | 40.91 | 96 | 3.97 | 781 |
| 783 |
| 2.93 | 41.27 | 0.1 | 400 | 4.07 | 784 |
| 785 |
| 2.95 | 41.38 | 0.01 | 20 | 4.1 | 777 |
| 779 |
| 3.02 | 41.76 | 0.1 | 96 | 4.2 | 780 |
| 782 |
| 3.16 | 42.48 | 20 | 4.4 | 776 |
| 778 |
| 4.34 | 40.46 | 0.01 | 400 | 6.04 | 900 | 738 |
| 739 |
| 4.48 | 40.92 | 96 | 6.22 | 733 |
| 735 |
| 4.58 | 41.29 | 0.1 | 400 | 6.37 | 736 |
| 737 |
| 4.61 | 41.39 | 0.01 | 20 | 6.41 | 729 |
| 731 |
| 4.73 | 41.77 | 0.1 | 96 | 6.57 | 732 |
| 734 |
| 4.95 | 42.49 | 20 | 6.88 | 728 |
| 730 |
| [214] | 2.56 | 32.28 | 0.01 | 1-4 | Budget-Alt2 | 5 | -21.38 | 3.79 | 216 |
| 6.02 | 45.51 | 0.1 | -34.61 | 4.24 | 213 |
| [196] | 5.9 | 51.74 | 2-2 | Budget-Alt1 | 6.4 | 26 | -45 |  | 6(OOK) | 96 | 130 | 5.9 | 1048 |
| 6.13 | 52.16 | 6 | 6.13 | 1051 |
| 6.6 | 400 | 1054 |
| 6.6 | 52.98 | 5 | 20 | 6.6 | 1045 |
| D2T2-B | [215] | 8.52 | 50.9 | 2-3 | 23 | -30 | 0.9 | 6 | 96 | 140 | 10 | 953 |
| 20 | 945 |
| 400 | 961 |
| -40 | 96 | 929 |
| 20 | 921 |
| 400 | 937 |
| 2-4 | -30 | 96 | 955 |
| 20 | 947 |
| 400 | 963 |
| -40 | 96 | 931 |
| 20 | 923 |
| 400 | 939 |
| [201] | 9.09 | 51.9 | 2-3 | 6 | 96 | 130 | 9.58 | 31 |
| 10.19 | 35 |
| 2-4 | 10.18 | 36 |
| 9.58 | 32 |
| [202] | 1.68 | 25.76 | 0.01 | 5.36 | 100 | 5 | 178 |
| 1.69 | 25.86 | 4.81 | 20 | 174 |
| 3.34 | 36.36 | 0.1 | 5.36 | 96 | 170 |
| 3.47 | 36.96 | 4.81 | 20 | 166 |
| [195] | 8.52 | 50.9 | 2-3 | 5.08 | 400 | 140 | 1028 |
| 5.49 | 96 | 1020 |
| 2-4 | 5.08 | 400 | 1029 |
| 5.49 | 96 | 1021 |
| [210] | 8.59 | 55.9 | 0.01 | 2-3 | 4.67 | -45 | 0 | 1000 | 10 | coherent | 284 |
| 2-4 | 285 |
| 32.07 | 71.45 | Budget-Alt2 | -67.45 | 289 |
| 50.03 | 78.35 | 2-3 | 288 |
| [190] | 7.45 | 48.81 | 2-4 | Budget-Alt1 | 6.43 | -45 | 6 | 150 | 1169 |
| 7.85 | 49.62 | 2-3 | 1168 |
| 11.76 | 55.9 | 0 | 704 |
| 706 |
| 1164 |
| 1166 |
| 6 | 708 |
| 2-4 | 0 | 705 |
| 707 |
| 1167 |
| 1165 |
| 6 | 709 |
| [212] | 9.03 | 51.8 | 2-3 | Budget Alt1 | 7 | -40 | 140 | 5 | 894 |
| non-coherent | 910 |
| 2-4 | coherent | 895 |
| non-coherent | 911 |
| 0.1 | 2-3 | coherent | 886 |
| non-coherent | 902 |
| 2-4 | coherent | 887 |
| non-coherent | 903 |
| 10.96 | 54.8 | 0.01 | 2-3 | 26 | 10 | coherent | 898 |
| non-coherent | 914 |
| 2-4 | coherent | 899 |
| non-coherent | 915 |
| 0.1 | 2-3 | coherent | 890 |
| non-coherent | 906 |
| 2-4 | coherent | 891 |
| non-coherent | 907 |
| [199] | 5.47 | 50.9 | 2-3 | Budget-Alt1 | 5.9 | 23 | 0 | 120 | 5 | coherent | 142 |
| 2-4 | 138 |
| [191] | 2.85 | 33.92 | 0.01 | 5 | -50 | 6 | 400 |  | 10 | non-coherent | 557 |
| 3.47 | 36.97 | 96 | 653 |
| 4.49 | 40.97 | 20 | 641 |
| 4.61 | 41.37 | 569 |
| 4.62 | 41.42 | 96 | 545 |
| 617 |
| 4.64 | 41.47 | 581 |
| 5.43 | 43.92 | 2-3 | 400 | 556 |
| 5.45 | 43.97 | 2-4 | 593 |
| 5.98 | 45.42 | 20 | 605 |
| 6.06 | 45.62 | 533 |
| 6.61 | 46.97 | 2-3 | 96 | 652 |
| 7.5 | 48.92 | 0.1 | 2-4 | 400 | 551 |
| 7.52 | 48.97 | 96 | 647 |
| 8.52 | 50.9 | 2-3 | -40 | 20 | 690 |
| 2-4 | 691 |
| 8.56 | 50.97 | 0.01 | 2-3 | -50 | 640 |
| 0.1 | 2-4 | 96 | 575 |
| 400 | 587 |
| 8.78 | 51.37 | 0.01 | 2-3 | 20 | 568 |
| 8.81 | 51.42 | 96 | 544 |
| 616 |
| 8.84 | 51.47 | 580 |
| 9.13 | 51.97 | 0.1 | 2-4 | 20 | 563 |
| 635 |
| 10.02 | 53.42 | 96 | 611 |
| 10.15 | 53.62 | 539 |
| 10.39 | 53.97 | 0.01 | 2-3 | 400 | 592 |
| 11.4 | 55.42 | 20 | 604 |
| 11.55 | 55.62 | 532 |
| 11.76 | 55.9 | 0.1 | -45 | 677 |
| 2-4 | 678 |
| 12.48 | 56.82 | -50 | 599 |
| 12.56 | 56.92 | 527 |
| 14.29 | 58.92 | 2-3 | 400 | 550 |
| 14.34 | 58.97 | 96 | 646 |
| 16.24 | 60.9 | 574 |
| 538 |
| 610 |
| 20 | 526 |
| 562 |
| 598 |
| 634 |
| 400 | 586 |
|  |  | 0.01 | 628 |
| 664 |
| 2-4 | 629 |
| 665 |
| 0.1 | 2-3 | 622 |
| 658 |
| 2-4 | 623 |
| 659 |
| [207] | 8.52 | 50.9 | 0.01 | 2-3 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 222 |
| 254 |
| 2-4 | 5 | 224 |
| 256 |
| 0.1 | 2-3 | 10 | 230 |
| 262 |
| 2-4 | 5 | 232 |
| 264 |
| [200] | 6.32 | 53.2 | 0.01 | Budget-Alt1 | 7.5 | -45 | 400 |  | 10 | 2000 | 810 |
| 811 |
| 6.56 | 53.79 | 96 | 805 |
| 807 |
| 6.72 | 54.15 | 0.1 | 400 | 808 |
| 809 |
| 6.77 | 54.26 | 0.01 | 20 | 801 |
| 803 |
| 6.93 | 54.64 | 0.1 | 96 | 804 |
| 806 |
| 7.26 | 55.36 | 20 | 800 |
| 802 |
| 7.52 | 55.9 | 0.01 | 2-3 | 96 | 793 |
| 795 |
| 20 | 789 |
| 791 |
| 400 | 798 |
| 799 |
| 0.1 | 96 | 792 |
| 794 |
| 20 | 788 |
| 790 |
| 400 | 796 |
| 797 |
| 9.97 | 53.34 | 0.01 | 2-4 | 900 | 762 |
| 763 |
| 10.28 | 53.81 | 96 | 757 |
| 759 |
| 10.52 | 54.17 | 0.1 | 400 | 760 |
| 761 |
| 10.59 | 54.27 | 0.01 | 20 | 753 |
| 755 |
| 10.85 | 54.65 | 0.1 | 96 | 756 |
| 758 |
| 11.37 | 55.38 | 20 | 752 |
| 754 |
| 11.76 | 55.9 | 0.01 | 2-3 | 96 | 745 |
| 747 |
| 20 | 741 |
| 743 |
| 400 | 750 |
| 751 |
| 0.1 | 96 | 744 |
| 746 |
| 20 | 740 |
| 742 |
| 400 | 748 |
| 749 |
| [214] | 2.56 | 32.28 | 0.01 | 1-4 | Budget-Alt2 | 5 | -21.38 | 20 | 130 | 217 |
| 6.02 | 45.51 | 0.1 | -34.61 | 214 |
| [196] | 13.4 | 60.8 | 2-4 | Budget-Alt1 | 6 | 26 | -45 |  | 6(OOK) | 96 | 1000 | 5 | 1052 |
| 5 | 20 | 1046 |
| 6.4 | 96 | 1049 |
| 6.6 | 400 | 1055 |

Figure 7.1.2.2.1.2-1



Table 7.1.2.2.1.2-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 2a, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [215] | 13.25 | 55.1 | 0.1 | 2-2 | Budget-Alt1 | 5 | 23 | -30 | 0.9 | 6 | 96 | 140 | 39.06 | non-coherent | 900 | 973 |
| 20 | 42.1 | 965 |
| 400 | 37.51 | 981 |
| [193] | 45.09 | 60.1 | 6 | -45 | 0 | 96 | 1000 | 172.21 | coherent | 60 |
| 6 | 115.52 | 55 |
| [201] | 26.48 | 56.1 | -40 | 130 | 55.92 | non-coherent | 37 |
| 62.62 | 41 |
| [192] | 45.09 | 60.1 | 0.01 | 3 | -45 | 20 | 140 | 75.98 | coherent | 341 |
| 4.7 | 96 | 73.99 | 344 |
| 5.8 | 400 | 67.4 | 347 |
| 0.1 | 3 | 20 | 99.16 | 323 |
| 4.7 | 96 | 95.91 | 326 |
| 5.8 | 400 | 89.74 | 329 |
| [202] | 5.32 | 44.05 | 0.01 | 4.81 | -40 | 20 | 100 | 5.32 | non-coherent | 173 |
| 5.65 | 44.5 | 5.36 | 96 | 5.65 | 177 |
| 7.4 | 46.52 | 0.1 | 7.4 | 169 |
| 7.73 | 46.85 | 4.81 | 20 | 7.73 | 165 |
| 19.99 | 53.99 | 0.01 | -45 | 120 | 5.32 | 192 |
| 21.22 | 54.44 | 5.36 | 96 | 5.65 | 194 |
| 27.79 | 56.46 | 0.1 | 7.4 | 190 |
| 29.02 | 56.79 | 4.81 | 20 | 7.73 | 188 |
| 45.09 | 60.1 | 0.01 | 5.36 | 96 | 140 | 5.65 | 210 |
| 4.81 | 20 | 5.32 | 208 |
| 0.1 | 5.36 | 96 | 7.4 | 206 |
| 4.81 | 20 | 7.73 | 204 |
| [195] | 23.18 | 55.1 | 5.08 | -40 | 400 | 73.31 | 1022 |
| 5.49 | 96 | 71.82 | 1014 |
| [194] | 0.01 | 7 | 130 | 12.07 | coherent | 107 |
| 20 | 13.47 | 104 |
| 400 | 11.28 | 110 |
| 0.1 | 96 | 14.79 | 98 |
| 20 | 16.82 | 95 |
| 400 | 13.95 | 101 |
| [210] | 45.09 | 60.1 | 0.01 | 4.67 | -45 | 0 | 96 | 1000 |  | 290 |
| 0.1 | 306 |
| 310 |
| 142 | 68.72 | 0.01 | Budget-Alt2 | -67.45 | 294 |
| [197] | 42.8 | 59.71 | Budget-Alt1 | 5 | -45 | 6 | 20 |  | 42.8 | non-coherent | 360 |
| 45.09 | 60.1 | 0.1 | 57.75 | 352 |
| [209] | 9.56 | 48.45 | 0.01 | 7 | -40 | 0 | 96 | 100 | 12.48 | coherent | 1065 |
| 12.9 | 50.7 | 0.1 | 16.84 | 1089 |
| 13.98 | 51.3 | 0.01 | 4.7 | 120 | 28.42 | 1068 |
| 0.1 | 38.27 | 1092 |
| 23.18 | 55.1 | 0.01 | 0.9 | 150 | 184.53 | 1062 |
| 1000 | 190.95 | 1059 |
| 120 | 47.13 | 1056 |
| 47.04 | 1074 |
| 0.1 | 150 | 213.18 | 1086 |
| 1000 | 217.37 | 1083 |
| 120 | 63.47 | 1098 |
| 1080 |
| 34.55 | 58.1 | 0.01 | 26 | 47.14 | 1077 |
| 0.1 | 63.6 | 1101 |
| 36.11 | 58.43 | 0.01 | 23 | -45 | 47.13 | 1071 |
| 45.09 | 60.1 | 0.1 | 63.47 | 1095 |
| [190] | 44.78 | 60.05 | 0.01 | 6.43 | 6 | 130 | 44.78 | 1157 |
| 45.09 | 60.1 | 0 | 170.62 | 695 |
| 143.51 | 696 |
| 116.76 | 1155 |
| 141.62 | 1156 |
| 6 | 76.26 | 697 |
| [213] | 21.79 | 54.64 | 6.99 | 400 |  | 845 |
| 23.92 | 55.34 | 5.77 | 96 | 839 |
| 28.63 | 56.69 | 3.87 | 20 | 833 |
| 29.2 | 56.84 | 0.1 | 6.99 | 400 | 842 |
| 31.63 | 57.44 | 5.77 | 96 | 836 |
| 39.4 | 59.09 | 3.87 | 20 | 830 |
| 45.09 | 60.1 | 0.01 | 3.41 | 869 |
| 4.89 | 96 | 875 |
| 5.72 | 400 | 881 |
| 0.1 | 3.41 | 20 | 866 |
| 4.89 | 96 | 872 |
| 5.72 | 400 | 878 |
| [199] | 23.18 | 55.1 | 5.9 | -40 | 0 | 96 | 120 | 42.32 | 139 |
| [191] | 14.55 | 51.6 | 0.01 | 5 | -50 | 6 |  |  | non-coherent | 468 |
| 18.98 | 53.6 | 20 | 456 |
| 23.18 | 55.1 | 0.1 | -40 | 680 |
| 32.33 | 57.6 | -50 | 96 | 462 |
| 35.39 | 58.28 | 0.01 | 504 |
| 40.8 | 59.35 | 0.1 | 20 | 450 |
| 40.97 | 59.38 | 96 | 498 |
| 45.09 | 60.1 | -45 | 20 | 667 |
| 45.27 | 60.13 | 0.01 | -50 | 400 | 444 |
| 45.57 | 60.18 | 96 | 432 |
| 45.87 | 60.23 | 20 | 492 |
| 46.18 | 60.28 | 420 |
| 46.8 | 60.38 | 0.1 | 400 | 438 |
| 48.7 | 60.68 | 96 | 426 |
| 49.03 | 60.73 | 20 | 486 |
| 49.36 | 60.78 | 414 |
| 51.51 | 61.1 | 0.01 | 400 | 408 |
| 53.6 | 61.4 | 96 | 396 |
| 55.79 | 61.7 | 0.1 | 400 | 402 |
| 56.91 | 61.85 | 0.01 | 20 | 384 |
| 59.23 | 62.15 | 0.1 | 96 | 390 |
| 65.02 | 62.85 | 20 | 378 |
|  |  | 0.01 | 400 | 480 |
| 516 |
| 0.1 | 474 |
| 510 |
| [207] | 23.18 | 55.1 | 0.01 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 61.41 | 251 |
| 56.4 | 219 |
| 0.1 | 64.05 | 259 |
| 61.33 | 227 |
| [205] | Budget-Alt1 | 6.86 | 1000 | 77.67 | 993 |
| D2T2-A2 | [215] | 13.25 | 5 | -30 | 120 | 14.06 | 975 |
| 20 | 15.15 | 967 |
| 400 | 13.5 | 983 |
| [193] | 33.68 | 57.91 | 6 | -45 | 96 | 33.68 | coherent | 56 |
| 45.09 | 60.1 | 0 | 50.21 | 61 |
| [201] | 26.48 | 56.1 | -40 | 6 | 32.31 | non-coherent | 42 |
| 28.86 | 38 |
| [192] | 45.09 | 60.1 | 0.01 | 3 | -45 | 20 | 130 | 53.64 | coherent | 342 |
| 4.7 | 96 | 52.23 | 345 |
| 5.8 | 400 | 47.58 | 348 |
| 0.1 | 3 | 20 | 70 | 324 |
| 4.7 | 96 | 67.71 | 327 |
| 5.8 | 400 | 63.35 | 330 |
| [195] | 23.18 | 55.1 | 5.08 | -40 | 141 | 27.09 | non-coherent | 1023 |
| 5.49 | 96 | 26.53 | 1015 |
| [194] | 12.23 | 50.29 | 0.01 | 7 | 400 | 120 | 8.19 | coherent | 111 |
| 14.06 | 51.34 | 96 | 8.77 | 108 |
| 17.63 | 53.04 | 20 | 9.78 | 105 |
| 18.97 | 53.59 | 0.1 | 400 | 10.14 | 102 |
| 21.38 | 54.49 | 96 | 10.74 | 99 |
| 23.18 | 55.1 | 20 | 12.22 | 96 |
| [210] | 24.43 | 55.49 | 4.67 | -45 | 0 | 96 |  | 311 |
| 24.75 | 55.59 | 0.01 | 291 |
| Budget-Alt2 | -67.45 | 295 |
| 34.53 | 58.09 | 0.1 | Budget-Alt1 | -45 | 307 |
| [197] | 34.78 | 58.15 | 0.01 | 5 | 6 | 20 | 140 | 34.78 | non-coherent | 361 |
| 45.09 | 60.1 | 0.1 | 46.92 | 353 |
| [209] | 1.3 | 33.45 | 0.01 | 7 | -40 | 0 | 96 | 70 | 1.7 | coherent | 1066 |
| 1.75 | 35.7 | 0.1 | 2.29 | 1090 |
| 2.96 | 39.65 | 0.01 | 4.7 | 90 | 3.87 | 1069 |
| 4 | 41.9 | 0.1 | 5.22 | 1093 |
| 4.92 | 43.45 | 0.01 | 0.9 | 6.42 | 1057 |
| 1075 |
| -45 | 1072 |
| 26 | -40 | 1078 |
| 6.63 | 45.7 | 0.1 | 23 | 8.66 | 1099 |
| 1081 |
| -45 | 1096 |
| 26 | -40 | 1102 |
| 23.18 | 55.1 | 0.01 | 23 | 1000 | 190.95 | 1060 |
| 120 | 47.13 | 1063 |
| 0.1 | 1000 | 217.37 | 1084 |
| 120 | 63.47 | 1087 |
| [190] | 23.3 | 55.14 | 0.01 | 6.43 | -45 | 6 | 23.3 | 1163 |
| 39.44 | 59.09 | 39.44 | 703 |
| 45.09 | 60.1 | 0 | 88.24 | 701 |
| 74.22 | 702 |
| 60.75 | 1161 |
| 73.68 | 1162 |
| [213] | 11.83 | 50.05 | 6.99 | 6 | 400 |  | 846 |
| 12.99 | 50.75 | 5.77 | 96 | 840 |
| 15.54 | 52.1 | 3.87 | 20 | 834 |
| 15.86 | 52.25 | 0.1 | 6.99 | 400 | 843 |
| 17.18 | 52.85 | 5.77 | 96 | 837 |
| 21.39 | 54.5 | 3.87 | 20 | 831 |
| 26.3 | 56.05 | 0.01 | 5.72 | 400 | 882 |
| 28.11 | 56.55 | 4.89 | 96 | 876 |
| 29.84 | 57 | 3.41 | 20 | 870 |
| 33.86 | 57.95 | 0.1 | 5.72 | 400 | 879 |
| 36.19 | 58.45 | 4.89 | 96 | 873 |
| 37.92 | 58.8 | 3.41 | 20 | 867 |
| [199] | 23.18 | 55.1 | 5.9 | -40 | 0 | 96 | 42.32 | 140 |
| [191] | 7.48 | 46.6 | 0.01 | 5 | -50 | 6 |  |  | non-coherent | 471 |
| 9.76 | 48.6 | 20 | 459 |
| 11.91 | 50.1 | 96 | 470 |
| 13.61 | 51.1 | 469 |
| 15.55 | 52.1 | 20 | 458 |
| 16.62 | 52.6 | 0.1 | 96 | 465 |
| 17.76 | 53.1 | 0.01 | 20 | 457 |
| 18.19 | 53.28 | 96 | 507 |
| 20.97 | 54.35 | 0.1 | 20 | 453 |
| 21.06 | 54.38 | 96 | 501 |
| 23.18 | 55.1 | -40 | 20 | 681 |
| 682 |
| 683 |
| 23.27 | 55.13 | 0.01 | -50 | 400 | 447 |
| 23.42 | 55.18 | 96 | 435 |
| 23.58 | 55.23 | 20 | 495 |
| 23.74 | 55.28 | 423 |
| 24.05 | 55.38 | 0.1 | 400 | 441 |
| 25.03 | 55.68 | 96 | 429 |
| 25.2 | 55.73 | 20 | 489 |
| 25.37 | 55.78 | 417 |
| 26.48 | 56.1 | 0.01 | 400 | 411 |
| 0.1 | 96 | 464 |
| 27.55 | 56.4 | 0.01 | 399 |
| 28.68 | 56.7 | 0.1 | 400 | 405 |
| 28.98 | 56.78 | 0.01 | 96 | 506 |
| 29.25 | 56.85 | 20 | 387 |
| 30.24 | 57.1 | 0.1 | 96 | 463 |
| 30.45 | 57.15 | 393 |
| 33.11 | 57.78 | 0.01 | 505 |
| 33.42 | 57.85 | 0.1 | -45 | 20 | 670 |
| -50 | 381 |
| 452 |
| 33.55 | 57.88 | 96 | 500 |
| 37.07 | 58.63 | 0.01 | 400 | 446 |
| 37.32 | 58.68 | 96 | 434 |
| 37.57 | 58.73 | 20 | 494 |
| 37.82 | 58.78 | 422 |
| 38.18 | 58.85 | 0.1 | 451 |
| 38.33 | 58.88 | 96 | 499 |
| 400 | 440 |
| 39.89 | 59.18 | 96 | 428 |
| 40.16 | 59.23 | 20 | 488 |
| 40.42 | 59.28 | 416 |
| 42.18 | 59.6 | 0.01 | 400 | 410 |
| 42.35 | 59.63 | 445 |
| 42.63 | 59.68 | 96 | 433 |
| 42.92 | 59.73 | 20 | 493 |
| 43.21 | 59.78 | 421 |
| 43.78 | 59.88 | 0.1 | 400 | 439 |
| 43.9 | 59.9 | 0.01 | 96 | 398 |
| 45.09 | 60.1 | 0.1 | -45 | 20 | 668 |
| 669 |
| 45.57 | 60.18 | -50 | 96 | 427 |
| 45.69 | 60.2 | 400 | 404 |
| 45.87 | 60.23 | 20 | 487 |
| 46.18 | 60.28 | 415 |
| 46.61 | 60.35 | 0.01 | 386 |
| 48.19 | 60.6 | 400 | 409 |
| 48.51 | 60.65 | 0.1 | 96 | 392 |
| 50.15 | 60.9 | 0.01 | 397 |
| 52.2 | 61.2 | 0.1 | 400 | 403 |
| 53.25 | 61.35 | 0.01 | 20 | 385 |
| 0.1 | 380 |
| 55.42 | 61.65 | 96 | 391 |
| 60.83 | 62.35 | 20 | 379 |
|  |  | 0.01 | 400 | 518 |
| 519 |
| 517 |
| 481 |
| 482 |
| 483 |
| 0.1 | 475 |
| 476 |
| 477 |
| 511 |
| 512 |
| 513 |
| [207] | 23.18 | 55.1 | 0.01 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 61.41 | 253 |
| 56.4 | 221 |
| 0.1 | 64.05 | 261 |
| 61.33 | 229 |
| [211] | 0.01 | Budget-Alt1 | 6.4 | 120 | 10.8 | 1035 |
| 0.1 | 12.32 | 1034 |
| [205] | 22.65 | 54.93 | 6.86 | 22.65 | 994 |
| D2T2-B | [215] | 13.25 | 55.1 | 2-3 | 5 | -30 | 140 | 10 | 977 |
| 20 | 969 |
| 400 | 985 |
| 2-4 | 96 | 979 |
| 20 | 971 |
| 400 | 987 |
| [193] | 45.09 | 60.1 | 2-3 | 6 | -45 | 0 | 96 | 1000 | coherent | 62 |
| 6 | 57 |
| 2-4 | 0 | 63 |
| 64 |
| 6 | 58 |
| 59 |
| [201] | 26.48 | 56.1 | 2-3 | -40 | 130 | 55.97 | non-coherent | 39 |
| 62.67 | 43 |
| 2-4 | 55.92 | 40 |
| 62.62 | 44 |
| [192] | 45.09 | 60.1 | 0.01 | 3 | -45 | 20 | 140 | 10 | coherent | 343 |
| 4.7 | 96 | 346 |
| 5.8 | 400 | 349 |
| 0.1 | 3 | 20 | 325 |
| 4.7 | 96 | 328 |
| 5.8 | 400 | 331 |
| [202] | 5.39 | 45.42 | 0.01 | 4.81 | -40 | 20 | 100 | 5 | non-coherent | 175 |
| 7.2 | 46.32 | 5.36 | 96 | 179 |
| 12.35 | 50.37 | 0.1 | 171 |
| 13.47 | 51.02 | 4.81 | 20 | 167 |
| 45.09 | 60.1 | 0.01 | 5.36 | -45 | 96 | 140 | 211 |
| 120 | 195 |
| 4.81 | 20 | 140 | 209 |
| 120 | 193 |
| 0.1 | 5.36 | 96 | 140 | 207 |
| 120 | 191 |
| 4.81 | 20 | 140 | 205 |
| 120 | 189 |
| [195] | 23.18 | 55.1 | 2-3 | 5.08 | -40 | 400 | 140 | 1024 |
| 5.49 | 96 | 1016 |
| 2-4 | 5.08 | 400 | 1025 |
| 5.49 | 96 | 1017 |
| [194] | 0.01 | 7 | 130 | 10 | coherent | 109 |
| 20 | 106 |
| 400 | 112 |
| 0.1 | 96 | 100 |
| 20 | 97 |
| 400 | 103 |
| [210] | 45.09 | 60.1 | 0.01 | 2-3 | 4.67 | -45 | 0 | 96 | 1000 | 292 |
| 2-4 | 293 |
| 0.1 | 2-3 | 308 |
| 312 |
| 2-4 | 309 |
| 313 |
| 894.51 | 82.55 | 0.01 | 2-3 | Budget-Alt2 | -67.45 | 296 |
| 2-4 | 297 |
| [209] | 3.49 | 40.88 | Budget-Alt1 | 7 | -40 | 90 | 5 | 1067 |
| 6.35 | 45.38 | 0.1 | 1091 |
| 13.98 | 51.3 | 0.01 | 4.7 | 110 | 1070 |
| 0.1 | 1094 |
| 23.18 | 55.1 | 0.01 | 0.9 | 140 | 1064 |
| 1000 | 1061 |
| 110 | 1058 |
| 1076 |
| 0.1 | 140 | 1088 |
| 1000 | 1085 |
| 110 | 1100 |
| 1082 |
| 34.55 | 58.1 | 0.01 | 26 | 1079 |
| 0.1 | 1103 |
| 45.09 | 60.1 | 0.01 | 23 | -45 | 1073 |
| 0.1 | 1097 |
| [190] | 0.01 | 2-3 | 6.43 | 130 | 10 | 710 |
| 712 |
| 1170 |
| 1172 |
| 6 | 714 |
| 1174 |
| 2-4 | 0 | 711 |
| 713 |
| 1171 |
| 1173 |
| 6 | 715 |
| 1175 |
| [213] | 67.21 | 63.1 | 3.41 | 26 | 20 | 5 | 871 |
| 4.89 | 96 | 877 |
| 5.72 | 400 | 883 |
| 3.87 | 20 | 835 |
| 5.77 | 96 | 841 |
| 6.99 | 400 | 847 |
| 0.1 | 3.41 | 20 | 868 |
| 4.89 | 96 | 874 |
| 5.72 | 400 | 880 |
| 3.87 | 20 | 832 |
| 5.77 | 96 | 838 |
| 6.99 | 400 | 844 |
| [199] | 23.18 | 55.1 | 2-3 | 5.9 | 23 | -40 | 0 | 96 | 120 | 143 |
| 2-4 | 141 |
| [191] | 21.16 | 54.42 | 0.01 | 5 | -50 | 6 |  | 10 | non-coherent | 473 |
| 23.18 | 55.1 | 0.1 | 2-3 | -40 | 20 | 684 |
| 2-4 | 685 |
| 36.03 | 58.42 | 0.01 | -50 | 461 |
| 45.09 | 60.1 | 0.1 | 2-3 | -45 | 671 |
| 2-4 | 672 |
| 80.07 | 64.42 | 0.01 | 2-3 | -50 | 96 | 472 |
| 87.71 | 65.1 | 400 |
| 436 |
| 508 |
| 20 | 388 |
| 424 |
| 460 |
| 496 |
| 400 | 412 |
| 448 |
| 2-4 | 96 | 401 |
| 437 |
| 509 |
| 20 | 389 |
| 425 |
| 497 |
| 400 | 413 |
| 449 |
| 0.1 | 2-3 | 96 | 394 |
| 430 |
| 466 |
| 502 |
| 20 | 382 |
| 418 |
| 454 |
| 490 |
| 400 | 406 |
| 442 |
| 2-4 | 96 | 395 |
| 431 |
| 467 |
| 503 |
| 20 | 383 |
| 419 |
| 455 |
| 491 |
| 400 | 407 |
| 443 |
|  |  | 0.01 | 2-3 | 520 |
| 484 |
| 2-4 | 521 |
| 485 |
| 0.1 | 2-3 | 478 |
| 514 |
| 2-4 | 479 |
| 515 |
| [207] | 23.18 | 55.1 | 0.01 | 2-3 | Budget-Alt-1 | 7 | -40 | 96 | 140 | 223 |
| 255 |
| 2-4 | 5 | 225 |
| 257 |
| 0.1 | 2-3 | 10 | 231 |
| 263 |
| 2-4 | 5 | 233 |
| 265 |
| [211] | 0.01 | Budget-Alt1 | 5.7 | 400 | 120 | 22.6 | 1037 |
| 5.5 | 20 | 26.74 | 1039 |
| 0.1 | 5.7 | 400 | 1036 |
| 5.5 | 20 | 33 | 1038 |
| [205] | 2-3 | 6.86 | 96 | 1000 | 10 | 995 |
| 2-4 | 996 |
| 997 |

Figure 7.1.2.2.1.2-2



###### 7.1.2.2.1.3 other data rate

7.1.2.2.1.3.1 [48 - 60 kbps]

Table 7.1.2.2.1.3.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 2a, D2T2, InF-DL 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** |
| D2T2-A1 | [197] | 7.91 | 49.76 | 0.01 | 2-2 | Budget-Alt1 | 55 | 23 | -45 | 0.9 | 6 | 96 |  | 7.91 | non-coherent | 900 | 362 |
| 10.75 | 54.51 | 0.1 | 10.75 | 354 |
| [199] | 4.61 | 49 | 44.8 | -40 | 1000 | 4.61 | 113 |
| [207] | 7.78 | 49.49 | 0.01 | Budget-Alt-1 | 56 | 140 | 49.49 | 234 |
| 8.52 | 50.9 | 54.73 | 266 |
| 0.1 | 57.46 | 274 |
| 54.51 | 242 |
| D2T2-A2 | [197] | 5.09 | 48.2 | 0.01 | Budget-Alt1 | 55 | -45 | 5.09 | 363 |
| 8.39 | 52.95 | 0.1 | 8.39 | 355 |
| [199] | 4.61 | 49 | 44.8 | -40 | 1000 | 4.61 | 114 |
| [207] | 7.78 | 49.49 | 0.01 | Budget-Alt-1 | 56 | 140 | 49.49 | 236 |
| 8.52 | 50.9 | 54.73 | 268 |
| 0.1 | 57.46 | 276 |
| 54.51 | 244 |
| D2T2-B | [199] | 5.47 | 2-3 | Budget-Alt1 | 44.8 | 1000 | 5 | 119 |
| 2-4 | 115 |
| [207] | 7.78 | 49.49 | 0.01 | Budget-Alt-1 | 56 | 140 | 240 |
| 8.35 | 50.59 | 2-3 | 10 | 238 |
| 8.52 | 50.9 | 270 |
| 2-4 | 5 | 272 |
| 0.1 | 2-3 | 10 | 278 |
| 246 |
| 2-4 | 5 | 280 |
| 248 |

Figure 7.1.2.2.1.3.1-1



Table 7.1.2.2.1.3.1-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 2a, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [197] | 38.74 | 58.96 | 0.01 | 2-2 | Budget-Alt1 | 55 | 23 | -45 | 0.9 | 6 | 96 |  | 38.74 | non-coherent | 900 | 364 |
| 45.09 | 60.1 | 0.1 | 50.55 | 356 |
| [199] | 23.18 | 55.1 | 44.8 | -40 | 1000 | 26.65 | 116 |
| [207] | 19.21 | 53.69 | 0.01 | Budget-Alt-1 | 56 | 140 | 53.69 | 235 |
| 23.18 | 55.1 | 58.93 | 267 |
| 0.1 | 61.66 | 275 |
| 58.71 | 243 |
| D2T2-A2 | [197] | 31.47 | 57.4 | 0.01 | Budget-Alt1 | 55 | -45 | 31.47 | 365 |
| 41.07 | 59.4 | 0.1 | 41.07 | 357 |
| [199] | 23.18 | 55.1 | 44.8 | -40 | 1000 | 26.65 | 117 |
| [207] | 19.21 | 53.69 | 0.01 | Budget-Alt-1 | 56 | 140 | 53.69 | 237 |
| 23.18 | 55.1 | 58.93 | 269 |
| 0.1 | 61.66 | 277 |
| 58.71 | 245 |
| D2T2-B | [199] | 2-3 | Budget-Alt1 | 44.8 | 1000 | 5 | 120 |
| 2-4 | 118 |
| [207] | 19.21 | 53.69 | 0.01 | Budget-Alt-1 | 56 | 140 | 241 |
| 22.25 | 54.79 | 2-3 | 10 | 239 |
| 23.18 | 55.1 | 271 |
| 2-4 | 5 | 273 |
| 0.1 | 2-3 | 10 | 279 |
| 247 |
| 2-4 | 5 | 281 |
| 249 |

Figure 7.1.2.2.1.3.1-2



7.1.2.2.1.3.2 others

Table 7.1.2.2.1.3.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 2a, D2T2, InF-DL 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** |
| D2T2-A1 | [199] | 3.68 | 46.52 | 0.1 | 2-2 | Budget-Alt1 | 84 | 23 | -40 | 0.9 | 0 | 96 | 120 | 3.68 | coherent | 900 | 130 |
| 3.75 | 46.72 | 15.6 | 6 | 3.75 | non-coherent | 124 |
| 121 |
| D2T2-A2 | 3.68 | 46.52 | 84 | 0 | 3.68 | coherent | 131 |
| 3.75 | 46.72 | 15.6 | 6 | 3.75 | non-coherent | 125 |
| 122 |
| D2T2-B | 2.74 | 43.25 | 2-4 | 84 | 0 | 5 | coherent | 132 |
| 2.84 | 43.65 | 15.6 | 6 | non-coherent | 123 |
| 126 |

Figure 7.1.2.2.1.3.2-1



Table 7.1.2.2.1.3.2-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 2a, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-A1 | [199] | 19.04 | 53.62 | 0.1 | 2-2 | Budget-Alt1 | 84 | 23 | -40 | 0.9 | 0 | 96 | 120 | 19.04 | coherent | 900 | 133 |
| 19.95 | 53.97 | 15.6 | 6 | 19.95 | non-coherent | 127 |
| D2T2-A2 | 19.04 | 53.62 | 84 | 0 | 19.04 | coherent | 134 |
| 19.95 | 53.97 | 15.6 | 6 | 19.95 | non-coherent | 128 |
| D2T2-B | 23.18 | 55.1 | 2-4 | 5 | 129 |
| 84 | 0 | coherent | 135 |

Figure 7.1.2.2.1.3.2-2



##### 7.1.2.2.2 Observations

For Device 2a and D2T2, it is observed that the maximum achievable coverage for InH-Office LOS is as follows,

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

- R2D Tx Power (R2D[1E]): 23 (M)

- Number of receive antenna elements / TxRU / chains (D2R[2A]): 1(M)

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

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

- Topology/Pathloss model ([0D]): InH-Office LOS

- R2D Budget-Alt1, D2R Budget-Alt2

Table 7.1.2.2.2

|  |  |  |  |
| --- | --- | --- | --- |
| Device 2a | D2T2-A1 | D2T2-A2 | D2T2-B |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity <= -45dBm | [45.09 ~ 65.02] meters. (10: [197]:45.09, [193]:45.09, [191]:65.02, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [202]:45.09, [209]:45.09, [213]:45.09) | [12.4 ~ 60.83] meters. (9: [197]:45.09, [193]:45.09, [191]:60.83, [192]:45.09, [203]:45.09, [210]:24.43, [190]:45.09, [209]:12.4, [213]:37.92) | [45.09 ~ 87.71] meters. (8: [193]:45.09, [191]:87.71, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [202]:45.09, [209]:45.09) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity >= -40dBm | [12.07 ~ 26.48] meters. (10: [199]:23.18, [215]:13.25, [191]:23.18, [201]:26.48, [205]:23.18, [211]:23.18, [202]:12.07, [209]:23.18, [194]:23.18, [195]:23.18) | [13.25 ~ 26.48] meters. (9: [199]:23.18, [215]:13.25, [191]:23.18, [201]:26.48, [205]:23.18, [211]:23.18, [209]:23.18, [194]:23.18, [195]:23.18) | [13.25 ~ 26.48] meters. (10: [199]:23.18, [215]:13.25, [191]:23.18, [201]:26.48, [205]:23.18, [211]:23.18, [202]:23.18, [209]:23.18, [194]:23.18, [195]:23.18) |
| D2R BLER 10% and data rate ~1kbps | [13.25 ~ 45.09] meters. (10: [197]:45.09, [215]:13.25, [193]:45.09, [192]:45.09, [205]:23.18, [211]:23.18, [202]:45.09, [209]:45.09, [213]:45.09, [195]:23.18) | [13.25 ~ 45.09] meters. (8: [197]:45.09, [215]:13.25, [193]:45.09, [192]:45.09, [205]:23.18, [209]:23.18, [213]:31.66, [195]:23.18) | [13.25 ~ 45.09] meters. (7: [215]:13.25, [193]:45.09, [192]:45.09, [205]:23.18, [202]:45.09, [209]:45.09, [195]:23.18) |
| D2R BLER 10% and data rate 5~7kbps | [13.25 ~ 65.02] meters. (14: [197]:45.09, [199]:23.18, [215]:13.25, [193]:45.09, [191]:65.02, [201]:26.48, [192]:45.09, [205]:23.18, [210]:45.09, [202]:45.09, [209]:45.09, [194]:23.18, [213]:45.09, [195]:23.18) | [13.25 ~ 60.83] meters. (14: [197]:45.09, [199]:23.18, [215]:13.25, [193]:45.09, [191]:60.83, [201]:26.48, [192]:45.09, [205]:22.65, [211]:23.18, [210]:24.43, [209]:23.18, [194]:23.18, [213]:37.92, [195]:23.18) | [13.25 ~ 87.71] meters. (13: [199]:23.18, [215]:13.25, [193]:45.09, [191]:87.71, [201]:26.48, [192]:45.09, [205]:23.18, [211]:23.18, [210]:45.09, [202]:45.09, [209]:45.09, [194]:23.18, [195]:23.18) |
| D2R BLER 1% and data rate ~1kbps | [23.18 ~ 45.09] meters. (9: [197]:45.09, [201]:26.48, [192]:45.09, [203]:45.09, [211]:23.18, [190]:45.09, [202]:45.09, [209]:45.09, [213]:45.09) | [23.18 ~ 45.09] meters. (7: [197]:45.09, [201]:26.48, [192]:45.09, [203]:45.09, [190]:45.09, [209]:23.18, [213]:24.75) | [26.48 ~ 45.09] meters. (6: [201]:26.48, [192]:45.09, [203]:45.09, [190]:45.09, [202]:45.09, [209]:45.09) |
| D2R BLER 1% and data rate 5~7kbps | [23.18 ~ 56.91] meters. (8: [197]:42.8, [191]:56.91, [192]:45.09, [190]:45.09, [202]:45.09, [209]:36.11, [194]:23.18, [213]:45.09) | [17.63 ~ 53.25] meters. (8: [197]:34.78, [191]:53.25, [192]:45.09, [211]:23.18, [190]:45.09, [209]:23.18, [194]:17.63, [213]:29.84) | [23.18 ~ 87.71] meters. (7: [191]:87.71, [192]:45.09, [211]:23.18, [190]:45.09, [202]:45.09, [209]:45.09, [194]:23.18) |
| D2R coherent receiver | [23.18 ~ 45.09] meters. (9: [199]:23.18, [193]:45.09, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [209]:45.09, [194]:23.18, [213]:45.09) | [23.18 ~ 45.09] meters. (9: [199]:23.18, [193]:45.09, [192]:45.09, [203]:45.09, [210]:24.43, [190]:45.09, [209]:23.18, [194]:23.18, [213]:37.92) | [23.18 ~ 45.09] meters. (8: [199]:23.18, [193]:45.09, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [209]:45.09, [194]:23.18) |
| D2R non-coherent receiver | [13.25 ~ 65.02] meters. (8: [197]:45.09, [215]:13.25, [191]:65.02, [201]:26.48, [205]:23.18, [211]:23.18, [202]:45.09, [195]:23.18) | [13.25 ~ 60.83] meters. (7: [197]:45.09, [215]:13.25, [191]:60.83, [201]:26.48, [205]:23.18, [211]:23.18, [195]:23.18) | [13.25 ~ 87.71] meters. (7: [215]:13.25, [191]:87.71, [201]:26.48, [205]:23.18, [211]:23.18, [202]:45.09, [195]:23.18) |
| CW cancellation capability < 120dB | [12.07 ~ 23.18] meters. (2: [202]:12.07, [209]:23.18) | [12.4 ~ 12.4] meters. (1: [209]:12.4) | [23.18 ~ 45.09] meters. (2: [202]:23.18, [209]:45.09) |
| CW cancellation capability < 140dB | [23.18 ~ 45.09] meters. (7: [199]:23.18, [201]:26.48, [190]:45.09, [202]:45.09, [209]:45.09, [194]:23.18, [213]:45.09) | [13.25 ~ 45.09] meters. (13: [199]:23.18, [215]:13.25, [193]:45.09, [201]:26.48, [192]:45.09, [203]:45.09, [205]:23.18, [211]:23.18, [210]:24.43, [190]:45.09, [209]:23.18, [194]:23.18, [213]:37.92) | [23.18 ~ 45.09] meters. (6: [199]:23.18, [201]:26.48, [211]:23.18, [190]:45.09, [202]:45.09, [194]:23.18) |
| CW cancellation capability >=140dB | [13.25 ~ 45.09] meters. (10: [215]:13.25, [193]:45.09, [192]:45.09, [203]:45.09, [205]:23.18, [211]:23.18, [210]:45.09, [202]:45.09, [209]:23.18, [195]:23.18) | [23.18 ~ 45.09] meters. (3: [197]:45.09, [209]:23.18, [195]:23.18) | [13.25 ~ 45.09] meters. (9: [215]:13.25, [193]:45.09, [192]:45.09, [203]:45.09, [205]:23.18, [210]:45.09, [202]:45.09, [209]:23.18, [195]:23.18) |
| R2D Tx EIRP power < 30dBm, | R2D Rx sensitivity of -45dBm  [45.09 ~ 65.02] meters. (10: [197]:45.09, [193]:45.09, [191]:65.02, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [202]:45.09, [209]:45.09, [213]:45.09)  R2D Rx sensitivity of -40dBm  [12.07 ~ 26.48] meters. (9: [199]:23.18, [191]:23.18, [201]:26.48, [205]:23.18, [211]:23.18, [202]:12.07, [209]:23.18, [194]:23.18, [195]:23.18) | R2D Rx sensitivity of -45dBm  [12.4 ~ 60.83] meters. (9: [197]:45.09, [193]:45.09, [191]:60.83, [192]:45.09, [203]:45.09, [210]:24.43, [190]:45.09, [209]:12.4, [213]:37.92)  R2D Rx sensitivity of -40dBm  [23.18 ~ 26.48] meters. (8: [199]:23.18, [191]:23.18, [201]:26.48, [205]:23.18, [211]:23.18, [209]:23.18, [194]:23.18, [195]:23.18) | R2D Rx sensitivity of -45dBm  [45.09 ~ 87.71] meters. (8: [193]:45.09, [191]:87.71, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [202]:45.09, [209]:45.09)  R2D Rx sensitivity of -40dBm  [23.18 ~ 26.48] meters. (9: [199]:23.18, [191]:23.18, [201]:26.48, [205]:23.18, [211]:23.18, [202]:23.18, [209]:23.18, [194]:23.18, [195]:23.18) |
| R2D Tx EIRP power >=30dBm and <35dBm | R2D Rx sensitivity of -45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| R2D Tx EIRP power >=35dBm | R2D Rx sensitivity of -45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity of -45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| FEC code (1/2, 1/3, 1/4) | [23.18 ~ 45.09] meters. (10: [193]:45.09, [192]:45.09, [203]:45.09, [205]:23.18, [210]:45.09, [190]:45.09, [202]:45.09, [209]:45.09, [194]:23.18, [213]:45.09) | [23.18 ~ 45.09] meters. (9: [193]:45.09, [192]:45.09, [203]:45.09, [205]:23.18, [210]:24.43, [190]:45.09, [209]:23.18, [194]:23.18, [213]:37.92) | [23.18 ~ 45.09] meters. (9: [193]:45.09, [192]:45.09, [203]:45.09, [205]:23.18, [210]:45.09, [190]:45.09, [202]:45.09, [209]:45.09, [194]:23.18) |
| without FEC | [13.25 ~ 65.02] meters. (9: [197]:45.09, [199]:23.18, [215]:13.25, [191]:65.02, [201]:26.48, [211]:23.18, [190]:45.09, [213]:39.4, [195]:23.18) | [13.25 ~ 60.83] meters. (9: [197]:45.09, [199]:23.18, [215]:13.25, [191]:60.83, [201]:26.48, [211]:23.18, [190]:45.09, [213]:21.39, [195]:23.18) | [13.25 ~ 87.71] meters. (7: [199]:23.18, [215]:13.25, [191]:87.71, [201]:26.48, [211]:23.18, [190]:45.09, [195]:23.18) |
| OOK | [13.25 ~ 65.02] meters. (13: [197]:45.09, [215]:13.25, [191]:65.02, [201]:26.48, [192]:45.09, [203]:45.09, [205]:23.18, [211]:23.18, [190]:45.09, [202]:45.09, [194]:23.18, [213]:45.09, [195]:23.18) | [13.25 ~ 60.83] meters. (12: [197]:45.09, [215]:13.25, [191]:60.83, [201]:26.48, [192]:45.09, [203]:45.09, [205]:23.18, [211]:23.18, [190]:45.09, [194]:23.18, [213]:37.92, [195]:23.18) | [13.25 ~ 87.71] meters. (11: [215]:13.25, [191]:87.71, [201]:26.48, [192]:45.09, [203]:45.09, [205]:23.18, [211]:23.18, [190]:45.09, [202]:45.09, [194]:23.18, [195]:23.18) |
| BPSK | [23.18 ~ 45.09] meters. (5: [199]:23.18, [193]:45.09, [210]:45.09, [190]:45.09, [209]:45.09) | [23.18 ~ 45.09] meters. (5: [199]:23.18, [193]:45.09, [210]:24.43, [190]:45.09, [209]:23.18) | [23.18 ~ 45.09] meters. (5: [199]:23.18, [193]:45.09, [210]:45.09, [190]:45.09, [209]:45.09) |
| MSK | [45.09 ~ 45.09] meters. (1: [190]:45.09) | [45.09 ~ 45.09] meters. (1: [190]:45.09) | [45.09 ~ 45.09] meters. (1: [190]:45.09) |

#### 7.1.2.3 Device 2b

##### 7.1.2.3.1 Collection of the results

###### 7.1.2.3.1.1 [1kbps]

Table 7.1.2.3.1.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 2b, D2T2, InF-DL 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** |
| D2T2-C | [201] | 7.51 | 51.9 | 0.01 |  | Budget-Alt1 | 1 | 23 | -40 | 0.9 |  | 20 |  |  | non-coherent | 900 | 4 |
| 6 |
| 72.36 | 73.45 | Budget-Alt2 | -61.55 | 5 |
| 7 |
| [203] | 11.76 | 55.9 | Budget-Alt1 | 0.43 | -45 | N/A | N/A | coherent | 16 |
| 18 |
| 0.83 | 96 | 12 |
| 14 |
| 1.02 | 400 | 20 |
| 22 |
| [202] | 8.52 | 50.9 | 0.7 | -40 | 20 | non-coherent | 40 |
| 1.07 | 96 | 48 |
| 0.96 | 20 | 44 |
| 0.1 | 1.07 | 96 | 46 |
| 0.96 | 20 | 42 |
| [195] | 30.95 | 70.9 | 1.14 | -60 | 0 | 96 |  | 217 |
| 1.06 | 400 | 219 |
| [198] | 11.76 | 55.9 | 1.14 | -45 | N/A | 96 | N/A | coherent | 1 |
| 3 |
| 0.95 | 20 | 2 |
| [210] | 131.64 | 93.35 | Budget-Alt2 | 0.58 | 26 | -79.45 | 0 | 96 | 76 |
| [190] | 11.76 | 55.9 | 0.01 | Budget-Alt1 | 0.96 | 23 | -45 |  | 20 |  | 420 |
| 421 |
| [211] | 1 | 0 | 400 | 0 | 154.28 | non-coherent | 231 |
| 0.1 | 200.67 | 230 |

Figure 7.1.2.3.1.1-1



Table 7.1.2.3.1.1-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~1kbps, device 2b, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-C | [193] | 45.09 | 60.1 | 0.1 |  | Budget-Alt1 | 0.8 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 200 |
| [203] | 0.01 | 0.43 | 20 | coherent | 17 |
| 19 |
| 0.83 | 96 | 13 |
| 15 |
| 1.02 | 400 | 21 |
| 23 |
| [192] | 1.1 | - | - | non-coherent | 206 |
| 212 |
| 0.43 | 20 | 204 |
| 210 |
| 0.83 | 96 | 205 |
| 211 |
| [202] | 23.18 | 55.1 | 0.7 | -40 | N/A | 20 | N/A | 41 |
| 1.07 | 96 | 49 |
| 0.96 | 20 | 45 |
| 0.1 | 1.07 | 96 | 47 |
| 0.96 | 20 | 43 |
| 45.09 | 60.1 | 0.01 | 1.07 | -45 | 96 | 61 |
| 0.96 | 20 | 59 |
| 0.1 | 1.07 | 96 | 60 |
| 0.96 | 20 | 58 |
| [195] | 331.98 | 75.1 | 1.14 | -60 | 0 | 96 |  | 216 |
| 1.06 | 400 | 218 |
| [209] | 13.98 | 51.3 | 0.01 | 1 | -40 | 4.7 | 96 | N/A | coherent | 256 |
| 0.1 | 264 |
| 23.18 | 55.1 | 0.01 | 0.9 | 252 |
| 253 |
| 254 |
| 255 |
| 258 |
| 0.1 | 260 |
| 261 |
| 262 |
| 263 |
| 266 |
| 34.55 | 58.1 | 0.01 | 26 | 259 |
| 0.1 | 267 |
| 45.09 | 60.1 | 0.01 | 23 | -45 | 257 |
| 0.1 | 265 |
| [190] | 0.01 | 0.96 |  | 20 |  | 422 |
| 423 |
| [213] | 170.64 | 70.1 | 0.65 | -55 | 6 | 94 |
| 1.25 | 96 | 102 |
| 1.67 | 400 | 110 |
| 0.53 | 20 | 142 |
| 0.9 | 96 | 150 |
| 1.09 | 400 | 158 |
| 0.1 | 0.65 | 20 | 90 |
| 1.25 | 96 | 98 |
| 1.67 | 400 | 106 |
| 0.53 | 20 | 138 |
| 0.9 | 96 | 146 |
| 1.09 | 400 | 154 |
| 254.39 | 73.1 | 0.01 | 0.65 | 26 | 20 | 95 |
| 1.25 | 96 | 103 |
| 1.67 | 400 | 111 |
| 0.53 | 20 | 143 |
| 0.9 | 96 | 151 |
| 1.09 | 400 | 159 |
| 0.1 | 0.65 | 20 | 91 |
| 1.25 | 96 | 99 |
| 1.67 | 400 | 107 |
| 0.53 | 20 | 139 |
| 0.9 | 96 | 147 |
| 1.09 | 400 | 155 |
| 1857.94 | 88.04 | 0.01 | Budget-Alt2 | 1.67 | 23 | -99.15 | 108 |
| 2523.36 | 90.34 | 1.25 | -99.02 | 96 | 100 |
| 3337.08 | 92.44 | 0.65 | -100.3 | 20 | 92 |
| 3614.5 | 93.04 | 0.1 | 1.67 | -103.35 | 400 | 104 |
| 4532.25 | 94.74 | 1.25 | -103.79 | 96 | 96 |
| 5317.14 | 95.94 | 0.01 | 1.09 | -99.15 | 400 | 156 |
| 5759.18 | 96.54 | 0.1 | 0.65 | -105.63 | 20 | 88 |
| 6406.24 | 97.34 | 0.01 | 0.9 | -99.02 | 96 | 148 |
| 7031.79 | 98.04 | 1.67 | 26 | -99.15 | 400 | 109 |
| 7318.24 | 98.34 | 0.53 | 23 | -100.3 | 20 | 140 |
| 8585.61 | 99.54 | 0.1 | 1.09 | -103.35 | 400 | 152 |
| 9550.23 | 100.34 | 0.01 | 1.25 | 26 | -99.02 | 96 | 101 |
| 10623.23 | 101.14 | 0.1 | 0.9 | 23 | -103.79 | 144 |
| 11975.11 | 102.04 | 0.53 | -105.63 | 20 | 136 |
| 12629.93 | 102.44 | 0.01 | 0.65 | 26 | -100.3 | 93 |
| 13679.9 | 103.04 | 0.1 | 1.67 | -103.35 | 400 | 105 |
| 17153.35 | 104.74 | 1.25 | -103.79 | 96 | 97 |
| 20123.95 | 105.94 | 0.01 | 1.09 | -99.15 | 400 | 157 |
| 21796.92 | 106.54 | 0.1 | 0.65 | -105.63 | 20 | 89 |
| 24245.88 | 107.34 | 0.01 | 0.9 | -99.02 | 96 | 149 |
| 27697.56 | 108.34 | 0.53 | -100.3 | 20 | 141 |
| 32494.18 | 109.54 | 0.1 | 1.09 | -103.35 | 400 | 153 |
| 40206.03 | 111.14 | 0.9 | -103.79 | 96 | 145 |
| 45322.55 | 112.04 | 0.53 | -105.63 | 20 | 137 |

Figure 7.1.2.3.1.1-2



###### 7.1.2.3.1.2 [5~7kbps]

Table 7.1.2.3.1.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 2b, D2T2, InF-DL 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** |
| D2T2-C | [202] | 8.52 | 50.9 | 0.01 |  | Budget-Alt1 | 5.36 | 23 | -40 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 56 |
| 4.81 | 20 | 52 |
| 0.1 | 5.36 | 96 | 54 |
| 4.81 | 20 | 50 |
| [195] | 30.95 | 70.9 | 5.08 | -60 | 0 | 400 |  | 223 |
| 5.49 | 96 | 221 |
| [210] | 94.08 | 88.14 | 0.01 | Budget-Alt2 | 4.67 | -79.45 | N/A | coherent | 74 |
| [190] | 11.76 | 55.9 | Budget-Alt1 | 6.43 | -45 |  |  | 82 |
| 83 |
| 84 |
| 414 |
| 415 |
| 416 |
| [212] | 7 | N/A | 140 | 186 |
| non-coherent | 190 |
| 0.1 | coherent | 184 |
| non-coherent | 188 |
| 14.27 | 58.9 | 0.01 | 26 | coherent | 187 |
| non-coherent | 191 |
| 0.1 | coherent | 185 |
| non-coherent | 189 |
| 56.34 | 80.19 | 0.01 | Budget-Alt2 | 23 | -69.29 | coherent | 194 |
| non-coherent | 198 |
| 68.37 | 83.19 | 26 | coherent | 195 |
| non-coherent | 199 |
| 131.15 | 93.29 | 0.1 | 23 | -82.39 | coherent | 192 |
| non-coherent | 196 |
| 159.15 | 96.29 | 26 | coherent | 193 |
| non-coherent | 197 |
| [199] | 8.59 | 55.9 | Budget-Alt1 | 5.9 | 23 | -45 | N/A | coherent | 38 |
| [191] | 3.13 | 35.36 | 0.01 | 5 | -50 | 6 | 400 | non-coherent | 346 |
| 358 |
| 3.79 | 38.36 | 96 | 356 |
| 344 |
| 4.6 | 41.36 | 20 | 354 |
| 4.91 | 42.36 | 342 |
| 5.77 | 44.86 | 0.1 | 400 | 357 |
| 5.96 | 45.36 | 345 |
| 6.56 | 46.86 | 0.01 | 20 | 360 |
| 6.78 | 47.36 | 96 | 350 |
| 362 |
| 6.87 | 47.56 | 20 | 348 |
| 7.97 | 49.86 | 0.1 | 96 | 355 |
| 343 |
| 8.5 | 50.86 | 0.01 | 400 | 352 |
| 9.38 | 52.4 | 297 |
| 9.67 | 52.86 | 0.1 | 20 | 341 |
| 353 |
| 11.43 | 55.46 | 0.01 | 96 | 313 |
| 12.75 | 57.16 | 0.1 | 361 |
| 12.92 | 57.36 | 349 |
| 400 | 351 |
| 13.78 | 58.36 | 20 | 359 |
| 347 |
| 14.8 | 59.46 | 0.01 | 311 |
| Budget-Alt2 | -71.45 | 409 |
| 15.18 | 59.86 | Budget-Alt1 | -50 | 299 |
| Budget-Alt2 | -70.65 | 397 |
| 15.22 | 59.9 | Budget-Alt1 | -50 | 96 | 295 |
| 307 |
| Budget-Alt2 | -67.35 | 393 |
| 15.28 | 59.96 | Budget-Alt1 | -50 | 301 |
| Budget-Alt2 | -67.35 | 399 |
| 16.24 | 60.9 | Budget-Alt1 | -50 | 20 | 293 |
| 305 |
| 400 | 303 |
| 0.1 | 96 | 294 |
| 300 |
| 306 |
| 312 |
| 20 | 292 |
| 298 |
| 304 |
| 310 |
| 400 | 296 |
| 302 |
| 19.7 | 63.9 | 0.01 | Budget-Alt2 | -71.45 | 20 | 403 |
| 19.96 | 64.1 | -70.65 | 391 |
| 24.69 | 67.4 | 0.1 | -66.45 | 400 | 394 |
| 24.79 | 67.46 | -77.45 | 96 | 410 |
| 28.2 | 69.46 | -78.95 | 398 |
| -66.45 | 400 | 400 |
| 30.08 | 70.46 | -80.45 | 20 | 408 |
| -80.65 | 396 |
| 33.01 | 71.9 | -77.45 | 96 | 404 |
| 33.44 | 72.1 | -78.95 | 392 |
| 41.1 | 75.3 | -80.45 | 20 | 402 |
| 41.37 | 75.4 | -80.65 | 390 |
|  |  | 0.01 | Budget-Alt1 | -50 | 400 | 309 |
| 315 |
| 364 |
| Budget-Alt2 |  | 96 | 405 |
| 411 |
| 400 | 395 |
| 401 |
| 407 |
| 413 |
| 0.1 | Budget-Alt1 | -50 | 308 |
| 314 |
| 363 |
| Budget-Alt2 |  | 406 |
| 412 |
| [207] | 52.82 | 79.19 | 0.01 | Budget-Alt-2 | 7 | -85.69 | 96 |  | 66 |
| 99.77 | 89.05 | 0.1 | -97.6 | 67 |
| 100.74 | 89.2 | 0.01 | -99.09 | 70 |
| 141.7 | 94.49 | 0.1 | -104.72 | 71 |
| [211] | 11.76 | 55.9 | 0.01 | Budget-Alt1 | 6.4 | -45 | 0 | 0 | 162.61 | 225 |
| 5.7 | 400 | 186.43 | 227 |
| 5.5 | 20 | 190.39 | 229 |
| 0.1 | 6.4 | 96 | 305.58 | 224 |
| 5.7 | 400 | 247.63 | 226 |
| 5.5 | 20 | 297.65 | 228 |
| [214] | 2.56 | 32.28 | 0.01 | Budget-Alt2 | 5 | -21.38 | N/A | N/A |  | 203 |
| 6.02 | 45.51 | 0.1 | -34.61 | 202 |
| [196] | 27.2 | 68.64 | Budget-Alt1 | 6.4 | 26 | -85 |  | 6(OOK) | 96 | 233 |
| 28.9 | 69.34 | 6 | 234 |
| 6.6 | 400 | 235 |
| 33.1 | 70.84 | 5 | 20 | 232 |

Figure 7.1.2.3.1.2-1

Table 7.1.2.3.1.2-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~5-7kbps, device 2b, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-C | [193] | 45.09 | 60.1 | 0.1 |  | Budget-Alt1 | 6 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 201 |
| [201] | 26.48 | 56.1 | -40 |  |  | 8 |
| 10 |
| 465.96 | 77.65 | Budget-Alt2 | -61.55 | 9 |
| 11 |
| [192] | 45.09 | 60.1 | 0.01 | Budget-Alt1 | 3 | -45 | - | 20 | - | 207 |
| 213 |
| 4.7 | 96 | 208 |
| 214 |
| 5.8 | 400 | 209 |
| 215 |
| [202] | 23.18 | 55.1 | 5.36 | -40 | N/A | 96 | N/A | 57 |
| 4.81 | 20 | 53 |
| 0.1 | 5.36 | 96 | 55 |
| 4.81 | 20 | 51 |
| 45.09 | 60.1 | 0.01 | 5.36 | -45 | 96 | 65 |
| 4.81 | 20 | 63 |
| 0.1 | 5.36 | 96 | 64 |
| 4.81 | 20 | 62 |
| [195] | 331.98 | 75.1 | 5.08 | -60 | 0 | 400 |  | 222 |
| 5.49 | 96 | 220 |
| [194] |  | 100.14 | Budget-Alt2 | 7 | -87.25 | N/A | 20 | N/A | coherent | 24 |
| 96.14 | -85.85 | 96 | 25 |
| 94.34 | -83.85 | 400 | 26 |
| 93.24 | 0.01 | -83.15 | 20 | 27 |
| 89.84 | -81.65 | 96 | 28 |
| 87.74 | -79.75 | 400 | 29 |
| [210] | 45.09 | 60.1 | Budget-Alt1 | 4.67 | -45 | 0 | 96 | 79 |
| 0.1 | 80 |
| 81 |
| 3206.46 | 92.14 | Budget-Alt2 | -79.45 | 78 |
| 3292.96 | 92.34 | 0.01 | 75 |
| 4418.01 | 94.55 | 0.1 | 77 |
| [209] | 13.98 | 51.3 | 0.01 | Budget-Alt1 | 7 | -40 | 4.7 | 240 |
| 0.1 | 248 |
| 23.18 | 55.1 | 0.01 | 0.9 | 236 |
| 237 |
| 238 |
| 239 |
| 242 |
| 0.1 | 244 |
| 245 |
| 246 |
| 247 |
| 250 |
| 34.55 | 58.1 | 0.01 | 26 | 243 |
| 0.1 | 251 |
| 45.09 | 60.1 | 0.01 | 23 | -45 | 241 |
| 0.1 | 249 |
| [190] | 0.01 | 6.43 |  |  | 85 |
| 86 |
| 87 |
| 419 |
| 417 |
| 418 |
| [213] | 170.64 | 70.1 | 3.41 | -55 | 6 | 20 | 166 |
| 4.89 | 96 | 174 |
| 5.72 | 400 | 182 |
| 3.87 | 20 | 118 |
| 5.77 | 96 | 126 |
| 6.99 | 400 | 134 |
| 0.1 | 3.41 | 20 | 162 |
| 4.89 | 96 | 170 |
| 5.72 | 400 | 178 |
| 3.87 | 20 | 114 |
| 5.77 | 96 | 122 |
| 6.99 | 400 | 130 |
| 254.39 | 73.1 | 0.01 | 3.41 | 26 | 20 | 167 |
| 4.89 | 96 | 175 |
| 5.72 | 400 | 183 |
| 3.87 | 20 | 119 |
| 5.77 | 96 | 127 |
| 6.99 | 400 | 135 |
| 0.1 | 3.41 | 20 | 163 |
| 4.89 | 96 | 171 |
| 5.72 | 400 | 179 |
| 3.87 | 20 | 115 |
| 5.77 | 96 | 123 |
| 6.99 | 400 | 131 |
| 993.93 | 83.34 | 0.01 | Budget-Alt2 | 23 | -96.29 | 132 |
| 1166.05 | 84.54 | 5.77 | -97.02 | 96 | 124 |
| 1481.72 | 86.34 | 3.87 | -100.52 | 20 | 116 |
| 1715.34 | 87.44 | 0.1 | 6.99 | -101.36 | 400 | 128 |
| 1985.79 | 88.54 | 5.77 | -102.55 | 96 | 120 |
| 2208.9 | 89.34 | 0.01 | 5.72 | -96.29 | 400 | 180 |
| 2523.36 | 90.34 | 4.89 | -97.02 | 96 | 172 |
| 2591.43 | 90.54 | 0.1 | 3.87 | -104.48 | 20 | 112 |
| 2844.48 | 91.24 | 0.01 | 3.41 | -100.52 | 164 |
| 3662.93 | 93.14 | 0.1 | 5.72 | -101.36 | 400 | 176 |
| 3761.75 | 93.34 | 0.01 | 6.99 | 26 | -96.29 | 133 |
| 4184.39 | 94.14 | 0.1 | 4.89 | 23 | -102.55 | 96 | 168 |
| 4413.2 | 94.54 | 0.01 | 5.77 | 26 | -97.02 | 125 |
| 4592.98 | 94.84 | 0.1 | 3.41 | 23 | -104.48 | 20 | 160 |
| 5607.89 | 96.34 | 0.01 | 3.87 | 26 | -100.52 | 117 |
| 6492.08 | 97.44 | 0.1 | 6.99 | -101.36 | 400 | 129 |
| 7515.67 | 98.54 | 5.77 | -102.55 | 96 | 121 |
| 8360.08 | 99.34 | 0.01 | 5.72 | -96.29 | 400 | 181 |
| 9550.23 | 100.34 | 4.89 | -97.02 | 96 | 173 |
| 9807.86 | 100.54 | 0.1 | 3.87 | -104.48 | 20 | 113 |
| 10765.57 | 101.24 | 0.01 | 3.41 | -100.52 | 165 |
| 13863.2 | 103.14 | 0.1 | 5.72 | -101.36 | 400 | 177 |
| 15836.78 | 104.14 | 4.89 | -102.55 | 96 | 169 |
| 17383.18 | 104.84 | 3.41 | -104.48 | 20 | 161 |
| [199] | 45.09 | 60.1 | Budget-Alt1 | 5.9 | 23 | -45 | N/A | 96 | N/A | 39 |
| [191] | 48.56 | 60.66 | 0.01 | 5 | -50 | 6 | 400 | non-coherent | 334 |
| 49.21 | 60.76 | 322 |
| 53.3 | 61.36 | 96 | 332 |
| 54.02 | 61.46 | 320 |
| 58.51 | 62.06 | 20 | 330 |
| 318 |
| 0.1 | 400 | 333 |
| 64.22 | 62.76 | 321 |
| 65.95 | 62.96 | 96 | 319 |
| 331 |
| 76.35 | 64.06 | 20 | 329 |
| 317 |
| 76.78 | 64.1 | 0.01 | 96 | 283 |
| Budget-Alt2 | -82.25 | 381 |
| 87.71 | 65.1 | Budget-Alt1 | -50 | 326 |
| 338 |
| 277 |
| 289 |
| 271 |
| 20 | 269 |
| 281 |
| 287 |
| 324 |
| 336 |
| 275 |
| 400 | 279 |
| 328 |
| 273 |
| 0.1 | 96 | 325 |
| 337 |
| 270 |
| 276 |
| 282 |
| 288 |
| 20 | 280 |
| 286 |
| 323 |
| 335 |
| 268 |
| 274 |
| 400 | 278 |
| 327 |
| 272 |
| 130.76 | 68.1 | 0.01 | Budget-Alt2 | -86.95 | 20 | 379 |
| 379.24 | 76.1 | 0.1 | -86.05 | 96 | 380 |
| 454.45 | 77.46 | 0.01 | -82.25 | 387 |
| 604.26 | 79.6 | 0.1 | -88.25 | 20 | 378 |
| 609.05 | 79.66 | -86.05 | 96 | 386 |
| 743.63 | 81.16 | 0.01 | -86.35 | 400 | 377 |
| 753.59 | 81.26 | 96 | 375 |
| 763.69 | 81.36 | -86.95 | 20 | 385 |
| 773.92 | 81.46 | 373 |
| 794.8 | 81.66 | 0.1 | -86.85 | 400 | 376 |
| 860.88 | 82.26 | -87.25 | 96 | 374 |
| 872.41 | 82.36 | -88.25 | 20 | 384 |
| 884.1 | 82.46 | -88.35 | 372 |
| 962.8 | 83.1 | 0.01 | -86.35 | 400 | 371 |
| 1042.84 | 83.7 | 96 | 369 |
| 1129.53 | 84.3 | 0.1 | -86.85 | 400 | 370 |
| 1175.55 | 84.6 | 0.01 | -86.95 | 20 | 367 |
| 1273.27 | 85.2 | 0.1 | -87.25 | 96 | 368 |
| 1534.08 | 86.6 | -88.35 | 20 | 366 |
|  |  | 0.01 | Budget-Alt1 | -50 | 400 | 285 |
| 291 |
| 340 |
| Budget-Alt2 |  | 383 |
| 389 |
| 0.1 | Budget-Alt1 | -50 | 284 |
| 290 |
| 339 |
| Budget-Alt2 |  | 388 |
| 382 |

Figure 7.1.2.3.1.2-2

###### 7.1.2.3.1.3 other data rate

7.1.2.3.1.3.1 [48 - 60 kbps]

Table 7.1.2.3.1.3.1-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 2b, D2T2, InF-DL 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** |
| D2T2-C | [199] | 8.59 | 55.9 | 0.1 |  | Budget-Alt1 | 44.8 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 30 |
| [207] | 37.24 | 73.77 | 0.01 | Budget-Alt-2 | 56 | -83.18 | 6 |  | 68 |
| 71.11 | 83.8 | 0.1 | -93.46 | 69 |
| 73.16 | 84.24 | 0.01 | -94.6 | 72 |
| 104.11 | 89.71 | 0.1 | -100.22 | 73 |

Figure 7.1.2.3.1.3.1-1

Table 7.1.2.3.1.3.1-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~48-60kbps, device 2b, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-C | [199] | 45.09 | 60.1 | 0.1 |  | Budget-Alt1 | 44.8 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 31 |

Figure 7.1.2.3.1.3.1-2



7.1.2.3.1.3.2 others

Table 7.1.2.3.1.3.2-1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 2b, D2T2, InF-DL 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** |
| D2T2-C | [199] | 8.59 | 55.9 | 0.1 |  | Budget-Alt1 | 15.6 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 32 |
| 84 | coherent | 34 |
| 36 |

Figure 7.1.2.3.1.3.2-1



Table 7.1.2.3.1.3.2-2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| others, device 2b, D2T2, InH-Office LOS | | | | | | | | | | | | | | | | |  |
| **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** |
| D2T2-C | [199] | 45.09 | 60.1 | 0.1 |  | Budget-Alt1 | 15.6 | 23 | -45 | 0.9 | N/A | 96 | N/A |  | non-coherent | 900 | 33 |
| 84 | coherent | 35 |
| 37 |

Figure 7.1.2.3.1.3.2-2



##### 7.1.2.3.2 Observations

For Device 2b and D2T2, it is observed that the maximum achievable coverage for InH-Office LOS

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

- R2D Tx Power (R2D[1E]): 23 (M)

- Number of receive antenna elements / TxRU / chains (D2R[2A]): 1(M)

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

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

- Topology/Pathloss model ([0D]): InH-Office LOS

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

Table 7.1.2.3.2

|  |  |  |
| --- | --- | --- |
| Device 2b | D2T2-C (Budget-Alt1) | D2T2-C (Budget-Alt2) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity <= -45dBm | [45.09 ~ 331.98] meters. (10: [199]:45.09, [193]:45.09, [191]:87.71, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [209]:45.09, [213]:170.6, [195]:332) | [1534.08 ~ 11975.1] meters. (3: [191]:1534, [210]:3206, [213]:1.198e+04) |
| R2D Tx power 23/24dBm dBm, R2D Rx sensitivity >= -40dBm | [23.18 ~ 26.48] meters. (3: [201]:26.48, [202]:23.18, [209]:23.18) | [NaN ~ NaN] meters. (0: ) |
| D2R BLER 10% and data rate ~1kbps | [45.09 ~ 331.98] meters. (4: [193]:45.09, [209]:45.09, [213]:170.6, [195]:332) | [11975.1 ~ 11975.1] meters. (1: [213]:1.198e+04) |
| D2R BLER 10% and data rate 5~7kbps | [26.48 ~ 331.98] meters. (8: [199]:45.09, [193]:45.09, [191]:87.71, [201]:26.48, [210]:45.09, [209]:45.09, [213]:170.6, [195]:332) | [1534.08 ~ 4592.98] meters. (3: [191]:1534, [210]:3206, [213]:4593) |
| D2R BLER 1% and data rate ~1kbps | [23.18 ~ 170.64] meters. (6: [192]:45.09, [203]:45.09, [190]:45.09, [202]:23.18, [209]:45.09, [213]:170.6) | [7318.24 ~ 7318.24] meters. (1: [213]:7318) |
| D2R BLER 1% and data rate 5~7kbps | [45.09 ~ 170.64] meters. (5: [191]:87.71, [192]:45.09, [190]:45.09, [209]:45.09, [213]:170.6) | [1175.55 ~ 2844.48] meters. (2: [191]:1176, [213]:2844) |
| D2R coherent receiver | [45.09 ~ 170.64] meters. (6: [199]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [209]:45.09, [213]:170.6) | [3206.46 ~ 11975.1] meters. (2: [210]:3206, [213]:1.198e+04) |
| D2R non-coherent receiver | [23.18 ~ 331.98] meters. (6: [193]:45.09, [191]:87.71, [201]:26.48, [192]:45.09, [202]:23.18, [195]:332) | [1534.08 ~ 1534.08] meters. (1: [191]:1534) |
| R2D Tx EIRP power < 30dBm, | R2D Rx sensitivity <=-45dBm  [45.09 ~ 331.98] meters. (10: [199]:45.09, [193]:45.09, [191]:87.71, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [209]:45.09, [213]:170.6, [195]:332)  R2D Rx sensitivity of -40dBm  [23.18 ~ 26.48] meters. (3: [201]:26.48, [202]:23.18, [209]:23.18) | R2D Rx sensitivity <=-45dBm  [1534.08 ~ 11975.1] meters. (3: [191]:1534, [210]:3206, [213]:1.198e+04)  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| R2D Tx EIRP power >=30dBm and <35dBm | R2D Rx sensitivity <=-45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity <=-45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| R2D Tx EIRP power >=35dBm | R2D Rx sensitivity <=-45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) | R2D Rx sensitivity <=-45dBm  [NaN ~ NaN] meters. (0: )  R2D Rx sensitivity of -40dBm  [NaN ~ NaN] meters. (0: ) |
| FEC code (1/2, 1/3, 1/4) | [23.18 ~ 170.64] meters. (8: [193]:45.09, [192]:45.09, [203]:45.09, [210]:45.09, [190]:45.09, [202]:23.18, [209]:45.09, [213]:170.6) | [3206.46 ~ 11975.1] meters. (2: [210]:3206, [213]:1.198e+04) |
| without FEC | [26.48 ~ 331.98] meters. (6: [199]:45.09, [191]:87.71, [201]:26.48, [190]:45.09, [213]:170.6, [195]:332) | [1534.08 ~ 5759.18] meters. (2: [191]:1534, [213]:5759) |
| OOK | [23.18 ~ 331.98] meters. (9: [193]:45.09, [191]:87.71, [201]:26.48, [192]:45.09, [203]:45.09, [190]:45.09, [202]:23.18, [213]:170.6, [195]:332) | [1534.08 ~ 11975.1] meters. (2: [191]:1534, [213]:1.198e+04) |
| BPSK | [45.09 ~ 45.09] meters. (4: [199]:45.09, [210]:45.09, [190]:45.09, [209]:45.09) | [3206.46 ~ 3206.46] meters. (1: [210]:3206) |
| MSK | [45.09 ~ 45.09] meters. (1: [190]:45.09) | [NaN ~ NaN] meters. (0: ) |