**IEEE 802.15**

**Wireless Speciality Networks**

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| Project | IEEE P802.15 Working Group for Wireless Specialty Networks (WSNs) | |
| Title | Proposal for revised tables on EVM and Rx Sensitivity Levels in Chapter 15 in 802.15.3RevB | |
| Date Submitted | 14 November 2022 | |
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| Re: |  | |
| Abstract | Proposal for revised tables on EVM and Rx Sensitivity Levels in Chapter 15 in 802.15.3RevB | |
| Purpose | Resolving comments of LB191 | |
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**Proposal for revised tables on EVM and Rx Sensitivity Levels in Chapter 15 in 802.15.3RevB**

**Starting Point:**

EVM values in Table 15-13 for the new MCS have been taken from "doc.15-22-0431-01-03ma-AWGN Simulation Results for new MCS". These simulations have been derived with a slighlty different method compared to the method used in deriving the values in IEEE Std 802.15.3d-2017 giving slightly different values for the already existing MCSs as shown in the above mentioned document. This gives inconsistent results across MCSs and has also an impact on the Reference sensitivity levels in tables 15-14 and 15-19.

**Proposed new tables**

**Table 15-14 Max EVM**

|  |  |  |  |
| --- | --- | --- | --- |
| MCS Identifier | Modulation | FEC Rate | Max. EVM (dB) |
| 0 | BPSK | 11/15 | -6 |
| 1 | BPSK | 14/15 | -7 |
| 2 | QPSK | 11/15 | -9 |
| 3 | QPSK | 14/15 | -10 |
| 4 | 8-PSK | 11/15 | -13 |
| 5 | 8-PSK | 14/15 | -15 |
| 6 | 8-APSK | 11/15 | -12 |
| 7 | 8-APSK | 14/15 | -15 |
| 8 | 16-QAM | 11/15 | -14 |
| 9 | 16-QAM | 14/15 | -17 |
| 10 | 64-QAM | 11/15 | -21 |
| 11 | 64-QAM | 14/15 | -23 |
| 12 | 16-APSK | 11/15 | -17 |
| 13 | 16-APSK | 14/15 | -22 |
| 14 | 32-APSK | 11/15 | -19 |
| 15 | 32-APSK | 14/15 | -23 |

**Table 15-14 Reference sensitivity levels for MCS for the THz-SC PHY**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MCS Identifier | Modulation | FEC Rate | Receiver Sensitivity (dBm) depending on the bandwidth | | | | | | | | |
| 2.16 GHz | 4.32 GHz | 8.64 GHz | 12.96 GHZ | 17.28 GHZ | 25.92 GHz | 34.56 GHz | 51.84 GHz | 69.12 GHz |
| 0 | BPSK | 11/15 | -67 | -63 | -60 | -57 | -55 | -54 | -52 | -51 | -49 |
| 1 | BPSK | 14/15 | -64 | -62 | -59 | -56 | -53 | -52 | -50 | -49 | -47 |
| 2 | QPSK | 11/15 | -64 | -60 | -57 | -54 | -51 | -50 | -48 | -47 | -45 |
| 3 | QPSK | 14/15 | -61 | -59 | -56 | -53 | -50 | -49 | -47 | -46 | -44 |
| 4 | 8-PSK | 11/15 | -59 | -56 | -53 | -50 | -47 | -46 | -44 | -43 | -41 |
| 5 | 8-PSK | 14/15 | -56 | -54 | -51 | -48 | -45 | -44 | -42 | -41 | -39 |
| 6 | 8-APSK | 11/15 | -59 | -57 | -54 | -51 | -48 | -47 | -45 | -44 | -42 |
| 7 | 8-APSK | 14/15 | -56 | -54 | -51 | -48 | -45 | -44 | -42 | -41 | -39 |
| 8 | 16-QAM | 11/15 | -57 | -55 | -52 | -49 | -46 | -45 | -43 | -42 | -40 |
| 9 | 16-QAM | 14/15 | -54 | -52 | -49 | -46 | -43 | -42 | -40 | -39 | -37 |
| 10 | 64-QAM | 11/15 | -52 | -48 | -45 | -42 | -39 | -38 | -36 | -35 | -33 |
| 11 | 64-QAM | 14/15 | -48 | -46 | -43 | -40 | -37 | -36 | -34 | -33 | -31 |
| 12 | 16-APSK | 11/15 | -70 | -52 | -49 | -46 | -43 | -42 | -40 | -39 | -37 |
| 13 | 16-APSK | 14/15 | -70 | -47 | -44 | -41 | -38 | -37 | -35 | -34 | -32 |
| 14 | 32-APSK | 11/15 | -70 | -50 | -47 | -44 | -41 | -40 | -38 | -37 | -35 |
| 15 | 32-APSK | 14/15 | -70 | -46 | -43 | -40 | -37 | -36 | -34 | -33 | -31 |

**Table 15-19 Reference sensitivity levels for MCS for the THz-OOK PHY**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MCS Identifier | Modulation | FEC Rate | Receiver Sensitivity (dBm) depending on the bandwidth | | | | | | | | |
| 2.16 GHz | 4.32 GHz | 8.64 GHz | 12.96 GHZ | 17.28 GHZ | 25.92 GHz | 34.56 GHz | 51.84 GHz | 69.12 GHz |
| 0 | OOK | 224/240 | -62 | -59 | -56 | -54 | -53 | -51 | -50 | -48 | -47 |
| 1 | OOK | 14/15 | -65 | -62 | -59 | -57 | -56 | -54 | -53 | -51 | -50 |
| 2 | OOK | 11/15 | -62 | -59 | -56 | -54 | -53 | -51 | -50 | -48 | -47 |