IEEE P802.11
Wireless LANs

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| 30.6.6 Modulation and Coding Scheme for OFDM Mode |
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Abstract

This document proposes specification text for subclause 30.6.6 of the spec describing Modulation and Coding Scheme (MCS) set for OFDM mode, [1].

*Editor: Add the content of the section 30.6.6 as specified below to the spec draft D0.35*

**30.6.6 Modulation and coding scheme (MCS)**

The MCS is a value that determines modulation and coding. For an EDMG PPDU, the MCS value is carried in the EDMG-Header-A field and in the EDMG-Header-B field. The data rate provided by an MCS depends on the guard interval length, the number of spatial streams, *NSS* (1 ≤ *NSS* ≤ 8), and the number of *NSD* data subcarriers defined per OFDM symbol.

Table 1 defines the set of MCSs for and EDMG OFDM mode PPDU. MCS indexes exceeding the largest MCS index defined in Table 1 are reserved.

Table 1: EDMG-MCSs for the EDMG OFDM mode

|  |  |  |  |
| --- | --- | --- | --- |
| **EDMG-MCS index** | **Modulation** | ***NCBPS*** | **Code Rate** |
| 1 | SQPSK | 1 | ½ |
| 2 | SQPSK | 1 | 5/8 |
| 3 | SQPSK | 1 | ¾ |
| 4 | SQPSK | 1 | 13/16 |
| 5 | SQPSK | 1 | 7/8 |
| 6 | QPSK | 2 | ½ |
| 7 | QPSK | 2 | 5/8 |
| 8 | QPSK | 2 | ¾ |
| 9 | QPSK | 2 | 13/16 |
| 10 | QPSK | 2 | 7/8 |
| 11 | 16QAM | 4 | ½ |
| 12 | 16QAM | 4 | 5/8 |
| 13 | 16QAM | 4 | ¾ |
| 14 | 16QAM | 4 | 13/16 |
| 15 | 16QAM | 4 | 7/8 |
| 16 | 64QAM | 6 | 5/8 |
| 17 | 64QAM | 6 | ¾ |
| 18 | 64QAM | 6 | 13/16 |
| 19 | 64QAM | 6 | 7/8 |

For a given type of guard interval used in the transmission of an EDMG OFDM mode PPDU, the total transmission data rate, ρ, provided by the PPDU is defined as:



where:

* *NSS* is defined above
*  is the data rate provided by the MCS of spatial stream *iSS* as defined in Table 2 and Table 3

Table 2 and Table 3 define data rate for given number of data subcarriers *NSD* and guard interval type.

Table 2: Data rate for the EDMG OFDM mode – NSD = 336, 734

|  |  |
| --- | --- |
| **MCS** | **Data rate per spatial stream (Mbps)** |
| ***NSD* = 336** | ***NSD* = 734** |
| **Normal GI** | **Short GI** | **Long GI** | **Normal GI** | **Short GI** | **Long GI** |
| 1 | 729.47 | 792.00 | 630.00 | 1593.60 | 1730.10 | 1376.30 |
| 2 | 911.84 | 990.00 | 787.50 | 1991.90 | 2162.70 | 1720.30 |
| 3 | 094.20 | 1188.00 | 945.00 | 2390.30 | 2595.20 | 2064.40 |
| 4 | 1185.40 | 1287.00 | 1023.80 | 2589.50 | 2811.50 | 2236.40 |
| 5 | 1276.60 | 1386.00 | 1102.50 | 2788.70 | 3027.80 | 2408.40 |
| 6 | 1458.90 | 1584.00 | 1260.00 | 3187.10 | 3460.30 | 2752.50 |
| 7 | 1823.70 | 1980.00 | 1575.00 | 3983.90 | 4325.40 | 3440.60 |
| 8 | 2188.40 | 2376.00 | 1890.00 | 4780.70 | 5190.40 | 4128.80 |
| 9 | 2370.80 | 2574.00 | 2047.50 | 5179.00 | 5623.00 | 4472.80 |
| 10 | 2553.20 | 2772.00 | 2205.00 | 5577.40 | 6055.50 | 4816.90 |
| 11 | 2917.90 | 3168.00 | 2520.00 | 6374.20 | 6920.60 | 5505.00 |
| 12 | 3647.40 | 3960.00 | 3150.00 | 7967.80 | 8650.70 | 6881.30 |
| 13 | 4376.80 | 4752.00 | 3780.00 | 9561.30 | 10381.00 | 8257.50 |
| 14 | 4741.60 | 5148.00 | 4095.00 | 10358.00 | 11246.00 | 8945.60 |
| 15 | 5106.30 | 5544.00 | 4410.00 | 11155.00 | 12111.00 | 9633.80 |
| 16 | 5471.10 | 5940.00 | 4725.00 | 11952.00 | 12976.00 | 10322.00 |
| 17 | 6565.30 | 7128.00 | 5670.00 | 14342.00 | 15571.00 | 12386.00 |
| 18 | 7112.40 | 7722.00 | 6142.50 | 15537.00 | 16869.00 | 13418.00 |
| 19 | 7659.50 | 8316.00 | 6615.00 | 16732.00 | 18167.00 | 14451.00 |

Table 3: Data rate for the EDMG OFDM mode – NSD = 1134, 1532

|  |  |
| --- | --- |
| **MCS** | **Data rate per spatial stream (Mbps)** |
| ***NSD* = 1134** | ***NSD* = 1532** |
| **Normal GI** | **Short GI** | **Long GI** | **Normal GI** | **Short GI** | **Long GI** |
| 1 | 2462.00 | 2673.00 | 2126.30 | 3326.10 | 3611.10 | 2872.50 |
| 2 | 3077.50 | 3341.30 | 2657.80 | 4157.60 | 4513.90 | 3590.60 |
| 3 | 3693.00 | 4009.50 | 3189.40 | 4989.10 | 5416.70 | 4308.80 |
| 4 | 4000.70 | 4343.60 | 3455.20 | 5404.80 | 5868.10 | 4667.80 |
| 5 | 4308.50 | 4677.80 | 3720.90 | 5820.60 | 6319.50 | 5026.90 |
| 6 | 4923.90 | 5346.00 | 4252.50 | 6652.10 | 7222.30 | 5745.00 |
| 7 | 6154.90 | 6682.50 | 5315.60 | 8315.10 | 9027.90 | 7181.30 |
| 8 | 7385.90 | 8019.00 | 6378.80 | 9978.20 | 10833.00 | 8617.50 |
| 9 | 8001.40 | 8687.30 | 6910.30 | 10810.00 | 11736.00 | 9335.60 |
| 10 | 8616.90 | 9355.50 | 7441.90 | 11641.00 | 12639.00 | 10054.00 |
| 11 | 9847.90 | 10692.00 | 8505.00 | 13304.00 | 14445.00 | 11490.00 |
| 12 | 12310.00 | 13365.00 | 10631.00 | 16630.00 | 18056.00 | 14363.00 |
| 13 | 14772.00 | 16038.00 | 12758.00 | 19956.00 | 21667.00 | 17235.00 |
| 14 | 16003.00 | 17375.00 | 13821.00 | 21619.00 | 23472.00 | 18671.00 |
| 15 | 17234.00 | 18711.00 | 14884.00 | 23282.00 | 25278.00 | 20108.00 |
| 16 | 18465.00 | 20048.00 | 15947.00 | 24945.00 | 27084.00 | 21544.00 |
| 17 | 22158.00 | 24057.00 | 19136.00 | 29934.00 | 32500.00 | 25853.00 |
| 18 | 24004.00 | 26062.00 | 20731.00 | 32429.00 | 35209.00 | 28007.00 |
| 19 | 25851.00 | 28067.00 | 22326.00 | 34924.00 | 37917.00 | 30161.00 |

**References:**

1. Draft P802.11ay\_D0.35