IEEE P802.11
Wireless LANs

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| EDMG SC mode A-PPDU transmission |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Takenori Sakamoto | Panasonic | 600 Saedo-cho, Tsuzuki-ku, Yokohama 224-8539, Japan |  | sakamoto.takenori@jp.panasonic.com |
| Hiroyuki Motozuka | Panasonic |  |  | motozuka.hiroyuki@jp.panasonic.com |
| Artyom Lomayev | Intel |  |  | artyom.lomayev@intel.com |
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Abstract

This document proposes specification text describing the waveform for the EDMG SC mode/OFDM mode A-PPDU transmission.

1.

30.5.10 PPDU transmission

30.5.10.1 General

This subclause defines the waveform for the EDMG SC mode and the non-EDMG duplicate PPDU transmission over a 2.16 GHz, 4.32 GHz, 6.48 GHz, and 8.64 GHz channel using *NTX* transmit chains.

The definition of the spatial mapping methods is provided in 30.5.10.2. The non-EDMG duplicate PPDU transmission shall be as defined in 30.5.10.3. The EDMG SU PPDU transmission shall be as defined in 30.5.10.4. The EDMG MU PPDU transmission shall be as defined in 30.5.10.5.

The frequently used symbol notations in this subclause are summarized in Table 67.

*Add following symbol into Table 67:*

1. —Frequently used parameters

|  |  |
| --- | --- |
| **Symbol** | **Explanation** |
|  | Space-time stream number |
|  | Total number of space-time streams over all users |
|  | User number |
|  | Total number of users |
|  | Transmit chain number |
|  | Total number of transmit chains |
|  | SC chip rate, equal to 1.76 GHz |
|  | SC chip time duration, equal to 1/*Fc* |
|  | Number of contiguous 2.16 GHz channels used for PPDU transmission, 1 ≤ *NCB* ≤ 4 |
|  | Spatial mapping matrix of size *NTX* by *NSTS* |
|  | Up-sampling parameter |
|  | Total number of PPDUs aggregated into EDMG A-PPDU |

30.5.10.4 EDMG SU PPDU transmission

30.5.10.4.1 PPDU transmission over a 2.16 GHz channel with *iSTS* = 1

*Editor: introduce the changes as below:*

An EDMG SC mode SU PPDU transmitted over a 2.16 GHz channel with single space-time stream (*iSTS* = 1) is composed of pre-EDMG, Data and TRN fields. The total number of transmit chains, *NTX*, shall be constant over the different fields of the PPDU.

For a single PPDU transmission, ~~T~~the pre-EDMG and Data fields include the following modulated fields:



where:

 is the duration of the L-STF field of the PPDU

 is the total duration of the L-STF and L-CEF fields of the PPDU

 is the total duration of the L-STF, L-CEF and L-Header fields of the PPDU

 is the total duration of the L-STF, L-CEF, L-Header and EDMG-Header-A fields of the PPDU

The definition of the L-STF, L-CEF, and L-Header fields is provided in 30.3.3.2.2, 30.3.3.2.3, and 20.6.3.1, respectively.

For an A-PPDU transmission aggregating *NPPDU* PPDUs, the pre-EDMG, the EDMG modulated field of the EDMG preamble, and Data fields include the following modulated fields:



Where:

*  is the duration of L-STF field of the PPDU
*  is the total duration of L-STF and L-CEF fields of the PPDU
*  is the total duration of L-STF, L-CEF, and L-Header fields of the PPDU
*  is the total duration of L-STF, L-CEF, L-Header, and EDMG-Header-A1 fields of the PPDU
*  is the total duration of L-STF, L-CEF, L-Header, EDMG-Header-A1, and Data1 fields of the PPDU
*  is the total duration of L-STF, L-CEF, L-Header, EDMG-Header-A1, Data1, and EDMG-Header-A2 fields of the PPDU
* …
*  is the total duration of L-STF, L-CEF, L-Header, EDMG-Header-A1, Data1, EDMG-Header-A2, Data2, …, and Data*NPPDU*-1 fields of the PPDU
*  is the total duration of L-STF, L-CEF, L-Header, EDMG-Header-A1, Data1, EDMG-Header-A2, Data2, …, Data*NPPDU*-1, and EDMG-Header-A*NPPDU* fields of the PPDU

30.5.10.4.2 PPDU transmission over a 2.16 GHz channel with *iSTS* > 1 and 4.32 GHz, 6.48 GHz, 8.64 GHz channel with *iSTS* ≥ 1

30.5.10.4.2.1 General

30.5.10.4.2.2 Transmission of pre-EDMG fields

30.5.10.4.2.3 Transmission of EDMG preamble and Data field

*Editor: introduce the changes as below:*

For a single PPDU transmission, the EDMG modulated field of ~~T~~the EDMG preamble and Data field of an SU PPDU is defined for the *iSTSth* space-time stream at the *NCB*×1.76 GHz chip rate and includes the following modulated fields:



where:

 is the duration of the EDMG-STF field of the PPDU

 is the total duration of the EDMG-STF and EDMG-CEF fields of the PPDU

For an A-PPDU transmission aggregating *NPPDU* PPDUs, the EDMG modulated field of the EDMG preamble and Data field of an SU PPDU is defined for *iSTS*th space-time stream at the *NCB* × 1.76 GHz chip rate and includes the following modulated fields:



where

*  is the duration of EDMG-STF field of the PPDU
*  is the total duration of EDMG-STF and EDMG-CEF fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, and Data1 fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, and EDMG-Header-A2 fields of the PPDU
* …
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, EDMG-Header-A2, Data2, …, and Data*NPPDU*-1 fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, EDMG-Header-A2, Data2, …, Data*NPPDU*-1, and EDMG-Header-A*NPPDU* fields of the PPDU

30.6.8 OFDM PPDU transmission

30.6.8.1 General

*Modify 30.6.8.1 in [1] as follows:*

This subclause defines a waveform for OFDM EDMG PPDU transmission over 2.16 GHz, 4.32 GHz, 6.48 GHz, and 8.64 GHz channel using *NTX* transmit chains.

The spatial mapping methods definition is provided in 30.6.8.2. The EDMG ~~SU~~OFDM PPDU transmission shall be as defined in 30.6.8.3. The EDMG MU PPDU transmission shall be as defined in 30.6.8.4.

The frequently used symbol notations in this subclause are summarized in Table 1.

Table 1 —Frequently used parameters

|  |  |
| --- | --- |
| **Symbol** | **Explanation** |
|  | Space-time stream number |
|  | Total number of space-time streams over all users |
|  | User number |
|  | Total number of users |
|  | Transmit chain number |
|  | Total number of transmit chains |
|  | SC chip rate, equal to 1.76 GHz |
|  | SC chip time duration, equal to 1/*Fc* |
|  | OFDM sampling rate equal to *NCB*×2.64 GHz |
|  | OFDM sample time duration, equal to 1/*Fs* |
|  | Number of contiguous 2.16 GHz channels used for PPDU transmission, 1 ≤ *NCB* ≤ 4 |
|  | Spatial mapping matrix of size *NTX* by *NSTS*, defined for *k*-th subcarrier |
|  | Up-sampling parameter |
|  | Total number of PPDUs aggregated into EDMG A-PPDU |

30.6.8.3 EDMG SU PPDU transmission

30.6.8.3.1 Pre-EDMG part of PPDU transmission

*Editor: introduce the changes as below to the text in [1]*

30.6.8.3.2 EDMG preamble, data part and TRN field transmission

For a single PPDU transmission, the EDMG modulated field of ~~T~~the EDMG preamble, ~~data part~~Data and TRN field of SU PPDU is defined for *iTX*-th transmit chain at the *Fs* = *NCB*×2.64 GHz sampling rate, sample time duration *Ts* = 1/*Fs* and includes the following modulated fields:



where

*  is ~~a~~the duration of EDMG-STF field of the PPDU
*  is ~~a~~the total duration of EDMG-STF and EDMG-CEF fields of the PPDU
*  is ~~a~~the total duration of EDMG-STF, EDMG-CEF, and Data fields of the PPDU

The EDMG-STF, EDMG-CEF, and TRN field shall be as defined in 30.6.3, 30.6.4, and 30.9.2.2.5 accordingly.

For an A-PPDU transmission aggregating *NPPDU* PPDUs, the EDMG modulated field of the EDMG preamble, Data and TRN field of SU PPDU is defined for *iTX*-th transmit chain at the *Fs* = *NCB*×2.64 GHz sampling rate, sample time duration *Ts* = 1/*Fs* and includes the following modulated fields:



where

*  is the duration of EDMG-STF field of the PPDU
*  is the total duration of EDMG-STF and EDMG-CEF fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, and Data1 fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, and EDMG-Header-A2 fields of the PPDU
* …
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, EDMG-Header-A2, Data2, …, and Data*NPPDU*-1 fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, EDMG-Header-A2, Data2, …, Data*NPPDU*-1, and EDMG-Header-A*NPPDU* fields of the PPDU
*  is the total duration of EDMG-STF, EDMG-CEF, Data1, EDMG-Header-A2, Data2, …, Data*NPPDU*-1, EDMG-Header-A*NPPDU* , and Data*NPPDU* fields of the PPDU

**References:**

* Draft P802.11ay\_D0.8

**Straw Poll**

* Do you agree to include the specification text describing the waveform of EDMG SC mode/OFDM mode A-PPDU proposed in 11-17/1683r0 to the Draft amendment?