
Project **IEEE 802.16 Broadband Wireless Access Working Group** <<http://ieee802.org/16>>

Title **FCH for 128 FFT mode**

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Submitted

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Re: Supporting document for recirculation ballot #14b.

Abstract In OFDMA mode, FCH message requires total of four subchannels per segment. In 128 FFT case, there are only total of three DL PUSC subchannels available for all three segments. The proposal is to use a modified compressed version of DLFP and allocate the two required subchannels per segment in time using two consecutive slots formed by four consecutive OFDM symbols.

Purpose To adopt the enhancements to OFDMA PHY in P802.16e/D3 draft.

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2 **1 Introduction**

3 In OFDMA mode, FCH message requires total of four subchannels per segment. In 128 FFT case, there
4 are only total of three DL PUSC subchannels available for all three segments.

5 The proposal is to modify the OFDMA DLFP to a compressed version of half its original size (12
6 effective un-coded bits compared to its current 24 bits) satisfying the needs of 128 FFT case more
7 efficiently and allocating the required two slots per segment in time formed by four consecutive OFDM
8 symbols.

9 In modifying the DLFP message the following considerations are used:

- 10 1. Because of the small number of subchannels remaining in 128 FFT case, there is no need to more
11 than 2 bits for “Used subchannel bitmap”.
- 12 2. Will not include four reserved bits.
- 13 3. Will allocate only 6 bits to “DL-Map_Length”. This means that the max length is 64 slots out of
14 the worst case (for 20 msec, 1.25 MHz BW) ~100 slots
- 15 4. Fix the “Repetition_Coding_Indication” to “No repetition coding on DL-MAP” and save the two
16 bits.

17 **2 Proposed Text Changes**

18 **Change 1:** Change the Title of Table 266 to “**OFDMA downlink Frame Prefix format for all FFT sizes
19 except 128**”

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21 **Change 2:** Add the following text and table for DLFP format for 128 FFT to the end of Section 8.4.4.3:

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23 For the case of 128 FFT, the following compressed format shall be used for DLFP.

24

25

Table xxx—OFDMA downlink Frame Prefix format for 128 FFT

Syntax	Size	Notes
DL Frame Prefix Format() {		
Used subchannel bitmap	2 bits	0b00: Subchannels 0 is used 0b01: Subchannels 1 is used 0b10: Subchannels 2 is used 0b11: Reserved
Ranging_Change_Indication	1 bit	
Coding_Indication	3 bits	Refer to definition of Coding_Indication in Table 266.
DL-Map_Length	6 bits	
}		

26

27

28 **Change 3:** Add the following text as the second paragraph of Section 8.4.4.4 at line 46:

29 In PUSC 128 FFT case, any segment used shall be allocated one subchannel. The first 2 slots in the
30 downlink part of the segment contain the FCH as defined in 8.4.4.3. These slots contain 24 bits
31 modulated by QPSK with coding rate 1/2 and repetition coding of 4.

32 **3 References**

33 [1] IEEE P802.16-REVd/D5-2004 Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed

- 1 Broadband Wireless Access Systems
- 2 [2] IEEE P802.16-REVe/D3-2004 Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed
- 3 Amendment for Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands