1

`Project	**IEEE 802.20 Working Group on Mobile Broadband Wireless Access** **<http://grouper.ieee.org/groups/802/20/>**
Title	**Bandwidth Definitions**
Date Submitted	July 14th, 2008
Authors(s)	Tamer Kadous Email : tkadous@qualcomm.com
Re:	The MBWA minimum performance project
Abstract	This contribution defines the different bandwidths referred to in the MPS contributions
Purpose	For consideration of 802.20
Notice	This document has been prepared to assist the IEEE 802.20 Working Group. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.20.
Patent Policy	The contributor is familiar with IEEE patent policy, as outlined in Section 6.3 of the IEEE-SA Standards Board Operations Manual <http://standards.ieee.org/guides/opman/sect6.html#6.3> and in *Understanding Patent Issues During IEEE Standards Development* <http://standards.ieee.org/board/pat/guide.html>.

1 INTRODUCTION

This contribution presents channel bandwidth and other related transmission parameter specification at the access network. Those definitions will be used in subsequent contributions presenting AN RF specifications.

2 BW DEFINITIONS

Table 1-1 presents the different channel bandwidths to be used for UMB signal transmission. Other channel bandwidths may be considered in future releases.

Table 2-1 UMB channel bandwidths

N_{FFT}	512	1024	2048
CBW, MHz	5	10	20
N_T, tiles	32	64	128
N_{guard}, tiles	1	2	4
TBW, tiles	30	60	120

CBW: Channel bandwidth in MHz

TBW: Transmission bandwidth that varies from one tile to the maximum transmission BW as defined in Table 2-1 . If the TBW is not associated with a number of tiles, then what is meant is the maximum TBW.

5 MHz and larger channel bandwidths include guard-bands of 1 Tile for 5 MHz, 2 Tiles for 10 MHz and 4 Tiles for 20 MHz channels.

Figure 1 illustrates the spectral arrangement of a 10 MHz bandwidth UMB signal.

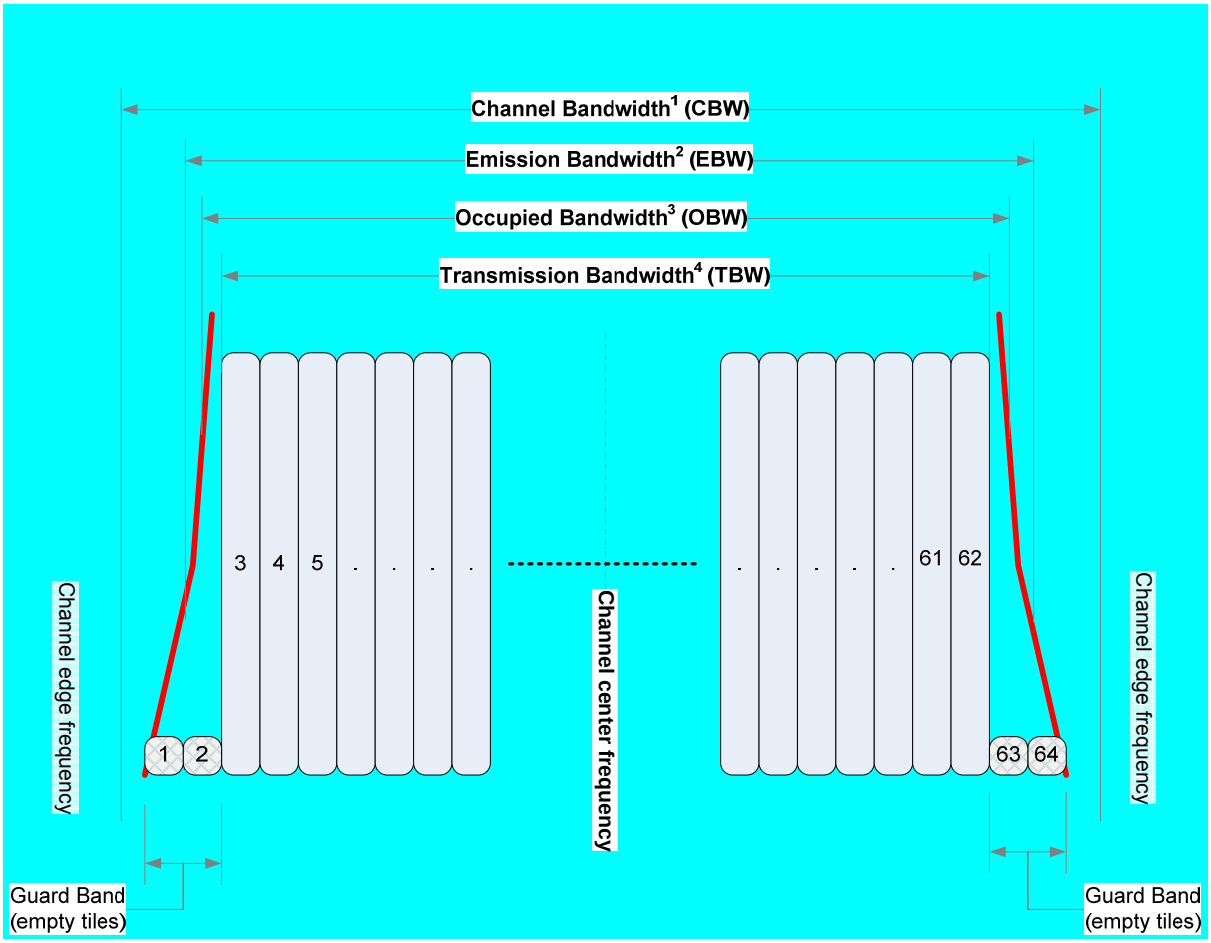

Figure 1 10 MHz signal example

Note 1: **Channel Bandwidth (CBW) = [1.25; 2.5; 5; 10; 20], *MHz*;** *CBW > EBW;*

Note 2: **Emission Bandwidth (EBW) = x- dB Bandwidth, *MHz*;** *the latter is defined in ITU-R SM.328-10; x=26 dB is used in FCC definitions;* $EBW_{26dB} > OBW_{99\%}$

Note 3: **Occupied Bandwidth (OBW) = x% Bandwidth, *MHz*;** *defined in ITU-R SM.328-10; x=99% is typical value; OBW ≥ TBW;*

Note 4: **Transmission Bandwidth (TBW) = (N_{FFT} – N_{guard} *2) * 0.0096 / 16, *tiles*;** N_{guard} *is number of guard sub-carriers on each side of the carrier.*

2.1 Emission BW

The EBW is defined in Note 2 above. It is commonly used in regulations when specifying the emission requirement in the first 1 MHz to the channel edge. For instance FCC requires -13dBm for 1% of the 26dB-EBW in that region.

2.2 Occupied BW

Measurement of occupied bandwidth provides a verification of channel bandwidth. Occupied bandwidth shall be less than channel bandwidth. It is defined as the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage β/2 of the total mean power of a given emission. Unless otherwise specified by the Radiocommunication Assembly for the appropriate class of emission, the value of β/2 should be taken as 0.5%. [1], [2].

2.2.1 Requirements

The occupied bandwidth for UMB shall be based on β/2 = 0.5%. The occupied bandwidth shall be less than the channel bandwidth.

The measurement shall employ a resolution BW (RBW)of ≥ 1% of the CBW, except where it is explicitly set otherwise.

The method of measurement section will be completed in a future revision to this contribution.

3 REFERENCE:

1. Recommendation ITU-R SM.328-10, “Spectra and Bandwidth of Emissions”.

2. “International Telecommunications Union Radio Regulations”, Edition 2004, Volume 1 – Articles, ITU, December 2004.