Project	**IEEE 802.16[1] Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**IEEE 802.16-2004[1] and IEEE 802.16e[1] RF Characteristics**
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Re:	In response to ITU-R activities related to coexistence studies between IMT-2000 and OFDM-based broadband wireless access systems in the 2.5-2.69 GHz band.
Abstract	This document provides a recommended list of RF characteristics for IEEE 802.16-2004 and 802.16e to be used in performing spectrum sharing studies in ITU-R Working Party 8F.
Purpose	For approval and submission to the next ITU-R WP 8F meeting
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IEEE 802.16-2004 and 802.16e RF Characteristics

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Introduction

In its 15th meeting in Geneva, ITU-R Working Party 8F (WP8F) continued its discussion on the proposal from the US administration to produce a Report on the issue of adjacent frequency sharing of the 2.5-2.69 GHz between IMT-2000 systems and OFDM-based Broadband Wireless Access (BWA) systems in the same geographical area. As a result of these discussions, WP8F agreed to "…conduct sharing studies initially between IMT-2000 and fixed broadband wireless access systems including nomadic applications. Therefore, a liaison statement to WPs 8A, 9B and 9D asking for technical information regarding non-IMT-2000 broadband wireless access systems and material relevant to these sharing studies was approved." [2]

IEEE 802.16-2004 and its mobile evolution 802.16e are certainly among those OFDM-based BWA systems that are being considered for deployment in the 2.5-2.69 GHz band and are, therefore, likely to share this band with IMT-2000 systems. IEEE 802.16-2004, supporting nomadic BWA applications has been published in 2004. IEEE 802.16e, supporting mobile applications, is in its final stages and is expected to be approved later this year. Since none of the ITU-R Working Parties that received the liaison letter from WP8F have official approved technical documentation on 802.16 systems, and also since such information is not included in any approved ITU-R Recommendation, it is hereby recommended that IEEE 802.16 send such information directly to the next WP8F meeting, to be held June 7-15, 2005 in Quebec City, Canada, to facilitate commencement of spectrum sharing studies as soon as possible.

RF Characteristics

Below in Table 1 are listed some key parameters, and their suggested values, recommended for performing a spectrum sharing study between 802.16 systems and IMT-2000 systems in adjacent bands and in the same geographical area. It is also suggested that IEEE 802.16 ask WP8F that any future inquires on additional information be sent directly to IEEE 802.16.

It should be noted that the values in the above table are best considered as typical numbers in the context of performing sharing studies and are not based on any specific implementation of the standard.

[2] Document 8F/TEMP/208-E, Meeting Report of WG Spectrum.

Table 1 – IEEE 802.16 RF parameters to be used in coexistence studies for the band 2500-2690 MHz

Parameter	802.16-2004		802.16e	
	BS	**SS**	**BS**	**MSS**
System-wide				
Carrier Bandwidth (MHz)	5		5	
No. of Sectors	3		3	
Reuse factor	1:1, 1:3		1:1, 1:3	
MCL (dB)	60	n/a	60	n/a
Propagation model	For BS to BS interference: dual-slope propagation model; For BS to SS (or MSS): Modified COST-231, Greenstein-Erceg (SUI)			
Fade margin (dB)	12		10	
Building penetration loss (dB)	15			
Cell radius (km) Urban/sunurban/rural	1/2/4		1/2/4	
TX				
rms Power (dBm)	36	24	36	20
TDD activity factor (dB)	3		3	
Antenna gain (dBi)	16	8	16	0
Antenna height (m)	30	2	30	2
Loss of gain due to downtilt (dB)	0	n/a	0	n/a
Misc. losses (dB)	2	2	2	2
Adjacent Channel Leakage Ratio, ACLR (dB) [1), 2)]				
ACLR_1 (dB)	67	49	67	45
ACLR_2 (dB)	67	49	67	45
ACLR_3 (dB)	67	49	67	45
RX				
Antenna gain (dBi)	16	8	16	0
Antenna height (m)	30	2	30	2
Misc. losses (dB)	2	2	2	2
Loss of gain due to downtilt (dB)	0	n/a	0	n/a
Noise Figure (dB)	4	7	4	7
Noise Floor (dBm/Hz)	-170	-167	-170	-167
Sensitivity (QPSK _) (dBm)	-99	-96	-99	-96
Adjacent Channel Selectivity, ACS (dB) [2), 3)]				
ACS_1 (dB)	70	40	70	40
ACS_2 (dB)	70	59	70	59

ACS_3 (dB)	70	-	70	-
Interference criteria, I/N (dB)	-10	-10	-10	-10
Max. tolerable interference power (dBm)	-113	-110	-113	-110

Notes

1) ACLR calculations based on $67+10\log_{10}(P)$ for BS and $55+10\log_{10}(P)$ for SS, P in Watts.
2) ACLR_*n* and ACS_*n* are ACLR and ACS values at *n* carriers away in either direction.
3) ACS numbers are based on expected achievable performance in the industry.