Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Image Rejection for 802.16d**
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Re:	
Abstract	The image rejection specification of section 8.3.11.5 should be removed
Purpose	The contribution discusses why the image rejection specification in 802.16-2004 should be removed from the standard.
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Image Rejection for OFDM Receivers

There are a few reasons to change or eliminate the image rejection specification.

A) The location of the image is implementation dependent, and the test will have to rely on information from the vendor as to where the exact location of the image is. This makes testing very difficult to do. For some radios(direct conversion), there is no image, for others (low IF), it is close to the RF band. I note that the current RCT for 802.16d has continuously delayed image rejection testing due to great difficulties in testing. It is currently scheduled for wave 3 testing, which effectively means that it will never be tested, since it is unikely that RCT will be developed beyond wave 2 for 802.16d.

B) There is no image rejection specification for OFDMA radios. Since the RF front end of an OFDM and OFDMA radio should be virtually identical, leaving the image rejection specification in place penalizes the OFDM supplier, and offers no significant advantage.

C) If a low IF radio architecture is used, then the image should be identical to a non-adjacent channel blocker. For example, if there is any signal at the image frequency, it will pass through the radio, and will cause interference, so will degrade overall radio performance. This is exactly the same as if a blocker is present. Analysis shows that the current blocker spec requiring the radio to operate with non-adjacent-channel blockers 23 dB above the desired signal is equivalent to 47 dB rejection of the blocker. Therefore, the 60 dB image rejection specification is 13 dB more stringent than the blocking specification. This overly complicates the radio, and increases cost and size, with little or no benefit, since the image specification is considerably harder to meet than the blocker spec, and blockers are much more likely to be seen than images.

There are 2 options to proceed.
1. Remove the spec completely (preferred).
2. Relax the specification so that the image rejection specification is equivalent to the worst-case non-adjacent channel blocker specification. This would see us relaxing the image rejection spec to, say, 45 dB. This still makes testing difficult, but does not overly complicate radio design.