IEEE P802.11
Wireless LANs

|  |
| --- |
| LB 203 Comment Resolution for 8.4.2.170  |
| Date: 2014-08-25 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Jianhan Liu | Mediatek Inc. | 2860 Junction Ave., San Jose, CA, 95134 |  | Jianhan.liu@mediatek.com |

Abstract

This submission proposes resolutions for comments in subclause 8.4.2.170 of TGah Draft 2.0 with the following CIDs:

-3523, 3524, 3525

Revisions:

* Rev 0.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3523 | Edward Reuss | 123.37 | 8.4.2.170 | This equation does NOT describe the "Open Loop Link Margin Index" as indicated in the text. This equation actually describes the "Open Loop Link Margin" in dB. The "Open Loop Link Margin Index" is actually the value "D" described in the last paragraph of this section. | Either:1. Change the left side of the equation from "en-Loop Link Margin Index" (sic) to read "Open-Loop Link Margin", or2. Change the right side of the equation to read "((Ptx +Rsensitivity)+128)\*2".In either case, change "en" to "Open". | Accepted –Change the left side of the equation from "en-Loop Link Margin Index" (sic) to read "Open-Loop Link Margin". The fllowing changes are also made.“The Open-Loop Link Margin ~~Index field~~ is defined as the summation of transmit power *Ptx* and the receiversensitivity *RXsensitivity* ” chanes to “The Open-Loop Link Margin ~~Index~~ is defined as the summation of transmit power *Ptx* and the receiversensitivity *RXsensitivity*”. |
| 3524 | Edward Reuss | 123.50 | 8.4.2.170 | The last paragraph in this section (Starting on line 50) is better than in D1.0, but it's still a mess. It confuses dB and dBm, and it also confuses open-loop link margin and the Open-Loop Link Margin Index. The link margin is NOT measured in dBm. Instead it is measured in dB. The value "D" is actually the Open-loop Link Margin Index. The first sentence correctly refers to the link margin, but incorrectly identifies it in units of dBm. The second and third sentences incorrectly refer to the Open Loop Link Margin Index (Which is in units of 0.5 dB), but they are both actually describing the open loop link margin, which should also be in dB, not dBm. | The cheap & dirty solution to make this paragraph technically & mathematically correct is to change all three instances of "dBm" to "dB", and to change both instances of "Open-Loop Link Margin Index" to open-loop link margin. However, this solution still does not properly describe how to calculate the Open-Loop Link Margin Index from the Ptx and the RXsensitivity. Therefore, the complete solution is to either choose the option #2 in my previous comment, which describes the equation for the Open-Loop Link Margin Index, or else to introduce that formula in this paragraph. | Revised –Open-loop link margin is measured in dBm. It is a fixed value. Open-loop link margin index is used to indicate this abosolute value. The revised text isThe open-loop link margin is defined as (-128+D×0.5) dBm, where D is an unsigned integer value of the Open-Loop Link Margin Index field. For example, if the value D shown in Open-Loop Link Margin Index field is 0, then it indicates the Open-Loop Link Margin ~~Index~~ is -128 dBm. If the value D shown in Open-Loop Link Margin Index field is 255, then it indicates the Open-Loop Link Margin ~~Index~~ is -0.5 dBm. |
| 3525 | Edward Reuss | 123.40 | 8.4.2.170 | This description is an extremely simplistic link margin model. It does not account for several factors normally accounted for in a more general solution, such as the Friis Transmission Model. Many of these are static and can be folded into this simple model, but many cannot, either because they are dynamic, or else they do not follow TX/RX antenna reciprocity. Two of these factors of particular concern are in-channel interference and signal reflections. This means that the open loop link margin defined in this section is exceedingly optimistic, assuming zero interference and zero reflections, which is not realistic as the band for TGah is both unlicensed and a very reflection-rich environment. These factors limit the usefulness of the simplified open-loop link model. | Add an informative paragraph describing the impact of interference and reflections on the open loop link margin. Copying the description in the "Comment" section of this comment might be a good place to start. | Revised –Reason:Open-loop link margin is used for rough link adapation and power control. The idea is to make it simple and need least protocols. The goal is to enable sensor devices which do one time transmission and go back to sleep. However, to make the procedure clear, the usage of open-loop-link-margin is added. Please see the discussion for details. |

**Discussion:**

To resolve the comments 3523, 3524, 3525 and make clear of the usage of open-loop link margin index, the revised text is as follows.

“The S1G Open-Loop Link Margin $Δ\_{OPLM} $is defined as the summation of transmit power *Ptx* and the receiver sensitivity *RXsensitivity*

$Δ\_{OPLM}=P\_{tx1}$+$RXsensitiv.$

The transmit power $P\_{tx1}$indicates the actual power used as measured at the output of the antenna connector, in units of dBm, by a STA when transmitting the frame containing the S1G Open-Loop Link Margin Index element. The receiver sensitivity *RXsensitivity* is the minimum required receive power for reception of MCS10 for 1 MHz channel.

The S1G Open-Loop Link Margin $ Δ\_{OPLM}$ is calculated as (-128+D×0.5) dBm, where D is called Open-Loop Link Margin Index. D is an unsigned integer value that is contained in S1G Open-Loop Link Margin Index field. For example, if the value D shown in S1G Open-Loop Link Margin Index field is 0, then it indicates the S1G Open-Loop Link Margin$ Δ\_{OPLM}$ is -128 dBm. If the value D shown in S1G Open-Loop Link Margin Index field is 255, then it indicates the S1G Open-Loop Link Margin $Δ\_{OPLM}$ is -0.5 dBm.

The S1G Open-Loop Link Margin Index element can be used for open-loop link adaptation and open-loop transmit power control. When a STA receives the Open-loop link Margin index, it can calculate the S1G Open-Loop Link Margin $Δ\_{OPLM} $by using (-128+D×0.5) dBm. Then the SNR margin over the MCS 10 can be derived at the STA that receives the frame that conatins S1G Open-Loop Link Margin Index based on its own transmit power $P\_{tx2 }$and the received RSSI measured for the packet containing the S1G Open-Loop Link Margin Index.

$$SNR \_{Margin}=P\_{tx2}-Δ\_{OPLM}+RSSI$$