IEEE P802.11  
Wireless LANs

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| Resolutions for LB263 CIDs 57, 59, 12 | | | | |
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|  |  |  |  |  |

Abstract

Proposed text to resolve LB263 CIDs 57, 59, 12 on 11bb D2.0

***Discussion: Highlighted text preceded by “Discussion” are not to be copied into the TGbb Draft. Such text provides rationale for the proposed changes.***

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| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** |
| 57 | Nancy Lee | 31.2 | 13/8 | should be e.g. HT MAC not HT STA MAC as in e.g. REVme B.4.17.1 HT MAC features | change "An LC HT STA MAC shall consist of an HT STA MAC. An LC VHT STA MAC shall consist of a VHT STA MAC. An LC HE STA MAC shall consist of an HE STA MAC" to "The MAC of an LC HT STA shall consist of an HT MAC. The MAC of an LC VHT STA shall consist of a VHT MAC. The MAC of an LC HE STA shall consist of an HE MAC" |
| 59 | Nancy Lee | 32.1 | 13/19 | inconsistent naming: in some places e.g. LC HT PHY, other places e.g. LC HT mode, and other places e.g. LC HT mode PHY. Compare 32.1 on p. 13 with 32.3.3.1 on p. 16 and 32.3.3.2 on p. 16 | pick one, or explicitly state that LC HT PHY and LC HT mode are synonymous |
| 12 | Robert Stacey | 32.1 |  | Is the mode "LC HT PHY mode" or "LC HT mode"? I think it is the latter (since that is what you have later in the clause). Also, there is redundancy in the 2nd and 3rd paragraphs. | Remove the 2nd paragraph. Remove "PHY" from each of the three bullets. And remove the full stop/period on the last bullet (a bulleted list does not need additional punctuation). |

**Proposed resolution of CID57:** REVISED remove LC MAC as shown below

**Proposed resolution of CID59:** REVISED use e.g. “LC PHY operating in the HT mode” as shown below

**Proposed resolution of CID12:** REVISED use e.g. “LC PHY operating in the HT mode” as shown below

***Discussion: By defining an LC STA as the same as HT STA, VHT STA, or HE STA except with e.g. the HT PHY replaced by the LC PHY operating in the LC HT mode, there is no need to specify an LC MAC.***

***Discussion: There is only one LC PHY, not multiple LC PHYs. Align abstract wording with 11ax abstract, which uses “modifications to the IEEE 802.11 physical layer (PHY)”***

**Abstract:** This amendment specifies modifications to the IEEE 802.11 physical layer (PHY) that enable operation of IEEE 802.11 over the wireless light medium. This amendment provides uplink and downlink operations in 800 nm to 1000 nm band, achieves minimum single-link throughput of 10 Mb/s as measured at the MAC data service access point (SAP), and facilitates interoperability among solid state light sources with different modulation bandwidths.

**4.3.31 Light Communications (LC) STA**

An LC STA is either an LC HT STA or an LC VHT STA or an LC HE STA. An LC HT STA is an HT STA except that it uses an LC PHY operating in the LC HT mode. An LC VHT STA is a VHT STA except that it uses an LC PHY operating in the LC VHT mode. An LC HE STA is an HE STA except that it uses an LC PHY operating in the LC HE mode.

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**32.1 Introduction**

Clause 32 (LC PHY specification) specifies the PHY entity for intensity modulation and direct detection (IM/DD) systems; an example of which is explained in 32.3.2 (LC Light interface example). The light communications intermediate frequency (LC IF) signal, which is introduced in Fig. 32-1, covers the frequency range of near direct current (DC) up to a few hundred MHz, see 32.3.4 (Channel numbering).

An LC STA shall support at least one of the three modes of the LC PHY, which are:

- LC HT

- LC VHT

- LC HE

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**32.3.3.2 LC High Throughput (LC HT) mode**

The LC PHY operating in the LC HT mode shall be the same as Clause 19 (High-throughput (HT) PHY specification) and behavior specified for a HT STA shall apply to an LC STA using the LC HT mode, except when the specifications in 32.3.3.2 (LC High Throughput (LC HT) mode) supersede corresponding text in Clause 19 (High-throughput (HT) PHY specification).

The subclause 19.3.14 20 (Regulatory requirements) does not apply to the LC HT mode. For channel numbering, refer to 32.3.4 (Channel numbering).

**32.3.3.3 LC Very High Throughput (LC VHT) mode**

The LC PHY operating in the LC VHT mode shall be the same as Clause 21 (Very high throughput (VHT) PHY specification) and behavior specified for a VHT STA shall apply to an LC STA using the LC VHT mode, except when the specifications in 32.3.3.3 (LC Very High Throughput (LC VHT) mode) supersede corresponding text in Clause 21 (Very high throughput (VHT) PHY specification).

The subclause 21.3.13 (Regulatory requirements) does not apply to the LC VHT mode. For channel numbering, refer to 32.3.4 (Channel numbering).

**32.3.3.4 LC High Efficiency (LC HE) mode**

The LC PHY operating in the LC HE mode is the same as Clause 27 (High Efficiency (HE) PHY specification) and behavior specified for a HE STA shall apply to an LC STA using the LC HE mode, except when the specifications in 32.3.3.4 (LC High Efficiency (LC HE) mode) supersede corresponding text in Clause 27 (High Efficiency (HE) PHY specification).

The subclause 27.3.24 (Regulatory requirements) does not apply to the LC HE mode. For channel 38 numbering, refer to 32.3.4 (Channel numbering).

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**32.3.5 Multiple transmitters and receivers**

In the LC HT, LC VHT and LC HE modes, the LC PHY supports the use of multiple transmitters and receivers. An example of the LC PHY TX connected to multiple LC optical TX antennas is shown in Figure 32-3, and an example of multiple LC optical RX antennas connected to the LC PHY RX is shown in Figure 32-4.

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When operating the LC PHY with multiple optical TX antennas in the LC HT mode, the LC PHY TX shall use the procedures defined in 19.3 (HT PHY), where NTX transmit chains in the HT PHY shall be connected to NTX LC optical TX antennas. The LC HT PHY mode shall support the same maximum number of LC optical antennas as the maximum number of antennas supported by the HT PHY.

When operating the LC PHY with multiple optical TX antennas in the LC VHT mode, the LC PHY TX shall use the procedures defined in 21.3 (VHT PHY), where NTX transmit chains in the VHT PHY shall be connected to NTX LC optical TX antennas. The LC VHT mode shall support the same maximum number of LC optical antennas as the maximum number of antennas supported by the VHT PHY.

When operating the LC PHY with multiple optical TX antennas in the LC HE mode, the LC PHY TX shall use the procedures defined in 27.3 (HE PHY), where NTX transmit chains in the HE PHY shall be connected to NTX LC optical TX antennas. The LC HE mode shall support the same maximum number of LC optical antennas as the maximum number of antennas supported by the HE PHY.

**32.3.6 Clear Channel Assessment (CCA) for LC**

**32.3.6.1 CCA requirements**

The CCA requirements for the HT PHY in 19.3.19.5 (CCA sensitivity) to detect a channel busy condition are applicable to LC HT mode.

The CCA requirements for VHT PHY in 21.3.18.5 (CCA sensitivity) to detect a channel busy condition are applicable to LC VHT mode.

The CCA requirements for HE PHY in 27.2.6 (Support for non-HT, HT and VHT formats) and 27.3.20

(Receiver specification) to detect a channel busy condition are applicable to LC HE mode.

For the CCA to function, light signals are converted into electrical power levels. LC transmissions are mostly directional, hence a non-AP LC STAs might not be able to receive signals from peer non-AP LC STAs.