IEEE P802.11  
Wireless LANs

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| Resolution of CID32 in CC against D2.1 | | | | |
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Abstract

This contribution proposes revised working text and a graph for direct operation of the LC PHY being more power efficient compared to up-down conversion architecture defined in D2.1.

Rev.0: initial text for discussion

**Motivation**

The LC channel can be used by modulating the existing 802.11 waveforms onto a LC IF carrier as defined in 32.3.4 (Channel numbering). This goal can be achieved the up-down-conversion architecture shown in Fig. 32-1 (Interfacing the LC PHY to light emitter and light receiver), and the current draft is based mostly on this assumption. However, it is very energy-consuming to convert baseband signals to the center frequencies defined in the 5 GHz or 6 GHz radio band, pass them through a power amplifier, possibly attenuate the signals, before they can be downconverted to the LC IF center frequencies. If the baseband signals would be directly accessible, they could be directly converted to the LC IF center frequencies, which is significantly more power efficient and has potentially also less impairments (phase noise, IQ imbalance, non-linear amplifiers etc.) that are introduced by the various RF components in the up-down-conversion architecture defined in D2.1. In order to show the potential for 11bb to be integrated into mobile devices, a direct conversion architecture should be added as second example to the draft.

Proposed new text and figure to be embedded after P15L6 in TGbb D2.1

Figure 32-1a shows an alternative implemnentation how the LC light interface can be implemented. A transmit OFE can be directly connected to a direct LC PHY transmitter (TX) that has an LC IF output. A receive OFE can be connected to a direct LC PHY receiver (RX) that has an LC IF input. In the direct LC PHY TX, the baseband signal is directly upconverted to the LC IF signal such that the center frequency aligns with the LC IF channel frequency defined in 32.3.4 (Channel numbering). In the direct LC PHY RX, the LC IF signal is directly downconverted to the baseband using the center frequency as defined in 32.3.4 (Channel numbering).



**Figure 32-1a—Direct LC light interface**