

**Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)**

**Submission Title:** [Proposal for channelization-harmonization-for-LECIM-draft-PHY]

**Date Submitted:** [15 March2012]

**Source:** [David Howard, Steve Jillings, Shuzo Kato]

**Company:** [Ramp Wireless, Semtech Corporation, Tohoku University]

**E-Mail:** [david.a.howard@ieee.org , sjillings@ieee.org, shukato@riec.tohoku.ac.jp]

**Re:** []

**Abstract:** []

**Purpose:** [To assist with the definition of the 15.4k PHY of the LECIM draft standard]

**Notice:** This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

**Release:** The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.

## LECIM PHY Channelization

- Proposal to define a common equation to derive the channel center frequency for the designated channels of each frequency band as defined in 15-12-0089-05-004k

- 8.1.1 Operating Frequency Band
  - Amend Table 66 as follows:

PHY (MHz)	Frequency Band (MHz)	Spreading Parameters		Data Parameters		
		Chip Rate (kchips/s)	Modulation	Bit Rate (kb/s)	Symbol Rate (ksymbols/s)	Symbols
917	917.1 – 923.5	-	FSK / GFSK / P=FSK / P=GFSK	37.5	37.5	Binary
		-		25	25	Binary
		-		12.5	12.5	Binary

- 8.1.2.11 Channel Assignments for LECIM PHYs
- Amend 8.1.2.11 as follows:
  - The LECIM PHY channel plan is described in the following equation
  - The channel center frequency, *ChanCenterFreq* for all LECIM PHYs, except those listed in 8.1.2.11.1 shall be derived as follows:
    - $$\text{ChanCenterfreq} = \text{FreqBandEdge} + \text{FreqOffset} + (\text{ChanNum} - 1) * \text{spacing}$$
  - Where
    - *ChanCenterFreq* is the channel center frequency in MHz
    - *FreqBandEdge* is the band edge for each frequency band in MHz
    - *FreqOffset* is the frequency offset for each band in MHz
    - *NumChan* is the designated channel identifier number from 0 to N
  - Not all designated channels may be available

- **8.1.2.11 Channel Assignments for LECIM PHYs**
  - The parameters FreqBandEdge, FreqOffset, Spacing and the range of valid ChanNum channel numbers for each frequency band are listed in table 68I, below:

- 8.1.2.11 Channel Assignments for LECIM PHYs
  - Table 68l: Frequency Band, Frequency Band Offset and Channel Spacing for LECIM PHYs:

Frequency Band (MHz)	<i>FreqBandEdge (MHz)</i>	<i>FreqOffset (MHz)</i>	<i>Spacing (MHz)</i>	<i>ChanNum Range</i>
433.050 – 434.790	433	0.17	0.1	1 – 16
	433	0.22	0.2	1 – 8
470 – 510	470	0.1	0.1	1 – 399
	470	0.2	0.2	1 – 199
779 – 787	779	0.1	0.1	1 – 79
	779	0.2	0.2	1 – 39
863 – 870	863	0.075	0.1	1 – 69
	863	0.125	0.2	1 – 34
902 – 928	902	0.1	0.1	1 – 259
	902	0.2	0.2	1 – 129
	902	0.3	0.4	1 – 64
	902	0.8	1.0	1 – 25
	902	1.0	2.0	1 – 13
2400 – 2483.5	2400	0.2	0.2	1 – 416
	2400	2	2	1 – 39

- Delete table 68m
- Add Section 8.1.2.11.1
- 8.1.2.11.1 Non multiple of 100 kHz channel spacing
  - The following LECIM PHYs channel spacing is not based upon a multiple of 100 kHz:
    - 169 MHz LECIM FSK PHY
      - The channel plan for the 169 MHz band is as follows:
        - Channel0: 169.4375 MHz
    - 868 MHz LECIM DSSS PHY
      - The channel plan for the 868MHz band is as follows:
        - Channel 0: 868.300 MHz
        - Channel 1: 868.950 MHz
        - Channel 2: 869.525 MHz

- Amend 19.2.4.7 as follows:
- 19.2.4.7 Receiver interference rejection
  - The minimum receiver interference rejection levels are given in Table 202. The adjacent designated channels are those on either side of the desired designated channel that are closest in frequency to the desired designated channel. The alternate designated channel is more than one removed from the desired designated channel in the operational frequency band.
  - For example the adjacent designated channel is  $\text{ChanNum} \pm 1$  removed from the desired designated channel and the alternate channel is  $\text{ChanNum} \pm 2$  from the desired designated channel.
  - ChanNum is the channel identifier number of the designated channel