**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **SNUST - Offset-VPWM PHY PPDU Format and PIB Attributes Specification Revision**  |
| Date Submitted | January, 2017 |
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| Re: | Draft D1 Comment Resolution based Offset-VPWM PHY PPDU Format and PIB Attributes Specification Revision |
| Abstract | Details of Resolutions regarding to the submitted Comments on D1 are suggested for Offset-VPWM PHY PPDU Format and PHY PIB Attributes Specification Revision. The Flash Light designed to support LBS, Authentication, IoT/IoL, etc. |
| Purpose | D1 Comments Resolutions and Editorial Revision. |
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# **1. PPDU FORMART FOR Offset-VPWM**

# **Offset-VPWM PPDU Format**

The PPDU frame structure is formatted as illustrated in Figure 4-1 for PHY-IV ISC/ Low Rate PD.



**Figure 220 – Offset-VPWM PPDU Format**

**8.6.6.3.1 SHR Field**

The preamble field is used by the transceiver to obtain optical clock synchronization with an incoming message. The standard defines one fast locking pattern (FLP). The MAC shall select the optical clock rate for communication during the clock rate selection process. The preamble shall be sent at a clock rate chosen by the TX and supported by the RX. The preamble is a time domain sequence and does not have any channel coding or line coding.

The preamble first starts with a FLP. The FLP is fixed as a pattern “11010010”. The fast locking pattern length shall not exceed the maximum. The timing information for preamble is shown in Figure 211.



**Figure 211 – Preamble Timing Diagram**

In the Offset Variable Pulse Width Modulation for Smart Device Flash Light PHY uses OOK modulation for preamble transmission using flash light. The Preamble Bit Mapping shown in Figure 212.



**Figure 212 – Preamble Transmission – OFFSET VPWM BIT MAPPING**

**8.6.6.3.2 PSDU Field**

The PSDU field has a variable length and carries the data of the PHY IV frame. The FCS is appended if the PSDU has a non-zero byte payload. The structure of the PSDU field is as shown in Figure 213.



**Figure 213 – Offset-VPWM PHY PSDU Field Structure**

# **2. PHY PIP ATTRIBUTES FOR OFFSET-VPWM**

# **PHY PIB Attributes**

The PHY PIB comprises the attributes required to manage the PHY sublayer of a device. The attributes contained in the IEEE802.15.7-2011 PHY PIB are presented in Table 125 - PHY PIB Attributes.

The additional PHY IV PIB attributes added for Offset Variable Pulse Width Modulation for Smart Device Flash Light PHY is presented in the Table 188 —PHY PIB attributes (continued).

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| **PHY PIB Table 100 Additions** |
| **Attribute** | **Identifier** | **Type** | **Range** | **Description** |
| phySMFlashLIGHTApplicationSpecificMode | 0x10 | Unsigned | 0~255 | This attribute specifies the application specific PHY mode.0 : Normal Data (Media Content, Information Content based on the Application used)1 : ID Data 2 : Authentication Data |
| phyOffsetVPWMStdPERIOD | 0x11 | Integer | 0-65535 | This attribute specify the standard PWM period used to transmit the data (in micro secs) |
| phyOffsetVPWMOffsetPERIOD | 0x12 | Integer | 0-65535 | This attribute specify the Variable offset PWM period used to transmit the data (in micro secs) |

**Table 188 — PHY PIB attributes (continued for Offset-VPWM)**