**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | Definition of Gaussian filter for CMB GFSK |
| Date Submitted | [July 18, 2013] |
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| Abstract | This document is a contribution to clarify definition of Gaussian filter for CMB GFSK PHY. |
| Purpose | This document is contribution to add a sub-clause where definition of Gaussian filter is addressed. |
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**[Discussion]**

Although the BT value of Gaussian filter is fixed to be 0.7 for all modes based on the TG4n’s previous discussions, the definition of Gaussian filter for CMB GFSK PHY is not mentioned in the draft 0.01 revision 1 (IEEE P802.15-13-0447-01-004n). This point is made clear in the following proposal document.

**[Proposal document]**

***Sub-clause number and TBD value will be determined based on a discussion in TG4n.***

Definition of Gaussian filter for CMB GFSK

The transmission pulse shape *p*(t) for CMB GFSK PHY shall be constrained by the shape of a normalized cross-correlation function (t) with a standard reference Gaussian filter whose pulse shape *r*(*t*) given by the next formula.

where *BT* is 0.7 and *t* is normalized by the symbol duration.

The normalized cross-correlation (t) between two waveforms, *p*(*t*) and *r*(*t*), is defined as

where *Er* and *Ep* are the energies of *r*(*t*) and *p*(*t*) respectively.

In order for CMB GFSK PHY transmitter to be compliant with this standard, the transmitted pulse *p*(*t*) shall have a magnitude of the cross-correlation function |  (τ)| whose main lobe is greater than or equal to **TBD1,** when integrated over a period of at least 2x**TBD2** time.

Add eye diagram