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

Submission Title: Dimming related CIDs in draft D1
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Re:

Abstract: proposes comment resolutions for a set of CIDs related to dimming

Purpose:

Comments for CIDs

454, 467, 666,669, 695, 738, 739, 748, 820, 822, 829, 831, 173, 178

Dimming support

PHY support

- VPM
- dimmed OOK mode
- visible pattern

MAC support

- Visible frame
- Dimmer notification command

E-mail discussion (see Intel e-mail on reflector) that Dimming support is not mandatory but MAC/PHY shall honor any dimming requests (mandatory), if dimming is supported.

Use of dimming notification command

Dimming notification command mentions the dimmer level from TX to RX and the dimmer timer.

VPM by default uses only 50% duty cycle. If dimming is supported, the VPM pulse shape is obtained using the dimmer command and using the algorithm provided in Figure 48.

Before dimming using VPM starts, dimming notification command needs to be sent by the MAC to the receiver.

CID 454, 467, 447

Dimming support using VPM

- Same comment as for 6.6.4.1. How can the transmitter check the receiver's capability for dimming support before dimming using VPM?
- Remove last sentence of the paragraph below table 27. Remove the sentence "The transmitter should check the receiver's capability for dimming support before dimming using VPM".
- I don't understand why the transmitter should check if the receiver supports dimming. I would think dimming support is mandatory so this sentence should be removed.

Instruction to editor

- Accept in principle. Need to add clarification text " Before dimming is supported by VPM in the PHY, dimming notification command needs to be sent by the MAC to the receiver. Both the TX and RX shall use the algorithm for VPM dimming as discussed in Figure 48. The transmitter shall honor all dimming requests from the upper layer. It is recommended that the transmitter use the receiver's capabilities information as provided in Sub-Clause 7.2.3.2.1 for VPM dimming support as obtained during the device discovery process as provided in Sub-Clause 7.6.2.4."

CID 666, 669

Dimming support in PHY/ MAC

- row of bit 11 "Dimming support in MAC"
- row of bit 19 "Dimming support in PHY (VPM)"
- what MAC section in the draft contains the "Dimming support in MAC" text? Why do we need to have this as a capability information field?
- What PHY section in the draft contains the "Dimming support in PHY" text? Why do we need to have this as a capability information field?

Instruction to editor

- Accept in principle. Delete (VPM) from the text indicating dimming support for PHY. Provide clarification text.
- If bit 11 is set, the MAC supports dimming using the visibility frame and dimming notification command.
- If bit 19 is set, the PHY supports dimming using both the dimmed OOK mode and VPM, if the corresponding data rates are supported.

CID 695

Dimming notification command

- What is the purpose of this command? Is this redundant with the visibility frame. The visibility frame is used to carry the information on the VPM symbol shape, even though this command could be used for that also. How is this command used?

Instruction to editor

- Accept in principle. Add clarification text “Dimming notification command mentions the dimmer level from TX to RX and the dimmer timer. VPM by default uses only 50% duty cycle. If dimming is supported using VPM as in Sub-Clause 7.2.3.2.1 , the VPM pulse shape is obtained using the dimmer command and using the algorithm provided in Figure 48. Before dimming is supported using VPM, dimming notification command needs to be sent by the MAC to the receiver”
- Visibility frame is not used for communicating the symbol shape. Any reference to such must be modified.

CID 738

visibility frame

- mention visibility level is same as dimming level. Add VPM dimming uses this before VPM can be applied. Also mention use for CSK color calibration

Instruction to editor

- Use consistent terminology “use dimming level instead of visibility level”. Add clarification text “the visibility pattern is also used for color stabilization for PHY III as explained in subclause x.xx”
- x.xx is dependent on the subclause location for color stabilization in D2.

CID 739

Robustiness of the visibility frame

- According to section 6.7 the VF carriers critical info on the VPM symbol shape; hence, the VF needs to be encoded and protected against errors to the same degree as the associated data packets being used by the VPM PHY. Is this the case? An alternative is to use the "dimming notification command" of section 7.3.10 for passing symbol shape information, assuming this command is equivalently error protected as the data packet.

Instruction to editor

- Accept in principle. Add clarification text “Dimming notification command is used to communicate the dimming level. The dimming notification command is sent at the lowest data rate corresponding to the currently negotiated optical clock rate. The symbol shape information for VPM is derived using Figure 48 after the dimming level is obtained”.

CID 748

Figure 47 lists the visible patterns, but it does not show them being sent in contention, uplink or downlink slots. Wrong reference

Instruction to editor

- Accept. Please update Figure 47 to Figure 105.

CID 820, 822

Remove the dimming override capability section from the standard. Remove the PWM signal override capability section from the standard

- I do not believe that a device or coordinator should be allowed to override dimming. To do so opens up the standard to causing flicker. To be honest, a device can always chose to over dimming on its own without the standard sanctifying this action.

Instruction to editor – part 1

- Agree in principle that dimming override should not be misused. Add clarification text “The use of the override capability is constrained and can be done only during device discovery and device disassociation. This override shall not be used in the middle of VLC communication”

CID 820, 822

Instruction to editor – part 2

- Further agreement – Upper layer should make the decision on dimming override and not the MAC.
- Change the dimming override signal to “dimming override *request* signal”
- Change the PWM override signal to “PWM override *request* signal”

Instruction to editor – suggested text

A dimmer override capability request signal is added to the MLME SAP and provided to the external dimmer interface.This dimmer override request signal shall be set to '1' by the MAC during VLC operation and shall be set to '0‘ after the communication has been completed. The dimmer circuit can decide whether to accept or reject this request. The response to this dimmer override request signal by the external dimmer circuit is out-of-scope.

Instruction to editor – suggested text

A PWM signal override request signal is added to the PLME SAP and provided to the external dimmer interface. This PWM override request signal shall be set by the VLC PHY to ‘1’ to inform the dimmer circuit that the VLC PHY will be responsible for dimming and to disable any PWM circuit present in the dimmer. The duty cycle for dimming is then driven by modulation mode provided by the VLC PHY (such as VPM). . The response to this PWM override request signal by the external dimmer circuit is out-of-scope.

CID 831

mention use of VF for sending information

dimming information provided by VF. VPM starts after using this.

Instruction to editor

- Reject. The dimming notification command is used to provide dimming information for VPM.
- Remove “visibility level” from visibility frame in Figure 101” and related text. Visibility level is same as dimming level provided in dimming notification command.
- Add clarification text “Visibility frame is used for sending the visibility pattern for a fixed period of time, supporting features such as flicker mitigation, continuous visibility, device discovery, color stabilization and power savings to the receiver.”

CID 829

Use of dimming pattern for device discovery

- This section indicates that the dimming pattern can be used for device discovery for the infrastructure mode. But we have multiple MCS, so what MCS is used for this function. To my knowledge, the standard does not specify what PHY type should be used for the infrastructure coordinator.

Instruction to editor

- Accept in principle. Add clarification text. “The in-band visibility pattern can help with device discovery. The visibility pattern is uncoded as shown in Figure 101 (Section 7.5). The header for the visibility frame is sent at the lowest data rate corresponding to the currently negotiated clock rate.

CID 173, 178

Figure 17—Visible/Dimming Frame, frame format seems to be special in that the optional data follows the FCS. It would be good to explain why this is done (i.e. as opposed to defining a MAC command frame.)

update text to reflect use for dimming and VPM support (and also, for color stabilization)

Instruction to editor

- Accept. Use CID resolution for 829 and 831 and apply in subclause 5.