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**Abstract:**

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# VLC Considerations on Band Plan and Dimming

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# Considerations on band plan

Dividing the visible light wavelength band into seven wavelengths is proposed as a method for all the visible light communication schemes.

An LED package containing 7 LED chips with different colors will be impractical due to the following reasons:

- The lifetime of each LED chip is different, as a result, the color balance changes over time.
- It is not easy to divide visible light spectrum into 7 bands with nearly equal bandwidths because of LED device characteristics

# Considerations on band plan (continued)

VLCC considers that a white LED using a blue LED and a yellow phosphor will be widely used for an LED illumination light source in the future. Thus, VLCC thinks that it is not appropriate to use multiple band plan for visible light communication.

VLCC, instead, in the September meeting, proposed a visible light communication method using white LEDs with its full visible light spectrum.

If a full-spectrum white light is used for visible light communication, we do not need narrow-band filters, resulting in cost reduction and better reliability.

# Considerations on Dimming

There are proposals about dimming in the September meeting. In the proposals, the pulse width is adjusted in order to control the brightness of light.

We have following comments about dimming:

Illumination companies should be involved in the dimming discussion. Without them, we may end up proposing dimming method which will not be accepted in the illumination industry.

# Considerations on Dimming (continued)

On the other hand, it will be convenient to share a circuit for modulation and dimming function for cost reduction.

Dimming function should be carefully added to communication function without sacrificing illumination function.

If we include dimming in our scope of visible light communication, understanding of dimming is necessary before deciding its details.

For example,

- We need to know what the maximum and minimum ratio of dimming is required as a dimming control.
- We need to know various dimming schemes which are already adopted for LED illumination, and do the comparisons among them in terms of power efficiency, reliability, and cost.