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

Submission Title: [VLC 5C Draft]
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Abstract: [5 criteria of proposed project are described.]

Purpose: [Contribution to IEEE 802.15 SG-VLC]

VLC 5C Draft

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Outline

- Broad Market Potential
  - Broad sets of applicability
  - Multiple vendors and numerous users
  - Balanced costs
- Compatibility
- Distinct Identity
  - Substantially different from other IEEE 802 standards
  - One unique solution per problem (not two solutions to a problem)
  - Easy for the document reader to select the relevant specification
- Technical Feasibility
  - Demonstrated system feasibility
  - Proven technology, reasonable testing
  - Confidence in reliability
- Economic Feasibility
  - Known cost factors, reliable data
  - Reasonable cost for performance
  - Consideration of installation costs

1. Broad Market Potential

– Broad sets of applicability

There is increasing interest in Visible Light Communication (VLC)

Examples of applications include secure point-to-point communication, indoor Location Based Service (LBS), secure point-to-Multipoint communication (office, hospital, air plane), Intelligent Transportation System (ITS), information broadcast, and etc.

Examples of devices include cellular phone, PNP, PDA, Navigation, visible light AP, signboard, traffic signal, in-vehicle lamp, street lamp, visible light ID. With an effective wireless standard, geared to this class of applications, the VLC market potential is huge. The wireless capability will make these devices easier to use and make possible additional functionality and efficiency.

– Multiple vendors and numerous users

The breadth of membership of this Visible Light Communication (VLC) Study Group demonstrates the interest in utilization of Visible Light Communication technologies. Members include international wireless industry leaders, academic researcher, system integrators, consumer electronics companies and end users.

– Balanced costs

The Standard for the Visible Light Communication (VLC) will be developed with the aim that the connectivity costs will be reasonably small fraction of the cost of the target devices previously mentioned.

2. Compatibility

The MAC (Medium Access Control) Layer of Visible Light Communication (VLC) Standard will be compatible with the IEEE 802 requirements for architecture, management, and inter-networking as needed.

3. Distinct Identity

– Substantially different from other IEEE 802 standards

From a communication media point of view, this project will be distinguishable from the other IEEE 802 standards. The visible light is used for the communication media.

This communication can be used either in RF-crowded area or RF-restricted area, such as the hospital, inside the air plane, since the visible band has neither the frequency regulation nor the interference to RF. However, the naked eye effectiveness of the visible light needs to be considered. We are, yet, unaware of the current project in IEEE 802.15 Standards that will be able to support these services.

–One unique solution per problem (not two solutions to a problem)

The proposed standard will address a unique solution for visible light communication that provide short-range communications, using the visible band, targeting various applications such as secure point-to-point communication, indoor Location Based Service (LBS), secure point-to-Multipoint communication (office, hospital, air plane), Intelligent Transportation System (ITS), information broadcast, and etc.

– Easy for the document reader to select the relevant specification

The proposed VLC Standard will be distinct document with clearly distinguishable specifications.

4. Technical Feasibility

– Demonstrated system feasibility

There have been sufficient test results, demonstrations and simulations verifying that VLC implementations are feasible.

– Proven technology, reasonable testing

There are examples of technology that exist today, which allow design and fabrication of VLC optical systems.

– Confidence in reliability

The air interface protocol will be designed to meet commercial reliability standards. Previously demonstrated prototypes provide confidence in the reliability of the proposed project.

5. Economic Feasibility

– Known cost factors, reliable data

High volume applications using mobile VLC devices will provide a low cost source of components. Development efforts for VLC will ensure a cost that is consistent with reasonable business strategy.

– Reasonable cost for performance

Based on test results and prototypes, the estimates meet expected size, cost, and power requirements.

– Consideration of installation costs

One of the project objectives includes low cost installation with minimal to no operator intervention.