

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

Submission Title: [VLC Use Cases using Automobile LED for Smart Driving]

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Re: [vlc_sg]

Abstract: [This document presents VLC use cases using automobile LED for smart driving]

Purpose: [To introduce VLC use cases using automobile LED for smart driving]

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VLC Use Cases using Automobile LED for Smart Driving

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Contents

- Automotive lighting
- LED at Automobile
- VLC use cases using automobile LED for smart driving

Automotive lighting

- Forward illumination
 - Headlamps
 - Low beam, High beam
 - Assistant lamps
 - Driving lamps, Rally and off-road lamps, Fog lamps, Cornering lamps, Spot lighting
- Signaling devices
 - Stop lamps (Break lamps)
 - Centre High Mount Stop lamp
 - Turn signal
 - Reversing lamps

LED lamps at Automobile

- Centre High Mount Stop Lamps (CHMSL)
 - First application of LED at Automobile
- Stop lamps (Break lamps)
 - Fast lighting then incandescent bulbs
- Turn signal
- Head lamps recently

*www.hyundai-motor.com



How can we use LED lamps for VLC at automobile ?

- Vehicle-to-vehicle communication
 - Information exchange
 - Auto driving by following the car ahead
- LED traffic light to vehicle communication
 - Idle stop
 - Car black box
- LED signboard to vehicle communication
 - Vehicle condition indication
 - Service information
 - Advertisement

Vehicle-to-vehicle VLC with an unknown driver

- Information exchange using the voice communication
 - Exterior device condition which driver is unaware
 - Ask a way
- Speed information
 - Reduction of speed by sudden stop of car ahead
 - Traffic information map

VLC mesh network

- Traffic information exchange
 - Mesh network by automobile



Vehicle-to-vehicle VLC with a companion

- Navigation information
 - Direction information
 - Best route
- Sharing entertainment
 - Movie, music and so on
- Auto driving by following the car ahead
 - Speed, turn information

LED traffic light to vehicle communication using VLC

- Idle stop
 - Receive the red light interval from LED traffic light and save gas
- Car black box
 - Save the traffic signal information.
 - Check the stored data after car accident.

Signboard communication at the Gas station

- Service information
 - Oiling amount, price
 - Fuel efficiency
 - Possible mileage according to oiling amount and fuel efficiency
- Vehicle Condition
 - Maintenance information

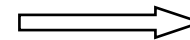
Signboard communication on the road

- Interworking with Navigation system

- Traffic information
- change a route



Road condition
information

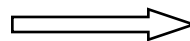


- Advertisement on public transportation

- display on the monitor in the bus or taxi.



Advertisement



Considerations

- Is there any kind of barrier?
- What application can be realized only by VLC?
- What can be the VLC Killer application?

Next Step

- System requirements for Automobile VLC
- MAC/PHY requirements for Automobile VLC