THE ROAD TO AUTONOMOUS DRIVING

SAFETY & CONVENIENCE WITH AUTOMOTIVE COMMUNICATION

Dedicated Short Range Communications (DSRC) or Cellular-Vehicle-to-Everything (C-V2X)

Seamless communication between the vehicle and the environment is crucial as vehicles achieve higher levels of automation. Whether you are working on C-V2X or DSRC/ITS-G5, our V2X solutions are accelerating the industry toward the goal of fully autonomous vehicles.

COMPARISON

Radio Design	DSRC 802.11p	C-V2X Release 14/15
Synchronization	• Asynchronous	• Synchronous
Channel size	• 10/20 MHz	• Rel. 14: 10/20 MHz • Rel. 15: 10/20 MHz/Nx20 MHz)
Resource multiplexing across vehicles	• Time division multiplexing (TDM) only	• TDM & frequency-division multiple (FDM) access
Data channel coding	• Convolutional	• Turbo
Hybrid automatic repeat request (HARQ) Retransmission	• No	• Rel. 14/15: Yes • Rel. 15: Ultra-reliable communication possible
Waveform	• Orthogonal frequency-division multiplexing (OFDM)	• Single-carrier FDM (SC-FDM)
Resource selection	• Carrier-sense multiple access with collision avoidance (CSMA-CA)	• Semi-persistent transmission with frequency domain
MIMO support	• No support standardized	• Rx diversity for 2 antennas mandatory • Tx diversity for 2 antennas supported
Deployment	• Since 2017. OEM rollout in 2019	• 2020/2021
Roadmap	• 802.11NGV: Targets interoperability with 802.11p	• C-V2X Rel. 16 based on 5G New Radio • Rel. 16 will operate in different channel from • Rel. 14/15

Sources: Autotalk / 5GAA / Qualcomm

Enabling the Road to Autonomous Driving

Leveraging decades of leadership in wireless communications technologies, Keysight brings cutting-edge test and measurement solutions to help you test various applications for connected cars and autonomous driving.

KEYSIGHT DSRC SOLUTIONS

Achieve OmniAir certification for your dedicated short-range communications (DSRC) applications.

KEYSIGHT C-V2X SOLUTIONS

Ensure interoperability and reliability for your C-V2X systems and applications.

KEYSIGHT AUTOMOTIVE ETHERNET COMPLIANCE SOLUTIONS

Perform in-vehicle backplane conformance tests to meet specifications for layers 1-7.

NO AUTOMATION

Zero autonomy. Driver performs all driving tasks.

DRIVER ASSISTANCE

Vehicle controlled by driver. May include some driving assist features.

PARTIAL AUTOMATION

Vehicle has combined automated functions, like acceleration and steering. Driver remains engaged with driving and environment monitoring at all times

CONDITIONAL AUTOMATION

Driver is a necessity, but not required to monitor environment. Driver is ready to take control of the wheel with notice.

HIGH AUTOMATION

Vehicle performs all driving functions under certain conditions. Driver may opt to control the vehicle.

FULL AUTOMATION

Vehicle performs all driving functions under all conditions. Driver may opt to control the vehicle.

Source: Definitions of Levels 0-5: Society of Automotive Engineers

KEYSIGHT TECHNOLOGIES

Get into the fast lane today with the latest technical resources on autonomous driving:
www.keysight.com/find/auto-tips