



ResearchInChina
www.researchinchina.com

C-V2X and CVIS Industry Research Report, 2024

May 2024

The pilot application of "vehicle-road-cloud integration" commenced, and C-V2X entered a large-scale verification cycle

The pilot application of "vehicle-road-cloud integration" commenced, and C-V2X entered a large-scale verification cycle.

C-V2X has basically beaten DSRC in the global standard competition:

- United States: In 2023, it was made clear that C-V2X should be deployed throughout the country. By 2034, C-V2X will cover 100% of national highways and 75% of urban intersections, and a C-V2X boarding plan was formulated to mainly handle traffic accidents.
- Europe: Although the status of C-V2X is not clear, the European Union has indicated that each country can choose C-V2X according to its own judgment on technology, so that C-V2X and ITS-G5 coexist as two technical standard systems in Europe.

* South Korea: In December 2023, it officially announced to abandon DSRC technology and adopt LTE-V2X as the only Internet of Vehicles communication technology.

In 2024, China officially launched the pilot application of "vehicle-road-cloud integration" of intelligent connected vehicles, with the pilot period from 2024 to 2026:

- It will gradually improve the connectivity rate of vehicles, and 100% of pilot vehicles will be equipped with C-V2X and digital identity certificate carriers;
- In public areas such as city buses, official vehicles, and taxis, existing vehicles are encouraged to install C-V2X; 50% of new vehicles should be fitted with C-V2X.

* Pilot cities are advocated to install C-V2X in new production vehicles with L2 and higher-level autonomous driving functions.

According to ResearchInChina's statistics, more than 270,000 Chinese passenger cars (accounting for 1.2%) were equipped with C-V2X by OEMs in 2023. It is expected that large-scale installation will occur from 2026 to 2027, with optimistic predictions that the OEM installation rate can exceed 9%.

OEM C-V2X Installation Rate of Passenger Cars and Market Size in China, 2023-2027E

OEM C-V2X Installation Rate of Passenger Cars and Market Size in China, 2023-2027E



Source: ResearchInChina

The basic logic behind the increasing OEM penetration rate of C-V2X:

- The 2024 version of C-NCAP officially includes V2X in the evaluation scope. C-V2X can ensure that OEMs score more points in the field of active safety for new cars. This rule will be implemented from July 2024;
- The pilot application policy of "vehicle-road-cloud integration" of intelligent connected vehicles has been enforced, and C-V2X has entered the development stage of large-scale urban operation and scenario verification;
- BYD, Volkswagen, Audi and the like have begun to deploy C-V2X technology in new models, and GAC, FAW Hongqi, Ford and other OEMs that dabbled in the field of C-V2X earlier are actively promoting the evolution of C-V2X technology to the second stage;
- C-V2X empowers intelligent transportation and more and more application scenarios that reach consumers who are more willing to pay for C-V2X as they feel better, which will then push OEMs to install C-V2X. For example, during the implementation of urban NOA, the prediction of traffic light status, real-time road conditions, driving risks and other information in the city has become very important. Based on the C-V2X system, accurate roadside data is provided to the vehicle, which is conducive to the development of urban NOA;
- The integration of C-V2X is getting higher and higher, and the installation cost of OEMs continues to decline. C-V2X will be more integrated into the 5G intelligent cockpit or the 5G communication module to help improve its OEM installation rate;

* With the higher and higher "C-V2X roadside equipment coverage rate" and "automotive terminal penetration rate", the development node from quantitative change to qualitative change will appear.

C-V2X chips/modules are developing towards high performance and high integration.

Only a few suppliers who can provide C-V2X chips in the world, such as Qualcomm, Autotalks, Morningcore Technology, Huawei and ZTE. Among them, Qualcomm has a leading position in the field of C-V2X chips.

Qualcomm said in 2023 that it would acquire Autotalks. Through the acquisition, the production-ready, dual mode, Autotalks standalone safety solutions will be incorporated into Qualcomm Technologies' expanding Snapdragon? Digital Chassis product portfolio in a bid to help accelerate the development and adoption of V2X solutions to improve traffic efficiency and help with driver and road user safety. In March 2024, the anticipated acquisition by Qualcomm of Autotalks was abandoned due to regulatory inspections, including investigations by the European Commission, UK, and Israeli antitrust regulators.

From the technical layout of major suppliers, C-V2X chip technology is becoming more and more integrated in its evolution to the second stage.

Qualcomm: There are three sets of C-V2X chip platforms: 9150 chipset, 9250 chipset and 2150 chipset. In addition, Qualcomm's 5G SA415/SA515M platform can choose to plug in V2X functions.

Qualcomm's latest 5G platform features a highly integrated V2X solution, which includes an application processor, ITS stack, Aerolink Security, message signing, up to 2500 message verification per second, PC5/Uu modem connectivity, Wi-Fi 6 and BT 5.1 connectivity, MF-GNSS, and controller area network (CAN) support. In addition, Qualcomm's fourth-generation cockpit platform is pre-integrated with Qualcomm's Snapdragon Automotive 5G platform supporting C-V2X technology.

Mass production and application: Based on the Snapdragon? Auto 5G Modem-RF Gen 2, HARMAN Ready Connect 5G TCU launched in February 2024 represents a significant advancement in upgradeability and scalability.

The C-V2X chipset has evolved to the third-generation TEKTON3 and SECTON3

Autotalks: The C-V2X chipset has evolved to the third-generation TEKTON3 and SECTON3, which are suitable for the first and second phases of C-V2X. Autotalks is working with Hyundai Mobis to develop MTCU (Multi-functional Telematics Control Unit) connectivity modules (based on Autotalks' third-generation chipset) which will debut in 2024. Models equipped with Autotalks' third-generation chipset will be launched in 2025.

At present, C-V2X is developing in the direction of high integration. In the future, C-V2X will exist in an integrated form on vehicles, while independent modules may be mainly used in roadside communication components.



Source: Autotalks

Samsung Harman Ready Connect 5G TCU



Source: Harman

At present, C-V2X is developing in the direction of high integration. In the future, C-V2X will exist in an integrated form on vehicles, while independent modules may be mainly used in roadside communication components.

ZTE: The ZM9300, a full-stack self-developed 5G/V2X automotive module series launched in the second half of 2023, uses 3GPP Rel-16 technology and is developed based on ZTE's full-stack self-developed automotive 5G Modem chip platform. At present, the module has landed in the automotive communication terminal platform project of GAC R&D Center which will unveil the first production model in 2024.

ZTE launched Y2002, the industry's first CVIS integrated equipment, which boasts a powerful AI chip based on the previous Y2001 and integrates RSU with roadside edge calculation.

The computing power of Y2002 hits 100TOPS. It can access 16 cameras, 8 radars, and 2 LiDARs.



Source: ZTE

China Mobile put forward the concept of "four integrations":

At the beginning of 2024, **China Mobile** put forward the concept of "four integrations": 5G+V2X communication integration, car-road computing power integration, car+city+cloud integration and people+car+home integration. China Mobile believes that the road-network-vehicle basic communication construction must be integrated and unified to jointly improve the coverage, and the roadside equipment coverage is of great significance for the large-scale promotion of C-V2X.

C-V2X and CVIS Industry Research Report, 2024 by ResearchInChina highlights the following:

- The promotion policy, standard trends, market size, market structure and so on of China C-V2X industry;
- * Mass production and application of C-V2X by OEMs and governments;
- C-V2X installation modes, technical layout of OEMs, installation cases, etc.
- Key technologies of C-V2X, including chips, module, roadside, cloud, network communication, HD maps, information security and so on;
- The latest technical layout and solution layout of main C-V2X terminal and system solution suppliers;
- * Technology evolution and main products of major C-V2X chip and module vendors.



Source: ISMARTWAYS, Ford

Table of Content (1)

1 C-V2X Standardization and Industry Prospects

Summary: With the further support of the government, C-V2X will grow

Summary: Main Development Stages of C-V2X

1.1 Development Stages of C-V2X

1.1.1 Internet of Vehicles Includes V2X

1.1.2 Internet of Vehicles Is in the Application Stage of Assisted Driving

1.1.3 CVIS Solutions Based on Internet of Vehicles

1.1.4 Key Factors in the Development of CVIS (1)

1.1.5 Key Factors in the Development of CVIS (2)

1.1.6 Evolution and Popularization of CVIS Application Functions

1.1.7 Evolution and Popularization of CVIS Application Functions: Collaborative Control

1.1.8 Status Quo of CVIS: Initial Formation of Various Commercial Models

1.2 Policies for the Development of C-V2X

1.2.1 Five Ministries and Commissions Promote the Pilot Application of "Vehicle-road-cloud Integration" of Intelligent Connected Vehicles (1)

1.2.2 Five Ministries and Commissions Promote the Pilot Application of "Vehicle-road-cloud Integration" of Intelligent Connected Vehicles (2)

1.2.3 Release of Notice on the Pilot Program for Admittance and Road Access of Intelligent Connected Vehicles

1.2.4 Release of Collaborative Development Framework of CVIS Autonomous Driving System (Vehicle-road-cloud Integrated System) (1)

1.2.5 Release of Collaborative Development Framework of CVIS Autonomous Driving System (Vehicle-road-cloud Integrated System) (2)

1.2.6 Development Goals of Intelligence and Connectivity Integration Based on C-V2X

1.2.7 Development Roadmap of Intelligence and Connectivity Integration Based on C-V2X

1.2.8 Evolution of Key Technologies amid Development of Intelligence and Connectivity Integration: Vehicle Technology Roadmap

1.2.9 Evolution of Key Technologies amid Development of Intelligence and Connectivity Integration: Roadside Technology Roadmap

1.2.10 Evolution of Key Technologies amid Development of Intelligence and Connectivity Integration: Cloud Technology Roadmap

1.2.11 Evolution of Key Technologies amid Development of Intelligence and Connectivity Integration: Communication Technology Roadmap

1.2.12 Evolution of Key Technologies amid Development of Intelligence and Connectivity Integration: Information Security Technology Roadmap

1.3 C-V2X Communication Standardization Process

1.3.1 C-V2X Wins in Global Industrial Competition

1.3.2 C-V2X Wins in Global Industrial Competition: the United States Deploys C-V2X on a Large Scale

1.3.3 C-V2X Wins in Global Industrial Competition: South Korea abandons DSRC

1.3.4 C-V2X Wins in Global Industrial Competition: China C-NCAP Introduces V2X Tests (1)

1.3.5 C-V2X Wins in Global Industrial Competition: China C-NCAP Introduces V2X Tests (2)

1.3.6 Standards in 2023-2024: Technical Requirements for Information Interaction of AM Automotive Equipment Based on LTE-V2X Direct Communication

1.3.7 Standards in 2023-2024: 2023- 2023 Guidelines for the Construction of the National Internet of Vehicles Industry Standard System (Connected Vehicles) (2023)

1.3.8 Standards in 2023-2024: Vehicle-road-cloud Integrated System: Vehicle-cloud Data Interaction Specification

1.3.9 The Ministry of Industry and Information Technology Has Formulated Six V2X Standards.

1.3.10 The Ecology of CVIS Industry Is Complex, and Standard Construction Becomes

the Top Priority

1.4 Smart Road Standardization Process

- 1.4.1 CVIS Capabilities Required by Different Grades of Roads
- 1.4.2 Infrastructure Required by Different Grades of Expressways
- 1.4.3 The Latest Dynamics in 2023-2024

1.5 C-V2X Market Size and Pattern

- 1.5.1 CVIS Size
- 1.5.2 Construction Scale of CVIS Infrastructure
- 1.5.3 China C-V2X Passenger Car Installation and Market Size
- 1.5.4 Market Size of C-V2X Modules for RSU in China
- 1.5.5 China C-V2X Market Size
- 1.5.6 C-V2X Industrial Ecology Is Gradually Improved
- 1.5.7 Internet Giants Shrink V2X Business, and Vertical Suppliers Face Opportunities
- 1.5.8 Internet Giants Have Competitive Advantages in the Field of Intelligent Transportation

2 Mass Production and Application of C-V2X

Summary: C-V2X on Vehicles Is Developing towards High Integration

Summary: More Roadside Intelligent Traffic Scenarios Are Built Based on C-V2X

2.1 Application of C-V2X: To B (OEM)

- 2.1.1 C-V2X To B market size: China's Passenger Car OEM OBU (T-BOX) Market Size
- 2.1.2 Top 15 Suppliers of C-V2X Automotive Terminals (1)
- 2.1.3 Top 15 Suppliers of C-V2X Automotive Terminals (2)
- 2.1.4 Top 15 Suppliers of C-V2X Automotive Terminals (3)
- 2.1.5 Top 5 AM OBU Suppliers of C-V2X Automotive Terminals

- 2.1.6 Evolution of Installation Forms of C-V2X To B Automotive Terminals
- 2.1.7 Evolution of OBU Technology of C-V2X To B Automotive Terminals
- 2.1.8 C-V2X To B Automotive Terminals: V2X BOX Architecture
- 2.1.9 Application of C-V2X To B Automotive Terminals: General T-Box Integrated with C-V2X Module

2.2 C-V2X Application: To G (Roadside)

- 2.2.1 C-V2X To G Market Size: Expressway RSU Demand and Market Size
- 2.2.2 C-V2X To G Market Size: Urban Road RSU Demand and Market Size
- 2.2.3 Top 10 Roadside C-V2X Equipment (RSU) Suppliers (1)
- 2.2.4 Top 10 Roadside C-V2X Equipment (RSU) Suppliers (2)
- 2.2.5 Evolution of C-V2X To G (Government) Application
- 2.2.6 Layout of C-V2X To G (Government) Suppliers: China Mobile's "Four Integrations"
- 2.2.7 Application Cases of C-V2X To G (Government)

2.3 Specific C-V2X Application Scenarios: Fusion Application

- 2.3.1 Comparison among Different C-V2X Fusion Applications
- 2.3.2 C-V2X Fusion Application Framework: Prompt Applications Are Not Connected to Intelligent Driving Systems
- 2.3.3 C-V2X Fusion Application Framework: Early Warning Applications Are Connected to the Decision-making Layer of Intelligent Driving Systems
- 2.3.4 C-V2X Fusion Application Framework: Control Fusion Function Should Be Integrated with Intelligent Driving Systems in the Aspects of Perception, Decision-making and Control
- 2.3.5 C-V2X Prompt Fusion Application: GLOSA Requirements Based on C-V2X
- 2.3.6 C-V2X Prompt Fusion Application: GLOSA Structure Based on C-V2X (1)
- 2.3.7 C-V2X Prompt Fusion Application: GLOSA Structure Based on C-V2X (2)
- 2.3.8 C-V2X Prompt Fusion Application Cases (1)

Table of Content (3)

- 2.3.9 C-V2X Prompt Fusion Application Cases (2)
- 2.3.10 C-V2X Early Warning Fusion Application: Obstacle Avoidance Requirements Based on C-V2X
- 2.3.11 C-V2X Early Warning Fusion Application: Obstacle Avoidance
- 2.3.12 C-V2X Early Warning Fusion Application: Collision Early Warning System Architecture

- 2.4 C-V2X Application Scenarios: Collaborative Urban Management
 - 2.4.1 CVIS Will Evolve towards Intelligent Connected Transportation System
 - 2.4.2 Novel Internet of Vehicles Infrastructure Promotes the Integrated Development of Vehicles, Roads and Cities
 - 2.4.3 Next-generation Vehicle-Road-City Collaborative Architecture
 - 2.4.4 Development Path of Vehicle-Road-City Collaboration
 - 2.4.5 C-V2X Empowers Urban Development: Transform Traditional Transportation System into Flexible Transportation System
 - 2.4.6 Flexible Transportation System Based on C-V2X: Main Features
 - 2.4.7 Flexible Transportation System Based on C-V2X: Construction Path
 - 2.4.8 Technical Architecture of Flexible Transportation System Based on C-V2X: Cyber-Physical System (CPS) Architecture
 - 2.4.9 Practice of Technical Architecture of Flexible Transportation System Based on C-V2X: Flexible Parking System

- 2.5 C-V2X Application Scenarios: Autonomous Driving
 - 2.5.1 C-V2X Is Enhanced Technology for Intelligent Driving
 - 2.5.2 C-V2X Is Applied in the Field of Intelligent Driving by Stage And Scenario
 - 2.5.3 C-V2X Promotes the Development of L2+ and Empowers Autonomous Driving
 - 2.5.4 C-V2X Empowers Smart Mobility
 - 2.5.5 L2+ Autonomous Driving Application Scenarios Based on C-V2X: Connected AEB Based on 12V

- 2.5.6 L2+ Autonomous Driving Application Scenarios Based on C-V2X: High Speed Crash
- 2.5.7 Autonomous Driving Application Cases Based on C-V2X (1)
- 2.5.8 Autonomous Driving Application Cases Based on C-V2X (2)
- 2.5.9 Autonomous Driving Application Cases Based on C-V2X (3)
- 2.5.10 Autonomous Driving Application Cases Based on C-V2X (4)

3 Installation of C-V2X

Summary: Mass Production of OEMs

Summary: More Models Equipped with C-V2X as Standard

3.1 Installation Forms of C-V2X

3.1.1 Mass Production and Installation Forms of C-V2X

3.1.2 Deployment Modes of C-V2X on Vehicles (1)

3.1.3 Deployment Modes of C-V2X on Vehicles (2)

3.1.4 Deployment Modes of C-V2X on Vehicles (3)

3.1.5 Automotive Information Display Mode of C-V2X: AR HUD

3.2 C-V2X Technology Layout of OEMs

3.2.1 Five Requirements of OEMs for C-V2X Installation

3.2.2 Summary of C-V2X Deployment Plans of Domestic OEMs (1)

3.2.3 Summary of C-V2X Deployment Plans of Domestic OEMs (2)

3.2.4 Summary of C-V2X Deployment Plans of Domestic OEMs (3)

3.2.5 Summary of V2X Deployment Plans of Overseas OEMs

3.2.6 Summary of Domestic Production Models with C-V2X (1)

3.2.7 Summary of Domestic Production Models with C-V2X (2)

3.2.8 Summary of Domestic Production Models with C-V2X (3)

3.2.9 Summary of Domestic Production Models with C-V2X (4)

3.2.10 V2X Layout Trends of OEMs

Table of Content (4)

- 3.3 C-V2X Installation Cases of OEMs
 - 3.3.1 C-V2X Installation Cases of OEMs (1): Function Testing of Hongqi's Second-generation C-V2X
 - 3.3.2 C-V2X Installation Cases of OEMs (1): Hongqi's Second-generation C-V2X Explores Direct Connection Mode
 - 3.3.3 C-V2X Installation Cases of OEMs (1): Hongqi's Brand-new New Energy Vehicle Is Equipped with C-V2X Technology
 - 3.3.4 C-V2X Installation Cases of OEMs (2)
 - 3.3.5 C-V2X Installation Cases of OEMs (3)
 - 3.3.6 C-V2X Installation Cases of OEMs (3)
 - 3.3.7 C-V2X Installation Cases of OEMs (4)
 - 3.3.8 C-V2X Installation Cases of OEMs (5)
 - 3.3.9 C-V2X Installation Cases of OEMs (5)
 - 3.3.10 C-V2X Installation Cases of OEMs (5)
 - 3.3.11 C-V2X Installation Cases of OEMs (5)
 - 3.3.12 C-V2X Installation Cases of OEMs (5)
 - 3.3.13 C-V2X Installation Cases of OEMs (6)
 - 3.3.14 C-V2X Installation Cases of OEMs (7)
 - 3.3.15 C-V2X Installation Cases of OEMs (8)
 - 3.3.16 C-V2X Installation Cases of OEMs (8)
 - 3.3.17 C-V2X Installation Cases of OEMs (9)
 - 3.3.18 C-V2X Installation Cases of OEMs (9)
 - 3.3.19 C-V2X Installation Cases of OEMs (10)

4 Key Technologies of C-V2X Mass Production

Summary: Key Automotive Technologies Are Evolving towards High-level Applications

Summary: Roadside Technology Evolution

4.1 Key Technologies of C-V2X: Chip

- 4.1.1 Passenger Car C-V2X Chip Market Size in China
- 4.1.2 Top Five C-V2X Chipset Suppliers (1)
- 4.1.3 Top Five C-V2X Chipset Suppliers (2)
- 4.1.4 Four Major Suppliers of C-V2X Modem Chips and AP Processor Chips
- 4.1.5 C-V2X Chip Technology Evolution
- 4.1.6 C-V2X Chip Technology Evolution: Communication Standard Update
- 4.1.7 C-V2X Chip Technology Evolution: The Second-stage Application Scenarios Supported

4.2 Key Technologies of C-V2X: Module

- 4.2.1 C-V2X Module Market Size
- 4.2.2 Top 12 C-V2X Module Suppliers (1)
- 4.2.3 Top 12 C-V2X Module Suppliers (2)
- 4.2.4 Top 12 C-V2X Module Suppliers (3)
- 4.2.5 C-V2X Module Technology Evolution
- 4.2.6 C-V2X Module Technology Trends (1): Integration
- 4.2.7 C-V2X Module Technology Trends (2): Softwareization

4.3 Key Technologies of C-V2X: Roadside

- 4.3.1 AI Technology Is Introduced to Roadside of CVIS: OpenV2X (1)
- 4.3.2 AI Technology Is Introduced to Roadside of CVIS: OpenV2X (2)
- 4.3.3 Evolution of RSU Technology
- 4.3.4 RSU Technology Trends (1)
- 4.3.5 RSU Technology Trends (2)

4.4 Key Technologies of C-V2X: Cloud

- 4.4.1 CVIS Cloud Control Platform: Architecture
- 4.4.2 Main Suppliers of CVIS Cloud Control
- 4.4.3 Application of C-V2X Cloud Control Platform Cases

Table of Content (5)

4.5 Key Technologies of C-V2X: Network Communication

- 4.5.1 C-V2X Protocol Hierarchy and Division of Labor Logic between OEMs and Tier 1 Suppliers
- 4.5.2 C-V2X Protocol Stack Suppliers (1)
- 4.5.3 C-V2X Protocol Stack Suppliers (2)

4.6 Key Technologies of C-V2X: HD Maps

- 4.6.1 Autonomous Vehicle Certification and HD Map Distribution Services Are Important Carriers of V2X
- 4.6.2 Local Dynamic Maps (LDMs) under CVIS Autonomous Driving
- 4.6.3 Role of HD Maps in CVIS (1)
- 4.6.4 Role of HD Maps in CVIS (2)
- 4.6.5 Role of HD Maps in CVIS (3)

4.7 Key Technologies of C-V2X: Information Security

- 4.7.1 C-V2X Security Certification Process
- 4.7.2 C-V2X Security Certification Platform Structure
- 4.7.3 C-V2X CA Industrial Structure
- 4.7.4 Internet of Vehicles Trusted Root Platform Access Modes (1)
- 4.7.5 Internet of Vehicles Trusted Root Platform Access Modes (2)
- 4.7.6 Internet of Vehicles Trusted Root Platform Access Modes (3)
- 4.7.7 C-V2X Information Security Cases: Xinda Jiean Serves Audi V2X
- 4.7.8 C-V2X Information Security Cases: Beijing Demonstration Zone Project (1)
- 4.7.9 C-V2X Information Security Cases: Beijing Demonstration Zone Project (2)

5 C-V2X Terminal and System Solution Providers

- 5.1 Baidu
 - 5.1.1 CVIS Was Spun off from Intelligent Driving Business Group
 - 5.1.2 CVIS Business Layout

- 5.1.3 C-V2X Ecological Cooperation: Launch of CVIS Computing Unit with Inspur
- 5.1.4 C-V2X Ecological Cooperation: Intelligent Transportation Layout with China Mobile
- 5.1.5 Application Scenarios Based on C-V2X: Intelligent Information Control
- 5.1.6 Application Scenarios Based on C-V2X: Intelligent Parking
- 5.1.7 Application Scenarios Based on C-V2X: Low-speed Autonomous Delivery

5.2 Tencent

- 5.2.1 V2X Business
- 5.2.2 Vehicle-Road-Cloud-Network Full Link Services
- 5.2.3 Development Concept from CVIS to Vehicle-City Collaboration
- 5.2.4 Release of "Digital Smart Intersections with CVIS Empowerment" with GOSUNCN

5.3 Alibaba

- 5.3.1 CVIS Solutions
- 5.3.2 Alibaba Cloud's Ubiquitous CVIS Mode
- 5.3.3 Alibaba Cloud and AutoNavi Jointly Release "CVIS Navigation and Industrial Services"

5.4 ISMARTWAYS

- 5.4.1 C-V2X Industry Layout
- 5.4.2 C-V2X Product Line Evolution
- 5.4.3 C-V2X Hardware: Various Product Forms
- 5.4.4 C-V2X Software: HUALI C-V2X
- 5.4.5 C-V2X Software: Cloud Control Platform
- 5.4.6 C-V2X Application: Traffic Light Assisted Driving Data Service
- 5.4.7 C-V2X Industrial Ecology

Table of Content (6)

- 5.5 CiDi (Changsha Intelligent Driving Institute) Ltd.
 - 5.5.1 C-V2X Product Line
 - 5.5.2 C-V2X Products: Evolution toward 5G
 - 5.5.3 C-V2X Application: Park Logistics Solutions
 - 5.5.4 C-V2X Application: Smart Intersection Solutions
 - 5.5.5 C-V2X Application: Intersection Collaborative Perception System Based on Multi-camera Fusion
- 5.6 Hikailink
 - 5.6.1 V2X Business
 - 5.6.2 CVIS Solution Architecture
 - 5.6.3 C-V2X Hardware: OBU
 - 5.6.4 C-V2X Hardware: RSU
 - 5.6.5 Application of C-V2X
- 5.7 TransInfo Technology
 - 5.7.1 OBU
 - 5.7.2 RUS
- 5.8 CICTCI
 - 5.8.1 Overall Architecture of CVIS Solutions
 - 5.8.2 C-V2X Products and Services
 - 5.8.3 C-V2X Product Line Evolution
 - 5.8.4 C-V2X Module: DMM21
 - 5.8.5 C-V2X Module: parameters of DRA10 Frequency Compensation Module
 - 5.8.6 C-V2X Module: Parameters of DMD3A
 - 5.8.7 C-V2X Software: Development Kit
 - 5.8.8 C-V2X Software: Technology Protocol Stack
 - 5.8.9 C-V2X Automotive Terminal: C-V2X & ADAS Integrated Domain Controller

- 5.8.10 C-V2X Automotive Terminal: Parameters of C-V2X & ADAS Integrated Domain Controller
- 5.8.11 RSU: Parameters of DTVL3110P
- 5.8.12 RSU: Parameters of DTVL5000
- 5.9 NEBULA LINK
 - 5.9.1 “Vehicle-road-cloud” Industry Layout
 - 5.9.2 C-V2X Product Line Evolution
 - 5.9.3 C-V2X Automotive Products: V-Box II
 - 5.9.4 C-V2X Automotive Products: DTU
 - 5.9.5 C-V2X Automotive Products: V2X Antenna
 - 5.9.6 C-V2X Automotive Products: VT- BOX
 - 5.9.7 C-V2X Automotive Products: RSU+
 - 5.9.8 C-V2X Software: V2X Protocol Stack
 - 5.9.9 C-V2X Software: V2X Protocol Stack Configuration Solution
 - 5.9.10 Application Projects of V2X Technology
- 5.10 Genvict
 - 5.10.1 Autonomous Driving Business
 - 5.10.2 C-V2X Product Line Evolution
 - 5.10.3 C-V2X Automotive Equipment
 - 5.10.4 OBU Functions of Next-generation Intelligent Voice
 - 5.10.5 C-V2X Software: Architecture of Vlink
 - 5.10.6 V2X Roadside Equipment
 - 5.10.7 C-V2X Cooperation: Entry into Huawei’s Ecology
- 5.11 VanJee Technology
 - 5.11.1 Intelligent Transportation Layout
 - 5.11.2 C-V2X Product Line Layout

Table of Content (7)

- 5.11.3 V2X Automotive Units: ETC CVIS OBU
- 5.11.4 V2X Automotive Units: Parameters of W-981B
- 5.11.5 V2X Automotive Units: Parameters of WV2X-L923
- 5.11.6 RSU: New Patents

- 5.12 MOGO
- 5.12.1 Vehicle-road-cloud Business Layout
- 5.12.2 Vehicle-road-cloud Integrated Technical Solutions

- 5.13 Gosuncn
- 5.13.1 C-V2X Product Line Evolution
- 5.13.2 C-V2X Modules
- 5.13.3 RSU
- 5.13.4 OBU
- 5.13.5 V2X Software
- 5.13.6 Major Customers

- 5.14 Joyson Electronics
- 5.14.1 Application of V2X Products

- 5.15 Neusoft Group
- 5.15.1 Vehicle-road-cloud Layout (1)
- 5.15.2 Vehicle-road-cloud Layout (2)
- 5.15.3 C-V2X Software: VeTalk Automotive-grade Software Protocol Stack
- 5.15.4 C-V2X software: VeTest
- 5.15.5 C-V2X Software: Super Cloud Control Platform
- 5.15.6 C-V2X Automotive Application: T-Box

- 5.16 PATEO CONNECT+

- 5.16.1 C-V2X Development Route
- 5.16.2 C-V2X Solutions
- 5.16.3 V2X-BOX

- 5.17 DIAS
- 5.17.1 V2X Automotive Terminals
- 5.17.2 Application of V2X

- 5.18 SenseAuto
- 5.18.1 SenseAuto V2X Platform (1)
- 5.18.2 SenseAuto V2X Platform (2)
- 5.18.3 Road: V2X-E Edge Computing Platform
- 5.18.4 Cloud: V2X-M Intelligent Computing Platform
- 5.18.5 V2X Application: V2X-I Vehicle-City Network System
- 5.18.6 Vehicle: SenseAuto Autonomous Vehicle

- 5.19 Jingwei Hirain
- 5.19.1 C-V2X Automotive Products: OBU
- 5.19.2 C-V2X System Application: L4 Port Autonomous Driving

- 5.20 Samsung Harman
- 5.20.1 V2X Products
- 5.20.2 Latest TCU Integrates V2X Platform
- 5.20.3 Dual-mode V2X System
- 5.20.4 V2X Technology of Savari
- 5.20.5 V2X Application Demonstration

- 5.21 Hitachi
- 5.21.1 C-V2X Layout

Table of Content (8)

- 5.21.2 Technical Advantages of C-V2X
- 5.21.3 C-V2X Automotive Application: V-BOX 5002
- 5.21.4 C-V2X Automotive Application: V2X IVI and Mobile App
- 5.21.5 C-V2X Software: V2X Protocol Stack

6 C-V2X Chip and Module Vendors

- 6.1 Qualcomm
 - 6.1.1 Automotive Solution Strategy
 - 6.1.2 Automotive Connectivity Solutions and V2X Product Line
 - 6.1.3 V2X Chipset: Platform Evolution
 - 6.1.4 V2X Chipset: Business Strategy
 - 6.1.5 V2X Chipset: Internal Architecture of SA2150P
 - 6.1.6 V2X Chipset: Architecture of MDM9250 Platform
 - 6.1.7 V2X Chipset: Architecture of 9150
 - 6.1.8 Snapdragon 5G SOC Platform: The Second Generation
 - 6.1.9 Snapdragon 5G SOC Platform: The First Generation
 - 6.1.10 Snapdragon Cockpit SOC: The Fourth Generation Supports C-V2X
- 6.2 Autotalks
 - 6.2.1 C-V2X Product Line Evolution
 - 6.2.2 C-V2X Chipset: TEKTON3 and SECTON3 Debut
 - 6.2.3 C-V2X Chipset: Features of CRATON2
 - 6.2.4 Application Cases of V2000A Chipset: MediaTek
 - 6.2.5 Application Cases of V2000A Chipset: 5G Module Is Integrated with V2X
- 6.3 Morningcore Technology
 - 6.3.1 C-V2X Product Line Evolution
 - 6.3.2 V2X Chips: Features of CX1910
 - 6.3.3 V2X Chips: Architecture of CX1860

- 6.3.4 Application of V2X Chips
- 6.3.5 Application of V2X Chips 5G+C-V2X Dual-mode Reference Solutions of Mobiletek
- 6.3.6 V2X Modules
- 6.4 Huawei
 - 6.4.1 C-V2X Product Line Layout
 - 6.4.2 V2X Chips
 - 6.4.3 V2X Modules
 - 6.4.4 RSU: RSU6201
 - 6.4.5 C-V2X Solutions: Architecture
 - 6.4.6 C-V2X Solutions: 5G-A Vehicle-Road-Network-Cloud Demonstration Route
 - 6.4.7 C-V2X Solutions: Road Network Digital Services
 - 6.4.8 C-V2X Solutions: Architecture of Road Network Digital Services
 - 6.4.9 C-V2X Solutions: Service Model Exploration
- 6.5 NXP
 - 6.5.1 Chips Corresponding to C-V2X Architecture
 - 6.5.2 C-V2X Product Line Layout
 - 6.5.3 V2X Chips: Architecture of SAF5100
 - 6.5.4 V2X Chips: Architecture of SAF5400
 - 6.5.5 V2X Chips: Architecture of SXF1800
 - 6.5.6 C-V2X Solutions
- 6.6 u-blox
 - 6.6.1 V2X Chips
 - 6.6.2 V2X Modules
- 6.7 Quectel
 - 6.7.1 Automotive Product Line Layout

Table of Content (9)

- 6.7.2 V2X Product Line Layout
- 6.7.3 Automotive 5G+C-V2X Modules: Features of AG59X
- 6.7.4 Automotive 5G+C-V2X Modules: Features of AG550Q
- 6.7.5 Automotive 5G+C-V2X Modules: Parameters of AG56xN and AG57xQ
- 6.7.6 Automotive C-V2X Modules: Parameters of AG18
- 6.7.7 Automotive C-V2X Modules: Features of AG15
- 6.7.8 Automotive LTE- A+C-V2X Modules: Features of AG520R
- 6.7.9 C-V2X AP Module: Architecture of AG215S
- 6.7.10 5G + C-V2X End-to-End Solutions
- 6.7.11 C-V2X ITS Software Stack Partners
- 6.7.12 V2X Module Application Cases (Part)

6.8 ZTE

- 6.8.1 V2X Product Line
- 6.8.2 C-V2X Module: ZM9300
- 6.8.3 C-V2X Modules
- 6.8.4 Roadside Equipment: Y2002
- 6.8.5 Roadside Equipment: 5G Roadside Computing Platform of Unlimited AI (1)
- 6.8.6 Roadside Equipment: 5G Roadside Computing Platform of Unlimited AI (2)

6.9 Fibocom

- 6.9.1 Intelligent Connected Vehicle Business
- 6.9.2 V2X Modules

6.10 SIMCom

- 6.10.1 Automotive Modules
- 6.10.2 V2X Module Lineup

6.11 MeiG Smart Technology

- 6.11.1 Communication Module Lineup
- 6.11.2 5G+ C-V2X Modules: MA522/ MA522
- 6.11.3 5G+ C-V2X Modules: Performance of MA925 (1)
- 6.11.4 5G+ C-V2X Modules: Performance of MA925 (2)

6.12 Others

- 6.12.1 Neoway Technology's Automotive-grade V2X Modules
- 6.12.2 Longsung Technology's V2X Modules
- 6.12.3 nFore Technology's V2X Products
- 6.12.4 Denso's V2X Automotive Units



Beijing Headquarters

TEL: 13718845418

Email: report@researchinchina.com

Website: [ResearchInChina](http://ResearchInChina.com)

WeChat: Zuosiqiche



Chengdu Branch

TEL: 028-68738514

FAX: 028-86930659

