

GLOSSARY OF TECHNICAL TERMS

This glossary contains explanations of certain terms used in this document in connection with our Company and our business. The terminology contained in this glossary and their given meanings may not correspond to standard industry meaning or usage of these terms.

“4G/5G”	4th/5th Generation Mobile Communication Technology
“5G RedCap”	5G Reduced Capability, a 5G communication standard designed for medium-speed IoT application. It retains key features of 5G broadband while reducing complexity, power consumption and cost
“ADAS” or “advanced driver-assistance systems”	groups of electronic technologies that assist drivers in driving and parking functions; it also refers to levels 1 to 3 autonomous driving as defined by the Society of Automotive Engineers
“AECS” or “Accident Emergency Call System”	a system can provide the user with E-Call rescue services (GNSS positioning and voice call services) in the event of an emergency, and it can be activated manually and automatically
“AOI” or “Automated Optical Inspection”	a fully automated system that utilizes advanced image capturing and processing technologies to inspect products for defects during quality control, primarily in the manufacturing of printed circuit boards and other electronic components
“API” or “application programming interface”	a set of rules, protocols, and tools that allow different software applications to communicate and interact with each other
“autonomous driving”	a driving technology under which a vehicle can, in certain scenarios or conditions, perform driving tasks by itself using software, sensors and computing systems, with limited or no real-time human input depending on the level of automation
“AUTOSAR” or “Automotive Open System Architecture”	a standardized software framework that enables car manufacturers to develop scalable, flexible, and reliable software across various vehicle models
“BDS” or “Beidou”	China’s global navigation satellite system (GNSS), which provides accurate positioning, navigation, and timing services to users worldwide. It is comparable to other GNSS systems such as GPS (U.S.) and Galileo (EU)
“BLE” or “Bluetooth Low Energy”	a wireless communication standard designed for short-range communication with low power consumption. It is commonly used for applications such as automotive keyless entry, wearable devices, security systems, and health monitoring
“Bluetooth”	a short-range wireless technology standard for data exchange between fixed and mobiles devices over short distances
“BOM” or “Bill of Materials”	a list of raw materials, components, subassemblies, and parts required to manufacture or assemble a product
“CAN FD” or “CAN with Flexible Data Rate”	a data communication protocol that sends control information and sensor data between parts of an electronic system

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“CGW” or “Central Gateway”	a critical component in modern vehicle architectures, serving as the communication hub that manages data flow between different vehicle subsystems and external platforms like V2X or cloud services
“CMMI” or “Capability Maturity Model Integration”	a framework used to assess and improve how well a company develops and manages software and engineering projects. A higher CMMI level generally indicates more standardized, controlled and mature development processes
“communication middleware”	a software layer that facilitates communication between different systems or applications, ensuring seamless data exchange and interaction. In automotive systems, it acts as an intermediary between various vehicle components, such as sensors, electronic control units (ECUs), and external networks, allowing them to communicate efficiently and reliably
“component variations”	the individually numbered component categories our Company creates for each OEM project. In response to the development needs of different OEM customers and different vehicle models, our Company assign a unique, internally-controlled product code to that specific component category development
“DIP” or “dual in-line package”	a type of electronic component package commonly used for integrated circuits (ICs). It features a rectangular housing with two parallel rows of pins (or leads) on either side, which are used to connect the component to a circuit board. The pins are typically inserted into holes in the PCB (Printed Circuit Board) and soldered to establish electrical connections
“domain controller”	a computer that controls a set of vehicle functions related to a specific area, or domain. Functional domains that require a domain controller are typically compute intensive and connect to a large number of input and output devices
“DSDA” or “Dual-Sim Dual-Active”	a technology enables a single mobile device to simultaneously utilize both SIM cards for voice and data services
“ECU(s)” or “electronic control unit(s)”	a vital component in modern vehicles, responsible for controlling and managing specific electronic functions within the vehicle. They are embedded in various systems, such as engine control, transmission, airbag, braking, infotainment, and lighting, to monitor and regulate their operations. They receive inputs from sensors, process the data, and execute commands to ensure the systems function optimally
“EEA” or “Electrical Electronic Architecture”	refers to the integrated system of electrical and electronic components that enable a vehicle’s functions, including power distribution, communication, and control. It defines the layout and structure of the vehicle’s electrical systems, specifying how components like sensors, actuators, controllers, and communication networks interact with each other
“EV(s)” or “electric vehicle(s)”	cars with engines powered by electricity rather than the combustion engines found in gasoline-powered cars

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“FCT” or “functional circuit test”	a testing process for printed circuit board assembly (PCBA) that checks the functionality of the circuits to ensure they are free of defects before progressing to the next production stage
“Galileo”	Europe’s own global navigation satellite system, providing a highly accurate, guaranteed global positioning service under civilian control
“GLONASS” or “Global’naya Navigatsionnaya Sputnikovaya Sistema”	global navigation satellite system, a satellite navigation is a system that uses satellites to provide autonomous geopositioning
“GNSS” or “Global Navigation Satellite System”	a satellite-based positioning system that helps determine a vehicle’s location, direction and timing
“GPS” or “global positioning system”	a satellite-based navigation system used to determine precise location and provide real-time directions
“ICE” or “internal combustion engine”	a type of engine that generates power through the combustion of fuel (such as gasoline, diesel, or natural gas) within a confined space, creating a high-pressure environment that drives mechanical components. In vehicles, ICEs are typically used to power the drivetrain, converting chemical energy from fuel into mechanical energy to move the vehicle. The engine operates by igniting a fuel-air mixture inside cylinders, causing a series of explosions (combustions) that push pistons, which in turn rotate the crankshaft and power the vehicle
“ICT” or “in-circuit testing”	a testing mechanism designed to evaluate and verify individual components on a printed circuit board assembly
“ICV” or “Intelligent Connected Vehicle”	refers to a new generation of vehicles equipped with advanced technologies that enable real-time communication and interaction between the vehicle, its systems, and external networks
“intelligent driving”	driving functions that use software, sensors, computing systems and vehicle control technologies to assist or automate certain driving tasks, such as lane keeping, adaptive cruise control, parking assistance or collision warning
“L4”	level four of driving automation, or high driving automation level, as classified by SAE. Under L4, vehicles can automatically drive without human intervention under limited conditions such as certain locations, road types, weather, etc.
“LTE” or “Long Term Evolution”	a wireless broadband communication standard developed by 3GPP, used for cellular mobile devices and data terminals
“MCU” or “microcontroller unit”	a programmable integrated circuit that integrates central processing unit along with memory and input/out peripherals

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“modularity”	refers to the design principle of breaking down complex systems into smaller, self-contained, and interchangeable units or modules, each performing a specific function. In the context of automotive systems, modularity enables flexibility, scalability, and efficient customization of vehicle components
“MPU” or “microprocessor unit”	a high-performance computing chip, serving as the core processor of domain controllers, which executes complex computations and runs operating systems, requiring external memory and peripherals to support the implementation of software-defined vehicle functionalities
“NFC” or “Near Field Communication”	a short-range wireless communication technology that enables data exchange between devices when they are in close proximity, typically within a few centimeters. In automotive applications, NFC is commonly used for features such as keyless entry, secure vehicle access, and mobile payment systems
“NTN” or “Non-Terrestrial Networks”	refer to communication networks that rely on satellite and other space-based infrastructure, rather than traditional terrestrial networks, to provide connectivity. They enable global coverage, including in remote or underserved areas where ground-based infrastructure is limited or unavailable
“OEM” or “Original Equipment Manufacturer”	automotive original equipment manufacturers (automotive manufacturer(s)), company(ies) that design, develop, and manufacture vehicles, and market their vehicles directly to customers
“OTA” or “over-the-air”	the wireless delivery of software updates and patches to vehicles without the need for physical access
“PCB” or “printed circuit board”	a flat board that supports and electrically connects electronic components conductive pathways etched from copper sheets, critical for assembling electronic systems in vehicles using
“PEPS” or “Passive Entry and Passive Start”	a radio frequency identification (RFID)-based intelligent automotive control system that automatically detects the position of authorized keys to enable contactless door access/closure and engine start/stop operations, while integrating personalized setting storage functions
“RF” or “radio frequency”	a specific range of electromagnetic oscillation frequencies
“robotaxi”	an autonomous vehicle providing autonomous ride-hailing transportation for passengers
“SAE”	the Society of Automotive Engineers, a global professional association and standards organization
“sensor”	a device, module, machine, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor

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“SMD” or “Surface-Mount Device”	electronic components that are designed to be mounted directly onto the surface of a PCB, without the need for drilling holes
“semi-autonomous driving”	a level of driving in which the vehicle can perform certain driving functions on its own in specific situations, but a human driver must remain attentive and ready to take over when needed
“smart cockpit solutions”	integrated in-vehicle solutions that support the driver’s and passengers’ in-car experience, such as information display, voice interaction, navigation, entertainment, connectivity and interaction between the user and the vehicle
“SMT” or “surface-mount technology”	a method of electronic component assembly where components are mounted directly onto the surface of a printed circuit board (PCB), rather than being inserted into holes as with traditional through-hole technology. SMT allows for smaller, more compact designs, as the components are typically smaller and lighter than their through-hole counterparts
“SOA” or “Service-Oriented Architecture”	a design paradigm where software applications are structured as discrete, interoperable services, which communicate over a network to provide functionality and enable integration across different systems
“SoCs” or “system-on-chips”	a single chip that integrates multiple computing components, including the processor, memory, communication interfaces, and power management systems
“SPICE” or “Software Process Improvement and Capability Determination”	a framework used to evaluate and improve the quality and capability of software development processes, especially in industries such as automotive where software reliability and process control are important
“T-Box” or “Telematics Box”	a critical component in modern vehicles that facilitates communication between the vehicle and external networks, such as cloud platforms, mobile devices, and other vehicles. It serves as the vehicle’s central communication unit, enabling real-time data exchange for a variety of functions, including remote vehicle condition checks, over-the-air (OTA) updates, vehicle tracking, and the management of in-vehicle services
“TDRA Certification”	certification or approval issued by the Telecommunications and Digital Government Regulatory Authority of the United Arab Emirates, which is generally required for certain telecommunications or connected electronic products to be lawfully marketed or used in that jurisdiction
“UART” or “Universal Asynchronous Receiver-Transmitter”	a basic communication interface used in electronic devices that allows two components to send and receive data with each other in serial form
“UDS” or “Unified Diagnostic Services”	a standardized communication protocol used in the automotive industry for vehicle diagnostics, testing, fault reading, software flashing and other maintenance or service-related functions

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“UWB” or “Ultra-Wideband”	a radio technology that uses a wide range of frequencies to transmit data over short distances with high precision. Unlike traditional communication technologies that operate on narrow frequency bands, UWB spreads its signal across a wide frequency spectrum, allowing for fast and highly accurate data transmission
“V2I” or “Vehicle-to-Infrastructure”	a communication mode enabling bidirectional information exchange between vehicles and road infrastructure, allowing vehicles to access real-time traffic data, road conditions, weather updates, and construction alerts
“V2X” or “Vehicle to Everything”	a communication technology that enables vehicles to exchange information with each other (V2V), infrastructure (V2I), pedestrians (V2P), and the cloud (V2C). This technology is critical for improving vehicle safety by enabling advanced features such as real-time traffic alerts, collision avoidance, adaptive traffic signal control, and enabling autonomous driving. V2X plays a significant role in creating smarter and safer transportation systems
“V2V” or “Vehicle-to-Vehicle”	a real-time inter-vehicle information exchange system based on wireless mobile communication that transmits driving speed, relative position, and other data via WiFi to enable collision risk prediction
“ZCU” or “Zonal Control Unit”	an advanced electronic component used in modern vehicles to centralize the management and control of specific vehicle functions within designated zones. As part of the transition to domain-centralized or zonal architectures in automotive electrical/electronic (E/E) systems, the ZCU replaces the need for multiple discrete Electronic Control Units (ECUs) by consolidating control functions for various subsystems into a single unit within a defined zone of the vehicle