



SESEC V Report

2024 Standardization Work Updates for Automotive Chips in China

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Seconded European Standardization Expert in China
(SESEC)

2024 Standardization Work Updates for Automotive Chips in China

China views automotive chips as a crucial foundation for the transformation and upgrading of its automotive industry. In recent years, as the proportion of chips in automotive electronic systems has steadily increased, and risks from global industrial and supply chains have also risen, China is accelerating the development of its own automotive chip supply capabilities. In this process, standards play a core role in guiding and regulating the development of the automotive chip industry.

1. Policies:

As early as October 2021, China proposed in its flagship standardization policy document, the *National Standardization Development Outline*, to "study and formulate key technology standards in fields such as new energy vehicles and intelligent connected vehicles to promote industrial transformation."

Subsequently, in August 2023, the Ministry of Industry and Information Technology (MIIT), Ministry of Science and Technology, National Energy Administration (NEA), and State Administration for Market Regulation (SAMR) jointly issued the *Implementation Plan for New Industry Standardization Pilot Project (2023-2035)* to improve the standard system construction for emerging industries and proactively plan future industry standard research. This document proposes to "develop i) general requirements for the automotive chip environment and reliability, electromagnetic compatibility, functional safety, and information security, ii) test standards for the application of chip products and technologies in control, computing, sensing, and for system matching and chip-vehicle matching, and iii) device standards for high-precision sensors, lidar, high-precision cameras, etc.

In January 2024, MIIT specifically released the *Guidelines for Developing National Automotive Chip Standard System* to plan and systematically deploy the standardization work of automotive chips, guide and regulate the function and performance testing, as well as selection and applications of automotive chips, and thus promote the healthy and sustainable development of the automotive chip industry. This document outlines the technical logic structure of China's automotive chip standard system, as shown below.

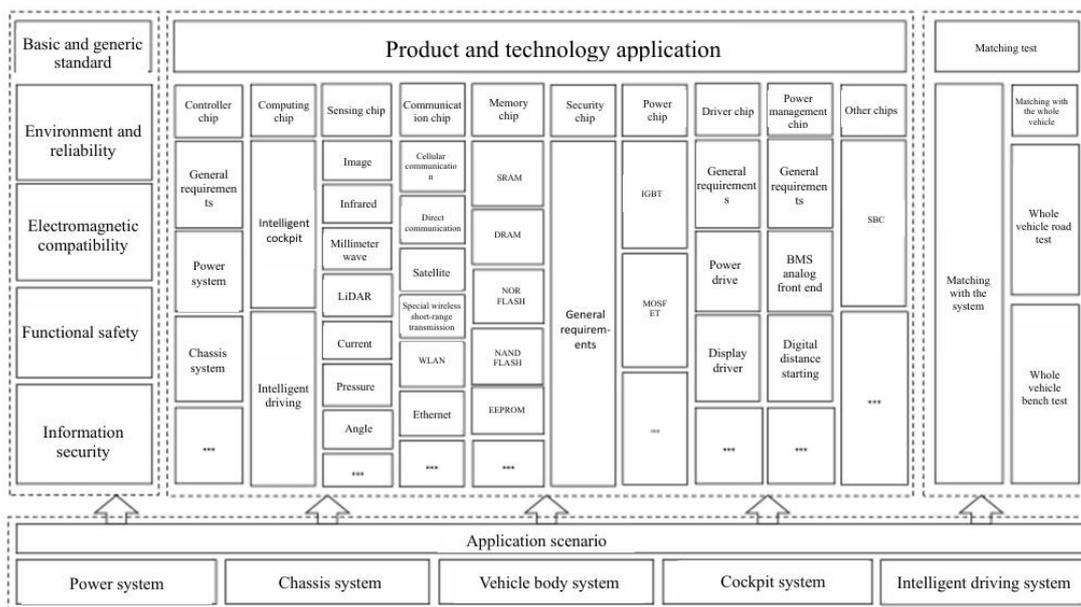


Figure 1: Technical logic structure of China's automotive chip standard system

Based on this technical logic structure and considering the performance requirements, functional requirements, and test methods of various automotive chips in different application scenarios, the document

further proposes the architectural framework of China's automotive chip standard system, as shown below.

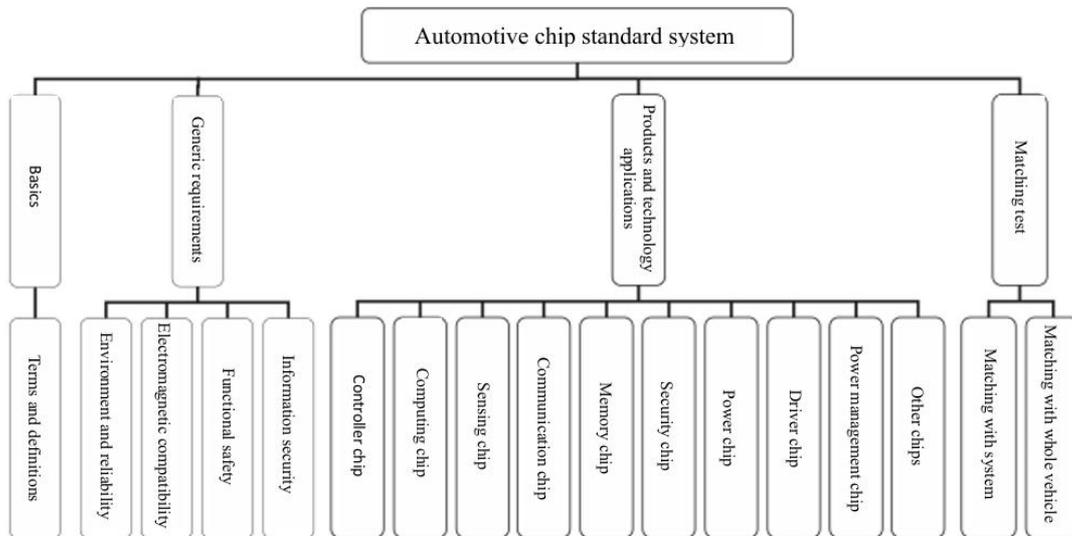


Figure 2: China's automotive chip standard system

The document also outlines the plan of China developing automotive chip standards in the following years. Specifically,

- By 2025: Formulate over 30 key automotive chip standards to, i) clarify foundational requirements such as environment and reliability, electromagnetic compatibility, functional safety, and information security, ii) provide technical specifications for key products and applications, including control, computing, storage, power, and communication chips, and iii) establish test methods for vehicle and key system matching. This is to meet the basic needs for the safe and reliable application and pilot demonstration of automotive chip products.
- By 2030: Formulate over 70 automotive chip-related standards, to i) further refine the general requirements for product and technology application and matching tests, effectively supporting the research and development of forward-looking and integrated automotive chip technologies and products, ii) achieve comprehensive coverage of typical application scenarios and test methods for automotive chips, fulfilling the need to build a safe, open, and sustainable automotive chip industry ecosystem.

In the coming years, China's automotive chip standardization work will proceed according to the above plans.

2. Government Standards (National Standards and Sector Standards):

Two major players in developing government standards for automotive chips in China are National Integrated Circuit Standardization Technical Committee (SAC/TC599) and National Automotive Standardization Technical Committee (SAC/TC114).

- SAC/TC599: This newly established committee focuses on chip standardization, with its secretariat hosted by the China Electronics Standardization Institute (CESI). In the automotive chip area, SAC/TC599 is responsible for developing standards related to environmental and reliability aspects as well as electromagnetic compatibility standards within China's automotive chip standard system.
- SAC/TC114: This committee focuses on the standardization of automobiles and their components, with its secretariat undertaken by the China Automotive Technology and Research Center (CATARC). In the automotive chip area, SAC/TC114 is responsible for developing other standards within China's automotive chip standard system.

In 2021, SAC/TC114 established the Automotive Chip Standard Research Working Group. This group includes over 140 members of vehicle and component manufacturers, chip companies, research institutions, and universities.

Currently, the working group is developing standards in 12 areas, including environment and reliability, new energy vehicle chips, automotive chip information security, ETC chips, automotive computing chips, automotive positioning chips, automotive cellular and direct communication chips, automotive infrared thermal imaging chips, automotive control chips, in-vehicle communication chips, automotive storage chips,

and automotive LiDAR chips.

As of June 2024, six sector standards initiated by the working group have been approved and are in the process of being formulated:

- *Technical Requirements and Test Methods for Power Battery Management System Analog Front-End Chips for Electric Vehicles*
- *Technical Requirements and Test Methods for Power Drive Chips for Electric Vehicles*
- *Technical Requirements and Test Methods for Intelligent Driving Computing Chips for Vehicles*
- *Technical Requirements and Test Methods for Intelligent Cockpit Computing Chips for Vehicles*
- *Non-Stop Toll Collection System - Onboard Electronic Unit Chips - Technical Requirements and Test Methods*
- *Technical Requirements and Test Methods for Automotive Safety Chips*

Additionally, the working group has proposed 15 standard-setting proposals covering areas such as automotive chip information security, power discrete devices, power modules, Controller Area Network (CAN) transceiver chips, Local Interconnect Network (LIN) transceiver chips, cellular communication chips, power system control chips, chassis system control chips, satellite positioning chips, infrared thermal imaging chips, 100Mbps Ethernet physical layer interface (PHY) chips, serializer and deserializer (Serdes) chips, general control chips, and chip environment and reliability.

In 2024, the working group plans to propose the following new standard projects:

- *Technical requirements and test methods for automotive gateway chips*
- *Technical requirements and test methods for automotive direct communication chips*
- *General specifications for the environment and reliability of electric vehicle chips*
- *Technical requirements and test methods for automotive LiDAR chips - Part 1: Electronic chips*
- *Technical requirements and test methods for automotive dynamic random-access memory (DRAM) chips - Part 1: DDR4*
- *Technical requirements and test methods for automotive dynamic random-access memory (DRAM) chips - Part 3: LPDDR5*

In the future, the working group will categorize the 79 projects identified in the automotive chip standards system and prioritize the development of those that have clear industry demand, are prerequisites for other standards, and can replace foreign standards.

3. Market Standards (Association Standards):

In addition to government-led national and sector standards, some industrial groups in China have also started developing association standards for automotive chips. Due to their flexibility and short development cycles, these association standards can often quickly respond to industry needs and complement government standards. Some excellent association standards can be converted into government standards when conditions are ripe, thereby supporting the implementation of national policies and regulations in the future.

Currently, there are eight main industrial groups in China developing association standards for automotive chips.

- **China Society of Automotive Engineers of China:** This academic society is composed of Chinese automotive science and technology workers. Currently, SAE-China has released 10 automotive chip standards, with an additional 9 standards under development.
- **Zhongguancun Standardization Association:** Aiming to formulate advanced association standards and build the "Zhongguancun Standard" brand, this association established a sub-technical committee for automotive chips in 2021. It has released 7 automotive chip standards to date.
- **China Advanced Semiconductor Industry Innovation Alliance:** Founded in 2015 by third-generation semiconductor research institutions and enterprises, this alliance has released 3 automotive chip standards.
- **China Road Safety Association:** Established in 1994 to enhance road traffic management and improve the application of traffic science and technology, this association has released 1 automotive chip standard.

- Innovation Association of Wide Bandgap Semiconductor Technology: Founded in 2016, this alliance primarily focuses on professional technical R&D and the commercialization of technological achievements. It has released 1 automotive chip standard.
- China Association of Automobile Manufacturers: This self-regulating, non-profit social organization formed by Chinese automotive industry enterprises established a specialized committee for automotive chips in December 2023. The committee is currently developing 8 automotive chip standards.
- Tianjin Automotive Chip Standards Testing Innovation Federation: Initiated by CATARC in 2023, this organization is currently developing 4 automotive chip standards.
- China Electronics Standardization Association (CESA): As the largest industrial association in the Chinese electronics industry and led by CESI, CESA is currently developing 3 automotive chip standards.

4. Summary:

Under the guidance of government policies, China is rapidly improving its automotive chip standard system to support its fast-growing new energy and intelligent connected vehicle industry, aiming to achieve maximum technical (standard) autonomy. Based on the current standard projects being carried out, China has just begun the development of standards in almost all subfields of automotive chips. This provides an opportunity for European standards to exert influence. We recommend that the European automotive chip industry strengthen its interactions with relevant Chinese standardization organizations and actively participate in the development of these standards to minimize future technical differences between China and Europe in automotive chip standards.

Introduction of SESEC Project



The Seconded European Standardization Expert in China (SESEC) is a visibility project co-financed by the European Commission (EC), the European Free Trade Association (EFTA) secretariat and the three European Standardization organizations (CEN, CENELEC and ETSI). Since 2006, there has been four SESEC projects in China, SESEC I (2006-2009), SESEC II (2009- 2012), SESEC III (2014-2017), SESEC IV (2018- 2022) and SESEC V (2022-2025). Dr. Betty XU is nominated as the SESEC expert and will spend the next 36 months on promoting EU-China standardization information exchange and EU-China standardization cooperation.

The SESEC project supports the strategic objectives of the European Union, EFTA and the European Standardization organizations (ESOs). The purpose of SESEC project is to:

- **Promote European and international standards in China;**

- **Improve contacts with different levels of the Chinese administration, industry and standardization bodies;**
- **Improve the visibility and understanding of the European Standardization System (ESS) in China;**
- **Gather regulatory and standardization intelligence.**

The following areas have been identified as sectoral project priorities by the SESEC project partners: Internet of Things (IoT) & Machine-to-Machine(M2M) communication, communication networks & services, cybersecurity & digital identity, Smart Cities (including transport, power grids & metering), electrical & electronic products, general product safety, medical devices, cosmetics, energy management & environmental protection (including eco-design & labeling, as well as environmental performance of buildings).