



CATARC - Testing



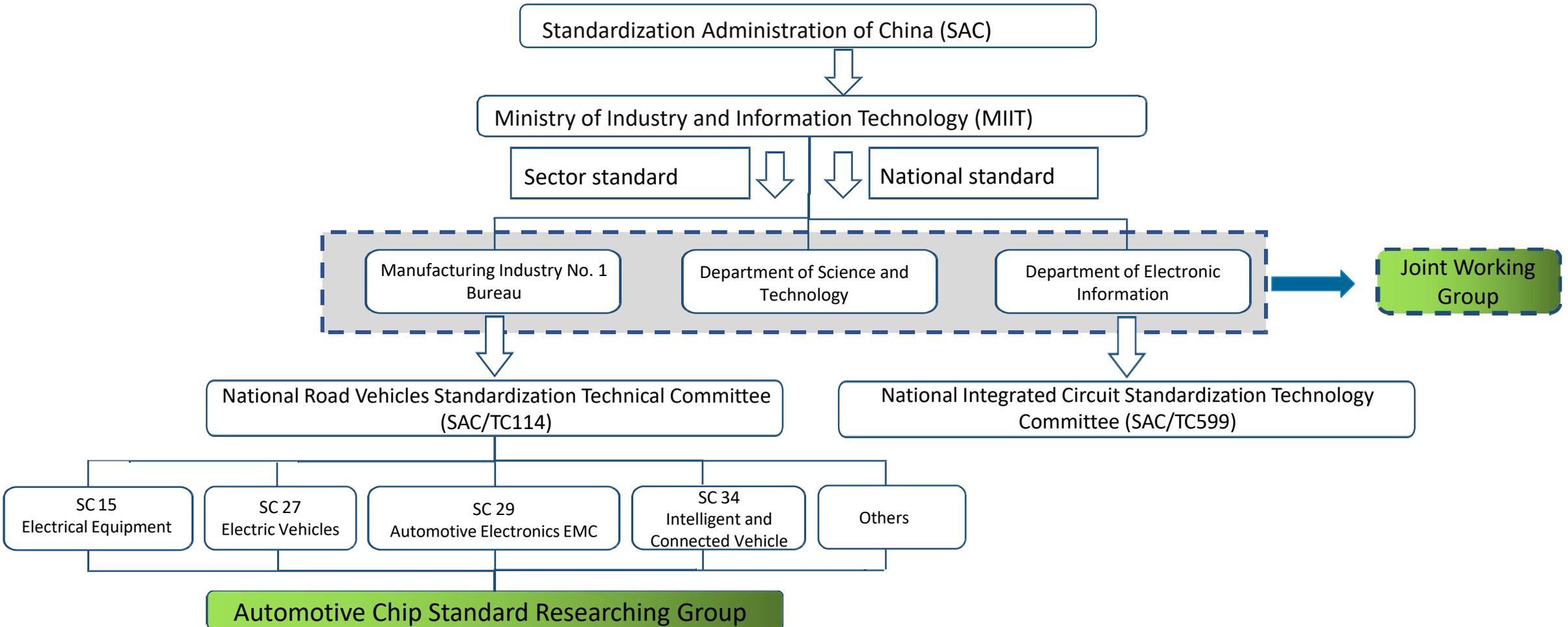
CATARC - Testing

Introduction to the Automotive Chip Standard System

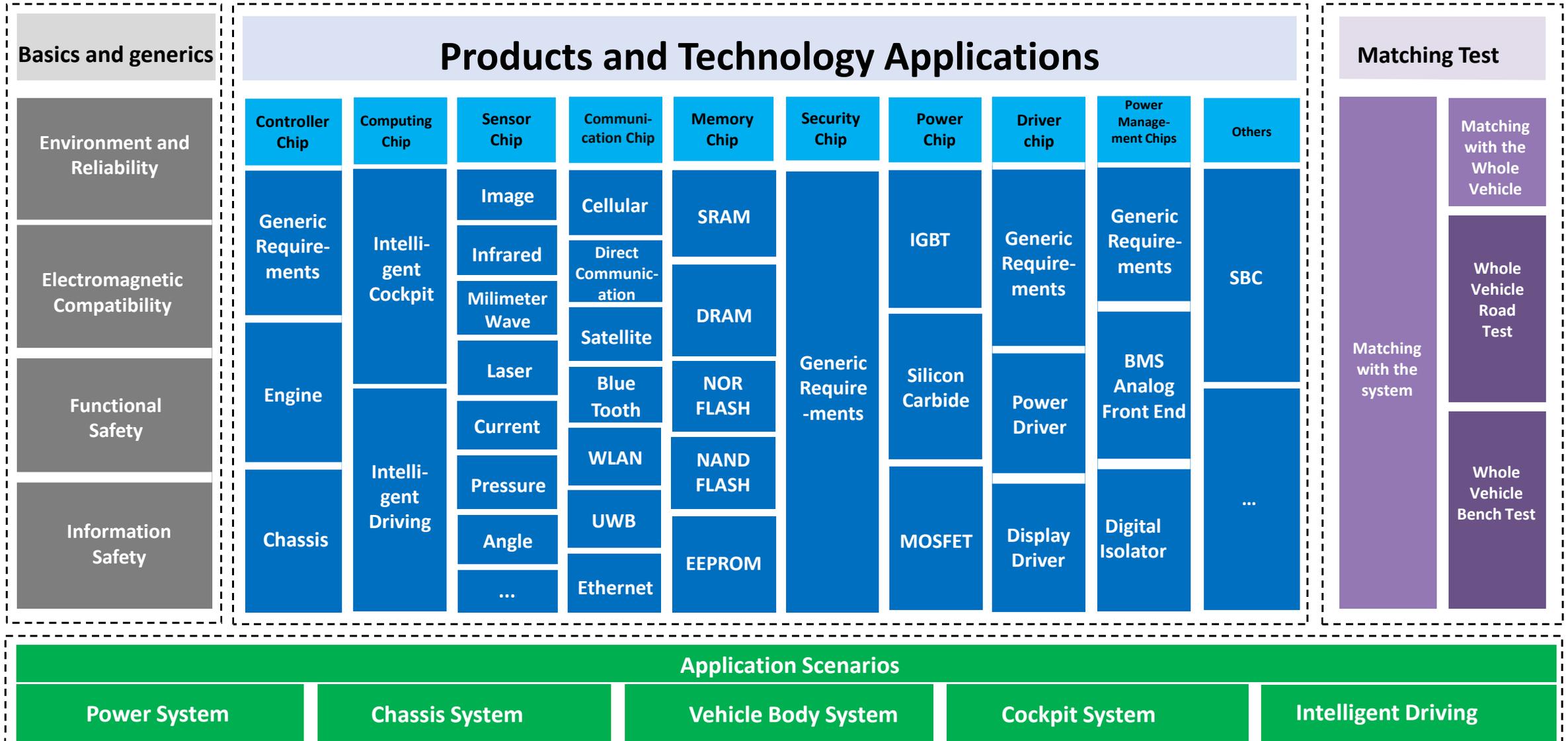
September 2023

1.1 Automotive Chip Standard Working Groups

- In 2021, the CATARC led the formulation the Automotive Chip Standard Researching Group and solicited expert members of the working group from the industry.

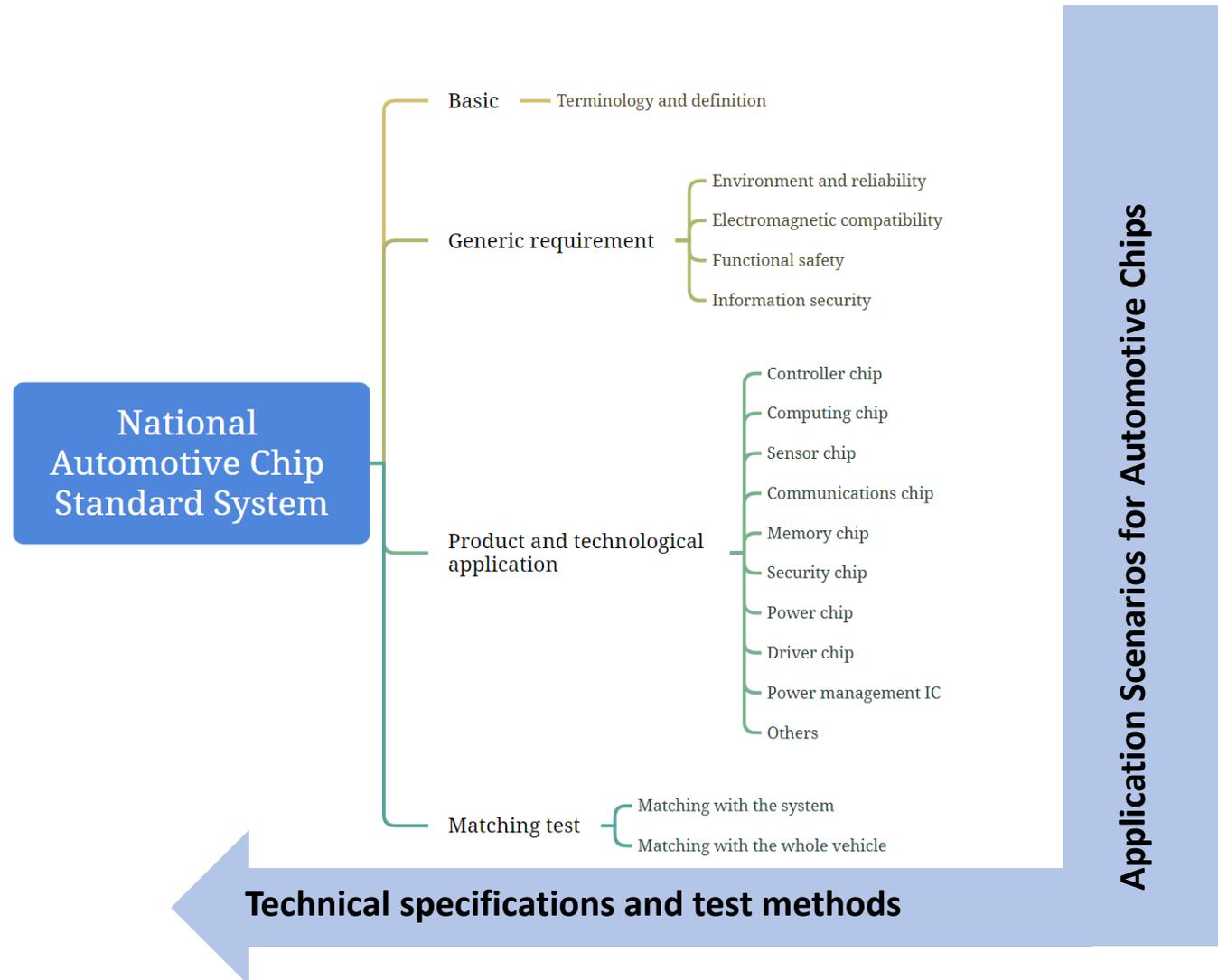


1.2 Architecture Diagram of Automotive Chip Standard System Technology



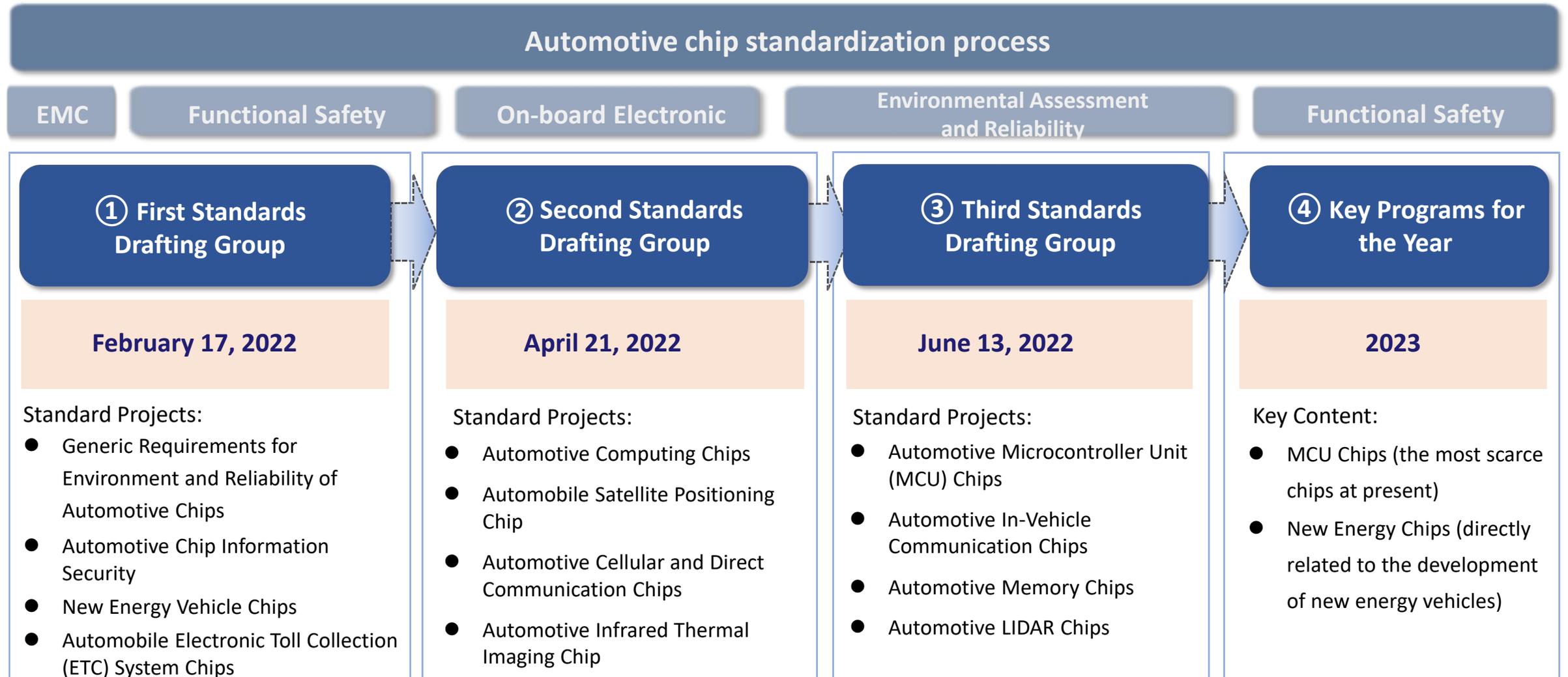
1.3 Development of the Automotive Chips Standard System

- Initially establish a chip standard system and coordinating industrial resources for division of labor.



1.4 Research Progress of Automotive Chip Standard Project

- The work on automotive chip standards has made stage-by-stage progress, with three batches of standards drafting groups having been initiated and the standardized system having been put out for public consultation.



1.5 Current Status of Specific Standards

- Based on the *Guidelines for the Construction of the a Automotive Chip Standardization System*, comprehensively promote the automotive chips standardization working groups establishment and standard drafting.

| Standardization Project Classification | | Name of the Standard | | Type | Status | Name of the Standard | | Type | Status |
|--|----------------------------------|-------------------------------------|--|--|-------------------|----------------------|---|-------------------|-----------|
| Basic (100) | Terminology and definition (101) | 101-1 | Automotive chip terms and definitions | National Standard | Pre-study | | | | |
| Generic Requirements(200) | Environmental Reliability (201) | 201-1 | Automotive chip environment and reliability application guidelines | National Standard | Pre-study | 201-2 | Stress test requirements for integrated circuits for automobiles | National Standard | Pre-study |
| | | 201-3 | Stress test requirements for discrete devices for automobiles | National Standard | Pre-study | 201-4 | Stress test requirements for automobile semiconductor optoelectronic devices | National Standard | Pre-study |
| | | 201-5 | Stress test requirements for micro-electromechanical system (MEMS) sensors for automobiles | National Standard | Pre-study | 201-6 | Stress test requirements for automotive multi-chip modules (MCM) | National Standard | Pre-study |
| | | 201-7 | Stress test requirements for automobile passive components | National Standard | Pre-study | 201-8 | Automotive semiconductor device electrical parameter control guide | National Standard | Pre-study |
| | | 201-9 | Analysis guidelines for automotive chip yield statistics | National Standard | Pre-study | 201-10 | Guidelines on characterization of electrical performances of automotive integrated circuits | National Standard | Pre-study |
| | | 201-11 | Zero defect guidelines for automotive chip products | National Standard | Pre-study | 201-12 | Test requirements for reliability of lead-free components for automobiles | National Standard | Pre-study |
| | | 201-13 | Test requirements for reliability of automotive components using copper lead interconnects | National Standard | Pre-study | 201-14 | Test methods for reliability of automotive semiconductor devices | Sector Standard | Pre-study |
| | | 201-15 | Test methods for the reliability of electrical/electronic modules of automotive chips | Sector Standard | Pre-study | 201-16 | Electric vehicle chips environment and reliability application guidelines | Sector Standard | Pre-study |
| | | 201-17 | Automotive chip consistency inspection specification | Sector Standard | Pre-study | | | | |
| | | Electromagnetic Compatibility (202) | 202-1 | EMC test generic specification of Vehicle IC | National Standard | Established | | | |
| | Functional Safety (203) | 203-1 | Road vehicles—Functional safety—Part 11: Guidelines on applications to semiconductors | National Standard | Approved | | | | |
| | Information Safety (204) | 204-1 | Automotive chip information safety technical specification | National Standard | Applying | | | | |

1.5 Current Status of Specific Standards

- Based on the *Guidelines for the Construction of the a Automotive Chip Standardization System*, comprehensively promote the automotive chips standardization working groups establishment and standard drafting.

| Standardization Project Classification | | Name of the Standard | | Type | Status | Name of the Standard | | Type | Status |
|---|-----------------------|----------------------|---|-----------------|-----------|----------------------|--|-----------------|-----------|
| Product and technological application (300) | Controller Chip (301) | 301-1 | General technical specifications and test methods for automotive controller chips | Sector Standard | Pre-study | 301-2 | Technical specifications and test methods for controller chips for electric vehicles | Sector Standard | Pre-study |
| | | 301-3 | Technical specifications and test methods for automotive engine system controller chips | Sector Standard | Initiated | 301-4 | Technical specifications and test methods for automotive chassis system controller chips | Sector Standard | Initiated |
| | Computing Chip (302) | 302-1 | Technical specifications and test methods for automotive intelligent cockpit computing chips | Sector Standard | Applying | 302-2 | Technical specifications and test methods for automotive intelligent driving computing chips | Sector Standard | Applying |
| | Sensor Chip (303) | 303-1 | Technical specifications and test methods for automotive image sensor chips | Sector Standard | Pre-study | 303-2 | Technical specifications and test methods for automotive infrared thermal imaging chips | Sector Standard | Pre-study |
| | | 303-3 | Technical specifications and test methods for automotive millimeter-wave radar chips | Sector Standard | Pre-study | 303-4 | Technical specifications and test methods for automotive LiDAR chips | Sector Standard | Pre-study |
| | | 303-5 | Technical specifications and test methods for current sensors for electric vehicles | Sector Standard | Pre-study | 303-6 | Technical specifications and test methods for power battery pressure sensors for electric vehicles | Sector Standard | Pre-study |
| | | 303-7 | Technical specifications and test methods for rotor angle sensors of drive motors for electric vehicles | Sector Standard | Pre-study | 303-8 | Technical specifications and test methods for leakage current sensors for electric vehicles | Sector Standard | Pre-study |
| | | 303-9 | Technical specifications and test methods for linear Hall chips for electric vehicles | Sector Standard | Pre-study | 303-10 | Technical specifications and test methods for voltage detection chips for electric vehicles | Sector Standard | Pre-study |
| | | 303-11 | Technical specifications and test methods for position detection chips for electric vehicles | Sector Standard | Pre-study | 303-12 | Technical specifications and test methods for magnetic field detection chips for electric vehicles | Sector Standard | Pre-study |

1.5 Current Status of Specific Standards

- Based on the *Guidelines for the Construction of the a Automotive Chip Standardization System*, comprehensively promote the automotive chips standardization working groups establishment and standard drafting.

| Standardization Project Classification | | Name of the Standard | | Type | Status | Name of the Standard | | Type | Status |
|--|-------------------------|----------------------|---|-----------------|------------------|----------------------|--|-----------------|-----------|
| Product and technological application(300) | Communication Chip(304) | 304-1 | Technical specifications and test methods for automotive cellular communication chips | Sector Standard | Applying | 304-2 | Technical specifications and test methods for automotive direct communication chips | Sector Standard | Applying |
| | | 304-3 | Technical specifications and test methods for automotive satellite positioning chips | Sector Standard | Pre-study | 304-4 | Technical specifications and test methods for automotive bluetooth chips | Sector Standard | Pre-study |
| | | 304-5 | Technical specifications and test methods for automotive wireless local area network (WLAN) chips | Sector Standard | Pre-study | 304-6 | Technical specifications and test methods for automotive ultra-wideband (UWB) communication chips | Sector Standard | Pre-study |
| | | 304-7 | Technical specifications and test methods for automotive Near Field Communication (NFC) chips | Sector Standard | Pre-study | 304-8 | Technical specifications and test methods for on-board electronic unit chips for automobile non-stop toll collection systems | Sector Standard | Applying |
| | | 304-9 | Technical specifications and test methods for automotive local interconnect network (LIN) transceiver chips | Sector Standard | Applying | 304-10 | Technical specifications and test methods for automotive controller area network (CAN) transceiver chips | Sector Standard | Applying |
| | | 304-11 | Technical specifications and test methods for automotive Ethernet 100Mbps physical layer (PHY) chips | Sector Standard | Ready for launch | 304-12 | Technical specifications and test methods for automotive Ethernet 1Gbps physical layer (PHY) chips | Sector Standard | Pre-study |
| | | 304-13 | Technical specifications and test methods for automotive Ethernet switch chips | Sector Standard | Pre-study | 304-14 | Technical specifications and test methods for automotive central gateway chips | Sector Standard | Pre-study |
| | | 304-15 | Technical specifications and test methods for automotive serializer and deserializer (Serdes) chips | Sector Standard | Pre-study | | | | |
| | Memory Chip(305) | 305-1 | Technical specifications and test methods for Dynamic Random Access Memory (DRAM) chips for automobiles | Sector Standard | Pre-study | 305-2 | Technical specifications and test methods for static random access memory chips (SRAM) for automobiles | Sector Standard | Pre-study |
| | | 305-3 | Technical specifications and test methods for NORFLASH memory chips for automobiles | Sector Standard | Pre-study | 305-4 | Technical specifications and test methods for NANDFLASH memory chips for automobiles | Sector Standard | Pre-study |
| | | 305-5 | Technical specifications and test methods for EEPROM memory chips for automobiles | Sector Standard | Pre-study | | | | |

1.5 Current Status of Specific Standards

- Based on the *Guidelines for the Construction of the a Automotive Chip Standardization System*, comprehensively promote the automotive chips standardization working groups establishment and standard drafting.

| Standardization Project Classification | | Name of the Standard | | Type | Status | Name of the Standard | | Type | Status |
|---|-----------------------------|--------------------------------|---|--|-----------------|----------------------|---|-----------------|-----------|
| Product and technological application (300) | Security Chip (306) | 306-1 | Technical specifications and test methods for automotive security chips | Sector Standard | Applying | | | | |
| | Power Chip (307) | 307-1 | Environmental test requirements and test methods of insulated-gate bipolar transistors(IGBT) module for electric vehicles | Sector Standard | Released | 307-2 | Technical specifications and test methods for power modules for electric vehicles - Part 1: IGBT | Sector Standard | Initiated |
| | | 307-3 | Technical specifications and test methods for power modules for electric vehicles - Part 2: silicon carbide | Sector Standard | Applying | 307-4 | Technical specifications and test methods for power discrete devices for electric vehicles - Part 1: IGBT | Sector Standard | Applying |
| | | 307-5 | Technical specifications and test methods for power discrete devices for electric vehicles - Part 2: silicon carbide | Sector Standard | Applying | 307-6 | Technical specifications and test methods for power discrete devices for electric vehicles - Part 3: Power MOSFET | Sector Standard | Initiated |
| | Chip of driver (308) | 308-1 | General technical specifications and test methods for driver chips of automobiles | Sector Standard | Pre-study | 308-2 | Technical specifications and test methods for power driver chips for electric vehicles | Sector Standard | Applying |
| | | 308-3 | Technical specifications and test methods for display driver chips for electric vehicles | Sector Standard | Pre-study | | | | |
| | Power Management Chip (309) | 309-1 | General technical specifications and test methods for automotive power management chips | Sector Standard | Pre-study | 309-2 | Technical specifications and test methods for analog front-end chips for power battery management systems for electric vehicles | Sector Standard | Applying |
| | | 309-3 | Technical specifications and test methods for digital isolator chips for electric vehicles | Sector Standard | Pre-study | | | | |
| | Others (310) | 310-1 | Technical specifications and test methods for power battery management system base chip (SBC) for electric vehicles | Sector Standard | Pre-study | | | | |
| | Matching test (400) | Matching with the system (401) | 401-1 | Automotive chip system matching test methods | Sector Standard | Pre-study | | | |
| Matching with the whole vehicle (402) | | 402-1 | Automotive chip whole vehicle matching road test methods | Sector Standard | Pre-study | 402-2 | Automotive chip whole vehicle matching bench test methods | Sector Standard | Pre-study |