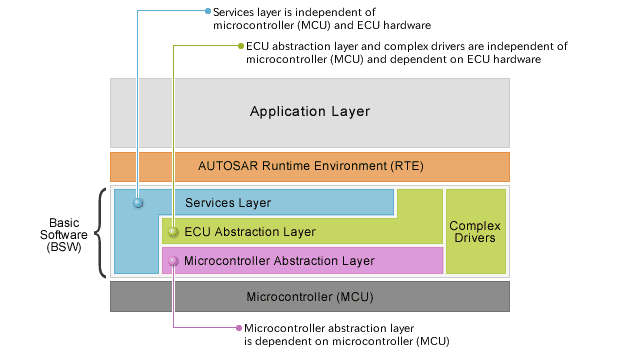
## Corporate

# **AUTOSAR Layered Architecture**

In AUTOSAR, software is componentized and application software reusability is improved. AUTOSAR's layered architecture and details of each layer are shown below.



AUTOSAR Layered Architecture

## **Description of Layers**

| Layer name | | Overview | Purpose | Features | |
| --- | --- | --- | --- | --- | --- |
| Mounting | High-order interface |
| Runtime Environment (RTE) | | Middleware layer providing communication services for AUTOSAR software components (SWC) and applications containing AUTOSAR sensor/actuator parts. | Make AUTOSAR software components (SWC) independent of mapping to specific ECU. | Specialized for ECU and application. Generated for each ECU. | Interface is completely independent of ECU. |
| Basic Software (BSW) | Services Layer | Highest basic software layer; provides the following functions:   * OS * Vehicle network communications and management * Memory service (NVRAM management) * Diagnostic service (including UDS <protocol> communication and error memory) * ECU state management | Provide basic services and basic software modules for applications. | Specialized for microcontroller (MCU), part of ECU hardware, and application. | Interface is independent of microcontroller (MCU) and ECU hardware. |
| ECU Abstraction Layer | Interface with MCAL (including external device driver); provides the following:   * Access to peripherals and devices irrespective of whether they are inside or outside the microcontroller (MCU) * API for interfacing with microcontroller (MCU) (port pins, interface type) | Make upper software layer independent of ECU hardware layout. | Mounting is independent of microcontroller (MCU) and dependent on ECU hardware | Interface is independent of microcontroller (MCU) and ECU hardware. |
| Complex Drivers | Layer used for complex functions not found on other layers. This layer accesses the microcontroller (MCU) directly. Examples: Injection control, control of electrical values, position increase detection, etc. | Fulfills special functions and timing requirements needed to operate complex sensors and actuators. | Highly dependent on microcontroller (MCU), ECU and application. | Interface is standardized and mounted according to AUTOSAR (AUTOSAR interface). |
| Microcontroller Abstraction Layer (MCAL) | Software module that directly accesses on-chip microcontroller (MCU) peripheral modules and external devices that are mapped to memory. | Make upper software layer independent of microcontroller (MCU). | Dependent on microcontroller (MCU). | Interface is independent of standardized microcontroller (MCU). |

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* [iSim:PE Offline Simulation Tool](https://www.renesas.com/us/en/software-tool/isimpe-offline-simulation-tool)
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