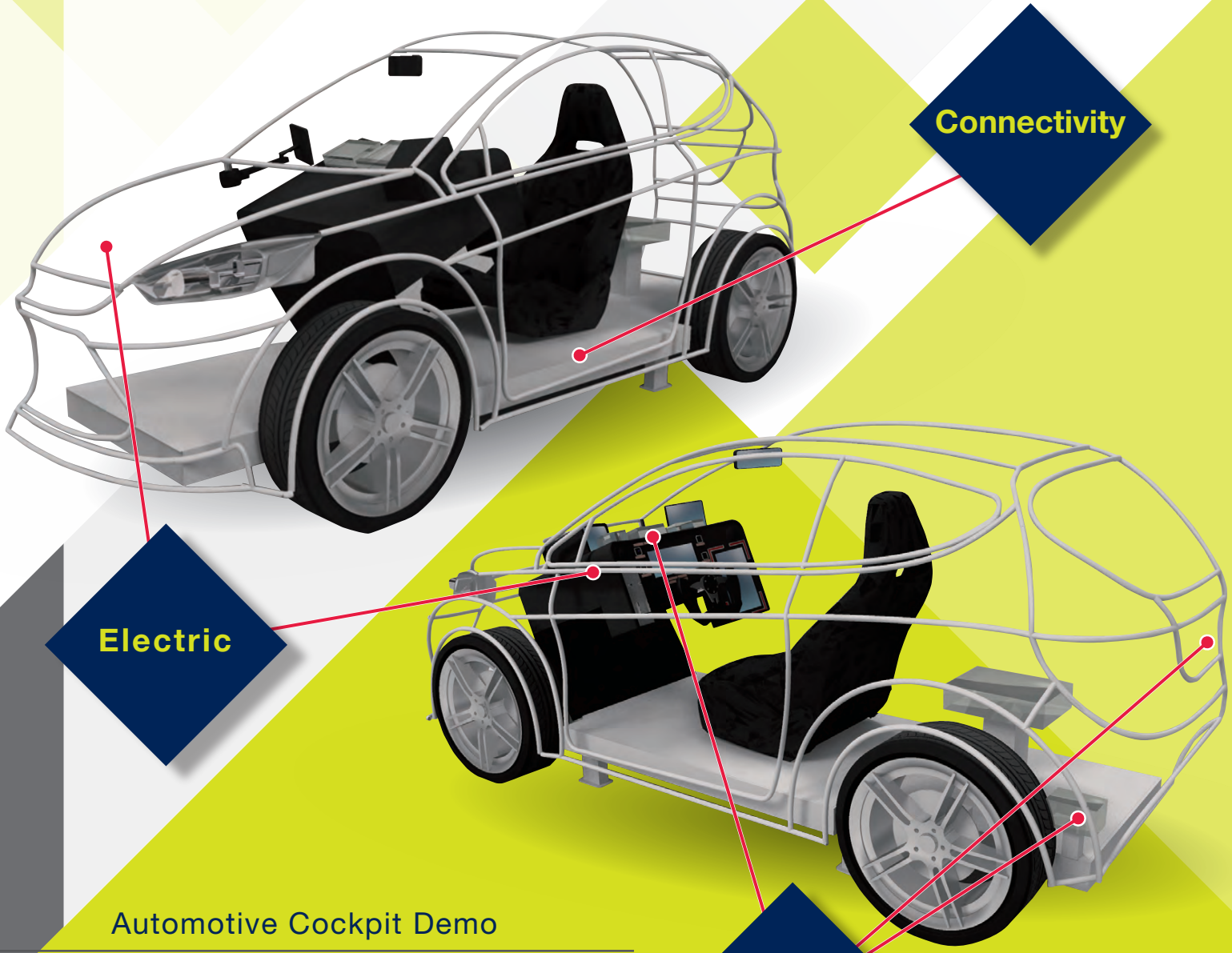
Automotive Technologies

ROHM SEMICONDUCTOR

ROHM's broad automotive lineup supports an increasingly sophisticated mobile society transitioning towards EVs and autonomous driving

ROHM aims for 'zero defects' for the tens of thousands of electronic components used to keep vehicles running. And ROHM continues to contribute to the rapidly emerging automotive field of 'functional safety'. In terms of functionality and performance, we support 'motorization' through a broad range of motor drivers, 'increased energy savings and efficiency' with power devices that include SiC, and 'autonomous driving' by offering AFEs for sensors and power supplies.



Automotive Cockpit Demo

This demo showcases a variety of solutions utilizing ROHM key devices, allowing users to experience the numerous functions semiconductor technologies can provide through a series of processes, from entering to exiting the vehicle.

Electric

Electric Water Pump Unit

Electric water pumps installed in hybrid vehicles, EVs, and fuel cell cars reduce battery load by improving energy savings and efficiency. They are designed to use available energy more efficiently.

ROHM Products
- High-Performance 3-Phase Fan Motor Driver IC
- Power MOSFETs
- Chip Resistors for Current Detection

ADB (Adaptive Driving Beam)

When driving with high beams, oncoming vehicles within the beam range are detected and the beam pattern automatically adjusted using light distribution control. Partial shading is performed to avoid exposing oncoming drivers to glare which can be discomforting and distracting.

ROHM Products
- LED Driver ICs with PWM Signal Generation Circuit

Sequential Lighting

Sequential lighting is carried out based on lighting patterns built into the IC to indicate the intended turn direction.

ROHM Products
- High-Performance 3-Phase Fan Motor Driver IC

Inverter

Integrating the industry's most advanced SiC power devices in the main drive inverter achieves dramatically higher efficiency in a smaller, lighter form factor.

ROHM Products
- SiC MOSFET

Rear Tail Lamp

ROHM's red LEDs utilize a completely silver-less construction to achieve high brightness with superior sulfuration resistance. And LED drivers with built-in LED abnormality input/output function are offered that detect lighting malfunctions and notifies the driver.

ROHM Products
- Sulfuration-Resistant Red LEDs
- Driver ICs for Exterior Lamp Control

Automatic Tilt Steering

The steering wheel automatically telescopes to the preset position once personal authentication is performed via smartphone when the driver enters the vehicle.

ROHM Products
- H-Bridge Driver ICs

Ambient Lighting

High brightness 3-color LEDs are installed around the instrument panel, interior doors, and footwells, while LED drivers with built-in dimming function make it possible to customize the interior cabin lighting to the driver's favorite color.

ROHM Products
- High Brightness 3-Color LEDs
- RGB Control LED Driver ICs

High Resolution Audio

The trend towards quieter cabins and high resolution sound sources has increased the demand for more accurate audio representation in vehicle systems. ROHM's high resolution playback IC provides high fidelity analog volume control with low noise to achieve greater performance and comfort while driving.

ROHM Products
- High Resolution Audio SoC

High Definition LCD Monitor

Large, high definition LCDs are used for the instrument panel, side mirror area, and more. ROHM introduces a chipset that provides functional safety for driving and controlling vehicle LCD panels. Each IC within the chipset integrates a function for mutually detecting the expected failure mode. Information such as input signals to the LCD and LCD driver damage/separation is detected and fed back, making it possible to complementarily detect panel failures as a chipset. Incorporating functional safety contributes to the prevention of serious accidents caused by the malfunction of monitors used for the speedometer, side mirrors, and other systems.

ROHM Products
- Chipset for High Definition LCD Panels

Autonomous

Sonar Sensor

In recent years, applications such as parking assist systems, automatic parking systems, and throttle management systems designed to prevent unintended acceleration are seeing increased adoption. However, in order to meet the various needs, of these systems (i.e. automatic parking), further specifications are required for detection distance. ROHM contributes to improving the detection distance of sonar sensors through the evolution of Analog Front End (AFE) ICs that amplify weak sensor signals.

ROHM Products
- AFE (Analog Front End) ICs for Sonar Sensors

CMOS Camera Module

CMOS camera modules are used to replace the driver's eyes during autonomous driving. One of the major roles required of cameras is image recognition. To achieve this, the resolution has steadily increased from conventional VGA to HD, then full HD. CMOS sensors also require a stringent, complex power supply system. ROHM offers high efficiency monolithic power supplies that support high image quality. In addition, the interface that transmits images from the camera to the display panel must be able to handle large quantities of information at high speeds. In response, ROHM is developing ultra-low-noise transceiver/receiver ICs compatible with the LVDS standard.

ROHM Products
- System Power Supply ICs for Vehicle HD/FHD Cameras
- Bidirectional Clockless Link™ ICs

Connectivity

Wireless Charging

Initiate wireless charging by simply placing a smartphone on the charging pad. As a regular member of WPC, ROHM quickly carries product development to meet market demands, such as for wireless charging which is expected to make device connectors safer and more water- and dust-resistant.

ROHM Products
- Wireless Power Transmission IC

Heart Rate Sensor

The driver's heart rate is detected utilizing an optical pulse wave sensor embedded in the steering wheel. The heart rate is shown on the center cluster display.

ROHM Products
- Optical Heart Rate Sensor IC (Reference Exhibit)

The pulse wave (heart rate) sensor included in this demo does not collect or store user data, nor will customer information be shared with third parties. In addition, please note that this demo is not intended for medical use.

Vehicle Communication

ROHM offers transceiver ICs compliant with the next-generation vehicle communication standard (CXPI), contributing to improved ECU communication response and reliability while reducing the size of the wiring harness.

ROHM Products
- CXPI Transceiver ICs