TATA ELXSI | RENESAS

TATA

NEXT GENERATION EV INNOVATION CENTER (NEVIC)

Powering the Future of Electric Mobility Solutions

Trends

- The global electric scooter and electric motorcycle markets are experiencing phenomenal growth at a CAGR of 33.1%

- Battery management system market size is estimated to grow from USD 5.2 billion in 2019 to USD 12.6 billion by 2024, at a CAGR of 19.5%

- Increasing electric vehicle adoption, the need for robust charging infrastructure, and improving battery energy efficiency are driving demand for battery management systems.

- The rapid growth of premium electric vehicles has increased demand for Connect Digital clusters, as OEMs seek to provide real-time vehicle information to their users in a digital and interactive format.

- Higher efficiency, cross-sector usage, and reduced electricity consumption are the factors driving the demand for an efficient DC motor control system globally

- Demand for lowering the EV battery costs in order to produce affordable EVs and increase revenue.

Opportunities

- Electric vehicles are changing not only the traditional car environment, but also the overall mobility and energy ecosystem. As a result, NEVIC addresses opportunities in all critical areas of an electric vehicle, such as the battery management system, motor control system, and connectivity.

- OEMs, Tier 1s, and partners developing the EV ecosystem must strategize in order to create a portfolio of products and services that can successfully meet numerous use cases while also adapting to the changing regulatory landscape.

- Different players face different challenges in the development of electric vehicles. Traditional players have customizable platforms and infrastructure. New players, on the other hand, must build their platforms from the ground up. Agility and skill in design, development, and validation are required to meet this requirement.

- The majority of electric two-wheelers in the Asia-Pacific region lack Battery Thermal Management System (BTMS) and are frequently overcharged, leading to fire incidents. The presence of a Battery Management System (BMS) can prevent EV fires by stopping charging in the event of overheating.

- EV stakeholders need collaborative strategies to lead the way in the EV ecosystem. Finding the right cloud partner brings in complementary capabilities and experience to ensure a significant competitive advantage.
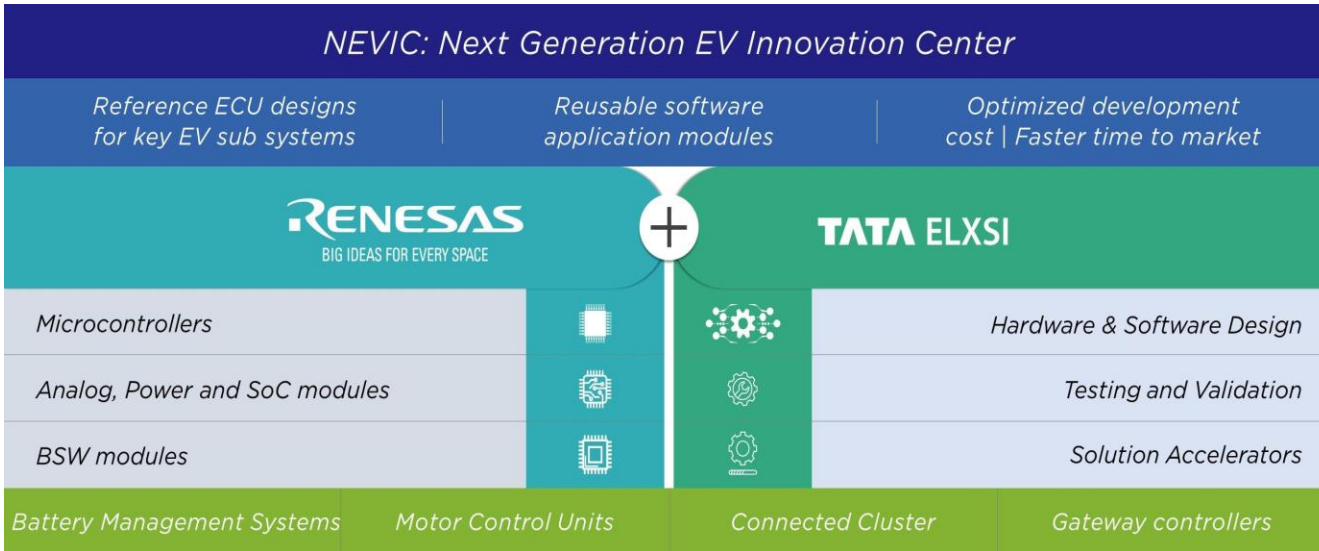
BENEFITS

- Address the challenges of time to market for EV products. Customers can focus on only the specialized product requirements beyond the hygiene requirements.

- Optimized solution design with foresight planning for semiconductor supply chain management.

- A one-stop shop for embedded hardware, software, mechanical, testing & validation, and connected digital platform.

Scan to know more

Partnership

NEVIC: Next Generation EV Innovation Center

Reference ECU designs for key EV sub systems	Reusable software application modules	Optimized development cost | Faster time to market

RENESAS BIG IDEAS FOR EVERY SPACE + **TATA ELXSI**

Microcontrollers			Hardware & Software Design
Analog, Power and SoC modules			Testing and Validation
BSW modules			Solution Accelerators

| Battery Management Systems | Motor Control Units | Connected Cluster | Gateway controllers |

Differentiators

- NEVIC will address the fundamental requirements, allowing customers to concentrate on unique features.
- Renesas extended support for core semiconductor components and associated software peripherals
- Tata Elxsi's expertise and solution ecosystem will be used to advance the solution to the next stage of maturity and production intent.
- Remote monitoring through cloud-based connected vehicle platform

Features

Battery Management System (BMS)

System Features

- RH850F1K and ISL 78714 Platform based architecture
- Application software based on Matlab/Simulink Models
- Supports battery pack paralleling
- Scalable architecture
- Supports battery swapping
- Easily configurable across vehicle platforms
- Supports multiple battery chemistry
- CAN interface for vehicle communication
- Supports OTA update
- Functional Safety compliant Architecture

Motor Control Unit (MCU)

System Features

- RH850C1M based platform architecture
- Application software based on Matlab/Simulink Models
- Easily configurable across motor platforms
- Intelligent Power Device (IPD) for external load drive
- Supports different sensor types for position estimation
- Inbuilt Hardware IP for FOC & Trapezoidal Control
- CAN interface for vehicle communication
- Functional Safety compliant architecture
- Supports OTA update

BMS & MCU Application Features

Monitoring	Protection	Fault Handling
De-rating	Thermal Management	Power Control
Estimation	Connected	State Management