



Tech
Mahindra

EV PORTFOLIO



Connected World.
Connected Experiences.

EPOWERTRAIN KEY TRENDS AND CHALLENGES



KEY TRENDS & CHALLENGES

- Limited expertise in ePowertrain technologies
- Collaboration within the eMobility value chain
- Charging infrastructure
- Government regulations and subsidies



CUSTOMER'S FOCUS AREAS

- Achieve ZERO emission
- Complete powertrain solutions
- Advanced software and controls for seamless integration

EPOWERTRAIN FOCUS AREAS



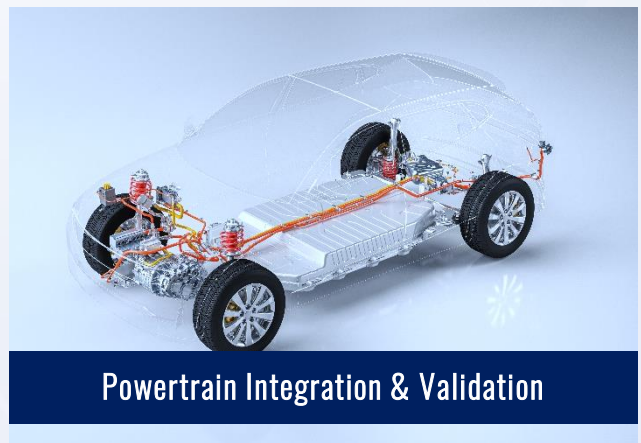
Drivetrain Development



Battery Management Systems Design



Charging Solutions Development



Powertrain Integration & Validation

SERVICES OFFERING



ELECTRIC MOTOR

- Electro Magnetic Modeling
- Torque Speed Characteristics
- Efficiency Mapping
- Thermal Modelling
- FEA & CAE Simulations



BMS

- Highly Efficient SoC & SoH Algorithm
- Passive Cell Balancing
- Liquid Cooled Thermal Management
- Master Slave Architecture



OBC / DC-DC CONVERTER

- High Performance AC – DC Converter
- Power Factor Correction Control, DC –DC Converter



POWER INVERTER

- Traction Power Distribution with Protection
- Auxiliary Circuit Power Distribution and Protection
- Integrated Pre-charge circuit



POWER STORAGE SYSTEMS

- Regenerative Power Storage System for Electric Vehicle based on Ultra Capacitors
- Ultra Regenerative Power Storage System for Electric Vehicle



POWER DISTRIBUTION UNIT

- High Performance Motor Control Algorithm
- Model Based Development
- Liquid Cooled Thermal Management
- Safety Compliance – ISO 26262
- EMI / EMC Compliance



VALUE PROPOSITION:

- Turnkey Solutions – End to End Program Ownership
- Ready-to-use, State-of-the-art Lab Infrastructure for EV Development and Testing (~50Mn+ USD Investments within Mahindra Ecosystem on EV Lab & Test Infra)
- 10% - 12% Cost Savings through VAVE Approach
- Future Ready : Telemetry Data + Cloud Platform + Analytics of EV Components

OUR CREDENTIALS

48V /350V Power Inverter (Motor Control ECU) for Mild HEV

Design and Development of an Integrated Motor Control Unit for Interior Permanent Magnet Synchronous Motor for Mild Hybrid Electric Vehicle

- 20 Months+ Development Time
- 18-20 People Team
- 30+ Prototypes

BMS (Battery Management System) of 48V / 350V Electric Vehicle

Design and Development of Battery Management System of Lithium-Ion Battery Pack for 48V Electric Vehicle

- BMS System Level Design – Master Slave Architecture
- Software Design and Development
- Hardware Design and Development
- Testing : Software, Hardware & Battery Pack Level Testing
- Functional Safety Compliance – ISO 26262

About Tech Mahindra Engineering

Tech Mahindra's Integrated Engineering Solutions (IES) delivers solutions enabling "Digital Engineering Enterprise" across aerospace and defense, automotive, industrial, telecom, healthcare, energy & utilities and ISVs. With 50+ exclusive global engineering centers supporting new program launches and 350+ active global customers, Tech Mahindra IES is an established leader for Engineering Services in the industry.

Tech Mahindra delivers exponential value to engineering enterprises by collaborating with them across three key tenets: **robust products, ubiquitous platforms and cyber factories**. The vision for Tech Mahindra engineering is founded on the new digital economy considering emerging market trends like digital engineering, intelligent workplaces, adoption of tele-everything, end-to-end connected and immersive approach covering smart manufacturing and the need for an overall resilient business framework.

We call this approach of **accelerating** outcomes, **inventing** better products and **transforming** businesses into digital as - Engineer Your NXT.NOW™

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