



DRIVING THE FUTURE OF ELECTRIC VEHICLES

We are the world leader of in-wheel motors for passenger cars, light commercial vehicles and future transport solutions.

Protean Electric is an automotive technology firm with over 100 talented people globally. Our mission is to drive sustainable transport through innovation, and we are the imagination behind vehicles that travel further, perform better and use fewer components.

We believe that freedom of ideas, integrity of response, desire to improve, and collaborative thinking drive innovation. Joining Protean means working with talented experts across the organisation who value your ideas, empower you to make a difference, and encourage you to challenge yourself and others.

Principal Power Electronics Engineer Farnham, UK

The Role

Principal Power Electronics Engineer within our Electronics team.

Main Duties & Responsibilities

The role of Principal Power Electronics Engineer is key in the development of the electronics within Protean's in-wheel motor range, throughout the entire lifecycle of the products. With ownership of power electronics development, you will lead the end-to-end delivery of EV traction power electronics systems, providing technical leadership across multidisciplinary engineering teams from concept definition through production launch.

Reporting, Location & Travel

This role reports to the Electronics Manager and is based in Farnham, Surrey with occasional requirement for national and international travel, primarily to local suppliers / partners and China.

Key Responsibilities

Responsibilities include, although are not limited to the following:

1. Key Ownership

- Ownership of the power electronics development, technical strategy and influences on roadmap
- Accountable for achievement of efficiency, power density, reliability, and performance targets
- Chairing design reviews
- Technical risk identification and mitigation
- Mentoring and coaching senior and junior engineers
- Supporting industrialisation from concept through high-volume production

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2. Key Design Responsibilities

- Drive the end-to-end development of EV traction inverter systems (50 kW to 300 kW, 400 V/800 V platforms), providing technical leadership across multidisciplinary engineering teams from concept through production launch.
- Drive the design and review inverter power stages using IGBT and/or SiC MOSFET technologies.
- Drive the power semiconductor characterisation and integration with gate drivers.
- key design decisions, and technical trade-offs (efficiency, cost, power density, reliability)
- Specify and develop gate drive circuits, SMPS circuit, DC-link, current/voltage sensing, and protection circuits.

3. Simulation, Modelling & Analysis

- Perform detailed electrical, thermal and electromagnetics simulations (SPICE, PLECS, FEA).
- Analyse switching losses, conduction losses, short-circuit behaviour, and fault responses.
- Support system-level modelling for motor-inverter interaction.

4. Thermal & Mechanical Integration

- Collaborate with mechanical teams to define thermal architecture and conduct thermal design.
- Ensure power semiconductor junction temperature targets and lifetime models are met.

5. Validation & Testing

- Lead prototypes bring-up, hardware debugging, and root-cause failure analysis.
- Define and execute DV / PV test plans (electrical, thermal, environmental).
- Support EMC/EMI troubleshooting and compliance testing.

6. Safety Compliance

- Support inverter development in accordance with ISO 26262 and automotive safety processes.
- Ensure proper creepage, clearance, and insulation coordination in line with automotive HV safety standards.

7. Cross-Functional & Supplier Collaboration

- Work closely with controls/software, motor, mechanical, vehicle integration, manufacturing, and quality teams.
- Lead or support technical discussions with Tier-2 suppliers and external partners.
- Support sourcing decisions, cost optimization, and design reviews.
- Control electronics and EMC responsibility when project requires

8. Production & Quality Support

- Support design for manufacturability (DFM) and design for test (DFT).
- Support production launch, field issues, and continuous improvement activities.

Relevant Skills & Behaviours

We value and measure ourselves against the following 'Best-Self' Behaviours:

- **Will to Win:** we succeed by delivering to customers; on time, on quality, and on cost
- **Pioneering:** we are passionate about the technology
- **Courageous:** we face our challenges
- **Working Together:** we can rely on each other, and others can rely on us
- **Personally Responsible:** we do what needs doing, when it needs doing
- **With Integrity:** we are honest, open and respectful

Successful candidates should be able to demonstrate the following relevant skills and behaviours:

- Exercise discretion and independent judgment in the performance of duties set out above



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- Ability to communicate verbally and through technical documentation in English
- Exhibit sound interpersonal skills including interfacing, coordinating and negotiating with company personnel, customers and suppliers
- Utilise computer skills to prepare and review appropriate reports and documents
- Make decisions using sound judgment while complying with policies, procedures, appropriate principles and applicable laws and regulations
- Ability to self-motivate and work with minimal oversight

Relevant Knowledge & Experience

Candidates should assess their suitability against the following essential and/or desirable relevant knowledge and experience:

Essential:

- Master's degree in Power Electronic Engineering or other relevant subjects
- A minimum of 8 years' experience in R&D of inverters for electric motors
- Practical experience of design, test and evaluation of 400V+ high voltage and 50kW to 300kW power electronics systems
- Solid SiC / GaN and gate driver application and integration knowledge
- Strong Electrical, thermal or electromagnetics modelling and simulation
- Multiple journeys through complete development life cycles
- Practical PCBA schematic and layout software experience

Desirable:

- Knowledge of Insulation Coordination
- EMC design, verification and troubleshooting
- Electromagnetic FEA simulation experience
- Familiarity with relevant automotive legislation, standards and guidelines
- Understanding of motor control and sensors
- Calculation of component stress & de-rating and reliability estimation
- Design for functional safety to ISO26262
- Using and applying DFMEA