Job Description

Role Title: Power Electronics Engineer

Reporting to: Chief Electrical and Electronics Engineer

Role Purpose:

We require a Power Electronics Engineer to develop power conversion products, motor drives and power control systems for our wide range of customer applications focussed on electric vehicles and electrification.
The successful candidate will be involved at all stages of the design process including inception, development and verification. They will liaise directly with suppliers and manufacturers and work with the wider multi-disciplinary engineering team to support the delivery of effective engineering solutions.

Key Responsibilities:

- Work closely with the electronics team and other engineering disciplines, such as software, mechanical and EDS, to develop modern, innovative, and practical power electronic solutions operating at high current or hazardous voltages
- Design of robust power electronic systems incorporating gate drives, switching devices, magnetic components and filtering with required voltage and current sensing
- Generation of detailed electronic design schematics and overseeing PCB design layouts
- Estimation of power losses and support to thermal management/analysis to manage component temperature
- Definition of control system requirements to control and monitor the system
- Commissioning and verification of power electronic systems to confirm compliance with requirements and relevant standards. Root-cause investigation and resolution of any issues
- Support prototype builds and provide electronics support for system test and integration
- Support the management of requirements, delivery of FMEA and other systems analysis and functional safety compliance at a hardware level
- Work to company engineering standards, within change control and other processes and create required project documentation to ensure necessary levels of design quality
- Delivery of engineering tasks and reporting of progress and issues in line with project milestones
- Develop and maintain relationships with external suppliers of relevant components or technologies

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Qualifications, Experience and Skills Required:

- Degree qualified in electronics engineering or similar, ideally with specialism or further study in power electronics
- Experience in development of power electronic systems such as DCDCs, inverters or rectifiers at high voltage (>400V) and high power (>10kW). Design of gate drives, selection of switching components, filter design and specification of inductors and transformers. Design of low-level analog and digital electronics to interface the power electronics to the control system.
- Component selection, schematic design and the specification, review and evaluation of PCB designs for high voltage/current
- Use of simulation tools (e.g. PLECS, PSIM, SPICE) to model system behaviour and performance
- Practical experience of lab testing of hazardous voltage systems and safe working practices
- Working within a multi-disciplinary team to deliver products to cost, time and quality constraints

Preferred:

- Experience of product development in a relevant industry (such as automotive, energy storage aerospace)
- Knowledge of EMC standards and practical experience in testing and troubleshooting
- Knowledge/experience of hardware design to functional safety standards
- Knowledge of electrical safety legislation, protection schemes and energy grids
- Experience in the design of complex multi-layer PCBs for high-current applications using industry standard toolset
- Skilled in soldering and rework of printed circuit boards and cabling to a professional standard

System or Knowledge:

- Understanding of various power conversion topologies (e.g. LLC, PSFB, DAB), multi-level switching and how to select appropriately depending on the application. Understanding of the algorithms and techniques used to control them and optimise their operation.
- Understanding of switching device technologies (e.g. Si MOSFET/IGBT, SiC, GaN) and package types and how to select appropriately depending on the application
- Understanding of gate driver specification and critical factors affecting switching performance
- Understanding of magnetic components, their specification (including core and winding materials), construction and mechanisms for power loss
- Understanding of thermal analysis techniques to estimate and limit device temperature

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Personal Attributes:

- Good problem solving and analytical skills
- Quality-focussed with an attention to detail
- Strong communication skills – including report writing and presentation
- Self-motivated and enjoys working within a team environment
- Willingness to accept responsibility and challenges required to achieve objectives
- Commitment to professional development and continuous learning

Location and Travel:

- You must be eligible to work in the UK and have no restrictions for world-wide travel.
- This role is based at our Head Office in the UK, with flexibility for remote working.
- Working hours are 0900 to 1700, including 30-minute paid break, 5 days a week, however some travel is expected, and flexible working patterns are essential to the role.

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