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| Job title  | Research Associate/Fellow  | Job family and level | Research and Teaching Level 4 Training Grade/ Level 4 |
| School/Department | Faculty of Engineering – PEMC Research Group | Location | PEMC Centre, Triumph Road, Jubilee Campus, Nottingham |
| Purpose of roleApplications are invited for two full-time 18-month Research Associate/Fellow positions within the Power Electronics Machines and Control research group. The successful candidates will support three new research projects funded by EPSRC and Horizon Europe in designing fast switching power semiconductor modules and electrical circuits using wide bandgap devices (silicon carbide and gallium nitride). This could include models for electronic packaging and circuit (e.g. interconnects such as wirebonds, solder joints and PCB), and for semiconductor devices (e.g. SiC-MOSFET, GaN-HEMT etc.). |
|  | Main responsibilities(Primary accountabilities and responsibilities expected to fulfil the role) | **% time** **per year** |
| 1 | Plan, develop and conduct individual and collaborative research tasks in the area of characterisation and modelling of wide-bandgap power semiconductor devices (SiC and GaN), modules and circuits. Sustain and purse a personal research plan and present findings at internal project meetings. Take responsibility for planning future research tasks. | 40% |
| 2 | Produce technical reports and written deliverables. | 10% |
| 3 | Produce reports, datasets and computer models, based experimental investigations, for internal use and delivery to project partners. | 30% |
| 4 | Present results at project review meetings, including to external academic and industry partners. Present results at national and international academic conferences. | 5% |
| 5 | Guide and mentor other researchers and research students. Provide technical support to researchers working in related areas. | 5% |
| 6 | Maintain good working relations with external partners through effective and regular communication. | 5% |
| 7 | Any other duties appropriate to this post as required by line manager | 5% |

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| Person specification |
|  | **Essential** | **Desirable** |
| **Skills** | * General laboratory practical skills, e.g. use of electronic test equipment for electrical, thermal characterisation of electronic components.
* The ability to model power semiconductor devices or simulate power electronics circuits using software (at least one from below: MATLAB/Simulink, LTSpice, PSpice, Saber, TCAD, PLECs….)
* Excellent communication and presentation skills.
* Candidates should also have the ability to work independently within a multidisciplinary research team and have excellent communication and presentation skills.
 | * Computer programming skills in a relevant language for software co-simulation.
* Publications in peer-reviewed journals and conferences.
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| **Knowledge and experience** | * Knowledge of wide bandgap (SiC/GaN) power semiconductor devices and their characteristics.
* Experience of designing PCB and circuits for semiconductor device test and evaluation
* Experience working independently within a multi-disciplinary research team, such as might be gained from working within an academic research group.
 | * Knowledge of electronic system packaging and assembly techniques, and the impact of these techniques on system electro-thermal performance, reliability and/or experience using equipment for packaging semiconductors (e.g. soldering, sintering, wirebonding).
* Experience using equipment for characterisation of electronic components: e.g. electrical characterisation of semiconductors (static I-V curves, capacitance measurement, parasitic inductance measurement, double pulse tests, electromagnetic noise emission measurement); thermal characterisation of components (thermal impedance measurement).
* Experience using commercial Finite-Element type simulation software for electro-thermal or electro-magnetic simulation of electrical/electronic component/circuit.
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| **Qualifications, certification and training (relevant to role)** | * Either hold, or be about to obtain, a PhD in electrical/electronic, mechanical or materials engineering or a related subject.
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| Expectations and behaviours |
| The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University’s strategy, vision and values. The following are essential to the role: |
| **Valuing people** | Is friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported. |
| **Taking ownership** | Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations. |
| **Forward thinking** | Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process. |
| **Professional pride** | Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices. |
| **Always inclusive** | Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area. |

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| Key relationships with others |