UNIVERSITY OF CAMBRIDGE

Athena SWAN Silver Award

Further Information: HR7.

Job title	Research Assistant/Associate in Power Electronics Packaging and Integration
Grade	5/7
Salary range	Research Assistant: £33,662 - £36,320 Research Associate: £38,448 - £46,970
Staff Group	Research
Department / Institution	Department of Engineering

Role-specific information

Role Summary

The post holder will research advanced power electronics packaging and integration within Professor Teng Long's Power Electronics Research Group, combining package structural design, multiphysics modelling and experimental validation for SiC and GaN devices. The work will investigate chip-scale and module-level architectures, die attachment, interconnections and thermal interfaces. Power semiconductor electrical and thermal testing will form an integral part of the design process, including transient thermal impedance measurements, structure-function analysis and thermal-network identification. Measured results will validate models and guide improvements in heat flow, electrical parasitics, thermomechanical stress and reliability. Power cycling and degradation analysis will support the development of robust, low-stress and resource-efficient packaging.

Appointment at Research Associate level is dependent on having a PhD. Those who have submitted but not yet received their PhD will be appointed at Research Assistant level, which will be amended to Research Associate once the PhD has been awarded.

Key Responsibilities

Research on advanced power electronics packaging and integration • Design and fabricate chip-scale and module-level SiC/GaN packages, including die attachment, interconnections, thermal interfaces and heat-spreading structures. • Develop electrical, thermal and thermomechanical models using finite-element analysis and compact thermal networks; extract parameters and correlate models with experiments. • Develop power semiconductor electrical and thermal tests to assess conduction and switching behaviour, electrical parasitics, junction temperature and transient thermal impedance. • Use temperature-sensitive electrical parameters, structure functions and thermal-network identification to assess heat-flow paths and junction-to-case thermal resistance. • Conduct power cycling and failure analysis; relate changes in thermal response to package degradation and use the findings to refine package structures and materials. • Develop automated acquisition and analysis software and reproducible test procedures; compare design variants against performance, reliability and resource-efficiency objectives.	**70%**
Writing research publications and documentation	**10%**
Liaison with the Academic or Industrial Partner and attending project meetings	**10%**
Guiding PhD students and assisting the PI in preparing research proposals	**10%**

Location	Department of Engineering, The Electrical Engineering Building, 9 JJ Thomson Avenue, Cambridge, CB3 0FA
Working pattern	Full time
Hours of Work	Your employment is full-time.
Length of appointment	12 months or until 31/12/2027, whichever comes sooner.
Limited funding	This post is funded by a research grant or contract and, in the event that this funding should cease, the post may be at risk of redundancy. In the first instance, the funding supporting the post is available for 12 months or until 31/12/2027, whichever comes sooner and the head of department, or his/her nominee, will keep the role holder informed of the funding situation.

Probation period	The probation period is 6 months.
Annual leave	Full time employees are entitled to annual paid leave of 6.6 weeks (or 41 days for those working full time), inclusive of public holidays (pro-rata for part-time staff). The period for calculating entitlement to holiday leave in any particular year is the academic year i.e. 1 October to 30 September.
Pension eligibility	You will automatically become a member of the Universities Superannuation Scheme (USS) on commencement of employment. Please note that it is not possible to opt out of the scheme until you have received certain specified information about the pension scheme and this will be sent to you shortly after you have been paid for the first time. Pension scheme details are available on our web pages at: http://www.pensions.admin.cam.ac.uk/. Information about the legal requirement for the University to automatically enrol its eligible jobholders into a qualifying workplace pension scheme is available on our web pages at: http://www.pensions.admin.cam.ac.uk/auto-enrolment-workplace-pensions.
Retirement age	The University does not operate a retirement age for research staff. Further details are available in the University Retirement Policy on our web pages at http://www.hr.admin.cam.ac.uk/policies-procedures/retirement-policy/statement-policy.

Person Profile

This section details the knowledge, skills and experience we require for the role.

Education & qualifications	Applicants must have (or be close to obtaining) a PhD in Electrical Engineering or a related discipline, with research in power electronics packaging, integration or thermal management.
Specialist knowledge & skills	Knowledge of advanced power semiconductor packaging, SiC or GaN devices, interconnections, thermal management, and the relationship between package structure, electrical performance and reliability. Skills in electrical, thermal and thermomechanical modelling, experimental validation, and MATLAB, Python or equivalent tools for model development, test automation and data analysis. Experience with finite-element analysis, compact thermal networks or model parameter extraction is desirable.
Interpersonal & communication skills	Ability to communicate research clearly in written and spoken English, work collaboratively, and contribute to publications, research proposals and student supervision.
Relevant experience	Experience in one or more of advanced package design or fabrication, power semiconductor electrical testing, transient thermal impedance measurements, structure-function analysis, power cycling or failure analysis. Experience linking test results

	to model validation and package design improvements is desirable. At least two accepted or published journal papers.

Terms and Conditions

Pre-employment Check Requirements

We have a legal responsibility to ensure that you have the right to work in the UK before you can start working for us. If you do not have the right to work in the UK already, any offer of employment we make to you will be conditional upon you gaining it. If you need further information, you may find the Right to Work page within the 'Applying for a job' section of the University's Job Opportunities pages helpful (please see http://www.jobs.cam.ac.uk/right/have/).

Application Process

To submit an application for this vacancy, please click on the link in the 'Apply online' section of the advert published on the University's Job Opportunities pages. This will route you to the University's Web Recruitment System, where you will need to register an account (if you have not already) and log in before completing the online application form.

Please ensure that you upload your Curriculum Vitae (CV), publication list, and a covering letter in the Upload section of the online application. If you upload any additional documents which have not been requested, we will not be able to consider these as part of your application.

If you have any questions about this vacancy, please contact Michyla Castle (mc2149@cam.ac.uk).

General Information

The University of Cambridge

The University of Cambridge is one of the world's oldest and most successful Universities, with an outstanding reputation for academic achievement and research. It was ranked first in the 2011 QS World University Rankings and its graduates have won more Nobel Prizes than any other university in the world. The University comprises more than 150 departments, faculties, schools and other institutions, plus a central administration and 31 independent and autonomous colleges.

The University and the Colleges are linked in a complex historical relationship. The Colleges are self-governing, separate legal entities which appoint their own staff. They admit students, provide student accommodation and deliver small group teaching (supervisions). The University awards degrees and its faculties and departments provide lectures and seminars for students, determine the syllabi for teaching and conduct research.

There is much more information about the University at http://www.cam.ac.uk/univ/works/index.html which we hope you will find helpful.

Department of Engineering

The Department of Engineering is the largest department in the University of Cambridge, representing approximately 10% of the University's activities by the majority of common metrics, and is one of Europe's largest integrated engineering departments. It achieves the highest standards in both research and teaching. Its international reputation attracts the best students, academics, sponsors and partners from around the world.

The Department seeks to benefit society by creating world-leading engineering knowledge that fosters sustainability, prosperity and resilience. We share this knowledge and transfer it to industry through publication, teaching, collaboration, licensing and entrepreneurship. By integrating engineering disciplines in one department, we can address major challenges and develop complete solutions, serving as an international hub for engineering excellence.

What the University can offer you

One of our core values at the University of Cambridge is to recognise and reward our staff as our greatest asset. We realise that it's our people who have built our outstanding reputation and that we will only maintain our leading position in the academic world by continuing to attract and retain talented and motivated people. If you choose to come and work with us, you will find that we offer:

- **Excellent benefits –** You will be eligible for a wide range of competitive benefits and services, including numerous discounts on shopping, health care, financial services and public transport. We also offer defined benefits pension schemes and tax-efficient bicycle, car lease and charity-giving schemes.

  We will help you balance your home and work life by providing you with generous annual leave entitlement and procedures for requesting a career break or flexible working arrangements if you need them. You will also have access to a range of well-being support services, including in-house Occupational Health and Counselling services. If you have childcare responsibilities, you may also benefit from the enhanced maternity/adoption pay, two nurseries and a holiday play scheme that we provide.

  We are keen to welcome new employees from other parts of the UK and other countries to Cambridge. If you will be relocating to Cambridge on a centrally funded appointment of two years or more, you may be eligible for our relocation expenses scheme. The University Accommodation Service will also be available to help you find suitable rented accommodation and to provide advice on renting arrangements and local facilities, if required. In addition, certain academic and academic-related appointments are eligible for the Shared Equity Scheme which offers financial assistance with the purchase of living accommodation. You may find the pages at www.internationalstaff.ac.uk helpful in planning a relocation.

- **A welcoming and inclusive environment -** We will help you settle into your new role and working environment through a central University induction event, local induction activities and our online induction package. Where appropriate to your role, you will have a probation period to provide a supportive framework for reviewing your progress and discussing your training and development needs.

If you are relocating to Cambridge, you and your family will be welcome to attend the Newcomers and Visiting Scholars Group, which provides an opportunity to find out more about Cambridge and meet other people new to the area.

- **Extensive development opportunities -** The encouragement of career development for staff is one of the University's core values. We put this into practice through various services and initiatives, including:
  - A wide-range of training courses and online learning packages.
  - The Staff Review and Development (SRD) Scheme, which is designed to enhance work effectiveness and facilitate career development post-probation.
  - Leave for career and personal development, including long-term study leave for assistant staff and sabbatical leave for academic staff.
  - The CareerStart@Cam programme, which supports assistant staff roles without higher education qualifications to develop their skills, experience and qualifications. Assistant staff may also apply for financial assistance for study which results in a qualification.
  - Reduced staff fees for University of Cambridge graduate courses.
  - The opportunity to attend lectures and seminars held by University departments and institutions.
  - Policies and processes dedicated to the career development of researchers and the implementation of the principles of the Concordat, which have led to the University being recognised with an HR Excellence in Research Award by the European Commission.

You can find further details of the benefits, services and opportunities we offer can be found in our CAMBens Employee Benefits web pages at http://www.admin.cam.ac.uk/offices/hr/staff/benefits/. A range of information about living and working in Cambridge is also available to you within the University's web pages at http://www.jobs.cam.ac.uk/ and http://www.admin.cam.ac.uk/offices/hr/staff/.

Equality of Opportunity at the University

We are committed to a proactive approach to equality, which includes supporting and encouraging all under-represented groups, promoting an inclusive culture and valuing diversity. We make selection decisions based on personal merit and an objective assessment against the criteria required for the post. We do not treat job applicants or members of staff less favourably than one another on the grounds of sex (including gender reassignment), marital or parental status, race, ethnic or national origin, colour, disability (including HIV status), sexual orientation, religion, age or socio-economic factors.

We have various diversity networks to help us progress equality; these include the Women's Staff Network, the Disabled Staff Network, the Black and Minority Ethnic Staff Network and the Lesbian, Gay, Bisexual and Transgender Staff Network. In addition, we were ranked in the top 100 employers for lesbian, gay and bisexual (LGB) staff in Stonewall's Workplace Equality Index 2013 and we hold an Athena SWAN silver award at organisation level for promoting women in Science, Technology, Engineering and Medicine.

The Department is committed to promoting gender equality as part of a landscape of encouraging diversity, tolerance and a culture of mutual support. The dedicated Diversity Committee oversees equality, diversity and inclusion related activities in the Department, and holds regular events to promote Engineering to under-represented groups. The Department was first granted an Athena SWAN Silver Award in 2017, which was renewed in September 2020 to recognise the Department's ongoing

commitment to advancing the careers of women in STEMM. The Department of Engineering continues to make excellent progress towards achieving gender balance amongst its staff and students. More information on the Athena SWAN Charter can be found here.

Information if you have a Disability

The University welcomes applications from individuals with disabilities and we are committed to ensuring fair treatment throughout the recruitment process. We will make adjustments to enable applicants to compete to the best of their ability wherever it is reasonable to do so, and, if successful, to assist them during their employment. Information for disabled applicants is available at http://www.admin.cam.ac.uk/offices/hr/staff/disabled/.

We encourage you to declare any disability that you may have, and any reasonable adjustments that you may require, in the section provided for this purpose in the application form. This will enable us to accommodate your needs throughout the process as required. However, applicants and employees may declare a disability at any time.

If you prefer to discuss any special arrangements connected with a disability, please contact Michyla Castle, who is responsible for recruitment to this position by email at mc2149@cam.ac.uk. Alternatively, you may contact the HR Business Manager responsible for the department you are applying to via hrenquiries@admin.cam.ac.uk.