



Ampère

Unité Mixte de Recherche du CNRS - UMR 5005

Génie Électrique, Automatique et Bio-Ingénierie

Post Doctoral offer:

Subject : Advanced Characterization of SiC power thyristor

Scientific field and context:

The civilian market for SiC power devices have been driven by an exponential growth since the 2010s, thanks to the needs of automotive and solar industry. The industrial offer is now mature for 1200 V and 1700 V SiC components, either diodes, MOSFETs. However, the higher the breakdown voltage goes, the sparser the market offer gets. This results from lesser market size, and technological difficulties that remain to be solved. However, SiC semiconductor is probably even more attractive for higher voltages range (3.3kV-10kV) when compared to Si solutions. It is worth noticing that at higher breakdown voltage classes bipolar transistors such as GTOs are expected to be available earlier than MOSFETs because of their higher current and voltage capabilities, and the more complex reliability issues for the latter transistor. So bipolar devices will be relevant for the civilian market, even if they are deemed less convenient application-wise. The CARTHAGE project aims to provide such a demonstration.

Objectives:

As part of the ASTRID Carthage project (<https://anr.fr/Projet-ANR-23-ASM2-0010>), the Ampère Laboratory will recruit a postdoctoral researcher to conduct advanced characterization of SiC power thyristors and diode samples.

The tasks include:

- On-die and packaged electrical characterizations;
- Identification of electrically active defects (traps) using DLTS;
- Assessment of periphery protection efficiency through OBIC (Optical Beam Induced Current) measurements.

Keywords: Silicon Carbide, thyristor, power devices, characterization.

Candidate profile:



The candidate must possess a PhD degree related to semiconductor physics and must have some knowledge of power electronics. Experience in power semiconductor device characterization will be appreciated.

General information:

Duration: 13 months

Start: from April 2025

Contact: luong-viet.phung@insa-lyon.fr

Funding: ANR ASTRID Maturation CARTHAGE

Location: Ampère Laboratory, campus de la Doua, Villeurbanne, France

How to apply:

Send by e-mail: complete resume, motivation letter.