**Context of the research activity**

Power electronics is facing a new paradigm because of electric vehicles, on board charger and charger unit it is necessary to design and fabricate new power module. The power module is based on heterogeneous device where power MOSFET is close to the driver and both devices are bare die, more over in many cases in the same module the digital controller is direct connected, bare die too. Based on this subject, the candidate will face:

a) the study of laser welding to manufacture dedicats packaging  
b) the study of materials useful to dissipate the heat produced by the power module and laser processable.  
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**Objectives**

The objectives of this PhD are:

- Study and characterization of polymers point out the most important materials useful from the thermal conductivity point of view and applicable for the laser welding process  
- Design of the apparatus based on the most suitable laser source, assembly of the prototype and set-up of different laser welding process such as contour and quasi simultaneous

**Skills and competencies**

The ideal candidate should be a material scientist or engineer, chemical or physical engineer, or a physicist. Expertise in materials, mechanical, electronics or nanotechnologies, as well
as problem solving ability and practical experience in laboratory would be an additional value.
Candidates should have a strong motivation to learn through advanced research.