

## Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2012-TEC-ETM(4)	Integration of High efficiency SSPA with reduced footprint for satellites	ESTEC
<p><b>Overview of the Division missions:</b>            The work shall take place within the Microwave and Millimetre-wave section (ETM), Payload and Systems division, Electrical Engineering Department at ESTEC.</p> <p>The mission of the division is to:</p> <ul style="list-style-type: none"> <li>- Develop advanced RF&amp; Microwave technologies and Systems capable to fulfill next generation satellite applications</li> <li>- Support current ESA projects in the field of expertise related to on-board RF payloads (design , characterization, validation)</li> </ul>		
<p><b>Overview of the field of activity proposed:</b>            The context of this work is the development of solid state power amplifiers for RF payload systems on board Navigation, Earth observation and Telecom satellites.</p> <p>The RF amplifiers are designed such to exploit the maximum performance of their key components (RF power transistors) but doing so, the components are used close to their limits. To get maximum performance new RF amplifiers architectures are being investigated for efficiency enhancement, while ensuring safe operation.</p> <p>The aim of this training period will be two folds:</p> <ul style="list-style-type: none"> <li>- Identify the various efficiency enhancement techniques in RF amplifiers (Doherty, Class E,F,D, S Envelope Tracking etc...) suitable for integration on a single chip/package and suitability specific to space industry in terms of footprint and performance improvement</li> <li>- Identify suitable technology for implementation, requirements and resources for implementation</li> <li>- Identify clear way of working (layout, testing etc...) and implementation of it.</li> </ul> <p>The different steps envisaged for this training period are:</p> <ul style="list-style-type: none"> <li>- Detailed study of techniques available / upcoming in commercial market, improvements and possible adaptation for space industry.</li> <li>- Justification in terms of size, reliability , and performance</li> <li>- Simulation and layout of the High Power Amplifier selected topologies (based on discrete transistors or MMIC)</li> <li>- Detailed layout, test and characterisation plan</li> <li>- Test reports</li> <li>- Reviews of achieved milestones</li> </ul> <p>The candidate will need to work with standard RF design tools and techniques and RF test equipment. This will include RF load pull test systems developed to determine the best non linear operational conditions of RF / Microwave power transistors, but also general RF test equipment to determine RF payload performance. Testing using complex modulated signal as per Telecom, Navigation RF payload applications is expected.</p>		
<p><b>Required Education:</b>            Microwave / Telecommunications Engineer or University Degree, familiar with RF design techniques, RF test equipment and Simulation software (e.g. ADS). Design experience of RF/Microwave circuits is required. Design skills related to RF Solid State power amplifiers is an asset.</p>		