
We are looking for a master student to work on

GaN Flying Capacitor Multilevel Converter Characterization

Background

The ongoing development of power electronics converters is pushing towards new semiconductor technologies. Currently, wide bandgap (WBG) semiconductors are quite promising, being able to greatly reduce the power losses of the converters. Among WBG, gallium nitride (GaN) devices are particularly promising for high switching frequency applications (> 100 kHz), leveraging their low switching losses.

Thesis goal

The goal of this thesis is the thermal and power loss characterization of a 100 kVA flying capacitor inverter using 650V GaN transistors.

Your tasks

- Study of the test setup based on regenerative technique
- Development of the testing procedure
- Implementation of the test procedure on the test setup (C coding on digital controllers)
- Setup of the power measurement equipment
- Laboratory testing

Necessary skills

- Basic knowledge of power electronics
- Basic knowledge of PLECS or other power electronics simulators
- **MANDATORY:** C programming skills (programming of microcontrollers) for laboratory validation

What you will learn

- Knowledge of GaN devices and multilevel inverters
- Testing procedures for high power converters
- Experimental skills in terms of i) testbench setup including power supplies and oscilloscopes, ii) use measurement systems, and iii) organization and execution of experimental tests involving power converters

Duration of the thesis: 6 months minimum

Application

We are looking forward to receiving your application. Please include your CV and a short motivation letter about why you fit the position (Italian or English). Send your application to: fabio.mandrile@polito.it, enrico.vico@polito.it, radu.bojoi@polito.it.