Bachelorarbeit

Dead-time Evaluation of IGBT with its Rated Voltage and Current in the Single Phase H-bridge Inverter

To avoid shoot-through of the dc-link, a small interval during which both the upper and lower switches in a phase leg are off. This is achieved by either interlock time of the control signals or the gate driver hardware parameters setting. In past, the value of this dead-time is chosen by the rule of thumb, and normally overrated (several µs) as result of overcautious design. In order to quantitatively investigate the value of the dead-time, a master project has been carried out in our institute. Several interesting results have been founded. However, the previous experiments are all with low voltage and current (below 150V, 5A). We find that the duration of the dead-time is strongly dependent on the working voltage and current of the IGBT itself, therefore we want to implement a new test bench which has the capability of testing the IGBT with rated voltage and current.

This masterarbeit contains three parts.
1. Test bench implementation.
2. FPGA controller programing.
3. Experimental verification and evaluation of the IGBT dead-time.

Prerequisites:
- Knowledge of control and power electronics systems
- PCB design
- Basic knowledge of C code
- Knowledge of FPGA and VHDL

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