

Master 2019

Raghu Mutthugadahalli Shivakumar

Development and Control of Stress Condition to Regulate the Temperature of the Silicon During Qualification Test.

ABSTRACT - Masterthesis

High temperature Operating Life tests (HTOL) are carried to prove the desired life time of the device in an accelerated manner. Usually, HTOL test is done in an oven at high temperature. The test depends on the temperature used to accelerate the aging of the device. In this topic, a new method of performing HTOL test for buck converters without heating chamber is presented. The operating conditions of the buck converter are optimized to induce maximum self-heating on the device to reach the junction temperature. To measure the junction temperature of the device more precisely, a substrate diode available within the device is characterized and the characteristic equation is used to measure and control the temperature. The work also tests the limitations of such diode to induce additional energy into the device to increase temperature. An automated test bench based on LabVIEW to perform HTOL-tests using this approach is developed. HTOL tests using this setup together with performance test before and after the HTOL test are presented.