



Contribution ID: 858 Contribution code: THU-PO3-803-01

Type: **Poster**

## A novel cryogenic model for SiC MOSFET

*Thursday, 18 November 2021 10:00 (20 minutes)*

Power electronic devices are typically utilized to provide quench protection for the superconducting magnets. Integrating quench protection devices in the Dewar can make the system more compact. The cryogenic characteristics of the power electronic device are therefore necessary to be studied in order to ensure that it can work properly under the low-temperature condition. The characteristics of power electronic devices, especially the threshold voltage, leakage current, and on-resistance, change significantly with temperature. Based on the typical structure, this paper analyzes the physical characteristics of several commercial SiC MOSFETs. The effect of temperature on SiO<sub>2</sub>/SiC interface is studied. Furthermore, a novel cryogenic model of MOSFET at low temperature is proposed, which is more suitable for a wide temperature range.

**Primary authors:** Ms TIAN, Chenyu; GUO, Wenyong (Institute of Electrical Engineering, Chinese Academy of Science); Mr SANG, Wenju; Mr CAI, Yang; Mr YU, Suhang; Mr XIAO, Liye

**Presenter:** GUO, Wenyong (Institute of Electrical Engineering, Chinese Academy of Science)

**Session Classification:** THU-PO3-803 Current supply, regulation & cryogenic power electronics