

# Microdefects in Czochralski single-crystal silicon

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Microdefects can corrupt manufacturing of devices in active layer under wafer surface. One of examples could be bulk microdefect oxygen precipitate, which can corrupt TIGBT manufacturing. Many researchers and technicians from semiconductor industry preciously describe microdefects in boron doped silicon single-crystals in last decades. We have done complex investigation of microdefect distribution focused on heavily N-type doped Czochralski (CZ) single-crystal silicon.

Bulk microdefects (BMD) in heavily N-type doped CZ silicon wafers after two-step annealing at temperatures 750 °C/8 h + 1050 °C/16 h has been investigated. Samples were etched in selective etchant for delineation of microdefects. We observed radial and axial distribution of bulk microdefects in silicon CZ crystals. We found possible correlation between bulk microdefects distribution and oxygen concentration distribution. Bulk microdefects distribution was compared with resistivity, pulling rate and COP defect distribution also, but without any correlation.

- 1 POŠTULKA, D.. Microdefects in Czochralski single-crystal silicon. Ostrava, 2019, Diploma thesis. Technical University of Ostrava.
- 2 ZENG, Y., J. CHEN, X. MA, Z. ZENG and D. YANG. Grown-in defects in heavily phosphorus-doped Czochralski silicon. *Physica B* 404, 2009, 4619–4621.