Advanced characterization of carrier profiles in germanium using micro-machined contact probes

The accurate determination of the sheet resistance and carrier depth profile, i.e. active dopant profile, of shallow junction isolated structures involving new high mobility materials, such as germanium, is a crucial topic for future CMOS development. In this work, we discuss the capabilities of new concepts based on micro machined, closely spaced contact probes (10 μm pitch). When using four probes to perform sheet resistance measurements, a quantitative carrier profile extraction based on the evolution of the sheet resistance versus depth along a beveled surface is obtained. Considering the use of only two probes, a spreading resistance like setup is obtained with small spacing and drastically reduced electrical contact radii (~10 nm) leading to a substantial reduction of the correction factors which are normally required for converting spreading resistance profiles. We demonstrate the properties of both approaches on Al+ implants in germanium with different anneal treatments.

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, Nanointegration, Experimental Surface and Nanomaterials Physics, Silicon Microtechnology, IMEC, Università di Catania, Università di Padova
Pages: 167-170
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: A I P Conference Proceedings Series
Volume: 1496
ISSN (Print): 0094-243X
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 0.26 SJR 0.165 SNIP 0.3
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.21 SJR 0.165 SNIP 0.246
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 0.18 SJR 0.18 SNIP 0.218
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 0.17 SJR 0.171 SNIP 0.202
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 0.16 SJR 0.164 SNIP 0.187
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.14 SJR 0.176 SNIP 0.193
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.12 SJR 0.161 SNIP 0.16
ISI indexed (2011): ISI indexed no
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.166 SNIP 0.158
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.163 SNIP 0.156
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.17 SNIP 0.132
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.171 SNIP 0.176