Abstracts

Prospects of silicon-germanium-based technology for very high-speed circuits

S. Subbanna, J. Johnson, G. Freeman, R. Volant, R. Groves, D. Herman and B. Meyerson. "Prospects of silicon-germanium-based technology for very high-speed circuits." 2000 MTT-S International Microwave Symposium Digest 00.1 (2000 Vol. I [MWSYM]): 361-364.

Silicon-germanium (SiGe) heterojunction bipolar transistor (HBT) BiCMOS technology has developed into a production manufacturing technology that replaces and extends the performance of silicon-based BiCMOS technology. The market impetus for this development has been the insatiable requirement for bandwidth in network communication at speeds up to 40 Gbit/s and the rapid growth of the global cellular and wireless LAN markets. There has also been much work on the use of silicon-based structures for microwave frequencies. This paper focuses on a review of the status of our SiGe BiCMOS technology, based on four generations of scaling CMOS-compatible SiGe. We also show in principle how techniques commonly used in III-V semiconductor technology and microwave systems can also be applied to SiGe chips, along with silicon-on-insulator (SOI) and other existing technology, to provide a possible further extension in SiGe performance, for 50+ GHz circuits.

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