

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Heat Removal with Graphene Lateral Heat Spreaders¹ S. SUBRINA, D. KOTCHETKOV, S. GHOSH², A.A. BALANDIN, Nano-Device Laboratory, Department of Electrical Engineering, University of California Riverside, Riverside, CA 92521 — Device downscaling leads to higher chip power densities. A possible approach for heat removal from the localized hot spots is incorporation to chips of materials with high thermal conductivity. Recently, graphene and few-layer graphene (FLG) were proposed for heat removal owing to their superior thermal conductivity [1]. To evaluate the feasibility of this approach we simulated numerically heat propagation in SOI-based chip with and without graphene layers. It was found that incorporation of graphene or FLG can lead to substantial reduction of the hot spot's temperature [2]. The obtained results and are important for the design of graphene heat spreaders and interconnects [3].

[1] A.A. Balandin, et al., Nano Lett., 8, (2008); S. Ghosh, et al., Appl. Phys. Lett., 92, (2008)

[2] S. Subrina, et al., Electron Dev. Lett., December (2009)

[3] A.A. Balandin, "New materials can keep chips cool," IEEE Spectrum, October 2009

¹The work at UCR was supported by DARPA - SRC through FENA and IFC.

²Intel Corporation, Hillsboro, Oregon 97124

S. Subrina
Nano-Device Laboratory, Department of Electrical Engineering,
University of California Riverside, Riverside, CA 92521

Date submitted: 29 Dec 2009

Electronic form version 1.4