Heat Removal with Graphene Lateral Heat Spreaders\textsuperscript{1} S. SUBRINA, D. KOTCHETKOV, S. GHOSH\textsuperscript{2}, 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 \cite{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 \cite{2}. The obtained results are important for the design of graphene heat spreaders and interconnects \cite{3}.

\textsuperscript{3}A.A. Balandin, “New materials can keep chips cool,” IEEE Spectrum, October 2009

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\textsuperscript{2}Intel Corporation, Hillsboro, Oregon 97124