

Abstract Submitted  
for the GEC09 Meeting of  
The American Physical Society

**Self-Regulation Plasma Doping for 2D and 3D devices** BUNJI MIZUNO, Ultimate Junction Technologies Inc., UJT LAB TEAM — Plasma Doping has been industrialized for DRAM application. On the other hand, for 3D application, conformal and shallow doping for tri-gate and side-wall doping for fins are required to form junctions on the side-walls. This requirement is quite difficult to be realized by conventional ion implantation (**II**) or cluster **II**. Plasma doping (**PD**) has been proposed as a candidate for this requirement. Relatively better conformality was achieved such as the ratio of the top to the side resistivity of fin is 1.4 by **PD** and 1.08 by **VPD** or **ALD**. In addition, sputter erosion for fins was the most significant issue in case of **PD**. We have been proposed **SRPD** as a technique to solve the less conformality of **II** and the less controllability of conventional **PD**, **VPD** and **ALD**. We present New Self-Regulation Plasma Doping (**nSRPD**) with  $B_2H_6/He$  plasma that has been developed to provide precisely controllable ultra-shallow junctions for planar FET and conformal junctions for 3D structures. Manufacturing level of process controllability (<1% on dose) and advantage on the devices of **nSRPD** has been achieved with FinFETs and planar pMOSFETs. This **nSRPD** has been developed on commercially available and production worthy plasma platform.

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Date submitted: 15 Jun 2009

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