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_{2}H_{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.