New Guideline for Hydrogen Treatment in Advanced System LSI

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The impact of hydrogen treatment in the System LSI was investigated. We have demonstrated that NBTI and HCI are degraded by excess hydrogen while improving retention characteristics of eDRAM. It is shown for the first time that anomalous degradation in TDDB for downsized MOSFET is caused by the compressive stress from STI and shows strong correlation with hydrogen process. The optimization of hydrogen processes is indispensable for highly reliable system LSI in future generations.