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P-type field effect transistor based on Na-doped $BaSnO_3$[1] YEAJU JANG, SUNGYUN HONG, JISUNG PARK, KOOKRIN CHAR, Seoul Natl Univ — We fabricated field effect transistors (FET) based on the p-type Na-doped $BaSnO_3$ (BNSO) channel layer. The properties of epitaxial BNSO channel layer were controlled by the doping rate. In order to modulate the p-type FET, we used amorphous HfO_x and epitaxial $BaHfO_3$ (BHO) gate oxides, both of which have high dielectric constants. HfO_x was deposited by atomic-layer-deposition and BHO was epitaxially grown by pulsed laser deposition. The pulsed laser deposited $SrRuO_3$ (SRO) was used as the source and the drain contacts. Indium-tin oxide and La-doped $BaSnO_3$ were used as the gate electrodes on top of the HfO_x and the BHO gate oxides, respectively. We will analyze and present the performances of the BNSO field effect transistor such as the I_{DS}-V_{DS}, the I_{DS}-V_{GS}, the I_{on}/I_{off} ratio, and the field effect mobility.

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