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Field effect transistors based on BaSnO₃ with AlO_x and HfO_x gate oxides YOUNG MO KIM, CHULKWON PARK, USEONG KIM, KOOKRIN CHAR, Department of Physics and Astronomy, Seoul National University — L-doped BaSnO₃ (BLSO) is a transparent perovskite oxide semiconductor with high electron mobility and excellent oxygen stability. We fabricated n-type field effect transistors (FETs) on undoped BaSnO₃ (BSO) buffer layers on SrTiO₃ (STO) substrates using BLSO as the semiconducting channels and amorphous AlO_x and HfO_x as the gate insulators. BSO buffer layers and BLSO channels were grown by pulsed laser deposition, while the AlO_x and HfO_x gate insulators were grown by atomic layer deposition (ALD). Sn:In₂O₃ (ITO) was used as the source, the drain and the gate electrodes. At room temperature, we achieved the field effect mobility value of 17.8 cm²/Vs for the AlO_x FET and 19.2 cm²/Vs for the HfO_x FET. The subthreshold swing was measured to be 3.2 V/dec for the AlO_x FET and 1.2 V/dec for the HfO_x FET.

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