

Abstract Submitted  
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**High mobility La-doped BaSnO<sub>3</sub> on non-perovskite MgO substrate**<sup>1</sup> YOUJUNG KIM, JUYEON SHIN, YOUNG MO KIM, KOOKRIN CHAR, Seoul Natl Univ — (Ba,La)SnO<sub>3</sub> is a transparent perovskite oxide with high electron mobility and excellent oxygen stability. Field effect device with (Ba,La)SnO<sub>3</sub> channel was reported to show good output characteristics on STO substrate. Here, we fabricated (Ba,La)SnO<sub>3</sub> films and field effect devices with (Ba,La)SnO<sub>3</sub> channel on non-perovskite MgO substrates, which are available in large size wafers. X-ray diffraction and transmission electron microscope (TEM) images of (Ba,La)SnO<sub>3</sub> films on MgO substrates show that the films are epitaxial with many threading dislocations. (Ba,La)SnO<sub>3</sub> exhibits the high mobility with 97.2 cm<sup>2</sup>/Vs at 2 % La doping on top of 150 nm thick BaSnO<sub>3</sub> buffer layer. Excellent carrier modulation was observed in field effect devices. FET performances on MgO substrates are slightly better than those on SrTiO<sub>3</sub> substrates in spite of the higher dislocation density on MgO than on SrTiO<sub>3</sub> substrates. These high mobility BaSnO<sub>3</sub> thin films and transistors on MgO substrates will accelerate development for applications in high temperature and high power electronics.

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