Electronic Supplementary Information

Post-annealing optimization of the heteroepitaxial La-doped SrSnO₃

integrated on silicon via ALD

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Fig. S1 Rocking curves of the overall film stack at 44.5° 2θ for LSSO (002)/BTO (002) reflection.

As shown in Fig. S1, the XRD rocking curve of the overall film stack at 44.5° 2 θ for LSSO (002)/BTO (002) reflection has been carried out. A FWHM of 0.62° could be extract from the rocking curve.



Fig. S2 The capacitance–voltage (C–V) characteristics of Device A for frequencies from 1 kHz to 100 kHz. The capacitance is normalized by dividing the minimum.

As shown in Fig. S2, indistinct C-V characteristics indicate the significant density of



defects in the heterostructures.

Fig. S3 The capacitance–voltage (C–V) characteristics of Device B for frequencies from 1 kHz to 100 kHz. The capacitance is normalized by dividing the minimum.

As shown in Fig. S3, a tremendous amount of noise of *C*–*V* measurement indicates high defects density of films and interfaces.



Fig. S4 The capacitance–voltage (C-V) characteristics of Device E for frequencies from 1 kHz to 100 kHz. The capacitance is normalized by dividing the minimum.



Fig. S5 The capacitance–voltage (C–V) characteristics of Device F for frequencies from 1 kHz to 100 kHz. The capacitance is normalized by dividing the minimum.

As shown in Fig. S4 and S5, the capacitance shows no sign of saturation in the accumulation regime even if the low-frequency dispersion phenomenon is not obvious.



Fig. S6 The leakage current density–voltage (J-V) characteristics of Device D. The capacitance is normalized by the area of the top circle electrode with a diameter of 280 μ m.