Supporting Information for

Solution-Processed High-κ $SrTiO_3$ with High Breakdown Field for Gate Dielectrics

Dinghao Ma[1,†], Zihao Chen[2,†], Haowei Li[1], Boxi Ye[1], Liting Liu[3], Han He[1,4], Shiwei Sun[1], Nanting Luo[1], Hao Huang[1,] Daocheng Pan[1*], Bingsuo Zou[1,*]*

[1] State Key Laboratory of Featured Metal Materials and Life-cycle Safety for Composite Structures; School of Resources, Environment and Materials; Guangxi University, Nanning 530004, China.

[2] Key Laboratory of Intelligent Sensing System and Security of the Ministry of Education, Hubei Key Laboratory of Micro-Nanoelectronic Materials and Devices, School of Microelectronics, Hubei University, Wuhan 430062, China

[3] Center on Nanoenergy Research, Guangxi Key Laboratory for the Relativistic Astrophysics, School of Physical Science and Technology, Guangxi University, Nanning 530004, China.

[4] Guangdong Basic Research Center of Excellence for Energy & Information Polymer Materials, State Key Laboratory of Luminescent Materials and Devices, School of Materials Sciences and Engineering, South China University of Technology, Guangzhou 510640, China.

† These authors contribute to this article equally

*E-mail: hhuang@gxu.edu.cn; dcpan@gxu.edu.cn; zoubs@gxu.edu.cn

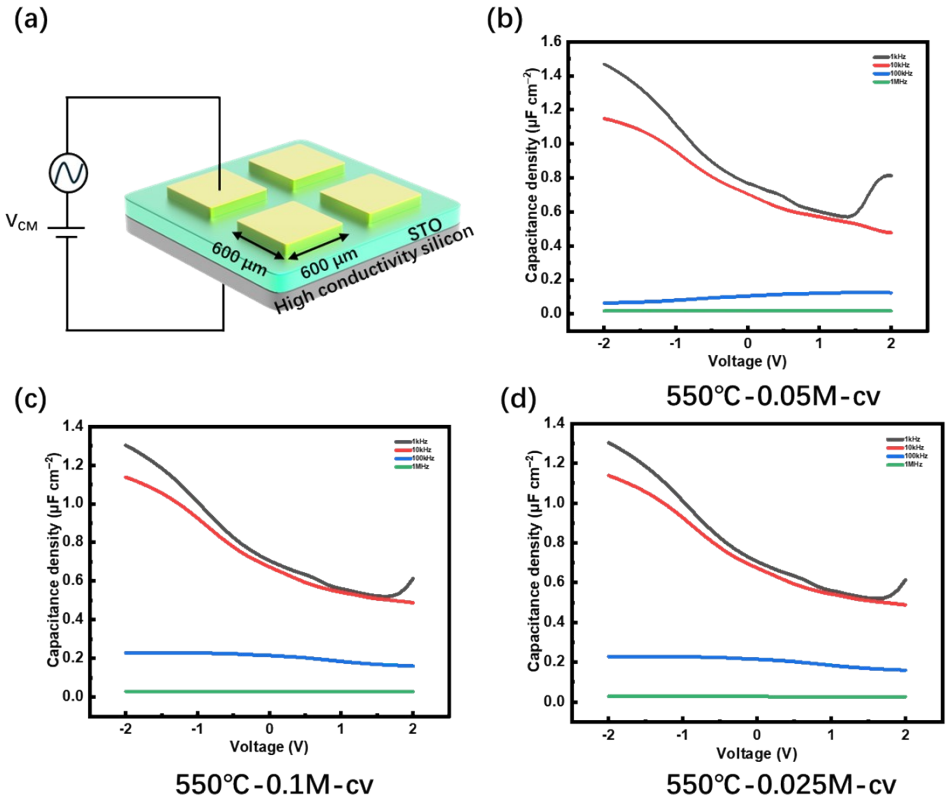

Figure S1. C-V curve with reduced concentration gradient.

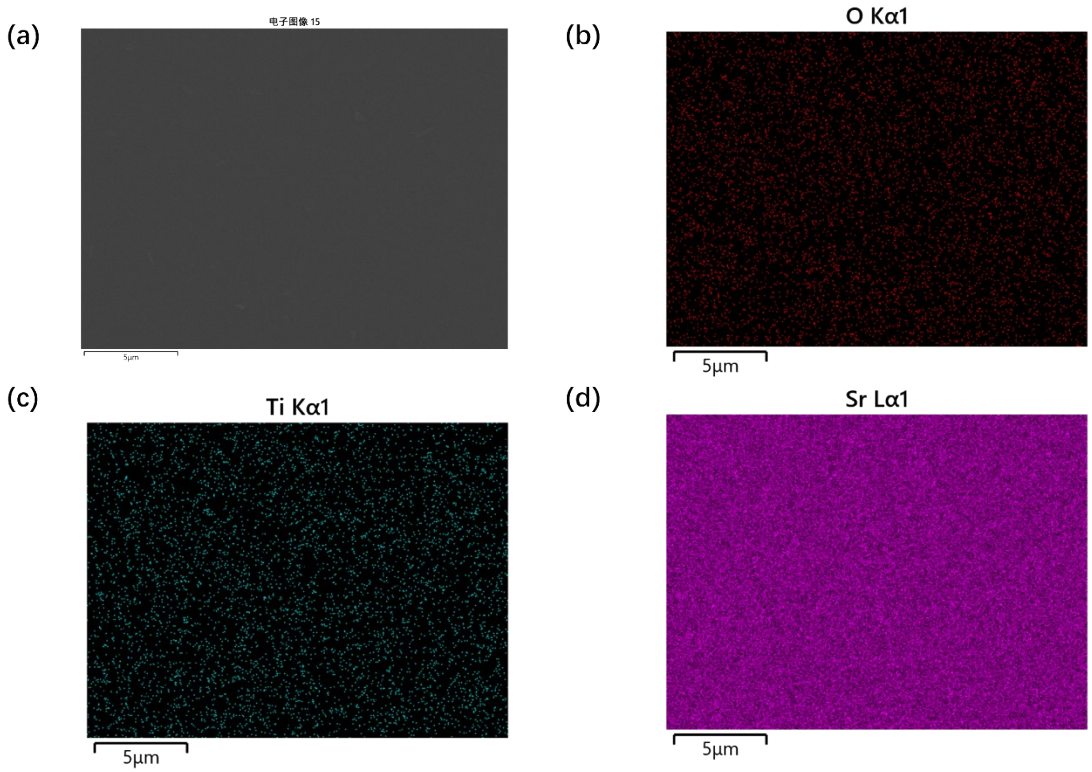

Figure S2. Energy spectrum characterization of strontium titanate thin films.

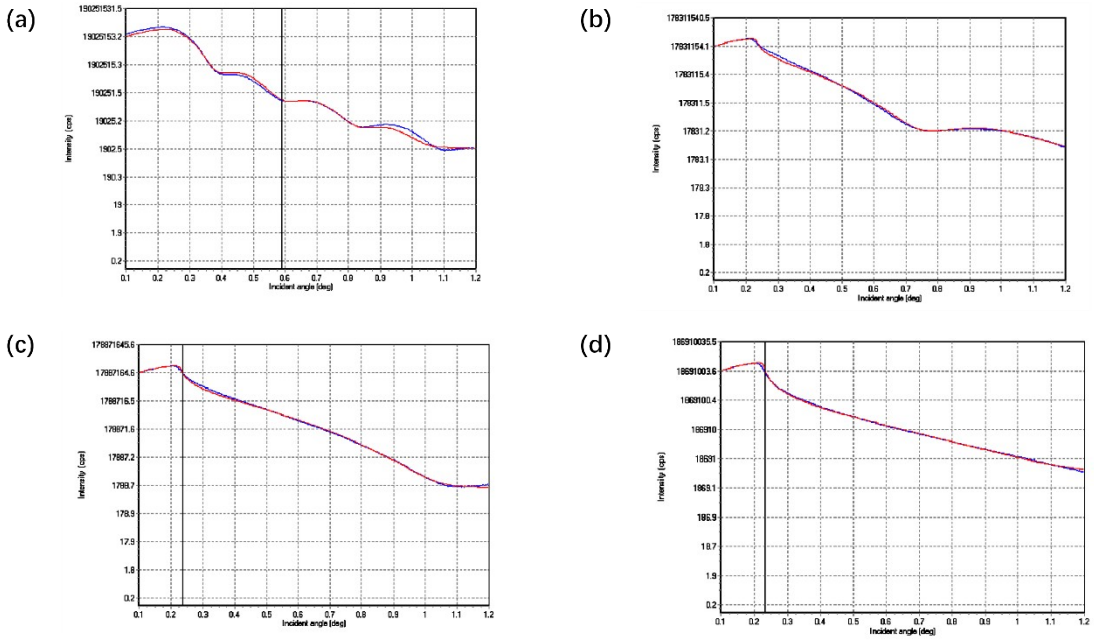

Figure S3. XRR fitting data.

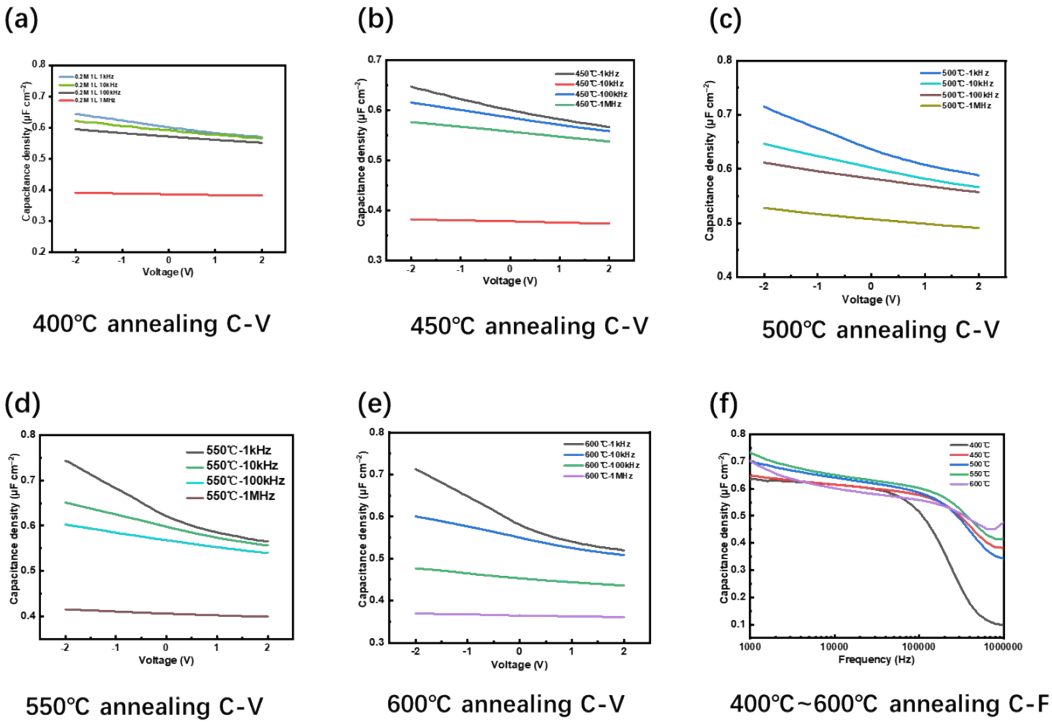

Figure S4. C-V and C-F relationship curves at different annealing temperatures with a 0.2M concentration.

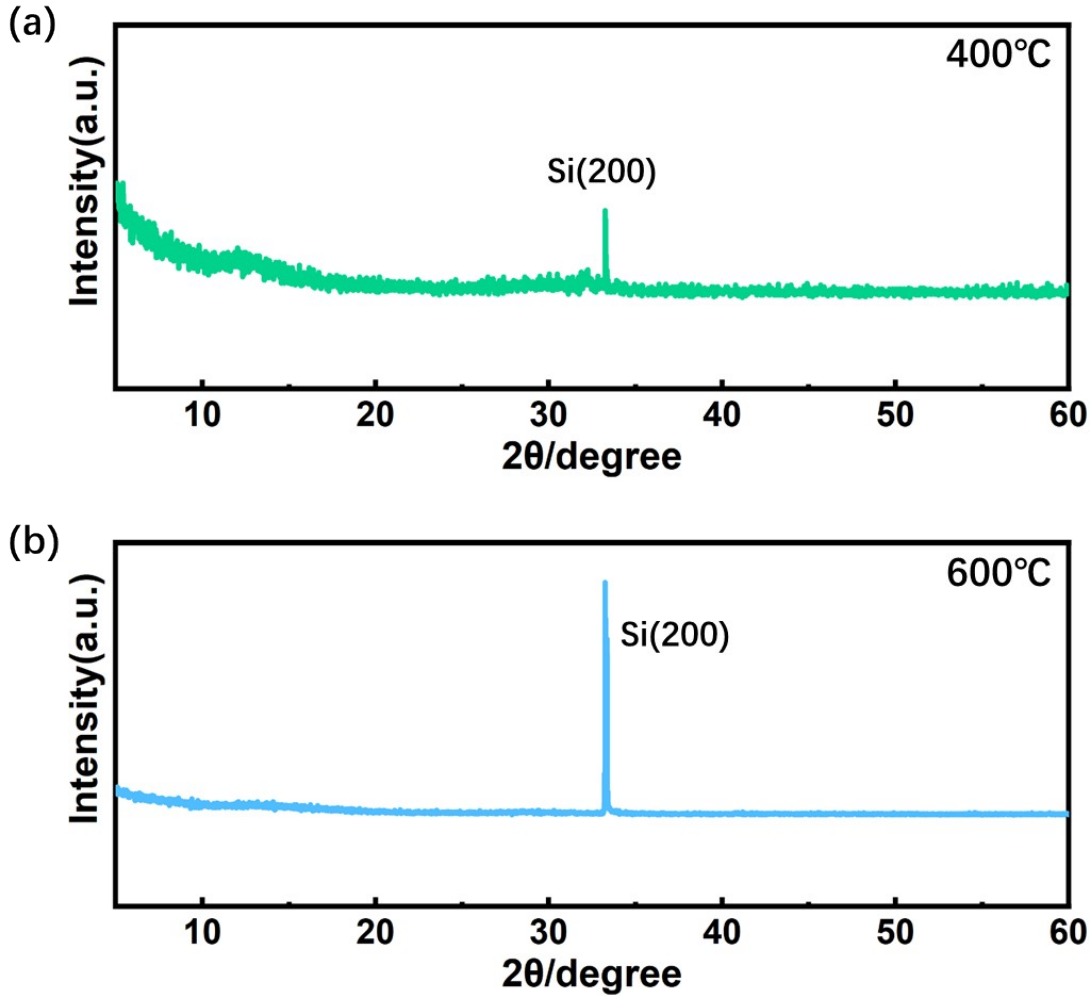

Figure S5. XRD patterns of the thin films annealed at 400 °C and 600 °C**.**

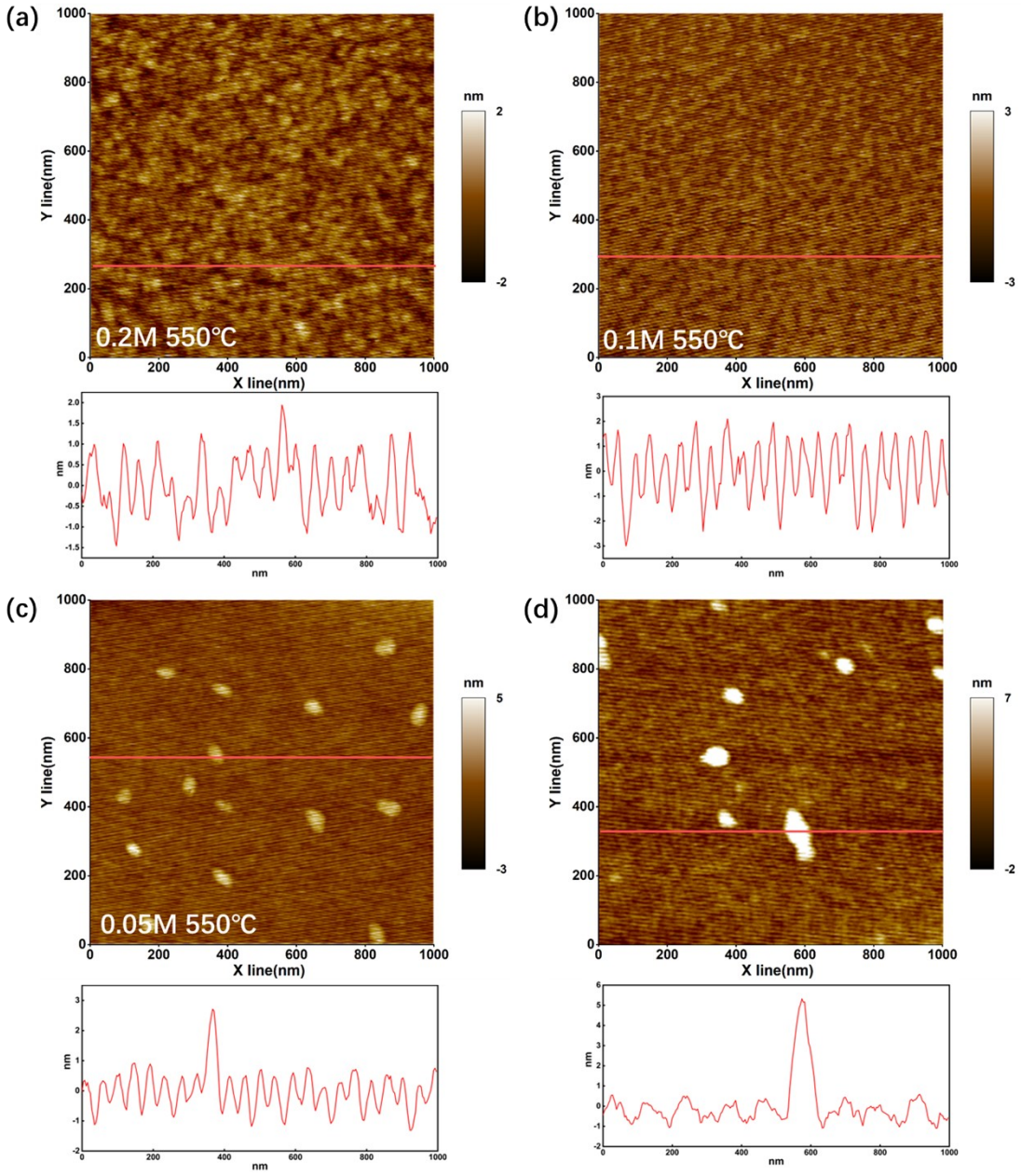

Figure S6. AFM images of thin films with varying precursor concentrations annealed at 550 ℃. The partial cross-sectional height profile is also provided.

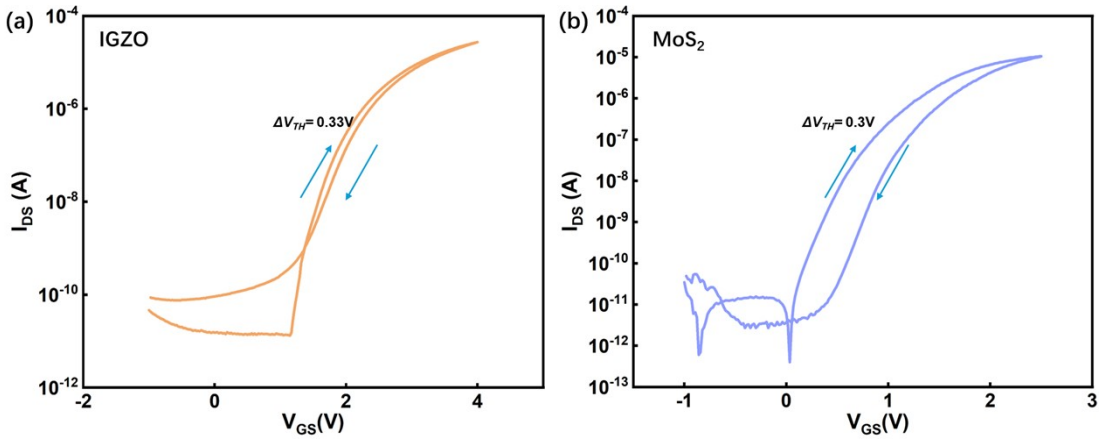

Figure S7. Bidirectional-Sweep Transfer Characteristic Curves of IGZO TFTs and MoS_2 FET

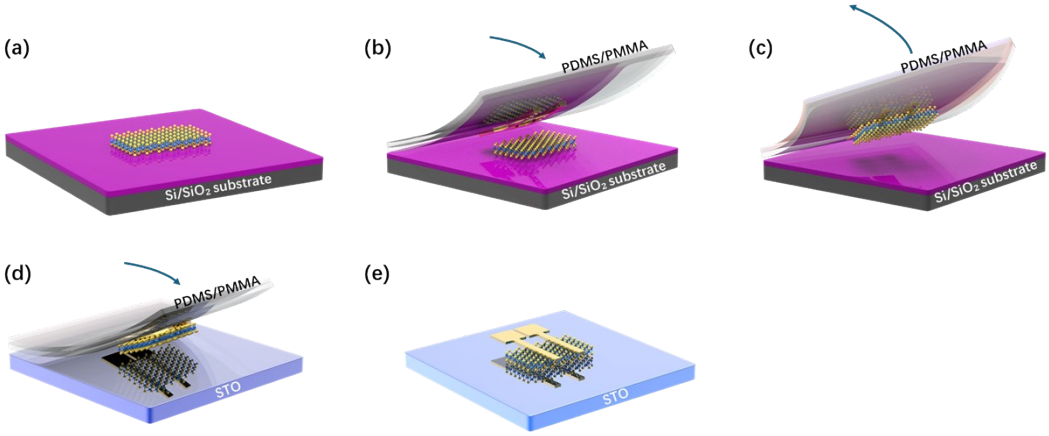

Figure S8. Fabrication procedure for MoS_2 field-effect transistors.

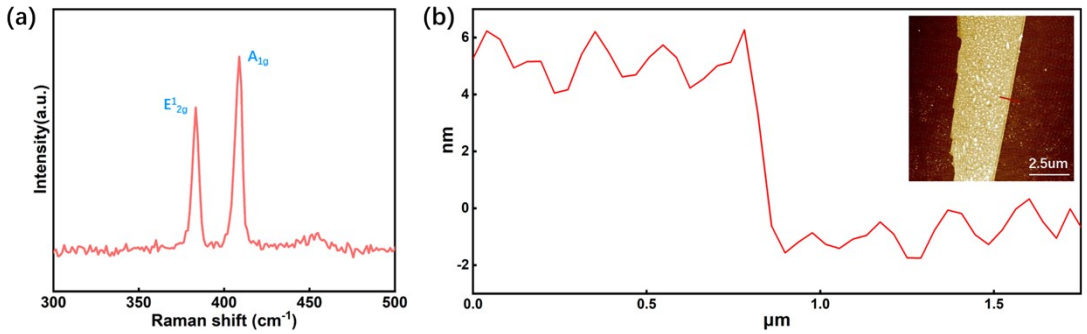

Figure S9. (a) Raman spectrum of the MoS_2 nanosheet; (b) AFM height profile taken along the red line in the inset AFM image. Inset: AFM topography of the MoS_2 flake, scale bar: 2.5 μm.

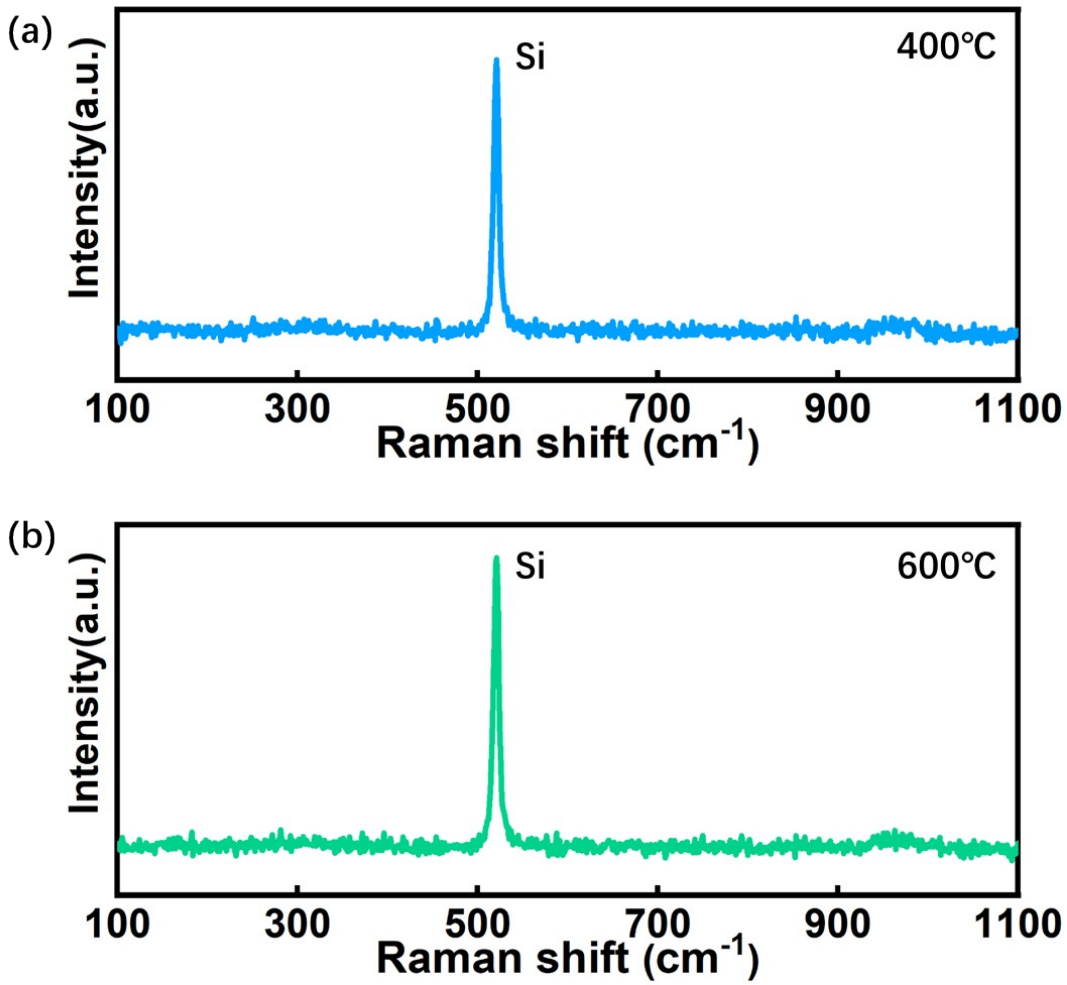

Figure S10. Raman spectroscopic characterization of $SrTiO_3$ thin films deposited from a 0.2 M precursor solution and annealed at 400 °C and 600 °C.

Table S1 Comparison Table for TFTs with Different Dielectric/Semiconductor Combinations

Dielectric	Channel materials	Ion/Ioff	μ ($cm^2/V·s$)	SS (mV/dec)	V_{TH}(V)	Hysteresis (V)	Ref.
$SrTiO_3$	IGZO	~10^6	9.15	210	1.65	0.33	This work
$SrTiO_3$	MoS_2	~10^5	4.06	0.23	0.81	0.3	This work
Al_2O_3	In_2O_3	~10^5	23.9	170	0.26	0.5	1
HfO_2	ITGZO	~10^6	32.3	206	-0.89	0.6	2
ZrO_2	ZnO	/	/	560	3.2	3	3
HfO_2-GPTMS	IGZO	~10^4	4.74	/	0.3	/	4
$HfAlO_x$-PVP	In_2O_3	~10^6	3.39	890	2.2	/	5
$ZrHfO_2$	IGZO	~10^7	2.45	680	1.2	/	6
Al_2O_3-GPTMS-PMMA	IGZO	~10^6	29.3	420	2.9	/	7
AlO_x	IGZO	~10^6	2.99	180	0.73	/	8
Al_2O_3	IGZO	~10^4	3.9	108	0.2	/	9

Reference

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