Supporting Information

Ferroelectric Relaxor Polymer Enhanced *p*-Type WSe₂ Transistor

Chong Yin^{1, 2#}, Xudong Wang^{2#}, Yan Chen^{2,3#}, Dan Li^{2,3#}, Tie Lin^{2*}, Shuo Sun²,

Hong Shen², Piyi Du¹, Jinglan Sun², Xiangjian Meng², Junhao Chu², Hon Fai Wong⁴, Chi Wah Leung⁴, Zongrong Wang¹* and, Jianlu Wang^{2,3}*

¹State Key Laboratory of Silicon Materials, School of Materials Science and Engineering, Zhejiang University, 38 Zhe Da Road, Hangzhou 310027, China, ²State Key Laboratory of Infrared Physics, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, 500 Yu Tian Road, Shanghai 200083, China, ³University of Chinese Academy of Sciences, 19 Yuquan Road, Beijing 100049, China. ⁴Department of Applied Physics, The Hong Kong Polytechnic University, Hung Hom, Hong Kong, China



Figure S1. Transfer characteristic curves of FET based on few layers WSe_2 gated by 300 nm SiO_2 with different work function metal contacts at room temperature.



Figure S2. (a) Optical microscopic image of the six-layer WSe₂ and FET in Fig.2b and 2c. The scale bar stands for 50 μ m and 5 μ m in inset. The channel width is ~ 5 μ m, length is ~ 6 μ m, and the thickness of the SiO₂ is 300 nm. (b) AFM image of this six-layer WSe₂ on Si/SiO₂ substrate and inset is height profile of a line scan across the WSe₂-SiO₂ boundary.



Figure S3. (a) Transfer and output curves inserted of a two-layer WSe₂ channel before and after coating with P(VDF-TrFE-CFE). (b) Transfer characteristic curves in linear coordinate from 40 V to -40 V of this two-layer WSe₂ FET before and after coating with P(VDF-TrFE-CFE). The field effect mobility versus V_{bg} is shown in the inset.



Figure S4. Transfer characteristic curves of the same six-layer WSe₂ FET in Fig.2b after the coated sample is placed in ambient condition just after coating with P(VDF-TrFE-CFE) and for 7 days, respectively.



Figure S5. (a) Threshold voltage (V_{th-off} and V_{th-on}) and (b) Subthreshold swing (SS_{off} and SS_{on}) extracted from the transfer curves in Fig.4a and 4b at different temperatures.