

Supplementary Information

Table S1: cartesian coordinates of the β -SiC₇ cell

Element	x(Å)	y(Å)	z(Å)
Carbon	0.7090258	0.95323794	5
Carbon	3.3434514	3.7404826	5
Carbon	4.4902877	2.9190529	5
Carbon	4.5954874	1.4910524	5
Silicon	0.70824057	3.7938571	5
Carbon	2.1964201	2.9191259	5
Carbon	2.0924904	1.4910753	5
Carbon	3.3439942	0.67284241	5

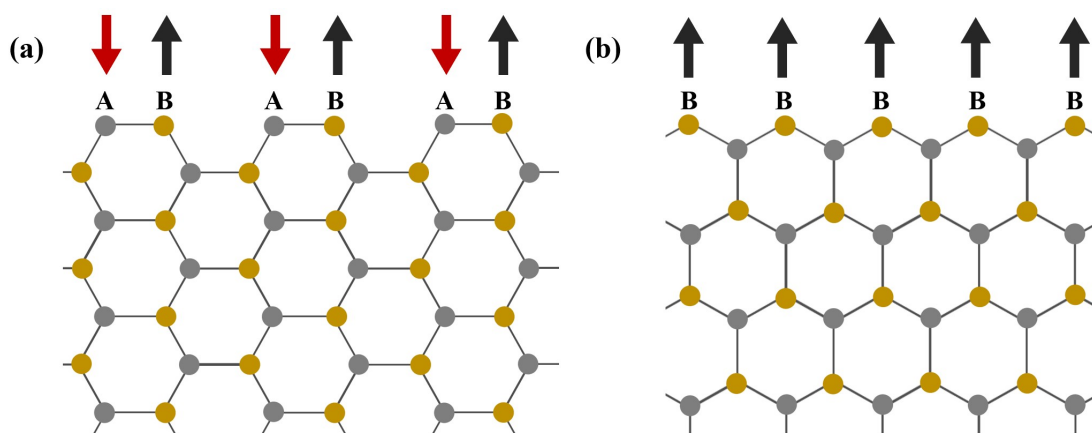


Figure S1. Schematic diagrams of the sublattice symmetry of (a) armchair and (b) zigzag edges. The circles represent sites and the up- and down-arrows indicate spins.

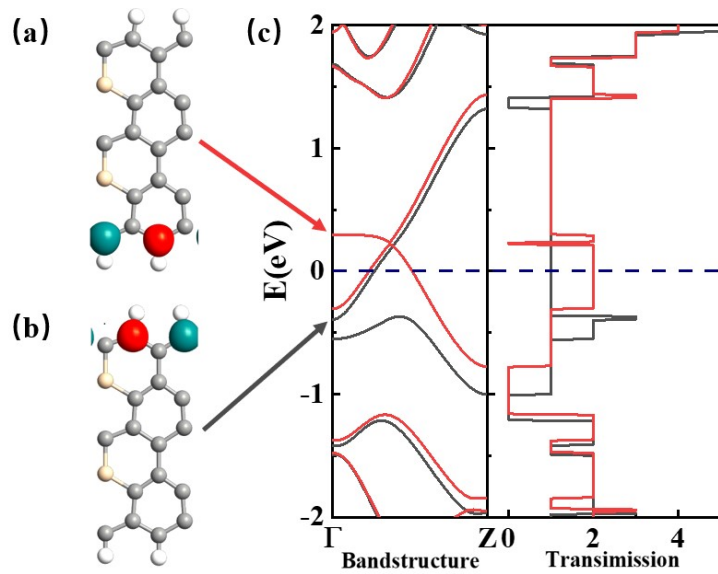


Figure S2. (a)-(b) Isosurface plots of the Γ -point wave functions of the two nearest subbands to E_F . (c) Spin-dependent band structure and transmission spectrum of 5-ZCC in the FM state.

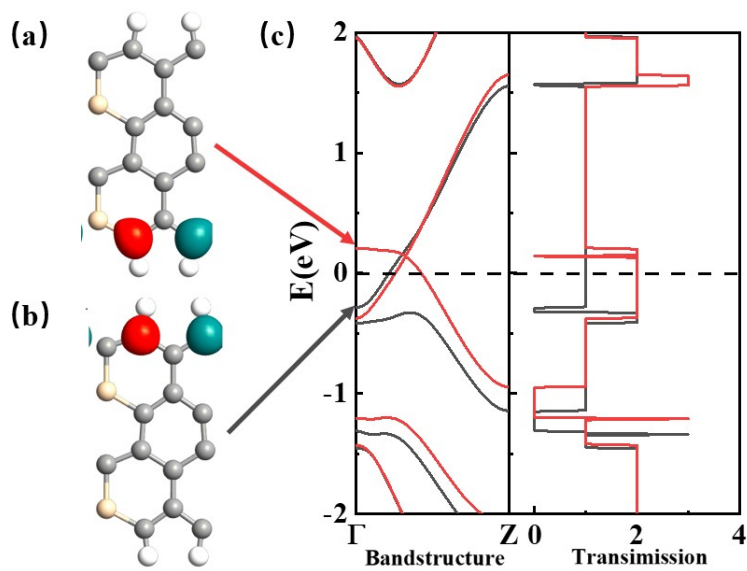


Figure S3. (a)-(b) Isosurface plots of the Γ -point wave functions of the two nearest subbands to E_F . (c) Spin-dependent band structure and transmission spectrum of 4-ZCSi in the FM state.

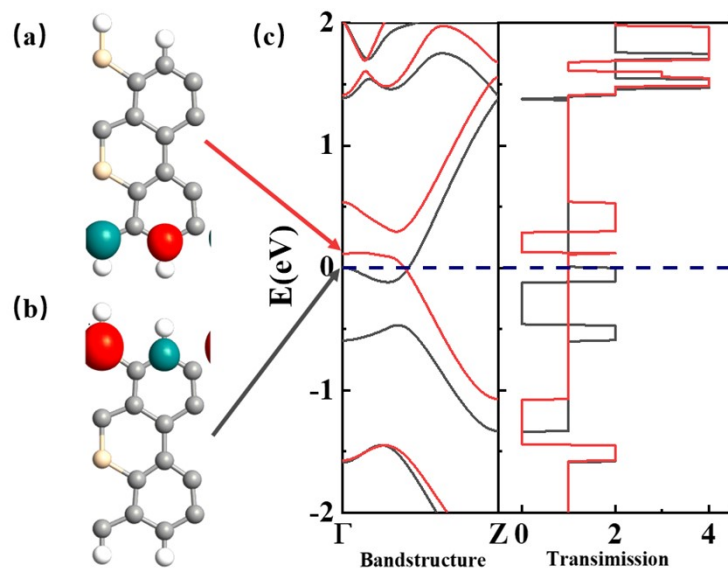


Figure S4. (a)-(b) Isosurface plots of the Γ -point wave functions of the two nearest subbands to E_F . (c) Spin-dependent band structure and transmission spectrum of 4-ZSiC in the FM state.

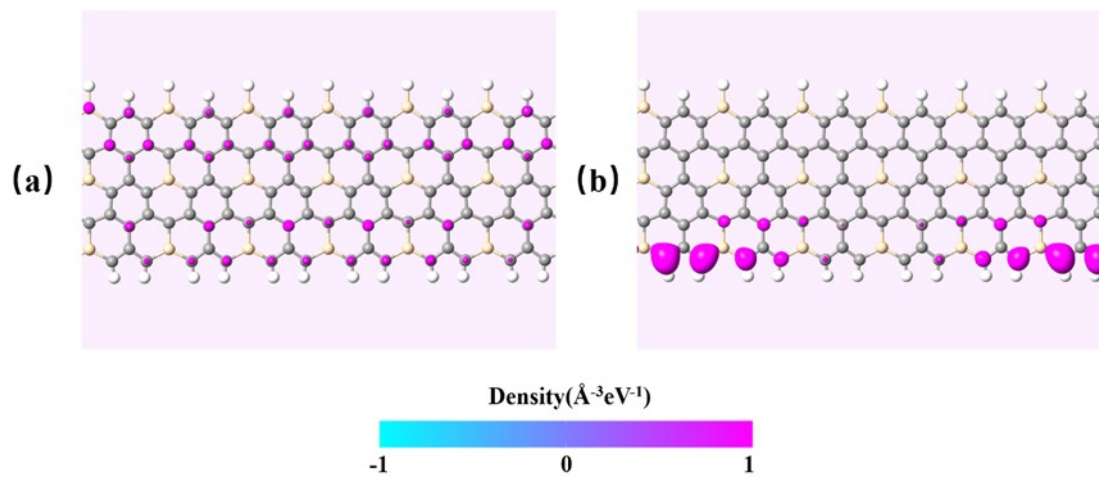


Figure S5. The LDOS of the 5-ZSiSi system at E_F is a gate voltage of 0.9 V. The left column indicates spin up and the right column shows spin down.

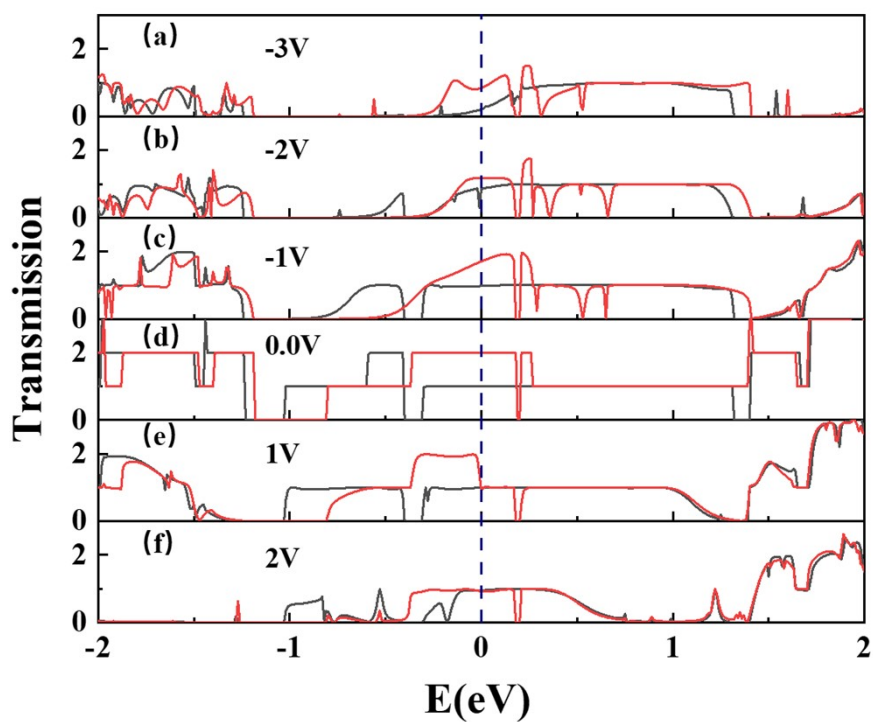


Figure S6. (a)–(f) The transmission spectra of the three-terminal 5-ZCC system at different V_g , which is denoted in each case.

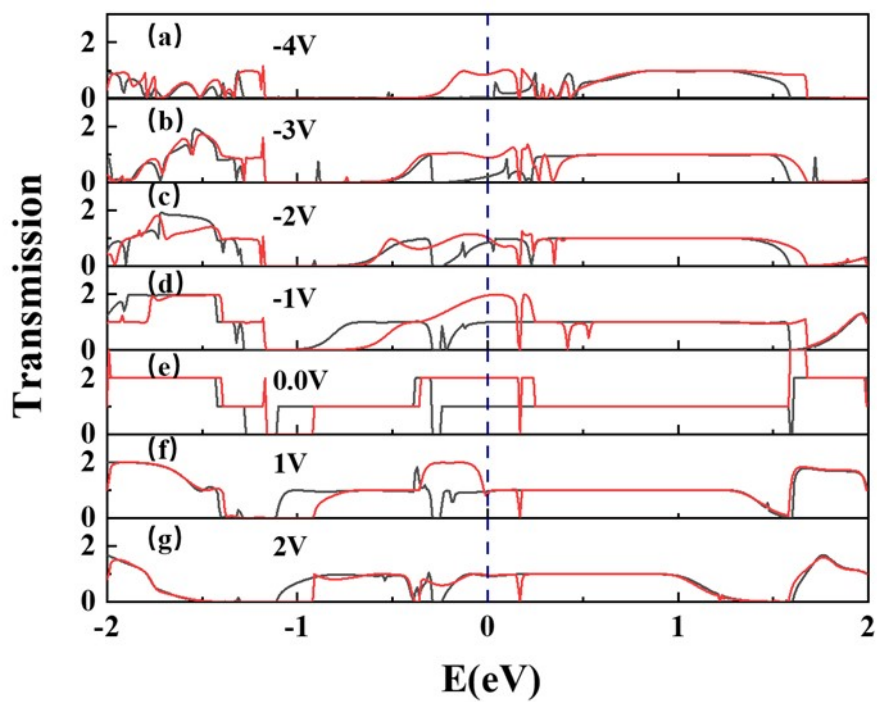


Figure S7. (a)–(g) The transmission spectra of the three-terminal 4-ZCSi system at different V_g , which is denoted in each case.

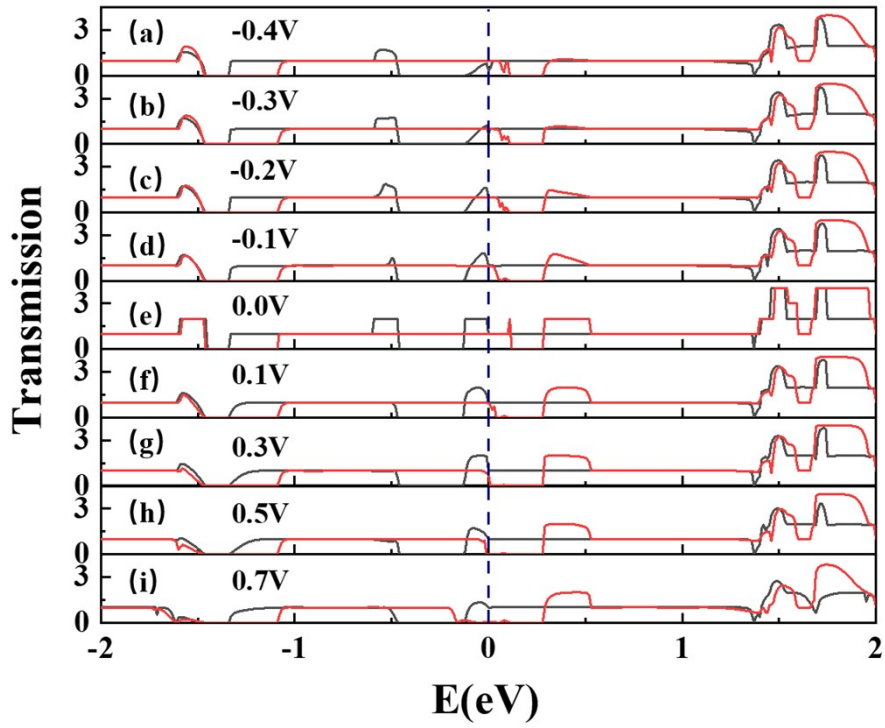


Figure S8. (a)–(i) The transmission spectra of the three-terminal 4-ZSiC system at different V_g , which is denoted in each case.

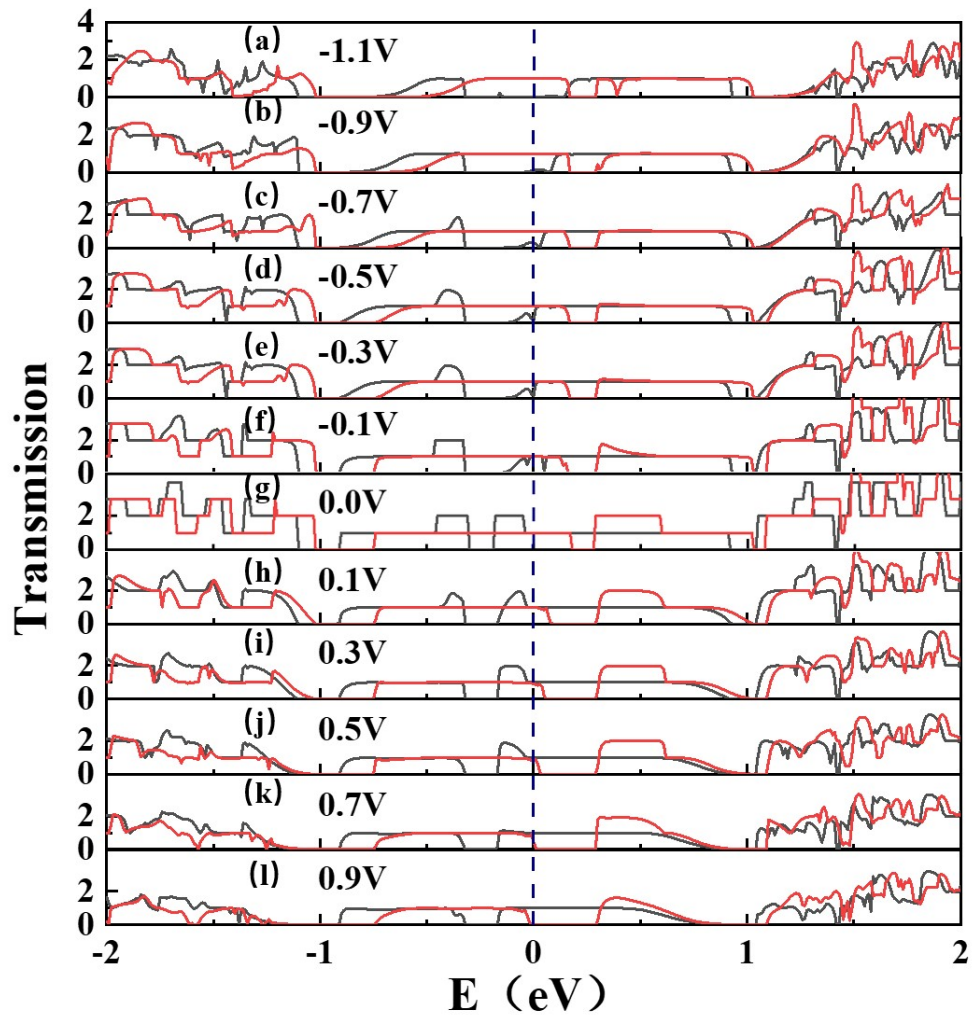


Figure S9. (a)–(l) The transmission spectra of the three-terminal 7-ZSiSi system at different V_g , which is denoted in each case.