



Figure 1. Diode schematic and measurement results of Si/GaN, AlN/Si, and GaAs/GeSn diodes. (a) Device structure (b) Optical microscope image of the diodes, and (c) IV curves of the diodes

	Si/GaN	AlN/Si	GaAs/GeSn
Diode Structure	p-n	n-p	n-i-p
Interfacial Oxide (Thickness)	Al ₂ O ₃ (0.5 nm)	SiO ₂ (0.5 nm)	Al ₂ O ₃ (1.0 nm)
On/off Ratio (@ ±2V)	2.84 × 10 ⁹	*6.37 × 10 ¹	9.39 × 10 ⁴
Ideality Factor	1.36	1.83	1.66

*Low on/off ratio of AlN/Si diode is due to band to band tunneling current at reverse bias

Table. Summary of the Si/GaN, AlN/Si, and GaAs/GeSn diode structures and IV characteristics