

## Supporting Information

# Leakage Mechanism and Cycling Behavior of Ferroelectric $\text{Al}_{0.7}\text{Sc}_{0.3}\text{N}$

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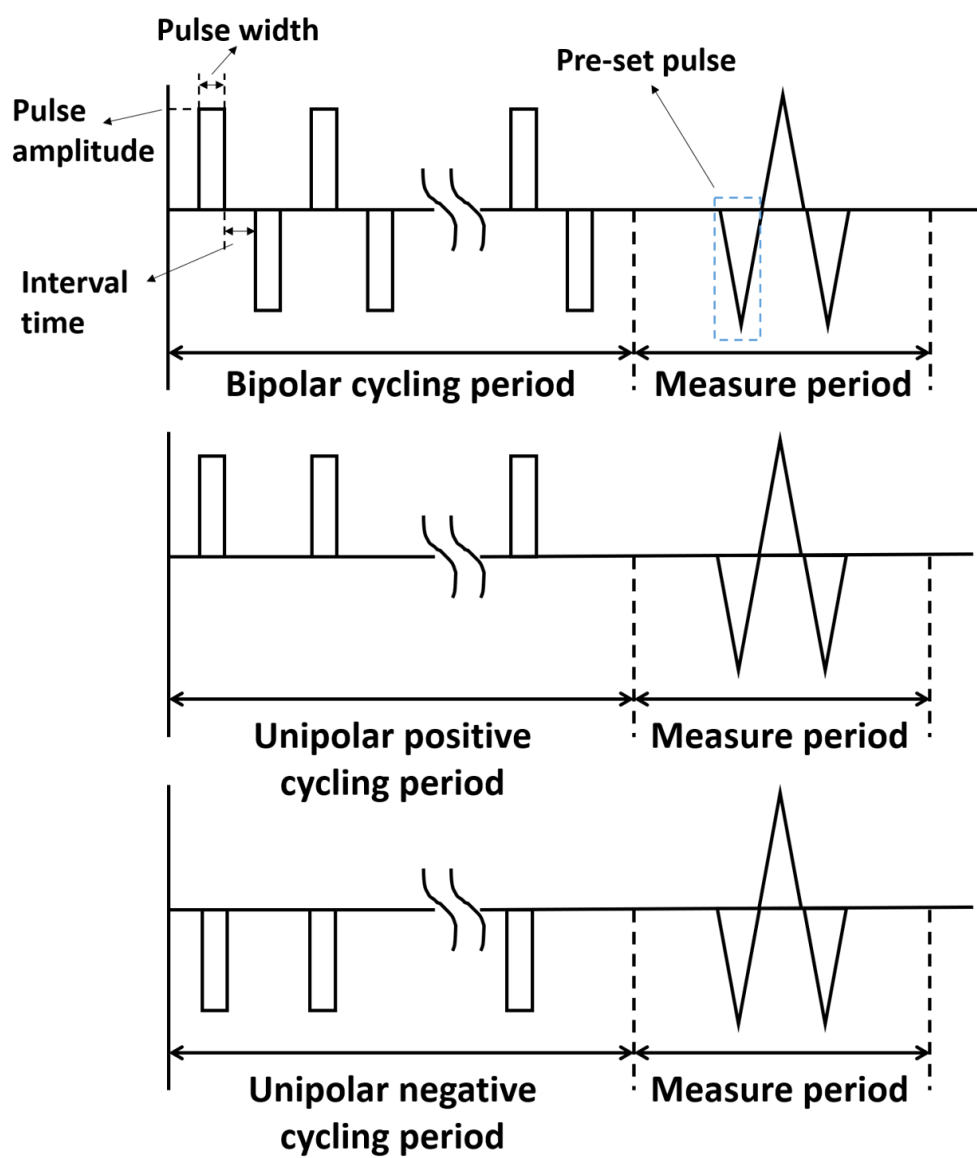
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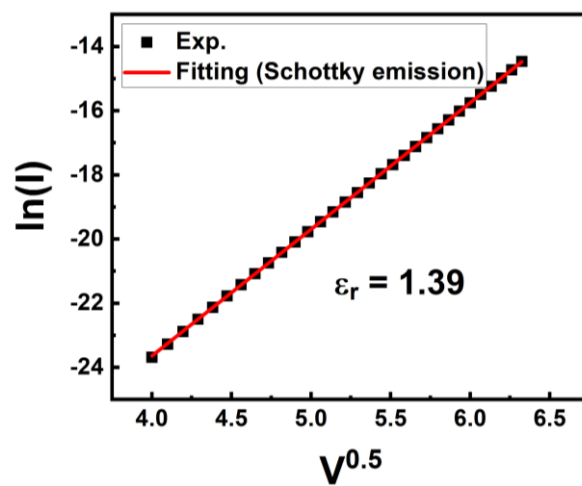
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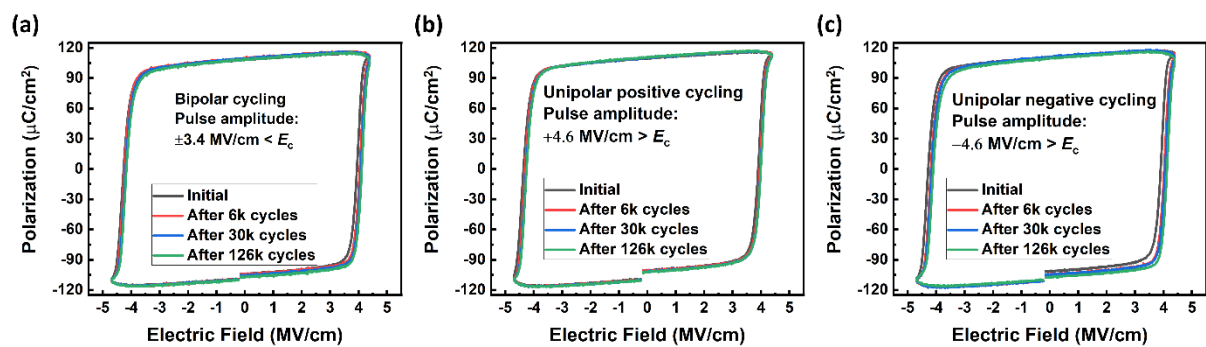
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**Figure S1.** Schematic of the pulse setup for cycling tests.



**Figure S2.** Fitting of experimental  $\ln(I)$ - $V^{0.5}$  data to the Schottky emission model. The extracted optical dielectric constant is 1.39.



**Figure S3.**  $P$ - $E$  loops of the devices undergoing bipolar cycling with a pulse amplitude smaller than  $E_c$  (a), and unipolar cycling with a pulse amplitude larger than  $E_c$  (b)-(c), respectively. There are no obvious  $P$ - $E$  degradation for all these three cases.