Supporting Information

Ultra-high energy storage performance with mitigated polarization saturation in lead-free relaxors

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Figure S1. Schematic diagram for calculating energy densities via *P*-*E* loops. The red area represents the recoverable energy density and the blue area represents the dissipated energy density. The sum of the two areas represents the stored energy density.



Figure S2. Temperature dependence of the permittivity and dielectric loss of $(Na_{0.25}Bi_{0.25}Sr_{0.5})(Ti_{1-x}Sn_x)O_3$ ceramics measured at frequencies from 100 Hz to 1 MHz. (a) x = 0; (b) x = 5%; (c) x = 10%; (d) x = 15%; (e) x = 20%; (f) x = 25%.



Figure S3. (a) Weibull analysis of breakdown strength for $(Na_{0.25}Bi_{0.25}Sr_{0.5})(Ti_{1-x}Sn_x)O_3$ ceramics at room temperature; (b) the corresponding Weibull characteristic BDS values of the ceramics.



Figure S4. (a) *P*-*E* loops of Sn20 ceramic at various electric fields; (b) the electric field dependence of the maximum polarization (P_{max}), the remnant polarization (P_r), and their difference ΔP .



Figure S5. Schematic diagram for the charging-discharging measurements. The sample (capacitor) is first charged by the external voltage source, and then, through the high-voltage switch, the stored energy in the sample is discharged to a load resistor, and the current waveform is recorded.