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Supplementary information

Comprehensively enhanced energy-storage properties in $(Pb_{1-3x/2}La_x)(Zr_{0.995}Ti_{0.005})O_3$ antiferroelectric ceramics *via* composition optimizing

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Experimental procedure

The high-quality slurry, the second ball-milled PLZT matrix powders, solvent (toluene/ethanol) and dispersant (phosphate ester) were ball-milled at 200 rpm for 12 h. Then, binder (polyvinyl butyral), plasticizer (polyethylene glycol-400/benzyl butyl phthalate) and homogenizer(cyclohexanone) were added and ball-milled for 12 h. And then, the bubbles were removed from the slurry in a defoaming machine. The prepared slurry with good liquidity was cast on a film-belt substrate with an initial thickness of 100 mm by using a tape casting machine. The wet films were kept for 12 h at room temperature for desiccation. The ceramic thick films were cut to square with the diameter of 12 mm and the same thick films were pressed into square green bodies at 30 MPa and 70 ^{o}C by using a hot press mold. Finally, the samples were sintered to form ceramics. The thickness of testing sample before and after sintering is about 405 μm and 350 μm, respectively.

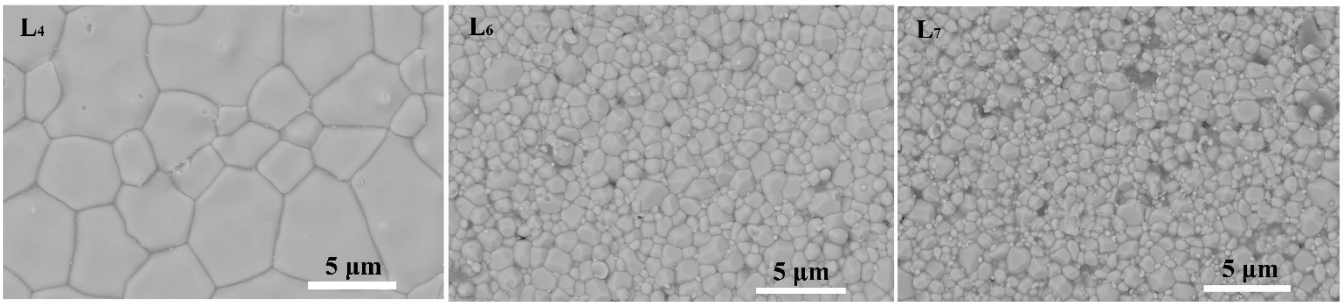

Fig. S1. The SEM micrographs of the L_4, L_6 and L_7 ceramics**.**

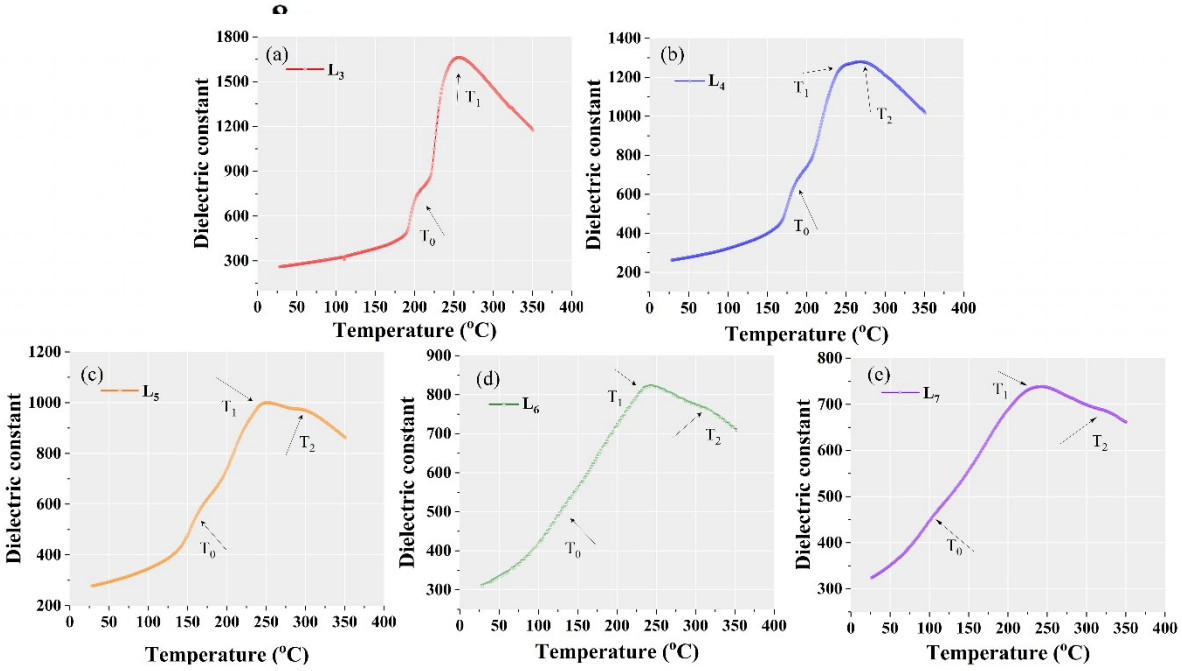

Fig. S2. Temperature dependence of the dielectric constant (ε_r) with different La^{3+} contents.

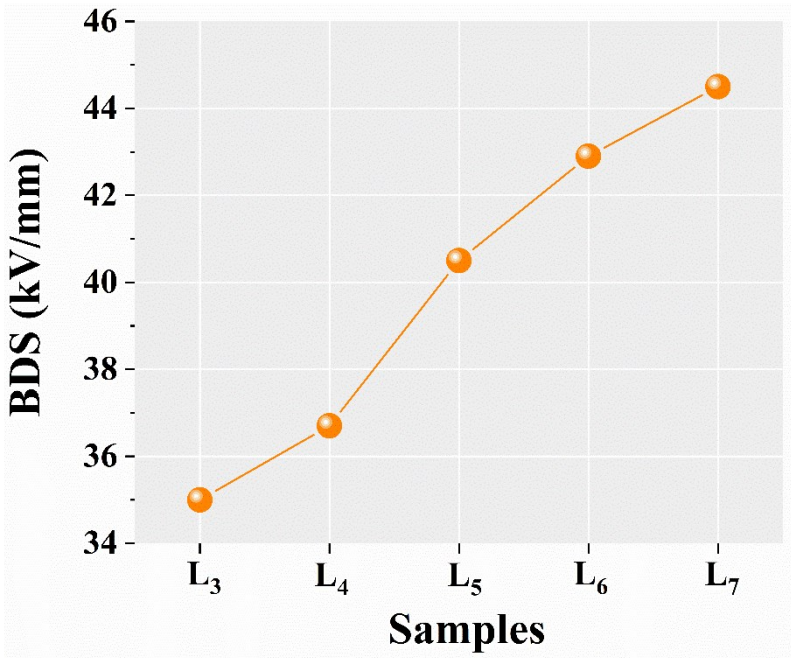

Fig. S3. The BDS of the PLZT ceramics with different La^{3+} contents.

Fig. S4. The discharge current waveforms of the L_5 ceramic under 38 kV/mm.