

Electronic Supplementary Information

La_{0.5}Ba_{0.5}MnO₃/nanoporous anodic aluminum oxide multilayered film thermistor intermediate temperature sensors

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Figure S1 shows the FESEM images for the AAO layer on the Al substrate. The nanoporous layer consisted of the nanotubular arrays with the initiation layer on the top. The initiation layer would become the source of Al₂O₃ NF arrays after the sealing pore process.

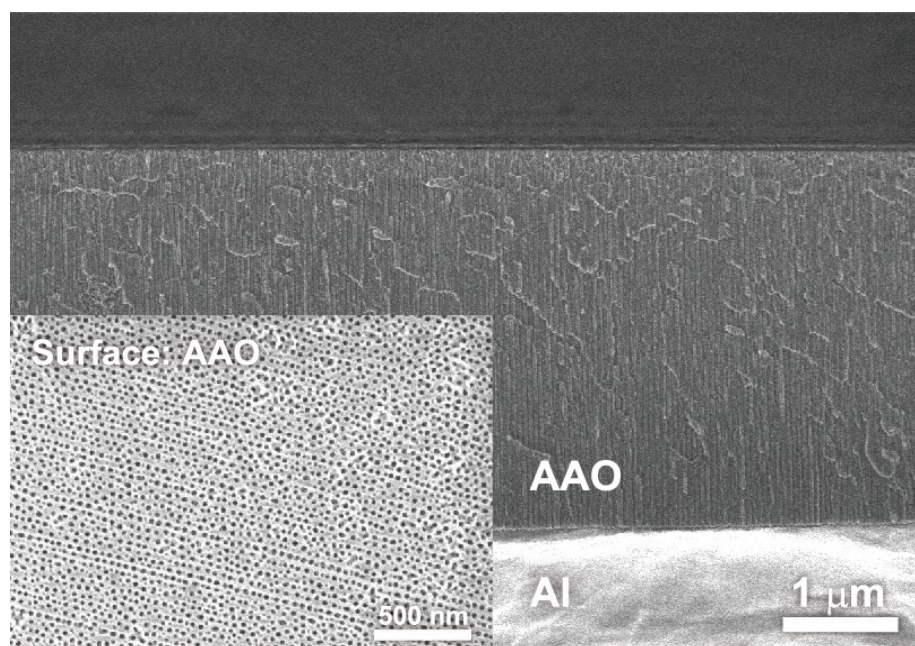


Fig. S1: The surface and cross-sectional views of FESEM image for the nanoporous anodic aluminum oxide (AAO) layer.

For the preparation of LBMO films on Al₂O₃ substrates, we used same LBMO dispersion with the samples prepared by the PRNP process. The LBMO dispersion was spin-coated onto Al₂O₃ substrates at 2000 rpm for 10 s. The coated LBMO films were preheated at 400 °C for 10 min in air. The spin coating and preheating sequence was repeated three times to increase film thickness. Finally, the precursor films were heated at 1000 and 1100 °C for 1 h. Figure S2 shows the XRD patterns for the LBMO films on Al₂O₃ substrates after the heating at 1000 and 1100 °C.

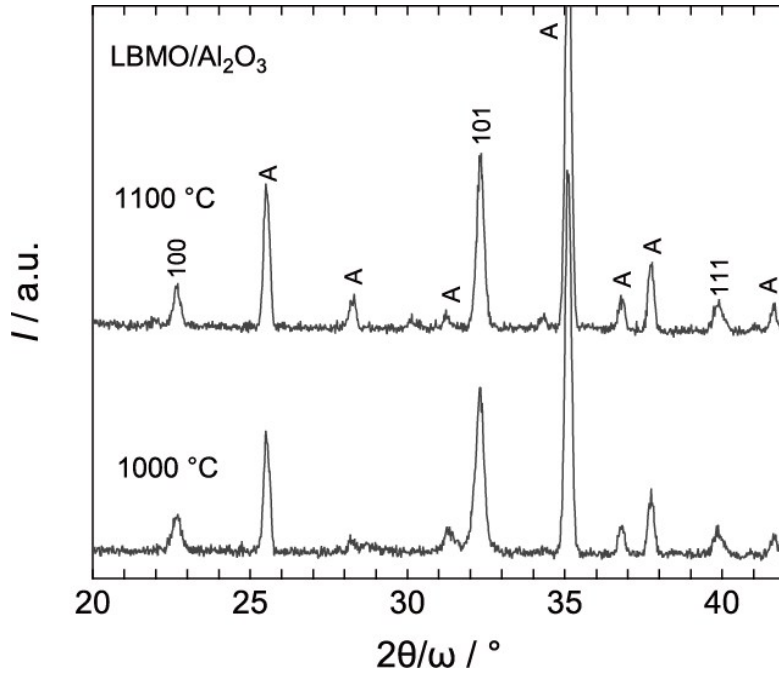


Fig. S2: The XRD patterns for the LBMO films on Al₂O₃ substrates after the heating at 1000 and 1100 °C. The A represents the reflection peaks assigned to α -Al₂O₃.

The reference ceramic chip thermistor was mounted on the sputtered Pt bottom electrodes by Ag paste (Fig. S3). The configuration of bottom electrodes was same with the LBMO/AAO-Al film thermistor.

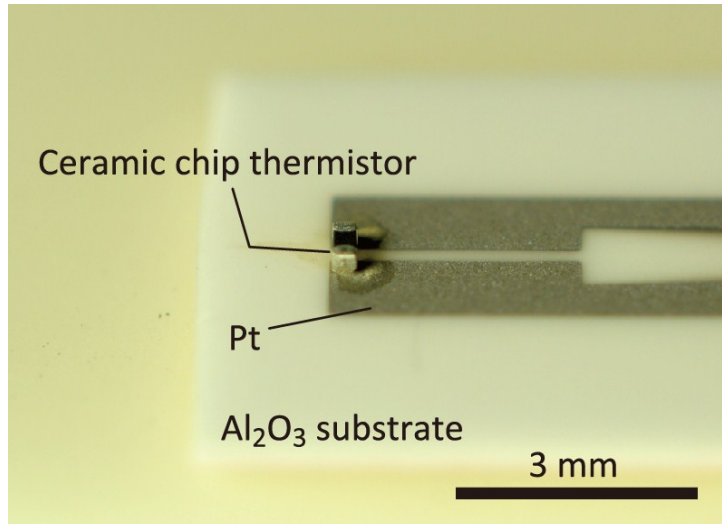


Fig. S3: The configuration for the ceramic chip thermistor and Pt bottom electrodes on the Al₂O₃ substrate.

We found the high stability of temperature response in the LBMO/AAO-Al film thermistor against the temperature cycle test for 1000 cycles (Fig. S4).

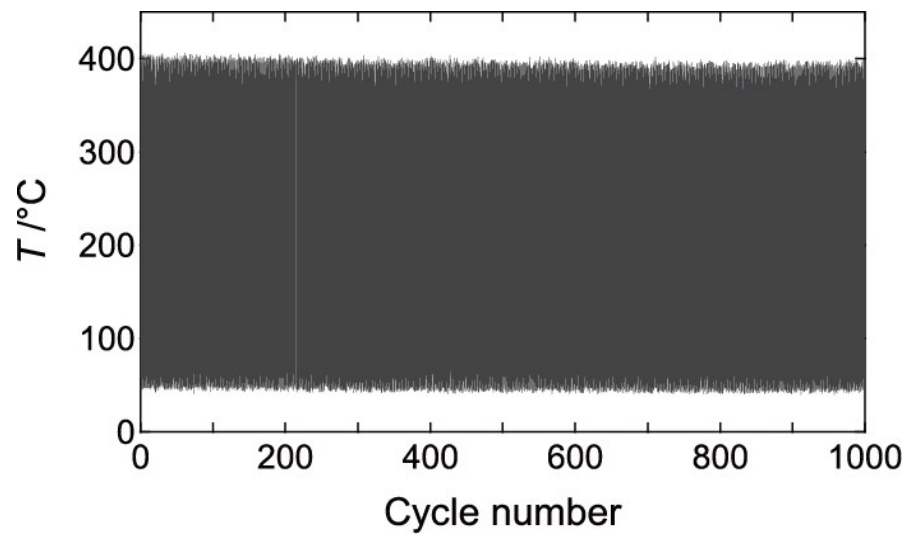


Fig. S4: Temperature cycling test for the LBMO/AAO-Al thermistor. The temperature of the heat source was 400 °C.
