

Supporting Information

**Experimental Studies on the Anisotropic
Thermoelectric Properties of Conducting Polymer
Films**

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Experimental

Chemicals. PEDOT:PSS (PH1000, Clevios) was purchased from H.C. Starck. Ethylene glycol (>99.5%) was purchased from TCI Chemicals.

Film Preparation. A 1-mm-thick cross-linked poly(dimethylsiloxane) (PDMS) (SILPOT 184, Toray) film was prepared in a 20 mL polystyrene bottle. PEDOT:PSS solution (10 mL) containing 3 wt % ethylene glycol was added and the polystyrene bottle was heated on a hot plate at 70 °C. After all the solvent was gone, the PEDOT:PSS film was easily detached from the PDMS substrate. The as-prepared free-standing PEDOT:PSS film was annealed at 150 °C for 30 min and then immersed in ethylene glycol for 30 min. This process was repeated three times.

Characterization. The film thickness was measured by using a high-resolution digimatic measuring unit (VL-50-B, Mitsutoyo). The in-plane conductivity was measured with a four-probe conductivity test meter (MCP-T600, Mitsubishi Chemical Corporation). The through-plane conductivity was measured by using a micro-ohm meter (34420A, Agilent). The current-voltage characteristics were measured using a semiconductor parameter

analyzer (4200-SCS, Keithley). The thermal diffusivity was measured by using a xenon flash analyzer (LFA 447 Nanoflash, Netzsch).

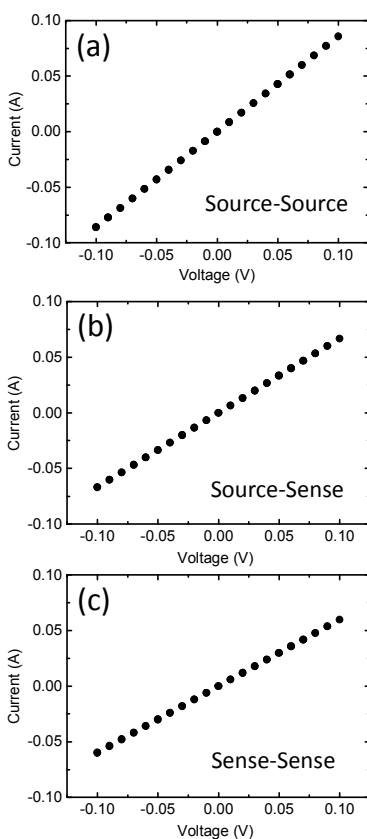


Figure S1). Current–voltage (I – V) characteristics between (a) the source probe – the source probe, (b) the source probe – the sense probe and (c) the sense probe – the sense probe during the measurement of through-plane conductivity of PEDOT:PSS films.

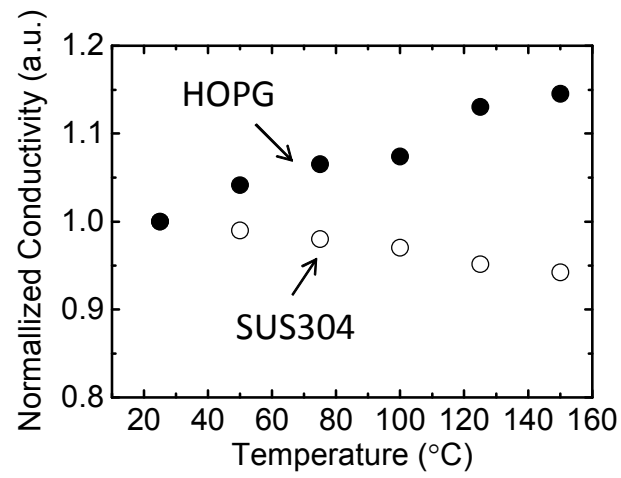


Figure S2). Normalized electrical conductivity in the through-plane directions plotted as a function of temperature.