Supporting Online Material for

Unsymmetrical hot electron heating in quasi-ballistic nanocontacts

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The Supplementary Information includes:

1. Supplementary Figures (Fig. S1-S3)

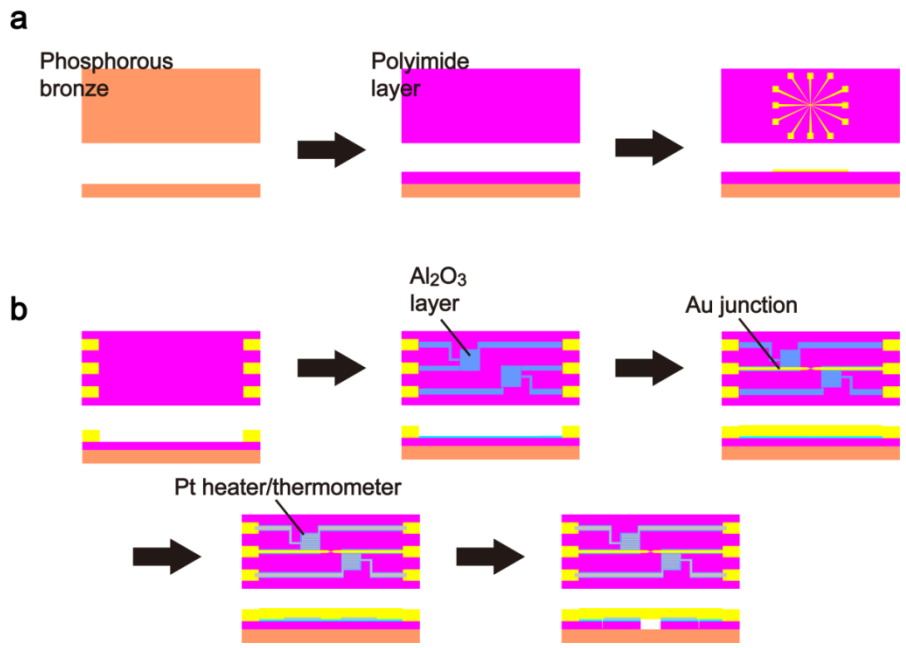

Figure S1. Fabrication procedure of micro-thermometer-embedded mechanically-controllable break junctions. **a,** Microscale electrodes were fabricated on the polyimide-coated phosphorous bronze substrate using photolithography and radio-frequency magnetron sputtering processes and subsequent lift-off. **b,** After that, Al_2O_3 layers, Au junctions, and Pt thermometers/heaters were patterned in the 100 μm × 100 μm region at the center of the sample substrate using electron beam lithography and radio-frequency magnetron sputtering methods followed by lift-off processes. The sample was then exposed to the isotropic reactive ion etching. As a result, polyimide underneath the thin Au and Pt leads and junctions were removed making some parts of the structure free-standing.

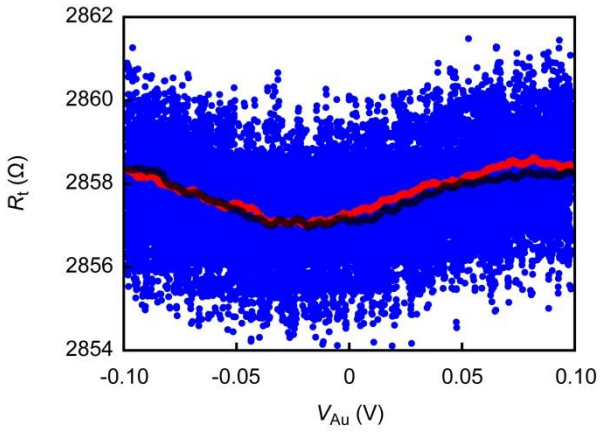

Figure S2. Raw data of R_t (blue) and corresponding $<R_t>$ (Black and Red) plotted as a function of V_{Au}. Although R_t fluctuates considerably, the overall dependence on V_{Au} is almost the same as that of $<R_t>$.

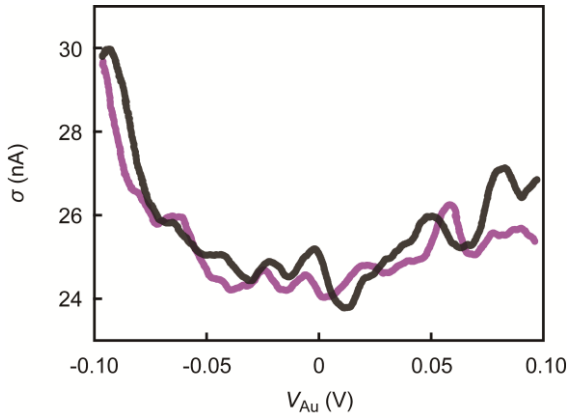

Figure S3. The current noise σ in the Au single-atom wire plotted as a function of the bias voltage V_{Au}. σ increases in a stepwise manner with $|V_{Au}|$.