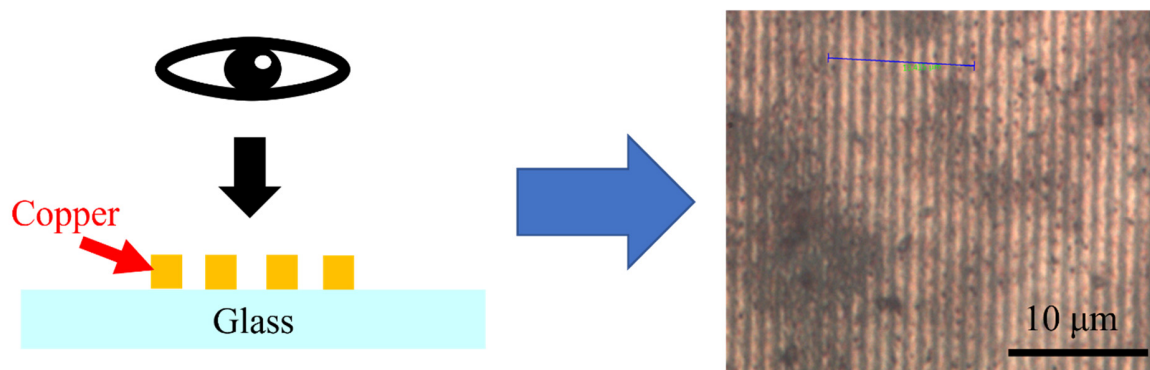


Figure S1. Blade coating process. overall coating procedure is as follows: Twenty microliters of the MOD ink is applied on the substrate. next, substrate is placed on the Z-axis stage base and placed proper height. then, gap between jig surface and glass substrate is few micrometers. After then, blade moves and remove the ink. because blade is located on jig surface, only few micrometers thick ink remain.

(a) OM View, normal



(b) OM View, through glass

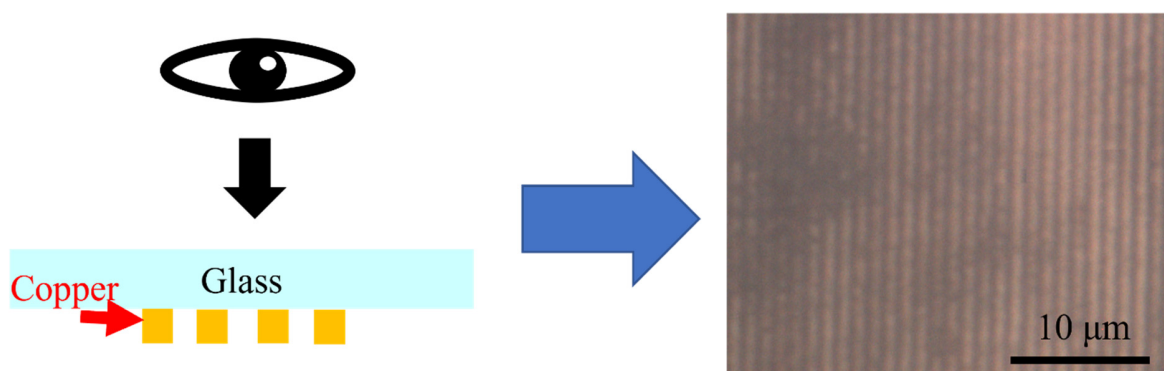


Figure S2. OM images of the copper electrode: (a) normal view and (b) view through the glass. These images show that the electrode consists of many copper lines arranged in parallel.

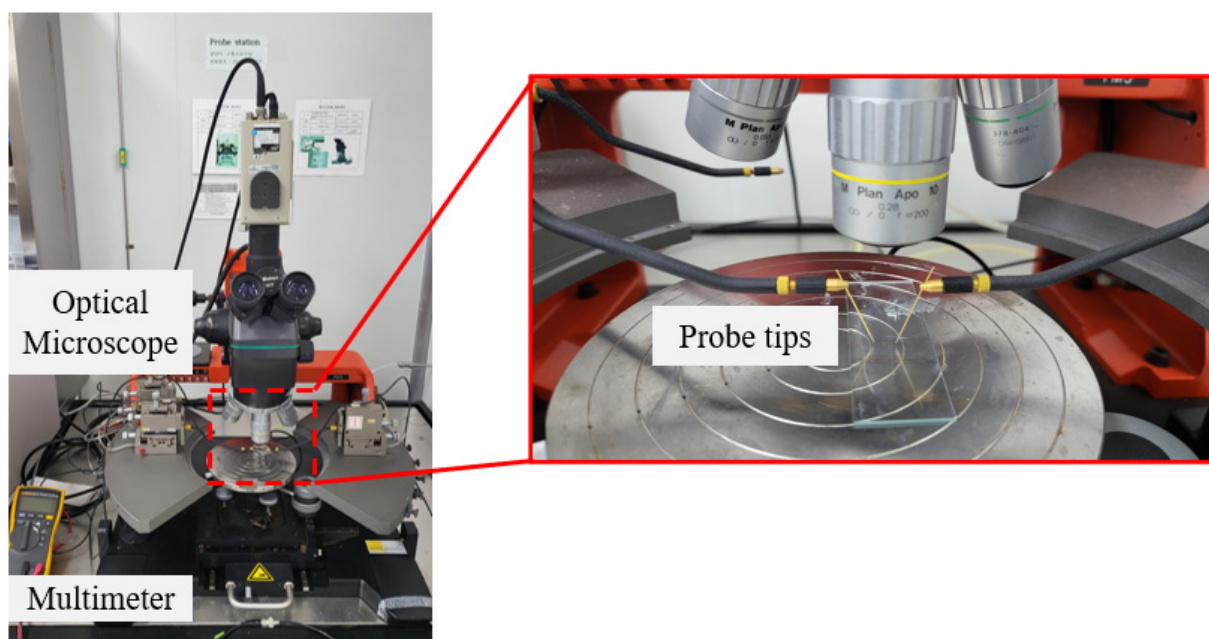


Figure S3. Setup for resistivity measurement.