

Combining electrical bias and detection of single nanodevices with nanofocused X-rays

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A horizontal contacted single nanowire device

The *p-i-n* doped InP NW has 180 nm diameter and 3.3 μm long (Figure S1(a)). Each doped segment is nominally 1.1 μm long. This NW was lied on a SiN membrane window with a Si wafer as a supporting frame. Metal contacts on both ends of the NW consisted of Pd/Zn/Pd/Au layers which were made by the electron beam lithography (EBL) and the metal evaporation techniques (Figure S1(b)). The supporting frame together with the NW device on the membrane surface was glued and wedge bonded on a 10 \times 18 mm 14-pin chip carrier (Figure S1(c)).

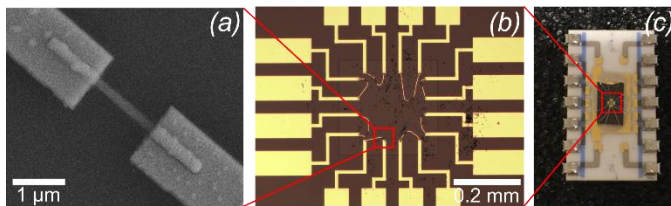


Figure S1. An image of horizontal contacted single NW device. (a) a SEM image of NW devices. (b) an overall image of NW devices on a SiN membrane window as seen as a square surrounded by Au bonding pads. (c) a mounted Si wafer, which is the supported structure of the SiN membrane as well as all the NW devices in (b), on the 10 \times 18 mm 14-pin chip carrier. Each of the pads in (b) was wedge bonded to an individual pin of the chip carrier.

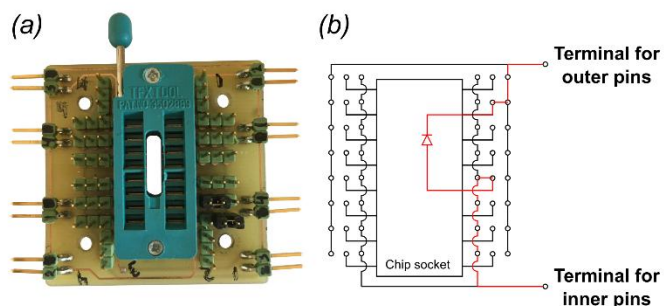


Figure S2. An old designed sample holder and a schematic diagram of the circuit board (a) An old designed sample holder which uses a pivot chip socket and pin connector terminal instead. (b) a schematic diagram of the connection on the circuit board. Red traces show how the device on the chip could be connected to the external equipment through the outer and the inner terminals.

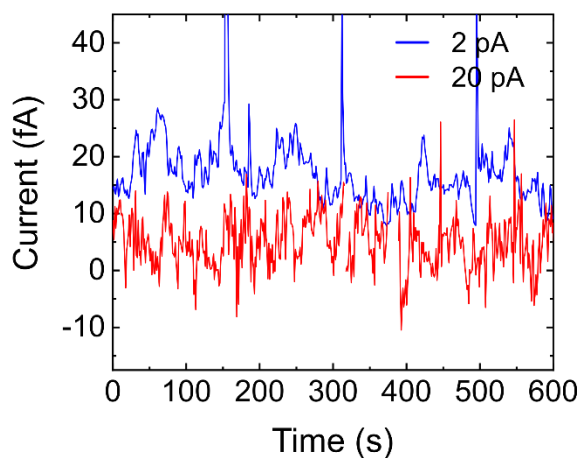


Figure S3. Internal noise of the measurement system using the old designed sample holder. The result shows data points with the random non-reproducible spike.

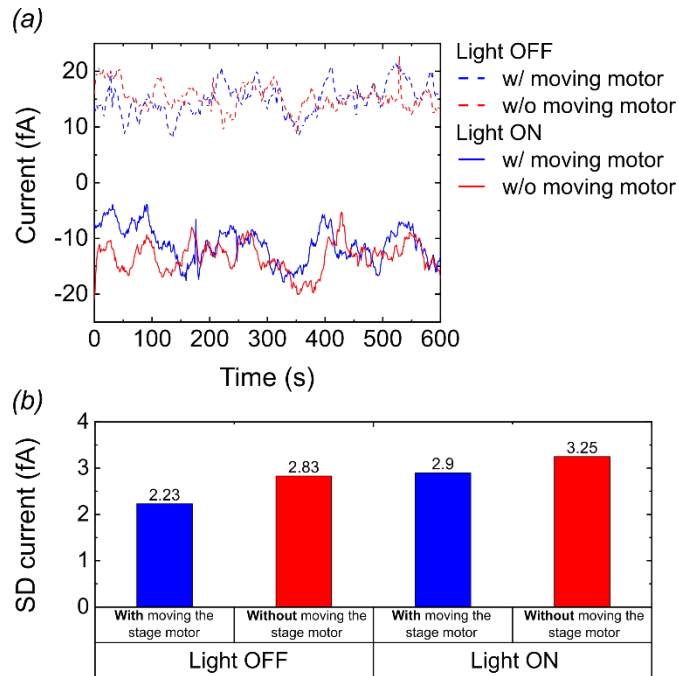


Figure S4. Comparison noises with and without an ambient light. (a) A noise measured with (blue traces) and without (red traces) moving stage motor, which the dashed and the solid lines correspond to the measurement in the dark condition and with the ambient light on, respectively. (b) The corresponding noise from the result in (a) displays in a histogram plot.

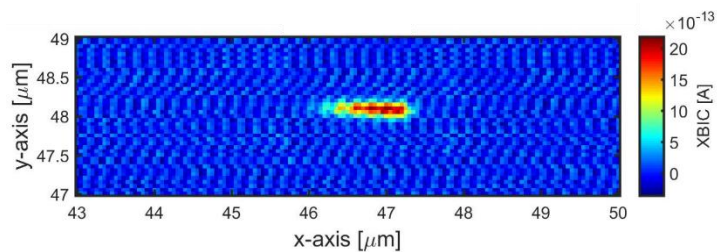


Figure S5. XBIC map using “fly-scan” with too short latency time with the acquisition time of 0.01 s and the latency time of 0.005 s for this fly-scan measurement