

Figure 1: Schematic view of the impact of scaling interconnect structures of either the barrier thickness, resulting in Cu diffusion, or Cu area, resulting in high Cu resistivity. Replacing the conventional barrier by 2D-TMDs can scale the barrier thickness without losing its functionality.

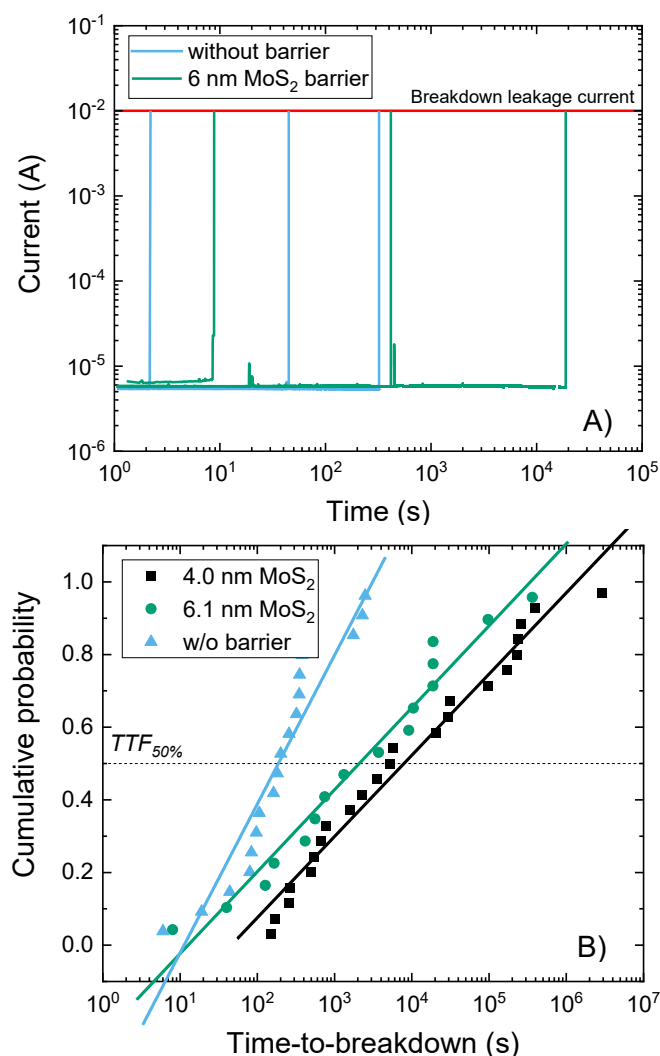


Figure 2: Time-dependent dielectric breakdown (TDDDB) results of samples with and without a MoS<sub>2</sub> barrier layer deposited at 450°C. A) Individual TDDDB measurements for two different sample types, showing the current as a function of time. The red line indicates the breakdown leakage current. B) Cumulative probability plot for the time-to-breakdown for three different sample types. The median time-to-failure ( $TTF_{50\%}$ ) is used as a quantitative measure for the barrier performance.