

Figure 1: Time-dependent dielectric breakdown (TDDB) measurement showing the current as function of time for six individual samples. The inset shows a schematic of the TDDB setup with the device stack used for these measurements.<sup>2</sup>

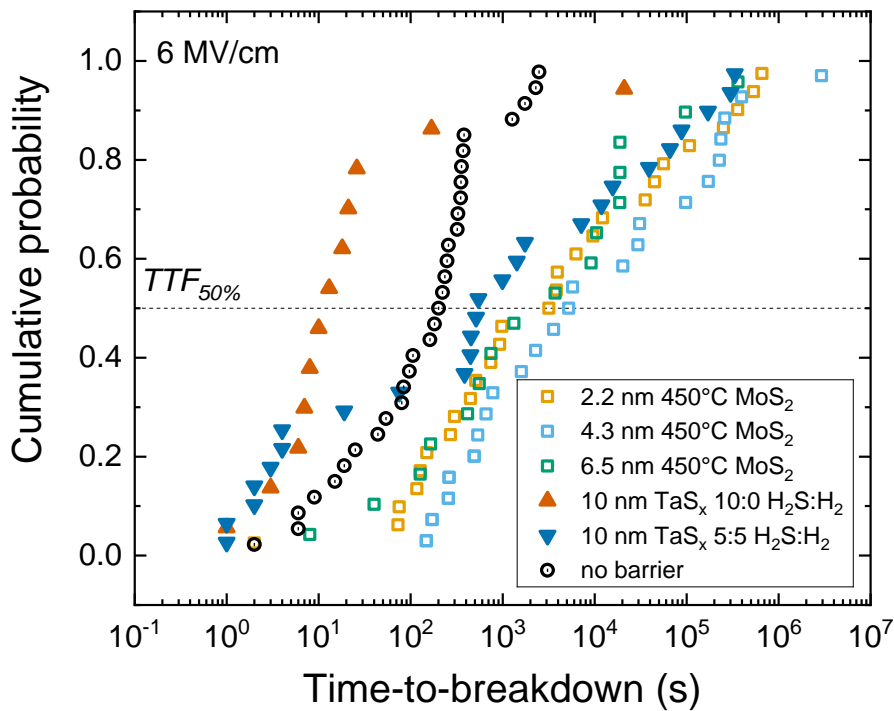


Figure 2: Cumulative distribution of time-to-breakdown resulting from TDDB measurements of different 2D TMC barriers synthesized by ALD, measured at an electric field of 6 MV/cm. The larger the median time-to-failure ( $TTF_{50\%}$ ), the better the barrier performance. Measurements of samples without a barrier are added as a reference. The  $H_2S:H_2$  ratio for  $TaS_x$  refers to the flow during the plasma co-reactant of the ALD process.