

Fig. 1 : Two peaks are observed in the transconductance of the device.

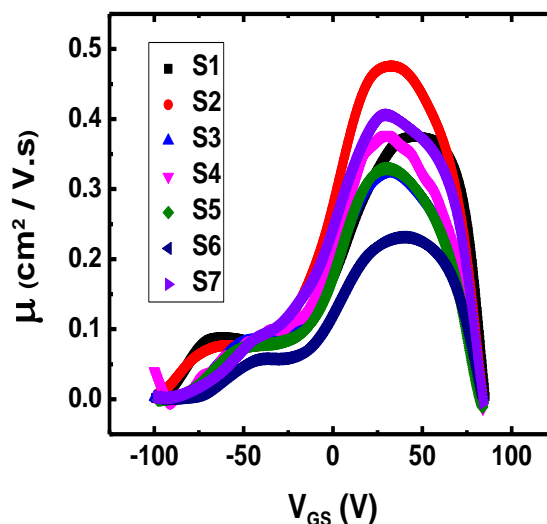


Fig. 2 μ_{inc} for 7 devices. Two local peaks were observed in every device.

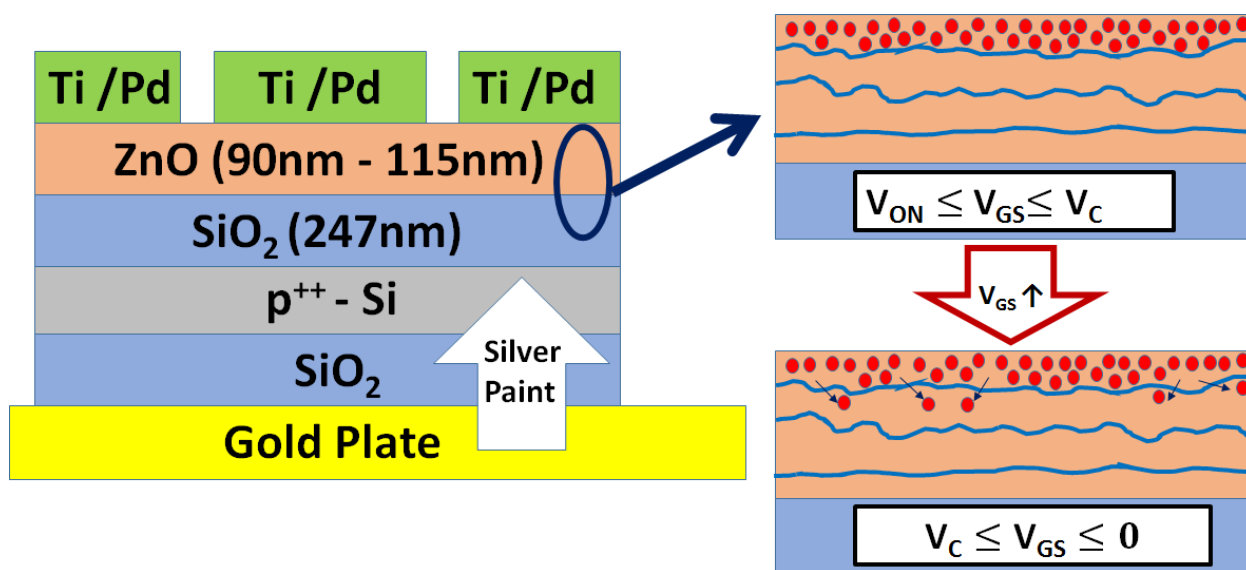


Fig. 3 (Left) Schematics of the cross-section of the device. (Right) Accumulation and blockage of the charge carriers in the upper layer due to the ZnO-ZnO interface. For an interval, increasing V_{GS} will not increase the carrier concentration due to the interface double Schottky potential barrier.

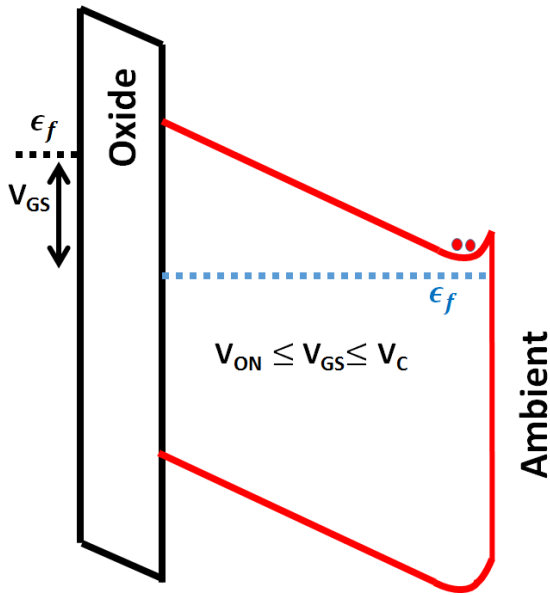


Fig. 4 At $V_{ON} \leq V_{GS}$, the back channel starts to form and carriers are injected just below the ZnO-ambient interface.

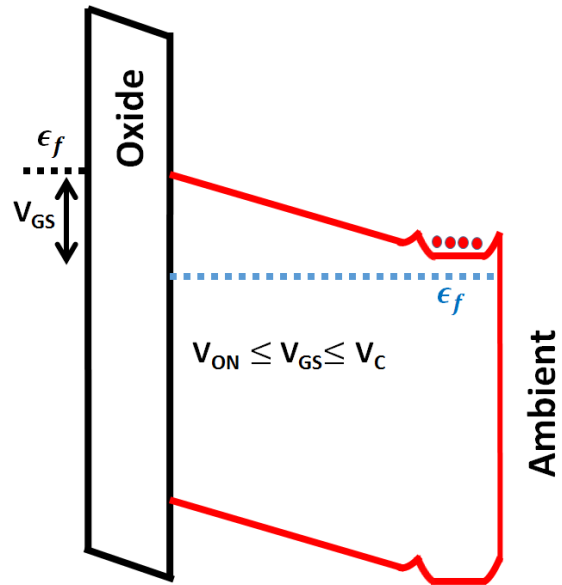


Fig. 5 After the first local g_m maximum peak and prior to the critical voltage (V_C) where g_m hits a local minimum, the top ZnO layer acts as a single layer channel.

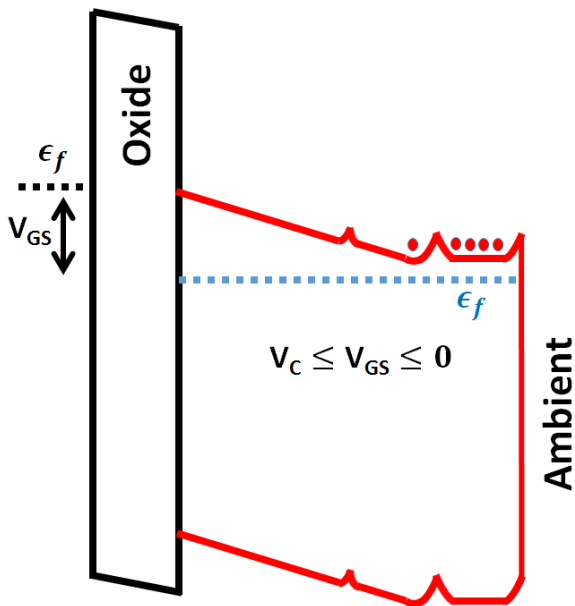


Fig. 6 Above the critical voltage (V_C), the carriers are able to tunnel through the narrow depletion layer and utilize the second layer.