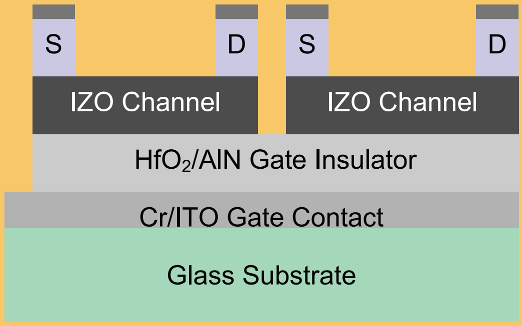
Plasma Quest Limited

www.plasmaquest.co.uk

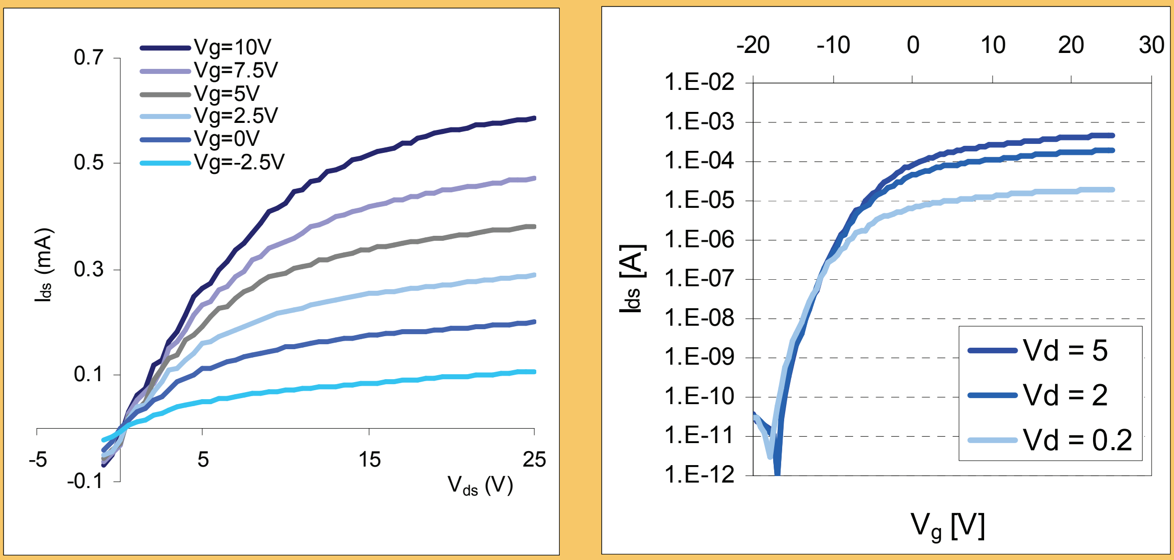
High Mobility TFTs

- **Mobility ~ 10 $cm^2V^{-1}s^{-1}$**
- **Switching ratio > 10^6**
- **Low Temperature Process**
- **Fully transparent options**
- **InZnO or ZnO Channel**



Plasma Quest Limited in collaboration with Cambridge University have been developing high mobility alternatives to a-Si:H TFT devices based on amorphous metal-oxides. PQL's patented HiTUS deposition system offers unparalleled control of material properties to enable the reactive deposition of ZnO (μ~0.4$cm^2V^{-1}s^{-1}$) and InZnO (μ~10$cm^2V^{-1}s^{-1}$) channel layers. The control exhibited also permits accurate control of the resistivity of the channel from insulating ($\rho=3x10^{10}\Omega$.cm) to conducting ($\rho=3x10^{-3}\Omega$.cm) enabling the deposition of charge injection layers on the source and drain contacts. The performance of the IZO layer has been tested on 2µm thermal SiO_2 by the University of Cambridge and demonstrate a switching ratio greater than 6 orders of magnitude.

Dielectic insulators have been developed with high dielectric constants (k=23 for HfO_2) suitable for high performance devices. Hafnium oxide (breakdown >10$MVcm^{-1}$ and $\rho=2.5x10^{13}\Omega$.cm) and Aluminium Nitride (Breakdown > 3$MVcm^{-1}$ and $\rho=2.7x10^{13}\Omega$.cm) have both been studied. The optical transmission of all the layers is >90% transmission enabling the production of fully transparent devices. All the layers of the device have been deposited at plastic compatible temperatures (T<70°C).



Transport Characteristics for Indium Zinc Oxide Channel on 2µm SiO_2 Insulator

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