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Barlage et al.(10) **Pub. No.: US 2024/0213370 A1**(43) **Pub. Date: Jun. 27, 2024**(54) **THIN FILM TRANSISTOR**(71) Applicant: **Zinite Corporation**, Edmonton (CA)(72) Inventors: **Douglas W. Barlage**, Edmonton (CA);
Gem Shoute, Edmonton (CA); **Alex M. Wa**, Edmonton (CA)(21) Appl. No.: **18/539,612**(22) Filed: **Dec. 14, 2023****Related U.S. Application Data**

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(57)

ABSTRACT

A novel thin film transistor (TFT) includes a source channel interfacial member between at least the source of the transistor and the semiconductor member in which the channel will be formed. The TFT further includes at least a source carrier reservoir in contact with the source and the source end of the semiconductor member. The interaction of the source channel interfacial member and the carrier reservoir provides the TFTs with an increased threshold voltage to place the TFT into an ON state and with reduced current leakage when the TFTs are in an OFF state and the source carrier reservoir provides a source of charge carriers to inhibit carrier starvation through the channel. The materials selected for formation of the TFTs also allow the TFTs to be formed with MOL and/or BEOL processes over logic and other circuitry formed in conventional FEOL processes to obtain three dimensional circuits on semiconductor dies.

