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(54) Title: PAD-LN-A-BOTTLE CHEMICAL MECHANICAL PLANARIZATION POLISHING WITH COST-EFFECTIVE NON-POROUS SOLID POLISHING PADS

(57) Abstract: A novel pad-in-a-bottle (PIB) technology and PIB-type advanced chemical-mechanical planarization (CMP) Copper or THROUGH-SILICON VIA (TSV) CMP compositions, systems and processes have been disclosed. The role of conventional polishing pad asperities is played by high-quality micron-size polyurethane (PU) beads that are comparable to the sizes of pores and asperities in polishing pads. The less expensive non-porous, and solid polishing pads were less expensive, have been employed for reducing electronic device fabrication cost. There are benefits for using PIB-type Cu CMP slurries vs Non-PIB type Cu CMP slurries. Increased Cu removal rates at different applied down forces and sliding velocities, reduced Cu line dishing across different sized Cu line features and slightly reduced averaged COF have been observed using PIB-type Cu CMP slurries.