Abstracts

A Manufacturing Process for Analog and Digital Gallium Arsenide Integrated Circuits

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A process for manufacturing small-to-medium scale GaAs integrated circuits is described. Integrated FET's, diodes, resistors, thin-film capacitors, and inductors are used for monolithic integration of digital and analog circuits. Direct implantation of Si into >10/sup 5/ omega/spl dot/cm resistivity substrates produces n-layers with ±10-percent sheet resistance variation. A planar fabrication process featuring retained anneal cap (SiO/sub 2/), proton isolation, recessed Mo-Au gates, silicon nitride passivation, and a dual-level metal system with polyimide intermetal dielectric is described. Automated on-wafer testing at frequencies up to 4 GHz is introduced, and a calculator-controlled frequency domain test system described. Circuit yields for six different circuit designs are reported, and process defect densities are inferred.

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