

Title (en)
PHYSICAL VAPOR DEPOSITION OF SEMICONDUCTING AND INSULATING MATERIALS

Title (de)
PHYSIKALISCHE DAMPFABSCHIEDUNG HALBLEITER- UND ISOLIER- STOFFE

Title (fr)
DEPOT PHYSIQUE EN PHASE VAPEUR DE MATIERES SEMI-CONDUCTRICES ET ISOLANTES

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Application
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Abstract (en)
[origin: WO0038213A2] The invention provides an apparatus for depositing semiconducting, insulating, and particularly, high dielectric constant (HDC) material, such as barium strontium titanate, on a substrate through reactive sputtering. The apparatus comprises a physical vapor deposition chamber having an asymmetric bipolar pulsed direct current power source supplying a first bias to a target and a second bias to the substrate support member in the chamber. The pulsed direct current power source supplies an electrical waveform comprising a negative deposition voltage that attracts the argon ions to cause sputtering from the target and a reverse small positive neutralization voltage to cause charge neutralisation of the target that eliminates arcing and micro-arcing on the target surface. Preferably, the first bias is synchronized with the second bias for the deposition period and the neutralization period. A floating-ground shield surrounds the processing region between the target and the substrate. A first gas inlet introduces a gas for the plasma through the top portion of the chamber, and a second gas inlet introduces a reaction gas adjacent the substrate surface to react with the sputtered material to form the HDC film on the substrate.

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