

Title (en)
INTEGRATED CIRCUITS WITH BARRIER LAYERS AND METHODS OF FABRICATING SAME

Title (de)
HALBLEITERANORDNUNGEN MIT BARRIERSCHICHTEN UND VERFAHREN ZUR HERSTELLUNG

Title (fr)
CIRCUITS INTEGRES A COUCHES BARRIERE ET LEURS PROCEDES DE FABRICATION

Publication
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Application
EP 00964977 A 20000912

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Abstract (en)
[origin: WO0124237A1] A hydrogen diffusion barrier (132, 124, 332, 324, 432, 424, 532, 524, 720, 710, 750, 770, 912) in an integrated circuit (100, 200, 300, 400, 500, 700, 740, 900) is located to inhibit diffusion of hydrogen towards a dielectric thin film (128, 328, 428, 528, 711, 764, 908) of metal oxide material. The hydrogen diffusion barrier comprises at least one of the following oxides: tantalum pentoxide; tungsten oxide; aluminum oxide; titanium oxide. The dielectric thin film is ferroelectric or high-dielectric, nonferroelectric material. Preferably, the metal oxide comprises ferroelectric layered superlattice material. The hydrogen diffusion barrier layer may be a single continuous layer (132)completely overlying a common plate electrode and the dielectric thin film, but leaving other elements in the circuit exposed to hydrogen. The dielectric thin film may be displaced laterally from transistor elements so that certain portions of the circuit remain exposed to hydrogen. A metal oxide barrier layer (124, 324, 424, 524, 710) under the dielectric film prevents diffusion of elements in the dielectric layer to the integrated circuit substrate and also acts as a hydrogen diffusion barrier layer. The hydrogen diffusion barrier layers are formed by applying a metal organic precursor solution to a substrate (102, 104, 116, 124, 126, 128 and 130) and then heating it.

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