

ABSTRACT

SEED SUBSTRATE FOR EPITAXIAL GROWTH AND METHOD FOR PRODUCING SAME, AND SEMICONDUCTOR SUBSTRATE AND METHOD FOR PRODUCING SAME

The present invention relates to obtaining high-quality, inexpensive seed substrates with few crystal defects for epitaxial growth of epitaxial substrates and solid substrates of group III nitrides such as AlN, $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 < x < 1$) and GaN, and manufacturing method thereof.

The seed substrate for epitaxial growth of the present invention has a support substrate, a planarizing layer of 0.5 to 3 μm provided on the top surface of the support substrate, and a seed crystal layer provided on the top surface of the planarizing layer. The support substrate includes a core of group III nitride polycrystalline ceramics and a 0.05 to 1.5 μm encapsulating layer that encapsulates the core having surface voids filled and flattened by Al or Si oxide, nitride, oxynitride, or a mixture thereof. The seed crystal layer is provided by thin-film transfer of 0.1 to 1.5 μm of the surface layer of Si $\langle 111 \rangle$ single crystal with oxidation-induced stacking faults (OSF) of less than 10 defects/ cm^2 .

[Figure 2]