Abstracts

Influence of Surface Layers on the RF-Performance of AlInAs-GaInAs HFET's

J. Dickmann, H. Dambkes, H. Nickel, R. Losch, W. Schlapp, J. Bottcher and H. Kunzel. "Influence of Surface Layers on the RF-Performance of AlInAs-GaInAs HFET's." 1992 Microwave and Guided Wave Letters 2.12 (Dec. 1992 [MGWL]): 472-474.

The influence of thickness and doping level of the GaInAs cap layer in AlInAs-GaInAs-InP HFET structures on the dc- and RF-performance is systematically investigated. We compare three different approaches, the undoped cap layer, the highly doped thick cap layer, and as a new approach, the thin doped and therefore surface depleted cap layer. HFET devices with 0.3 µm gates have been processed. While all devices demonstrate f/sub T/ -values around 80GHz distinct differences are observed for the f/sub max/f/sub T/ ratios between 1 (highly doped cap) over 1.3 (undoped cap) to 2.7 (surface depleted cap). The best f/sub max/ of 240 GHz is achieved for the new cap layer approach. A systematic investigation of the influence of the g/sub m//gd and C/sub gs/C/sub ds/ ratios demonstrates the strong influence of a proper layout of the cap layer at the drain side of the gate region.

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