

硅基AlN椭圆形IDT-SAW滤波器的设计

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摘要：

在已知的压电材料中，AlN薄膜的声表面波传播速度是最快的。本设计采用硅基AlN薄膜作为压电材料，利用变迹加权的方法来优化设计IDT，改进型 δ 函数模型为椭圆形结构IDT的建模工具。通过建模仿真并根据仿真结果设计SAW带通滤波器版图，在实验室制作了中心频率为300MHz，带内插损11dB的SAW带通滤波器样品，测试结果表明其仿真结果与试验结果一致性较好，具有实际应用意义

关键词：滤波器；椭圆形IDT结构；变迹加权；插入损耗；AlN薄膜

The Design of silicon substrate AlN ellipse IDT Structure SAW filter

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Abstract:

The propagation velocity of surface acoustic wave (SAW) of AlN film is the fastest in the known piezoelectric materials. The AlN/Si film is used in this design, apodization weighting methods was used to optimize the design of IDT, and the improved δ function model was used as modeling tool of apodization weighted ellipse IDT structure. According to the results of simulation, a layout of SAW band-pass filter was designed and a sample was fabricated with center frequency of 300MHz and insertion loss of 11dB. The test results show the consistency of simulation results and experimental results. The design shows its potential in practical application.

Keywords: filter; ellipse IDT structure; Apodization weighted; Insertion loss; AlN film

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