

## Microwave Low Insertion Loss SAW Filter By Using ZnO/Sapphire Substrate with Ni Dopant

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Microwave low insertion loss SAW filters are realized by using ZnO epitaxial film on sapphire substrate. The epitaxial growth conditions and dopant are carefully determined to realize low propagation loss and high stability. 1.5 to 2.5 GHz range SAW filters are fabricated with the insertion loss of only 1 to 2dB and the outline dimensions of 0.01 to 0.02cc.

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