Cross-Coupled Band-Pass Superconducting Microstrip Filter

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ABSTRACT

We have fabricated microstrip band-pass filters based on the quadruplet geometry using high-temperature superconductor. Every half-wave length resonator in the filter consists of loop-like inductor and two patch capacitors at both ends. The inductive coupling in between the loop-like inductors of non-adjacent resonators produces transmission zeros in the frequency response. The transmission zero can be allocated by changing the polarity and the strength of the cross coupling. We have fabricated filters using double-sided YBa2Cu3O7-5 (YBCO) thin films on 20-mm-square LaAlO3 substrates. The filter has 1.925 GHZ center frequency?18MHZ -3dB bandwidth, and 0.13 dB insertion loss at 77K. Due to the transmission zeros near the passband, the steep skirt characteristic is exhibited.

Keywords : cross coupling ; high-temperature superconductor ; sputter ; ybco

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