Fabrication and Microwave Properties of Asymmetric Dual-Passband High-Tc Superconducting Filters

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ABSTRACT

In work, synthesises of symmetric and asymmetric Dual-Passband band-pass filters are presented for the applications of IEEE 802.11b/g (2.4 GHz ~ 2.48 GHz) on the multimode wireless local area networks (WLAN). The high temperature superconducing (HTS) filters were fabricated by patterning YBa2Cu3O7 films double-sided deposited on 20 × 20 mm² LaAlO3 substrates with an RF sputtering technique and by putting them in copper housings. The synthesis simulation results show the symmetric dual-band feature of two pass bands at 2.45 and 2.49 GHz with an insertion loss of 0.18 and 0.17 dB, and bandwidths of 11 and 24 MHz, respectively. The asymmetric dual-band feature of two pass bands at 2.45 and 2.48 GHz with insertion losses of 0.3 and 0.29 dB, and bandwidths of 20 and 23 MHz, respectively. The temperature-dependent frequency responses can be well described by the modified two-fluid model based formulas, indicating that the frequency shift in HTS BPF is dominated by the temperature dependence of the magnetic penetration depth.

Keywords : Dual-band, asymmetric Dual-Passband Filter, High-Tc superconducting
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