Abstracts

Multi-stage dual-mode cross-slotted superconducting filters for telecommunication application

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Dual mode high temperature superconducting (HTS) filters represent an interesting device class for telecommunication application since they combine a high power handling capability with a miniaturized size. Here we report on the design and realization of dual mode cross slotted filters presenting a more compact size if compared with the traditional dual mode patch filters. Single stage filters operating in C-band with 1% fractional bandwidth have been designed and tested at prototype level by using double sided YBa/sub 2/Cu/sub 3/O/sub 7-x/ (YBCO) and Tl/sub 2/Ba/sub 2/CaCu/sub 2/O/sub 8/ (Tl-2212) superconducting films grown on LaAlO/sub 3/ substrates. The YBCO filter presents insertion losses IL=1 dB and a power handling higher than 10 dBm at T=77 K while the Tl-2212 allows operation at higher temperatures with comparable performances. Dual stage (four poles) and four stage (eight poles) filters with 1% fractional bandwidth operating in C-band and presenting a Chebyshev or a quasi elliptical response have been analyzed. Finally, a four stage filter fitting well on a 1"/spl times/1" substrate was designed.

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