Abstracts

Elliptic-disc filters of high-T/sub c/ superconducting films for power-handling capability over 100 W

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On future digital communication systems, distortion of transmitted signals should be eliminated as much as possible for high communication quality. However, the need to both minimize distortion of signal amplifiers and continue to provide good filtering protection can become difficult to achieve with conventional devices. In this paper, the RF coplanar circuit filter using elliptic-disc resonators is proposed and investigated. This proposition makes it possible to miniaturize power filter circuits and to realize high performance of power ability of high-temperature superconducting (HTS) filters. End spread signal coupling electrodes are investigated in order to adjust the coupling degree between disc and feedline circuits and provide proper characteristic impedance of circuit. Two-mode coupling operation in the elliptic disc is then explained. Electromagnetic-field distribution change caused by this mode coupling can protect current and heat concentration, and realize power-handling capability over 100 W. Finally, the design principle of a multiple-disc filter is introduced for high performance of out-of-band rejection and passband flatness. It has been confirmed that an elliptic-disc resonator filter can bring out the excellent performance of HTS materials.

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