Abstracts

Cryogenic millimeter-wave ring filter for space application

P. Piironen, J. Mallat and A.V. Raisanen. "Cryogenic millimeter-wave ring filter for space application." 1998 Transactions on Microwave Theory and Techniques 46.9 (Sep. 1998 [T-MTT]): 1257-1262.

A tunerless cryogenic millimeter-wave ring filter has been designed for a space application. Detuning of the center frequency caused by thermal deformations has been compensated by a novel mechanism based on the use of two materials with different temperature expansion coefficients. An improvement of 1:8 in the detuning of the center frequency, compared to an uncompensated ring filter, is reported. By applying the new design, external tuning aids can be avoided even in applications where a wide operational temperature range is of interest. Thus, the new ring filter is especially advantageous in space-borne millimeter-wave receivers.

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