August 1970 Brief 70-10385

NASA TECH BRIEF

Nonequal Iteration Directional Filters Permit Selective Clearance of Ripples in Passband Circuits

Modified directional filters have demonstrated improved performance in the separation of fundamental and harmonic frequencies at millimeter wavelengths. Insertion loss curves for equal iteration directional filters normally contain a fair degree of passband ripple. Excessive ripple activity, even in narrow-band circuits, results in an unstable passband circuit loss. Filter loss becomes sensitive to temperature variations and fabrication tolerances. Wideband networks require wide regions of low passband ripple activity.

Nonequal iteration directional filters permit selectively clearing ripples from wide portions of the passband. Alternate pairs of dielectric and air-gap filter sections, with unequal electrical lengths, comprise the modified directional filter. Dielectric phase length does not equal air-gap phase length in the resulting filter.

This filter type provides more flexibility in choosing dielectric material thickness and permits switching from specially ground to less expensive and readily available standard thicknesses. Selecting thicker dielectric slabs allows increasing mechanical strength where necessary. Frequency rejection or selection at the output ports may be modified by varying only the air space thickness.

Note:

The following documentation may be obtained from:

Clearinghouse for Federal Scientific and Technical Information
Springfield, Virginia 22151
Single document price $3.00
(or microfiche $0.65)

Reference: NASA-CR-1453 (N70-11775), Study of Quasi-Optical Circuit Techniques in Varactor Multipliers

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: G.P. Kurpis of
Cutler-Hammer Airborne Instrument Laboratory
under contract to
Electronics Research Center
(ERC-10313)

Category 01