Abstracts

New Design Techniques for Miniature VHF Circulators

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Since the feasibility of Y junction circulators was first reported in 1959, such circulators have been built to operate in frequency bands from 100 mc to the millimeter wavelength range. All of these circulators appear to operate on essentially the same principle. Using this approach the ferrite disc diameter is proportional to the wavelength, While junction circulators have been useful at microwave frequencies because of their simplicity and small size, such circulators at UHF and VHF frequencies have been expensive and inconveniently large because of the large ferrite volume required. This paper reports the development of a new type of circulator for the VHF and UHF bands. The approach utilizes the lumped element techniques which are natural and convenient for this frequency range and as a result the size of the circulator, and ferrite volume, do not increase with the wavelength. Lumped element circulators have also been developed recently in Japan by Konishi. Figure 1 illustrates the size reduction which has been obtained with the new technique.

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