Abstracts

UHF Magnetoacoustic Delay Line

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The feasibility of exploiting the relatively slow velocity of propagation of acoustic waves in order to delay an electromagnetic signal in the microwave frequency range has been clearly established. Several different approaches in the conversion of the electromagnetic energy to acoustic energy have been shown to be practical. One of these involves the use of a rod of single crystal yttrium iron garnet (YIG) which serves both as the delay medium and also as the transducer to convert the electromagnetic energy to acoustic energy, and vice-versa. A basic advantage of this type of delay line is the ability to vary delay time continuously over a large range by means of a magnetic biasing field. Though considerable progress has been reported in the field of magnetoacoustic delay lines of this type further advances are required in the reduction of insertion loss, increase in the delay time, and a more precise understanding of the phenomena involved. In pursuance of these objectives, experiments have been performed on a magnetoacoustic delay line intended for operation over the range of 200 to 1000 mc. Comprehensive data on insertion loss and VSWR is presented and analyzed. Also, results of bonding two single crystal YIG rods to achieve a longer delay are given.

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