

## MICROWAVE ULTRASONICS

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### ABSTRACT

Recent activity in the study of high frequency elastic waves (ultrasonic waves) has resulted in an expanded knowledge of the elastic properties of materials at high frequencies and in new types of ultrasonic devices utilizing these properties.

Measurements indicate that a number of material classes have low ultrasonic losses and are efficient transmission media at microwave frequencies. In addition, the materials which are piezoelectric or magnetostrictive allow for the electrical generation and detection of ultrasonic waves. Ultrasonic transducer techniques have been developed for generation at microwave frequencies with either stoichiometric or specially doped materials using both resonant and nonresonant transducers.

The interaction of elastic waves with magnetic or electric fields in magnetostrictive and piezoelectric materials also makes possible a number of nonreciprocal and nonlinear ultrasonic devices.

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## NOTES

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THOMPSON RAMO WOOLDRIDGE INC.

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Antennas, Coaxial Connectors, Electro-mechanical Switches  
Ferrite Devices, Filters and other microwave devices.