Abstracts

A Laser Probing System for Characterization of SAW Propagation on LiNbO/sub3/, LiTaO/sub3/, and Quartz

A. Holm, R. Weigel, P. Russer and W. Ruile. "A Laser Probing System for Characterization of SAW Propagation on LiNbO/sub3/, LiTaO/sub3/, and Quartz." 1996 MTT-S International Microwave Symposium Digest 96.3 (1996 Vol. III [MWSYM]): 1541-1544.

A nondestructive high-resolution technique for the optical detection of the phase and amplitude of high-frequency surface acoustic wave (SAW) devices is presented. The test setup incorporates a mode-locked ps-laser, harmonic mixing, and coherent detection. Dynamic range and minimum detectable surface displacement were 50 dB and 1 pm//spl rudic/Hz, respectively. The probing technique allows not only the measurement of the SAW field but also the precise direct determination of the phase velocity which is a fundamental design parameter in SAW technology. We present experimental results of the phase velocity of both SAW and Leaky SAW modes on quartz, LiNbO/sub3/ and LiTaO/sub3/ with an accuracy of up to 1.5·10/negative5/. Our results agree very good with theory and other experiments.

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