

## Printed-Circuit Waveguides with Anisotropic Substrates: A New Leakage Effect

---

*M. Tsuji, H. Shigesawa and A.A. Oliner. "Printed-Circuit Waveguides with Anisotropic Substrates: A New Leakage Effect." 1989 MTT-S International Microwave Symposium Digest 89.2 (1989 Vol. II [MWSYM]): 783-786.*

A new class of power leakage effects has been found for the dominant mode on uniform printed-circuit waveguides when anisotropic dielectric materials are used as substrates. We demonstrate both from physical reasoning and by accurate quantitative calculations that above a certain critical frequency the dominant mode on uniform printed-circuit waveguides, such as microstrip line, slot line or coplanar waveguide (whether of finite or infinite width), on suitable anisotropic substrates will leak power into surface waves on the substrate, and that the maximum leakage rate can be rather large. This power leakage is a qualitatively new effect, reported here for the first time, and is entirely distinct from the leakage or radiation into surface waves that occurs at junctions or discontinuities on the line.

 [Return to main document.](#)