

## Full-Wave Analysis of Lossy Transmission Line Incorporating the Metal Modes

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A full-wave mode-matching analysis of a unilateral finline with finite conductivity, metalization thickness, and holding grooves is presented. A new class of metal modes exist in the metalized region for its most part and decay sharply in the air region. It is shown for the first time that without incorporating the metal modes presented here, the mode-matching method for tackling lossy millimeter-wave or microwave transmission lines can not produce accurate results.

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