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Sommario/riassunto

Discusses the growth mechanisms of tin whiskers and the effective mitigation strategies necessary to reduce whisker growth risks This book covers key tin whisker topics, ranging from fundamental science to practical mitigation strategies. The text begins with a review of the characteristic properties of local microstructures around whisker and hillock grains to identify why these particular grains and locations become predisposed to forming whiskers and hillocks. The book discusses the basic properties of tin-based alloy finishes and the effects of various alloying elements on whisker formation, with a focus on potential mechanisms for whisker suppression or enhancement for each element. Tin whisker risk mitigation strategies for each tier of the supply chain for high reliability electronic systems are also described. . Discusses whisker formation factors including surface grain geometry, crystallographic orientation-dependent surface grain boundary structure, and the localization of elastic strain/strain energy density distribution. Examines how whiskers and hillocks evolve in time through real-time studies of whisker growth with the scanning electron microscope/focused ion beaming milling (SEM/FIB). Covers characterization methods of tin and tin-based alloy finishes such as transmission electron microscopy (TEM), scanning electron microscopy (SEM), and electron backscatter diffraction (EBSD). Reviews theories of mechanically-induced tin whiskers with case studies using pure tin and

other lead-free finishes shown to evaluate the pressure-induced tin whiskers Mitigating Tin Whisker Risks: Theory and Practice is intended for the broader electronic packaging and manufacturing community including: manufacturing engineers, packaging development engineers, as well as engineers and researchers in high reliability industries.