Chapter 6. Surface Mount Assembly of Electronic Modules

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Abstract: Surface mounting, as a constructive-technological approach in miniaturizing fourth-generation electronic equipment, has yielded significant advancements. These include the miniaturization of structural elements, a two- to three-fold increase in mounting density, decreased material consumption, and enhanced resistance to vibration-a critical factor ensuring equipment reliability. Shortening the lead length has correspondingly diminished parasitic inductance, capacitance, and resistance, thereby improving electrical parameters and bolstering equipment reliability. This chapter presents a classification of surface mounting varieties and discusses the technological equipment used for applying solder paste, placement and soldering components. The soldering of SMD components using solder pastes necessitates precise individual temperature profiling of heating for each board size, typically facilitated by a microcontroller. Soldering modes, governed by the melting of solder pastes, are determined by a temperature–time diagram, which is meticulously optimized for IR ovens with multiple heating zones. The chapter also addresses the primary defects encountered in surface mounting processes and delineates measures for their effective elimination.

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