Chapter 11. Laser Soldering of Electronic Modules

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Abstract: The primary types of lasers and laser diode systems used for assembly soldering are examined in detail. The technological features of laser soldering are presented for various types of contact connections in electronic modules, including bulk conductors, planar lead elements, chips, and device packages. By modeling the parameters of laser soldering, the optimal technological regimes for these processes have been determined. Laser radiation offers several advantages over infrared methods, including high localization of power in the heating zone, noninertial impact allowing for heating with short-duration pulses, precise dosing of emitted energy, and a minimal thermal effect zone. Soldered joints created through laser soldering exhibit a glossy surface, well-formed fillets, and enhanced strength properties. The ability to regulate flexibly and dose precisely the supplied energy enables the adjustment of temperature and soldering time over a wide range, enhancing the control and quality of the soldering process.

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