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Sommario/riassunto	Semiconductor devices are ubiquitous in the modern computer and telecommunications industry. A precise knowledge of the transport equations for electron flow in semiconductors when a voltage is applied is therefore of paramount importance for further technological breakthroughs. In the present work, the author tackles their derivation in a systematic and rigorous way, depending on certain key parameters such as the number of free electrons in the device, the mean free path of the carriers, the device dimensions and the ambient temperature. Accordingly a hierarchy of models is examined which is reflected in the structure of the book: first the microscopic and macroscopic semi-classical approaches followed by their quantum-mechanical counterparts.