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introduces the physical principles and operational characteristics of high speed semiconductor devices intended for use by advanced students as well as professional engineers and scientists involved in semiconductor device research it includes the most advanced and important topics in high speed semiconductor devices initial chapters cover material properties advanced technologies and novel device building blocks and serve as the basis for understanding and analyzing devices in subsequent chapters the following chapters cover a group of closely related devices that includes mosfets mesfets heterojunction fets and

permeable base transistors hot electron transistors microwave diodes and photonic devices among others each chapter is self contained and features a summary section a discussion of future device trend and an instructional problem set

physics of semiconductor devices covers both basic classic topics such as energy band theory and the gradual channel model of the mosfet as well as advanced concepts and devices such as mosfet short channel effects low dimensional devices and single electron transistors concepts are introduced to the reader in a simple way often using comparisons to everyday life experiences such as simple fluid mechanics they are then explained in depth and mathematical developments are fully described physics of semiconductor devices contains a list of problems that can be used as homework assignments or can be solved in class to exemplify the theory many of these problems make use of matlab and are aimed at illustrating theoretical concepts in a graphical manner

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