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Nota di contenuto	Electrical Characterization of Organic Electronic Materials and Devices; Contents; Preface; 1 General concepts; 1.1 Introduction; 1.2 Conduction mechanism; 1.3 Chemistry and the energy diagram; 1.3.1 Energy diagram of crystalline materials; 1.3.2 Energy diagram of amorphous materials; 1.4 Disordered materials and the Meyer-Neldel Rule; 1.5 Devices; 1.5.1 Resistor; 1.5.2 Schottky diode; 1.5.3 MIS diode and MIS tunnel diode; 1.5.4 Thin-film transistor; 1.6 Optoelectronics/photovoltaics; 2 Two-terminal devices: DC current; 2.1 Conductance; 2.1.1 Ohmic conduction; 2.1.2 Poole-Frenkel 2.1.3 Tunneling2.1.4 Space-charge-limited current; 2.1.5 Granular materials; grain boundaries; 2.2 DC current of a Schottky barrier; 2.2.1 High-current regime; 2.2.2 Displacement current; 2.3 DC measurements; 2.3.1 van der Pauw; 2.3.2 Hall effect; 3 Two-terminal devices: Admittance spectroscopy; 3.1 Admittance spectroscopy; 3.1.1 Low-frequency RCL bridge; 3.1.2 DC admittance; 3.2 Geometrical capacitance; 3.3 Equivalent circuits; 3.4 Resistor; SCLC; 3.5 Schottky diodes; 3.5.1 Schottky diode; nonuniform doping; 3.5.2 Schottky

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	diode; adding an abundant deep acceptor level 3.5.3 Schottky diode minority levels; 3.5.4 Schottky barrier; temperature dependence; 3.6 MIS diodes; 3.6.1 MIS of doped semiconductors; 3.6.2 MIS with interface states; 3.6.3 MIS of low- mobility semiconductors; 3.7 MIS tunnel diode; 3.8 Noise measurements; 4 Two-terminal devices: Transient techniques; 4.1 Kinetics: Emission and capture of carriers; 4.1.1 Emission and capture in organic materials; 4.2 Current transient spectroscopy; 4.2.1 Example of an emission experiment; 4.2.2 Example of a capture experiment; 4.3 Thermally stimulated current; 4.4 Capacitance transient spectroscopy 4.4.1 Case study: Example of a capacitance transient measurement4.5 Deep-level transient spectroscopy; 4.6 Q-DLTS; 5 Time-of-flight; 5.1 Introduction; 5.2 Drift transient; 5.3 Diffusive transient; 5.4 Violating Einstein's Relation; 5.5 Multi-trap-and-release; 5.6 Anomalous transients; 5.7 High current (space charge) transients; 5.8 Summary of the ToF technique; 6 Thin-film transistors; 6.1 Field-effect transistors; 6.2 MOS-FET; 6.2.1 MOS-FET threshold voltage; 6.2.2 MOS-FET current; 6.2.3 Exact solution; 6.2.4 MOS-FET subthreshold current and subthreshold swing; 6.3 Introducing TFTs 6.4 Basic model6.4.1 Threshold voltage and subthreshold current; 6.5 Justification for the two-dimensional approach; 6.6 Ambipolar materials and devices; 6.7 Contact effects and other simple nonidealities; 6.7.1 Insulator leakage; 6.7.2 Contact resistance; 6.7.3 Contact barriers; 6.7.4 Grain boundaries; 6.7.5 Parallel conductance; 6.8 Metallic contacts in TFTs; 6.9 Normally-on TFTs; 6.9.1 Narrow gap semiconductors; 6.9.2 Thick TFTs; 6.9.3 Doped semiconductors and inversion-channel TFT; 6.9.4 Metal-insulator-metal TFT; 6.10 Effects of traps; 6.10.1 Traps and threshold voltage 6.10.2 Traps and output curves
Sommario/riassunto	Think like an electron Organic electronic materials have many applications and potential in low-cost electronics such as electronic barcodes and in light emitting devices, due to their easily tailored properties. While the chemical aspects and characterization have been widely studied, characterization of the electrical properties has been neglected, and classic textbook modeling has been applied. This is most striking in the analysis of thin-film transistors (TFTs) using thick "bulk" transistor (MOS-FET) descriptions. At first glance the TFTs appear to behave as regular MOS-FETs.