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Nota di contenuto	Cover; The Circuit Designer's Companion; Contents; Introduction; Introduction to the second edition; Chapter 1 Grounding and wiring; 1.1 Grounding; When to consider grounding; 1.1.1 Grounding within one unit; 1.1.2 Chassis ground; 1.1.3 The conductivity of aluminium; Other materials; 1.1.4 Ground loops; 1.1.5 Power supply returns; Varying loads; Power rail feed; Conductor impedance; 1.1.6 Input signal ground; Connection to 0V elsewhere on the pcb; Connection to 0V within the unit; External ground connection; 1.1.7 Output signal ground; Avoiding the common impedance 1.1.8 Inter-board interface signalsPartitioning the signal return; 1.1.9 Star-point grounding; 1.1.10 Ground connections between units; Breaking the ground link; 1.1.11 Shielding; Which end to ground for LF shielding; Electrostatic screening; Surface transfer impedance; 1.1.12 The safety earth; 1.2 Wiring and cables; 1.2.1 Wire types; Wire inductance; Equipment wire; 1.2.2 Cable types; 1.2.3 Power cables; 1.2.4 Data and multicore cables; Data communication cables; Structured data cable; Shielding and microphony; 1.2.5 RF cables; 1.2.6

Twisted pair; 1.2.7 Crosstalk; Digital crosstalk

1.3 Transmission linesTransmission line effects; Critical lengths for pulses; 1.3.1 Characteristic impedance; 1.3.2 Time domain; Forward and reflected waves; Ringing; The Bergeron diagram; The uses of mismatching; 1.3.3 Frequency domain; Standing wave distribution vs. frequency; Impedance transformation; Lossy lines; Chapter 2 Printed circuits; 2.1 Board types; 2.1.1 Materials; Epoxy-glass; 2.1.2 Type of construction; 2.1.3 Choice of type; 2.1.4 Choice of size; Sub-division boundaries; Panelisation; 2.1.5 How a multilayer board is made; 2.2 Design rules; 2.2.1 Track width and spacing

Conductor resistanceVoltage breakdown and crosstalk; Constant impedance; 2.2.2 Hole and pad size; Vias; Through hole pads; Surface mount pads; 2.2.3 Track routing; 2.2.4 Ground and power distribution; Ground rail inductance; Gridded ground layout; The ground plane; Inside or outside layers; Multiple ground planes; 2.2.5 Copper plating and finishing; 2.2.6 Solder resist; Screen printed resists; Photo-imaged film; 2.2.7 Terminations and connections; Two-part connectors; Edge connectors; 2.3 Board assembly: surface mount and through hole; 2.3.1 Surface mount design rules; Solder process

Printed circuit board qualityThermal stresses; Cleaning and testing; 2.3.2 Package placement; 2.3.3 Component identification; Polarity indication; 2.4 Surface protection; Variations in surface resistance; Circuit design vs. surface resistance; 2.4.1 Guarding; 2.4.2 Conformal coating; Coating vs. encapsulation; Steps to take before coating; Application; Test and rework; 2.5 Sourcing boards and artwork; 2.5.1 Artwork; Using a bureau; Disadvantages of a bureau; 2.5.2 Boards; Chapter 3 Passive components; 3.1 Resistors; 3.1.1 Resistor types; Surface mount chip; Metal film; Carbon; Wirewound Precision resistors

#### Sommario/riassunto

Tim Williams' Circuit Designer's Companion provides a unique masterclass in practical electronic design that draws on his considerable experience as a consultant and design engineer. As well as introducing key areas of design with insider's knowledge, Tim focuses on the art of designing circuits so that every production model will perform its specified function - and no other unwanted function - reliably over its lifetime. The combination of design alchemy and awareness of commercial and manufacturing factors makes this an essential companion for the professional electronics designer.