Introduction

Chapter 1 Grounding and wiring

1.1 Grounding

1.1.1 Grounding within one unit

1.1.2 Chassis ground

1.1.3 The conductivity of aluminum

1.1.4 Ground loops

1.1.5 Power supply returns

1.1.6 Input signal ground

1.1.7 Output signal ground

1.1.8 Inter-board interface signals

1.1.9 Star-point grounding

1.1.10 Ground connections between units

1.1.11 Shielding

1.1.12 The safety earth

1.2 Wiring and cables

1.2.1 Wire types

1.2.2 Cable types

1.2.3 Power cables

1.2.4 Data and multicore cables

1.2.5 RF cables

1.2.6 Twisted pair

1.2.7 Crosstalk
1.3 Transmission lines

1.3.1 Characteristic impedance

1.3.2 Time domain

1.3.3 Frequency domain

Chapter 2 Printed circuits

2.1 Board types

2.1.1 Materials

2.1.2 Type of construction

2.1.3 Choice of type

2.1.4 Choice of size

2.1.5 How a multilayer board is made

2.2 Design rules

2.2.1 Track width and spacing

2.2.2 Hole and pad size

2.2.3 Track routing

2.2.4 Ground and power distribution

2.2.5 Copper plating and finishing

2.2.6 Solder resist

2.2.7 Terminations and connections

2.3 Board assembly: surface mount and through hole

2.3.1 Surface mount design rules

2.3.2 Package placement
2.3.3 Component identification

2.3.4 Understanding thermal behavior