

## EMC principles for PCB layout designers

A one day in-house training course for electronics companies

*Suitable for all electronic manufacturing and related companies*

### Description

This seminar is a one-day overview of EMC design practice for PCB layout. Good EMC design offers a product that is more reliable and better fitted for its environment. The seminar will introduce participants to the design principles which underpin the EMC-related aspects of the PCB layout.

### Who should attend

**PCB layout designers and design managers:** a basic knowledge of electronics is assumed. The course will be of particular interest to PCB layout designers in all sectors whose layouts must meet EMC requirements as part of their project specification. It will help them understand EMC requirements and avoid costly EMC-related design mistakes. The principles can be applied with any PCB layout CAD software.

**Course material:** course notes, including all slides used and explanatory text, will be sent before the start for copying and distribution to the delegates.

### Cost for the basic course

**£1250.00 (no per-delegate fee)**

plus travel and accommodation expenses for the course presenter

### For a firm quote and booking

Contact:

Elmac Services, Chichester, UK

Tel +44(0)1243 673372

e-mail [courses@elmac.co.uk](mailto:courses@elmac.co.uk)

web <http://www.elmac.co.uk>

### Payment, admin and cancellations

The course will be invoiced on completion. The client is responsible for administering the seminar. A purchase order is required for confirmation at least four weeks before the agreed start date. Cancellations with less than two weeks' notice will incur a charge.

### The presenter



**Tim Williams**, consultant with Elmac Services, is the author of "EMC for Product Designers" (fourth edition), now regarded as a standard reference for design engineers needing to meet the EMC Directive, and "EMC for Systems and Installations" (with Keith Armstrong), as well as "The Circuit Designer's Companion" (second edition). He has written and presented many articles, conference papers and seminars internationally on circuit design and testing for EMC. He has been a technical assessor for UKAS and SWEDAC, and has conducted EMC design reviews for numerous companies in every industry sector.

## Programme

### Morning

- 09.00-10.30 Introduction to EMC requirements: *Why EMC? – the definition of EMC and its relevance to PCB design – Directives and other requirements – the product quality aspects of EMC – basic principles: inductance and capacitance, controlling their effects*
- 10.45-12.15 Electromechanical Design of PCBs: *Segregation and partitioning – critical tracks and their routing – connectors, interface layout and grounding, placement of filter and buffer components – on-board shielding – heatsinks – bonding to chassis metalwork – controlling the PCB's antenna properties – daughter and mezzanine board-to-board connections – physical construction of planes: gaps, holes, mesh, thermal relief*

### Afternoon

- 13.15-15.00 Electronic Design of PCBs: *The development and purpose of the 0V plane – to split or not to split – when not to have a 0V plane – 0V planes on multiple layers – application of power planes: segmenting the power distribution – plane edge effects – layer stack-ups: power-0V proximity, layer thickness, differences as between two or n layers – transmission line issues: balance, constant impedance – decoupling: how a decap looks at RF, power rail impedance, consequences for decap placement, tracking and vias – high density interconnect*
- 15.15-16.30 What to expect at a PCB Design Review: *Partitioning circuit areas and placement of components – ground plane strategy – layer stack-up – power plane strategy – decoupling layout – routing of critical tracks – use of transmission lines – interface layout – chassis bonding*
- 16.30-17.00 Wrap up and final discussion