

π

PERANCEA

Shielding at PCB Level

Shielding, perhaps the most common technique for controlling EMC - Electro-Magnetic Compatibility - is deceptively simple! Metal enclosures keep harmful interference out and also unwanted emissions in.

As with most simple concepts, practical EMC shielding requires considerable engineering skill to give good results. However, at product enclosure level, it can be complex and expensive, adding to both material and assembly costs. Added to that, effective enclosure shielding usually requires substantial filtering of all cables which pass out of the product, right at the point where they penetrate the enclosure shield.

Tackling an EMC solution cost effectively and conclusively, shielding at PCB level is simple and low-cost. Board level shielding solutions can be used to achieve an EMC performance that would be far more difficult and costly at product enclosure level.

At board level, small shielding cans can be applied selectively to the problem areas of a circuit, directly tackling components with emissions that are too high or are too sensitive.

In effect, PCB shielding cans are simple metal boxes that are easily soldered in place, much like any other board level component. Tackling EMC problems at this level, keeps component and assembly costs low and the appearance and ease of maintenance of the product are not compromised.

With circuit board tracking and wiring shielded inside a can solution, the contained tracks and wires are consequently very short and thus not very efficient as aerial radiating RFI or EMI. Furthermore, they may not need much, if any, filtering to reduce overall emissions to an acceptable level.

Where immunity is a pre-requisite and the problem to be resolved, board level shielding will require the same performance from cable filters as for enclosure-level shielding. However, as the filters can now be fitted to the PCB instead of an enclosure shield, component and assembly costs are minimised.

Although board level shielding using simple metal cans is much easier than shielding at enclosure level, there are still important design issues to be considered. These are discussed briefly as follows:

Ground Plane:

In operation, a PCB shielding can must be soldered to a good ground plane which lies underneath all the components that require shielding to create a complete six-sided metallic enclosure - a mini Faraday cage. The ground plane, as discussed later, must not have any significant apertures in it.

**CA Electro
Components Ltd.**

36 Park Lane, Bishops Cleeve,
Hertfordshire, CM23 3NH, United Kingdom.

Telephone and Fax: (44) 01279 656051

In line with our policy of continuous improvement, we reserve the right to make design or product alterations without prior notice.

The technical information for this data sheet was independently provided by Cherry Clough Consultants.