

ELECTRICAL TEST FOR PCBs – EXPENSIVE NECESSITY OR A WASTE OF MONEY

Today PCBs must fulfill a number of quality requirements before they can leave the production hall. A manufacturer who cannot give a 100% guarantee for the electrical perfection of his products will not find any buyers. Along with a final detailed optical check, it considerably reduces the extent of a purchaser's incoming controls. Nevertheless, electrical tests are often seen as an irritating and, particularly, a cost raising triviality.

THE DILEMMA IS OBVIOUS:

Demands for quality controls mean additional production costs. In the common interest of customers and manufacturers, the question of optimal testing is repeatedly posed in the production process.

The days of the first "printed circuits" which could be checked simply with the naked eye are over. Today, high-tech equipment is necessary for a thorough PCB test.

Optical checks with the aid of conventional microscopic equipment are sufficient for one-sided and relatively simple double-sided PCBs. Residues, constricted conductors and sub-corrosions can be discovered which would otherwise lead to PCB failure after a number of operational hours.

An electrical test is needed to check the actual functions of a PCB. It is an essential if inner layers need to be tested, as is the case with multi-layers.

In two position measurements all connections in the PCB are checked for stoppages and short circuits. All SMD pads and plated through holes are checked. The electrical test can be conducted as a parallel or finger test.

PARALLEL TEST:

For the parallel test a control adaptor is constructed, consisting, e.g. of several

synthetic sheets positioned above each other and fitted with control pins.

An adaptor programme must be written to reflect the actual holes in each individual synthetic layer of the adaptor. The pin positions are identical to the control points enabling an overall PCB test within seconds.

The control adaptors are all the more expensive the higher the density and the lower the grid distances between control points. The adaptors can also only be used for one specific type of PCB which explains the high set-up costs for the test.

FLYING PROBE TEST:

As PCB series are not always produced in mass, the flying probe test was developed as an alternative solution for small or medium-sized series. Manoeuvrable probes move to the control points without necessitating an adaptor. As the points are checked individually, the time required for a complete check depends on the number of test points. In extremely complex layouts the test can take up to 30 minutes.

Electrical testing of PCBs is costly and time intensive. However, it is obvious that testing is necessary. Just consider the consequences of a defective PCB discovered only after assembling is completed!

As purchasers are generally unable to conduct tests themselves, there is no alternative to the electrical test.