

Fault finding on PCBs has become increasingly complex with the increase in high density parts and the widespread use of multi-layer PCBs. Here are some answers to questions most frequently asked of us.

1. I understand that your Toneohm 950 can locate Vcc to Gnd shorts on multilayer PCBs. Why should I do this as it is clearly the PCB manufacturer's problem.

Toneohm 950 customers tell us that over 90% of Vcc to Gnd shorts or inner layer shorts on assembled boards are actually assembly process related. Before they had access to a Toneohm 950 they assumed that any Vcc to Gnd short was a board problem. The majority of PCB manufacturers test their boards extensively for shorts — especially inner layer shorts. Most common causes of Vcc to Ground shorts on assembled boards are solder bridges under SMD decoupling capacitors. These are relatively easy to locate with a Toneohm 950. Other causes include misaligned SMDs shorting to Pin Grid arrays or through-hole components. A high percentage of these types of faults is easy to repair.

2. What is the probe tip life on the FT100 Flying probe test system?

On clean flux free boards the probe tip can last many hundreds of hours. However on boards contaminated with flux or oxide the life can be very short. Clean component leads make faultfinding with the FT100 a much more reliable process. However FT100 probe tips are the same as those used in circuit test fixtures and have a very low replacement cost. If you choose to source them from a vendor other than Polar please remember to specify 4 ounce (120 gram) spring pressure.

3. Can I program the FT100 from Gerber files?

Gerber is primarily a format for board manufacturers; on its own it does not contain enough information to generate a good FT100 test program. Ideally we recommend you program with CAD data. FTCam Pro will take Gerber but you will find you do not have as much flexibility in terms of program generation as you do with CAD based data.

4. How can I fault-find a PCB without a known good board?

PCB faultfinding or troubleshooting takes practice. Its simpler (but still needs some practice) to find a fault when you have a known good board available. With a PFL you can save the comparison information on your PC. Without access to a good board a good start is to look for areas of the board that should be the same. For instance, check that all data bus lines have an identical signature; do the same for address lines. Does the board have more than one channel? If one channel is good compare it with the others. Does the board contain simple logic? Then power it and check it with the Quicktest Auto function on the PFL780; this will compare the logic function with that generated by a software simulator of the device. Finally, remember that fault locators are not magic, they are only able to work with the information they have available. Don't be surprised if there are some boards you can't repair. With experience your yield will increase, but remember that no one can offer a 100% solution.

5. I notice that you package Toneohm Short circuit locators with PFL Fault locators (PWS9090), surely there is no requirement for a short circuit locator in a service department?

Maybe we got the name wrong — you can use Toneohms to locate loading problems on data and address busses. We are often asked "If there are 5 devices on a bus or node, which is the faulty one?" Well, if the fault shows as a low resistance, say, less than 200 Ohms, (a slightly sloping vertical signature on a PFL or T-Series) then you can use the Current Trace or Plane Shorts method to home in on the exact faulty part. This is equally applicable in a service workshop or a production test area.

7. The PCBs I assemble have become too complex for in-circuit bed of nails type test. We have moved to a purely functional test strategy but the functional test system only supplies very limited diagnostic information if the board fails.

Several FT100 flying probe test systems are installed in this type of situation to assist in post functional test repair. For very low volumes, sometimes a PFL760 with comprehensive SMD probes will be adequate. But if you need to fault find around 10 boards per day (the quantity depends on size or complexity) the FT100 starts to become an economic alternative.

8. I am unable to load the IPC file into my Toneohm 970 software.

Use the 'Plot Netlist' menu and then the 'Read IPC' dropdown.

The 'File Command' on the Toneohm970 is used for saving repair databases.

9. Can I repair battery backed RAM boards with Polar fault locators?

Please take care. Some CNC machines contain their programs in battery-backed RAM. This data may be lost if performing a digital test and you may need to have the program reloaded by the original manufacturer. Digital RAM tests mean the RAM will be erased and tested with a pattern of 1s and 0s.

Only learn reference boards with battery RAM based programs if you have the tools to reload the original data back into the battery based RAM.



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