



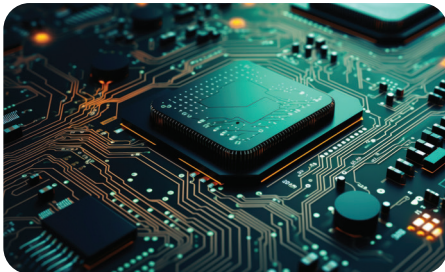
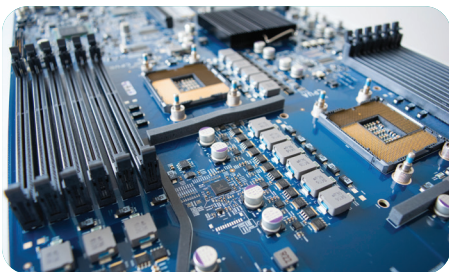
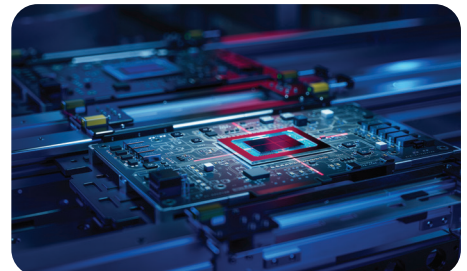
Multilayer Shorts Locator



Toneohm 950A



Physically locate power & ground plane shorts.



Locates ground and power plane shorts

Ideal for assembly and fabrication

Pinpoints many types of PCB shorts

Handles most PCB technologies

polarinstruments.com



Multilayer shorts location made simple

Manufacturers and assemblers of electronic printed circuit boards are constantly striving to:

- Increase production throughput
- Minimize rejects and scrap
- Reduce rework time and cost
- Find root cause of short circuits

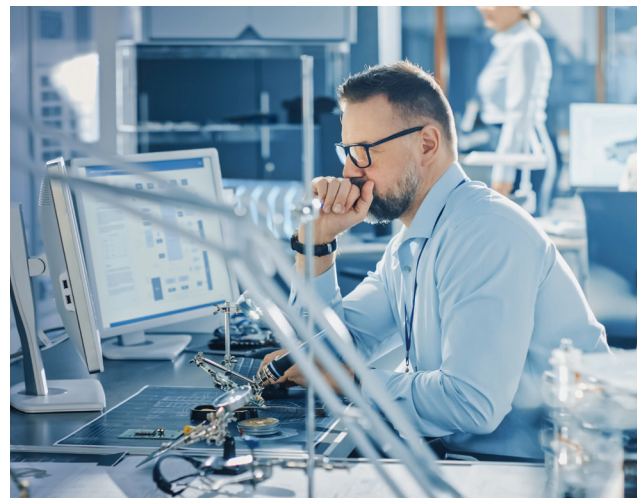
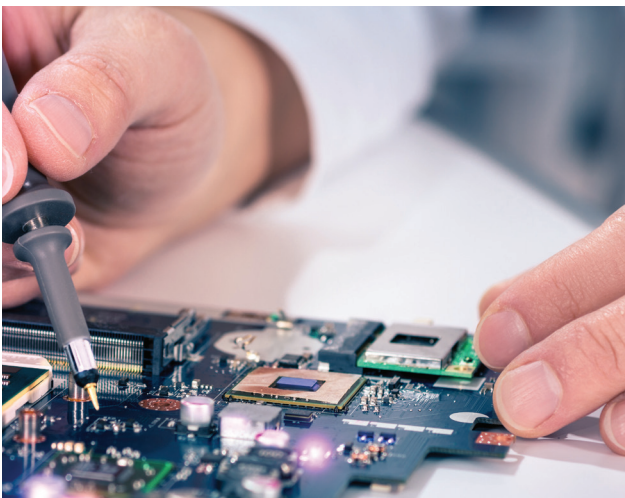
A significant percentage of electronics manufacturing and in-service defects are caused by PCB short-circuits or faulty devices loading the circuit. Automatic test equipment or conventional fault location can be used to diagnose the presence of shorts, but not their physical location.

The Toneohm 950A represents the definitive solution to all these problems. Employing Polar's innovative Vector Plane Stimulus (VPS™) technique, the 950A provides fast and accurate guidance to the origin of PCB shorts. From an operator's point of view, nothing could be easier to use - you just follow the arrows on the instrument's front panel which navigate you to the location of the fault.

Short circuit location has become more difficult due to the introduction of:

- Multilayer boards
- Bus-structured circuits
- Densely-packed components, including surface-mount
- Fine-line tracks
- Power and ground planes

Toneohm 950A is an ideal tool for the electronics production environment. Able to quickly and accurately locate shorts on both bare and loaded PCBs, the 950A provides a very cost-effective means of minimizing repair-time and rework of faulty PCBs that have been identified by pass/fail testing on an ATE system.



Why do you need the Toneohm 950A?

PCBs are becoming more complex and valuable in terms of both cost and the requirements for 100% yield in the production process. Witness the very rapid growth in multilayer fabrication techniques, surface-mount technology and lean manufacturing. You simply cannot afford to spend excessive time locating faults such as short-circuits, since this adds cost and reduces quality. Scrapping the board results in even higher costs and unacceptable shortfalls in production yield.

Since a significant percentage of short circuits are caused by process faults - you need help in locating these with minimum of rework.

Multiple power and ground planes on PCBs further compounds the problem. PCBs employing maximum copper outer layers for EMC screening are an extreme case in point, making it virtually impossible to locate shorts with conventional fault-finding tools.

Field service

By combining milliohm measurement capabilities with sensitive, non-contact, current-tracing facilities, Toneohms are able to locate many types of PCB shorts that occur during in-service use. These include low resistance faults (soft shorts) caused by failing decoupling capacitors and 'stuck-at' logic devices, which often pose considerable problems for field service.

How is the Toneohm 950A used?

The Toneohm 950A provides a non-destructive means of tracing short-circuits to their point of origin and is easy to use with a rapid learning curve. The instrument offers four operating modes, which cover virtually all categories of hard and soft PCB shorts, including etch problems, solder bridges, stuck bus lines and faulty decoupling capacitors.

All modes use industry standard Polar Tone guidance lead you to the source of solder bridges, track shorts, and leaky components. The tone guidance is complemented with an easy to use graphic touchscreen display.

Plane to Plane Shorts / Trace to Plane shorts

The 950A has a powerful feature that allows you to locate the position of a short between two planes (e.g. GND and Vcc) or tracks that are shorted to a power or ground plane at an unknown location. You attach four stimulus leads to the PCB and use the four arrows on the touchscreen display of the 950A to guide you where to place a probe on the PCB. After three or four movements of the probe, you are likely to be within a few millimetres of the short and all the arrow indicators will illuminate. Tone guidance then leads you to the area of the short circuit. The majority of plane to plane shorts are caused by problems on the outer layers (e.g a shorting chip capacitor) and you can use the 950A to quickly identify the location and cause of the fault. Access to CAD data can be useful in locating the corners of the planes and the best places to access the ground plane for the short location process.



Toneohm 950A System Specification

Track resistance

Ranges	40mΩ, 200mΩ, 2Ω, 200Ω, 2kΩ, 20kΩ
Probe voltage	260mV maximum
Probe protection	Momentary contact up to 30V

Track voltage

Ranges	2mV, 20mV, 200mV, 2V, 20V
Input resistance	120Ω in 2mV, 20mV 1MΩ in 200mV, 2V, 20V
Probe protection	Momentary contact up to 30V
Indication	Tone in 2mV, 20mV, 200mV, 2V

Plane shorts

Indication	Tone, uncalibrated DVM and bar-graph, and fault direction arrows.
Sensitivity	Adjustable for differing plane resistance. Capable of detecting shorts up to 20Ω.

Drive source

Output voltage	0 to 500mV, (0 to 100mA into short circuit) peak. AC in Trace, DC in Volts ranges.
Protection	Protected to ± 30V

Power Requirements

90 to 264V AC, 47 to 63Hz, 0.49A max, 20VA

Approvals

Conforms to applicable European Directives and is CE marked.

Accessories (standard)

(950A accessories use high reliability connectors and are incompatible with legacy Toneohm accessories)

Description

- Needle probes
- Current trace/drive source probe
- Plane probe
- Plane stimulus leads
- Lightweight headphones
- Online operator manual

Designed for Diagnostic purposes

The 950A is designed to provide the most effective tool box for short circuit location. The ranges are indicative and no calibration is required. Ranges are designed to give the best tonal and display resolution to assist the operator in the physical location of short circuit and loading faults.

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