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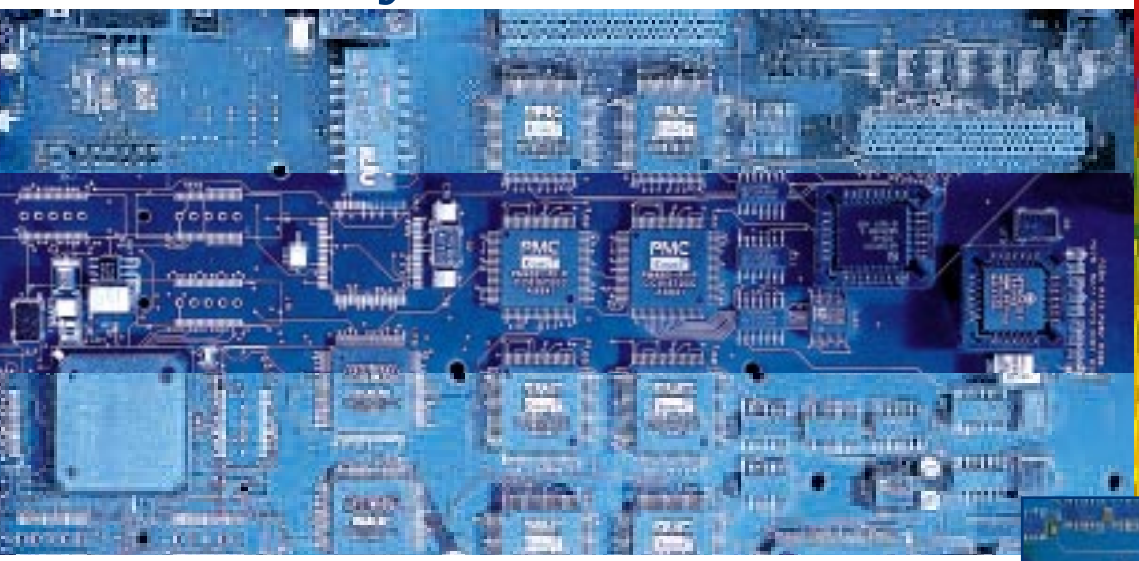
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Find the *Polar Toneohm 950* at our website: ***Click HERE***

Toneohm 950
Multilayer Shorts Locator







Multilayer shorts location made simple on assembled PCBs

Ideal for production and service

Pinpoints virtually all types of PCB short

Handles all PCB fabrication technologies

polarinstruments.com

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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
- Maintain and improve quality





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 fault detection techniques can be used to diagnose the presence of shorts, but not their physical location.

The Toneohm 950 represents the definitive solution to all these problems. Employing Polar's innovative Vectored Plane Stimulus techniques (VPS), the instrument provides fast and accurate guidance to the origin of PCB shorts. From an operators 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!!.

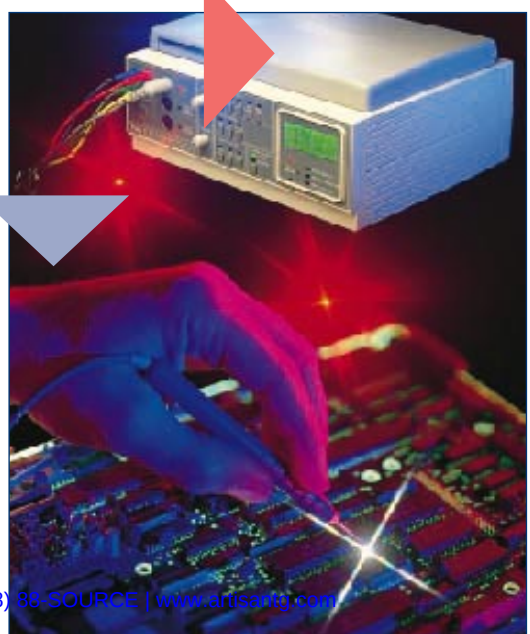
In recent years, shorts location has become more difficult due to the introduction of:

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

Manufacturing support

Polar Toneohms are ideal tools for the electronics production environment. Able to quickly and accurately locate shorts on both bare and loaded PCBs, they provide 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





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Why do you need the Toneohm 950?

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 just-in-time 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 process faults are caused by shorts - you need help in locating these with minimum of rework. The introduction of power and ground planes on multilayer boards has further compounded 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.

How is the Toneohm 950 used?

The Toneohm 950 can be used by a non-technical operator, and provides a non-destructive means of tracing short-circuits to their point of origin.
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.

Field service

By combining milliohm and microvolt measurement capabilities with sensitive, non-contact, current-tracing facilities, Toneohms are able to locate virtually all 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.

In addition to high-sensitivity Track Resistance and Track voltage modes, Toneohm 950s provide a completely non-invasive means of measuring PCB track current - without requiring you to break or cut the circuit. Employing a non - contact current-sensing probe, the Track Current mode facilitates easy location of Vcc-to-ground shorts, and of faults in bus-structured boards such as backplanes and memory banks.
A backlit liquid crystal display provides clear indication of relative measurement values, and an audio tone enables you to walk the probes along the shorted tracks without even looking at the instrument - the highest tone will indicate the short.





Plane to Plane Shorts

The 950 has a powerful feature that allows you to locate the position of a short between two planes (eg GND and Vcc). You attach four stimulus leads to the PCB and use the four arrows on the front of the 950 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 LEDs will illuminate. The majority of plane to plane shorts are caused by problems on the outer layers (eg a shorting chip capacitor) and you can use the 950 to quickly identify the location and cause of the fault.

“ By introducing Polar Toneohms into our production process, we are able to achieve maximum throughput of quality-approved boards in our repair facility. This has proved to be a sound economic investment for Motorola. ”

Barry Hayes,

Production Manager, Motorola, UK

“ Its ease of operation makes Polar Toneohm 950 a viable and economical way of curing ground-plane shorts ”

Cyril Cooper,

Test Specialist, Design to Distribution Ltd.

HEAD OFFICE

Polar Instruments Ltd.
Garenne Park Guernsey
UK. GY2 4AF
Tel: +44 1481 253081
Fax: +44 1481 252476
mail@polarinstruments.com

Polar Instruments UK Ltd.
20A Picton House
Hussar Court
Waterlooville Hampshire
England PO7 7SQ
Tel: +44 2392 269113
Fax: +44 2392 269114
mail@polarinstruments.com

Polar Instruments Inc
320E. Bellevue Avenue
San Mateo
CA 94401, USA
Tel: (800) 328 0817
Fax: (650) 344 7964
mail@polarinstruments.com

Polar Instruments (Singapore) Ltd
The Fleming Unit #59D
Singapore Science Park 1
Singapore 118243
Tel: +65 873 7470
Fax: +65 873 7471
mail@polarinstruments.com

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Toneohm 950 System Specification

Track resistance	
Ranges	Ω, 200mΩ, 2Ω, 200Ω, 20kΩ
Accuracy	±4% in 200mΩ ±5% in 20kΩ
Ω range	High sensitivity uncalibrated, approximately 40mΩ full scale
Probe voltage	60mV maximum
Probe protection	±30V
Indication	Tone and meter on all ranges

Track Current	
Ranges	200mA, 2A, Trace
Accuracy	200mA, 2A, ±15%
Trace	Reading proportional to current when UNCALIBRATED illuminates Reading proportional to detected magnetic field strength
Probe voltage	600mV maximum in 200mA, 2A
Probe protection	±30V
Indication	Tone and meter on all ranges

Track voltage	
Ranges	2mV, 20mV, 20V
Accuracy	±4% ±15µV
Input resistance	120Ω in 2mV, 20mV 1MΩ in 20V
Probe protection	±30V
Indication	Tone and meter on all ranges

Plane shorts	
Indication	Tone, digital display and LED fault direction arrows
Sensitivity	Adjustable to compensate for differing plane resistance

Drive source	
Output voltage	0 to 550mV, adjustable AC in TRACE, DC in all other modes. Protected to ±30V

Plane stimulus	
Output voltage	550mV maximum

Power req:	230V±10% or 115V±10% @ 50/60Hz, 25VA

Accessories	**Description**	**Part Number**
(standard)	Needle probes	ACC152
	Current trace/drive source probe	ACC114
	Plane probe	ACC113
	Plane stimulus leads	ACC134
	Lightweight headphones	EPM115
	Operator manual	MAN129
(optional)	Graphical repair software	GRS25
	Service manual	MAN130
	Bare board stimulus leads	ACC231

Approvals	Conforms to applicable European Directives and is CE marked Polar Instruments Ltd is certified to ISO 9001

Bare Boards
If you have shorts on bare PCBs, ask for details of the Toneohm 970

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LIT: 110

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