

# accuprobe

## PROBITY

Volume 2, Issue 1

August 2003

### Inside this issue:

**New Premise 1**

**PCB Router 2**

**High Temperature Probing 2**

**Ceramic Blade Probes 3**

**Adjustable Probe Card 3**

**Probe Pitch 3**

### Accuprobe Moves into New Premise

In November 2002 Accuprobe moved to new premises in Salem, Massachusetts to upgrade the quality of its office setting and provide the basis for an increase in production capacity. The old premises were clearly worn out after 25-years of occupation and the time had come for the upgrade. The new premise, remodeled especially for Accuprobe, was part of the old mill complex on the waterfront in Salem, Massachusetts. The original Naumkeag mill was built in 1839 and in its heyday produced more than 18 million yards of cotton and employed nearly 1,500 workers. Mills such as this were prevalent and formed the cradle of the industrial revolution, manufacturing products in the northeast of the United States. A fire destroyed the original structure in 1914 and the current 1.5 million square feet of space, spread over several buildings, was subsequently constructed. A variety of high-tech and



Naumkeag Steam Cotton Company c1850

service companies currently occupy the space, now know as Shetland Park. In the high-tech industry of today's modern world, Accuprobe has re-established this structure in preparation for future demands. The new layout has been designed specifically to streamline production, to ensure a more satisfied workforce and facilitate higher product quality.



Accuprobe's New Facility

## Accuprobe's PCB Router

An Excellon EX-110 with CNC-6 control printed circuit board router, has been installed by Accuprobe to provide increased customer service, improve quality, and allow more efficient production. The router automatically cuts out printed circuit board profiles to meet unique customer needs. Customers require different board cutouts to match the size of the device under test and to ensure balanced contact force. The Excellon router also allows multiple boards to be routed with a single set up, both increasing productivity and allowing faster delivery following customer requests. Excellon printed circuit board routers are the de-facto standard of the printed circuit board manufacturing industry. Accuprobe has hundreds of standard probe cards in stock, each of which can be precisely routed to a unique design using the new equipment.



Accuprobe's Excellon Board Router

## High Temperature Probing

To provide design verification, ensure reliability and also meet the exacting standards in the automotive, telecommunications and defense industries, many devices need to be tested at elevated temperatures. To accomplish this, wafers are typically placed on thermal chucks heated to 150-350°C. Testing may be instantaneous or activated over several hours or days of continuous operation at the elevated temperature. At these temperatures considerable attention needs to be paid to the materials used in the construction of the probe card to ensure the integrity of the card and also to minimize probe movement as temperatures rise. Probe card materials other than standard FR4 glass epoxy must be used as this material becomes unstable at these high temperatures. Standard 60SN/40PB solder melts at about 180°C and hence cannot be used in proximity to these temperatures on the hot chuck.

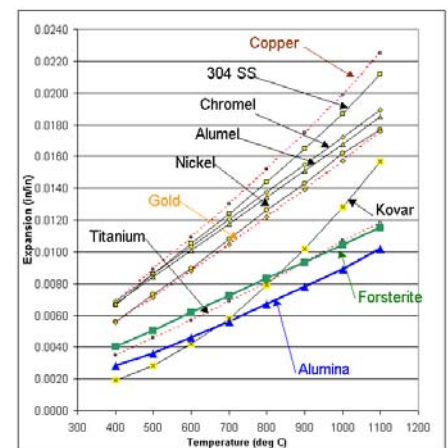
Accuprobe has designed probe cards specifically for effective use at temperatures in excess of 150°C. Advanced circuit board materials are used for the probe card and ceramic blade probes with tungsten probe needles provide the interface to the DUT. Ceramic blades are excellent for this application as they are stable at temperatures well in excess of 350°C and have a low coefficient of thermal expansion. Probe cards constructed from ceramics such as  $Al_2O_3$ , can also be provided to compliment the excellent thermal properties of ceramic blades. Accuprobe typically utilizes tungsten probe needles for high temperature applications as they provide good stability with a low coefficient of thermal expansion of  $4.3 \times 10^{-6}/^{\circ}C$ .

High temperature probing is possible by designing probe cards with:

- Sufficient heat capability
- Appropriate solders for the specific temperatures desired
- Minimal coefficients of thermal expansion
- High bulk resistivity
- Minimal probe lengths to curtail probe movement

Contact Accuprobe for all of your high temperature probing requirements.

***“Accuprobe has designed probe cards specifically for effective use at temperatures in excess of 150°C.”***



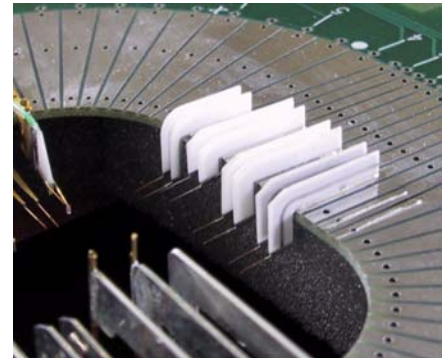
Material expansion with temperature

## Ceramic Blade Product Range

To expand our extensive range of ceramic blades, Accuprobe has recently introduced the *CZ1* ceramic blade. This 50Ω stripline blade is designed for use with a 144mil working depth and is available in both short and medium arm lengths. The *CZ1* ceramic blade is gold plated to minimize path resistance to less than 0.5Ω. Active and passive components can be mounted on the blade for sensitive signal applications. The

*CZ1* joins the other 144, 244, and 317mil working depth ceramic blades available from Accuprobe.

All of Accuprobe's ceramic blades can be equipped with customer selectable probe needles with individual material, tip diameter, tip shape, tip length, and extension.

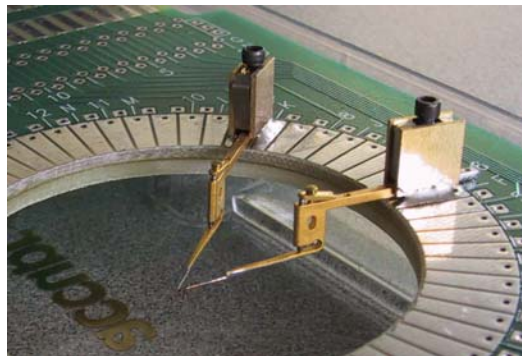


Ceramic Blade Probes

## Adjustable Probe Card

Accuprobe's newly designed low cost *Z-Bridge* accommodates Accuprobe's Z-adjustable probes and allows in-situ x and y adjustment of probe position. The *Z-Bridge* is especially useful where an urgent probing situation needs to be addressed and time is not available to have a probe card constructed. The Accuprobe *Z-Bridge* can be soldered to the lands of any probe card and the probe is positioned and then locked into position using a simple setscrew. The x and y positional adjustability of the *Z-Bridge* is

complemented by the Z adjustability inherent in the Z adjustable probe. Accuprobe



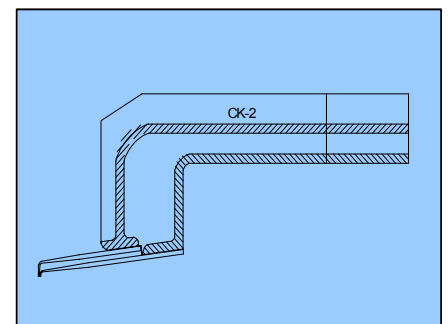
New Adjustable Z-Bridge

has an extensive range of Z adjustable probes that allow for traditional and Kelvin probing, coupled with a wide range of tip geometries and tip materials. Accuprobe's recently introduced inline K-probe is a perfect fit with the *Z-Bridge* for precise targeting of small device pads for Kelvin measurements.

## Probe Pitch

While 100μm pads and 150μm pitches were state-of-art a few years ago, pads of 25-50μm, with sub100μm pitches are not uncommon today. Geometries such as this are challenging and expensive to target with any of the current probing technologies. Accuprobe offers 6-10 mil probe needles with 0.5 to 1 mil probe tips to assist in solving these applications. Our BH series of small metal blades are constructed so that the blade width is less than 18 mils including the probe needle

to allow high density probe pad arrays to be addressed. In many cases small pads need to be targeted using Kelvin measurement techniques, necessitating two probes landing on the small pad. Accuprobe's z-adjustable probes can target sub-100micron geometries with dual probes on the same pad. Accuprobe has also designed a dual in line ceramic blade for sub 100 micron Kelvin probing (CK series) as shown in the graphic. Single and multi tie epoxy ring arrays are also well established solutions for fine pitch probing.



Kelvin Ceramic Blade Probe

**MEMSprobe™ coming  
soon!**

## **Accuprobe, Inc.**

BITA ELECTRONIQUE S.A.  
45 Rte d'Arlon , LU-1140 LUXEMBOURG VILLE

Ph. +352 450010  
Fx. +352 332643  
Email: [info@bita.lu](mailto:info@bita.lu)  
[www.bita.lu](http://www.bita.lu)

Accuprobe manufactures fixed pattern probe card assemblies for use by semiconductor producers. Probe cards are used for semiconductor wafer sort and Hybrid circuit laser trim applications. Accuprobe also manufactures probe card assembly and repair equipment which allows customers to assemble their own probe card assemblies using Accuprobe needles, tips, blank probe cards, edge sensors and other related components. Accuprobe offers Epoxy Ring, Z Adjustable, Metal Blade, Ceramic Blade and Blade Spring probes.

**For further information  
or subscription changes  
contact the Editor.**

# accuprobe

**Distributed By:**



Accuprobe's Jeff Wake at the Semi  
Trade Show, San Jose, CA 2003