

This miniature Kelvin Contact allows unique test setups and flexible placement on custom circuit boards, which make it desirable for many electronic test applications.

Background

Many electrical tests require low resistance "Kelvin" (dual contact or 4-wire) connections to the electrical point of interest, which allows for correction or elimination of the resistance inherent in the measurement system itself. Typically the commercial contacts used to interface with pin type applications involve large "alligator clips" or other awkward contacts with large wire bundles (four wires per pin tested), which frequently damage the very pins being tested. For testing groups of pins (headers and pin arrays), such Kelvin contacts are just not feasible.

Description

This Miniature Kelvin Contact uses two double ended "POGO" contacts contained in an insulating housing to make the 4 wire connection to a single pin, and provides that connection directly to a circuit board. This Kelvin Contact Assembly engages the tip of the test pin and compresses to maintain electrical contact with the end of the pin. Contact forces of both pogo pins are in line with the pin, minimizing side load stresses on the test pin.

The opposite end of each contact assembly is mounted directly to a common circuit board, which eliminates separate wiring, and allows pins and contacts to be placed in any desired location, providing flexible interface with product connections and unrestricted pin spacing. As products and test contacts continue to shrink, providing a flexible, repeatable and reliable test interface solution will become increasingly important.

Advantages

Several styles of Kelvin contacts have been developed to provide testing connections to pin contacts.

Alligator style Kelvin contacts are simple to use, but cause bent pins and damage to pin plating and base metal. Physical connection to product pins is different with each test. Usually only a few pins can be tested at once.

Fixed Kelvin contacts wipe on both sides of product pins, damaging the full length of the pin with each mating. Contacts and wire bundles are typically large and awkward. Usually only a few pins can be tested at once.

Zero insertion force (ZIF) type connectors minimize pin damage, but apply side loading and are limited to a single pin pattern and spacing. Product pins and spacing must conform to the ZIF connector spacing.

This Miniature Kelvin Contact provides several desirable improvements over these existing technologies, including:

- Reliable and repeatable test connections
- Minimized physical damage to the part or pins being tested
- Minimized bending damage (side loading) of product pins
- Direct interface to circuit board
- Elimination of wire bundles
- Eliminated wiping damage to test pins
- Small physical package
- Flexible positioning to accommodate testing of virtually any pin pattern and spacing

Applications

In the electronics industry many products require electrical tests which include "Kelvin" (dual contact or 4-wire) connections to multiple pins, in order to provide reliable low resistance measurements. The applications and requirements are well known in the industry. Never-ending redesigns and product miniaturization requires continual modifications to pin configurations and test hardware.

This Miniature Kelvin Contact allows unique test setups, and flexible placement on custom circuit boards, which make it desirable for many electronic test applications, including:

- Component and product test systems within the electronics and computer industry
- Reliability testing applications within the aerospace industry

Intellectual Property Status

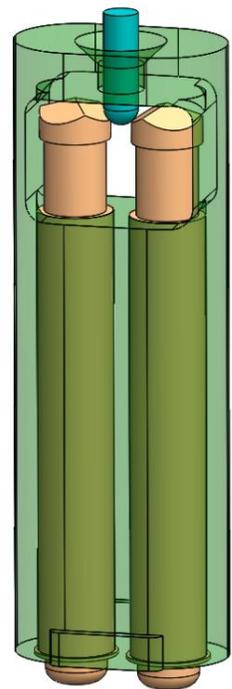
This technology is patented under US Patent # 8,936,495 issued 01/20/2015.

Keyword List

Kelvin, 4 wire, Zero Insertion Force, Low Resistance, Dual Pogo

Contact

Andrew Myers
816-488-4432
amyers@kcp.com



The Department of Energy's Kansas City National Security Campus is a multi-mission engineering, manufacturing and sourcing enterprise delivering trusted national security products and government services. Managed by Honeywell Federal Manufacturing & Technologies, LLC., for the DOE under contract number DE-NA0002839.

