MEETING THE NEED FOR FINE WIRE MICRO-TERMINATION SOLUTIONS

New automated micro termination process eliminates the error-prone human element and delivers guaranteed micro connectivity for ever-shrinking applications.

BUSINESS CHALLENGE

As devices grow ever smaller, it is necessary for components to shrink as well. Terminating micro connectors and wires becomes increasingly challenging as a result.

Currently, crimp contact connections are available down to AWG 30 (0.30mm conductor diameter, stranded) wire size with pitches down to 1.0mm and total mated heights of 1.5mm. Terminations for AWG 36 and smaller are not commonly available, and those available in the AWG 42 to 50 range require hand soldering under large magnification. Wires at the lower end of this range have a diameter of only 20-25 microns, making them around one quarter the diameter of a single strand of human hair.

The very precise work involved in standard approaches to terminating small wires often leads to errors, increasing the amount of time needed to terminate the necessary amount of connections and resulting in low yields, making micro terminations very costly. Additionally, these hand-soldered connections by some manufacturers in the industry often make a permanent connection to the substrate at densities that are far from true “micro”.

In the medical industry, where extremely small structural and/or thermocouple elements often need joined to circuit boards, there is zero margin for error. Thus, medical customers have been in search of to be a method to automate the micro-termination process and eliminate this time-consuming and error-prone work.

SOLUTION

Molex has developed proprietary equipment to strip and prepare wires as small as AWG 50 with a range of insulation types. Custom-designed jigs and fixtures allow for micro positioning of various wire types, and a state-of-the-art solder process using mini reflow ovens allows for fast and accurate batch processing results in faster manufacturing time and more guaranteed connectivity.

Molex Micro-Termination Solutions use Temp-Flex Micro-Ribbon Cables and wires down to AWG 50 to affix tiny structural elements to flexible circuits and other substrates. Highly reliable Temp-Flex cables, comprised of a small pitch, tight tolerance and a variety of wire gauges (AWG 36 to 50), deliver optimum signal transmission and precise electrical length-matching and ease of routing. Temp-Flex MediSpec High-Density Micro-Ribbon Cables use biocompatible materials and are ideal for implantable and invasive medical applications.

Methods for applying Molex Micro-Termination Solutions include 1) interposer Flex to Micro FPC Connector, 2) interposer Flex to SlimStack Board-to-Board Connector, or 3) direct cable-to-ASIC termination.

In addition to medical, Molex Micro-Termination Solutions are applicable for use in aerospace, data and telecommunications, as well as in smartphones and mobile devices. This technology can support the mobile device industry demand for smaller and lighter wearable devices and smart textiles, offering a reliable connection for components that that could be combined with other sealing technologies for smart garments that need to be washed.

CONCLUSION

With the industry previously lacking standard product connector offerings below 0.30mm pitch, Molex responded by developing a termination process along with a super-fine-pitch FPC interposer that allows for a custom miniaturized solution. Proprietary equipment automates stripping and prepping and a solder process using customer reflow SMT for batch processing of micro terminations, reducing both labor time and costs involved and providing customers a true separable connection and significant space savings compared to competitor offerings.

To learn more www.molex.com/link/microterminations.html

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