

Surface Mount Header Assembly Employs Capillary Action

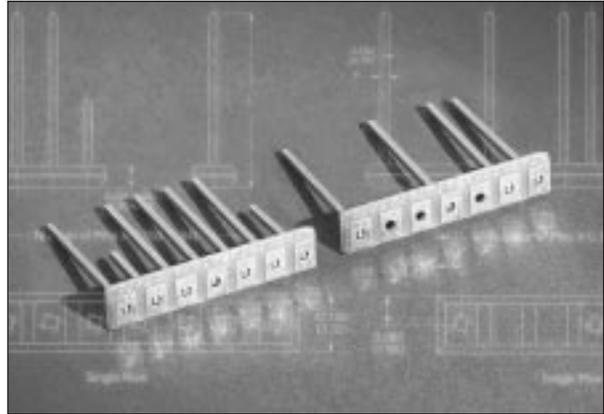
Zierick's unique header assembly features capillary action to improve solder joint strength. As a result, pin retention force is 50% higher than that of J-Lead type headers. As the capillary action draws the solder, it pulls the header assembly tightly to the PCB. At the same time, co-planarity problems are eliminated because the force generated by the capillary action also pulls the header into proper position over the solder pad—even if the part has been placed off-center.

A circular solder pad on top of the board and a square solder pad on the bottom are connected to the conductive wall of the plated through hole. The size of the hole is such that it holds the square pin in place, yet leaves four cavities defined by the flat side of the pin and the curved wall of the hole. The cavities promote capillary action by drawing most of the melted solder up through the cavities where it forms a ring at the top side of the header assembly board. This solder ring is a visual indication that the reflow process is perfect and complete.

Further, because the header base is made of the same material as the PCB, there are no thermally induced stresses on the solder joint—long term reliability is guaranteed.

In addition, deep score lines run across both sides of the header base. The assembly is very flexible and can accommodate board warpage without weakening connections.

To meet varying application requirements, Zierick headers are available with pins missing at specified positions or



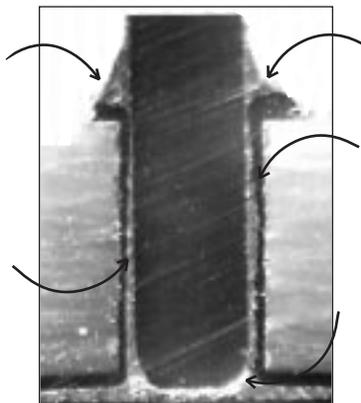
with pins of different lengths and sizes. Pins are offered in brass or copper, and optional configurations are available.

Features and benefits of Zierick headers:

- Co-planarity problems eliminated
- Minimal real estate required on board
- 50% higher pin retention force
- Optional configurations
 - Single row
 - Dual row
 - Horizontal
 - Matrix
- More forgiving board placement tolerances
- Visual indicator assures quality processing
- Highest resistance to thermal shock and thermal cycling due to material selection

The melted solder rises through the cavities and forms a ring at the top.

The capillary action provided by the four cavities (formed between the pin and plated through hole) will pull up the melted solder, resulting in a stronger solder joint.



This ring indicates that the reflow process is complete.

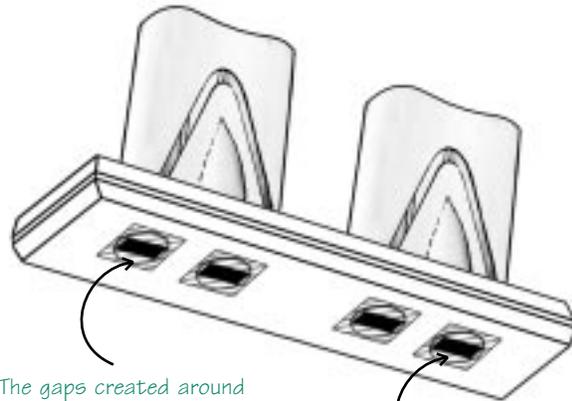
The pin is soldered into the plated through hole at the same time the header is soldered to the PC board.

The force which pulls the melted solder into the cavities will also pull the header board assembly and the PCB together.

SMT Fuse Receptacle Header – Design Concept



Application specific headers are available utilizing almost any type of Zierick component.

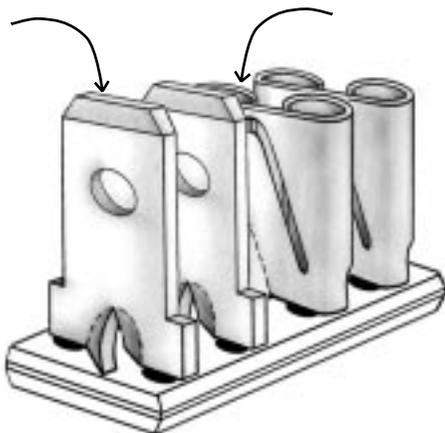


The gaps created around the square base allow the solder to rise through the header, which both solders the component in place, and secures the placement of the header on the PCB.

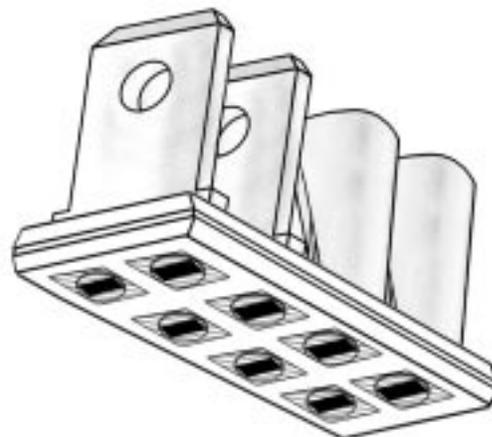
Zierick headers achieve capillary action with the use of the round plated through holes designed to firmly hold the base of the component in place.

SMT Tab/Receptacle Combination Header – Design Concept

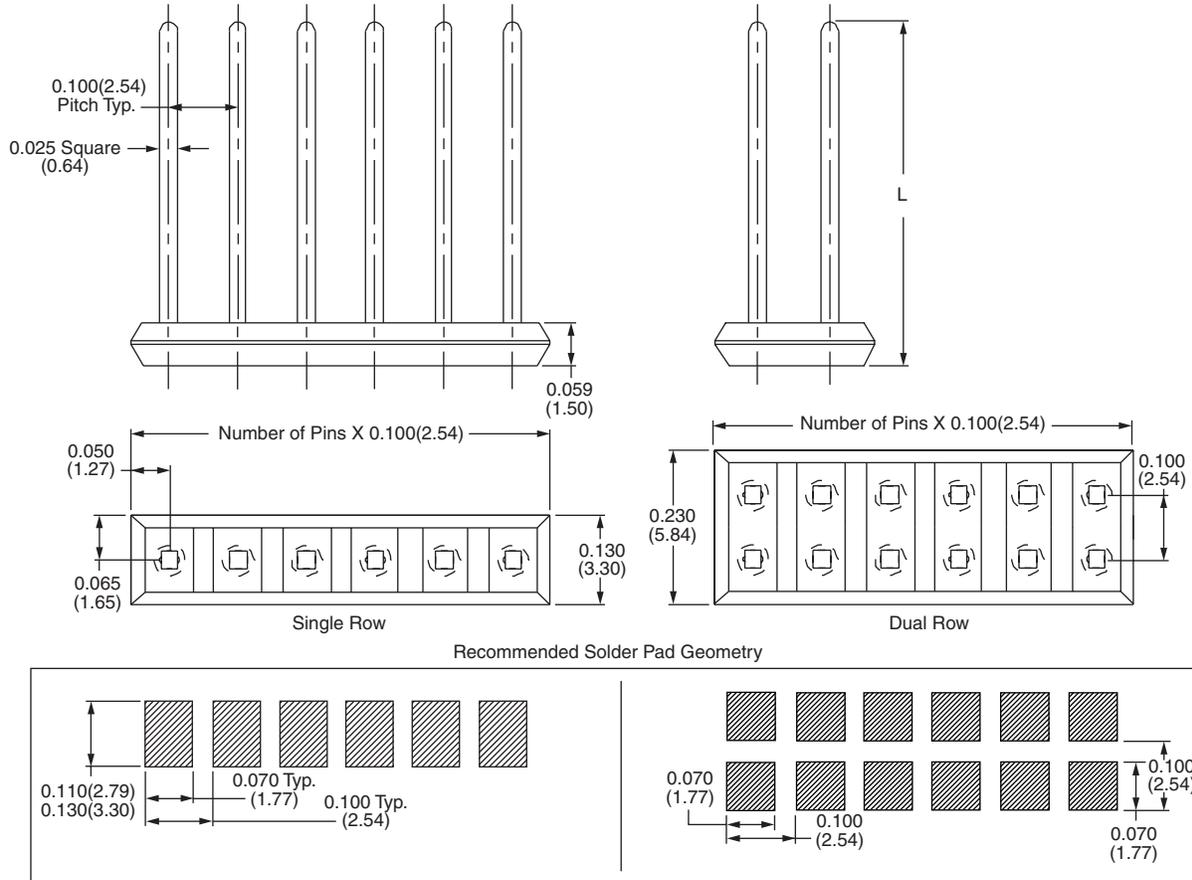
Combine different components on a single surface mount header to meet your application specific requirements.



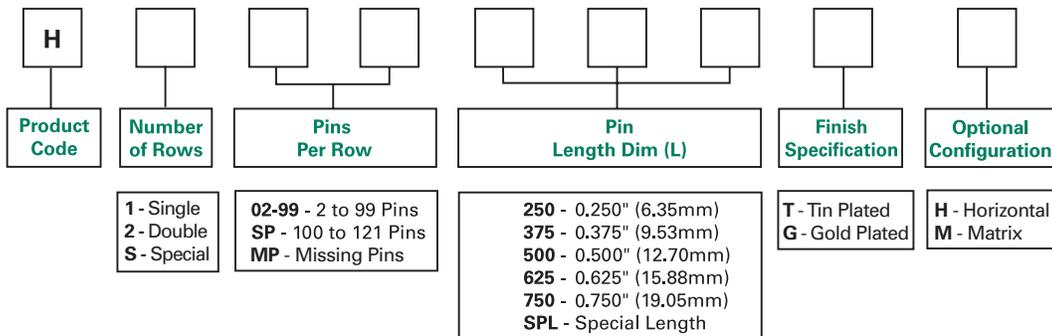
On the top side of the board, there is a small circular solder pad centralized around the plated through hole allowing for visual confirmation that reflow has taken place.



The plated through holes are located at the center of a square solder pad on the bottom of the board providing capillary action and a firm solder bond to the PCB pad.



Part Numbering System



EXAMPLE

H 1 1 0 2 5 0 G H

H - Product Code, 1 - Single Row Header, 10 - Ten Pins Per Row
250 - 0.250" (6.35mm) Pin Length, G - Gold Plated, H - Horizontal

Pins - Available in brass or copper

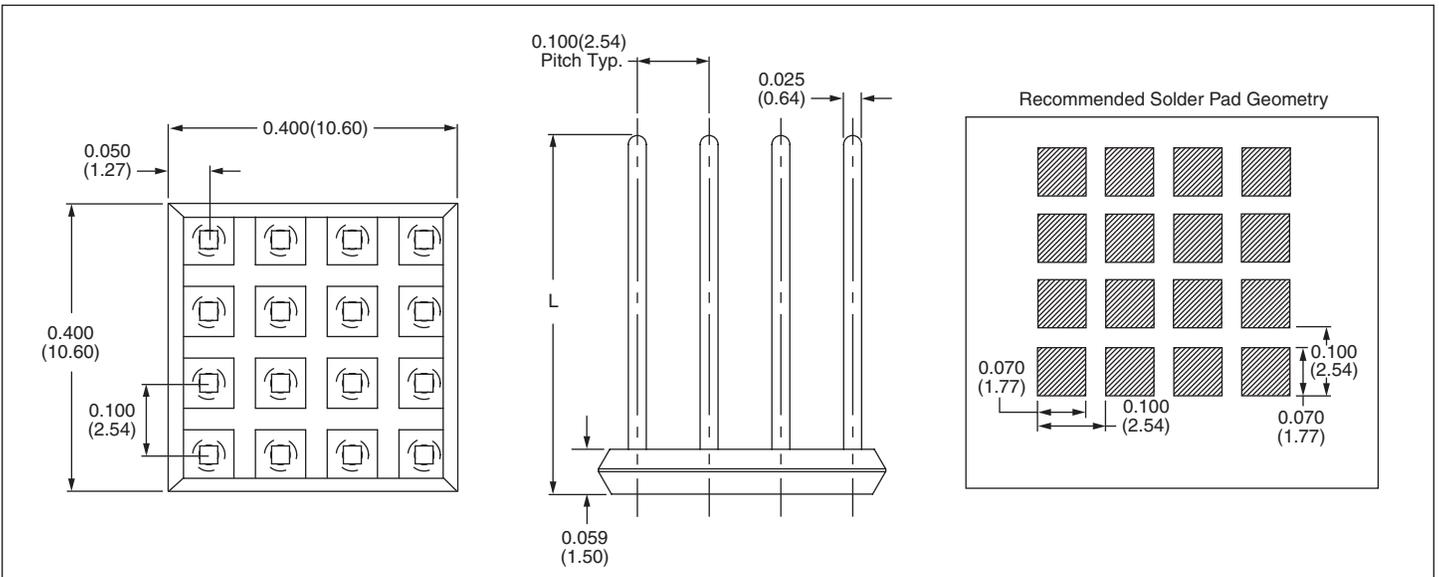
Packaging - Loose Piece or Strip Format

Feeder System - Surf Shooter SMT™ - Header Feeder. The Header Feeder integrates into standard flexible placement equipment and feeds header strips, then shears and presents individual header assemblies for nozzle pick up.

Customize - Provide your specific requirements for special number of rows, missing pins per row or special pin lengths.

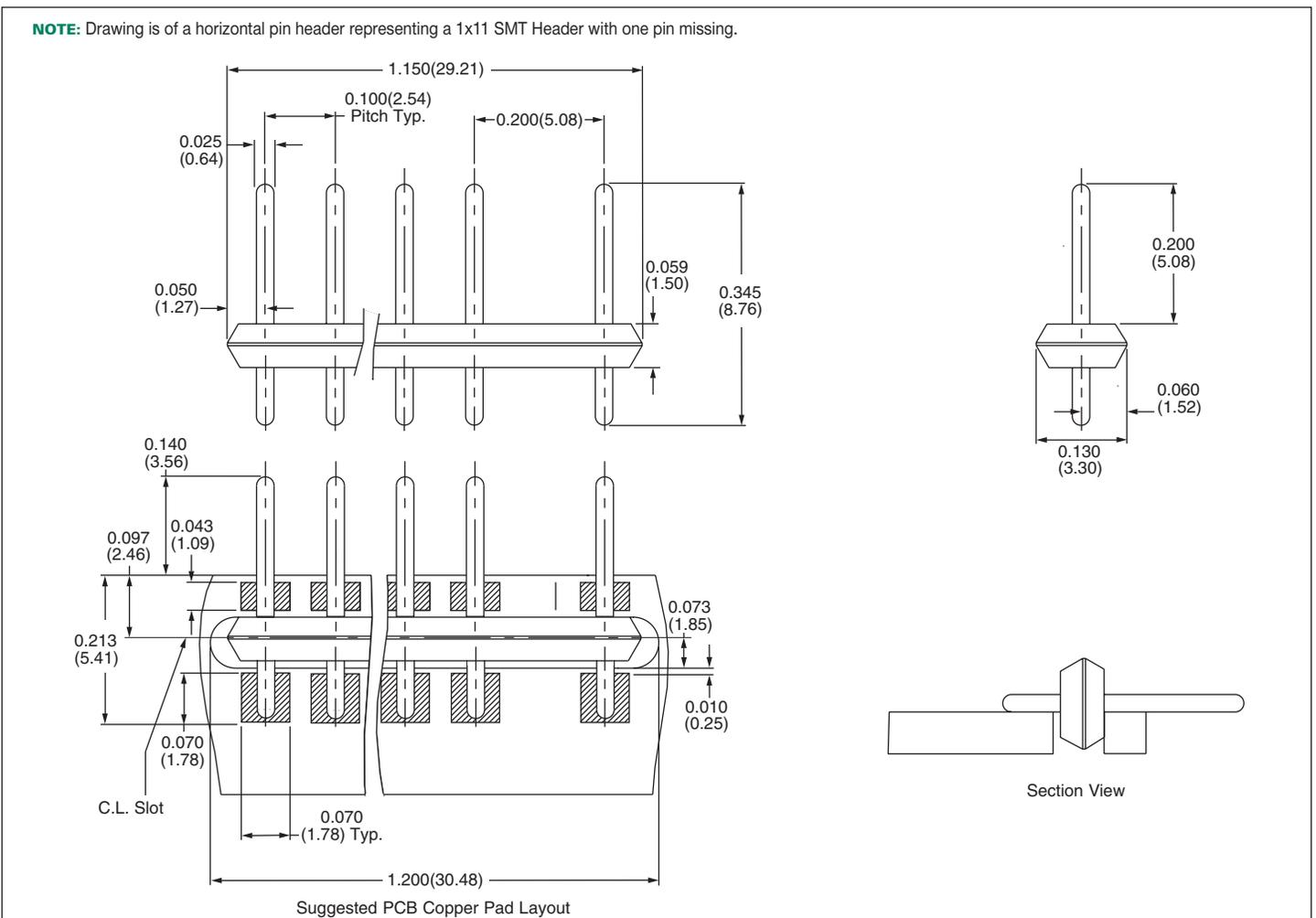
Patent(s) pending

SMT Pin – Matrix Headers

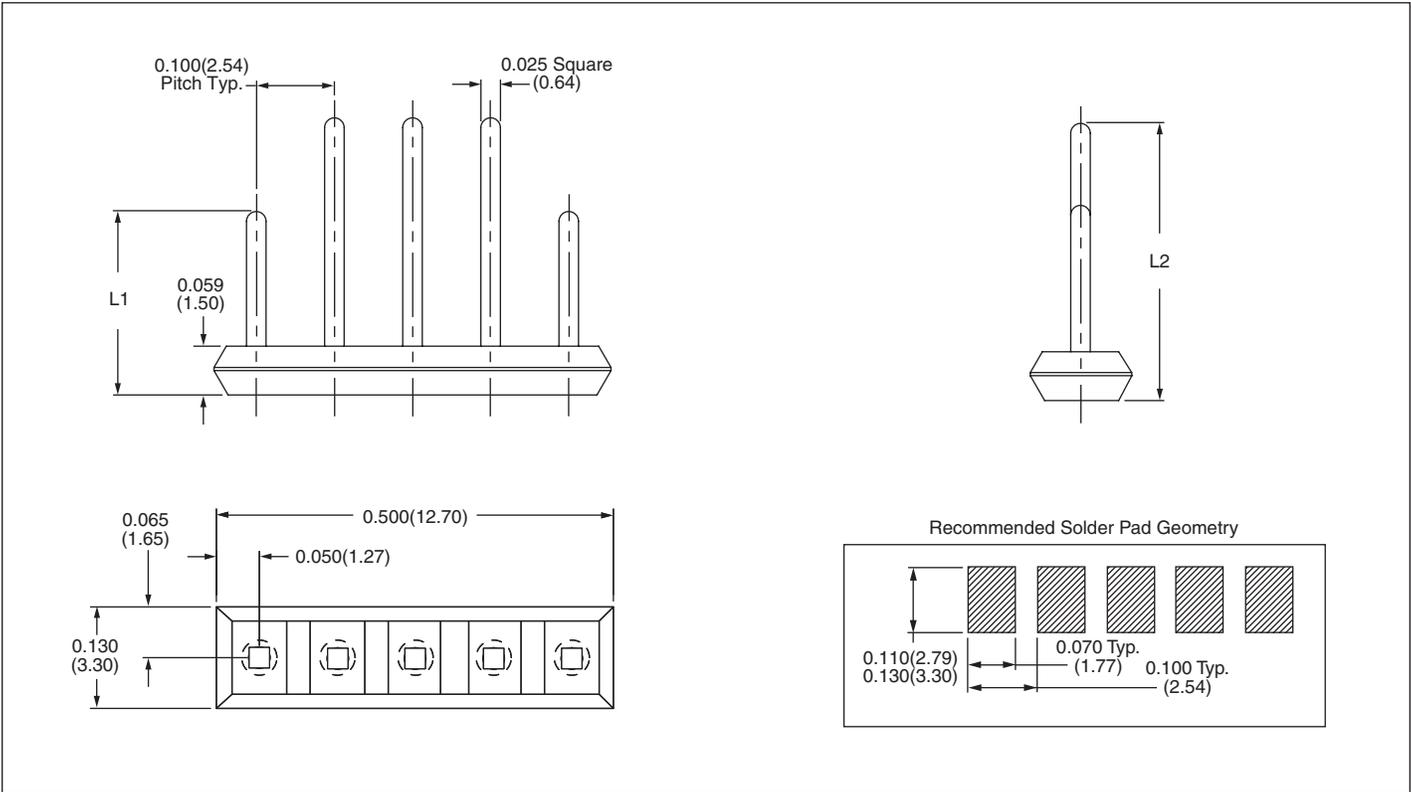


SMT Pin – Horizontal Headers

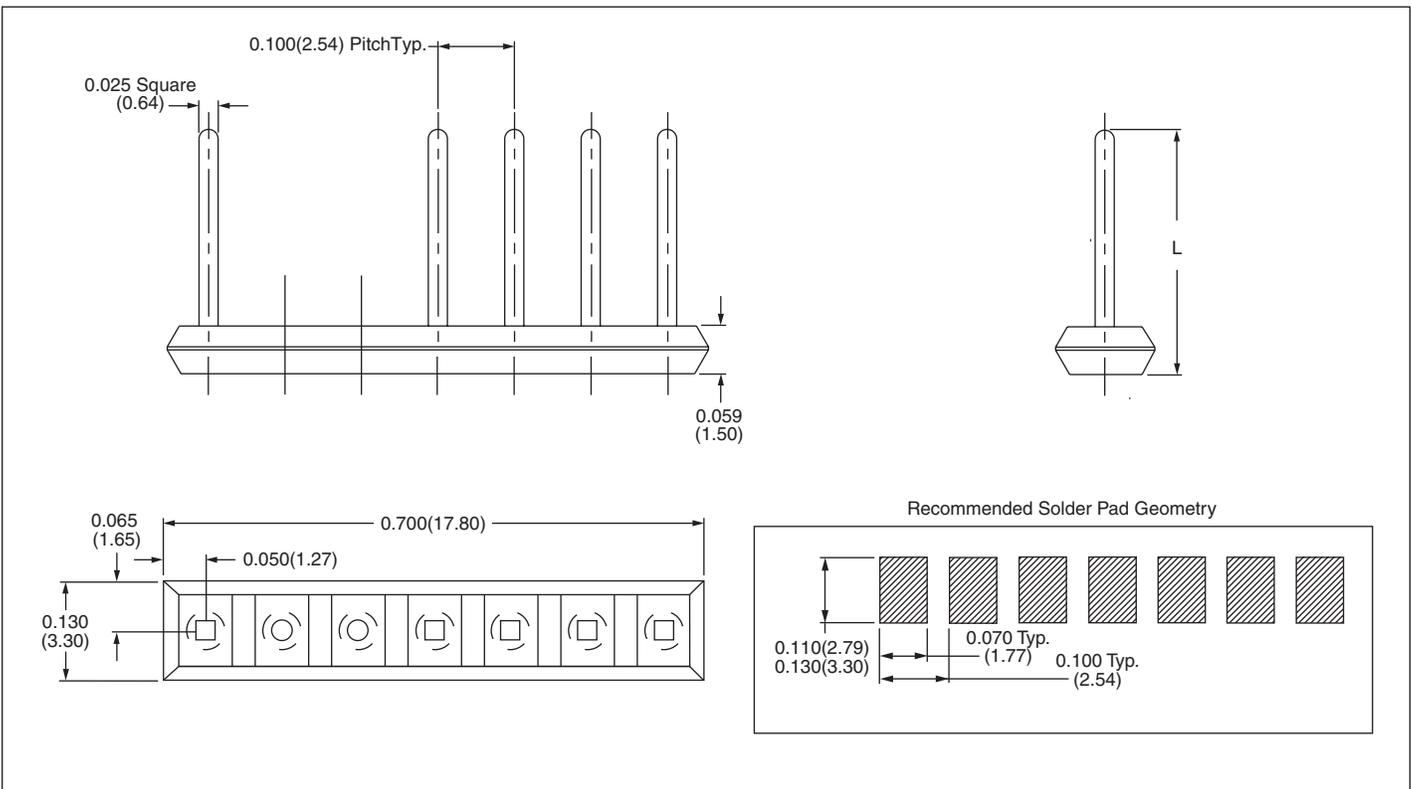
NOTE: Drawing is of a horizontal pin header representing a 1x11 SMT Header with one pin missing.



SMT Pin – Variable Length Headers



SMT Pin – Missing Pin Headers



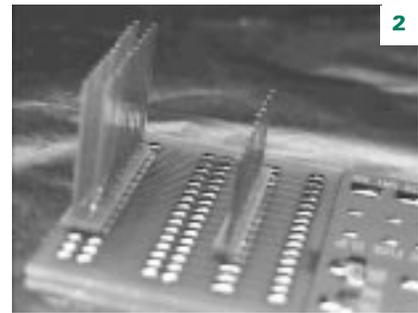
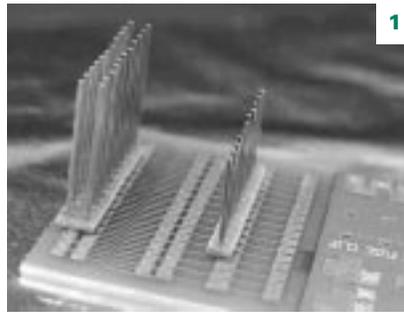
Capillary action is defined in the dictionary of science as the general term for phenomena observed in liquids due to unbalanced inter-molecular attraction at the liquid boundary. Zierick has found a way to use this technology on our surface mount connectors, including the capillary action enhanced surface mount header.

The resulting benefits of this use are: increased strength on solder joints, a reduction of solder joint fractures, the ability to ensure placement of headers in precise locations, and a minimization of board warpage and co-planarity problems.

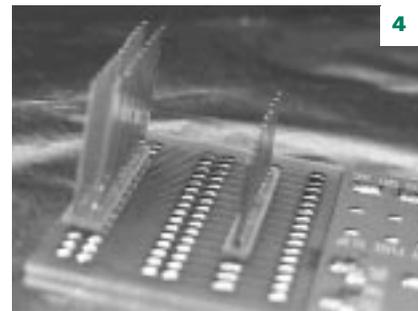
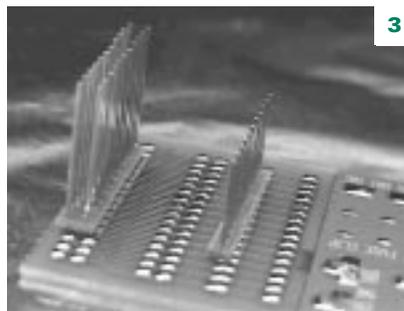
The header assembly consists of square pins and a serrated header printed circuit board with round plated through holes. The size of the hole is such that it holds the square press fit pin firmly in place, but will allow for four cavities on the four sides of the pin. The cavities are defined by the flat side of the pin and the curved wall of the plated through hole. The function of these cavities is to promote capillary action.

Solder paste, which was stenciled onto the pads on the receiving board, melts during reflow. The capillary action pulls the melted solder from the receiving board into the cavities between the pin and the plated through hole.

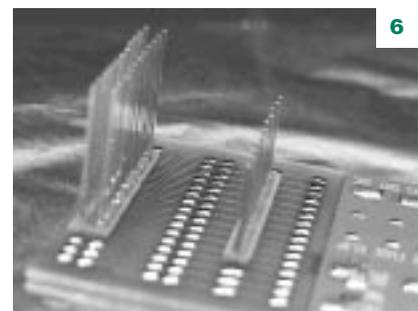
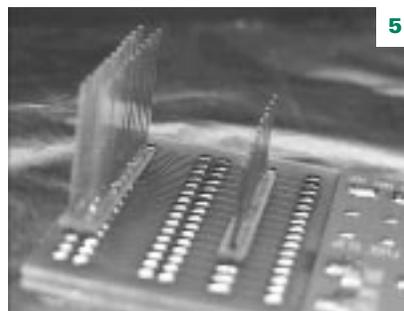
The pin is being soldered into place at the same time. While the solder is being pulled up into the capillary tube from under the header, the same force will concurrently pull the header down to the surface of the receiving board.



Solder paste, which was stenciled onto the pads on the receiving board (1), rises as it melts during reflow (2). The capillary action pulls the melted solder from the receiving board into the cavities between the pin and the plated through hole.



Zierick surface mount headers can be placed off the center of the pad (3) and the capillary action will pull them back onto center. First, the single row header moves into place (4).



Then, the double row header moves into place (5). The melted solder continues to rise through the cavities and forms a ring at the top of the pin. This provides a visual indicator that the reflow process is complete (6).

Visit the following link to watch the capillary action enhanced headers during reflow:

www.zierick.com/videos/capillary_action_enhanced_SMT_headers.mpg

This force will align the pad on the bottom of the header with the corresponding pad on the receiving board and physically pull the two together, eliminating co-planarity problems.

This surface mount header can be fully automated with our header

feeder. Zierick can produce headers in almost any configuration. Call our sales department with your specific requirements and ask for samples. And remember, we're here to help you solve your interconnection problems.