

ARIES CSP test socket "probe and spring"

Aries has designed a completely, new and cost effective concept for test sockets. So how is this new design cost effective? Two main reasons.

First, each contact position consists of just two elements — a probe and a spring.

Second, Aries has “tooled up” five different sizes of “standardized” socket subassemblies. These socket subassemblies consist of a molded lid, latch, and base or housing. Since the standardized socket subassemblies are molded, the only parts that have to be machined or modified are the top and bottom interposer, the pressure pad and the device guide opening in the base or housing.

The key to the new Aries CSP Test Socket design is that it does not use pogo pins. Instead, the Aries CSP Test Socket design uses a contact system that consists of just two pieces — a “probe” and a “spring”.

Here is how it works.

First an interposer set is designed and constructed from a top interposer and a bottom interposer. Both interposers are drilled to the exact footprint of the customer’s device. Once the interposer set is complete, it is ready to be populated with the spring probe selected for the specific device that the socket is designed for.

If the customer’s specific device is a BGA device, a 4-point crown shaped probe is used. If the customer’s specific device is something other than BGA, an alternate probe is used, typically a sharp single point probe or possibly a flat tip probe. For Kelvin test applications, our Kelvin probes are used in pairs contacting each contact point on the device. Special shaped probes for custom applications can be quoted depending on the application and quantity required. Custom coated probes can be supplied that resist the buildup of solder on the tips, reducing the frequency of removal of solder buildup keeping the sockets in use longer.

Once this assembly process is complete, an “interposer sandwich” or CIP has been created. The completed CIP is inserted into the bottom side of the base or housing that has had the device guide opening machined into it. The device guide opening

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accurately locates and positions the device contact points (solderballs, pads or formed leads) with the spring probe locations in the CIP. Replacement CIP's are easily interchanged when an existing CIP is worn out or in need of repair.

Finally, a modified custom pressure pad is positioned into the lid of the socket subassembly. The pressure pad thickness and shape all depend on the thickness and type of device being tested. The pressure pad bottom surface will be flat for CSP, BGA, LGA and leadless devices, such as QFN's. For devices with formed leads, such as QFP's, a pressure pad with raised rectangular blades will be created to back up the formed leads during contact with the spring probes.

The completed sockets are shipped in custom shipping trays or on shipping plates to protect the bottom coils of the spring probe springs during shipping and handling. Prior to mounting the sockets on the test boards, the shipping plates must be removed (if the sockets were shipped on one). The completed socket assembly can now be placed on the test board by aligning the two alignment pins of the socket with the two alignment holes in the socket footprint area of the test board. Hold the socket so the bottom is parallel with the test board and slowly lower the socket alignment pins into the alignment holes and bolt the socket to the test board. The bolting process compresses the bottom coils of the spring probe springs that extend past the bottom surface of the interposer, to mate with the pads of the customer's test board creating a "pressure mount".

The customer places the device into the device guide opening of the Aries test socket and closes the lid. This allows the device leads to mate with the top of its corresponding probe and create the electrical connection

When the lid is latched closed, the pressure pad seats the device into the device guide opening and the device leads compress the spring probes. During spring probe compression each spring will "tilt", resulting in a very short signal path from the device lead, to the probe head, to the tilted spring, to the test board pad.

Sockets can be customized by adding a top or bottom mounted heat sinks, thermal air stream holes and vents, thermocouples, custom backing plates, multiple cavity sockets, or kapton interposer sets. Fully machined and custom socket designs are always available.

For more information on this product and other products from Aries go to www.arieselec.com [1]. Please refer to the "Contact Us" section of the website to contact us with any questions or applications you want us to quote or discuss.

<http://arieselec.com/> [2]

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