



Innovative Interconnections™

**For Immediate Release**

### **Custom Connector Designs Using FR4 Headers Maximize Flexibility and Cost Effectiveness**

San Diego, CA - - Autosplice offers a full range of design capabilities and hands-on applications experience for creating custom FR4 based connector designs, which optimize the flexibility for meeting specific application requirements while maximizing reliability and minimizing overall costs and lead time of product introduction and production ramp-up.

FR4 is an industry-standard glass-filled material that can be used for high-temperature applications. Making connector headers with this material has numerous advantages. Instead of designing special moldings (and incurring the associated tooling costs and lead time) for each connector, the Autosplice approach makes use of standard FR4 as the dielectric insulating material that holds the individual contacts.

A wide range of thicknesses of FR4 glass epoxy have already become standards in the PCB industry along with proven automated techniques for its precise cutting, drilling and perforation. FR4 is readily available and its wide acceptance and usage has already driven its cost to very acceptable levels. Therefore, it is a straight-forward process for Autosplice design engineers to turn customers' connector requirements into precise design specifications from which board vendors can produce entire sheets of perfectly dimensioned, perforated dielectrically-reliable connectors.

Then Autosplice's high-speed automated terminal insertion equipment can be used to quickly, accurately and completely populate each sheet of connectors. Many different types of terminals or pins can be used in FR4 connector designs; including numerous styles of compliant terminals, bandolier pins, surface mount tabs, fuse receptacle terminals, quick disconnect and insulation displacement blade terminals, in addition to our endless variety of round, square and rectangular style continuous reeled pins. The FR4 substrate can be any size or shape and the terminals that are inserted into the FR4 can be on any pitch or configuration. FR4 headers are ideal for prototyping and lower volume applications, however, in many situations, FR4 headers provide an excellent path for high-volume applications as well.

Depending upon the individual connector dimensions and complexity, a single sheet may contain from several to as many as hundreds of separate connectors. Also, because they are in a panelized format, all the connectors on each sheet can undergo any subsequent processes such as wave or re-flow solder in a single pass, thus eliminating the delays and costs associated with traditional hand-soldering operations of individual connectors. The scored sheet can then be separated into the completed individual connectors or can be left intact for transport and handling until the connectors are ready for higher level assembly steps. After separation, the final FR4-based connectors can be packaged in many different

ways to support subsequent production requirements, including standard foam packaging, thermoform trays, tubes, carrier tape, etc.

The FR4 design approach also allows for the capability to include epoxy dot standoffs. These standoff dots are typically used to provide the customer with a washway for post-soldering. Autosplice can provide these dots anywhere from 0.005” up to 0.060” tall. The diameter of the dots is dependent on the height (taller dots require a larger OD).

Also, overall design reliability can be significantly improved because connectors built using FR4 have the same thermal coefficient of expansion as the PCBs to which they are connected. This inherent matching of thermal expansion characteristics between FR4 connectors, daughter-boards, mother-boards and stacked-board modules can greatly reduce temperature-induced solder joint stress factors during subsequent thermal processing or operation of the final product.

In addition, because it uses automation early in the design process, this technique has the dual advantages of low-cost and ease-of-use both as a prototype tool for perfecting overall assembly designs and as a final production technique. FR4 allows for very quick turn-around time, with Autosplice typically able to deliver prototype samples to a customer within 2 to 3 weeks, based on preliminary product design concepts. Finally, the use of FR4 headers in the prototype phase allows for seamless transition from prototypes to production parts, with a sample process that mirrors the production process so closely that a customer can very easily use initial samples for design verification (DV) builds.

In summary, FR4-based custom connector designs offer the following benefits:

- Leverages proven automation techniques and industry-standard substrates
- Quicker design turnaround
- Lower overall cost-per-connector
- Eliminates tooling costs for molded connector bodies
- Increases product reliability thru CTE matching
- Improves design flexibility
- Allows for rapid prototyping
- Provides a smooth transition to cost-effective volume production

Autosplice is a leading manufacturer of terminals, component assemblies and applicator systems, providing automated solutions for high-volume electrical interconnections. Autosplice systems enable substantial cost savings and provide superior reliability over conventional connector products and assembly methods.

**For More Information:**

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