MANUFACTURING

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STI Electronics’ manufacturing lab encompasses 26,000 sq ft of floor space containing two surface mount lines, automated through-hole processing, and multiple flexible work cells for final assembly, 7711/7721 certified rework and repair, box build, and test. The facility and equipment is complimented by a highly skilled and trained workforce of electronic technicians and associates, all of whom are certified to the highest standard of IPC J-STD-001 ES (Space Addendum).

**Contract Assembly**

STI is equipped with a state of the art 26,000 sq ft manufacturing area with the latest in high speed placement, inspection, and test equipment in addition to work cells to assemble complex box builds. Our personnel are uniquely qualified to assemble to the highest quality standards and are all trained and certified to J-STD-001 ES (Space Addendum). This includes all technicians, machine operators and support personnel.

Placement capability includes surface mount high speed placement of components down to 01005 in size. Juki FX-3 and KE2080-L pick and place machines offer placement rates that can compete with any contract manufacturer. Inline and secondary automatic optical inspection (AOI) ensures in-process control for placement accuracy of components. STI’s reflow operation is performed in a 13-zone oven to ensure proper profile and temperature ramp (± 2°/s) to eliminate overstress due to wide variance in thermal exposure. This is especially critical on large, fine-pitch devices (e.g. BGAs, etc). Additionally, high speed through-hole component processing is available using our Juki selective solder machine which automates through-hole soldering for higher volume applications.

At STI, product quality is our top objective. All processes are governed by a quality system certified to ISO 9001-2008 with manufacturing and inspection in accordance with IPC J-STD-001 ES. All completed assemblies are washed and visually inspected after each process. BGA devices are 100% X-RAY inspected, and X-RAY images are available upon request. Flying probe testing is available to detect any opens and shorts on the assembly as well as to provide statistical analysis for device tolerances. Final inspection and packing is performed by IPC-certified inspectors with 10+ years in past performance experience with critical hardware. STI has 20+ years in past performance building mission-critical Class III circuit card assemblies (CCA). Documentation of past performance and references are available upon request.
Prototype Development

STI strives to be a complete partner from schematic forward design through first article validation. A key step in this cycle is prototype development process. Prototypes are a requirement in the design validation step and often consume more funding and time than initially budgeted. STI's unique prototype development approach mitigates these expenses and reduces the overall time to market for our customer's new products.

The typical approach to prototype development is to design, check, build and evaluate. Upon completion of the evaluation, boards are “re spun” to implement changes desired thus adding time and money to the development cycle. STI’s approach is different with our objective focused on the implementation of corrective actions via rework and repair per IPC 7711/21 (STI is an approved development center for IPC 7711/21) to get the first prototype to the customer’s desired “production” performance level. The product can be released for beta build and test once this milestone is achieved. STI’s prototype development approach reduces the overall cost and time to market by compressing the development stages from as many as 6 cycles to as few as 2 cycles.

The prototype development process is complimented by the capabilities in our analytical lab. The prototype can be subjected to environmental and analytical tests as required. These include but are not limited to thermal shock, vibration, humidity, etc. Our tests can be performed to customer-supplied specifications or a customized test plan based on best practices learned over the years. We also have the ability to test prototypes to failure. This test will provide feedback as to the most vulnerable part of the design.

New Product Introduction (NPI) Builds

STI’s goal for being your partner for new product introduction (NPI) is one of transparency. At STI, we see our NPI role as being a gateway to high volume production. We understand the need for data exchange throughout the entire process to guarantee a seamless transfer. We will assign a project manager who will work closely with your team to mutually develop and define requirements so as to avoid any delay caused by miscommunication. By working together transparently, STI can bridge the gap between your concept and volume production through effectively executing your NPI builds.
Process Development

The best electronics assembly design won’t necessarily become the product you envision without carefully selected materials and manufacturing processes. STI is staffed with experienced and skilled process engineers who understand the impact of the materials selected and process parameters used to manufacture electronic hardware. In addition, design engineers at STI are available to generate special tooling and custom fixtures to ensure that your final product meets your form, fit, and function requirements.

Design for Manufacturing (DFM)

STI’s engineering team places emphasis on defect prevention and non-value added process step elimination by analyzing the design data package for common errors relating to the BOM selection, PCB design, and manufacturing materials/processes used to assemble the customer’s product. In this day of global competition, STI understands that the key to a successful product is quality, cost, and speed to market. Design for manufacturing (DFM) and design for test (DFT) services offered by STI ensures quality of the final product and facilitates an efficient manufacturing cycle from fabrication, assembly, testing and ultimately through delivery.

Ensuring that the customer’s design aligns with existing manufacturing processes and materials will result in higher yields and fewer design iterations to generate a product that is easily and economically manufactured.
Box Build & Test

Circuit card assemblies (CCAs) and box builds have been STI’s core competency for over 12 years. Our commitment to quality and customer satisfaction separates us from our competition. STI is proud to be ISO 9001:2008 certified which means that we consistently manufacture products that meet our customer’s requirements. We are vertically integrated and can take your product from concept to design through manufacturing, i.e. from prototype to full production. STI also offers logistics services for consignment and/or turn-key builds with components and materials from trusted suppliers. When you add our state-of-the-art analytical lab for product reliability and assurance, you get a true one stop/one solution electronic manufacturing services (EMS) provider that is capable of meeting all

- PCB Assembly Services
- Testing Services
- PCB Coating and/or Encapsulation
- Manufacturing and Testing
- DFM/DFT Analysis
- Leaded or Lead-Free Solder Assembly
- Touch Screen Integration
- Turnkey Systems

If you have decided to outsource your production of electronic assemblies and/or box builds, consider STI Electronics as your service provider. We are located in Huntsville (central north Alabama) in close proximity to the Army’s Redstone Arsenal and NASA’s Marshall Space Flight Center. STI is a company committed to quality, service and the success of our customers.
STI has qualified technicians trained in IPC 7711/7721, as well as in custom design solutions, to address your electronic rework and repair needs. STI’s services encompass both mainstream assembly technologies (surface mount and through-hole) as well as specialized processes that include ball grid array (BGA) reballing and leadless chip carrier rework.

BGA rework can be a daunting task if you don’t have an experienced technician with the right tool set. At STI, we offer trained technicians utilizing top of the line BGA rework systems to complete the tasks in accordance with IPC standards.

STI offers high-reliability, cost-effective reballing services to restore all of your BGAs to their original specifications. STI has the capability to handle most of today’s BGA package sizes and ball counts. We offer both standard reballing fixtures in addition to custom designed fixtures for a wide range of component package styles.

Circuit card assemblies (CCA) today are more complex and miniaturized which requires highly-skilled technicians trained to IPC certifications to successfully perform circuit board rework and repair. STI is staffed with experienced technicians and engineers to diagnose and serve your repair and rework needs.

Sometimes prototypes or new layout boards need to have jumper wires, i.e. white wires, added to troubleshoot and/or verify design modifications. STI stands ready to help diagnose circuit board issues and perform design layout verifications by offering jumper wire solutions. These white wires can be run underneath microBGAs, QFNs, and other leadless chip carrier style packages to troubleshoot and/or perform verification.
Feasibility Assessment

Engineers at STI are available to perform a design feasibility assessment as you begin developing the standards of your next product or revision upgrade. Our design engineers will provide objective feedback on key design issues such as functional requirements, form and fit factor, thermal performance, environmental resistance, reliability/warranty performance, and manufacturability. By taking these critical design points into consideration early in the design phase, STI can help reduce cost and time to market through a reduction in your product design cycle.

- Thermal Performance
- Heat Sink, Enclosure/Housing Design
- Environmental Resistance
- Temperature, Humidity, Vibration, Shock
- Component Selection
- Functional Requirements, Form Factor, Performance
- Form and Fit Factor
- Miniaturization, Interconnectivity, Weight/Mass
- Reliability
- Warranty Expectations
- Manufacturability
- DFM, DFT, Reliability

Experimental Design and Processing (Electronics DOE)

STI helps customers understand their layout parameters, processing challenges, component selections, laminate materials, and enclosure materials. These decisions, in some cases, can be quite detailed and considered a multi-variable analysis. To this end, STI provides evaluation services combined with custom design of experiments (DOE) to help guide engineers to sound design and processing choices. STI creates a custom DOE that is co-developed with the customer’s design engineers to gather the data necessary to understand those multi-variable issues. STI’s approach is to create a DOE that gathers data to develop a full understanding of the interrelationship of the variables as well as the ability to replicate the variable sets. This ensures a full understanding of the impacts of a multi-variable problem.

The DOE is a custom designed test protocol to gather and quantify the data into a format that enables a decision to be reached on the problem at hand. STI utilizes the assets of its multi-disciplined departments to develop these unique DOEs that aid in defining and understanding the complex relationship between material choices, component selections, board design layout, processing materials (i.e. flux selection, alloy composition, etc), as well as their impact on the assembly process and reliability of the final product. These variables all play a role in the product’s performance and its ability to meet the design objective and warranty expectations. Examples of variables to be considered in a customized DOE are as follows:

- Flux Type and Alloy Composition for Solder Interconnects
- Cleaning Requirements
- Component Selection
- Layout Requirements
- Laminate Choice and PCB Layout Design
- Processing Requirements
- Processing Aids
- Enclosure Requirements
- Harsh Environment Design Guidelines
- Reliability and Warranty Expectation
For more information contact:

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