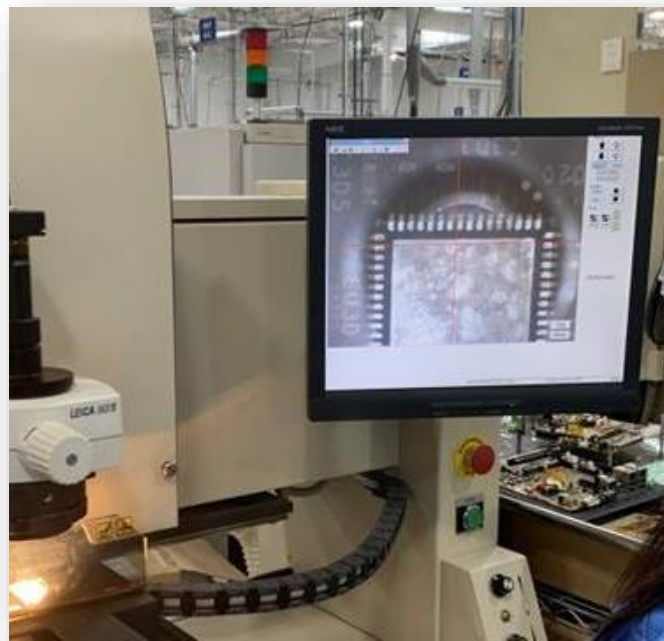*Simplifying Sourcing Series*

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I N T E R N A T I O N A L

BGA Rework/Repair:

Benefits and Challenges

BGA Rework/Repair: Benefits and Challenges

By Jay Vyas

Material constraints continue to be one of the biggest issues facing electronics industry OEMs. The engineering team at SigmaTron's Union City (UC), CA facility is helping address that challenge with its BGA rework/reballing services. This whitepaper looks at the rework and reballing process and discusses typical project composition.

Why Consider BGA Rework/Reballing as an Option?

There are two key reasons to consider a rework or reballing process:

- **Cost** – BGA reballing provides a high quality solution in cases where high dollar, salvageable components could be reused instead of scrapped. The process can also be used to rework packages other than BGAs.
- **Availability** – Reballed or reworked units meeting the customer's requirement can be delivered within days to weeks.

The Process

Each project is unique, with its own specific requirements and constraints. SigmaTron's Union City (UC), CA facility specializes in these services. In SigmaTron's process, a dedicated technical team reviews component specifications against customer requirements and develops required tooling and a process plan that will enable the product to stay in compliance with specifications throughout the process. The team has the expertise to develop a scalable process that supports proof of concept, prototype/pre - production units and sustained follow-up volumes.

With a specific process in place, the team has been supporting BGA components such as CPU processor sockets, non-BGA components including SMT and through-hole memory connectors, and board-to-board connectors.

A wide range of components can be supported including high pin count active parts intended for high current/voltage applications and high speed signal processing applications including DAC/ADC, ASIC, memory and CPU-related functions.

The facility has multiple stations for BGA removal, reballing and installation. Reballed components are placed utilizing automated SMT lines. The facility's automated Xray inspection equipment and

methodology helps validate the process parameters and inspect finished units for acceptable solder joint structural integrity.

The team focuses on designing a process and tooling that minimizes the amount of thermal stress. In many instances, the team has come up with a plan to remove multiple BGAs in single cycle. While processes are designed to enable products to be in compliance with IPC-A-610 and/or J-Std-001, process development considers the unique constraints associated with each project.

Typical project volumes run in the thousands of units and fall into one of three categories:

- **Interposer** – where a part such as a QFN is converted to a BGA and either be installed on a customer's printed circuit board assembly (PCBA) or shipped to a vendor as a component. This service can address issues such as pad-to-part size mismatch and geometric interference.
- **Rework** – Rework enables companies to salvage PCBAs by replacing problem parts and extend active support of older products with limited inventory. It can also be used to preserve high dollar parts such as FPGAs by removing them from scrap PCBAs for reuse. SigmaTron's rework capabilities can be used for many different package types besides a typical BGA, including high pin count through-hole and surface mount memory connectors, CPU sockets, board-to-board connectors and power connectors.
- **PCBA upgrade** – where a BGA or connector package is replaced on an older revision PCBA, enabling the PCBA's functionality to be upgraded.

BGA reballing/rework services empower customers with high quality options relative to ensuring product availability, increasing functionality, addressing product recalls with either minimal or no product redesign required, and minimizing the loss of high value components when PCBAs must be scrapped.

Jay Vyas is SigmaTron International's Director Engineering. *He can be reached at* jay.vyas@sigmatronintl.com*.*