American Standard Circuits

Sunstone Circuits

Pioneering PCB Innovation

Case Study: Pre-Bond to Post Bond Transformation in PCB Manufacturing

Discover American Standard Circuits commitment to close collaboration with their customers, showcasing how obstacles seamlessly transform into opportunities and long term solutions.

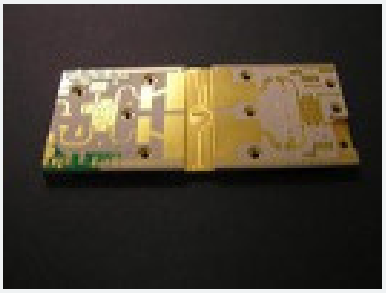
USE CASE SUMMARY

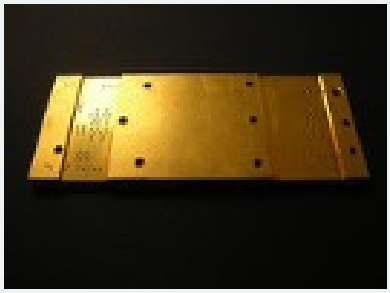
In the fast-evolving world of PCB manufacturing, continuous innovation and process optimization are crucial for delivering exceptional product performance, reducing costs, and staying ahead of market demands. This case study demonstrates how ASC is leading the way in advancing manufacturing practices by shifting from pre-bond to post-bond processing. It highlights the transformative impact of these changes on efficiency, cost-effectiveness, and overall product quality.

THE CHALLENGE

The pre-bond phase utilized Rogers RT6010 pre-bonded to 0.125" 110 Grade Copper, with a final finish of 35 µ in hard gold on both the PCB and the heat sink. The backside of the heat sink included two cutouts for plated through-hole (PTH) vias. While these high-quality materials and finishes provided excellent performance, the overall manufacturing process incurred substantial costs.

Pre-Bond Phase:





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THE SOLUTION:

To reduce costs without compromising product integrity, the post-bond phase included a comprehensive redesign of the PCB and heat sink assembly. Key changes implemented during this phase include the elements below:

1: **Redesigned PCB:** The PCB was re-engineered to transition from Rogers RT6010 to RT3010 material, and from a single-layer to a two-layer configuration. This redesign optimized material usage and streamlined the manufacturing process while maintaining high performance.

2: **Heat Sink Finish Update:** The heat sinks final finish was changed from hard gold to silver, providing a more cost-effective solution without sacrificing functionality.

3: **Removal of Backside Cutouts:** Through a complete re-evaluation of the PCB layout, the backside cutouts in the heat sink were eliminated. This simplified design reduced manufacturing complexity and enhanced the structural integrity of the overall assembly.

4: **Bonding Process:** The pre-bonding step was replaced by bonding the PCBs to the heat sink using Electrasil—a reliable material renowned for its excellent thermal conductivity and strong adhesive properties.

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THE RESULTS: DELIVERING PERFORMANCE AND EFFICIENCY, WITHOUT COMPROMISE

These improvements streamlined production, reduced costs, and maintained exceptional performance standards.

- **Cost Savings:** Shifting from pre-bond to post-bond manufacturing achieved substantial cost savings, delivering a notable 35% reduction for the customer. This optimization not only improved profitability but also strengthened the product's competitiveness in the market.

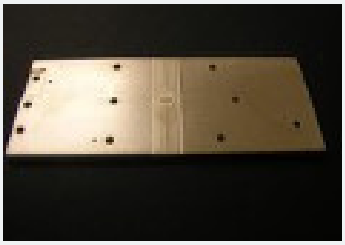
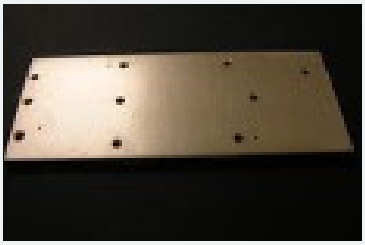
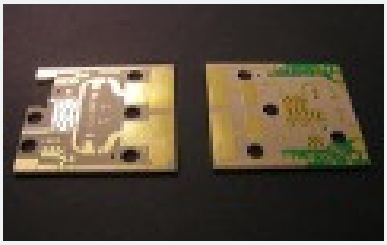
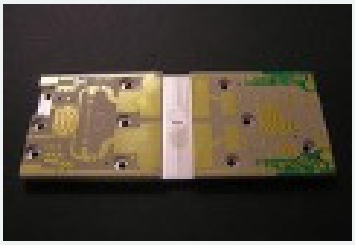
- I**mproved Efficiency:** By redesigning the PCB layout and heat sink assembly, we streamlined manufacturing processes, reduced complexity, and enhanced efficiency. Eliminating backside cutouts and adopting a simplified bonding process also led to faster production cycles and increased throughput.

- **Enhanced Performance:** Despite the cost-saving measures, the post-bond assembly upheld high-quality standards and functionality. The use of Electrasil for bonding provided reliable thermal management and mechanical stability, resulting in improved overall performance and long-term reliability of the PCB assembly.

CONCLUSION: DRIVING INNOVATION TO MEET TOMORROW'S CHALLENGES - TODAY

This transition from pre-bond to post-bond manufacturing highlights the critical role of continuous improvement and innovation in PCB production. By strategically redesigning and adopting cost-effective solutions, we achieved significant cost savings without sacrificing quality or performance. This case study demonstrates how adaptability and efficiency can meet evolving industry needs while delivering high-value solutions to our customers.

Pre-Bond Phase:

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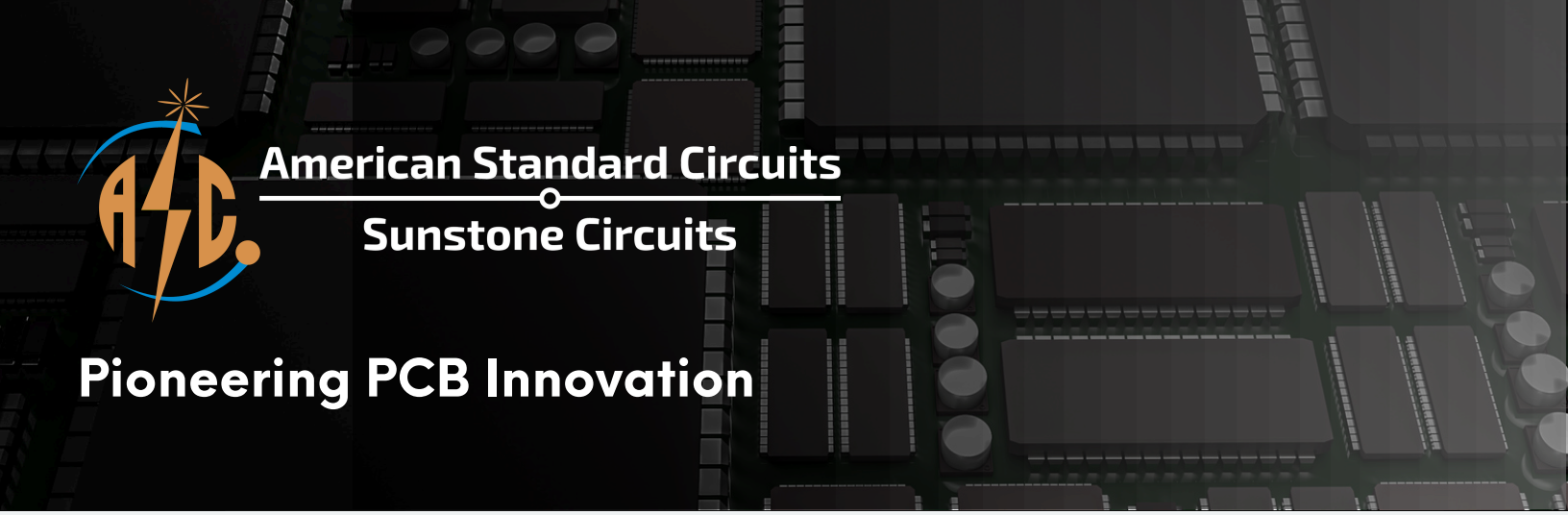

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About Us

At American Standard Circuits, our mission is to partner with our customers to provide the ultimate PCB solution. With over 50 years of combined expertise, we deliver a full range of innovative, high-quality products—from ultra HDI to flex and rigid-flex PCBs—designed to meet the unique needs of industries like aerospace and defense. By focusing on Design for Manufacturability, we streamline the entire process, from concept to production, while leveraging advanced technology and unmatched customer support to ensure precision, reliability, and success in every project.

Industries We Serve

- Military
- Aerospace
- Medical
- Commercial
- Industrial
- Telecom

Certifications

- ISO 13485:2016
- AS9100:D
- IATF16949:2016
- ITAR Registered
- MIL-PRF-31032
- UL Certified

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