

# Customized Thermal Testing of Circuit Boards to Narrow Causes of Latency in Field

A vast majority of products on the market today are enabled with electronic functionality. Many of the most vital, often life-changing products in commercial and healthcare applications depend on the functionality and reliability of these electronics; sometimes it's a life-saving feature.

Printed circuit boards (PCBs) mechanically support, and virtually connect, electronic components. Using conductive materials and pathways embedded and etched on sheets, PCBs are the 'brains' of electronics. A PCB that also hosts electronic components is known as a printed circuit assembly or printed circuit board assembly (PCBA).

A proper PCBA contributes significantly to the safety, performance, and reliability of an electronic component. PCBA manufacturing, therefore, demands strict quality control, which is absolutely critical, and driven by industry standards. Testing at all stages

of the lifecycle – prototype, design, manufacture, field use – helps ensure quality success. And, just as quality electronic components depend on quality PCBAs, quality PCBAs depend on quality testing.

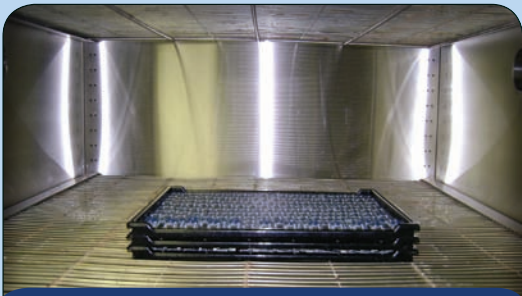
*"I have been very satisfied with both the testing services and the personnel at CSZ."  
– EPIC Technologies, LLC  
Ohio Valley  
Operations Quality Manager  
Gordon Willins*

Located in the Ohio Valley, EPIC Technologies, LLC provides electronic manufacturing services (EMS) – from initial concept to complete fulfillment – that includes PCBA services. EPIC contracts with original equipment manufacturers (OEMs) in the industrial control, automotive, medical, computer,

and telecommunications industries. A key factor in EPIC accomplishments is its willingness to embrace processes that deliver to both its customers' and its own bottom line. EPIC employs lean manufacturing principals – minimization of raw-material, outdated-variation, and finished-good inventories – to maximize response rates, error liabilities, and resource waste. And, EPIC regulatory and quality certifications are many, including ISO 9001, QS 9000, ISO 14001, and ISO/TS 16949.

When an EPIC customer expressed concern about in-field product quality, EPIC realized it did not have sufficient capabilities to do the testing in-house, certainly not at the desired level and without risking losing the ability to maintain planned schedules. EPIC turned to CSZ testing division, an A2LA-accredited lab that also is ISO certified.

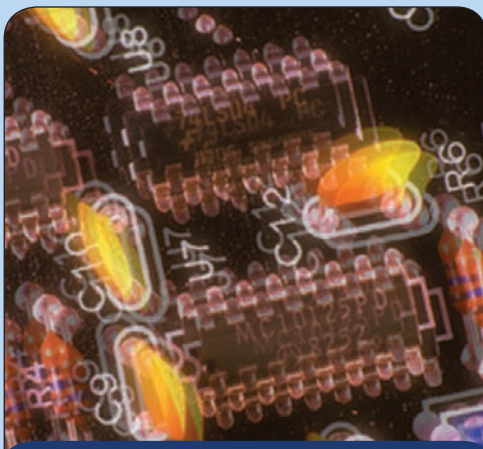
EPIC Technologies Ohio Valley Operations Quality Manager Gordon Willins recounted the decision to use CSZ, "Thermal cycling testing was a request from our customer. We had work done by them [an individual affiliated with them] many years ago, so



TEMPERATURE CYCLING TESTING

that was one of the reasons for using CSZ. Also, they are close so it was easy to deliver and pick up product." EPIC Technologies, LLC

Ohio Valley Operations Program Manager Mary Bieber explained further, "A customer was having issues [latent field failure] that it wanted to contain. It considered temperature could be a factor...[or] a possible cause." EPIC presented its customer with CSZ's background information, and they have been testing the customer's product ongoing since (based on the customer's request).



VIBRATION TESTING

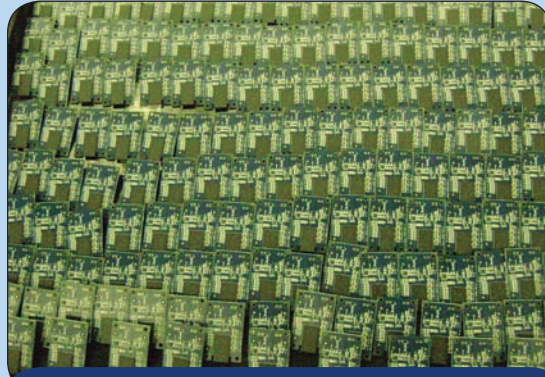
In order to isolate possible temperature-associated impact on the product, on behalf of EPIC and its customer, CSZ has employed a series of temperature-based tests. During thermal cycling testing, CSZ has carried the affected EPIC products through extreme temperature

variations, ramping up to 50 degrees Celsius, and then down to 0 degrees Celsius, 48 cycles.

EPIC bestows a 5 of 5 satisfaction rating to CSZ. Willins said, "I have been very satisfied with both the testing services and the personnel at CSZ, they have been extremely flexible and helpful on the drop in orders from EPIC... they have gone out of their way to be sure that the product is packaged and ready." Bieber added everyone working at CSZ is "very polite, professional, a pleasure to work with, always accommodating to our schedule... They've been so quick, we've been able to keep production lead times the same."

In the end, with a certificate of compliance drawn based on the testing results and a detailed report generated based on CSZ's testing services, both EPIC and its end-use OEM customer are well-informed of service findings and benefits. The additional information about the components and designs assists EPIC in engineering better and higher quality solutions for their customers.

EPIC Technologies, LLC is a premier specialty electronics manufacturer in the high-mix, low-to-medium volume segment of the EMS industry. EPIC's electronics manufacturing services consist primarily of the manufacture of complex printed circuit board assemblies and complete systems integration. EPIC provides turnkey services from board layout, test development, prototype testing, printed circuit board assembly, and box build to customers in the medical, automotive, telecommunications, and industrial equipment markets. Contributing to EPIC's success has been the Company's robust quality operating system, supply chain management, and adherence to lean manufacturing principles. The Company has manufacturing plants in Norwalk and Lebanon, Ohio; Johnson City, Tennessee; and Juarez, Mexico. For more information, see [www.epictech.com](http://www.epictech.com).



CIRCUIT BOARD TESTING

CSZ testing operates as a division of Cincinnati Sub-Zero, Inc. to deliver tests specially suited for design verification, product performance, regulatory

compliance, failure analysis, life cycle, and environmental stress testing. A2LA-accredited, CSZ offers a wide range of ready, sophisticated, environmental testing services, including climatic (temperature, humidity), salt-spray, shock, thermal, and vibration testing. CSZ Industrial division, manufactures a wide range of environmental test chambers, from bench-top to full walk-in rooms. For more information or to inquire about CSZ in-house testing division, please visit... [www.csztesting.com](http://www.csztesting.com).

*Note: Effective January 2009, ESSC Test Laboratory changed the company name to CSZ Testing. The company still operates as a division of Cincinnati Sub-Zero. Customer testimonials contained herein have been updated to reflect the new company name.*

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