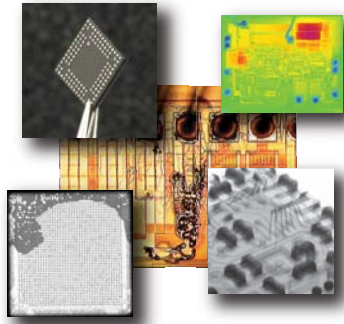


Best-in-Class Services

Failure Analysis Services



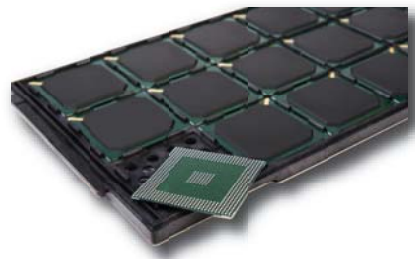
EAG provides failure analysis services within the context of our client's commitment to achieve high quality and reliable products at a reasonable cost. Our commitment to achieving this goal has been repeatedly demonstrated in providing testing services that are designed to compliment your internal lab capabilities or to provide full outsourced failure analysis. EAG has optimized service offerings to provide you with the maximum value, fast response, extensive product and system level knowledge, and the widest array of analytical tools. EAG is an integrated laboratory with an unmatched knowledge base that is accessible to all of our clients through our engineering staff. When it needs to be done right, you can count on EAG.

Reliability Qualification Services

Reliability qualification demonstrates the fitness of a product for use in the field and helps our clients better understand the fundamental wear-out mechanisms, detect design marginality combined with parameter drift and determine failure rates due to latent manufacturing defects. EAG provides stress based reliability qualification and knowledge based reliability qualification based on industry standards. EAG's experienced Reliability Engineers can create qualification plans and perform testing to meet our client's requirements.



ATE Services



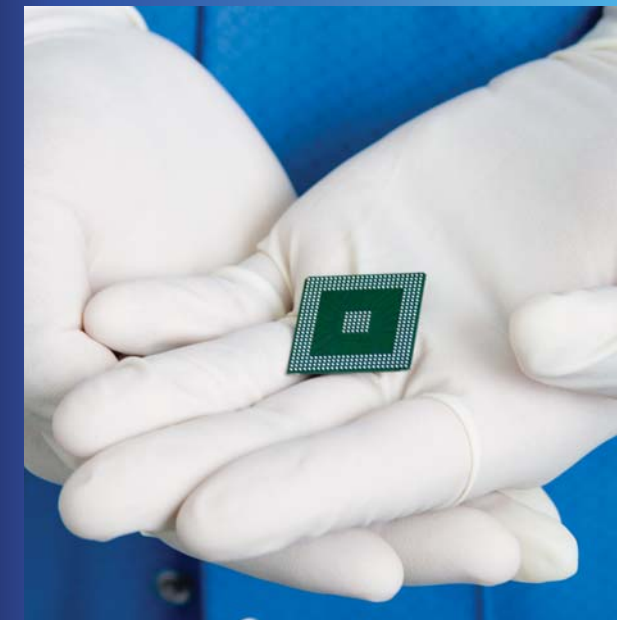
Whether you want a single product tested or you are considering outsourcing all of your testing services, as a full turn-key solutions provider EAG will meet your requirements.

EAG's professional Development Services are comprehensive and utilize standardized test development modules providing cost effectiveness, efficiency and fast development times. What's more, EAG is committed to giving our clients as much flexibility in their service options as they have in developing your products. EAG offer you a full portfolio of choices, ranging from Test Program Development, Electrical Characterization, Test Limit Evaluation, Test Cost Reductions and Multi-site Conversions.

Whatever solution you choose, you'll receive services closely attuned to your requirements, from a provider known for delivering technical excellence and top-flight value. When it needs to be done right, you can count on ATE Services from Evans Analytical Group.



ESD Services



Visit www.eaglabs.com for more information about all of EAG's services and solutions.

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ESD and Latch-Up Services

Evans Analytical Group® (EAG), is a leading independent provider of integrated testing services and materials characterization. Our services support clients in the development of semiconductor integrated circuits and the development of new materials. With over three decades of supporting clients, EAG is at the forefront of innovation in working with a wide range of newly emerging materials and innovative new products.

As a long term outsource provider to the worlds leading technology companies and new start-up technology innovators, EAG is a proven business partner and we understand many of the challenges facing our clients. We continue to be committed to working closely with our clients who count on fast turnaround times and complete confidentiality.

ESD and Latch-Up

ESD and Latch-Up testing of electronic components is an expensive part of the design and manufacturing of new products. Increased integration and smaller device geometries increase the risk of device failure due to ESD (Electrostatic Discharge). If those failures happen in the field it will significantly effect customer satisfaction and reliability.

Types of ESD and Latch-Up Testing

Destructive discharge that may be undetectable to a human is often fatal to today's integrated circuits. Although energy levels may be low, the device must dissipate that energy. At EAG we provide different ESD stress tests including the Human Body Model (HBM), Machine Model (MM), Charged Device Model (CDM), Latch-Up and Transmission Line Pulse (TLP).

Testing Standards

EAG is an active participant in many industry standards organizations including ESDA and JEDEC. We test to the latest AEC, JEDEC, ESDA and Military Standards. EAG believes that Standards alone are not enough and we offer additional services that will help you to narrow down failures.

Human Body Model (HBM):

The HBM model simulates the direct transfer of electrostatic charge, from the human body, to a test device. A 100pF capacitor is discharged through a switching component and a 1.5 Kohm series resistor. This is currently the most requested industry model, for classifying device sensitivity to ESD.

JESD22-A114 (JEDEC standard)

MIL-STD-883, Method 3015.7 (Department of Defense Test Method Standard)

AEC-Q100-002 (Automotive Electronics Council)

ESD STM 5.1-1998 (ESD Association Standard Test Method)

Machine Model (MM):

The machine model module emulates the rapid direct transfer of electrostatic charge, from a charged conductive object, such as a metallic tool or fixture, to a test device. This model consists of a discharged 200pF capacitor, with no series resistor.

JESD22-A115 (JEDEC Standard)

AEC-Q100-003

ESD STM 5.2-1999

Charged Device Model (CDM):

During standard packaging, assembly, and automated processing, integrated circuits may be exposed to rapid electrostatic charge transfer. Typical device triboelectrification occurs during frictional sliding and then rapid discharge via contact with a conductive object. During CDM testing, the device under test is rapidly charged and discharged through a ground plane.

JESD22-C101 (JEDEC Standard)

ESD STM 5.3.1-1999

Latch-Up:

Latch-up testing is performed to determine the device latch-up susceptibility. It is based on JESD78 at the customer's specified current levels and temperatures up to 150°C.

JESD78 (JEDEC Standard)

AEC-Q100-004 for LU

Transmission Line Pulse (TLP):

ESDA SP5.5-2003

ESD Test Chip Evaluation

The ESD Total Solution

At EAG, we have established a Center of Excellence for ESD and latch-up testing. EAG works with clients worldwide to create the knowledge exchange that builds successes in the design of next generation integrated circuits. Our engineers use their industry leading knowledge and years or real world experience of the latest semiconductor technologies, circuit design, and device physics to optimize our customer's ESD and latch-up results.

When you choose the EAG ESD Total Solution, you will be working together with recognized experts in the field of ESD and latch-up testing. We are committed to providing our customers with the most up-to-date testing methodologies, along with technical interpretation of the test data and accurate assessment of the results.

For new customers, industry leaders from EAG can provide customized training for you and your team about ESD or LU issues, methods, standards & processes. We will help you to gather all of the information required to test your part successfully.

The full power of the EAG team is used to clarify your project goals and design the optimum test approach. A test plan is created, reviewed, and questions are answered.

Before testing begins, EAG will work with you to review the technical material, verify the in-situ test setup, and obtain customer sign-off. Our customer focused testing methodology is informative and interactive – just like having a test lab down the hall.

EAG test reports are complete, concise, and definitive. We review the results with your team, providing clarification, technical interpretation and access to the secure FTP site for data review.

EAG experts can provide recommendations for the next steps, if needed. Our failure analysis labs are equipped with the latest advanced tools and techniques to localize failure sites, including front side and backside methods, light emission, infrared, and laser signal injection microscopy. EAG uses advanced deprocessing techniques, and we provide fail site/mechanism imaging using high resolution scanning electron microscopy. A portable Light Emission Microscopy (LEM) system can be placed on the tester to isolate latch-up sites

Finally, EAG has access to design consultants who can help you understand your failure mechanics and make the design changes necessary to meet your customer's ESD and latch-up requirements.

Tester Specifications

- Humidity controlled lab
- Best in Class ESD and latch-up tester equipment
- Up to 2304 pins for HBM, MM & Latch-up
- 256,000 state vector preconditioning at multiple voltage levels for latch-up testing
- Up to 125°C ambient temperature capability for latch-up testing
- Ability to provide pre and post CDM curve traces
- CDM testing is performed under nitrogen purge

Over 300 Test Fixtures & Sockets

- Universal BGA boards for most 1.27mm, 1.0mm, 0.8mm, 0.65mm, 0.5mm, and 0.4mm packages
- If we do not have a test fixture for your package, we can have boards designed and built.
- Our test boards are designed and built to provide less inductance and accurate pulses to your components.

Advancing Technology through Leadership in Testing