

# Ensuring Compliance With the **U.S. CHIPS Act**: Identifying the Source of Electronic Components

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The U.S. CHIPS Act aims to strengthen domestic semiconductor manufacturing and enhance supply chain security. As part of this initiative, manufacturers must ensure compliance with specific regulations regarding the sourcing of electronic components. This white paper provides an overview of the compliance



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requirements, relevant laws and standards, and introduces innovative technological solutions to verify the provenance of electronic components. Moreover, it highlights the importance

of comprehensive verification that extends beyond sourcing to include the production stage, finished goods, and semi-finished products. By ensuring that all components are original and have not been tampered with at any point in the supply chain, manufacturers can maintain product integrity and uphold regulatory compliance.

## **1. Compliance Requirements and Relevant Laws**

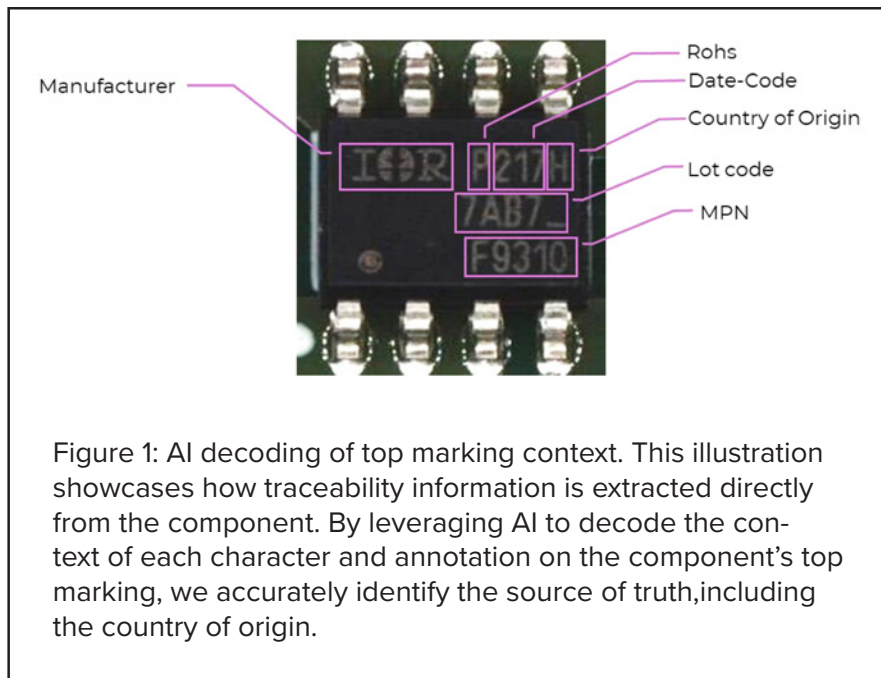
The CHIPS Act emphasizes the importance of transparency and traceability in the semiconductor supply chain. Essential compliance requirements include:

- **Documentation of origin:** Companies must maintain detailed records documenting the origin of all electronic components used in production.
- **Verification processes:** Manufacturers are required to implement processes that ensure the authenticity of the source of their components, reducing reliance on potentially fraudulent documentation.
- **Adherence to standards:** Compliance with industry standards such as IPC-1752A (Material Declaration Management) and ISO 9001 (Quality Management Systems) is essential for ensuring quality and traceability.

## 2. Current Solutions: A Trust-based Approach

Despite the clear regulations, current solutions predominantly rely on trust. Manufacturers depend on paper reports and documentation provided by the supply chain to verify the sources of their components. This approach has significant drawbacks:

- **Lack of ground truth:** Existing methods do not provide a technological means to obtain ground truth regarding the origins of components. Verification is limited to the accuracy of documents and trust in suppliers.



- **Increased risk:** The reliance on paperwork increases the risk of fraud and misrepresentation, which can lead to non-compliance and reputational damage.

## 3. Introducing Deep AI Visual Verification

Cybord offers innovative solutions designed to address these challenges through advanced visual inspection technology.

- **Deep visual analysis:** These software solutions enable the visual inspection of the top surface of assembled circuit boards to accurately identify the manufacturer and country of origin of all assembled components.
- **Provenance detection:**
  - » **Top marking recognition:** For components with visible markings, the software reads and decodes the context of the markings, extracting the country of origin and additional traceability data.
- **Direct image verification:** By capturing images during assembly from automated optical inspection (AOI) machines or after assembly using top images of the circuit board, Cybord ensures the provenance of the components. This technology guarantees that 100% of components are verified against their reported country of origin.
- **Comprehensive verification of components:**

Cybord's technology extends its verification capabilities to finished goods and semi-finished products. This ensures that all components used in the assembly are original and have not been tampered with, modified, or replaced during production, shipping, or at any point in the supply chain. By employing deep visual analysis and forensic examination, manufacturers can confidently verify the integrity of their products, ensuring compliance with regulatory requirements and maintaining the highest quality and safety standards.

## Conclusion

As compliance with the US CHIPS Act becomes increasingly significant, the need for reliable verification of electronic component sources is paramount. Traditional trust-based methods are insufficient in today's complex supply chains. Cybord's solutions provide a robust, technology-driven approach to ensure compliance and provenance. By leveraging advanced AI visual inspection and forensic analysis, manufacturers can achieve

a level of certainty that was previously unattainable. Additionally, Cybord's technology extends to verifying finished goods and semi-finished products, ensuring that all components are original and have not been tampered with or modified at any point in the supply chain. This comprehensive verification capability not only reinforces product integrity but also supports adherence to regulatory requirements, ultimately enhancing trust in the supply chain. **SMT007**

## WHITE PAPER EXCERPT

# IPC-A-610 Standard Compliance by Using Advanced AI Technology

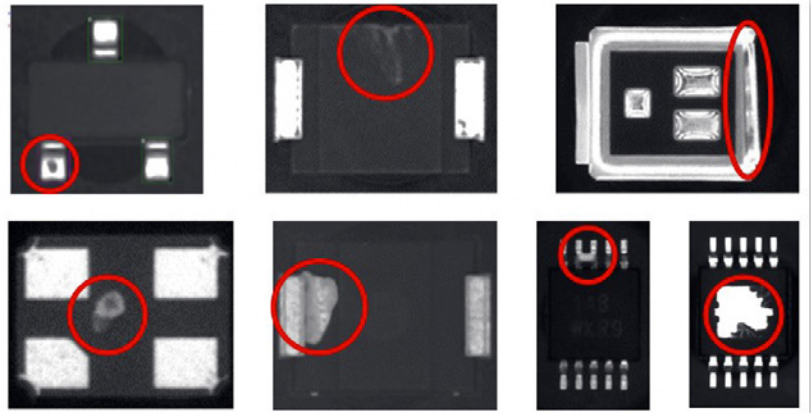
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In the ever-evolving landscape of electronics manufacturing, standards serve as guiding principles, adapting to the pulse of emerging technologies. This white paper embarks on an exploration of IPC-A-610, focused on the quality of assembled PCBs, not merely as a compliance framework but as a dynamic entity poised for evolution.

Our focus zeroes in on electronic components. This is because existing practices predominantly utilize technology to inspect the assembly process, often sidelining the examination of individual electronic components. As a result, these crucial components often find themselves excluded from the majority of automated tests conducted along the manufacturing line.

We advocate for a user-centric approach, where immediate detection technology becomes the catalyst for redefining how IPC-A-610 integrates with the shop floor. This isn't a revolution; it's a transformation, a shift in the orchestration of compliance. As we engage in this dialogue, we pose a simple yet profound question: How does the user experience change with the infusion of real-time insights into IPC-A-610?

Amidst our contemplation, we introduce a novel technology—a visual inspection system based on



advanced AI that scrutinizes every component during assembly, ensuring a discreet yet comprehensive 100% compliance check. Join us on this understated journey, not just to follow standards but to gently mold them into a harmonious resonance with contemporary possibilities, ushering IPC-A-610 into the realm of Smart manufacturing.

### White Paper Contents:

- Defects on component leads/terminations
- Bent or warped leads
- Corrosion and cleanliness
- Cleanliness: Foreign object debris (FOD)
- Loss of metallization
- Mounting upside down
- Incorrect or missing marking

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