Cybord

Enhancing Product Integrity with AI-Powered Visual Inspection

The Customer

Global OEM – Data Center Equipment

The Challenge

A leading Tier 1 OEM supplying data center systems faced a widespread quality issue after multiple unit malfunctions were reported across customer sites. Root cause analysis traced the issue to defective components used in systems assembled at a specific contract manufacturing site.

While production records and supplier declarations were in place, the OEM needed proof of what was actually assembled — not just what was documented. Trust in standard traceability processes had eroded. With high-stakes customers and long deployment cycles, the OEM sought a real-time, component-level inspection solution that could detect physical defects, validate component authenticity, and ensure traceability at scale.

The Solution: Cybord Visual-AI

The OEM deployed **Cybord's visual AI platform,** integrating both **top-side and bottom-side inspection modules** directly into the SMT production line at the identified facility.

✔ **Top-side analysis** verifies component markings, dates, lot codes, and origin

✔ **Bottom-side inspection** flagged physical defects, contamination, and improper handling — including corrosion, probe marks, and FOD (Foreign Object Debris).

Integration was completed in **just two days,** without disrupting production, creating **a layer of real-time intelligence** over the existing Pick & Place and AOI systems.

Results

Within the first couple of weeks of deployment, the system already flagged numerous anomalies that had gone undetected by existing inspection processes. Critically, many of these defects may not even trigger failures during factory-level functional tests — meaning they would only surface later, as malfunctions in the field. By identifying these risks at the component level during production, the OEM was able to intervene early and prevent costly, reputation-damaging failures at customer sites.

Findings included:

Bottom-side anomalies:

- Body defects in thousands of components in violation of IPC-A-610 Section 8.2.2.
- Corrosion and contamination in violation of IPC-A-610 Section 10.6.4.
- Probe marks, orientation errors, and upside-down components in hundreds of components.

Date code mismatches across hundreds of boards

- For example components marked as 2024 WW32 were traced to mismatched lots like 2417, 2435, or even 2241.

Leveraging Cybord, the OEM is now able to intervene in real time, stop faulty units from reaching customers, and **restore confidence in the integrity of its production process.** Cybord provided the OEM with full visual traceability for every component and board coming off the line. In addition, the OEM now has a comprehensive repository of every component assembled on its boards.

> " *Our customers expect uncompromising reliability - and that starts at the component level. With Cybord, we gained visual evidence of what's actually being assembled, not just what's on paper. The integration was fast, and we now have a powerful AI layer that improves inspection, adds traceability, and protects our customer's infrastructure*"
>
> **Dir. of Product, Global OEM.**

High Resolution Board Level Repository

## Discrete Component Repository

	Discrete Board Info.			Discrete Component Info.		Detailed board repository						AVL Verification		
						Date Codes			Lot Codes				MPNs		
	Board PN	Board SN	Refdes	Part Number		Marking	Identified	Traced	Marking	Traced	Manufacturer		Marking	Traced	Country of Origin
	BNJY-2025-YKH254	4500000140721	PU2600	EW50003YL0Q		39	2336	-	A69T	-	TEXAS INSTRUMENTS		53319DQP	TPS53319DQPR	Philippines
	BNJY-2025-YKH254	4500000140721	PU600	EW50003RX0Q		48	2432	-	ZEN8	-	TEXAS INSTRUMENTS		53353DQP	TPS53353DQPR	Philippines
	BNJY-2025-YKH254	4500000140721	PU2901	EW50003TP0Q		37	2327	-	P4EV	-	TEXAS INSTRUMENTS		TPS53515	TPS53515RVER	Thailand
	BNJY-2025-YKH254	4500000140721	PU3200	EW50003YL0Q		37	2327	-	P4EV	-	TEXAS INSTRUMENTS		TPS53515	TPS53515RVER	Thailand
	BNJY-2025-YKH254	4500000140721	PU2601	EW50003RX0Q		39	2336	-	A69T	-	TEXAS INSTRUMENTS		53319DQP	TPS53319DQPR	Philippines
	BNJY-2025-YKH254	4500000140721	PU1200	EW50003YL0Q		48	2432	-	ZEN8	-	TEXAS INSTRUMENTS		53353DQP	TPS53353DQPR	Philippines
	BNJY-2025-YKH254	4500000140721	U60	EW50003UD0Q		23	2210	-	A7XG	-	TEXAS INSTRUMENTS		VRFQ	TPS2003CDRCR	Philippines
	BNJY-2025-YKH254	4500000140721	PU2500	EW50003YL0Q		39	2336	-	A69T	-	TEXAS INSTRUMENTS		53319DQP	TPS53319DQPR	Philippines

Body Defect

Board
4500000140721
PU600

Discrete Bottom Comp. Image

PU600

Discrete Top Comp. Image