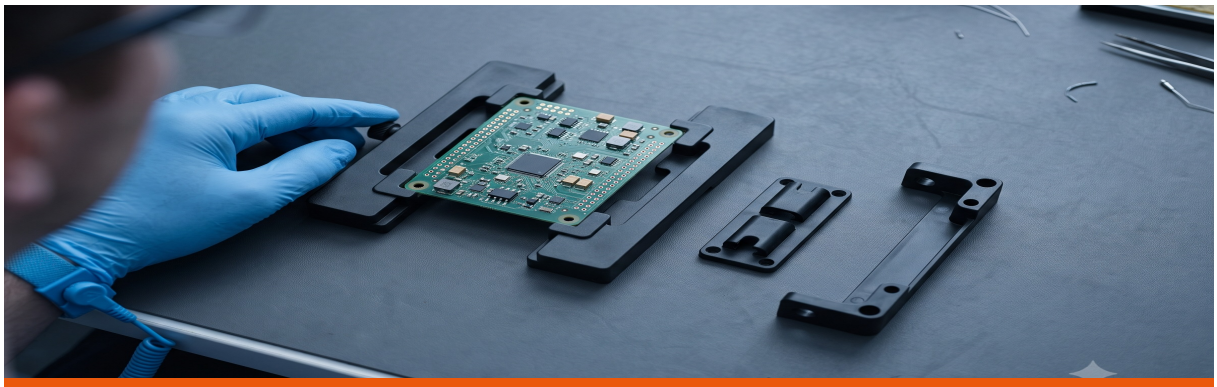


WHAT WE DELIVERED

A dissipative HIPS tray with four engineered zones per cavity — PCB nest, LED tent, harness channel with mid-point lock, and a 180-degree poka-yoke corner. Taking OEM-line incoming rejections from 2.5% to under 0.3%.

ELECTRONICS · AUTOMOTIVE-GRADE LED PCB · BENGALURU

Packing an LED PCB with its own harness — in a single tray, with a built-in poka-yoke.

2.5% → 0.3%	30%	9 days	10^8 ohm
OEM rejection drop	Operator time saved	Die turnaround	ESD-dissipative

THE CHALLENGE

A leading automotive-grade LED driver and lighting PCB manufacturer was shipping assembled PCBs with pre-attached wiring harnesses to a passenger-car OEM. The existing packaging — antistatic bubble bags inside a corrugated outer — had three persistent failure modes:

- Harness tangling: loose harnesses tangled with neighbouring boards, damaging connector terminals and stressing solder joints at the harness-to-board interface.
- LED lens scuffing: harness wires moving against adjacent PCBs scuffed the optical surfaces, failing the OEM's visual inspection.
- LED damage: direct top pressure during stacking occasionally bent LEDs or compromised solder joints.
- Incoming-inspection rejections at the OEM line were running around 2.5% — unacceptable for automotive-grade supply.

OUR SOLUTION

One tray. Four functional zones. Zero wrong-way loading.

Our team studied the PCB, harness geometry, connector pitch and the OEM line's unpack sequence. The result was a custom-engineered dissipative HIPS tray (resistance measured at 10^8 ohms) with four integrated zones per cavity:

>> PCB nest.
A recessed pocket shaped to the PCB outline that supports the board only on its edges — no contact under the LEDs, no pressure on the component side.

>> LED tent.
A raised dome moulded over the LED array that keeps any top-stacking tray or lid clear of the lens surface. Zero contact, zero scuffing.

>> Harness channel with mid-point lock.
A guided groove runs from the connector seat out to the tray edge, with a snap-fit lock halfway along that holds the harness captive. The harness cannot migrate during transit, cannot tangle, and cannot stress the connector-to-PCB solder joints.

>> 180° asymmetric poka-yoke.
One corner of the tray carries an asymmetric cutout that only aligns with the OEM's loading jig in one orientation. Wrong-way loading is physically impossible — a feature the OEM's quality team specifically requested after reviewing the first prototype.

The tray also carries X-Y locking features for safe stacking, and ergonomic finger-access notches at each PCB nest so operators lift boards without touching the component side.



Design reference: PCB components nested in a custom-engineered dissipative tray — one of 70+ PCB die designs in our library.

> *"The harness-lock feature changed the game for us. Before, the operator had to carefully route each harness. Now the tray does it. It takes thirty seconds, not three minutes."*
> — Production Head, LED Lighting Manufacturer

WHAT WE BUILT

- Material: dissipative HIPS, 10^8 ohm resistance
- Features: PCB nest · LED tent · harness channel with mid-point lock · X-Y stack lock · 180-degree poka-yoke
- Tooling: aluminium die, 9 days from design sign-off to first article
- Drawn from our library of 70+ PCB die designs
- Programme in production since: 2025

Customer name withheld under confidentiality. Full named reference available on request.