Mechanical Engineer_High Voltage_TN_202609_035 高压机械设计工程师

工作职责

Responsible of mechanical design for an integrated x-in-1, 800+ V high-voltage control module for NEVs, ensuring robust packaging, thermal/structural performance, HV safety, EMC-ready interfaces, sealing/IP integrity, and manufacturability from concept through SOP and across derivatives.

1 Architectural Definition & Concept Development

1.1 Break down OEM customer technical specifications into mechanical requirements, boundary envelopes, and Interface Control Documents.
1.2 Lead the concept trade-off studies and mechanical architecture of high-voltage "X-in-1" units, integrating housing, cover, busbars, power modules (SiC/IGBT), control boards, thermal cooling circuits, and high-voltage interconnects.
1.3 Direct space-claim, vehicle-level packaging studies, and bracket/mounting interfaces in compliance with commercial vehicle chassis installation zones.

2 Detailed Mechanical Design & DFx Execution

2.1 Design structural aluminum die-cast housings, extruded cooling plates, stamped/bent copper and aluminum busbars, injection-molded parts, and EMI shielding covers using 3D CAD software.
2.2 Apply Design for Manufacturing, Assembly, and Testing (DFM/DFA/DFT) rules to optimize production yields, cycle times, and scrap rates across casting, CNC machining, automated dispensing, and screw-driving processes.
2.3 Perform detailed tolerance stack-up analyses (1D/3D worst-case and RSS statistical evaluations) and create 2D manufacturing drawings following GD&T standards

3 Thermal Management & Structural Integrity Optimization

3.1 Coordinate closely with simulation specialists on CFD (pressure drop, flow distribution, cooling efficiency) and FEA (vibration, shock, screw prestress) analyses.
3.2 Ensure structural designs withstand vehicle environments (severe shock, sustained multi-axis random vibration per ISO 16750-3).
3.3 Select and integrate Thermal Interface Materials (TIM)—including structural gap fillers, thermal pads, and adhesives—to safeguard low thermal resistance across all operating conditions.

4 High-Voltage Safety, Sealing & Reliability Assurance

4.1 Ensure mechanical compliance with automotive HV safety directives (ISO 6469, GB/T 18384, ECE R100), securing mandatory

职位号码
REF82126R

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creepage and clearance distances, touch protection (IPXXB/IPXXD), and HVIL integration.
4.2 Engineer sealing concepts (elastomer gaskets, Formed-In-Place Gaskets / FIPG) and pressure equalization membranes (protective vents) to achieve IP67 and IP6K9K ingress protection ratings over vehicle service life.
4.3 Lead Design FMEA (DFMEA) according to AIAG-VDA standards to identify and mitigate mechanical failure modes early.

5 Industrialization, Supplier Technical Management & Problem Solving

5.1 Guide mechanical suppliers (die-casters, mold makers, stamping houses, connector manufacturers) through technical feasibility reviews, tooling trials, and PPAP approval
5.2 Support internal prototype builds (A/B/C samples), resolve assembly problems, drive Engineering Change Requests (ECR), and implement Root Cause Analysis (8D, Ishikawa, 5-Why).
5.3 Act as the technical lead for production lines during line setup, clamping/screwing process qualifications, and end-of-line (EOL) air-leak testing.

6 Risk, quality, and compliance management

6.1 Lead mechanical risk identification and mitigation (DFMEA ownership/oversight, risk list, contingency planning).
6.2 Ensure compliance to applicable standards and customer specs
6.3 Plan and track DVP for mechanical/environmental, thermal, vibration, leak/IP, and durability; ensure test readiness, issue closure (8D), and change implementation via ECNs.
6.4 Coordinate APQP/PPAP for mechanical parts and assemblies; oversee PFMEA/control plans with suppliers and plant.

7. Cost, weight, and value engineering

Set and track cost/weight targets for mechanical content; lead VA/VE workshops (e.g., casting consolidation, fastener strategy, surface treatments, TIM optimization) without compromising reliability.

8. Communication and stakeholder management

8.1 Provide clear status, risk, and decision logs to leadership and customers; prepare gateway packages and lead design/quality reviews.
8.2 Manage issue/action registers, KPIs dashboards, and lessons learned; deploy standards and best practices across programs.

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1) Bachelor's or Master's degree in Mechanical Engineering, Mechatronics, Automotive Engineering, or equivalent.

2) 5+ years in mechanical development for automotive high voltage control modules
3) Demonstrated delivery of enclosure/cooling/sealing-heavy products under automotive quality systems (APQP, PPAP, IATF 16949).

4) Working knowledge of 800V-1000V + HV safety and mechanical topics (creepage/clearance, CTI-driven materials, UL94 flammability).
5) Background in die casting and welded aluminum housings, sealing systems (O rings, form-in-place gaskets, venting), and thermal interface materials/potting.
6) Launch experience for integrated multi-function HV modules (e.g., OBC + DC/DC + PDU/inverter controls) with tight packaging and thermal zoning.
7) Familiarity with EMC from a mechanical perspective (shielding joints, grounding continuity).
8) Proficiency with CAD/PLM-driven release processes. Creo @ Windchill and change control (ECR/ECN).
9) Strong cross-functional collabration, supplier management, and communication skills.
10) Fluent English communication

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关于我们

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