

carboncalcpcf.com

Product Carbon Footprint Dashboard

Product: **shkzdsqted (Smart Gadget X)**

Quantity: 1.0 unit | System Boundary: factory_gate | Production Country: China | Standard: GHG Protocol

15.266 kgCO₂e

Total Carbon Footprint per unit

Total Footprint

15.266 kgCO₂e

Per 1 unit of Smart Gadget X

Carbon Intensity

15.266 kgCO₂e/unit

Emissions per functional unit

Top Material Hotspot

Circuit Board (PCB)

2.500 kgCO₂e (38% of material impact)

Primary Emission Scope

Use Phase (Scope 3, Cat 11)

7.500 kgCO₂e (48.2% of gross footprint)

Lifecycle Stage Breakdown

Use Phase (Scope 3, Cat 11)	7.500 kgCO2e (48.2%)
Materials (Scope 3, Cat 1)	6.581 kgCO2e (42.3%)
Manufacturing Energy (Scope 2)	1.241 kgCO2e (8.0%)
Downstream Transport (Scope 3, Cat 9)	0.118 kgCO2e (0.8%)
Upstream Transport (Scope 3, Cat 4)	0.106 kgCO2e (0.7%)
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End-of-Life Treatment (Net Saving)	-0.280 kgCO2e

Top Material Carbon Impact

Circuit Board (PCB)	2.500 kgCO2e (38.0%)
Aluminum Casing	1.600 kgCO2e (24.3%)
Lithium-ion Battery	0.750 kgCO2e (11.4%)
PC Plastic Housing	0.525 kgCO2e (8.0%)
Silicon Microchip	0.500 kgCO2e (7.6%)

Key Insights & Hotspots

- The **Use Phase** is the most significant contributor to the carbon footprint (7.500 kgCO₂e), accounting for 48.2% of gross emissions, mainly due to electricity consumption over the product's lifespan.
- **Material Acquisition and Processing** is the second largest hotspot (6.581 kgCO₂e), with the Circuit Board (PCB) being the single highest impact material at 2.500 kgCO₂e.
- **Manufacturing Energy** contributes 1.241 kgCO₂e, highlighting opportunities for further investment in 100% renewable energy sources at the production facility.

Reliability Note: This PCF has 'medium' reliability due to reliance on generic emission factors. Higher accuracy requires primary data.

Action Plan for Emission Reduction

- **Product Design for Energy Efficiency:** Implement innovations to drastically reduce energy consumption during the product's use phase.
- **Sustainable Material Sourcing:** Prioritize suppliers offering low-carbon materials, increased recycled content, and transparent cradle-to-gate data.
- **Renewable Energy Transition:** Target 100% renewable energy usage in manufacturing operations, moving beyond the current 60%.
- **Optimize Logistics:** Analyze and streamline transport routes and modes (e.g., shift to lower-emission options like rail/sea) for both inbound and outbound logistics.
- **Enhance Circularity:** Strengthen take-back and recycling programs, focusing on high-value material recovery and extending product lifespans.