

carboncalcpcf.com

Product Carbon Footprint: unwxhlxyeh

47.51 kg CO₂e

Total PCF

Total Footprint

47.51 kg CO2e

per 1.0 unit

Carbon Intensity

47.51 kg CO2e

per functional unit

Top Material Hotspot

Aluminum Casing

3.5 kg CO2e

Primary Emission Scope

Use Phase

40.00 kg CO2e (84.19%)

Emissions Breakdown

Lifecycle Stage Contribution

- Materials Acquisition & Pre-processing (13.15%)
- Production (Scope 2) (0.25%)
- Logistics (1.66%)
- Use Phase (84.19%)
- End-of-Life (0.74%)

Top Material Impacts (kg CO2e)

Aluminum Casing	3.50 kg CO2e
Silicon Chip	1.25 kg CO2e
Recycled ABS Plastic	0.60 kg CO2e
Copper Wire	0.50 kg CO2e
Packaging Cardboard	0.30 kg CO2e

Key Highlights

Use Phase Dominance: The product's operational life accounts for approximately 84% of its total carbon footprint, making it the most critical impact area.

Material Impact: Upstream material acquisition and processing contribute about 13% of the total footprint, indicating material selection as a key optimization area.

Circular Economy Success: A high recyclability rate (80%) and robust take-back programs significantly mitigate End-of-Life emissions.

Recommendations for Carbon Reduction

Use Phase Optimization: Focus on improving the energy efficiency of the product during its 5-year lifespan through lower-power components or smart energy management.

Renewable Energy Integration: Further increase the percentage of renewable energy used in the manufacturing facility beyond the current 75% to reduce Scope 2 emissions.

Supply Chain Engagement: Collaborate with suppliers to identify and integrate lower-carbon materials and processes, particularly for high-impact components like aluminum.

Logistics Optimization: Explore opportunities to optimize transport routes, switch to lower-emission freight modes, and consolidate shipments.

Circular Economy Expansion: Continue to invest in and expand take-back and recycling programs to maximize material recovery and further reduce EoL impacts.