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Product Carbon Footprint for gnkirvwdix

14.467 kg CO₂e

Total Footprint (per unit)

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14.467 kg CO₂e

per 1.0 unit of gnkirvwdix

Carbon Intensity

31.45 kg CO₂e/kg

based on 0.46 kg product weight

Top Material Hotspot

Silicon Chip

1.500 kg CO₂e from materials

Primary Emission Scope

Scope 3 (Use Phase)

12.500 kg CO₂e impact

Gross
Emissions

Lifecycle Stage Breakdown

16.136 kg

Gross
Emissions

- Materials: 3.250 kg CO₂e (20.14%)
- Production Energy: 0.192 kg CO₂e (1.19%)
- Transportation: 0.194 kg CO₂e (1.20%)
- Use Phase Energy: 12.500 kg CO₂e (77.47%)
- End-of-Life: -1.669 kg CO₂e (Net avoided emissions)

Material Composition vs. Carbon Impact

| | |
|---------------------|---------------|
| Silicon Chip | 1.500 kg CO2e |
| Aluminum Casing | 1.000 kg CO2e |
| Polymer Housing | 0.525 kg CO2e |
| Copper Wiring | 0.150 kg CO2e |
| Packaging Cardboard | 0.075 kg CO2e |

Key Insights & Hotspots

- **Use Phase Dominance:** The product's use phase contributes 12.500 kg CO2e, representing approximately 77.5% of the gross positive emissions, making it the most significant environmental hotspot.
- **Material Impact:** Upstream material extraction and processing account for 3.250 kg CO2e, with the Silicon Chip being a primary driver at 1.500 kg CO2e.
- **Circular Economy Benefits:** Robust End-of-Life programs, including recycling and take-back initiatives, result in a substantial net avoided emission of -1.669 kg CO2e.

Recommendations for Emission Reduction

1. **Use Phase Optimization:** Prioritize product design for enhanced energy efficiency during its 5-year lifespan and encourage end-users to adopt renewable energy sources.
2. **Sustainable Material Sourcing:** Explore alternatives for high-impact materials, focusing on lower-carbon or recycled content for components like the Silicon Chip and Aluminum Casing.
3. **Logistics Efficiency:** Strategically optimize transportation routes and modes, favouring rail or electric vehicles for regional and last-mile distribution where feasible.
4. **Circular Economy Enhancement:** Strengthen and expand active take-back and refurbishment programs to maximize product lifespan and material recovery rates.