

Supply Chain Risk Assessment: Critical Single-Source Dependencies & Second-Sourcing Strategy

Purpose

This executive engineering brief evaluates catastrophic single-source supply chain vulnerabilities across Gigavolt's active product platforms. It outlines qualification timelines for secondary component suppliers to prevent manufacturing halts and warranty fulfillment delays.

Critical Component Vulnerability Matrix

Component Description	Part Number	Primary Tier-1/Tier-2 Supplier	Upstream Vulnerability	Risk Level	Secondary Supplier Alternative
CobaltMax 65Ah Pouch Cell	CEL-NMC-065	Aura Energy Storage Ltd. (SUP-AUR-04)	Tier-3 raw cobalt refined solely by Katanga Cobalt & Mineral (SUP-KMR-03) in DRC. Geopolitical supply disruption risk.	High	NorthVolt Nordic AB (P/N: CEL-NMC-066-ALT, undergoing cycling trials).
Prismacell 280Ah LFP Cell	CEL-LFP-280	Voltaic Core Technologies (SUP-VCT-0)	Single-region concentration of cell casing extrusions via	Medium	EVE Energy Corp. (P/N: CEL-LFP-280-EV, ISO

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		1) / SinoPower Cell Foundry (SUP-SPC-11)	Apex Extrusions (SUP-AEX-19).		9001 certified).
Inverter Gate Drive PCB	PCB-DRV-3500	Semicon Dynamics Inc. (SUP-SDI-09)	Sole-source custom ASIC gate driver chip with 26-week foundry lead time.	Critical	Redesign project ECO-2025-004 initiated to utilize discrete automotive-grade microcontrollers.
PTC Enclosure Heater	HTR-CAB-100	ThermalFlow Systems (SUP-TFS-14)	High MTBF failure rate during extreme freeze events.	Low	Stego Industrial Heating (P/N: HTR-IND-150, drop-in compatible).

Quality Escape Mitigation Protocols

If an active supplier is placed on provisional quarantine due to failure analysis teardowns (as occurred under Incident **INC-2024-088** with supplier **Apex Cell Tech Corp**):

1. Immediately switch Enterprise Resource Planning (ERP) allocation to the secondary qualified vendor.
2. Quarantined stock must be electronically locked in **Parts_Inventory** to prevent automated warehouse dispatches for field technician repair tickets.