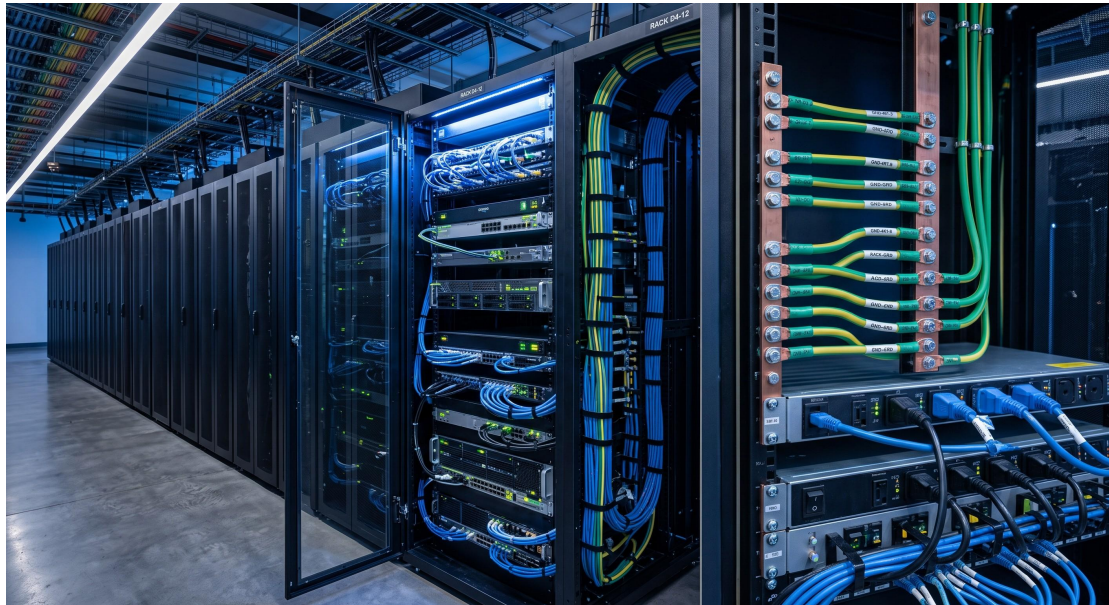


Telecom Power System Grounding Standards - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview of the Telecom Power System Grounding Standards, defining the critical hardware specifications, grounding methodologies, and compliance requirements for carrier-grade power distribution architectures. As a foundational element of network infrastructure integrity, proper grounding and bonding ensure personnel safety, equipment protection, and electromagnetic compatibility (EMC) for telecom installations spanning central offices, data centers, and remote cell sites.

The grounding standards addressed herein are derived from international regulatory frameworks, including ANSI T1.333, ETSI EN 300 253, and NEBS GR-1089-CORE, establishing a unified engineering approach to earth-ground reference systems, DC return paths, surge protection, and fault current dissipation. This datasheet serves as the primary reference for field engineers, system architects, and procurement specialists tasked with deploying resilient, code-compliant power infrastructure.



ARCHITECTURE & CHASSIS DESIGN

The architectural foundation of our Telecom Power Grounding System integrates a galvanically isolated, single-point ground reference plane with active monitoring capabilities. The system chassis, constructed from heavy-gauge corrosion-resistant steel with a conductive protective finish, accommodates up to four rectifier modules, two battery disconnect units, and a configurable distribution panel. Each chassis is equipped with dual ground bus bars — one dedicated to AC protective earth and the other for DC return (DC-RTN)—connected to a central ground tie point (CTP) via 2/0 AWG copper cabling.

Key structural features include a transparent polycarbonate front cover for visual inspection, modular sliding trays for component access, and integrated

EMI gasketing to maintain shielding effectiveness. The rack-mountable design supports 19-inch and 23-inch EIA standards, with optional seismic bracing for NEBS Zone 4 compliance.

HARDWARE FEATURES

Our grounding solution encompasses a suite of field-proven hardware elements engineered for mission-critical reliability:

- GROUND REFERENCE BARS: Tinned copper bus bars with multiple M8 bolt studs (4-hole NEMA pattern), rated for 300 A continuous fault current. Each bar is equipped with a bonded test link for periodic ground resistance verification.
- SURGE PROTECTION DEVICES (SPDS): Hybrid Type 1+2 components incorporating both metal-oxide varistor (MOV) and gas discharge tube (GDT) technologies, clamping transient voltages to <500 V at 20 kA 8/20 μ s surge capacity. Standard field replaceable modules with LED status indicators.
- MONITORING & DIAGNOSTICS: Embedded ground-fault detection circuits continuously measure leakage current from 1 mA to 50 A, triggering visual and SNMP-trap alarms upon threshold violation. A 1.5" OLED display presents real-time ground resistance (ohm), chassis potential (V), and neutral-to-ground

voltage differential.

- BONDING NETWORK INTERFACE: Pre-drilled landing points for bonding jumpers (#6 AWG stranded copper) to equipment racks, cable trays, and building structural steel, ensuring equipotential plane creation per IEEE 1100 (Emerald Book).

COMPLIANCE & STANDARDS

The system is fully certified for global deployment, meeting the stringent requirements of:

- TELECOM INDUSTRY: ANSI/TIA-607-C (Generic Telecommunications Bonding and Grounding), GR-1089-CORE (Electrostatic Discharge and Electrical Fast Transient), and GR-1275-CORE (Surge Withstand Capability).
- SAFETY & ENVIRONMENTAL: UL 60950-1 / IEC 62368-1 for ITE safety, IP20 ingress protection rating, and RoHS/REACH substance compliance. Operating temperature range -40°C to +75°C with derating for high-altitude sites.
- EMC DIRECTIVES: FCC Part 15 Class A, EN 55022 Class A, and CISPR 22 radiated/conducted emission limits, with immunity testing per IEC 61000-4-2 through -4-6.

Parameter	Specification
Form Factor	3RU Chassis, 19/23-inch rack compatible
Switching Capacity	200 A DC continuous, 300 A fault current
Power Supply	Dual-redundant AC/DC rectifiers, 1000 W each
Ground Resistance	< 0.1 ohm measured at 60 A
Surge Protection	20 kA 8/20 μ s per phase, hybrid MOV/GDT
Monitoring Accuracy	$\pm$ 2% leakage current, $\pm$ 1% voltage

ORDERING OPTIONS

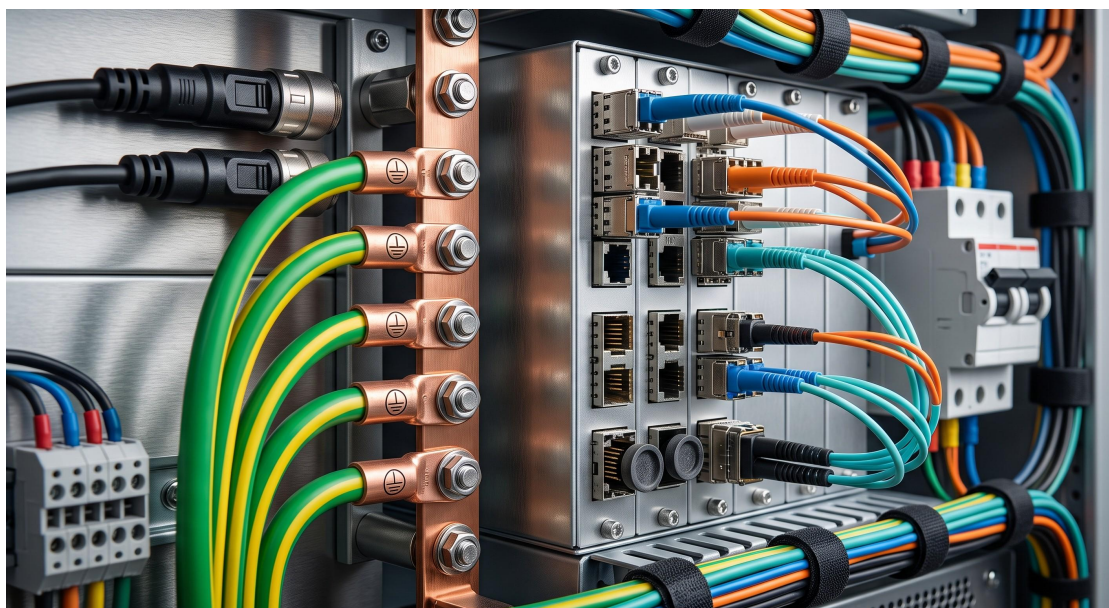
The platform supports three distinct product variants, each tailored for specific deployment densities and environmental conditions:

BASLINE MODEL (GND-1000): Standard chassis, 100 A DC distribution, single ground bus pair, suitable for small cell and edge POP locations. Includes factory-molded 10 ft ground cable assembly.

ENHANCED MODEL (GND-2000): Expanded chassis with dual rectifier slots, 200 A distribution, redundant ground bar set, integrated surge monitors, and slide-out maintenance tray. Recommended for medium central offices.

RUGGEDIZED MODEL (GND-3000): Full NEBS Level 3 certification with corrosion-resistant coating (MIL-STD-810F), conformal-coated PCBs, and enhanced EMI filtration. Includes field-replaceable ground-fault interrupter modules and -40°C cold-start capability.

All configurations ship with comprehensive installation kits, torque wrench-adjustable hardware, and a quick-reference grounding checklist laminated in UV-stable plastic. Custom color and connector options available for private-label procurement contracts.



VERIFICATION & ACCEPTANCE TESTING

Factory acceptance testing includes 100% visual and mechanical inspection, dielectric strength (HI-POT) at 1500 V RMS for 60 seconds, and ground continuity verification at 60 A for 30 minutes. Each unit is subjected to a 48-hour burn-in period at rated load to validate thermal performance and bonding integrity. Site acceptance testing (SAT) protocols are provided separately in our Field Installation Manual (Doc. Ref. TPG-9110).

LIFECYCLE SUPPORT

The product carries a standard 5-year limited warranty covering material and workmanship, with optional extended support (up to 10 years) featuring advanced replacement service and 24/7 technical hotline. Firmware updates for monitoring controllers are delivered via secure USB interface, ensuring continuous compliance with evolving local utility regulations.