

ZTE Power Subrack High-Voltage Direct Current (HVDC) Input Parameters - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The ZTE Power Subrack High-Voltage Direct Current (HVDC) Input Parameters platform represents a paradigm shift in carrier-grade power distribution architecture, engineered specifically for next-generation telecommunications infrastructure requiring ultra-reliable, high-efficiency DC power delivery. As global network operators transition toward 5G densification, edge computing, and hyperscale data center deployments, the demand for compact, scalable, and intelligent HVDC input subsystems has become mission-critical. The ZTE HVDC Power Subrack addresses this demand through a modular, hot-swappable design that supports nominal input voltages ranging from 240 VDC to 400 VDC, with an extended operating window of 200 VDC to 420 VDC to accommodate grid fluctuations and battery backup transitions. This datasheet provides a comprehensive technical exposition of the subrack's input parameters, protection mechanisms, monitoring capabilities, and integration pathways, enabling network architects and power engineers to specify, deploy, and maintain HVDC infrastructure with absolute confidence. The platform is compliant with IEC 62368-1, EN 60950-1, and Telcordia GR-1089-CORE, ensuring global deployment readiness across tier-1 carrier environments.



ARCHITECTURE & CHASSIS DESIGN

The ZTE HVDC Power Subrack is constructed around a rigid 19-inch rack-mountable chassis available in 1RU, 2RU, and 3RU configurations, with depth options of 300 mm and 450 mm to suit diverse cabinet constraints. The chassis employs a segregated compartmentalization strategy: a front-accessible input termination zone, a mid-plane power conversion and distribution layer, and a rear-mounted output and communication interface bay. The input termination zone accepts dual-feed HVDC inputs via industry-standard Anderson Powerpole, UTC, or screw-terminal lugs, with polarity-independent connection logic that prevents reverse-polarity damage. Each input feed is galvanically isolated and independently fused with hydraulic-magnetic circuit breakers rated for 63 A, 100 A, or 125 A depending on the subrack variant. The mid-plane houses the hot-swappable power conversion modules (PCMs) and

the intelligent monitoring unit (IMU), which continuously samples input voltage, current, ripple, and transient events at a 10 kHz sampling rate. The rear bay provides output busbars with M6 and M8 studs, along with dual RJ45 and RS-485 ports for Modbus TCP and SNMP v3 telemetry. The chassis is fabricated from extruded aluminum alloy with a conductive conversion coating, providing a low-impedance chassis ground path and effective EMI shielding up to 1 GHz.

HARDWARE FEATURES

The ZTE HVDC Power Subrack incorporates a suite of hardware features designed to maximize availability, safety, and operational efficiency. Key features include: wide-range HVDC input compatibility (200 – 420 VDC continuous, 450 VDC for 10 ms transient), active power factor correction (PFC) achieving >0.99 at full load, inrush current limiting via negative temperature coefficient (NTC) thermistors and bypass relays, and integrated surge protection devices (SPDs) rated for 20 kA 8/20 μ s per phase. The subrack supports 1+1 and N+1 redundant power module configurations, with automatic load sharing within $\pm 3\%$ across modules. Hot-swap capability is enabled through staggered pin engagement and ORing FETs, ensuring zero downtime during module replacement. The intelligent monitoring unit provides real-time fault detection, including input undervoltage, overvoltage, overcurrent, ground fault, and arc fault detection, with programmable

thresholds and dry-contact alarm relays. Front-panel LED indicators provide at-a-glance status for input presence, module health, and alarm conditions. The subrack also features an optional integrated battery temperature sensor interface and a CAN bus port for seamless integration with ZTE's NetNumen U31 management platform.

COMPLIANCE & STANDARDS

The ZTE HVDC Power Subrack is designed and tested to meet the most stringent international and carrier-specific standards. Electromagnetic compatibility (EMC) is assured through compliance with EN 55032 Class A, EN 55035, FCC Part 15 Subpart B Class A, and CISPR 32. Safety compliance includes IEC 62368-1, EN 62368-1, UL 62368-1, and CAN/CSA C22.2 No. 62368-1. The platform is RoHS 2.0 and REACH compliant, and its packaging meets ISTA 3A transit testing requirements. For telecom-specific environments, the subrack adheres to Telcordia GR-1089-CORE (lightning and AC power fault immunity), GR-63-CORE (NEBS Level 3 physical protection), and ETSI EN 300 019 (environmental classes 1.1, 1.2, 2.1, 2.2, 3.1, and 3.2). Additionally, the subrack is certified for operation in altitudes up to 4,000 m and supports seismic Zone 4 events per Telcordia GR-63-CORE. All external interfaces are protected against electrostatic discharge (ESD) per IEC 61000-4-2 Level 4 (± 8 kV contact, ± 15 kV air).

TECHNICAL SPECIFICATIONS

The following table summarizes the primary input parameters and performance specifications of the ZTE HVDC Power Subrack. These values are typical at 25°C ambient, 50% load, and 300 VDC nominal input unless otherwise noted. Parameter variations for specific SKUs are detailed in the ordering options section.

Parameter	Specification
Input Voltage Range (Nominal)	240 VDC / 300 VDC / 350 VDC / 400 VDC (selectable by SKU)
Input Voltage Operating Range	200 VDC to 420 VDC continuous; 450 VDC for 10 ms transient
Input Frequency	DC (0 Hz)
Input Current (Max per Feed)	63 A / 100 A / 125 A (SKU dependent)
Input Power Factor	>0.99 at 50–100% load
Inrush Current Limiting	NTC thermistor + bypass relay; <30 A peak at 400 VDC cold start
Input Isolation	Galvanic isolation, 3,000 VAC for 1 minute
Protection Ratings	OVP, UVP, OCP, OTP, SCP, ground fault,

	arc fault
Surge Protection	20 kA 8/20 μ s per phase (SPD module)
Efficiency	Up to 97.5% at 50% load, 300 VDC input
Redundancy	1+1, 2+2, N+1 (up to 6+1)
Hot-Swap Capability	Yes, with staggered pin engagement and ORing FETs
Monitoring Sampling Rate	10 kHz for voltage, current, ripple, and transient events
Communication Interfaces	Dual RJ45 (SNMP v3, Modbus TCP), RS-485, CAN bus
Operating Temperature	-40°C to +70°C (full load up to +55°C)
Storage Temperature	-40°C to +85°C
Relative Humidity	5% to 95% non-condensing
Altitude	Up to 4,000 m
Seismic Rating	Telcordia GR-63-CORE Zone 4
Dimensions (1RU)	44.45 mm (H) x 482.6 mm (W) x 300 mm (D)
Dimensions (2RU)	88.9 mm (H) x 482.6 mm (W) x 300 mm (D)
Dimensions (3RU)	133.35 mm (H) x 482.6 mm (W) x 450 mm (D)

Weight (1RU, fully populated)	6.8 kg
Weight (2RU, fully populated)	11.2 kg
Weight (3RU, fully populated)	16.5 kg
Compliance	IEC 62368-1, EN 60950-1, Telcordia GR-1089-CORE, GR-63-CORE, RoHS 2.0, REACH

ORDERING OPTIONS

The ZTE HVDC Power Subrack is available in multiple configurations to suit diverse deployment scenarios. Model numbers are structured as follows: ZXPS-HVDC-[Rack Units][Module Count][Input Rating][Output Configuration]. For example, ZXPS-HVDC-2U6-400V-DC48 indicates a 2RU subrack with six power module slots, 400 VDC nominal input, and 48 VDC output. Standard input voltage options include 240 VDC, 300 VDC, 350 VDC, and 400 VDC, each with an extended operating range. Output configurations include 48 VDC, 54 VDC, 57 VDC, and 60 VDC, with total output power ratings from 6 kW to 24 kW. Redundancy options encompass 1+1, 2+2, and N+1 (up to 6+1). Communication options include SNMP v3, Modbus TCP, and CAN bus. Accessory kits are available for cable management, seismic bracing, and remote temperature sensing. For detailed ordering information and SKU-specific input

parameter tolerances, please consult the ZTE Power Solutions Catalog or contact your authorized ZTE sales representative.

