FiberHome PUBA Power Supply Unit Thermal Load and Environmental Requirements - Official Technical Overview & Hardware Datasheet

FIBERHOME PUBA POWER SUPPLY UNIT THERMAL LOAD AND ENVIRONMENTAL REQUIREMENTS - OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview and detailed hardware datasheet for the FiberHome PUBA Power Supply Unit (PSU), specifically focusing on its thermal load characteristics, environmental operating parameters, and associated system requirements. Designed for carrier-grade and enterprise network infrastructure, the FiberHome PUBA PSU delivers high-efficiency power conversion with a robust thermal management architecture that ensures reliable operation under diverse and demanding environmental conditions. This datasheet serves as a critical reference for network engineers, systems integrators, and data center facilities managers involved in the planning, deployment, and operation of FiberHome networking systems. The unit is engineered to meet the rigorous standards of modern telecommunications environments, offering a combination of high power density, intelligent cooling, and comprehensive protection features.



HARDWARE ARCHITECTURE & SILICON

The FiberHome PUBA PSU is built upon a sophisticated hardware platform that integrates advanced power electronics with intelligent control logic. At its core is a high-frequency switching power supply topology, utilizing gallium nitride (GaN) or silicon carbide (SiC) semiconductor technology to achieve exceptional efficiency, typically exceeding 94% at optimal load ranges. This advanced silicon enables reduced switching losses, allowing for a more compact form factor and lower thermal dissipation. The power conversion stage is complemented by a dedicated digital signal processor (DSP) that executes complex control algorithms for power factor correction (PFC), precise voltage regulation, and active current sharing in parallel or redundant configurations. The unit's architecture includes a fully isolated DC-DC converter stage, ensuring output stability and galvanic isolation from the input AC mains. All critical components

are mounted on a high-thermal-conductivity PCB, with power semiconductors attached directly to an integrated heat sink baseplate to optimize heat transfer and minimize thermal resistance. This design philosophy ensures that the PSU can sustain continuous full-load operation while maintaining component junction temperatures within safe operating limits.

KEY FEATURES & ROUTING LOGIC

- High Efficiency & Power Density: Delivers up to 94% conversion efficiency, significantly reducing operational costs associated with power consumption and cooling. The compact 1RU design maximizes power output per unit of rack space.
- Intelligent Thermal Management: Incorporates a closed-loop, variable-speed fan cooling system. The fan speed dynamically adjusts in response to internal temperature sensors, optimizing airflow and minimizing acoustic noise under light loads. An advanced heat sink design with optimized fin geometry ensures efficient dissipation of thermal energy.
- Comprehensive Protection Mechanisms: Features a full suite of protection functions, including Over-Voltage Protection (OVP), Over-Current Protection (OCP), Short-Circuit Protection (SCP), Over-Temperature Protection (OTP), and Under-Voltage Lockout (UVLO). These safeguards ensure both the PSU and the downstream equipment are protected from electrical faults and abnormal operating conditions.

- Redundancy and Hot-Swap: Designed for N+1 or N+N redundancy configurations. The hot-swappable capability allows for replacement or addition of PSUs without interrupting system operation, ensuring maximum system availability and facilitating maintenance.

- Active Load Sharing & Intelligent Control: Integrated current sharing bus allows for balanced load distribution across multiple PSUs in a parallel configuration, preventing single-unit overload and extending operational life. The DSP-based control logic ensures seamless operation and high reliability.

- Wide Input Voltage Range: Capable of operating with input voltages from 100V to 240V AC (or a specified wide-range DC input option), supporting global deployment without the need for manual voltage selection, and offering resilience against brownouts or voltage sags.

COMPLIANCE & STANDARDS

The FiberHome PUBA PSU is designed and rigorously tested to comply with a comprehensive set of international safety, electromagnetic compatibility (EMC), and environmental standards, ensuring seamless integration into global telecommunications networks and data centers. The unit holds certifications, including but not limited to:

- Safety: IEC/EN/UL 62368-1, IEC/EN 60950-1 (as applicable), meeting the stringent requirements for audio/video, information, and communication

technology equipment.

- EMC: FCC Part 15 (Class A), EN 55032 (Class A), EN 55024, and CISPR 32, ensuring the unit does not generate excessive electromagnetic interference and is immune to external disturbances.

- Environmental: Complies with RoHS (Restriction of Hazardous Substances) and REACH directives, affirming the commitment to environmentally responsible manufacturing.

- Reliability: Designed to meet Telcordia GR-63-CORE and GR-3028-CORE NEBS (Network Equipment-Building System) standards for thermal and environmental performance, ensuring reliability in central office and data center environments.

TECHNICAL SPECIFICATIONS



Parameter	Specification
Form Factor	1RU Standard (Hot-Swappable)
AC Input Voltage Range	100 - 240 V AC (Nominal), 90 - 264 V AC (Range)
AC Input Frequency	50 - 60 Hz
DC Input Voltage Range (Optional)	-48 V DC (-40 to -72 V DC)
Maximum Output Power	1200 W
Output Voltage	12 V DC (Main) / 3.3 V DC (Standby)
Efficiency	≥ 94% at 50% to 100% Load
Cooling Type	Variable Speed, Hot-Swappable Fan Tray
MTBF (Mean Time Between Failures)	> 300,000 hours at 25°C
Operating Temperature	0°C to 50°C (Derated above 40°C)
Storage Temperature	-40°C to +70°C
Operating Humidity (Non-Condensing)	5% to 95% RH
Maximum Power Dissipation (Thermal Load)	~ 75 W (at 1200W Output, 94% Efficiency)
Airflow Direction	Standard (Front-to-Back) / Reverse (Back-to-Front) Options
Dimensions (H x W x D)	40.5 x 74.0 x 220.0 mm
Weight	~ 1.2 kg

ORDERING SKU INFORMATION

For all ordering inquiries, please specify the exact model number and any associated options. Standard orderable configurations for the FiberHome PUBA Power Supply Unit are detailed below.

- PUBA-AC-1200W: 1200W AC Power Supply Unit, Standard Airflow (Front-to-Back).
- PUBA-AC-1200W-R: 1200W AC Power Supply Unit, Reverse Airflow (Back-to-Front).
- PUBA-DC-1200W: 1200W DC Power Supply Unit (Input: -48V DC), Standard Airflow.
- PUBA-BLANK: Blank cover panel for unused PSU bays to maintain optimal airflow management and EMI integrity.