

Data Center Power Infrastructure Market - A Global and Regional Analysis: Focus on Power Supply Architecture, AI Specific Data Center Requirements, Cloud Infrastructure, Gan Applications

<https://marketpublishers.com/r/D47A500DEEEFEN.html>

Date: June 2025

Pages: 0

Price: US\$ 4,900.00 (Single User License)

ID: D47A500DEEEFEN

Abstracts

Hard copy option is available on any of the options above at an additional charge of \$500. Please email us at order@marketpublishers.com with your request.

This report will be delivered in 7-10 working days. Introduction to the Global Data Center Power Infrastructure Market (Including Market in 2025 and Beyond)

The Global Data Center Power Infrastructure Market is expanding rapidly as organizations modernize their IT environments, add AI-specific workloads, and adopt cloud and hyperscale designs. By 2025, data centers will increasingly prioritize energy-efficient power distribution and supply architectures to handle higher rack densities, mitigate costs, and comply with sustainability mandates. Innovations in GaN-based power solutions, DC distribution, and advanced packaging (e.g., 3D stacking) are reshaping how data centers manage and convert power.

Looking further ahead, the drive to accommodate specialized compute (GPU servers, HPC clusters) will intensify the need for robust, flexible power systems. As more operators adopt green energy sources and push for low-PUE (Power Usage Effectiveness) targets, advanced power conversion and distribution solutions become critical to staying competitive and meeting environmental goals.

Segmentation by Application

Data Center Type

Hyperscale: Massive cloud providers (e.g., AWS, Microsoft, Google) with large capital expenditures in power infrastructure.

Colocation & Retail: Multi-tenant facilities requiring flexible, scalable power solutions for varied workloads.

Enterprise Data Centers: Private, on-premises facilities focusing on in-house reliability and control.

Others: Edge or specialized data centers with unique power constraints.

Segmentation by Product

1. Power Supply Architecture

Distribution

Centralized: Traditional model with large-scale AC distribution.

Distributed: Modular or cluster-level power distribution offering localized control.

Power Supply

Rack-Level: AC-DC or DC-DC conversion at each rack.

Infrastructure Level: Bulk AC or emerging DC supply at data hall or facility scale.

Component

Power Supply: AC/DC and DC/DC converters, multi-phase VRMs, hot-swap modules, digital power control units.

Power Distribution & Management: PDUs (basic, metered, intelligent), busbar systems, ATS, switchgear.

Regional Overview

North America

Dominant hyperscale providers drive large-scale expansions, focusing on advanced power designs for HPC and AI.

Retrofitting older facilities to meet sustainability targets spurs demand for newer, more efficient power systems.

Europe

Emphasis on green data center operation and tight efficiency standards.

Growing HPC/AI clusters in key countries (Germany, France, the Netherlands) raise power supply and distribution demands.

Asia-Pacific

Rapid data center build-outs in China, India, and Southeast Asia, fueled by cloud and e-commerce expansions.

Emergence of local HPC facilities adopting advanced power conversion technologies.

Rest-of-the-World

Middle East invests in large data centers leveraging renewables, while Latin America sees moderate growth.

Infrastructure expansions often incorporate modern, efficient power systems to optimize OPEX and comply with local regulations.

Trend in the Market

A prominent trend is the rise of distributed and modular power architectures, particularly in AI-oriented facilities. As compute density grows, data centers adopt local or “pod-level” power distribution models that minimize loss, simplify scaling, and accommodate diverse workload demands.

Driver in the Market

Soaring AI and HPC workloads spur higher rack densities, intensifying the need for efficient, high-capacity power solutions. Operators expand power capacity at both the rack and infrastructure levels, adopting next-gen technologies like GaN-based converters to sustain performance and control energy costs.

Restraint in the Market

Complex integration and higher upfront expenses can slow adoption. Advanced power architecture (e.g., fully DC distribution) requires re-engineering data hall designs, staff training, and robust maintenance procedures, leading some operators to delay or opt for incremental upgrades over radical shifts.

Opportunity in the Market

Emerging edge data centers and specialized HPC facilities provide a fertile ground for adoption of cutting-edge power infrastructure. As computing moves closer to users (for low-latency services), smaller data centers will need robust, efficient power and distribution solutions customized for limited footprints and unique site conditions. Suppliers offering modular, future-proof architectures can capture these underserved segments.

Contents

Executive Summary
Scope and Definition
Market/Product Definition
Key Questions Answered
Analysis and Forecast Note

1. MARKETS: INDUSTRY OUTLOOK

1.1 Data Center Trends: Current and Future Impact Assessment

1.1.1 Data Center Capacities: Current and Future

1.1.1.1 Retrofitting and Brownfield Projects

1.1.1.2 Green Field projects and New Installation

1.1.1.3 Cloud Infrastructure Deployment

1.1.1.3.1 Colocation VS Hyperscale

1.1.1.3.2 AI Workloads

1.1.2 Data Center Power Consumption Scenario

1.1.3 Other Industrial Trends

1.1.3.1 HPC Cluster Developments

1.1.3.2 Blockchain Initiatives

1.1.3.3 Super Computing

1.1.3.4 5G and 6G Developments

1.1.3.5 Impact of Server/Rack Density

1.1.4 Data Center Deployment Market

1.1.4.1 Market by Components

1.1.4.1.1 IT Infrastructure

1.1.4.1.1.1 General Servers

1.1.4.1.1.2 Accelerated or GPU Servers

1.1.4.1.1.3 Storage Systems

1.1.4.1.1.4 Network Infrastructure

1.1.4.1.2 Data Center Physical Infrastructure

1.1.4.1.2.1 UPS Systems and Backup Generators

1.1.4.1.2.2 Electrical Systems

1.1.4.1.2.3 Cooling Equipment

1.1.4.1.2.4 Data Center Management software

1.2 R&D Review

1.2.1 Patent Filing Trend by Country, by Company

1.3 Stakeholder Analysis

- 1.3.1 Use Case
- 1.3.2 End User and Buying Criteria
- 1.4 Market Dynamics Overview
 - 1.4.1 Market Drivers
 - 1.4.2 Market Restraints
 - 1.4.3 Market Opportunities

2. DATA CENTER POWER INFRASTRUCTURE MARKET (BY APPLICATION)

- 2.1 Application Segmentation
- 2.2 Application Summary
- 2.3 Data Center Power Infrastructure Market (by Data Center Type)
 - 2.3.1 Hyperscale Data Centers
 - 2.3.2 Colocation and Retail Data Centers
 - 2.3.3 Enterprise Data Centers
 - 2.3.4 Others
- 2.4 Data Center Power Infrastructure Market (by Application)
 - 2.4.1 Conventional and Non-AI Data Centers
 - 2.4.2 AI Data Centers

3. DATA CENTER POWER INFRASTRUCTURE MARKET (BY PRODUCT)

- 3.1 Product Segmentation
- 3.2 Product Summary
- 3.3 Data Center Power Infrastructure Market (by Power Supply Architecture)
 - 3.3.1 Market by Distribution
 - 3.3.1.1 Centralized
 - 3.3.1.2 Distributed
 - 3.3.2 Market by Power Supply
 - 3.3.2.1 Rack Level
 - 3.3.2.1.1 AC-DC
 - 3.3.2.1.2 DC-DC
 - 3.3.2.2 Infrastructure Level
 - 3.3.2.2.1 AC Supply
 - 3.3.2.2.2 DC Supply (not yet used at infrastructure level)
 - 3.3.3 Market by Component
 - 3.3.3.1 Power Supply
 - 3.3.3.1.1 AC/DC and DC/DC Converters
 - 3.3.3.1.2 Multi-Phase Voltage Regulator Modules (VRMs)

- 3.3.3.1.3 Hot-Swap Power Modules
 - 3.3.3.1.4 Digital Power Control Units
 - 3.3.3.2 Power Distribution and Management
 - 3.3.3.2.1 Power Distribution Units (PDUs)
 - 3.3.3.2.2 Intelligent/Metered PDUs
 - 3.3.3.2.3 Busbar and Busway Systems
 - 3.3.3.2.4 Automatic Transfer Switches (ATS)
 - 3.3.3.2.5 Switchgear
 - 3.4 GaN-Based Power Solutions for Data Centers
 - 3.4.1 Transistors
 - 3.4.2 Modules
 - 3.4.3 Power ICs
 - 3.4.4 Key Players and Their Products
 - 3.5 Component-Level Technology Integration
 - 3.5.1 Advanced Packaging (3D Packaging, SiP, TSV)
 - 3.5.1.1 3D Stacking and Through-Silicon Vias (TSVs)
 - 3.5.1.2 System-in-Package (SiP) Implementations for Servers
 - 3.5.1.3 High-Density Modules for Compute-Intensive Racks
 - 3.5.1.4 Package-Level Thermal Dissipation Considerations
 - 3.5.2 Integrated Power Modules on PCB
 - 3.5.3 On-Chip/On-Board Interconnects
 - 3.5.4 Thermal Interface and EMI/EMC Components
 - 3.5.5 Adoption by Integration Level
 - 3.5.5.1 SoC vs. SiP Adoption Rates in Data Centers
 - 3.5.5.2 Growth Projections for 3D Packaging Technologies
- Note: 3.5 will be provided at global level. Section 3.5 is a Qualitative Chapter which does not have any forecast of Market size

4. DATA CENTER POWER INFRASTRUCTURE MARKET (BY REGION)

- 4.1 Data Center Deployment Market (by Region)
- 4.2 North America
 - 4.2.1 Regional Overview
 - 4.2.2 Driving Factors for Market Growth
 - 4.2.3 Factors Challenging the Market
 - 4.2.4 Application
 - 4.2.5 Product
 - 4.2.6 U.S.
 - 4.2.6.1 Data Center Trends and Capex

- 4.2.6.2 Market by Application
- 4.2.6.3 Market by Product
- 4.2.7 Canada
 - 4.2.7.1 Data Center Trends and Capex
 - 4.2.7.2 Market by Application
 - 4.2.7.3 Market by Product
- 4.2.8 Mexico
 - 4.2.8.1 Data Center Trends and Capex
 - 4.2.8.2 Market by Application
 - 4.2.8.3 Market by Product
- 4.3 Europe
 - 4.3.1 Regional Overview
 - 4.3.2 Driving Factors for Market Growth
 - 4.3.3 Factors Challenging the Market
 - 4.3.4 Application
 - 4.3.5 Product
 - 4.3.6 Germany
 - 4.3.6.1 Data Center Trends and Capex
 - 4.3.6.2 Market by Application
 - 4.3.6.3 Market by Product
 - 4.3.7 France
 - 4.3.7.1 Data Center Trends and Capex
 - 4.3.7.2 Market by Application
 - 4.3.7.3 Market by Product
 - 4.3.8 U.K.
 - 4.3.8.1 Data Center Trends and Capex
 - 4.3.8.2 Market by Application
 - 4.3.8.3 Market by Product
 - 4.3.9 Italy
 - 4.3.9.1 Data Center Trends and Capex
 - 4.3.9.2 Market by Application
 - 4.3.9.3 Market by Product
 - 4.3.10 Netherlands
 - 4.3.10.1 Data Center Trends and Capex
 - 4.3.10.2 Market by Application
 - 4.3.10.3 Market by Product
 - 4.3.11 Ireland
 - 4.3.11.1 Data Center Trends and Capex
 - 4.3.11.2 Market by Application

- 4.3.11.3 Market by Product
- 4.3.12 Rest-of-Europe
 - 4.3.12.1 Data Center Trends and Capex
 - 4.3.12.2 Market by Application
 - 4.3.12.3 Market by Product
- 4.4 Asia-Pacific
 - 4.4.1 Regional Overview
 - 4.4.2 Driving Factors for Market Growth
 - 4.4.3 Factors Challenging the Market
 - 4.4.4 Application
 - 4.4.5 Product
 - 4.4.6 China (including Hong Kong)
 - 4.4.6.1 Data Center Trends and Capex
 - 4.4.6.2 Market by Application
 - 4.4.6.3 Market by Product
 - 4.4.7 Japan
 - 4.4.7.1 Data Center Trends and Capex
 - 4.4.7.2 Market by Application
 - 4.4.7.3 Market by Product
 - 4.4.8 South Korea
 - 4.4.8.1 Data Center Trends and Capex
 - 4.4.8.2 Market by Application
 - 4.4.8.3 Market by Product
 - 4.4.9 Australia
 - 4.4.9.1 Data Center Trends and Capex
 - 4.4.9.2 Market by Application
 - 4.4.9.3 Market by Product
 - 4.4.10 India
 - 4.4.10.1 Data Center Trends and Capex
 - 4.4.10.2 Market by Application
 - 4.4.10.3 Market by Product
 - 4.4.11 Rest-of-Asia-Pacific
 - 4.4.11.1 Data Center Trends and Capex
 - 4.4.11.2 Market by Application
 - 4.4.11.3 Market by Product
- 4.5 Rest-of-the-World
 - 4.5.1 Regional Overview
 - 4.5.2 Driving Factors for Market Growth
 - 4.5.3 Factors Challenging the Market

4.5.4 Application

4.5.5 Product

5. MARKETS - COMPETITIVE BENCHMARKING & COMPANY PROFILES

5.1 Next Frontiers

5.2 Geographic Assessment

5.3 Company Profiles

5.3.1 Dell

5.3.1.1 Overview

5.3.1.2 Top Products/Product Portfolio

5.3.1.3 Top Competitors

5.3.1.4 Target Customers

5.3.1.5 Key Personnel

5.3.1.6 Analyst View

5.3.1.7 Market Share

5.3.2 Hewlett Packard Enterprise

5.3.2.1 Overview

5.3.2.2 Top Products/Product Portfolio

5.3.2.3 Top Competitors

5.3.2.4 Target Customers

5.3.2.5 Key Personnel

5.3.2.6 Analyst View

5.3.2.7 Market Share

5.3.3 Supermicro

5.3.3.1 Overview

5.3.3.2 Top Products/Product Portfolio

5.3.3.3 Top Competitors

5.3.3.4 Target Customers

5.3.3.5 Key Personnel

5.3.3.6 Analyst View

5.3.3.7 Market Share

5.3.4 Boyd

5.3.4.1 Overview

5.3.4.2 Top Products/Product Portfolio

5.3.4.3 Top Competitors

5.3.4.4 Target Customers

5.3.4.5 Key Personnel

5.3.4.6 Analyst View

- 5.3.4.7 Market Share
- 5.3.5 IEIT Systems
 - 5.3.5.1 Overview
 - 5.3.5.2 Top Products/Product Portfolio
 - 5.3.5.3 Top Competitors
 - 5.3.5.4 Target Customers
 - 5.3.5.5 Key Personnel
 - 5.3.5.6 Analyst View
 - 5.3.5.7 Market Share
- 5.3.6 Huawei
 - 5.3.6.1 Overview
 - 5.3.6.2 Top Products/Product Portfolio
 - 5.3.6.3 Top Competitors
 - 5.3.6.4 Target Customers
 - 5.3.6.5 Key Personnel
 - 5.3.6.6 Analyst View
 - 5.3.6.7 Market Share
- 5.3.7 Cisco
 - 5.3.7.1 Overview
 - 5.3.7.2 Top Products/Product Portfolio
 - 5.3.7.3 Top Competitors
 - 5.3.7.4 Target Customers
 - 5.3.7.5 Key Personnel
 - 5.3.7.6 Analyst View
 - 5.3.7.7 Market Share
- 5.3.8 Schneider Electric
 - 5.3.8.1 Overview
 - 5.3.8.2 Top Products/Product Portfolio
 - 5.3.8.3 Top Competitors
 - 5.3.8.4 Target Customers
 - 5.3.8.5 Key Personnel
 - 5.3.8.6 Analyst View
 - 5.3.8.7 Market Share
- 5.3.9 Vertiv
 - 5.3.9.1 Overview
 - 5.3.9.2 Top Products/Product Portfolio
 - 5.3.9.3 Top Competitors
 - 5.3.9.4 Target Customers
 - 5.3.9.5 Key Personnel

- 5.3.9.6 Analyst View
- 5.3.9.7 Market Share
- 5.3.10 Eaton
 - 5.3.10.1 Overview
 - 5.3.10.2 Top Products/Product Portfolio
 - 5.3.10.3 Top Competitors
 - 5.3.10.4 Target Customers
 - 5.3.10.5 Key Personnel
 - 5.3.10.6 Analyst View
 - 5.3.10.7 Market Share
- 5.3.11 Rittal
 - 5.3.11.1 Overview
 - 5.3.11.2 Top Products/Product Portfolio
 - 5.3.11.3 Top Competitors
 - 5.3.11.4 Target Customers
 - 5.3.11.5 Key Personnel
 - 5.3.11.6 Analyst View
 - 5.3.11.7 Market Share
- 5.3.12 Netapp
 - 5.3.12.1 Overview
 - 5.3.12.2 Top Products/Product Portfolio
 - 5.3.12.3 Top Competitors
 - 5.3.12.4 Target Customers
 - 5.3.12.5 Key Personnel
 - 5.3.12.6 Analyst View
 - 5.3.12.7 Market Share
- 5.3.13 Arista
 - 5.3.13.1 Overview
 - 5.3.13.2 Top Products/Product Portfolio
 - 5.3.13.3 Top Competitors
 - 5.3.13.4 Target Customers
 - 5.3.13.5 Key Personnel
 - 5.3.13.6 Analyst View
 - 5.3.13.7 Market Share
- 5.3.14 Modine
 - 5.3.14.1 Overview
 - 5.3.14.2 Top Products/Product Portfolio
 - 5.3.14.3 Top Competitors
 - 5.3.14.4 Target Customers

- 5.3.14.5 Key Personnel
- 5.3.14.6 Analyst View
- 5.3.14.7 Market Share
- 5.3.15 Mitsubishi Electric
 - 5.3.15.1 Overview
 - 5.3.15.2 Top Products/Product Portfolio
 - 5.3.15.3 Top Competitors
 - 5.3.15.4 Target Customers
 - 5.3.15.5 Key Personnel
 - 5.3.15.6 Analyst View
 - 5.3.15.7 Market Share

6. RESEARCH METHODOLOGY

I would like to order

Product name: Data Center Power Infrastructure Market - A Global and Regional Analysis: Focus on Power Supply Architecture, AI Specific Data Center Requirements, Cloud Infrastructure, Gan Applications

Product link: <https://marketpublishers.com/r/D47A500DEEEFEN.html>

Price: US\$ 4,900.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/D47A500DEEEFEN.html>