

Global Coherent DSP ASIC Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Coherent DSP ASIC market size is expected to reach \$ 10623 million by 2032, rising at a market growth of 11.5% CAGR during the forecast period (2026-2032).

A coherent DSP ASIC is a digital application-specific integrated circuit used in coherent optical communications. It maps high-speed electrical data into phase, amplitude, and polarization-multiplexed optical signals at the transmitter side, and performs sampling, equalization, chromatic dispersion compensation, carrier recovery, polarization demultiplexing, forward error correction, link monitoring, and data recovery at the receiver side. It is the core electronic device in coherent optical modules, coherent optical engines, and optical transport systems. These chips address signal distortion, noise accumulation, spectral efficiency, and power constraints in high-speed long-distance fiber transmission, and typically work together with silicon photonics, indium phosphide, thin-film lithium niobate modulators, coherent receivers, drivers, transimpedance amplifiers, and tunable lasers. Product forms include standalone merchant ASICs, module-embedded DSPs, DSP-optics co-packaged devices, line-card embedded coherent engines, and pluggable digital coherent optical modules. Customers include cloud service providers, telecom operators, optical module vendors, transport equipment vendors, and high-speed router vendors. Applications extend from data center interconnect, metro transport, regional long haul, backbone networks, and submarine cables to cross-data-center AI cluster connectivity, while technology development focuses on higher baud rates, advanced CMOS process nodes, stronger FEC and PCS algorithms, lower power per bit, smaller packaging, and broader open-standard interoperability.

The value of coherent DSP ASICs is rapidly expanding from traditional long-haul transport systems into cloud data center interconnects and AI infrastructure. The key

driver is the need to move larger volumes of data between AI training and inference clusters across campuses and data centers, while conventional short-reach direct-detection solutions face increasing pressure under longer reach, higher spectral efficiency, and lower error-rate requirements. Marvell's Orion targets 800G ZR/ZR+ pluggable modules, Cisco Acacia's Jannu supports 1.2T single-carrier multi-haul transmission, and NTT Innovative Devices' ExaSPEED GAIA supports 1.2T per wavelength, demonstrating that high-end coherent DSPs are becoming critical bottleneck components for cross-data-center and carrier optical transport networks.

The competitive landscape is forming around three routes: merchant chip suppliers, vertically integrated system vendors, and new AI interconnect chip entrants. At 400G, Acacia and Marvell were key forces, while at 800G, system vendors such as Ciena and Nokia are more actively competing for pluggable coherent market share. Retym is entering the AI infrastructure and cloud connectivity segment with a 5 nm programmable coherent DSP, adding a new competitive layer to the existing supply chain.

Technology upgrades are centered on CMOS process nodes, baud rate, PCS algorithms, FEC capability, silicon photonics co-packaging, and power per bit. Ciena WaveLogic 6 uses a 3 nm CMOS coherent DSP, Nokia PSE-6s integrates its DSP with CSTAR silicon photonics, and Infinera ICE7, now under Nokia after the acquisition, uses a 5 nm CMOS DSP. These developments indicate that high-end products are moving from pure chip-performance competition toward integrated competition across silicon, optical front end, packaging, and system-level control.

This report studies the global Coherent DSP ASIC production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Coherent DSP ASIC and provides market size (US\$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Coherent DSP ASIC that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Coherent DSP ASIC total production and demand, 2021-2032, (Million Units)

Global Coherent DSP ASIC total production value, 2021-2032, (USD Million)

Global Coherent DSP ASIC production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Million Units), (based on production site)

Global Coherent DSP ASIC consumption by region & country, CAGR, 2021-2032 &

(Million Units)

U.S. VS China: Coherent DSP ASIC domestic production, consumption, key domestic manufacturers and share

Global Coherent DSP ASIC production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Million Units)

Global Coherent DSP ASIC production by Transmission Reach Class, production, value, CAGR, 2021-2032, (USD Million) & (Million Units)

Global Coherent DSP ASIC production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Million Units)

This report profiles key players in the global Coherent DSP ASIC market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Marvell Technology, Inc., Cisco Systems, Inc., NTT Innovative Devices Corporation, Nokia Corporation, Ciena Corporation, EFFECT Photonics B.V., Credo Technology Group Holding Ltd, Retym, Inc., Huawei Technologies Co., Ltd., ZTE Corporation, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Coherent DSP ASIC market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (Million Units) and average price (US\$/Unit) by manufacturer, by Transmission Reach Class, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Coherent DSP ASIC Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Coherent DSP ASIC Market, Segmentation by Transmission Reach Class:

Access Edge Short-Reach Coherent DSP ASIC

Metro Mid-Reach Coherent DSP ASIC

Regional Long-Reach Coherent DSP ASIC

Backbone Ultra-Long-Reach Coherent DSP ASIC

Submarine Transmission Coherent DSP ASIC

Global Coherent DSP ASIC Market, Segmentation by Packaging Integration Method:

Bare-Die Packaged Coherent DSP ASIC

BGA Packaged Coherent DSP ASIC

Multi-Chip Module Coherent DSP ASIC

DSP-Optics Co-Packaged Coherent DSP ASIC

Other

Global Coherent DSP ASIC Market, Segmentation by Primary Algorithm Capability:

Fixed Baud-Rate Coherent DSP ASIC

Adaptive Baud-Rate Coherent DSP ASIC

Probabilistic Constellation Shaping Coherent DSP ASIC

Channel-Matched Shaping Coherent DSP ASIC

Low-Complexity Access Coherent DSP ASIC

Other

Global Coherent DSP ASIC Market, Segmentation by Standards Adaptation:

400ZR Standard Coherent DSP ASIC

OpenZR+ Standard Coherent DSP ASIC

OpenROADM Standard Coherent DSP ASIC

Other

Global Coherent DSP ASIC Market, Segmentation by Application:

Data Center Interconnect

Metro Optical Transport

Long-Haul Backbone Optical Transport

Submarine Cable Transmission

Access Edge Aggregation

DWDM Router Interconnect

5G Transport Network

AI Cluster Cross-Data-Center Interconnect

Other

Companies Profiled:

Marvell Technology, Inc.

Cisco Systems, Inc.

NTT Innovative Devices Corporation

Nokia Corporation

Ciena Corporation

EFECT Photonics B.V.

Credo Technology Group Holding Ltd

Retym, Inc.

Huawei Technologies Co., Ltd.

ZTE Corporation

FiberHome Telecommunication Technologies Co., Ltd.

Coherent Corp.

Key Questions Answered:

1. How big is the global Coherent DSP ASIC market?
2. What is the demand of the global Coherent DSP ASIC market?
3. What is the year over year growth of the global Coherent DSP ASIC market?
4. What is the production and production value of the global Coherent DSP ASIC market?

5. Who are the key producers in the global Coherent DSP ASIC market?
6. What are the growth factors driving the market demand?

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