

SAMPLE

Co-Packaged Optics & Optical Interconnects

Patent Landscape Analysis

January 2026

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ONE-HOUR PRESENTATION

The author of the report is available to address any questions you may have.

A **one-hour online presentation** of the report is included with your purchase. This session offers the opportunity for a direct interaction with the author, including a presentation of the results and a dedicated Q&A session.

Feel free to contact the author to schedule a meeting.



Contact us



KNOWMADE is a technology intelligence and IP strategy consulting company specializing in the analysis of patents and scientific publications. We assist innovative companies, investors, and research organizations in understanding the competitive landscape, anticipating technological trends, identifying opportunities and risks, improving their R&D, and shaping effective IP strategies. Our highly qualified analysts transform patent information and scientific literature into actionable insights to support decision-making in R&D, innovation, investment, and intellectual property.

MAIN PATENT ASSIGNEES MENTIONED IN THIS REPORT

Intel, TSMC, Huawei, Broadcom, Cisco, Lightmatter, Avicena, Celestial AI, Rockley Photonics, Ayar Labs, Ranovus, Samsung Group, NVIDIA, Teramount, ZTE, Resonac, Marvell, Nokia, Oracle, Micron, Senko Group, VTT, Alphabet, Accelink Technologies, Ruijie Networks, Eliyan, Mitsubishi Electric, LIPAC, RTX Corporation, HP - Hewlett Packard Development, UnilC (Tsinghua Unigroup), Yangzhou Xinli Integrated Circuit, Juniper, Suzhou Singularity Photon Intelligent Technology, Huagong Tech, NCAP, CEA, ASTAR, Sumitomo Electric, JCET Group, Apple, GlobalFoundries, ASE Group, Nubis communications, Amkor Technology, Lightelligence, Zhejiang Lingxin Optoelectronics Technology, Corning, Zhongshan Meisu Technology, Nano Photonics, Guangbenwei Technology, Wuxi institute of interconnect technology, Li Hong Electronic, Yongjiang Laboratory, SMIC, Tsinghua University, Sky Semiconductor, Elphic, Lightip Technologie, NTT - Nippon Telegraph & Telephone, Innolux, Shanghai Xizhi Technology, United Test and Assembly Center, University College Cork, Lumentum, Hanyang University, Furukawa Electric, Raytek, Hangzhou Guangzhiyuan Technology, Dongguan Luxshare Technology, PICadvanced, SPIL, Wuhan Optics Valley Information Optoelectronics Innovation Center, MACOM Technology Solutions, Ciena, MaxLinear, AIP - Advanced Integrated Photonics, Lyte AI, Browave, Xunyun Electronic Technology, Xperi/Adeia, HKUST - Hong Kong University of Science And Technology, ITRI - Industrial Technology Research Institute

INTRODUCTION

Context and objectives of the report

Artificial intelligence (AI) is fundamentally reshaping industries, driving massive increases in data generation and intensifying the demand for energy-efficient computing. As data volumes grow, hardware innovation has become critical, particularly in rethinking data center infrastructure to support accelerated computation, reduced power consumption, improved performance, and lower latency.

Silicon photonics has emerged as a transformative technology at the heart of this shift, replacing traditional copper interconnects with light-based data transmission. Among the most promising advances is **Co-Packaged Optics (CPO)**, an innovative packaging technology that integrates optical components directly within or near electronic devices for greater efficiency and scalability.

While silicon photonics is currently best known for its use in pluggable optical transceiver modules, now commercially available at speeds up to 800 Gbps, industry trends are moving toward tighter integration of optics with ASICs and other electronic chips. This evolution is giving rise to a new paradigm: **direct optical I/O**, where optical interfaces are embedded directly onto electronic packages to drastically shorten data paths and eliminate high-loss, power-hungry electrical traces. One key step in this direction is the use of **on-board optics (OBO)**, where optical engines are positioned around the ASIC package to support bandwidths of up to 1.6 Tbps. Building on OBO, emerging technologies like **CPO** and **optical I/O** take integration further by minimizing the length of electrical interconnects, significantly improving power efficiency (to the level of picojoules per bit), thermal management, and bandwidth (scaling to 3.2 Tbps and beyond).

CPO achieves these gains by placing optics adjacent to the ASIC, connected via ultra-short electrical traces or integrated optical waveguides. This close coupling is especially beneficial for high-throughput, latency-sensitive applications such as:

- **Hyperscale data centers**
- **High-performance computing (HPC)**
- **Artificial intelligence and machine learning (AI/ML)**

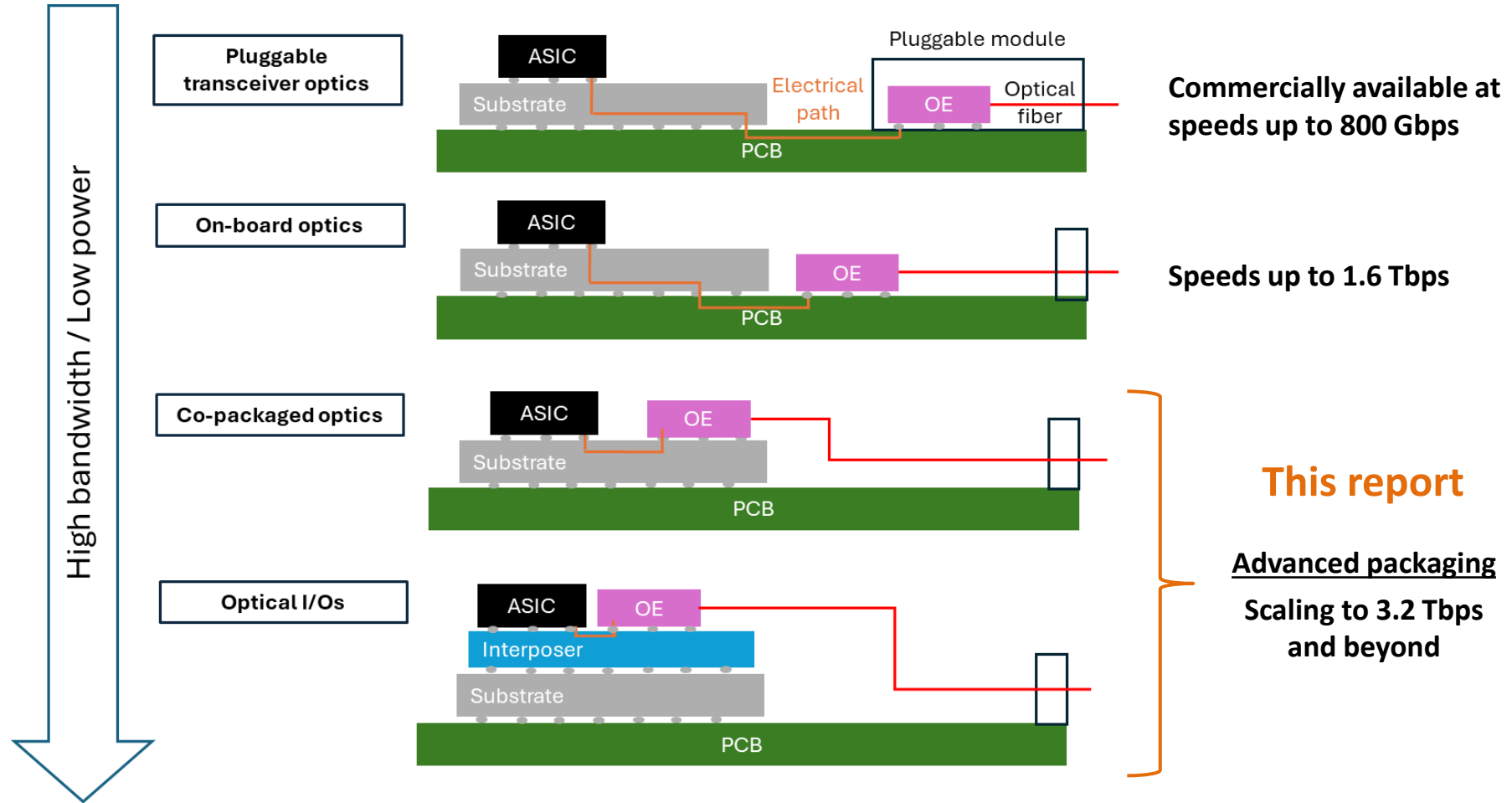
Accordingly, CPO development is focused on two primary opto-electronic integration domains:

- **Networking performance**, via CPO-enabled Ethernet switches (using an ASIC switch)
- **Computing performance**, through CPO-based interconnects for XPU's (using an ASIC processor)

There are multiple technical pathways to integrate photonic and electronic components, each presenting unique advantages and engineering challenges. This report leverages patent data analysis on CPO and optical interconnects to uncover key technological trends and identify the leading intellectual property (IP) contributors shaping this rapidly evolving landscape.

INTRODUCTION

Co-integration of optics and electronics



CPO integrates optics directly alongside the ASIC on a single substrate interface, enabling maximum integration, minimal signal loss, higher bandwidth and reduced power consumption. On the other hand, CPO complexifies integration triggering an innovation momentum in advanced packaging that can be analyzed in the IP landscape.

INTRODUCTION

Scope of the report

We have selected and analyzed more than **4,000 patents and patent applications** published worldwide from 2010 to June 2025, representing more than **1,300 patent families** (inventions) relevant to the scope of this report.

The patent search strategy has been implemented using advanced search equations in the patent database and by a cautious patent selection performed by the analyst to get the most out of the corpus.

More details are available in METHODOLOGY part.



Inventions related to **Co-packaged optics & Optical interconnects** have been selected as follows:

Included

Patents clearly focused on co-packaged optics (CPO) for networking performance and computing performance: Core inventions

- Co-integration on the same substrate of PIC + EIC, or PIC + interposer + ASIC, CPO with Switch, or CPO with XPU

Patents that are not directly focused on co-packaged optics (CPO) but are related to it: Complementary inventions

- CPO application inferred from the description or from the company products and communications.
- Component level: PIC, photonic components, optical interconnects, optical/glass interposers, optical connectors, pluggable light sources, etc.

Excluded

Other optics/electronics co-integration

- On-board optics (OBO), near-package optics, pluggable optical transceiver modules (QSFP), etc.

Co-packaged optics (CPO) for other applications than networking performance and computing performance

- Imaging applications, optical sensors, etc.

READING GUIDE

SAMPLE

Report sections



Your concern



Information you get



TECHNOLOGY

For R&D teams, engineers, scientists

IP

For IP teams, patent attorneys

MARKET

For executives, business developers

PLAYER

Zoom in a competitor / partner

PATENT LANDSCAPE OVERVIEW

- **Ranking of players** (enforceability, current activity, geo/tech coverage, prior-art contribution, etc.)
- **Patent filings dynamics per player**
- **IP collaborations** (co-filings, IPR transfers)
- **Patent litigation/oppositions**

Innovators

Main patent owners
IP risks/opportunities

Ecosystem
(competitors, newcomers, partners, clients)
Main trends
IP vs Market

IP position vs Market position
Player relationships
(collaborations/dependencies)

SEGMENTS ANALYSIS

- **Patent filings dynamics per segment**
- **IP leaders per segment** (enforceability, current activity, blocking potential)
- **Key patents per segment**
- **Recent patenting activity per segment**

Technology trends
Technology mapping

Blocking players
IP risks/opportunities in each segment
(FTO, litigation, licensing)

Benchmarking
Markets of interest
Future developments

IP position and level of investment in each segment
Key IP developments

IP PROFILE OF KEY PLAYERS

- **Patent portfolio summary** (portfolio size, IP activity evolution, patents legal status, geo/tech coverage, strengths/weaknesses, etc.)
- **Key patents**
- **Recent patenting activity**

Current R&D activities
Technology roadmap

Blocking patents
Geo/Tech coverage
Link between patents and products

Future products
Potential partners
Potential targets

R&D investment level
Key inventions
Current IP activities
Strengths / Weaknesses

EXCEL DATABASE

SAMPLE

With this report, an **Excel file** is provided that includes all **1,387 patent families** (inventions) selected and analyzed in this study. This **useful patent database** allows for **multi-criteria searching** and includes patent publication numbers, **hyperlinks to an updated online database** (original documents, legal status, etc.), priority date, title, abstract, patent assignees, etc.

Co-Packaged Optics (CPO) and Optical Interconnects - Patent Landscape Analysis 2025

The data are extracted from the FamPat worldwide patent database (Questel-ORBIT) which provides 100+ million patent documents from 100+ worldwide patent offices.
 The search for patents was completed in June 2025.
 The patents are grouped in patent families. A patent family is a set of patent applications filed in multiple countries to protect a single invention by a common inventor(s).
 (*) A core invention is one identified within our selected patent database as demonstrating the highest degree of relevance to the domain of co-packaged optics and optical I/O. These patents are clearly focused on co-packaged optics (co-integration on the same substrate of PIC + EIC, or PIC + interposer + ASIC, CPO with Switch, or CPO with PIC + EIC).

Family number (Questel unique family ID from FamPat database)	Patent numbers (publication numbers)	Current patent assignees (as mentioned in the patent database)	Patent assignee name used in the report	Title	Abstract	Biblio Summary (Link to full patent description and original documents)	Earliest application date of the family (yyyy-mm-dd)	Earliest publication date of the family (yyyy-mm-dd)	Expected expiry dates (yyyy-mm-dd)	Current legal status (Pending, Granted, Revoked, Expired, Lapsed)	Core invention (*)
106588950	US20230308188	LIGHTMATTER	Lightmatter	(US20230314711)	(US20230314711)	Open	2023-03-27	2023-09-28	(US20230314711)	(US20230314711)	x
113474996	US20250067942	LIGHTMATTER	Lightmatter	(US20250067942)	(US20250067942)	Open	2024-08-20	2025-02-27	(US20250067942)	(US20250067942)	x
113240433	US20250046775	LIGHTMATTER	Lightmatter	(US20250046775)	(US20250046775)	Open	2024-07-31	2025-02-06	(US20250046775)	(US20250046775)	x
91429726	US20200355880	AYAR LABS	Ayar Labs	(US20240310589)	(US20240310589)	Open	2020-07-23	2020-11-12	(US20240310589)	(US20240310589)	x
111815687	US20240353614	LIGHTMATTER	Lightmatter	(US20240353614)	(US20240353614)	Open	2024-04-18	2024-10-24	(US20240353614)	(US20240353614)	x
90553363	CA3131615	LIGHTMATTER	Lightmatter	(US20250284055)	(US20250284055)	Open	2020-03-05	2020-09-10	(US20250284055)	(US20250284055)	x
111412361	US20240310593	LIGHTMATTER	Lightmatter	(US20240310593)	(US20240310593)	Open	2024-03-07	2024-09-19	(US20240310593)	(US20240310593)	x
95504112	US20210242124	LIGHTMATTER	Lightmatter	(US20210242124)	(US20210242124)	Open	2021-02-02	2021-08-05	(US20210242124)	(US20210242124)	x
93913641	US20210132309	AYAR LABS	Ayar Labs	(US20210132309)	(US20210132309)	Open	2021-05-06	2021-05-06	(US20240176081)	(US20240176081)	x
95709493	US20210257021	AYAR LABS	Ayar Labs	(US20210257021)	(US20210257021)	Open	2021-08-19	2021-08-19	(US20230370170)	(US20230370170)	x
110176171	US20240201444	LIGHTMATTER	Lightmatter	(US20240201444)	(US20240201444)	Open	2023-12-18	2024-06-20	(US20240201444)	(US20240201444)	x
109867043	US20240178923	LIGHTMATTER	Lightmatter	(US20240178923)	(US20240178923)	Open	2024-05-30	2024-05-30	(US20240178923)	(US20240178923)	x
95709605	US20210257288	AYAR LABS	Ayar Labs	(US20210257288)	(US20210257288)	Open	2021-08-19	2021-08-19	(US20210257288)	(US20210257288)	x
98556853	US20220035107	AYAR LABS	Ayar Labs	(US20220035107)	(US20220035107)	Open	2022-02-03	2022-02-03	(US20220035107)	(US20220035107)	x
108371302	US20240045464	LIGHTMATTER	Lightmatter	(US20240045464)	(US20240045464)	Open	2024-02-08	2024-02-08	(US20240045464)	(US20240045464)	x
92467301	WO2021/016486	AYAR LABS	Ayar Labs	(EP4004617)	(EP4004617)	Open	2021-01-28	2021-01-28	(EP4004617)	(EP4004617)	x
88291155	US20200116930	LIGHTMATTER	Lightmatter	(US20200116930)	(US20200116930)	Open	2020-04-16	2020-04-16	(US20200116930)	(US20200116930)	x
72298197	US20120301149	CISCO TECHNOLOGY	Cisco	(US20120301149)	(US20120301149)	Open	2012-08-07	2012-11-29	(US20120301149)	(US20120301149)	x
86379454	US20190326266	CISCO TECHNOLOGY	Cisco	(US20190326266)	(US20190326266)	Open	2019-10-24	2019-10-24	(US20190326266)	(US20190326266)	x
86387188	US10459161	CISCO TECHNOLOGY	Cisco	(US10459161)	(US10459161)	Open	2018-08-14	2019-10-29	(US10459161)	(US10459161)	x
103868125	US20230060862	CISCO TECHNOLOGY	Cisco	(US20230060862)	(US20230060862)	Open	2021-08-25	2023-03-02	(US20230060862)	(US20230060862)	x
73981747	US20160246018	CISCO TECHNOLOGY	Cisco	(US20160246018)	(US20160246018)	Open	2016-05-02	2016-08-25	(US20160246018)	(US20160246018)	x
99473100	US20220113480	CISCO TECHNOLOGY	Cisco	(US20220113480)	(US20220113480)	Open	2020-10-14	2022-04-14	(US20220113480)	(US20220113480)	x
74938578	KR10-2016-0142252	CISCO TECHNOLOGY	AMERICAN MERCHANT	(US20180234189)	(US20180234189)	Open	2016-06-02	2016-12-12	(US20180234189)	(US20180234189)	x
79597532	US9964719	CISCO TECHNOLOGY	Cisco	(US9964719)	(US9964719)	Open	2017-04-28	2018-05-08	(US9964719)	(US9964719)	x

INTERACTIVE DASHBOARD (optional)

An optional [interactive dashboard](#) can be provided with this report, transforming the analysis into a true decision-support tool that puts you in control. It enables you to dynamically explore the patent landscape by players, technologies, countries, dates, or legal status, and to instantly drill down into key insights, from high-level trends to individual players and patents. Tailored to the specific needs of R&D, IP strategy, and business development teams, the dashboard delivers immediate visual answers to critical questions, enabling faster and more informed strategic decision-making across your organization.

[Request a demo](#)

Easily filter the data

Navigate easily through the data and quickly get strategic insights

Identify key players and newcomers by country and technology segment

Key IP players

IP newcomers

Select a player to view its IP profile
Understand IP strategy, positioning, strengths & weaknesses

Deep dive by publication country

Understand IP dynamics

Browse patent families and spot key patents

List of patent families

Select a patent family and explore it in depth
Patent full text + Geographic coverage + Citations analysis

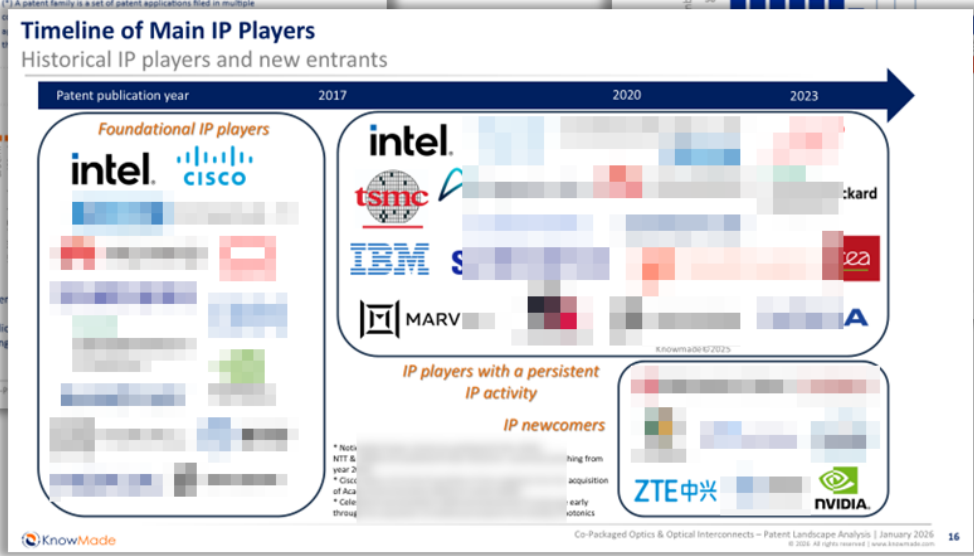
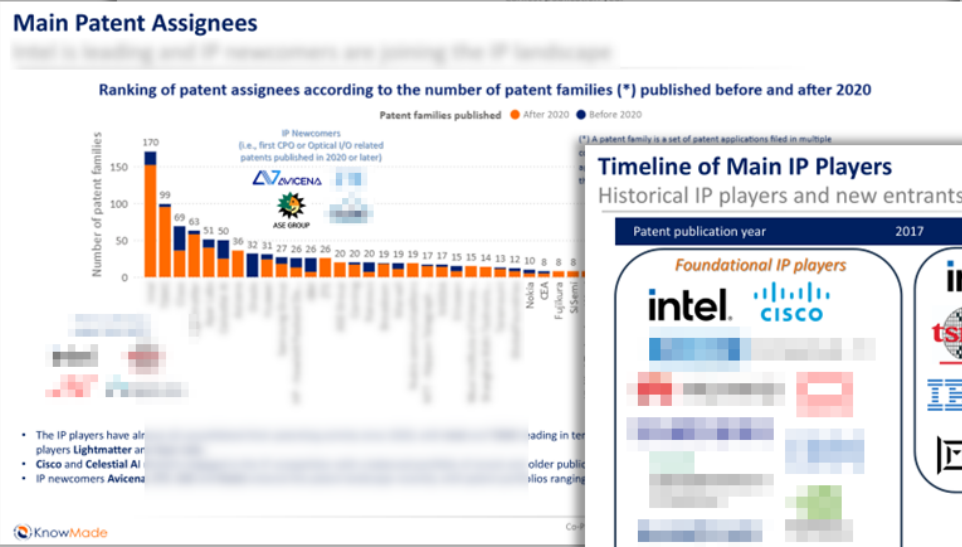
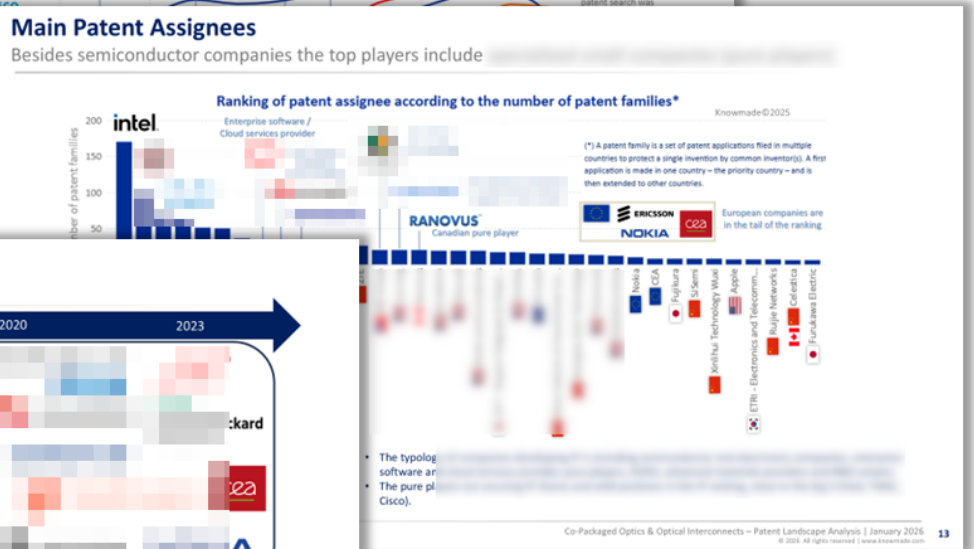
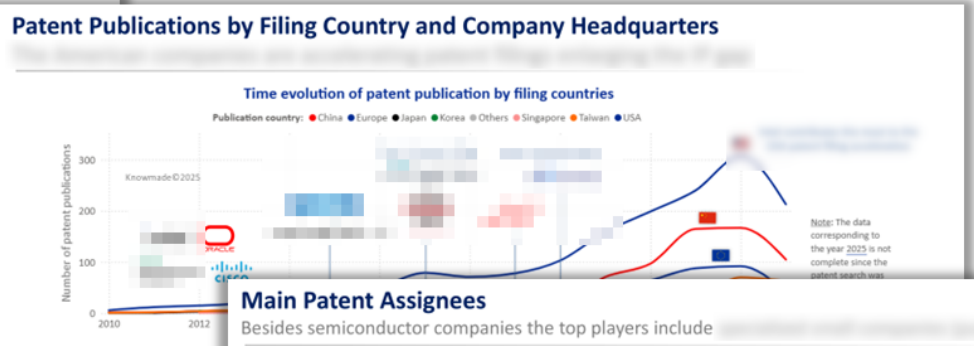
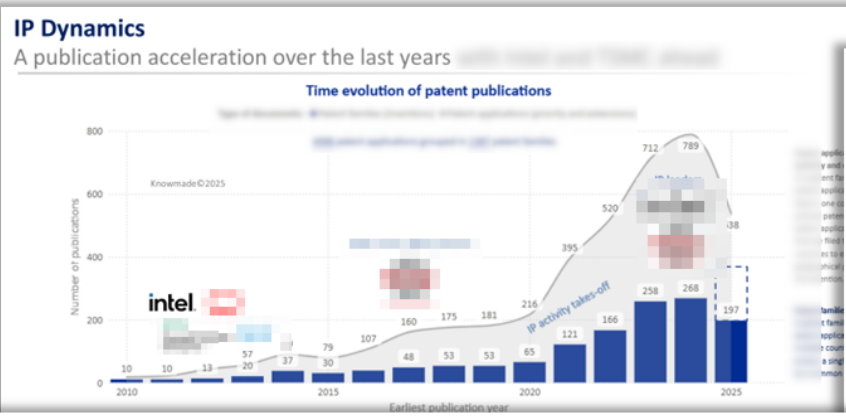
Assess technology segment impact

Landscape at a glance

PATENT LANDSCAPE OVERVIEW

General trends, main patent assignees and new entrants

SAMPLE



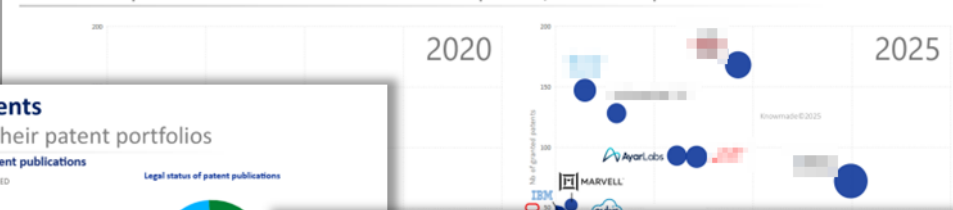
PATENT LANDSCAPE OVERVIEW

IP leaders, IP strategies, and key patents

SAMPLE

IP Leadership of Patent Assignees

IP leadership evolution from 2020 for CPO & Optical I/O related patents



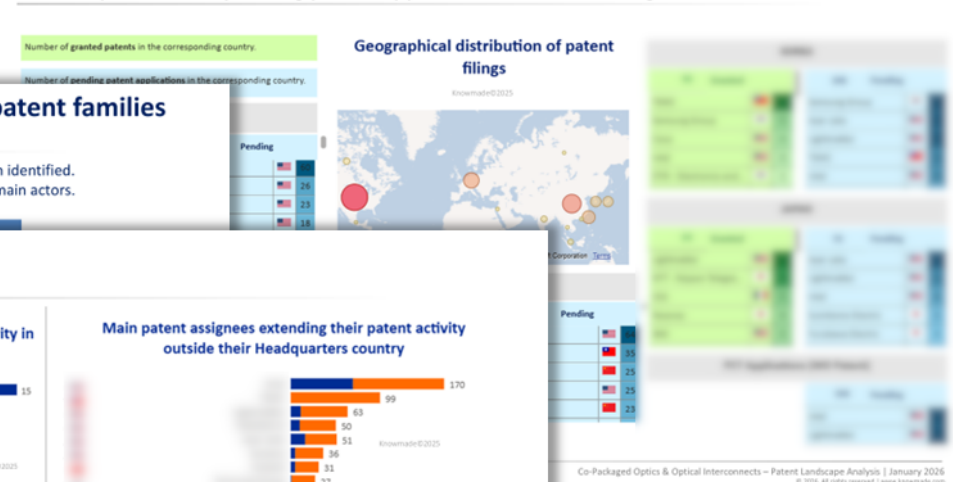
Main IP Players and Current Legal Status of Their Patents

are expanding their patent portfolios



Geographic Coverage of Alive Patents

Granted patents and pending patent applications in different regions



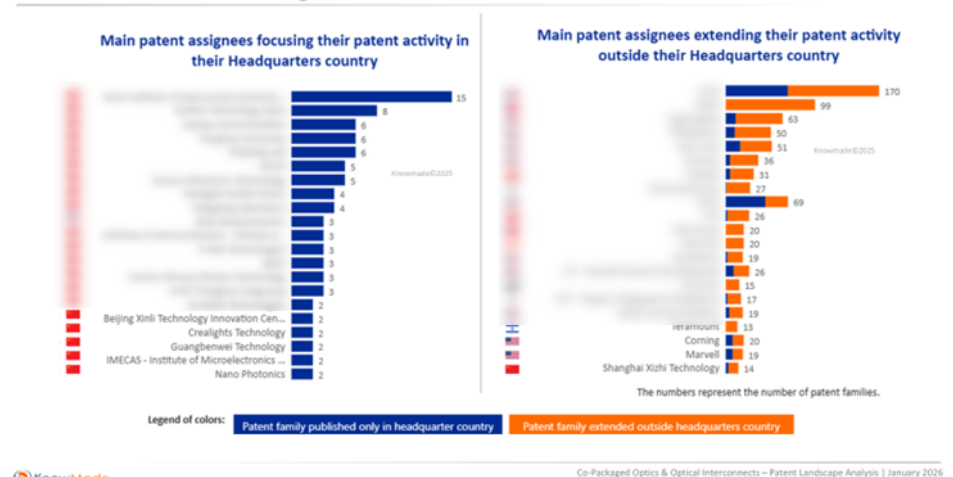
Ranking of assignees according to the number of alive triadic patent families

Inventions with a strategic geographic coverage

More than 270 patent families with a strategic geographical coverage in key markets (US, EU, Asia) have been identified. Further details regarding significant triadic patent families* can be found in the subsequent IP profiles of the main actors.

IP Strategy of Main Patent Assignees

Domestic vs. Global IP Strategies



IP PROFILE OF PLAYERS

IP portfolio summary, IP strategy, and notable patents

SAMPLE

A focus on a selection of IP players and newcomers is provided in a dedicated section. For each player, the **CPO & Optical I/O patent portfolio** is analyzed to provide an overview of its level of IP activity, geographical coverage, strengths, potential for reinforcement, and to highlight notable patents.



This section contains a collage of patent analysis reports for several companies. The reports include:

- TSMC Patent portfolio overview**: A report with a bar chart showing patent activity by publication countries and a list of patent classes (G1, G2, G3, G4).
- Celestial AI Co-packaged optics integration**: A report discussing the integration of optics into electronic packages.
- Lightmatter Patent portfolio overview**: A report detailing the company's patent portfolio in the field of optical interconnects.
- Samsung Co-packaging and optical I/Os**: A report focusing on Samsung's work in co-packaging and optical I/Os.
- ASE Group Electronic-photonics co-packaging / Heat management**: A report on ASE Group's approach to co-packaging and heat management.
- Ayar Labs**: A report on Ayar Labs' work in light source modules and optical interconnects.

The reports feature various elements such as bar charts, line graphs, and technical diagrams illustrating the patent landscape for each player.

ORDER FORM

Co-Packaged Optics and Optical Interconnects

Patent Landscape Analysis – January 2026

Ref.:KM26001

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2. Corporate license: the report can be used by unlimited users within the company. Subsidiaries and joint ventures are not included.

“Products”: Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

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1. SCOPE

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1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivocal consent by any duly authorized person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”. This results in acceptance by the Buyer.

1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7 days] from the date of order, to be sent either by email or to the Buyer’s address. In the absence of any confirmation in writing, orders shall be deemed to have been accepted.

2. MAILING OF THE PRODUCTS

2.1 Products are sent by email to the Buyer:

- within [1] month from the order for Products already released; or

- within a reasonable time for Products ordered prior to their effective release. In this case, the Seller shall use its best endeavours to inform the Buyer of an indicative release date and the evolution of the work in progress.

2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer.

The Seller shall by no means be responsible for any delay in respect of article 2.2 above, and including in cases where a new event or access to new contradictory information would require for the analyst extra time to compute or compare the data in order to enable the Seller to deliver a high quality Products.

2.3 The mailing of the Product will occur only upon payment by the Buyer, in accordance with the conditions contained in article 3.

2.4 The mailing is operated through electronic means either by email via the sales department. If the Product’s electronic delivery format is defective, the Seller undertakes to replace it at no charge to the Buyer provided that it is informed of the defective formatting within 90 days from the date of the original download or receipt of the Product.

2.5 The person receiving the Products on behalf of the Buyer shall immediately verify the quality of the Products and their conformity to the order. Any claim for apparent defects or for non-conformity shall be sent in writing to the Seller within 8 days of receipt of the Products. For this purpose, the Buyer agrees to

produce sufficient evidence of such defects.

2.6 No return of Products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any Product returned to the Seller without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer’s risk.

3. PRICE, INVOICING AND PAYMENT

3.1 Prices are given in the orders corresponding to each Product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated from time to time. The effective price is deemed to be the one applicable at the time of the order.

3.2 Payments due by the Buyer shall be sent by cheque payable to Knowmade, PayPal or by electronic transfer to the following account:

Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var, France

BIC or SWIFT code: CCBPFRPPMAR

IBAN: : FR76 1460 7003 6360 6214 5695 139

To ensure the payments, the Seller reserves the right to request down payments from the Buyer. In this case, the need of down payments will be mentioned on the order.

3.3 Payment is due by the Buyer to the Seller within 30 days from invoice date, except in the case of a particular written agreement. If the Buyer fails to pay within this time and fails to contact the Seller, the latter shall be entitled to invoice interest in arrears based on the annual rate Refi of the «BCE» + 7 points, in accordance with article L. 441-6 of the French Commercial Code. Our publications (report, database, tool...) are delivered only after reception of the payment.

3.4 In the event of termination of the contract, or of misconduct, during the contract, the Seller will have the right to invoice at the stage in progress, and to take legal action for damages.

4. LIABILITIES

4.1 The Buyer or any other individual or legal person acting on its behalf, being a business user buying the Products for its business activities, shall be solely responsible for choosing the Products and for the use and interpretations he makes of the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.

4.2 The Seller shall only be liable for (i) direct and (ii) foreseeable pecuniary loss, caused by the Products or arising from a material breach of this agreement

4.3 In no event shall the Seller be liable for:

a) damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use of or inability to use the Seller’s website or the Products, or any information provided on the website, or in the Products;

b) any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.

4.4 All the information contained in the Products has been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.

4.5 All the Products that the Seller sells may, upon prior notice to the Buyer from time to time be modified by or substituted with similar Products meeting the needs of the Buyer. This modification shall not lead to the liability of the Seller, provided that the Seller ensures the substituted Product is similar to the Product initially ordered.

4.6 In the case where, after inspection, it is acknowledged that the Products contain defects, the Seller undertakes to replace the defective products as far as the supplies allow and without indemnities or compensation of any kind for labor costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date. Any replacement is excluded for any event as set out in article 5 below.

4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non-acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement of its first down payment to the exclusion of any further damages.

4.8 The Seller does not make any warranties, express or implied, including, without limitation, those of saleability and fitness for a particular purpose, with respect to the Products. Although the Seller shall take

reasonable steps to screen Products for infection of viruses, worms, Trojan horses or other codes containing contaminating or destructive properties before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

5. FORCE MAJEURE

The Seller shall not be liable for any delay in performance directly or indirectly caused by or resulting from acts of nature, fire, flood, accident, riot, war, government intervention, embargoes, strikes, labor difficulties, equipment failure, late deliveries by suppliers or other difficulties which are beyond the control, and not the fault of the Seller.

6. PROTECTION OF THE SELLER’S IPR

6.1 All the IPR attached to the Products are and remain the property of the Seller and are protected under French and international copyright law and conventions.

6.2 The Buyer agreed not to disclose, copy, reproduce, redistribute, resell or publish the Product, or any part of it to any other party other than employees of its company. The Buyer shall have the right to use the Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use the Product for purposes such as:

- Information storage and retrieval systems;

- Recordings and re-transmittals over any network (including any local area network);

- use in any timesharing, service bureau, bulletin board or similar arrangement or public display;

- Posting any Product to any other online service (including bulletin boards or the Internet);

- Licensing, leasing, selling, offering for sale or assigning the Product.

6.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.

6.4 The Buyer shall define within its company point of contact for the needs of the contract. This person will be the recipient of each new report in PDF format. This person shall also be responsible for respect of the copyrights and will guaranty that the Products are not disseminated out of the company.

7. TERMINATION

7.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for any other direct or indirect consequential loss that may be borne by the Seller, following this decision.

7.2 In the event of breach by one Party under these conditions or the order, the non-breaching Party may send a notification to the other by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

8. MISCELLANEOUS

All the provisions of these Terms and Conditions are for the benefit of the Seller itself, but also for its licensors, employees and agents. Each of them is entitled to assert and enforce those provisions against the Buyer.

Any notices under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party.

The Seller may, from time to time, update these Terms and Conditions and the Buyer, is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated to him in due time.

9. GOVERNING LAW AND JURISDICTION

9.1 Any dispute arising out or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Grasse, which shall have exclusive jurisdiction upon such issues.

9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.

KNOWMADE

Patent and Technology Intelligence

KNOWMADE PURPOSE

Turning **patent** and **scientific data** into **actionable insights** to support **decision-making in R&D, innovation, investment, and intellectual property.**

Competitive landscape | Technology trends | Opportunities / Risks | R&D and IP strategy



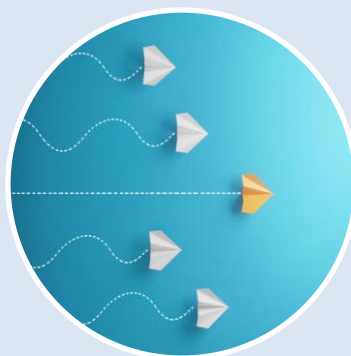
WHAT INFORMATION CAN YOU GET ?



INTELLECTUAL PROPERTY

*For IP teams,
patent attorneys*

- Risks and opportunities (FTO, litigations, licensing)
- Key patents
- Link between patents and products



TECHNOLOGY

*For R&D teams,
engineers, scientists*

- R&D activities
- Technological roadmap
- Position on the supply chain



MARKET

*For executives,
business developers*

- Identify competitors
- Compare IP with market position
- Evaluate the level of investment
- Future products & target markets

KNOWMADE OFFER

CUSTOM SERVICES

(Tailor-made analysis)

To meet your needs and budget/lead time constraints

- Specific and dedicated report.
- Prior-art search, literature review, patent landscape, freedom-to-operate, patent valuation, IP due diligence, technology scouting, monitoring service, etc.

Format

- PDF file with analyses.
- Excel file with data.
- Access to the analyst.

REPORTS

(multi-client product)

To understand the competitive landscape and explore the emerging ecosystems and new technologies

- Stand alone report
- Patent landscape.
- Overview on IP dynamics, trends and players.
- Competitor, technology and strategy analysis.
- Benchmark of patent portfolios.
- Key IP players & key patents.

Format

- PDF file with analyses.
- Excel file with patent data.

MONITORS

(multi-client product)

To track the latest R&D developments and IP activities, and to be sensitive to weak signals

- Annual subscription
- Patent monitoring service.
- Quarterly updated patent data and technology trends.
- Current R&D and IP activities.
- Early detect weak signals, opportunities and risks.
- Open discussion with analyst.

Format

- PDF file with analyses.
- Excel file with patent data.
- Direct access to the analyst.

INSIGHTS

(free article & webinar)

To get unique information about industry and technology

- Analyst point of view about industry news (product release, M&A, start-up, fund-raising, etc.) from a patent perspective.

Format

- Knowmade website

MAIN FIELDS OF EXPERTISE

SEMICONDUCTORS

- Materials & Substrates
- Power electronics
- RF & Wireless datacom
- MEMS, Sensing & Imaging
- Photonics, Lighting & Display
- Memory
- Packaging

ENERGY

- Batteries
- Fuel-cells
- Solar PV
- Power management

HEALTHCARE

- New therapeutic tools
- Medical diagnostics
- Medical devices and imaging
- Drug discovery and delivery

AGRI-FOOD

- Food processing & formulation
- Vegan food
- Next-gen packaging
- Microbiology







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