

RF GaN Technology

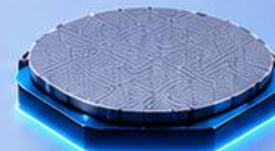
*From materials to devices,
modules & circuits*

Patent Landscape Analysis

August 2026

From Technologies to IP Business Intelligence

GaN-on-Si



GaN-on-SiC



GaN-on-diamond



GaN-on-AlN



Engineered
substrates



Defense & Aerospace



Telecommunications



Satellite communications



Automotive radar
ADAS & V2X



Cellular & 5G/6G



Wireless
Connectivity



Industrial & IoT



Medical & Healthcare

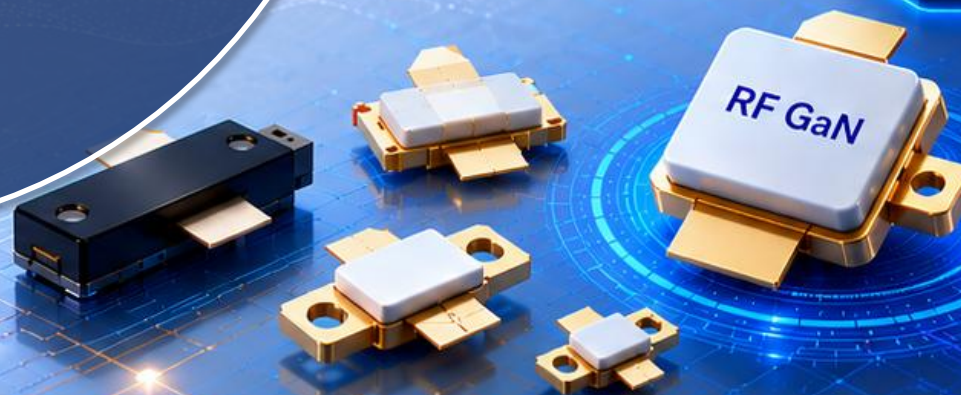


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THE AUTHORS

SAMPLE



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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.



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MAIN PATENT ASSIGNEES MENTIONED IN THIS REPORT

INDUSTRIALS

CETC, Sumitomo Electric, Macom, Mitsubishi Electric, Toshiba, Fujitsu, Wolfspeed, Intel, Qorvo, Panasonic, NXP, NTT, RTX Corporation, HiWAFER, San'an, HRL, Dynax Semiconductor, Samsung, Northrop Grumman, Hatchip, Huawei, Murata, NEC, RFHIC, NGK Insulators, Shin Etsu, Akoustis, Ampleon, CASIC - China Aerospace Science and Industry Corporation, Jiangsu Broadwave Electric Technology, Hanhua Semiconductor, NPP Pulsar, Qualcomm, ZTE, Sony, SpaceX, WIN Semiconductors, Broadcom, TSMC, BAE Systems, Comba Telecom, Infineon, Oki Electric, JRC - Japan Radio, Skyworks, Sumitomo Chemical, Analog Devices, OnMicro Electronics, Taiyo Yuden, Thales, Innoscience, Gejing Semiconductor, Lockheed Martin, SETi - Sensor Electronic Technology, Zhejiang Jimaike Microelectronics, Enkris, IQE, Nuvoton, Proterial, SDSX, YASC, Yunnan Hui Hui Electronic Technology, Innotion Technology, Jezetek, Nokia, Beijing Hua Jinchuangwei Electronic, Boxin Semiconductor, GlobalFoundries, Renesas Electronics, Watech Electronics, Akash Systems, GlobalWafers, UMC, Advanced Micro Semiconductors, BOE Technology, Ericsson, Eridan Communications, Rohm, Shaanxi Reactor Microelectronics, Sharp, Wavice, Chengdu 630 Electronic Equipment, CoorsTek, Gaxtrem, LG Group, Raytron Technology, Shenzhen MTC, Soitec, STMicroelectronics, Zhuhai Crystal Resonance Technologies, Beijing Advanced Semiconductor Innovation, Boeing, CCT (Huaxun China) - China Communication Technology, CEC - China Electronics Corporation, China Aerospace Science and Technology Corporation (CASC), China State Shipbuilding Corporation (CSSC), Epitronic, etc.

RESEARCH ORGANISATIONS

Xidian University, SCUT, IMECAS, UESTC, Institute of Semiconductors (CAS), ETRI, Hangzhou Dianzi University (HDU), US government, SINANO (CAS), University of California, Southeast University, KETI, Fudan University, Hubei Jiufengshan Laboratory (JFS), Peking University, South China Normal University, Zhejiang University, KNU - Kyungpook National University, SUSTech, Tsinghua University, Chongqing University of Posts and Telecommunications, Fraunhofer, MIT, Shanghai Institute of Microsystem & Information Technology (CAS), imec, Institute of Electrical Engineering (CAS), Cornell University, Shandong University, Sun Yat-sen University, Suzhou University of Science and Technology, AIST, CEA, Tianjin University, Beijing Hua Jinchuangwei Electronic, Nanjing University of Science and Technology, SITP - Shanghai Institute of Technical Physics (CAS), University of Science and Technology of China, FVB - Forschungsverbund Berlin, Jiangnan University, Jiangsu University, Nanjing Chip Industrial Technology Institute, NICT - National Institute of Information and Communications Technology, NITech, NJUPT - Nanjing University of Posts & Telecommunications, NYCU - National Yang Ming Chiao Tung University, Shanghai University, Sichuan University, Tianjin University of Technology, Tokai National Higher Education and Research System (THERS), Xi'an Jiaotong University, Agency for Defense Development, ANHUI EAST CHINA PHOTOELECTRIC TECHNOLOGY RESEARCH INSTITUTE, Beijing University of Technology, CETC, CNRS, Georgia Tech, Jiangsu Institute of Advanced Semiconductors, Northwestern Polytechnical University, etc.

INTRODUCTION

Context and objectives of the report

- **The RF GaN market is entering a new growth phase**, with the device market projected to reach **\$2.4 billion by 2031**. Telecom infrastructure remains the largest segment—around 40% of the market in 2025—but defense, electronic warfare, counter-drone systems and satellite communications are becoming increasingly important growth engines. Defense-related RF GaN revenues alone are forecast to increase from \$592 million in 2025 to \$1.06 billion in 2031.
- **GaN-on-SiC remains the established reference platform** for high-power telecom infrastructure, military radar and electronic warfare, owing to its power density, thermal performance, reliability and qualification history. However, the transition from 4-inch to 6-inch manufacturing is progressing more slowly than initially expected, while substrate availability, process know-how and long qualification cycles continue to create high barriers to entry.
- **GaN-on-Si has moved from an emerging concept to early industrialization**. Limited shipments for 5G base stations began in 2023, supported by 8-inch manufacturing. Its strongest opportunities are expected in lower-power radio architectures and, longer term, in FR3 and 6G applications above 10 GHz. Nevertheless, cost competitiveness, thermal performance, reliability, process maturity and scalability remain critical challenges before broader adoption.
- **Innovation is increasingly taking place across the entire RF GaN value chain**, from semi-insulating substrates and epitaxy to transistor architectures, high-voltage power amplifiers, thermal management, advanced packaging, heterogeneous integration and RF circuits. GaN-on-diamond and GaN-on-AlN offer potentially disruptive thermal and performance advantages, but remain long-term technology bets constrained by cost, manufacturing complexity and qualification requirements.
- **The competitive landscape remains concentrated and IDM-led but is being reshaped by consolidation, licensing and portfolio repositioning**. SEDI, Qorvo and Macom represented nearly half of RF GaN device revenues in 2025. Recent strategic developments include Macom's acquisition of Wolfspeed's RF business and licensing of HRL's 40-nm GaN-on-SiC technology, NXP's planned withdrawal from RF GaN and LDMOS, and the proposed combination of Skyworks and Qorvo. The Skyworks–Qorvo transaction was announced in October 2025 and remains subject to completion conditions.
- **Geopolitical tensions and export restrictions are regionalizing the RF GaN ecosystem**. The US defense market continues to rely on a trusted and highly qualified domestic supply chain, while China is accelerating the localization of substrates, epitaxy, foundry and device capabilities. Manufacturing sovereignty, access to semi-insulating SiC, technology transfer restrictions and control of critical process IP are therefore becoming as strategically important as device performance.

In this context, patents are not only instruments for protecting technical inventions; they are strategic assets that can secure access to critical technologies, create barriers to market entry, protect qualified manufacturing routes and strengthen a company's negotiating position in licensing, cross-licensing, partnerships, supply agreements and M&A. Patent portfolios may also be used defensively to preserve freedom to operate or offensively to challenge new entrants as RF GaN technologies move toward larger-scale industrialization.

The RF GaN Patent Landscape report therefore analyses how players are building and leveraging IP positions across substrates, epitaxy, devices, thermal management, packaging, circuits and applications. It identifies established IP leaders, specialized challengers and emerging newcomers; reveals R&D priorities and technology trajectories; highlights white spaces and potentially blocking patent positions; and detects collaboration, licensing and acquisition opportunities. Ultimately, the report assesses the IP, technology-dependency and patent-assertion risks associated with GaN-on-SiC expansion, GaN-on-Si industrialization and the development of next-generation RF GaN platforms.

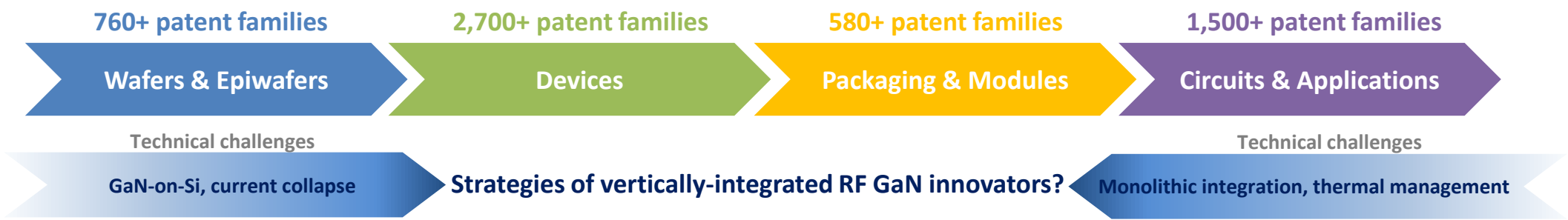
INTRODUCTION

Patent investigation of the RF GaN ecosystem

SAMPLE

Leverage the patent information to anticipate new competitions in the GaN industry (business, technology and IP)

RF GaN Electronics patent landscape (5,300+ patent families)



Future competitors in the RF GaN market?

New applications for RF GaN?



Looking to more sovereign supply chains and technology independence for RF GaN?

INTRODUCTION

Patent selection: Focus of the invention depends on its position on the supply chain

- This report provides a detailed picture of the patent landscape related to **GaN-based RF electronics**, covering the whole value chain:
 - ✓ **Substrates and Epitaxial structures**, **RF transistors** (HEMT, HBT), **RF diodes** (varactor, RTD, IMPATT, etc.), **RF acoustic wave devices** (SAW, TC-SAW, FBAR, BAW-SMR), **Integrated circuits** (MMIC, RFIC, etc.), **Circuitry & Operating methods** (biasing, matching, protection, distortion compensation, etc.), **Packaging, Modules & Systems** (RF FE, PA assemblies, T/R, infrastructures, etc.).
 - ✓ **GaN-on-SiC**, **GaN-on-Silicon** (incl. GaN-on-SOI), **GaN-on-Sapphire**, **GaN-on-Diamond**, **GaN-on-GaN** (incl. free-standing substrates).
 - ✓ **Power amplifiers** (PA/LNA, Doherty, Switch-mode PA, etc.), **RF switch**, **RF filters**.
 - ✓ **Radio waves**, **Microwaves**, **mm-Waves**, **THz**.
- We have selected and analyzed more than **11,000 patents and patent applications** published **worldwide** up to **January 2025**, representing more than **5,000 patent families** (inventions) relevant to the scope of this report.

Included

- Patents describing **GaN-based RF devices** (HEMT, HBT, diodes, SAW, BAW, RFIC, MMIC, etc.) explicitly suitable for using in wireless communication, digital broadcasting, mobile communication base station, satellite ground station, aerospace, radar, electronic warfare equipment, military and space communication, etc.
- Patents pertained to **GaN-based power amplifier** (PA, LNA, Doherty PA, switch-mode PA, etc.), **RF switch** and **RF filter** (SAW, BAW, FBAR, etc.).
- Patents related to **modules and systems** which explicitly use **GaN-based RF power devices** (RF FE modules, PA assemblies, T/R, network infrastructures, etc.).
- Patents claiming **GaN-based epitaxial structures** with improved **high-frequency** characteristics and explicitly suitable for using in **high power/high frequency applications** (RF, microwaves, mm-waves).
- Patent claiming **substrates or templates** explicitly targeting GaN-based RF applications.

Excluded

- Patents describing RF devices, modules or systems which can use **WBG materials** (SiC, GaN, etc.) without any embodiment or preferred solution on GaN.
- Patents related to **GaN-based high-voltage electronics and power devices** which have application value in **electric power conversion and electric power control** (power converter, power rectifier, power supply, etc.).
- Patents related to electronic devices (transistors, diodes, etc.) not mentioning any preferred applications.
- Patents related to **GaN-based optoelectronics and photonics** (lightwaves), audio amplifiers, wireless charging technologies; etc.

SAMPLE

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INTRODUCTION

Excel patent database

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With the present report is provided an extensive **Excel database with the 5,000+ patent families** (inventions) analyzed in this study. This useful patent database allows for multicriteria searches and includes patent publication numbers, **hyperlinks to an updated online database** (original documents, legal status, etc.), priority date, title, abstract, patent assignees, patent's current legal status, and **segments** (wafers & epiwafers, devices, modules & packaging, circuits, dynamic on-resistance, e-mode, GaN-on-Silicon, monolithic integration, thermal management, vertical devices).

Patent information												Supply chain			Topology		Headquarter country										Tech	
Questel unique family ID	Publication numbers	Title	Abstract	Legal status (Pending, Granted, Revoked, Expired)	Latest standardized assignees (Known names)	Earliest application date (yyyy-mm-dd)	Earliest publication date (yyyy-mm-dd)	Earliest grant date (yyyy-mm-dd)	Expected expiry dates (yyyy-mm-dd)	Link to Original Document (Biblio Summary)	(1) Wafers and epiwafers	(2) Devices	(3) Packaging and module	(4) Circuits and applications	Academic	Industrial	Chinese entities	European entities	Japanese entities	South Korean entities	Taiwanese entities	US entities	Entities from other countries	Current collapse	E-mode	GaN-on-Si		
109305447	US20250234676	(WO/2024/07535)	(WO/2024/07535) ROHM		ROHM	08/08/2023	11/04/2024		(WO/2024/07535)	https://patentlink.orbit.com/Ren	X								X									
84120372	US20250220801	(EP/3698395)J2	(EP/3698395)J2 LAM RESEARCH		LAM Research	18/10/2017	16/04/2019	16/04/2019	(EP/3698395)J2	https://patentlink.orbit.com/Ren												X						
93089076	AU2019389020	(EP/3886981)J2	(EP/3886981)J2 ULTHERA		Ulthera	25/11/2019	04/06/2020	31/05/2024	(EP/3886981)J2	https://patentlink.orbit.com/Ren																		
99989890	JP2025074106E	(EP/4246593)J2	(EP/4246593)J2 KAEPI - KOREA		KAEPI (Korea)	12/11/2020	11/05/2022	11/05/2022	(EP/4246593)J2	https://patentlink.orbit.com/Ren																		
108277990	CN1197322020I	(WO/2024/02556)	(WO/2024/02556) MONDE WIRELESS		Monde Wireless	29/07/2022	01/02/2022	29/10/2024	(WO/2024/02556)	https://patentlink.orbit.com/Ren				X						X								
103770547	US20250191935	(EP/4135007)J2	(EP/4135007)J2 STIMCOLE		STIMCOLE	12/08/2021	15/02/2023	30/08/2024	(EP/4135007)J2	https://patentlink.orbit.com/Ren																		
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99732941	JP7690029JP2	(EP/4428926)J2	(EP/4428926)J2 MACOM TECH		Macom	27/10/2020	28/04/2022	15/11/2022	(EP/4428926)J2	https://patentlink.orbit.com/Ren																		
100950523	JP2025063262	(EP/4016840)J2	(EP/4016840)J2 QORVO		Qorvo	17/09/2021	21/08/2022	27/08/2024	(EP/4016840)J2	https://patentlink.orbit.com/Ren																		
103015187	US20250191935	(US/12237382)J2	(US/12237382)J2 WIN SEMICON		WIN Semicond	30/05/2022	20/12/2022	01/07/2023	(US/12237382)J2	https://patentlink.orbit.com/Ren																		
108026913	JP7710614US2	(WO/2024/00431)	(WO/2024/00431) NGK INSULATOR		NGK Insulators	07/04/2023	04/01/2024	11/04/2025	(WO/2024/00431)	https://patentlink.orbit.com/Ren																		
103414538	US20250125265	(WO/2023/12164)	(WO/2023/12164) MONDE WIRELESS		Monde Wireless	20/12/2021	17/01/2023	17/01/2023	(WO/2023/12164)	https://patentlink.orbit.com/Ren																		
112879952	IN2024103967	(IN2024103967)	(IN2024103967) SATEETHA INI		SATEETHA INI	13/12/2024	27/12/2024		(IN2024103967)	https://patentlink.orbit.com/Ren																		
112768428	IN20241039753	(IN20241039753)	(IN20241039753) INDIAN INSTITUTE		Indian Institutes	10/12/2024	21/2/2024		(IN20241039753)	https://patentlink.orbit.com/Ren																		
112815470	CN119208374C	(CN119208374)	(CN119208374) SHANGHAI		SHANGHAI	02/02/2025			(CN119208374)	https://patentlink.orbit.com/Ren																		
94206910	US12308794C1	(EP/4062532)J2	(EP/4062532)J2			09/09/2021	EP/4062532J2	https://patentlink.orbit.com/Ren	https://patentlink.orbit.com/Ren	https://patentlink.orbit.com/Ren	X																	
112784006	CN119208372C	(CN119208372)	(CN119208372) SHANGHAI		SHANGHAI	02/02/2025			(CN119208372)	https://patentlink.orbit.com/Ren																		
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112052245	CN119389593	(CN119389593)	(CN119389593) SHENZHEN PI		SHENZHEN PI	01/12/2024	01/12/2024		(CN119389593)	https://patentlink.orbit.com/Ren																		
111858167	CN119230604	(CN119230604)	(CN119230604) SHANGHAI		SHANGHAI	13/09/2024	22/10/2024		(CN119230604)	https://patentlink.orbit.com/Ren																		
106577002	EP4495301EP4	(EP/4495301)J2	(EP/4495301)J2 MITSUBISHI		MITSUBISHI	18/03/2023	21/09/2023		(EP/4495301)J2	https://patentlink.orbit.com/Ren																		
112779880	CN119208368	(CN119208368)	(CN119208368) SHANGHAI		SHANGHAI	01/12/2024	01/12/2024		(CN119208368)	https://patentlink.orbit.com/Ren																		
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105472169	US2024042929E	(WO/2024/19885)	(WO/2024/19885) XIAMEN SAN		XIAMEN SAN	28/03/2023	23/06/2023		(WO/2024/19885)	https://patentlink.orbit.com/Ren																		
111791520	CN118783904I	(CN118783904)	(CN118783904) SUZHOU ACME		ACME - Advan	03/09/2024	15/10/2024		(CN118783904)	https://patentlink.orbit.com/Ren																		
111763355	CN118783904I	(CN118783904)	(CN118783904) SUZHOU ACME		ACME - Advan	03/09/2024	15/10/2024		(CN118783904)	https://patentlink.orbit.com/Ren																		
112306474	CN119001574	(CN119001574)	(CN119001574) UNIVERSITY OF UESTC		UNIVERSITY OF UESTC	21/08/2024	22/10/2024		(CN119001574)	https://patentlink.orbit.com/Ren																		
112420311	CN119051638J	(CN119051638)	(CN119051638) SYNERGY INNO		Guangdong Unir	29/08/2024	29/11/2024		(CN119051638)	https://patentlink.orbit.com/Ren																		
112492525	CN119050677	(CN119050677)	(CN119050677) 10TH RESEARCH		CETC	22/08/2024	06/12/2024		(CN119050677)	https://patentlink.orbit.com/Ren																		
108959741	WO/2025/13892	(WO/2025/13892)	(WO/2025/13892) SUZHOU DABO		Suzhou Dabo N	18/12/2023	20/02/2024	05/04/2024	(WO/2025/13892)	https://patentlink.orbit.com/Ren																		
106315927	EP4484621EP4	(EP/4484621)J2	(EP/4484621)J2 MITSUBISHI		Mitsubishi Cher	20/02/2023	31/08/2023		(EP/4484621)J2	https://patentlink.orbit.com/Ren																		
106315887	EP4484620EP4	(EP/4484620)J2	(EP/4484620)J2 MITSUBISHI		Mitsubishi Cher	20/02/2023	31/08/2023		(EP/4484620)J2	https://patentlink.orbit.com/Ren																		
90058139	JP2024152895F	(EP/3918636)J2	(EP/3918636)J2 WOLF SPEED		WolfSpeed	28/08/2020	06/08/2020	29/03/2023	(EP/3918636)J2	https://patentlink.orbit.com/Ren																		
112643986	CN119030472I	(CN119030472)	(CN119030472) ANHUI EAST C		ANHUI EAST C	28/08/2024	28/11/2024		(CN119030472)	https://patentlink.orbit.com/Ren																		

Segments

Supply chain: wafers & epiwafers, devices, modules & packaging, circuits & applications

Technical challenges: dynamic on-resistance, e-mode, GaN-on-Silicon, monolithic integration, thermal management, vertical devices

Patent information

Dates and numbers of priority/application/publication/grant

Title, abstract, claims

Patent applicants, current assignees, inventors

Current legal status of patents (granted, pending, expired, etc.)

Hyperlinks to an updated online database

< > ... tent family list +

Segments

Supply chain: wafers & epiwafers, devices, modules & packaging, circuits & applications

Technical challenges: dynamic on-resistance, e-mode, GaN-on-Silicon, monolithic integration, thermal management, vertical devices

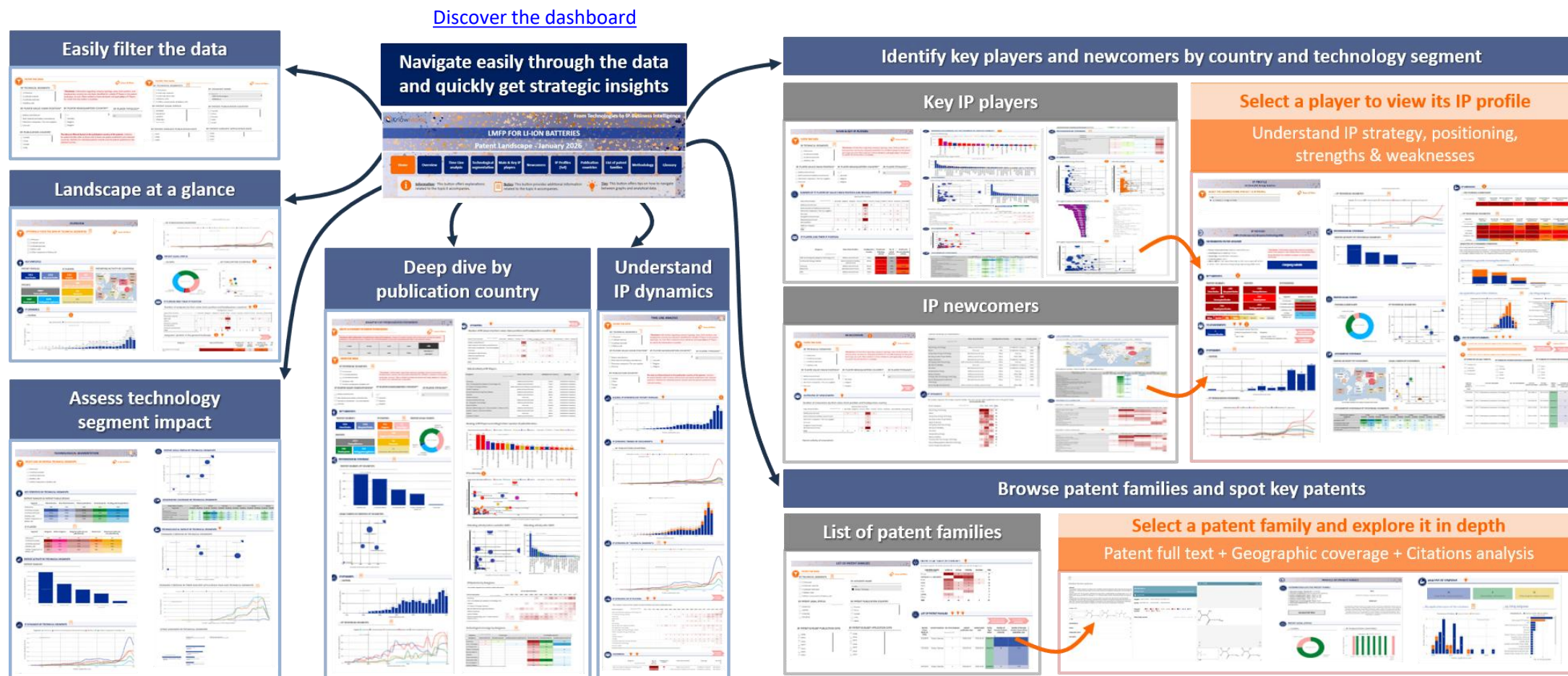
INTRODUCTION

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 player, technology, geography, publication period, or legal status, and to drill down instantly 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.



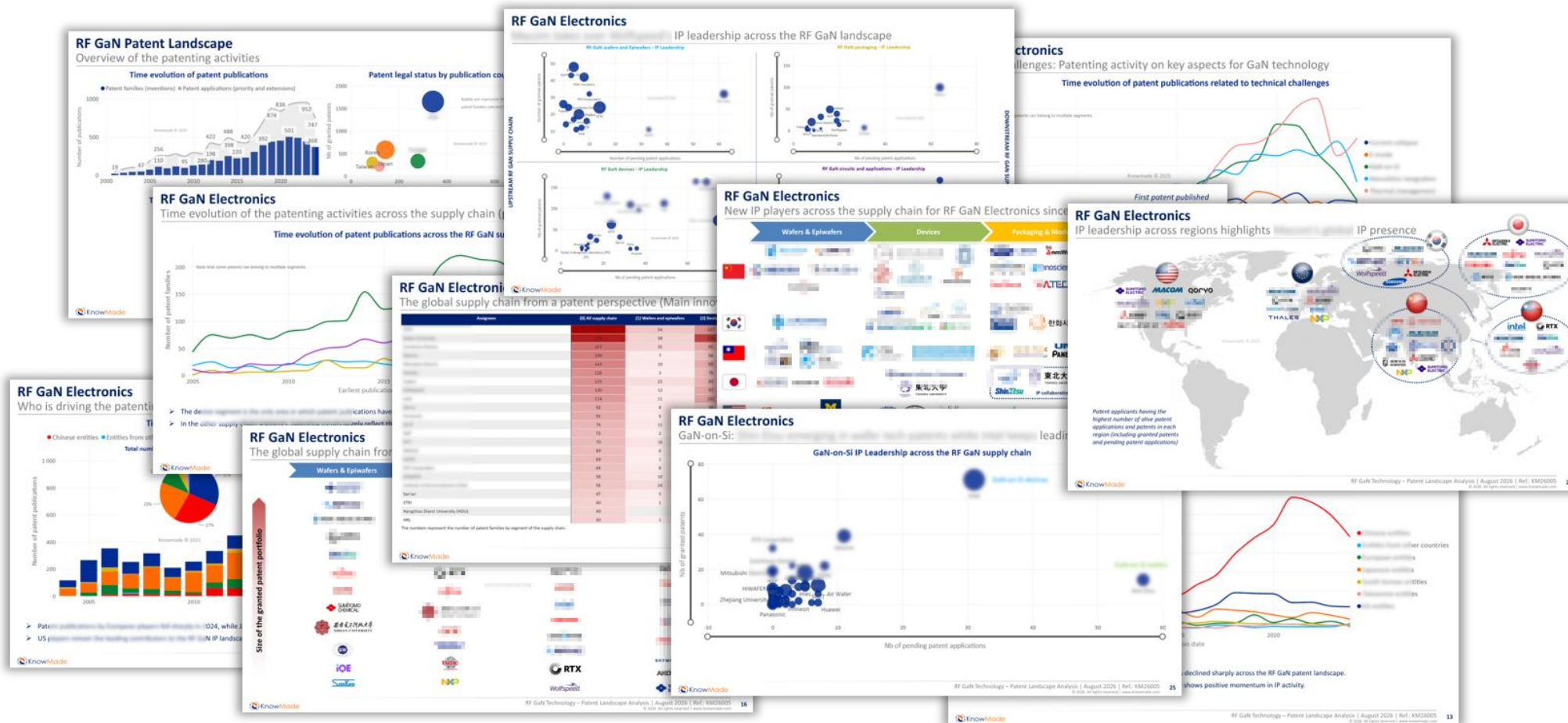
SAMPLE



Patent Landscape Overview

SAMPLE

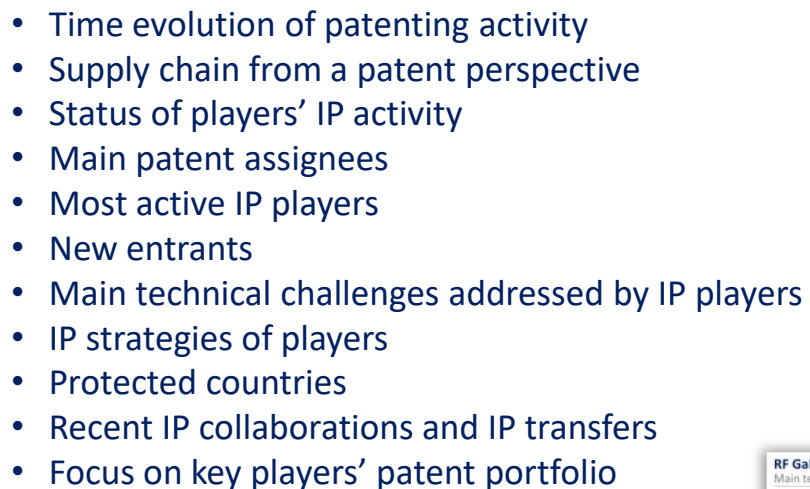
- Who is driving the patenting activity?
- The global supply chain from a patent perspective
- Most active IP players and new entrants
- Main technical challenges (dynamic on-resistance, e-mode, GaN-on-Si, vertical devices, monolithic integration, thermal management, etc.)



SAMPLE

- [illegible]

SAMPLE



Taiwanese Patent Landscape Analysis

- Time evolution of patenting activity
- Supply chain from a patent perspective
- Status of players' IP activity
- Main patent assignees
- Most active IP players
- New entrants
- Main technical challenges addressed by IP players
- IP strategies of players
- Protected countries
- Recent IP collaborations and IP transfers
- Focus on key players' patent portfolio



South Korean Patent Landscape Analysis

- Time evolution of patenting activity
- Supply chain from a patent perspective
- Status of players' IP activity
- Main patent assignees
- Most active IP players
- New entrants
- Main technical challenges addressed by IP players
- IP strategies of players
- Protected countries
- Recent IP collaborations and IP transfers
- Focus on key players' patent portfolio

SAMPLE



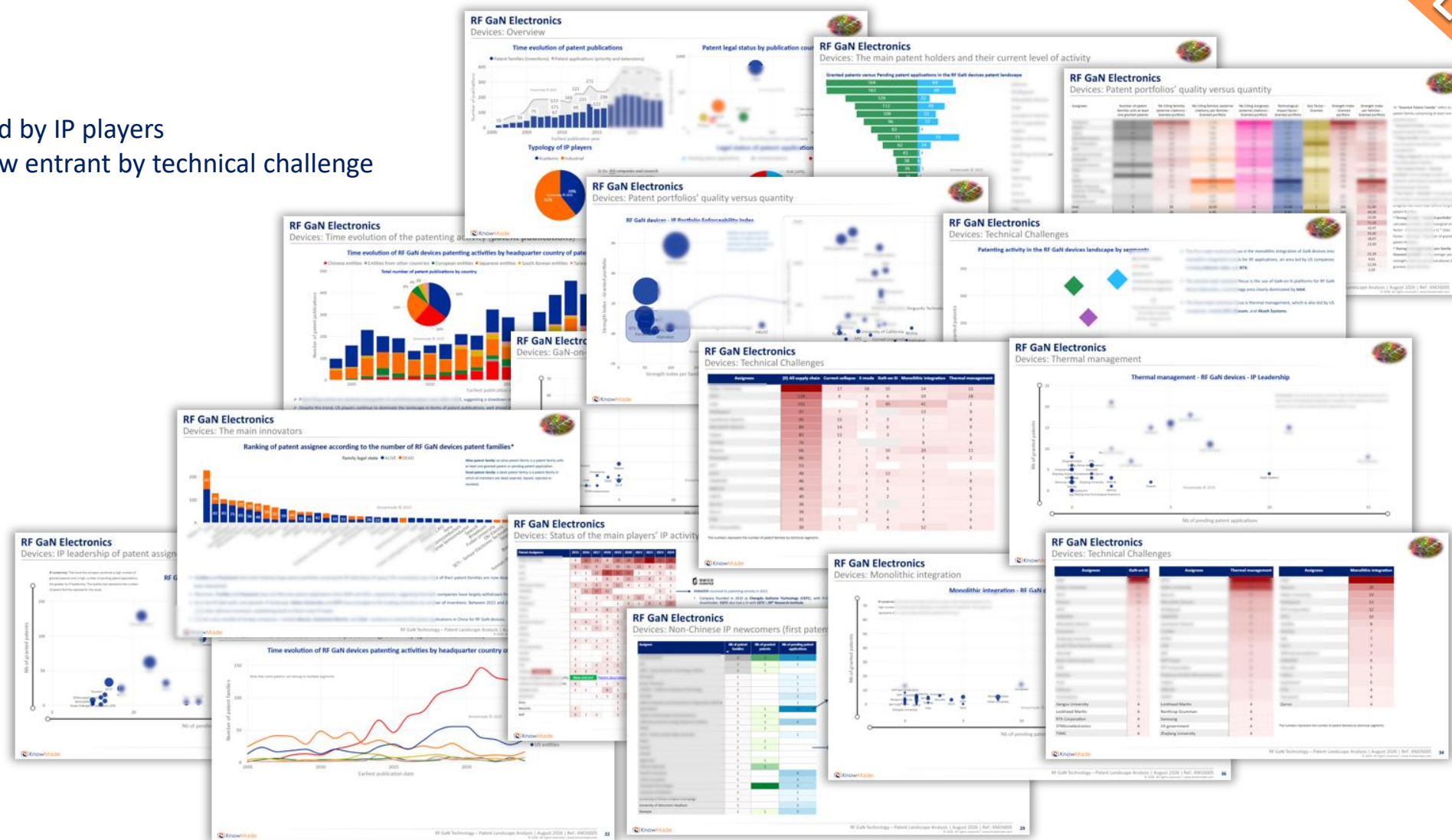
Wafers and Epiwafers for RF Applications

- Time evolution of patent publications from US players, Japanese players, European players, etc.
- Main patent assignees
- Most active IP players
- New entrants
- Current legal status of patents
- Technical challenges addressed by IP players
- Main patent assignees and new entrant by technical challenge



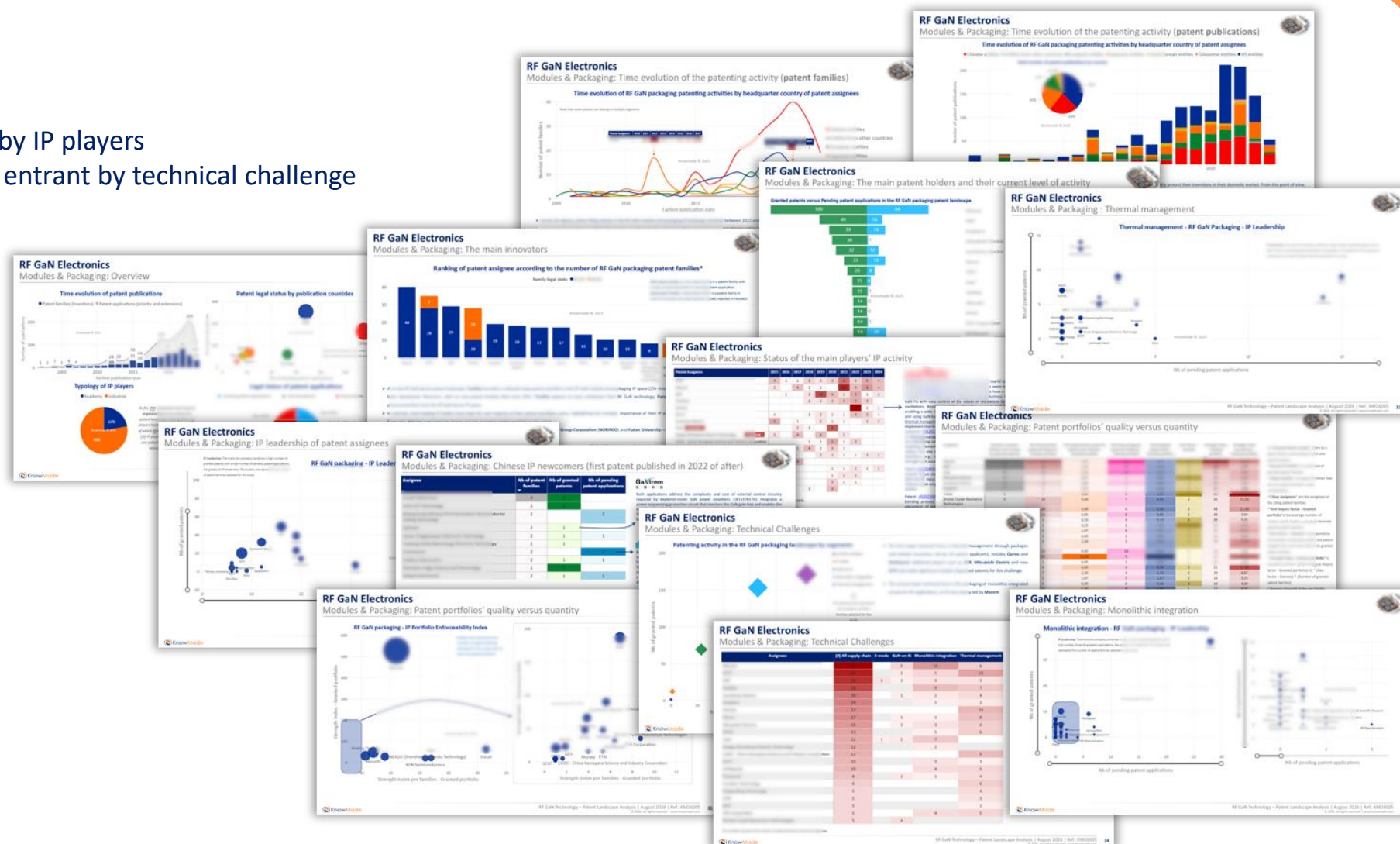
GaN RF Devices

- Time evolution of patent publications from US players, Japanese players, European players, etc.
- Main patent assignees
- Most active IP players
- New entrants
- Current legal status of patents
- Technical challenges addressed by IP players
- Main patent assignees and new entrant by technical challenge



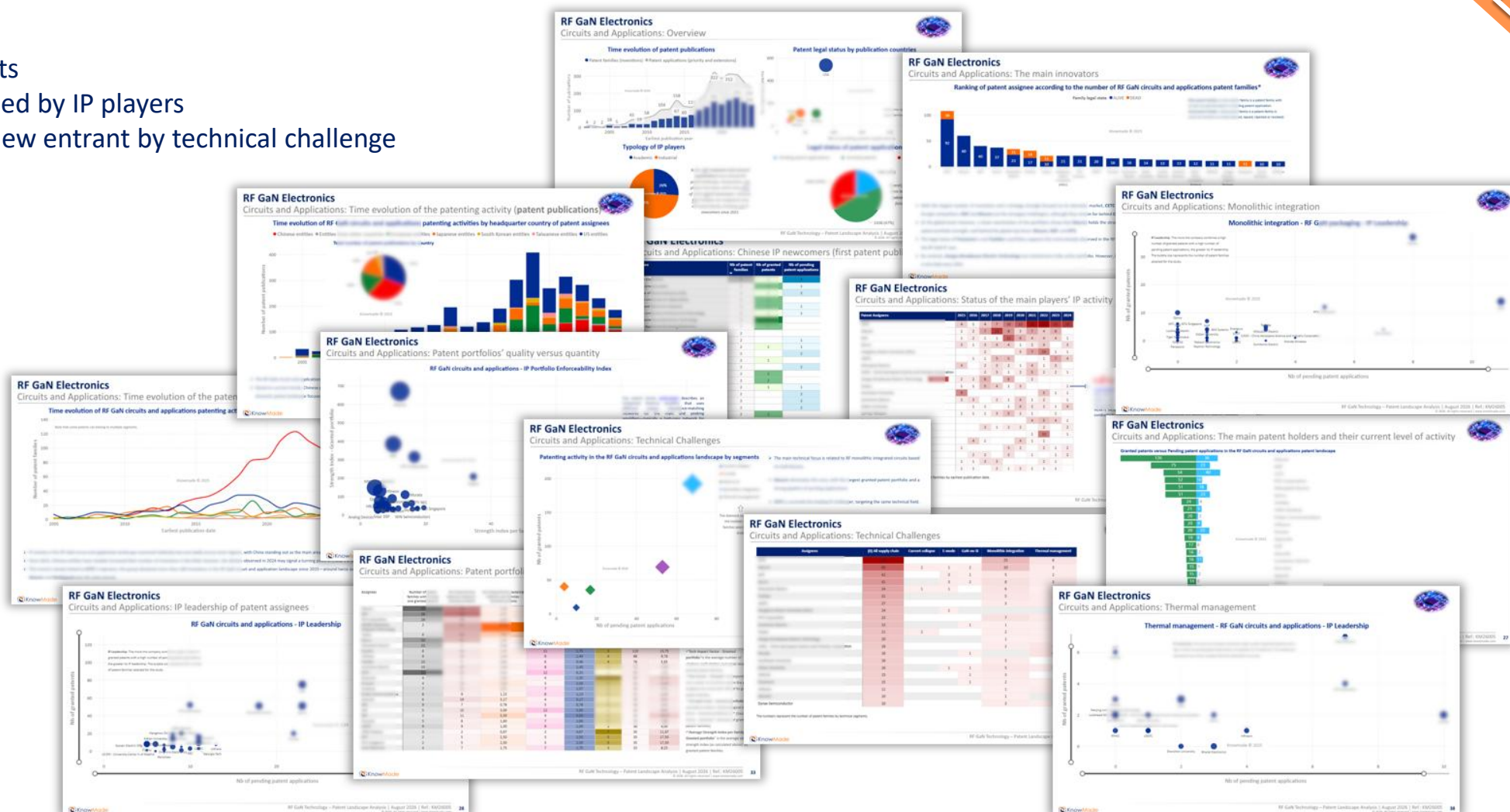
RF Modules & Packaging

- Time evolution of patent publications from US players, Japanese players, European players, etc.
- Main patent assignees
- Most active IP players
- New entrants
- Current legal status of patents
- Technical challenges addressed by IP players
- Main patent assignees and new entrant by technical challenge



RF Circuits & Applications

- Time evolution of patent publications from US players, Japanese players, European players, etc.
- Main patent assignees
- Most active IP players
- New entrants
- Current legal status of patents
- Technical challenges addressed by IP players
- Main patent assignees and new entrant by technical challenge



ORDER FORM

RF GaN Technology

Patent Landscape Analysis – August 2026

Ref.:KM26005

SHIP TO

Name (Mr/Ms/Dr/Pr):

Job Title:

Company:

Address:

City:

State:

Postcode/Zip:

Country:

VAT ID Number for EU members:

Tel:

Email:

Date:

PRODUCT ORDER

☐ REPORT + DATABASE ⁽¹⁾: **4,990 EUR**

☐ REPORT + DATABASE ⁽¹⁾ + DASHBOARD ⁽²⁾: **7,990 EUR**



For price in dollars, please use the day's exchange rate.

For French customer, add 20% for VAT.

The report (PDF), database (Excel), and access to the interactive online dashboard will be delivered electronically upon receipt of payment.

⁽¹⁾Report & Database are provided under a **multi-user license and can be shared internally** among employees of the purchasing organization. Subsidiaries and joint ventures are excluded from this license. Please be aware that the report is watermarked on each page, with the name of the recipient and the organization (the name mentioned in the PO).

⁽²⁾Access to the interactive dashboard is granted for **one year (12 months) to an unlimited number of authorized users** within the purchasing organization. Access codes must not be shared with any third party. The dashboard must not be used to produce analyses or reports that are resold, sublicensed, or otherwise made available to any external user or entity outside the purchasing organization.

I hereby accept Knowmade's Terms and Conditions of Sale

Signature:

PAYMENT METHODS

Check

To pay your invoice using a check, please mail your check to the following address:

KnowMade S.A.R.L.
2405 route des Dolines, Le Drakkar,
06560 Valbonne Sophia Antipolis
FRANCE

Money Transfer

To pay your invoice using a bank money wire transfer please contact your bank to complete this process. Here is the information that you will need to submit the payment:

Payee: KnowMade S.A.R.L.
Bank: Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var, France
IBAN: FR76 1460 7003 6360 6214 5695 139
BIC/SWIFT: CCBPFRPPMAR

Paypal

In order to pay your invoice via PAYPAL, you must first register at www.paypal.com. Then you can send money to the KnowMade S.A.R.L. by entering our E-mail address contact@knowmade.fr as the recipient and entering the invoice amount.

RETURN ORDER BY

E-mail: contact@knowmade.fr

Mail: KnowMade S.A.R.L., 2405 route des Dolines, Le Drakkar,
06560 Valbonne Sophia Antipolis, FRANCE

Terms and Conditions of Sales

DEFINITIONS

“Acceptance”: Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions “I hereby accept KnowMade’s Terms and Conditions of Sale”.

“Buyer”: Any business user (i.e. any person acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

“Contracting Parties” or “Parties”: The Seller on the one hand and the Buyer on the other hand.

“Intellectual Property Rights” (“IPR”) means any rights held by the Seller in its Products, including any patents, trademarks, registered models, designs, copyrights, inventions, commercial secrets and know-how, technical information, company or trading names and any other intellectual property rights or similar in any part of the world, notwithstanding the fact that they have been registered or not and including any pending registration of one of the above mentioned rights.

“License”: For the reports and databases, 2 different licenses are proposed. The buyer has to choose one license:

1. One user license: a single individual at the company can use the report.

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.

“Seller”: Based in Sophia Antipolis (France headquarters), KnowMade is a technology intelligence company specialized in the research and analysis of scientific and technical information. We provide patent landscapes and scientific state of the art with high added value to businesses and research laboratories. Our intelligence digests play a key role to define your innovation and development strategy.

1. SCOPE

1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. Any additional, different, or conflicting terms and conditions in any other documents issued by the buyer at any time are hereby objected to by the seller, shall be wholly inapplicable to any sale made hereunder and shall not be binding in any way on the seller.

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.

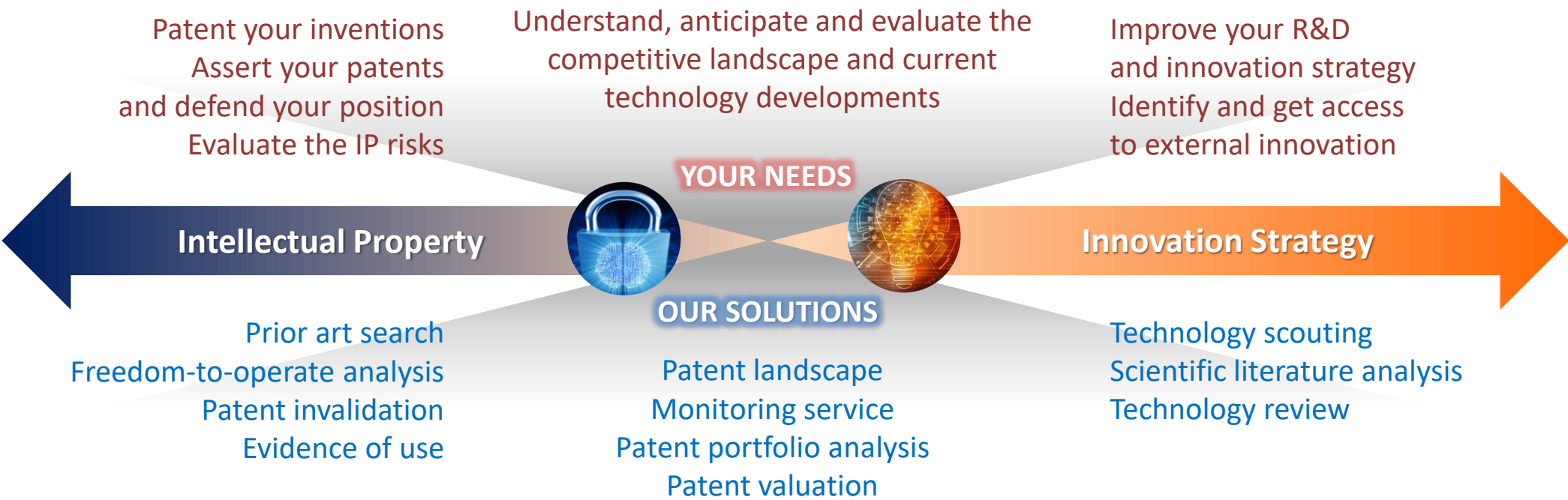
KNOWMADE

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



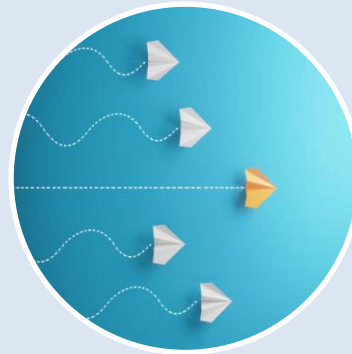
WHAT INFORMATION CAN YOU GET ?



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

- Analysis report
- Patent data base
- Interactive dashboard
- 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

- Analysis report
- Patent data base
- Interactive dashboard

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.

Format

- Updated interactive dashboard
- Updated patent data base

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

- Therapeutic tools
- Diagnostics and Theragnostics
- Medical devices and imaging
- Drug discovery and delivery

AGRI-FOOD

- Food processing & formulation
- Vegan food
- Next-gen packaging
- Agriculture 4.0





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06560 Valbonne Sophia Antipolis,
France

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contact@knowmade.fr