



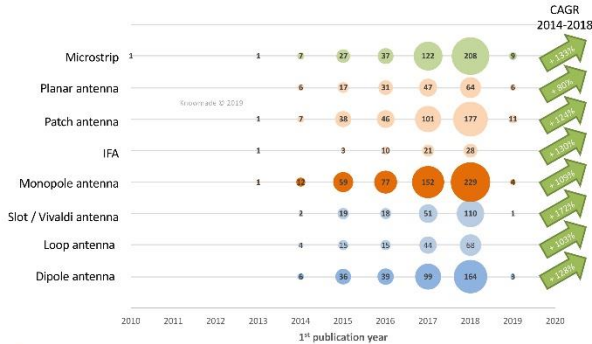
即时发布：

5G 天线：三星、英特尔、爱立信、华为等多家公司已开始拓展产品组合

摘自：《5G 天线与 5G 相关应用——专利格局分析》，Knowmade, 2019 - 《5G 技术对射频前端模块与手机连接的影响报告》，Yole Développement, 2018

Antenna for 5G & 5G-related applications: time evolution of patent family publications per main technology

(Source: Antenna for 5G and 5G-related Applications Patent Landscape, Knowmade, 2019)



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法国里昂讯—2019年5月22日：[Knowmade](#) 宣称，目前与 5G 天线相关的格局尚未尘埃落定。超过 75% 的专利申请依旧处于待定状态，因此在接下去的几年里还会有很大变数。

继初期的国内专利申请阶段之后，IP 领域和市场方面的主要竞争者，包括三星、英特尔、爱立信和华为在内，都已开始拓展自己的全球产品组合”，[Knowmade](#) 的专

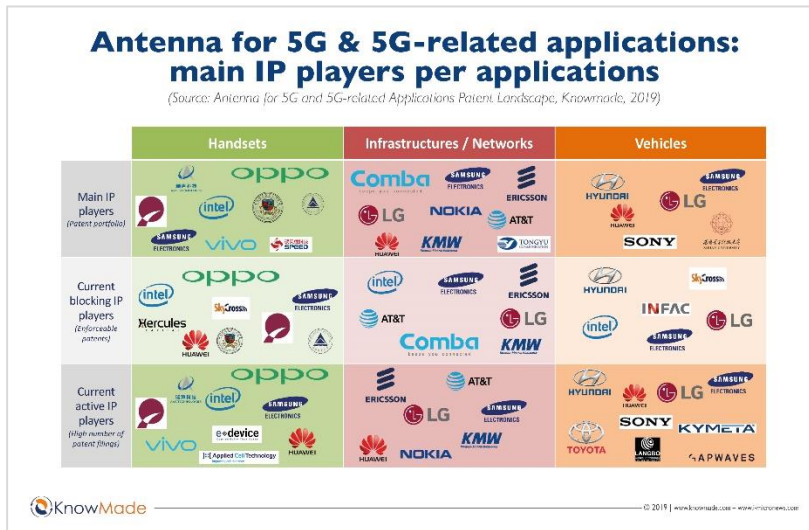
利与技术分析师 **Paul Leclaire** 博士称：“三星和英特尔目前似乎占据着最为有利的领先地位，能制约其主要竞争对手的专利活动和自由运作。”

今天，[Knowmade](#) 在其新发布的专利格局分析报告《[5G 天线与 5G 相关应用](#)》中提出了对这些主要竞争者已获专利的技术和当前 IP 战略的深入见解。据 [Knowmade](#) 的分析师们指出，有超过 620 项专利申请都涉及 5G 应用的天线开发。

在开发大环境如此活跃的形势下，这份报告让您真正有机会通过对主要竞争者专利组合的详尽分析对其 IP 定位和整个生态系统获得深入了解。[Knowmade](#) 在这项新的分析中也探究了每家公司对其他竞争对手在 5G 天线相关活动方面的制约能力。

就技术发展和市场趋势而言，在天线层面会有何种影响？领先企业将如何处理 5G 技术的引入？目前这些公司在研发方面做了哪些努力？IP 格局的现状如何？今天，[Yole Développement \(Yole\)](#) 公司的合作伙伴 [Knowmade](#) 对天线专利生态系统做了一番有重要价值的全面概览。

作为下一代移动技术标准，截止到 2020 年，5G 无线通信可望投放市场。因此，5G 技术将彻底重新定义射频前端在网络和调制解调器之间的互动方式。的确，新的 6GHz 以下 (sub-6 GHz) 射



频频段和毫米波对产业界而言是一大挑战。但与挑战随之而来的还有搅动市场领导地位的机遇……

“在5G技术的6 GHz以下波段领域，包括高通、Qorvo、思佳讯和村田制作所在内的当前前端领先企业已经开始调整适应这些变化，” Yole 的技术与市场分析师 **Cédric Malaquin** 解释道。他还补充说：“思佳讯已经推出自己的5G前端平台 Sky5™，Qorvo 将把5G内容

整合到其高端LTE平台 RF Fusion™ 上。高通则发布了可集成到智能手机边角的紧凑封装型专用天线，以此推广5G毫米波技术方案。”

“新加入这个市场的高通带来了从调制解调器到天线的端到端解决方案，” Yole 的技术与市场分析师 **Antoine Bonnabel** 解说道：“此外，对 TDK 爱普科斯公司滤波技术的战略性投资也已然带来盈利。首批收益是在2017年间由射频前端市场产生的。Yole 认为在不远的将来还可望有进一步收益。索尼的 XZ2 已成为第一台采用高通完整解决方案的手机。”……

Antoine 也参与了 Yole 射频电子方面的工作，并与 Cédric 密切合作，完成整年度相关的技术与市场分析和讲演。

伴随着移动设备，5G 和 5G 相关的网络需要部署新的基础设施以支持特定的协议和操作模式，如 MIMO、大规模 MIMO、波束赋形、波束控制、载波聚合等等。除了加快数据速率和带宽，5G 设备还必须与多种数据类型兼容。

5G 领域的企业要探索的不只是新频段——尤其是从 20GHz 到 300GHz 的毫米波频段。在目前处在开发阶段的所有 5G 应用射频组件，包括滤波器、功率放大器、射频前端模块等等中，天线已经成为 5G 网络领域一个极为复杂又极为重要的细分市场。

2014 年 ‘5G’ 这个名词才开始出现在专利中。此后与 5G 相关的专利发布数量就大大增加，从 2014 年到 2018 年的增长率达到 113%，” Knowmade 的 **Paul Leclaire** 阐述道。“这股强劲的加速势头主要是由中国 IP 竞争企业推动的。我们还特别注意到大量来自中国学术界的专利申请方，这在电信领域很不寻常。”

Knowmade 在这份报告中就申请方信息对专利资料进行了手动细分。分析表明，经过了一段由从事基础设施和网络天线开发的欧

美 IP 企业主导的时期，与手持设备天线相关的 IP 活动开始升温。中国巨头 Oppo 和华为在专利方面活动势头强劲，提交了大量与手持设备天线相关的极具潜力的专利，由此推动了与手持设备相关的 IP 领域，使之变得强势，重要性也将继续提升……



Knowmade 和 Yole Développement 不断深入调研，并在今天推出了一套重要的系列射频电子报告。这两家合作公司都是 Yole 企业集团的成员，他们结合各自在市场、技术和专利方面的专长，进行全面分析，为领先半导体企业的发展助力。

访问 i-micronews.com 网站上的射频电子专区，即可获得关于每份报告的详细描述。

另外，Yole 企业集团将亮相 [欧洲微波周](#)（法国巴黎，9月29日至10月4日，B577号展位）。现在就预留时间，欢迎您届时光临，与我们的专家会面！

ABOUT THE REPORTS:

- [Antenna for 5G and 5G-related Applications Patent Landscape](#)

Players worldwide are racing to develop and assert their next generation of antenna devices. On the cusp of the release of the first 5G devices, get an insider's view of players' IP activities and their related antenna technology developments. – Performed by Knowmade

- [5G's Impact on RF Front-End Module and Connectivity for Cell Phones 2018](#)

How is 5G enabling new business opportunities despite flat mobile growth? - **Produced by Yole Développement**

Companies cited in the report:

AIROHA, Akoustis, Alcatel, Alcatel-Lucent, Analog Devices Inc. (Hittite), Amazon, Amkor, Apple, ASE Group, ASUS, AT&T, BLU, Broadcom Ltd. (Avago echnologies, Javelin Semiconductor), Brocade, Cavendish Kinetics, Cisco, China Mobile, China Telecom, China Unicom, Coolpad, DelfMEMS, Ericsson, Fujitsu, GLOBALFOUNDRIES, Gartner, Gionee, and more ...

About the authors:

- **Nicolas Baron**, PhD. is CEO and co-Founder of Knowmade. He manages the company's development and strategic direction, and personally leads the Electronics & Telecom department. He holds a PhD in Physics from the University of Nice Sophia-Antipolis and a master's degree in Intellectual Property Strategies and Innovation from the European Institute for Enterprise and Intellectual Property (IEEPI Strasbourg), France.
- **Antoine Bonnabel** works as a Technology & Market Analyst for the Power & Wireless team of Yole Développement (Yole). He carries out technical, marketing and strategic analyses focused on RF devices, related technologies and markets.

Prior to Yole, Antoine was R&D Program Manager for DelfMEMS (FR), a company specializing in RF switches and supervised Intellectual Property and Business Intelligence activities of this company. In addition, he also has co-authored several market reports and is co-inventor of three patents in RF MEMS design.

Antoine holds a M.Sc. in Microelectronics from Grenoble Institute of Technologies (France) and a M.Sc. in Management from Grenoble Graduate School of Business (France).

- **Paul Leclaire**, PhD works for Knowmade in the fields of RF technologies, Wireless communications and MEMS sensors. He holds a PhD in Micro and Nanotechnology from the University of Lille (France), in partnership with IEMN in Villeneuve-d'Ascq and CRHEA-CNRS in Sophia-Antipolis (France). Paul previously worked in innovation strategy consulting firm as Consultant.
- As a Technology & Market Analyst, specialized in RF devices & technologies within the Power & Wireless division at Yole Développement (Yole), **Cédric Malaquin** is involved in the development of technology & market reports as well as the production of custom consulting projects.

Prior his mission at Yole, Cédric first served Soitec as a process integration engineer during 9 years, then as an electrical characterization engineer during 6 years. He deeply contributed to FDSOI and RFSOI products characterization. He has also authored or co-authored three patents and five international publications in the semiconductor field.

Cédric graduated from Polytech Lille in France with an engineering degree in microelectronics and material sciences.

ABOUT YOLE GROUP OF COMPANIES

Knowmade is a Technology Intelligence and IP Strategy consulting company specialized in analysis of patents and scientific information. The company supports the business development of R&D organizations, industrial companies, and investors by helping them to understand the competitive landscape, follow the technology trends, and find out opportunities and threats in terms of technology and patents. Knowmade is involved in compound semiconductors, power electronics, batteries, RF electronics & wireless communications, solid-state lighting &

display, photonics, MEMS sensors, memories, semiconductor manufacturing & packaging, medical devices, medical imaging, biotech/pharma, and agri-food.

Knowmade's experts provide prior art search, patent landscape analysis, scientific literature analysis, patent valuation, IP due diligence and freedom-to-operate analysis. In parallel the company proposes litigation/licensing support, technology scouting and IP/technology monitoring service. Knowmade's analysts combine their technical and patent expertise with powerful analytics tools and proprietary methodologies, delivering invaluable patent analyses and scientific reviews.

More info on <http://www.knowmade.com> and follow Knowmade on LinkedIn.



Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 80 collaborators worldwide covering MEMS and image sensors, Compound Semiconductors, RF Electronics, Solid-state lighting, Displays, software, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management.

The “More than Moore” market research, technology and strategy consulting company Yole Développement, along with its partners System Plus Consulting, PISEO and KnowMade, support industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to grow their business. . For more information, visit www.yole.fr and follow Yole on [LinkedIn](#) and [Twitter](#).

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