

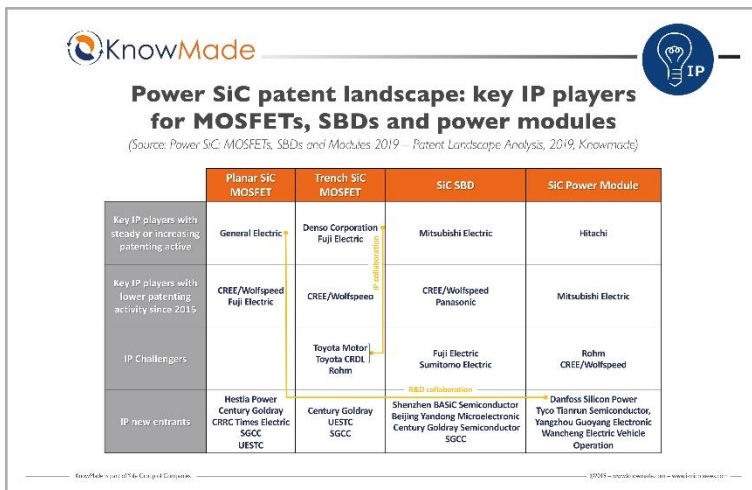


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## SiC 应用步伐加快：业界供应链是否准备就绪？

摘自：Knowmade 公司的《2019 年功率 SiC：MOS 场效应管、肖特基势垒二极管和模块——专利格局分析》| Yole Développement 公司的《2018 年功率 SiC：材料、器件和应用》

法国里昂讯—2018 年 3 月 4 日：来自技术情报与 IP 策略咨询公司 [Knowmade](#) 的专利与技术分析师 Rémi Comyn 博士断言：“2016 年-2018 年期间对整个碳化硅产业至关重要。”他表示：“碳化硅 MOS 场效应管进入商用市场已有几年时间，赢得了大量客户的信心，而且明显开始打入各种不同的应用领域。”IP 格局也印证了这一趋势，尤其突显日本企业的强势领导地位、中国企业的加入和在汽车产业中令人侧目的进军步伐。



截止到 2018 年，Knowmade 的团队都十分确定。SiC 市场必将增长，如今的主要问题不是这个市场是否会发展，而是更多地聚焦在未来五年中它将发展到何种规模。Knowmade 的兄弟公司 [Yole Développement \(Yole\)](#) 预测该市场在 2017 年到 2023 年间将以 31% 的年均复合增长率扩张，到 2023 年其规模将达到 15 亿美元。于是众多业内公司都在关心，供应链是否已做好准备迎接这样的

市场加速度。Yole 的高级技术与市场分析师 Hong Lin 博士评价道：“这样大的市场潜力有强烈的吸引力，促使足够多的公司想要涉足其中，与此同时，功率器件业界巨头之间的竞争也在升温。这场竞争已经加剧。”

这一 IP 生态系统的状况究竟如何？谁是当前的业界领袖？未来几年中谁将拥有最优秀的 IP?……

Knowmade 的分析师们为您带来对 SiC IP 生态系统的最新全局概览。

Knowmade 明确指出，伴随着首批碳化硅 MOS 场效应管产品的商用，2011 年到 2015 年间涉及碳化硅 MOS 场效应管的专利申请显著增加。日本的整合厂商在碳化硅 MOS 场效应管相关的专利申请活动中一马当先，尤其是日本电装公司（Denso）和富士电机（Fuji Electric）。



凭借着独特的市场地位，Knowmade 能从专利的角度提供对竞争格局和技术发展的独特见解。与 Yole 团队的合作更让其得以结合市场、技术和 IP 方面的专长，形成相关而准确的分析。

针对这个活力多变的生态系统，Knowmade 发布了一项专门的专利格局分析，《[功率 SiC: MOS 场效应管、肖特基势垒二极管和模块](#)》。从 MOS 场效应管到包含功率模块的肖特基势垒二极管，这份报告针对基于 SiC 的功率电子产品详细呈现了业界和研究领域的 IP 生态系统。它涵盖了截止到 2018 年 10 月发布的全球专利，对超过 1,600 个专利家族进行了全面分析。即刻访问 [Knowmade 网站](#)，可获得对 SiC IP 分析的详细描述。

合作双方的 Knowmade 和 Yole Développement 都是 Yole 企业集团的成员。双方将再次参加 2019 年 SCAPE——斯德哥尔摩功率电子应用大会，会议将于 5 月 13 和 14 日在斯德哥尔摩举行。详细会议日程、演讲者名单及更多信息都将很快揭晓。

如需获取更多信息，敬请联系 [Camille Veyrier](#)。

**ABOUT THE REPORTS:****[Power SiC: MOSFETs, SBDs and Modules 2019 – Patent Landscape Analysis](#)**

*The SiC power device market outlook is promising as market adoption is ongoing. Who are the current key IP players for MOSFETs, SBDs and power modules, and who will have the best IP position in the coming years?* – Produced by Knowmade

**Companies cited in the report:**

Denso, Cree, Wolfspeed, Fuji Electric, Toyota Motor, Mitsubishi Electric, Sumitomo Electric, Rohm, General Electric, Hitachi, Toyota Central R&D Labs, Xidian University, Panasonic, Hyundai Motor, CRRC Times Electric, Century Goldray Semiconductor, Infineon, State Grid Corporation of China (SGCC), Hestia Power, Nissan Motor, Siemens, NXP, Toshiba, Philips, Microsemi, Littelfuse, IXYS, Monolith Semiconductor, Renesas Electronics, Bosch, ABB, Shindengen Electric Manufacturing, Showa Denko, Kansai Electric Power, On Semiconductor, Beijing Yandong Microelectronic, Tyco Tianrun Semiconductor Technology, Shenzhen Basic Semiconductor, Sharp, Guangdong Midea, Siemens, Danfoss Silicon Power...

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- **Nicolas Baron, PhD.** is CEO and co-founder of Knowmade. He manages the development and strategic orientation of the company and personally leads the Semiconductor department. He holds a PhD in Physics from the University of Nice Sophia Antipolis, and a Master of Intellectual Property Strategies and Innovation from the European Institute for Enterprise and Intellectual Property (IEEPI) in Strasbourg, France.

**[Power SiC 2018: Materials, devices and applications – Market & Technology report](#)**

*Automotive is putting SiC on the road. Is the supply chain ready?* – Produced by Yole Développement (Yole).

**Companies cited in the report:**

ABB, Alstom, Ascatron, Aymont, Bombardier, Basic Semiconductor, Brückwell Technology, Caly Technology, Clas-SiC wafer fab, Cree, CRRC, Danfoss, Delphi, DENSO, Dow Corning, Epiworld, Episil, Fraunhofer IISB, Fuji Electric, GE, GeneSiC, Global Power Device, Global Power Technology, Hestia Power, Hitachi, IBS, II-VI, Infineon, MicroSemi, Mitsubishi Electric, Norstel, Northrop Grumman, NXP, ON Semiconductor, Panasonic, Philips, Powerex, Raytheon, RENESAS, ROHM, Sanrex, Schneider Electric, Semikron, Shindengen, SICC, Siemens, SMA, STMicroelectronics, Toshiba, Toyota, United Silicon Carbide, WeEn, Wolfspeed, X-Fab, Yaskawa...

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*Dr. Hong Lin and Dr. Ana Villamor, all part of the Power & Wireless division at Yole Développement co-authored the Power SiC 2018: Materials, Devices and Applications report:*

- **Dr. Hong Lin** works as a Technology and Market Analyst, Compound Semiconductors since 2013. She is specialized in compound semiconductors and provides technical and economic analysis. Before joining Yole Développement, she worked as R&D engineer at Newstep Technologies. She was in charge of the development of cold cathodes by PECVD for visible and UV lamp applications based on nanotechnologies. She holds a Ph.D in Physics and Chemistry of materials.
- **Dr. Ana Villamor** serves as a Technology & Market Analyst, Power Electronics & Compound Semiconductors. She is involved in many custom studies and reports focused on emerging power electronics technologies at Yole Développement, including device technology and reliability analysis (MOSFET, IGBT, HEMT, etc). In addition, Ana is leading the quarterly power management market updates released in 2017. Previously Ana was involved in a highadded value collaboration related to SJ Power MOSFETs, within the CNM research center for the leading power electronic company ON Semiconductor. During this partnership and after two years as Silicon Development Engineer, she

acquired a relevant technical expertise and a deep knowledge of the power electronic industry. Ana is author and co-author of several papers as well as a patent. She holds an Electronics Engineering degree completed by a Master in micro and nano electronics, both from Universitat Autònoma de Barcelona (SP).

## 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](http://www.yole.fr) and follow Yole on [LinkedIn](#) and [Twitter](#).

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