LYON, France – July 30, 2015: In a competitive landscape, Yole Développement (Yole) points out the serenity of the Wide Band Gap (WBG) market and the confidence of its players: WBG companies are slowly but surely reshaping the industry and accelerate the market adoption with numerous strategic mergers and acquisitions (Cree, Infineon Technologies...) and the development of disruptive solutions...

In its latest technology and market analysis entitled “GaN & SiC for power electronics applications”, the “More than the Moore” company highlights the different strategies defined by the leaders. Infineon Technologies ensures the development of its WBG activities with the introduction of a new Gallium Nitride (GaN) segment: the company acquired International Rectifier in January 2015. Few months later, Cree announced the willingness to spin out its power and RF activities and acquired the US-based company APEI to strengthen its position in SiC based power electronics.

Yole also lists huge investments that have been done by the WBG companies. Latest examples are:

- **Exagan**, that raised US$ 6.5 million in first-round financing, to produce high-speed power switching devices on 200mm wafers, based on GaN technologies.
- And **Transphorm** with its US$ 70 million investment round led by global investment firm KKR.

WBG companies are so moving in the right direction to overcome the remaining technical challenges and confirm their confidence in these new solutions.

So far, the WBG market has not grown as fast as people in the business have hoped. The four barriers to WBG device adoption remain: high cost at the device level – reliability - multi-sourcing – integration.

- Many R&D programs have been launched in recent years and some prototypes
have demonstrated that the cost of the Bill Of Materials (BOM) can be lower at the system level when using WBG devices.

- To overcome reliability challenges, ROHM and Cree have announced new Silicon Carbide (SiC) device generations or platforms with enhanced, more stable, specifications. SiC and GaN devices are also going through reliability tests to lower their adoption risk.

- “Numerous companies have now developed SiC MOSFETs, including Cree, Rohm, ST Microelectronics, Mitsubishi and GE” says Dr Hong Lin, Technology & Market Analyst at Yole. And she explains: “This means end users are better able to multi-source these devices. By contrast, there’s a limited number of suppliers in the GaN market. In coming years, new entrants like Exagan and TSMC will provide extra sourcing options. Infineon and Panasonic also announced in 2015 that they would establish a dual-sourcing relationship for normally-off 600V GaN power devices.”

- Integrating these fast switching, high operating temperature devices remains one of the major challenges. WBG suppliers and end users need to reconsider many factors, including device packaging, module packaging, gate driver integration and topology design. Packaging is becoming a particular bottleneck, but the good news is that companies are moving in the right direction. GaN device makers EPC and GaN Systems have both adopted advanced packaging, which seems to be more suitable than traditional power device packages. The recent acquisition of APEI by Cree will likewise accelerate the development of SiC module packaging.

Recent financial moves also indicate market confidence in WBG devices. There have recently been several pieces of good news for the WBG business. The current SiC device market leader Cree decided to spin off its power and RF division as a separate company, and will issue shares in a new IPO. At Yole, analysts interpret this announcement as a positive sign of the continuing growth in the SiC power device market.

At the same time, around US$ 100 million in investments have been made in different GaN startups:

- In May 2015, the company GaN Systems raises US$ 20 million venture funding.
In June 2015, ExaGaN raises € 5.7M (US$ 6.5 million) to produce high-efficiency GaN-on-Silicon power-switching devices on 200mm wafers.

And the same month, Transphorm announces new US$ 70 million investment led by KKR.

These investments reflect the confidence in the GaN device market and investors’ willingness to provide funds to accelerate production capabilities. Under this context, Yole’s analysts propose a comprehensive survey of the WBG applications in the power electronics area. This report describes the WBG power device industrial landscape, its players and their strategies of development. It presents the main remaining technical challenges facing WBF devices; it projects the market for GaN lateral devices and SiC power devices up to 2020... A detailed description of this report is available on i-micronews.com, compound semiconductor reports section.

By the end of 2015, the consulting company will take part in numerous compound semi. conferences. Yole’s analysts will present the latest results of the WBG analysis, with a special focus on the applications. Feel free to meet them and compare your market and technology points of view at Yole’s booth:

- ICSCRM (Giardini Naxos, Italy - October 4 to 9, 2015) – Yole’s booth #37
- SEMICON Europa (Dresden, Germany – October 6-8, 2015). Yole is supporting the Power Electronics session and will present its latest analysis in Wide Band Gap (WBG) for the power electronics applications - Yole’s booth (#1207).

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FOR IMMEDIATE RELEASE

About GaN and SiC for power electronics applications report:
Rates: Euros 5,990.00 (Full report - Multi user license). For special offers and the price in dollars, please contact David Jourdan (Phone: +33 472 83 01 90).

SiC and GaN will compete with silicon from low to high power voltage.

GaN and SiC for power electronics applications report from Yole Développement will be available on August 24, 2015.

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  Dr. Hong Lin works at Yole Développement as a technology and market analyst 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. Pierric Gueguen is Business Unit Manager for Power Electronics and Compound Semiconductor activities at Yole Développement. He has a PhD in Micro and Nano Electronics and a master degree in Micro and Nanotechnologies for Integrated Circuits. He worked as PhD student at CEA-Leti in the field of 3D Integration for Integrated Circuits and Advanced Packaging. He then joined Renault SAS, and worked for 4 years as technical project manager in R&D division. During this time, he oversaw power electronic converters and integration of Wide Band Gap devices in Electric Vehicles. He is author and co-author of more than 20 technical papers and 15 patents.

- Companies cited in the report:


About Yole Développement

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, Manufacturing, Nanomaterials and Power Electronics. The group supports industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

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