

SiC and GaN, two key segments for the power semiconductor industry

Quarterly Market Monitor – Q2, 2020

MARKET DYNAMICS:

- Company updates – Q2, 2020:
GTAT & ON Semiconductor, a five-year collaboration for production and supply of SiC crystals.
New in-house epitaxy capability for X-FAB with the increase of its SiC capacity.
Huawei launched its first internally made accessory GaN charger. Apple and Samsung are rumored to launch an in-box GaN fast charger by the end of the year.
Innoscence made its entry in the higher volume fast charger market, with its built-in “Chinese core” GaN chip for the accessory brand ROCK.
And more...
- COVID-19 outbreak:
Power SiC & GaN industries are expected to feel short-term impacts.
At the end of Q1-20, COVID-19 broke out throughout EU and USA, creating supply chain disruptions and lockdown at some device manufacturers and OEMs¹.
China: the situation seems to have slowly returned to normal.
- Quarterly trends & market figures:
GaN & fast charging applications: adoption is rapidly increasing...
EV/HEV is still the killer application for SiC devices.
The power GaN device market is estimated to show 2% Q/Q growth in Q1-2020, due to the COVID-19 outbreak.
Despite the short-term impact as a result of the pandemic, SiC device market revenue continues its growth and is expected to exceed US\$3 billion by 2025.

SIC & GAN, KEY SEGMENTS OF THE POWER SEMICONDUCTOR INDUSTRY

The rapid evolution of the WBG² compound semiconductor market between 2018 and 2019 has positioned both SiC and GaN as key materials within the power device market. There has been a remarkable shift of interest in SiC for automotive applications and in GaN for mainstream consumer applications.

“These applications will respectively drive the SiC and GaN power device market in the coming years,” explains **Ezgi Dogmus, Technology & Market Analyst at [Yole Développement](#)**

¹ OEM: Original Equipment Manufacturer

² WBG: Wide Band Gap

(Yole). And she adds: “In H1-2020, the global COVID-19 outbreak has caused a significant slowdown of various end markets, especially the automotive and consumer segments, and thus has impacted the related power SiC and GaN market revenues.”

DRIVEN BY AUTOMOTIVE APPLICATIONS, POWER SiC DEVICES ARE PROSPERING

Since the first commercialization of SiC diodes, the power SiC device market has been driven by power supply applications. Nevertheless, automotive is becoming the killer application, following SiC’s notable adoption for Tesla’s main inverters in 2018. Since then, different Tier I-component makers, such as ZF and Bosch, and carmaker OEMs like BYD and Renault have recently made announcements on their adoption of SiC technology in some of their products. In the prospering SiC power market, the automotive segment is undoubtedly the foremost driver, and as such will hold more than 50% of total device market share in 2025.

“However, following the global Covid-19 outbreak, almost all automotive OEMs had to shut down and the supply chain faced significant disruption,” comments **Ahmed Ben Slimane, Technology & Market Analyst at Yole**. “In this context, we expect the power SiC market’s Y/Y growth to slow down to 7% in 2020, with a significant impact in Q2-2020 and Q3-2020.”

POWER GaN: CONSUMER PLAYERS CONFIRM ITS ADOPTION

In the power GaN landscape, the market research & strategy consulting company Yole confirms a remarkable entry of several players into the high-volume consumer market, notably Power Integrations and Navitas. “For sure, the GaN power market is evolving rapidly,” comments **Ahmed Ben Slimane from Yole**.

Many phone OEMs³ including Oppo, Vivo, Realme, and Meizu opted for GaN based in-box fast chargers, released with their flagships in the beginning of 2020. Samsung, Huawei, and Xiaomi chose GaN for accessory chargers. This represents a first milestone for power GaN devices in a high-volume consumer market.

Driven by such consumer fast-charger applications, power GaN device market growth will be in the range of 167% Y/Y in 2019, with a market value of more than US\$700 million in 2025. However, due to the COVID-19 outbreak, smartphone production is estimated to drop 20% in 2020. The impact of the pandemic is region and player dependent.



Compound Semiconductors Market: How Has the Covid-19 Outbreak Impacted the Emerging Power SiC and GaN Markets? – LIVE MARKET BRIEFING

Driven by EV/HEV and consumer fast-charger applications, the power SiC and GaN markets are expected to feel the short-term impacts of the Covid-19 outbreak. – On July 2 at 5.00 PM CET – 8 AM PDT
Register today!

³ OEM: Original Equipment Manufacturer



[Yole's Compound Semiconductor Quarterly Market Monitor](#) on SiC and GaN power applications will be published every beginning of March (Q1), June (Q2), September (Q3) and December (Q4)... Aim of these services is to provide an in-depth coverage of rapidly changing market dynamics and main players' status and strategy.

This is why [Yole's Quarterly Market Monitor](#) will also evolve and incorporate step by step a new module on RF GaAs and RF GaN markets in the Q3 2020 edition, next to the existing Power GaN and Power SiC module. Stay tuned to [i-Micronews](#) to get further information about our Compound Semiconductor & Power electronics activities!

Press contacts

Sandrine Leroy, Director, Public Relations, sandrine.leroy@yole.fr

Marion Barrier, Assistant, Public Relations, marion.barrier@yole.fr

Le Quartz, 75 Cours Emile Zola – 69100 Villeurbanne – Lyon –France – +33472830189

www.yole.fr - www.i-micronews.com – [LinkedIn](#) – [Twitter](#)

About the compound semiconductor team at Yole Développement

As a Technology & Market Analyst, Compound Semiconductors, **Ezgi Dogmus**, PhD is member of the Power & Wireless division at Yole Développement (Yole).

She is daily contributing to the development of these activities with a dedicated collection of market & technology reports as well as custom consulting projects.

Prior Yole, Ezgi was deeply involved in the development of GaN-based solutions at IEMN (Lille, France). Ezgi also participated in numerous international conferences and has authored or co-authored more than 12 papers.

Upon graduating from University of Augsburg (Germany) and Grenoble Institute of Technology (France), Ezgi received her PhD in Microelectronics at IEMN (France).

Ahmed Ben Slimane, PhD. is a Technology & Market Analyst, specialized in Compound Semiconductors at Yole Développement (Yole).

As part of the Power & Wireless team, Ahmed is contributing to the development of dedicated collection of compound semiconductors market & technology reports and monitor.

Previously, he worked as an epitaxy (MBE/MOCVD) & fabrication process engineer for GaAs-based photovoltaic applications at TOTAL and IPVF (Paris-Saclay, France). Ahmed also completed his PhD in Material Engineering from KAUST (Saudi Arabia), where his mission was focused on GaN-based microstructures for flexible solid state lighting.

During this career, Ahmed Ben Slimane proposed lot of presentations towards an international audience. He authored/co-authored more than 20 publications in the semiconductor field, and submitted a patent on the III-V hetero-structure for PV industry.

Ahmed obtained his Master degree in Electronics Engineering from INPG (Grenoble, France).

About Yole Développement

Founded in 1998, Yole Développement (Yole) 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... [More](#)

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