

GaN power devices market growing at 86% CAGR to \$280m in 2021

Yole Développement expects 600V GaN HEMTs to take off.

Driven by emerging applications including power supplies for data-centers and telecoms (AC fast charger, lidar, ET and wireless power), the GaN power device market is rising at a compound annual growth rate (CAGR) of 86% from 2016 to \$280m in 2021, according to the report 'Power GaN 2016: Epitaxy and Devices, Applications and Technology Trends' from Yole Développement.

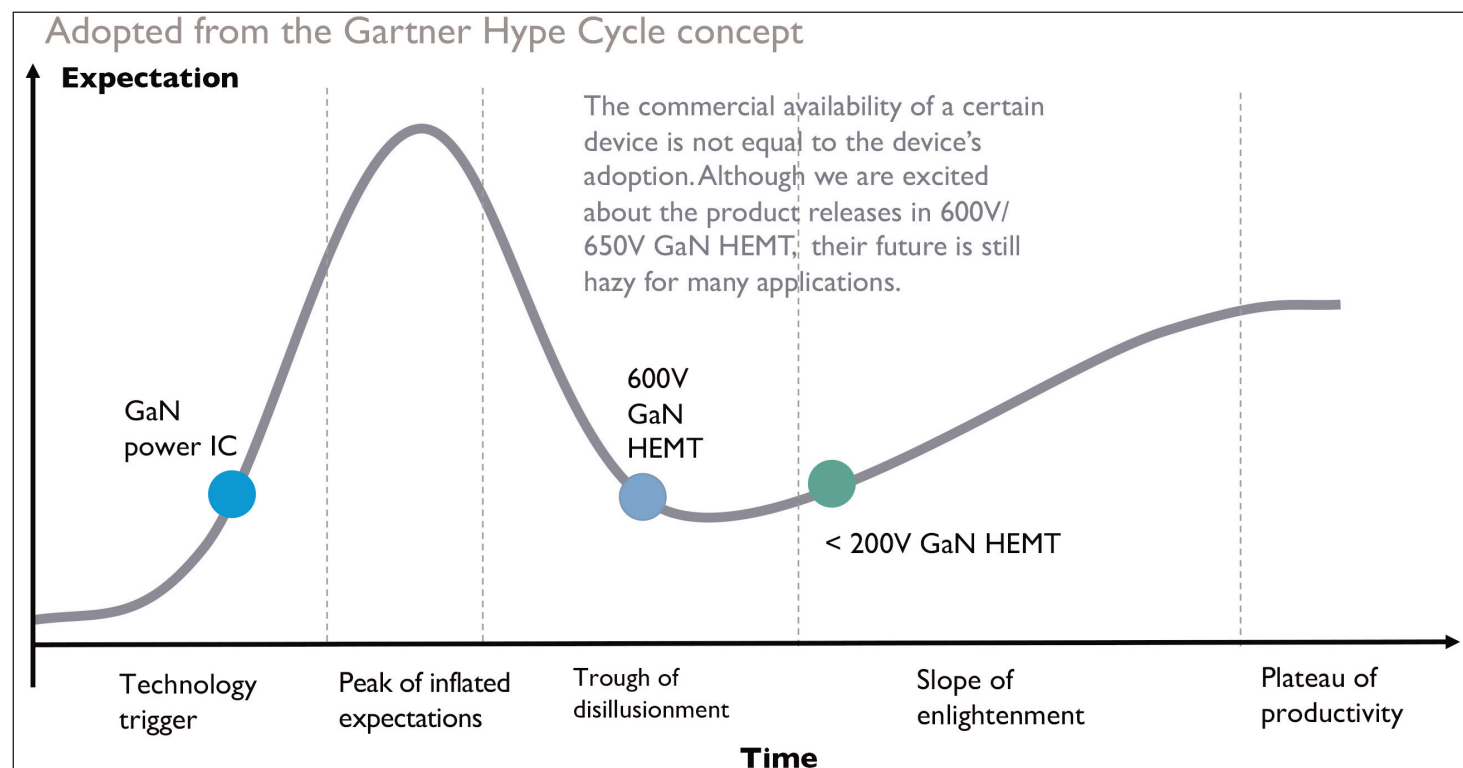
"Numerous powerful developments and key collaborations have been announced during this period and confirmed a promising and fast-growing industry," comments technology & market analyst Dr Hong Lin.

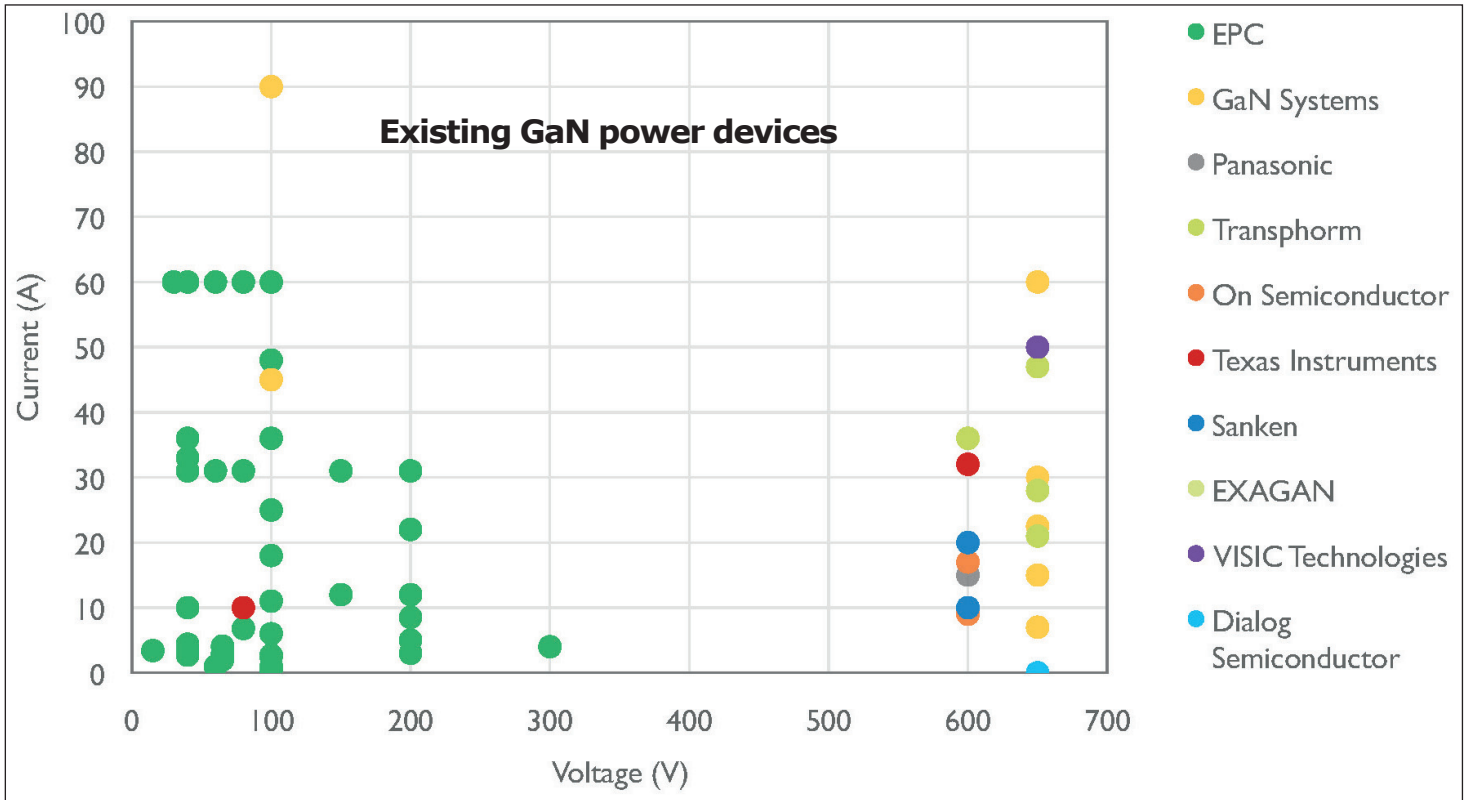
Integrated Device Technology (IDT) and Efficient Power Conversion (EPC); Infineon Technologies and Panasonic; Exagan and XFab; TSMC and GaN Systems for volume production and much more... all these collaborations took place in 2 years, between 2015 and 2016. In parallel, Texas Instruments launched a 80V power stage in 2015 and a 600V power stage in 2016. Also, VisIC announced its first GaN product in 2015. Since then, 2015–2016 have been exciting years for the GaN

power business: after many ups and downs, 600V GaN is now commercially available.

Up until late 2014, the commercial availability of 600V/650V GaN HEMTs was still questionable, despite some announcements from various players. Fast forward to 2016, end users can now buy not only low-voltage GaN (<200V) devices from EPC Power but also high-voltage (600V/650V) components from several players including Transphorm, GaN Systems, and Panasonic.

In parallel the new start-up Navitas Semiconductor announced its GaN power IC this March, followed by Dialog Semiconductors unveiling its GaN power IC in August. The idea of bringing GaN from the power semiconductor market to the much bigger analog IC market is of interest to several other players too. For example, EPC Power and GaN Systems are both working on more integrated solutions, and the well-established analog IC player Texas Instruments has also been engaged in GaN activities, releasing an 80V power stage and 600V power stage in 2015 and 2016, respectively.





Despite these developments, the GaN power market remains small compared to the gigantic \$335bn silicon semiconductor market. In fact, according to Yole, the GaN power market was less than \$10m in 2015. "Remember that a small market size is not unusual for products just appearing on the market," notes Lin. Indeed, the first GaN devices were not commercially available until 2010. The most important factor is the potential of GaN power, notes Yole. "The current GaN power market is mainly dominated by low-voltage (<200V) devices in the forecasted period, but the 600V devices should take off," comments technology & market analyst Zhen Zong.

The take-off of patenting activity took place in the 2000s, with a first wave of patent publications over the 2005–2009 period due mainly to American and Japanese companies. A second wave started in 2010 while first commercial GaN products, collaborations and mergers and acquisitions emerged. "In today's power GaN market, it is crucial to understand the global patent landscape through in-depth analyses," states KnowMade's CEO & co-founder Nicolas Baron. "This approach helps the companies to anticipate the changes, identify and evaluate business opportunities, mitigate risks and make strategic choices."

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"More than 200 patent applicants are involved in the power GaN industry," reckoned KnowMade in its report 'GaN for Power Electronics: Patent Investigation' (KnowMade, August 2015). Such a figure shows the strong interest from power players in the GaN busi-

