Is it possible for GaN to reach more mainstream applications under 3.5 GHz?

“RF GaN Technology & Market Analysis: Applications, Players, Devices & Substrates 2010-2020” report from Yole Développement

Lyon, France – May 26, 2014 – “Today, the need for high-power, high-frequency transistors is increasing steadily, commensurate with the huge demand for wireless telecommunications”, explains Dr Kamel Madjour, Technology & Market Analyst, Yole Développement. Indeed more power, more frequency bands, better linearity and improved efficiency are still driving RF semiconductor devices’ current development, since the market needs devices able to handle all of these specifications at a reasonable price. So, under this context, is it possible for GaN substrate to reach more mainstream applications under 3.5 GHz?

Recent mergers and acquisitions are a concern for the overall RF market and Si-LDMOS, GaAs and GaN-based devices. The overall RF market doesn’t seem big enough for so many players; as a result, companies are trying to gain scale in order to increase profitability, which has stagnated. We expect that commercial wireless telecom, CATV and defense applications will be the main applications affected.

“Although significant improvements have been achieved in RF GaN-based devices (performance and yields), we believe there’s still a barrier preventing GaN-on-SiC from entering mainstream applications (i.e. in wireless telecom base stations or CATV)”, details Dr Hong Lin, Technology & Market Analysts at Yole Développement. In sub-3.5 GHz range...
applications, GaN-on-SiC is not cost-effective enough vs. Si-LDMOS, resulting in low market penetration rates. Macom and IQE believe they will enter mass production using 6” and 8” GaN-on-Si substrates in two years. IQE will offer Macom a significant mass production level due to its existing production for other applications. Our analysis shows that GaN-on-Si could be implemented in 2 - 5 years within telecom base stations, Milcomm & CATV. In this optimistic scenario, RF GaN-based devices could see an increased penetration rate and reach more than 20 % of the overall RF device market by 2020.

All results are presented in a new report released by Yole, last week. RF GaN Technology & Market Analysis: Applications, Players, Devices & Substrates 2010-2020 report is dedicated to the to RF GaN technology. It is part of the huge collection of technology & market analysis performed by Yole’s Compound Semi. & Power Electronics team, including GaN-on-Si substrate technology & market, GaN-on-Si substrate patent, sapphire applications ... and Power GaN (To be released in June 2014). Under this report, analysts review the technological challenges and solutions for GaN-based power RF devices. They provide an overview of the playground as well as an in-depth analysis of the technological and cost aspects. This report also includes an overview of possible business models and market data. More info. on www.i-micronews.com, reports section.


- **Authors:**
  
  Dr. Kamel Madjour recently joined Yole Développement as a Technology & Market Analyst for Compound Semiconductors and Power & RF Electronics. Dr. Madjour holds a Ph.D. and an M.Sc in microelectronics and a second M.Sc in sales and marketing. Before joining Yole Développement, he worked as a research scientist with the Institute of Micro & Nano-Electronics at Lille (IEMN Lab.), focused mainly on the development of new GaN-based transistors and detectors for microwave and millimeter-wave applications.

  Dr. Hong Lin has worked at Yole Développement as a Technology and Market Analyst since 2013. She specializes in Compound Semiconductors and provides technical and economic analysis. She is the main author of the following reports: “Bulk GaN 2013”, “GaN-On-Si 2014” and “GaN-On-Si Patent investigation 2014”. Before joining Yole Développement, she worked as an R&D engineer at Newstep Technologies, where she oversaw the development of cold cathodes by PECVD for visible and UV lamp applications based on nanotechnologies. Dr. Lin holds a Ph.D in physics and chemistry of materials.

- **Companies cited in the report (non-exhaustive list)**

Innovation, Suzhou Jiangzhan Semiconductor, TDI, Telstra, Thales, Thales 3-5 lab., T-Mobile, Toshiba, ToyodaGosei, UMS, US Air Force Laboratory, Verizon, WIN Semiconductors and more…

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