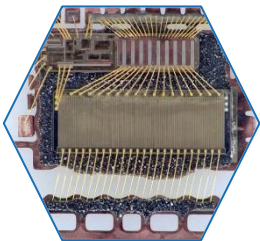
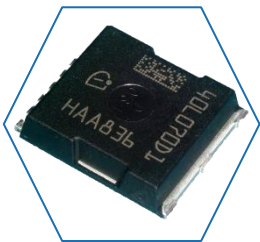


## GaN Power Transistor Comparison 2020

*Comparison of the technology and cost of 18 GaN devices from: EPC, GaN Systems, Infineon, Innoscience, Navitas, Nexperia, Panasonic, Power Integrations, Texas Instruments and Transphorm.*



GaN devices are gaining the confidence of many customers and are penetrating various applications. This is confirmed by the promising market outlook for GaN devices having a compound annual growth rate (CAGR) of 81% for the period 2019-2025 according to Yole Développement. This relates to market forces pushing for loss reduction and improved efficiency.

Since their first commercialization in 2010, the performance of GaN devices and the value that they add have been gradually proven. Their price has also become increasingly acceptable to end users. Manufacturers use different approaches for device design, depending on the targeted electrical performance and application.

GaN devices still have some technical and commercial challenges to face. For example, both GaN wafer processing and packaging impact the price and make it the major cost-driver of a GaN device. Other challenges include the complexity of some process steps, mainly epitaxy, which hinder GaN adoption on a large commercial scale.

In this report, System Plus Consulting presents an overview of the state-of-the-art of GaN power devices. It highlights differences in design and manufacturing processes, and their impact on device size and production cost. Overall, it analyses

18 devices from ten of the main suppliers: EPC, GaN Systems, Infineon, Innoscience, Navitas, Nexperia, Panasonic, Power Integrations, Texas Instruments and Transphorm. The report includes optical and SEM pictures of the devices to understand the technological choices at die design and assembling level.

This report includes an estimated manufacturing cost of the analysed GaN devices and their selling prices. It provides physical, technological, and manufacturing cost comparisons between the analysed devices.

### COMPLETE TEARDOWN WITH

- Detailed optical and SEM photos
- Precise measurements
- Material EDX analysis
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis
- Estimated selling price
- Technology and cost comparisons of low voltage and medium voltage GaN devices

**Title:** GaN Power Transistor Comparison 2020

**Pages:** 279

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**Price:** EUR 6,490

**Reference:** SP20538

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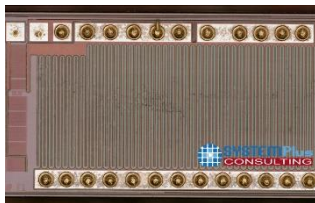


**Taha Ayari, PhD** is involved in analyzing compound semiconductor devices within Power Electronics and Compound Semiconductors team. Taha holds a PhD in Electrical and Computer Engineering from Georgia Tech Lorraine.



**Peggy Gallois** joined System Plus Consulting's laboratory of microelectronics team in July 2019. She has a deep knowledge of metallic materials. She previously worked in the laboratory of metallographic expertise for Dassault Aviation near Paris.

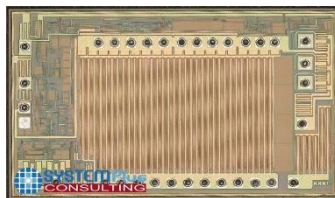
## RELATED REPORTS



### Innoscience's 650V GaN-on-Si Transistor

*The first 100% Chinese GaN-on-Si power device found in Rock's fast charger, manufactured on an 8-inch platform.*

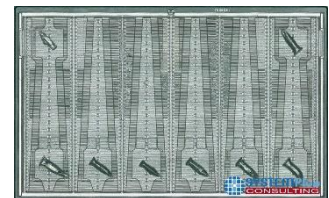
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October 2019 - EUR 3,990\*

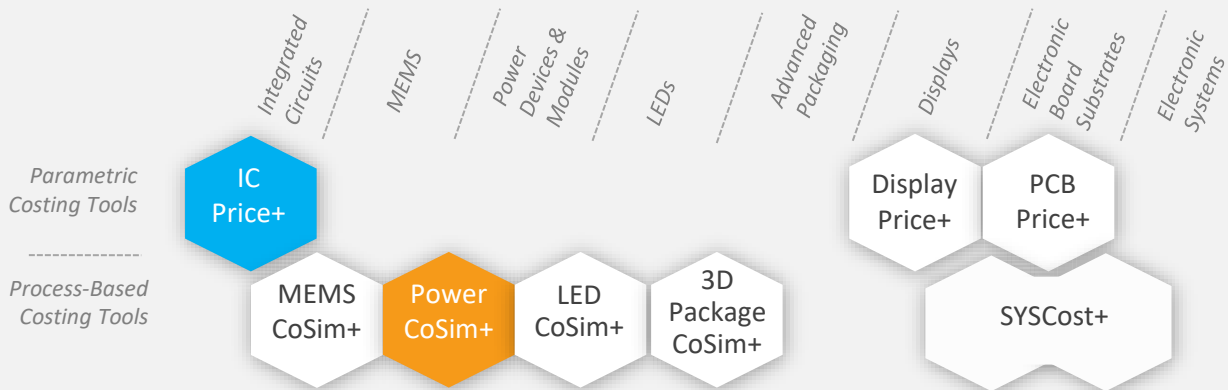


### Nexperia's AEC-Q101 Qualified 650 V GaN-based Power Device

*Deep analysis of the GAN063-650WSA, Nexperia's first GaN product.*

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## COSTING TOOLS



Our analysis is performed with our costing tools Power CoSim+ and IC Price+.

System Plus Consulting offers powerful costing tools to evaluate the production cost and selling price from single chip to complex structures.

### Power CoSim+

Cost simulation tool to evaluate the cost of any Power Electronics process or device: from single chip to complex structures.

### IC Price+

The tool performs the necessary cost simulation of any Integrated Circuit: ASICs, microcontrollers, memories, DSP, smartpower...

## ABOUT SYSTEM PLUS CONSULTING

## WHAT IS A REVERSE COSTING®?

Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



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Buyer must note that placing an order means an agreement without any restriction with these terms and conditions.

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Prices of the purchased services are those which are in force on the date the order is placed. Prices are in Euros and worked out without taxes. Consequently, the taxes and possible added costs agreed when the order is placed will be charged on these initial prices.

System Plus Consulting may change its prices whenever the company thinks it necessary. However, the company commits itself in invoicing at the prices in force on the date the order is placed.

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The quoted prices already include the rebates and discounts that System Plus Consulting could have granted according to the number of orders placed by the Buyer, or other specific conditions. No discount is granted in case of early payment.

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System Plus Consulting delivered services are to be paid within 30 days end of month by bank transfer except in the case of a particular written agreement.

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System Plus Consulting remains sole owner of the delivered services until total payment of the invoice.

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The delivery schedule on the purchase order is given for information only and cannot be strictly guaranteed. Consequently any reasonable delay in the delivery of services will not allow the buyer to claim for damages or to cancel the order.

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The transport costs and risks are fully born by the Buyer. Should the customer wish to ensure the goods against lost or damage on the base of their real value, he must imperatively point it out to System Plus Consulting when the shipment takes place. Without any specific requirement, insurance terms for the return of goods will be the carrier current ones (reimbursement based on good weight instead of the real value).

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System Plus Consulting responsibility will not be involved in non execution or late delivery of one of its duties described in the current terms and conditions if these are the result of a force majeure case. Therefore, the force majeure includes all external event unpredictable and irresistible as defined by the article 1148 of the French Code Civil?

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As a rule, all information handed by customers to system Plus Consulting are considered as strictly confidential. A non-disclosure agreement can be signed on demand.

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