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IC

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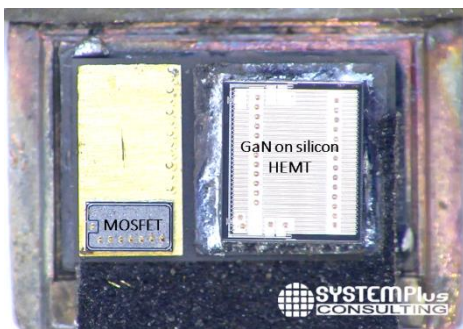
PACKAGING

SYSTEM

POWER

Transphorm TPH3208PS 650V GaN HEMT

A new 650V GaN HEMT from Transphorm with a simplified cascode structure and enhanced electrical characteristics



In tearing down the new TPH3208PS GaN HEMT from Transphorm, System Plus Consulting has found the company is using a new manufacturing process. The epitaxy is optimized to reduce the die area and increase current density. The transistor's metal contact and field plate structure

have also been shrunk from the previous version.

The TPH3208PS is a 650V EZ-GaN™ HEMT for high frequency operation from Transphorm. Manufactured by Fujitsu and assembled in a TO220 package, it features the Quiet-Tab™ scheme, which increases switching speed.

The TPH3208PS combines a normally-on GaN-on-Silicon HEMT, which withstands high voltages, and a standard low voltage MOSFET, which drives high frequency, in a cascode configuration that ultimately yields a normally-off transistor. The cascode structure has been simplified compared to the previous model. The report shows all changes in the cascode structure.

Based on a complete teardown analysis, the report provides an estimation of the production cost of the package, HEMT, MOSFET and resistor.

The report also proposes a comparison with GaN Systems' GS66504B 650V HEMT, Panasonic's PGA26C09DV 600V HEMT and Transphorm's TPH3206PS 600V HEMT. This comparison highlights the huge differences in design and manufacturing processes and their impact on device size and production cost.

Title: Transphorm TPH3208PS
650V GaN HEMT

Pages: 98

Date: May 2017

Format: PDF & Excel file

Price: Full report: EUR 3,290

COMPLETE TEARDOWN WITH:

- Detailed photos and identification
- SEM analysis of epitaxy layers and transistor structure
- EDX analysis of epitaxy layers
- Manufacturing process flow
- In-depth economic analysis
- Manufacturing cost breakdown
- Selling price estimation
- Comparison with other Transphorm and GaN Systems devices

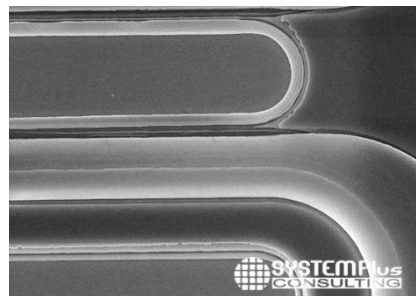
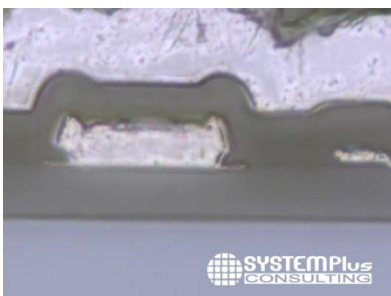


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AUTHORS:



Sylvain Hallereau

Sylvain is in charge of costing analyses for IC, power and MEMS. He has more than 10 years of experience in power device manufacturing cost analysis and has studied a wide range of technologies.



Yvon Le Goff (Lab)

Yvon has joined System Plus Consulting in 2011 to setup its laboratory. He previously worked for 25 years at Atmel Nantes Technological Analysis Laboratory as fab support in physical analysis, and for three years at Hirex Engineering in Toulouse, in a destructive physical analysis lab.

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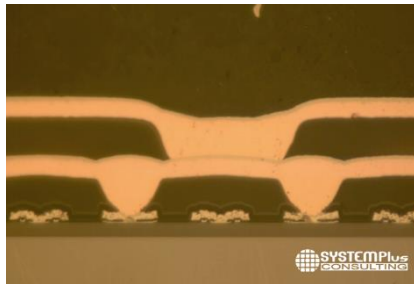
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Panasonic PGA26C09DV 600V GaN HEMT

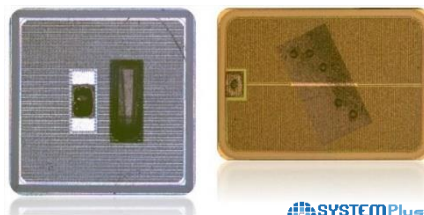
Panasonic's first 600V GaN HEMT has an innovative structure designed to integrate a normally-off transistor in a standard package, without a cascode structure.



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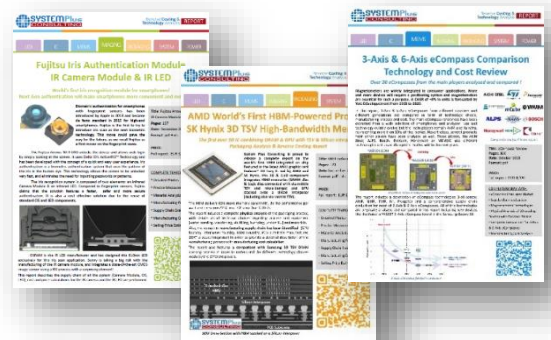
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