

IMS 2012-Panel Session

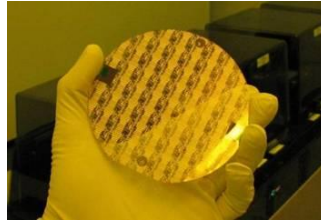
GaN market opportunities

UMS

GaN in UMS

● GaN offers:

- Better system performance
- Architecture simplification
- Less environmental impact
- Lower operating costs



● Market:

- GaN is maturing
- Defence is
 - an early adopter
 - the fastest growing segment
- New applications will emerge:
 - as maturity increases
 - as costs go down



● UMS strategy:

- GaN is strategic for UMS
- Defence is the first key target
- extends UMS' power leadership
 - Product offer
 - Foundry services



● Partners:

- UMS is at the centre of European GaN
- European Defence & Space Agencies
- Cooperation with NXP
- Collaboration with R&D labs in Europe

Power GaN technology overview

● GH50 technology:

- MCM & Discrete devices
- Up to C-Band (7 GHz)
- High voltage : up to 50V
- Highly robust (VSWR & Thermal)
- Design for very wideband applications
- Power Transistors up to 200W CW



Technology in production

● GH25 technology:

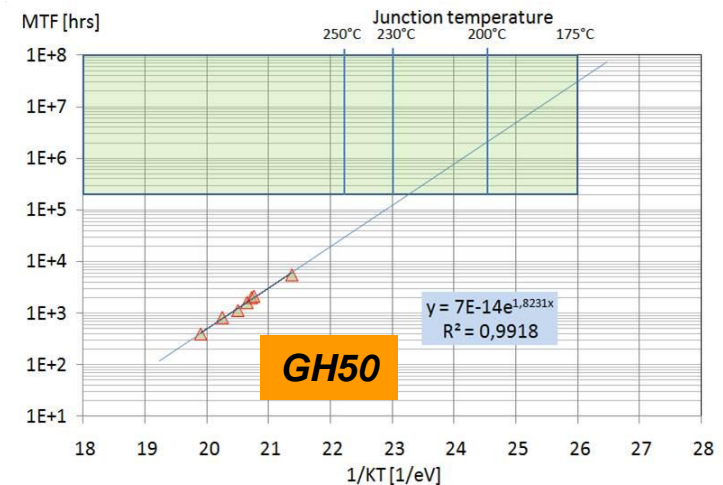
- MMIC, MCM & discrete devices
- Up to Ku-band
- High voltage : up to 30V
- Highly robust (VSWR & Thermal)
- High PAE performance

Move to 4" in progress

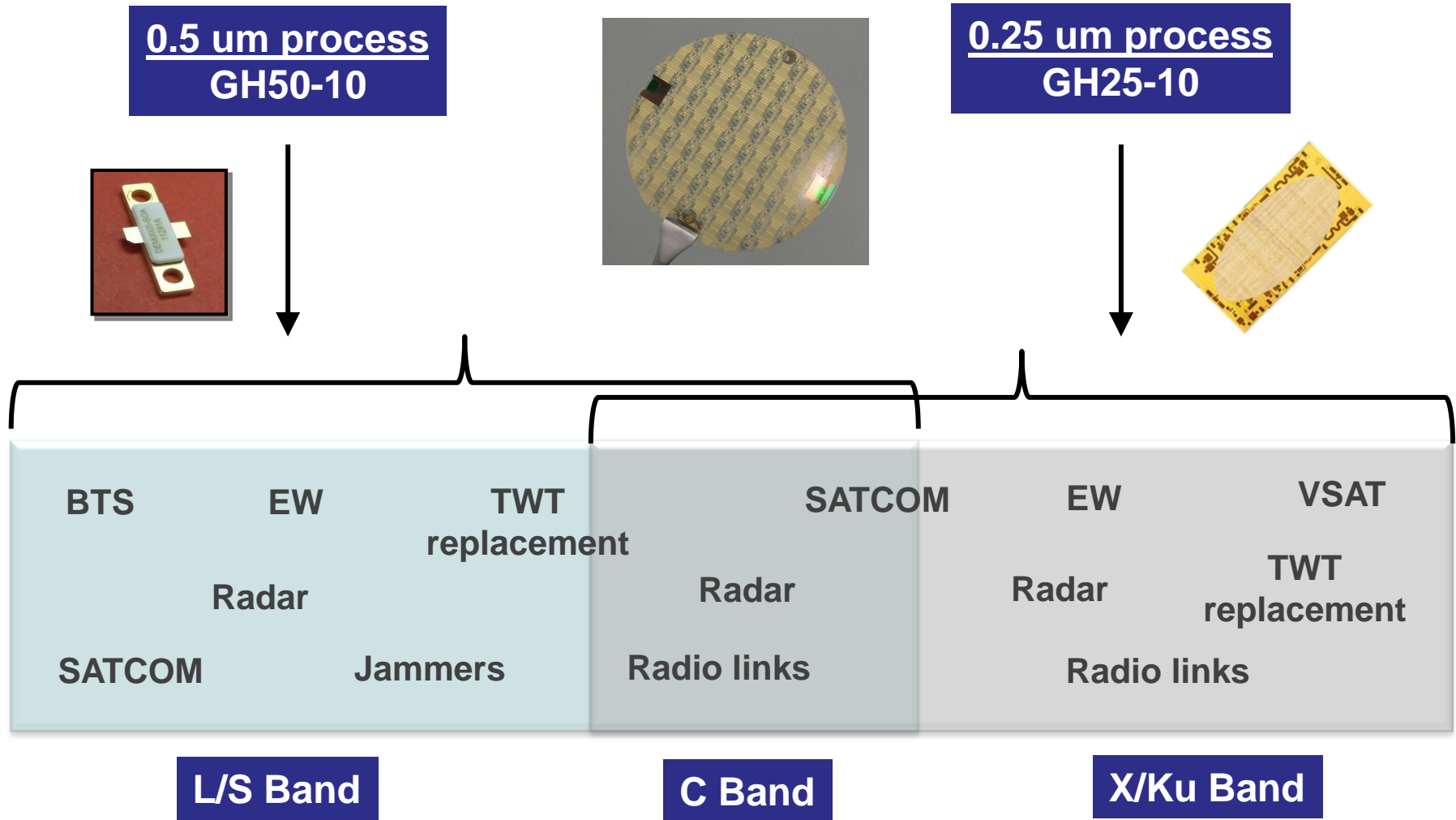
● GH50 reliability assessment:

- >16 wafers used for qualification
- >300 devices tested
- >80,000 hours of life test (10years)
- >24,000,000 cumulated component hours

MTF >200 years @ $T_j=200^\circ\text{C}$



GaN applications and UMS technology & product offer



All information contained in this document remains the sole and exclusive property of UNITED MONOLITHIC SEMICONDUCTORS and shall not be disclosed by the recipient to third party without the prior consent of UNITED MONOLITHIC SEMICONDUCTORS.

UMS RESTRICTED

Applications: Radar (AESA)

● Applications:



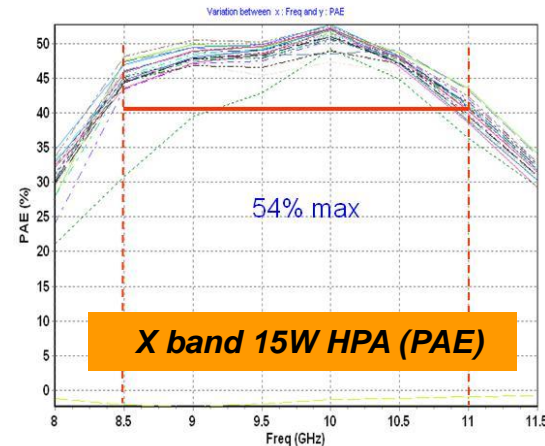
● Market needs:

- Improved detection range
- Improved system capability (multiband)
- Improved robustness and reliability
- Simplify system architecture
- Reduce size and weight

● GaN offers:

- Higher PAE and better power density
- Higher robustness
- Broadband PA
- Robust LNA
- Lower consumption

● UMS Offer:



CHK080

Applications: Jammers and EW

- Applications:



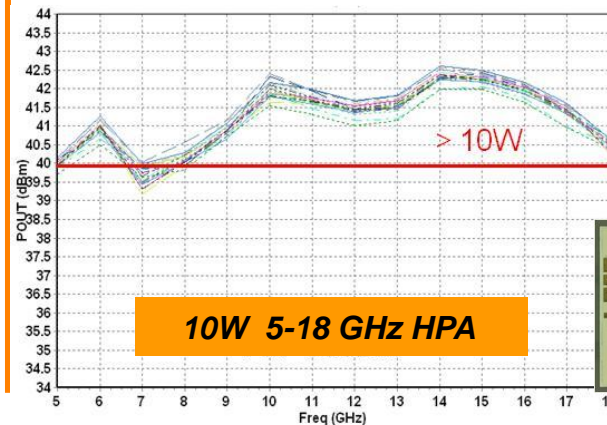
- GaN offer:

- Higher PAE for broadband PA
- Higher output power
- Easy wide-band matching
- Better thermal behaviour
- Higher robustness

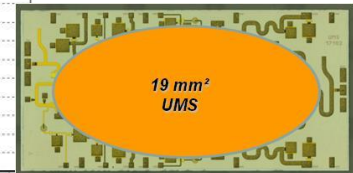
- Market needs:

- More power and less power dissipation
- Increase bandwidth
- Improve robustness and reliability
- Reduce size and weight

- UMS Offer:



CHK040



All information contained in this document remains the sole and exclusive property of UNITED MONOLITHIC SEMICONDUCTORS and shall not be disclosed by the recipient to third party without the prior consent of UNITED MONOLITHIC SEMICONDUCTORS.

UMS RESTRICTED

Applications: SATCOM & Military communication

● Applications:



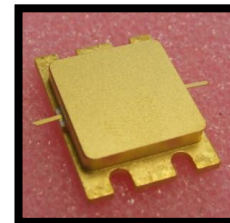
● Market needs:

- Replace TWT by SSPA
- More output power
- System simplification
- Reduce size and weight
- Lower consumption

● GaN offer:

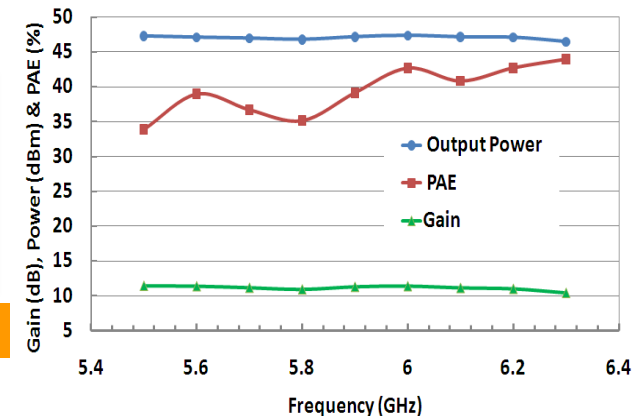
- Higher efficiency
- Higher power density
- Better robustness
- Broadband PA with good efficiency

● UMS Offer:



CHZ050A

C-band 50W HPA



Applications: Commercial Telecom Infrastructure

- Applications:



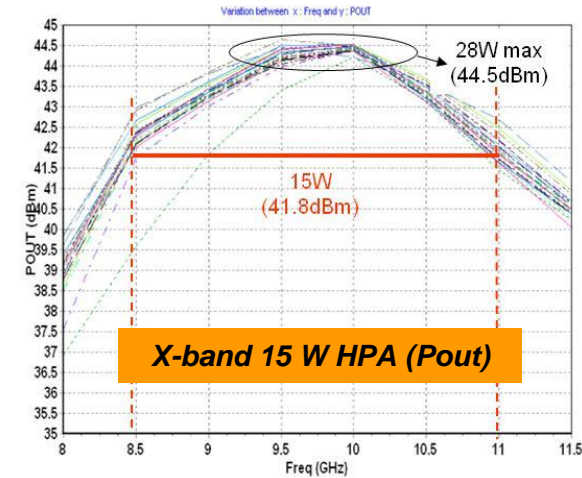
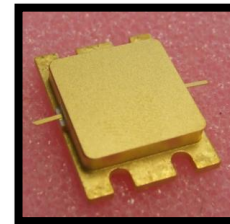
- Market needs:

- More capacity
- Lower consumption
- Increase bandwidth
- Size reduction
- Cost reduction \$/W

- GaN offer:

- Higher PAE
- Higher power density
- Broadband PA with good efficiency
- Better thermal behavior
- Higher robustness

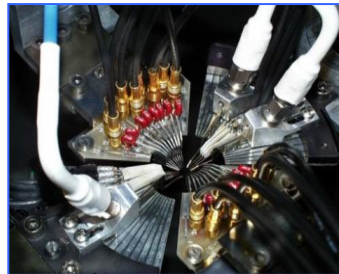
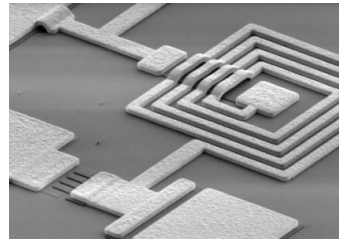
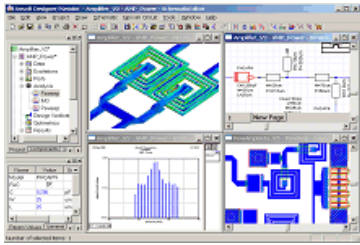
- UMS offer:



the sale and exclusive property of UNITED MONOLITHIC SEMICONDUCTORS and shall not be disclosed by the recipient to third party without the prior consent of UNITED MONOLITHIC SEMICONDUCTORS.

UNITED MONOLITHIC SEMICONDUCTORS

Open foundry service based on GH25



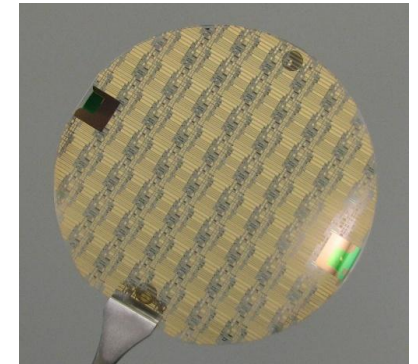
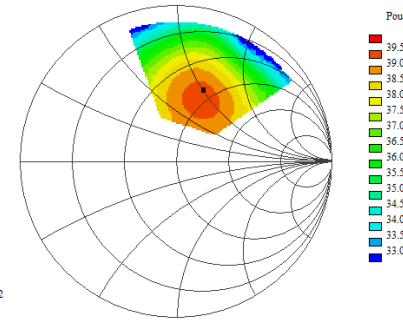
● Offer:

- GH25 MMIC technology
- Open foundry service
- Applications up to 20 GHz
- Back-end activity on demand

● Status:

- Preliminary design kit is available
- Early technology access available
- > 30 successful projects to date

Load pull characterization



All information contained in this document remains the sole and exclusive property of UNITED MONOLITHIC SEMICONDUCTORS and shall not be disclosed by the recipient to third party without the prior consent of UNITED MONOLITHIC SEMICONDUCTORS.

UMS RESTRICTED

Conclusions and next steps

- GaN is a disruptive technology which is rapidly maturing
- Technologies & products are available today to create improved systems
- UMS is bringing to market directly and via our NXP partnership:
 - Two reliable GaN technologies
 - Standard and custom power transistors and MMIC products
 - Early foundry access
- Next steps in UMS:
 - Increasing production volumes
 - Continuous improvement of production yields
 - Full release of GH25 technology mid 2013
 - Space evaluation of GaN technologies

