Build your own **GaN & GaAs** solutions with UMS

Space Evaluated Technologies

www.ums-gaas.com
UMS has developed a proven family of GaAs and GaN based processes for high performance low noise and high power MMICS. These processes are extensively used by foundry customers and by UMS to offer MMIC solutions for the Defence, Automotive, Space, Telecom and Industrial markets.

UMS Design Manuals and Design Kits developed by highly skilled engineers support the realisation of your own MMICs. During the design phase, the UMS Foundry team provides support and supplies you with wafers that meet Process Control Monitor specifications.

In addition, UMS offers several optional services including, foundry training, on-wafer tests (DC, RF, noise, power), wafer dicing, die sorting, visual inspection, picking and packaging or delivery of Known Good Dies (KGD).

This comprehensive range of services contributes to successful partnerships with our customers.

**RF & mm-wave applications**

UMS offers a large portfolio of fully tested, high-performance and reliable GaAs and GaN on SiC processes for MMIC design and production. Our state-of-the-art HBT and pHEMT technologies and our support services allow you to efficiently design and have your own circuits manufactured.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>GaN</th>
<th>GaAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1GHz</td>
<td>GH25 HEMT GaN (0.25µm)</td>
<td>PH25 Low Noise pHEMT (0.25µm)</td>
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<tr>
<td>2GHz</td>
<td></td>
<td>PH15 Very Low Noise pHEMT (0.15µm)</td>
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<tr>
<td>5GHz</td>
<td></td>
<td>PH10 Very Low Noise High Gain pHEMT (0.1µm)</td>
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<tr>
<td>10GHz</td>
<td></td>
<td>PPH25 Power pHEMT (0.25µm)</td>
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<tr>
<td>20GHz</td>
<td></td>
<td>PPH25X High Power pHEMT (0.25µm)</td>
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<tr>
<td>50GHz</td>
<td></td>
<td>PPH15X High Power pHEMT (0.15µm)</td>
</tr>
<tr>
<td>100GHz</td>
<td></td>
<td>HB20M VCO InGaP HBT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HP07 MesFet (0.7µm)</td>
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<tr>
<td></td>
<td></td>
<td>BES 100 Schottky Diode Technology</td>
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</tbody>
</table>

**ULRC** is a low-cost pure passive process on GaAs including:
- MIM capacitors
- Inductors
- Metallic resistors
- Via holes

It allows passive design:
- Couplers
- Filters
- RF matching circuit

- 0.25, 0.15, 0.10µm GaAs pHEMT
- 2µm HBT technology
- 0.7µm MESFET
- Schottky technology
- 0.25µm HEMT GaN on SiC
Our processes include:

- Air bridges
- MIM capacitors
- TaN and TiWSi resistors
- 100µm & 70µm thinning
- Via-holes
- Coating for packaging

Open processes / Wafer fabrication

Process Design Kits

UMS modeling and CAD Teams work on well established and advanced process technologies in order to provide complete and accurate Process Design Kits (PDK). These PDK include scalable active (small and large signal models) and passive models directly linked to auto-layout and library options, compatible with your CAD tools.

UMS PDKs include schematic capture, layout generation, layout verification (DRC) and 3D view generation for EM simulation. They are fully compatible with:

- ADS 2015 to ADS 2017 from Keysight for all processes.
- Microwave Office from NI-AWR for GaAs and GaN HEMT, HBT and Schottky diodes.
- Nexxim from Ansys for low noise pHEMTs and BES.

Circuit RF Option (Ansys)

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Foundry services

UMS offer is based on standard Foundry Services such as delivery of Design Kits and Design Manuals, mask and wafer manufacturing. UMS has also developed a large range of Back-End services to respond to customer needs.

Back-end services:

• **On-wafer tests:** UMS provide a unique set of automated on-wafer testing solutions for circuit characterization and sorting according to your product specifications. 17 automatic test stations enable full circuits characterization from 1 to 110GHz. 100% functional on-wafer tests are available (S parameters, DC, noise, CW or pulsed power).

• **Dicing:** UMS benefits from laser dicing equipments for GaAs.

• **Visual inspection:** UMS propose the visual inspection of your circuits according to your required commercial or space screening level.

• **Picking:** According to your sorting criteria, the individual die numbering allows identification of your chips. Known Good Dies may be delivered in Gel-Pak®, waffle pack or on UV-film.

Prototyping:

UMS has qualified a prototyping assembly line for small quantity of chips assembly in package or on board, for demo boards or test jigs.

**This line includes at least:**

• Ball & Wedge wirebonders
• Ovens for reflow
• 2D and 3D X-ray control
• Fine and gross leak testers

QFN packaging

UMS is enlarging its GaAs foundry offer with standard molded plastic packaging. This new offer enables single chip low cost plastic encapsulation of your circuits developed on UMS processes with the BCB option.

8 Standard QFN packages from 3x3mm² to 6x6mm² are offered. ADS models are available in the associated Design Kit for packaged MMIC designs.

This offer is available for production or prototyping runs with a minimum quantity.
Foundry course

The UMS Foundry Training Course provides you the opportunity to access to the complete GaAs and GaN MMIC design methodology provided by our experienced product line designers and engineers. Topics presented cover all aspects: process, modeling, CAD demo, design, reliability, electrical measurement, picking, packaging and industrialization.

Technology processes, Low Noise Amplifier, Power Amplifier and Mixer design flows and production rules are addressed in detail during these 2 day sessions. Foundry courses are organized regularly and on request.

Multi Project Wafer (MPW)

Shared foundry runs or Multi-Project Wafers are a cost effective foundry approach well suited for institutes, labs, research centers and universities. This service allows different customer projects on a single wafer.

Participants have free access to Design Kits and will receive 20 diced & untested MMICs in Gel-Pak® box.

The possible die length and width, including dicing streets, are:

- **For high power processes PPH25X, PPH15X:**
  - 1.4; 2; 2.4; 3.4; 4; 4.4mm with maximum aspect ratio 1:3

- **For low-medium power processes PH25, PH15, PH10, PPH25, HB20M, HP07, BES:**
  - 1; 1.4; 2.4; 3.4; 4mm with maximum aspect ratio 1:3

- **For passive process ULRC:** 1.4; 2; 2.4; 3.4mm

Price is determined according to die area and process.

You will find additional details and planning on our website www.ums-gaas.com

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Example of mask tiles with available die size (mm).

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Contact UMS

For further technical information about foundry services, please contact our foundry team:

E-mail: foundry@ums-gaas.com

In addition to Foundry services, UMS offers a complete family of microwave products and solutions, both in standard and ASIC forms.

For further information about our products and ASICs, please contact:

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Visit our website: www.ums-gaas.com

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UMS is committed to offer full space evaluated processes. UMS is certified ISO 9001, ISO 14001 and ISO TS16949.