

## GaAs Integrated Circuits: Their Evolution in Alenia Towards Next Generation Electronic Sub-systems

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Reducing costs, increasing performance and improving reliability have always been, and will remain, the major objectives of any competitive technology. These objectives together with the requirements of emerging applications (operation at higher frequencies, higher levels of integration, analogue/digital interfaces, etc.) are determining the technological milestones for next generation electronic sub-systems based on GaAs and related compounds.

In this presentation the evolution of GaAs integrated circuits in Alenia towards next generation electronic sub-systems will be outlined by tracing a route from single function MMIC and hybrid high power components to multi-function self-packaged sub-system modules. In so doing, the concept of sub-system design conceived to take full advantage of GaAs MMIC potential will be discussed and the following basic technologies introduced:

- ion-implanted MESFET technology for the production of low-level, control and power MMIC's up to 20GHz;
- heterostructure "δ-doped" PHEMT technology for the production for low-level/low noise MMIC's up to 40GHz;
- heterostructure HFET technology for the production of power MMIC's up to 30GHz;
- miniaturised hybrid solid state power amplifier (SSPA) technology for high power ( $P_o \geq 10W$ ) sub-systems;
- multi-function self-aligned gate (MSAG) technology for high reliability low cost analogue/digital MMIC's;
- GaAs and InP based heterostructure technologies for low-level and power millimetre-wave applications;
- advanced assembly/packaging techniques for next generation electronic sub-systems.

Development of new or modified technologies is determined by the company's future market interests and is integrated with existing production to ensure not only that the next generation products are available when the commercial markets emerge but more important to ensure maximum sensitivity to unforeseen technical difficulties and/or variations in market trends.