Yes, we GaN!

IMM-Catania in the year of Gallium Nitride

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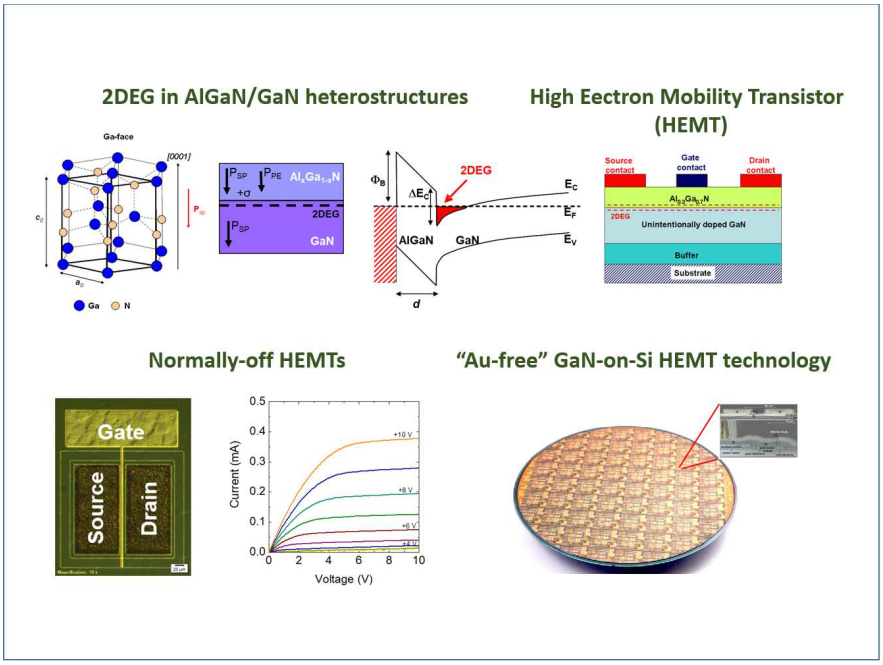

Gallium Nitride (GaN) is a widely used material for optoelectronics devices, e.g. LEDs and laser diodes. However, owing to its excellent properties, like a wide band gap, high critical field, electron mobility and saturation velocity, this semiconductor can find application also in power electronics, where it can guarantee superior performances with respect to conventional Si devices and can co-exist with the more mature (and popular) wide band gap 4H-SiC.

In this presentation, first the properties of GaN and related heterostructures will be briefly introduced, illustrating the potential benefits of the material for power electronics applications. Then, some highlights on the research activities carried out at IMM-Catania in the framework of EU and National projects will be given, and explained also in the context of the current power device market's trends. Finally, the recent evolution of this research and its perspectives within the new funded project GaN4AP will be shortly presented.

References

[1] F. Roccaforte, P. Fiorenza, R. Lo Nigro, F. Giannazzo, G. Greco, *Physics and technology of gallium nitride materials for power electronics*, Riv. Nuovo Cimento **41** (2018) 625-681

[2] F. Roccaforte, G. Greco, P. Fiorenza, F. Iucolano, *An overview of normally-off GaN-based high electron mobility transistors*, Materials **12**, (2019) 1599.

[3] *Nitride Semiconductor Technology: Power Electronics and Optoelectronic Devices*, First Edition. Edited by F. Roccaforte and M. Leszczyński. © 2020 Wiley-VCH Verlag GmbH & Co. KGaA.