

RECONFIGURABLE SOI-CMOS PA

HIGH POWER BROADBAND RECONFIGURABLE SOI-CMOS PA MODULE

+ ABOUT THIS RECONFIGURABLE SOI-CMOS PA

CEA-Leti introduces a reconfigurable SOI-CMOS PA that can penetrate 4G, 5G and WiFi6/6E markets. To do so, CEA-Leti has developed a high power highly integrated broadband reconfigurable SOI-CMOS PA supporting High-Power User-Equipment (HPUE) power mode with excellent efficiency and linearity without pre-distortion and supply modulation.

+ APPLICATIONS

- 4G/5G front-end modules for smartphones
- WiFi6/6E front-end modules
- Energy-efficient low-cost 5G small-cell and WiFi6/6E networks for smart manufacturing and Industry 4.0.

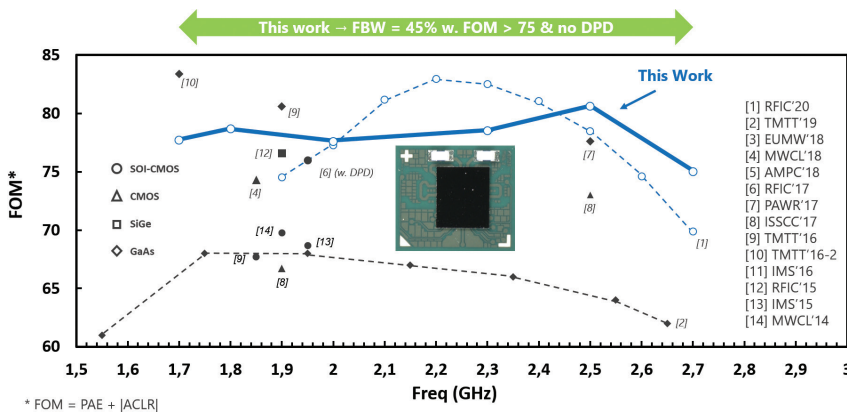
+ WHAT'S NEW?

About the broadband reconfigurable PA Module:

- Combines a high-efficiency tunable Doherty architecture with SOI-CMOS technology
- Classical bandwidth limitation of the Doherty PA architecture is overcome by an efficient integration of tunable features in SOI-CMOS technology
- PA module includes biasing and digital control circuitry on the same die

Key figures:

- Wideband signals (10 to 100 MHz) with high peak-to-average-power-ratio (> 6dB)
- State-of-the-art efficiency (57% peak)
- High power levels (up to 4 Watts)
- Extended frequency range (1.7GHz to 2.7GHz)
- High-linearity (<-35dBc) and efficiency (>40%) over the entire operating band (1.7-2.7GHz)



Benefits from RFSOI PA solution:

- From a design perspective, enabling the integration of several additional features (digital controller, power management, LNAs and switches) along with the PAs.
- Cost reduction of the RF FEM, RFSOI foundries having a large capacity for high-volume production with 200mm and 300mm wafers.
- The combination of these factors will enable energy-efficient low-cost digitally assisted 5G small-cells and WiFi6/6E networks for smart manufacturing and Industry 4.0.

CEA-Leti, technology research institute

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+ CEA-LETI'S ROADMAP

1. **Develop new High-Efficiency PA and Transmitter architectures** such as hybrid load/supply modulated architectures, enabling significant boost in efficiency, operating bandwidth, and linearity.
2. **Develop new integrated RFSOI FEM (Front-end-Module) demonstrators** to address new applications/markets such as 5G small-cell, Cellular Vehicle-to-Everything (C-V2X), WiFi6/6E, 5G FR1/FR2 UE and infrastructure applications.
3. **Explore higher frequencies and new technologies (RFSOI, GaN)** requiring a move toward more aggressive nodes (<100nm), and the use of Fan-Out-Wafer-Level Packaging (FOWLP) to enable low-profile RF FEM solutions.

KEY FACT

Best Industry Paper Award–
2nd place, IEEE Radio Frequency
Integrated Circuits Symposium
(RFIC), 2020

INTERESTED IN THIS TECHNOLOGY?

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