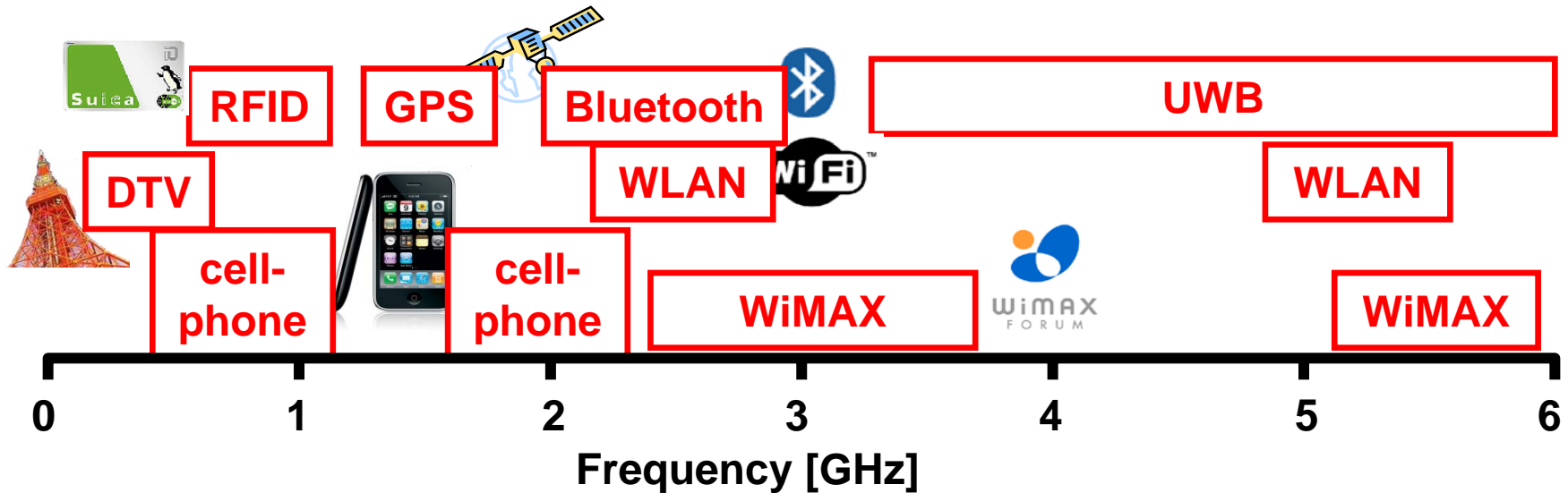


A 2-6 GHz Fully Integrated Tunable CMOS Power Amplifier for Multi-Standard Transmitters

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A broadband device(PA) is necessary
to support various communication methods.

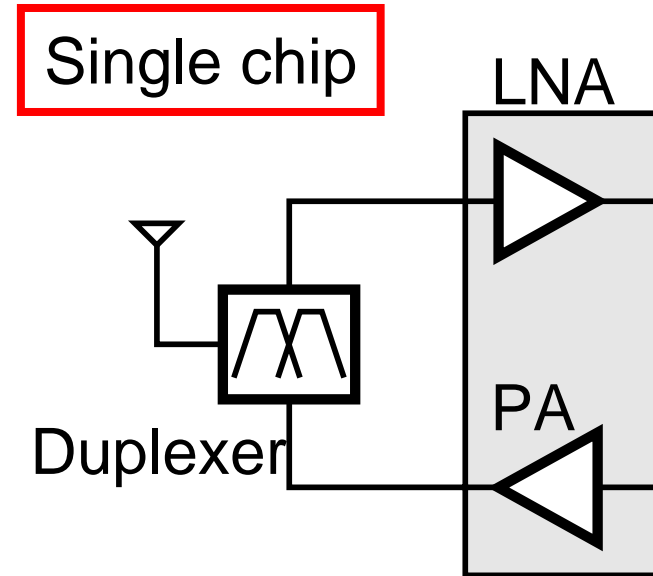
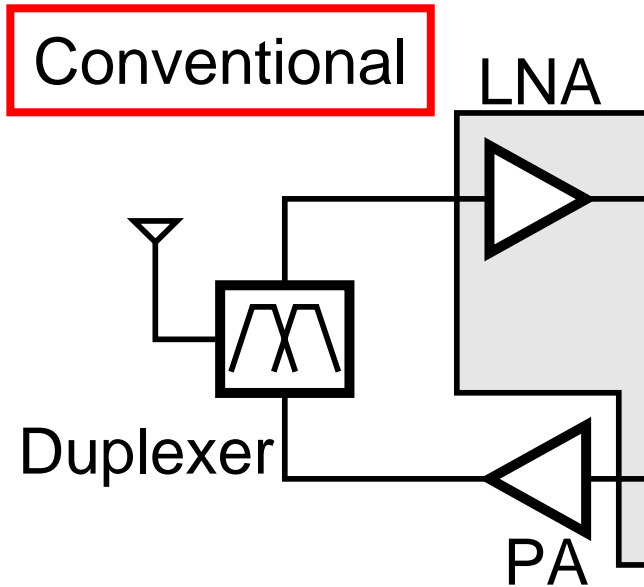


Problems of reported wideband PA

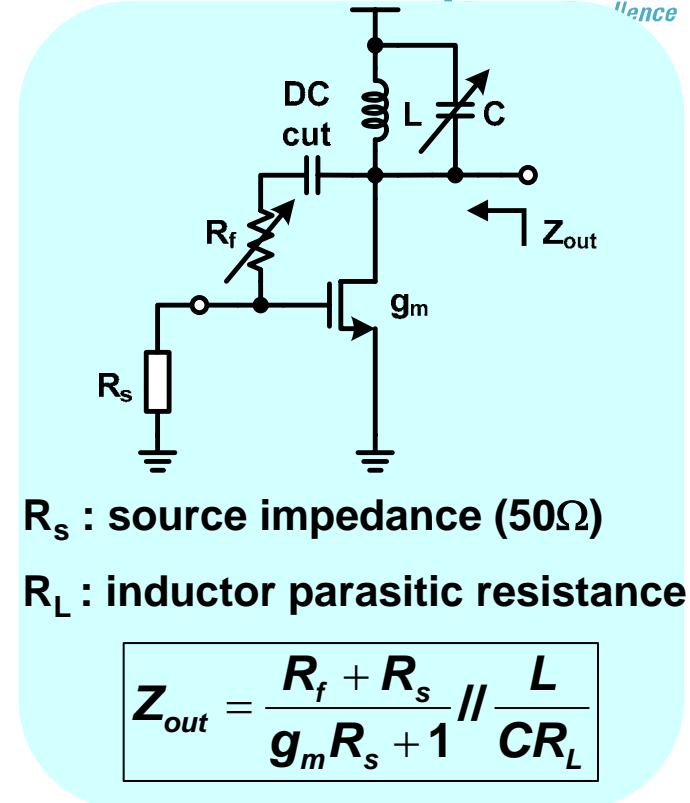
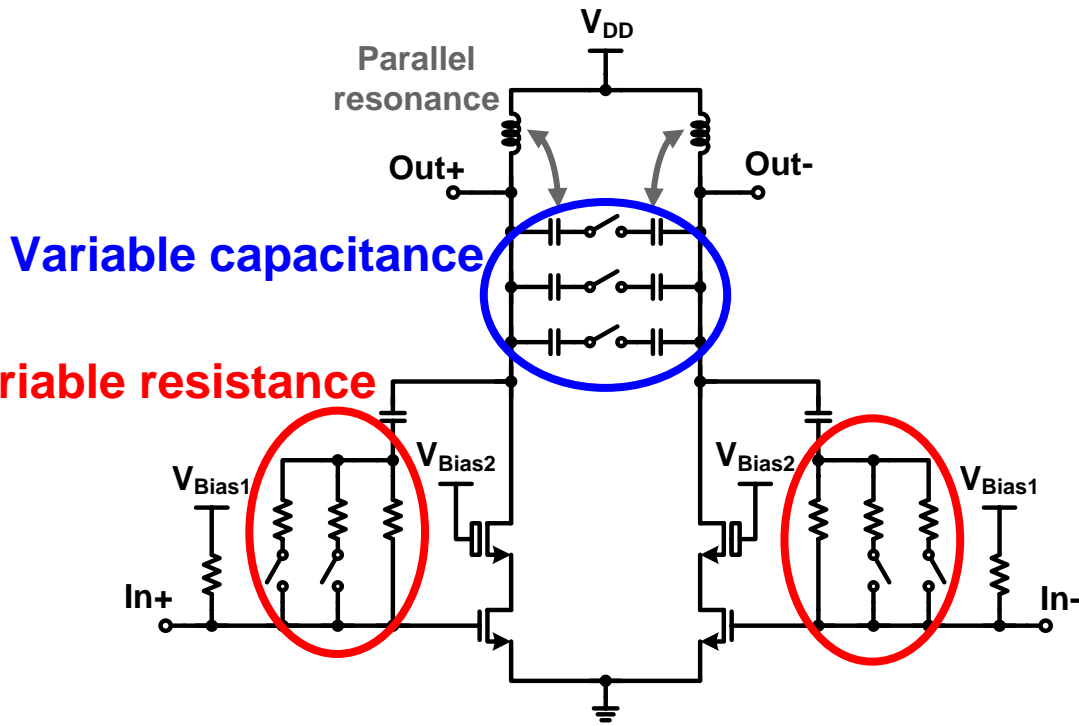
- large area
- Insufficient output power, etc.

Realization of single chip is demanded

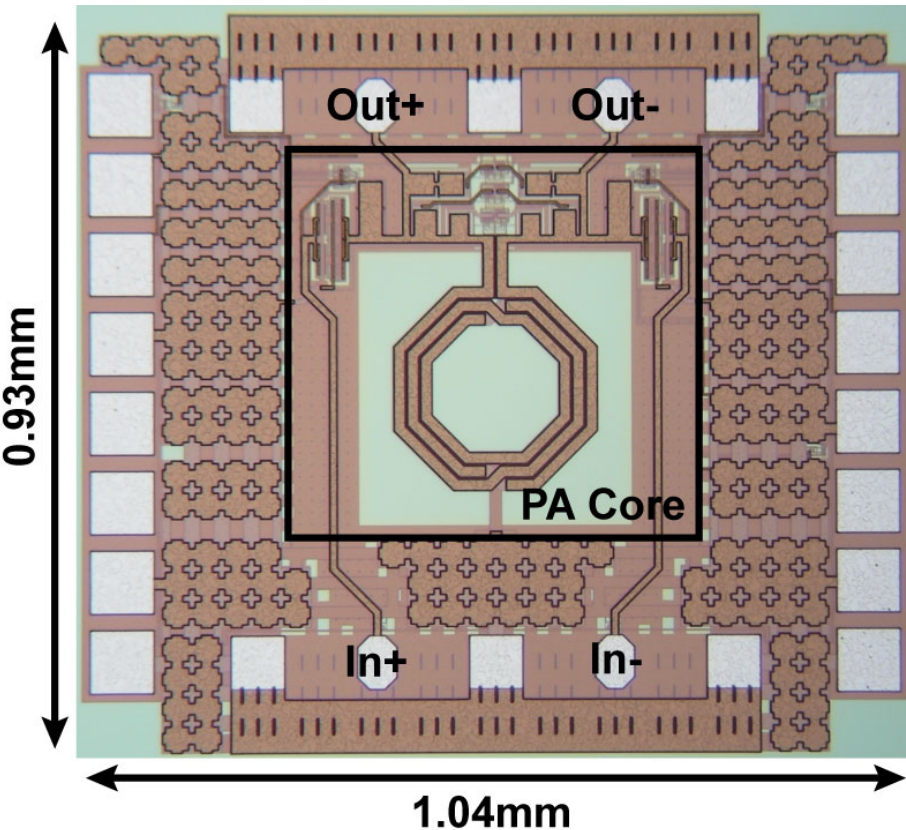
by making a CMOS PA on chip.



➔ I made a CMOS PA having a characteristic of **broadband(tunable)** and **downsizing** by using resistance feedback and parallel resonance.

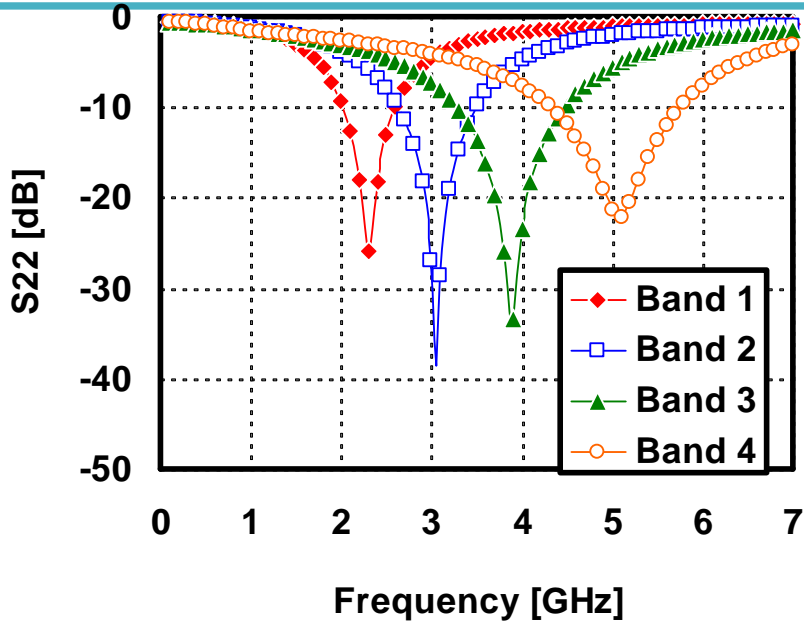


- Class-A bias
- Differential topology for 3dB larger P_{sat}
- Change output matching band by switching C and R
- Isolators was removed by maintaining Z_{out} to 50Ω

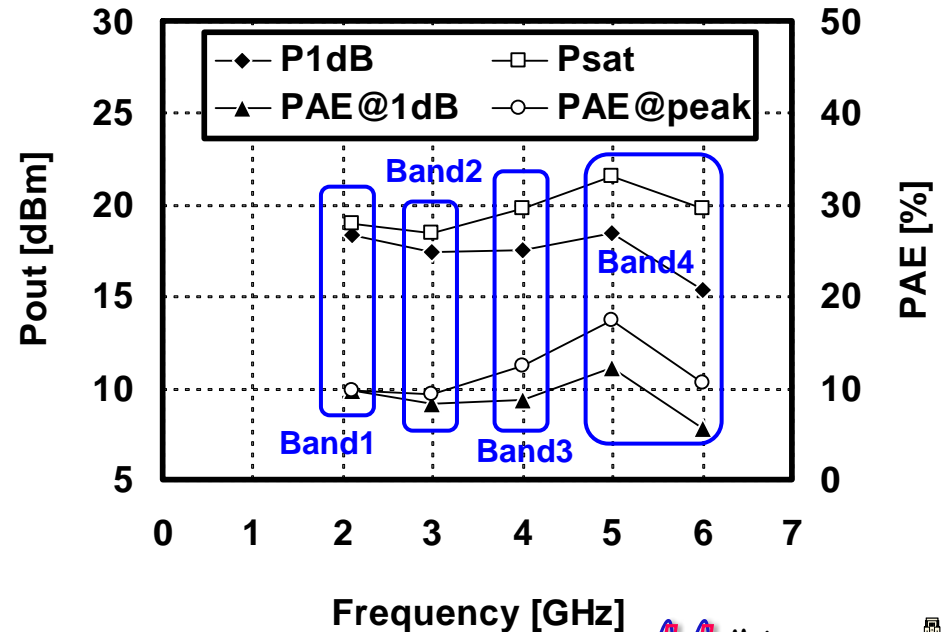
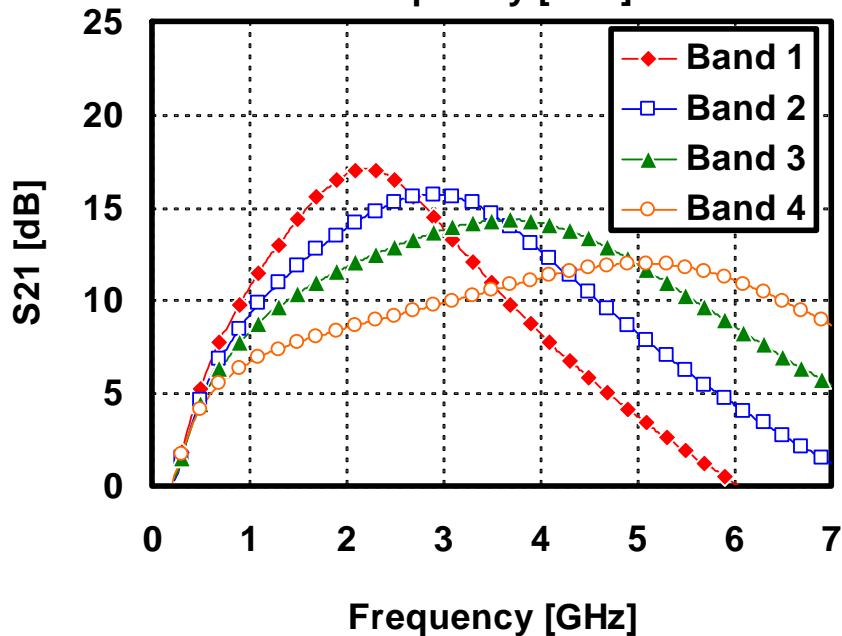


Tunable PA	
Technology	0.18 μ m CMOS
Frequency	2-6GHz
V_{DD}	3.3V
Output matching	Tunable

Measurement results



S₂₂ [dB]	≤ -8
Freq.[GHz]	2.1-6
P_{1dB} [dBm]	15-18
P_{sat} [dBm]	18-22
PAE_{max} [%]	9-17



- **Purpose**

- For multiband transmitters, making CMOS PA that can tune an output impedance matching in broadband.

- **Method**

- Making a prototype using 0.18 μ m CMOS process
- Utilizing resistive feedback and parallel resonator with an inductor and a tunable capacitor array

- **Result**

- Output impedance matching from 2.1GHz to 6.0GHz
- Output 1dB compression point more than 15dBm
- Realization an isolator-less PA

➡ **The first tunable PA at 2-6GHz**