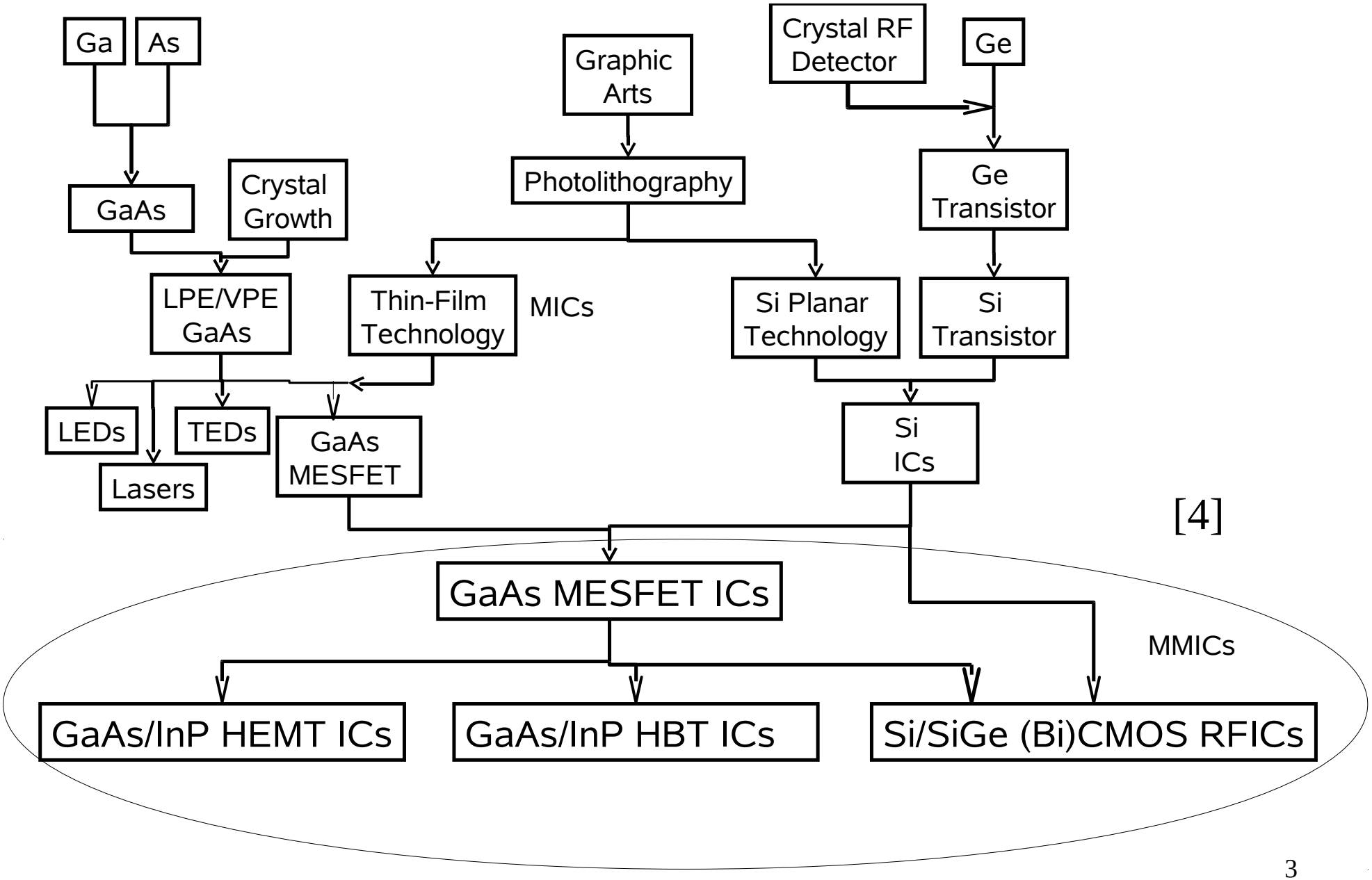
# 1. Introduction

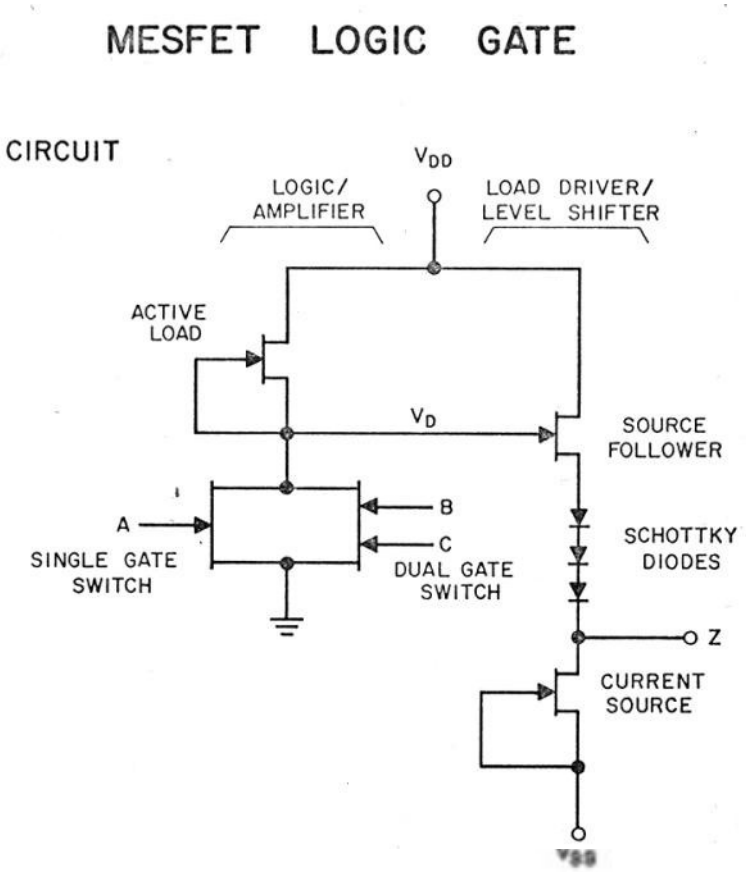
# Outline

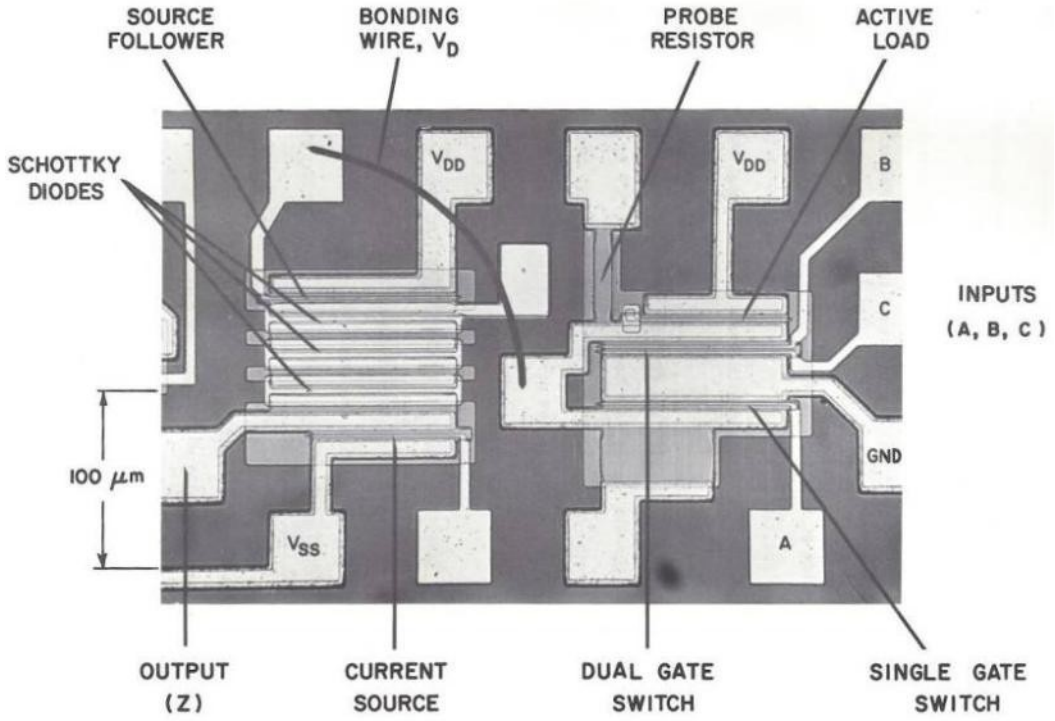
- Origins of HF ICs
- Early Days of GaAs ICs
- Silicon HF and Fiberoptic ICs
- Future trends

# The MMIC family tree



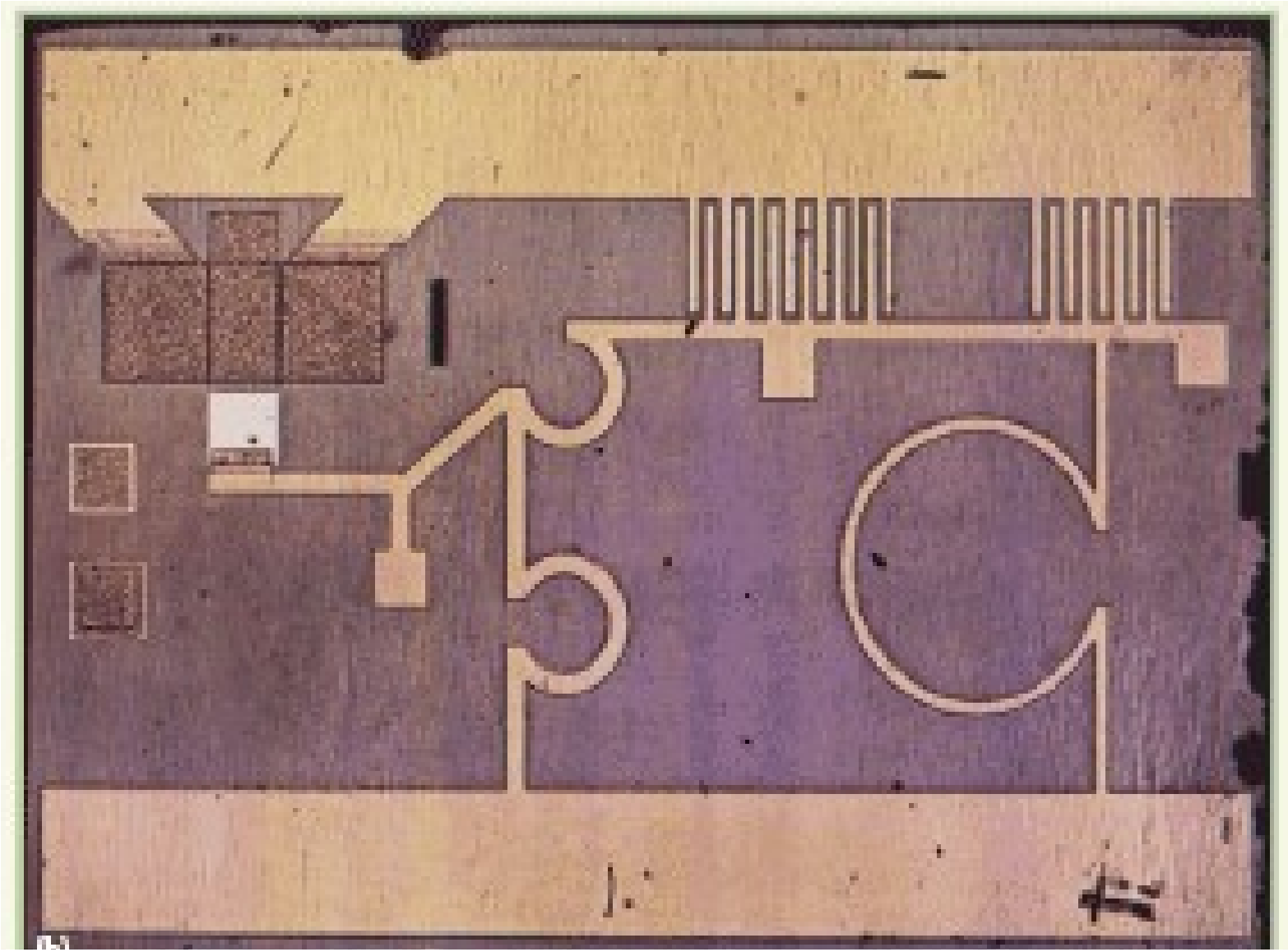
# The first Gb/s GaAs Logic Gates



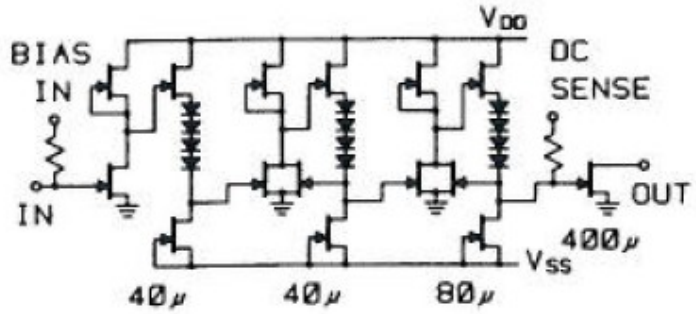

[4]

# The first MMIC LNA at 10 GHz

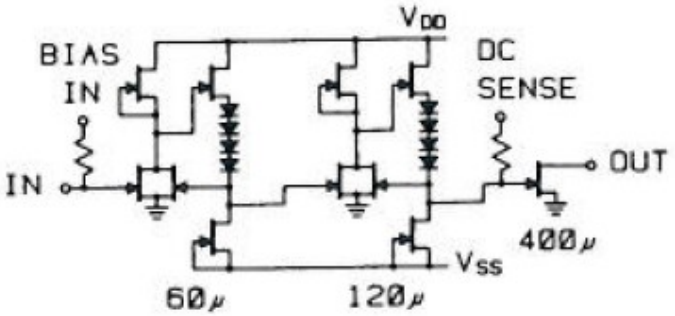


[3]

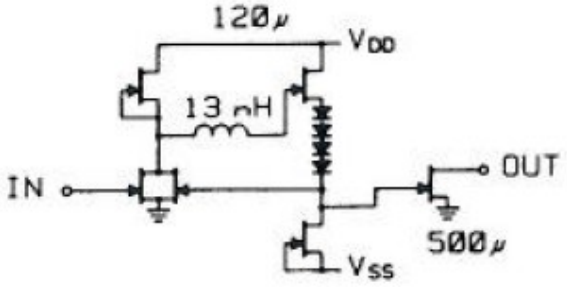
# The first broadband amplifiers



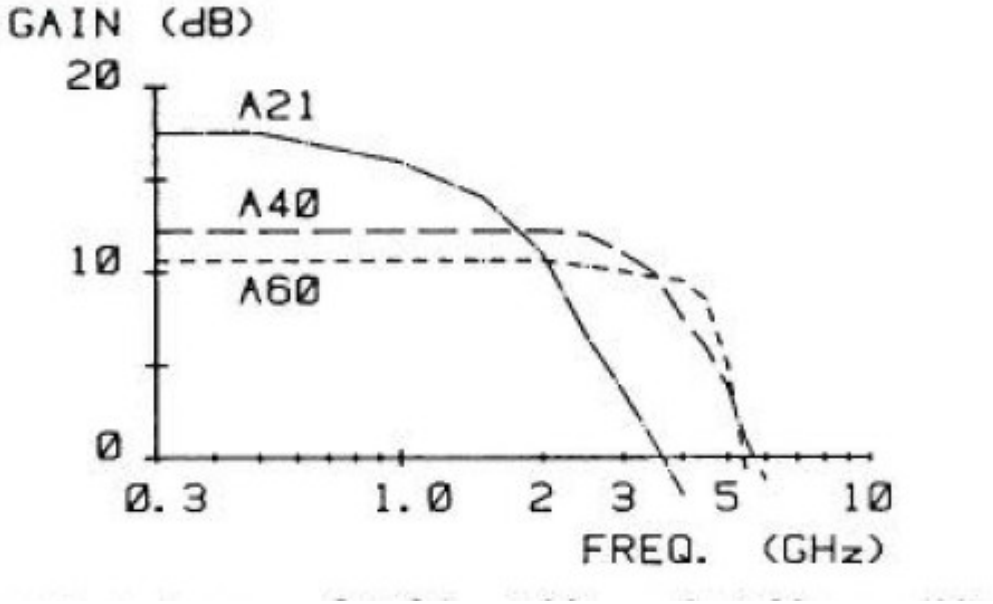

(a)




(b)

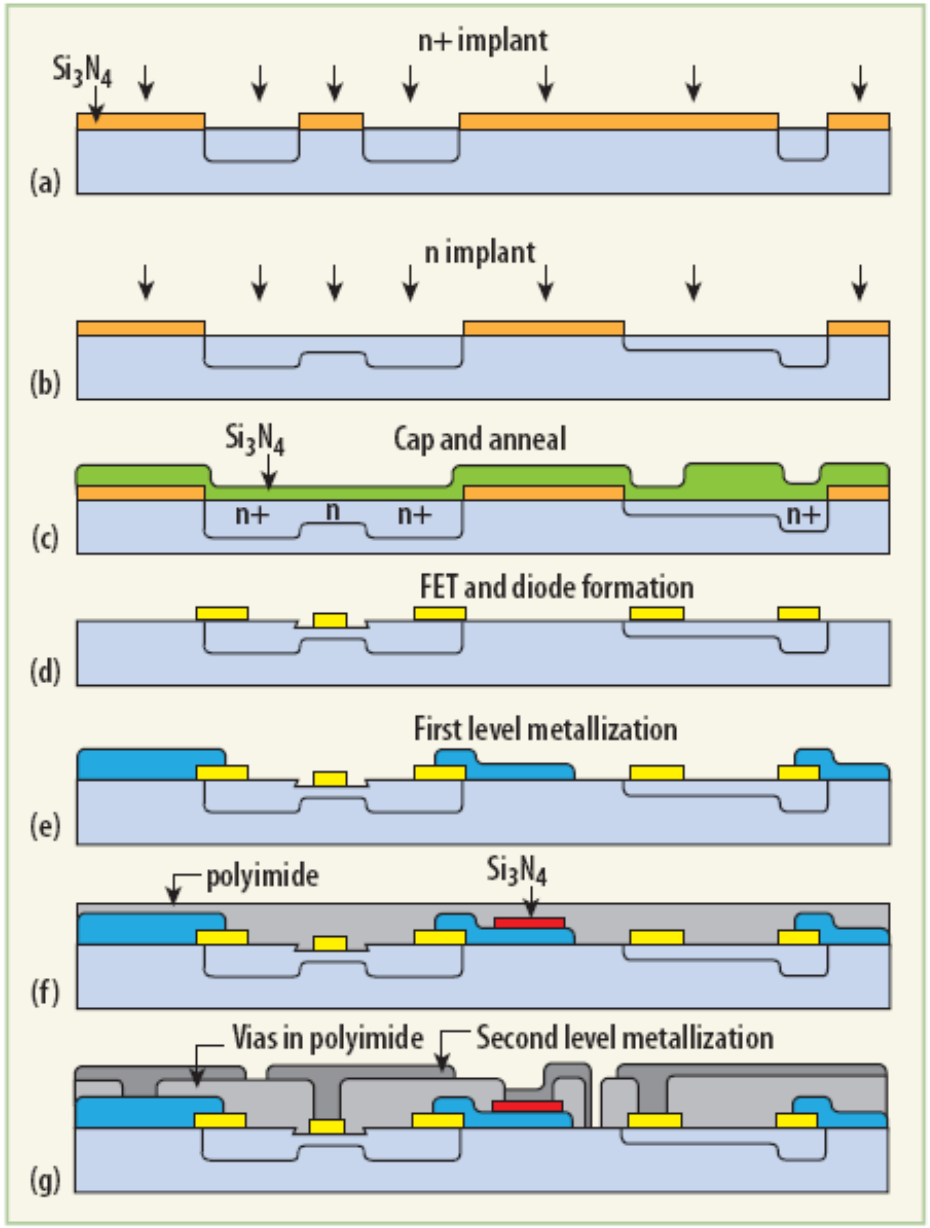



(c)




[4]

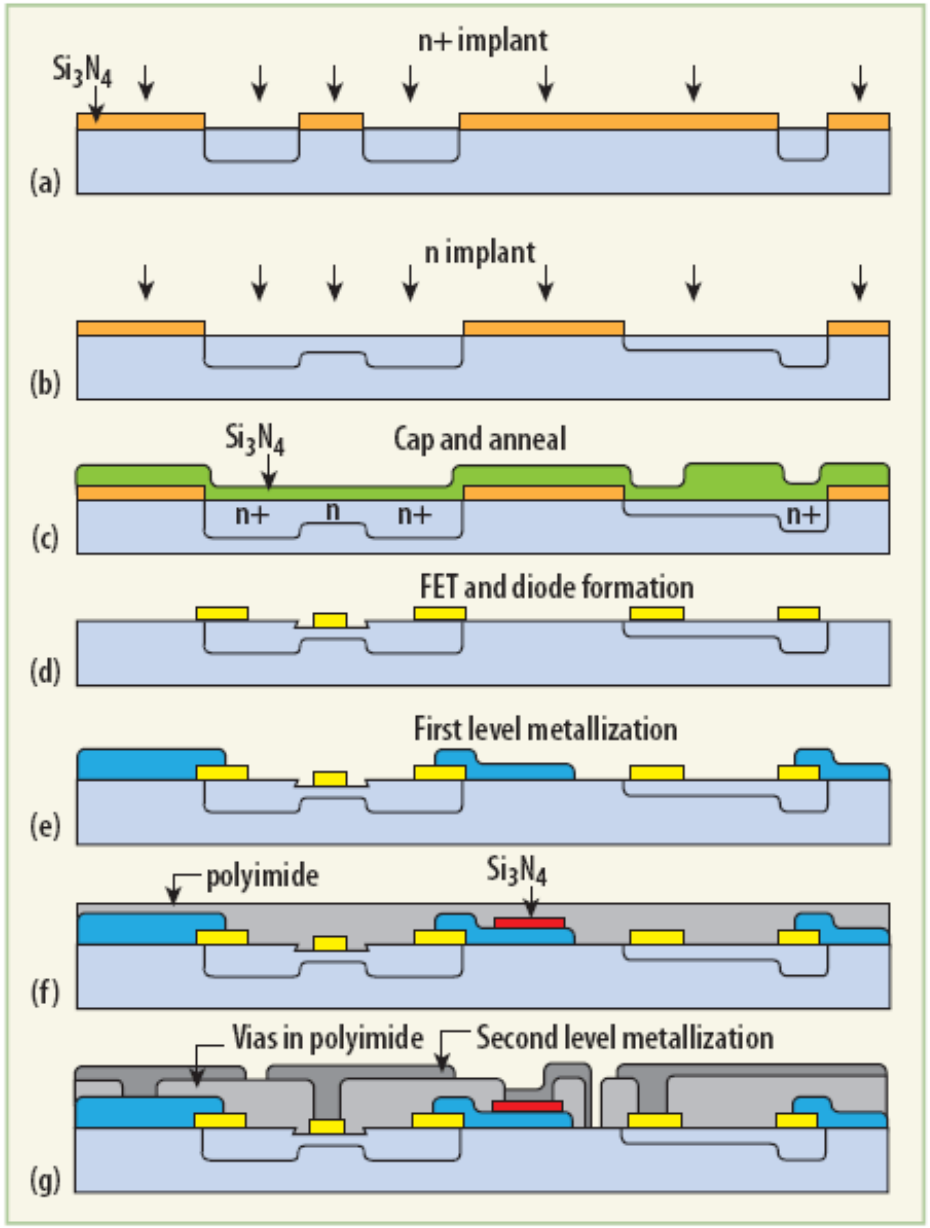
# Early GaAs MESFET MMIC process flow




6. This processing sequence was used by by Plessey to fabricate GaAs MMICs either on ion-implanted GaAs or vapor-phase-epitaxial (VPE) GaAs material.

[3]

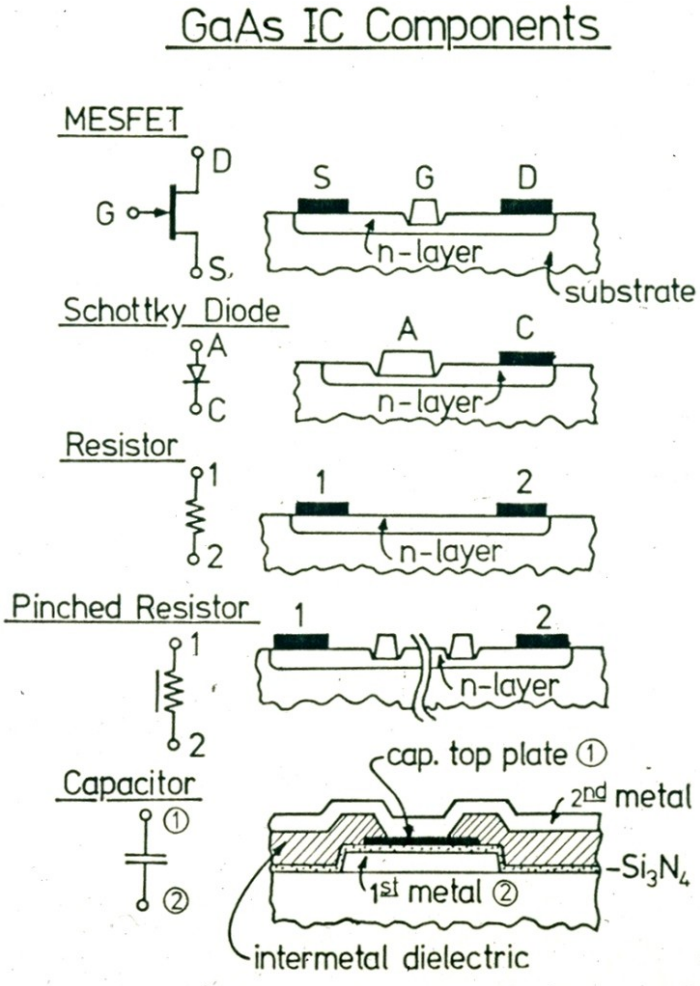
# Early GaAs MESFET MMIC process flow

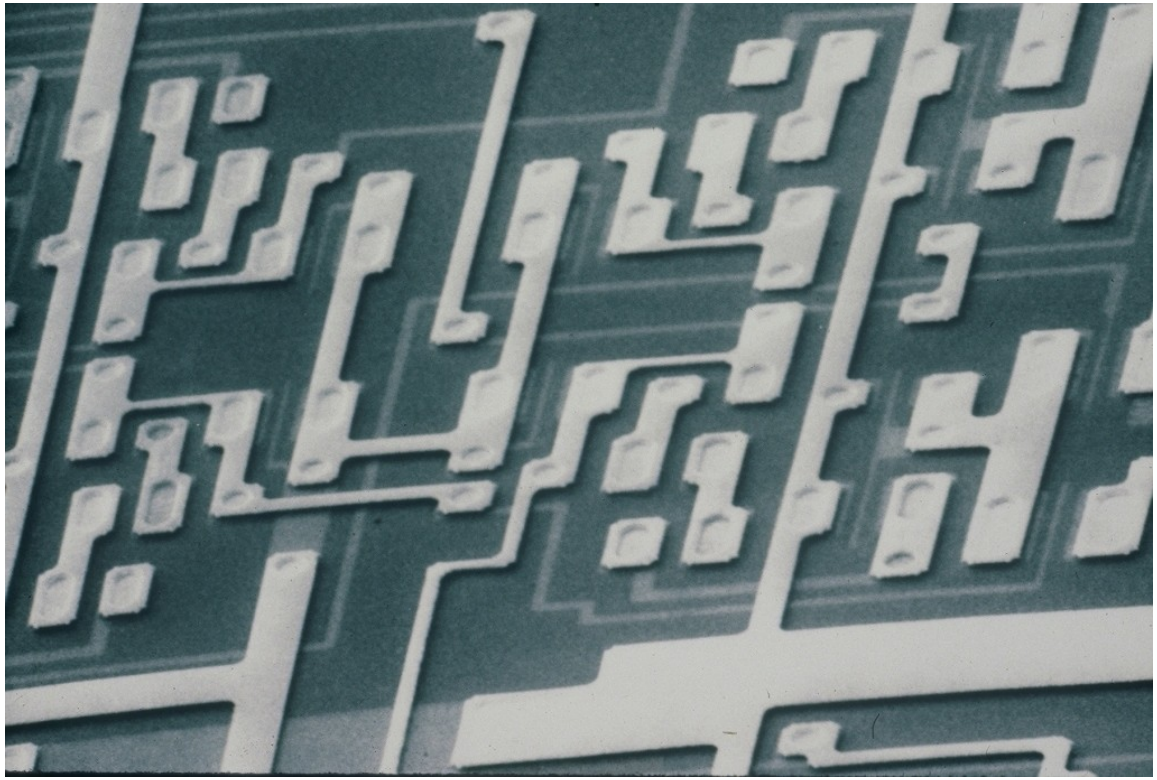



6. This processing sequence was used by by Plessey to fabricate GaAs MMICs either on ion-implanted GaAs or vapor-phase-epitaxial (VPE) GaAs material.

[3]

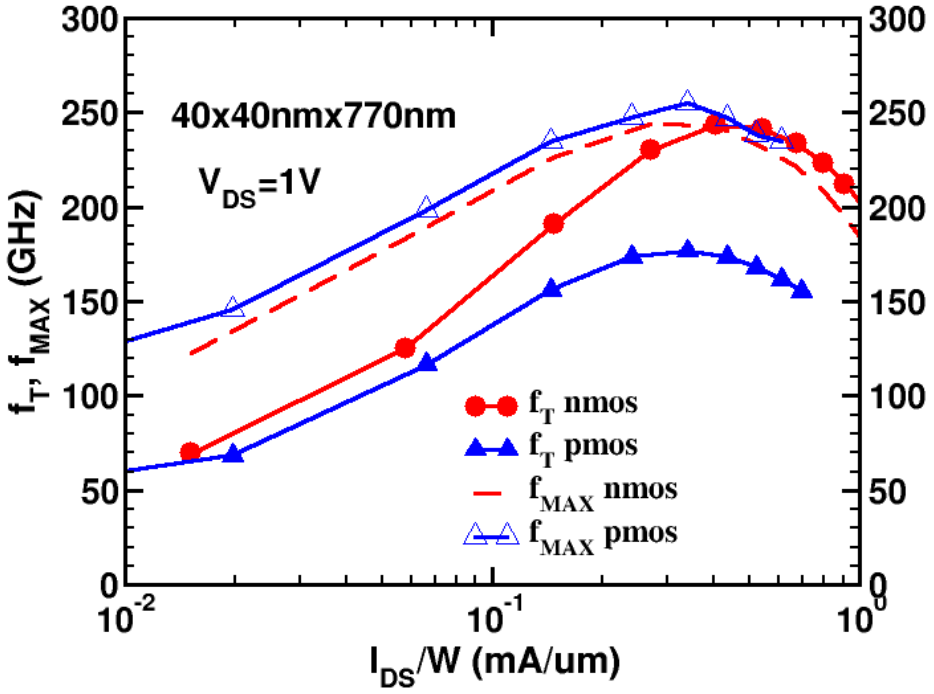
# RFIC GaAs MESFET process components

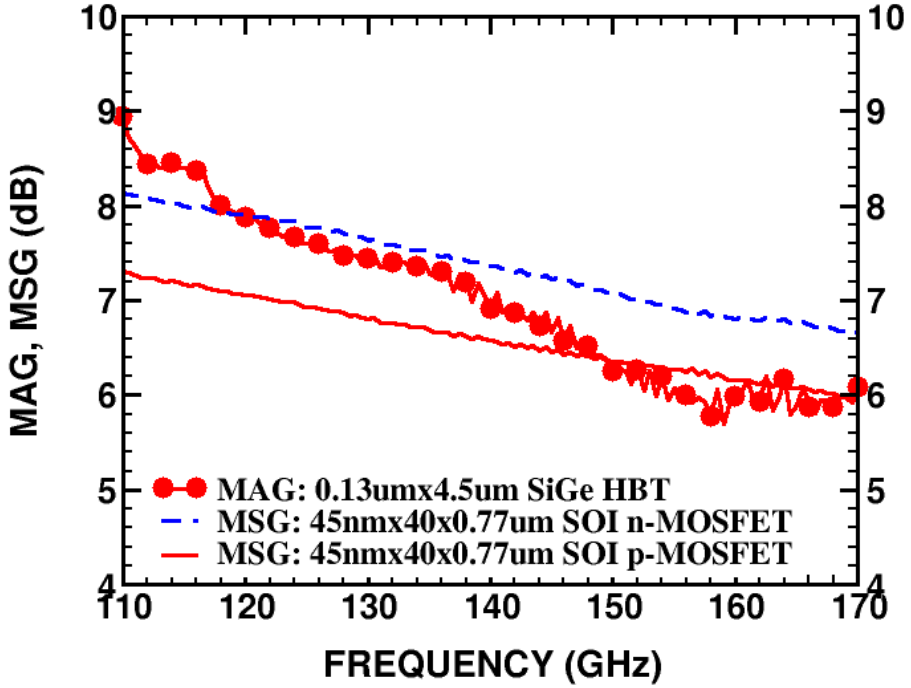


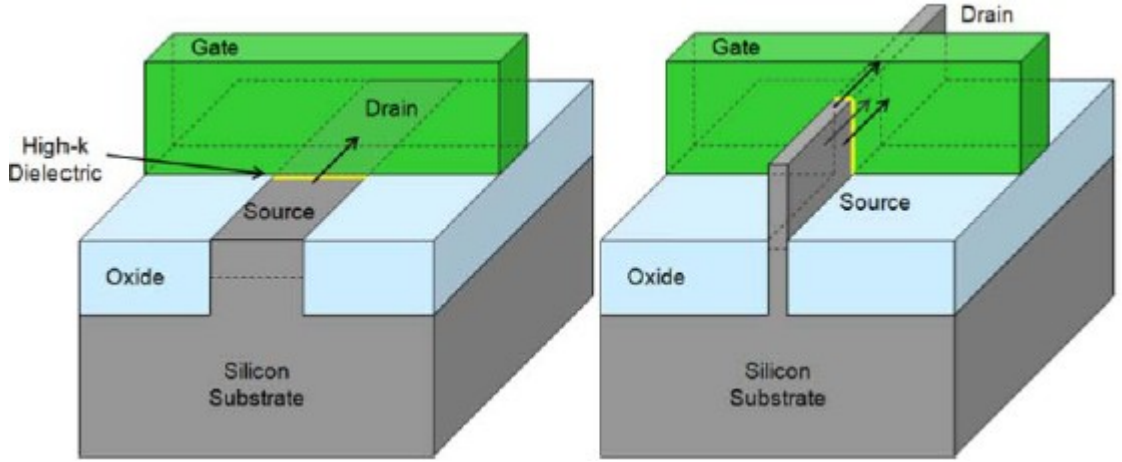
[4]

# HF performance of fully wired SOI CMOS and SiGe HBT

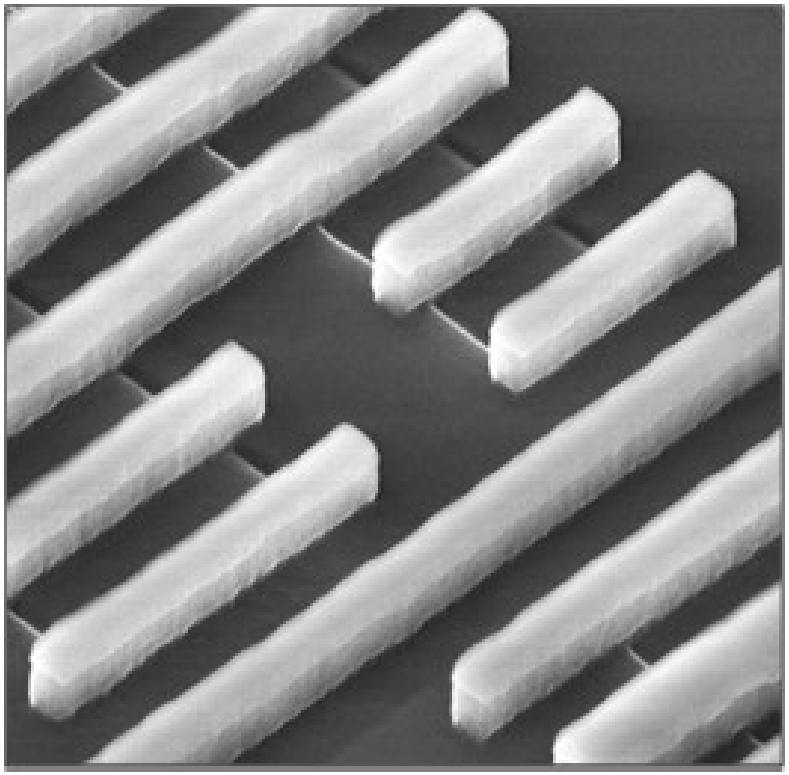


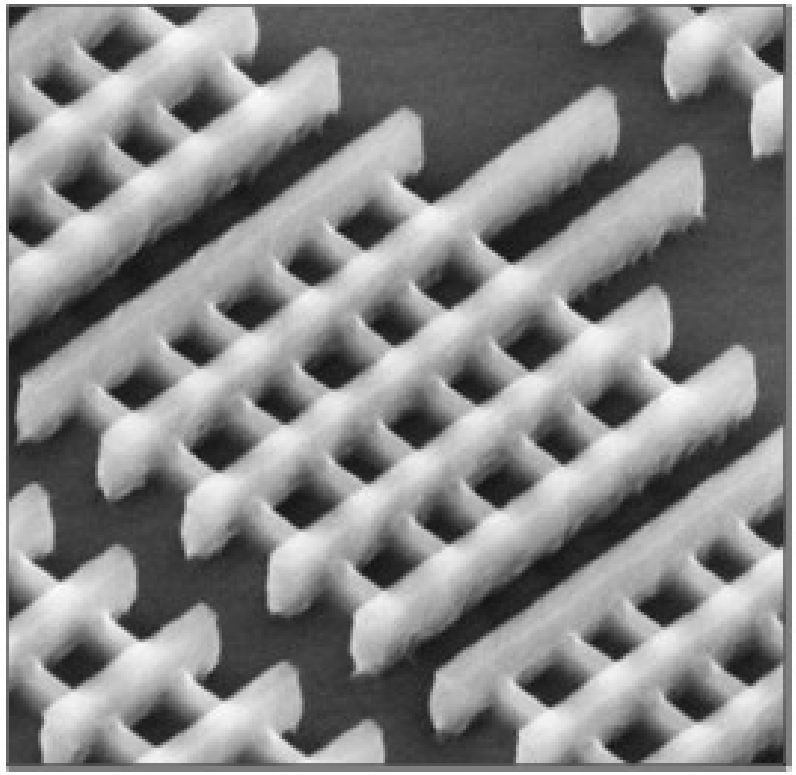



# 32-nm planar vs. 22-nm FinFET CMOS ICs

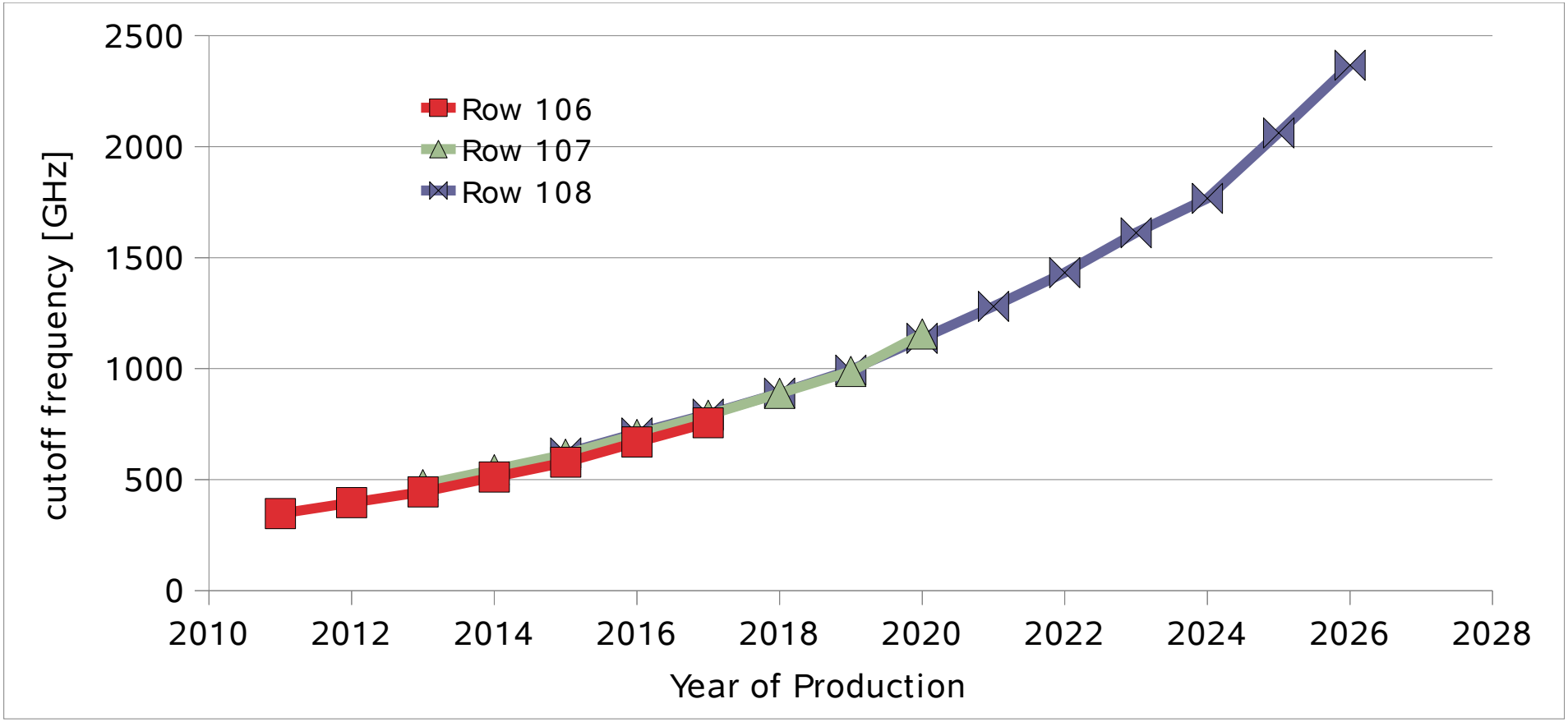



[5]





# ITRS predictions of intrinsic MOSFET $f_T$ without layout parasitics



# Measured performance of Si MOSFETs and SiGe HBTs with layout parasitics