

Overview

- In previous releases low-frequency noise parameters included only in VBIC model
 - Parameter (kfn, afn) based on old measurement data (2011)
 - Q4/18 new 1/f noise measurement system installed (ProPlus)

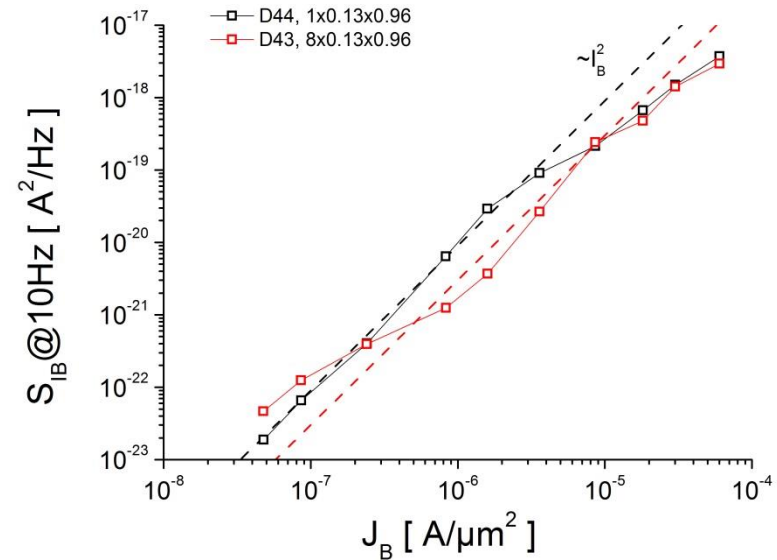
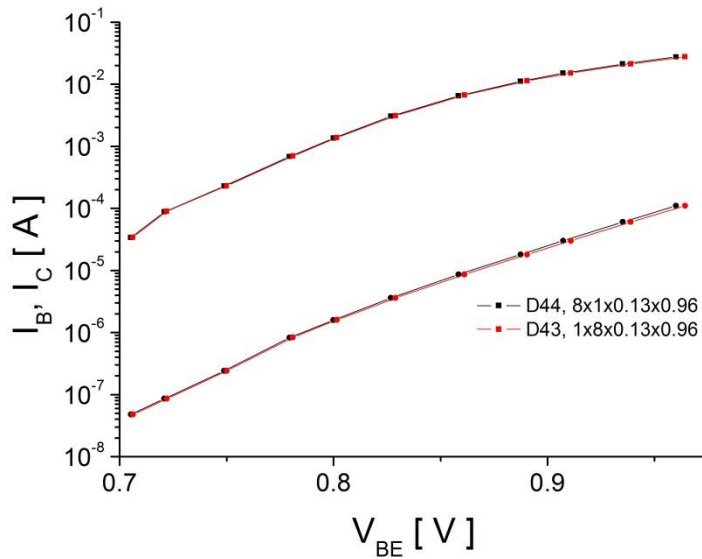
Summary:

- Noise measurements performed on current qualification wafer
 - Operating points: $V_{BE}=0.7...0.925V$ (g2, g2I), $V_{CE}=1V$, $f=1Hz...10kHz$
- Model parameters extracted for
 - npn13g2: VBIC and HICUM

DUT: npn13g2

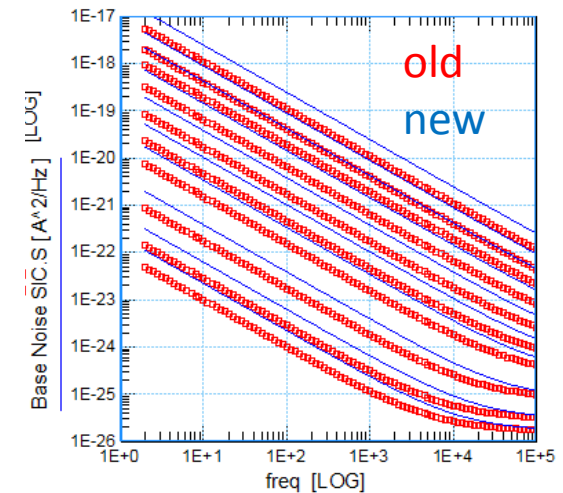
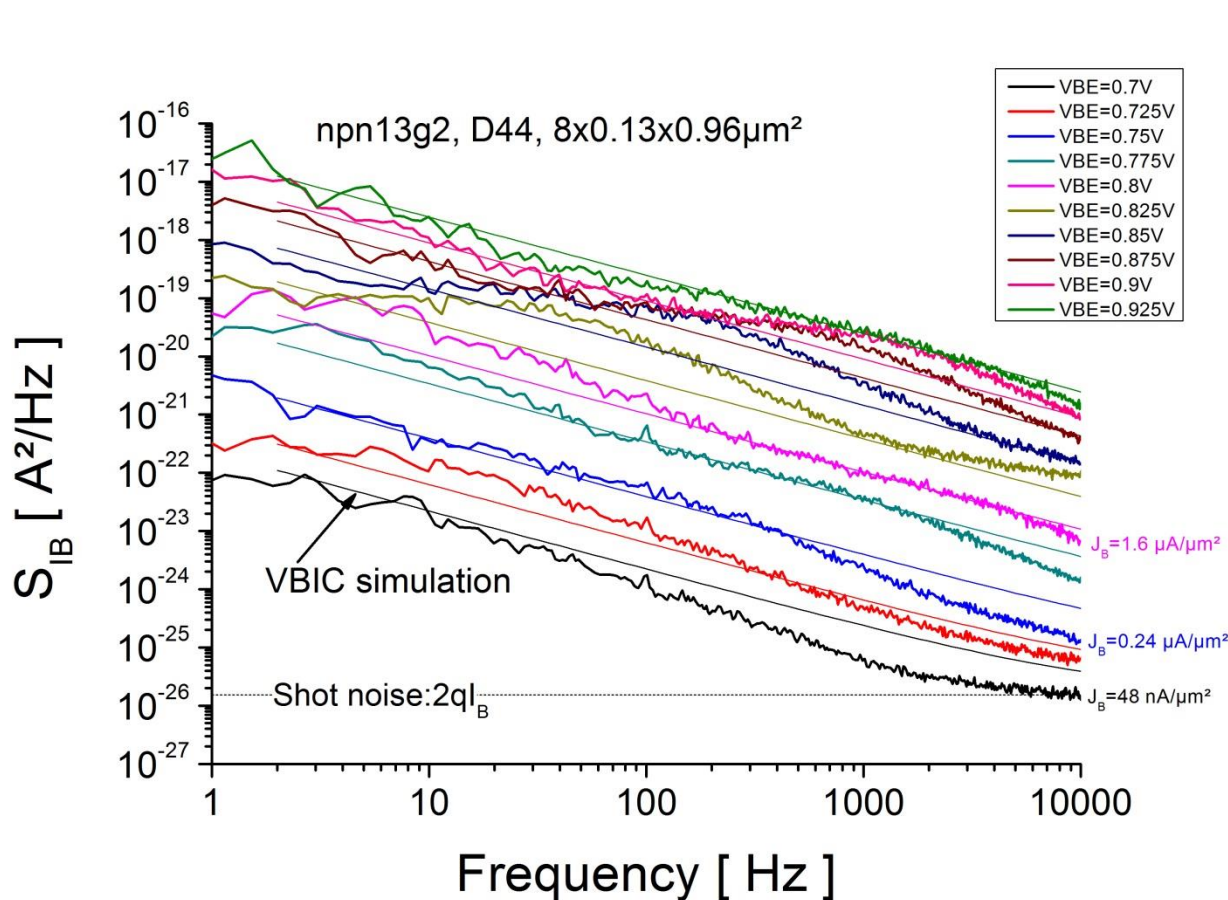
■ LF noise was measured for the operating points shown below:

■ For both DUT (Nx=1 und Nx=8) $S_{IB}@10\text{Hz} \propto I_B^{1.8}$



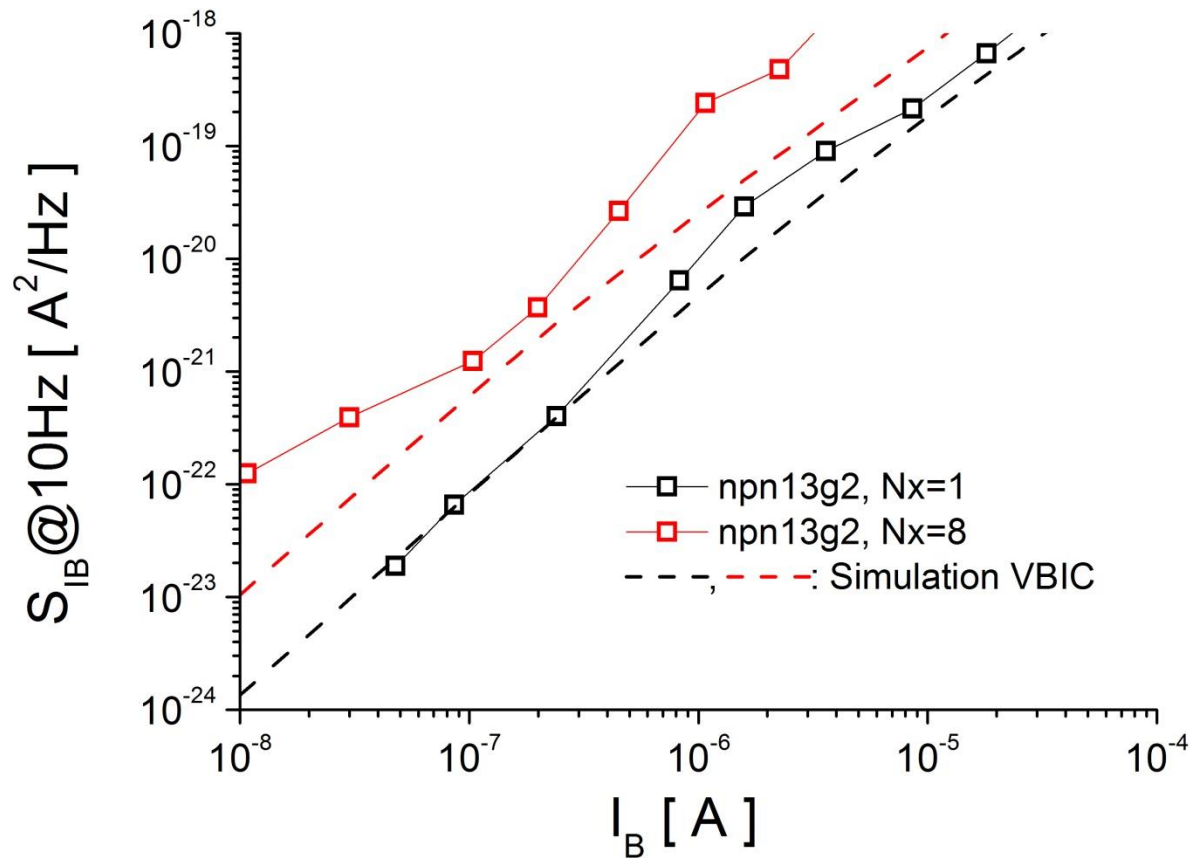
Example: npn13g2, Nx=8

- Simulation with new VBIC parameters shows good agreement with measurement
- Comparison to old model shows slight increase of I_f noise



Example: npn13g2, $S_{IB}(I_B)$ for $N_x=1$, $N_x=8$

- Simulation with new VBIC parameters shows good agreement with measurement



Model Comparison: npn13g2, Nx=8

- Simulation with VBIC and HICUM shows good agreement

