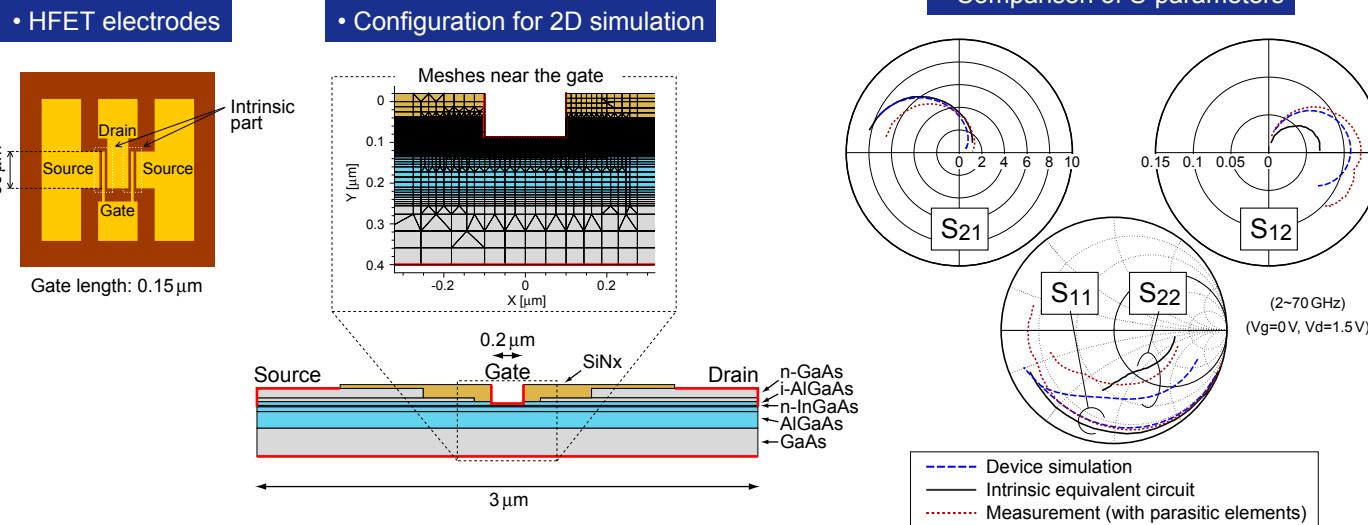
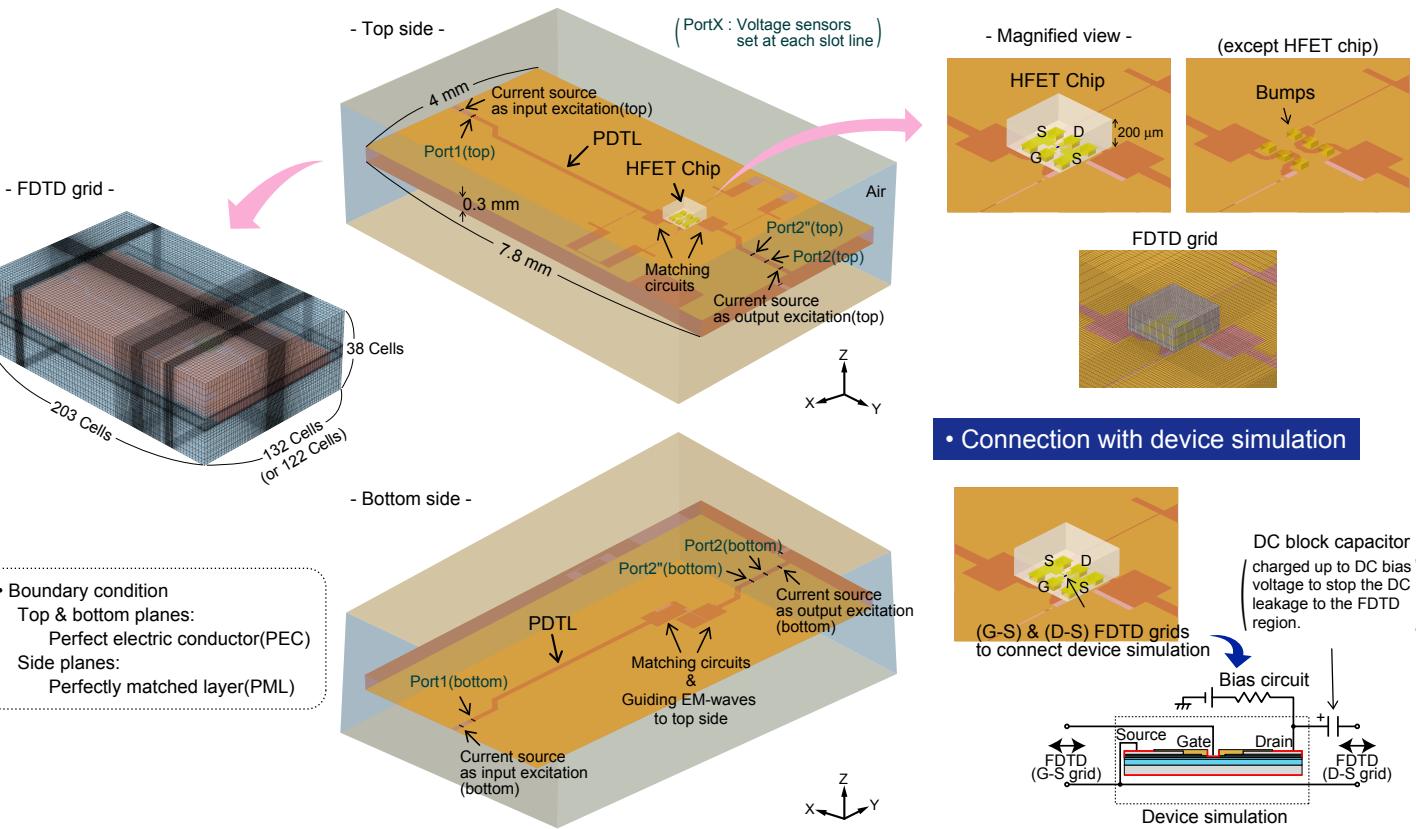


DEVICE SIMULATION OF HFET



CONFIGURATION FOR FDTD SIMULATION

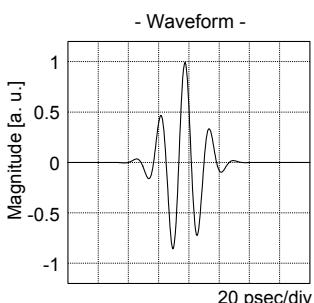


EXCITATION PULSE SHAPE

A product of a Gaussian function and a sine function :

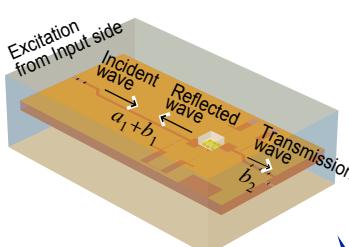
$$s(t) = A \cdot \exp\left(-\frac{(t-t_0)^2}{2\sigma^2}\right) \cdot \sin(2\pi f t)$$

Reduction at unnecessary bands → Good convergence

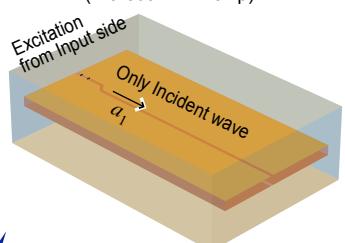


DERIVATION OF S-PARAMETER

- FDTD configuration of the module -



- Only transmission line - (without HFET chip)



Separation of the incident and reflected waves

$$S_{11} = \left. \frac{b_1(f)}{a_1(f)} \right|_{a_2=0} \quad S_{21} = \left. \frac{b_2(f)}{a_1(f)} \right|_{a_2=0}$$

Similarly for S_{12}, S_{22}