IDEC Chip Design Contest

Channel Confined THz Detector for THz Imaging System

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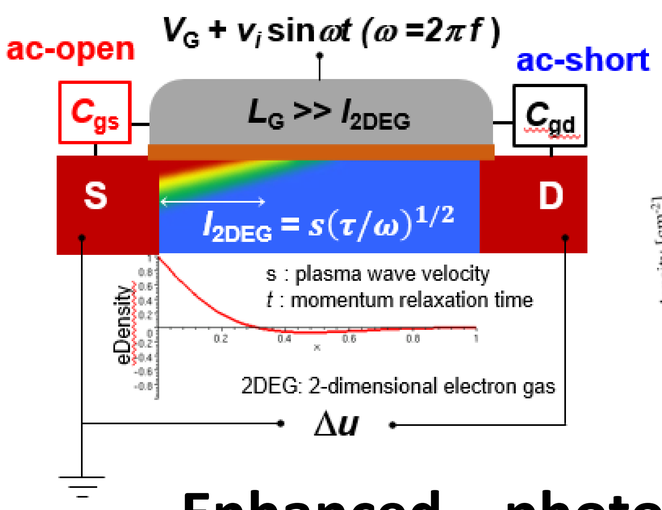
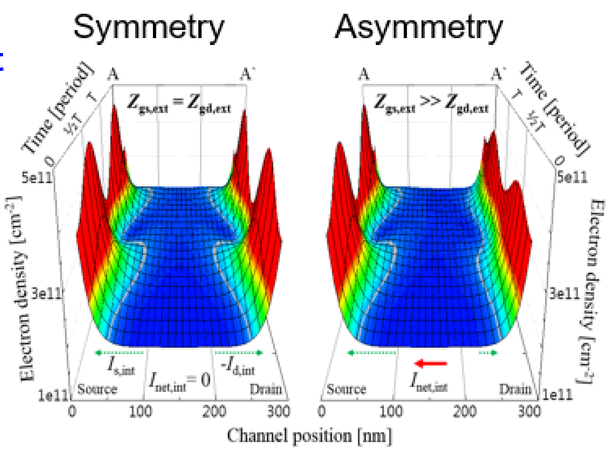
❖Abstract

- We have analyzed the photoresponse (Δu) of Gnd-in and Gnd-out with inner width (d_{in}) scaling.
- As the channel regions are confined more and more, the performance enhanced in the case of Gnd-out.
- Then, We conducted THz imaging with channel confined THz detector.

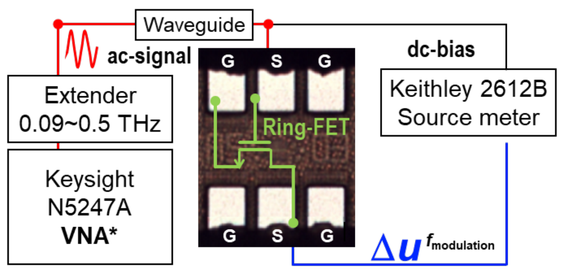
❖Introduction : Plasmonic THz detector

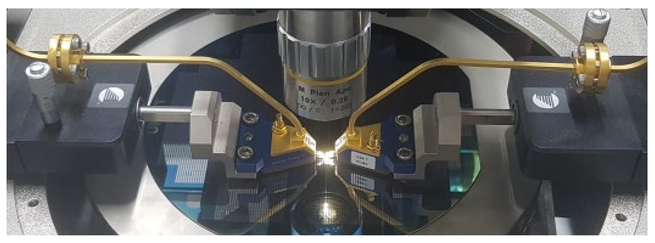


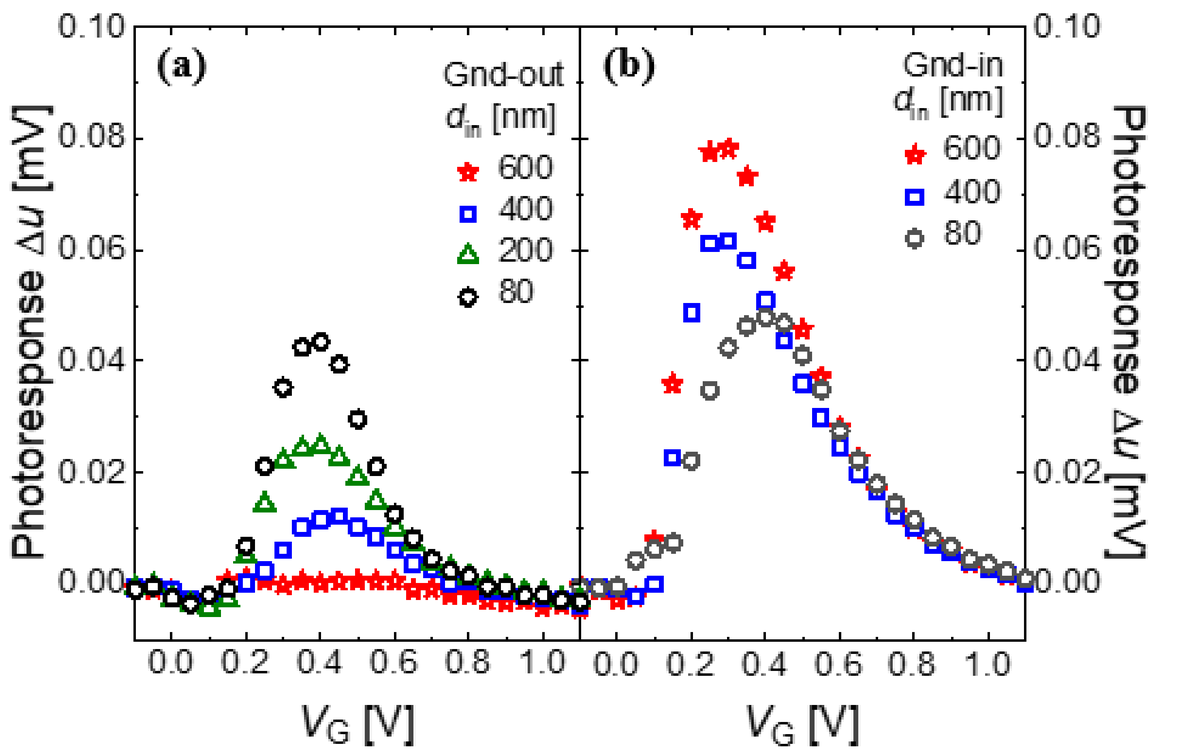


Enhanced photo-response with asymmetric boundary condition.

❖Performance enhancement

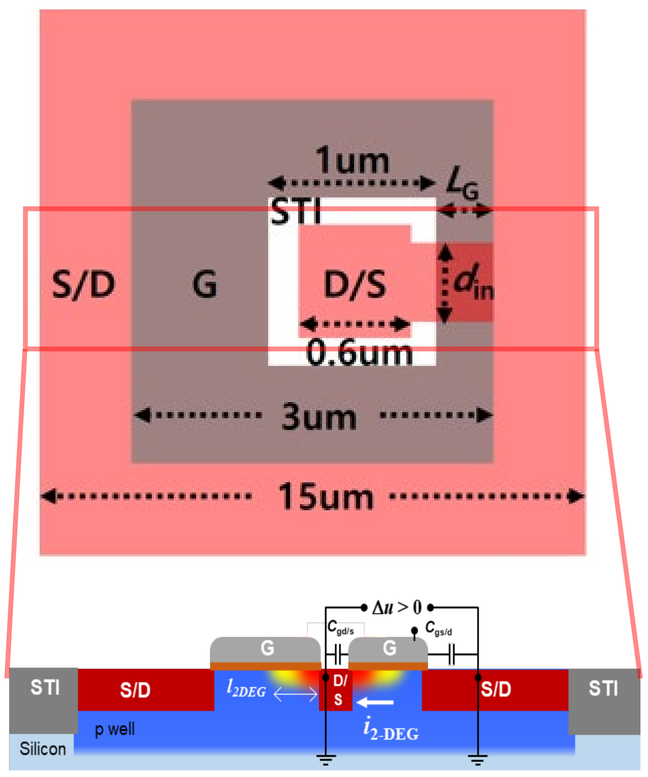


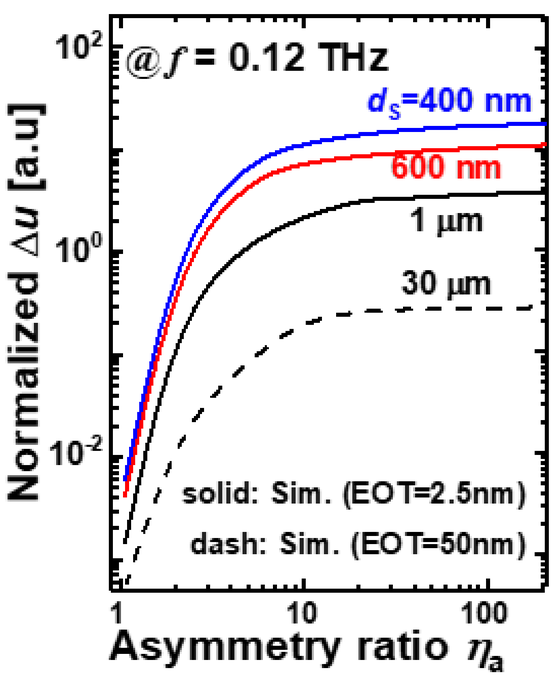




Performance enhancing of THz detector with channel confinement

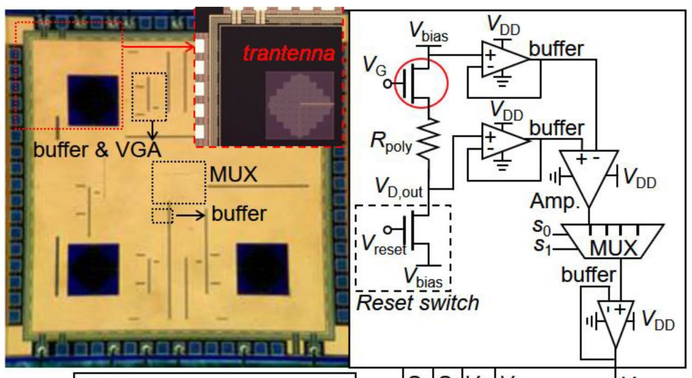
❖Performance enhancement by D_{in} scaling

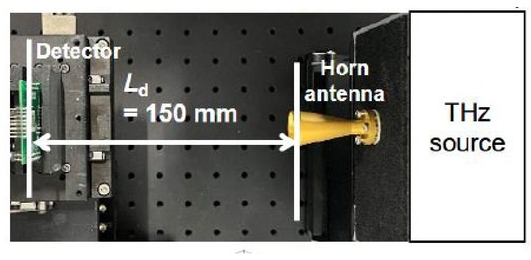


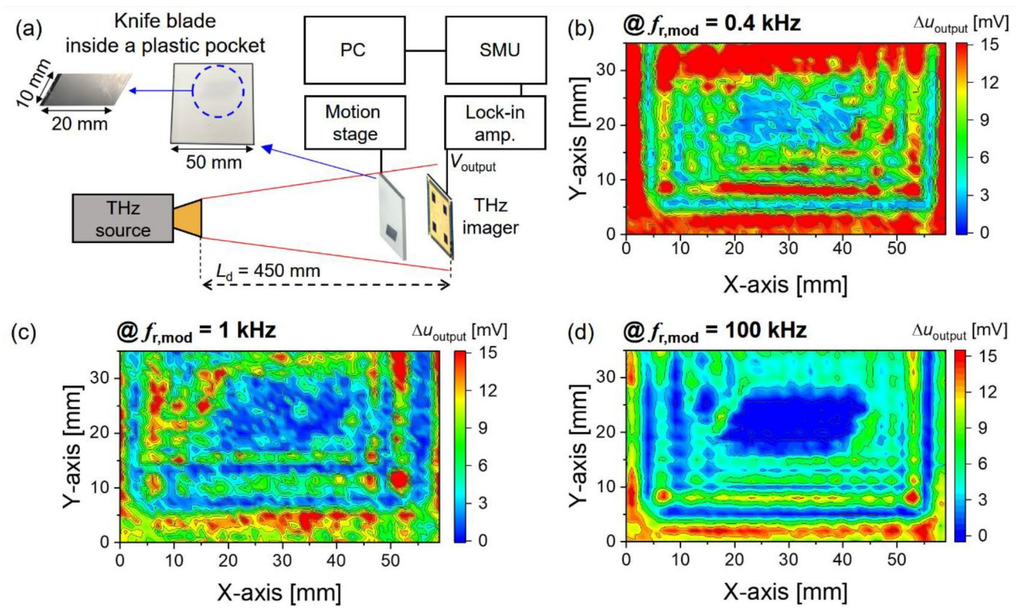


It is predicted that the photo-response will increase as d_{in} decreases the overlap capacitance and the asymmetric boundary condition improves.

❖THz imaging with channel confined detector







THz see through imaging with channel confined detector for hidden object

❖Acknowledgements

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❖Conclusion

- We have experimentally demonstrated the performance enhanced the THz detector with channel confinement
- The THz detector with improved photo-response can perform imaging for detecting the hidden object.