

High Speed Micro-OLEDs for Optical Interconnects

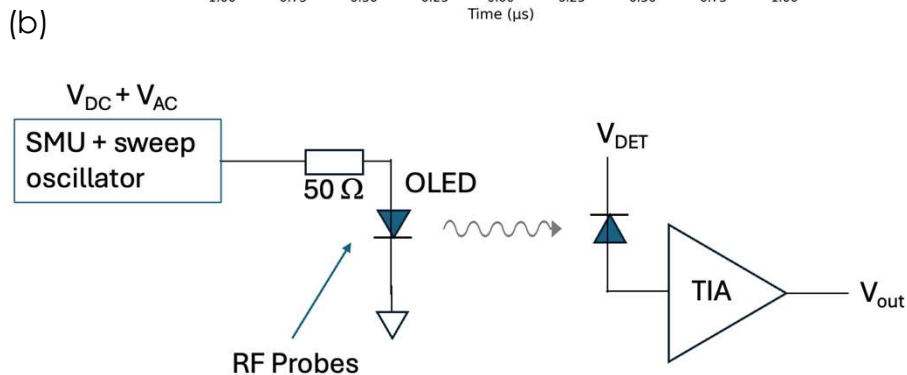
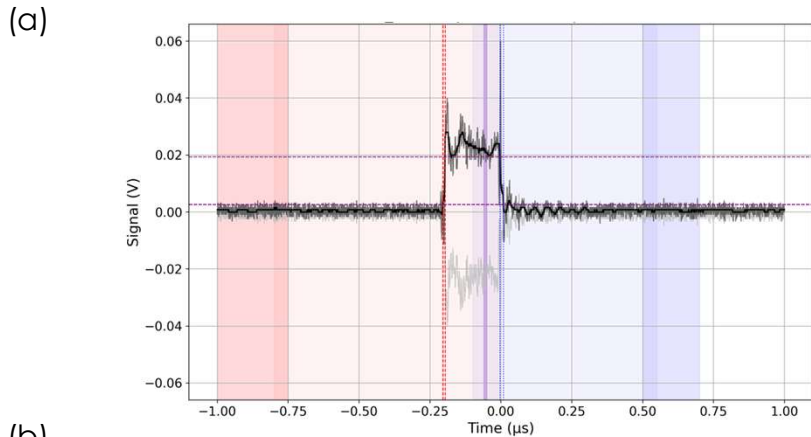


Figure: (a) Pulse response of 100 x 100 μm pixel with rise time of 7.5ns and (b) frequency domain measurement setup

Objective

➤ To demonstrate the single pixel OLED with bandwidth > 300MHz at -3dB, along with a comprehensive characterization platform and scalability for micron scale arrays on silicon.

Impact

OLEDs have achieved major commercial success in displays, but their use in visible light communication and optical interconnects remains limited by concerns over low carrier mobility and bandwidth. This micro-OLED project aims to overcome these limitations and demonstrate OLEDs as compact, back end of line (BEOL)-compatible light sources that can be integrated with Si CMOS and other photonic platforms. Their wavelength tunability further enables scalable multi-color emitter arrays for future on-chip and off-chip optical communications.

Facilities and Methods Used

- Vacuum Thermal Evaporation
- Sputtering
- Photolithography
- Metrology tools – SEM, confocal microscope, optical microscope

Relevant Papers

- K. Yoshida, Advanced Photonics, DOI: 10.1117/1.AP.7.3.036005

Funding

- Universal Display Corporation
- Department of Energy

Contact

- Darcy He (darcyhe@umich.edu)