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Electric Field Dependent Photocurrent Decay Length in Single Lead Sulfide Nanowire Field Effect Transistors DONG YU, RION GRAHAM, CHRIS MILLER, U.C. Davis, EUNSOON OH, Chungnam National University, Korea — We determined the minority carrier diffusion length to be $\sim$1 μm in single PbS nanowire field effect transistors by scanning photocurrent microscopy. PbS nanowires grown by the vapor-liquid-solid method were p-type with hole mobilities up to 49 cm^2/Vs. We measured a photo-response time faster than 14 μs with near-unity charge separation efficiency at the contacts. For the first time, we also observed a field dependent photocurrent decay length, indicating a drift dominant carrier transport at high bias.

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