

Supplementary Figures

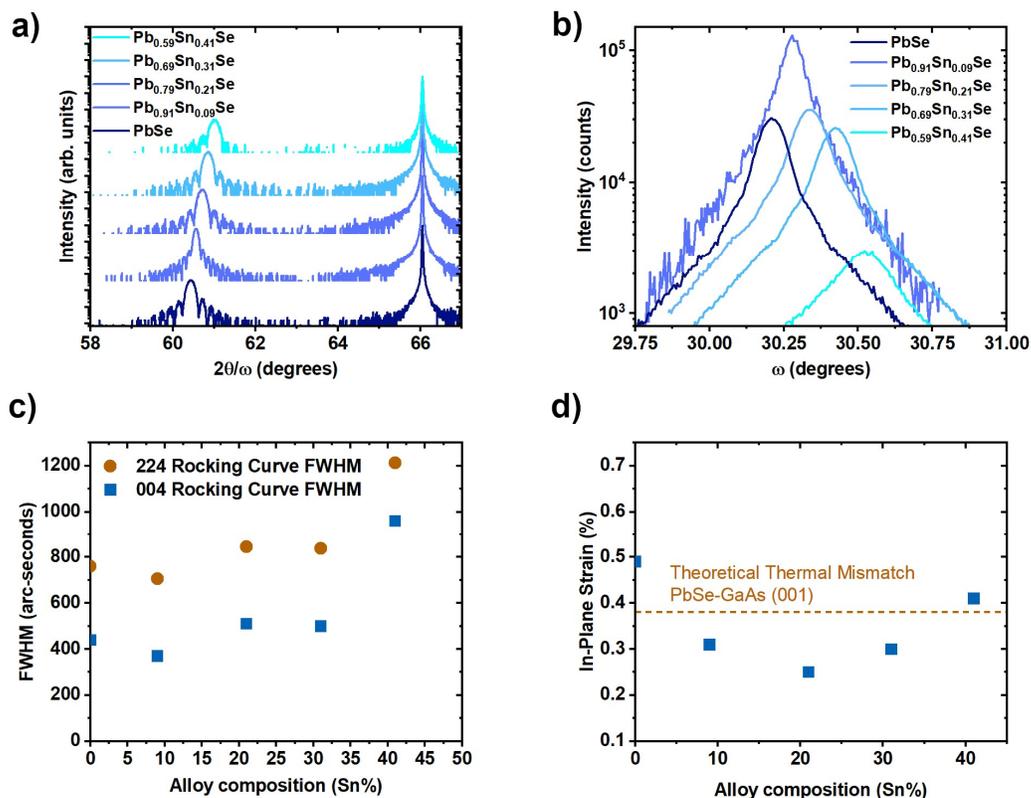


Figure S1. High resolution x-ray diffraction results of $\text{Pb}_{1-x}\text{Sn}_x\text{Se}$ epitaxial layers on GaAs. a) Symmetric $2\theta/\omega$ scans of the (004) peaks for $\text{Pb}_{1-x}\text{Sn}_x\text{Se}$ films. b) Corresponding double axis rocking curves of the (004) peaks for each film. c) Full-width-at-half-maximum for the symmetric (004) and asymmetric (224) peaks vs Sn alloy composition. d) In-plane tensile strain vs alloy composition for the $\text{Pb}_{1-x}\text{Sn}_x\text{Se}$ films. The dashed line is the theoretical thermal-mismatch strain for an (001) PbSe film on GaAs when cooled from 300C to room temperature.

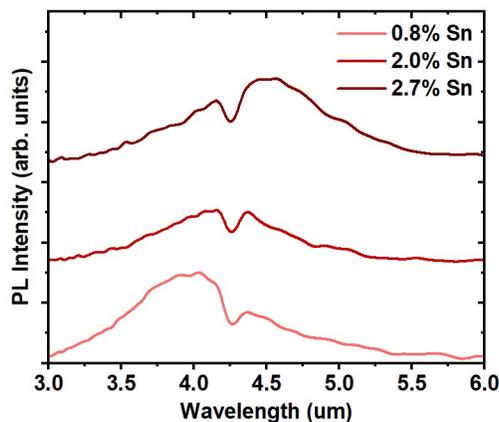


Figure S2. Mid-IR Photoluminescence (PL) of dilute $\text{Pb}_{1-x}\text{Sn}_x\text{Se}/\text{GaAs}$ at room temperature. The PL for each sample is offset on linear scale to see the subtle redshift in peak wavelength. The dips in intensity at $\sim 4.3 \mu\text{m}$ are due to atmospheric absorption.