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Molecular Beam Epitaxy Grown Long Wavelength Infrared HgCdTe on Compliant Si Substrates PRIYALAL WIJEWARNASURIYA, Army Reserach Laboratory, YUANPIN CHEN, Arny Research laboratory, GREGORY BRILL, NIBIR DHAR, Army research Laboratory, MICHAEL CARMODY, Teledyne Imaging Sensors — Large format, low cost, reliable and high performance infrared focal plane arrays (IRFPA) are essential for the Army's Third Generation IR Imaging Technology. Bulk-grown $Cd_{0.7}Zn_{\sim 0.3}Te$ (CZT) substrates are the natural choice for HgCdTe epitaxy since it is lattice matched to HgCdTe alloy. However, a lack of large area CZT substrates, high production costs, and more importantly, the difference in thermal expansion coefficients between CZT substrates and silicon readout integrated circuits are some of the inherent drawbacks of CZT substrates. Consequently, $Hg_{1-x}Cd_xTe$ detectors fabricated on silicon substrates are an attractive alternative generating considerable interest. Recent developments in the MBE Chalcogenide buffer layer growth technology on Si substrates has revolutionized the HgCdTe research and offered a new dimension to HgCdTe-based IR technology. We have fabricated large format 256x256 pixels with 40 microns pitch on LW-MBE-HgCdTe material grown on compliant CdSeTe/Si and CdTe/Si substrates. This paper will present data on 256x256 FPA and single device performance.

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