Multi-terminal Two-color ZnCdSe/ZnCdMgSe Based Quantum-well Infrared Photodetector

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In this work, we report on two-color QWIPs based on the large conduction band offset (~1.12ev) ZnCdSe/ZnCdMgSe material system lattice matched to InP. QWIPs were designed based on a bound to quasi-bound transition, centered at 4 μm and 7 μm and each QW is repeated 50 times to eliminate the high dark current and a contact layer is inserted between the two stacks of QWs for independent electrical contacts. Wafers are processed into two step rectangular mesas by lithography and wet etching. Experiments showed absorption spectra centered at 4.9 μm and 7.6 μm at 80 K and the full width at half maximums were Δλ/λ = 21% and Δλ/λ = 23%, respectively. Current work studies the Johnson and the background noise limited detectivities of these QWIPs.

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