

Architecture of mct matrix element with reduced dark current

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Ternary allow of cadmium-mercury telluride (MCT, HgCdTe) is one of the famous semiconductor materials used for high performance FPAs. Performance of promising P+-v(π)-N+-structure under a reverse bias voltage have been calculated. The dark current reduction was achieved by using improved three-layer architecture, which was consisted of two high-doped contact MCT layers and a low-doped MCT absorbing layer located between them for effectively suppression of the thermal generation-recombination. Thus, in a given spectral range, the dark current of each three-layer architecture photodiode was decreased to the background radiation limit, and under the complete depletion of the absorption region determined by the Shockley-Reed-Hall generation-recombination mechanism.

Keywords: HgCdTe, KPT, P+-v(π)-N+-structure, Focal Plane Array (FPA), dark current.

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