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夜视技术

像元间距为25μm、160×120元无热电制冷器的非致冷非晶硅探测器（英文）

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摘要 介绍用非晶硅微型辐射热量计制成的160×120元非致冷红外焦平面阵列的特点和性能，该阵列集成在一个无铅芯片载体封装中，像素间距为25μm，适合于大批量生产。25μm像元结构得益于较小的热时间常数，该技术使我们能够设计出更高的热隔离性能，从而能以35μm技术为基础开发出25μm技术。通过采用新的像素设计和更进一步推动设计方法，在没有采用复杂昂贵的双层结构的前提下，保持了较高填充因子。从读出集成电路结构、封装、可操作性和光电性能入手对该探测器进行了介绍。为该探测器设计了一种新型集成读出电路。可以通过串行链接对增益、图像翻转和积分时间等高级功能进行操控，降低电气对接的数量。研制的小型无铅芯片载体封装便于大规模生产探测器，主要用途为便携式摄像机或头盔摄像机。

关键词 IRFPA 非晶硅 微型辐射热量计 非致冷红外探测器

分类号 TN214

160×120 uncooled amorphous silicon TEC-less detector with 25μm pixel-pitch（English）

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Abstract This paper reviews characteristics and performance of a 160×120 uncooled infrared focal plane array made from amorphous silicon microbolometers with a pixel-pitch of 25μm, integrated in a LCC package compatible with mass production. The 25μm pixel architecture profits from the low thermal time constant which characterizes our technology, to design a higher pixel thermal insulation and therefore to develop a 25μm version from the well mastered 35μm technology. Thanks to a new pixel design and by pushing the design rules even further, a high fill factor has been kept, without the use of complex, as well as expensive, two-level structure. The detector is described in terms of ROIC architecture, packaging, operability and electro-optical performances.
A new read out integrated circuit structure has been designed for this detector. High level functions like gain, image flip and integration time could be operated through a serial link to minimize the number of electrical interconnections.
A small LCC package has been developed enabling a mass production of detectors for compact hand held or helmet mounted cameras.

Key words IRFPA amorphous silicon microbolometer uncooled IR detector

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