

OTK冷却方案与分析

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OTK冷却方案

按目前OTK给定的模块电子学初步尺寸和发热量，考虑了不同位置的冷却方案，对冷管布置在芯片一侧和asic一侧，分别作了模拟（仅考虑热传导）：

ASIC Power: 35.84W (15x140x3 mm)

PCB t=1.6mm

LGAD t= 0.5mm

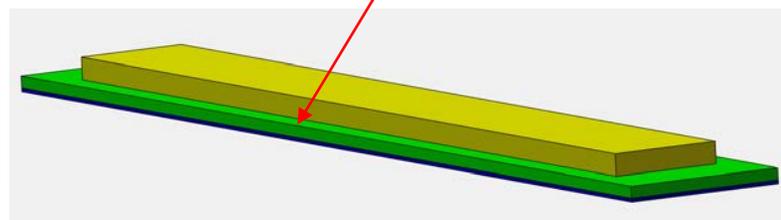
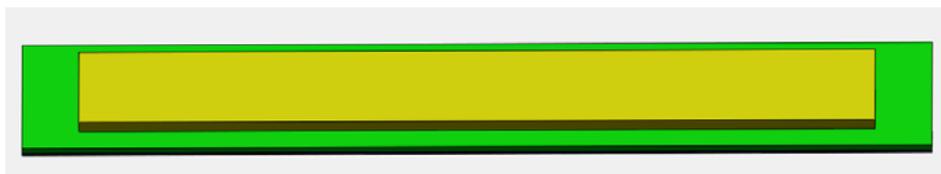
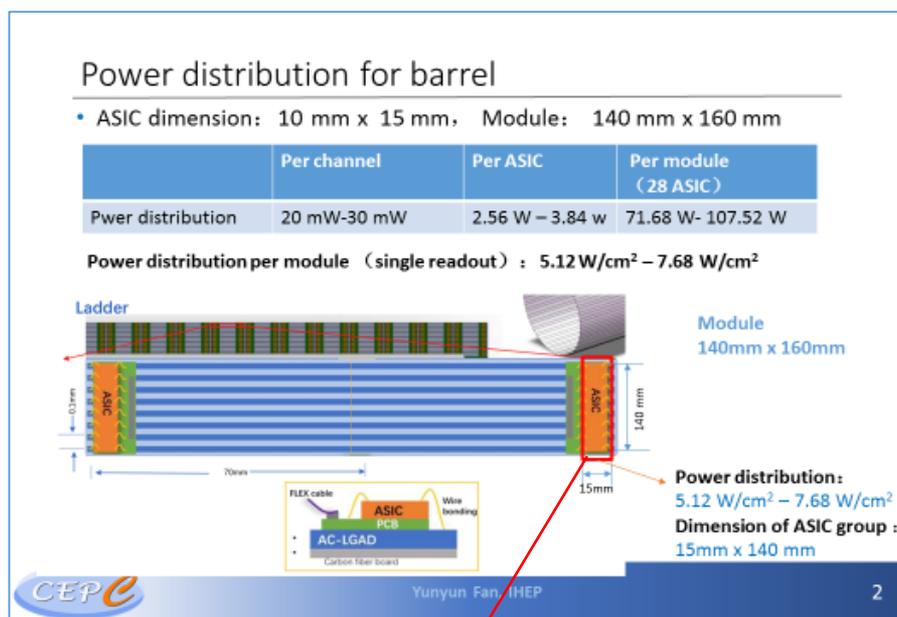
包管-CFRP t=0.2

冷管-钛

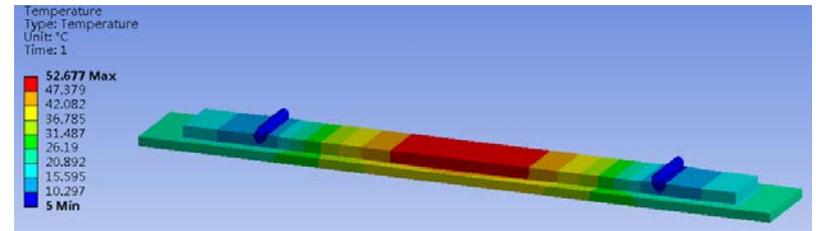
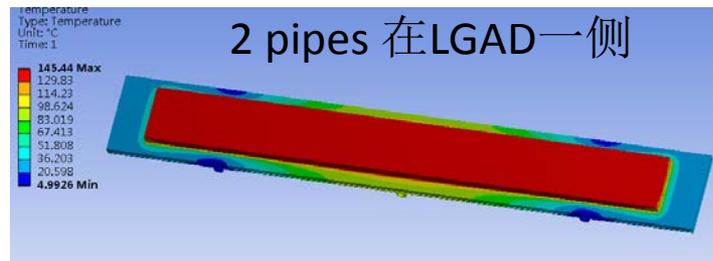
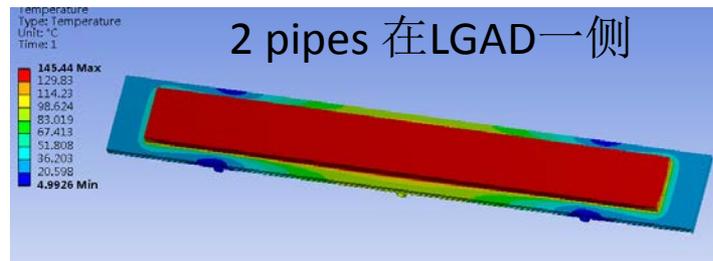
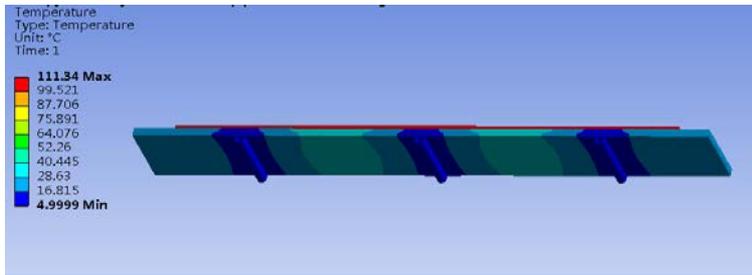
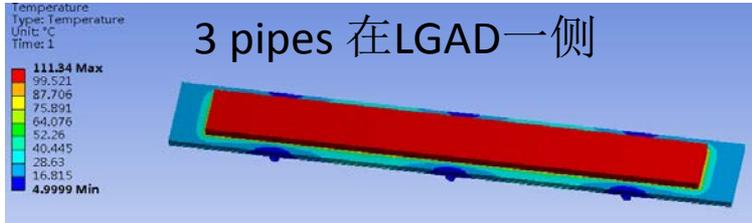
LGAD、ASIC-硅

PCB

冷管温度5°C



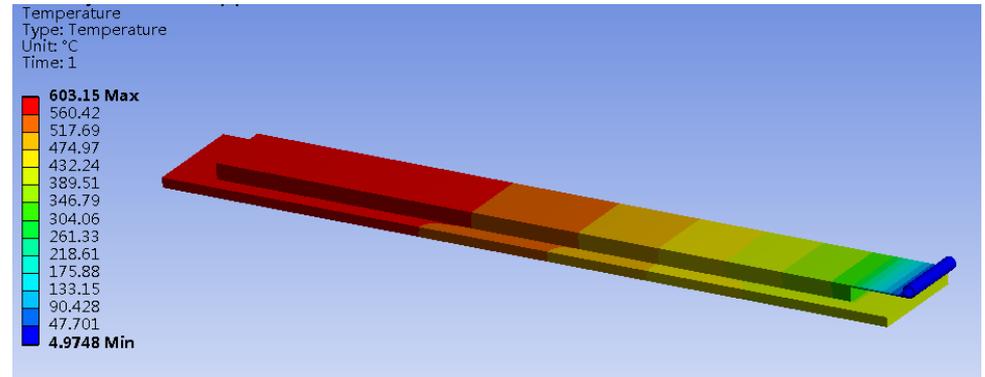
典型结果



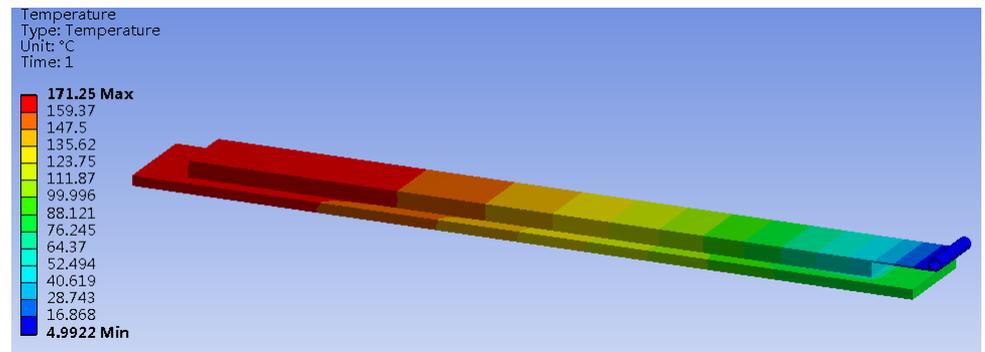
初步结果显示PCB导热影响，将管布置在LGAD一侧的冷却效果太差，不能满足要求。布置在ASIC效果较好。考虑冷管固定的可行性（ASIC一侧实际难度太大），设计了其它冷却方案正在分析中。

续-侧面布置方案-单管

一侧单根导热板-铝

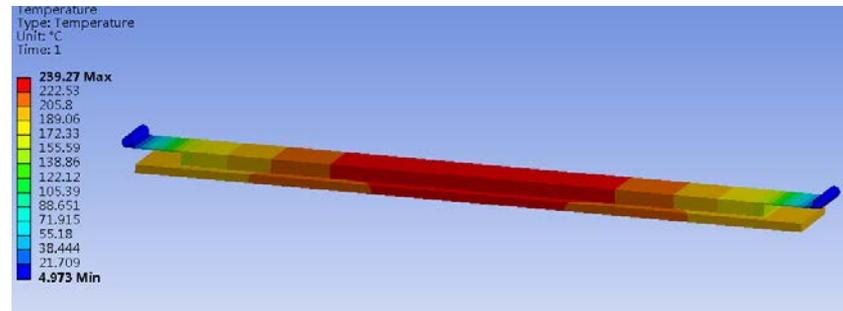


极限对比：
假定一侧单根导热板-高导热率 2000

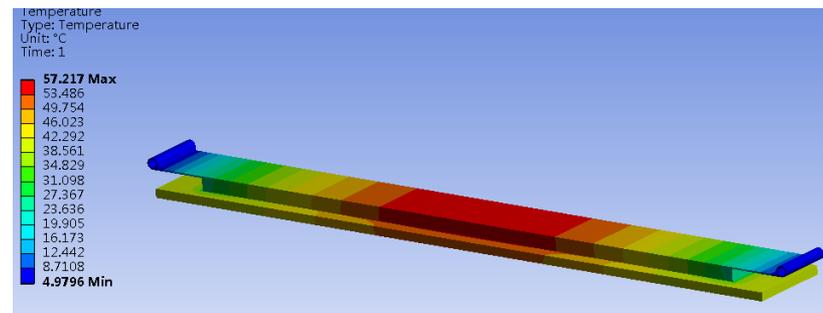


续-侧面布置方案-双管

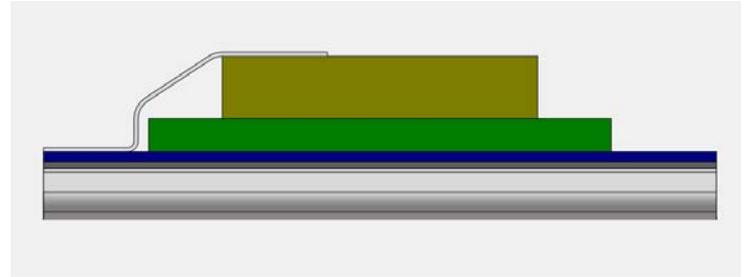
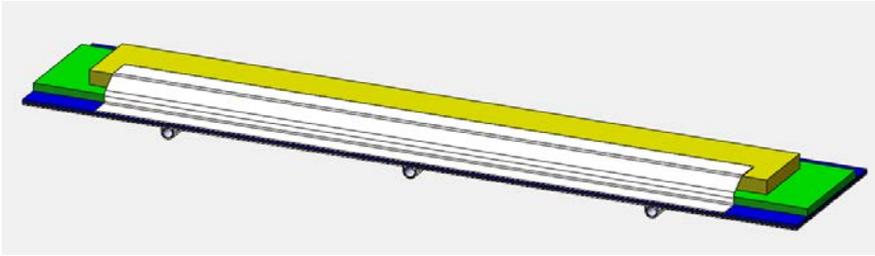
导热板-铝



极限对比：
假定导热板-高导热率 2000



新方案



导热板连接asic和lgad，跨过PCB
接触面用绝缘导热胶？