Mechanical Model of PICO Focal Plane

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Mounting strategy: clamping



Gap between wafers = 4 mmWidth of Cu = 80 mils (2 mm)

Bottom frame

The relative linear expansion coefficients between 300K and 4K: Cu, -0.33%; Invar, -0.05%

Extensions

Each inner wafer has 3 extensions on sides; some of outer wafers can have more. Current extension = 4 mm



Mounting strategy: clamping

Filter stand Screw holes Wafer-mount slots Top frame Bottom frame

Focal Plane (not completed, bottom view)





* Mass of silicon is overestimated due to wrong thickness of lenslet wafers. We are going to fix it.

Heat Sinking

 We are considering heat sinking the TDM boards directly through Cu bottom frame; then heat sink detector wafers through TDM

Back-up slides



Filters

Metal mesh low-pass



Metal mesh filters

Pixel	Bands* [GHZ]	Thickness [mm]
Α	43	7.68380404
В	52	6.44145392
С	129	2.77209274
D	155	2.33779912
E	385	1.00491065
F	462	0.84849103
G	555	0.71570017
H	666	0.60429767
	799	0.51035409

* Highest band in the pixel

Invar vs Cu



Thermal contraction for Cu ~ 0.4 mm, silicon and invar ~ 0.1 mm