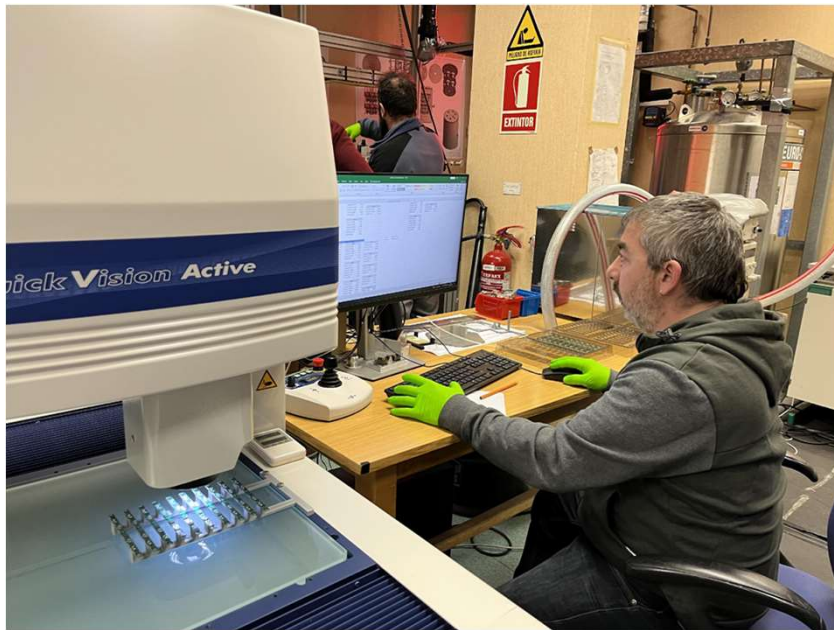

FD1 HPK SiPMs boards production Mechanical Measurements

Laura Pérez Molina
Aritz Canto Combarro
Enrique Calvo Alamillo
Antonio Verdugo de Osa

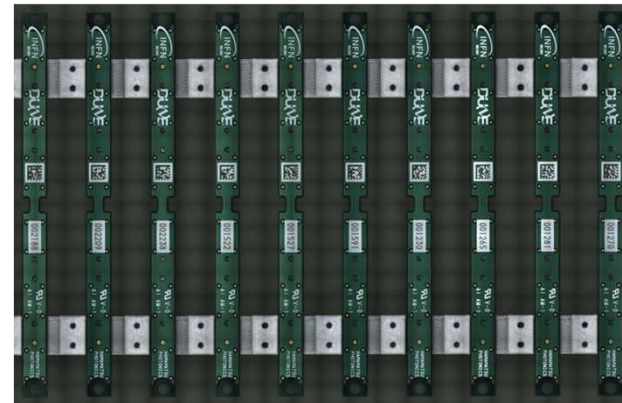


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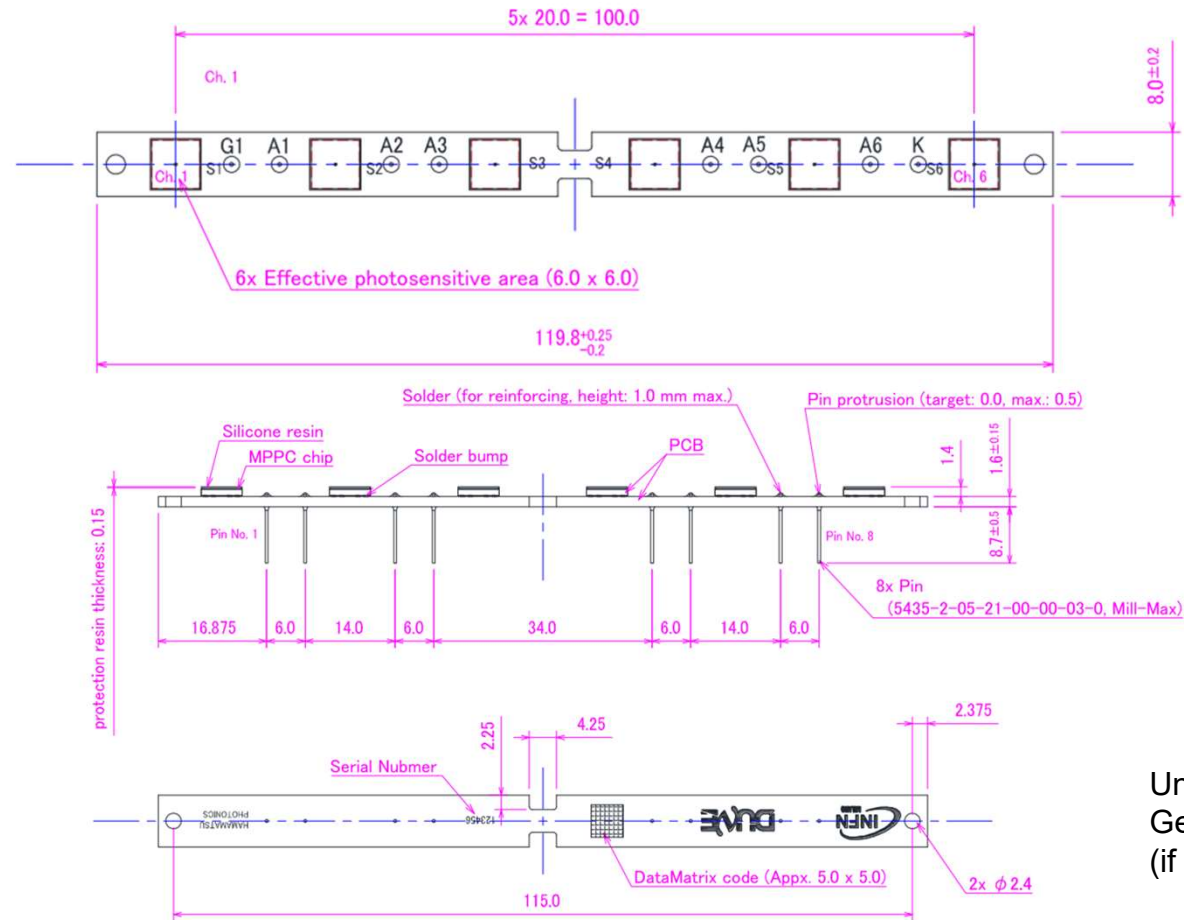
How do we measure?



Measurements made with a *3D vision machine*
Model: QUICK VISION Active 404
Precision: $\pm 1.5 \mu\text{m}$



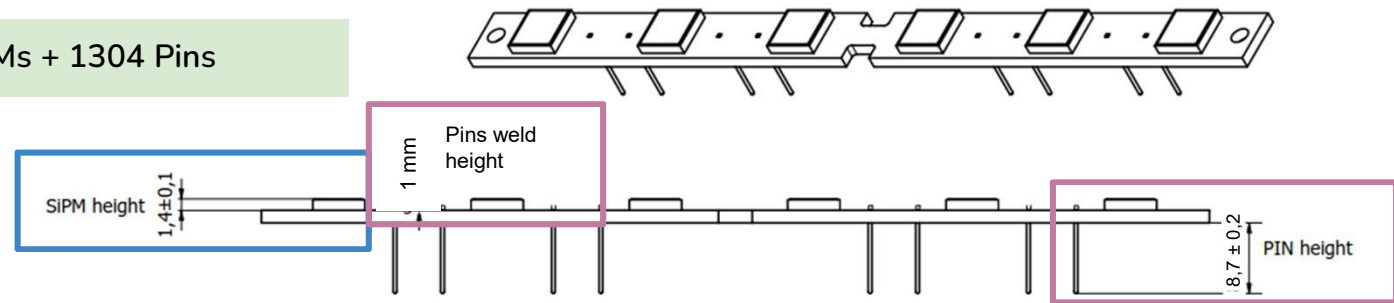
Specifications in the contract with HPK



Units: mm
 General tolerance: ± 0.1
 (if no other is specified)

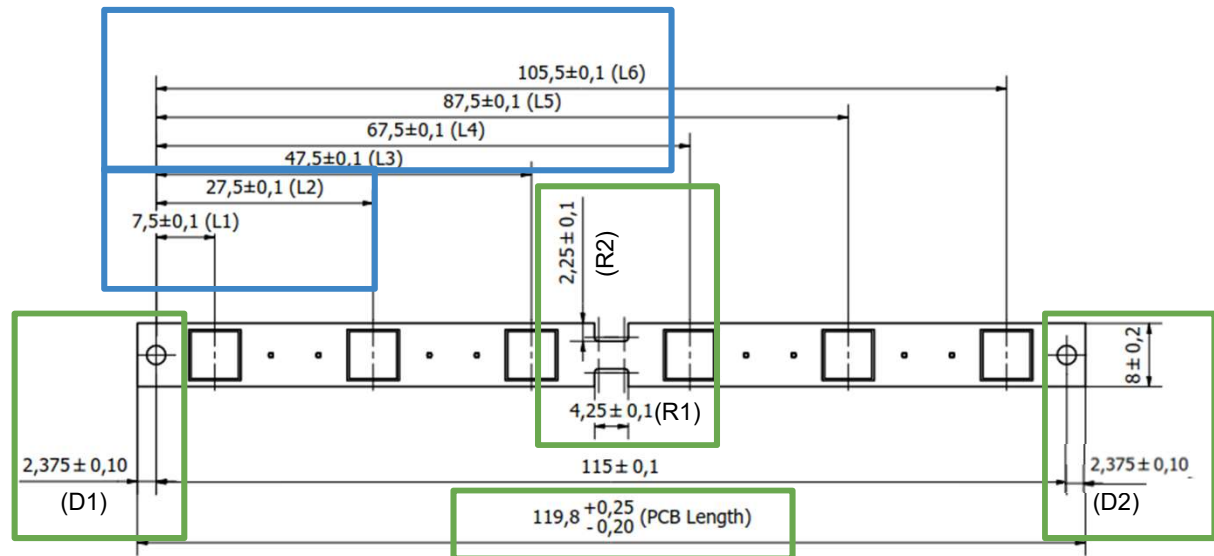
Measurements

So far: 163 PCBs + 973 SiPMs + 1304 Pins

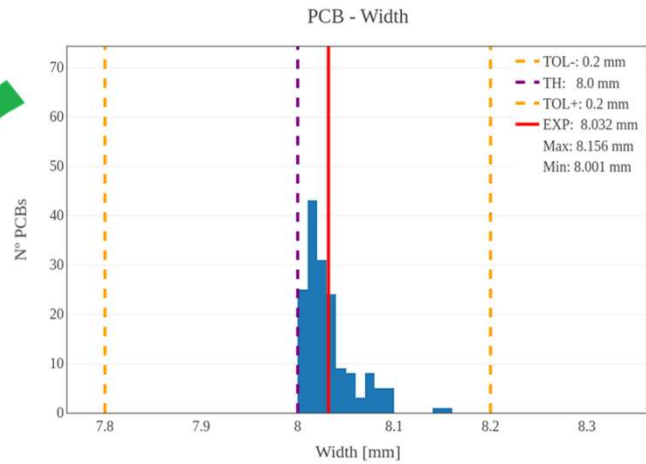


PLOTS

- PCB Width
 - PCB Length
 - Distances to drill (D1, D2)
 - Burr length/width (R1/R2)
- Pins Height
 - Pins - weld height
- SiPMs Height
 - SiPMs Position Y (L1-6)



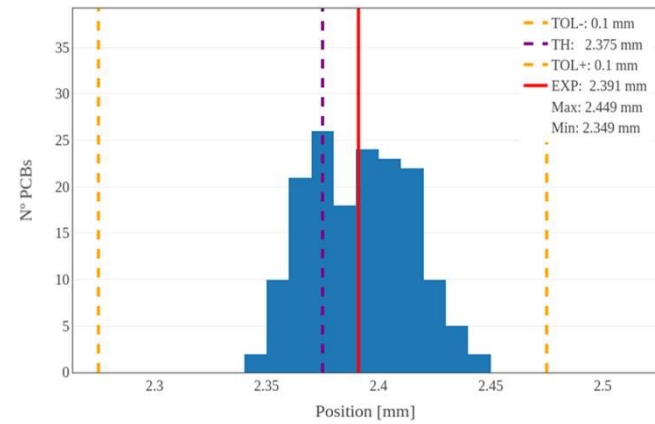
Results: PCBs (x163)



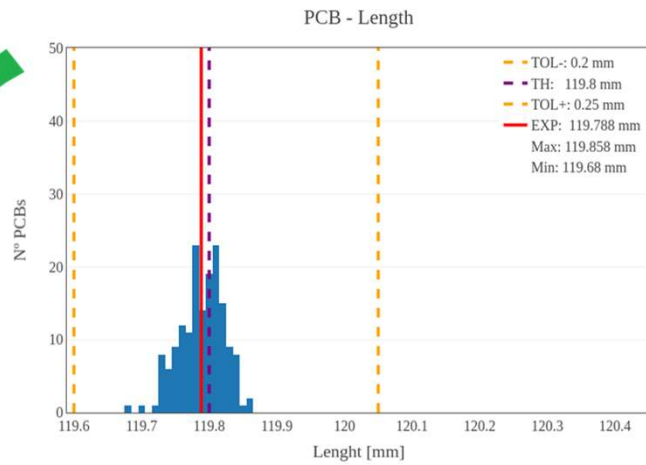
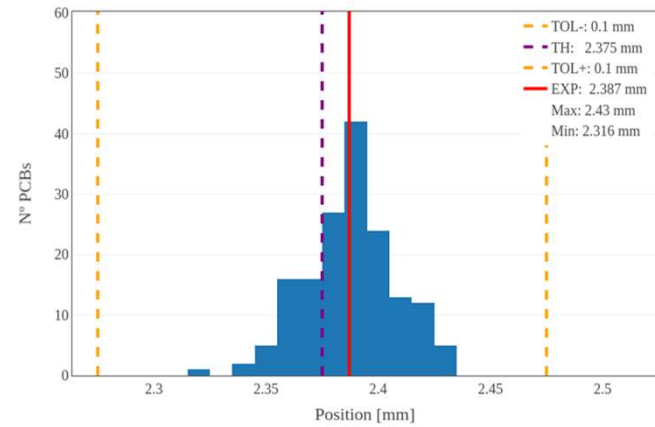
TH, TOL⁻, TOL⁺:
theoretical value and tolerances from the contract.

EXP, Max, Min:
Experimental measurement, maximum and minimum measures.

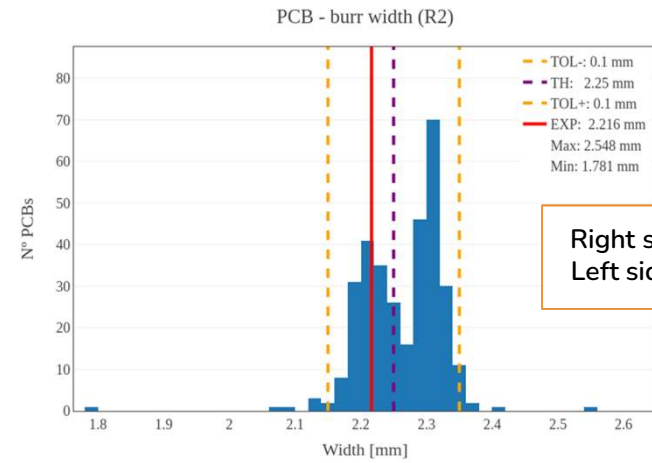
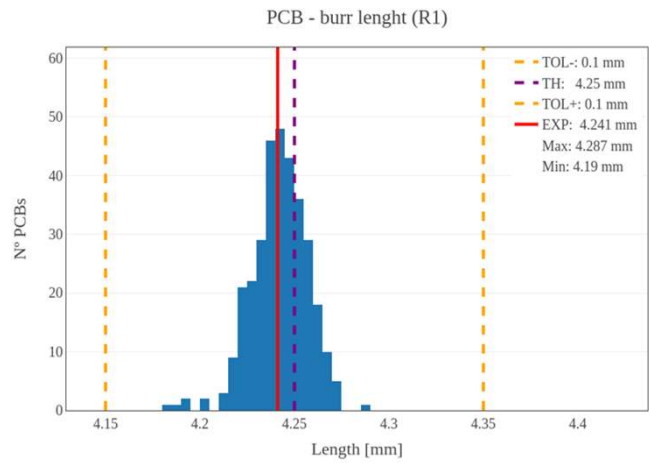
PCB - Distance to Drill (D1)



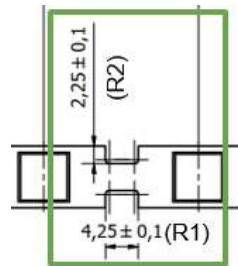
PCB - Distance to Drill (D2)



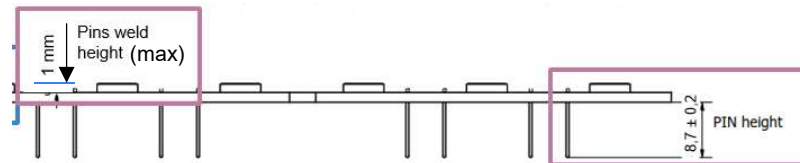
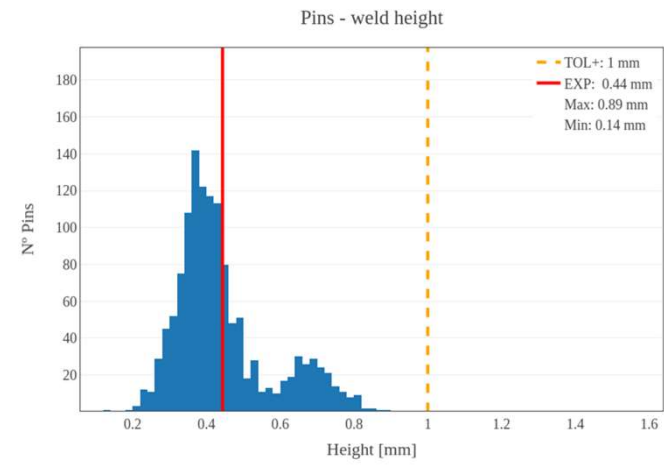
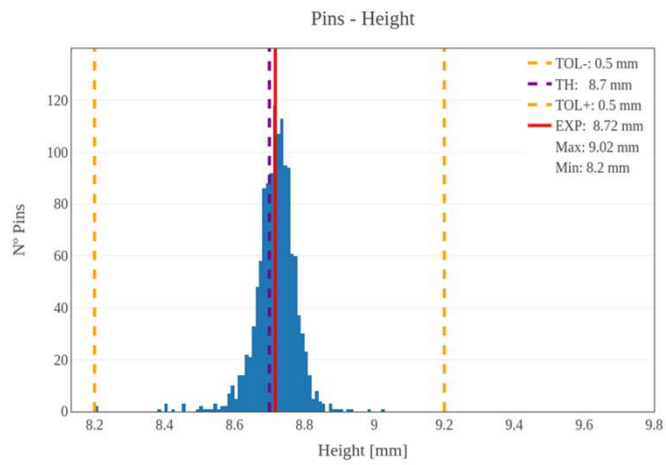
Results: PCB (x163)



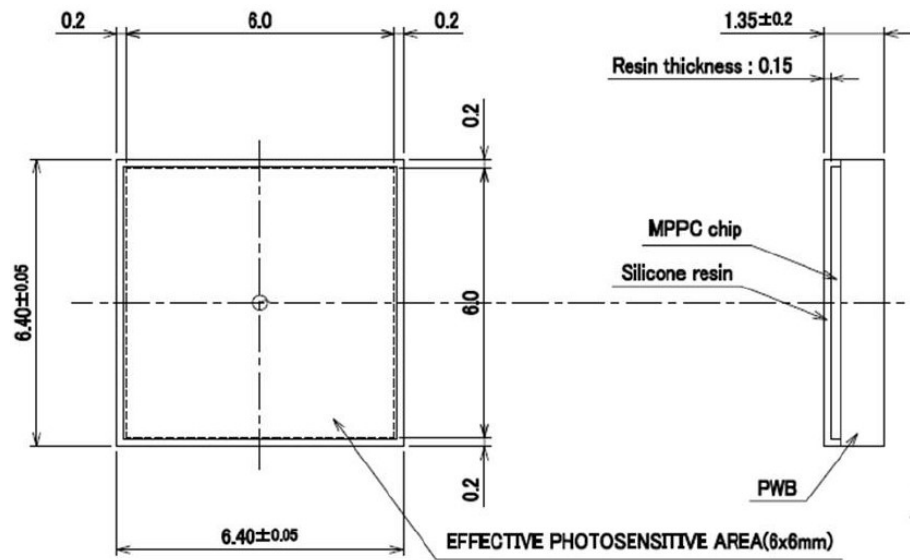
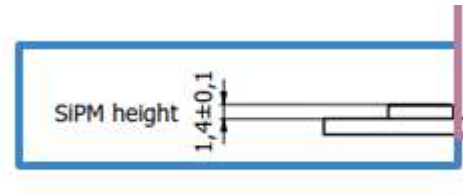
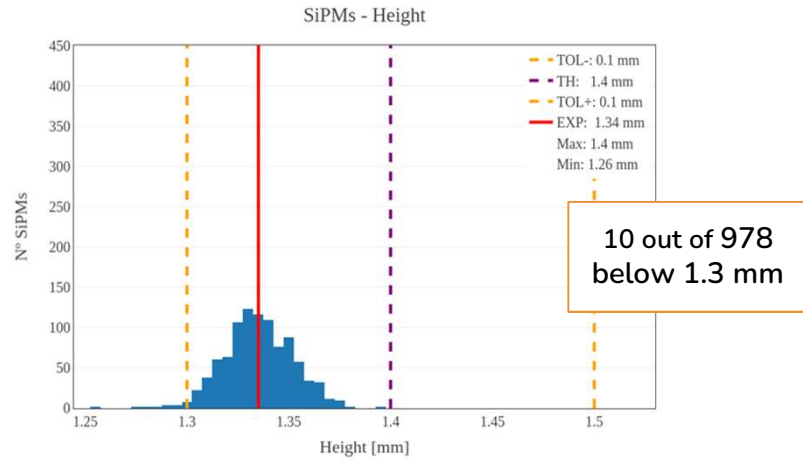
Right side: 7 out of 163
Left side: 11 out of 163



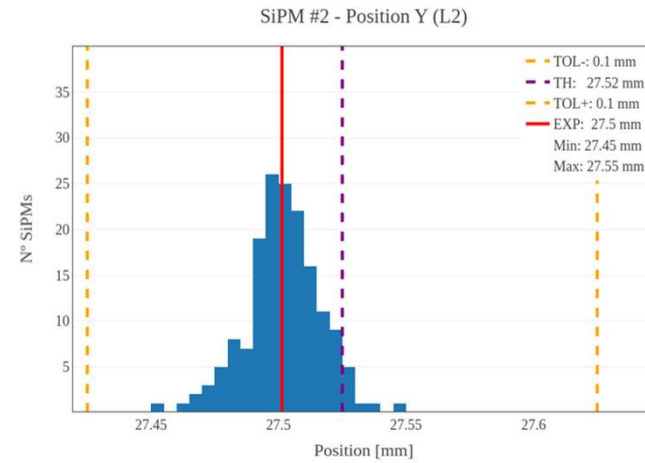
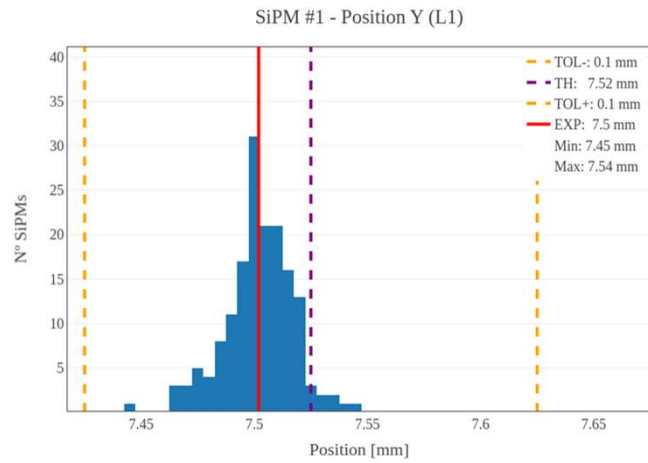
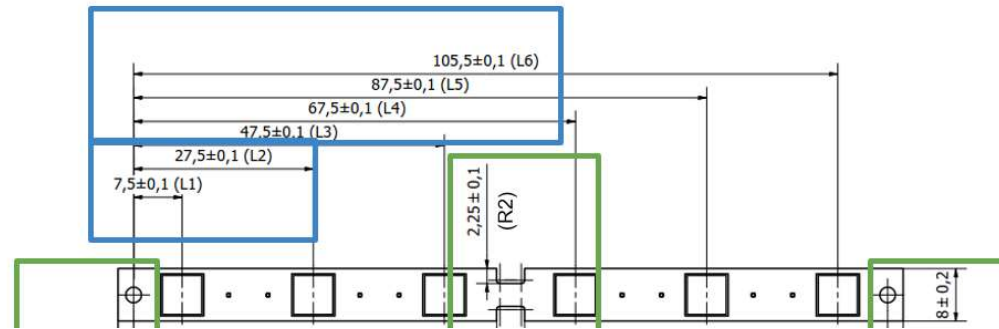
Results: Pins (x1304)



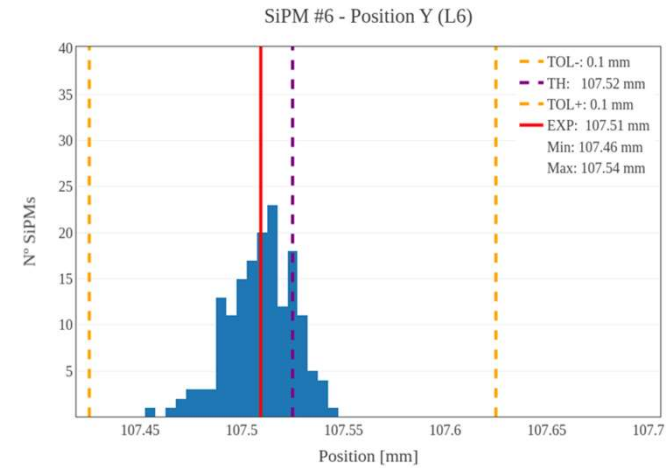
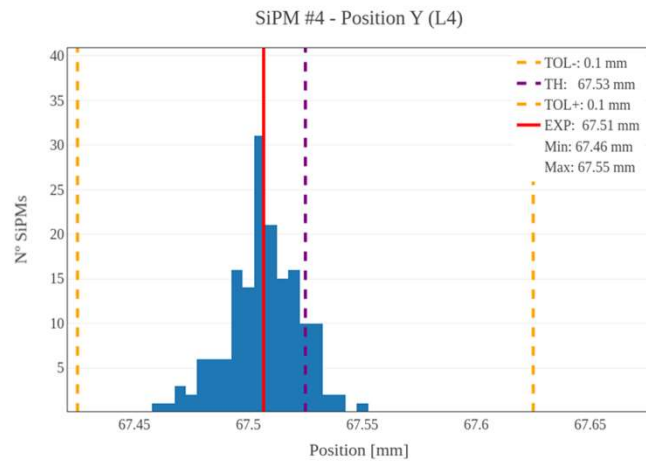
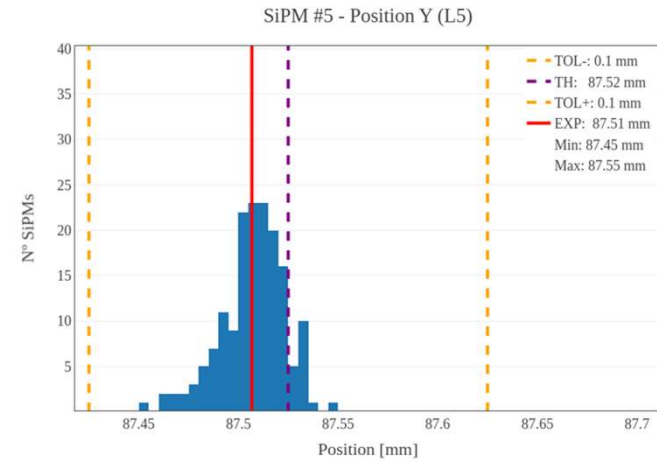
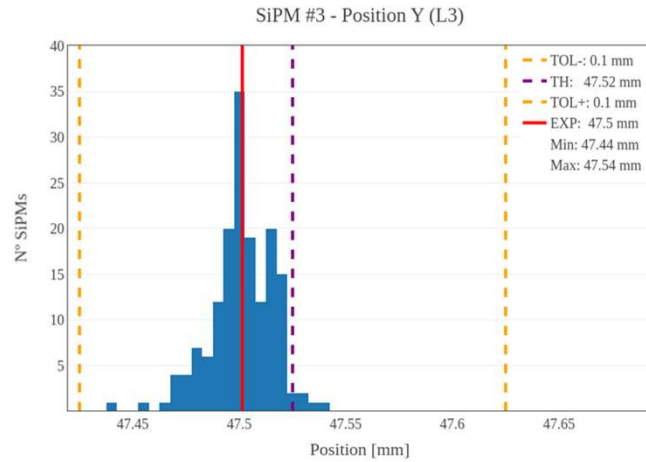
Results: SiPMs (x978)



Results: SiPMs (x978)



Results: SiPMs (x978)



Thank you !