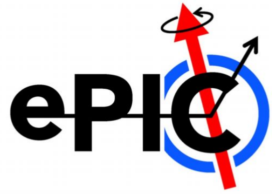


ALCOR - dRICH Readout

Fabio Cossio on behalf of the ALCOR group
INFN Torino

ePIC Electronics & DAQ WG meeting
ASICs & Electronics Monthly Progress Reports

19.03.2026

ALCOR 64 packaging status

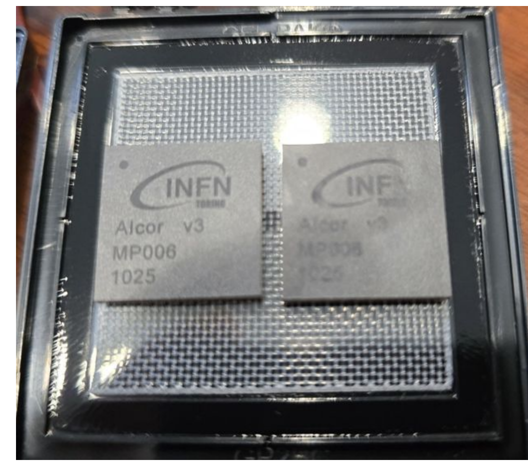
Packaging company (I-Tronics) confirmed **ALCOR packaging issue is due to UBM process** (managed by them via different subcontractor):

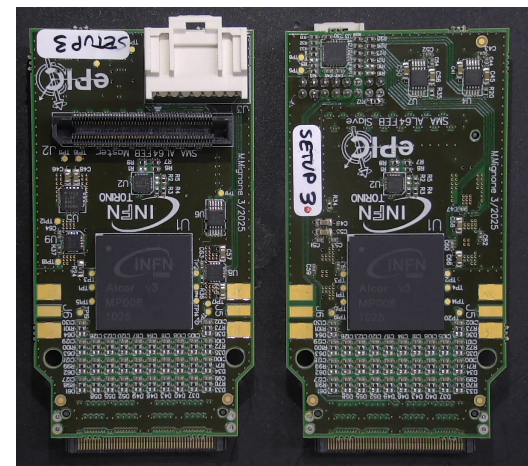
- **UBM layers extend beyond the bump pads**, covering additional areas of the chip surface above the passivation layer
- This metalization **creates a wetting surface** that facilitates solder migration from the substrate-side bumps to the die → the **solder overflows across the UBM**, leading to **short circuits between adjacent pads**

Completed packaging on 4 ALCOR dies using company proposed **recovery solution** (*gold stud bump)* which reduces/avoids solder overflow

BGA devices received in February, then assembled on ALCOR FEB → 4 FEBs with ALCOR-64 received on Mar 3rd

Critical issues on all 4 tested devices: many short-circuits and some open-circuit on ALCOR pins



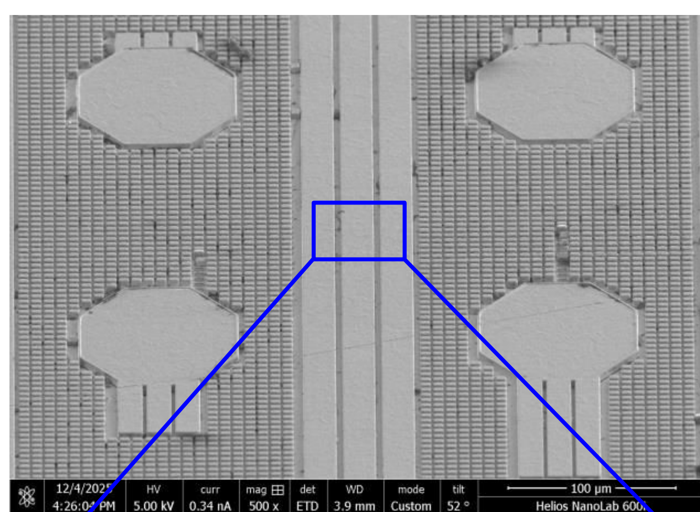


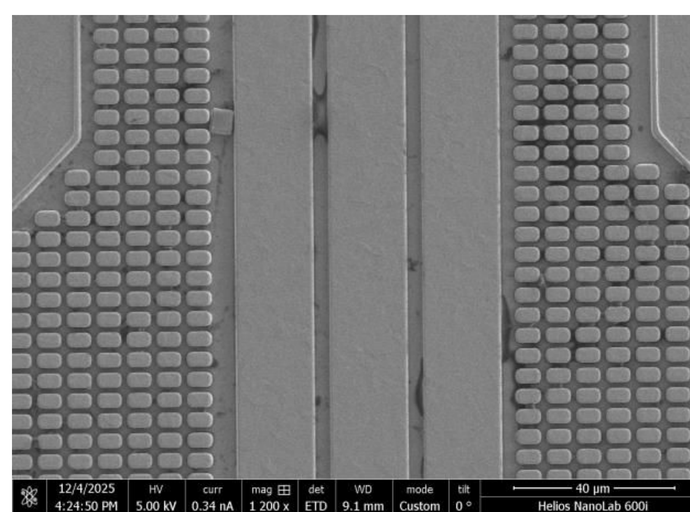
Short-circuit pins correspond to adjacent bump pads on the chip, this spatial correlation strongly support the hypothesis that the UBM metallization between pads facilitates solder overflow, creating bridges during the reflow process

Next steps

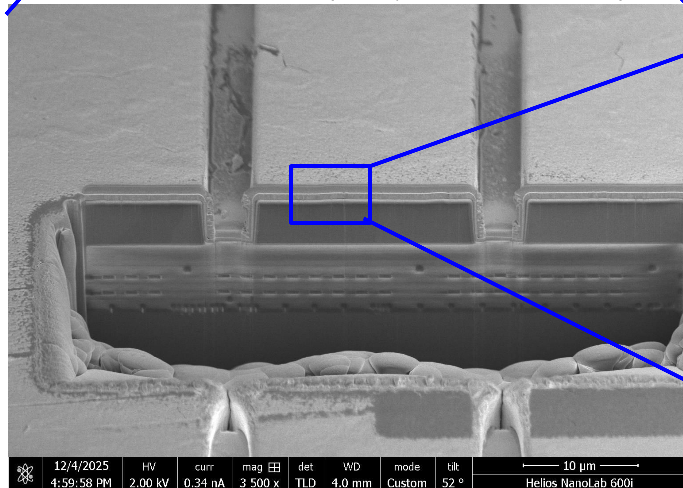
- We have requested the packaging vendor to perform impedance measurements and continuity tests, probing directly on the bump pads of the remaining bare dies to check if open/short circuits are already present before the assembly process (but after UBM)
- This issue introduces an important **delay** in our **schedule**
- Started discussions for a **new MPW run** and **alternatives for UBM process**
- No ALCOR-64 for beam tests in May-June 2026: we will use the old front-end electronics

Results from investigation carried out by packaging vendor

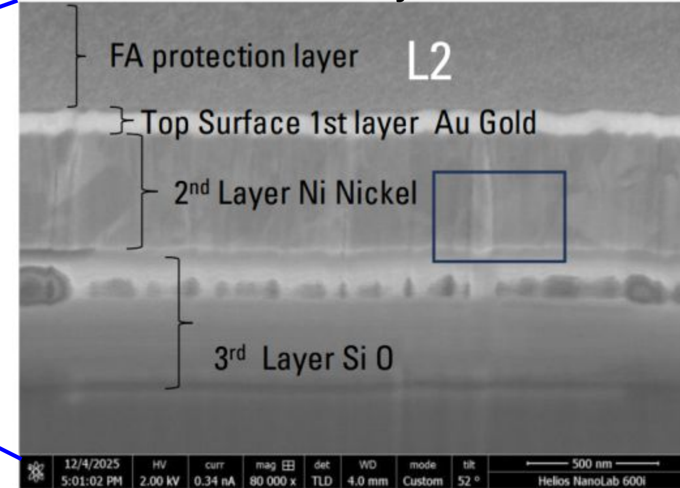




FIB dissection (away from pad area)



EDX analysis



Au and **Ni** layers are from **UBM process** and they are above chip passivation layer, in an area away from bump pads

This shows that we have exposed metals between pads