Packaging on Sevilla Boards

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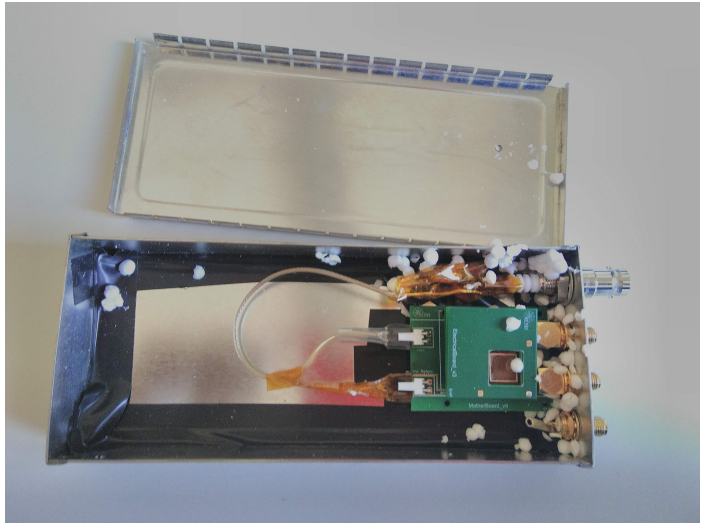
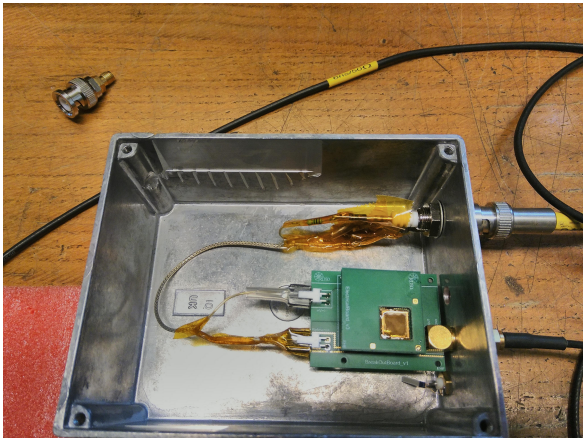
Sevilla Amplifier from the US



We should not use this kind of material for packaging

Setup

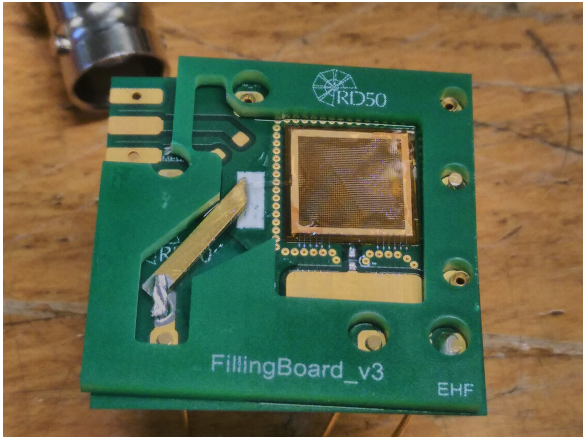


- Al box to have better light tightness
- Sevilla breakout board
- 10 MΩ in series to the sensor
- Cividec and oscilloscope readout
- 5 μA current limit

Sensors

- 1 sensor received with the Sevilla board (Sensor 0)
- 3 sensors received later (Sensor 1, 2, 3)
- All 4 sensors could be biased to at most 1500 V
- All 4 sensors shown signals of 1.5 V amplitude several times per second
- The sensors showed a sudden breakdown jumping from O(100 nA) to 5 μA

Underfill of Sensor 0 and 1



- Epo-tek 301-2
- Two component epoxy for underfill
- Underfill through capillarity
- Room temperature cure possible
- Recommended cure 3h @ 80C

Procedure:

- Mix and degass the epoxy
- (Let Rui) Apply the epoxy at the die edges and under the “bridge” for the wirebonds
- Sensor 1: cure @ 80C directly
- Sensor 0: cure at RT for 12h and then @ 80C: this avoid expansion of eventual residue bubbles during the cure at 80C

Results

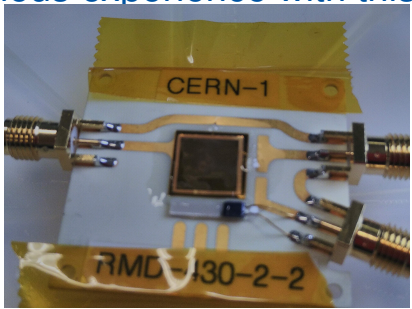
Sensor 1:

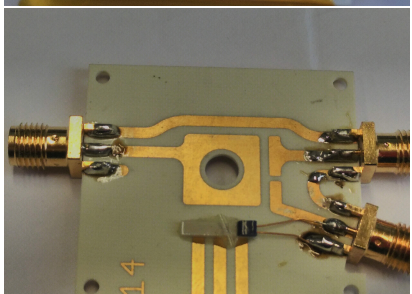
- Sudden breakdown at 1540 V
- Frequency of the dark signals strongly reduced o(0.1 Hz)

Sensor 0:

- Sudden breakdown at 1700 V, “trainable”
- Seen particles at 1675 V
- Unstable operation
- Frequency of dark pulses strongly reduced

Previous experience with this epoxy





Differences:

- The back contact bad has the same area as the die
- No degassing
- Cure at RT for 12h and then @ 80C

Results:

- Sensor could be operated continuously at 1775 V

Backup Material