

UCSC QA Tests

on 4 GLAST Hamamatsu Prototype Sensor

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1 Mechanical Dimension

- 1.1 ID numbers have not been applied to the 4 sample detectors.
The scratch pad available for marking detectors has been left blank
They have to be labeled later. Hamamatsu # 35483 -4,6,8,9.
- 1.2 Visual inspection shows detectors to be in good condition.
There are very few scratches or edge defects.
- 1.3 Mechanical dimensions compared to specifications.
 - 1.3.1 Accuracy of mask placement:
better than the ± 1 (μm) quoted in the specifications.
Deviations in rotation of mask within edge cut:
 < 20 microns across the detector.
Outside dimension: < 20 microns from specs
Internal dimensions (strip length, pitch, probe pads, etc):
agree with specifications to within micron.

2 Bulk electrical properties

- 2.1 I-V measurements show uniform I-V curves, **(Figure I-V)**
about 9nA/cm^2 at 100 volts, $< 50\text{nA/cm}$ specs,
one detector was raised to 450V with no breakdown exceeding the >200 V specs.

2.2 C-V measurements

depletion of the 4: 80-95V, within the specs of 70-125V(**Fig. C-V, Fig. 1/C**)
above depletion: capacitance value uniform to 5%,

=> variation of depletion voltage due to wafer resistivity, not thickness.

body capacitance 0.5pF/cm per strip, as expected.

3 Electrical Measurements on all strips

(measurements will be performed with probe card.)

3.1 Leakage current per strip: NY

3.2 Coupling capacitor integrity: NY

4 Electrical Measurements on few strips

4.1 Interstrip capacitance CI as a function of Frequency (**Fig CI**) at 90V bias.

(Capacitance to 4 neighbors on each side.)

Central strips (no bypass strip neighbors) (#222) : CI = 4.22pf @ 10kHz

Side strips (floating neighboring bypass strips) (#315): CI = 4.25pf @ 10kHz

Bypass strip (one implant neighbor floating) : CI = 3.56pF@ 10kHz

4.2 Interstrip isolation: > 10 G Ω

(spec of 30M Ω is too small !).

4.3 Coupling capacitance: NY

4.4 Bias resistors (**Fig R**)

63-64M Ω across detector on each of 4 sensors.

This value is on the desirable high side of the 30-80M Ω specs

variation across detector well within +/-10 % specs.

4.5 Resistance of Al: NY

4.6 Resistance of Al bypass NY