

## Meeting Notes

### GLAST SSD with HPK in Hamamatsu City on March 27/28, 2001

Present: K. Yamamoto, K. Yamamura, T. Inuzuka, I. Okamoto, K. Sato (HPK)  
 T. Ohsugi (Hiroshima U.), R. Bellazzini, G. Spandre (INFN-Pisa), T. Borden (SLAC), H. Sadrozinski (UC Santa Cruz)

#### Decisions:

1. Reduce by half specs on leakage current to eliminate the potential of having several noisy strips/SSD
1. Define more clearly breakdown and required tests and deliverables by Seller
2. Seller will measure location of saw cut (parallel to strips) relative to fiducials
3. Hiroshima to get the two detectors with onset of breakdown at ~170V for investigation.
4. INFN will order the additional 28 (-2) SSD and 10 mechanical samples
5. Depletion voltage specs: will ask for two quotes: one for <150V, one for <100V
6. Probing on outer (bonding) pad by Seller will be allowed
7. Request yield information from with HPK to trace process
8. Do QA Testing at Hiroshima every 2 weeks concentrate on long-term, HV stability and radiation
9. HPK will be able to manufacture SSD dummies (glass, Al strips, Al backside)
10. Arrange for meeting after testing of first 150 SSD in June (potentially by e-mail / phone / visit with HPK)
11. Agree for meeting at the Nov 4-10 IEEE NS meeting and/or SLAC at the same time.
12. HPK is to start production according to our schedule.  
 Delivery will be on the 20<sup>th</sup> of the month  
 150/month May-August, 500/month starting in September.
13. Delivery of parts on Sept. 20 means start of production / ordering in June 2001  
 Will have three coordinated bids, with their preparation starting now.

<u>Institution</u>	<u>Responsible</u>	<u>Number</u>	<u>When</u>
INFN	Bellazzini	Entire 5,000	start after INFN approval ~ May
KEK	Ohsugi	First 650	start bid now, takes 3 month Rebid in 2002
SLAC	Borden	900	start now

#### Action Items:

- |  |                          |
|--|--------------------------|
| 14. Distribute info on bidding docs etc                      | Bellazzini/Ohsugi/Borden |
| 15. Discuss with HPK how to trace the yield                  | Ohsugi /Yamamoto         |
| 16. Send full non-functioning wafers to SLAC and UCSC        | Yamamoto                 |
| 17. Work out needs for mechanical samples/dummy detectors    | Bellazzini/Borden        |
| 18. Get price of mechanical samples/dummy detectors          | Ohsugi                   |
| 19. Check if bowing spec can be changed (now <100um)         | Bellazzini/Yamamura      |
| 20. Write justification for reduction of max leakage current | Ohsugi/Sadrozinski       |
| 21. Write justification for reduction of av. leakage current | Ohsugi /Bellazzini       |
| 22. Reword bonding requirement e.iii                         | Ohsugi/Yamamoto          |

23. Change humidity to >40%, <60%	Sadrozinski
24. Data Base details (HPK will access ftp server?)	Spandre/Ohsugi/Yamamura
25. Confirm shipping address, customs declarations etc	Bellazzini/Yamamoto
26. Shipping Containers	Yamamoto/Bellazzini
27. Update Specs LAT-DS-00011	Sadrozinski
28. Update QA provisions LAT-CR-00082	Sadrozinski
29. Check procedure of Interstrip Cap measurement on skinny detector at SLAC	Sadrozinski

### Proposed QA Testing Program at Hiroshima on test structures

Test 1 or 2 structure / processing unit (every 2 weeks)

(this allows us to detect changes in process before the parts are used)

Bond out on simple PCB so that we don't need probe station for long-term testing

Measure:

Leakage current (I-V): Long-term and HV stability and radiation damage

Interstrip parameters (C, R): Long-term stability and radiation damage

In addition, Hiroshima U. will trace the processing at HPK using the HPK measurements and yield numbers.

### Changes in Specs LAT-DS-00011:

- c.ix Uniformity of thickness on single wafer
- e. Process control of bonding pads for ultra-sonic bonding with 25um Al wire"
- e.iii Demonstrated # of bad channels due to wire bonding < 0.1% (TBR)
- h. Electric properties ( at 25°C, humidity <60%, >40%)
- h.ii Max leakage current < 390nA  
average leakage current < 200nA (TBR)
- h.iii Breakdown voltage (change of slope of I-V curve) > 200V
- h.iv Total leakage current per sensor at 200V: < 500nA
- k.iii Distance of edge parallel to strips to fiducials "B".
- k.iv The total detector leakage current vs. bias voltage (I-V)  
(in 5 volt steps up to 200V at 20 - 25°C, humidity <60%, > 40%)  
and the measurement temperature.
- k.v A list of bad channels with their defects indicated  
(Coupling capacitors tested up to +100V on AC pad)
- k.vi The body capacitance vs. bias voltage (C-V)  
(in 5 volt steps up to 200V at a frequency of 1kHz)
- k.vii The depletion voltage extracted from the C-V plots
- k.viii Information supplied with every batch  
Measured resistance values of poly bias resistor and Al electrode in the  
batch (average, minimum, maximum)  
Traceability data of processing (relative yield, start and end date, ...)

and wafer (batch number, boule QC, ...).??

1. Radiation hardness

The radiation hardness will be verified by GLAST LAT on the small test detectors. Those samples will be exposed to gamma-rays from a  $^{60}\text{Co}$  radiation source up to 100 Gy in biased condition. The irradiated sample detector shall satisfy the following requirements (@150V, 25°C, humidity <60%, > 40%):

Changes in QA LAT-CR-00082:

Change INFN-Pisa to Italian Institutions

Change “electronic form” to “on web / ftp / e-mail”

Change “paper form” to “diskette”

Change humidity to >40%, <60%