PEL Analysis Checklist

T53VG3R, T53VG3RA
SEM/EDS Analysis Update

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PEL Analysis Update (1 of 3)

• **T53Vg3R & RA**
  - Completed
    • SEM/BSE, particle search on cells 2 (61), 16 (75), 30 (89), 44 (103), 57 (116)
    • SEM/BSE on upstream side of input coupler iris
    • **Particle analysis as a function of chemistry and size**
  - In progress
    • Crater analysis as a function of position and chemistry
    • **Validate results**

• **H90Vg5R**
  - Completed
    • SEM/BSE, particle search on cells 2, 12, 13, 14, 40 upstream and downstream
PEL Analysis Update (2 of 3)

- **Coupons**
  - Polycrystal and single crystal (LLNL) machined
    - Completed: SEM/BSE – microbalance - AFM
    - In progress: Profilometry
  - KEK single crystal machined
    - To be completed: SEM/BSE/Profilometry – microbalance after etch after thermal cycle
  - Cornell breakdown studies
    - Completed: SEM/BSE/Auger/XPS on SLAC/KEK coupon
    - In progress: New KEK Coupon breakdown at Cornell and subsequent PEL analyses
  - RF structure quality control coupons
    - T53Vg3MC Completed: SEM/EDS on post plating and post bake coupons
    - H60VG3N_6C and H90Vg3N – XPS completed coupon are cleaned
    - H60VG3S18 – XPS completed coupon are cleaned
PEL Analysis Update (3 of 3)

• Coupons
  – 8 Pack quality control coupons
    • A series of coupons have been XPS /SEM after cleaning and a 525C H2 firing – contamination by Pb and Bi. No particle contamination. This coupons have been fired in C. Pearson furnace they are OK. The brazing parts of 8 pack with their coupons in the MFD furnace are XPS clean. We are tracing the contamination (march 10); H60Vg3S18 has been cleaned march 21 & april 4, no contamination.
    • We are looking into the MFD furnace. Coupon went back clean
      • Altair coupon are XPS cleaned. More particles but nothing unusual.

• New NLC structures for autopsy
  – H60VG3N-6C

• Secondary Electron Yield Measurements
  – System calibration
T53VG3R Particle Count by Chemical Composition

Particles per Square Centimeter

- Metals (not S, Mn, or Al)
- Mn-S
- Al compounds
- Mn-other
- S compounds
- Carbon

Cell Number

1 Up 1 Down 2 Up 2 Down 16 Up 16 Down 30 Up 30 Down 44 Up 44 Down 57 Up 57 Down
T53VG3RA Particle Count by Chemical Composition
T53VG3RA (Interior Cells)

Particles per Square Centimeter

Cell Number

- Metals (not S, Mn, or Al)
- Mn-S
- Al compounds
- Mn-other
- S compounds
- Carbon

29-May-03 Physical Electronics Group
T53VG3R Particle Size Distribution
(in Microns)

4 particles > 10 microns; 2 particles > 20 microns; 4 particles > 50 microns

Percentage of total particles

Cell number

0 10 20 30 40 50 60 70 80 90

< 1 micron
1 to 2.5
2.5 to 5
5 to 10
4 particles > 10 microns; 2 particles > 20 microns; 4 particles > 50 microns

29-May-03

Physical Electronics Group
T53VG3RA Particle Size Distribution (in Microns)

2 particles > 10 microns; no particles > 20 microns

Cell number

Percentage of total particles

< 1 micron
1 to 2.5
2.5 to 5
5 to 10

1 Up 1 Down 2 Up 2 Down 16 Up 16 Down 30 Up 30 Down 44 Up 44 Down 57 Up 57 Down