Imaging Product Engineer

Responsibilities:

Responsible for CMOS Imager products and projects, such as yield improvements, circuit simulation and debug, device characterization and enhancement. Extensive semiconductor design and/or process experience is a plus.

Skills:

Must have basic product engineering abilities and candidate should have strong drive and good analytical and problem solving skills

The following skills are desirable:
Outstanding knowledge of transistors (MOS/BJT) and device physics.
Solid process knowledge.
DF2 skills (layout, schematics, simulation).
Lab equipment (parametric analyzers; curve tracer; o#scopes, etc.).
Failure analysis skills or knowledge of (EM, SEM/TEM).
Ability to microprobe.
Familiarity with basic circuits (Analog; ADCs, DACs, Op-amp, regulators, etc.) I-Mate and/or other bench tester knowledge.
Data extraction and analysis; basic software skills.
Able to communicate effectively with other groups (design, process, layout, QA, apps, PE).

Experience:

Knowledge of CMOS Imagers a plus.
Knowledge of ADC characterization and DSP a plus.
Familiar with ATE a plus.

Education:

BS or MS Degree

Personal Requirements:
Good time management skills with the ability to stay focused on pertinent issues.
Strong work ethic with a high level of motivation and a can-do attitude.
Good written and oral communication skills.
Must be a team player.
Willing to support a 24 hour day/7 day week production environment. (A regular shift will be expected, but availability in case of emergencies is a must).

Job Functions:
Support for Design
Product engineers work closely with Design engineers throughout a product's life. When the part is first conceived, the Product engineer (PE) supports Design by helping with trade-offs for manufacturability. It is PE's role to make sure that specific design issues are communicated to the various manufacturing groups.

When a new product goes through Fab, PE constantly monitors the line to observe the lot's progress. During this time, PE helps Probe and Test engineering put together electrical test programs. These electrical tests tell PE how the device performs under various operating conditions; for example, dark and midlevel imaging tests, how it reacts to different temperatures and voltage levels, and how reliable the device will be when it reaches our customers. Product engineers use the Probe and Test data to decide whether a circuit change is needed and interacts with Design to facilitate the tape out a new fix. When there is a problem with the part, the PE determines if it is process-related (Fab or Process Development) or design-related.

Support for Fab

Product engineers support the Fab by updating the Fab engineers on customer issues and probe test coverage. The manufacturing of Imaging products is relatively new at Micron. This has required a consistent increase in test coverage as customer feedback and standards shift. The development and rational of these tests are communicated to Fab to allow for root cause analysis. Physical Fail Analysis (PFA) locates and analyzes the failing defect mechanism for the Fab. PE also helps when no defect can be found and characterization of the part is necessary.

Yield optimization is a primary focus for PE. Further, PE reviews Probe data for Fab's Special Work Requests (SWRs).

Support for Process Development/Integration PE gives the same support to Process Development/Integration as it does for fab engineers. Whenever there is a new process to test, Process Development runs a "process vehicle" this may encompass one or more lots in a single or multiple SWR(s).

Support for YE/YA

YE/YA deprocesses the Probe fails to locate the defects that cause yield hits and relay this information back to the Fab so that necessary changes can be made to improve the yield. PE has developed most of the electrical testing that YE/YA does in their lab. PE helps if the defect cannot be seen and an electrical characterization is needed on the wafer.

Support for Probe

PE support Probe by helping correlate Probe results with actual measurements taken in the PE labs. This is critical when a new part comes out of Fab to determine if the fail is due to process, circuit design, or an actual Probe test. Imaging PE has also been instrumental in analyzing RMAs and devising new tests to contain these failures.

This information is also fed back to the CT group for specification modification. Once a part matures, Probe asks PE to correlate certain tests when the testing condition changes or if there is a high fallout to a certain test. It is PE's responsibility to make sure that the Probe and Test Programs are correct and to assist with test time reduction and overkill evaluation.

Support for Assembly

As the wafers from a new product make it through Probe, PE makes sure that they are correctly dispositioned into Assembly. For example, PE determines what qualities make a product eligible for die sales vs.packaged part sales. PE provides data for SpecTek to generate reconstruction pick maps and for assembly engineering to develop packages. This dispositioning ensures that the correct configurations are used to internally qual the product and then qual the product for Micron's customers. Frequently, PE requests Assembly to pick certain die for further testing on the bench and for characterization.

Support for Test

As the lots enter Test, PE closely monitors their progress. The lots see much the same tests at Test as they saw in Probe but conditions change after the die is packaged. PE is responsible to provide the test limit changes. PE will analyze failures at Test and determine if they can add tests at Probe to make the parts fail earlier in the flow. PE is the back end of line monitor.

Support for QA

PE supports QA by making sure that they have enough parts to qual a new design. PE addresses any fails that QA sees during the qual and also helps QA debug Acceptable Quality Level (AQL) fails. These are fails from samples pulled from inventory. Customer returns (Returned Material Authorizations or RMAs) are given to QA and PE helps debug these if needed as well.

Support for Planning/Sales/Marketing

PE supplies Planning/Marketing the overall part yield so that shortages or excesses can be determined. PE prediction the date when the part will shift from MS to ES to QS to MP (when parts will qual and be available in volume). Finally, PE helps the Applications engineers with any customer questions they cannot answer, and they review the data sheets prior to publishing, making adjustments in the specs for customer requests or needs.