



Promik Assessment Report – Sept 2005

Attendees from Freescale Semiconductor:

Georg Breucker -	Product Quality	- Munich
Tommy Kirk -	Field Quality	- East Kilbride
Engelbert Wittich –	Field Application	- Munich

Agenda:

Robust and consistent Manufacturing process during programming:

- Handling and processing facilities monitored for product identification and traceability
- Process to verify product is programmed correctly (reliability monitor)
- Yield analysis with set control/action limits
- Process to ensure mechanical integrity
- Visual and mechanical verification, lead inspection
- Control of non conforming product / Product segregation
- Program verification
- ESD Control
- Environmental conditions, (temp / humidity etc.)
- Power Supply control, flash protection

Programming Algorithm and equipment used:

- Traceability of algorithm & hardware / software changes
- Mask set traceability system
- Regular & proactive maintenance regimes
- Closed loop feedback to equipment supplier and Freescale of issues/faults

Programming exercise

- As detailed in Assessment checklist 4.5
-

Trained and responsible workforce:

- Evidence of documented processes and full understanding across all employees
- Training records
- Clear reporting structure

Co-operative and open Management that proactively address issues:

- Culture of operation including focus on quality and continual improvement
- QS9000, ISO9001:2000, TS16949:2002.



Scope of 2005 assessment – Review of previous assessment

- Identify opportunities where appropriate
- Identify areas of continuous improvement
- Review appropriate quality metrics and associated data

REPORT

(Based on Freescale Product Programming assessment Checklist – Rev 4.5)

1. General Information

- Business in Promik is predominately designing programming systems either for their own use or directly inline equipment to be installed at the customer premises.
-
- Temperature, Humidity and Dust is controlled and monitored continually, as per recommendations
-

2. Handling & Storage

- Handling within the facility is very good, with no areas of concern.
- Racking in storage area not ESD grounded, deemed not necessary as all product remains in controlled packaging.
- Time out of dry pack is recorded, availability of calibrated oven if necessary to re bake.
- Traceability of component to process is maintained to the lot number/ mask number as well as the date code.

3. ESD

- ESD controls are good, with all flooring being conductive and overalls/ shoes supplied and used as a normal event.
- Wrist straps, shoes are checked daily on entrance to the programming area, records are maintained.
- Training is given and maintained annually to all employees, records are maintained
- Clear identification of ESD areas and work stations, where people are working (sitting) at a workstation wrist straps are supplied.
- Audits of the ESD facility, flooring, workstations etc is conducted annually using an external company.
- Equipment checking ESD is included into the calibration system



4. Programming – Automated & Manual – (including information on Power supplies, EMI & flash protection)

- After laser marking packs are placed at relevant tester, as long as parts are taped & reeled there is no chance for parts to miss programming, small chance otherwise as laser is first process.
- Mask set checked on the system, although this is late in the process and could effect customer in a time perspective it does full proof against wrong mask set being programmed.
- Test heads monitored individually, identifying either mechanical or electrical failures IO or NIO (In Ordnung or Nicht in Ordnung) and stats are run from this.

Quality Systems

- Certified to TS16949:2002 since January 2004, approval body TÜV
- Certified to ISO9001:2000, approval body TÜV
- Management system responsibility lies with Hr. Rosenberger – Managing Director.
- Quality manual and systems were implemented with the assistance of a consultant (BFK)
- Management review is held, with the assistance of an external consultancy BFK.
- Internal audits are conducted annually using the consultancy of BFK, last round during March 2003 with 0 issues highlighted.
- Continual improvement is sought and can be demonstrated, one area is introduction of trays for SOIC components.
- Corrective action documentation is covered using 8D reports.
- Customer requirements are taken care of at initial order request, all go via Hr Rosenberger.
- Customer satisfaction measures are evaluated
- Job card follows every job; typically all jobs started will be finished within the same day to ensure moisture sensitivity is not an issue.
- Check sum value must be hand written on the job card to ensure the operator has checked actual versus requested.
- Computer infrastructure includes servers where all SW is stored; there are systems in place to back this up.



5. Lead Inspection

- Lead inspection is conducted both before and after programming on the programming equipment.
- This equipment monitors both 3D and 2D, covering co planarity and co linearity

6. Laser marking

- Marking is typically the first process, prior to programming and packing and is separate to try to avoid dust in the programme machines
- Marking is carefully placed, avoiding any original marking ensuring no data related to traceability is lost.

7. Tape & Reel

- As previously mentioned part of the programming process and is continually monitored for temperature.
- Peel strengths checks conducted monthly
- Orientation and marking can also be check whilst in the tape.

STRENGTHS

- o On-line tracking of defects- sorting them into electrical/ mechanical failures
- o Complete reduction of manual handling due to self designed processes
- o Investment in new equipment, improving capability and reduction of handling. New system installed since previous assessment includes many innovative enhancements such as using no oil in its mechanical parts, mechanical improvements, and controls of key parameters.
- o Able to demonstrate several areas of improvement since previous assessment – for example Improved logistics have enabled Promik to STL (Ship to line) for key Automotive customer
- o Demonstrated improvements with regard to traceability of parts
- o Margin Verify procedures

Equipment exercise and test setup.

As part of this assessment Promik were requested to program a standard S Record and different File Format and put additional serial number on each S12x/S12 and EY16 device.

- Promik is able to handle all different File Formats successfully.
- MPC555 Flash programming and standard verify was done successfully.
- S12D64 Flash programming and standard verify and margin "1" and "0" verify was done successful.
- S12D128 Flash programming and standard verify and margin "1" and "0" verify was done successfully.
- S12D256 Flash programming and standard verify and margin "1" and "0" verify was done successfully.
- S12xDG512Flash programming and standard verify and margin verify was done successfully.
- S12X - 144 Pin Margin Verify test t was done successfully.



All S12 and S12X Margin "1" and "0" test result were included in failure report!
- 68HC908EY16 Flash programming and standard verify was done successfully.
Equipment was able to save original trimming values and re-trim to a final value.

Process improvements for future consideration:

Creating an automatic random or serial number would be an additional option to have a 100% tractability for all S12/S12X .

CONCLUSION

Promik are categorised as a Provisional 'A' Class programming facility

