



RoodMicrotec
powerful solutions

Supply Chain Management Services



Stuttgart



Zwolle



Nördlingen



Dresden

...certified by RoodMicrotec.



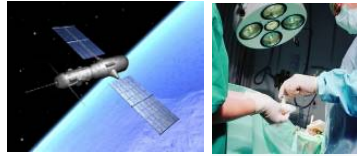
**RoodMicrotec – the leading independent
European company for semiconductor
testing and quality services.**

Fields of Activity



Market Segments:

- Automotive
- Industrial
- Aerospace
- Communications
- Medical



Customers:

- Fabless design companies
- Component manufacturers and -users
- System manufacturers and -users
- Distributors

Services Throughout The Entire Product Lifecycle



DEVELOPMENT

- ❖ Development support
- ❖ Design for test
- ❖ Debug
- ❖ Characterization, screening
- ❖ Chip repair (FIB)
- ❖ Qualification Consulting
- ❖ Qualification

PRODUCTION

Supply Chain Management Services

plus:

- ❖ Sophisticated failure analysis
- ❖ System level analysis
- ❖ Solderability tests
- ❖ ESD/ESDFOS evaluation
- ❖ Lifetime/reliability calculations

PHASE-OUT

- ❖ Long time storage for wafers and packaged devices
- ❖ Physical examination (DPA/IPI)
- ❖ Bake / burn-in
- ❖ Solderability tests, MSL
- ❖ Functional tests
- ❖ Etc.

Why Work With A European Supplier



Engineering Know How

- Turn-Key capabilities

Geography & Mentality

- Travelling distance
- Culture & communication
- Infrastructure
- Political issues



Logistics

- No issues with e.g. labeling
- Fast deliveries - if required within hours

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Why Work With RoodMicrotec



Engineering

- Extensive accumulated knowledge
- Focus on key strengths

Flexibility

- Geared for flexibility rather than mega-volume production
- Focus on solutions rather than on problems

Communication

- Fast response time
- Communication with qualified personnel
- Phone, email & internet connections without hours of time shift

Logistics

- Shipments to RM-Germany inside Europe

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Why Work With RoodMicrotec



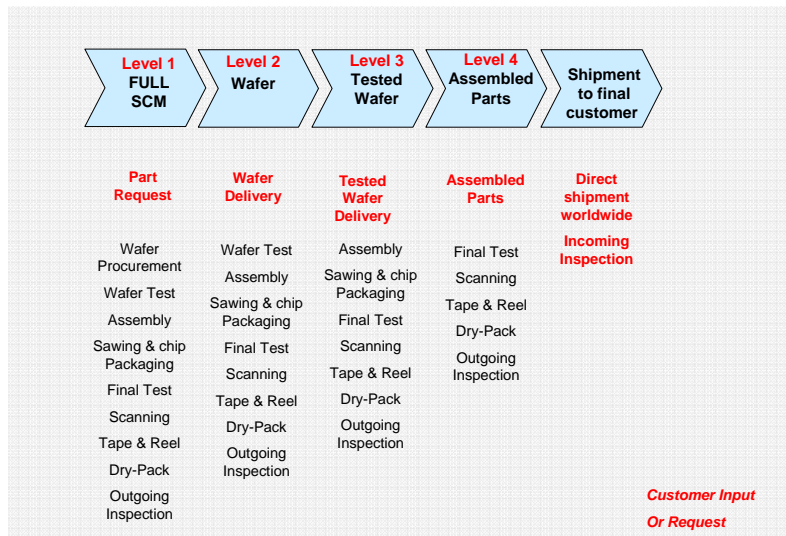
Support

- Support during development phase
- Support during ramp-up phase
- Extensive package portfolio for assembly
- In-house qualification, failure analysis and chip repair capabilities

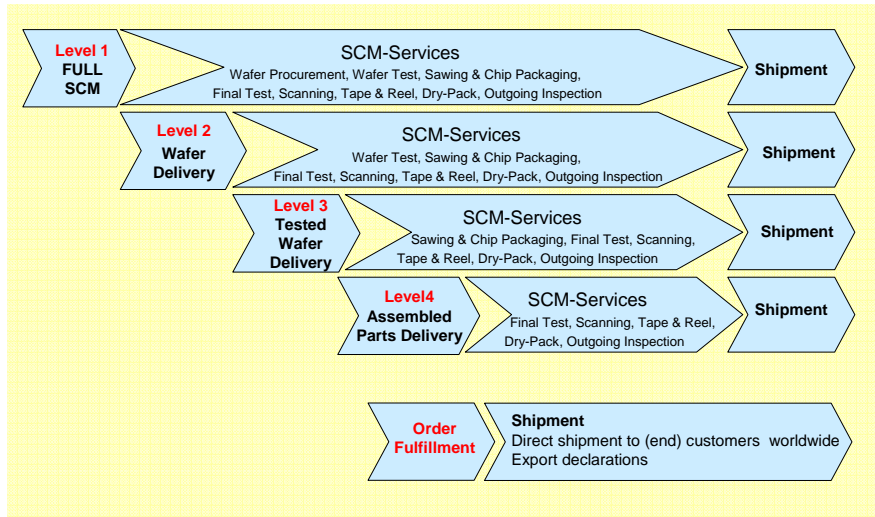
SCM Support Level

- Various levels of SCM support possible

Supply Chain Levels



Supply Chain Levels



Development Phase Support



Definition Support

- Package definition
- Design parameter for chip designer
- Die size
- Thermal properties
- Bond parameter

Delivery Specification

- Tray
- Tube
- Tape & Reel

Logistics Support



Order Processing & Order Fulfillment

- Quotations to new customers
- Forecast handling
- Production planning and control
- Order confirmations
- Invoices

Logistics & Shipping

- Shipment planning & preparation
- Customs clearing
- All paperwork

Electronic Information Exchange



Operation / Quality data

- Ship alert
- Drop ship report
- Received material report
- Scheduled lots report
- Test binning report
- FTP data exchange (push / pull)
- Access to data via VPN
- Inventory report (on request)

Commercial data

- Rolling Forecast system

Assembly Partners

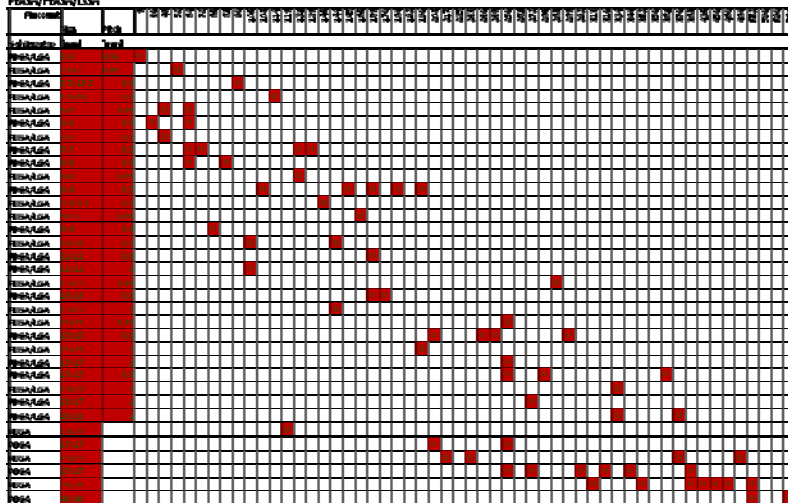


● Partner locations

Package Portfolio – Example: BGA's



Array Packages
PBGA,FBGA,LSGA



Quality Management



Stuttgart:

- ISO 17025
- ISO/TS 16949
- ISO 9001

Nördlingen / Dresden

- ISO 17025
- ISO/TS 16949
- ISO 9001

Qualification and Burn-In



- Qualifications acc. to international standards like AEC-Q, ESCC, Telcordia, MIL, JEDEC, IEC
- Component to board
- Optoelectronic devices
- Operating life test for ICs, LEDs, Laser Diodes, VCSELs
- Real-time monitoring Burn-In
- Climatic stress testing
- Mechanical stress testing
- ESD testing
- Solderability tests
- MSL classification



Failure- & Technology Analysis



Services from wafer level to assembled boards

- Internal physical inspection (IPI / DPA)
- First silicon debug and chip repair
- Focused Ion Beam (FIB) Services
- Customer return management
- Identity check

- Metallographic X-sectioning
- Material characterization
- Extensive microscopy: SAM, SEM, X-ray



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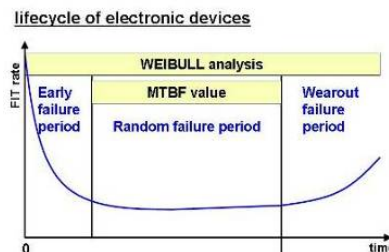
Evaluation & Consulting



- **Competence center for packages, interconnection technology, printed circuit boards and printed board assembly**
 - Interconnection technology evaluation
 - Process, product & supplier audits

- **Life time prediction**
 - MTBF (Meantime Between Failure) calculation
 - FIT (Failure In Time) rate calculation acc. WEIBULL

- **ESD Services**
 - ESD Evaluation
 - ESDFOS (ESD from outside to surface) evaluation



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Summary



- Target customers are fabless semiconductor companies and IC users applying a COT model.
- Support from initial idea via realization of high volume production to end-of-life
- Permanent quality monitoring and root cause analysis using in-house FA/QA labs
- Working together with certified assembly subcontractors in Europe and Asia plus with leading wafer foundries
- Optimal procurement by combining production volumes
- Co-operating - *not* competing- with semiconductor design houses / silicon IP providers

RoodMicrotec – Your Partner For Supply Chain Management

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