INTERCONNECT STRESS TEST

DESIGN VERIFICATION AND SUPPLIER SELECTION

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WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

DESIGN VERIFICATION AND SUPPLIER SELECTION

Content overview

1. Basics Interconnect Stress Test
2. Current applications of Interconnect Stress Test
3. Interconnect Stress Test as an element of quality planning
4. Support by Wuerth Elektronik

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BASICS INTERCONNECT STRESS TEST

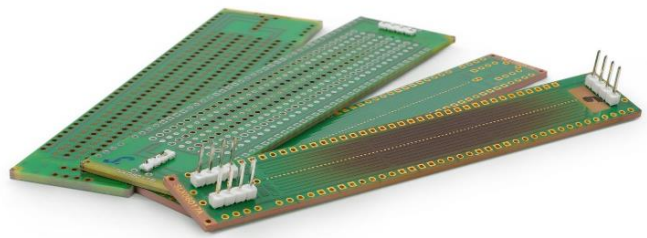
Introduction

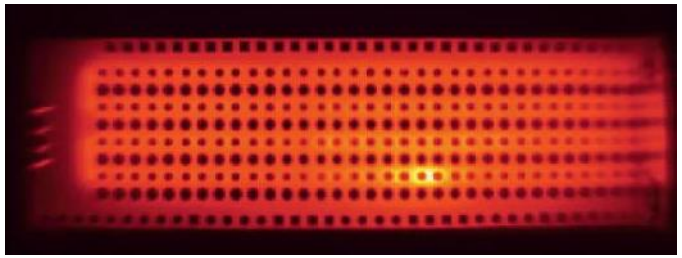
- Testing according to IPC TM 650 2.6.26 Method A

- What is the procedure for interconnect stress test?
  - Testing of specific test coupons that represent the product
  - Simulation of soldering cycles and life cycles by thermal load

- What is measured?
  - Resistance change in relation to thermal stress
  - Resistance change as a failure criterion

- What results does the IST provide?
  - Concrete failure cycles of the test coupons
  - Failure points can be detected



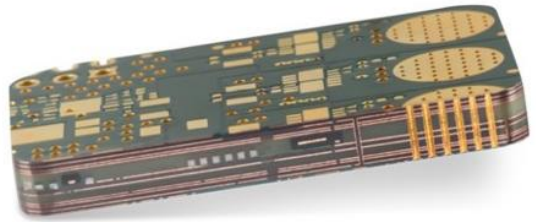


CURRENT APPLICATIONS OF INTERCONNECT STRESS TEST

Accompanying test

- Qualification
  - Process
  - Materials
  - Product

- Testing parallel to production
  - Testcoupon required



- Test due to assembly or field failure

CURRENT APPLICATIONS OF INTERCONNECT STRESS TEST

Application triggers

- Failure of printed circuit boards detected by the customer as a result of assembly, failure of microvias
- Customer has initiated the Interconnect Stress Test as a reliability check due to his own research
- Suppliers were able to adapt internal processes to improve quality with feedback to the failure of these microvias
- Testing with Interconnect Stress Test at Würth Elektronik was defined as a product-accompanying measure for safeguarding before assembly

CURRENT APPLICATIONS OF INTERCONNECT STRESS TEST

Influence of insufficient reliability

- Failure in qualification
  - Reliability of bare power circuit boards uncertain
  - Delay in start of production

- Failure in test parallel to production
  - Delay in deliveries of the assembled product
  - Reliability of assembled and bare power circuit boards unknown
  - Subsequent delivery reliability is unknown

- Failure in field operation
  - Reliability of assembled product in the field is uncertain
  - Safety risk

CURRENT APPLICATIONS OF INTERCONNECT STRESS TEST

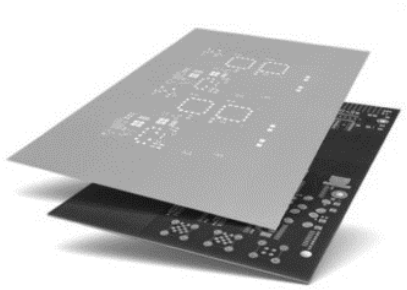
Reliability assurance planning

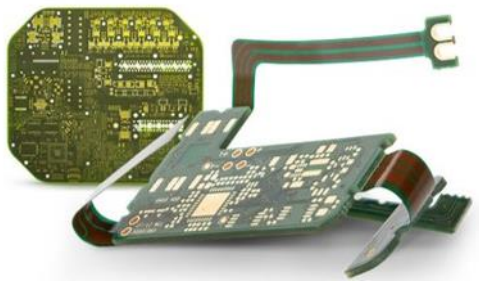
- Is a test in response to deviations adequate?
- When should reliability be proven in the project process?
- What are the requirements of customers and suppliers about the proof of reliability?

SCHEDULING THE INTERCONNECT STRESS TEST

Building blocks of reliability

- Material
  - Glass transition temperature
  - Expansion
- Design
  - Via types
- Suppliers
  - Manufacturing processes





SCHEDULING THE INTERCONNECT STRESS TEST

Planned application

- Customer specifies reliability as critical factor in project phase
- Exchange with Würth Elektronik on suitable test parameters
- All potential suppliers produce test coupons for the Customer
- Interconnect Stress Test performed by Würth Elektronik
- Results of the Interconnect Stress Test enable supplier selection on the basis of the proof of reliability

SCHEDULING THE INTERCONNECT STRESS TEST

Planned application

- Interconnect stress test a requirement for the product set by the customer
- Suppliers produce the coupons and deliver those to Würth Elektronik
- Execution of the Interconnect Stress Test at Würth Elektronik as a service
- Analysis of the failures by Würth Elektronik - Identification of improvements to increase reliability
- Verification of the optimization implemented by retesting

SCHEDULING THE INTERCONNECT STRESS TEST

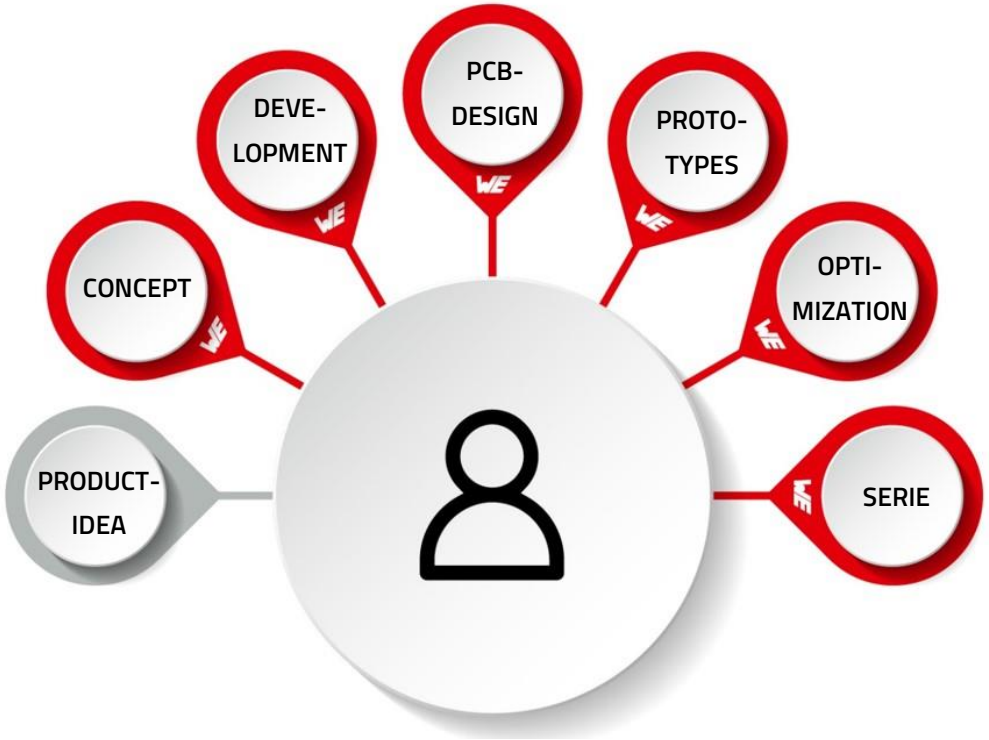
Advantages

- Supplier perspective
  - Proof of reliability to customers
  - Optimization of internal processes with proof of effectiveness
  - Reliability of design rules
- Customer perspective
  - Supplier selection based on reliability
  - Assurance of the product before production start
  - Reliability of the design

SUPPORT FROM WÜRTH ELEKTRONIK

Application of the Interconnect Stress Test

- How can Würth Elektronik support you?



SUPPORT FROM WÜRTH ELEKTRONIK

Benefits

- Experience as a printed circuit board manufacturer
  - Knowledge of the production processes
  - Knowledge of the defect patterns
  - Knowledge of material fatigue

- Experience as a service provider
  - Know-How of the Interconnect Stress Test
  - Experience in the execution of the Interconnect Stress Test
  - Experience with services – customers in power circuit board manufacturing as well as assembly/final customers

SUPPORT FROM WÜRTH ELEKTRONIK

Planning and analysis of the interconnect stress test

- Service
  - Consulting and support of our customers from planning to actual results
  - Execution of interconnect stress tests
  - Evaluation of test results, documentation in customer report

- Customer report - contents:
  - Microsection analysis
  - Statistical evaluation
  - Thermomechanical analysis of the structure, extrapolation of test data

INTERCONNECT STRESS TEST

DESIGN VERIFICATION AND SUPPLIER SELECTION

What are your requirements?

Contact us, we will support you in your next steps!

E-mail contact: pcb-test@we-online.de