IPC - Reliability Summit

Reliability standards developed in Japan by JEITA for Pb-free soldered interconnections, and reliability tests methods by JPCA

Dr. A. Shibata/JPCA, 2007-02-23

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- Lead-free solder joints –
- Reliability documents by JEITA (Japan Electronics and Information Technologies industries Association)

ET 7409 - Generic,

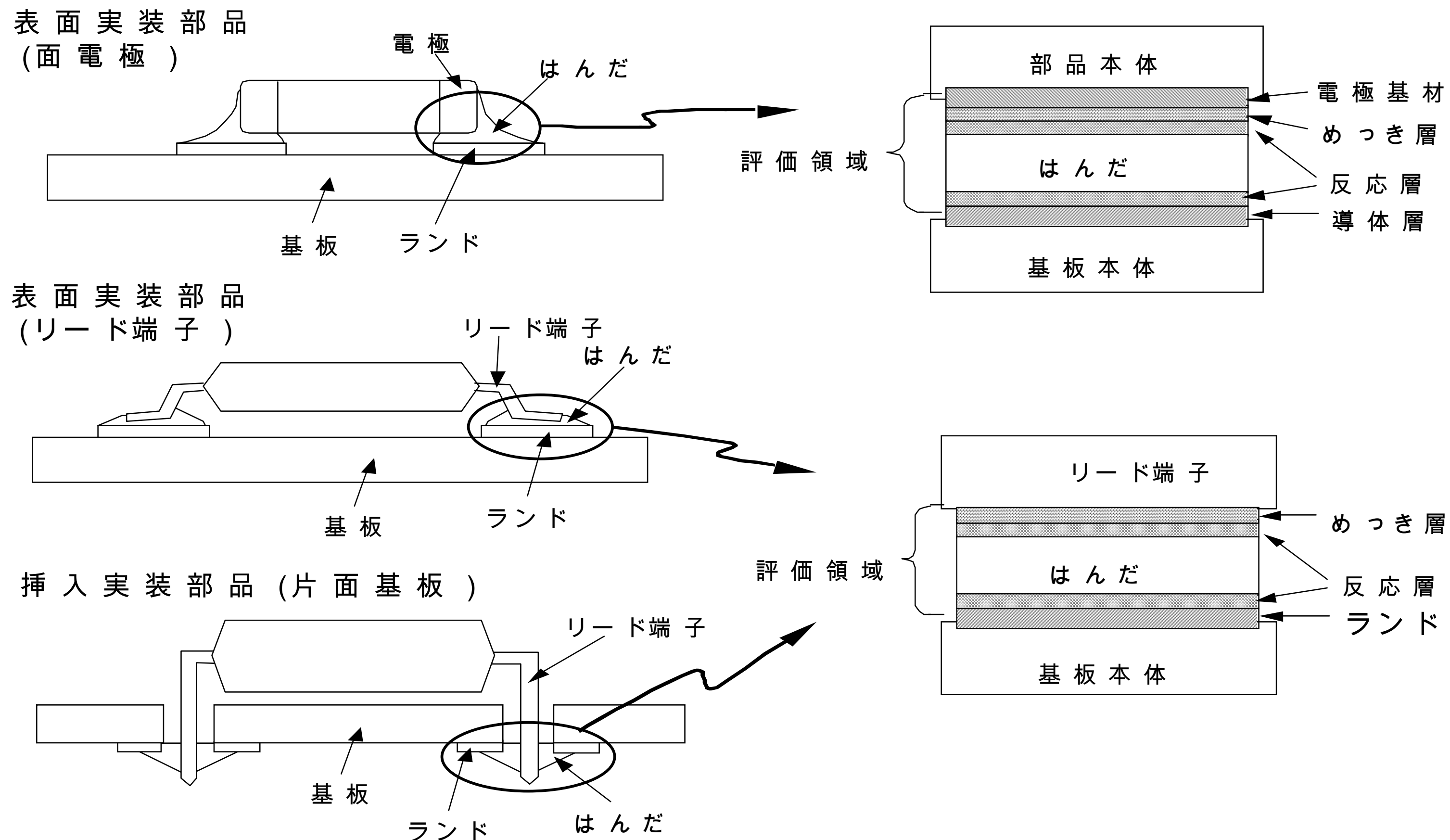
ET 7409/101 ~ 106,

ET 7409/201 & 202,

ET 7410 – Whisker growth at leads

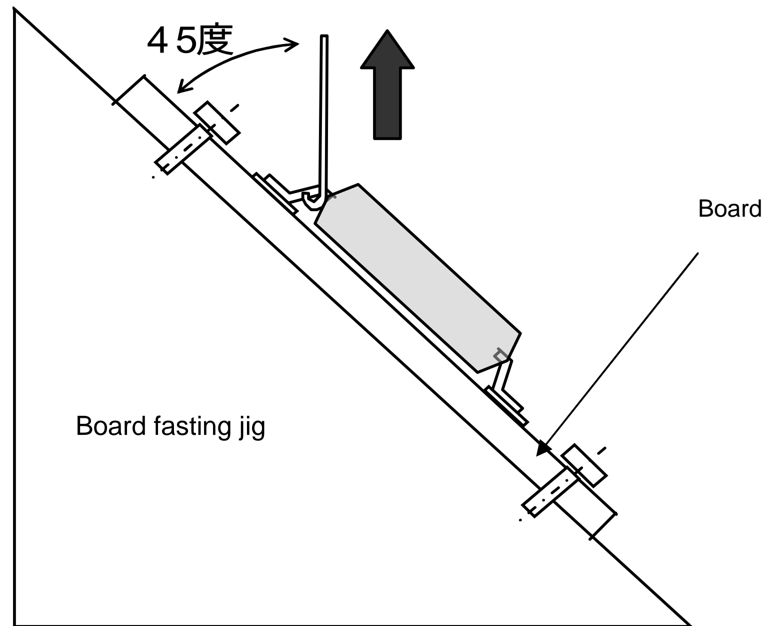
Some of them submitted to IEC/TC91

- ET-7409, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device or lead terminal type device Selection of the test methods



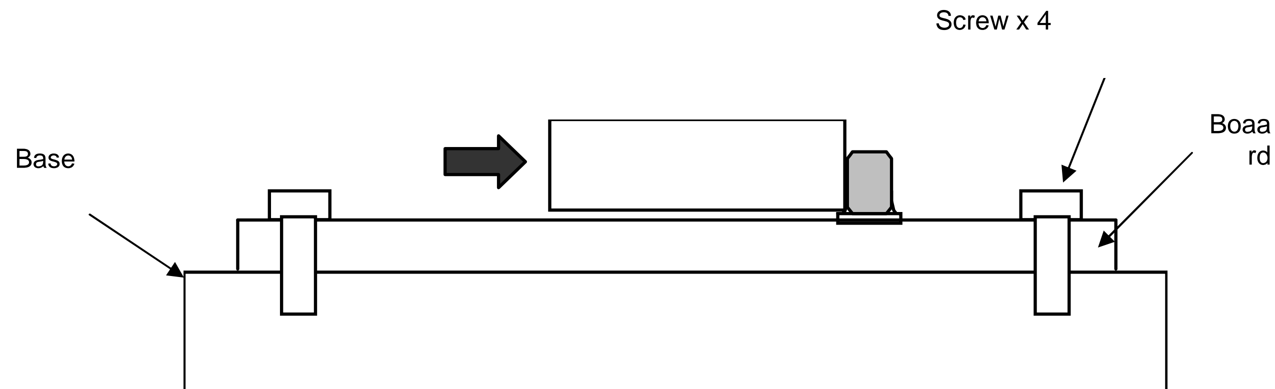
- ET-7409/101, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device Part 101: Pull strength test

  → to be IEC 62137-1-1

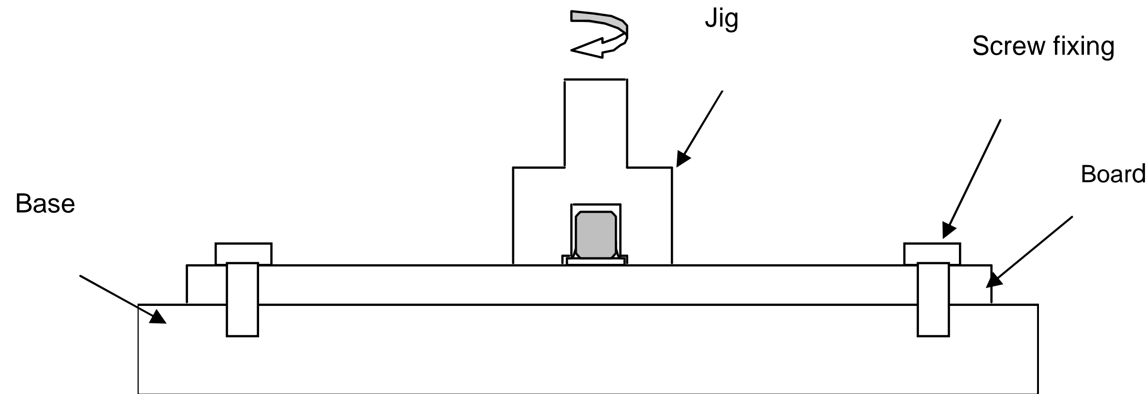


- ET-7409/102, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device Part 102: Shear strength test

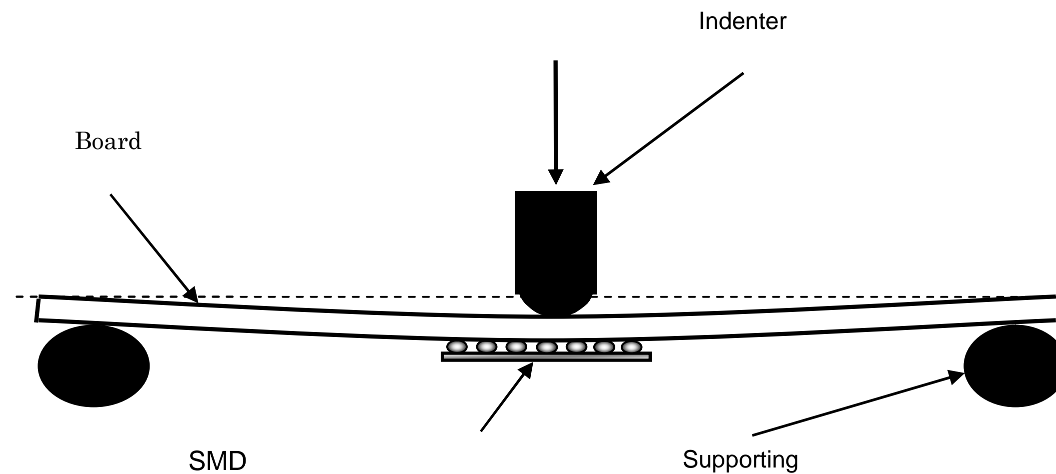
  → to be IEC 62137-1-2



- ET-7409/103, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device Part 103: Torque shear strength test

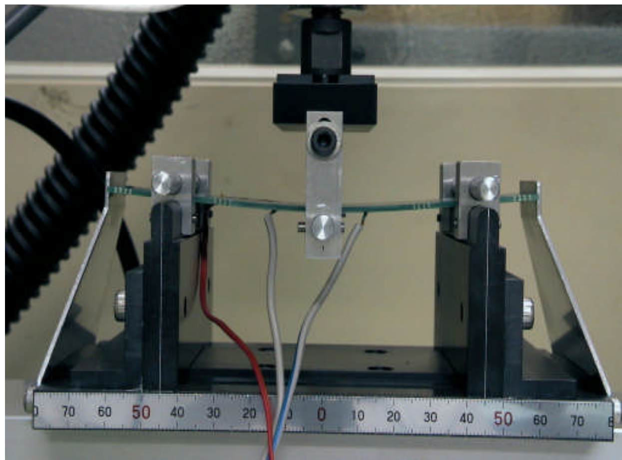


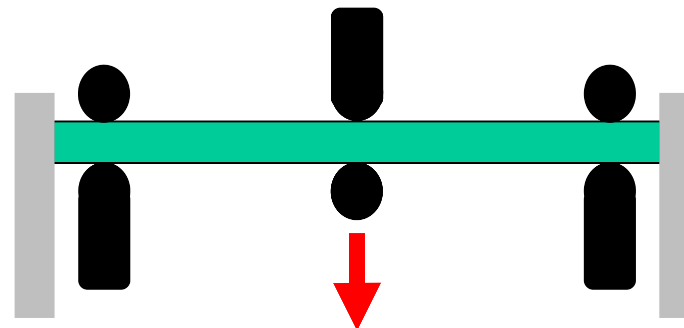
- ET-7409/104, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device Part 104: Monotonic bending strength test



- ET-7409/105, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device Part 105: Cyclic bending strength test

  → to be IEC62137-1-4

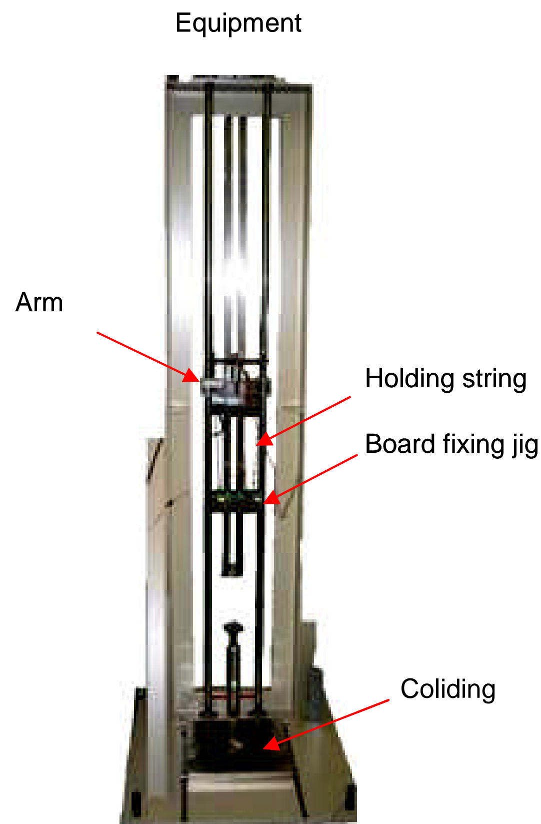




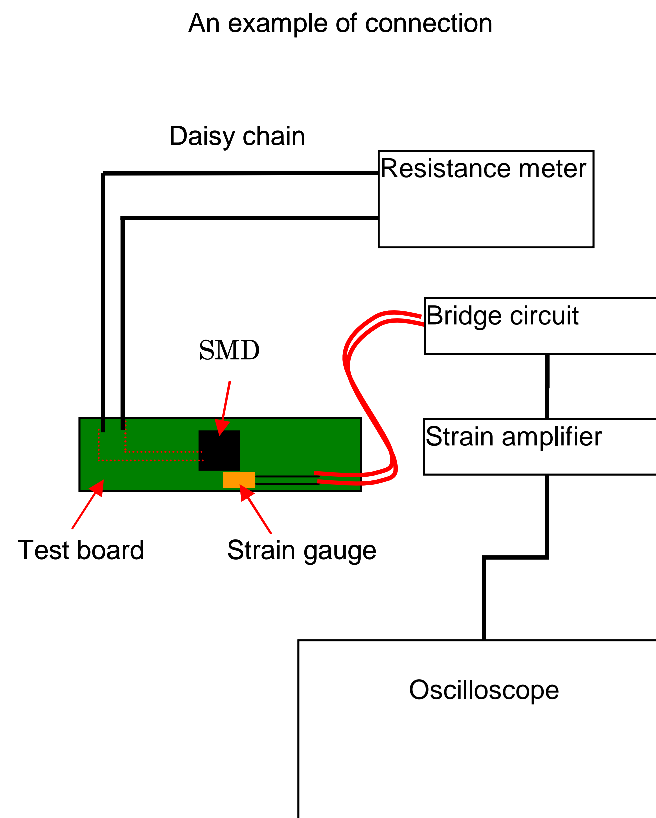
- ET-7409/106, 2005.11 Surface mount technology-Environmental and endurance test methods for solder joint of surface mount device Part 106: Cyclic drop test

  → to be IEC 62137-1-3

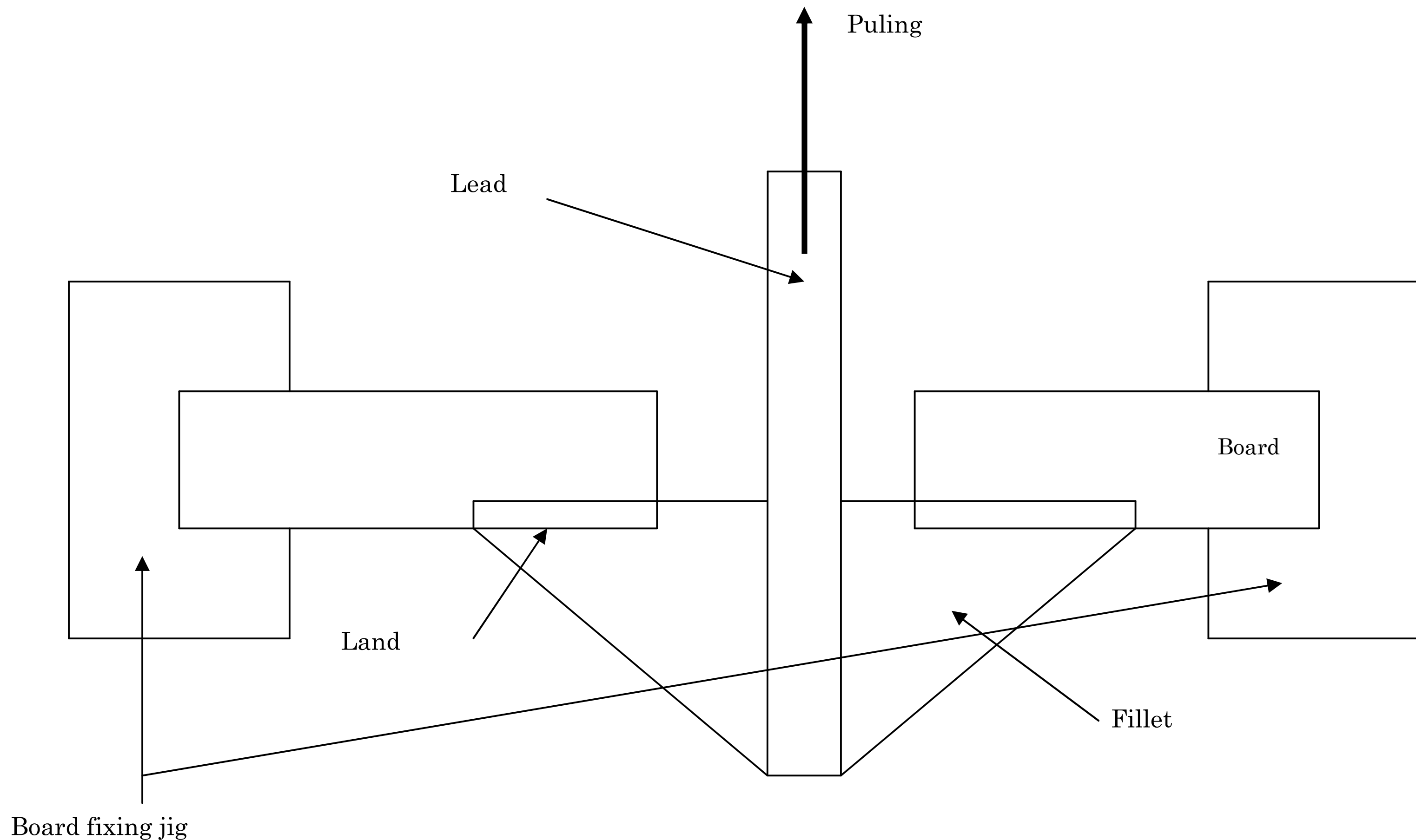
Equipment



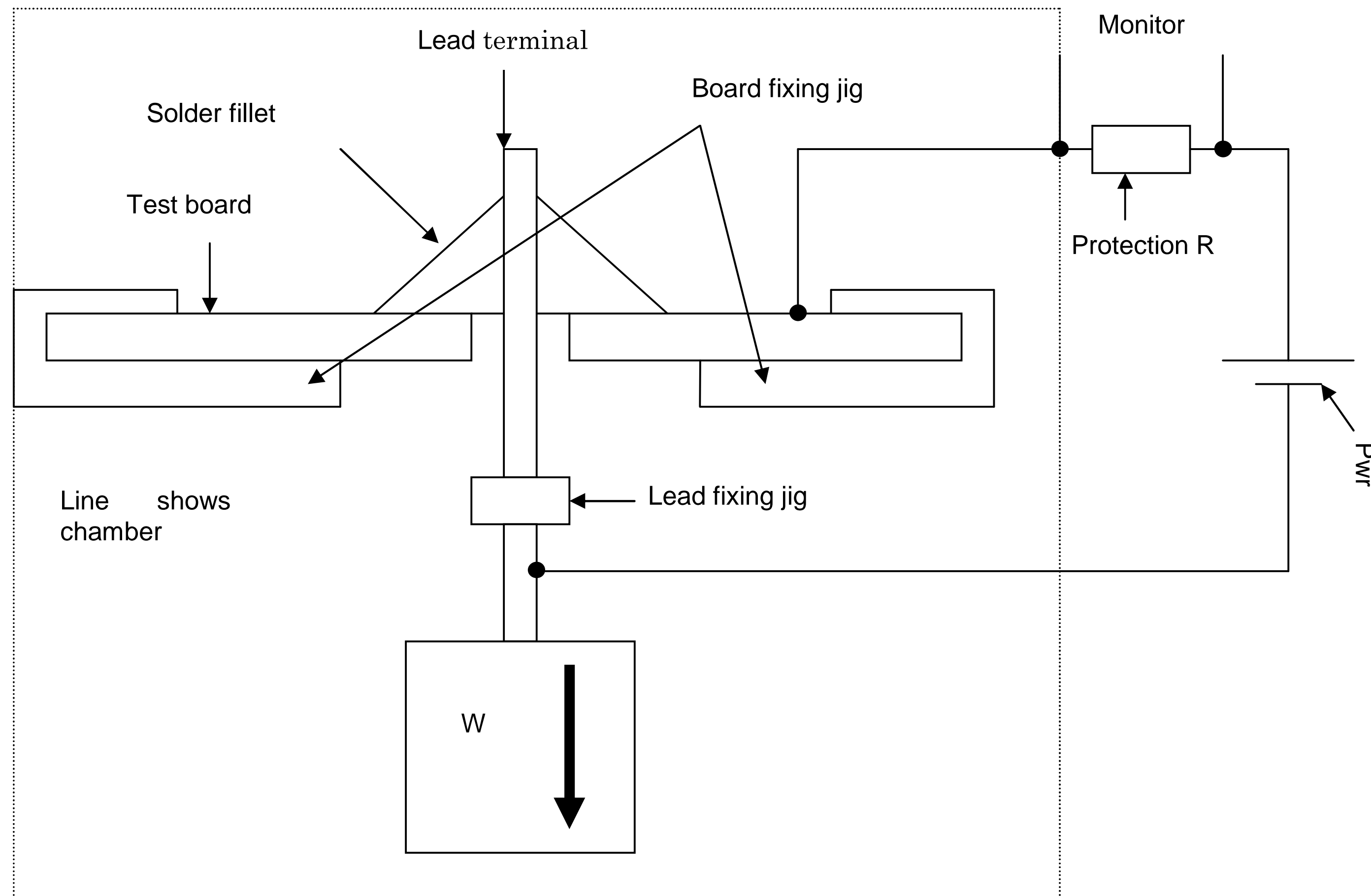
An example of connection



- ET-7409/201, 2005.11 Surface mount technology - Environmental and endurance test methods for solder joint of lead terminal type device Part201: Pull strength test



- ET-7409/202, 2005.11 Surface mount technology - Environmental and endurance test methods for solder joint of lead terminal type device Part202: Creep strength test



- ET-7410, 2005.12 Whisker test methods on components for use in electrical and electronic equipment → IEC 60068-2-82 & JIS C 60068-2-82

  Scope

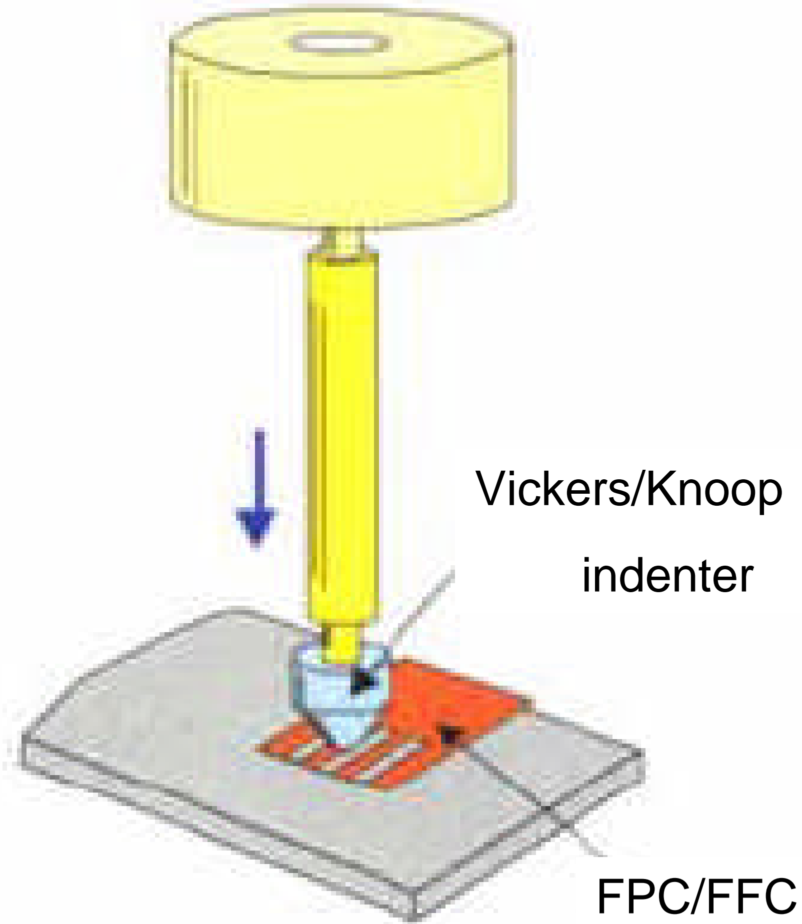
  Tests applicable to whisker growth on Sn/Sn-alloy plated terminals of electric/electronic components but not applicable to whiskers grown under the influence of external strain

  A set of tests at
  - room temperature
  - high temperature + high humidity
  - cyclic temperature change

- JPCA Documents

- JPCA-DG02-3ed.– 2006: Performance Guide for Single- and Double-sided Flexible Printed Wiring Boards → IEC/PAS 62505
  - Whisker test for flexible printed wiring board (FPC) with an applied mechanical external stress
  - Ion migration test for flexible wiring boards

- JPCA-ET01~09: Environmental test methods for printed wiring boards


Vickers/Knoop
indenter
FPC/FFC

- JPCA-ET01~09: Environmental test methods for printed wiring boards

- ET01: Environmental test methods for printed wiring boards – Part 1: Generic
- ET02: Part 2: Constant temperature and humidity (40°C, 93 %RH)
- ET03: Part 3: Constant temperature and humidity (60°C, 90 %RH)
- ET04: Part 4: Constant temperature and humidity (85°C, 85 %RH)
- ET05: Part 5: Temperature-humidity cycle test (12h + 12h)
- ET06: Part 6: Combined temperature and humidity (cycle, with low temperature)
- ET07: Part 7: Combined temperature and humidity (cycle, no low temperature)
- ET08: Part 8: High temperature – high humidity, constant (unsaturated and pressured water vapour (HAST))
- ET09: Part 9: Cyclic dew formation

Reliability related documents

- Other documents submitted to IEC/TC91 from Japan

  PNW 91-639: Evaluation criteria for voids in soldered joint of BGA

  IEC 62137-1-5: Surface mounting technology – Environmental and endurance test methods for surface mount solder joints – Part 1-5: Mechanical shear fatigue test

- JEITA documents not submitted to IEC

  ET-7405: Test methods of ultrasonic cleaning exposure of surface mounting devices1998.03

  ET-7407: Environmental and endurance test methods for CSP/BGA package on mounting condition1999.12

Thank you for your attention

For info of these and other JEITA standards,

visit:

http://www.jeita.or.jp/english/index.htm

For enquiry and information: also to

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