

NINETEENTH ANNUAL

BiTS

TM

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BiTS Contactor Life Cycle Panel Session

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Qorvo



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Qorvo

Formed from the merger of TriQuint Semiconductor and RF Micro Devices → January 2015

We test a broad portfolio of RF devices: from low volume custom products to high volume general market devices at package and die level

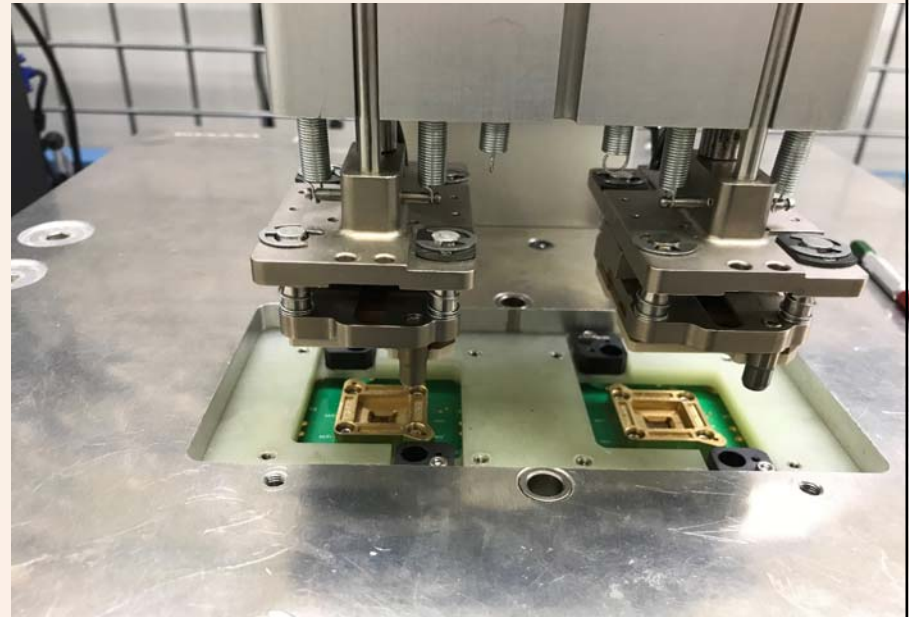
Correspondingly need a variety of contactor solutions to satisfy divergent families of products with different needs

End of Useful Life Requirements

- Yield (electrical) or # of cycles (planned mechanical)
 - Poor performance (low yield), customized by product as each device is unique
 - Contact Performance Maintenance System (CPMS) used to set standard maintenance and replacement intervals based on similar products initially
 - Factory adjusts intervals based on testing
- Typically will run a contact to failure (fatigue) if possible
 - Replace all pins at once
 - Do not mix new and old contacts in same socket

Socket Evaluation Methodology

- Life Tester
 - Socket designed around product
 - Uses handler plunge assembly to cycle devices
 - Socket mounted on test fixture
- Process
 - Plunge actual devices, mimic test time
 - Periodic read points to inspect/measure
- Other
 - Use force gauge to determine displacement versus normal force to get average normal force per pin



Purpose of Internal Data

- Our data is to estimate the expected life of a socket/contact as used in production setting
- Use data to set cleaning and replacement intervals (CPMS)
- Use actual devices rather than surrogates to determine wear rate of contacts and damage to pads
- Observe changes in contact surface (plating), shape (wear), and damage

IDM Standards

- What are the major influences on socket life?
 - Real world use → contamination, temp, current
- How should life cycle be defined across the industry?
 - Change in contact resistance is basically a default standard (20%?)
 - Measured at nominal current and max current along with defined duty cycle and recommended/max stroke
 - Common surrogate device design
 - Need a significant sample to determine population