

Space-Efficient Wafer Level Burn-In tool

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SEMICS

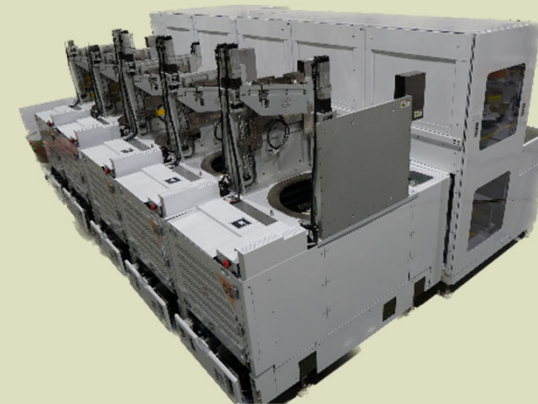
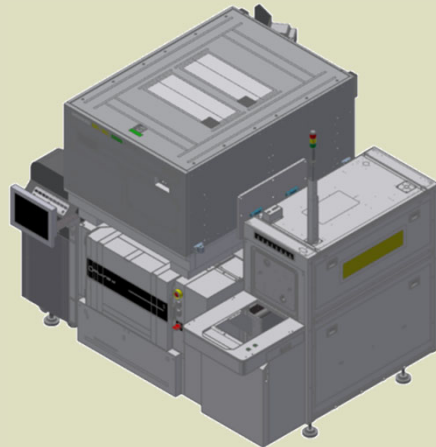


Contents

- importance of reliability to semiconductor business
- how to burn-in(as-is)
- baseline cost of burn-in
- strategy to make it more efficient
- ideal arrange
- next challenge

importance of reliability

- basically: to screening infant failure of mass production
- HBM: additive structure, lot of connection
- power device: simpler function, required highly reliability
- when deforms, crack or void comes to sub-micro level, inspection could be more expensive than burn-in



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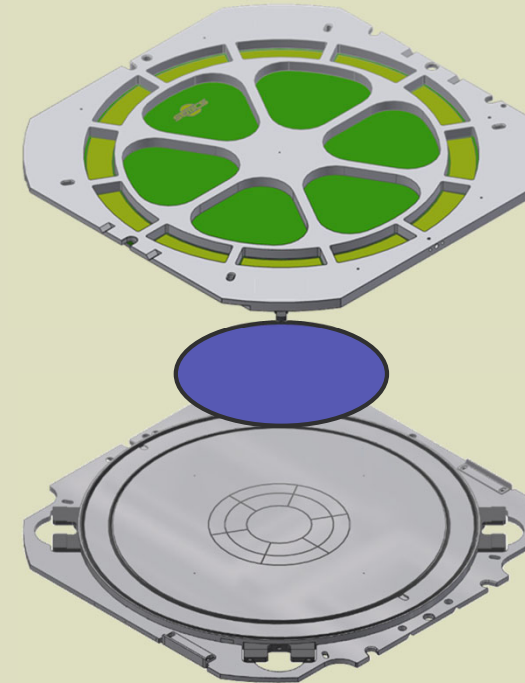


cost of burn-in

- only two things needed to burn-in – space and time
 1. where to place a wafer?
 2. what/when/where is this happen?
- **1 prober's** capacity **7 days** / 10 hours = 16.8 wafer/week
- to produce **100 wafers** a week, 10 hours x 100 wafer = 1 000 wafer-hours
- required number of tool, 1 000 wafer-hours / 16.8 = **60 probers**
- 60 probers footprint = very large

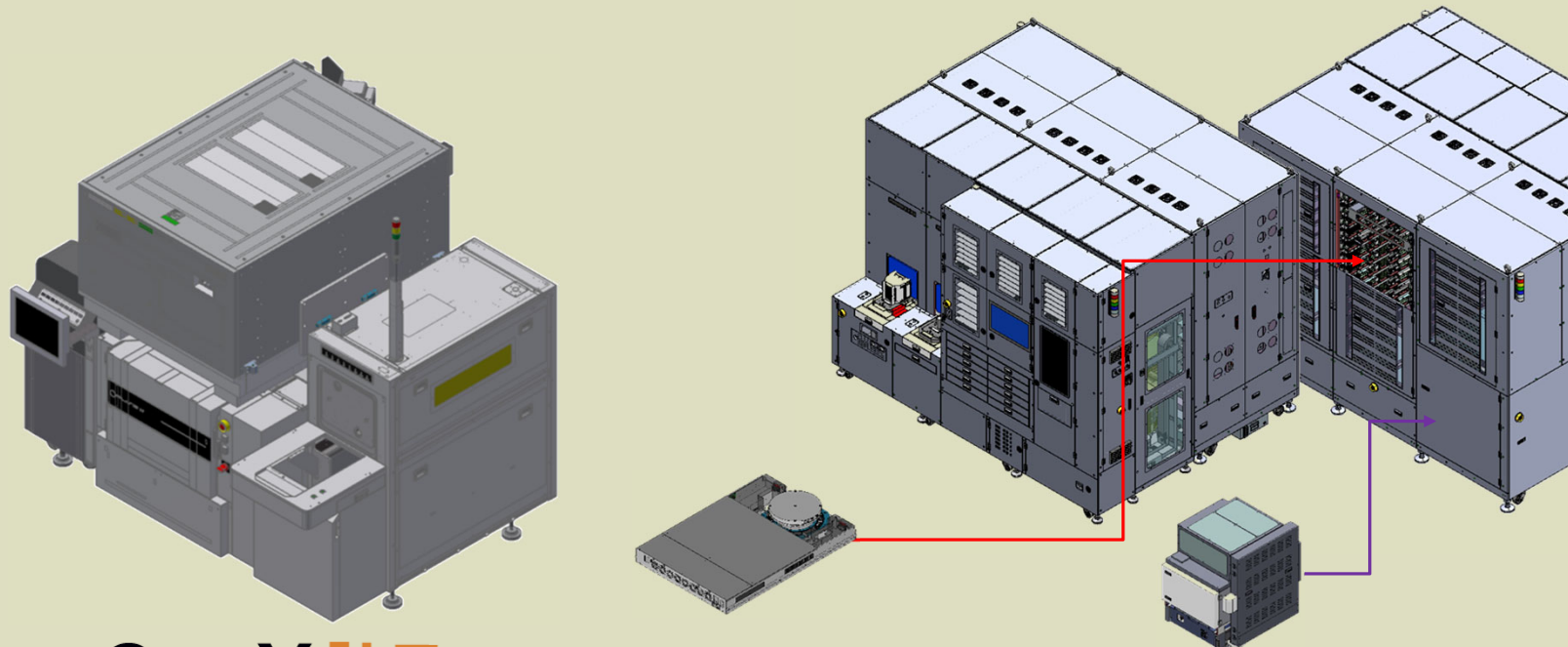
structure of TCS

- 3 things those required to burn-in
 1. alignment; probe card with wafer, also probe card with tester
 2. contact; probe card with wafer, also probe card with tester
 3. burn-in; execute pgm under controlled thermal, electrical circumstance



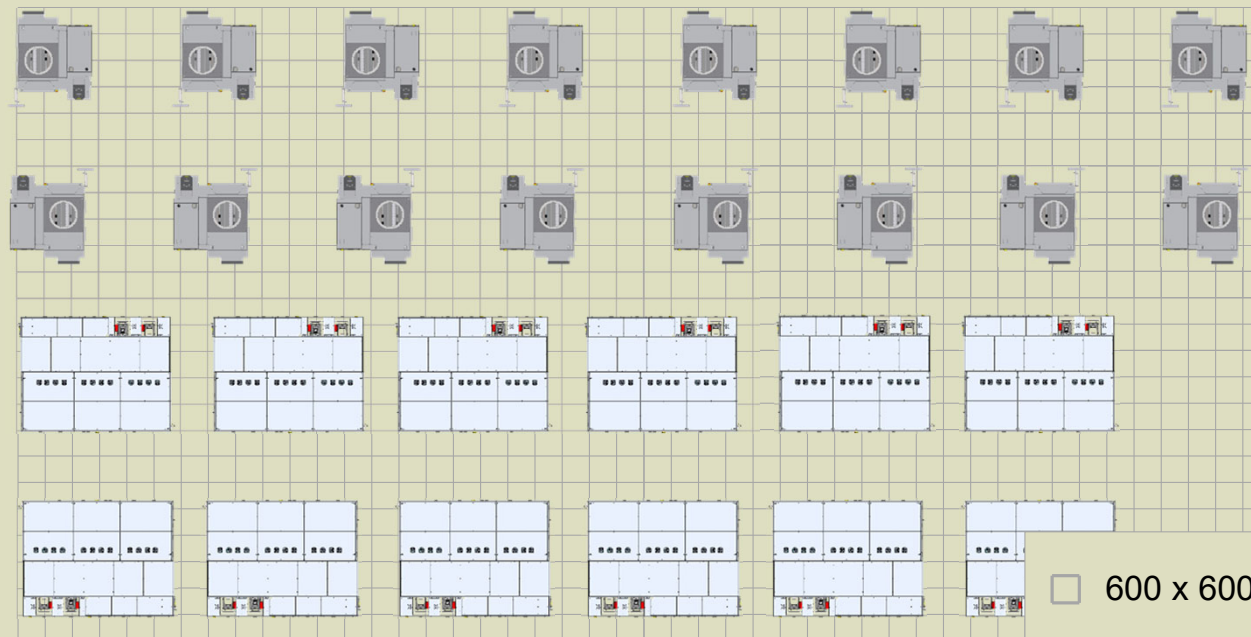
ideal arrangement

- efficient arrange of a system



improve spatial efficiency

- efficient arrange of a system



before

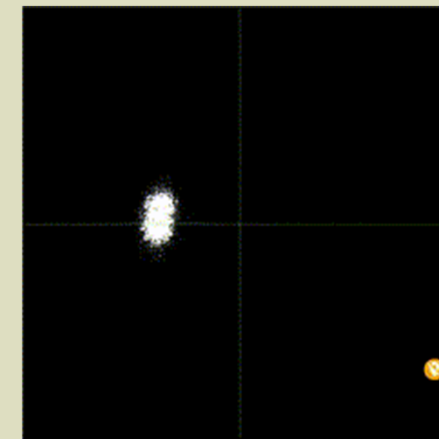
1 system: 4.3 m²
28 m x 7 m: 16 system
1 operation: 16 wafers

after

1 system: 8.9 m²
28 m x 7 m: 12 system
1 operation: 408 wafers

additional function

- individual process – simple and easy to manage lot
- fully automated – less man-hour, less idle time
- cost of ownership



upcoming challenges

- developing tester to be capable for final test
- developing smaller tester, to achieve higher density
- developing tester capability for more kind of device

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