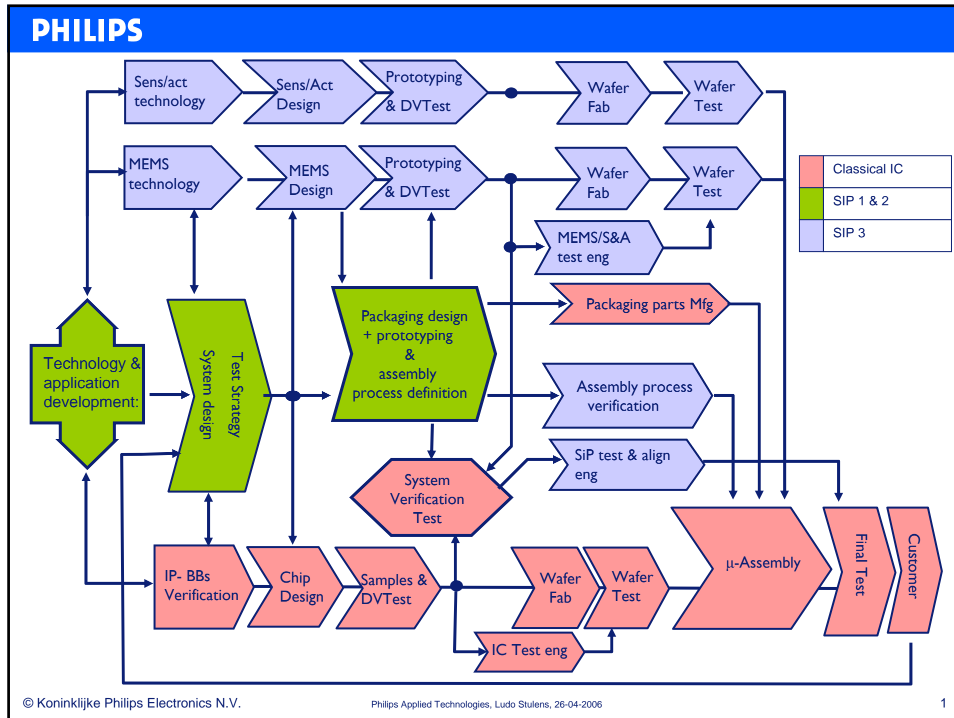

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Test challenges in SiP3

- Component level test : the transducers, IC's, passives, substrates
  - Placement(position & orientation) } Assembly process related,
  - Interconnection(pin level) } DfT be in to enable and must to reduce test effort
  - Value / function / performance => relying KGD , but how good is KGD
- Align or adjust to compensate for process and product immaturity
- System level
  - Performance
  - Critical packaging parameters
  - Calibration
- DfT to enable structural/functional test on assembly level:
  - alternative test methods, indirect measurement of non electric parameters

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Test challenges in SiP3

- KGD / KGM for all assembling components:
  - Full coverage testing at wafer level: parametric, system,
  - Issues to resolve: at-speed testing, wafer probing
  - For MEMS components: dicing can introduce defects or parameter shift !!!
- Structural test with functional check strategy requires robust designs and robust processes:
  - CTQ down-flow process and relation to testing is very important.
  - Product and process verification are during development phase are very important to:
    - Identify the fault spectrum or defect distribution.
    - To adapt the design reducing the fault spectrum
    - To correct the test strategy if needed (DfT / test programs/ test equipment)
  - Process control and SPC during manufacturing is mandatory, fast feedback to product and process development must be organised , especially during trial runs and ramp-up

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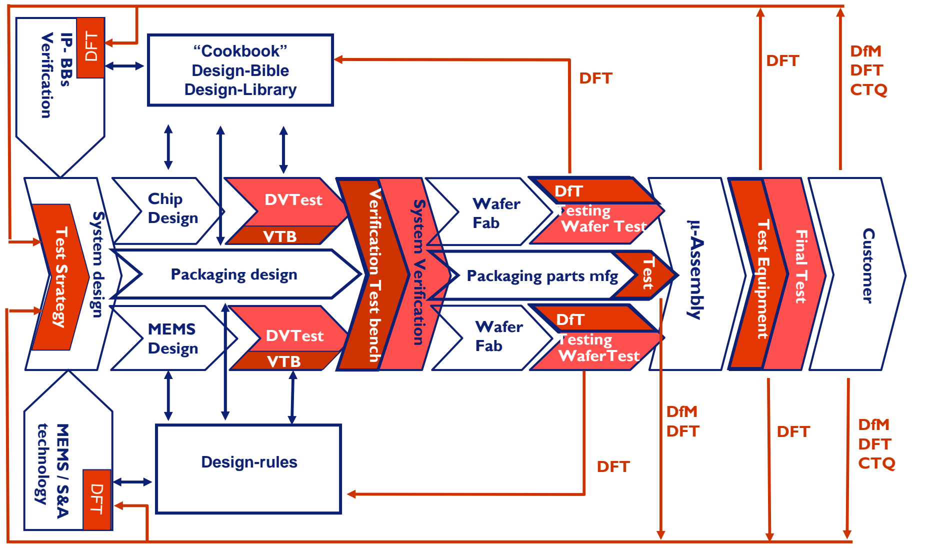
Other general test issues

- Different fields of application – Different levels of quality required
  - Consumer : Low Cost and <200 ppm delivery quality
  - Automotive: below 0 PPM delivery quality, reliability
  - Medical: accuracy, reliability, contamination, calibration,
- How to test/calibrate one-time-use, disposable diagnostic devices for bio sensor applications.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Test process management for SiP/3 devices
IP- BBs Verification
DFT
"Cookbook"
Design-Bible
Design-Library
DFT
DFT
DfM
DFT
CTQ
Test Strategy
System design
Chip Design
DVTest
VTB
Packaging design
MEMS Design
DVTest
VTB
Verification Test bench
System Verification
Wafer Fab
DfT
Testing
Wafer Test
Packaging parts mfg
Test
Wafer Fab
DfT
Testing
WaferTest
μ-Assembly
Test Equipment
Final Test
Customer
MEMS / S&A technology
DFT
Design-rules
DFT
DfM
DFT
DFT
DfM
DFT
CTQ
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