A proof of concept for IEEE P1581

P1581 Demo Board discussion and demonstration

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Objective

- Background Information on IEEE P1581

- Introduction of P1581 Demo Board

- Compare Test Methods

- Solicit Feedback

Disclaimer: P1581 Working Group may or may not agree with content.

P1581 – A quick review

- Simple Test Logic Implementation for Memory Devices *(and possibly other complex, slave-type components)*

- No extra pins required

- Not relying on complex Memory Access Cycles

- Fast test execution, small test vector set

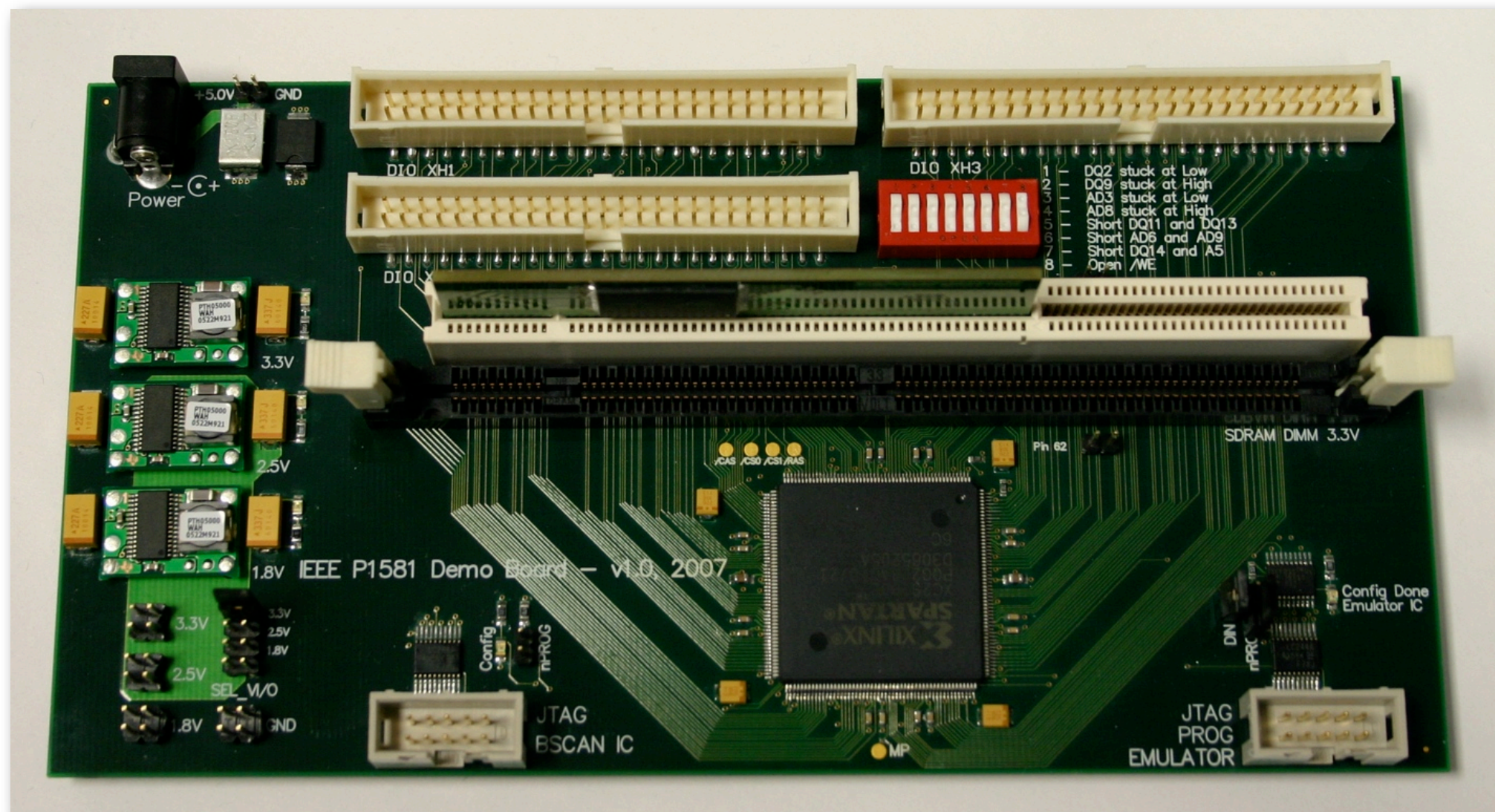- Usable with any access methodology (BScan, functional, even ICT)

P1581 Concept
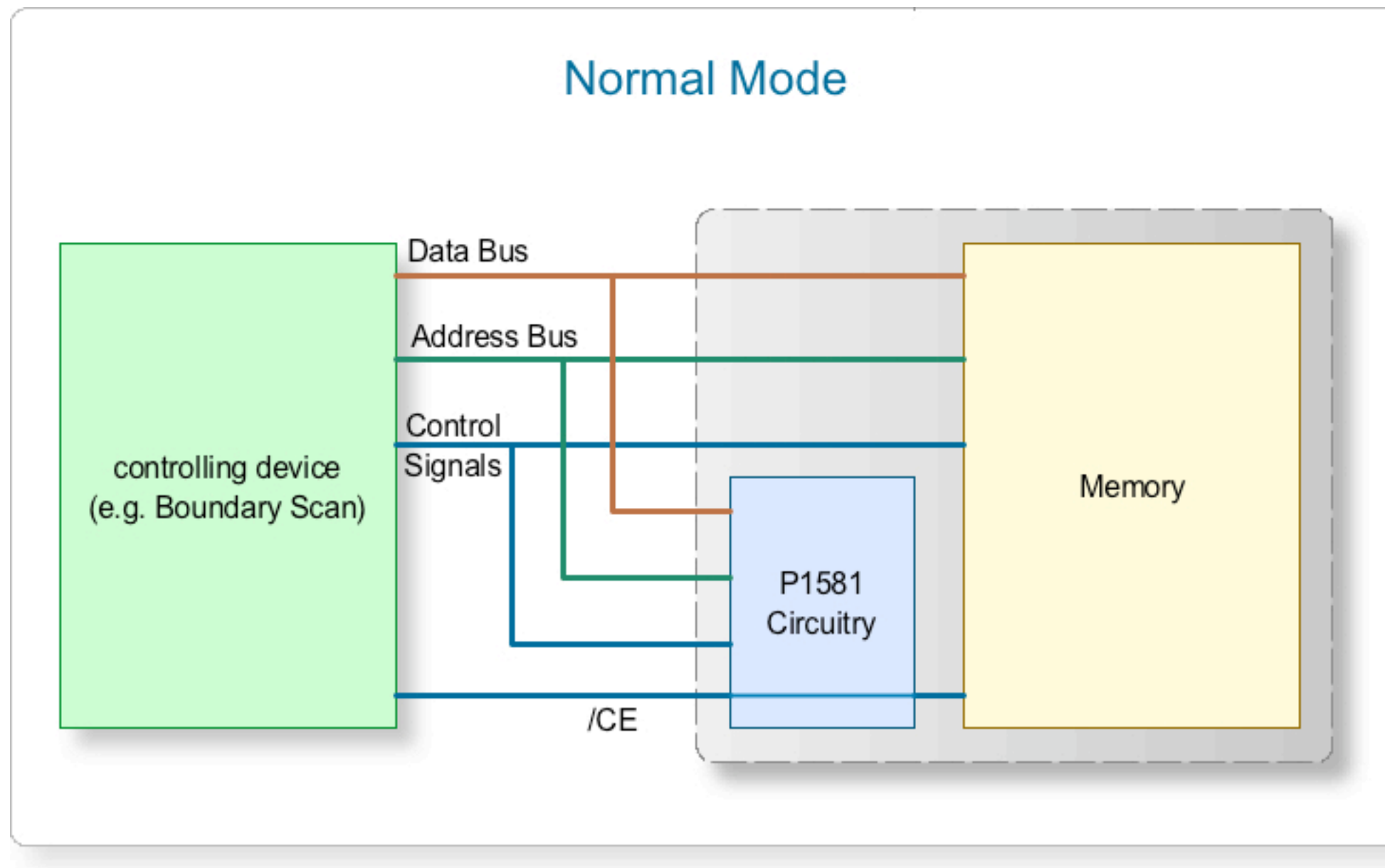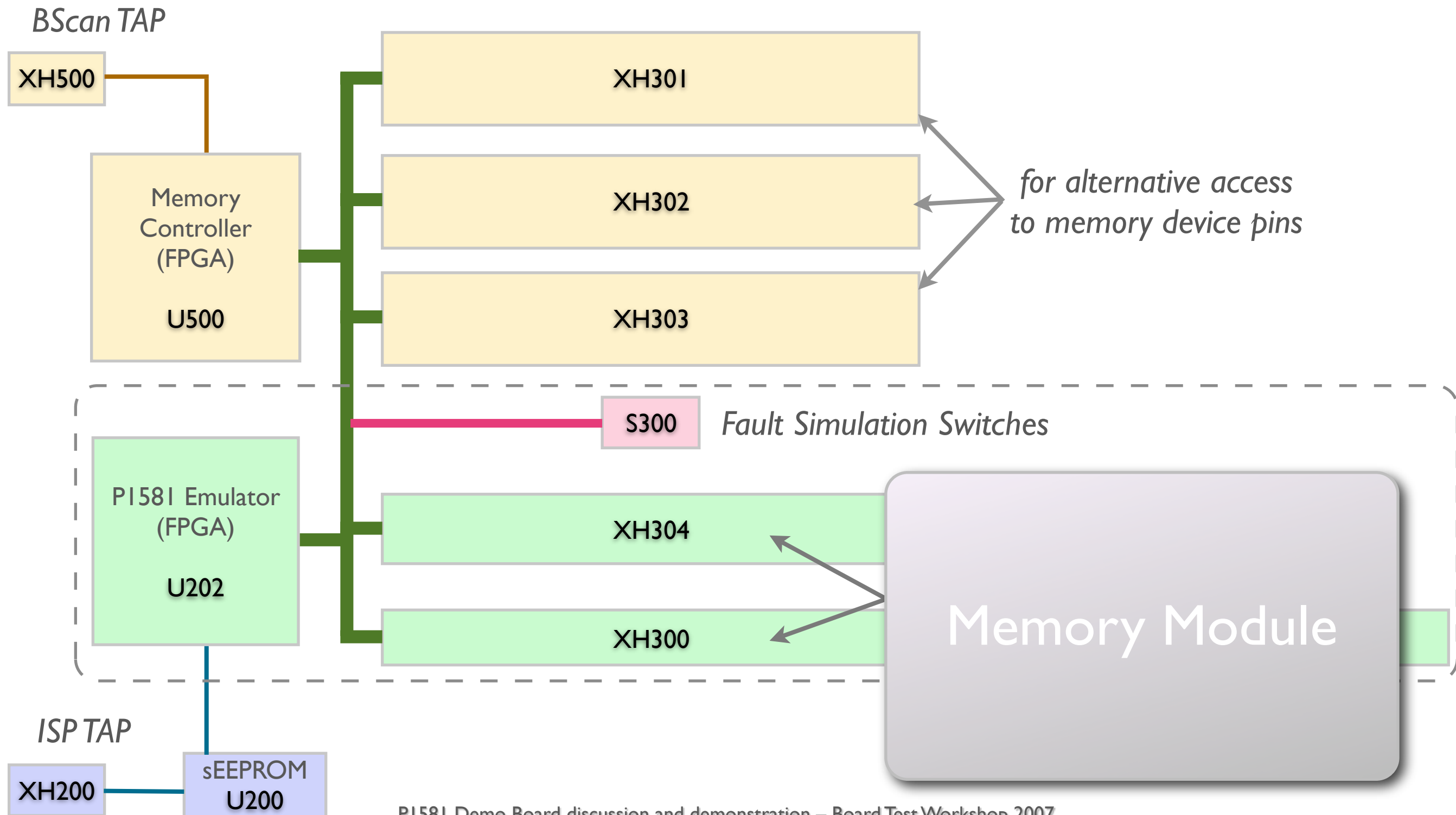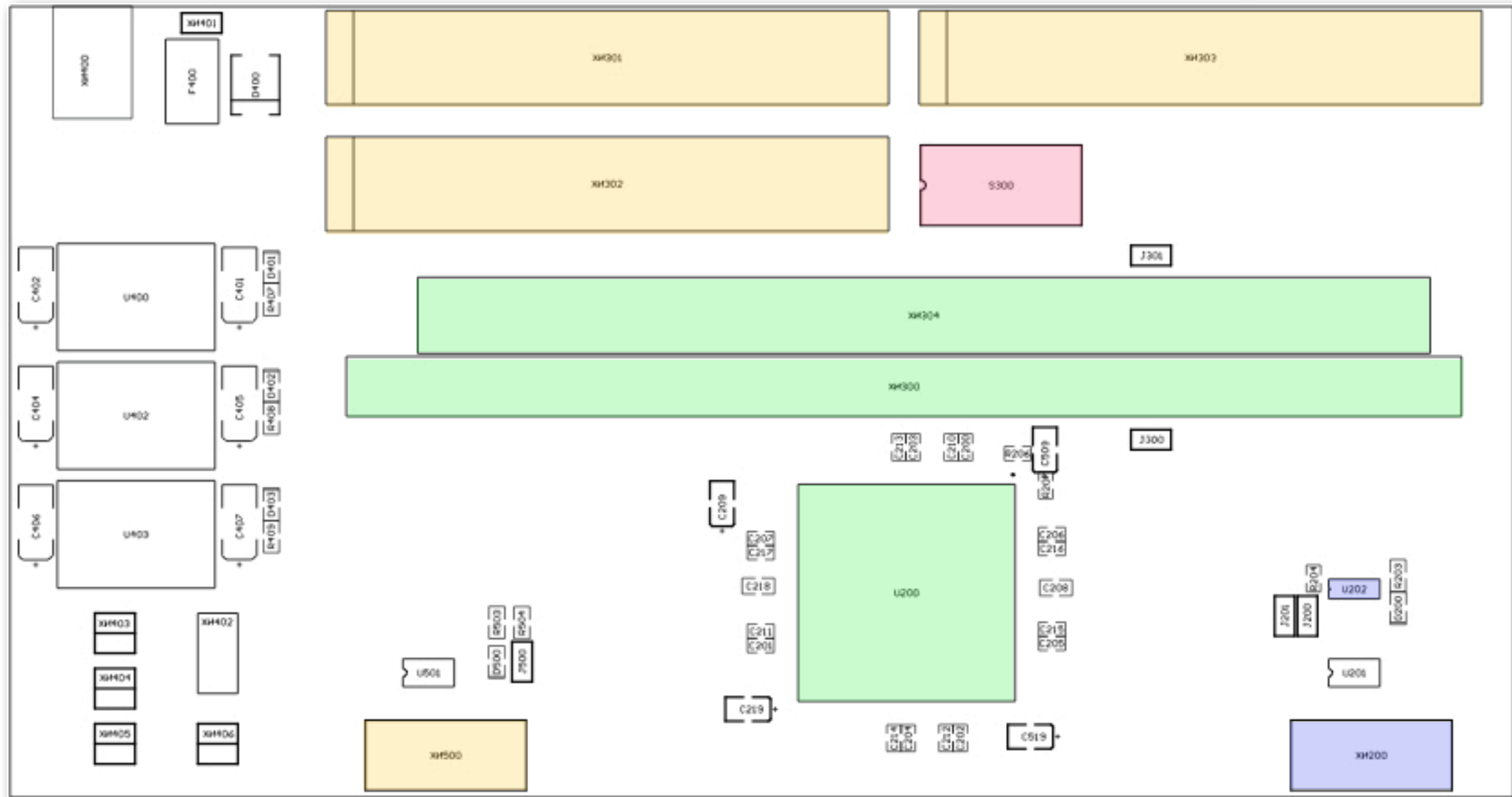
P1581 Concept
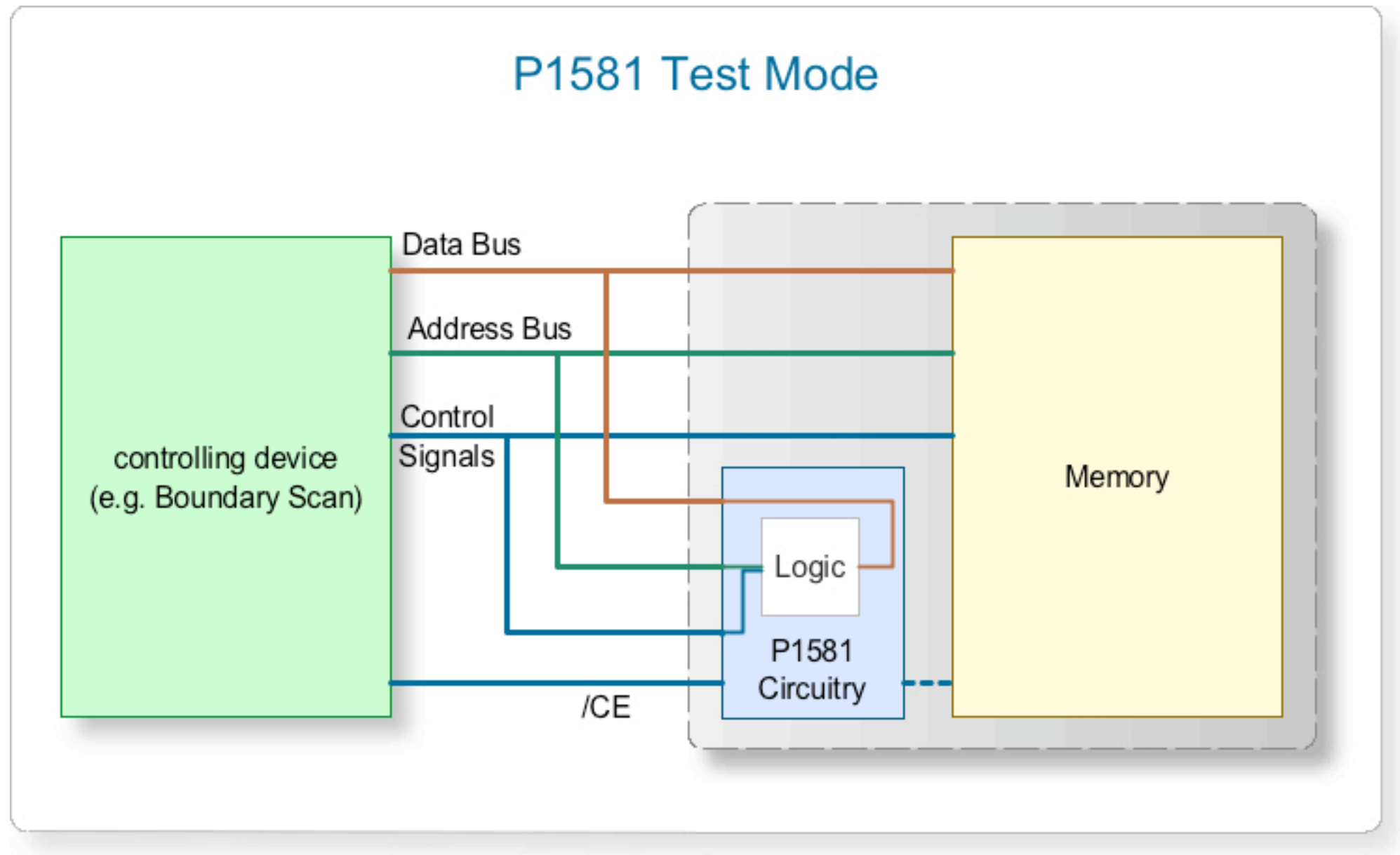
P1581 Demo Board

Demo Board Features

- Boundary Scan Device for Memory Access

- FPGA for P1581 Emulation

- Serial PROM for FPGA configuration

- PCI and DIMM Slot for Memory Modules

- Connectors for non-Boundary Scan control
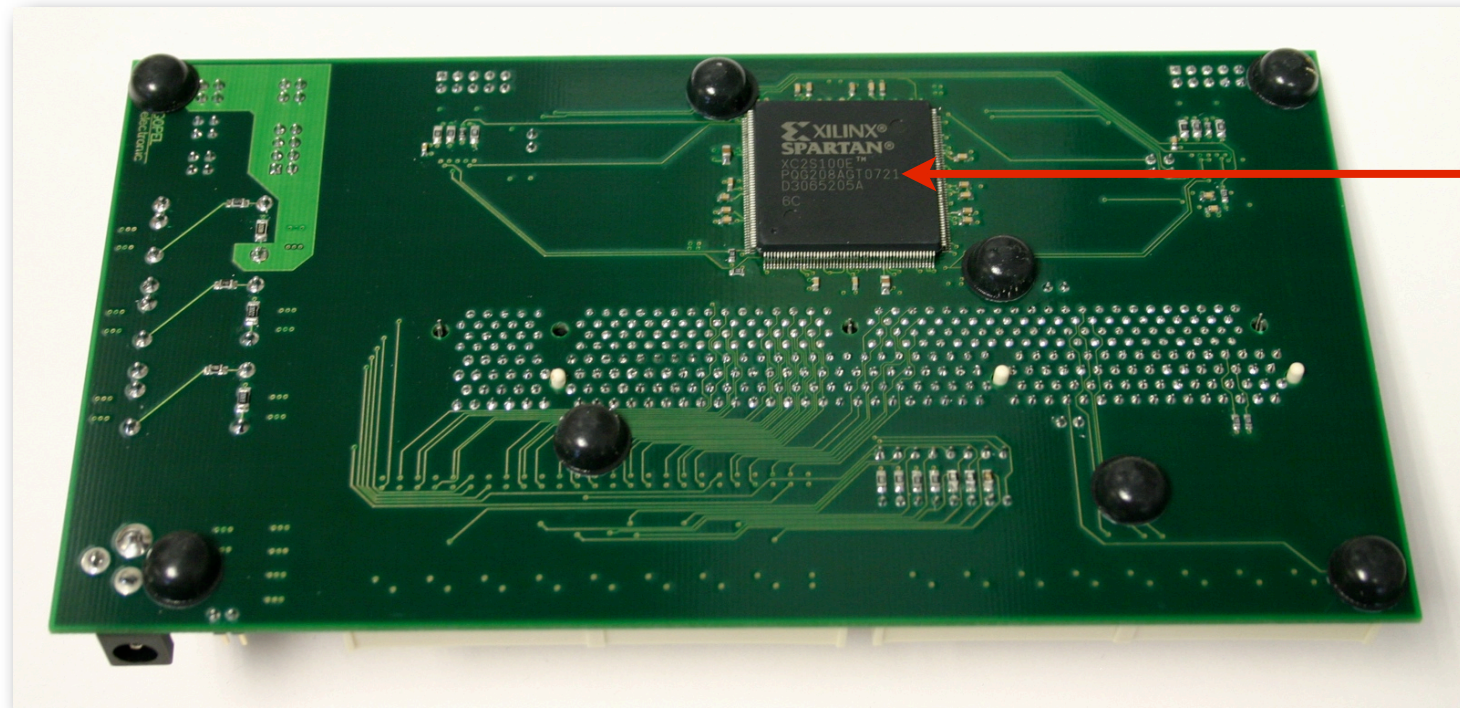
- DIP Switches for Fault Simulation

Block Diagram

BScan TAP

XH500

Memory Controller (FPGA)

U500

XH301

XH302

XH303

for alternative access to memory device pins

S300

Fault Simulation Switches

P1581 Emulator (FPGA)

U202

XH304

XH300

Memory Module

ISP TAP

XH200

sEEPROM
U200

P1581 Demo Board Layout

P1581 Demo Board

Memory Controller
(BScan Device)

Fault Switches

Memory Module
(holding SRAM)

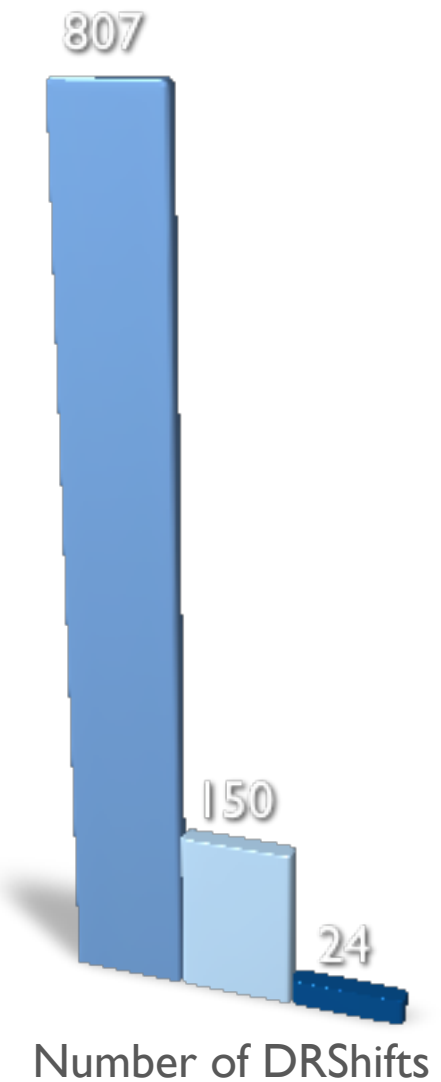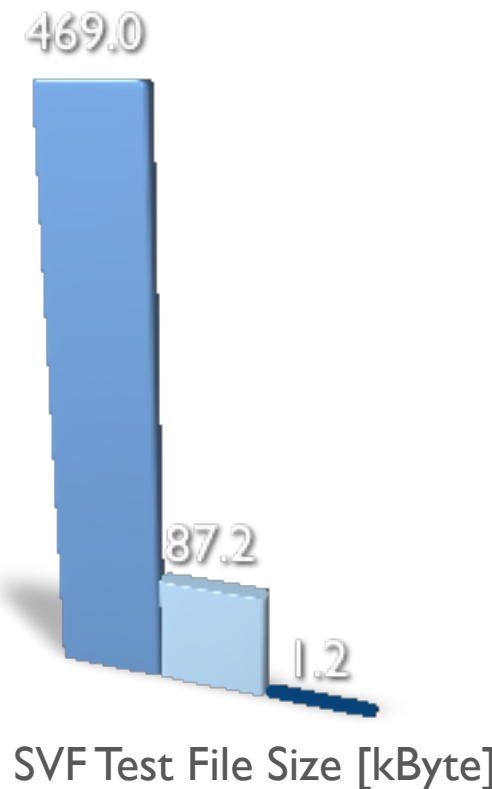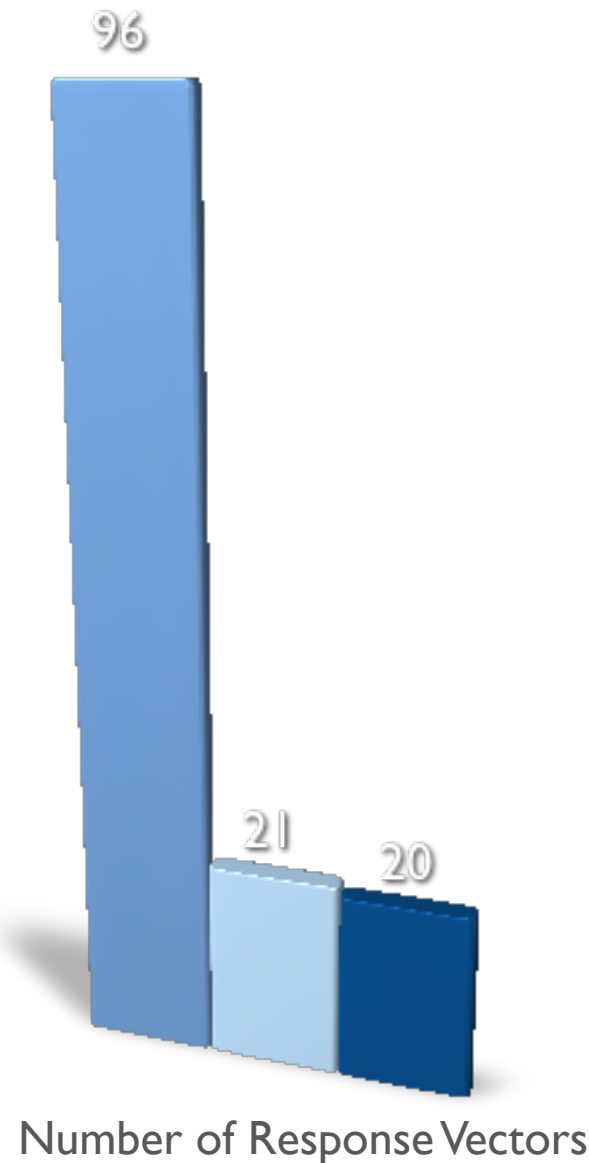P1581 Demo Board discussion and demonstration – Board Test Workshop 2007
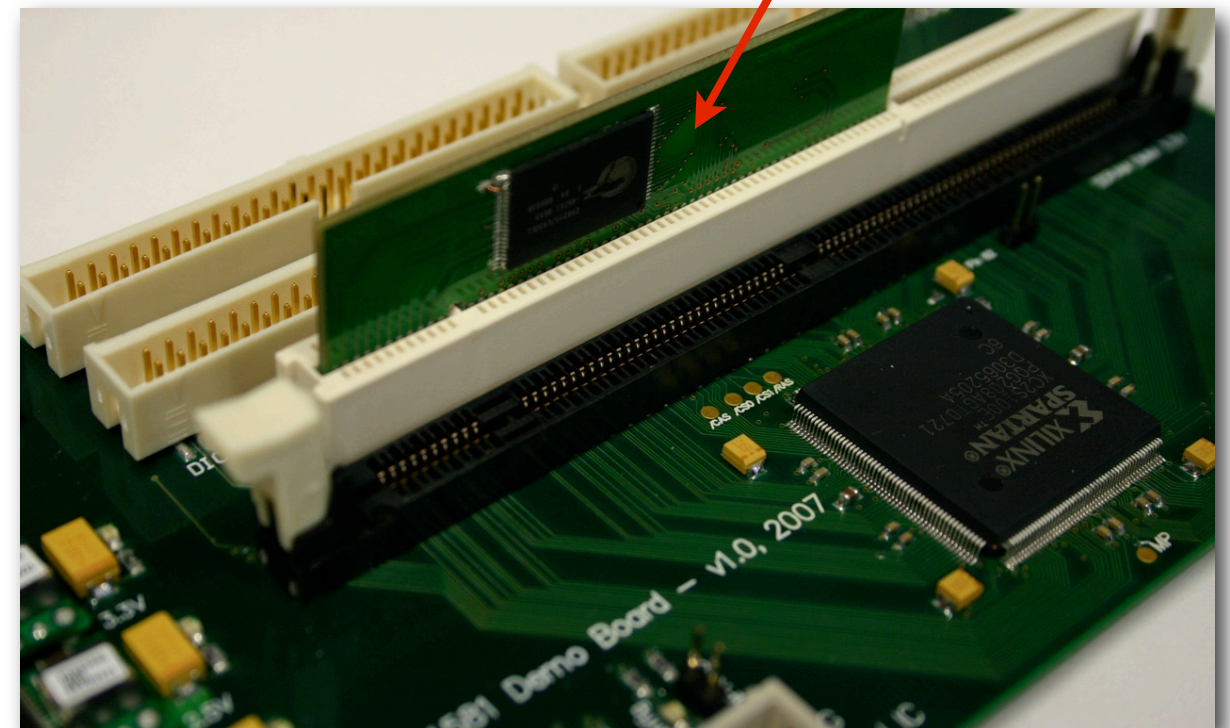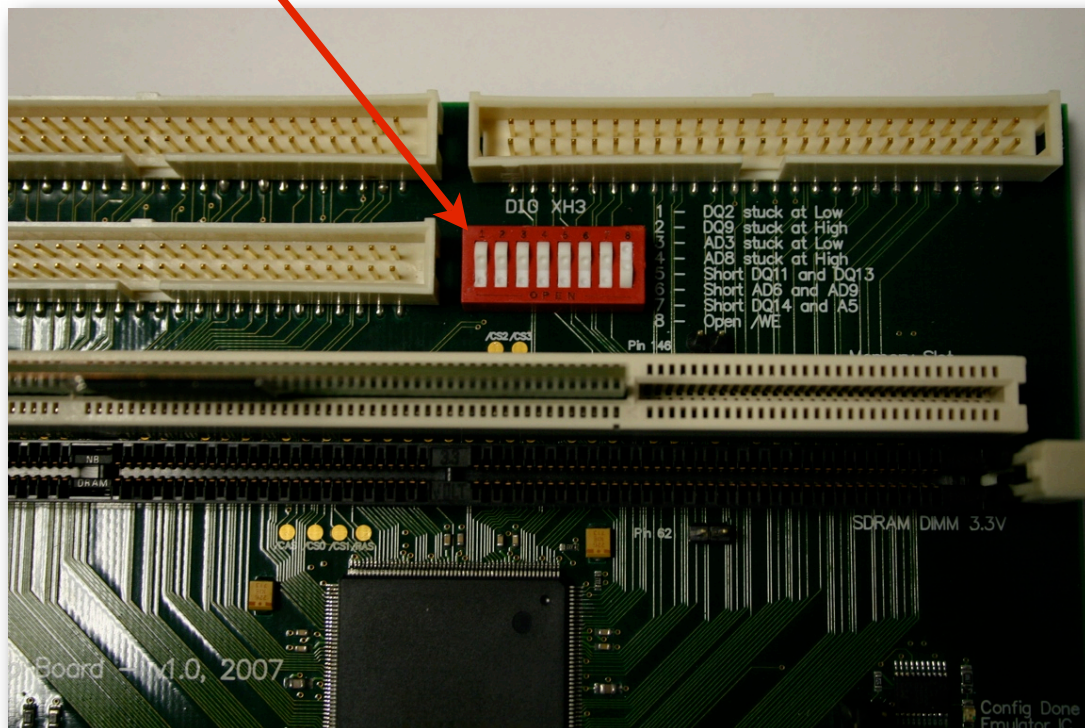
Test applications

- Memory Access Test from Boundary Scan device

- P1581 Continuity Test

- P1581 Device ID verification

- In-System Programming for P1581 Emulator

- Standard Boundary Scan tests for board tests (Infrastructure, Interconnect)

Results

- Test Time

- Test Development (complexity)

- Number of DRShifts

- Test Program Size

- Diagnostics

Results

Number of Response Vectors: 96, 21, 20

SVF Test File Size [kByte]: 469.0, 87.2, 1.2

Number of DRShifts: 807, 150, 24

Test Time [s]: 7.1, 1.3, 0.6

BScan Memory Access Test (with Diagnostics)
BScan Memory Access Test (without Diagnostics)
P1581 Continuity Test (with Diagnostics)

{Less is better in all four graphs.}
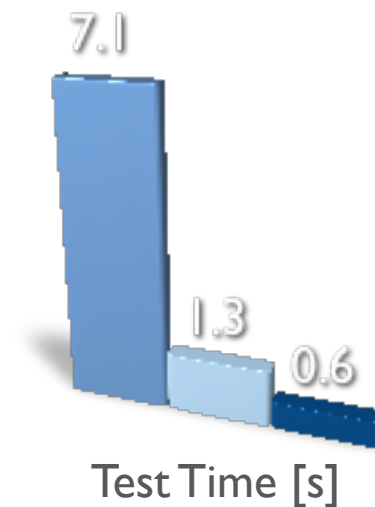
Outlook

- IEEE P1581 provides real benefits

- P1581 Demo Board usable for other Memory Types (e.g. FLASH)

- Demo Board documentation available

- Test Community needs to plead case to Memory Device Manufacturers

▸ http://grouper.ieee.org/groups/1581