

Emulation Circuitry Adds P1581 to an Off-the-Shelf SRAM

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P1581 Working Group may or may not agree with content.

RJR BTW 13 SEP 2007

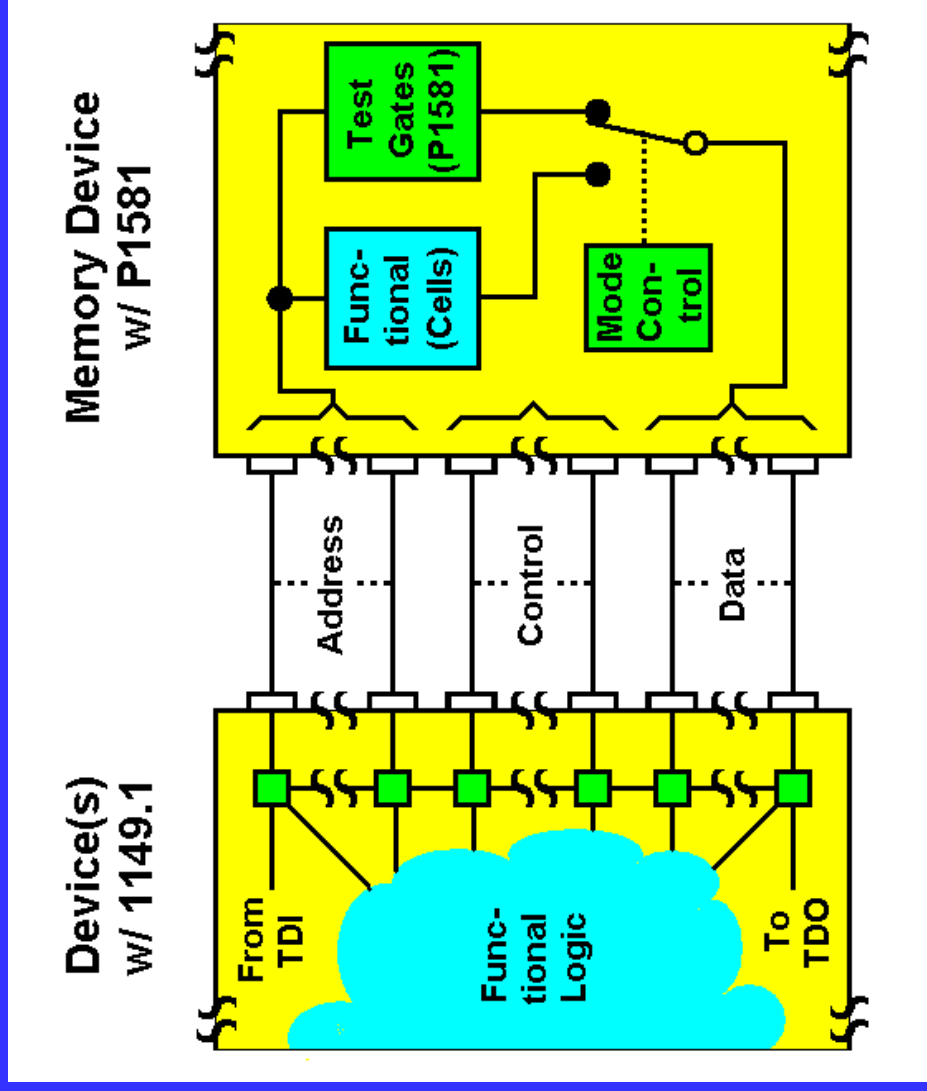
Outline

- Developments Since BTW 2006
- P1581 Standard / Optional Operations
- Testmode Control Without Added Pins
- Comparison of P1581 & 1149.1 for Memory Devices
- P1581 Emulation Goals & General Concept
- Emulation Circuitry Details
- Conclusion: Emulation Allows First Silicon Success

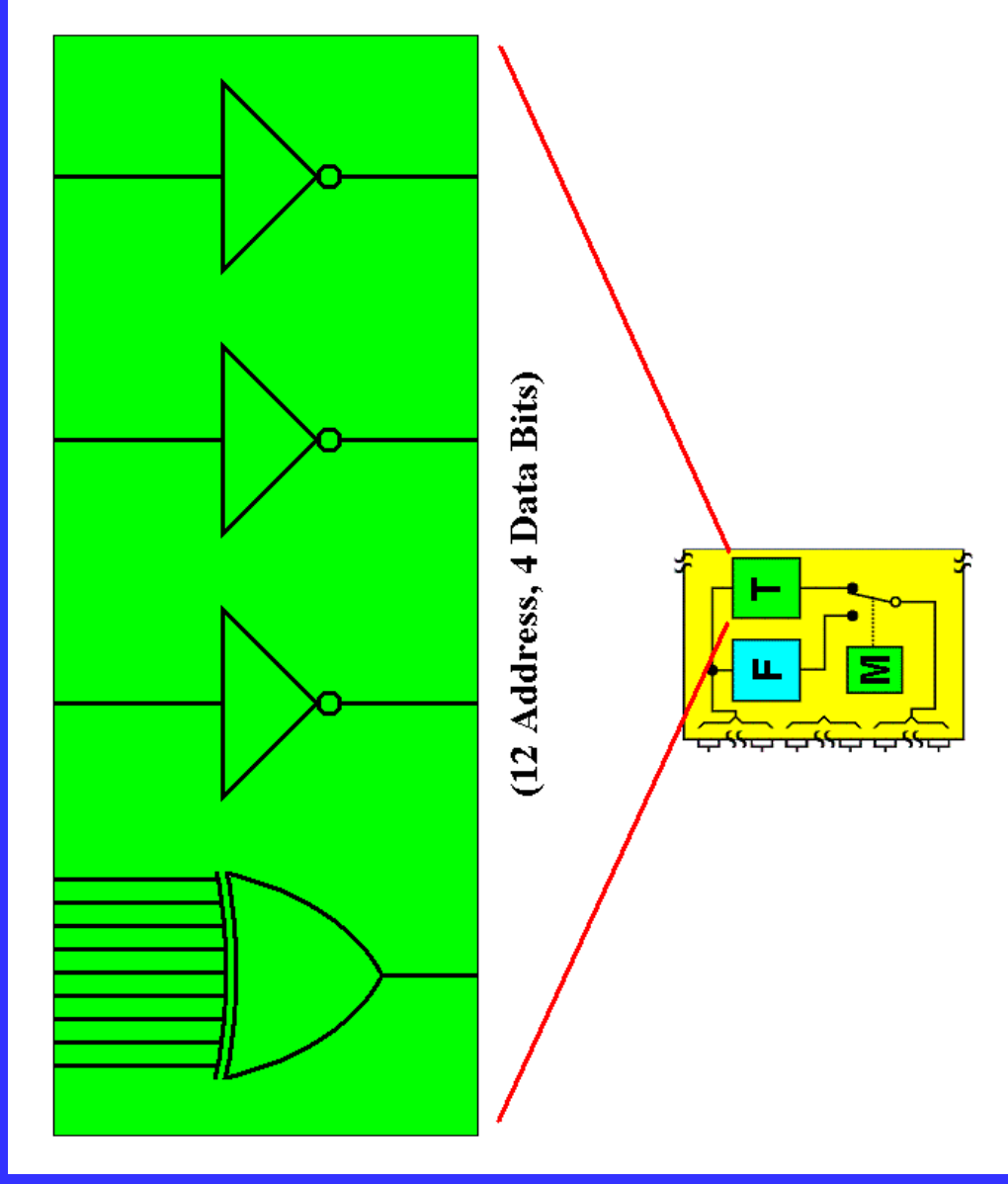
Developments Since BTW 2006

- Device ID Added
 - Standard 1149.1 Format (Extensions Possible)
 - P1581 Now Includes Key Features of 1149.1
- Emulation Method Devised
 - Means to Avoid First (Etc.) Silicon Errors
 - Significant Advantage Over 1149.1
- Emulation Demo Board
 - Proof of Concept
 - Supports Device / Tool Development
 - Design Available Without Charge

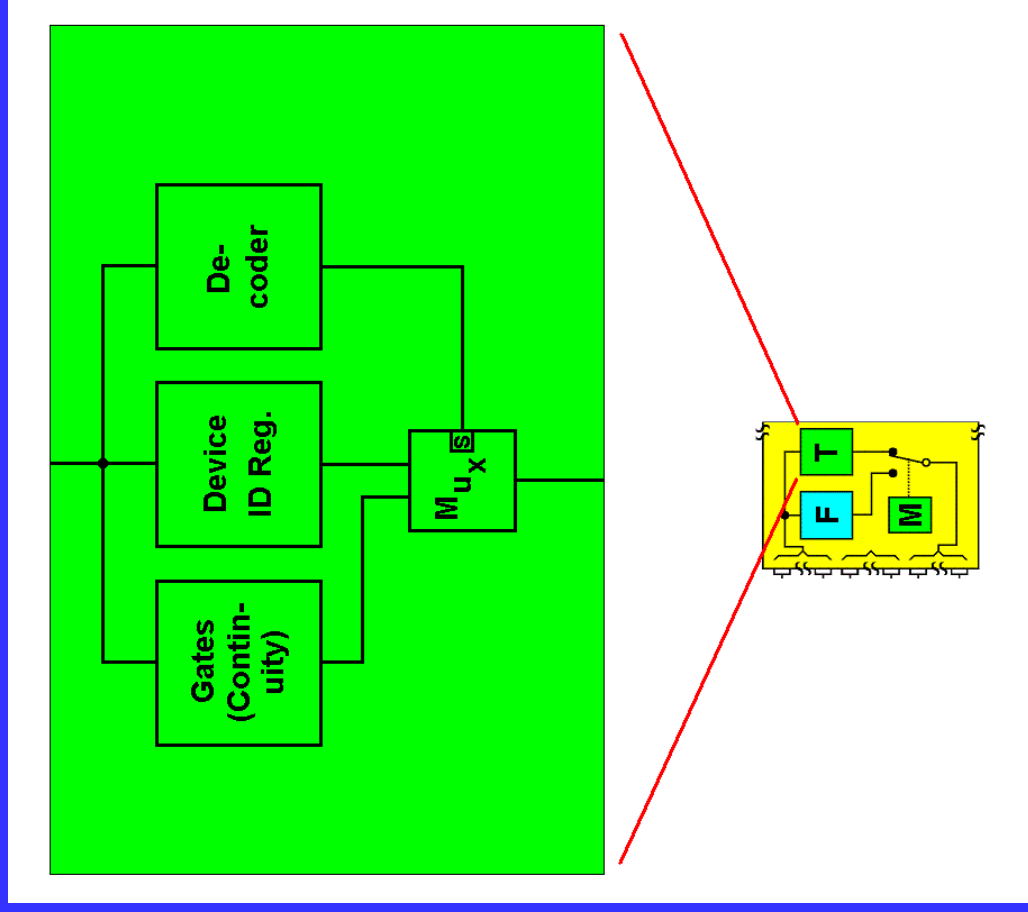
P1581 Continuity Test Concept



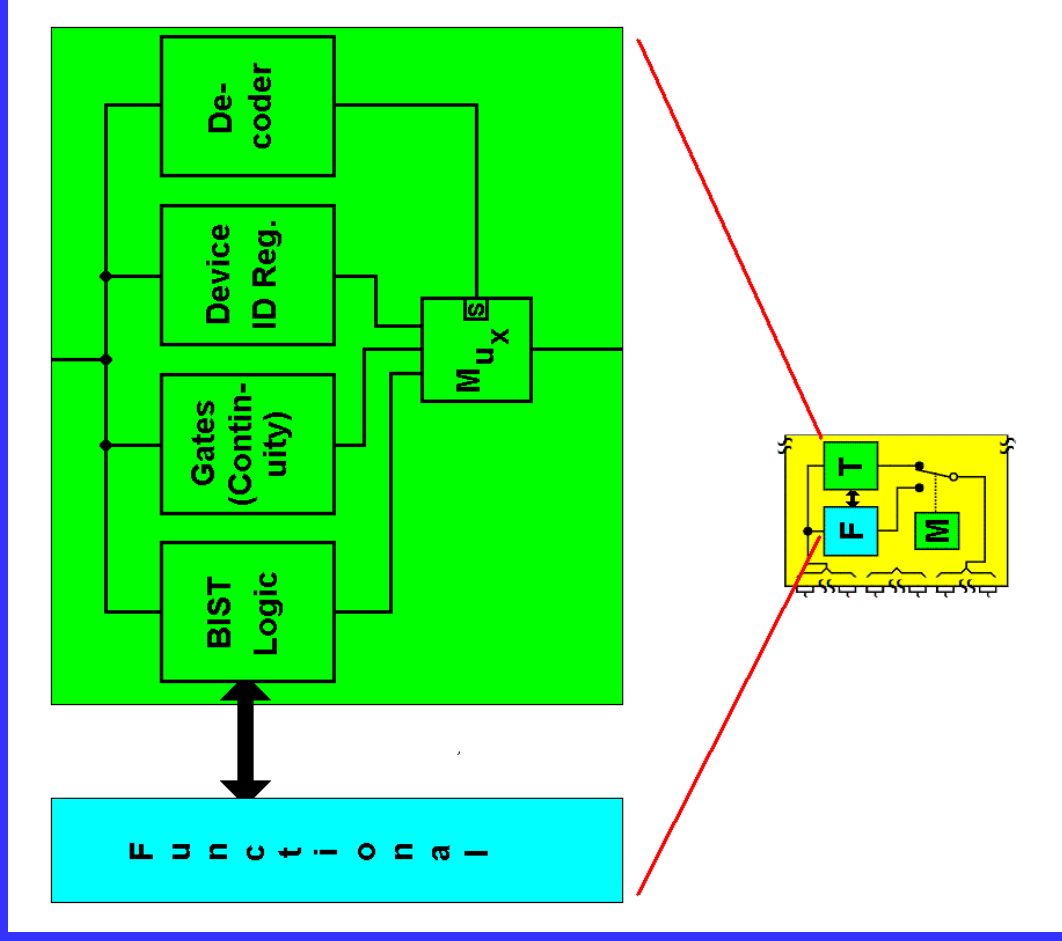
Continuity Test Gating - IAX



Device Identification Option

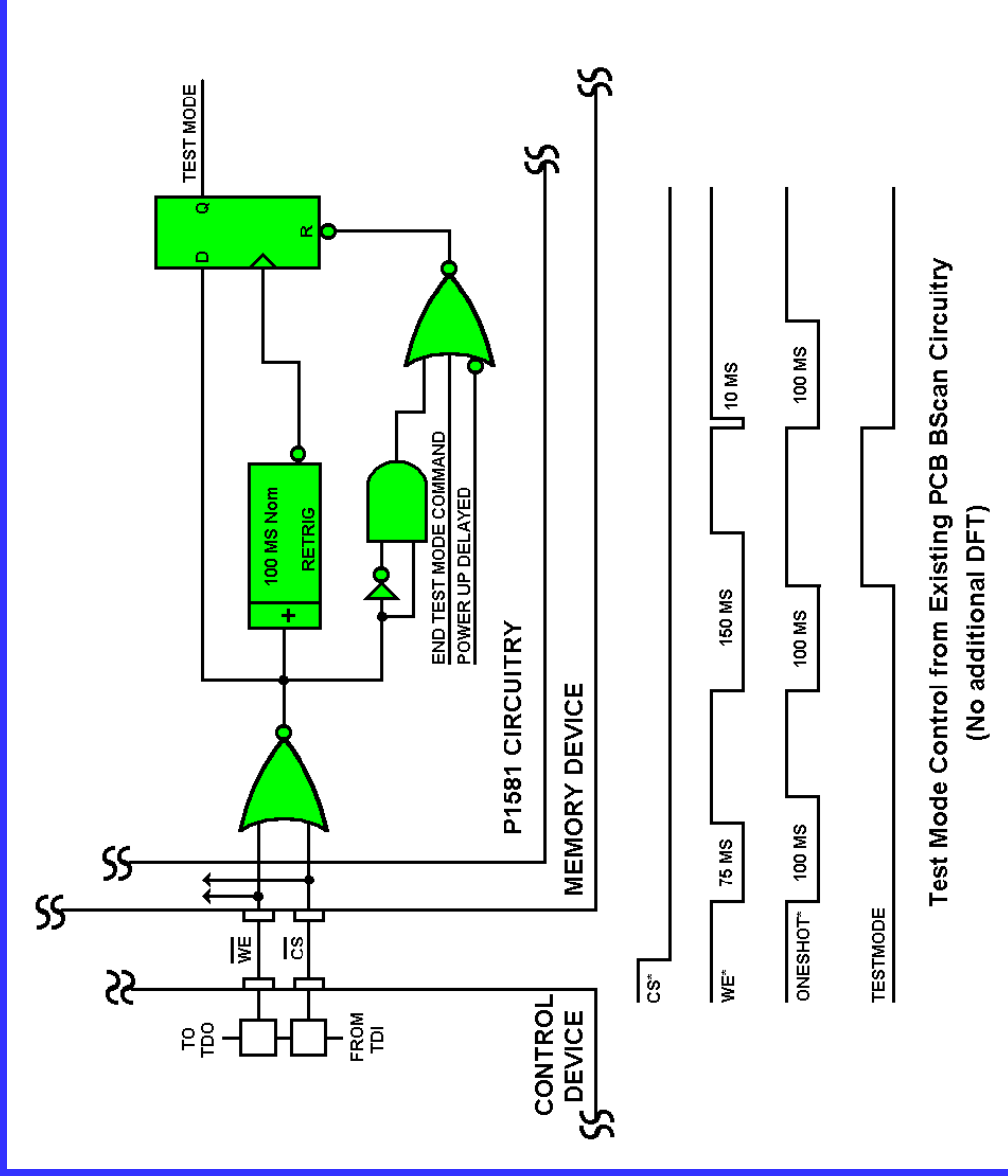


BIST & Device ID Options

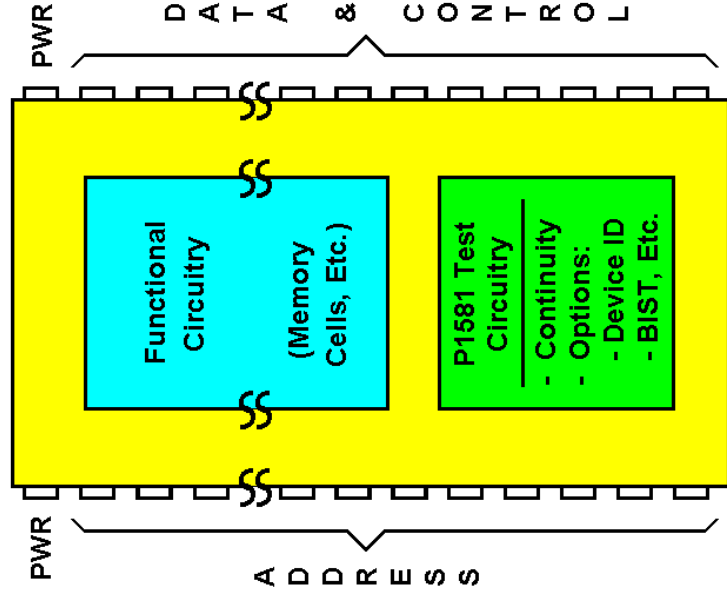


Non-Functional Stimulus

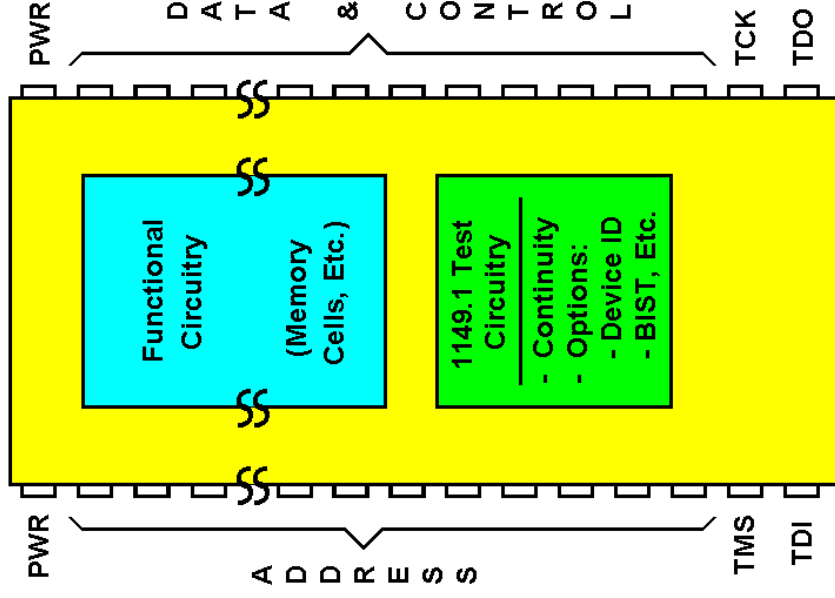
Mode Control



P1581 / 1149.1 Comparison



Memory Device w/ P1581



Memory Device w/ 1149.1

P1581 Features Summary

- Equivalent to 1149.1:
 - Continuity Test
 - Device ID Option
 - BIST Option
 - Other Public / Private Options
- Improvements over 1149.1
 - No Testpins Required
 - Same Device Usable in Legacy (non-P1581) and P1581 Board Applications

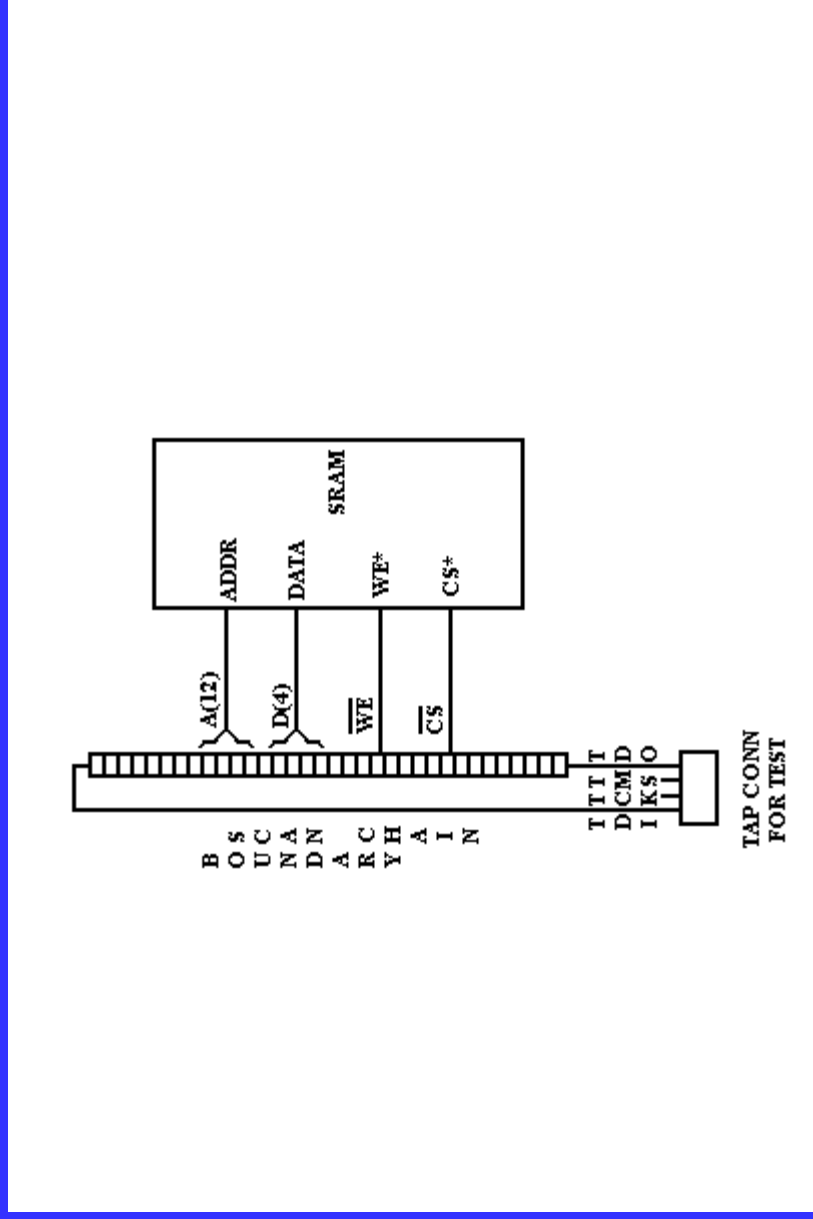
P1581 Emulation Goals

- Allow Off-the-Shelf Memory Devices to be Adapted for P1581 Design / Development Operations
- Run At or Near Speed for Board Level Substitution
- Support Test Jig Operation
 - Device Design Debug
 - Test & Test Tool Development

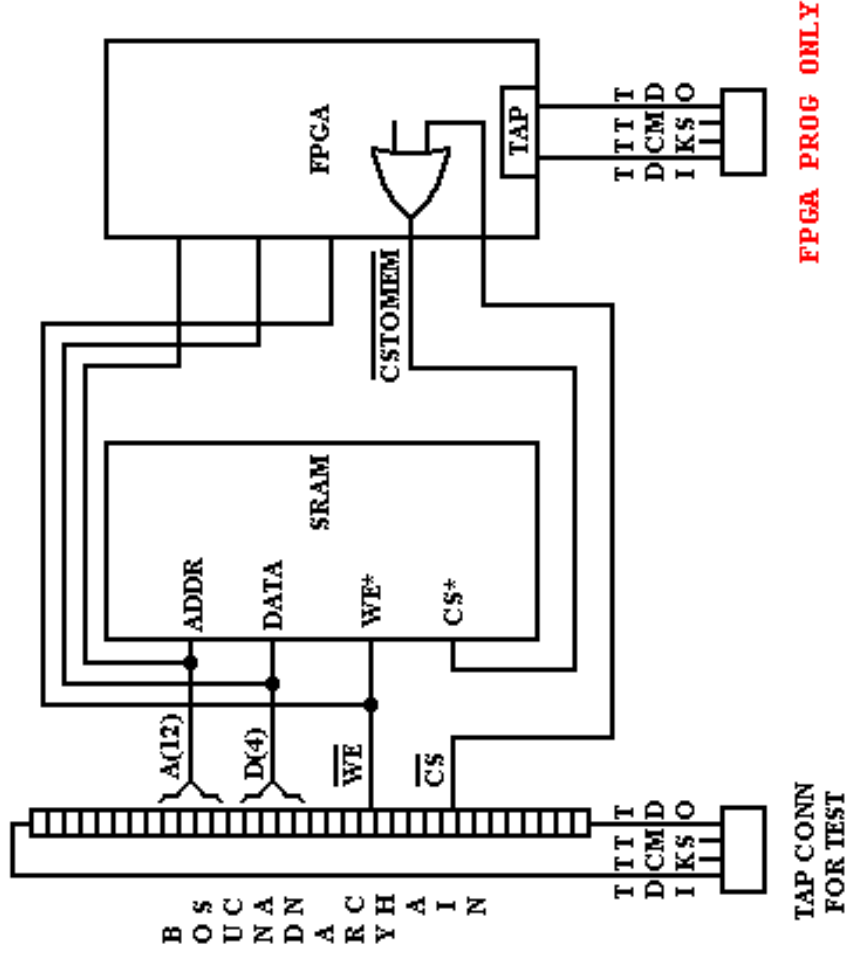
Emulation for Demo

- Cypress CY62157EV30 TSOP I
- Chosen for Complexity
- Dual Configuration: 1Meg x 8 / 512K x 16
- Emulator Must Work for All Board Applications
- BYTE* Tied H / L for 16 / 8 Bit Operation
- Data Pin Doubles as Address Pin (Potential Issue Because P1581 Uses Address Pins as Inputs, Data Pins as Outputs)
- Note: TSOP I Version Different Than Others

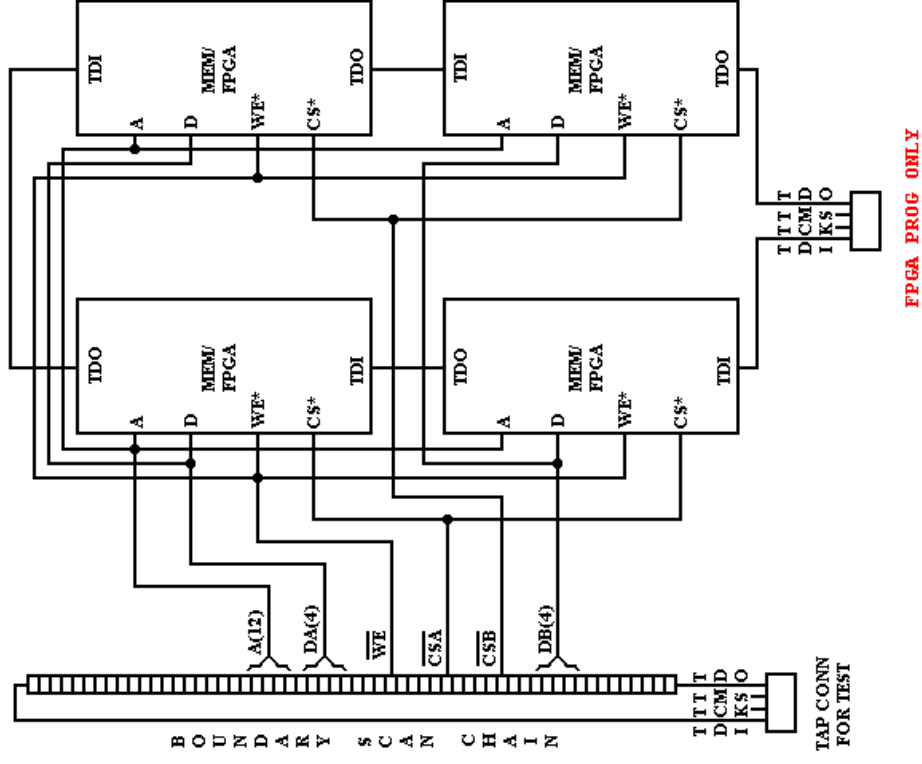
Emulation Environment



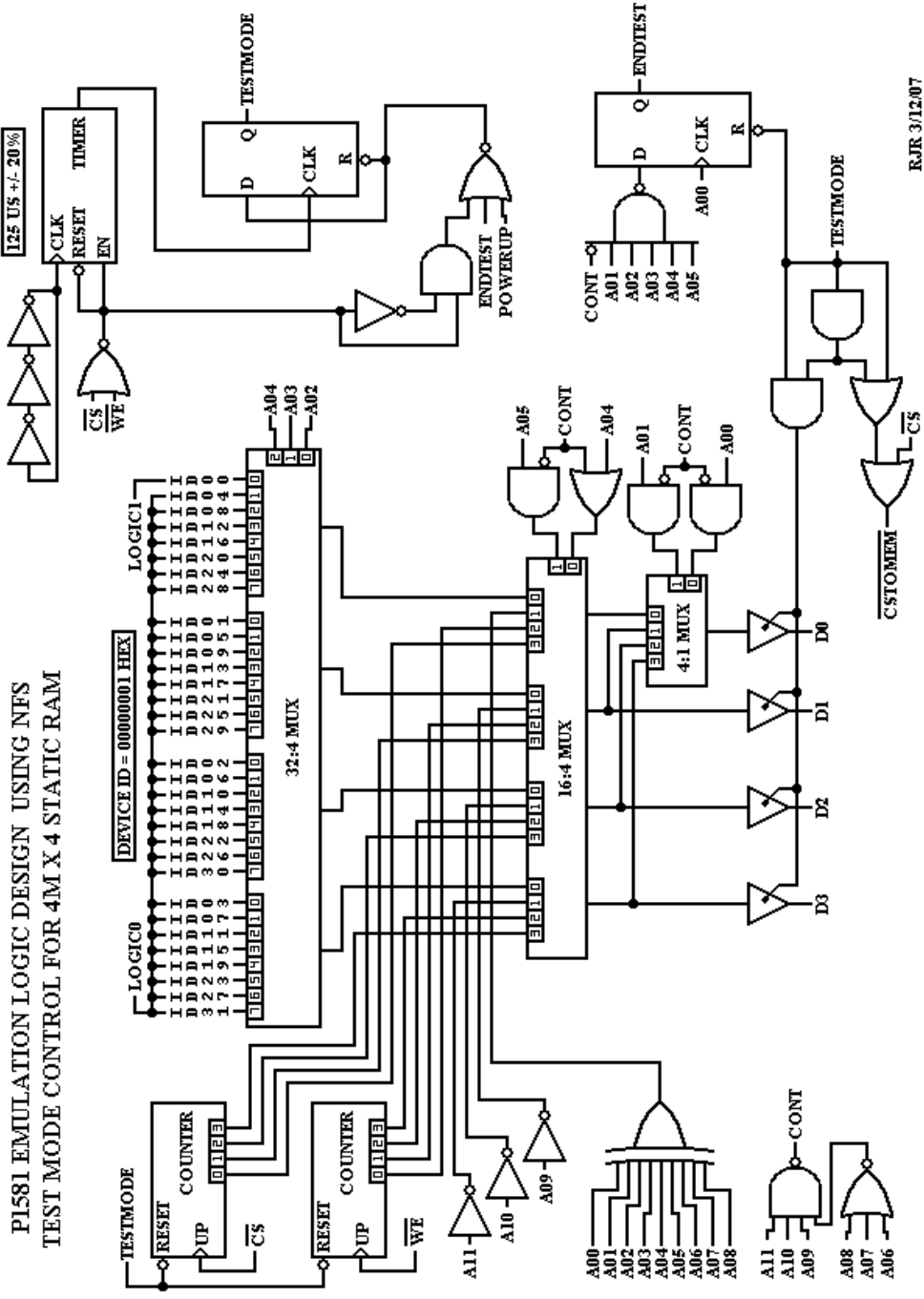
P1581 Emulation Concept



Bank Emulation Example



Emulation - Simple Memory



PL581 EMULATION LOGIC DESIGN
USING NFS TESTMODE CONTROL FOR
512K X 16 / 1M X 8 STATIC RAM
CYPRESS CY62157EV30 TSOP I



Summary

- Enhancements Since BTW 2006
- P1581 Basic Operation
- P1581 Options (Device ID, BIST, Public, Private)
- NFS Mode Control (No Dedicated Testpins)
- P1581 Vs. 1149.1 for Memory Devices
- Emulation Goals & General Concept
- Emulation Circuitry Details

Conclusion

- P1581 Includes Key 1149.1 Features
- Emulation Facilitates First Silicon Success
- P1581 Preferable to 1149.1 for Some Memory Devices

Further Information

- IEEE P1581 Working Group Website:
<http://grouper.ieee.org/groups/1581/>
- Sit In on WG Telephone Conference
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