

MemChar

Automatic Memory Characterization with Smart 'Timing Soft Error' and 'Glitch' Prevention

“Legend’s MemChar and SpiceCut have enabled us to accurately characterized more than a thousand of memories from our compilers.”

Steve Crain, Director
BroadCom Corporation

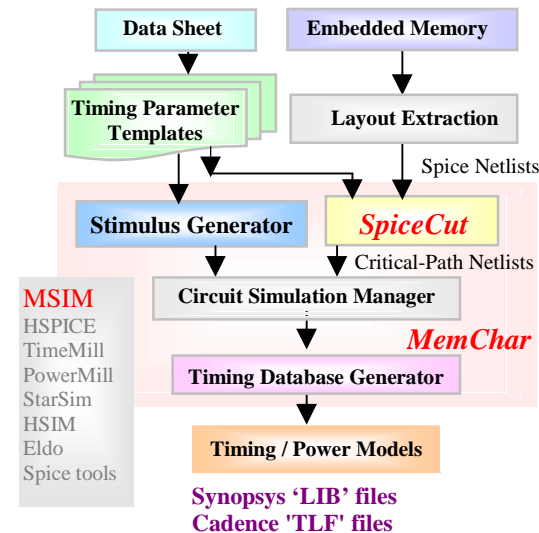
“MemChar provide us not only the ‘true’ setup and hold time, but also the automated flow.”

LeeChung Yiu, VP
Marvell Semiconductor, Inc.

“VIA has selected Legend’s MemChar and SpiceCut for memory characterization. We are impressed by the automation, accuracy and performance of Legend’s tools.”

Alan Liaw, CAD Director
VIA Technologies, Inc.

IC designs are becoming more memory dominant now. To integrate all kinds of memories, logic and function blocks onto a single chip, an accurate timing and power model of memories must be characterized for system-level simulation and verification. Due to sophisticated design, sensitivity to technology and complicated integration, embedded memories also need to be validated through characterization by simulation.



MemChar is a tool box of characterization
SpiceCut-Memory builds critical-path circuits for simulation and also perform circuit verification.
MSIM is a characterization oriented circuit simulator.

The Complete Solution

- ‘Bi-Section’ Mode
 - Setup/hold time from binary iterations
 - ‘Timing Soft Error’ and racing prevention
 - Accurate and automated
- ‘Path’ Mode
 - Setup/hold time from paths’ difference
 - Automated by latch pattern recognition

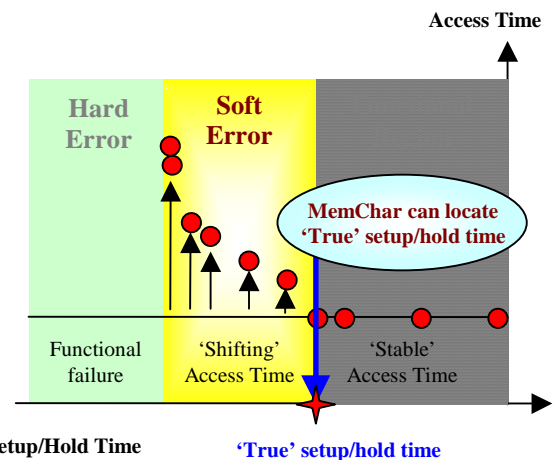
The Applications

- ✦ Generate timing and power models of memory compiler
- ✦ Instance characterization to fine-tune models for high performance designs
- ✦ Qualification for memory IP selection
- ✦ Validation for failure prevention
- ✦ Failure Analysis and debugging by ‘what-if’ simulations
- ✦ Porting and Re-targeting for legacy-usage

The Intelligence

Timing Soft Error Prevention

Timing Soft Error problem impacts on both circuit reliability and performances, especially for memory designs. Timing Soft Error which is caused by internal racing and glitches etc., is extremely difficult to observe and debug. Legend’s tools, MemChar and SpiceCut, can help to prevent and debug the problems.



Glitch Prevention

If the setup or hold time too small, it could induce the glitches, which may affect the overall integrity of the circuit. In MemChar, the setup and hold time could be characterized based upon the error tolerance for the glitches. For example, 10% or 20% of VDD may be specified for the maximum glitch tolerance.

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