Synopsys Custom Designer in the TowerJazz Power Management 180 nm Reference Flow

Overview

October 2010
Galaxy Custom Designer
*Addressing Modern AMS Era Challenges*

- Architected for Productivity
- Complete Custom Design Solution
- Open Environment

**Single Platform for Cell-based and Custom Design**
Architected for Productivity

Familiar Look and Feel

More Productivity

Fewer Clicks

- Custom Designer
  - Shift-Click
  - Type Value
  - Enter

- Others
  - Click Select
  - Move Form
  - Scroll to Field
  - Type Value
  - Apply Value
  - Close Form
Complete Custom Solution

• Full-Custom Chip and Block Design

• Unified & Integrated Environment

• Industry Leading Synopsys tools
Interoperability Through Open Standards

- Open database standard: OpenAccess
- Open customization languages: Tcl, Python, C++
- Open process design kits standards: iPDK

Lower cost-of-ownership - Less strategic risk - Greater interoperability
Complete Custom Solution
Design Entry & Simulation

Design Entry
Simulation & Analysis
Schematic Driven Layout
DRC/LVS/Extraction
Post-Layout Verification
IC Compiler Link

Custom Designer SE
• Built-In simulation environment including Corners & Monte Carlo analysis
• HSPICE and CustomSim integration
• Powerful WaveView analyzer
• Distributed processing support
Complete Custom Solution
Schematic Driven Layout Design

- Design Entry
- Simulation & Analysis
- Schematic Driven Layout
- DRC/LVS/Extraction
- Post-Layout Verification
- IC Compiler Link

Custom Designer LE and SDL
- Smart Design-Rule-Driven
- Schematic Driven Layout
- High-altitude and bus editing aids
- On-demand IC Validator DRC/LVS and StarRC extraction
Unified Platform for Cell & Custom Design Entry

- Design Entry
- Simulation & Analysis
- Schematic Driven Layout
- DRC/LVS/Extraction
- Post-Layout Verification
- IC Compiler Link

IC Compiler Integration
- Optimized direct link
- Ease of use and data integrity
- High performance & capacity

Custom Designer

Routed Blocks & Chips

Custom Blocks
Accelerating Market Success

- Aggressive product development

Rapid technology Innovation

- SmartDRD
- SoC-Capacity Editing
- Analog Environment
- Schematic Driven Layout
- Open Platform
- Schematic & Layout Editor

18 Months
Accelerating Market Success

- Aggressive product development
- Rapid customer adoption

World’s Largest Analog IP Group Uses Custom Designer

Over 200 designers switched from Virtuoso to Custom Designer in 7 months

All new IP projects start on Custom Designer

100% adoption of Custom Designer in 2010

#1 Provider of
#2 Provider of
PCI EXPRESS
ddr3

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Accelerating Market Success

- Aggressive product development
- Rapid customer adoption

- Over 200 designers switched from Virtuoso to Custom Designer in 7 months
- All new IP projects start on Custom Designer
- 100% adoption of Custom Designer in 2010
- World’s Largest Analog IP Group Uses Custom Designer
Accelerating Market Success

- Aggressive product development
- Rapid customer adoption
- Dozens of successful tape outs

Since January 2010:
- 62 Tape outs
- 14 Families of IP
- 25 Process nodes
- 55 PDK's
Accelerating Market Success

- Aggressive product development
- Rapid customer adoption
- Dozens of successful tape outs
- Worked with IPL to create the iPDK interoperable PDK standard

Leadership in Industry Standards

IPL 1.0
The semiconductor industry's first open standard for interoperable Process Design Kits (iPDKs)

- IPDK developer’s guide
- sample 90nm reference IPDK
- reference design
- user guide

DOWNLOAD NOW!
iPDK for Interoperable Multi-Vendor Flow
*One Interoperable PDK for All EDA Vendor Solutions*

- Schematic Capture
- Simulation
- Schematic Driven Layout
- DRC/LVS/RCX & Post-layout Simulation

Interoperable PDK

1 interoperable PDK
1 OA design database
No data translation

All EDA Vendor Solutions

Synopsys
Cadence
Mentor Graphics
Magma
SpringSoft
CIRANOVA

PyCell Development Environment
Foundry iPDK Content

Cadence OA PDK

- OA Schematic Symbols
- Component Description Format (CDF)
- SKILL Callbacks
- SKILL PCells
- Spice Models
- Tech Files
  - DRC/LVS/LPE

OpenAccess (SKILL)

Foundry iPDK

- OA Schematic Symbols
- Interoperable Component Description Format (ICDF)
- SKILL Callbacks
- Tcl Callbacks
- PyCells
- Spice Models
- Tech Files
  - DRC/LVS/LPE

Open Access, Open-standard languages (Python and Tcl)

One Foundry iPDK for all EDA vendors
Foveon Success Story

GOAL
- Migrate customer completely from Virtuoso to Custom Designer

COMPANY
- Subsidiary of Sigma Corporation
- 3 production chips under way

TECHNOLOGY
- High-resolution direct image sensor
- >14 million pixels
- 180nm

1. PDK MIGRATION
   - 2 weeks elapsed
   - 2 person effort

2. MIGRATE 3 ACTIVE DESIGNS
   - 3 weeks elapsed
   - 2 person effort

3. VERIFICATION
   - Simulation netlist accurate
   - CDL netlist accurate
   - Layout XOR clean

Customer migrated all designs and taped out with Custom Designer in less than 2 months
Synopsys-TowerJazz Reference Flow
180nm

- A complete custom implementation solution with Custom Designer
- Includes tutorials and a reference example
- iPDK based

Live demo at Synopsys booth
TowerJazz Reference Flow
Schematic

- Smart Connect
- On-canvas parameter editing
- Real-time connectivity
- Device palette
- Library-wide design integrity checks
- Dynamic object information
- Parameterized connections
TowerJazz Reference Flow Simulation

- Rich set of analyses
  - DC
  - Transient
  - AC
  - Parameter sweep
  - Monte Carlo analysis
  - Corner analysis
  - PSRR
- Distributed processing
- Waveform viewer
- Results calculator
- Operating points back-annotated to the schematic
TowerJazz Reference Flow Layout

- DRD Autofix
- DRD Visual / Assist
- SDL cloning
- Auto-via creation
- Interdigitation
- Real-time connectivity tracking
- Transaction history per window
- Shadow Mode
Galaxy Custom Designer

*Validated in TowerJazz Reference Flow*

- Architected for Productivity
- Complete Custom Design Solution
- Open Environment

Demo of Custom Designer at Synopsys booth
Why Synopsys?

• Long term strategic commitment
  – Over 180 engineers globally working on Custom Designer development and support

• Strong, experienced leadership
  – Fred Sendig, Randy Bishop, John Cooper

• Focused on differentiation and openness
  – Aggressive development
Synopsys is Committed to Success

Over 180 R&D engineers dedicated to Custom Designer

Production Adoption

Silicon Proven

Interoperable PDK

3rd Party Ecosystem
IPL Alliance
One PDK Works in Multiple Vendor Environments

Growing Membership
Go to www.IPLNow.com for more information