Aeroflex AX-Series brings new approach to RF and Mixed Signal Test

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The New World: Connected Mobile Consumers
The New World: Consumer Pricing Rules Apply

Technology Innovation Quickly Driving Down Mobile Data Cost per Bit in the Radio Access Network

Mobile Broadband Cost per Bit Decreases Exponentially With Each Generation of Technological Advancement

- ~50% Cost per Bit Reduction From WCDMA To HSPA
- >>50% Cost per Bit Reduction From HSPA To LTE

Network Cost per MByte as % of GPRS

GPRS 100%
EDGE (2.5G) 80%
WCDMA (3G) 60%
HSDPA (3.5G) 40%
HSPA+ 20%
LTE (4G) 0%

Semiconductor Business Environment

• Massive downward price pressure
  – Consumerisation
    • Wireless
      – Handsets
      – Networks
        – 2G, 3G, 4G, WiFi, RFID, NFC, Chip cards
    • Automotive
      – Electronics content rising
        » Bluetooth, WLAN, 2G, 3G, 4G, GPS, Radar
    • Computer
      – for everyone: school, games, work, social, information, shopping
    • Consumer
      – DTV, STB, DVD, Games …
    • Utilities
      – Smart Meters – Zigbee, Z…

• High Volume Data Driven Applications

High Volume Mass Production
Challenges with current ATE Model

• Characterization Test
  – Production ATE is overkill for engineering
    • Engineering need flexibility and wide instrument choice
  – Current Characterization solutions are custom
    • New system development consumes valuable engineering resources
    • Lab instrument solutions have the functionality, but not the integration
    • Cabling - slot management – DUT interface ...

• Production Test
  – Relentless cost pressure
  – Test development requires designer / engineering support
    • Need to re-use engineering test development

• Sustainable lower tester prices need a different model
  – Shift from Proprietary ATE with a finite roadmap to systems integrated from industry standard components
  – Re-use the R&D spent elsewhere in T&M hardware and Software
  – Need more suppliers not less
  – Lower support costs
Opportunity

- Test Instrument technology has moved on
- PCI replaces proprietary ATE bus
- Standard instruments are viable for mixed signal
- New AXIe standard enables industry standard digital cards
- Industry standard software can be used
- Build systems from Industry standard hardware and software
Industry Standards

Hardware

AXIe

Software

PXI

C
PXI Standard

- PXISA website
  - “PXI is a modular instrumentation platform designed for measurement and automation applications that require high-performance and a rugged industrial form-factor”
- Established 1998, 2011: 56 members, 1150 products
- Uses PCI bus
PXI Modular Instruments
AXIe Standard

• Derivative of PXI based on ATCA with larger board size & higher power handling
• Standards committee initiated in 2009
• Over a dozen AXIe instruments launched by multiple vendors
### PXI & AXIe Standards for Semiconductor Test

- AXIe & PXI modular instrument standards now provide “big iron ATE” performance at a lower price point
- AXIe & PXI instrumentation suppliers now cover the full range of DC, AC, Digital, and RF requirements
- The standards based ecosystem provides optimal price performance and long term investment protection as needs evolve

<table>
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<th>GPIB</th>
<th>LXI</th>
<th>VXI</th>
<th>PXI / PXIe</th>
<th>AXIe</th>
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<td>Ethernet</td>
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<td><strong>Power</strong></td>
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<td>Cable</td>
<td>Cable</td>
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</table>
PXI/AXIe Semiconductor Test System

Visual Studio Test Routines & Test Stand Test Flow

PXI/AXIe Instrument Programming, Debug, & Characterization Tools

AX Series Production Interface

Benchtop Version
Aeroflex Semiconductor Portfolio

**Industry Standards Based Instruments**
- RF PXI products:
  - Dual vector port module
  - Quad source distributor
  - Quad multiplexer

**AXRF PXI Subsystem**
- 2-16 universal vector ports
- 6GHz with modulation
- PXI Studio VSA software
- Supports 3rd party PXI cards

**AX500 Subsystem**
- Self contained AXIe system
- Up to 192 digital pins
- Up to 48 device power supplies
- Supports 3rd party AXIe cards

**Integrated Characterization & Production Systems**
- AX520 System
  - 5 AXIe slots & 20 PXI slots
  - 144 Digital Pins
  - DSP12, DD48, & AXRF
  - Supports 3rd party AXIe & PXI

- AX1020, AX1420, AX2820 Systems
  - 10/14 AXIe slots & 20 PXI slots
  - 288/528/1056 Digital Pins
  - DSP12, DD48, & AXRF
  - Supports 3rd party AXIe & PXI

**AXle products:**
- System cage controller
- DD48 digital pin card
- DPS12 device power supply
Aeroflex AX Series Product Introduction

- Family of semiconductor test options
  - Instruments, subsystems, and systems
  - For engineering characterization & production
- Aeroflex key skills, experience and technologies
  - Global Local Support
  - Semiconductor ATE design experience
  - Manufacturing Test experience
  - AXIe industry standard
- Based on PXI & AXIe instrument standards
  - Third party instrumentation can be easily added
  - AXIe starter module and reference design available for custom instrument development
- Launched Semicon West, July 2011
- European Launch, Semicon Europa October 2011

www.aeroflex.com/ats