Excellence

through

Experience, Execution and Integrity
Company Background

- In business for over 16 years
- Headquartered in Austin, Texas
- **Founding Partners** are Test Software & Hardware Engineers with 150+ years combined experience
- We hire only the **best and brightest** engineers
- Independently owned and operated

**Vision:**
To be the leading independent US provider of Semiconductor Test Solutions

**Core Values:**
Excellence through Experience, Execution and Integrity
Where We Provide Solutions

Test Spectrum provides the products and services required to support your test requirements throughout the product lifecycle.

Semiconductor IC Design → Test Plan → Schematic Design → Vector Translation → Test Hardware Development → Test Software Development → Test Debug: Qual, CZ, & Production Release → Sustaining Eng Support

Wafer Fab → Assembly → Production Test Facility

Debug Test Facility
Where we Provide Solutions

ATE Companies
- Test Application Development

IDM’s
- Manufacturing (Probe & Package)
- Product Group
  - Design Group A
  - Design Group B

Test Companies
- Production Test (Probe & Package)

IP Companies
- Core Verification & Characterization

Fabless Semiconductor Companies
- Product Group
  - Design Group A
  - Design Group B

Semiconductor Test Solutions
Semiconductor Test Solutions

- Test Hardware
- Test Software
- Turnkey Solutions
- Test Tools
Test Software
Turn-Key Test Development for New IC’s

- Test Plan Development
- Test Platform Selection
- Vector Translation
- Schematic Design
- Test Program Development & Debug
- Characterization
- Qualification
- Production Release
Test Software

Turn-Key Test Development for Existing IC’s

• Test Platform Conversions
  ➢ Pattern Conversions
  ➢ Program Conversions
  ➢ Correlation Analysis
  ➢ Production Release

• Test Program Optimization
  ➢ Parallel Test Solutions
  ➢ Pattern Compression
  ➢ Test Technique Improvements
  ➢ Correlation Analysis
  ➢ Production Release

Testing Asynchronous Devices in Parallel using Cascading Match-Mode
Test Tools

VectorPro → Vector Generation

VectorPort → Pattern Conversion

DataView → Data Analysis

Custom Tools: Defined by Customer
**Test Tools: VectorPro**

Pattern Generator

**VectorPro**
- Used for generating cyclized ATE test vectors
- GUI driven, no command files
- Reads VCD and EVCD files
- Generates WGL or STIL patterns
- Batch mode converts multiple simulations
**Test Tools: VectorPort**

Pattern Converter

- Tool for converting WGL/STIL vectors to targeted ATE tester formats
- Includes pattern, timing, and pinmap data.
- Read and write both parallel (Flat) vectors and serial (SCAN) vectors.
Test Tools: DataView

- Data Analysis Tool
- STDF input
- Reports include
  - Mean
  - Standard Deviation
  - Min, Max (Range)
  - Cp, Cpk
- Composite Histograms
- Wafer Maps
Test Tools: DataView
Histograms
Test Tools: DataView

Wafer Maps
Test Hardware

- PCB layout design (Cadence Allegro)
  - RF, Mixed-Signal,
    High Speed Digital/Datacomm
  - Schematic Driven Flow LVS Verification using ORCAD/Capture or Concept.
  - Schematic & BOM Back Annotation.
  - Calculated Electrical Parameters.
Test Hardware

- PCB fabrication
  - Controlled Impedance
  - Specialized materials when required
  - Sequential Lamination
  - Blind/Buried Vias
  - Electrical test for impedance and continuity
  - High Drill Aspect Ratios
Test Hardware

• Component procurement & installation
  ➢ Automated or Manual Assembly
  ➢ Flying Probe Option
  ➢ Surface Mount
  ➢ Reflow & X-Ray verification when required.
  ➢ Sockets

• Probe card needle and epoxy ring assembly.
  ➢ Cantilever
  ➢ Vertical Probe
## ATE Platform Capabilities

<table>
<thead>
<tr>
<th>ATE Manufacturer</th>
<th>Tester Platform</th>
<th>Pattern Conversion</th>
<th>Test Software</th>
<th>Test Hardware</th>
</tr>
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<tbody>
<tr>
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<td><strong>Xcerra (LTX/Credence)</strong></td>
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# Product Technology Experience

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<tr>
<th>Digital/Datacomm</th>
<th>Mixed-Signal/Analog</th>
<th>RF</th>
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<tbody>
<tr>
<td>ASIC w/ PCIe, GDDR3</td>
<td>UWB BBIC</td>
<td>UWB Front End</td>
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<td>PPC DDR II SOC</td>
<td>PHS BBIC</td>
<td>PHS PA/SW/Down Conv</td>
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<tr>
<td>Dual MCU/DSP Core BB</td>
<td>Class D Audio Amplifier</td>
<td>FM Tuners</td>
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<tr>
<td>Quad Serial Backplane</td>
<td>Voice over SLAC</td>
<td>Direct IQ Mod/Mixer</td>
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<tr>
<td>Multi-Port Serdes IC's</td>
<td>VDSL Front End</td>
<td>GPS RF ASIC</td>
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<td>Disk Drive Read Channel</td>
<td>Bluetooth Transceivers</td>
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<tr>
<td>5Gbps Laser Driver &amp; PA</td>
<td>WLAN BBIC</td>
<td>WLAN Dual Transceivers</td>
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<td>DC-DC Converters</td>
<td>CDMA/FM BBIC w/ RF</td>
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<td>8ch, 1.6Gbps Timing Gen</td>
<td>Powerline Transceiver</td>
<td>GPS RF Front End</td>
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<tr>
<td>CMOS Image Sensors</td>
<td>Power Management IC's</td>
<td>Software Radios</td>
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</table>
Benefits of using Test Spectrum

• Stable - Established Corporation.
• Experienced - Test Software & Hardware Expertise, with turnkey solutions.
• Flexible - Large Pool of Engineering Resources.
• Cost Effective - Avoid expanding staff for “Peak Demand Only” situations.
• Focused – Semiconductor Test Development.
Excellence through Experience, Execution and Integrity