Cohu

DIAMONDx TEST SYSTEM

Flexible, Cost Optimized Test Solutions for a Comprehensive Range of Applications

Breakthrough cost reductions in both capital and operating costs for the mobility, connectivity, consumer, automotive and industrial markets

- Small form-factor, zero footprint
- Air cooling – no heat exchange or plumbing
- Energy efficient, low power consumption, global sales and support network

Highlights

- Low cost of operations
- High multi-site efficiency
- Broad range of proven test technologies including power, high speed and high density

Key Features

- Adaptable and scalable architecture
- Extremely high-speed data bus based on PCI-Express Industry Standard
- Covers Precision Analog, DC, RF and SerDes IP cores' testing

The Diamond$_x$ test system is cost-optimized for both today's and future test requirements for a wide range of ASSP and microcontrollers ICs used in wireless and mobility applications, as well as consumer ICs including:

- Wireless cellular, WAN, LAN, PAN, BAN, GPS-location and tuners
- Mobility digital and analog baseband and applications processors
- Mobility power management ICs & battery charger ICs
- Microcontrollers: 8/16/32-bit
- High definition digital TV and set-top box decoders and controllers
- Serial and clock forwarded busses; MIPI, VByOne, EDP, PCIe, SATA, USB2/3, LVDS, memory interfaces, I2C, SPIE and others
- Automotive and industrial high voltage ICs
- Printer drivers and motor controllers
- Flat panel display driver and touch controller ICs

DIAMOND$_X$ TEST SYSTEM

Driving a New Level of Production Efficiency

Cohu's Semiconductor Test Group is a pioneer of semiconductor ATE solutions, continues to develop innovative test system architectures that drive production floor efficiency to ever higher levels.

Compact Low Power (CLP) technology enables unique architecture that provides testing with best UPH/$ and highest quality.

Diamond$_x$ Offers:

- Universal instrument slot architecture: Allowing easy scaling from single-site to multi-site, from digital only to mixed-signal to power to RF ASSP configurations
- Small footprint, making it ideal for lab development and high-volume production
- PCI-Express2 Data Bus up to 80Gbps bi-directional transfer between system CPU and test-head
- Concurrent Test Support, enabling the testing of multiple digital ports, SerDes, analog and RF in parallel

Flexible

The Diamond$_x$ instrument portfolio provides a range of solutions for testing cellular baseband, multi-core application processors, Wireless RF ASSPs, mobility power management & battery charging ICs, microcontroller, consumer and mobility ASSPs, PC peripherals and high definition devices (BluRay, HDTV and HD-STB) as well as touch and display driver ICs.

Scalable

Diamond$_x$ architecture facilitates easy reconfiguration to adapt to changing test and market requirements. For digital intensive applications the Diamond$_x$ can scale up to 7,296 digital pins or 2,736 analog pins and 384 relay control for high-volume, high multi-site production test. Pin count is enabled by Diamond$_x$ high-density digital, DUT power supply and analog/VI instruments and IMA. Configuring for 16-site RF TxRx test is possible through DragonRF configured with 32 RF Ports.

With the scalability of this test system, a single Diamond$_x$ test-head for testing RF ASSPs that contain audio, voice and housekeeping ADC/DAC could be configured with 32 full Vector RF Ports, 2880 digital, 88 analog supplies, a Multi-Wave DSP/Mixed Signal instrument with four source and four measure for audio or video measurements.

www.xcerra.com/diamondx
info@cohu.com
Semiconductor Test Group
www.xcerra.com/ate

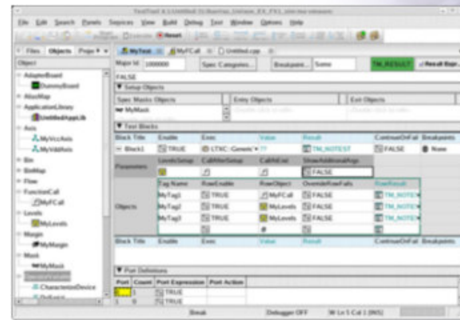
Cohu, Inc.
12367 Crosthwaite Circle, Poway, CA 92064-6817 | Tel. +1 858.848.8000
www.cohu.com | © 2018 Cohu, Inc.: All rights reserved.

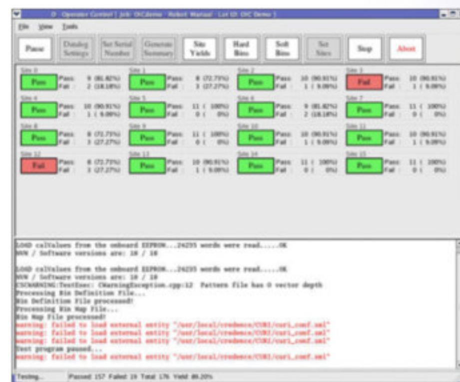
Cohu

DIAMOND$_X$ TEST SYSTEM

Software

The Diamond$_x$ comes with a full suite of graphical software tools for test creation, debug, characterization and high-volume production of digital and consumer ASSP devices. The software, Unison, is based on industry standards such as the IEEE Standard Test Interface Language (STIL), C++, and Linux.





Key Specifications

1 General

1.1 Instrument Slots:
- 19 instrument slots and 1 system DUT utility board in a single test head (x1 IMA)
- 38 instrument slots and 2 system DUT utility board (x2 IMA)

1.2 Max Digital Pin Count:
- 3,648 single test head (x1 IMA)
- 7,296 (x2 IMA)

1.3 Multisite Test Sites: up to 1024

1.4 Thermal Management: air cooled

1.5 Prober and Handler Interfaces: GPIB, TTL, RS-232, Ethernet

1.6 Instrumentation: broad range of digital, DC and power, DSP analog, SerDes and RF instrumentation

2 Software

2.1 Software Environment: C++, Unison

2.2 Operation System: high performance Multi MPU, Multicore Linux based PC

3 Facilities Requirement

3.1 Electrical: 190 – 240 VAC, 50 Hz/60 Hz 3-Phase 30 A

3.2 Ethernet Required

3.3 Other: no compressed air or chiller required

4 Physical Characteristics

4.1 Test Head Dimensions [width/depth/height]:
- 12″ x 26.5″ x 29.5″ configured w/o DragonRF
- 17″ x 26.5″ x 29.5″ configured with DragonRF

4.2 Test head weight [width/depth/height]:
- 200 lbs (90 kg) without DragonRF
- 250 lbs (150 kg) with DragonRF

4.3 Mainframe Dimensions:
- 20.5″ x 32″ x 20.5″ without DragonRF
- 20.5″ x 32″ x 38″ with DragonRF

4.4 Mainframe Weight:
- 150 lbs (68 kg) without DragonRF
- 230 lbs (104 kg) with DragonRF

5 System DUT Utility Resources

5.1 SDU:
- Loadboard power supplies
- User control bits (128)
- Reference clocks
- Serial and parallel control buses

Rev20190227

www.xcerra.com/diamondx
info@cohu.com
Semiconductor Test Group
www.xcerra.com/ate

Cohu, Inc.
12367 Crosthwaite Circle, Poway, CA 92064-6817 | Tel. +1 858.848.8000
www.cohu.com

© 2018 Cohu, Inc.: All rights reserved.

Cohu

DIAMOND$_X$ TEST SYSTEM

Instrumentation

1 Composite Instrumentation

1.1 AT1$_X$: Automotive Test Composite Pin
- Composite Pin Instrument allowing for testing CAN and LIN, that conforms to SAE standards required for these automotive products
- Reduced loadboard complexity through CAN and LIN loads and LIN driver, along with integrated switch paths for multiple resources to DUT pin connections
- Transient detect capability to capture perturbations at the device in program development or production test

2 DC and Power Instrumentation

2.1 DPS16: Device Power Supply
- Continuous voltage source
- Voltage and current measurement
- Diamond software support

2.2 DPS1$_X$: High Performance Device Power Supply
- Multisite testing of multi-core application processors and other high current, low voltage devices
- Drop-in replacement for DPS16 with enhanced capabilities

2.3 FPVI$_X$: High Voltage, High Current Floating Programmable Power Supply
- Fast throughput with high power pulsed mode operation
- Transient detect capability to capture perturbations at the device in program development, or production test
- Reduced loadboard complexity using the SmartMux for high voltage and current signal routing
- Expert mode to maximize energy efficiency of the instrument

2.4 HDVI: High Density Voltage Current Instrument for Massive Multisite Test
- Highest V/I pin density in the industry
- Voltage/current supply (VIS) mode
- Precision analog source (PAS) mode
- Flexible triggering options
- External input matrix

2.5 HPVI$_X$: High Power Voltage/Current Programmable Power Source
- Fast throughput with high power pulsed mode operation
- Transient detect capability to capture perturbations at the device in program development, or production test
- Reduced loadboard complexity using the SmartMux for high voltage and current signal routing

2.6 PMVI$_X$: Voltage/Current Source for Mobile Power Management, ASSP, Automotive and MCU ICs
- Meets the test challenges of integrated mobile power management devices with dozens of DC-DC and linear regulators ranging from under 100 mA to several amps.

2.7 VIS16: Precision Voltage/Current Source and Measurement with Advanced Features
- V/I source mode
- AWG and digitizer functions
- Time measurement
- Differential voltage measurement
- Timers, triggers and gates
- Alarms

3 Digital Instrumentation

3.1 DPIN-96: High-Value Solution for Testing Digital and Mixed-Signal Devices
- Flexible timing
- Reconfigurable pattern memory
- Deep capture memory
- High-precision PMU
- Built-in time measurement
- Super voltage
- Comprehensive software tools

3.2 GX1$_X$: General-Purpose Digital Instrument for Digital ASSP, Analog ASSP and MCU Digital Testing
- Flexible pattern memory allocations
- Multiple pattern generation
- Transmit and receive of digitized waveforms
- Pattern synchronization and control of DC and AC analog test instruments

3.3 MP1$_X$: Optimized Solution for LVDS Port and DDR Memory Port Test
- Matching the interface structure and requirements of a DDR memory controller for simplified DUT boards
- Supporting built-in memory protocol support
- Same cycle match capability to support for data latency of up to 8 cycles

www.xcerra.com/diamondx
info@cohu.com
Semiconductor Test Group
www.xcerra.com/ate

Cohu, Inc.
12367 Crosthwaite Circle, Poway, CA 92064-6817 | Tel. +1 858.848.8000
www.cohu.com | © 2018 Cohu, Inc.: All rights reserved.

Cohu

DIAMOND$_X$ TEST SYSTEM

4 Mixed Signal / DSP Instrumentation

4.1 Multi-Wave: Highly Integrated Mixed-Signal Instrument for Multisite and Concurrent Testing
- Wide bandwidth analog source
- wide bandwidth analog capture
- Flexible triggering
- High-precision PMU
- Protected I/O channels
- Simpler test boards
- Mixed-signal software support

4.2 DCTM$_X$: Precision Data Converter Test Module
- Precision linearity to 1 ppm
- Single-ended, differential, and pseudo-differential connection
- Testing ADCs and DACs, and class-D amplifiers with a single instrument

4.3 PD1$_X$ / PD2$_X$ Test Solution for Ultra High Definition Display Driver ICs
- Integrated display drivers for mobile and tablet applications, including touch and display driver integration (TDDI)
- Large panel television and monitor applications, including ultra-high definition and 240Hz refresh rate
- Industrial and automotive display drivers

5 RF Instrumentation

5.1 Dragon RF: RF test solution for the complete spectrum of connectivity and mobility standards
- Extensive suite of new capabilities designed to provide the lowest cost of test without any compromise in RF test performance
- Innovative flexible architecture enables lower priced configurations without trade off in test coverage or test time

5.2 Nighthawk CT: Ultra compact RF instrument
- Comprehensive set of RF features at a fraction of the price of traditional RF ATE systems
- Highest throughput
- Low operating cost
- Portable between Cohu test systems

6 SerDes Instrumentation

6.1 HS1$_X$ Scalable data rate, Cost-Efficient Solution for High Performance SerDes Test
- Physical layer testing with built in PRBS BERT TX/RX
- BIST/DFT testing using high bandwidth drive/compare memory
- Protocol level and mixed-signal testing using deep send pattern memory

6.2 HSIO: 8 Lane SerDes Instrument for Testing of High-Speed Serial Interfaces
- Physical layer testing with built in PRBS BERT TX/RX
- BIST/DFT testing using high bandwidth drive/compare memory
- Protocol level testing using deep send and receive pattern memories

7 Time Measurement Instrumentation

7.1 ATMP$_X$ Analog Time Measurement Processor
- Flexible timing measurements through per-pin programmable comparator levels and programmable hysteresis
- Reduced loadboard complexity using the SmartMux for high voltage timing measurements

Detailed brochures for all instruments are available here:
https://resources.cohu.com/stg-diamondx-test-platform

All specifications are subject to change without notice

www.xcerra.com/diamondx
info@cohu.com
Semiconductor Test Group
www.xcerra.com/ate

Cohu, Inc.
12367 Crosthwaite Circle, Poway, CA 92064-6817 | Tel. +1 858.848.8000
www.cohu.com | © 2018 Cohu, Inc.: All rights reserved.

Cohu