SOC/ANALOG TEST SYSTEM
MODEL 3650-EX

Semiconductor manufacturing is a fast moving industry; more and more devices are highly integrated with various functions. Capital equipment must be built to outlive several device generations and applications. With varieties of available options, such as AD/DA converter test, ALPG for memory test, high voltage PE, multiple scan chain test, VI45 & PVI100 analog test options and HDADDA mixed-signal test options, Chroma 3650-EX can provide a wide coverage for customer to test different kind of devices with flexible configurations.

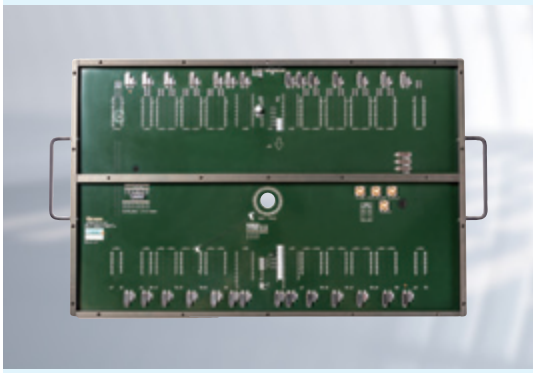
Moreover, Chroma 3650-EX platform architecture allows development of focused instruments by third-party suppliers that can be easily added for specific applications. It can stretch the boundaries of test by covering a broader range of devices than ever before possible in a low-cost production test system.

3650-EX achieves lower test cost not only by reducing the cost of tester system but also by testing more devices faster with higher parallel test capability. With Chroma PINF IC and the sophisticated calibration system, 3650-EX has the excellent overall timing accuracy better than other low cost ATE. With the any-pin-to-any-site mapping design, 3650-EX provides up to 512 sites high throughput parallel testing capabilities to enlarge the mass production performance with more flexible and easy layout.

MODEL 3650-EX

KEY FEATURES

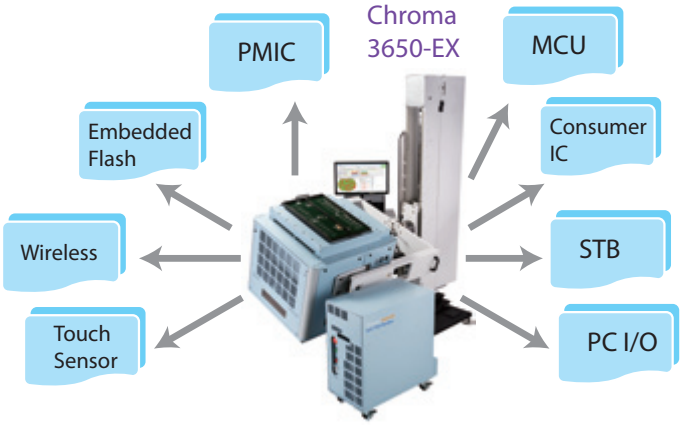
- 10 universal slots for digital, analog and mixed-signal applications
- 50/100 MHz clock rate, 100/200 Mbps data rate
- Up to 512 sites parallel test
- Up to 1024 digital I/O pins
- 32/64 MW vector memory
- Up to 32 CH PMU for high precision measurement
- Per-pin timing/ PPMU/ frequency measurement
- Scan features to 4G depth / scan chain
- ALPG option for memory test
- Edge placement accuracy ±300ps
- Up to 64 CH high-voltage pins
- 96 CH high density DPS
- 32 CH HDADDA mixed-signal option
- 8~32 CH VI45 analog option
- 2~8 CH PVI100 analog option
- MRX option for 3rd party PXI/PXIe applications
- Microsoft Windows® 7 OS
- C++ and GUI programming interface
- CRISP, full suite of intuitive software tools
- Test program and pattern converters for other platforms
- Accept DIB and probe card of other testers directly
- Support STDF data output
- Air-cooled, small footprint tester-in-a-test-head design



Chroma

Chroma 3650-EX brings you the most cost-effective SoC tester

Chroma 3650-EX is specifically designed for high-throughput and high parallel test capabilities to provide the most cost-effective solution for fabless, IDM and testing houses. With the full functions of test capability, high accuracy, powerful software tools and excellent reliability, 3650-EX is ideal for testing consumer devices, high-performance microcontrollers, analog devices and SoC devices.

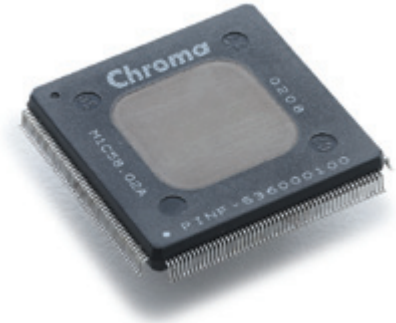


High performance in a low-cost production system

3650-EX achieves lower test cost not only by reducing the cost of tester system but also by testing more devices faster with higher parallel test capability. With Chroma PINF IC and the sophisticated calibration system, 3650-EX has the excellent overall timing accuracy better than other low cost ATE. The pattern generator of 3650-EX has up to 64M depth pattern instruction memory. By having the same depth as the vector memory, Chroma 3650-EX allows to add pattern instruction for each vector. Moreover, the powerful sequential pattern generator provides the variety of micro instructions to meet all kinds of different demands of complex test vectors. Hardware true per-pin architecture and the flexible site mapping with no slot boundaries are designed for multi-site test with high throughput. Up to 1024 digital pins, 96 device power supplies, per-pin PMU, mixed-signal and analog test capability, 3650-EX delivers a combination of high test performance and throughput with cost-effective test solution.

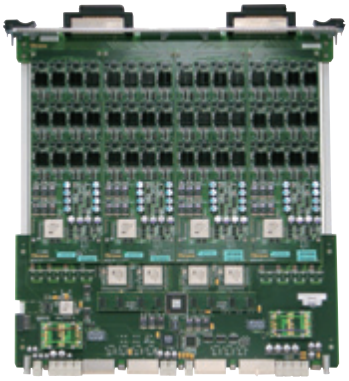
High parallel test capability

The powerful, versatile parallel pin electronics resources of 3650-EX can simultaneously perform identical parametric tests on multiple pins. 3650-EX integrates 128 digital pins into one slot. In each LPC board, it contains high performance Chroma PINF ICs which supports timing generation. The integration of local controller circuitry manages resources setup and result readout, and therefore cuts the overhead time of the system controller. With the any-pin-to-any-site mapping design, 3650-EX provides up to 512 sites high throughput parallel testing capabilities to enlarge the mass production performance with more flexible and easy layout.



Chroma PINF Timing Controller

128-Channel Logic Pin Card



48-Channel High Density Device Power Supply

Flexibility

Semiconductor manufacturing is a fast moving industry; more and more devices are highly integrated with various functions. Capital equipment must be built to outlive several device generations and applications. With varieties of available options, such as AD/DA converter test, ALPG for memory test, high voltage PE, multiple scan chain test, VI45 & PVI100 analog test options and HDADDA mixed-signal test options, Chroma 3650-EX can provide a wide coverage for customer to test different kind of devices with flexible configurations. Moreover, Chroma 3650-EX platform architecture allows development of focused instruments by third-party suppliers that can be easily added for specific applications. It can stretch the boundaries of test by covering a broader range of devices than ever before possible in a low-cost production test system.

From design to production

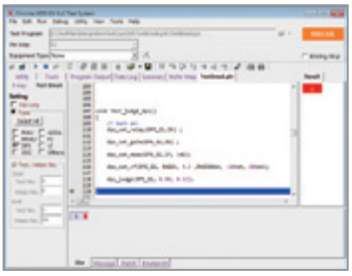
Chroma 3650-EX build-in MRX solution can support PXI instrumentation which can provide users wider coverage to different kind of applications. For those users use PXI instrumentation for their design validation and verification, they can move PXI instrumentation directly to 3650-EX for production. There will be less uncorrelated issues happened on design stage and production by using the same PXI instrumentation. Chroma 3650-EX had successfully integrated several PXI solutions like Audio, Video and RF applications not only on hardware integration, also for build-in libraries and tools in software to help users control PXI instrumentation more easily and enable accelerated test program development, reducing product time to market.

Powerful suite of software tools – CRISP

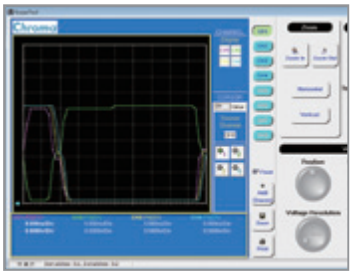
3650-EX features the powerful suite of software tools using Chroma Integrated Software Platform(CRISP). Not only provides the rapid test development function, CRISP covers various tools for test debugging, production and data analysis. CRISP integrates software functions of test program development, test execution control, data analysis and tester management together. Based on the Microsoft Windows 7® operation system and C++ programming language, CRISP provides the powerful, easy-to-use, intuitive, and fast-runtime GUI tools for users. In the Project IDE tool, test developer can easily shift between standard template, user-defined template and C++ code-based editor to create their test program quickly and automatically scale to multi-site for parallel test. Besides, CRISP also provides the test program and test pattern converters to facilitate the test conversion from other tester platforms to 3650-EX.

For the test program execution controller, user can select the System Control tool or Plan Debugger tool for normal mode or debugging mode. In the Plan Debugger tool, user can control the execution of test program by setting break point, step, step-into, step-over, resume execution, variable watch and variable-modify, etc. For the test debugging and data analyzing purposes, 3650-EX provides abundant software utility tools. Data log, Waveform and Scope tools are designed to support the measured data and digital waveform display. To find the parametric margin, SHMOO and Pin Margin tools can easily accomplish debug by auto-mode or manual-mode execution. Besides, the Wafer Map, Summary, Histogram and STDF tools are very helpful and powerful for collecting the test results and analyzing the parametric characterization. As for the Test Condition Monitor and Pattern Editor tools, they provide the superior functions for run-time debugging to change the test conditions or pattern data without breaking the test or modifying the source files. Besides, CRISP also prepares the ADDA tool and Bit Map tool for the analog and ALPG option. Using the ADDA tool, user can not only see the AD/DA test result by graphic tool, user can also create the ADC pattern easily. The full suite of powerful GUI tools will definitely meet the various purposes for test debugging and test report.

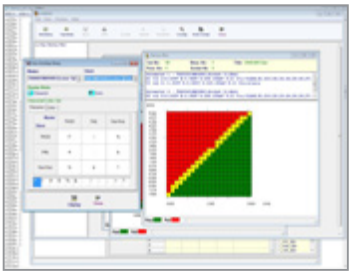
The OCI tool is the solution of CRISP for mass production. Easy-and-correct operation is the most important request for production run. Programmer can customize the setup of OCI tool by the Production Setup tool to meet the production environment requirement in advance. Then, what an operator has to do is just to select the planned process to start the mass production.



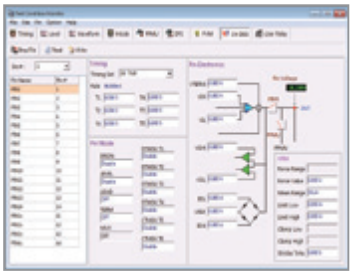
System Control



Scope Tool



Shmoo Tool



TCM tool

Peripheral

The 3650-EX provides multiple drivers for communications with handler and prober by GPIB and TTL interface. The supported handlers or probers include SEIKO-EPSON, SHIBASOKU, MULTITEST, ASECO, DAYMARC, TEL, TSK and OPUS II, and so forth. In addition to provide the convenient converter tools for test platform migration, 3650-EX provides the adaptor board solution for existed tester platform to save the cost of users. Through the adaptor board solution, Chroma 3650-EX can accept the DIB and probe card of other testers directly to save the cost for making the new load boards and probe cards

Small footprint

With air-cooled and small footprint tester-in-a-test-head design, 3650-EX delivers high throughput in a highly integrated package for minimum floor space. Smaller mainframe cabinet contains the power distribution units and the space for third-party instruments. With an optional manipulator, 3650-EX can be used in both package and wafer test.

Application support

Chroma offers the application support solutions to its new and established customers to accurately meet user needs. On request Chroma can provide customized support designed around your specific needs. Whether you need ramp up production, want to capitalize on emerging market opportunities, enhance productivity, lower testing costs with innovative strategies, Chroma worldwide customer support staff is committed to generate timely and efficient solution for you.

SYSTEM SPECIFICATIONS

Model	3650-EX
Digital IO Channels	1024 channels
Test Speed	50/100MHz (2/4 Edges), 200MHz (Mux)
Multi-site Test Capability	Maximum 512 sites
Software/Programming Language/Operating System	CRISP / C++ / WINDOWS 7
Logic Pin Card	HDLPC
IO Channels	64 / 128 CH per board
Pattern Memory	32 / 64M vector Depth
Drive VIL / VIH	-1.5V ~ +6.4V / -1.4V ~ +6.5V
Maximum Drive Current	50mA (static) / 100mA (dynamic)
Comparator VOL / VOH	-1.5V ~ +6.5V
Comparator Modes	Edge, Window
EPA (Drive / IO / Compare)	±300ps / ±300ps / ±300ps
Dynamic Load Current	±25mA
High Voltage Driver	4 channels per 64 IO / 0V ~ 15V, maximum 64 CH per system
Timing Edges	6 (2 Drive, 2 Drive & IO, 2 Compare)
Rate / Edge resolution	125ps / 62.5ps
Utility Pin Control	8 utility bits per 64 IO, maximum 128 bits per system
SCAN	1 / 2 / 4 / 8 / 16 / 32 scan chains, maximum 4G depth
Algorithm Pattern Generator (ALPG)	X = 16, Y = 16 / D = 16
Precision Measurement Unit	PMU
Number of Channels	2 CH per 64 IO / maximum 32 CH per system
Voltage Range	±2.5V, ±8V, ±16V
Current Range	±800nA ~ ±250mA
Device Power Supply	HDDPS
Number of Channels	48 CH per board / maximum 96 CH per system
Voltage Range	±6V, ±12V
Maximum Output Current	1A / 6V, 500mA / 12V
Current Gang Channels	x2 ~ x12, maximum 12A
Mixed-signal Options	HDADDA
Number of Channels	32 CH per board / maximum 64 CH per system
Sampling Rate	500 KHz
Resolution	16 Bit
Voltage Range	±2.5V / ±4.5V / ±9V
Analog Options	VI45
Number of Channels	8~32 CH per board
Voltage / Current Range	±45V / ±100mA
Current Ganged Channels	x2 ~ x8, 800mA maximum
AWG / DVM / TMU	1~4 CH AWG / 1~4 CH DVM / 8~32 CH TMU
Analog Options	PVI100
Number of Channels	2~8 CH per board
Voltage / Current Range	±100V / ±2A , ±50V / ±4A
Current Ganged Channels	x2 ~ x8, 32A maximum
AWG / DIG / DVM / TMU	2~8 CH AWG / 2~8 CH DIG / 2~8 CH DVM / 2~8 CH TMU
System and Dimension	
Power Consumption / Cooling	Maximum 10.8KW / Forced air cooling
Test Head Dimension (L x W x H)	800 x 744 x 806 mm
Mainframe 2 Dimension (L x W x H)	680 x 352 x 730 mm

Specifications are subject to change without notice. Please visit our website for the most up to date specifications.

HEADQUARTERS
CHROMA ATE INC.
66 Huaya 1st Road,
Guishan, Taoyuan
33383, Taiwan
T +886-3-327-9999
F +886-3-327-8898
www.chromaate.com
info@chromaate.com

HSINCHU BRANCH
6F, No. 5, Technology
Rd., Science Park,
Hsinchu City
30078, Taiwan
T +886-3-563-5788
F +886-3-563-5758

U.S.A.
CHROMA ATE, INC.
(U.S.A.)
7 Chrysler, Irvine,
CA 92618
T +1-949-421-0355
F +1-949-421-0353
www.chromaus.com
info@chromaus.com

SANTA CLARA
3350 Scott Blvd., #601
Santa Clara, CA 95054
T +1-408-969-9998
F +1-408-969-0375

EUROPE
CHROMA ATE
EUROPE B.V.
Morsestraat 32,
6716 AH Ede,
The Netherlands
T +31-318-648282
F +31-318-648288
www.chromaeu.com
sales@chromaeu.com

CHROMA ATE GERMANY
Südtiroler Str. 9, 86165,
Augsburg, Germany
T +49-821-790967-0
F +49-821-790967-600
support-germany@chromaeu.com

JAPAN
CHROMA JAPAN CORP.
888 Nippa-cho,
Kouhoku-ku,
Yokohama-shi,
Kanagawa,
223-0057 Japan
T +81-45-542-1118
F +81-45-542-1080
www.chroma.co.jp
info@chroma.co.jp

CHINA
CHROMA ELECTRONICS
(SHANGHAI) CO., LTD.
3F Building 40, No. 333,
Qin Jiang Rd., Shanghai,
China
T +86-21-6495-9900
F +86-21-6495-3964

SOUTHEAST ASIA
QUANTEL PTE LTD.
(A Company of Chroma Group)
46 Lorong 17 Geylang # 05-02
Enterprise Industrial Building,
Singapore 388568
T +65-6745-3200
F +65-6745-9764
www.quantel-global.com
sales@sg.quantel-global.com

3650-EX-E-201709-500