



Success Stories !

A fabless semiconductor company that designs, manufactures, and sells CMOS Image Sensors (CIS)

Chroma PXIe Testers Enable a Faster Time to Market for CMOS Image Sensors

● The Customer

A fabless semiconductor company that designs, manufactures, and sells CMOS Image Sensors (CIS)

● The Application

Home security cameras

● The Challenges

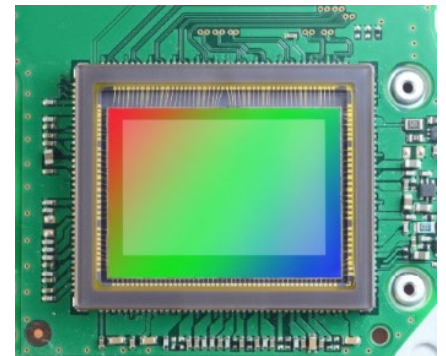
- Build a cost-effective test platform
- Increase the production capacity
- Combine ATE testing and image testing
- Integrate additional test modules
- Develop data analysis algorithms

● The Solutions

- Chroma's Semiconductor PXIe Tester 3300 Series
- PXIe software CRAFT

● Results

- Shortened overall development time
- Improved production capacity by 44%
- Speed up time to market for new products and increase competitiveness



We live in the age of innovation, where technologies profoundly enhance creativities. Thanks to the evolution of IC technology, it has become the mainstream that various features are merged into a single chip. The constantly changing market trends have made a great impact on semiconductor test requirements, with many fabless semiconductor companies facing test challenges and left clueless on how to build a reliable and sound test model to verify if their products are working. This is where the Chroma PXIe Tester steps in.

For many years, we at Chroma ATE have been dedicating ourselves to developing an ecosystem that offers our customers a total solution of semiconductor test systems for optimizing their production. The Chroma PXIe Tester has now fulfilled our promise to provide a flexible, user-friendly and cost-effective solution for professionals in the semiconductor industry.

Traditional ATE systems are capable of meeting high performance test requirements, where PXIe testers provide flexibility that allow users to reconfigure test setting in pursuit of continually growing test needs. CMOS image sensor (CIS), as one of many new technologies, is a great example of this flexible approach.

The Challenges

Our customer is a fabless semiconductor company that designs, manufactures and sells CIS that, in this case, is used in home security cameras. They were looking for a final test total solution that can best test their packaged product with high throughput performance and efficiency. Therefore, our goal was to build a cost-effective and easy-to-use test platform that can increase production capacity while ensuring product quality.



CIS testing poses a number of challenges for the production test process we needed to overcome. To start with, we needed to combine ATE standard testing and image testing as both are applicable to this CIS case. Since the customer requested a final test total solution, we chose the handler to pair with our tester. Additionally, the light source and image capture card needed to be upgraded for advanced image testing. Besides such hardware challenges, our customer also needed us to integrate test reports from all their test sites.

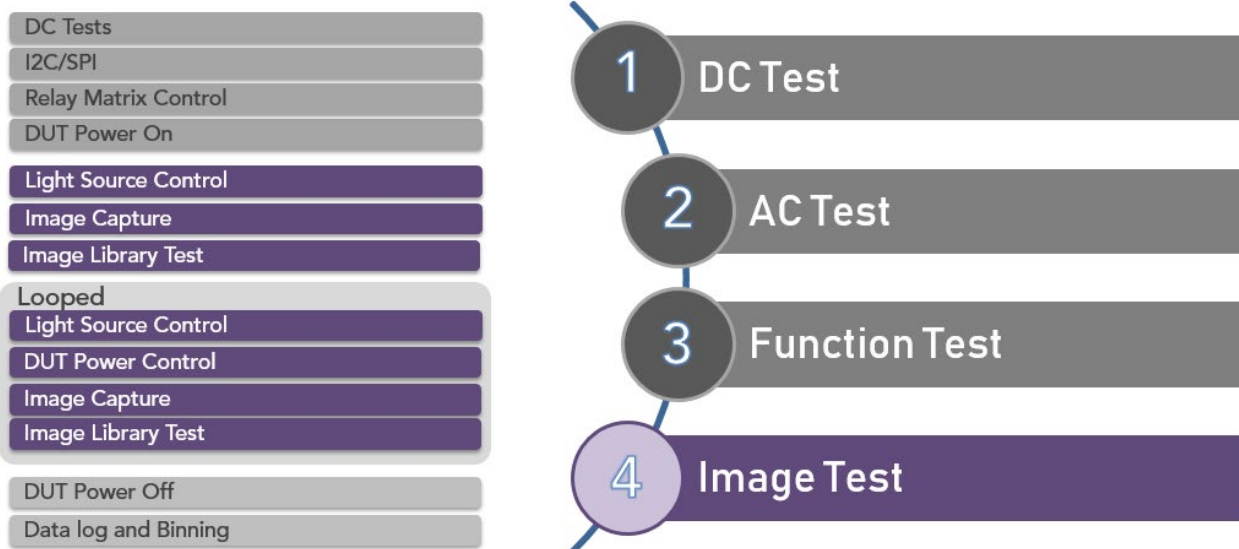
In conclusion, hardware upgrade and software integration are our main targets when we strive to help our customer to shorten test time.

The Solutions

Chroma Semiconductor PXIe tester and CRAFT deliver a lean alternative to the conventional ATE. They are able to reduce the overall development time, while being flexible enough to accommodate custom CIS testing.

Image testing is essential in such a CIS test project. Unlike a standard semiconductor test, image testing requires more resources to build test items, including light source control, image capture, and image quality test, which is normally done through customized libraries. Thanks to the powerful and comprehensive PXIe CRAFT software user interface, we could successfully merge traditional ATE testing - such as DC, AC, and function tests - with image testing to deliver the full test flow for the CIS project. With the highly efficient PXIe Tester, and running the full CIS test under PXIe CRAFT, we managed to conduct standard semiconductor test items within 3 seconds and image test within 17 seconds. This total test time of 20 seconds went far beyond our customer's expectation.

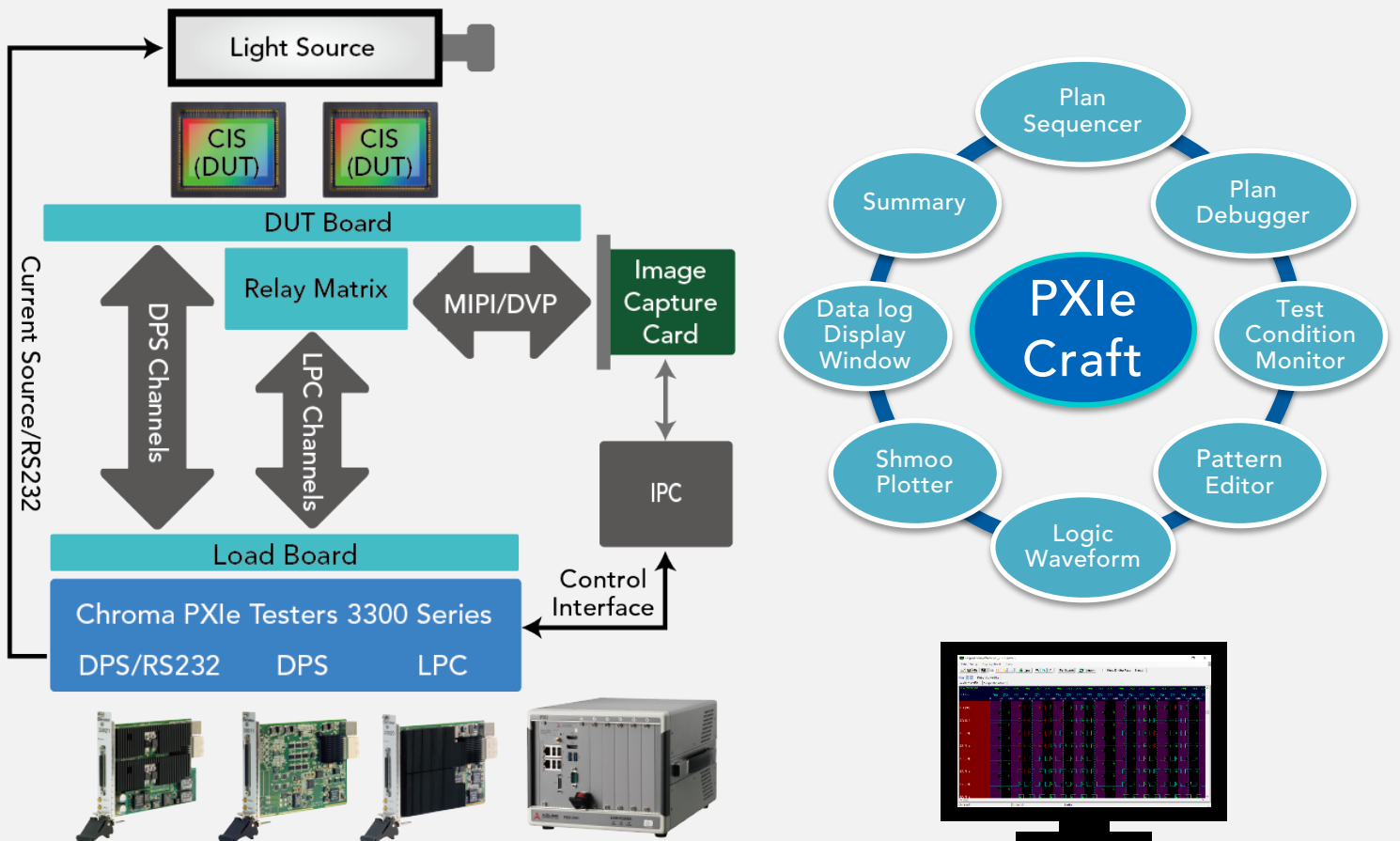
CIS Test Flow (Full under CRAFT)



We offer a full range of PXIe instruments, and in this case we suggested our customer to use one programmable high speed digital IO card, one relay driver control module, and one programmable device power supply. 6-slot economic chassis is a good choice for them since not only meet cost budget, there is still one slot available just in case if there is additional instrument is in need in the future.

Chroma field engineers helped this customer to integrate a LED light source, an image capture card with MIPI D-PHY interface that provides a fast transfer of image data to the host PC memory. To complete the test structure, we also provided customer valued additional services of load board design and manufacturing. With all that set up, along with our PXIe software CRAFT, the testing solution enabled our client to gather data and analyze test results efficiently.

Layout of the Solutions



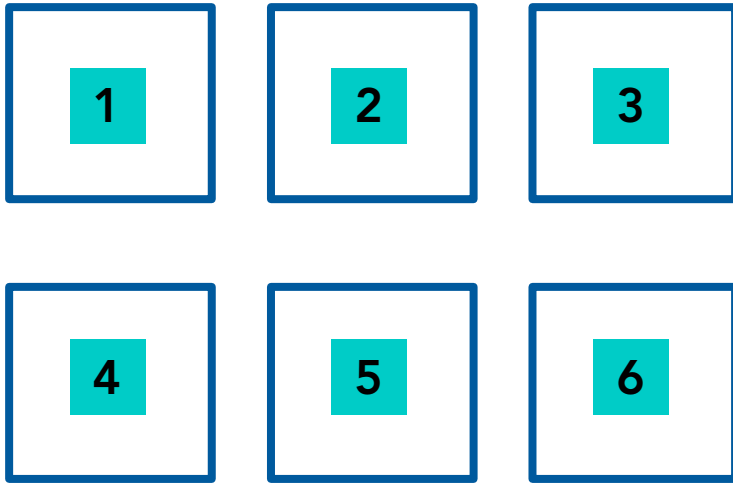
The Results

We duplicated 6 identical test sites, and each test site works independently with one PXle Tester and an external PC. We usually call this kind of test structure a Ping-Pong test scheme. Since the Ping-Pong structure works more efficiently than parallel testing, this combined solution helped the customer generate more throughput and thus reduced their total testing cost. With their original testing solution provided by another supplier, this customer could only produce 500 units per hour. By applying our PXle test platform, our customer can now produce 900 units per hour.

High integration of both hardware and software made reconfiguration for test runs easier, accelerated the product development process and shortened the time to market. As a new technology and application, specification changes are to be expected and the customer might develop more features or more enhanced products in the future. Chroma PXle Tester gives this flexibility to accommodate more test challenges. Also taking into account the customer's knowledge transfer effectiveness, the Chroma PXle Tester is a user-friendly test platform and easy to reconfigure, which improves the communication between engineers and allows users to create effective training programs.

Pain Reliever for Customers

6-Site Ping-Pong Test Structure



COST

Lower total cost by improving unit per hour (UPH)



TIME

Shorter time to market with an integrated platform



FLEXIBILITY

Scalable to accommodate kinds of test requirements



COMMUNICATION

Easy to create an effective training program



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