



MStar Semiconductor  
Improves TV Software  
Quality and Reliability  
with Synopsys Static  
Analysis (Coverity)



## Business overview and challenge

MStar Semiconductor is a global leader in supplying application specific ICs (ASIC) for the consumer and image processing product markets. Since its inception in 2002, MStar Semiconductor has built a diverse product portfolio and established a strong brand and foothold in the LCD monitor controller, analog and digital TV, and set-top box markets worldwide.

A key division in the company is the TV business unit, which develops business TVs, smart TVs, and embedded TVs for both businesses and consumers. Leveraging the company's leadership position in the TV market, MStar has created the complete MStar Connected TV and Smart TV Platform which includes best-in-class broadcast and broadband solutions. MStar Connected TV and Smart TV Platform aims to boost user experience and provide a rich portfolio of smart TV apps and features that accelerate time-to-market and reduce cost with a comprehensive suite of operating system support, middleware support, and in-house application development and third-party support.

With increasingly complex software integrated into TVs, time spent on testing software, fixing issues, and ensuring overall software quality has become a major concern for the business. Deputy Manager Frank Chang, who is responsible for improving the business unit's software development tools and workflows for quality assurance purposes, describes their challenges, "Our projects are rather complex and overall software integrity highly relies on the quality of each module integrated into the final software product." Ensuring code quality and reliability to meet customer requirements and expectations is not only crucial for maintaining a high degree of customer satisfaction, but is also vital for MStar Semiconductor's business image and brand reputation to secure the company's long-term success. "The need for high quality and reliability means that we must reduce the number of defects at the software module level to improve the integrity of the system, thus reducing overall business risk," Frank Chang explains. In today's demanding commercial and consumer electronic industry, MStar also recognizes that they must meet their ambitious schedule goals while still improving software quality. Thus, a solution that automates the defect detection process and accelerates time to market will give MStar a competitive advantage in the market.

"With [Synopsys Static Analysis], we can control our code quality and meet our customers' demands and expectations."

**Frank Chang**

Deputy Manager, TV Software Development

## Solution evaluation

MStar had several criteria in mind when evaluating static analysis tools as part of their initiative to drive continuous improvement and customer satisfaction. First, MStar wanted a static analysis tool that has low false-positive (a tool that indicates an error when it actually is not an error) and false-negative (a tool that fails to detect an actual error) rates. Low false-positive and false-negative rates are key to obtaining accurate analysis and actionable advice. The defects found should be critical enough to cause the program to misbehave during runtime. Second, they needed a high performance tool that can handle complex software modules and integrate

easily into their development lifecycle and process. Third, exceptional product service was essential for MStar to ensure their continuous development and integration meets their rigorous product delivery schedule. Mr. Chang illustrates the evaluation criteria for the solution: “We do not want to waste our precious resources on finding and fixing late-stage defects. We need to find a way to improve efficiency and effectiveness earlier in our development process.”

Using these requirements, MStar went through a careful evaluation process and experimented with several well-known static analysis tools in the market, including commercial and open source options. Mr. Chang explained that MStar selected Synopsys Static Analysis (Coverity) because “[Synopsys Static Analysis] was ranked #1 among all the static analysis tools we evaluated. The reports generated by [Synopsys Static Analysis] are very easy to read and they help developers in Research and Development solve the problem quickly and accurately.”

## Synopsys static analysis deployment and benefits realized

With a sizable development team working on complex software containing a large variety of modules, the introduction of Synopsys Static Analysis has made a significant impact on the MStar Semiconductor TV business unit. Synopsys Static Analysis enabled the team to find defect as they begin to code and when the software is still at the module level, allowing the developers to fix defects early in the development lifecycle with less complexity. Since MStar implemented Synopsys Static Analysis, it has been adopted by a team of 70 developers. Within a year, MStar started to realize the value Synopsys Static Analysis brought to the team and to their overall software quality.

Mr. Frank Chang gives a specific example, “There was one project in the past. Its software application contained a critical bug that always brought the system down. Because the code was very complex, the bug was extremely difficult to find and we were not able to find the root cause for a very long time. After we ran [Synopsys Static Analysis] and

## BUSINESS BENEFITS

### Synopsys Static Analysis deployment and benefits realized

By detecting and fixing defects with Synopsys Static Analysis before numerous modules are integrated into a complex TV software application, MStar obtains better control of overall software quality and reliability.

### Faster time-to-market

By enabling their development team to work faster and smarter with Synopsys Static Analysis integration and automation in the development lifecycle, MStar is able to further reduce the time-to-market while simultaneously increasing the quality of business TV, smart TV, and embedded TV applications.

### Improved customer satisfaction

In the competitive electronic market, customer satisfaction is crucial to a company’s success. With Synopsys Static Analysis, the MStar development team is able to identify and fix critical defects before product release, significantly reducing risks of system misbehaving in the field and improving customer satisfaction and loyalty.

followed all the actionable explanations of the issue, we were able to fix the defect in a couple of days instead of two to three weeks and the problem was completely resolved.”

Another major benefit that MStar Semiconductor realized was that they can integrate Synopsys Static Analysis into their development lifecycle, from design and development, to quality assurance and product release. Along with its accurate analysis, Synopsys Static Analysis is an effective solution due to its intuitive and easy to navigate user interface, allowing developers to further improve productivity. Since the deployment of Synopsys Static Analysis, the team has found and fixed defects at early stages of development, improved productivity for 300+ projects with automation throughout the development and testing process, and made the development process more predictable.

## Conclusion

Software quality and reliability is of paramount importance to the MStar Semiconductor TV business unit for continued customer satisfaction and strong brand reputation. Through the ability to detect and fix defects at early stages of the development cycle and automate testing and integration throughout the development process, Synopsys Static Analysis has enabled the TV software development team to control code quality and, at the same time, enhance developers’ productivity and confidence in the product released to the market. By using Synopsys Static Analysis, the team no longer wastes valuable resources and time on difficult-to-find late stage defects, but, instead, focuses on creating leading-edge high-quality products and applications.

With Synopsys Static Analysis, the MStar gains overall competitive advantage by increasing quality of software, accelerating time-to-market, and meeting customer demands.

Explore how Synopsys Static Analysis can improve your software security and quality.

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