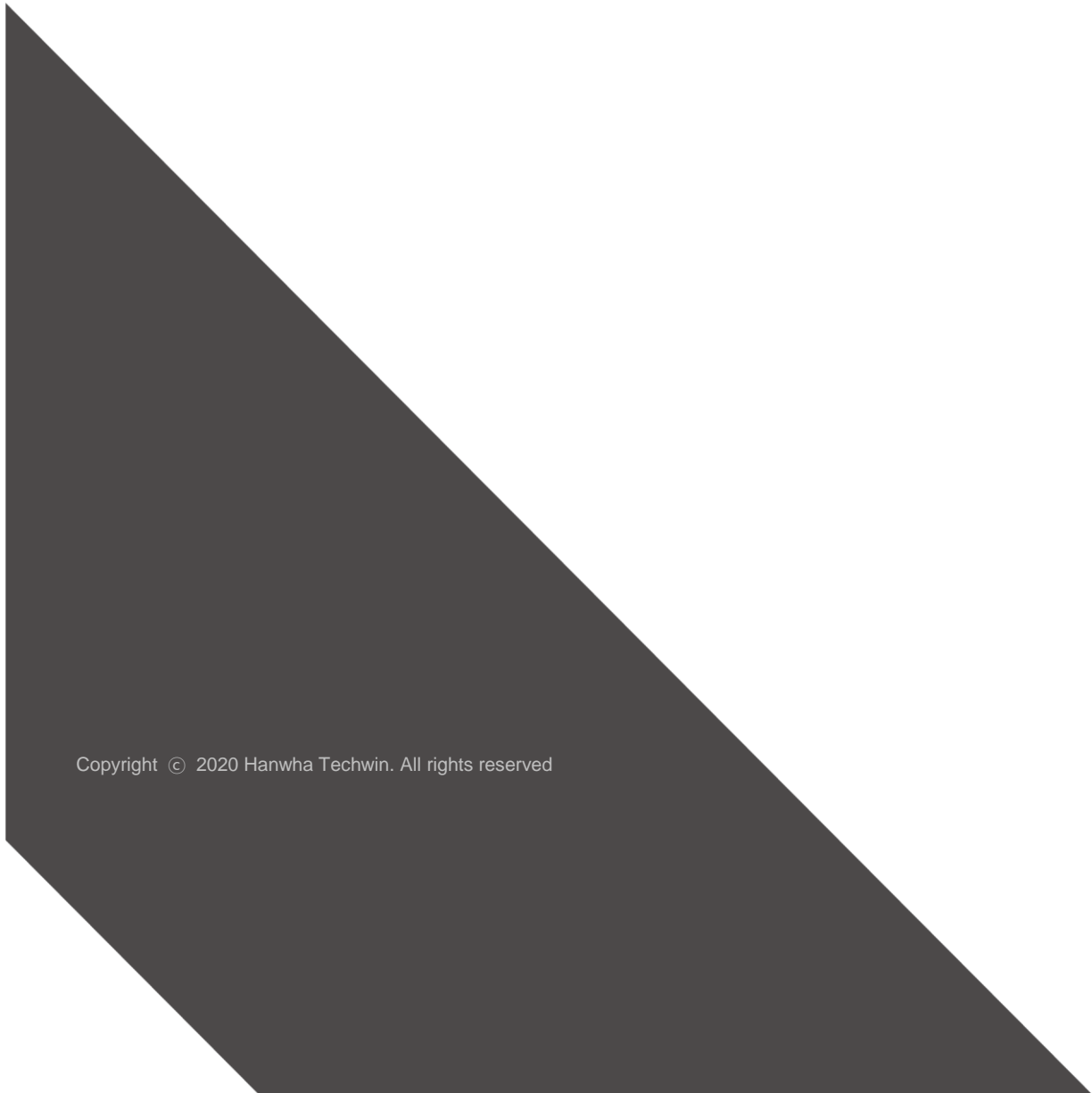




White Paper

Wisenet5 SoC (System on Chip)

27th 07 2020



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The heart and brains of a camera are the SoC (System on Chip), which is a collection of semiconductors packaged into an integrated circuit. In the past, computing systems for a specific arithmetic operation or data processing were composed of a box-type form factor, such as the desktop PCs we currently use. After many years of development, new computing system technology has allowed the manufacture of small board type processing systems. Now an SoC which can process millions of operations per second is in wide use. In general, a purpose-built SoC has advantages for miniaturization as well as providing low power consumption.

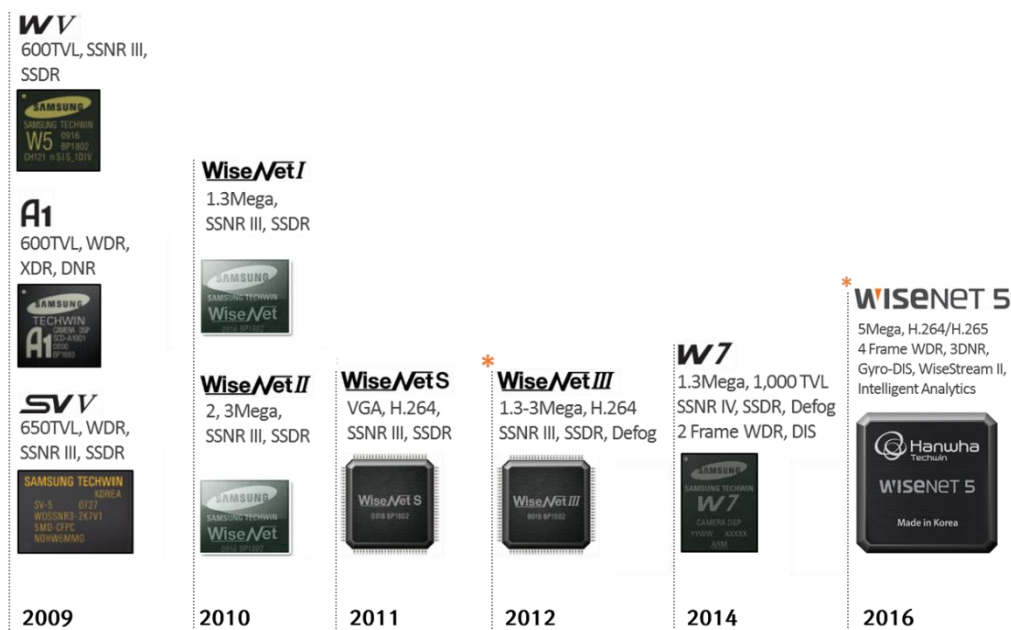
The demand for purpose-built SoCs started to grow in the video surveillance field as network surveillance cameras became more common. However, this requires sophisticated processor design, Quality Assurance technology, many resources, and long development time. For these reasons, many of the video surveillance manufacturers use a third-party general-purpose SoCs made for image processing.

However, Hanwha Techwin develops its own SoC based on ISP (Image Signal Processor) design know-how and technology. The first SoC Hanwha Techwin released was the WisenetS chipset, which was developed in 2011 for an entry-level network camera.

2. SoC Development History

Hanwha Techwin started the development of chipsets with the W3 ISP in 2004 and continued with the W5, A1, SV5 ISPs in 2009 for analog cameras, which was the mainstream video surveillance market in those days. In 2010, the Wisenet1 and Wisenet2 network camera ISP is developed as the network video surveillance market was growing. The WisenetS is the first full-fledged SoC that Hanwha Techwin developed, in 2011 for the entry lineup. Next was the Wisenet3 SoC, which supported increased resolution, the H.264 codec, intelligent video analytics, and the defog function.

Next was Wisenet5 in 2016 which supported additional intelligent analytics, including sound classification, the H.265 codec, and the WiseStream video compression technologies.



* SoC for network camera

Image 1. Hanwha Techwin's ISP and SoC development history

As the network video surveillance market has grown, many customers now require advanced features. The Wisenet5 SoC has been developed to meet these requirements to support many different vertical industries and work in any environment and application.

Compared to previous generation Wisenet3, Wisenet5 greatly enhanced its performance from design and manufacturing processes to advanced intelligence features.

3. 1. Wisenet5 Key Features

The Wisenet5 SoC utilizes Hanwha Techwin’s unique video processing technologies to greatly enhance image quality. The chipset supports WDR based on its improved video processing performances, and noise reduction with minimized motion blur and greatly improved sensitivity.

It also supports the WisestreamII smart codec which further processes the image to reduce bandwidth and storage for H.265 and H.264 video streams. Enhanced intelligent video analytics features are included to provide license-free event notification and recording. These analytics include digital image stabilization (DIS), heatmap, people counting, loitering, virtual line crossing, face/body detection, shock & tampering detection, and defocus detection. Audio detection and sound classification analytics are also included, which detects and analyzes sounds including screaming, gunshots, breaking glass, and explosions.



Image 2. Conventional WDR (left) and Wisenet5 WDR (right) comparison

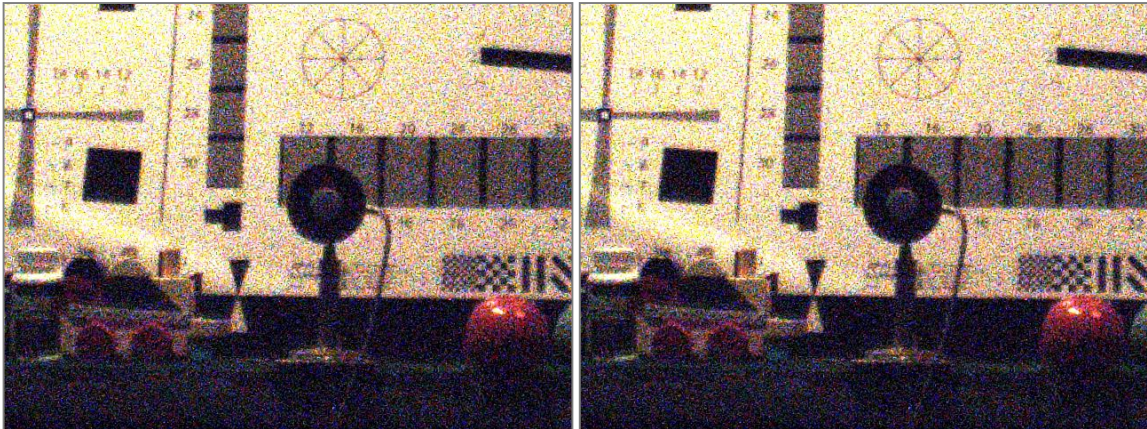


Image 3. Wisenet5 noise reduction off(left) and on(right)

4. Conclusion

Wisenet5 is the Hanwha Techwin SoC designed and optimized for the new Wisenet X series of network cameras. It has marked improvements on not only resolution but also intelligent features.

Since the release of the Wisenet5 SoC, Hanwha Techwin has invested in R&D efforts to develop its next-generation SoC. These new products are designed to be best in class while having a reliable lifespan. These efforts all start with the in-house development of our own, unique System on a Chip. We are pleased to offer these new products to you to protect your people, buildings, and assets safely and securely for years to come.

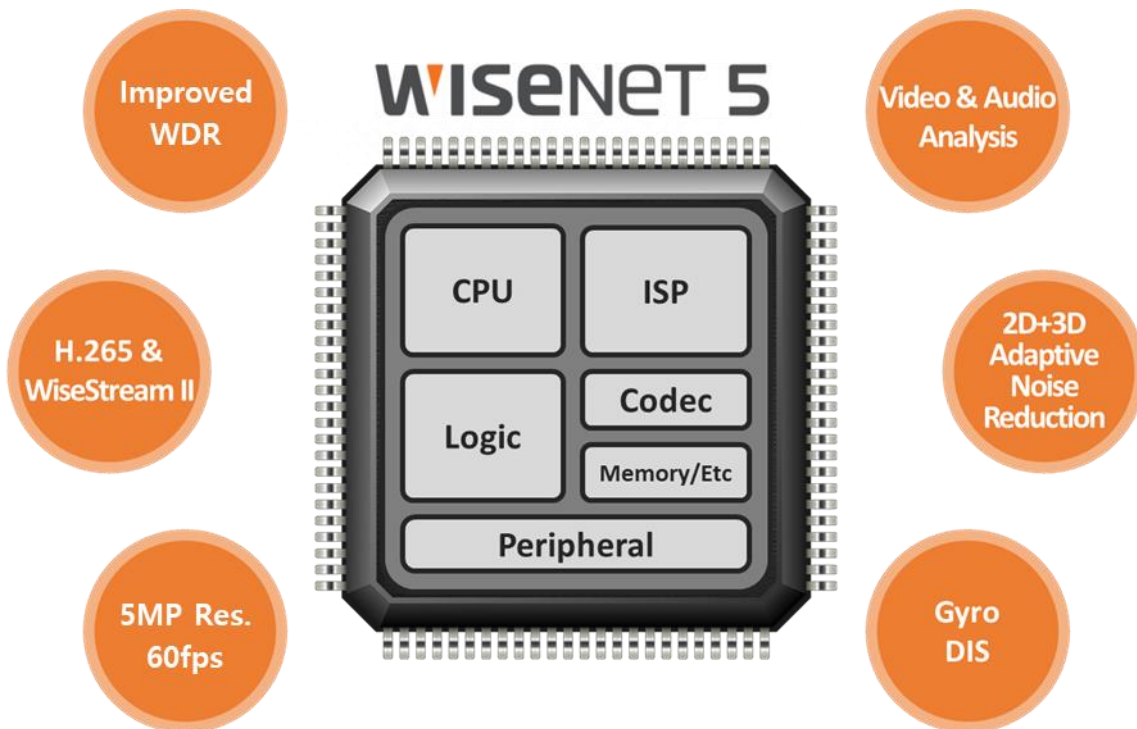


Image 4. Wisenet5 SoC structure and key features

WISENET

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