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WISENET

White paper

Hanwha Techwin Wisenet 5 SoC

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Hanwha
Techwin

Contents

SoC(System on Chip) is a system consist of integrated circuit or components on a single semiconductor. In the past, computing systems for a specific arithmetic operation or data processing was composed in a box type form such as desktop PC currently we use. After development of technology, computing system in a small board type came up, and now SoC which is able to process multiple operation is in wide use. Generally, SoC has advantages for device size down and low power consumption.

It is started to use SoC widely in video surveillance field as network surveillance camera became more common. It requires very high-level processor design, qualification technology and resources to develop a SoC. Due to this reason, many of video surveillance manufactures use SoCs for image processing from semiconductor companies.

However, Hanwha Techwin develops own SoC based on ISP(Image signal processor) design know-how and technology. The first SoC was Wisenet S which developed in 2011 for entry network camera. Hanwha Techwin's the lastest network camera, Wisenet X series use Wisenet 5 SoC developed in 2016.

2. Hanwha Techwin's SoC Dev. History

Hanwha Techwin developed own ISP W3 in 2004 and W5, A1, SV5 ISP in 2009 for analog camera which was mainstream of video surveillance market in those days. In 2010, Wisenet 1 and Wisenet 2 network camera ISP is developed as network video surveillance market is growing.

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The latest SoC, Wisenet 5 is developed in 2016 based on know-how and experience accumulated since Hanwha Techwin started video surveillance business in 1991. Wisenet 5 supports intelligence analytics, bandwidth reduction technology WiseStream II, H.265 codec and others.
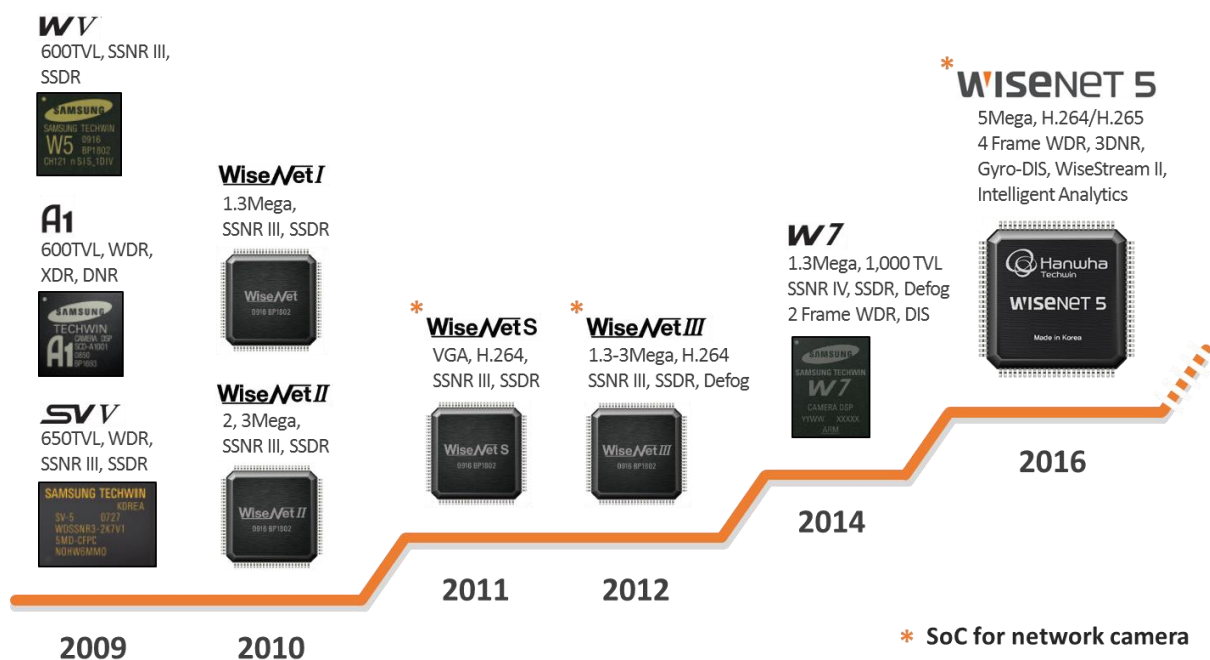
Figure 1. Hanwha Techwin's ISP and SoC development history

3. Hanwha Techwin Wisenet 5 SoC

Needs of advanced feature is also growing as network video surveillance market is growing with network environment. Wisenet 5 SoC is developed to meet the needs from market and customers under any environments.

Wisenet 5 SoC is improved markedly compare to previous Wisenet 3 in design, WDR, intelligence analytics and many others.

	Wisenet 3	Wisenet 5
CPU Type	Single core	Dual core
Process Technology	45nm	28nm
Memory Clock	667MHz	800MHz
Max Res. and fps	2M@60fps / 3M@30fps	*2M@120fps / 5M@30fps
Codec	H.264/MJPEG	H.265/H.264/MJPEG
WDR	102dB 2 frame type	150dB 4 frame type
Noise Reduction	2D+3D NR	2D+3D Adaptive NR
Image stabilization	Normal DIS	Gyro sensor DIS
Bandwidth Reduction	-	WiseStream II
Intelligence Statics	-	Heatmap/People counting/ Queue management
Audio Analysis	-	Explosion, Broken glass, Gun shot, Scream
De-warping	-	Supported

* Actual available fps may different according to product or usage condition.

Figure 2. Hanwha Techwin SoC Wisenet 3 and Wisenet 5 comparison

3.1. Wisenet 5 Key Features

Wisenet 5 provides advanced features as follows;

- ・ 150dB WDR : 4 frame type based on advanced image processing performance

- ・ Improved noise reduction with minimized motion blur

- ・ WiseStream II : video compression which synced to image processing

- ・ Gyro sensor integrated DIS(Digital Image Stabilization)

- ・ Intelligence statics features : Heatmap, People counting

- ・ Audio analytics : Scream, gun shot, explosion and glass breaking sound

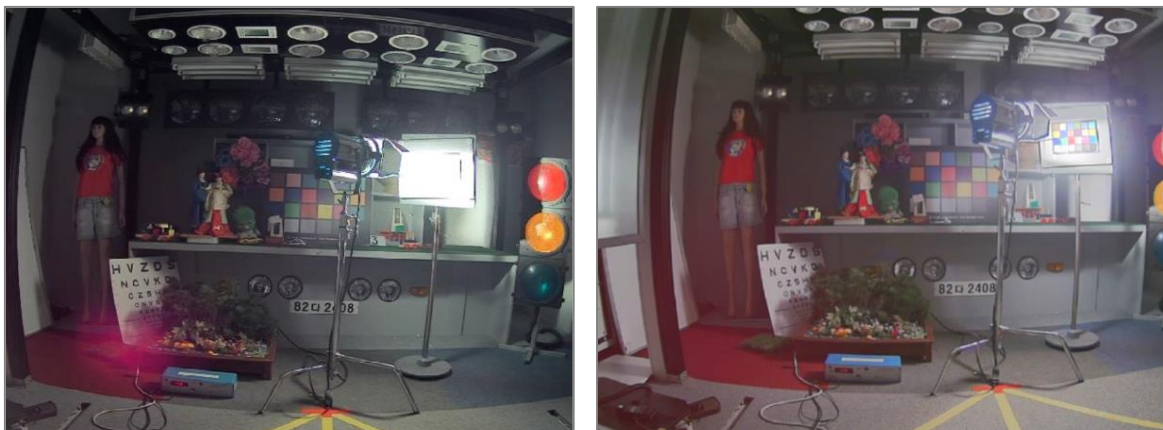Please visit [Hanwha Techwin website](#) and check white papers of above features for details.

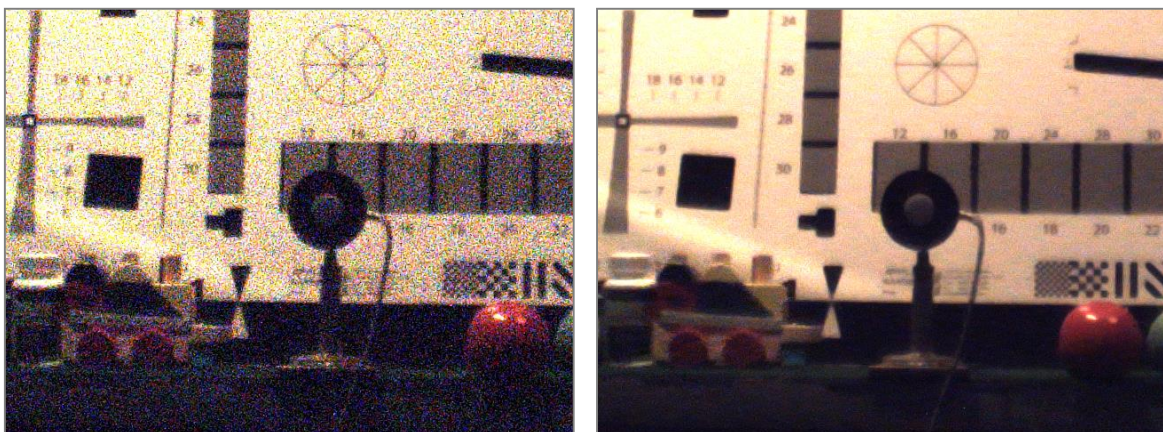Figure 3. WDR comparison between Hanwha previous model(left) and Wisenet 5(right)

Figure 4. Wisenet 5 noise reduction off(left) and on(right)

4. Conclusion

Wisenet 5 is the optimized SoC for Wisenet X series camera which is main network camera of Hanwha Techwin. It has marked improvements on not only resolution but also intelligent features.

Hanwha Techwin is making a lot of effort to develop reliable and outstanding products and the effort starts first at original SoC development.
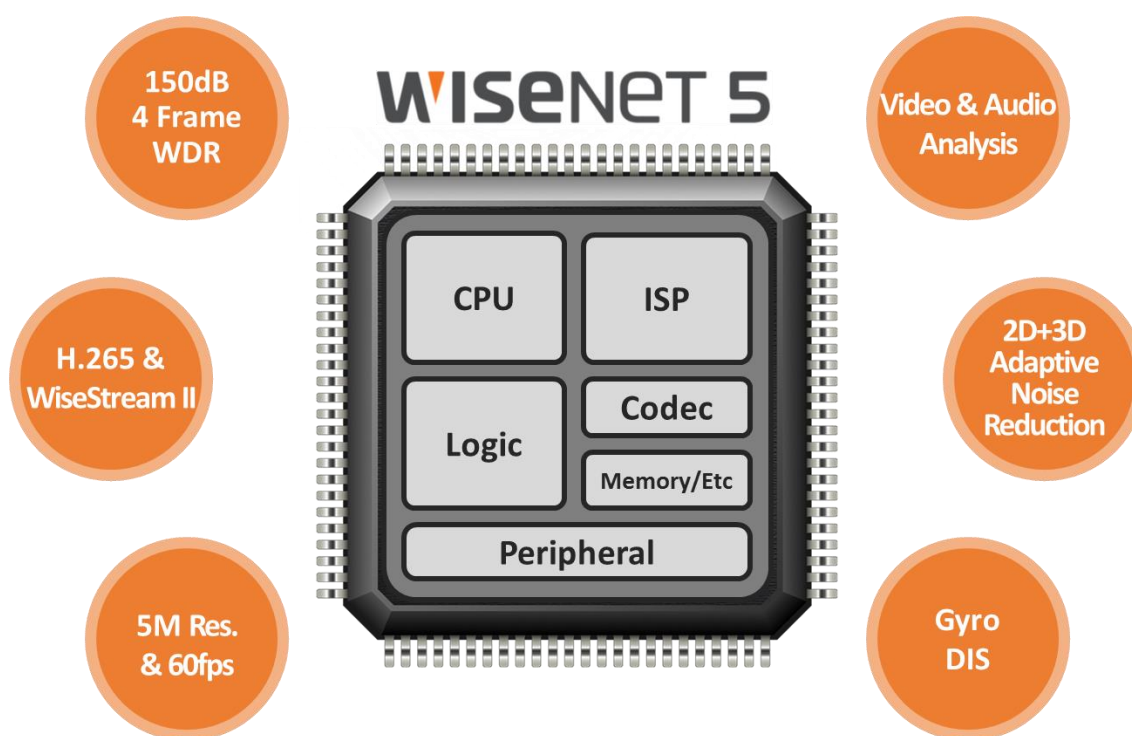

Figure 5. Wisenet 5 SoC structure and key features

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