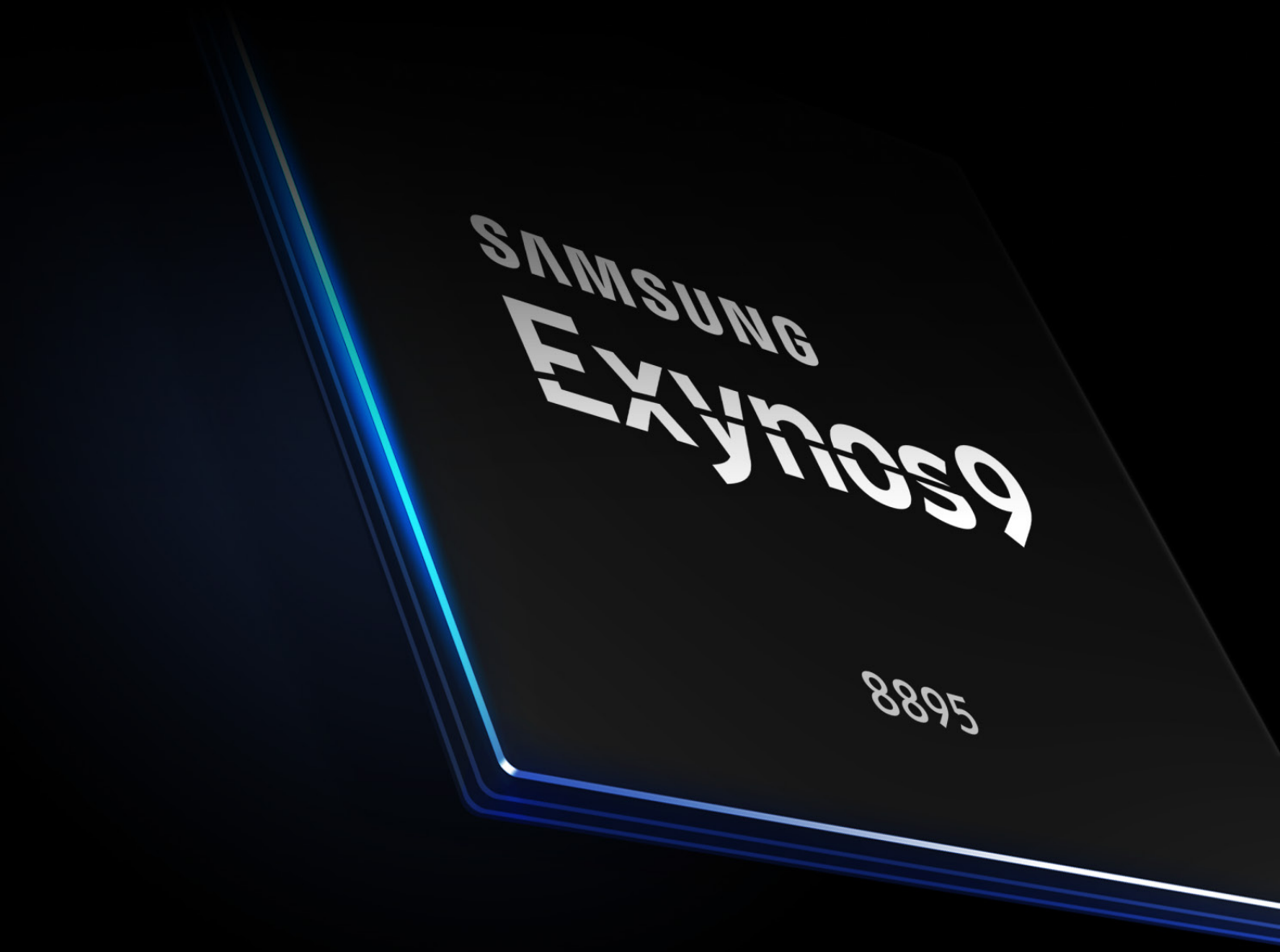

Exynos 9 Series (8895)

A MOBILE PROCESSOR THAT GOES BEYOND MOBILE INNOVATION

The Exynos 9 Series (8895) comes with a countless number of innovations all geared toward one simple goal: to provide the best mobile experience ever. The Exynos 8895, built on a cutting-edge 10nm FinFET process, features a 2nd generation custom CPU core and an advanced GPU for exceptional performance with low power consumption for extended battery life. For faster and reliable network performance, the processor embeds a 1Gbps LTE-Advanced modem that supports aggregation of up to five carriers. The advanced MFC and dual ISP in the processor enables a truly immersive multimedia experience.

10nm FinFET Process

Big in performance, small in power

The Exynos 8895 is built on a cutting-edge 10nm FinFET process that offers ultimate speed, superb power efficiency, and small chip size by utilizing structures which very effectively control current leakage. The 10nm FinFET process allows up to 27% higher performance or 40% lower power consumption when compared to 14nm LPE FinFET.

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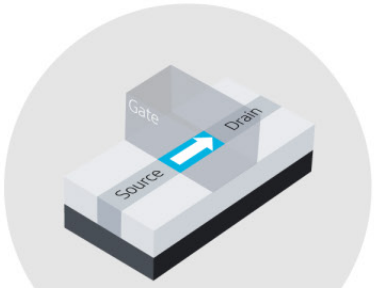
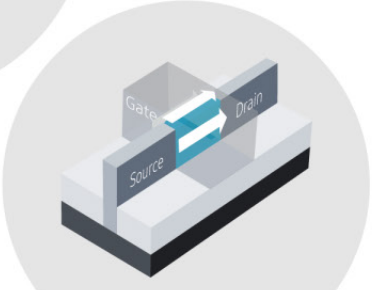
In a FinFET structure, gates enclose the protruding drain and source to effectively block current leakage. In a planar structure, the gate is attached to the transistor on only one surface, whereas in a FinFET structure, the gate is attached on three sides of the channel, allowing better control of the current leakage than planar. Electrons move from the source to the drain through a surface under the gate in a planar structure, whereas in a FinFET structure, electrons move across the three surfaces of the fin-shaped 3D structure. Furthermore, shorter gate length means electrons move a shorter distance for the path from source to drain, enabling transistors to switch on/off very quickly. For simplicity, if the channel is a road, more channels means more road lanes but at shorter length due to the advanced process node. With more paths that are shorter in length, more electrons can move faster through the channel resulting in enhanced performance.



Planar

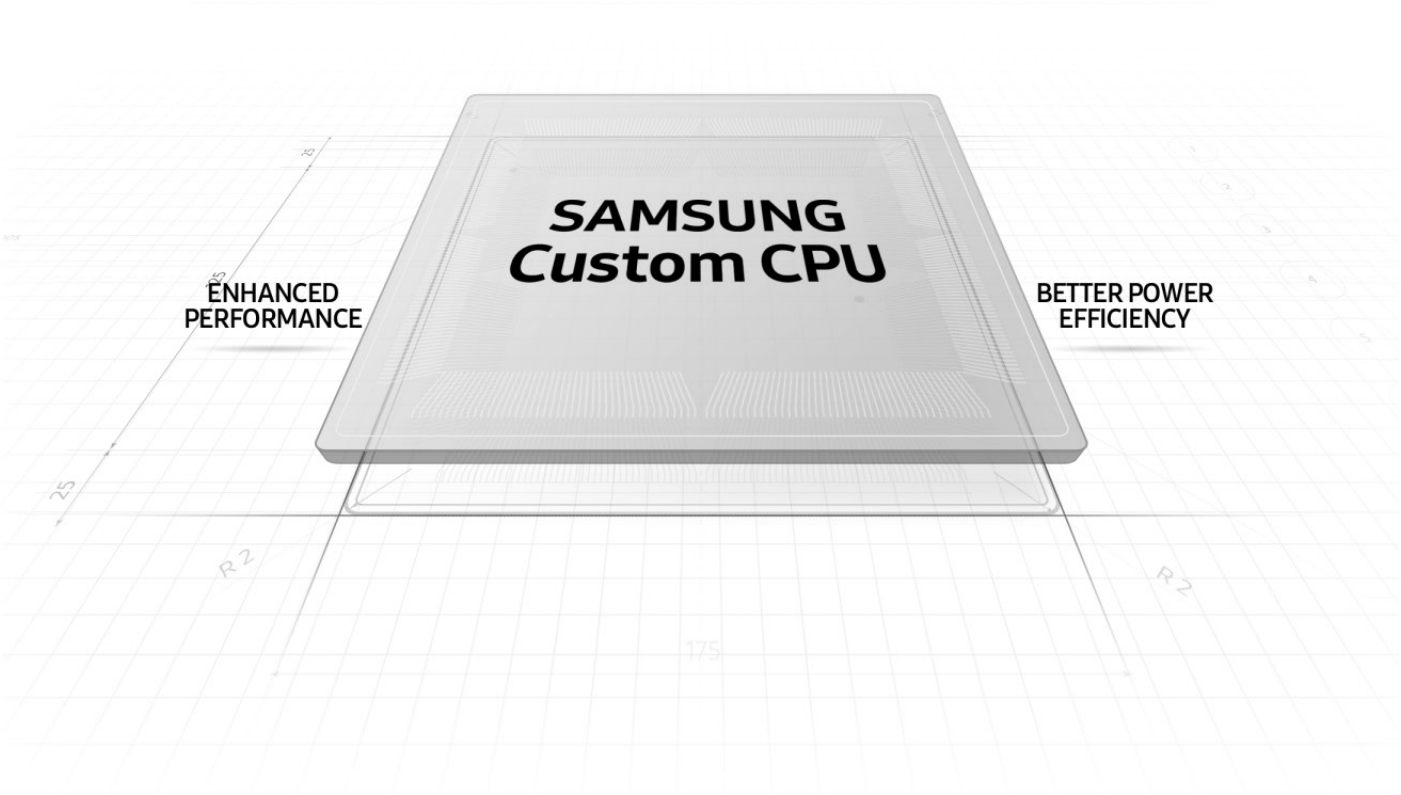


3D FinFET

Second Generation Custom-designed CPU

Exceptional design for unrivaled speed

The Exynos 8895 features an octa-core CPU which includes four Samsung's second generation custom designed main CPU cores for improved performance and power efficiency plus four Cortex®-A53 cores. The second generation custom CPU core delivers enhanced performance and energy efficiency through improved IP and architectural design. Furthermore, Samsung Coherent Interconnect (SCI) is also upgraded to support cache coherency between the CPU and GPU for HSA (Heterogeneous System Architecture) which enables faster calculations in fields such as artificial intelligence and deep learning.



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Through a completely clean sheet design, the new custom CPU core offers enhanced processing power while using less energy. To develop a custom CPU core, Samsung licensed the ARMv8 ISA (Instruction Set Architecture) from ARM Ltd. and designed the microarchitecture from scratch, including the branch prediction, fetch, decode, dispatch and execution units to make the best mobile CPU core to date.

In addition to performance, the custom CPU's power efficiency has been improved by adopting advanced low power microarchitecture design. Power dissipation is drastically reduced through aggressive clock gating design. And the CPU design is optimized to minimize unnecessary switching and data transfer.

Gigabit LTE Modem

Jet speed, reliable connection

The Exynos 8895 is the first mobile processor in the industry to integrate a gigabit LTE modem which supports 5CA(Carrier Aggregation) for downlink. It supports downlink speeds of up to 1Gbps with 5CA and uplink speeds of up to 150Mbps with 2CA resulting in a faster and more stable mobile communication experience. With advanced features such as FD-MIMO and LBT for LAA, the Exynos 8895 delivers the speed and reliability to keep you connected.

GPU

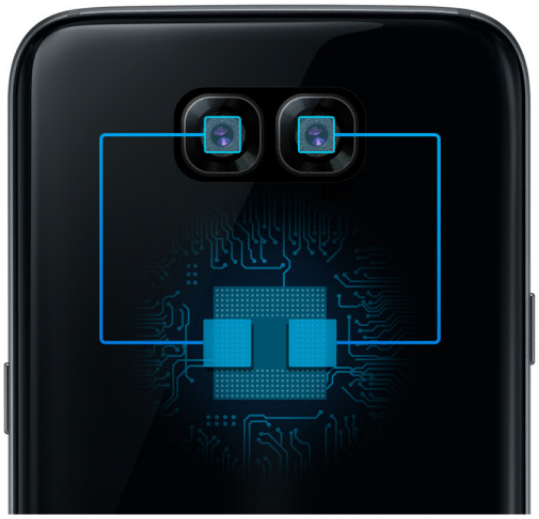
Realistic graphics that come alive

As the complexity of 3D mobile graphics content continues to increase, the Exynos 8895 employs ARM®'s latest GPU, the Mali™-G71, built on an advanced graphics architecture. With twenty powerful graphics processing cores, performance has been improved by up to 60% compared to its predecessor. Through design optimizations, the new GPU has improved power efficiency for longer lasting usage at lower temperatures. Supporting the latest graphics API, the Exynos 8895 offers sharp graphic details by utilizing advanced features such as MSAA, Mipmaps, and Tessellation.

MFC

Built for optical bliss

The Exynos 8895 makes the multimedia experience far more entertaining with the advanced MFC (Multi-Format Codec). It supports recording and playback of video content at a maximum resolution of 4K UHD at 120fps with the latest video codecs, including HEVC(H.265), H.264, and VP9. Notably, the advanced video processing techniques enable a higher quality visual experience by enhancing the image quality of a specific portion that is perceived more sensitive to the human eye.



ISP

Engineered to unleash creativity

Image Signal Processor (ISP) supports high resolutions up to 28MP for each rear and front camera with advanced features such as Smart WDR and PDAF. The Exynos 8895 features dual ISP with one ISP dedicated to high quality and the other dedicated to low power. Thus, it enables various combinations of dual camera scenarios for a DSLR-like photography experience while consuming very low power.

Security

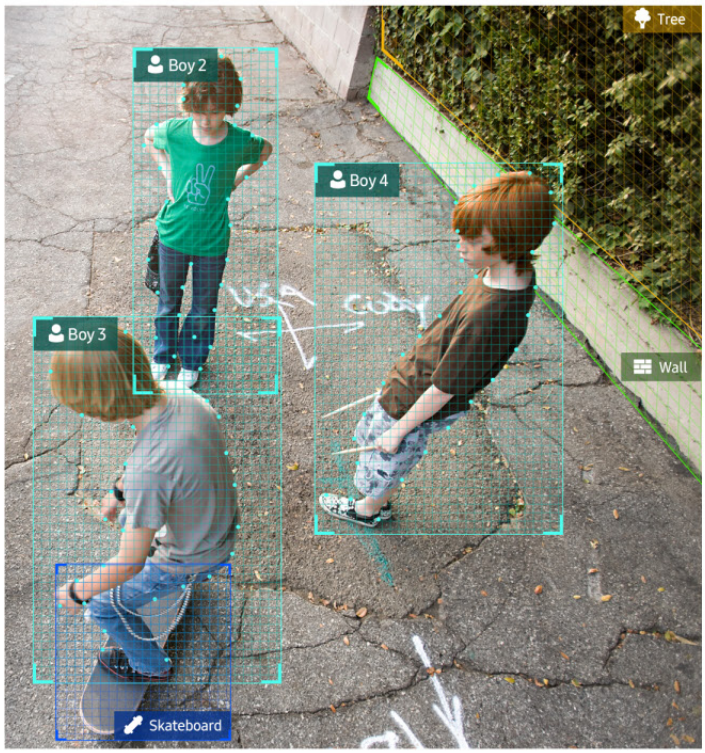
Dedicated layer for perfect protection

The Exynos 8895 provides a more secure environment for growing mobile services requiring a higher level of security, such as mobile payment using iris or fingerprint recognition. It features an enhanced security sub-system with a separate security processing unit and improved features including hardware crypto acceleration and flash memory protection.

Vision Processing Unit

Empowering devices to see and think

Exynos 8895 features VPU (Vision Processing Unit) which is designed for machine vision technology. This technology improves the recognition of an item or its movements by analyzing the visual information coming through the camera. Furthermore, it enables advanced features such as corner detection that is frequently used in motion detection, image registration, video tracking and object recognition.



Spec

CPU
2.5GHz Quad-Core (Custom CPU) + 1.7GHz Quad-Core (Cortex®-A53)

GPU
Mali™-G71 MP20

Process
10nm FinFET Process

Display
Up to WQUXGA (3840x2400), 4K UHD (4096x2160)

LTE Modem
LTE Cat.16 5CA 1Gbps (DL) / Cat.13 2CA 150Mbps (UL)

GNSS
GPS, GLONASS, BeiDou

Storage
eMMC 5.1, UFS 2.1, SD 3.0

Memory
LPDDR4x

Camera
Rear 28MP, Front 28MP, Dual Camera 28MP+16MP

Video
4K UHD 120fps encoding and decoding with HEVC (H.265), H.264, VP9 Codec

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