

Apple A4 vs. SEC S5PC110A01

June 4, 2010

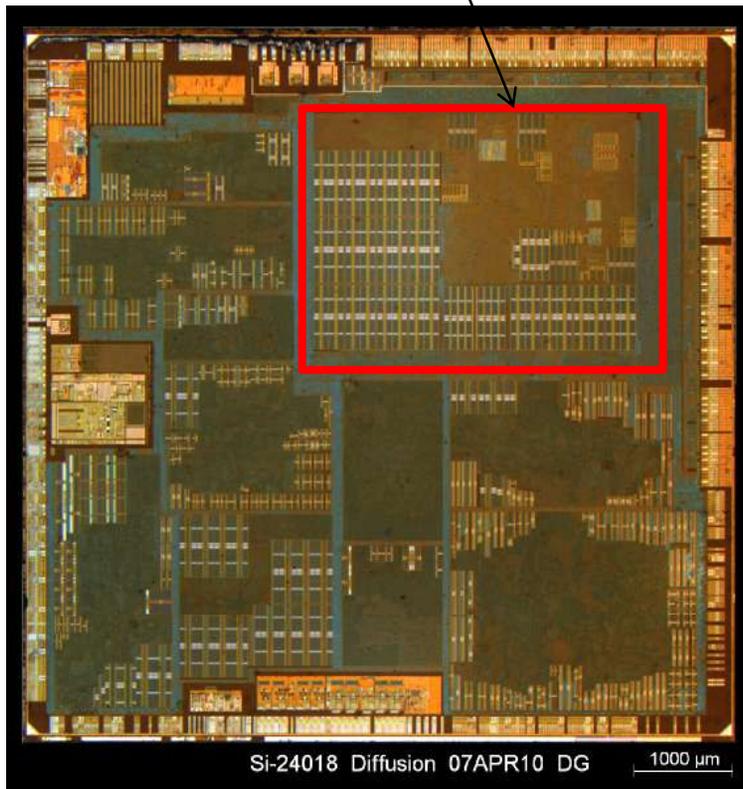
Young Choi

A4 and S5PC110A01

- A4 Processor
 - Main processor for the Apple iPad
 - 1GHz ARM Cortex A8 core (alleged)
- S5PC110A01
 - Applications processor for the Samsung Wave S8500 smart phone
 - 1GHz ARM Cortex A8 45nm core (announced by Samsung)
 - Cache size:
 - L1 I\$ = 32KB
 - L1 D\$ = 32KB
 - L2 = 512KB
 - Graphics engine: POWERVR SGX 3D engine from Imagination Technologies

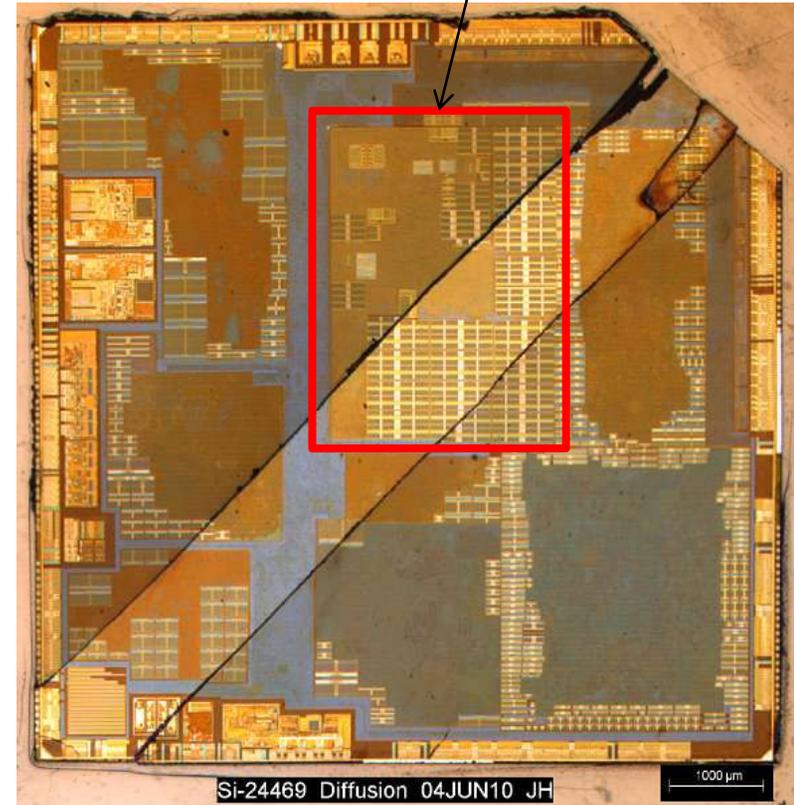
A4 vs. S5PC110A01 - Die Photos

ARM Core



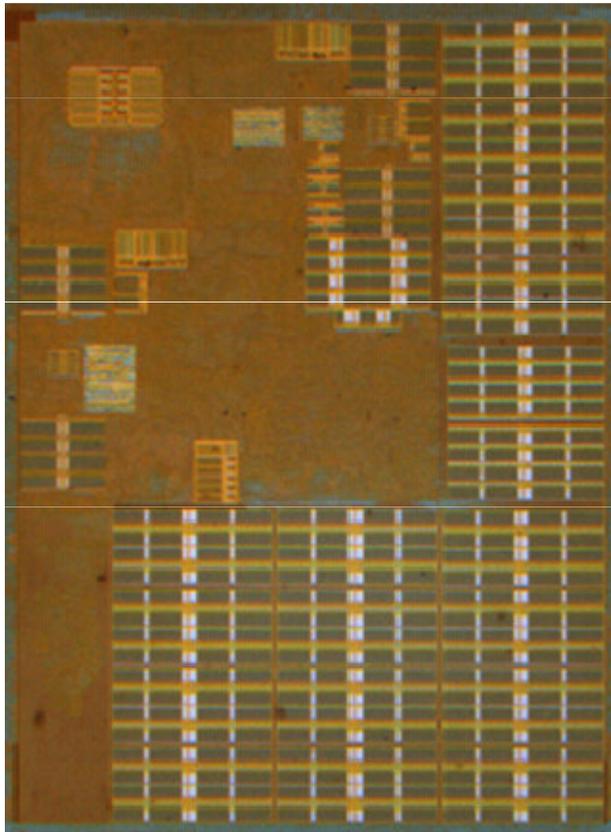
Apple A4 Processor
Chip Size = 53 mm²

ARM Core



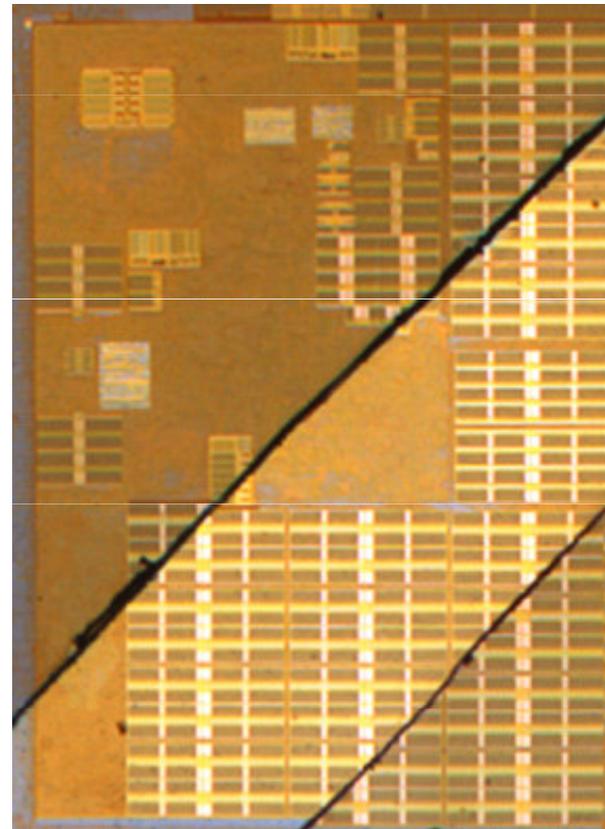
SEC S5PC110A01 Processor
Chip Size = 62 mm²

ARM Core Comparison



ARM Core of Apple
A4 Processor

Rotated 90 degree CCW from die photo



ARM Core of SEC
S5PC110A01 Processor

Samsung's press release

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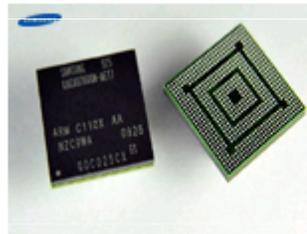
Events Schedule

Eco SAMSUNG

press releases

SAMSUNG Opens the Door to PC-Level Performance on Mobile Devices with 1GHz Low-power Application Processors

Taipei, Taiwan on Sep 22, 2009



Taipei, Taiwan - September 22, 2009 : Samsung Electronics Co., Ltd., a world leader in advanced semiconductor solutions, today introduced two new 1GHz ARM® CORTEX™-A8 based application processors, the S5PC110 and S5PV210, for advanced mobile devices at the sixth annual Samsung Mobile Solutions Forum held at the Westin Taipei Hotel. The S5PC110 is targeted for small form-factor connected devices such as multimedia intensive smartphones, while the S5PV210 is aimed at portable computing devices such as netbooks

that demand high performance and design flexibility.

"More and more, user generated contents currently accessed via the PC will be spread to mobile devices," said Dr. Kwang Hyun Kim, senior vice president, strategic marketing team, System LSI Division, Samsung Electronics. "PC-level performance with lower power consumption will become mainstream requirements for advanced mobile devices. Samsung developed S5PC110 and S5PV210 application processors to satisfy these conflicting requirements to enable a new level of user experience not previously possible."

Both the S5PC110 and S5PV210 ensure longer battery life for mobile devices running on standard size batteries through a variety of low power technologies, including the use of a 45-nanometer (nm) Low Power fabrication process and intricate low power architectures. Each of these application processors comes with 32KB data and 32KB instruction caches, and is equipped with a 512KB L2 cache. With the 1GHz clock speed and large size L2 cache, these processors enable real-time applications such as web browsing and user interface (UI) to run smoothly with a fast response time.

Summary

- Initial investigation revealed that the ARM core used in the Apple A4 processor and the Samsung S5PC110A1 processor are identical
- This furthers TechInsights' earlier finding that the A4 processor was based on the ARM Cortex A8 core with a minor correction: L2 Cache: 640KB -> 512KB
- TechInsights believes that the next Android based smart phone from Samsung, Galaxy S, will use the same applications processor, S5PC110A1