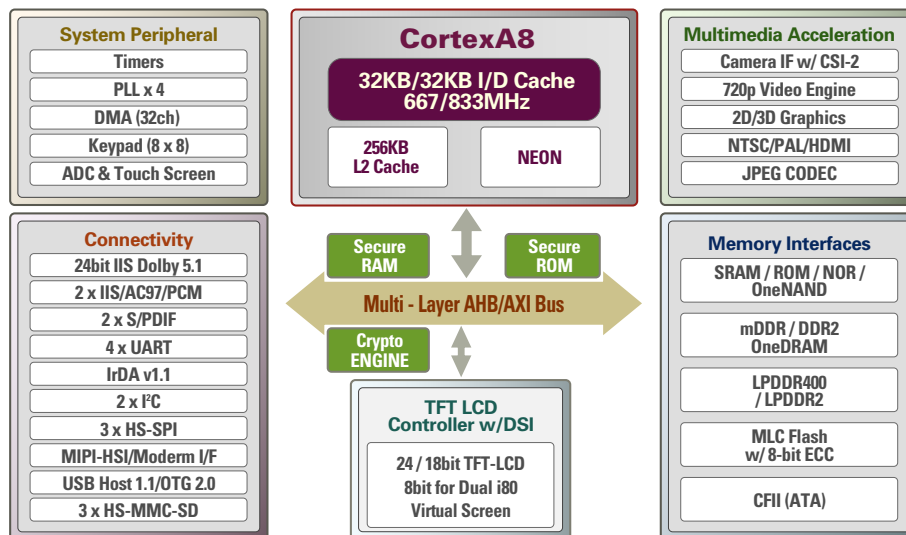# Samsung S5PC100

ARM Cortex A8 based Mobile Application Processor

From smartphones to personal navigation devices, the Samsung ARM Cortex A8-based S5PC100 Mobile Application Processor supports the requirements of a broad array of applications. The S5PC100 enables the integration of various functionalities, such as, wireless communication, personal navigation, camera, portable gaming, portable music/video player, mobile TV and PDA into one device. The S5PC100 adopts a 32-bit ARM Cortex A8 RISC microprocessor and a 64/32-bit internal bus architecture, and operates up to 833MHz.

S5PC100 Block Diagram

System Peripheral
Timers
PLL x 4
DMA (32ch)
Keypad (8 x 8)
ADC & Touch Screen

Connectivity
24bit IIS Dolby 5.1
2 x IIS/AC97/PCM
2 x S/PDIF
4 x UART
IrDA v1.1
2 x I²C
3 x HS-SPI
MIPI-HSI/Moderm I/F
USB Host 1.1/OTG 2.0
3 x HS-MMC-SD

CortexA8
- 32KB/32KB I/D Cache 667/833MHz
- 256KB L2 Cache
- NEON

Secure RAM — Secure ROM

Multi - Layer AHB/AXI Bus

Crypto ENGINE

TFT LCD Controller w/DSI
- 24 / 18bit TFT-LCD
- 8bit for Dual i80
- Virtual Screen

Multimedia Acceleration
Camera IF w/ CSI-2
720p Video Engine
2D/3D Graphics
NTSC/PAL/HDMI
JPEG CODEC

Memory Interfaces
SRAM / ROM / NOR / OneNAND
mDDR / DDR2 OneDRAM
LPDDR400 / LPDDR2
MLC Flash w/ 8-bit ECC
CFII (ATA)

High Definition Multi Format Codec enables higher resolution multimedia functions at low power consumption

High-quality video playback is fast becoming a must-have feature for smartphones, portable media players, GPS navigation units, and TV-enabled mobile devices. The S5PC100 processor features a built-in, 720p multi format codec (MFC) video Engine which ensures smooth 30fps video encoding and playblack at low power consumption, and supports three types of TV out interface (NTSC/PAL/HDMI). Products incorporating the S5PC100 will benefit from the rich video and multimedia functions which consumes very low power, enabling longer video playback time with a standard size battery:

- 720P quality video capture and playback both at 30fps
- High quality real-time video conferencing
- MPEG4 (SP/ASP) / H.263 (Profile3) / H.264 (BP/MP/HP) encode & decode
- VC1 (SP/MP/AP) decode

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Additional S5PC100 Advantages

The S5PC100 mobile application processor provides a cost-effective, low power, high-performance solution for any portable designs:

- **Cortex A8 Based Application Processor:** The S5PC100 is a highly optimized ARM Cortex A8 based application processor targeted for low power portable designs. The ARM subsystem includes separate 32KB Instruction and 32KB data caches, 256KB L2 caches, as well as a full MMU to handle virtual memory management. The Cortex A8 also provides support for JAVA acceleration, and includes a dedicated vector floating point coprocessor allowing efficient implementation of various encryption schemes and high quality 3D graphics applications.

- **Optimized interface for high memory bandwidth requirements:** The S5PC100 has an optimized interface to external memory capable of sustaining the demanding memory bandwidths required in high-end communication services. The memory system support mDDR / DDR2 / LPDDR2 of 200MHz which is enough bandwidth to cover XVGA display with 720p video decoding. Flash/ROM Port supports NAND Flash (MLC and SLC), NOR-Flash, OneNAND, ROM type external memory as well as, Samsung newly unveiled memory, MoviNAND. Additionally, it supports booting from MoviNAND.

- **Software support to reduce application design time:** Existing applications on Samsung application processor families can be ported to the S5PC100 application processors with minimal changes to the BSP. Different operating systems (such as Windows CE, Windows Mobile, Linux®, and Symbian), are supported on the S5PC100, enabling manufacturers and mobile operators to differentiate their products through a rich, easy-to-use and customizable user interface, and a robust and flexible application architecture.

- **Rich peripherals to reduce total system BOM cost and enhance overall functionality:** To reduce total system cost and enhance overall functionality, the S5PC100 includes many hardware peripherals; TFT 24-bit true color LCD controller, HDMI Interface, CF+, ATA I/F, 32-channel DMA, Dedicated IrDA port for FIR, MIR and SIR, AC-97 audio Codec interface, USB 2.0 OTG operating at high speed, SD Host & High Speed Multi-Media Card Interface and Touch Screen Panel (TSP) ADC. By integrating these system peripherals and analog blocks on chip, the S5PC100 minimizes overall system costs and eliminates the need of many costly external components. The S5PC100 further lowers the cost of system memory storage by supporting Multi-level Cell (MLC) NAND Flash, allowing more functionality and personalization options which requires high volume storage.

- **Support OneDRAM:** Next generation smartphone which incorporates the S5PC100 can leverage Samsung OneDRAM to further reduce the system BOM cost by sharing the OneDRAM memory between the S5PC100 and the modem, eliminating the standalone memory normally needed to support the modem operation.

- **Memory stacking options for smaller footprints:** The S5PC100 can be combined with various memory choices via Package-on-Package (POP) or Multiple-Chip-Package (MCP)