SH7724

Multimedia Application Processor for Mobile Internet Devices

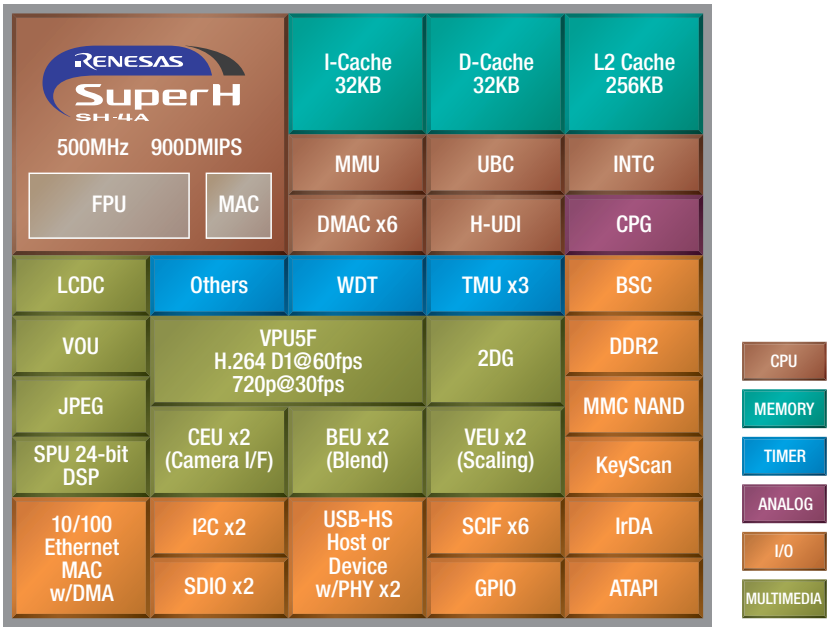
High-definition H.264 recording and playback at low power for video encoding, PND, and connected media device applications

The SH7724 application processor, based on the SH-Mobile series of chips widely used in portable multimedia products, decreases the power needed to run high-definition video applications. It expands markets by enabling power-efficient designs for enhanced products such as Megapixel security cameras, video-VoIP equipment, and personal navigation devices (PNDs).

This low-power device combines a unique video processing unit (VPU) and a 500MHz, 32-bit SH-4A superscalar CPU core containing a floating-point unit (FPU) and L2 cache. The SH7724's high-speed VPU rapidly processes analytics, user-interface software and graphics-intensive tasks, readily handling imaging, compression, and sound processing. This offloads the CPU core, making it available for the fast execution of computationally intensive tasks. Performance is up to 900MIPS (Dhrystone benchmark) for the CPU and up to 3.5 GFLOPS for the FPU.

The device provides an extensive set of peripheral functions (see diagram below). Particularly noteworthy are the 2D graphics accelerator, LCD controller, camera interface, sound I/O module, Ethernet MAC, dual high-speed USB interfaces with host or function control capability, and two high-speed SDIO interfaces. System engineering support for the SH7724 includes a full suite of hardware and software development tools integrated into the easy-to-use HEW development environment. Also, Linux®, middleware, reference platforms and other support products are available or planned.

SH7724 Block Diagram



SH7724 FEATURES

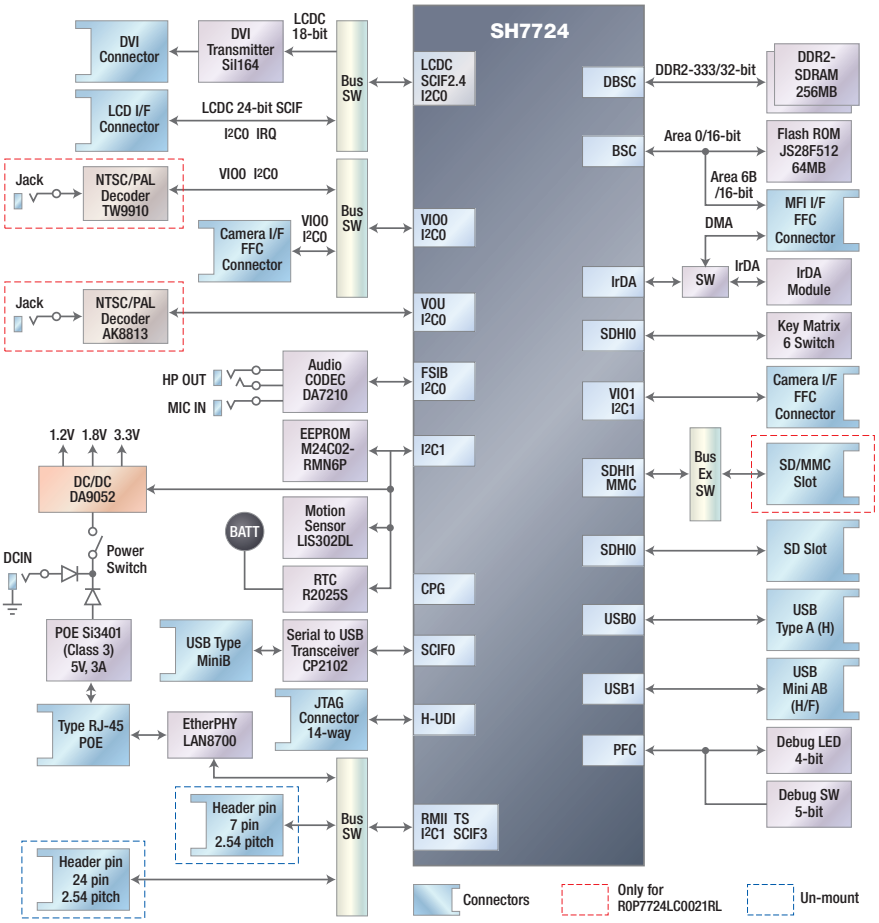
- 900DMIPS/500MHz 32-bit superscalar RISC CPU with 7-stage pipeline
- 3.5 GFLOP IEEE754-compliant single-/double-precision FPU with a 10-stage pipeline
- Parallel access to 4-way set-associative 32KB I-cache and 32KB D-cache
- 256KB L2 cache
- MPEG4, H.264, and WMV accelerators with 720p HD quality
- 2D graphics accelerator
- LCD controller for high-resolution panels
- Two camera interfaces; up to 5M pixel sensors
- ATAPI interface
- MPEG2 Transport Stream (TS) input
- Audio I/O module
- 2x USB2.0 host/function controller
- DDR2/Mobile DDR, SDRAM, NOR
- Ethernet MAC (10/100Mbps)
- eMMC 4.2 for managed NAND Flash
- Two channels of SDHI for SD memory cards and SDIO cards
- Comprehensive suite of development tools and an easy-to-use IDE
- Middleware: video (H.264, MPEG-4, and WMV) and audio (aacPlus)

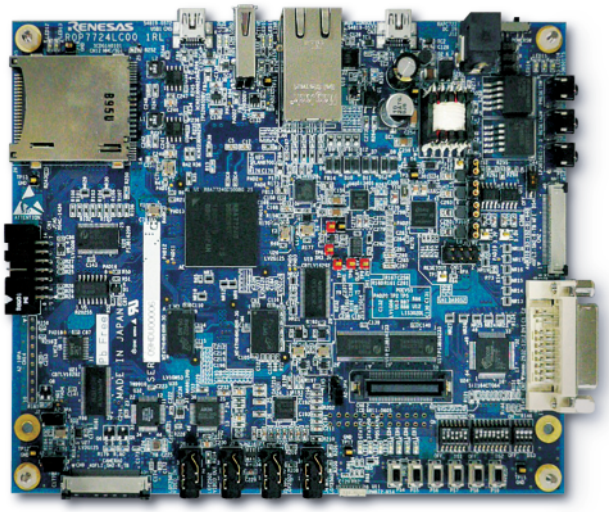
BENEFITS

- Offers leading multimedia capabilities while enabling products that are more power efficient
- Has rich connectivity capabilities and high-speed peripherals for host-based applications
- Enables great web-based playback systems with WMV and H.264 hardware accelerators that can perform 1280x720-size encoding or decoding at 30fps
- Achieves faster, better-quality map rendering in navigation applications
- Delivers clear TV pictures that don't appear fuzzy when enlarged from QVGA to WVGA or larger sizes
- Uses the compact SuperH® instruction set, reducing memory footprint by 30-40% vs. other chips
- Saves power because the superscalar architecture achieves 1.8MIPS/MHz, allowing fast application execution with a relatively low clock frequency
- Drives high-resolution displays that deliver a rich GUI
- Implements system designs with fewer external functions, reducing BOM cost and saving board space
- Supports Linux and other RTOS products, facilitating complex application development
- Enables shorter system development cycles so products can reach markets in less time

MS7724 Reference Platform

The MS7724 is a small form-factor system development platform for multimedia applications. It helps speed the design of products such as portable media players, handheld digital TVs, portable navigation systems and digital video cameras.





◄ MS7724 reference platform board, featuring the Renesas SH7724 application processor

Platform Specifications

CPU	SH7724
Operating speed	500MHz/900DMIPS On-chip H.264 video processor 720p HD support
Memory	DDR2 SDRAM: 256MB (option 512MB) NOR Flash: 64MB 16-bits
Network	10/100Mbps on-chip Ethernet MAC PoE support
Audio	One stereo output One microphone input
Video in	Camera; two cameras inputs NTSC/PAL
Video out	DVI NTSC/PAL
Display	7" WVGA LCD
User interface	6 push-button switches
USB	One type-miniAB connector (Host/Function) One type-A connector (Host) 2.0 High speed
Motion sensor	3-axis linear accelerometer
SD	2 slots
Debug	USB/Serial I/F H-UDI/JTAG I/F LED for status monitor
Power supply	DC input 5VDC/4A
Board size	165mm x 135mm
Temperature range	-20ºC to 70ºC

MS7724 Software Specifications

Complete Linux BSP & tool chain
Demo code for: – H.264 (720p & VGA) streaming over HTTP – MJPEG streaming over HTTP – H.264 + MJPEG simultaneous streaming over HTTP – 2 ch. H.264 streaming over HTTP

SH7724 Ordering Information

Part number:	R8A77240D500BG

For more information, please contact us at 408-382-7500 or www.am.renesas.com.

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