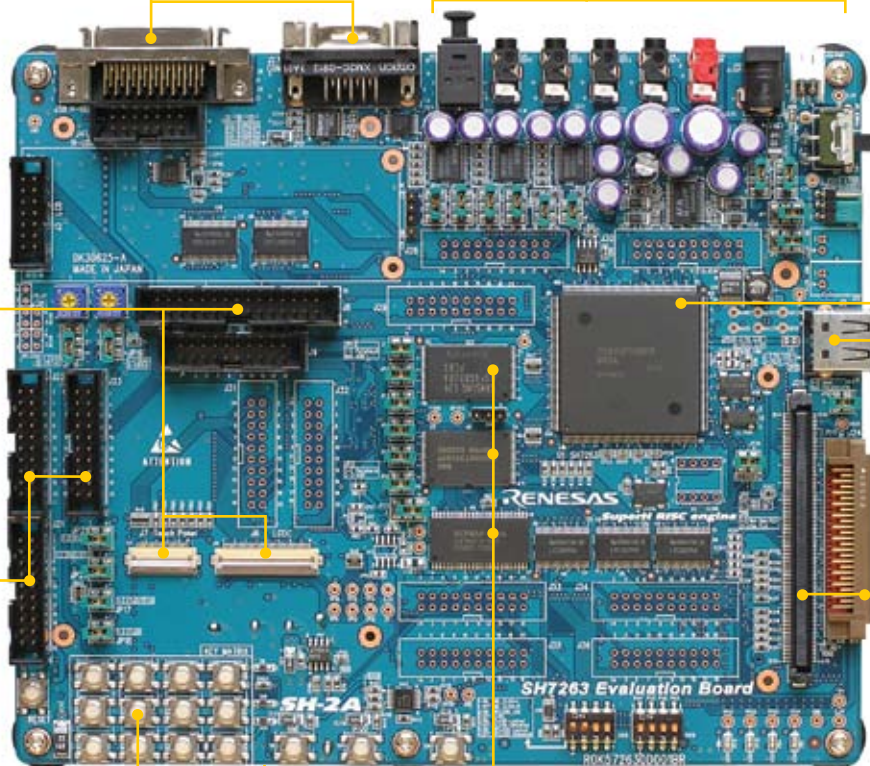


When is a microcontroller an SOC?

It's getting harder and harder to tell the difference between a microcontroller and an SOC (system on chip). Consider, for example, the SH7263 portable-media-player reference design from Renesas. It offers all the latest features, including a VGA (video-graphics-array)-level LCD, high-speed USB (Universal Serial Bus) and SD (secure-digital) interfaces, and decoders for a wide range of audio standards. Renesas is considering the addition of an MPEG-4 video decoder, as well. Surprisingly, the company based this design on the SH-powered 7263 microcontroller chip rather than on a proprietary multimedia SOC. The microcontroller core, offering performance greater than 400 Dhrystone MIPS, has the muscle for media decoders in software, and the chip includes controllers for high-speed USB 2.0 and a WVGA (wide-VGA)-display panel. That combination leaves not much but the mixed-signal interfaces, the audio DACs, and the power supply as separate components.



The E10A package includes the proprietary AUD (Advanced User Debugger) interface. Jumper switches let you select the AUD function. The device also includes a serial interface.

Audio DACs and a power supply are the only major functions not integrated into the microcontroller.

The SH7263 microcontroller has a 16.67-MHz input clock, a 66.67-MHz-maximum bus clock, and a 200-MHz-maximum CPU clock.

A WVGA-level LCD supports resolutions as high as WVGA—that is, 640×480 pixels with a 1.78-to-1 aspect ratio.

USB support includes high-speed capability.

The signal headers reside below the LCD panel.

Connectors support the chip's external expansion bus and ATAPI (advanced-technology-attachment packet interface) port.

A 3×4 user switch matrix is scanned by the microcontroller.

The SD-card slot resides on the underside of the board.

In addition to on-chip memory, the board includes a 512-Mbyte NAND flash, a 4-Mbyte×16-bit flash, and a 16-Mbyte×16-bit SDRAM.