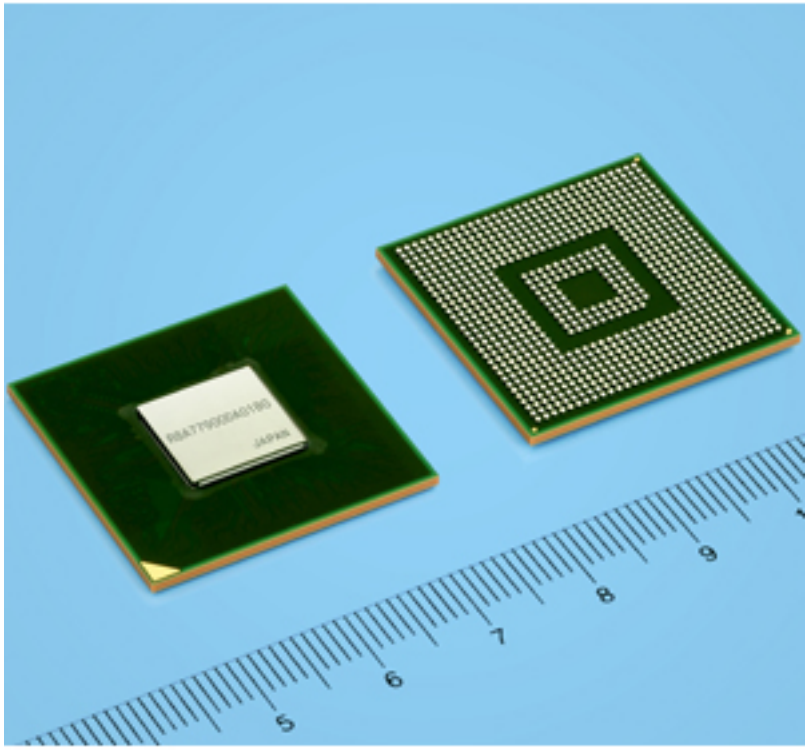
Automotive Systems-on-Chip capable of delivering more than 25,000 DMIPS



Renesas Electronics Corporation and Renesas Mobile Corporation announced the availability of a new member of the R-Car Series of automotive Systems-on-Chip (SoCs). Capable of delivering more than 25,000 DMIPS, the R-Car H2 provides high performance and state-of-the-art 3D graphics capabilities for high-end multimedia and navigation automotive systems. The R-Car H2 is powered by the ARM Cortex A-15 quad-core configuration running an additional ARM Cortex A-7 quad-core – the industry's first implementation of a Quad ARM Cortex A15 and the big.LITTLE processing technique in an automotive SoC.

Powerful media hardware accelerators enable features like 4 x HD 1080p video en/decoding including Blu-Ray support at 60 frames per second, image/voice recognition and high-resolution 3D graphics with almost no CPU load. These implemented hardware modules also execute the display content improvements needed for human-machine interface (HMI)/navigation data in parallel to Movie/DVD handling.

The R-Car H2 also features the Imagination Technologies PowerVR Series6 G6400 Graphics Processing Unit (GPU). This is the first worldwide implementation of the GPU into an automotive SoC, which demonstrates the state-of-the-art 3D graphics capability of the R-Car series. The R-Car H2 offers one of the best graphic performance solutions in the automotive embedded market. This GPU is ready to not only support open technologies like OpenGL ES 2.0, but also the OpenGL ES 3.0

and OpenCL standards. Support of the Open graphics standards combined with the R-Car H2's cutting-edge IP and other features makes it the perfect platform to develop next-generation infotainment systems.

Renesas' IMP-X4 core, implemented in R-Car H2 as an optional feature, provides real-time image processing that enables developers to support the emerging trend of augmented reality. In order to fully benefit from the IMP-X4 core, the R-Car H2 also supports up to four independent input camera channels, allowing easy implementations of 360º camera views and image recognition, just an example of the possible driver assistance functions. OpenCV support for IMP-X4 will also be offered. The R-Car H2 offers the highest level of integration of advanced safety concepts and infotainment features in the automotive market today.

The highly efficient bus architecture of the R-Car H2 includes dedicated CPU and IP caches, enabling Renesas to reduce the DDR3 memory bandwidth consumption. In order to ensure adequate memory bandwidth, the R-Car H2 is equipped with two independent DDR3-1600 32-bit interfaces. This allows for much more efficient access to different content simultaneously, compared to a single 64-bit DDR interface. The R-Car family aspires to provide users with the highest capable multitasking processing solution on the automotive market today.

In developing the R-Car series of SoCs, Renesas has leveraged the experiences with mobile products, where there is a strong focus on power consumption reductions. The applied technologies of these mobile products are transferred to Renesas' automotive SoCs to provide unique and effective power optimization and handling.

The R-Car H2 integrates advanced automotive interfaces like Ethernet AVB, MOST-150 and CAN and mass storage interfaces like SATA, USB3.0/2.0, SDcard and PCI Express for system expansion. As a device option, the GPS baseband engine handles all modern navigation standards. Even here, the integration level of R-Car H2 doesn't stop. A 24-bit DSP for codec, high-quality audio processing with hardware sample rate converters and audio mixing is part of the enormous function coverage. The Renesas R-Car family provides the highest level of advanced automotive peripherals in the market today. The Renesas Ethernet AVB solution achieves the fullest implementation of Ethernet AVB on the market, offering the Full Ethernet AVB specification and meeting the specification requirement demands of the automotive market.

With the R-Car H2, Renesas provides not only extremely powerful performance but also a robust ecosystem, including board support packages (BSPs), middleware, development environment and partner solutions, which enables quick prototyping and drastic reduction of high-end product development costs.

The R-Car H2's multi-core architecture allows customers to implement real-time features, such as quick-boot, backup camera support, and media processing, parallel to the execution of advanced operating systems such as QNX Neutrino RTOS, Windows Embedded Automotive or Linux. Renesas continuous close collaboration with industry-leading Operating System vendors means that the customers' toolboxes are full with the features and development tools they need to

rapidly create and bring to market differentiated high-performance products.

More information can be found at www.renesas.com [1]

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