

Separate Sheet 2

Main Product Specifications of the R-Car M3 SoC

Item	R-Car M3 Specifications		
Product No	R-Car M3 (R8J77960 (SiP), R8A77960 (SoC))		
Power supply voltage	3.3/1.8 V (IO), 1.1 V (LPDDR4), 0.9 V (core)		
CPU core	ARM® Cortex®-A57 Dual	ARM® Cortex®-A53 Quad	ARM® Cortex®-R7 Dual Lock-Step
Cache memory	L1 Instruction cache: 48 KB L1 Operand cache: 32 KB L2 cache: 1 MB	L1 Instruction cache: 32 KB L1 Operand cache: 32 KB L2 cache: 512 KB	L1 Instruction cache: 32 KB L1 Operand cache: 32 KB
External memory	<ul style="list-style-type: none"> • LPDDR4-SDRAM • Maximum operating frequency: 1600 MHz • Data bus width : 32 bits x 2 ch (12.8 GB/s x 2) 		
3D Graphics	Imagination Technologies' PowerVR® Series 6XT GX6250		
Video	Display Out x 3 ch		
	Video Input x 8 ch		
	Video codec module (H.265, H.264/AV, MPEG-4, VC-1 etc.)		
	IP conversion module		
	Up and down scaling, 1-D LUT/3D-LUT/1D-Histogram/2D-Histogram, color conversion, super resolution, rotate, ordered dithering, sharpness, lossless compression/decompression, lossy compression		
	TS Interface x 2 ch		
	stream and security processor		
	Distortion compensation module x 4 ch (IMR-LX4)		
Audio	High performance real-time image recognition engine (IMP-X5)		
	Audio DSP		

	Sampling rate converter x 10 ch
	Serial sound interface x 10 ch
Storage interfaces	USB 3.0 host interface(DRD) x 1 port (wPHY)
	USB 2.0 host interface x 1 port (wPHY)
	USB 2.0 host/function/OTG interface x 1 port (wPHY)
	SD host interface x 4 ch (SDR104)
	Multimedia card interface x 2 ch
	PCI Express 2.0 (1 lane) x 2 ch
In car network and automotive peripherals	Media local bus (MLB) Interface x 1 ch (3-pin interface)
	controller area network (CAN-FD support) Interface x 2ch
	Ethernet AVB 1.0-compatible MAC built in Interface: RGMII Ethernet AVB (802.1BA)
	<ul style="list-style-type: none"> ● IEEE802.1BA ● IEEE802.1AS ● IEEE802.1Qav ● IEEE1722
Security	Crypto engine (AES, DES, Hash, RSA) x 2ch
	SystemRAM
Other peripherals	SYS-DMAC x 48 ch, Realtime-DMAC x 16 ch, Audio-DMAC x 32 ch, Audio(peripheral)-DMAC x 58 ch
	32bit timer x 41 ch
	PWM timer x 7 ch
	I2C bus interface x 8 ch
	Serial communication interface (SCIF) x 11 ch
	SPI multi I/O bus controller (RPC) x 1 ch (HyperFlash™/QSPI support)
	Clock-synchronized serial interface(MSIOF) x 4 ch (SPI/IIS)
	Digital radio interface(DRIF) x 4 ch
Low power mode	Dynamic Power Shutdown
	AVS (Adaptive Voltage Scaling), DVFS (Dynamic Voltage and Frequency Scaling), DDR-SDRAM power supply backup mode

Package	1255-pin SiP module (40 mm x 40 mm, 0.8 mm pitch) 1022-pin Flip chip BGA (29 mm x 29 mm, 0.8 mm pitch)
Development environment	ICE for ARM CPU available from tool vendors
Evaluation board	A user system development reference platform with the following features is also available to enable the users to carry out efficient system development. (1) Incorporates car information system-oriented peripheral circuits, providing users with an actual device verification environment. (2) Can be used as a software development tool for application software, etc. (3) Allows easy implementation of custom user functions.
Software Platform	Support OS: Linux, Android, QNX® Neutrino® RTOS, Integrity® etc. OpenGL ES3.1 3D graphics library, Wide variety of H.265, H.264, MPEG-4 and VC-1 for video compliant with OpenMAX IL I/F in addition to BSPs compliant with OSs standard API are available to realize complete system concept.

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