

PRODUCT SCOUT AUTOMOTIVE

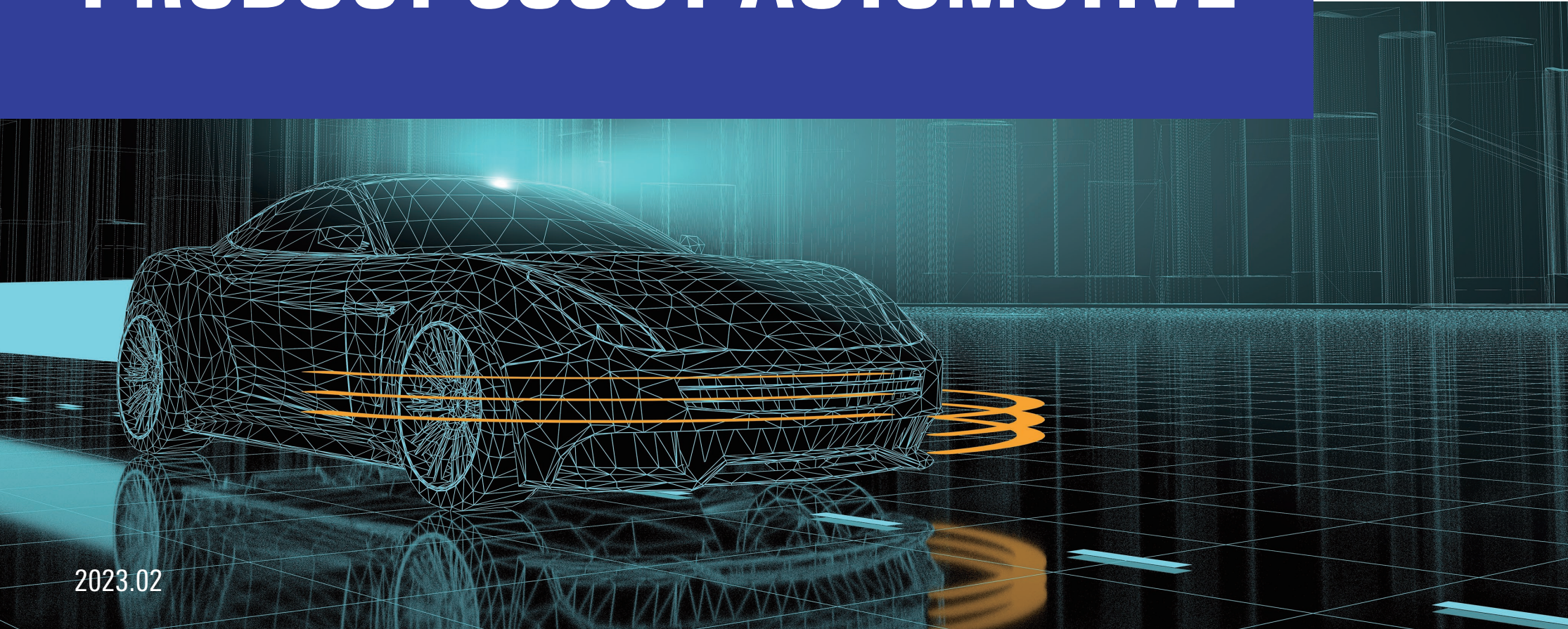


Table with columns: Series, Nickname/Group, Part number, Flash size [B], RAM [B], Data flash [B], Core, FPU, I/O lines, CS/UART/LIN, CAN/CAN-FD, I2C, External bus, Other interfaces, Timer channels, PWMs, Clock speed, Internal oscillator(s), Subclock, A/D converter/D/A converter, Supply voltage, Pins, Packages, T_ambient [°C], Other features. Rows are organized by series: F Series (RL78/F12, RL78/F13-LIN, RL78/F13-CAN, RL78/F14, RL78/F15, RH850/F1KM-S1, RH850/F1K, RH850/F1KM-S2, RH850/F1KM-S4, RH850/F1KH-DB, P Series, C Series, E Series, U Series), RH850/D Series, and RH850/H Series.

AUTOMOTIVE INFORMATION SYSTEMS - MICROCONTROLLER

Table with columns: Series, Nickname/Group, Part number, Flash size [B], RAM [B], Data flash [B], Core, FPU, I/O lines, CS/UART/LIN, CAN/CAN-FD, I2C, External bus, Other interfaces, Timer channels, PWMs, Clock speed, Internal oscillator(s), Subclock, A/D converter/D/A converter, Supply voltage, Pins, Packages, T_ambient [°C], Other features. Rows include RH850/D Series, RH850/H Series, and RH850/H Series.

Other features: CMA, CMP, DRI, DRO, DTS, DTV, DVS, DMP (Comparator), DMR (Direct memory access), DRI (Direct RAM Input), DRO (Direct RAM Output), DTS (Data Transfer Controller), DTV (Data Transfer System), DVS (Dual voltage supply), EMC (Encoder timer), ELC (Error Control Module), ETC (Event List Controller), EMC (Controller for external analogue MUX), ENC (Encoder timer for rotary switch), GFS (2D/3D graphics engine), GPS (GPS baseband controller), GPU (Graphics processing unit), ICU-S (Intelligent Cryptographic Unit - Slave), ICU-M (Intelligent Cryptographic Unit - Master), IMR (Image renderer), LCM (LCD controller/driver), LVI (Low-voltage indicator), MCT (Motor control timer), PAD (PWM with analogue diagnostic function), RTC (Power-On Clear Real-Time Clock), SMC (Stepper motor controller), SMD (Sound generator), SPS (System Protection Function), SPC (Sample Rate Converter), SVS (Single voltage supply), WTS (Window sensor), WXD (Thermal Watchdog Timer), XIP (Execute in Place from serial flash).

SYSTEM ON CHIP

Series	Nickname/ Group	Part number	Core	FPU	Clock Speed [MHz]	GPU	GPU Clock Speed [MHz]	DDR-Interface	Flash Interface	Video Output	Video Input	External bus	High Speed Interface	CAN/CAN FD	Ethernet 100 Mbit/1 Gbit	USB	MLB	SPI	UART	I ² C	Pins	Packages	T _j max. [°C]	Other features
R-Car Gen3e	R-Car H3e	R8A779M0	4x Cortex A57 4x Cortex A53 Cortex R7	✓	1700 1200 800	PowerVR - GX6650 D/AVE-HD	600	4x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS 2x HDMI	2x Digital 3x MIPI- CSI2	✓	2x PCIe SATA	2/2	-/1	3.0 4x 2.0	3-pin MOST50	4	11	7	1384	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car H3e-2G	R8A779M1	4x Cortex A57 4x Cortex A53 Cortex R7	✓	2000 1200 800	PowerVR - GX6650 D/AVE-HD	600	4x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS 2x HDMI	2x Digital 3x MIPI- CSI2	✓	2x PCIe SATA	2/2	-/1	3.0 4x 2.0	3-pin MOST50	4	11	7	1384	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car H3Ne	R8A779M8	4x Cortex A57 4x Cortex A53 Cortex R7	✓	1500 1200 800	PowerVR - GX6650 D/AVE-HD	600	2x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS HDMI	2x Digital 2x MIPI- CSI2	✓	2x PCIe SATA	2/2	-/1	3.0 2x 2.0	3-pin MOST50	4	11	7	1022	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car H3e-2G	R8A779M1	4x Cortex A57 4x Cortex A53 Cortex R7	✓	2000 1200 800	PowerVR - GX6650 D/AVE-HD	600	4x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS 2x HDMI	2x Digital 3x MIPI- CSI2	✓	2x PCIe SATA	2/2	-/1	3.0 4x 2.0	3-pin MOST50	4	11	7	1384	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car M3e	R8A779M2	2x Cortex A57 4x Cortex A53 Cortex R7	✓	1800 1300 800	PowerVR - GX6250 D/AVE-HD	700	2x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS HDMI	2x Digital 2x MIPI- CSI2	✓	2x PCIe	2/2	-/1	3.0 2x 2.0	3-pin MOST50	4	11	7	1022	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car M3e-2G	R8A779M3	4x Cortex A57 4x Cortex A53 Cortex R7	✓	2000 1300 800	PowerVR - GX6250 D/AVE-HD	700	2x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS HDMI	2x Digital 2x MIPI- CSI2	✓	2x PCIe	2/2	-/1	3.0 2x 2.0	3-pin MOST50	4	11	7	1022	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car M3Ne	R8A779M4	2x Cortex A57 Cortex R7	✓	1800 800	PowerVR - GE7800 D/AVE-HD	700	1x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS HDMI	2x Digital 2x MIPI- CSI2	✓	2x PCIe SATA	2/2	-/1	3.0 2x 2.0	3-pin MOST50	4	11	7	1022	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car M3Ne-2G	R8A779M5	2x Cortex A57 Cortex R7	✓	2000 800	PowerVR - GE7800 D/AVE-HD	700	1x 32-bit LPDDR4-3200	Parallel Serial Flash Raw NAND 2x eMMC 4x SDIO	Digital Out LVDS HDMI	2x Digital 2x MIPI- CSI2	✓	2x PCIe SATA	2/2	-/1	3.0 2x 2.0	3-pin MOST50	4	11	7	1022	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car E3e	R8A779M6	2x Cortex A53 Cortex R7	✓	1200 800	PowerVR - GE8300 D/AVE-HD	600	2x 16-bit DDR3(L)-1866	Parallel Serial Flash Raw NAND 1x eMMC 3x SDIO	Dig. Out / LVDS LVDS	2x Digital MIPI-CSI2	✓	PCIe	2/2	-/1	3.0 2x 2.0	3-pin MOST50	4	11	8	552	BGA	125	Audio DSP, Security, Safety, Video HW codec, Image Processor, Timers, WDT, PWMs
	R-Car D3e	R8A779M7	1x Cortex A53	✓	1000	PowerVR - GE8300 D/AVE-HD	600	1x 16-bit DDR3(L)-1866	Raw NAND Serial Flash 1x eMMC	Dig. Out / LVDS LVDS	1x Digital	-	-	2/2	-/1	2.0	3-pin MOST50	4	8	4	401	BGA	125	Security, Safety, Image Processor, Timers, WDT, PWMs

Series	Nickname/ Group	Part number	CPU system	Clock Speed [MHz]	SRAM [MB]	Memory I/F	High Speed Interface	CAN FD	Ethernet 100 Mbit/2.5 Gbit	FlexRay	LIN	UART	I ² C	ASIL level	Package	Other features
R-Car Gen4	R-Car S4-8	R8A779F4	8x Cortex A55 1x Cortex R52 2x RH850 G4MH	1200 1000 400	8	LPDDR4x-3200 (ECC corrected) 32bit (=> 12.8 GB/s) 2x OSPI 1x Hyperflash Serial NOR Flash I/F (OCTAL FLASH) eMMC 5.01	2x PCIe V4.0 (2 lanes)	16	1 AVB/3x Gbit TSN + swit	1	16	4	7	D	FCBGA 780 0.8mm pitch	HSM, crypto core Communication IP H/W acceleration Enhanced power management features LV PMIC RAA271005 HV PMIC RAA271041 Timing IC RC21212 JTAG debug I/F
	R-Car S4N-8	R8A779F5	8x Cortex A55 1x Cortex R52 2x RH850 G4MH	1200 1000 400	8	LPDDR4x-3200 (ECC corrected) 32bit (=> 12.8 GB/s) 2x OSPI 1x Hyperflash Serial NOR Flash I/F (OCTAL FLASH) eMMC 5.01	2x PCIe V4.0 (2 lanes)	16	1 AVB/3x Gbit TSN + swit	-	16	4	5	D	FCBGA 780 0.65mm pitch	HSM, crypto core Communication IP H/W acceleration Enhanced power management features LV PMIC RAA271006 HV PMIC RAA271041 Timing IC RC21212 JTAG debug I/F
	R-Car S4-4	R8A779F6	4x Cortex A55 1x Cortex R52 2x RH850 G4MH	1200 1000 400	8	LPDDR4x-3200 (ECC corrected) 32bit (=> 12.8 GB/s) 2x OSPI 1x Hyperflash Serial NOR Flash I/F (OCTAL FLASH) eMMC 5.01	2x PCIe V4.0 (2 lanes)	16	1 AVB/3x Gbit TSN + swit	-	16	4	5	D	FCBGA 780 0.8mm pitch	HSM, crypto core Communication IP H/W acceleration Enhanced power management features LV PMIC RAA271005 HV PMIC RAA271041 Timing IC RC21212 JTAG debug I/F
	R-Car S4N-4	R8A779F7	4x Cortex A55 1x Cortex R52 2x RH850 G4MH	1200 1000 400	8	LPDDR4x-3200 (ECC corrected) 32bit (=> 12.8 GB/s) 2x OSPI 1x Hyperflash Serial NOR Flash I/F (OCTAL FLASH) eMMC 5.01	2x PCIe V4.0 (2 lanes)	16	1 AVB/3x Gbit TSN + swit	-	16	4	5	D	FCBGA 780 0.65mm pitch	HSM, crypto core Communication IP H/W acceleration Enhanced power management features LV PMIC RAA271006 HV PMIC RAA271041 Timing IC RC21212 JTAG debug I/F

Series	Nickname	Part number	Real Time Core Freq. / kDMIPS	Application Core	GPU / Frequency	Computer Vision / Frequency	Deep Learning (TOPS)	Other Accel.	Video Codec	Audio Codec	DDR Interface	Flash Interface	Video Input	Video Output	High Speed Interface	Auto I/F	Ethernet 100Mbit/1Gbit	ASIL	Pins / Package	Other Features
R-Car V3x	R-Car V3M	R8A77970	CR7 Lockstep 800MHz/2k DMIPS	2x CA53 800MHz/ 3.6k DMIPS	No	2CvE / 400MHz	0.3 TOPS	1x ISP, 4x IMR	H264 Enc	No	32bit DDR3L-1600	2x OSPI	1x MIPI-CSI2 (4L) 2x Digital Vin TTL	1x DU 1x LVDS (OpenLDI) 1x Digital Vout TTL	No	2x CAN 2.0B/FD, FlexRay	1x Gbit AVB	Up to ASIL B	FCBGA 0.8mm 419 balls	4x UART 4x SPI 5x I ² C Security JTAG
	R-Car V3H	R8A77980A	CR7 Lockstep 800MHz/2k DMIPS	4x CA53 1GHz/9.2k DMIPS	No	5CvE / 533MHz	3.7 TOPS	2x ISP, 5x IMR, 1x DOF, 1x STV, 5x ACF	H264 Enc	No	32bit LPDDR4-3200	2x OSPI 1x eMMC	2x MIPI-CSI2 (4L) 2x Digital Vin TTL	1x DU 1x LVDS (OpenLDI) 1x Digital Vout TTL	1x PCIe 2.0	3x CAN 2.0B/FD, FlexRay	1x Gbit AVB 1x Gbit Std port	Up to ASIL C	FCBGA 0.8mm 538 balls	4x UART 6x SPI 7x I ² C Security JTAG

Series	Nickname	Part number	Real Time Core Freq. / kDMIPS	Application Core	GPU / Frequency	Computer Vision / Frequency	Deep Learning (TOPS)	Other Accel.	Video Codec	Audio Codec	DDR Interface	Flash Interface	Video Input	Video Output	High Speed Interface	Auto I/F	Ethernet 100Mbit/1Gbit	ASIL	Pins / Package	Other Features
R-Car V4x	R-Car V4H	R8A77960LA01BA	3x CR52 Lockstep 1.4GHz/9k DMIPS	4x CA76 1.8GHz / 49 kDMIPS	AXM-8256 600MHz 150 GFLOPS	4x Computer Vision Engine	34 TOPS	2x ISP, 5x IMR, 1x SMD, 1x DOF, 4x DSP	H.264 Enc./ H.264 Codec	No	64-bit LPDDR5-6400 LPDDR4-4266	2x OSPI 1x eMMC	2x MIPI-CSI2	2x DU 2x MIPI CSI2/ DSI-output	2x PCIe 4.0	8x CAN 2.0/FD, FlexRay	3xGbit AVB, 1xGbit TSN	Up to ASIL-D	FCBGA 1135 pins 0.65mm pitch 25x25mm	4x UART 6x SPI 7x I ² C I2S Security JTAG
	R-Car V4M	R8A779HLL131BA	3x CR52 Lockstep 1.4GHz/9k DMIPS	4x CA76 1 GHz / 27 kDMIPS	BXS-4-64 1GHz 50 GFLOPS	4x Computer Vision Engine	17 TOPS	1x ISP, 5x IMR, 1x SMD, 1x DOF, 2x DSP	H.264 Enc.	No	32-bit LPDDR5-6400 LPDDR4x-4266	2x OSPI 1x eMMC	2x MIPI-CSI2	1 x DU 1 x MIPI CSI2/ DSI-output	1x PCIe 4.0	4x CAN 2.0/FD, FlexRay	3xGbit AVB,	Up to ASIL-D	FCBGA 729 pins 0.65mm pitch 19x19mm	4x UART 6x SPI 4x I ² C I2S Security JTAG

Other features:	CvE DOF	Computer Vision Engine Dense Optical Flow	DU IMR	Display Unit Image Rectifier	ISP SMD	Image Signal Processor Simple Instruction Multiple Data	STV WDT	Stereo Vision Window Watchdog Timer
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