RENESAS

Separate Sheet

Product Specifications of the RX231 MCU Group

Group name		RX231			
Part No.*		R5F52318ADxx	R5F52317ADxx	R5F52316ADxx	R5F52315ADxx
		R5F52318AGxx	R5F52317AGxx	R5F52316AGxx	R5F52315AGxx
Internal memory	Flash ROM	512 KB	384 KB	256 KB	128 KB
	RAM	64 KB		32 KB	
	E2 data flash	8 KB			
Power supply voltage		1.8 - 5.5 V			
Maximum operating frequency		54 MHz			
Operating temperature		-40 to +85°C or -40 to +105°C			
CPU core		RXv2 CPU - General purpose: Sixteen 32-bit registers - Control: Ten 32-bit registers - Accumulator: Two 72-bit registers - Multiplier: 32-bit multiplier - Divider: Yes - Multiply-accumulator: Yes (two types: memory-to-memory operations and register-to-register operations) - Memory protection unit (MPU):Yes - Basic instructions: 75 Variable-length instruction format - Floating-point instructions: 11 - DSP instructions: 23			
Floating-point operation unit		Single-precision floating-point operation unit (Supports add/subtract/compare/multiply/divide and other instructions)			
On-chip peripheral functions	Transfer functions	• DMA controller (DMACA) × 4 channels • Data transfer controller (DTCa)			
	Timers	• 16-bit timer pulse unit (TPUa): 16 bit × 6 channels • Multi-function timer pulse unit 2: 16 bits × 6 channels (MTU2a) • Port output enable 2 (POE2a) • Compare match timer (CMT): 16 bits × 2 channels × 2 units • Watchdog timer (WDTA): 14 bits × 1 channel • Independent watchdog timer (IWDTa): 14 bit × 1 channel • Real-time clock (RTCe): 1 channel • Low Power Timer (LPT) : 1 channel • 8-bit timer (TMR): (8 bit × 2 channels) × 2 units			
	Communication functions	• Serial communications interface (SCIg): 100-pin [7 channels], 64-pin [5 channels], 48-pin [4 channels] • Serial communications interface (SCIh): 1 channel • I2C bus interface (RIICa): 1 channel • Serial peripheral interface (RSPIa): 1 channel			

		• USB 2.0 Full Speed/Low Speed (USBd): [1 channel, H/F/OTG] • Serial Sound Interface (SSI): 1 channel • IrDA interface (IRDA) : 1 channel
	Touch key functions	• 100-pin [24 channels], 64-pin [10 channels] , 48-pin [6 channels] • Self-capacitance and mutual capacitance are supported.
	Analog functions	• 12-bit A/D converter (S12ADE): 100-pin [24 channels], 64-pin [12 channels], 48-pin [8 channels] • Temperature Sensor (TEMPSa) : 1 channel • 12-bit D/A converter (R12DAA): 2 channels • Comparator B (CMPBa): 2 channels × 2 units
	Safety functions	• Clock frequency accuracy measurement circuit (CAC) • Data operation circuit (DOC) • 14-bit Independent watchdog timer (IWDTa) • Detection of 12-bit A/D converter analog input disconnection • CRC calculator (CRC)
	Clock generation circuit	• Main clock oscillator • Sub-clock oscillator • Low-speed on-chip oscillator (LOCO) • High-speed on-chip oscillator (HOCO) • IWDT-dedicated on-chip oscillator • USB-dedicated PLL frequency synthesizer • PLL frequency synthesizer

	Security	• Access management circuit
		• Encryption engine
		  AES
		   -Key sizes 128 or 256 bits,
		   -Block cipher mode of operation
		     GCM, ECB, CBC, CMAC, XTS, CTR, GCTR
		• true random number generator
		• Unique ID
		• Memory protection unit (MPU)

	Others	• Event Link Controller (ELC) • Multi-function Pin Controller (MPC) • Power-on Reset Circuit (POR) • Voltage Detection Circuit (LVDa) • Battery backup function
On-chip debugging function	Yes (with trace function)	

Low power consumption modes	3 modes
	  • Sleep mode
	  • Deep sleep mode
	  • Software standby mode	

Packages	100-pin TFLGA (PTLG0100KA-A) 5.5 × 5.5mm, 0.5mm pitch 100-pin LFQFP (PLQP0100KB-B）14 × 14mm, 0.5mm pitch 64-pin WFLGA (PWLG0064KA-A) 5 × 5mm, 0.5mm pitch 64-pin HWQFN (PWQN0064KC-A) 9 × 9mm, 0.5mm pitch 64-pin LFQFP (PLQP0064KB-C) 10 × 10mm, 0.5mm pitch	

	48-pin HWQFN (PWQN0048KB-A) 7 × 7mm, 0.5mm pitch
	48-pin LFQFP (PLQP0048KB-B) 7 × 7mm, 0.5mm pitch

*The characters following the Part Names listed above differ depending on the flash ROM size, package, etc.

Upper: Temperature range for the operation: -40 to +85°C

Lower: Temperature range for the operation -40 to +105°C

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