RENESAS
瑞 萨

The Core Difference in Your Design

RX600 Microcontrollers

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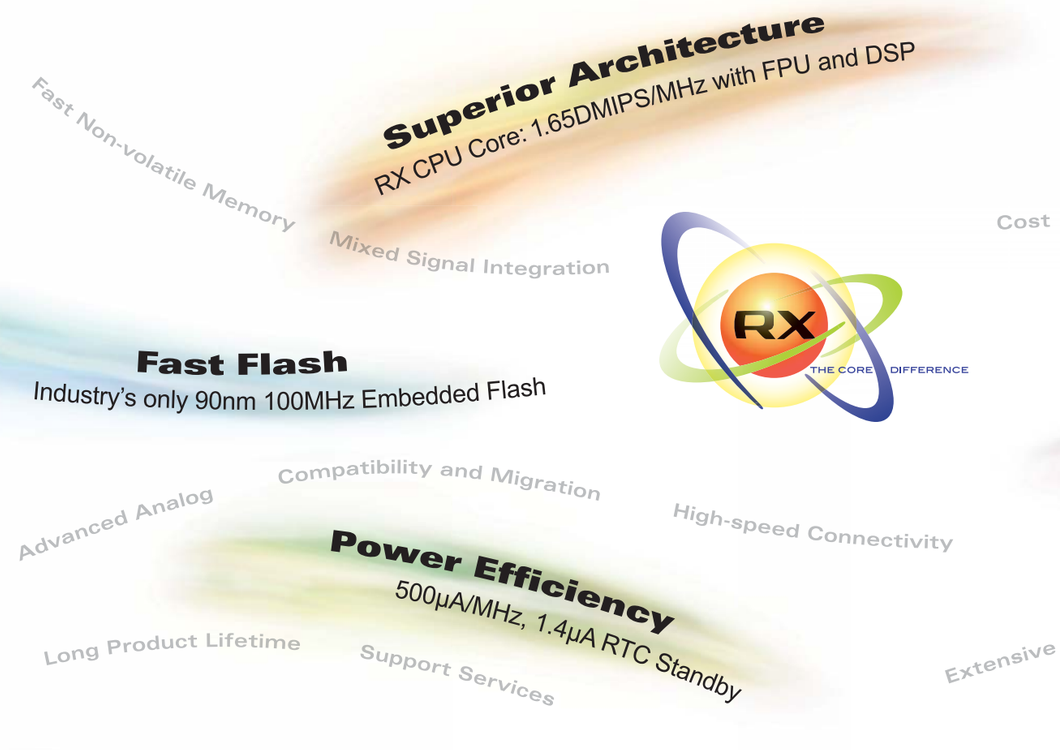
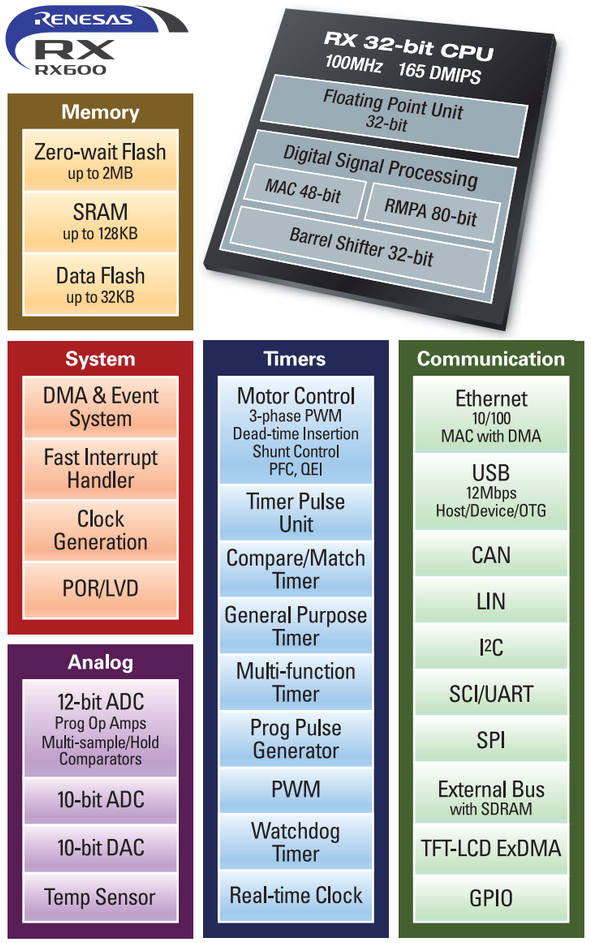
Performance without Sacrifice

The RX architecture is future oriented and feature rich. It's driven by a Renesas technology roadmap that focuses on the global environment and anticipates the enormous gains in sophistication that microcontroller-based products are expected to achieve in the next 10 to 20 years. Thus, the RX family of microcontrollers (MCUs) delivers superior performance in terms of core processing performance, code efficiency, and power consumption. An extensive portfolio of on-chip mixed-signal peripherals is available, and fast 90nm Flash memory is embedded. That Flash unleashes full CPU performance, feeding instructions to the 32-bit RX CPU with no delays – no waits, no stalls – maintaining the MCU's peak performance of 165 DMIPS. Memory acceleration isn't required, and the result is just pure, predictable performance.

Today designers are confronted with many critical design and implementation issues. RX MCUs are designed to solve these issues and help them create new innovative end-products faster and more easily than in the past.





- RX MCUs leverage Renesas' mature 90nm embedded Flash process, which is currently the fastest in the industry with a 10ns maximum read access time and is designed for optimized power consumption all the way up to full 100MHz operation.
- Design solutions in the RX600 series are scalable. Over 75 products are available now and about 300 products are expected by the end of 2011, offering Flash memory from 32KB to 2MB and packages with 48 to 177 pins.
- The companion low-voltage RX200 series will be available in Spring, 2011. These more economical MCUs operate down to lower voltages (as low as 1.62V), consume less power, and come in smaller packages and memory sizes. The RX200 and RX600 share the same CPU core and integrate many of the same peripherals for easy migration between the two series.

- ***Renesas is the number one MCU supplier world-wide[1], with a 30% market share.***
- RX MCUs come with comprehensive system development support, including a vast range of easy-to-use boards, tools, software, middleware, and RTOSs from Renesas and third-party suppliers, comprising a rich ecosystem of products for accelerating progress in design cycles and shrinking time to market.

Superior Architecture

- **RX CPU Core with FPU and DSP: 165 DMIPS at 100MHz, 2.25 CoreMark™/MHz[2]**
- **Enhanced Harvard architecture and 5-stage pipeline**
- **More than six internal busses**
- **Multiple Direct Memory Access control**
- **Rapid interrupt response**

Fast Flash

- **Industry's only 90nm 100 MHz embedded Flash**
- **CPU receives instructions with no delays**
- **Mature and reliable silicon process**

Power Efficiency

- **500µA/MHz, with all peripherals active**
- **1.4µA RTC Deep Standby (RX631/63N)**
- **1mW per DMIPS**
- **Extends battery life in portable applications**

Code Efficiency

- **Up to 28% code size savings[3] compared to popular 32-bit RISC MCUs on the market**
- **Variable-length CISC instructions**
- **FPU, DSP and bit manipulation instructions**

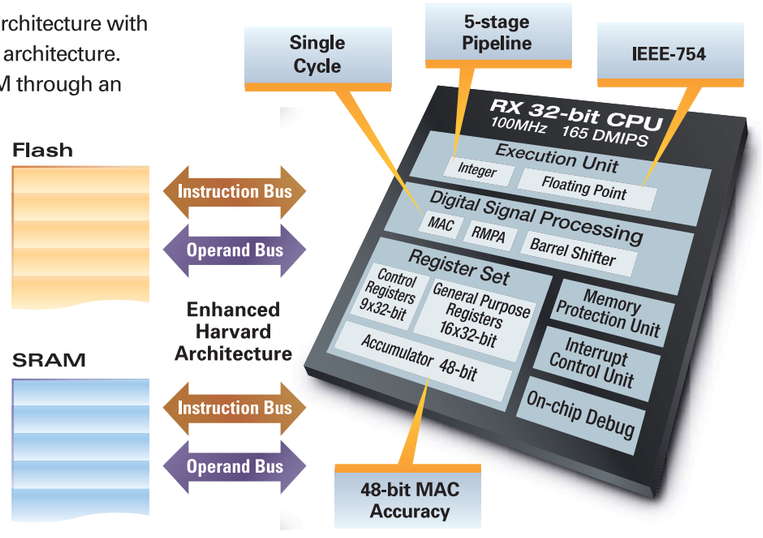
Footnotes:
1: Source: Gartner 2009 Worldwide Semiconductor Market Share Database, March 2010 results
2: Source: www.coremark.org as of Jan. 2011
3: Source: Renesas internal testing

Advanced Design and Integration

RX600 Key Benefits

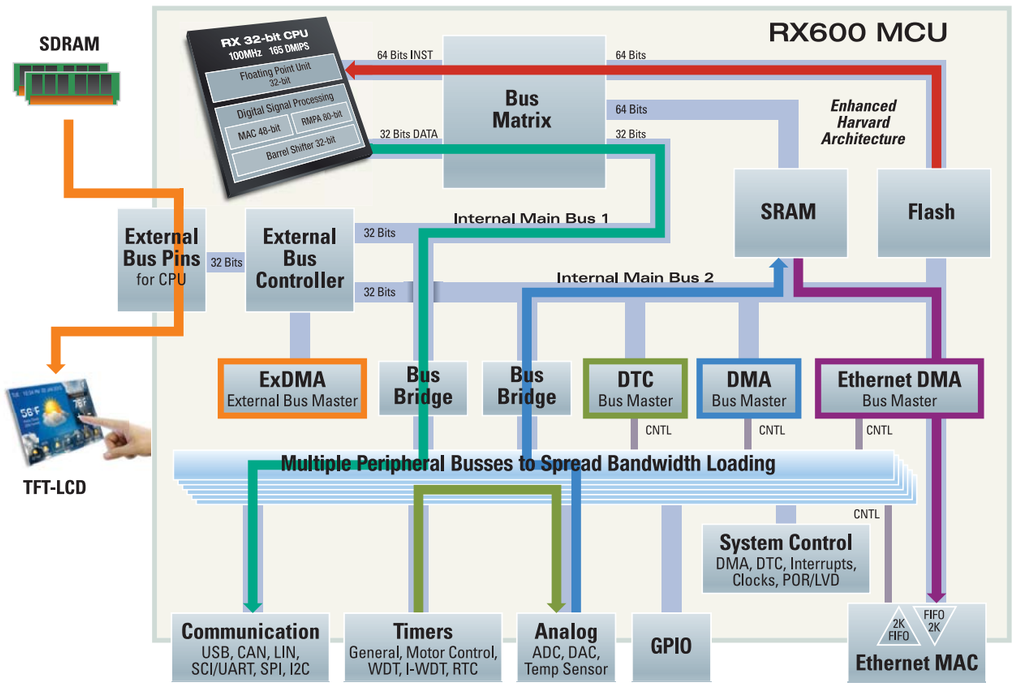
The RX Core marries the speed of a RISC architecture with the flexibility and code efficiency of a CISC architecture. The CPU interacts with the Flash and SRAM through an enhanced Harvard design. The RX Core leverages the industry's fastest Flash memory, delivering 1.65 DMIPS/MHz and 2.25 CoreMark/MHz without wait states.

Tightly coupled to the RX Core are the FPU, MAC, and RMPA (Repeat Multiply Accumulate), which are efficiently driven by DSP and floating point instructions to meet the growing demand of DSC (Digital Signal Controller) type applications.



Simultaneous Data Transfers

The RX Core uses a large number of parallel busses to handle simultaneous movement of data between the CPU core, Flash, SRAM, and peripherals. Six different peripheral busses enable a flexible distribution of slow and fast peripherals for optimized throughput. An external bus with an independent DMA can move data directly from one external device to another external device, such as a graphic frame buffer to a TFT-LCD panel.



Independent Data Transfers

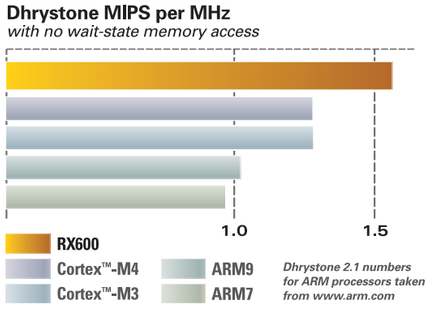
- *Fetch instructions*
- *Transmit USB data*
- *Move Ethernet data packets out of SDRAM*
- *Move RGB data from external SDRAM to TFT-LCD*

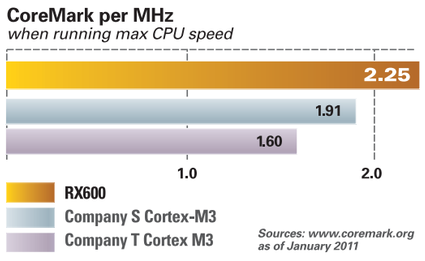
Interleaving Data Transfers

- *Load ADC values into SRAM*
- *Timer data written to DAC output*

Performance

The RX Core delivers 1.65 DMIPS per MHz, achieving 165 DMIPS when running at 100MHz.

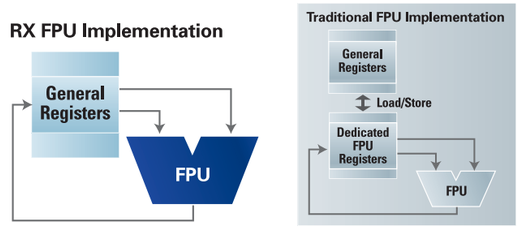




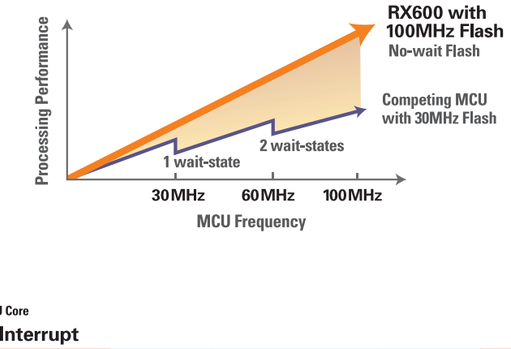
Superior FPU Implementation

The RX FPU implementation allows direct access to general registers, resulting in faster execution and smaller code size.

- RX eliminates the overhead of load/store operations
- Results in higher performance and smaller code size



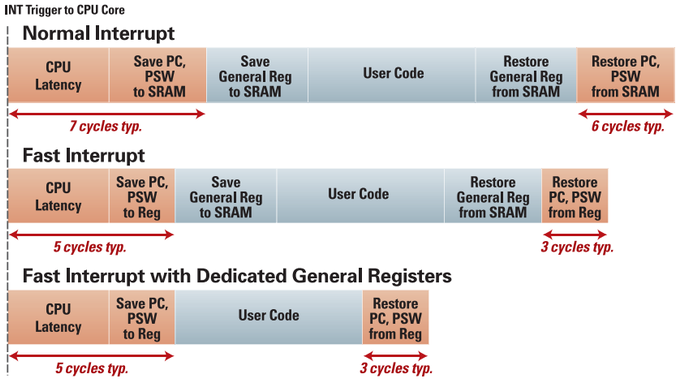
Industry's only 100MHz On-chip Flash



Efficient Interrupt Handling

There are flexible options to achieve minimum latency for various scenarios:

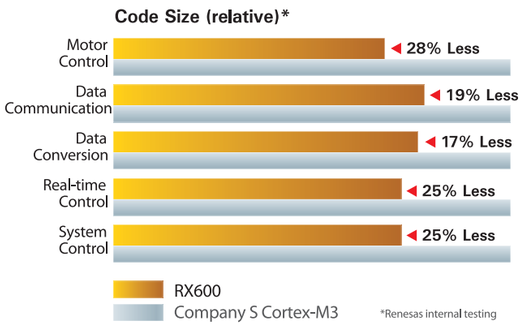
- Normal interrupt responds in as few as seven CPU clock cycles from the event until the firmware serves the interrupt.
- Fast interrupt mode can be assigned dynamically to any interrupt source, responding in just five CPU clocks, using dedicated registers to save and restore the CPU state.
- All interrupt service routines can be shortened by dedicating up to four RX CPU general registers for use only by interrupts, eliminating the need to push and pop the registers to and from the stack.



Substantial Code Size Reduction

The RX CISC CPU architecture has inherent advantages over RISC CPUs in terms of code size, with RX's variable length instructions ranging from 8 bits to 64 bits, allowing the compiler to select just the right instruction to do the job.

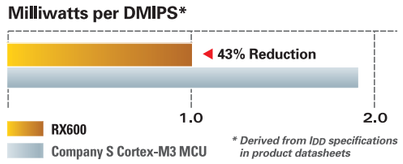
- Many RISC MCUs have only two instruction lengths, 16 bits and 32 bits, so the compiler must make compromises.
- RX CPU supports 10 addressing modes, which optimize manipulation and movement of data.
- Compiled RX code has been measured as much as 28% smaller than the same code compiled on a popular RISC MCU.



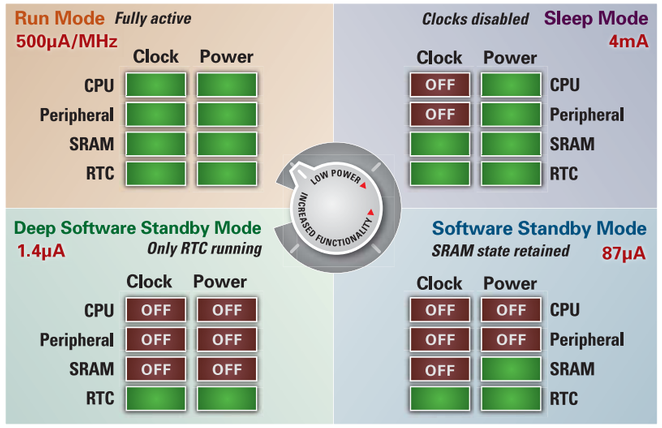
Highly Effective Power Management

Strike an optimized balance of performance and power consumption with many low-power modes of operation enabled by these design techniques:

- Flexible system clocking and gating for each peripheral
- Selective power domain gating for unused sections of the device
- Low-power, high-voltage threshold transistors minimize leakage



> Compared to a Cortex-M3 based MCU, an RX600 chip enables up to a 43% power reduction – consuming only 1mW per DMIPS

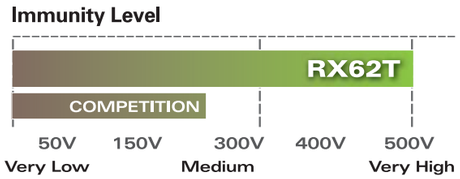


> The RX Series has four power modes to manage precious battery energy consumption without compromising performance

EMC Advantages – Built-in to Eliminate Add-Ons

Outstanding EMC performance of RX600 MCUs reduces system-integration problems, lowers development costs, and shortens design cycles. BOM costs drop, too, because external components can be eliminated.

- Strong electromagnetic immunity boosts system reliability
- Careful VCC and VSS layout
- Noise filters on input signals
- Advanced chip layout techniques



LANGER EMV-Technik

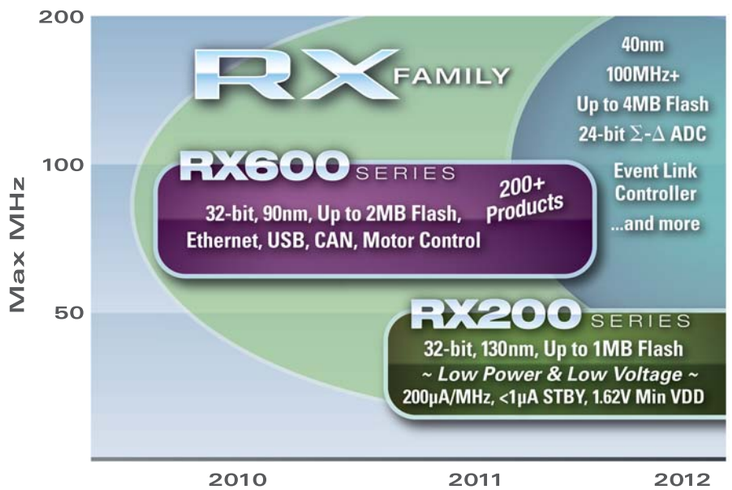
"Langer EMV and Renesas Electronics today announced that the RX600 microcontroller (MCU) family is the most robust MCU Langer EMV has ever tested against environmental noise"

Renesas press release, October 21, 2010

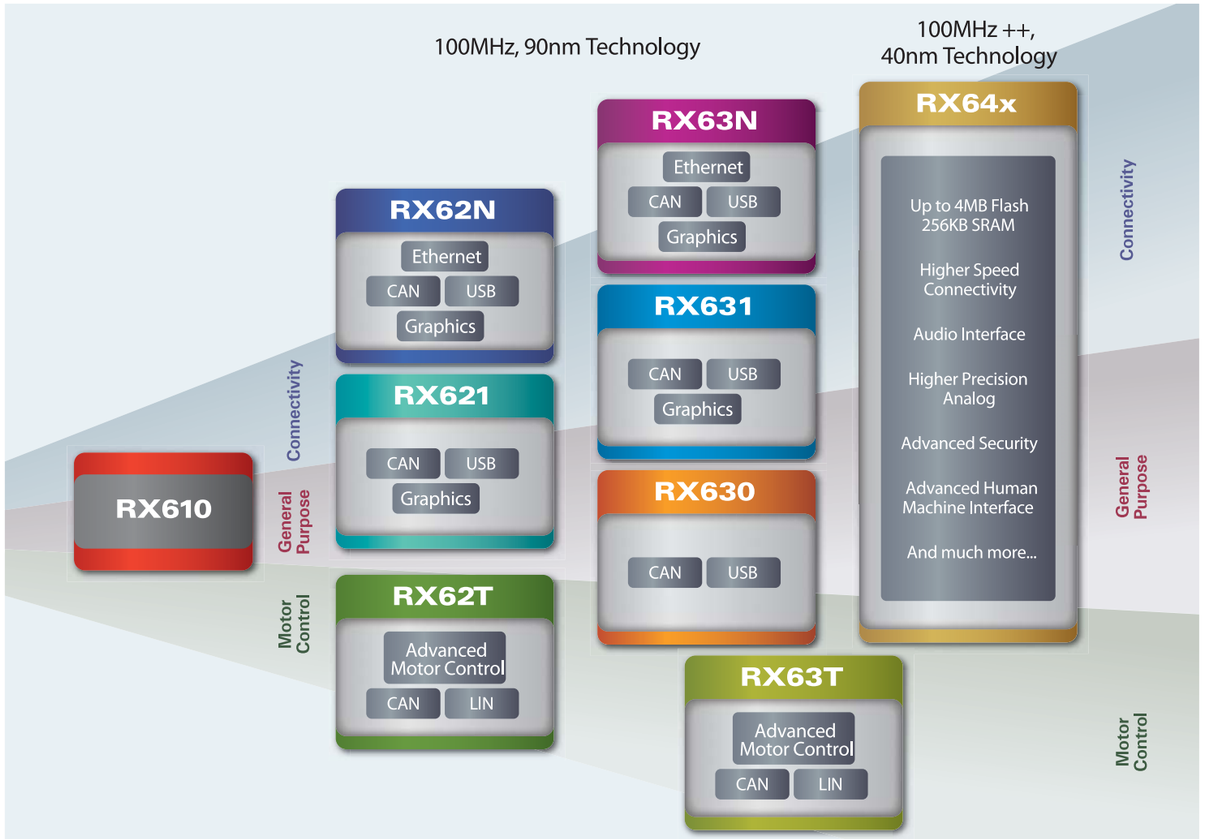
RX Family Product Portfolio

The RX family currently consists of two extensive product series. MCUs in the RX600 series are optimized for applications requiring high-performance, high-efficiency processors. Devices in the RX200 series being introduced in 2011 will expand the range of compatible system-design choices, adding smaller, lower power devices with fewer pins.

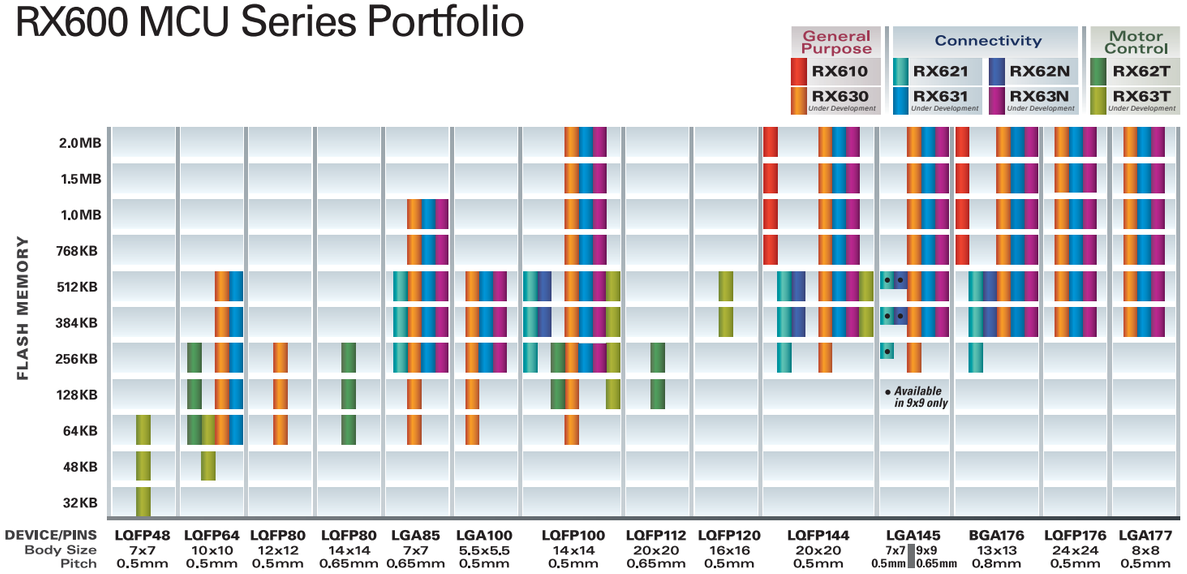
Migration from existing Renesas architectures to RX solutions is easy. And, of course, moving designs among RX family members is very easy, since RX600 and RX200 MCUs share the same CPU architecture and peripherals. This gives system engineers valuable design flexibility and provides substantial head starts on reusing software assets. New products for niche markets can be created quickly and efficiently, as can upgraded or simplified versions of existing products for addressing changes in customer preferences.



RX600 MCU Series Roadmap



RX600 MCU Series Portfolio



Comprehensive On-chip Peripherals

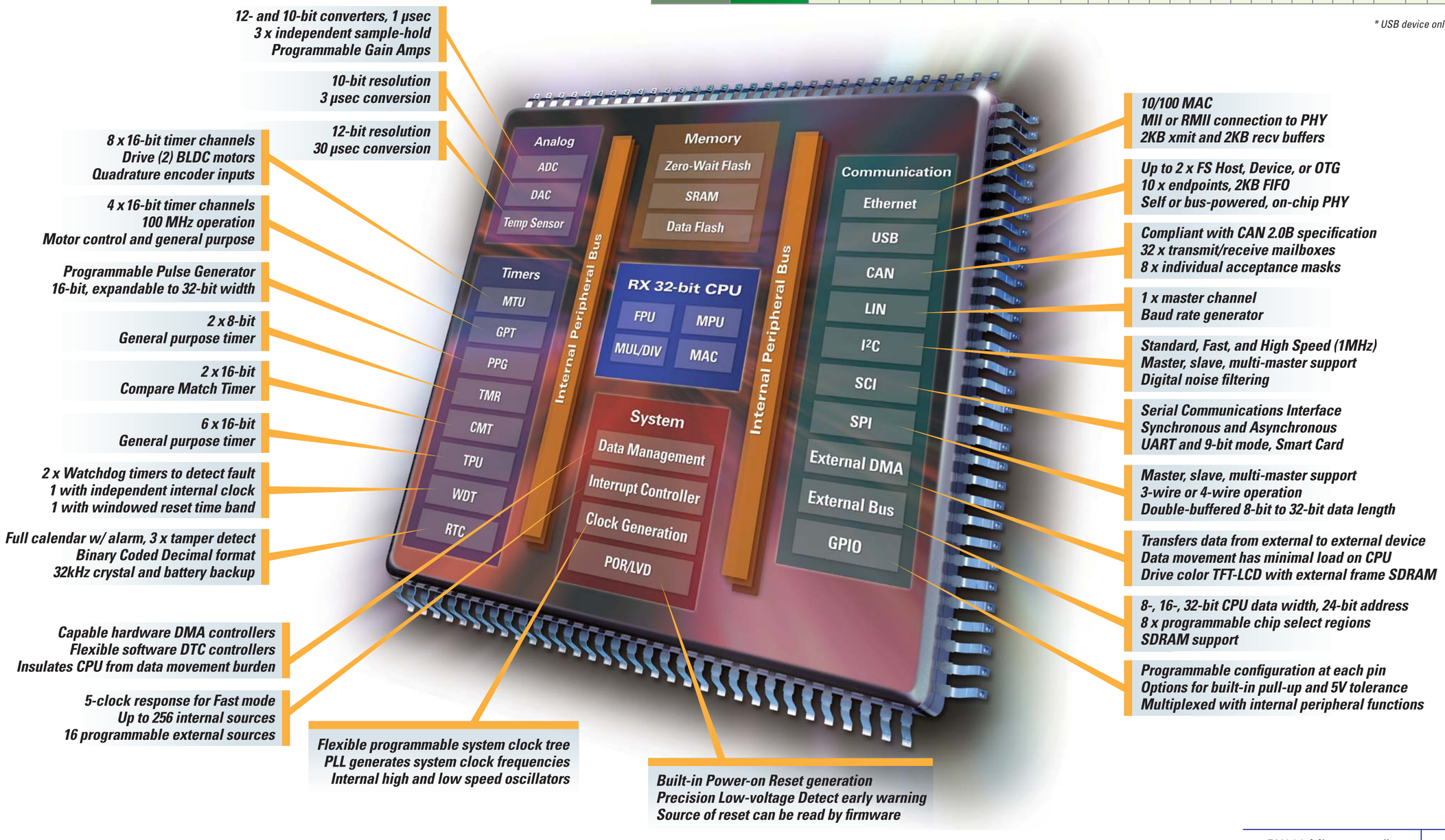
To save cost, simplify system designs, reduce total system power consumption, and enable the implementation of value-added features, a wide range of on-chip peripheral functions is clustered around the powerful CPU core of RX MCUs. Broadly categorized into analog, timer, communication and system functions, these numerous peripherals are proven designs delivering impressive performance. The many different types of RX MCUs offer diverse sets of functions, so chip capabilities and cost can be matched to application needs. The devices in the RX621/62N and RX62T product groups exemplify this diversity and optimization.

		Advanced Peripherals							Basic Peripheral Set																										
		Connectivity				Advanced Motor			Memory			Analog				Timers									Communication										
	Group	Ethernet 10/100 MAC	USB 2.0 Host/Device/OTG	CAN 2.0B	Graphics ExDMA	Advanced ADC 12-bit	MTU3	GPT	Flash (max)	SRAM (max)	Data Flash	ADC 10-bit	DAC 10-bit	ADC 12-bit	Temp Sensor	MTU2	TPU	PPG	TMR	CMT	WDT	I-WDT	RTC	I2C	SCI	ExBus	SPI	LIN							
Connectivity	RX621	–	1	1	1	–	–	–	512KB	96KB	32KB	–	2	12	–	12	–	8	4	4	1	1	1	2	6	8/16/32	2	–							
	RX631	–	2	3	1	–	–	–	1MB	128KB	32KB	8	2	21	1	6	12	8	4	4	1	1	1	4	13	8/16/32	3	–							
	RX62N	1	2	1	1	–	–	–	512KB	96KB	32KB	–	2	8	–	12	–	8	4	4	1	1	1	2	6	8/16/32	2	–							
	RX63N	1	2	3	1	–	–	–	1MB	128KB	32KB	8	2	21	1	6	12	8	4	4	1	1	1	4	13	8/16/32	3	–							
General Purpose	RX610	–	–	–	–	–	–	–	2MB	128KB	32KB	16	2	–	–	–	12	8	4	4	1	–	–	2	7	8/16	–	–							
	RX630	–	1*	3	–	–	–	–	2MB	128KB	32KB	8	2	21	1	6	12	8	4	4	1	1	1	4	13	8/16	3	–							
Motor Control	RX62T	–	–	1	–	8	8	4	256KB	16KB	8KB	12	–	–	–	–	–	–	–	4	1	1	–	1	3	–	1	1							

** USB device only*

> RX621/62N MCUs provide extensive communication peripherals with options for Ethernet, CAN, and up to two USB-FS 2.0 channels, each operating as USB Host, USB Device, or USB OTG (On the Go). Additionally, they offer up to six SCI, two SPI, and two I²C serial channels. Among their other peripherals are analog interfaces; timers; RTC and POR/LVD functions; and more.

> RX62T MCUs provide improved motor/inverter control timers and enhanced analog peripherals for implementing very precise motor control and positioning applications. The MTU3 and GPT timer peripherals enable one MCU to control three motors simultaneously. An FPU and improved analog functions make these MCUs ideal for use with three-shunt or single-shunt vector-type motor control methods.



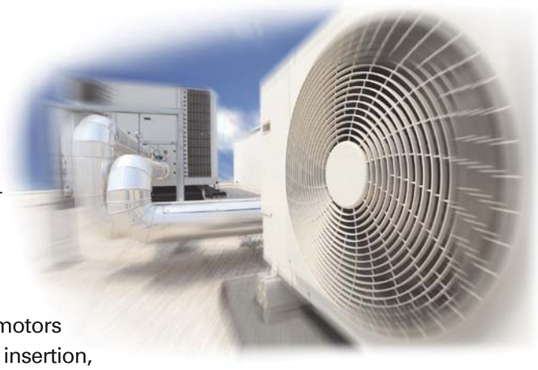
RX600 MCU Series Devices

Device		Operation		Memory			Serial Interface							Parallel Interface		Timer				Analog					GPIO	Package
Group	Part Number	Speed (MHz) Max CPU	Volt Range (V)	Flash (KB)	SRAM (KB)	Data Flash (KB)	Ethernet MAC	USB Host Dev OTG	CAN	SCI	SPI	I2C	LIN	Ext Data Bus	TFT-LCD	8-bit	16-bit	RTC	WDG	12-bit ADC	10-bit ADC	10-bit DAC	Prog Op Amp	POR LVD		
RX610	R5F56108WDBG	100	3.0-3.6	2048	128	32	–	–	–	7	7	2	–	Y	–	4	22	–	1	–	16	2	–	–	140	BGA176
	R5F56107WDBG			1536																						
	R5F56106WDBG			1024																						
	R5F56104WDBG			768																						
	R5F56108VDFP	100	3.0-3.6	2048	128	32	–	–	–	7	7	2	–	Y	–	4	22	–	1	–	16	2	–	–	117	LQFP144
	R5F56107VDFP			1536																						
	R5F56106VDFP			1024																						
	R5F56104VDFP			768																						
RX621	R5F56218BDBG	100	2.7-3.6	512	96	32	–	2	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	128	BGA176
	R5F56217BDBG			384	64																					
	R5F56216BDBG			256	64																					
	R5F56218BDLE	100	2.7-3.6	512	96	32	–	1	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	105	LGA145
	R5F56217BDLE			384	64																					
	R5F56216BDLE			256	64																					
	R5F56218BDFB	100	2.7-3.6	512	96	32	–	1	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	105	LQFP144
	R5F56217BDFB			384	64																					
	R5F56216BDFB			256	64																					
	R5F56218BDFP	100	2.7-3.6	512	96	32	–	1	1	6	2	2	–	Y	–	4	16	Y	2	8 or 8		2	–	Y	74	LQFP100
	R5F56217BDFP			384	64																					
	R5F56216BDFP			256	64																					
	R5F56218BDLD	100	2.7-3.6	512	96	32	–	1	1	6	2	2	–	Y	–	4	16	Y	2	8 or 8		2	–	Y	60	LGA85
	R5F56217BDLD			384	64																					
	R5F56216BDLD			256	64																					
RX62N	R5F562N8BDBG	100	2.7-3.6	512	96	32	Y	2	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	128	BGA176
	R5F562N8ADBG								–																	
	R5F562N7BDBG	100	2.7-3.6	384	64	32	Y	2	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	128	
	R5F562N7ADBG								–																	
	R5F562N8BDLE	100	2.7-3.6	512	96	32	Y	1	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	105	LGA145
	R5F562N8ADLE								–																	
	R5F562N7BDLE	100	2.7-3.6	384	64	32	Y	1	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	105	
	R5F562N7ADLE								–																	
	R5F562N8BDFB	100	2.7-3.6	512	96	32	Y	1	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	105	LQFP144
	R5F562N8ADFB								–																	
	R5F562N7BDFB	100	2.7-3.6	384	64	32	Y	1	1	6	2	2	–	SDRAM	Y	4	16	Y	2	8 or 8		2	–	Y	105	
	R5F562N7ADFB								–																	
	R5F562N8BDFP	100	2.7-3.6	512	96	32	Y	1	1	6	2	2	–	Y	–	4	16	Y	2	8 or 8		2	–	Y	74	LQFP100
	R5F562N8ADFP								–			1										1				
	R5F562N7BDFP	100	2.7-3.6	384	64	32	Y	1	1	6	2	1	–	Y	–	4	16	Y	2	8 or 8		1	–	Y	74	
	R5F562N7ADFP					8			–																	
RX62T	R5F562TAADFH	100	4.0-5.5	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	61	LQF112
	R5F562T7ADFH			128	8	8																				
	R5F562TABDFH	100	2.7-5.5	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	61	
	R5F562TADDFH			128	8				–																	
	R5F562T7BDFH	100	4.0-5.5	128	8	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	61	
	R5F562T7DDFH			256	16																					
	R5F562TAEDFH	100	2.7-5.5	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	61	
	R5F562T7EDFH			128	8																					
	R5F562TABDFP	100	2.7-5.5	256	16	32	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	55	LQFP100
	R5F562TAADFP		4.0-5.5						–																	
	R5F562TAEDFP		2.7-5.5						1																	
	R5F562TADDFP		4.0-5.5						–																	
	R5F562T7BDFP	100	2.7-5.5	128	8	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	55	
	R5F562T7ADFP		4.0-5.5						–																	
	R5F562T7EDFP		2.7-5.5						1																	
	R5F562T7DDFP		4.0-5.5						–																	
	R5F562TAADFF	100	4.0-5.5	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	44	LQF80
	R5F562T7ADFF		4.0-5.5	128	8																					
	R5F562T6ADFF		4.0-5.6	64	8																					
	R5F562TABDFF	100	2.7-5.5	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	44	
	R5F562T6BDFF		2.7-5.6	64	8																					
	R5F562TADDFF	100	4.0-5.6	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	44	
	R5F562T7DDFF		4.0-5.7	128	8																					
	R5F562T6DFFF		4.0-5.8	64	8																					
	R5F562TAEDFF	100	2.7-5.6	256	16	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	12	–	6	Y	44	
	R5F562T7EDFF		2.7-5.7	128	8																					
	R5F562T6EDFF		2.7-5.8	64	8																					
	R5F562TABDFM	100	2.7-5.5	256	16	32	–	–	1	3	1	1	1	–	–	–	14	–	2	8	–	–	6	Y	37	LQFP64
	R5F562TAADFM	80	4.0-5.5						–																	
	R5F562TAEDFM	100	2.7-5.5	256	16	32	–	–	1	3	1	1	1	–	–	–	14	–	2	8	–	–	6	Y	37	
	R5F562TADDFM	80	4.0-5.5						–																	
	R5F562T7BDFM	100	2.7-5.5	128	8	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	–	–	6	Y	37	
	R5F562T7ADFM	80	4.0-5.5						–																	
	R5F562T7EDFM	100	2.7-5.5	128	8	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	–	–	6	Y	37	
	R5F562T7DDFM	80	4.0-5.5						–																	
	R5F562T6BDFM	100	2.7-5.5	64	8	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	–	–	6	Y	37	
	R5F562T6ADFM	80	4.0-5.5						–																	
	R5F562T6EDFM	100	2.7-5.5	64	8	8	–	–	1	3	1	1	1	–	–	–	14	–	2	8	–	–	6	Y	37	
	R5F562T6DDFM	80	4.0-5.5						–																	

Design Potential and Versatility of the RX

System design versatility, application capability, and economic sensibility are built into the many microcontrollers in the RX family. Driven by a technology roadmap that anticipates more sophisticated applications in the next decade that demand cost effectiveness, RX devices offer abundant core performance and extensive peripheral functions.

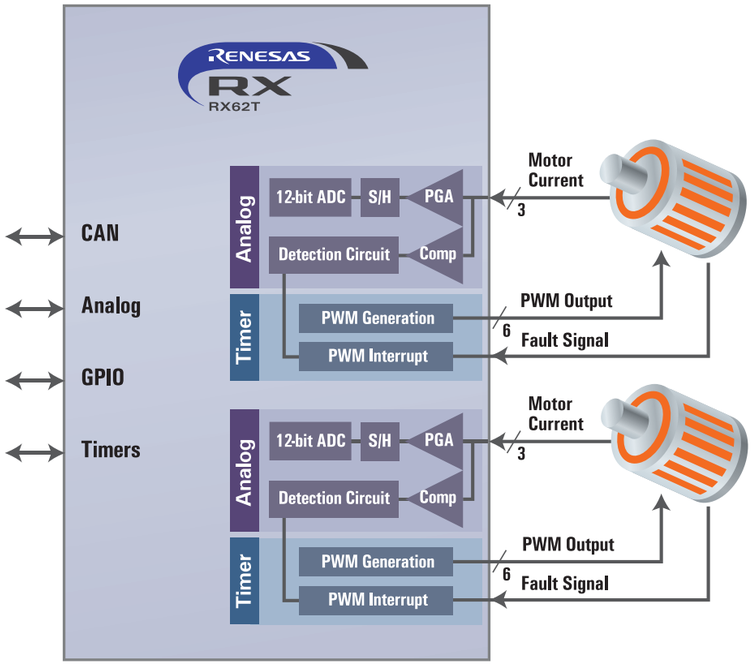
RX62T for Motor Control



High-performance CPU and FPU capability, and advanced analog and timer peripherals, make the RX62T an ideal solution for inverter and motor control applications. Renesas can help you develop your motor control solution with kits and firmware that support many kinds of motor control, including ultra-quiet, energy-efficient, and high-precision three-phase sensorless vector control.

In the home appliance example shown here, the RX62T is driving two three-phase motors simultaneously using its advanced PWM timers. These timers are well suited for Brushless DC three-phase motors by having complimentary PWM outputs with automatic dead-time insertion, an emergency "Shut-down" (stop) input, and quadrature encoder inputs for speed and direction feedback.

The RX62T's advanced analog subsystem with multiple sample-hold circuits enables sampling of three simultaneous current measurements. It also offers programmable operational amplifiers and integrated window comparators to eliminate external components. The 12-bit ADCs have a fast 1µsec conversion time, can be triggered by the PWM timers, and provide self-diagnostic capability.



Advanced Analog

- Two 12-bit ADC units, each with 4 input channels, 1 µsec conversion time and self-diagnostic capability
- Each 12-bit ADC unit has
  - 3 x independent sample-hold circuits
  - 3 x programmable op amps
  - 3 x analog window comparators
  - 3 trigger sources (PWM timers, external and software)

Advanced Timers

- 100 MHz, 16-bit Multifunction Timer unit (MTU3)
- 100 MHz, 16-bit General Purpose Timer unit (GPT)
- Complimentary PWM and Reset-Synchronous outputs
- Dead-time insertion
- Quadrature encoder inputs
- Emergency motor "Shut-down" (stop) input

RX for Connectivity

RX MCUs provide built-in hardware for implementing efficient communications with external peripherals, systems, test equipment and networks such as the Internet. The Ethernet, USB and CAN connectivity modules are well-proven, reliable designs.

Ethernet MAC

- 10/100 Mbps
- 2KB TX FIFO
- 2KB RX FIFO
- MII, RMII connection to PHY
- Wake on LAN

USB

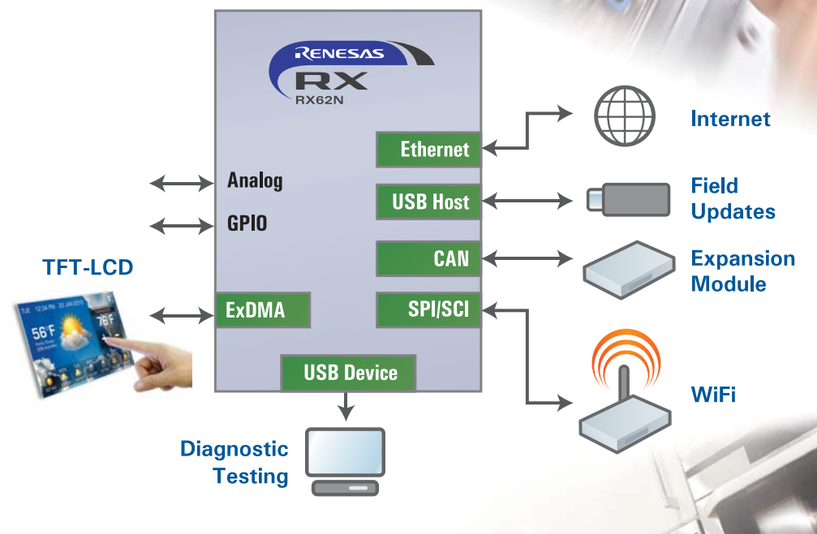
- Host/Device/OTG
- 12 Mbps
- Up to 2 ports
- 10 Endpoints
- 2KB FIFO

CAN

- ISO11898-1
- 1 Mbps
- 32 Mailboxes

SPI/SCI

- Up to 18MHz (SPI Master)
- Flexible configurations

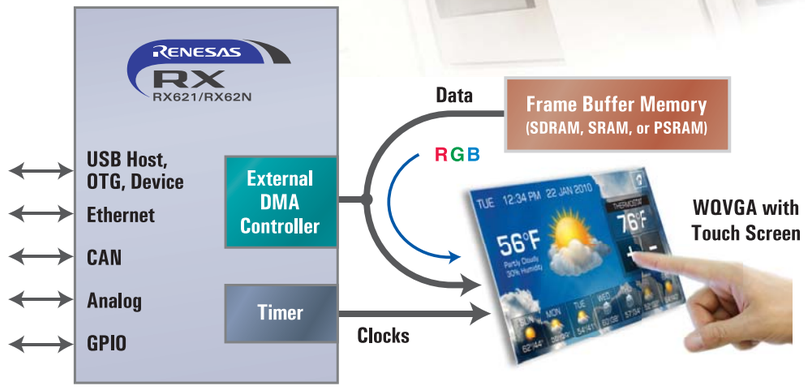


RX for TFT-LCD Applications

The external DMA controller integrated into RX devices can drive a TFT-LCD panel directly, greatly reducing the load on the MCU's CPU; thus, maximizing the performance of application software.

External DMA Controller

- Directly drive a TFT-LCD panel
- RGB pixel data moves directly from frame buffer to the TFT-LCD and never enters the RX MCU
- RX CPU is loaded only 5%, while refreshing at 60Hz
- Plenty of CPU bandwidth remains to run the application, communication channels, and create moderate animation on the TFT-LCD



Get up and running with the RX Ecosystem

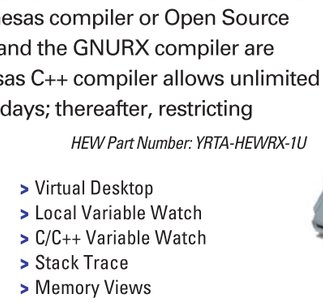
Renesas makes it easy to launch new system designs. And our comprehensive range of hardware and software tools – including very low cost and free products – helps swiftly advance the product development process from concept stage to final RX-based design.

System Development Kits

- The Renesas Starter Kit (RSK) facilitates in-depth MCU experimentation and allows system design development
- Renesas RX62N Demo Kit (RDK) aids familiarization with and evaluations of RX solutions

Renesas RX Starter Kit (RSK)

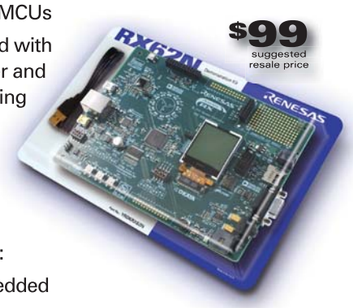
- This complete RX600-based hardware/software platform for in-depth application design includes the E1 Debugger, a trial version of the HEW IDE, and demonstration firmware.



Processor	*RSK Part Number*
RX610	R0K556100S000BE
RX62N	R0K5562N0S000BE
RX62T	R0K5562T0S000BE

Renesas Demonstration Kit (RDK)

- This board plugs into a PC's USB port to showcase the features and capabilities of RX600 MCUs
- 96MHz RX62N MCU board with J-Link integrated debugger and huge peripheral set including Ethernet, CAN and USB
- Graphic display
- 3-axis accelerometer
- Audio in/out
- Installation CD containing:
  - High-performance Embedded Workshop (HEW)
  - RX Family C/C++ toolchains (Renesas 128K evaluation version, full GNU version)
  - Quick-start guide, RX62N sample projects
- Shared firmware projects at www.renesas.com/RDKRX62N



Part number: **YRDKRX62N**

Application Development Tools

RX MCUs are supported by a comprehensive set of popular Renesas hardware and software tools that have been widely praised for their capabilities and ease of use. Additional support is provided by a dedicated community of third-party experts offering many helpful, time-saving products and services, including the development environments and optimized compilers from KPIT Cummins (GNURX) and IAR.

HEW: A Complete Integrated Development Environment (IDE)

HEW accelerates progress on the full range of system design tasks, from editing, to peripheral driver generation, to compilation, to debugging, and to Flash programming. HEW works with the Renesas compiler or Open Source GNURX compiler. HEW and the GNURX compiler are both free. The free Renesas C++ compiler allows unlimited binary output size for 60 days; thereafter, restricting compile size to 128 KB.

HEW Part Number: YRTA-HEWRX-1U

- Project Manager
- Output Window
- Built-in Editor
- Full Bus Trace
- Peripheral Driver Generator
- Virtual Desktop
- Local Variable Watch
- C/C++ Variable Watch
- Stack Trace
- Memory Views
- Debug Control (E1, E20, J-Link)

Complete Debugging, Emulation, and Programming

On-chip debugging of an RX-based application is performed via JTAG connection to the target and USB connection to the Windows-based IDE. E1 and J-Link offer thorough CPU control and visibility. E20 adds high-speed tracing.

Renesas E1
R0E000010KCE00

Renesas E20
R0E000200KCT00

SEGGER
J-Link

Support Software

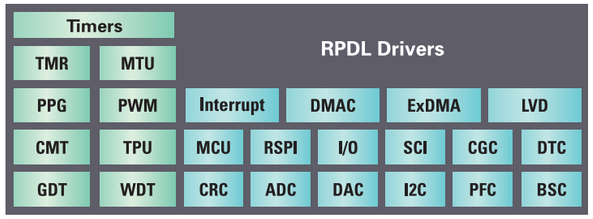
Renesas Software Library

Renesas offers a wide variety of free sample code and libraries supporting applications using Ethernet, USB, CAN, DSP, Motor Control, PCM Audio and Graphics. Renesas also provides the Renesas Peripheral Driver Library (RPDL) and the Peripheral Driver Generator (PDG) free of charge.

GRAPHICS | CAN | PCM AUDIO | MOTOR CONTROL | DSP LIBRARY | USB | TCP/IP

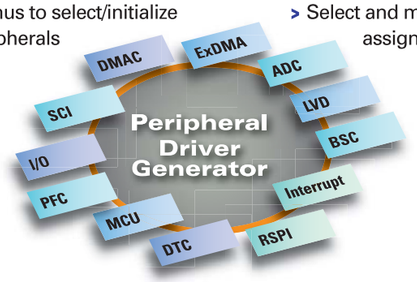
Renesas Peripheral Driver Library (RPDL)

Low-level firmware drivers for all basic RX peripherals are free, source code included. RPDL eliminates the need for creating your drivers, saving time and reducing errors. RPDL functions are easily integrated into HEW projects, and PDG can be used to generate initialization code and calls to RDPL functions based on your own specified configuration.



Renesas Peripheral Driver Generator (PDG)

- A Windows user interface for configuring RX peripherals and pins
- Menus to select/initialize peripherals
- Generates C code calls to RPDL driver functions
- Select and manage pin assignments



Third-party RTOS and Middleware

RX600 devices are well suited for embedded real time tasks, high computation, as well as simultaneous data transfers on many high-speed communication channels. Because of this, communication middleware and Real Time Operating Systems (RTOS) are commonly needed. Renesas has established technology partnerships with many leading independent suppliers to provide high-quality, cost-effective solutions.

	RTOS	USB Stack	TCP/IP Stack	File System	Graphic Software	W-iFi	BlueTooth
CandleDragon Inc.							✓
CMX Systems	✓	✓	✓	✓			
Crank Software Inc.					✓		
Micrium	✓	✓	✓	✓	✓		
Redpine Signals						✓	
RoweBots Research	✓	✓	✓	✓			
SEGGER	✓	✓	✓	✓	✓		
FreeRTOS	✓		✓				
HCC-Embedded		✓					
Express Logic	✓	✓	✓	✓			

Additional Renesas MCU Support

ALLIANCE PARTNER RENESAS

- The Alliance Partner Program allows you to connect instantly with hundreds of qualified design consulting and contracting professionals.

www.cn.renesas.com/alliance

RENESAS UNIVERSITY PROGRAM

- For educators and students. Teach with professional grade tools. Learn MCUs with a modern architecture.

www.cn.renesas.com/university

Renesas INTERACTIVE

- Gain the technical knowledge you need. Research and learn at your own pace, where you want, when you want, for free.

www.renesasinteractive.com

RenesasRulz.com
Think it. Build it. Post it.

MyRenesas

- Gathering place for technical information on Renesas MCUs and MPUs.

www.cn.renesas.com/MyRenesas

Solution Kits for RX

RX Direct-drive Solutions for TFT-LCD

A quick and easy solution to add color TFT-LCD to your design

- Low-cost 32-bit MCU solution to drive color TFT-LCD panels up to WQVGA resolution
- Only 5% loading on CPU when refreshing the TFT-LCD panel at 60Hz, with ample bandwidth left for running the rest of the application
- Free graphics API library and examples for evaluating graphics
- Third-party support for additional graphics requirements

Part number:
YLCDRSKRX62NS

WiFi Starter Kit Featuring the RX62N

For designs that require 802.11n connectivity, ultra-low power and high performance

- Self-contained, compact size
- WiFi modules for 802.11b/g/n or 802.11a/b/g/n
- FCC/IC/CE certified
- Throughput of up to 8Mbps
- Standby current as low as 0.5mA
- Free WiFi module API library
- Connects to MCU using SPI or UART interfaces
- Integrated encryption support for Open, WEP, WPA/WPA2-PSK (TKIP and AES) modes of operation
- WiFi modules with or without integrated TCP/IP stack

Kit sold thru Redpine Signals
Part number: **RS-RX62N-2201**
www.redpinesignals.com

Motor Control Solutions Using the RX MCU

A solid evaluation and development platform for motor control

- Drive sensorless PMAC motors
- Field oriented control, 3-phases
- Single PCB: inverter + MCU
- High-frequency modulation >20kHz
- Demo code and library
- Compact and small board USB powered
- E1, HEW, Renesas compiler unlimited for 60 days, 128KB code size limit after

Part number:
YRMCKITRX62T

Connectivity Solutions Using the RX62N

Explore connectivity through many possible layouts utilizing an integrated kit with CAN, USB and Ethernet

- Two RX-based boards connected to each other through different connectivity options
- Cables, Internet hub, debuggers included
- Free software with ready-to-run demos
- Integrated firmware
- RX62N, 512KB Flash, 96KB RAM

Coming Soon!

RX is Online – www.rxmcu.com

Renesas makes product data, design and application information, and much more available 24/7 in the RX area of our website. Bookmark it and visit it often to get the latest data on the newest and previously released devices, learn details about (and download free versions of) system development tools, use time-saving MCU-selection aids, participate in discussion forums, find out about upcoming events, take advantage of special promotions, and more.

- ***The handy Quick Device Selector will find just the right MCU for you according to your connectivity, flash, RAM and pin requirements.***

Online purchase: ***www.cn.renesas.com/easygo***

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http://www.cn.renesas.com

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