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BIG IDEAS FOR EVERY SPACE

RENESAS RA

32-BIT MCU FAMILY

RENESAS RA6T2 GROUP

240MHz Arm® Cortex®-M33, Motor/Inverter Control ASSP with High Real-time Performance

The Renesas RA6T2 Group, as part of the wide scalable RA6 Series, is optimized for enhanced Motor/Inverter control. The RA6T2 is built on a highly efficient 40nm process and equipped various peripherals and high speed memory suitable for application where performance matters most. To make engineers application design easy, RA6T2 is supported by the Flexible Software package (FSP) including motor control specific control code. Embedded new H/W accelerators reduce the CPU load, which free RA6T2 resources for other tasks. The provided solutions make the RA6T2 to a perfect choice for Quick Time to market.

Renesas RA6 Series	RA6T1	RA6T2
Performance Range	120MHz, Arm® Cortex®-M4	240MHz, Arm® Cortex®-M33
Memory Range	512kB Flash, 64kB RAM	512kB Flash, 64kB RAM
Package	64, 100pin LQFP	48, 64, 100pin LQFP 48, 64pin QFN
PWM Timer	●	●
Analog Function	● 12bit ADC, PGA, Comparator	● 16bit ADC, PGA, Comparator
Other Features	Safety, Security	HW accelerator for motor, Safety, Security

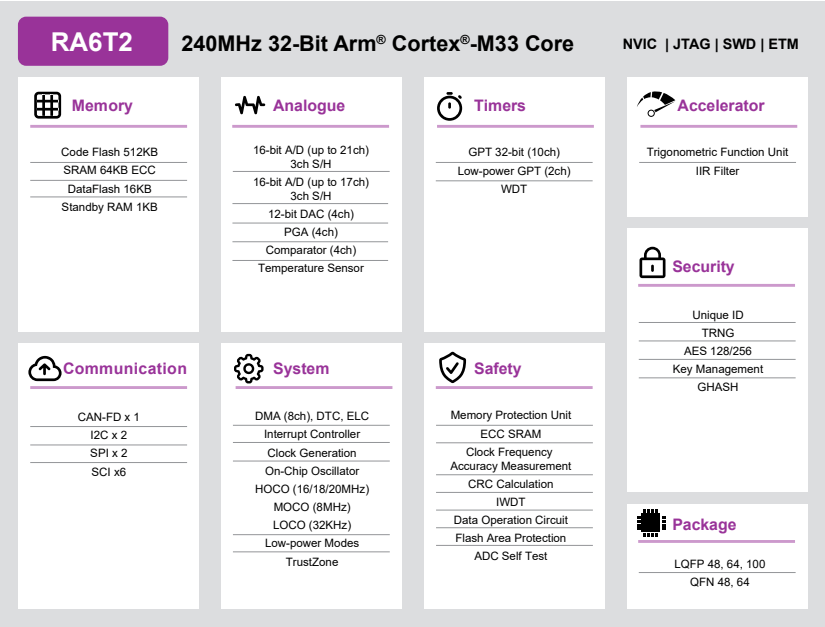
Target Applications

- Smart Home Applications
  - Air conditioner (outdoor unit)
  - Washing machine
  - IH cooker
  - Power tools
- Industrial Automation
  - AC drive
  - AC servo
  - Solar inverter

Key Features

- 240MHz Arm Cortex-M33 with TrustZone
- 256kB – 512kB Flash memory and 64kB ECC SRAM
- 16kB Data Flash to store data as in EEPROM
- Scalable from 48-pin to 100-pin packages
- PWM timer
- 16bit ADC
- Programmable gain amp
- High speed comparator
- 12bit DAC
- SCI (UART, Simple SPI, Simple I2C)
- SPI/I2C multi-master interface
- CAN-FD

Block Diagram



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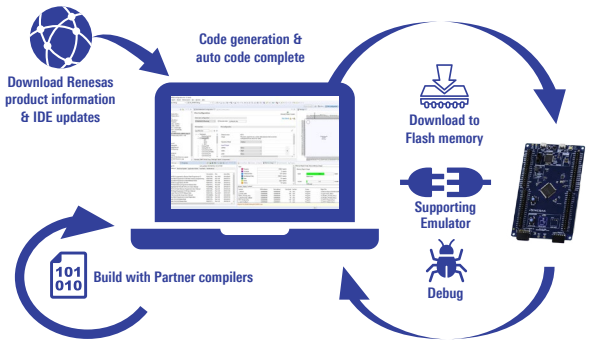
Benefits

- The fusion of Renesas 120MHz high-speed embedded flash memory and 240MHz Arm Cortex-M33 core realizes high real-time performance, which is the most important for motor/inverter control.
- Hardware accelerators to execute trigonometric and IIR filter operations that are often used to reduce the CPU load in a flexible and quickly manner.
- Easy to use Flexible Software Package (FSP), to speed up software development incl. security and connectivity demands, backed up by development tools from Renesas and the Arm partner ecosystem.
- Ready to use solutions enable customers to develop quickly and manage time to market.

Tools and Support

IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	■ GCC ■ Arm Compiler	■ Arm Compiler	■ IAR Arm Compiler
Debugger	■ Renesas E2/E2 Lite ■ SEGGER J-Link	■ SEGGER J-Link	■ IAR I-Jet ■ SEGGER J-Link
Programmer	■ Renesas PG-FP6 ■ SEGGER J-Flash ■ Third party solutions		

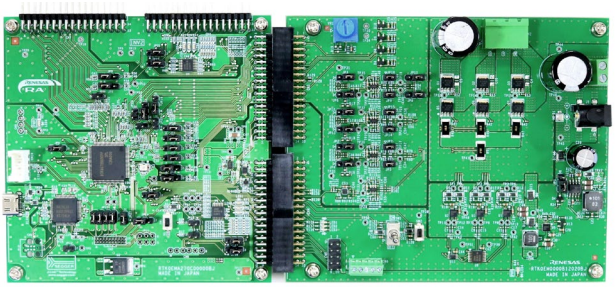


Evaluation Kit

- MCK-RA6T2 (Motor control evaluation kit) including On-Chip debugger
  - Part name: RTK0EMA270S00020BJ

Kit Contents:

- Inverter Board
- CPU Board
- Communication Board
- Brushless DC Motor



RA6T2 CPU Board and Inverter Board

  - For more information, visit **renesas.com/ra/mck-ra6t2**

Ordering References

Part Name	Flash						
		512KB w/o CAN-FD	R7FA6T2AD3CNE	R7FA6T2AD3CFL	R7FA6T2AD3CNB	R7FA6T2AD3CFM	R7FA6T2AD3CFP
		512KB w/ CAN-FD	R7FA6T2BD3CNE	R7FA6T2BD3CFL	R7FA6T2BD3CNB	R7FA6T2BD3CFM	R7FA6T2BD3CFP
		256KB w/o CAN-FD	R7FA6T2AB3CNE	R7FA6T2AB3CFL	R7FA6T2AB3CNB	R7FA6T2AB3CFM	R7FA6T2AB3CFP
		256KB w/ CAN-FD	R7FA6T2BB3CNE	R7FA6T2BB3CFL	R7FA6T2BB3CNB	R7FA6T2BB3CFM	R7FA6T2BB3CFP
RAM			64KB	64KB	64KB	64KB	64KB
DataFlash			16KB	16KB	16KB	16KB	16KB
Operating Temperature			-40/+105°C	-40/+105°C	-40/+105°C	-40/+105°C	-40/+105°C
Package			QFN48 pin	LQFP48 pin	QFN64 pin	LQFP64 pin	LQFP100 pin
Package Dimensions			7x7mm	7x7mm	8x8mm	10x10mm	14x14mm
Pin Pitch			0.5mm	0.5mm	0.4mm	0.5mm	0.5mm

For more details, please visit www.renesas.com/ra6t2

Corporate Headquarters
TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Contact information
For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:
www.renesas.com/contact/

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