



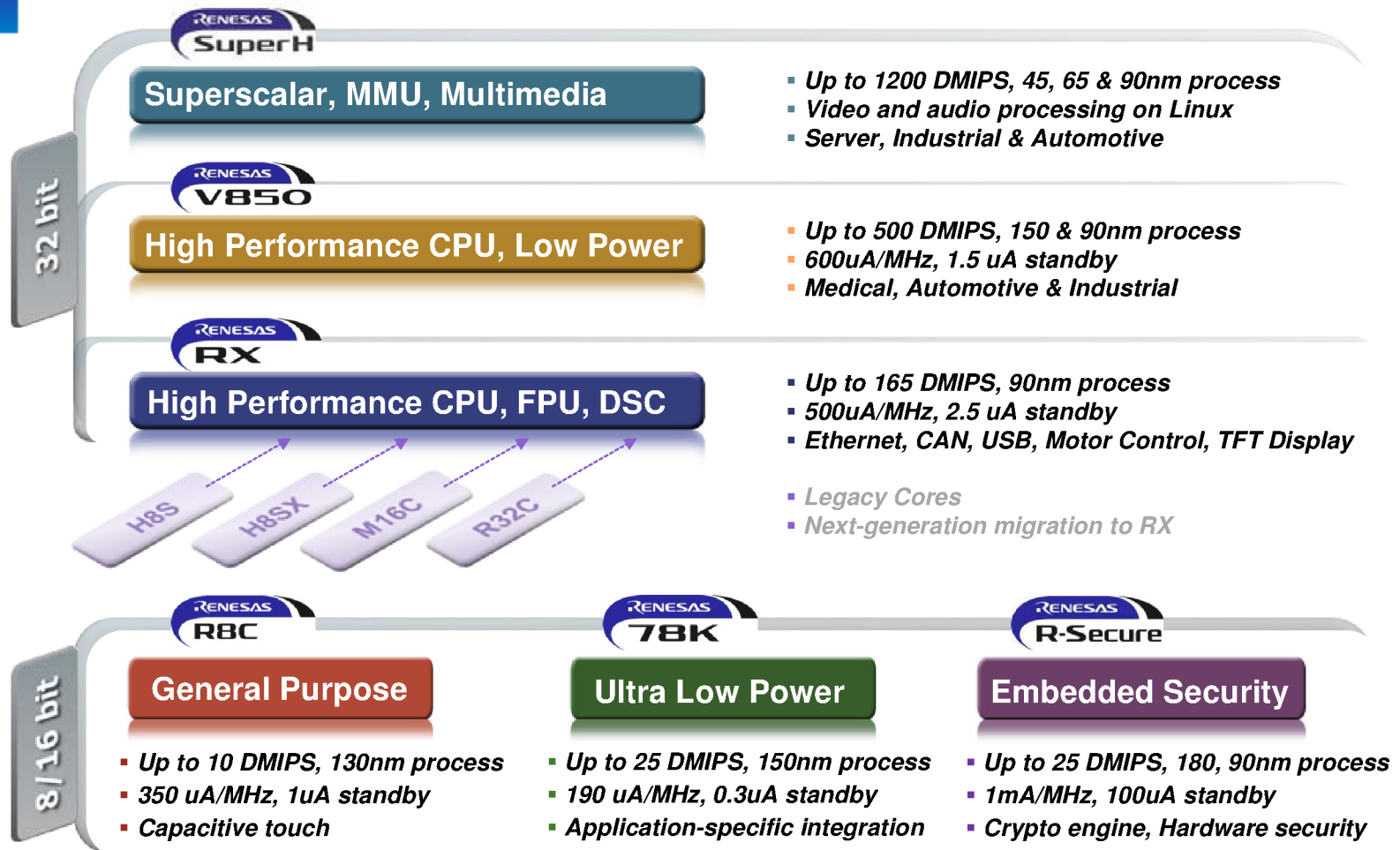
SuperH MCUs

SH7216 Highest Performance Flash-based MCU with Connectivity



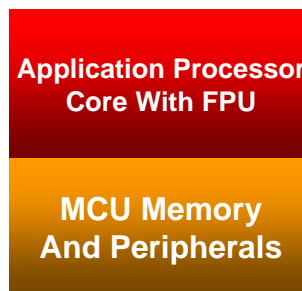
Renesas Electronics America Inc.

Microcontroller and Microprocessor Line-up



Our SH-2A MCU Solution

- High Performance SH-2A Process Core efficiencies Equivalent to Application Processors (2 DMIPS/MHz)
- Combined with High Performance Memory and Peripherals on MCUs



- The SH-2A with Floating Point Unit (FPU)
 - Integrates enough functionality to replace a DSP + MCU into a single chip
 - Benefits include smaller form factors, lower cost, less EMI
 - Software development is simple because everything is coded on a single platform

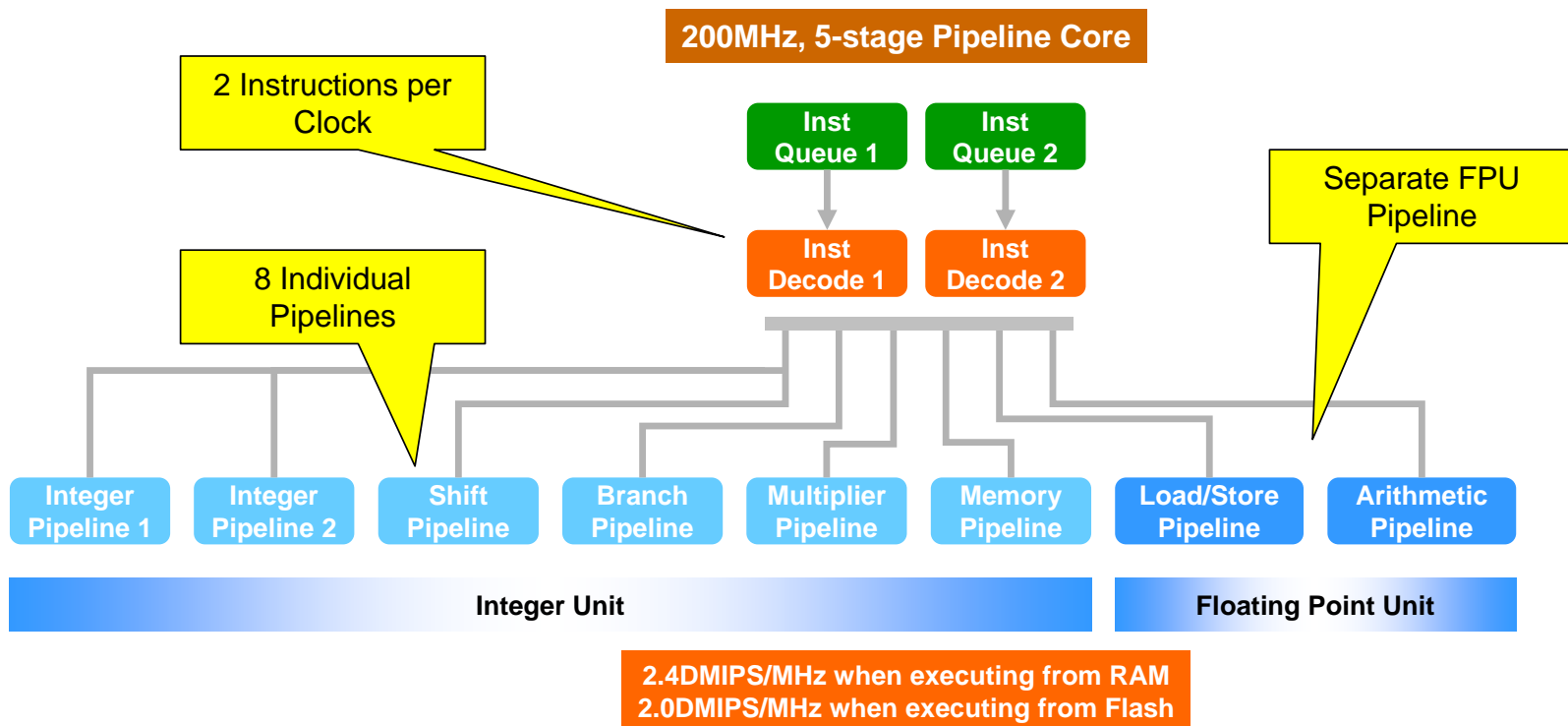
What's Unique about the SH7216?

The SH7216 shines when customer needs performance & high-throughput

Superscalar RISC Core		
2.0 DMIPS/ MHz	Double Precision 64 bit FPU	Short 9 cycle Interrupt Latency
Peripherals		
Multifunction Timers 2 Inverters supported	12 bit ADC Fast 1.0uS Sampling Rate	
High Speed Memory		
Industry's Fastest 10ns Flash Memory (1MB)	Large SRAM Up to 128KB	
Rich Connectivity		
10/ 100 Ethernet	CAN 2.0	USB 2.0

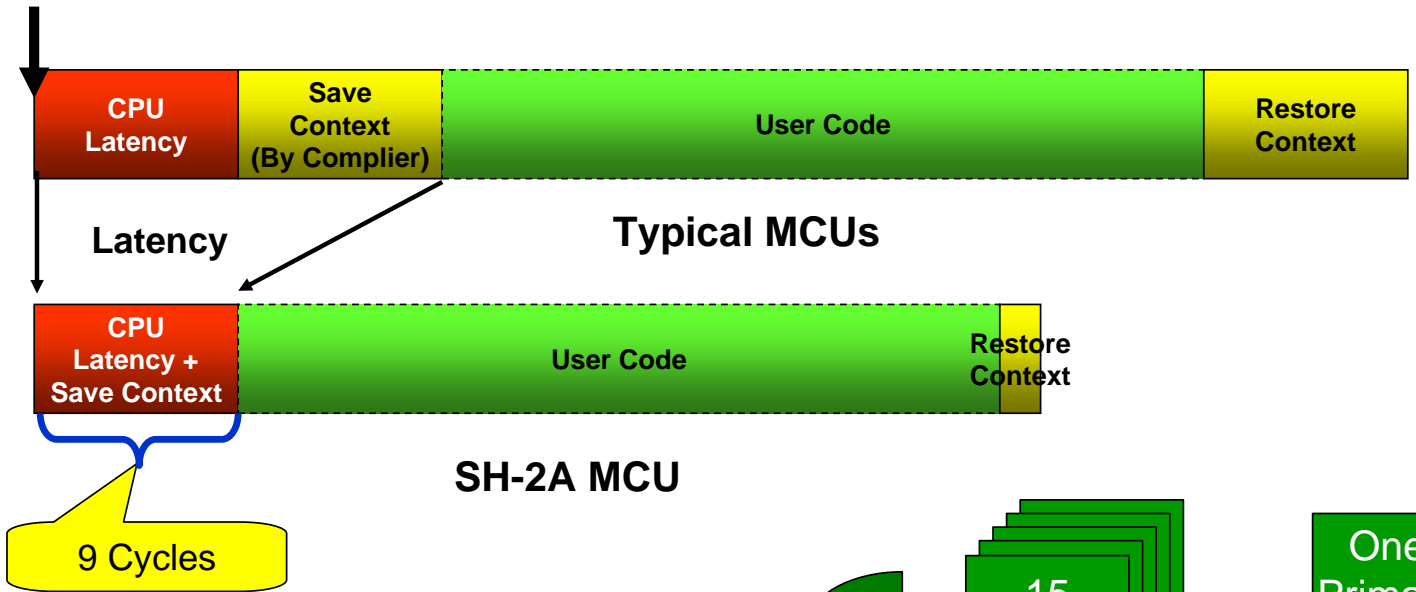
Supported by leading Third Party SW & Tools:
CMX, Eclipse, Express Logic, GNU Tool suite, IAR, Micrium, Segger

2 Instructions/Clock Core



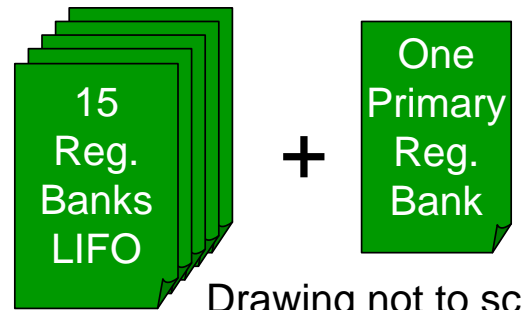
SH-2A Fast Interrupt Response

INT Trigger



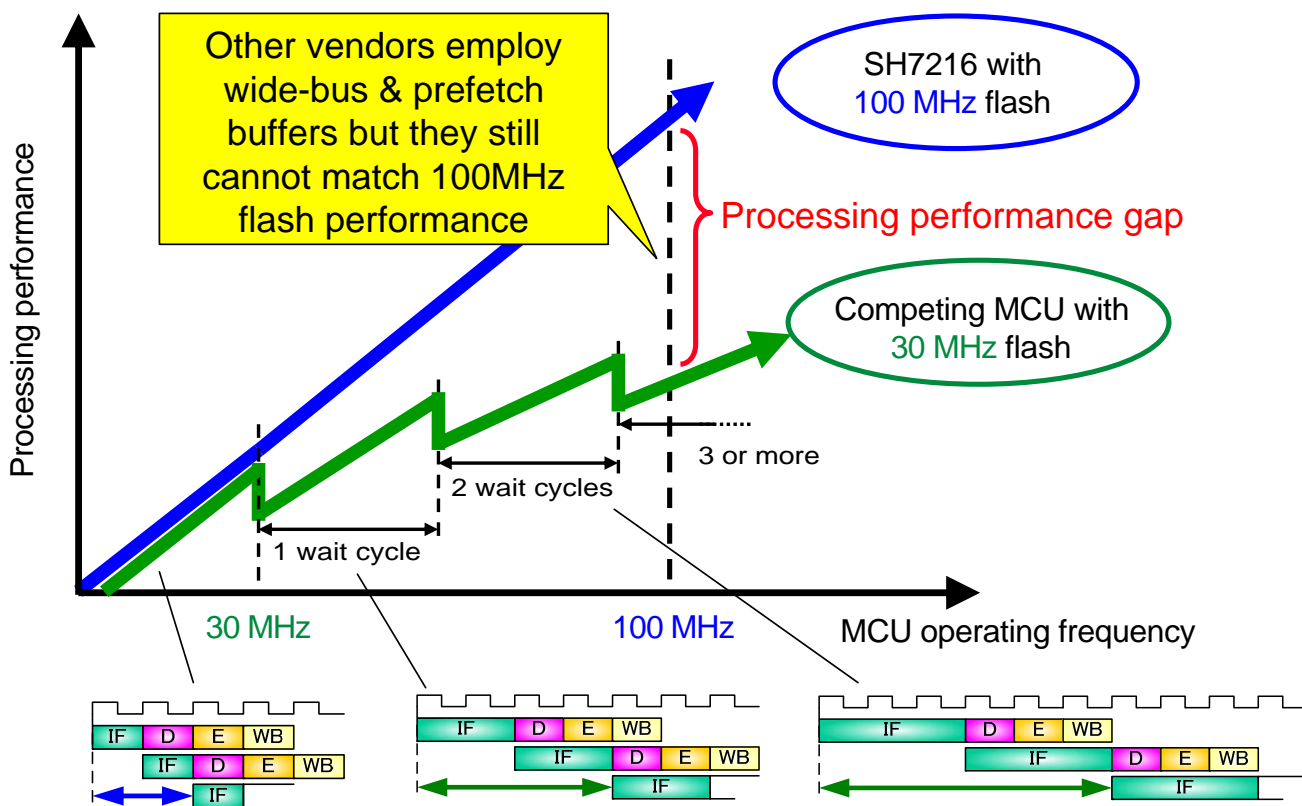
SH-2A MCU

HW saves the context in register bank LIFO



	SH7216	Cortex-M3	ARM7TDMI	PIC32
MCU Interrupt Latency	9	18+	24 – 42	18 – 40+

SH7216 Uses Fastest Flash (10ns read time)



	SH7216	A	B	C	D	E
Max Freq (MHz)	200	72	72	66	80	150
Flash Speed (MHz)	100	24	20	33	30	27

Target Applications

Factory Automation

Precision Motion Control
Industrial Connectivity
Fast I/O Control



Operator Panels



Scientific & Medical

Signal Analysis
Quiet Motor Control
Connectivity



Operator Panels



Consumer Media Players User Interfaces



Office Automation Image Processing Precise Stepper Control Connectivity Operator Panels



White Goods

Energy Efficient Motor Control



Information Displays



Building Automation High-end Security Systems Image Processing Speech, Connectivity Thermostat, Control Panel

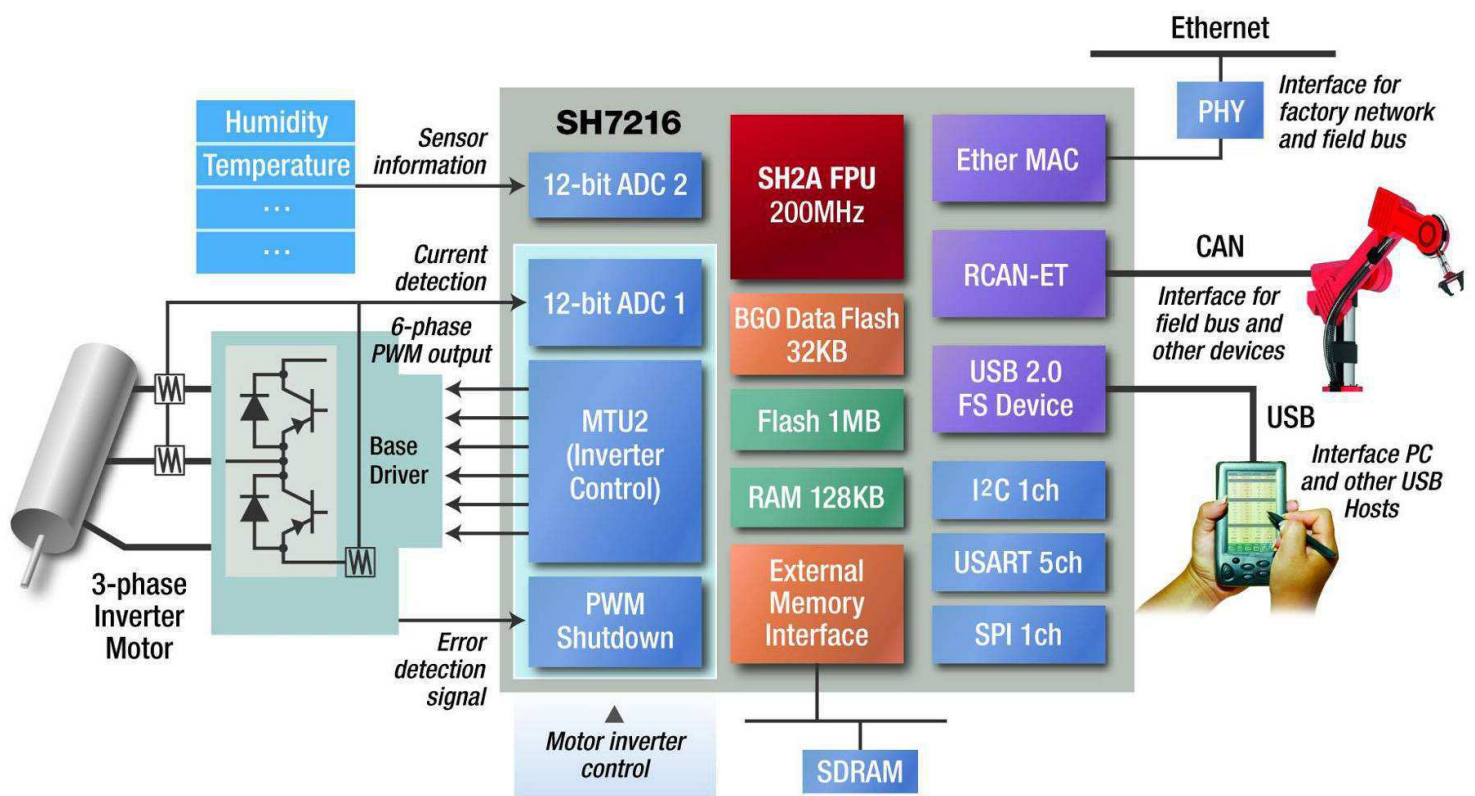


Control Panels



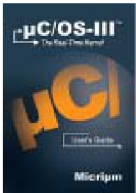
SH7216 Application Example

Factory Automation



SH7216 RDK + Micrium uC/ OS-II Book

- A comprehensive tool to learn, evaluate, & prototype using SH7216



uC/OS-III Book with
Example Applications

+

SH7216 Board
+
USB Cable
+
Power Supply

+

All Software is
downloaded
from Micrium Site

MSRP: \$199

Book Only MSRP: \$89

Available free with Future Promotion

■ Learn

- RTOS Theory of operation & Usage
- SH7216 Architecture

■ Evaluate

- Pre-programmed Demo Application
- Example Applications with Full Source

■ Prototype

- Full-featured, flexible board
- Debugger included on the board
- Power supply included



uC/OS-III
uC/Probe



Development Tools

Development Environments



FREE

Emulators



E10A-USB

E200F



GDB

FREE

C/C++ Compilers



KPIT GNU Tools

FREE

Evaluation Systems



Motor Control

RTOS & Middleware



FREE

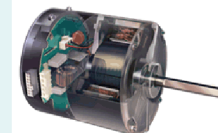
Sample Code & Libraries from Renesas



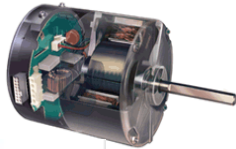
Software Library
1,000+ FREE sample codes. Software Library

CAN

USB



Free SW from Renesas



CAN



- Sample code for major peripherals
- Vector Control Motor Algorithms
- Ethernet Send/Receive, Open Source TCP/IP supporting uIP
- CAN API – compatible with R8C & R32C API
- USB Device – CDC, MSC, HID
- Fixed Point Math & DSP Libraries for SH-2A FPU

Available on am.renesas.com

SH7216 Third Party Support by SW Components

Third Party	IDE	Compiler	Debug	RTOS	TCP/IP Stack	USB Device	File
CMX	-	-	-	Y	Y	Y	Y
Express Logic	-	-	-	Y	Y	Y	Y
FreeRTOS.org	-	-	-	Y	Y	-	-
IAR	Y	Y	Y	-	-	-	-
KPIT GNU Tools	Y	Y	Y	-	-	-	-
Micrium	-	-	-	Y	Y	Y	Y
RoweBots	-	-	-	Y			Y
Segger	-	-	-	Y	Y	Y	Y

SH7216 Series Part Numbers

Ordering P/N	ROM/RAM	Package	Temperature	Features
R5F72165ADFA#V1	512K/64K	20x20 LQFP176	-40 to 85	200MHz, Ethernet, FPU, CAN, USB
R5F72167ADFA#V1	1M/128K	20x20 LQFP176	-40 to 85	200MHz, Ethernet, FPU, CAN, USB
R5F72165GDFA#V1	512K/64K	20x20 LQFP176	-40 to 85	100MHz, Ethernet, FPU, CAN, USB
R5F72167GDFA#V1	1M/128K	20x20 LQFP176	-40 to 85	100MHz, Ethernet, FPU, CAN, USB

Remaining part numbers are available for qualified opportunities – contact Marketing



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