



H8 Value Series Microcontrollers

**EASY TO BUY,
EASY TO USE AND
EASY TO DEVELOP
FOR COST-SENSITIVE
APPLICATIONS**

Overview

Renesas' 16-bit, high-performance H8 Value Series microcontrollers (MCUs) are low-cost embedded system solutions with up to 128KB of ROM. These devices, operating at 3V or 5V, are easy to buy, easy to use and easy to develop for a wide range of cost-sensitive embedded system applications, such as residential security systems, USB dongles, barcode scanners, and more.

Versatile Set of Features

- High-performance
16-bit CPU: 25MHz
- Minimum instruction execution time: 40ns
- Operating voltage range:
3.0 to 3.6V, or 4.5V to 5.5V
- Available in flash, mask ROM and ROMless versions
- 2 or 3 channels of serial communication interface
- Up to 6-channel 16-bit timer pulse unit (TPU)
- Up to 12 channels of 10-bit A/D converter
- Available in 100-, 128- and 144-pin QFP packages

Versatile Features

- + Competitive Pricing
 - + Full-Featured Tools
-
- = **Easy Decision**

Easy to Buy

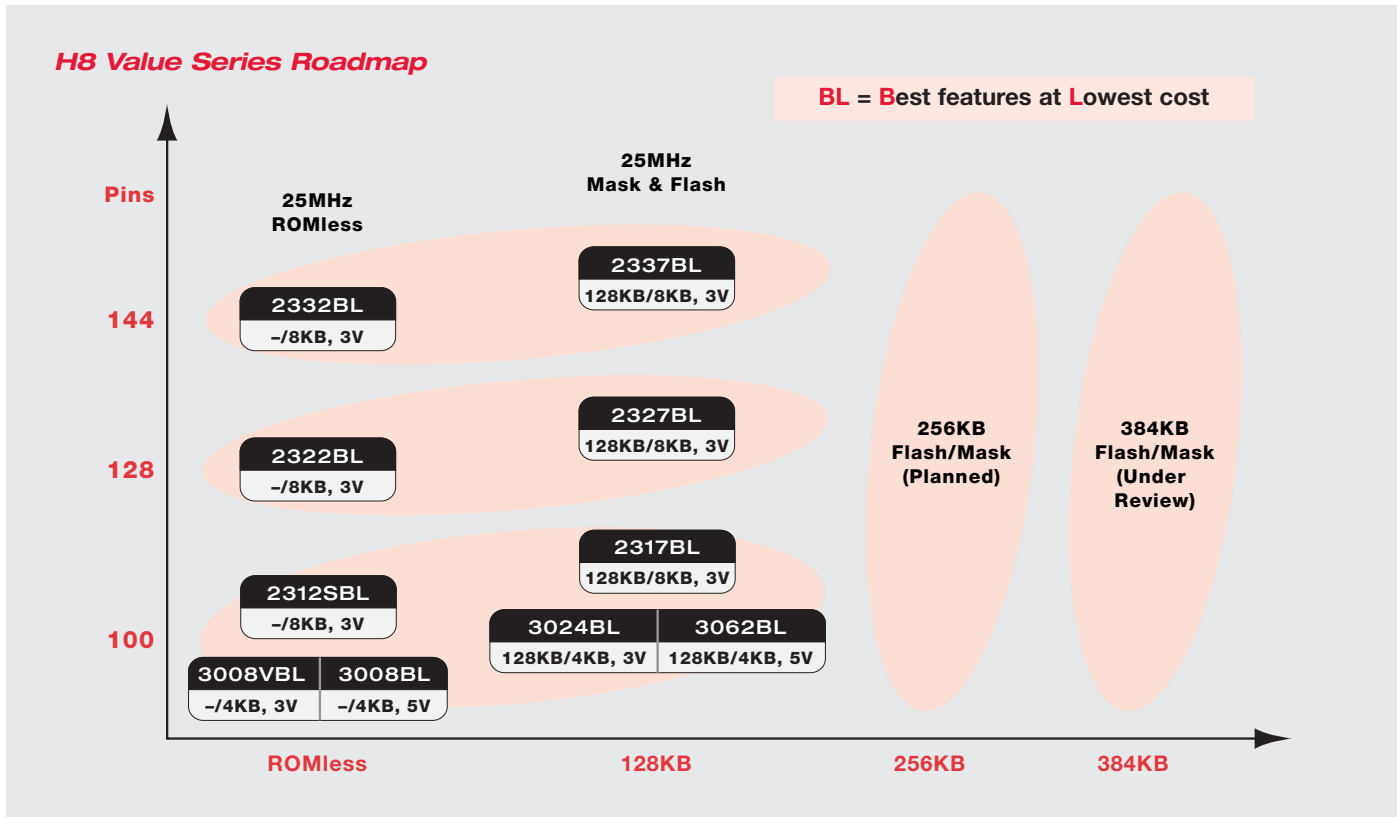
- Fixed low-cost, single-volume price published online
- Automatic annual price adjustment
- In stock, quick availability
- Detailed online information for fast decisions

Easy to Use

- Code compatible with other H8 series MCUs
- Low-cost Evaluation Design Kit
- Low-cost on-chip debugger with JTAG interface
- Powerful real-time, zero-wait-state in-circuit emulator
- Highly-optimized compiler, assembler, linker and debugger
- User-friendly tools for in-application flash reprogramming
- Online technical documentation: H/W manual, app notes, etc.
- Supported by third-party tools, including RTOS, compiler, firmware
- User-friendly online training and local FAE support

H8S CPU Core 25MHz (40ns)	Flash/Mask: 0 or 128KB
External Bus Interface	RAM: 4KB or 8KB
Interrupt Controller	16-bit TPU
A/D (8 ch x 10-bit)	8-bit Timer (2 ch)
D/A (2 ch x 8-bit)	Watchdog Timer (1 ch)
DTC (85 ch)	Serial Interface (2 ch)
DMAC (4 ch) (2322BL, 2327BL only)	3rd ch (2322, 2327 only)
	16-bit PPG (2322BL, 2327BL only)

H8 Value Series: Roadmap • Applications • Selector



Applications

Computing: PC peripherals, barcode scanners, label printers, touch-screen controllers, USB dongles

Consumer: White goods, security systems, ID readers, cell phones, Smart Card readers

Industrial: HVAC systems, utility meters, gas pumps, water distribution controllers, GPS systems, emission test equipment

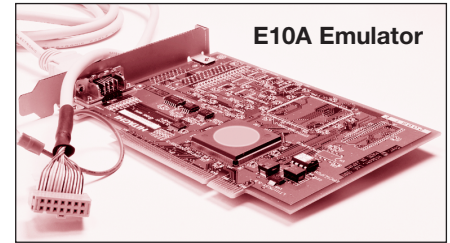
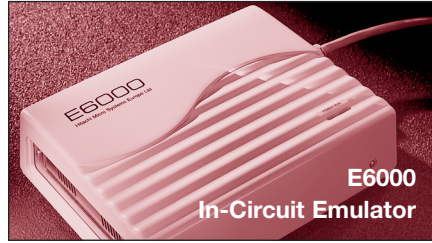
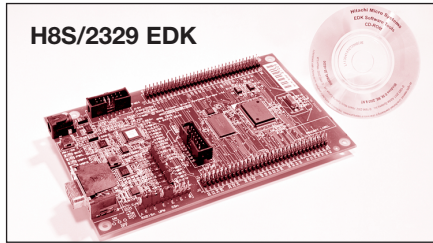
H8 Value Series Selector Guide

Part No.	ROM Type*	ROM (KB)	RAM (KB)	Vcc Min	Vcc Max	Max Freq (MHz)	Power Down Modes	16-bit Timer (ch)	8-bit Timer (ch)	Watchdog Timer	PPG (bits)	10-bit ADC (ch)	8-bit DAC (ch)	DTC (ch)	DMAC (ch)	Serial Async/Sync (ch)	Smart Card I/F	Interrupts	External Bus I/F	General Purpose I/O	Package	Mass Production
HD6413008FBL25	L	0	4	4.5	5.5	25	5	3	4	1	-	8	2	-	-	2	Y	7	Y	47	FP-100B	Now
HD6433062BFBL	M	128	4	4.5	5.5	25	5	3	4	1	-	8	2	-	-	2	Y	7	Y	79	FP-100B	Now
HD64F3062BFBL25L	F	128	4	4.5	5.5	25	5	3	4	1	-	8	2	-	-	2	Y	7	Y	79	FP-100B	Now
HD6413008VFBL25	L	0	4	3	3.6	25	5	3	4	1	-	8	2	-	-	2	Y	7	Y	47	FP-100B	Now
HD6433024FBL	M	128	4	3	3.6	25	5	3	4	1	-	8	2	-	-	2	Y	7	Y	79	FP-100B	Now
HD64F3024FBL25	F	128	4	3	3.6	25	5	3	4	1	-	8	2	-	-	2	Y	7	Y	79	FP-100B	Now
HD6412312SVTEBL25	L	0	8	3	3.6	25	5	6	2	1	-	8	2	85	-	2	Y	9	Y	47	TFP-100B	Now
HD6432317STEBL	M	128	8	3	3.6	25	5	6	2	1	-	8	2	85	-	2	Y	9	Y	79	TFP-100B	Now
HD64F2317VTEBL25	F	128	8	3	3.6	25	5	6	2	1	-	8	2	85	-	2	Y	9	Y	79	TFP-100B	Now
HD6412322RVFBL25	L	0	8	3	3.6	25	5	6	2	1	16	8	2	85	4	3	Y	9	Y	63	FP-128B	Now
HD6432327FBL	M	128	8	3	3.6	25	5	6	2	1	16	8	2	85	4	3	Y	9	Y	95	FP-128B	Now
HD64F2327BVFB25	F	128	8	3	3.6	25	5	6	2	1	16	8	2	85	4	3	Y	9	Y	95	FP-128B	Now
HD6412332VFCBL25	L	0	8	3	3.6	25	5	6	2	1	16	12	4	85	4	3	Y	9	Y	86	FP-144G	Now
HD6432337FCBL	M	128	8	3	3.6	25	5	6	2	1	16	12	4	85	4	3	Y	9	Y	118	FP-144G	Now
HD64F2337FCBL25	F	128	8	3	3.6	25	5	6	2	1	16	12	4	85	4	3	Y	9	Y	118	FP-144G	Now

* F = Flash; L = ROMless; M = Mask

Minimum order quantity is 10,000pcs for mask ROM version; NRE price of \$6500 is required for mask ROM versions

H8 Value Series: Development Tools



Development Device Selector

Corresponding H8S "E" series devices for using on-chip Debug Emulator (E10)

Part No.	ROM/RAM (KB)	Supported Devices	Price
HD64F2319EVTE25	512/8	H8S/2317F,17,12S	\$17.88
HD64F2329EVF25	384/32	H8S/2327BF,27,22R	\$18.38
HD64F2339EVF25	384/32	H8S/2337F,37,32	\$19.06

The H8/300H series do not have a corresponding device with on-chip debug; to debug with these, you must use the full In-Circuit Emulator (E6000)

Development Tool Selector

H8S/2317F,17,12S, H8S/2327F,27,22R, H8S/2337F,37,32 devices

H8S/2300 Value Series Development Kit: US2329-KIT1 comprising:		\$1529.73***	
C/C++ Compiler, Asm, Linker: USS008PXIW2SR		[\$1178.00]	
On-chip Debug Emulator**: Also available separately E10A PCMCIA Card: HS2339KCM01H		[\$945.30]	
E6000 In-Circuit Emulator: E62339 (inc. PCI Interface card)		[\$7594.14]	
E6000 Optional Emulator-to-PC Interface: PCI Interface Card HS6000EIC02HE		[\$979.80]	
PCMCIA Interface Card HS6000EIP01H		[\$503.70]	
LAN Interface Box HS6000ELN01H		[\$1883.70]	
USB Interface Box HS6000EIU01H		[\$1131.60]	
Evaluation Design Kit: EDK2329 + USBAG-PSU1* On-chip Debug Emulator**: E10A PCI Card: HS2339KCI01H		[\$200.00 + \$17.85] [\$750.00***]	
E6000 Emulator Target Adapter EHB2318Q100B (TFP/FP-100B)		[\$481.62]	
E6000 Emulator Target Adapter EHB2328Q128 (TFP-128)		[\$695.52]	
E6000 Emulator Target Adapter JHB2338Q144G (FP-144)		[\$401.35]	
		Series	
		H8S/2317F	
		H8S/2317	
		H8S/2312S	
		H8S/2327BF	
		H8S/2327	
		H8S/2322R	
		H8S/2337F	
		H8S/2337	
		H8S/2332	

H8/3024F,24,08V, H8/3062F,62,08 devices

H8/300H Value Series Development Kit: E63064B-KIT1 comprising:		\$8,999	
C/C++ Compiler, Asm, Linker: USS008PXIW2SR			
E6000 In-Circuit Emulator: E63064B			
E6000 Emulator-to-PC Interface: PCI Interface Card HS6000EIC02HE			
E6000 Emulator Target Adapter: EHB3064BQ100B (FP-100B)			
Evaluation Design Kit: US3068EDK1		[\$299]	
E6000 Optional Emulator-to-PC Interface: PCI Interface Card HS6000EIC02HE		[\$979.80]	
PCMCIA Interface Card HS6000EIP01H		[\$503.70]	
LAN Interface Box HS6000ELN01H		[\$1883.70]	
USB Interface Box HS6000EIU01H		[\$1131.60]	

NOTES:

All prices are Manufacturers Suggested Resale Price

* Power supply and serial cable for the evaluation board.

** For on-chip debug development you must use the corresponding "E" version development devices:
Part # HD64F2319EVTE25, HD64F2329EVF25, HD64F2339EVFC25

*** Promotional price for H8 Value Series customers only

Development Tool Features

Evaluation Design Kit

- Includes monitor for C source code debug from HEW, using serial interface
- 512Kb external SRAM
- User LED indicators
- Flash boot mode LED indicator
- NMI and reset circuitry
- 30-day evaluation C/C++ compiler included
- EDK2329 has HD64F2329EVF25 "E" version development device and E10A (JTAG) interface for on-chip debug emulator

HEW

(High-performance Embedded Workshop)

- Flexible code development and debugging interface
- Wizard for easy project setup
- Fully-featured integrated editor
- Optimized H8 C/C++ compiler toolchain
- Graphical selection of toolchain options for project files
- Hierarchical support for multiple projects in a workspace
- Customizable integrated MAKE facility

FDT (Flash Development Toolkit)

- Supports direct connection to customer's own target
- Supports BOOT and USER programming modes
- Serial communication interface
- Advance messaging levels to aid hardware development

Free download and upgrade patches to support new devices are available at:

www.eu.renesas.com/products/mpumcu/tool/fdt/support.html

E10A

- On-chip debug emulator via JTAG interface
- PCI or PCMCIA card form factors
- 256 PC breakpoints
- Hardware breakpoint on address and data
- 4-level branch trace
- Single stepping at C and assembly level
- Ability to program on-chip Flash

E6000 In-Circuit Emulator

- Zero wait state/real-time in-circuit emulator
- 256 PC breakpoints
- 12 sequenceable complex hardware breakpoint events
- 80-bit wide, 32k-cycle trace buffer
- Four user logic probes
- Multiple target clock selection
- HDI debugging software included

HDI (High-Level Debugging Interface)

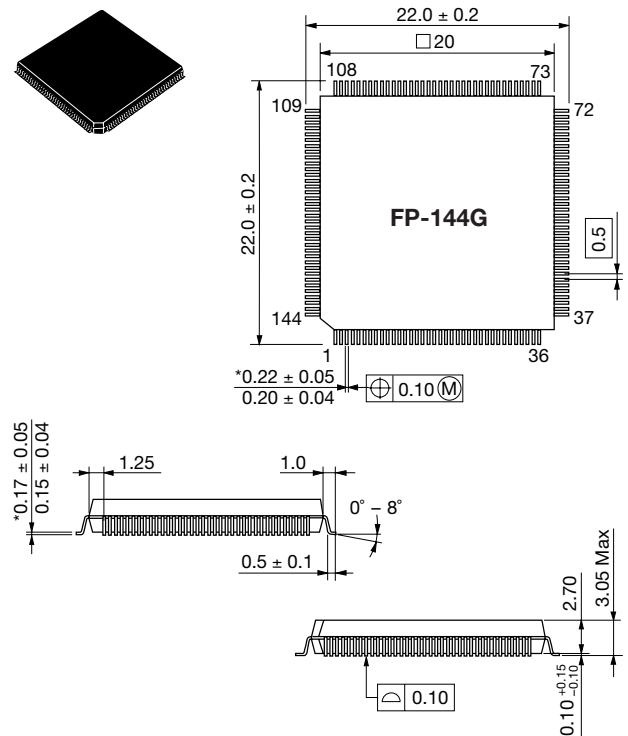
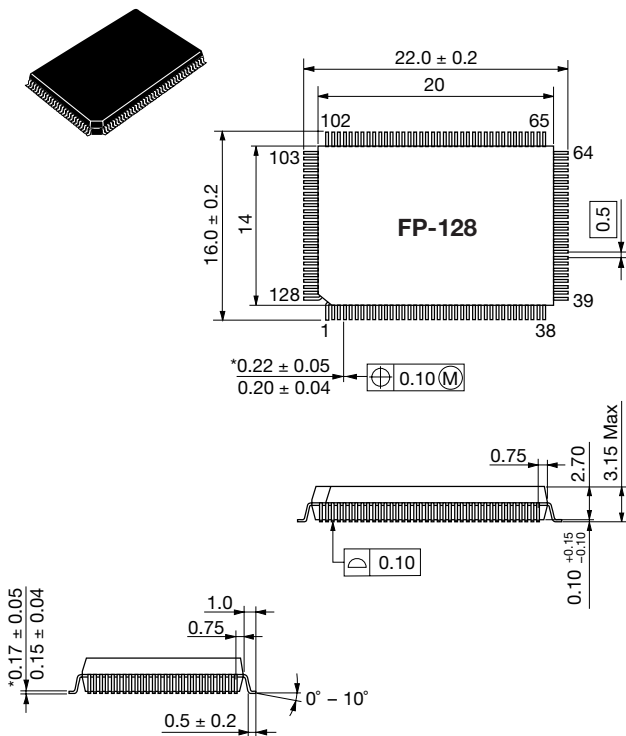
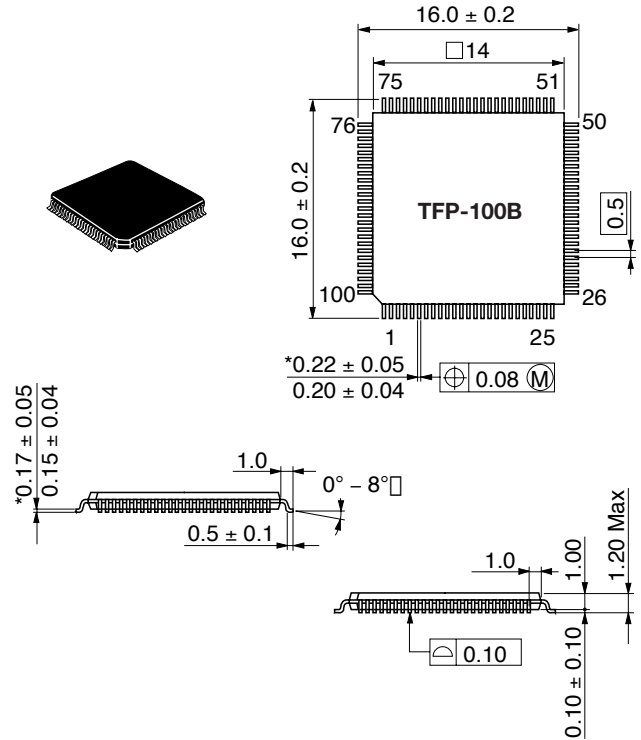
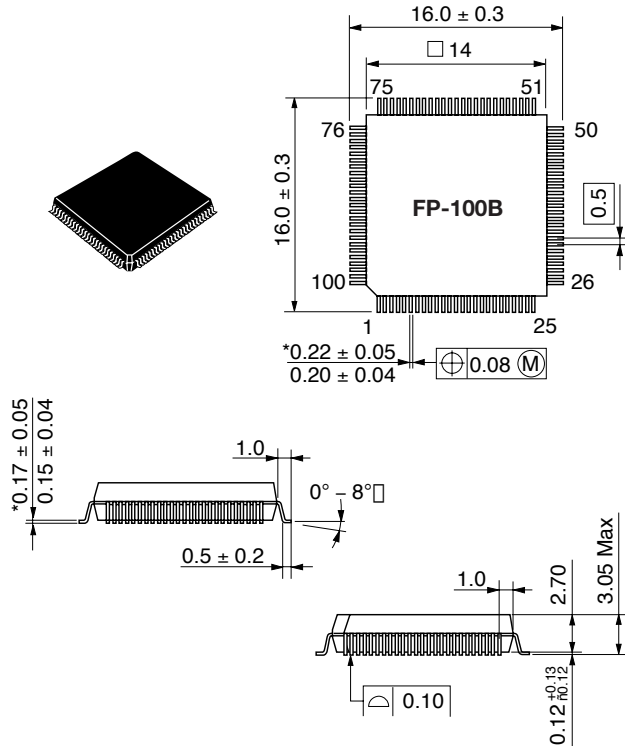
- C/C++ level, assembler or mixed debugging
- Graphical control over emulator breakpoint, trace and mapping functions
- Step-over, step-into, step-out functions
- Register display
- C-level watch points
- Memory window

ENTRY LEVEL

VALUE DEVELOPMENT SYSTEM

FULL ICE

H8 Value Series Package Outlines



© 2003 Renesas Technology America, Inc. Renesas Technology America, Inc. is a wholly owned subsidiary of Renesas Technology Corporation. H8 is a registered trademark of Renesas Technology Corporation. All other trademarks are the property of their respective owners. The information supplied by Renesas Technology America, Inc. is believed to be accurate and reliable, but in no event shall Renesas Technology America, Inc. be liable for any damages whatsoever arising out of the use or inability to use the information or any errors that may appear in this publication. The information is provided as is without any warranties of any kind, either express or implied. Renesas Technology America, Inc. reserves the right, without notice, to make changes to the information or to the design and specifications of its hardware and/or software products. Products subject to availability. Printed in U.S.A.

Renesas Technology America, Inc.

450 Holger Way, San Jose, CA 95134

Tel: 408-382-7500

www.renesas.com