Overview

The H8/534, H8/536 and H8/537 are CMOS microcomputer units (MCUs) comprising a CPU core plus a full range of supporting functions $BQa (Jn entire system integrated onto a single chip.

The CPU features a highly orthogonal instruction set that permits addressing modes and data sizes to be specified independently in each instruction. An internal 16-bit architecture and 16-bit access to on-chip memory enhance the CPU's data-processing capability and provide the speed needed for realtime control applications.

The on-chip supporting functions include RAM, ROM, timers, a serial communication interface (SCI), A/D conversion, and I/O ports. An on-chip data transfer controller (DTC) can transfer data in either direction between memory and I/O independently of the CPU.

For the on-chip ROM, a choice is offered between masked ROM and programmable ROM (PROM). The PROM version can be programmed by the user with a general-purpose PROM writer.

Function Overview

<table>
<tr><th>Features</th><th>Description</th></tr>
<tr><td>CPU</td><td>
General-register architecture
· Eight 16-bit general registers
· Five 8-bit and two 16-bit control registers
High speed
· Maximum clock rates
<table>
<tr><td rowspan="3">H8/534, H8/536</td><td rowspan="3">S- and A-mask products</td><td>5-V version</td><td>16 MHz (oscillator frequency: 32 MHz)</td></tr>
<tr><td>3-V version</td><td>10 MHz (oscillator frequency: 20 MHz)</td></tr>
<tr><td>2.7-V version</td><td>8 MHz (oscillator frequency: 16 MHz)</td></tr>
<tr><td>U-mask products</td><td>5-V version</td><td>16 MHz (oscillator frequency: 16 MHz)</td></tr>
<tr><td rowspan="3">H8/537</td><td rowspan="3"></td><td>5-V version</td><td>16 MHz (oscillator frequency: 16 MHz)</td></tr>
<tr><td>3-V version</td><td>10 MHz (oscillator frequency: 10 MHz)</td></tr>
<tr><td>2.7-V version</td><td>8 MHz (oscillator frequency: 8 MHz)</td></tr>
</table>
Two CPU operating modes
·Minimum mode: Supports an address space of up to 64 kbytes
</td></tr>
</table>

<table>
<tr><td></td><td>·Maximum mode: Supports an address space of up to 1 Mbyte
Highly orthogonal instruction set
·The addressing mode and data size can be specified independently for each instruction.
1.5 address instructions
·Register-register type
·Register-memory type
Instruction set optimized for the C language
·Special short formats for frequently-used instructions and addressing modes</td></tr>
<tr><td>Memory</td><td>· PROM or mask ROM
· high-speed on-chip RAM<table><tr><th>Product Name</th><th>RAM</th><th>ROM</th></tr><tr><td>H8/534</td><td>2 kbytes</td><td>32 kbytes</td></tr><tr><td>H8/536</td><td>2 kbytes</td><td>62 kbytes</td></tr><tr><td>H8/537</td><td>4 kbytes</td><td>124 kbytes</td></tr></table></td></tr>
<tr><td>16-bit free-running timer (FRT) (3 channels)</td><td>Each channel provides:
·One free-running counter (which can count external events)
·Two output-compare registers
·One input-capture register</td></tr>
<tr><td>8-bit timer (1 channel)</td><td>·One 8-bit up-counter (which can count external events)
·Two time constant registers</td></tr>
<tr><td>PWM timer (3 channels)</td><td>·Duty: Generates pulses with any duty ratio from 0 to 100%
·Resolution: 1/250</td></tr>
<tr><td>Watchdog timer (WDT) (1 channel)</td><td>·Generates a reset or external output on overflow
·Can also be used as an interval timer</td></tr>
<tr><td>Serial communication interface (SCI) (2 channels)</td><td>·Synchronous or asynchronous mode (selectable)
·Full duplex: can send and receive simultaneously
·Built-in dedicated baud rate generator</td></tr>
<tr><td>A/D converter</td><td>·Resolution: 10 bits
·Eight channels: single mode or scan mode (selectable)
·Sample-and-hold function
·A/D conversion start can be triggered by an external signal</td></tr>
<tr><td>I/O ports</td><td>·57 I/O pins: six 8-bit ports, one 5-bit port, one 4-bit port
·8 input-only pins: one 8-bit port</td></tr>
</table>

<table>
<tr><td>Interrupt controller (INTC)</td><td>·7 external interrupt pins: NMI, IRQ0, IRQ1 to IRQ5
·23 internal interrupts
·8 priority levels (settable)</td></tr>
<tr><td>Data transfer controller (DTC)</td><td>Supports bidirectional data transfers between memory and I/O space independent of the CPU</td></tr>
<tr><td>Wait-state controller (WSC)</td><td>Can insert wait states in accesses to external memory or the external I/O space</td></tr>
<tr><td>Operating modes</td><td>5 operating modes
<table>
<tr><th>Model Name</th><th>Mode No.</th><th>Mode</th><th>Address Space</th></tr>
<tr><td rowspan="5">H8/534,
H8/536</td><td>Mode 1</td><td>Expanded minimum mode (ROM disabled)</td><td>64 kbytes</td></tr>
<tr><td>Mode 2</td><td>Expanded minimum mode (ROM enabled)</td><td>64 kbytes</td></tr>
<tr><td>Mode 3</td><td>Expanded maximum mode (ROM disabled)</td><td>1 Mbytes</td></tr>
<tr><td>Mode 4</td><td>Expanded maximum mode (ROM enabled)</td><td>1 Mbytes</td></tr>
<tr><td>Mode 7</td><td>Single-chip mode</td><td>-</td></tr>
<tr><td rowspan="5">H8/537</td><td>Mode 1</td><td>Expanded minimum mode (ROM disabled)</td><td>64 kbytes</td></tr>
<tr><td>Mode 2</td><td>Expanded maximum mode (ROM ensabled)</td><td>128 kbytes</td></tr>
<tr><td>Mode 3</td><td>Expanded maximum mode (ROM disabled)</td><td>1 Mbytes</td></tr>
<tr><td>Mode 4</td><td>Expanded maximum mode (ROM ensabled)</td><td>1 Mbytes</td></tr>
<tr><td>Mode 7</td><td>Single-chip mode</td><td>-</td></tr>
</table>
Low power modes
·Sleep mode
·Software standby mode
·Hardware standby mode</td></tr>
<tr><td>Clock oscillator</td><td>
<table>
<tr><td rowspan="2">H8/534,H8/536</td><td>S- and A-mask products</td><td>Divide-by-two clock oscillator</td></tr>
<tr><td>U-mas products</td><td>1:1 clock oscillator</td></tr>
<tr><td>H8/537</td><td colspan="2"></td></tr>
</table>
</td></tr>
<tr><td>Other features</td><td>·E clock output available</td></tr>
</table>

Product Lineup

Model Namae			Package	ROM
H8/534	S-mask products	HD6475348SCG	84-pin windowed LCC (CG-84)	PROM
		HD6475348SCP	84-pin PLCC (CP-84)	
		HD6475348SF	80-pin QFP (FP-80A)	
		HD6475348STF	80-pin TQFP (TFP-80C)	
		HD6435348SCP	84-pin PLCC (CP-84)	Mask ROM
		HD6435348SF	80-pin QFP (FP-80A)	
		HD6435348STF	80-pin TQFP (TFP-80C)	
	A-mask products	HD6435348ACP	84-pin PLCC (CP-84)	Mask ROM
		HD6435348AF	80-pin QFP (FP-80A)	
		HD6435348SAF	80-pin TQFP (TFP-80C)	
	U-mask products	HD6475348UCG	84-pin windowed LCC (CG-84)	PROM
		HD6475348UCP	84-pin PLCC (CP-84)	
		HD6475348UF	80-pin QFP (FP-80A)	
		HD6475348UTF	80-pin TQFP (TFP-80C)	
		HD6475348UCP	84-pin PLCC (CP-84)	Mask ROM
		HD6475348UF	80-pin QFP (FP-80A)	
		HD6475348UTF	80-pin TQFP (TFP-80C)	
H8/536	S-mask products	HD6475368SCG	84-pin windowed LCC (CG-84)	PROM
		HD6475368SCP	84-pin PLCC (CP-84)	
		HD6475368SF	80-pin QFP (FP-80A)	
		HD6475368STF	80-pin TQFP (TFP-80C)	
		HD6435368SCP	84-pin PLCC (CP-84)	Mask ROM
		HD6435368SF	80-pin QFP (FP-80A)	
		HD6435368STF	80-pin TQFP (TFP-80C)	
	A-mask products	HD6435368ACP	84-pin PLCC (CP-84)	Mask ROM
		HD6435368AF	80-pin QFP (FP-80A)	
		HD6435368ATF	80-pin TQFP (TFP-80C)	
	U-mask products	HD6475368UCG	84-pin windowed LCC (CG-84)	PROM
		HD6475368UCP	84-pin PLCC (CP-84)	
		HD6475368UF	80-pin QFP (FP-80A)	
		HD6475368UTF	80-pin TQFP (TFP-80C)	
		HD6435368UCP	84-pin PLCC (CP-84)	Mask ROM
		HD6435368UF	80-pin QFP (FP-80A)	
		HD6435368UTF	80-pin TQFP (TFP-80C)	

H8/537		HD6475378CP	84-pin PLCC (CP-84)	PROM
		HD6475378CG	84-pin windowed LCC (CG-84)	
		HD6475378F	80-pin QFP (FP-80A)	
		HD647538TF	80-pin TQFP (TFP-80C)	
		HD6435378CP	84-pin PLCC (CP-84)	Mask ROM
		HD6435378F	80-pin QFP (FP-80A)	
		HD6435378TF	80-pin TQFP (TFP-80C)	

·H8/534 and H8/536

Specifications		Product Class			
		S- and A-Mask Products			U-Mask Products
		High-Speed Version	Low-Voltage Version		
		16-MHz Version	3-V Version	2.7-V Version	
Clock oscillator divisor		Divided by 2	Divided by 2	Divided by 2	No divisor
Operating frequency range		2 to 16 MHz	2 to 10 MHz	2 to 8 MHz	2 to 16 MHz
Supply voltage range		5 V ±10%	3 V to 5.5 V	2.7 V to 5.5 V	5 V ±10%
Model name	PROM versions	HD6475368S HD6475348S	HD6475368SV HD6475348SV	HD6475368SV HD6475348SV	HD6475368U HD6475348U
	Mask ROM versions	HD6435368S HD6435368A HD6435348S HD6435348A	HD6435368SV HD643568AV HD6435348SV HD6435348AV	HD6435368SV HD6435368AV HD6435348SV HD6435348AV	HD6435368U HD6435348U

·H8/537

Specifications		Model Name		
		High-Speed Version	Low-Voltage Version*	
		16-MHz Version	3-V Version	2.7-V Version
Type	PROM	HD6475378	HD6475378V	HD6475378V
	Mask ROM	HD6435378	HD6435378V	HD6435378V
Operating frequency		2 to 16 MHz	2 to 10 MHz	2 to 8 MHz
Operating power-supply voltage		5 V ±10%	3 V to 5.5 V	2.7 V to 5.5 V

Note: The product codes of the 3-V and 2.7-V low-voltage versions include a suffix that identifies the frequency version. The examples shown below are for the H8/536 PROM version in an 80-pin QFP package

Examples: 3-V version: HD6475368SVF10
2.7-V version: HD6475368DVF8

Internal Block Diagram

Pin Arrangement

·CP-84,Top V0000053195 00000 n 0000053371 00000 n 0000053428 00000 n 0000053538 00000 n 0000053650 00000 n 0000053707 00000 n 0000053764 00000 n 0000053821 00000 n 0000053930 00000 n 0000054064 00000 n 0000054121 00000 n 0