H8/310 (HD6483108)

8-bit Microcomputer with EEPROM

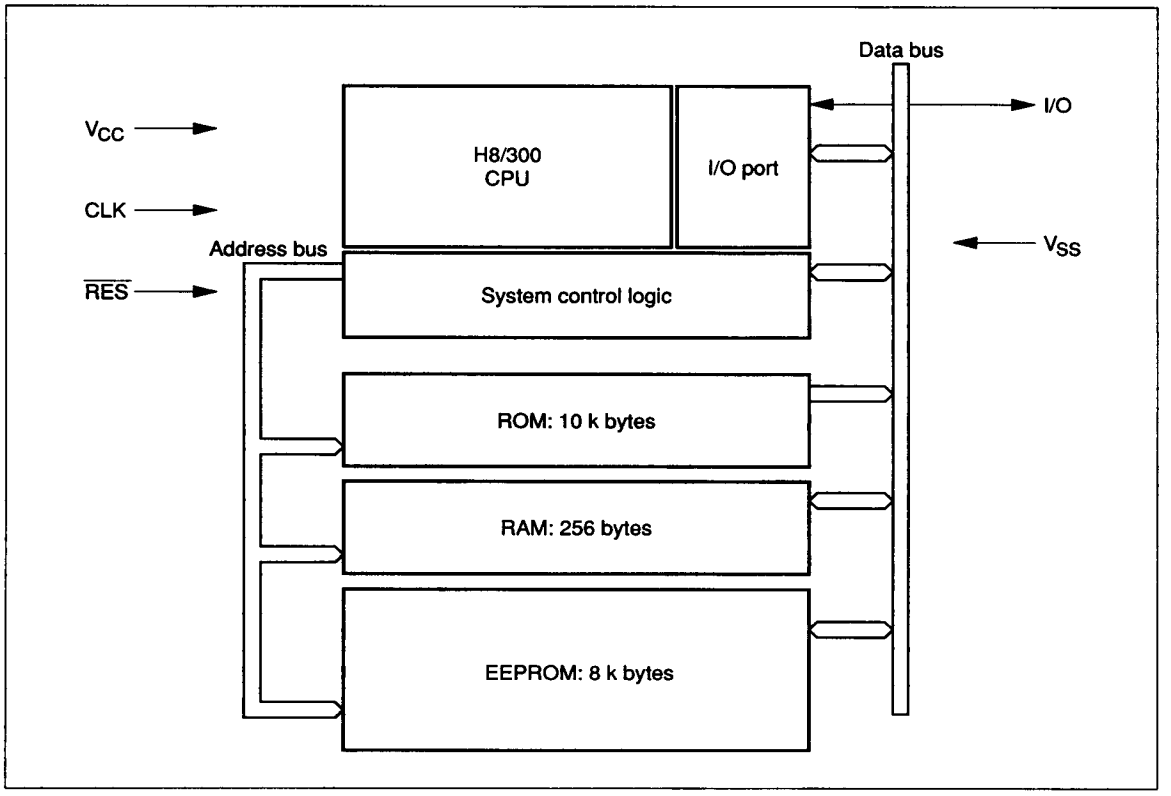
Features

- General-register machine
  - — Sixteen 8-bit general registers (or eight 16-bit general registers)
- High speed
  - — Maximum clock rate–5 MHz (with 10 MHz external clock input)
  - — High-speed instructions

8- or 16-bit register-register add	0.4 µs (at 5 MHz)
8 × 8-bit multiply	2.8 µs (at 5 MHz)
16 ÷ 8-bit divide	2.8 µs (at 5 MHz)

- RISC-like speed-oriented instruction set
  - — Fifty-four types of instructions with optimum addressing modes for each
  - — Instruction length: 2 or 4 bytes
  - — Fast multiply and divide instructions
  - — Powerful bit-manipulation instructions
- 8 kbytes of on-chip EEPROM
  - — EEPROM write instruction
  - — Page-at-a-time write/erase (1 page = 32 bytes)
  - — Data protection function
- 10 kbytes of on-chip masked ROM
- 256 bytes of on-chip RAM
- 1-bit input/outpt pin
- Security
  - — ROM data security
  - — EEPROM security prevents accidental writing or erasure

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	V_{CC}	–0.3 to +7.0	V
Input voltage	Vin	–0.3 to V_{CC} +0.3	V
Operating temperature	Topr	0 to +50	°C
Storage temperature	Tstg	0 to +50	°C

Electrical Characteristics

DC Characteristics (V_{CC} = 5 V ±10%, V_{SS} = 0 V, Ta = 0 to +50°C unless otherwise specified)

Item		Symbol	Min	Typ	Max	Unit	Test condition
Input high level voltage	$\overline{RES}$	V_{IH}	4.0	—	V_{CC} +0.3	V	
	CLK		2.4	—	V_{CC} +0.3		
	I/O		2.0	—	V_{CC} +0.3		
Input low level voltage	$\overline{RES}$	V_{IL}	–0.3	—	0.6	V	
	CLK		–0.3	—	0.5		
	I/O		–0.3	—	0.8		
Output high level voltage		V_{OH}	2.4	—	V_{CC}	V	$I_{OH\ max}$ = –100 µA
			3.8	—	V_{CC}		$I_{OH\ max}$ = –20 µA
Output low level voltage		V_{OL}	0	—	0.4	V	$I_{OL\ max}$ = 1 mA
Input leakage current	CLK	| Iin |	—	—	10.0	µA	Vin = 0.5 to V_{CC} –0.5 V
	$\overline{RES}$		—	—	150		
	I/O		—	—	150		
Current consumption		I_{CC}	—	—	40	mA	f_{CLK}*1 = 10 MHz
Pin capacitance		C_T	—	—	15	pF	Vin = 0 V, f = 1 MHz, Ta = 25°C

Note: 1. f_{CLK} is the external clock frequency.

AC Characteristics (V_{CC} = 5 V ±10%, V_{SS} = 0 V, Ta = 0 to +50°C unless otherwise specified)

Item	Symbol	Min	Typ	Max	Unit	Test condition
Clock cycle	tcyc	0.1	—	10.	µs	Figure 1
Clock high width	t_{CH}	0.4	—	0.6	tcyc	Figure 1
Clock low width	t_{CL}	0.4	—	0.6	tcyc	Figure 1
Clock fall time	tcf	—	—	10	ns	Figure 1
Clock rise time	tcr	—	—	10	ns	Figure 1
I/O port fall time	tf	—	—	1.0	µs	Figure 2
I/O port rise time	tr	—	—	1.0	µs	Figure 2
$\overline{RES}$ pulse width	t_{RWL}	20	—	—	tcyc	
EEPROM write time	t_{EPW}	—	10	15	ms	

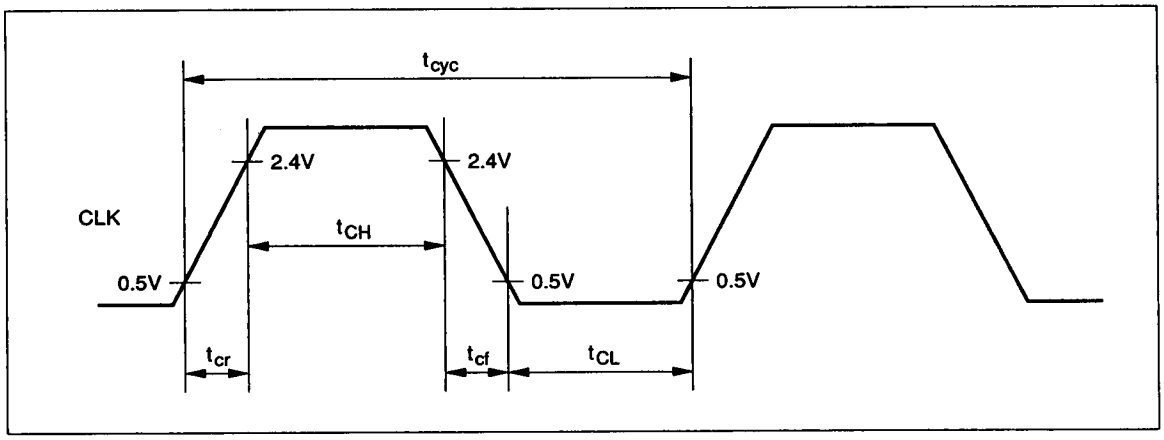


Figure 1 CLK Input Waveform

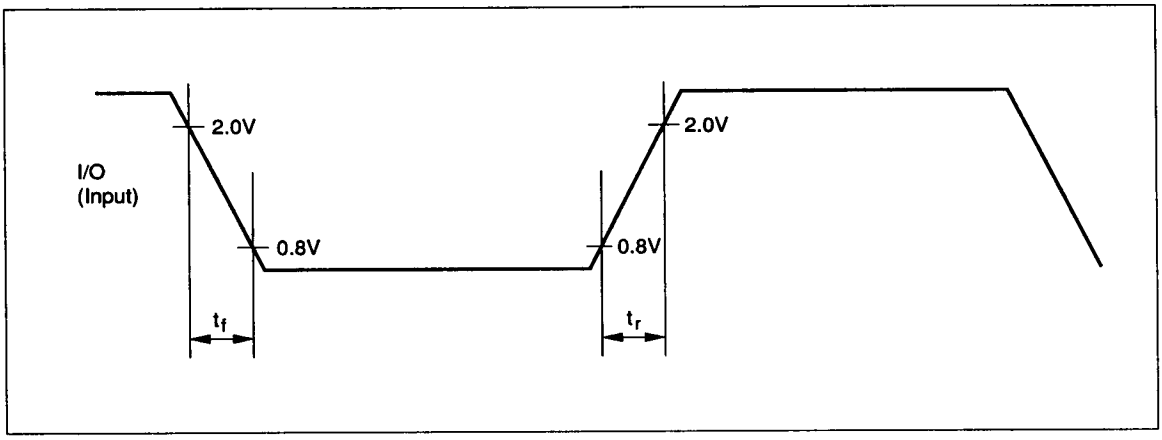


Figure 2 I/O Input Waveform