38B7 Group

SINGLE-CHIP 8-BIT CMOS MICROCOMPUTER

DESCRIPTION

The 38B7 group is the 8-bit microcomputer based on the 740 family core technology.

The 38B7 group has six 8-bit timers, one 16-bit timer, a fluorescent display automatic display circuit, 16-channel 10-bit A-D converter, a serial I/O with automatic transfer function, which are available for controlling musical instruments and household appliances.

The 38B7 group has variations of internal memory type. For details, refer to the section on part numbering.

For details on availability of microcomputers in the 38B7 group, refer to the section on group expansion.

Built-in pull-down resistors connected to high-breakdown voltage ports are available by specifying with the mask option in the mask ROM version. For the details, refer to the section on the mask option of pull-down resistor.

FEATURES

<Microcomputer mode>

- Basic machine-language instructions 71
- The minimum instruction execution time ..... 0.48 µs
  (at 4.19 MHz oscillation frequency)
- Memory size
  ROM ..... 60K bytes
  RAM ..... 2048 bytes
- Programmable input/output ports 75
- High-breakdown-voltage output ports 52
- Software pull-up resistors. (Ports $P6_4$ to $P6_7$, P7, $P8_0$ to $P8_3$, P9, PA, PB)
- Interrupts ..... 22 sources, 16 vectors
- Timers ..... 8-bit × 6, 16-bit × 1
- Serial I/O1 (Clock-synchronized) ..... 8-bit × 1
  (max. 256-byte automatic transfer function)
- Serial I/O2 (UART or Clock-synchronized) ..... 8-bit × 1
- Serial I/O3 (Clock-synchronized) ..... 8-bit × 1
- PWM ..... 14-bit × 1
  8-bit × 1 (also functions as timer 6)
- A-D converter ..... 10-bit × 16 channels
- D-A converter ..... 1 channel
- Fluorescent display function ..... Total 56 control pins
- Interrupt interval determination function 1
  (Serviceable even in low-speed mode)
- Watchdog timer ..... 16-bit × 1
- Buzzer output 1
- Two clock generating circuits
  Main clock (X_{IN}–X_{OUT}) ..... Internal feedback resistor
  Sub-clock (X_{CIN}–X_{COUT}) ..... Without internal feedback resistor
  (connect to external ceramic resonator or quartz-crystal oscillator)
- Power source voltage
  In high-speed mode ..... 4.0 to 5.5 V
  (at 4.19 MHz oscillation frequency and high-speed selected)
  In middle-speed mode ..... 2.7 to 5.5 V (*)
  (at 4.19 MHz oscillation frequency and middle-speed selected)
  In low-speed mode ..... 2.7 to 5.5 V (*)
  (at 32 kHz oscillation frequency)
  (*: 4.0 to 5.5 V for Flash memory version)
- Power dissipation
  In high-speed mode ..... 35 mW
  (at 4.19 MHz oscillation frequency)
  In low-speed mode ..... 60 µW
  (at 32 kHz oscillation frequency, at 3 V power source voltage)
- Operating temperature range ..... –20 to 85 °C

<Flash memory mode>

- Supply voltage ..... V_{CC} = 5 V ± 10 %
- Program/Erase voltage ..... V_{PP} = 11.7 to 12.6 V
- Programming method ..... Programming in unit of byte
- Erasing method
  Batch erasing ..... Parallel/Serial I/O mode
  Block erasing ..... CPU reprogramming mode
- Program/Erase control by software command
- Number of times for programming/erasing 100
- Operating temperature range (at programming/erasing)
  ..... Normal temperature

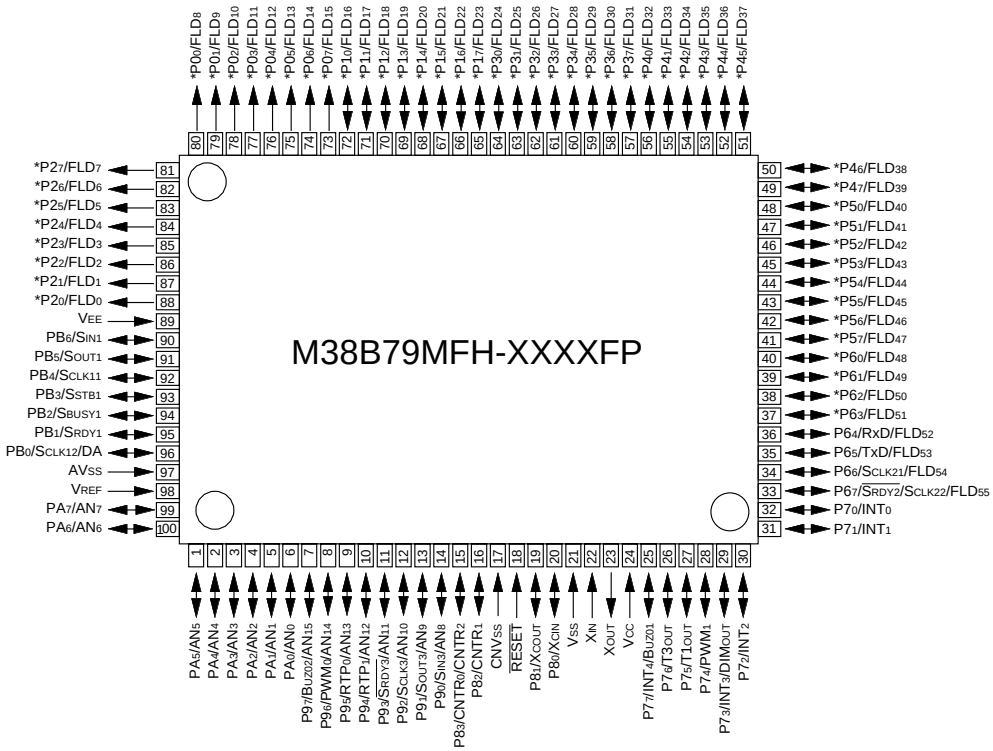
■Notes

1. The flash memory version cannot be used for application embedded in the MCU card.
2. Power source voltage Vcc of the flash memory version is 4.0 to 5.5 V.

APPLICATION

Musical instruments, VCR, household appliances, etc.

PIN CONFIGURATION (TOP VIEW)



*High-breakdown-voltage output port: Totaling 52

Package type: 100P6S-A

Fig. 1 Pin configuration of M38B79MFH-XXXXFP

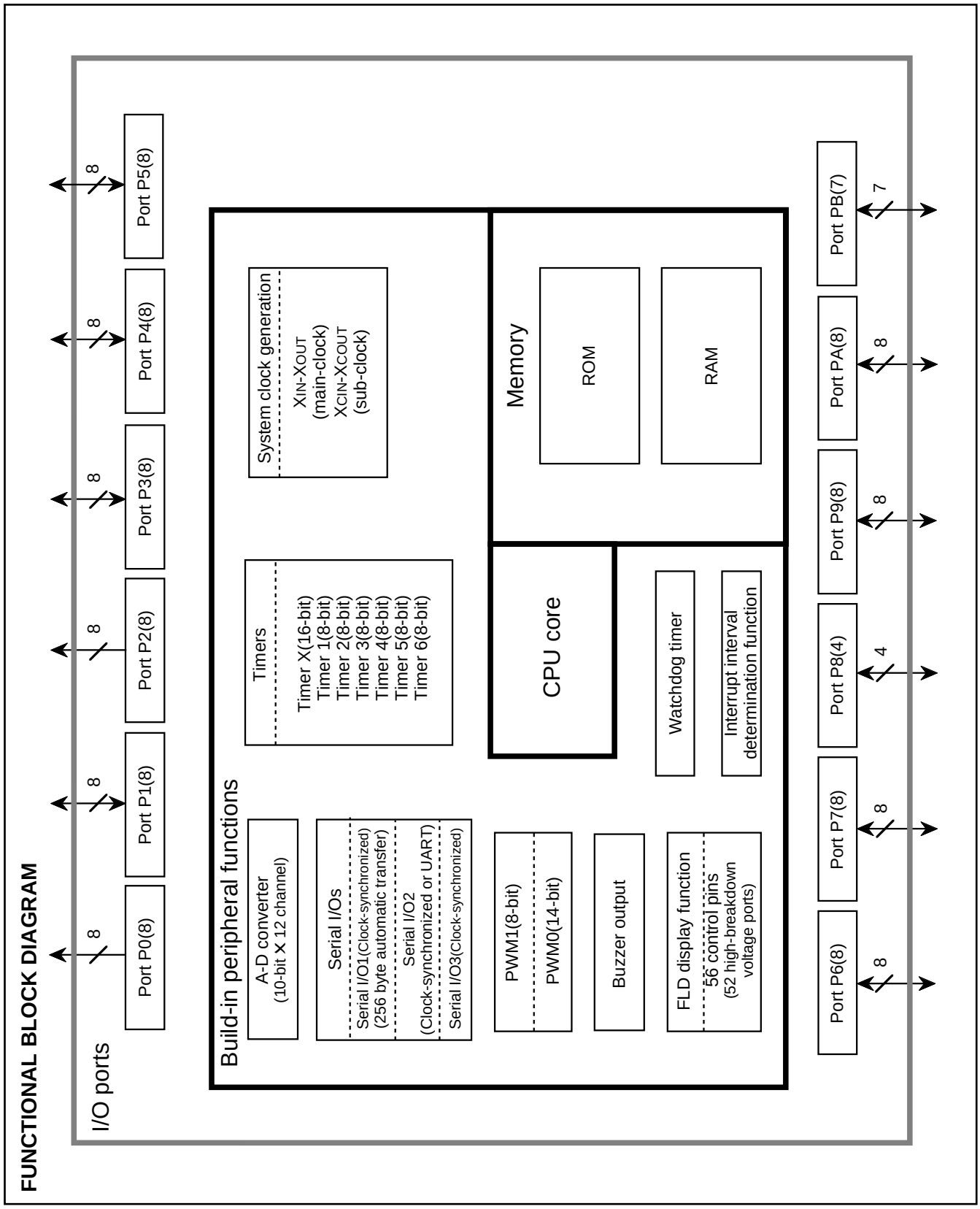


Fig. 2 Functional block diagram