❑ MN1872423 / 3223 / 4023 / 4823

Type	**MN1872423 / 3223 / 4023 / 4823**
ROM (x8-bit)	24K / 32K / 40K / 48k
RAM (x8-bit)	512 / 1024 / 1024 / 1024
Minimum Instruction Execution Time	With Main Clock operated **0.477µs (at 4.3 to 5.5V, 8.38MHz)** With Sub-clock operated **122µs (at 2.2 to 5.5V, 32.768kHz)*** *** The lower limit for operation guarantee for EPROM built-in version is 2.7V.**
Interrupts	• RESET • External 0 • External 1 • External 2 • External 3 • Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 4 • Timer 5 • Serial 0 • Serial 1 • Serial 2 • Key Scan • Auto RAM Data Transmission • Reserve

Timer Counter

Timer Counter 0 : 8-bit x 1 (Timer Output, Event Count, Synchronous Serial Clock Generator, Pulse Width Measurement)

Clock Source .....1/1, 1/4, 1/16, 1/64 of System Clock, 1/1, 1/4, 1/16, 1/64 of Timer 2 (Clock Flag), 1/1, 1/4, 1/16, 1/64 of XI Oscillation Clock, 1/1, 1/4, 1/16, 1/64 of External Clock Input

Interrupt Source .....Overflow of Timer Counter 0

Timer Counter 1 : 8-bit x 1 (Timer Output)

Clock Source .....1/16, 1/64, 1/256 of System Clock, OSC Oscillation Clock, Overflow of Timer 0

Interrupt Source .....Overflow of Timer Counter 1

Timer Counter 2 : 8-bit x 1 (Clock function, Time Base)

Clock Source .....1/4096 of System Clock, 1/128 of XI Oscillation Clock

Interrupt Source .....1/1, 1/2, 1/4, 1/8 of Timer Counter 2

Timer Counter 3 : 8-bit x 1 (Timer Output, Event Count, PWM Output, Synchronous Output (1-bit x 1ch))

Clock Source .....1/4, 1/16 of System Clock, External Clock Input

Interrupt Source .....Overflow of Timer Counter 3

Timer Counter 4 : 8-bit x 1 (Timer Output, Event Count)

Clock Source .....1/4, 1/16 of System Clock, OSC Oscillation Clock, External Clock Input

Interrupt Source .....Overflow of Timer Counter 4

Timer Counter 5 : 8-bit x 1 (Timer Output, Synchronous Output (1-bit x 1ch))

Clock Source .....1/1, 1/4, 1/16, 1/64 of System Clock, 1/1, 1/4, 1/16, 1/64 of XI Oscillation Clock, 1/1, 1/4, 1/16, 1/64 of Overflow of Timer Counter 4

Interrupt Source .....Overflow of Timer Counter 5

Watchdog

(Connectable) Timer Counter 0 + Timer Counter 2, Timer Counter 4 + Timer Counter 5

Serial Interface

Serial 0 : 8-bit x 1 (Synchronous Type) (Transmission/Reception of variable bit length, MSB/LSB selectable, Clock Polarity selectable, Start Condition function, DMA function)

Clock Source .....1/1, 1/8, 1/16 of System Clock, Timer Output Clock, $\overline{\text{SBT0}}$ Pin Input, PSBT0 Input

Serial 1 : 8-bit x 1 (Synchronous Type) (Transmission/Reception of variable bit length, MSB/LSB selectable, Start Condition function, DMA function)

Clock Source .....1/1, 1/8, 1/16 of System Clock, Timer Output Clock, $\overline{\text{SBT1}}$ Pin Input

Serial 2 : 8-bit x 1 (Synchronous Type) (Transmission/Reception of variable bit length, MSB/LSB selectable, Clock Polarity selectable, Start Condition function, DMA function)

Clock Source .....1/1, 1/8, 1/16 of System Clock, Timer Output Clock, $\overline{\text{SBT2}}$ Pin Input

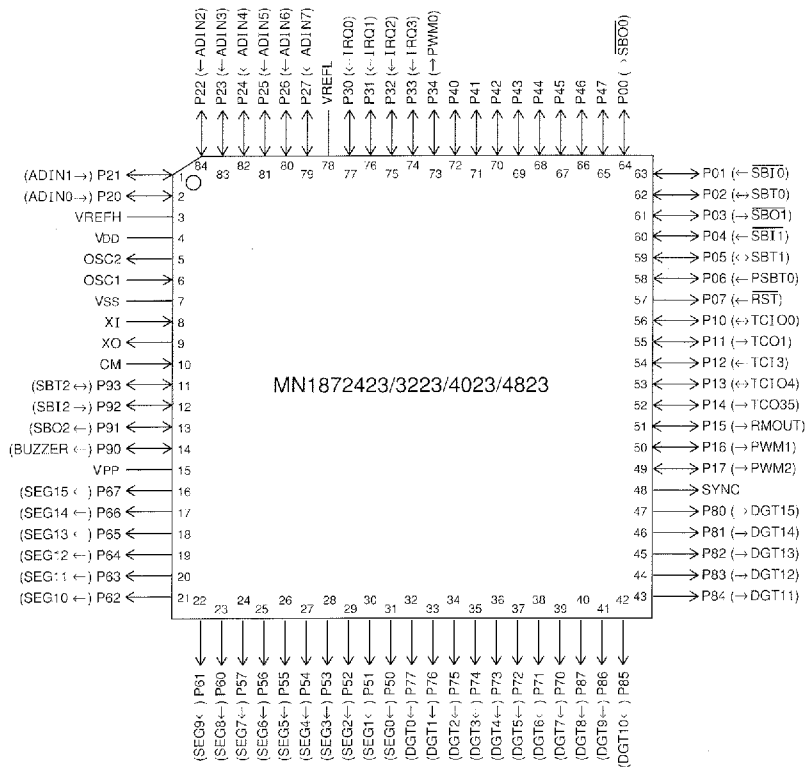
(Connectable) Serial 0 + Serial 1

I/O Pins	**I/O**	**41**	• Common use : 33 • Specified pull-up Resistor available : 33 (Software Programmable) • Specified pull-down Resistor available : 8 (Software Programmable)
	High Voltage Output	**32**	• Pch Open-drain (Breakdown Voltage -30V) : FL Driver : 32 • Specified pull-down Resistor available : 16 (Mask Option)
A/D Inputs			8-bit x 8ch (with S/H)
FLP			16 Segments x 16 Columns
PWM			14-bit x 1ch (Repetition Cycle 15.6ms, at 4.19MHz), 8-bit x 2ch (Repetition Cycle 244μs, at 4.19MHz)
Special Ports			Buzzer Output, 1 (Synchronous Output), Remote Control Transmission
Notes			Carrier Generator Circuit for Remote Controller built-in
Package			QFP084-P-1818

Support Tool

In-Circuit Emulator	PX-ICE1870 / 80 + PX-PRB1876423
Piggyback	Use **EP1876423** as piggy in QFP084-P-1818 package. **EP1876423** is corresponded to **MN1872423**.
EPROM built-in Type	Use **MN18P76423** (under development) in QFP084-P-1818 package.

Pin Assignment



QFP084-P-1818E

See the next page for electrical characteristics.

Electrical Characteristics

Supply Current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating Supply Current	IDD1	fosc=8.38MHz, VDD=5V			20	mA
	IDD2	fxi=32kHz, VDD=3V		50	100	μA
Supply Current at STOP	IDD3	fxi=32kHz, VDD=3V			10	μA

(Ta= –20 to +70°C, VSS=0V)

A/D Converter Characteristics

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
A/D Conversion Absolute Error		VrefH=5V, VrefL=0V			±3	LSB
A/D Conversion Relative Error					±3	LSB
A/D Conversion Time		fosc=4.19 / 8.38MHz			8.82	μs
Reference Input Voltage	VrefH		VrefL		VDD	V
	VrefL		VSS		VrefH	V
Analog Input Voltage	VADIN		VrefL		VrefH	V

(Ta= –20 to +70°C, VDD=5.0V, VSS=0V)