

MN150404 / 0804

Type		MN150404 / 0804	
ROM (x8-bit)		4K / 8K	
RAM (x4-bit)		256 / 384	
Number of Instructions		101 / 104	
Minimum Instruction Execution Time	With Main Clock operated	1.91µs at 1/8 frequency dividing (at 2.6 to 5.5V, 4.19MHz)	
	With Sub-clock operated	4.0µs at 1/8 frequency dividing (at 2.2 to 5.5V, 2MHz) 244µs at 1/8 frequency dividing (at 2.2 to 5.5V, 32.768kHz)	
Interrupts		• RESET • External • Timer • Serial	
Timer Counter		Timer Counter 1 : 8-bit x 1 (Event Count)	
		Clock Source 1/2, 1/8, 1/32, 1/128 of System Clock, 1/1, 1/4, 1/16, 1/64 of XI Oscillation Clock	
		Interrupt Source Overflow of Timer Counter	
		Timer Counter 2 : 8-bit x 1 (Timer Output, Event Count)	
		Clock Source 1/2 of System Clock, 1/16384 of OSC Oscillation Clock, 1/1, 1/64 of XI Oscillation Clock	
Serial Interface		Serial : 8-bit x 1 (Synchronous Type)	
		Clock Source . System Clock, $\overline{\text{SBT}}$ Pin Input	
I/O Pins	I/O	8	• Common use : 2 • Specified pull-up Resistor available 8 (Software Programmable)
	Input	8	• Common use 7 • Specified pull-up Resistor available 8 (Software Programmable)
	High Voltage Output	4	• Nch Open-drain (Breakdown Voltage 10V) 4
	Output	12	• Common use 8

Electrical Characteristics

Supply Current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating Supply Current	IDD1	fosc=4MHz, VDD=5V		2.0	5.0	mA
	IDD2	fosc=32.768kHz, VDD=3V		80	200	µA
Supply Current at STOP	IDD5	XI=32kHz, VDD=3V		7	13	µA
	IDD6	XI=OPEN, VDD=3V		4	8	µA
Supply Current at HALT	IDD3	fosc=4MHz, VDD=3V		0.5	1.2	mA
	IDD4	fosc=32.768kHz, VDD=3V		40	100	µA

(Ta= -20 to +85°C, VDD=5.0V, VSS=0V)

A/D Converter Characteristics

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
A/D Conversion Absolute Error		VDD=5.0V, VSS=0V, VREF+=VDD			±3	LSB
A/D Conversion Relative Error					±2	LSB
A/D Conversion Time		fosc=4MHz	18		18	µs
Reference Input Voltage	Vref+		VSS		VDD	V
Analog Input Voltage	VAD		VSS		Vref+	V

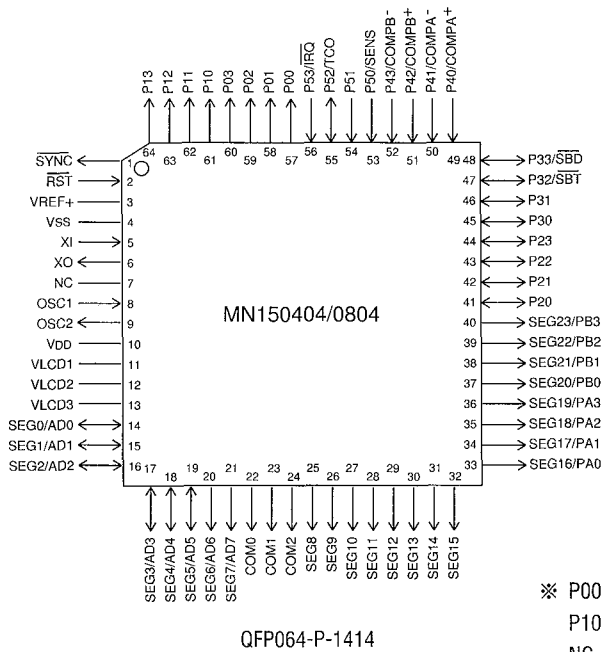
(Ta= -20 to +85°C, VDD=5.0V, VSS=0V)

Zero-cross Inputs	1
A/D Inputs	8-bit x 8ch (with S/H)
LCD	24 Segment • 3 Common • 1/3 Duty
Special Ports	Comparator (2)
Package	QFP064-P-1414

Support Tool

In-Circuit Emulator	PX-ICE1500 + PX-PRB150404 / 0804
EPROM built-in Type	Type MN15P0804
	ROM (x 8-bit) 8K
	RAM (x 4-bit) 384
	Minimum Instruction Execution Time 1 91μs (at 4.5 to 5.5V, 4.19MHz)
	Package QFP064-P-1414

Pin Assignment



※ P00 to P03 Output port (10V Breakdown Voltage)
P10 to P13 . High current output port
NC Nothing connected with pin
Note Use with on-chip MN15P0804 pull-up resistor open