

# MN150413 / 0813

<b>Type</b>		<b>MN150413 / 0813</b>	
<b>ROM (x8-bit)</b>		4K/8K	
<b>RAM (x4-bit)</b>		256/432	
<b>Number of Instructions</b>		103	
<b>Minimum Instruction Execution Time</b>		<b>At 1/4 frequency dividing</b> 2 $\mu$ s (at 1.8 to 5.5V, 2MHz) <b>At 1/4 frequency dividing</b> 0.94 $\mu$ s (at 2.7 to 5.5V, 4.24MHz) <b>At 1/8 frequency dividing</b> 2 $\mu$ s (at 1.8 to 5.5V, 4MHz)	
<b>Interrupts</b>		• RESET • External (Key Interrupt is available) • Timer • Serial	
<b>Timer Counter</b>		<b>Timer Counter 1 : 8-bit x 1</b> (Event Count) Clock Source .....1/2, 1/8, 1/32, 1/128 of System Clock, XI Oscillation Clock Remote Control Carrier Output 1/1, 1/4, 1/16, 1/64 of Time Base 8Hz Dividing Signal Interrupt Source .....Overflow of Timer Counter 1  <b>Time Counter 2 : 8-bit x 1</b> Clock Source.....1/1, 1/16, 1/32, 1/64 of OSC Oscillation Clock, 1/1, 1/16, 1/32, 1/64 of XI Oscillation Clock, 1/1, 1/16, 1/32, 1/64 of TCi2 Pin Input Interrupt Source.....Overflow of Timer Counter 2 Possible cascade connection with timer counter 1  <b>Time Base Counter</b> Clock Source .....1/8 of XI Oscillation Clock  <b>Watchdog Timer</b>	
<b>Serial Interface</b>		<b>Serial : 8-bit x 1</b> (Synchronous Type) Clock Source ..... $\overline{\text{SBT}}$ Pin Input, System Clock	
<b>I/O Pins</b>	<b>I/O</b>	<b>16</b>	• Common use : 10 • Specified pull-up Resistor available : 16 (Software Programmable) • SEG output selectable : 8 (Software Programmable)
	<b>Input</b>	<b>9</b>	• Common use : 5 • Specified pull-up Resistor available : 9 (Software Programmable)
	<b>Output</b>	<b>1</b>	• Common use : 1
<b>LCD</b>		33 Segments • 2 Common • 1/2 Duty, 33 Segments • 3 Common • 1/3 Duty, 32 Segments • 4 Common • 1/4 Duty	
<b>Special Ports</b>		Buzzer Output, Remote Control Transmission	
<b>Notes</b>		Built-in Carrier Generator Circuit for Remote Controller	
<b>Package</b>		QFP064-P-1414	

## Electrical Characteristics

### Supply Current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating Supply Current	IDD1	fosc=4MHz, 1/8 dividing		1.0	3.0	mA
Supply Current at STOP	IDD8	fxt=32.768kHz		4.0	10	$\mu$ A
	IDD9	Oscillation halt			2.0	$\mu$ A
Supply Current at HALT	IDD4	fosc=4MHz		0.6	1.2	mA

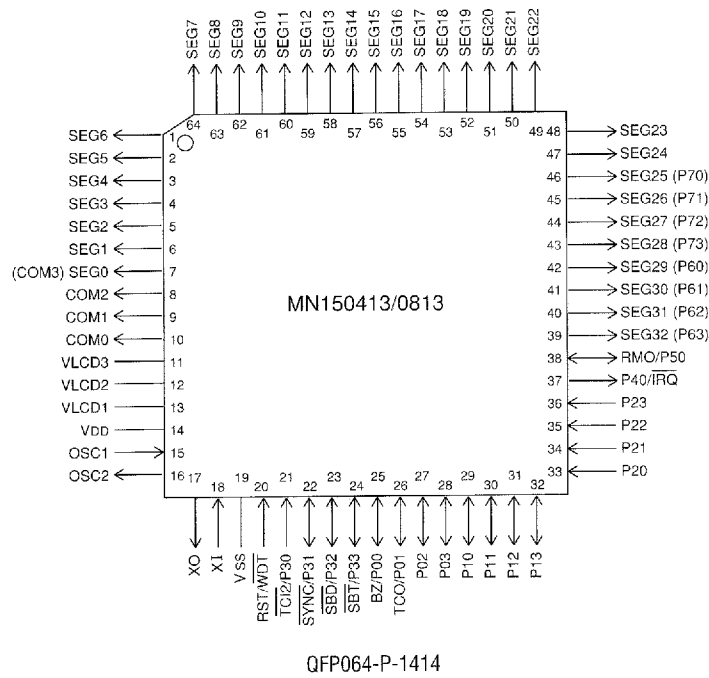
(Ta= -40 to +85°C. VDD=3.0V. VSS=0V)

## Support Tool

**In-Circuit Emulator** PX-ICE1500 + PX-PRB150413/0813

**EPROM built-in Type** Use **MN15P0813** in QFP064-P-1414 package.

## Pin Assignment



※ P30 to P33 : Input only when used as the port 3.

P60 to P63, P70 to P73 : I/O when used as the port 6 or 7.