

# MN155202 / 402

Type	MN155202 / 402		
ROM (x8-bit)	2K / 4K		
RAM (x4-bit)	128 / 192		
Number of Instructions	98		
Minimum Instruction Execution Time	1.0 $\mu$ s (at 4.5 to 5.5V, 8MHz) 4.0 $\mu$ s (at 2.0 to 5.5V, 2MHz)		
Interrupts	• RESET • External (Key Interrupt is available) • Timer • Serial		
Timer Counter	<p><b>Timer Counter : 8-bit x 1</b> (Timer Output, Event Count)</p> <p>Clock Source ..... 1/4, 1/16, 1/64, of P20 Pin Input, 1/2, 1/8, 1/32, 1/128 of System Clock 1/4, 1/16, 1/64 of XI Oscillation Clock</p> <p>Interrupt Source ..... Overflow of Timer Counter</p> <p><b>Time Base Counter</b> (Time Base) Clock Source ..... OSC Oscillation Clock</p> <p><b>Watchdog Timer</b></p>		
Serial Interface	<p><b>Serial : 8-bit x 1</b> (Synchronous Type)</p> <p>Clock Source ..... System Clock, SBT Pin Input</p>		
I/O Pins	I/O	21	<p>• Common use : 13 • LED Driver : 8 (15mA / 1.0V)</p> <p>• Specified pull-up Resistor available, Input selectable : 21 (by -bit, Mask Option)</p>
Zero-cross Inputs	1		
A/D Inputs	10-bit x 6ch (with S/H)		
Notes	Crystal / CR Oscillation selectable		
Package	<p>MN155202 : SDIP028-P-0400, SOP028-P-0375</p> <p>MN155402 : SDIP028-P-0400, SOP028-P-0375, QFH032-P-0707</p>		

## Electrical Characteristics

### Supply Current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating Supply Current	IDD1	fosc=8MHz, VDD=5V			10	mA
	IDD2	fosc=2MHz, VDD=5V			2.5	mA
Supply Current at STOP	IDD3	at no Auto-reset (Oscillation halt)			5	$\mu$ A
Supply Current at HALT	IDD4	fosc=8MHz			3	mA

(Ta= -20 to +70°C, VDD=5.0V, VSS=0V)

### A/D Converter Characteristics

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
A/D Conversion Relative Error	DF LNTY	AVDD=VDD=5.0V, AVSS=VSS=0V			$\approx \pm 3$	LSB
A/D Conversion Time	VCNV	fosc=8MHz		12		$\mu$ s
Analog Input Voltage			AVSS		AVDD	V

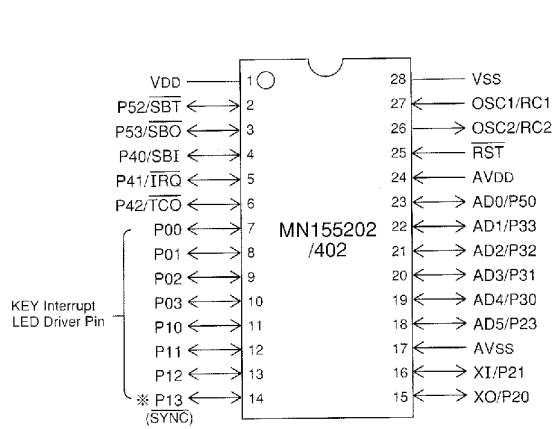
(Ta= -20 to +70°C, VDD=5.0V, VSS=0V)

$\approx \pm 3$  LSB relative error is a design-assured value.

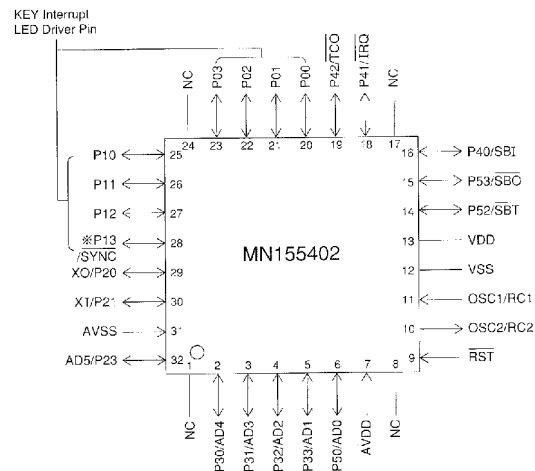
## Support Tool

<b>In-Circuit Emulator</b>	PX-ICE1500 + PX-PRB155202
<b>EPROM built-in Type</b>	Use <b>MN15P5402</b> in SDIP028-P-0400 / SOP028-P-0375 package.

## Pin Assignment



SDIP028-P-0400 / SOP028-P-0375



QFH032-P-0707

- ※ SYNC signal will be output from this pin during internal RESET.
- After RESET, this pin will function as P13.
- NC : Nothing connected with pin.