

# ■ MN102H55G

Type	MN102H55G	
ROM (×8-bit)	128 K	
RAM (×8-bit)	4 K	
Package	LQFP100-P-1414 *Lead-free	
Minimum Instruction Execution Time	With main clock operated	58 ns (at 3.0 V to 3.6 V, 34 MHz)
Interrupts	<ul style="list-style-type: none"> <li>• <math>\overline{\text{RST}}</math> pin • Watchdog • NMI pin • Timer counter 0 to 7 underflow • Timer counter 8 to 12 underflow</li> <li>• Timer counter 8 to 12 compare capture A • Timer counter 8 to 12 compare capture B</li> <li>• ATC ch.0 to 3 transfer finish • ETC ch.0 to 1 transfer finish</li> <li>• External 0 to 4 • Serial ch.0 to 4 transmission • Serial ch.0 to 4 reception • <math>\overline{\text{KI}}</math> pin (OR)</li> <li>• A/D conversion finish</li> </ul>	
Timer Counter	<p>Timer counter 0 : 8-bit × 1 (prescaler, timer output, event count, clock supply for 16-bit timer, timer interrupts)            Clock source ..... 1/2 of system clock (BOSC) frequency; 1/4 of system clock (XI) frequency; system clock (BOSC); TMOIO pin            Interrupt source ..... underflow of timer counter 0</p> <p>Timer counter 1 : 8-bit × 1 (serial clock generator, timer interrupts)            Clock source ..... 1/2 of system clock (BOSC) frequency; underflow of timer counter 0, 4            Interrupt source ..... underflow of timer counter 1</p> <p>Timer counter 2 : 8-bit × 1 (serial clock generator, timer interrupts)            Clock source ..... 1/2 of system clock (BOSC) frequency; underflow of timer counter 0, 4            Interrupt source ..... underflow of timer counter 2</p> <p>Timer counter 3 : 8-bit × 1 (A/D conversion start, timer interrupts)            Clock source ..... 1/2 of system clock (BOSC) frequency; underflow of timer counter 0, 4            Interrupt source ..... underflow of timer counter 3</p> <p>Timer counter 4 : 8-bit × 1            (serial clock generator, timer output, event count, clock supply for 16-bit timer, timer interrupts)            Clock source ..... 1/2 of system clock (BOSC) frequency; underflow of timer counter 0; TM4IO pin            Interrupt source ..... underflow of timer counter 4</p> <p>Timer counter 5 : 8-bit × 1 (serial clock generator, timer interrupts)            Clock source ..... 1/2 of system clock (BOSC) frequency; underflow of timer counter 0; system clock (BOSC)            Interrupt source ..... underflow of timer counter 5</p> <p>Timer counter 6 : 8-bit × 1 (timer interrupts)            Clock source ..... 1/4 of system clock (XI) frequency; underflow of timer counter 0, 4            Interrupt source ..... underflow of timer counter 6</p> <p>Timer counter 7 : 8-bit × 1 (timer output, event count, timer interrupts)            Clock source ..... 1/4 of system clock (XI) frequency; underflow of timer counter 0; TM7IO pin            Interrupt source ..... underflow of timer counter 7</p> <p style="text-align: center;">(Connectable) timer counter 0 to 7</p> <p>Timer counter 8 : 16-bit × 1 (timer output, event count, input capture, PWM output, 2-phase encoder input)            Clock source ..... underflow of timer counter 0, 4; TM8IB pin; 1/2 of system clock (BOSC) frequency; 2-phase encode of TM8IA pin/TM8IB pin (1 ×, 4 ×)            Interrupt source ..... underflow of timer counter 8; timer counter 8 compare capture A; timer counter 8 compare capture B</p>	

<b>Timer Counter (Continue)</b>	Timer counter 9 : 16-bit × 1 (timer output, event count, input capture, PWM output, 2-phase encoder input)
	Clock source ..... underflow of timer counter 0, 4; TM9IB pin; 1/2 of system clock (BOSC); 2-phase encode of TM9IA pin/TM9IB pin (1 ×, 4 ×); TM9IC pin
	Interrupt source ..... underflow of timer counter 9; timer counter 9 compare capture A; timer counter 9 compare capture B
	Timer counter 10 : 16-bit × 1 (timer output, event count, input capture, PWM output, 2-phase encoder input)
	Clock source ..... underflow of timer counter 0, 4; TM10IB pin; 1/2 of system clock (BOSC); 2-phase encode of TM10IA pin/TM10IB pin (1 ×, 4 ×)
	Interrupt source ..... underflow of timer counter 10; timer counter 10 compare capture A; timer counter 10 compare capture B
	Timer counter 11 : 16-bit × 1 (timer output, event count, input capture, PWM output, 2-phase encoder input)
	Clock source ..... underflow of timer counter 0, 4; TM11IB pin; 1/2 of system clock (BOSC); 2-phase encode of TM11IA pin/TM11IB pin (1 ×, 4 ×)
	Interrupt source ..... underflow of timer counter 11; timer counter 11 compare capture A; timer counter 11 compare capture B
	Timer counter 12 : 16-bit × 1 (timer output, event count, input capture, PWM output, 2-phase encoder input)
	Clock source ..... underflow of timer counter 0, 4; TM12IB pin; 1/2 of system clock (BOSC); 2-phase encode of TM12IA pin/TM12IB pin (1 ×, 4 ×)
	Interrupt source ..... underflow of timer counter 12; timer counter 12 compare capture A; timer counter 12 compare capture B
	Timer counter 13, 14 : 8-bit × 2 (simple PWM output)
	Clock source ..... 1/2 of system clock (BOSC); underflow of timer counter 0
	Timer counter 15 : 16-bit × 1 (pulse width measurement)
Clock source ..... system clock (BOSC); 1/2 of system clock (BOSC); underflow of timer counter 0; TM15IB pin	

<b>Serial Interface</b>	Serial 0, 1 : 8-bit × 1 (transfer direction of MSB / LSB selectable, transmission / reception of 7, 8-bit length)
	Clock source ..... 1/8 of timer counter 1 underflow; 1/8, 1/2 of timer counter 2 underflow; external pin
	Serial 2, 3 : 8-bit × 1 (transfer direction of MSB / LSB selectable, transmission / reception of 7, 8-bit length)
	Clock source ..... 1/8 of timer counter 4 underflow; 1/8, 1/2 of timer counter 5 underflow; external pin
	Serial 4 : 8-bit × 1 (transfer direction of MSB / LSB selectable, transmission / reception of 7, 8-bit length)
	Clock source ..... 1/8 of timer counter 1 underflow; 1/8, 1/2 of timer counter 5 underflow; external pin
	UART × 2 (common use with serial 3, 4)
I <sup>2</sup> C × 2 (common use with serial 3,4; single master)	

<b>I/O Pins</b>	<b>I/O</b>	82	• Common use : 46 (address data separate 8-bit mode) • Common use : 53 (address data multiplex 8-bit mode)
<b>A/D Inputs</b>		10-bit × 8-ch. (with S/H)	
<b>D/A Outputs</b>		8-bit × 2-ch.	
<b>PWM</b>		16-bit × 5-ch. (timer counter 8 to 12)	
<b>ICR</b>		16-bit × 5-ch. (timer counter 8 to 12)	
<b>OCR</b>		16-bit × 5-ch. (timer counter 8 to 12)	
<b>Notes</b>		Address / data multiplex bus interface, address / data separate bus interface, 8-bit / 16-bit bus width selectable	

See the next page for electrical characteristics, pin assignment and support tool.

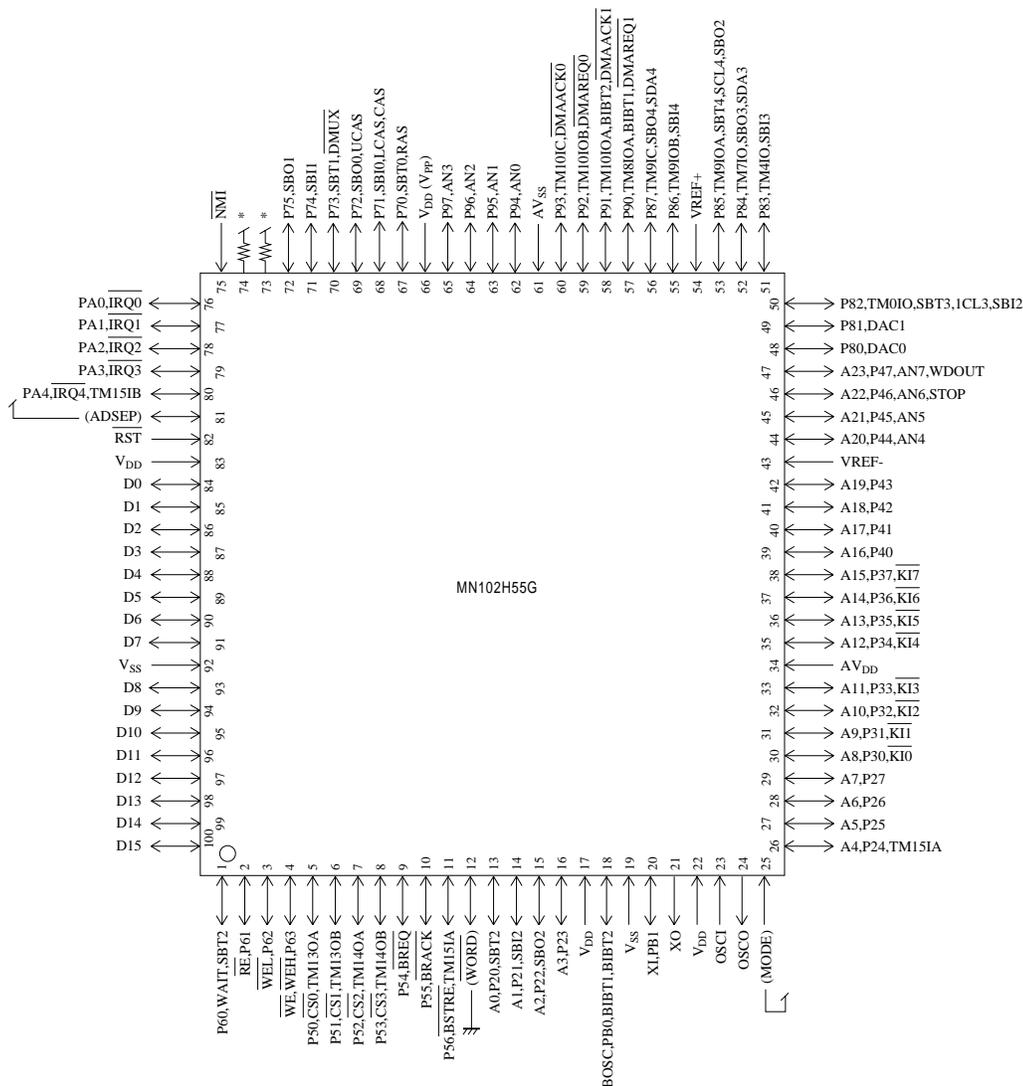
## Electrical Characteristics

### Supply current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDDopr	VI = VDD or VSS, output open f = 34 MHz, VDD = 3.3 V			50	mA
Supply current at STOP	IDDS	Pin with pull-up resistor is open all other input pins and Hi-Z state input/output			70	μA
Supply current at HALT	IDDH	pins are simultaneously applied VDD or VSS level f = 34 MHz, VDD = 3.3 V, output open			23	mA

(Ta = -40°C to +85°C, VDD = AVDD = 3.3 V, VSS = AVSS = 0 V)

Pin Assignment



LQFP100-P-1414 \*Lead-free

\* Use 33 kΩ to 50 kΩ

\* Pin position in 16-bit bus width address data split memory extension mode.

Support Tool

In-circuit Emulator	PX-ICE102H55-LQFP100-P-1414	
Flash Memory Built-in Type	Type	MN102HF55G
	ROM (× 8-bit)	128 K
	RAM (× 8-bit)	4 K
	Minimum instruction execution time	66.6 ns (at 3.0 V to 3.6 V, 30 MHz)
	Package	LQFP100-P-1414 *Lead-free

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