

# □ MN101C67D, MN101C67G

Type	MN101C67D (under development)	MN101C67G
ROM (×8-bit)	64 K	128 K
RAM (×8-bit)	6 K	10 K

**Package** TQFP080-P-1212D \*Lead-free

<b>Minimum Instruction Execution Time</b>	Standard:	0.1 μs (at 2.5 V to 3.6 V, 20 MHz)*
		0.2 μs (at 2.1 V to 3.6 V, 10 MHz)*
		0.5 μs (at 1.8 V to 3.6 V, 4 MHz)*
		62.5 μs (at 1.8 V to 3.6 V, 32 kHz)*
		Double speed: 0.119 μs (at 2.5 V to 3.6 V, 8.39 MHz)*

\* The operation guarantee range for flash memory built-in type is 3.0 V to 3.6 V.

**Interrupts**

- RESET • Watchdog • External 0 • External 1 • External 2 • External 3 • External 4 • External 5
- Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 4 • Timer 5 • Timer 6 • Time base
- Serial 0 reception • Serial 0 transmission • Serial 1 reception • Serial 1 transmission • Serial 2 • Serial 3
- Serial 4 • Automatic transfer finish • A/D conversion finish • Timer 7 (2 systems) • Key interrupts (8 lines)

**Timer Counter**

Timer counter 0 : 8-bit × 1  
 (square-wave/8-bit PWM output, event count, generation of remote control carrier, pulse width measurement)  
 Clock source ..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input  
 Interrupt source ..... coincidence with compare register 0

Timer counter 1 : 8-bit × 1 (square-wave output, event count, synchronous output event)  
 Clock source ..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/64, 1/128 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input  
 Interrupt source ..... coincidence with compare register 1

Timer counter 0, 1 can be cascade-connected.

Timer counter 2 : 8-bit × 1  
 (square-wave/8-bit PWM output, event count, synchronous output event, pulse width measurement)  
 Clock source ..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input  
 Interrupt source ..... coincidence with compare register 2

Timer counter 3 : 8-bit × 1 (square-wave output, event count, generation of remote control carrier)  
 Clock source ..... 1/2, 1/8 of system clock frequency; 1/1, 1/4, 1/16, 1/64, 1/128 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency; external clock input  
 Interrupt source ..... coincidence with compare register 3

Timer counter 2, 3 can be cascade-connected.

Timer counter 4 : 8-bit × 1  
 (square-wave/8-bit PWM output, event count, pulse width measurement, serial 1 baud rate timer)  
 Clock source ..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency;  
 1/1 of external clock input frequency  
 Interrupt source ..... coincidence with compare register 4

Timer counter 5 : 8-bit × 1  
 (square-wave/8-bit PWM output, event count, pulse width measurement, serial 0 baud rate timer)  
 Clock source ..... 1/2, 1/4 of system clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency;  
 1/1 of external clock input frequency  
 Interrupt source ..... coincidence with compare register 5

<b>Timer Counter (Continue)</b>	<p>Timer counter 6 : 8-bit freerun timer            Clock source ..... 1/1 of system clock frequency; 1/1, 1/4096, 1/8192 of OSC oscillation clock frequency; 1/1, 1/4096, 1/8192 of XI oscillation clock frequency            Interrupt source ..... coincidence with compare register 6</p> <p>Timer counter 7 : 16-bit × 1            (square-wave/16-bit PWM output, cycle / duty continuous variable, event count, synchronous output event, pulse width measurement, input capture)            Clock source ..... 1/1, 1/2, 1/4, 1/16 of system clock frequency; 1/1, 1/2, 1/4, 1/16 of OSC oscillation clock frequency; 1/1, 1/2, 1/4, 1/16 of external clock input frequency            Interrupt source ..... coincidence with compare register 7 (2 lines)</p> <p>Time base timer (one-minute count setting)            Clock source ..... 1/1 of OSC oscillation clock frequency; 1/1 of XI oscillation clock frequency            Interrupt source ..... 1/128, 1/256, 1/512, 1/1024, 1/8192, 1/32768 of clock source frequency</p> <p>Watchdog timer            Interrupt source ..... 1/65536, 1/262144, 1/1048576 of system clock frequency</p> <p>DMA controller (automatic data transfer)            Max. Transfer cycles ..... 255            Starting factor ..... external request, various types of interrupt, software            Transfer mode ..... 1-byte transfer, word transfer, burst transfer</p>
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<b>Serial Interface</b>	<p>Serial 0 : synchronous type / UART (full-duplex) × 1            Clock source ..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 5;            1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency</p> <p>Serial 1 : synchronous type / UART (full-duplex) × 1            Clock source ..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 4;            1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency</p> <p>Serial 2 : synchronous type × 1            Clock source ..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 3;            1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency</p> <p>Serial 3 : synchronous type/single-master I<sup>2</sup>C × 1            Clock source ..... 1/2, 1/4 of system clock frequency; pulse output of timer counter 3;            1/2, 1/4, 1/16, 1/32 of OSC oscillation clock frequency</p> <p>Serial 4 : I<sup>2</sup>C slave × 1            Applicable for I<sup>2</sup>C high-speed transfer mode, 7 bit/10bit address setting, general call</p>
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<b>I/O Pins</b>	<b>I/O</b>	62	• Common use • Specified pull-up resistor available • Input/output selectable (bit unit)
	<b>Input</b>	7	• Common use • Specified pull-up resistor available

<b>A/D Inputs</b>	10-bit × 7-ch. (with S/H)
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<b>Special Ports</b>	Buzzer output, remote control carrier signal output, high-current drive port
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See the next page for electrical characteristics, pin assignment and support tool.

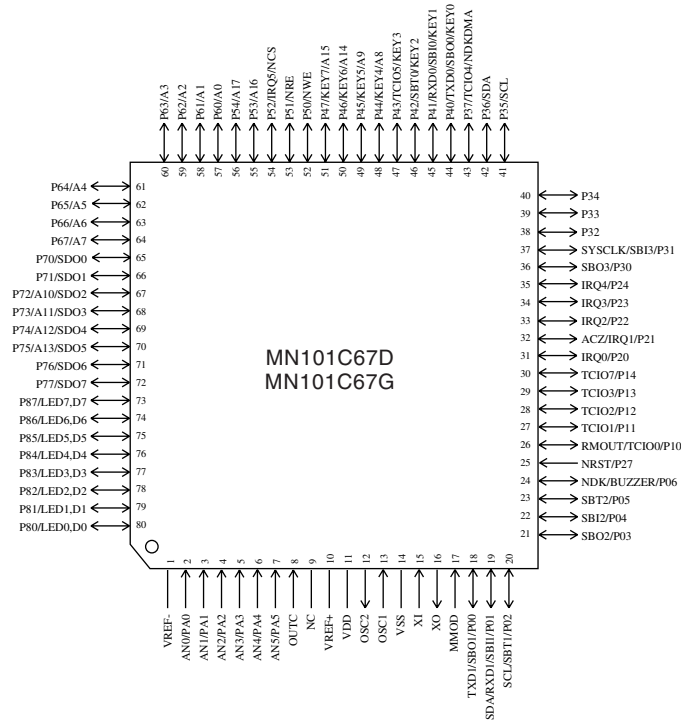
## Electrical Characteristics

### Supply current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	fosc = 20 MHz, VDD = 3 V, (fs = fosc/2)		5	12	mA
	IDD2	fosc = 8.39 MHz, VDD = 3 V, (fs = fosc/2)		2	5	mA
	IDD3	fx = 32.768 kHz, VDD = 3 V, (fs = fx/2)			40	μA
Supply current at HALT	IDD4	fx = 32.768 kHz, VDD = 3 V, Ta = 25°C		4	8	μA
	IDD5	fx = 32.768 kHz, VDD = 3 V			30	μA
Supply current at STOP	IDD6	VDD = 3 V, Ta = 25°C			2	μA
	IDD7	VDD = 3 V			20	μA

Ta = -40°C to +85°C, VDD = 1.8 V to 3.6 V, VSS = 0 V

## Pin Assignment



TQFP080-P-1212D \*Lead-free

NC serves as the VPP pin in the MN101CF67G, and cannot be used as a user pin.

## Support Tool

<b>In-circuit Emulator</b>	PX-ICE101C / D + PX-PRB101C67-TQFP080-P-1212-M	
<b>Flash Memory Built-in Type</b>	Type	MN101CF67G [ES (Engineering Sample) available]
	ROM (× 8-bit)	128 K
	RAM (× 8-bit)	10 K
	Minimum instruction execution time	0.1 μs (at 3.0 V to 3.6 V, 20 MHz)
	Package	TQFP080-P-1212D *Lead-free

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