

MN101C54A , MN101C54C

Type	MN101C54A	MN101C54C
ROM (×8-bit)	32 K	48 K
RAM (×8-bit)	2 K	2 K
Package	QFP084-P-1818E *Lead-free, LQFP080-P-1414A *Lead-free, TQFP080-P-1212D *Lead-free (under planning)	
Minimum Instruction Execution Time	0.1 μs (at 4.5 V to 5.5 V, 20 MHz) 0.25 μs (at 2.7 V to 5.5 V, 8 MHz)* ¹ 62.5 μs (at 2.0 V to 5.5 V, 32 kHz)* ^{1,2} * ¹ The lower limit for operation guarantee for flash memory built-in type is 4.5 V. * ² The lower limit for operation guarantee for EPROM built-in type is 2.3 V.	
Interrupts	• RESET • Watchdog • External 0 • External 1 • External 2 • External 3* ¹ • External 4 (key interrupt dedicated) • Timer 0 • Timer 1 • Timer 2 • Timer 3 • Timer 6 • Time base • Timer 7 (2 systems) • Timer 8 (2 systems) • Serial 0 (2 systems) • Serial 2 • A/D conversion finish * ¹ LQFP080-P-1414A, TQFP080-P-1212D: Not mounted	
Timer Counter	Timer counter 0 : 8-bit × 1 (square-wave/8-bit PWM output, event count, generation of remote control carrier, simple pulse width measurement) (square-wave/PWM output to large current terminal P50 possible) 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, 1/8192, 1/32768 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 output, additional pulse type 10-bit PWM output, event count, synchronous output event, simple pulse width measurement) (square-wave/PWM output to large current terminal P52 possible) 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, serial 0 baud rate timer) 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 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 Timer counter 7 : 16-bit × 1 (square-wave output, IGBT/16-bit PWM output (cycle / duty continuous variable), event count, synchronous output event, pulse width measurement, input capture) (square-wave/PWM output to large current terminal P51 possible) 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)	

Timer Counter (Continue)

Timer counter 8: 16 bit × 1

(square-wave/16-bit PWM output [duty continuous variable], event count, pulse width measurement, input capture)

(square-wave/PWM output to large current terminal P53 possible)

Clock source 1/1, 1/2, 1/4, 1/16, 1/128 of system clock frequency;

1/1, 1/2, 1/4, 1/16, 1/128 of OSC oscillation clock frequency;

1/1, 1/2, 1/4, 1/16 of external clock input frequency

Interrupt source coincidence with compare register 8 (2 lines)

Timer counters 7, 8 can be cascade-connected.

(square-wave output, PWM, input capture, pulse width measurement is possible as a 32-bit timer.)

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

Watchdog timer

Interrupt source 1/65536, 1/262144, 1/1048576 of system clock frequency

Serial Interface

Serial 0 : synchronous type/UART (full-duplex) × 1

Clock source 1/2, 1/4 of system clock frequency; pulse output of timer counter 3;

1/2, 1/4, 1/16, 1/64 of OSC oscillation clock frequency

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

I/O Pins

I/O

61
(60)

• Common use • Specified pull-up resistor available • Input/output selectable (bit unit)

(): LQFP080-P-1414A,TQFP080-P-1212D

Input

4
(3)

• Common use • Specified pull-up resistor available

(): LQFP080-P-1414A,TQFP080-P-1212D

A/D Inputs

10-bit × 8-ch. (with S/H)

LCD

32 segments × 4 commons (static, 1/2, 1/3, or 1/4 duty)

LCD power supply separated from VDD (usable if $VDD \leq V_{LCD} \leq 5.5$ V)

LCD power step-up circuit contained (3/2, 2 and 3 times)

LCD power shunt resistance contained

Special Ports

Buzzer output, remote control carrier signal output, high-current drive port

Electrical Characteristics

Supply current

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Operating supply current	IDD1	$f_{osc} = 20$ MHz, $VDD = 5$ V		25	60	mA
	IDD2	$f_{osc} = 8$ MHz, $VDD = 5$ V		10	25	mA
	IDD3	$f_x = 32$ kHz, $VDD = 3$ V		30	100	μA
Supply current at HALT	IDD4	$f_x = 32$ kHz, $VDD = 3$ V, $T_a = 25^\circ\text{C}$		4	8	μA
	IDD5	$f_x = 32$ kHz, $VDD = 3$ V, $T_a = -40^\circ\text{C}$ to $+85^\circ\text{C}$			30	μA
Supply current at STOP	IDD6	$VDD = 5$ V, $T_a = 25^\circ\text{C}$			2	μA
	IDD7	$VDD = 5$ V, $T_a = -40^\circ\text{C}$ to $+85^\circ\text{C}$			50	μA

See the next page for pin assignment and support tool.

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