# ■ MN101C54A , MN101C54C

Туре	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 *L	ead-free, TQFP080-P-1212D *Lead-free (under planning)		
Minimum Instruction Execution Time	0.25 μs (at 2.7	• • • • • • • • • • • • • • • • • • • •		
4 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 * LQFP080-P-1414A,TQFP080-P-1212D: Not mounted			
Timer Counter	·	current terminal P50 possible) clock frequency; 1/1, 1/4, 1/16, 1/32, 1/64 of OSC oscillation /1 of XI oscillation clock frequency; external clock input		
	Timer counter 1:8-bit × 1 (square-wave output, event count, synchronous output event)  Clock source			
	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			
	Timer counter 3: 8-bit × 1  (square-wave output, event count, generation of remote control carrier, serial 0 baud rate timer)  Clock source			
	Timer counter 2, 3 can be cascade-connected.			
		k frequency; 1/1, 1/4096, 1/8192 of OSC oscillation clock .096, 1/8192 of XI oscillation clock frequency ompare register 6		
	output evevt, pulse width measurement, input capt possible)  Clock source	cle / duty continuous variable), event count, synchronous ture) (square-wave/PWM output to large current terminal P51 of system clock frequency; 1/1, 1/2, 1/4, 1/16 of OSC requency; 1/1, 1/2, 1/4, 1/16 of external clock input frequency		

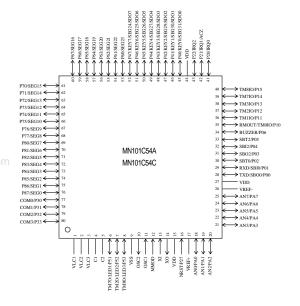
	Timer Counter (Continue)		Timer counter 8: 16 bit × 1  (square-wave/16-bit PWM output [duty continuous variable], event count, pulse width measurement, input capture)  (square-wave/PWM output to large current terminal P53 possible)			
			(square-wave/PWM output to large current terminal P53 possible)  Clock source			
				er counters 7, 8 can be cascade-connected. quare-wave output, PWM, input capture, pulse width measurement is possible as a 32-bit timer.)		
	Sheet4U.com		Time base timer (one-minute count setting)  Clock source			
			Watchdog timer Interrupt source			
	Serial Interfac	erial Interface		Serial 0 : synchronous type/UART (full-duplex) × 1  Clock source		
			Seri	al 2: synchronous type × 1  Clock source		
	I/O Pins	1/0	61 (60)	Common use		
		Input	4 (3)	Common use		
	A/D Inputs  LCD  Special Ports		10-bit × 8-ch. (with S/H)  32 segments × 4 commons (static, 1/2, 1/3, or 1/4 duty)  LCD power supply separated from VDD (usable if VDD ≤ VLCD ≤ 5.5 V)  LCD power step-up circuit contained (3/2, 2 and 3 times)  LCD power shunt resistance contained			
			Buzzer output, remote control carrier signal output, high-current drive port			
	Electrical Characteristics Supply current					

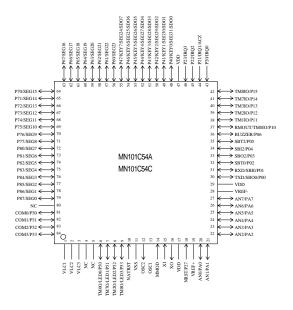
#### Supply current

Parameter	Symbol	Condition		Limit		
Farameter				typ	max	Unit
	IDD1	fosc = 20  MHz,  VDD = 5  V		25	60	mA
Operating supply current	IDD2	fosc = 8 MHz, VDD = 5 V		10	25	mA
	IDD3	fx = 32  kHz, VDD = 3  V		30	100	μА
Oursely surrent of HALT	IDD4	fx = 32 kHz, VDD = 3 V, Ta = 25°C		4	8	μА
Supply current at HALT	IDD5	$fx = 32 \text{ kHz}, VDD = 3 \text{ V}, Ta = -40^{\circ}\text{C to } +85^{\circ}\text{C}$			30	μА
Oursele surrent of OTOR	IDD6	VDD = 5 V, Ta = 25°C			2	μА
Supply current at STOP	IDD7	$VDD = 5 \text{ V}, \text{ Ta} = -40^{\circ}\text{C to} + 85^{\circ}\text{C}$			50	μА

See the next page for pin assignment and support tool.

#### Pin Assignment





QFP084-P-1818E \*Lead-free

LQFP080-P-1414A\*Lead-free

TQFP080-P-1212D \*Lead-free (under planning)

#### **Support Tool**

In-circuit Emulator	PX-ICE101C / D + PX-PRB101C54-TPFP080-P-1212D-M (under planning) PX-ICE101C / D + PX-PRB101C54-QFP084-P-1818E-M PX-ICE101C / D + PX-PRB101C54-LQFP080-P-1414A-M	
EPROM Built-in Type	Туре	MN101CP54C
	ROM (× 8-bit)	48 K
	RAM (× 8-bit)	2 K
	Minimum instruction execution time	0.1 μs (at 4.5 V to 5.5 V, 20 MHz)
		$0.25~\mu s$ (at $2.7~V$ to $5.5~V,8~MHz)$
		62.5 µs (at 2.3 V to 5.5 V, 32 kHz)
	Package	LQFP080-P-1414A *Lead-free, QFP084-P-1818E *Lead-free,
		TQFP080-P-1212D *Lead-free (under planning)
Flash Memory Built-in Type	Туре	MN101CF54D [ES (Engineering Sample) available]
	ROM (× 8-bit)	64 K
	RAM (× 8-bit)	2 K
	Minimum instruction execution time	0.1 μs (at 4.5 V to 5.5 V, 20 MHz)
		$0.25~\mu s$ (at 4.5 V to 5.5 V, 8 MHz)
		62.5 µs (at 4.5 V to 5.5 V, 32 kHz)
	Package	LQFP080-P-1414A *Lead-free, QFP084-P-1818E *Lead-free,
		TQFP080-P-1212D *Lead-free (under planning)

### MN101C54A , MN101C54C $\square$

/ww.DataSheet4U.com

## Request for your special attention and precautions in using the technical information and semiconductors described in this material

- (1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.
- (2) The technical information described in this material is limited to showing representative characteristics and applied circuits examples of the products. It neither warrants non-infringement of intellectual property right or any other rights owned by our company or a third party, nor grants any license.
- (3) We are not liable for the infringement of rights owned by a third party arising out of the use of the product or technologies as described in this material.
- (4) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
  - Consult our sales staff in advance for information on the following applications:
  - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
  - Any applications other than the standard applications intended.
- (5) The products and product specifications described in this material are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (6) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage, and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in your equipment.
  Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (7) When using products for which damp-proof packing is required, observe the conditions (including shelf life and amount of time let standing of unsealed items) agreed upon when specification sheets are individually exchanged.
- (8) This material may be not reprinted or reproduced whether wholly or partially, without the prior written permission of Matsushita Electric Industrial Co., Ltd.