



# MX23L12810

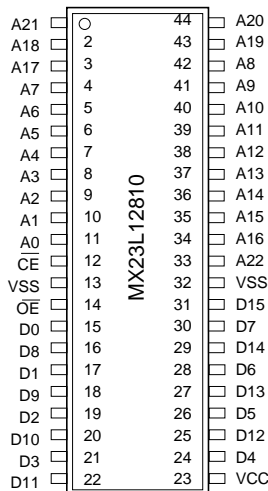
128M-BIT (8M x 16) MASK ROM  
(SOP ONLY)

## FEATURES

- Bit organization
  - 8M x 16 (word mode)
- Fast access time
  - Random access: 90ns (max.)
- Current
  - Operating: 50mA
  - Standby: 15uA
- Supply voltage
  - 3.0~3.6V
- Package
  - 44 pin SOP (500mil)
- Temperature
  - 0 ~ 70°C

## PIN CONFIGURATION

44 SOP(For Word Mode Only)



## PIN DESCRIPTION

Symbol	Pin Function
A0~A22	Address Inputs
D0~D15	Data Outputs
$\overline{CE}$	Chip Enable Input
$\overline{OE}$	Output Enable Input
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

## ORDER INFORMATION

Part No.	Access Time	Package
MX23L12810MC-90	90ns	44 pin SOP
MX23L12810MC-10	100ns	44 pin SOP
MX23L12810MC-12	120ns	44 pin SOP
MX23L12810MC-13	130ns	44 pin SOP
MX23L12810MC-15	150ns	44 pin SOP

**ABSOLUTE MAXIMUM RATINGS**

Item	Symbol	Ratings
Voltage on any Pin Relative to VSS	VIN	-1.3V to VCC+2.0V (Note)
Ambient Operating Temperature	Topr	0°C to 70°C
Storage Temperature	Tstg	-65°C to 125°C

Note: Minimum DC voltage on input or I/O pins is -0.5V. During voltage transitions, inputs may undershoot VSS to -1.3V for periods of up to 20ns. Maximum DC voltage on input or I/O pins is VCC+0.5V. During voltage transitions, inputs may overshoot VCC to VCC+2.0V for periods of up to 20ns.

**DC CHARACTERISTICS** (Ta = 0°C ~ 70°C, VCC = 3.0V~3.6V)

Item	Symbol	MIN.	MAX.	Conditions
Output High Voltage	VOH	2.4V	-	IOH = -0.4mA
Output Low Voltage	VOL	-	0.4V	IOL = 1.6mA
Input High Voltage	VIH	2.2V	VCC+0.3V	
Input Low Voltage	VIL	-0.3V	0.2 x VCC	
Input Leakage Current	ILI	-	5uA	0V, VCC
Output Leakage Current	ILO	-	5uA	0V, VCC
Operating Current	ICC1	-	50mA	f=5MHz, all outputs open
Standby Current (TTL)	ISTB1	-	1mA	$\overline{CE}$ = VIH
Standby Current (CMOS)	ISTB2	-	15uA	$\overline{CE}$ > VCC-0.2V
Input Capacitance	CIN	-	10pF	Ta = 25°C, f = 1MHZ
Output Capacitance	COUT	-	10pF	Ta = 25°C, f = 1MHZ

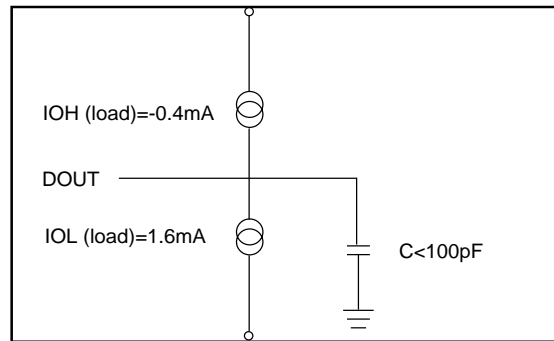
**AC CHARACTERISTICS** (Ta = 0°C ~ 70°C, VCC = 3.0V~3.6V)

Item	Symbol	23L12810-90		23L12810-10		23L12810-12		23L12810-13		23L12810-15	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	90ns	-	100ns	-	120ns	-	130ns	-	150ns	-
Address Access Time	tAA	-	90ns	-	100ns	-	120ns	-	130ns	-	150ns
Chip Enable Access Time	tACE	-	90ns	-	100ns	-	120ns	-	130ns	-	150ns
Output Enable Time	tOE	-	25ns	-	30ns	-	50ns	-	50ns	-	70ns
Output Hold After Address	tOH	0ns	-	0ns	-	0ns	-	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns	-	20ns	-	20ns	-	20ns

Note: Output high-impedance delay (tHZ) is measured from  $\overline{OE}$  or  $\overline{CE}$  going high, and this parameter guaranteed by design over the full voltage and temperature operating range - not tested.

## AC Test Conditions

Input Pulse Levels	0.4V~2.4V
Input Rise and Fall Times	10ns
Input Timing Level	1.4V
Output Timing Level	1.4V
Output Load	See Figure



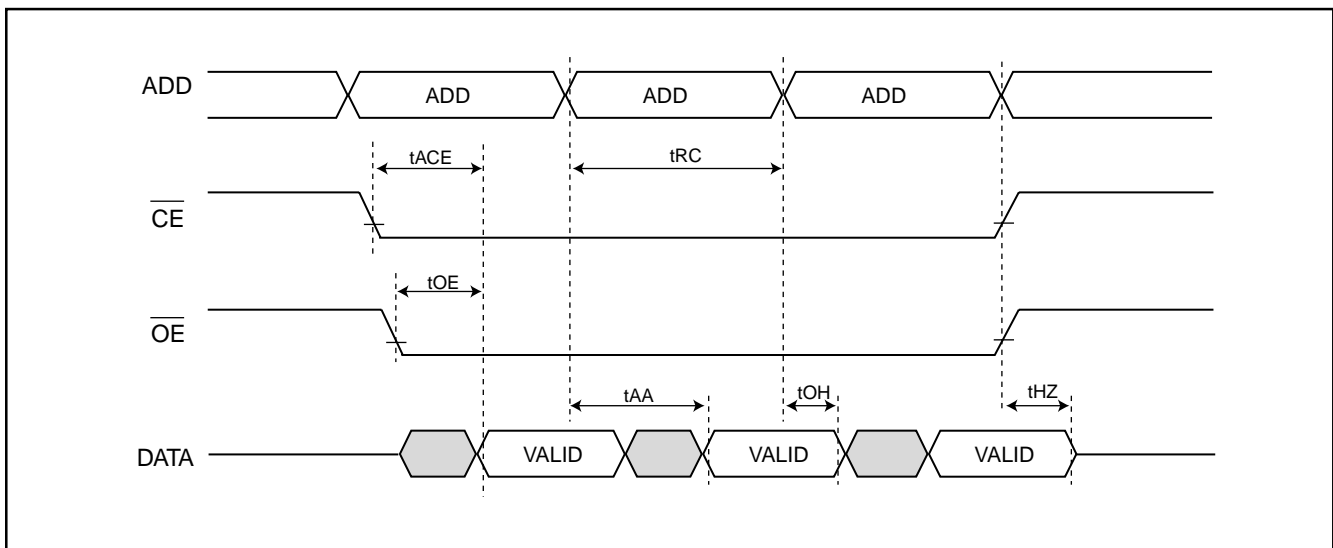
Note: No output loading is present in tester load board.

Active loading is used and under software programming control.

Output loading capacitance includes load board's and all stray capacitance.

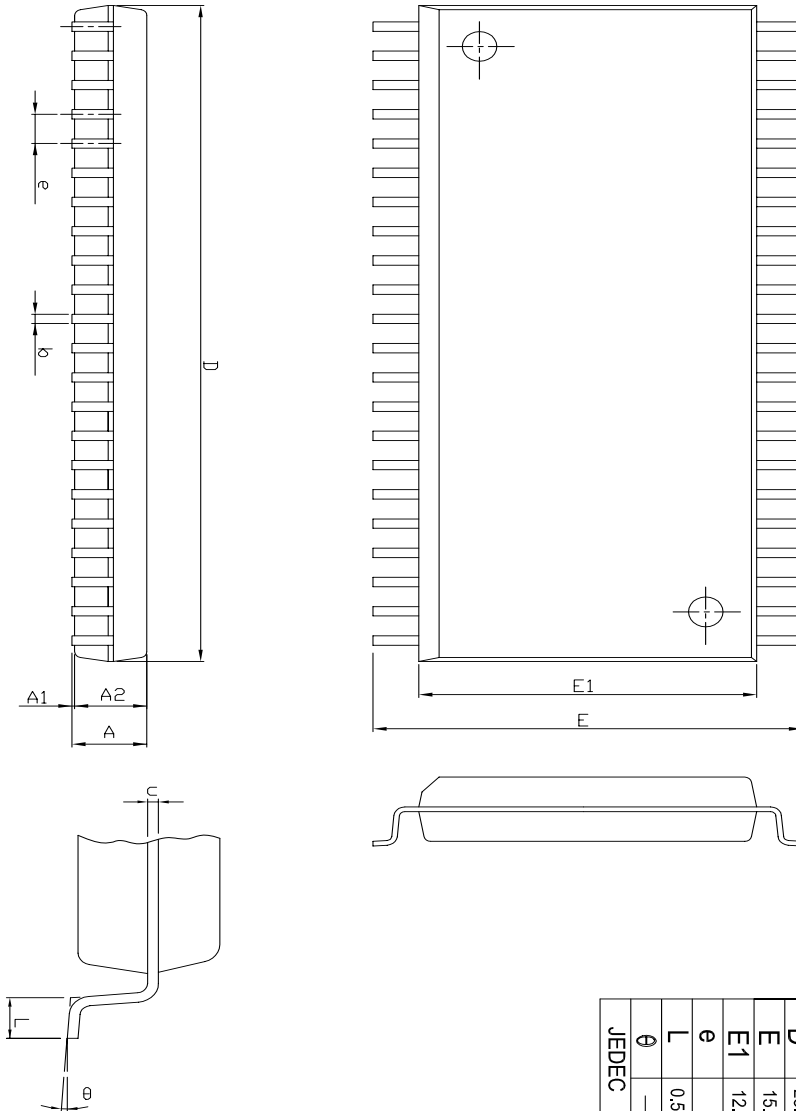
## TIMING DIAGRAM

### RANDOM READ



## PACKAGE INFORMATION

### 44-PIN PLASTIC SOP



Symbol	Dimension in mm (Base)			Dimension in inch (Ref.)		
	Min	Nom	Max	Min	Nom	Max
A	—	—	3.00	—	—	0.118
A1	0.10	—	—	0.004	—	—
A2	2.57	2.69	2.82	0.101	0.106	0.111
b	0.41 REF			0.016 REF		
c	0.20 REF			0.008 REF		
D	28.37	28.50	28.63	1.117	1.122	1.127
E	15.77	16.03	16.28	0.621	0.631	0.641
E1	12.47	12.60	12.73	0.491	0.496	0.501
e	1.27 REF			0.050 REF		
L	0.58	0.79	0.99	0.023	0.031	0.039
θ	5°			5°		

JEDEC

<b>MIIIC</b> 旺宏電子股份有限公司 Macronix International Co., Ltd.		DWG. NO. 61110-0207	
TITLE PACKAGE OUTLINE FOR SOP 44L (500 MIL)			
DRAWN C.I. Chiang	APPROVED Dennis Chang	DATE 05-03-01	UNIT INCH
TOLERANCE .X ± .XX ±.01 .XXX±.002		REVISION 2	
ROUGHNESS			

**REVISION HISTORY**

<b>Revision #</b>	<b>Description</b>	<b>Page</b>	<b>Date</b>
1.1	Modify Current Operating:60mA-->40mA	P1	DEC/12/2000
	Modify ICC1:60mA-->40mA, f=5MHz, all outputs open	P2	
	Del ICC2	P2	
1.2	Modify Current Operating:40mA-->50mA	P1	DEC/14/2000
	Modify ICC1:40mA-->50mA	P2	
1.3	Add Access Time:90/100/120ns	P1,2	AUG/28/2001
	Add Temperature:0~70°C	P1	
	Modify Supply voltage:3.4V±0.2-->3.0V~3.6V	P1,2	



**MX23L12810**

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