



# MX23L8103

## 8M-BIT MASK ROM

### FEATURES

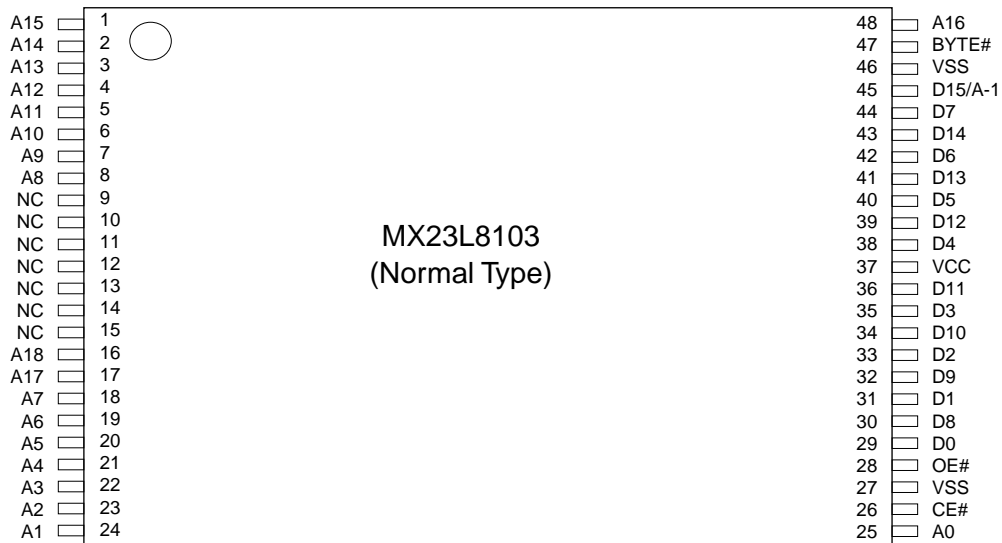
- Bit organization
  - 1M x 8 (byte mode)
  - 512K x 16 (word mode)
- Fast access time
  - Random access:70ns(max.)
- Current
  - Operating:15mA
  - Standby:5uA
- Supply voltage
  - 2.7V ~ 3.6V
- Package
  - 48 pin TSOP(12mm x 20mm)
  - 48 ball mini BGA (6mm x 8mm, ball pitch 0.8mm, ball size 0.3mm)
- Temperature
  - -40 ~ 85° C

### PIN DESCRIPTION

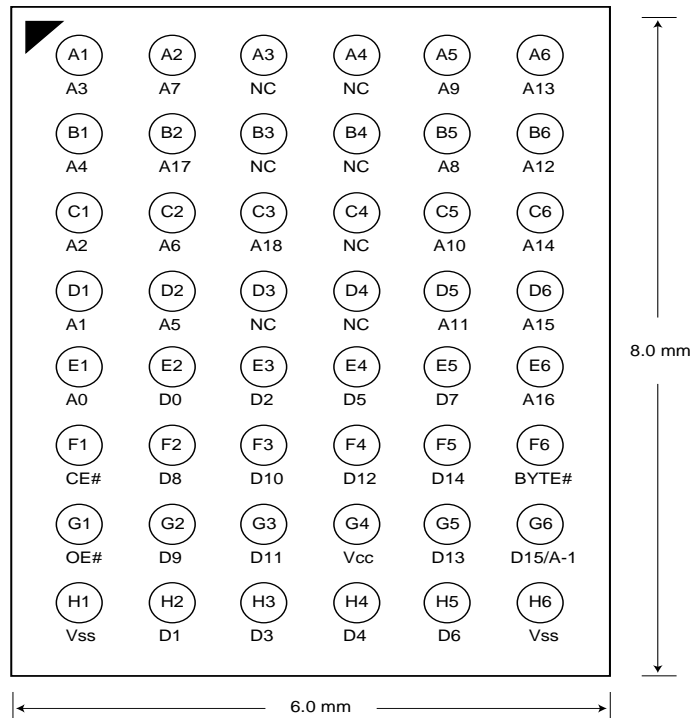
Symbol	Pin Function
A0~A18	Address Inputs
D0~D14	Data Outputs
D15/A-1	D15 (Word Mode)/ LSB Address (Byte Mode)
CE#	Chip Enable Input
OE#	Output Enable Input
Byte#	Word/ Byte Mode Selection
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

### PIN CONFIGURATION

#### 48 TSOP (Top View)



## 48 mini BGA (Top View, Ball Down)



## ORDER INFORMATION

Part No.	Speed	Package	Grade
MX23L8103TC-70	70ns	48 pin TSOP	Commercial
MX23L8103TC-90	90ns	48 pin TSOP	Commercial
MX23L8103TC-12	120ns	48 pin TSOP	Commercial
MX23L8103TI-70	70ns	48 pin TSOP	Industrial
MX23L8103TI-90	90ns	48 pin TSOP	Industrial
MX23L8103TI-12	120ns	48 pin TSOP	Industrial
MX23L8103XI-70	70ns	48 ball mini BGA	Industrial
MX23L8103XI-90	90ns	48 ball mini BGA	Industrial
MX23L8103XI-12	120ns	48 ball mini BGA	Industrial

Note: Industrial grade temperature: -40 ~ 85° C  
 Commercial grade temperature: 0 ~ 70° C

## MODE SELECTION

CE#	OE#	Byte#	D15/A-1	D0~D7	D8~D15	Mode	Power
H	X	X	X	High Z	High Z	-	Stand-by
L	H	X	X	High Z	High Z	-	Active
L	L	H	Output	D0~D7	D8~D15	Word	Active
L	L	L	Input	D0~D7	High Z	Byte	Active



## ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings
Supply Voltage Relative to VSS	VCC	-0.3V to 4.3V
Voltage on any Pin Relative to VSS	VIN	-0.3V to 3.9V
Ambient Operating Temperature	Topr	-40° C to 85° C
Storage Temperature	Tstg	-65° C to 125° C

## DC CHARACTERISTICS (Ta = -40° C ~ 85° C, VCC = 2.7V~3.6V)

Item	Symbol	MIN.	MAX.	Conditions
Output High Voltage	VOH	2.4V	-	IOH = -400uA
Output Low Voltage	VOL	-	0.4V	IOL = 1.6mA
Input High Voltage	VIH	2.1V	VCC+0.3V	
Input Low Voltage	VIL	-0.3V	0.8V	
Input Leakage Current	ILI	-	5uA	0V, VCC
Output Leakage Current	ILO	-	5uA	0V, VCC
Operating Current	ICC	-	15mA	f=5MHz, CE#=VIL, OE#=VIH all output open
Standby Current (CMOS)	ISTB	-	5uA	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 = -40° C ~ 85° C, VCC = 2.7V~3.6V)

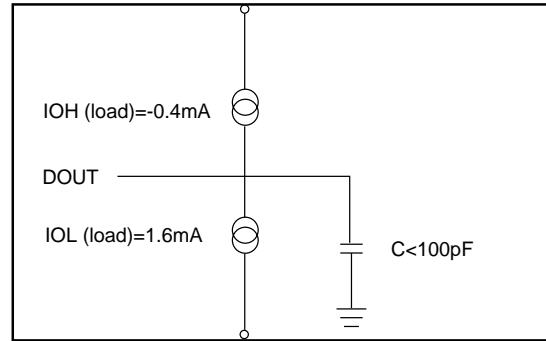
Item	Symbol	23L8103-70		23L8103-90		23L8103-12	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	70ns	-	90ns	-	120ns	-
Address Access Time	tAA	-	70ns	-	90ns	-	120ns
Chip Enable Access Time	tACE	-	70ns	-	90ns	-	120ns
Output Enable Time	tOE	-	30ns	-	35ns	-	50ns
Output Hold After Address	tOH	0ns	-	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns	-	20ns

Note: Output high-impedance delay (tHZ) is measured from OE# or 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	0V~ 3.0V
Input Rise and Fall Times	5ns
Input Timing Level	1.5V
Output Timing Level	1.5V
Output Load	See Figure

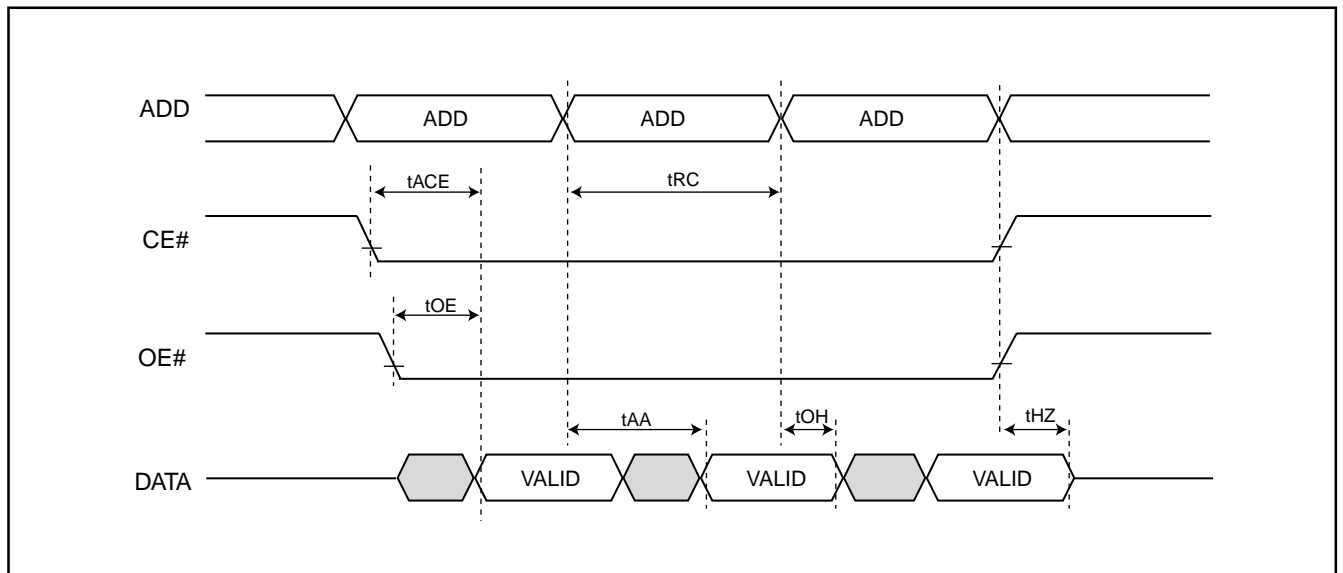
Note: 30pF output load capacitance for 70 and 90ns speed grade  
 100pF output load capacitance for 120ns speed grade



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.

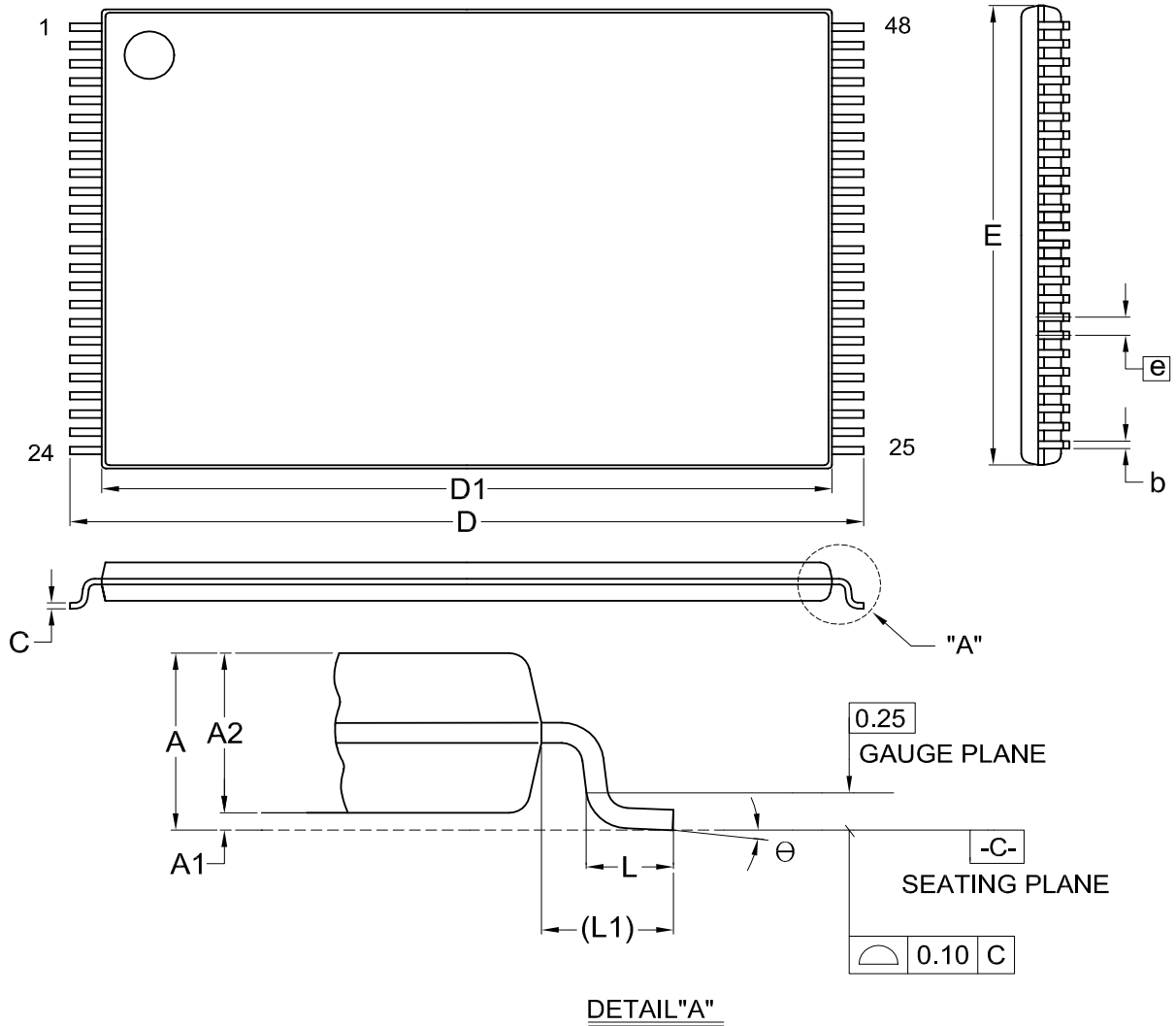
### TIMING DIAGRAM

#### RANDOM READ



## PACKAGE INFORMATION

Title: Package Outline for TSOP(I) 48L (12X20mm)NORMAL FORM



Dimensions (inch dimensions are derived from the original mm dimensions)

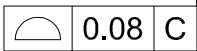
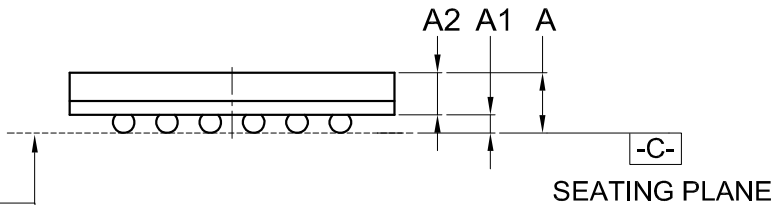
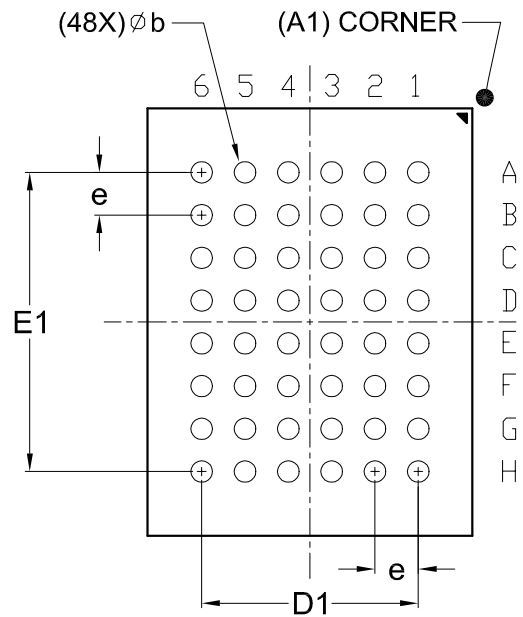
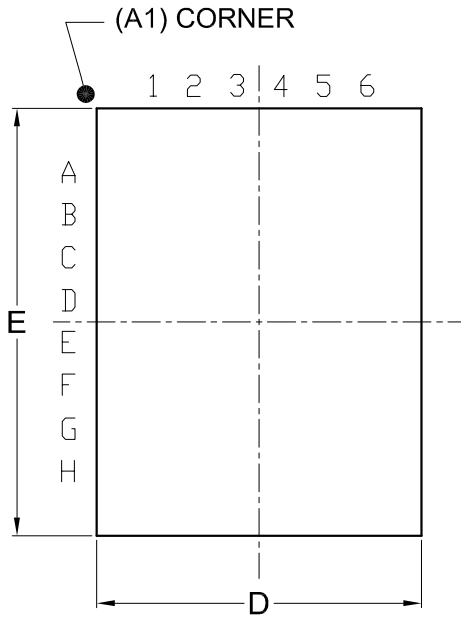
SYMBOL		A	A1	A2	b	C	D	D1	E	e	L	L1	$\theta$
mm	Min.	---	0.05	0.95	0.17	0.10	19.80	18.30	11.90		0.50	0.70	0
	Nom.	---	0.10	1.00	0.20	0.13	20.00	18.40	12.00	0.50	0.60	0.80	5
	Max.	1.20	0.15	1.05	0.27	0.21	20.20	18.50	12.10		0.70	0.90	8
Inch	Min.	---	0.002	0.037	0.007	0.004	0.780	0.720	0.469		0.020	0.028	0
	Nom.	---	0.004	0.039	0.008	0.005	0.787	0.724	0.472	0.020	0.024	0.031	5
	Max.	0.047	0.006	0.041	0.011	0.008	0.795	0.728	0.476		0.028	0.035	8

DWG.NO.	REVISION	REFERENCE			ISSUE DATE
		JEDEC	EIAJ		
6110-1607	7	MO-142			12-01-03

Title: Package Outline for CSP 48BALL(6X8X1.2MM,BALL PITCH 0.8MM,BALL DIAMETER 0.3MM)

## TOP VIEW

## BOTTOM VIEW



Dimensions (inch dimensions are derived from the original mm dimensions)

SYMBOL		A	A1	A2	b	D	D1	E	E1	e
mm	Min.	--	0.18	0.65	0.27	5.90		7.90		
	Nom.	--	0.23	--	0.30	6.00	4.00	8.00	5.60	0.80
	Max.	1.20	0.28	--	0.37	6.10		8.10		
Inch	Min.	--	0.007	0.026	0.011	0.232		0.311		
	Nom.	--	0.009	--	0.012	0.236	0.157	0.315	0.220	0.031
	Max.	0.047	0.011	--	0.015	0.240		0.319		

DWG.NO.	REVISION	REFERENCE			ISSUE DATE
		JEDEC	EIAJ		
6110-4201	4	MO-210			12-12-03



**REVISION HISTORY**

<b>Revision No.</b>	<b>Description</b>	<b>Page</b>	<b>Date</b>
1.1	Add Package 48-ball mini BGA 8mm x 13mm-->8mm x 9mm	P1, 2	MAY/31/2000
1.2	1.Modify Pin Configuration-- 48 mini BGA	P1,2	JUL/06/2001
	2.Added 48-Ball mini BGA--Package Information	P6	
	3.Modify DC Characteristics--VIH:2.2V-->2.1V	P3	
1.3	1.Added Order Information	P2	JUL/16/2001
	2.Add Temperature:-40~85° C	P1	
1.4	Add CE#=VIL, OE#=VIH in DC Characteristics's ICC	P3	SEP/28/2001
1.5	Add Supply Voltage Relative to VSS : -0.3V to 4.3V	P3	SEP/10/2002
1.6	Modify Package Information	P5~6	NOV/22/2002
1.7	1. Add commercial grade in order information	P2	MAY/03/2004



**MX23L8103**

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