

### FEATURES

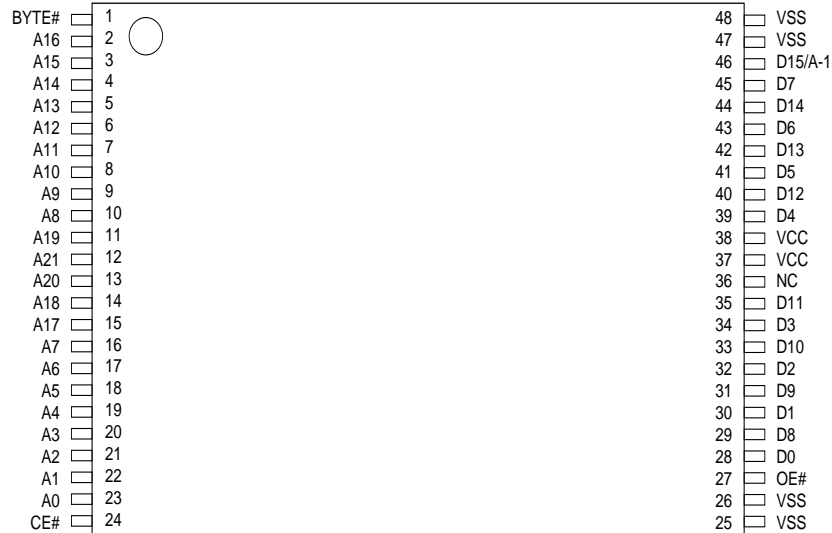
- Bit organization
  - 8M x 8 (byte mode)
  - 4M x 16 (word mode)
- Fast access time
  - Random access:70ns (max.)
  - Page access:25ns (max.)
- Page size
  - 8 words per page
- Current
  - Operating:20mA
  - Standby:15uA
- Supply voltage
  - 2.7V ~ 3.6V
- Package
  - 44 pin SOP (500mil)
  - 48 pin TSOP (12mm x 20mm)
- Temperature
  - 0° C ~ 70° C
- Process
  - 0.18um

### PIN DESCRIPTION

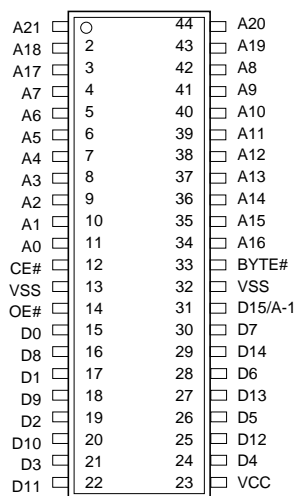
Symbol	Pin Function
A0~A21	Address Inputs
D0~D14	Data Outputs
D15/A-1	D15 (Word Mode)/ LSB Address (Byte Mode)
CE#	Chip Enable Input
OE#	Output Enable Input
BYTE#	Word/ Byte Mode Selection
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

### PIN CONFIGURATION

#### 48 TSOP (Top View)



## 44 SOP



## ORDER INFORMATION

Part No.	Speed	Package	Grade	Remark
MX23L6410ATC-70	70ns	48 pin TSOP	Commercial	
MX23L6410ATC-90	90ns	48 pin TSOP	Commercial	
MX23L6410ATC-70G	70ns	48 pin TSOP	Commercial	Pb-free
MX23L6410ATC-90G	90ns	48 pin TSOP	Commercial	Pb-free
MX23L6410AMC-70G	70ns	44 pin SOP	Commercial	Pb-free
MX23L6410AMC-90G	90ns	44 pin SOP	Commercial	Pb-free



## 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
Voltage on any Pin Relative to VSS	VIN	-0.3V to 3.9V
Ambient Operating Temperature	Topr	0° C to 70° C
Storage Temperature	Tstg	-65° C to 125° C

## DC CHARACTERISTICS (Ta = 0° C ~ 70° 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	0.7xVCC	VCC+0.3	
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	-	20mA	f=5MHz, CE#=VIL, OE#=VIH all output open
Standby Current (CMOS)	ISTB	-	15uA	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 = 2.7V~3.6V)

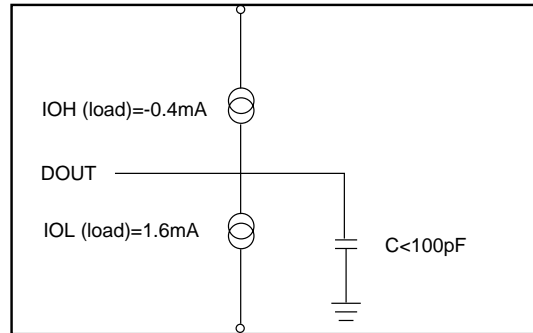
Item	Symbol	23L6410A-70		23L6410A-90	
		MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	70ns	-	90ns	-
Address Access Time	tAA	-	70ns	-	90ns
Chip Enable Access Time	tCE	-	70ns	-	90ns
Page Access Time	tPA	-	25ns	-	25ns
Output Enable Time	tOE	-	25ns	-	25ns
Output Hold After Address	tOH	0ns	-	0ns	-
Output High Z Delay	tHZ	-	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



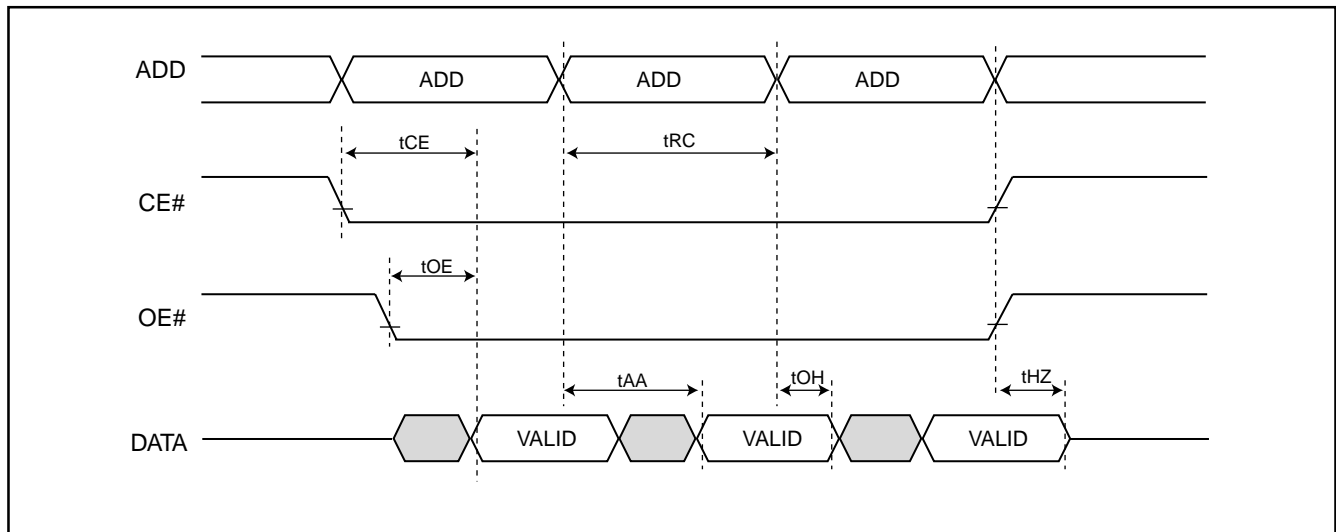
Note: No output loading is present in tester load board.

Active loading is used and under software programming control.

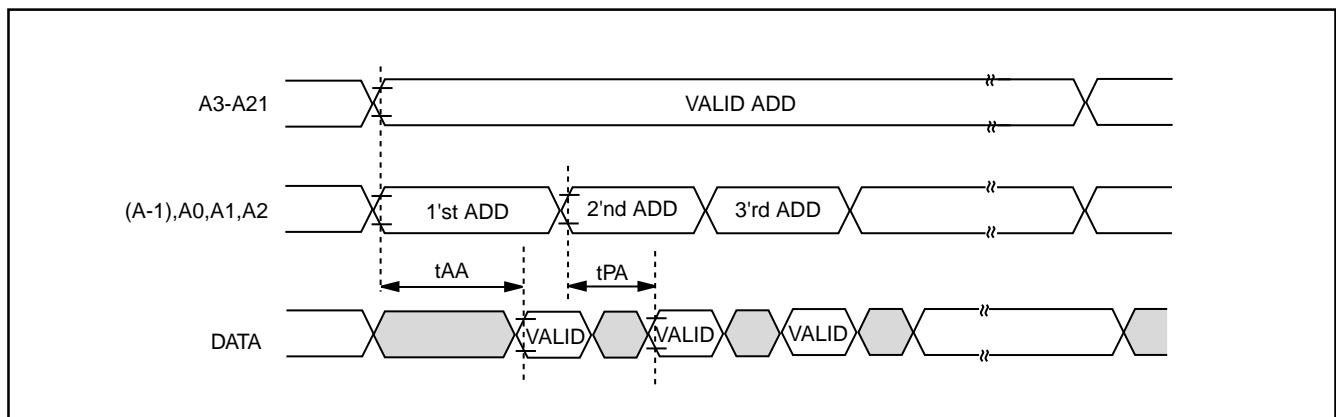
Output loading capacitance includes load board's and all stray capacitance.

## TIMING DIAGRAM

### RANDOM READ

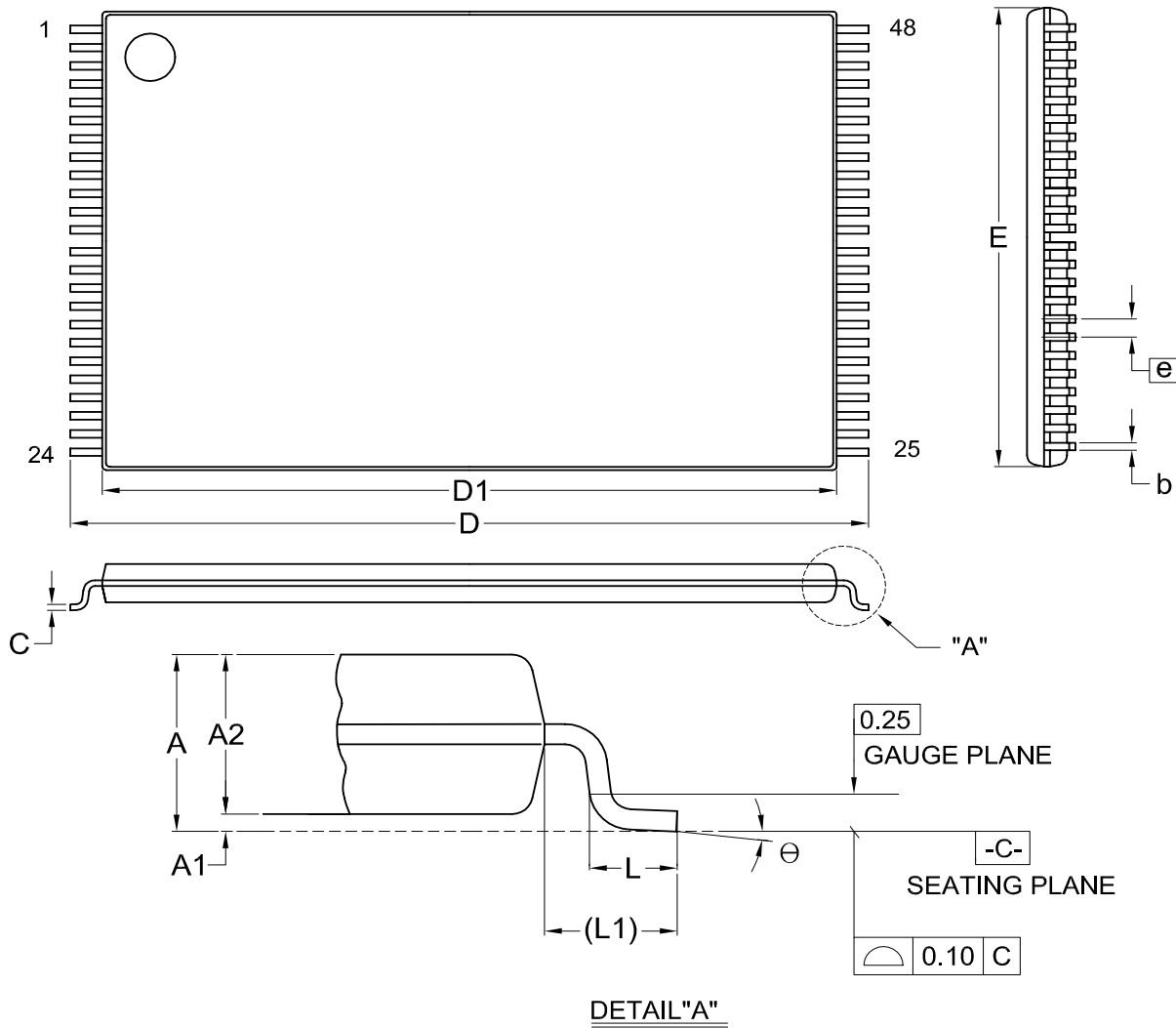


### PAGE READ



## PACKAGE INFORMATION

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

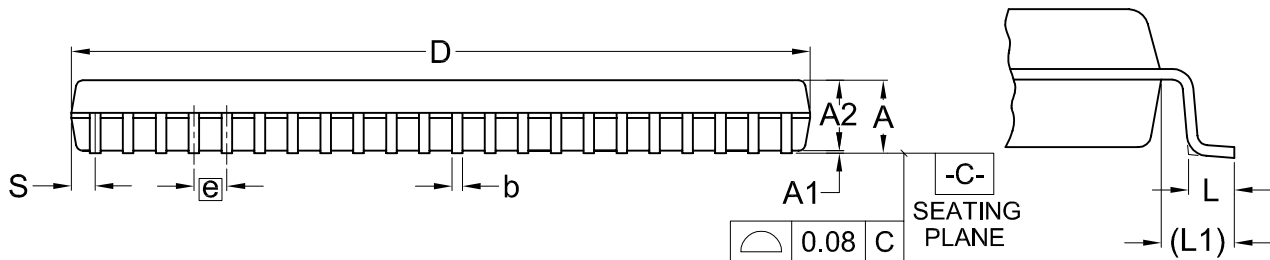
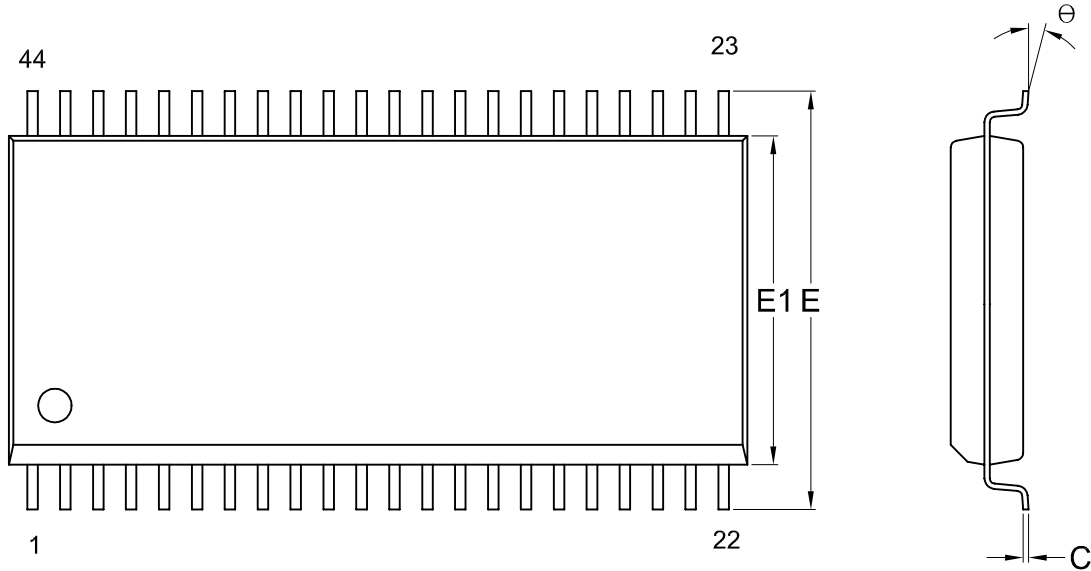


Dimensions (inch dimensions are derived from the original mm dimensions)

SYMBOL		A	A1	A2	b	C	D	D1	E	e	L	L1	θ
UNIT													
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 SOP 44L (500MIL)**



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

SYMBOL		A	A1	A2	b	C	D	E	E1	e	L	L1	S	$\theta$
UNIT														
mm	Min.	---	0.10	2.59	0.36	0.15	28.37	15.83	12.47		0.56	1.51	0.78	0
	Nom.	---	0.15	2.69	0.41	0.20	28.50	16.03	12.60	1.27	0.76	1.71	0.91	5
	Max.	3.00	0.20	2.80	0.51	0.25	28.63	16.23	12.73		0.96	1.91	1.04	10
Inch	Min.	---	0.004	0.102	0.014	0.006	1.117	0.623	0.491		0.022	0.059	0.031	0
	Nom.	---	0.006	0.106	0.016	0.008	1.122	0.631	0.496	0.050	0.030	0.067	0.036	5
	Max.	0.118	0.008	0.110	0.020	0.010	1.127	0.639	0.501		0.038	0.075	0.041	10

DWG.NO.	REVISION	REFERENCE			ISSUE DATE
		JEDEC	EIAJ		
6110-1405	6	MO-175			11-26-'03



**MX23L6410A**

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