MX23L6410

64M-BIT Mask ROM (8/16 Bit Output)

FEATURES

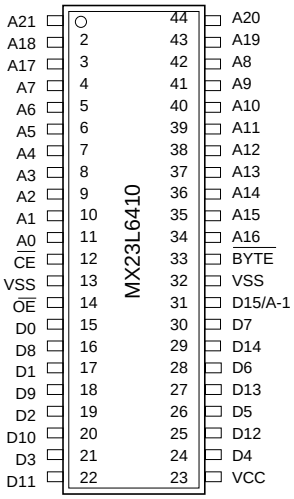
- Bit organization
  - 8M x 8 (byte mode)
  - 4M x 16 (word mode)
- Fast access time
  - Random access: 120ns (max.)
- Current
  - Operating: 60mA (max.)
  - Standby: 5uA (max.)
- Supply voltage
  - 2.9V~3.6V
- Package
  - 44 pin SOP (500 mil)
  - 48 pin TSOP (20mm x 12mm)

ORDER INFORMATION

Part No.	Access Time	Package
MX23L6410MC-12	120ns	44 pin SOP
MX23L6410MC-15	150ns	44 pin SOP
MX23L6410TC-12	120ns	48 pin TSOP
MX23L6410TC-15	150ns	48 pin TSOP
MX23L6410RC-12	120ns	48 pin TSOP (Reverse type)
MX23L6410RC-15	150ns	48 pin TSOP (Reverse type)

PIN CONFIGURATION

44 SOP



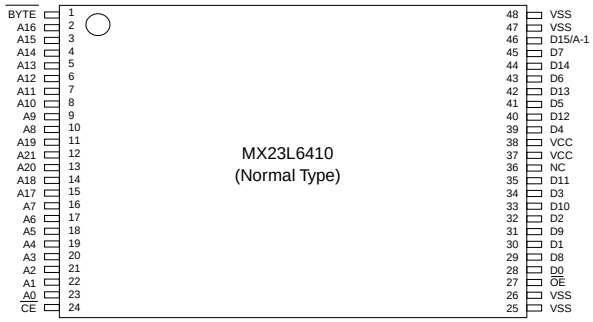
PIN DESCRIPTION

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

MODE SELECTION

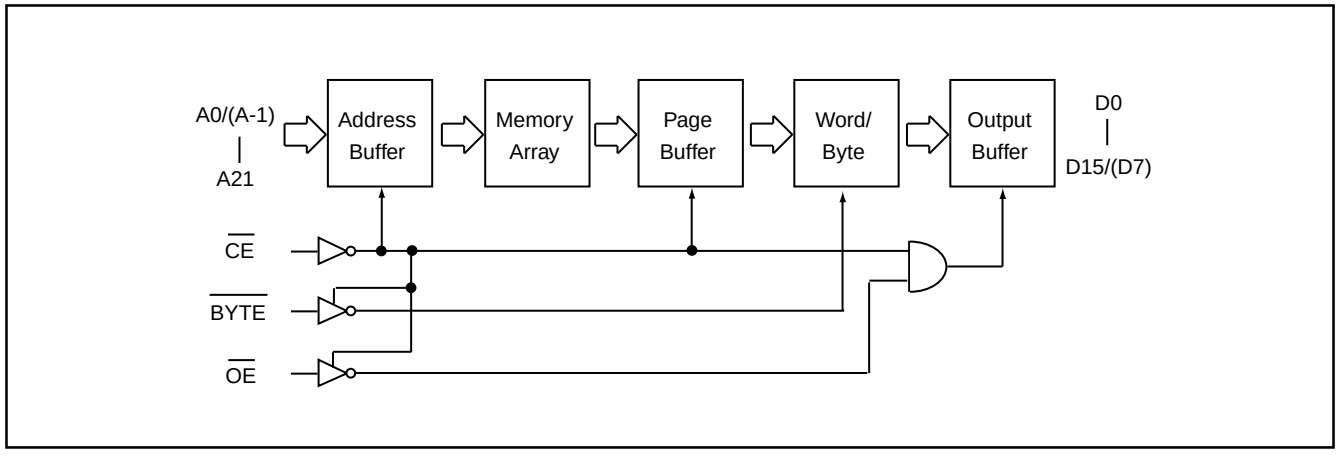
$\overline{CE}$	$\overline{OE}$	$\overline{Byte}$	D15/A-1	D0~D7	D8~D15	Mode	Power
H	X	X	X	High Z	High Z	-	Stand-by
L	H	X	X	High Z	High Z	-	Active
L	L	H	Output	D0~D7	D8~D15	Word	Active
L	L	L	Input	D0~D7	High Z	Byte	Active

48 TSOP (NORMAL TYPE)



48 TSOP (REVERSE TYPE)

BLOCK DIAGRAM



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℃ to 70℃
Storage Temperature	Tstg	-65℃ to 125℃

Note: Minimum DC voltage on input or I/O pins is -0.5V. During voltage transitions, inputs may undershoot VSS to -0.8V for periods of up to 20ns. Maximum DC voltage on input or I/O pins is VCC+0.5V. During voltage transitions, input may overshoot VCC to VCC+2.0V for periods of up to 20ns.

DC CHARACTERISTICS (Ta = 0℃ ~ 70℃, VCC = 2.9V~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	0.8V	
Input Leakage Current	ILI	-	5uA	0V, VCC
Output Leakage Current	ILO	-	5uA	0V, VCC
Operating Current	ICC1	-	60mA	tRC = 120ns, all output open
	ICC2	-	30mA	tRC=1us
Standby Current (TTL)	ISTB1	-	1mA	$\overline{CE}$ = VIH
Standby Current (cmos)	ISTB2	-	5uA	$\overline{CE}$>VCC-0.2V
Input Capacitance	CIN	-	10pF	Ta = 25℃, f = 1MHZ
Output Capacitance	COUT	-	10pF	Ta = 25℃, f = 1MHZ

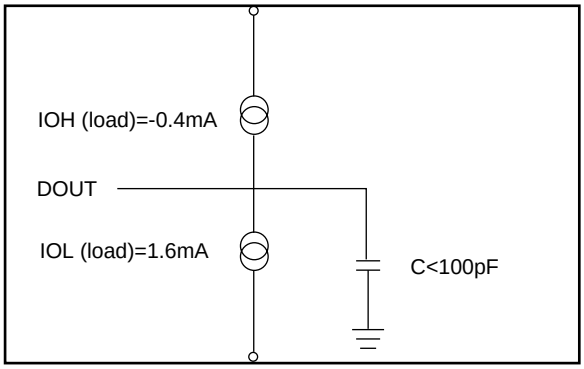
AC CHARACTERISTICS (Ta = 0℃ ~ 70℃, VCC = 5V±10%)

Item	Symbol	23L6410-12		23L6410-15	
		MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	120ns	-	150ns	-
Address Access Time	tAA	-	120ns	-	150ns
Chip Enable Access Time	tACE	-	120ns	-	150ns
Output Enable Time	tOE	-	60ns	-	70ns
Output Hold After Address	tOH	0ns	-	0ns	-
Output High Z Delay	tHZ	-	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

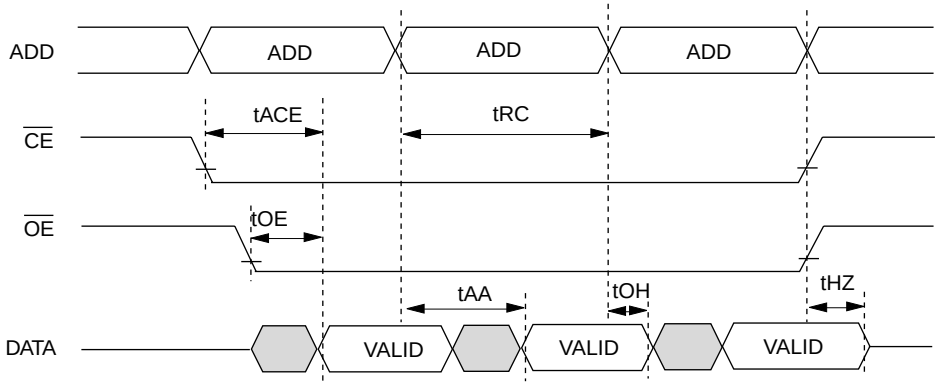
Input Pulse Levels	0.4V~ 2.4V
Input Rise and Fall Times	10ns
Input Timing Level	1.4V
Output Timing Level	1.4V
Output Load	See Figure



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



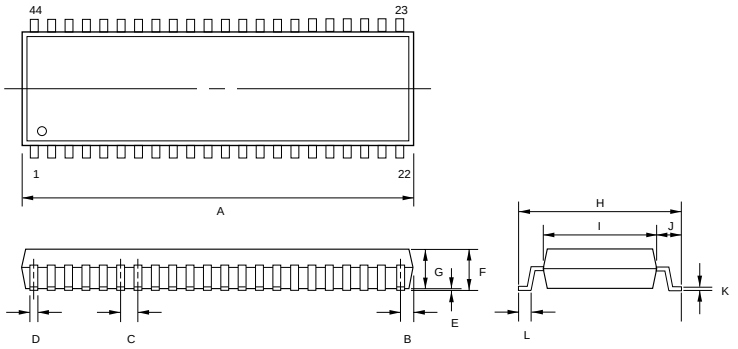
Note : $\overline{CE}$, $\overline{OE}$ are enable.

PACKAGE INFORMATION

44-PIN PLASTIC SOP

ITEM	MILLIMETERS	INCHES
A	28.70 max.	1.130 max.
B	1.10 [REF]	.043 [REF]
C	1.27 [TP]	.050 [TP]
D	.40 ± .10 [Typ.]	.016 ± .004 [Typ.]
E	.010 min.	.004 min.
F	3.00 max.	.118 max.
G	2.80 ± .13	.110 ± .005
H	16.04 ± .30	.631 ± .012
I	12.60	.496
J	1.72	.068
K	.15 ± .10 [Typ.]	.006 ± .004 [Typ.]
L	.80 ± .20	.031 ± .008

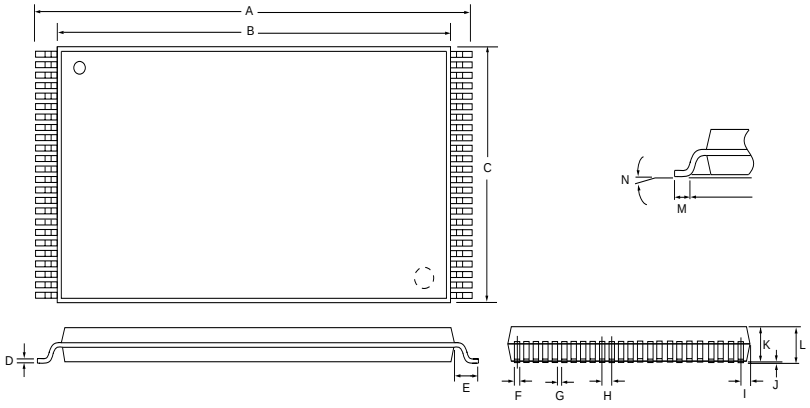
NOTE: Each lead centerline is located within .25 mm[.01 inch] of its true position [TP] at maximum material condition.



48-PIN PLASTIC TSOP

ITEM	MILLIMETERS	INCHES
A	20.0 ± .20	.787 ± .008
B	18.40 ± .10	.724 ± .004
C	12.20 max.	.480 max.
D	0.15 [Typ.]	.006 [Typ.]
E	.80 [Typ.]	.031 [Typ.]
F	.20 ± .10	.008 ±.004
G	.30 ± .10	.012 ± .004
H	.50 [Typ.]	.020 [Typ.]
I	.45 max.	.018 max.
J	0 ~ .20	0 ~ .008
K	1.00 ± .10	.039 ± .004
L	1.27 max.	.050 max.
M	.50	.020
N	0 ~ 5°	.500

NOTE: Each lead centerline is located within .25 mm[.01 inch] of its true position [TP] at maximum material condition.



REVISION HISTORY

REVISION	DESCRIPTION	PAGE	DATE
1.9	AC CHARACTERISTICS tOH 10ns-->0ns	P3	JAN/29/1999

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