



MX23L3210

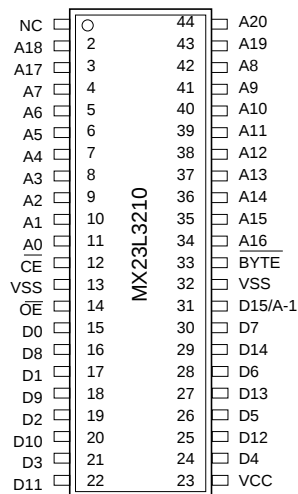
32M-BIT MASK ROM (8/16 BIT OUTPUT)

FEATURES

- Bit organization
 - 4M x 8 (byte mode)
 - 2M x 16 (word mode)
- Fast access time
 - Random access: 120ns (max.)
- Current
 - Operating: 40mA
 - Standby: 5uA
- Supply voltage
 - 2.7V~3.6V
- Package
 - 44 pin SOP (500mil)
 - 48 pin TSOP (20mm x 12mm)

PIN CONFIGURATION

44 SOP



ORDER INFORMATION

Part No.	Access Time	Package
MX23L3210MC-12	120ns	44 pin SOP
MX23L3210MC-15	150ns	44 pin SOP
MX23L3210TC-12	120ns	48 pin TSOP
MX23L3210TC-15	150ns	48 pin TSOP
MX23L3210RC-12	120ns	48 pin TSOP (Reverse type)
MX23L3210RC-15	150ns	48 pin TSOP (Reverse type)

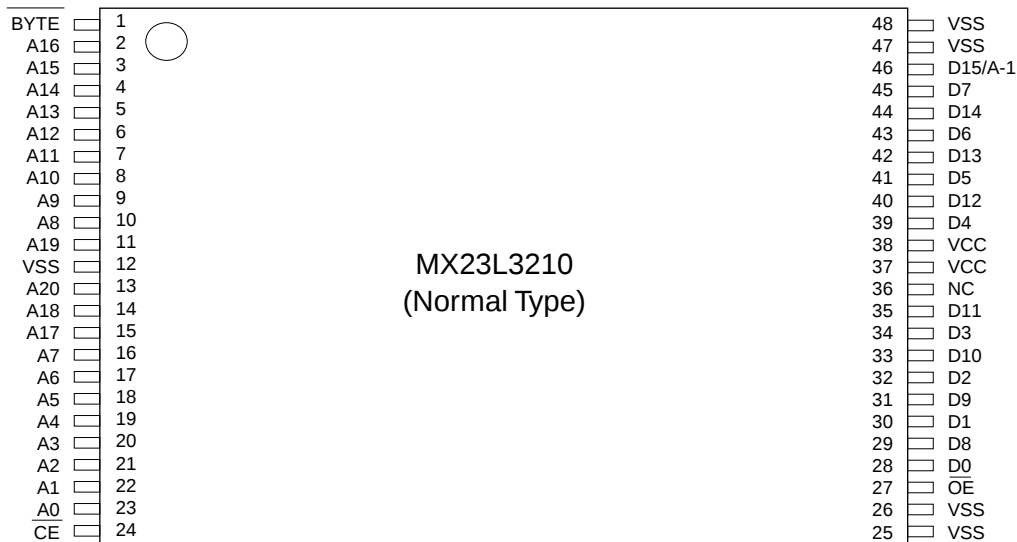
PIN DESCRIPTION

Symbol	Pin Function
A0~A20	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
Byte	Word/ Byte Mode Selection
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

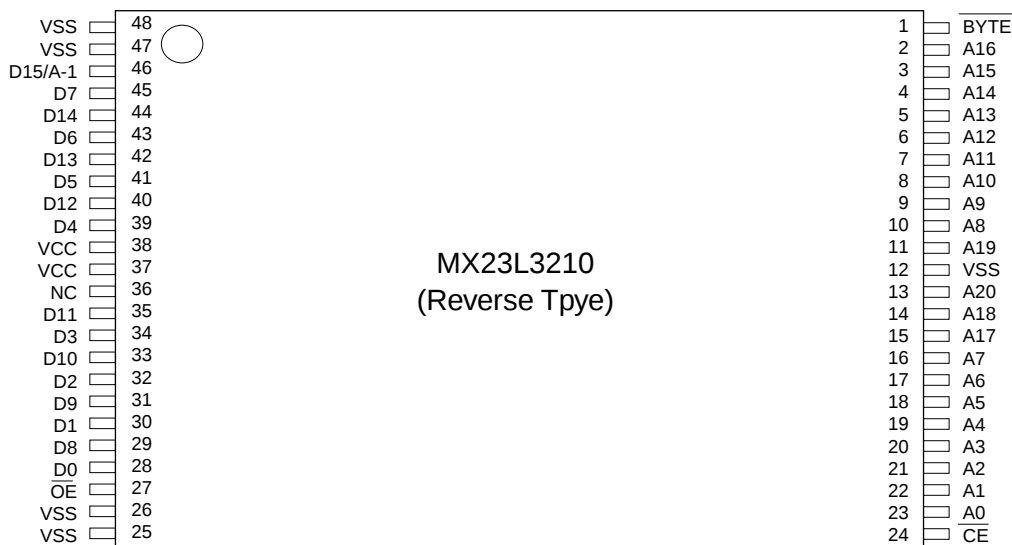
MODE SELECTION

$\overline{CE}$	$\overline{OE}$	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

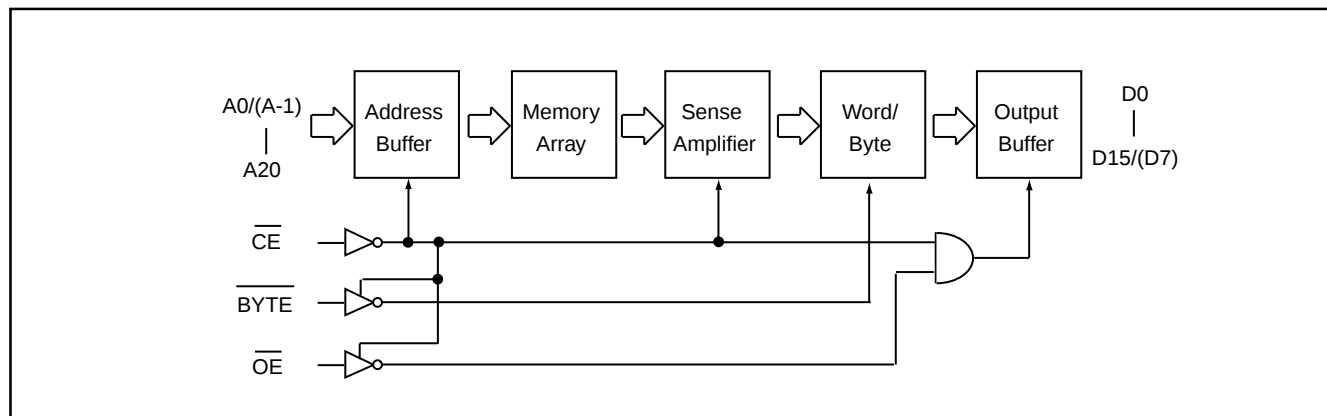
48 TSOP (Normal Type)



48 TSOP (Reverse Type)



BLOCK DIAGRAM



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	2.3V	-	IOH = -0.4mA
Output Low Voltage	VOL	-	0.4V	IOL = 1.6mA
Input High Voltage	VIH	2.1V	VCC+0.3V	
Input Low Voltage	VIL	-0.3V	0.2xVCC	
Input Leakage Current	ILI	-	5uA	0V, VCC
Output Leakage Current	ILO	-	5uA	0V, VCC
Operating Current	ICC1	-	40mA	tRC = 120ns, all output open
Standby Current (TTL)	ISTB1	-	1mA	$\overline{\text{CE}} = \text{VIH}$
Standby Current (CMOS)	ISTB2	-	5uA	$\overline{\text{CE}} > \text{VCC} - 0.2\text{V}$
Input Capacitance	CIN	-	10pF	Ta = 25°C, f = 1MHZ
Output Capacitance	COUT	-	10pF	Ta = 25°C, f = 1MHZ

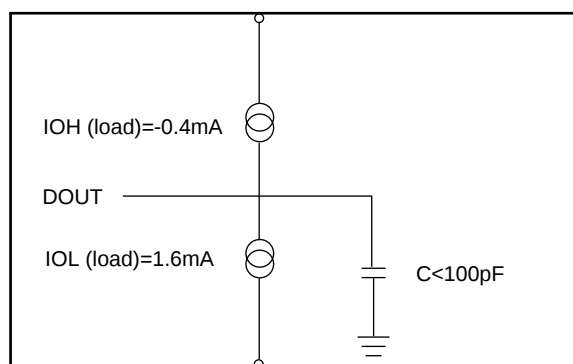
AC CHARACTERISTICS (Ta = 0 °C ~ 70 °C, VCC = 2.7V~3.6V)

Item	Symbol	23L3210-12		23L3210-15	
		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 $\overline{OE}$ 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	1.4
Output Load	See Figure



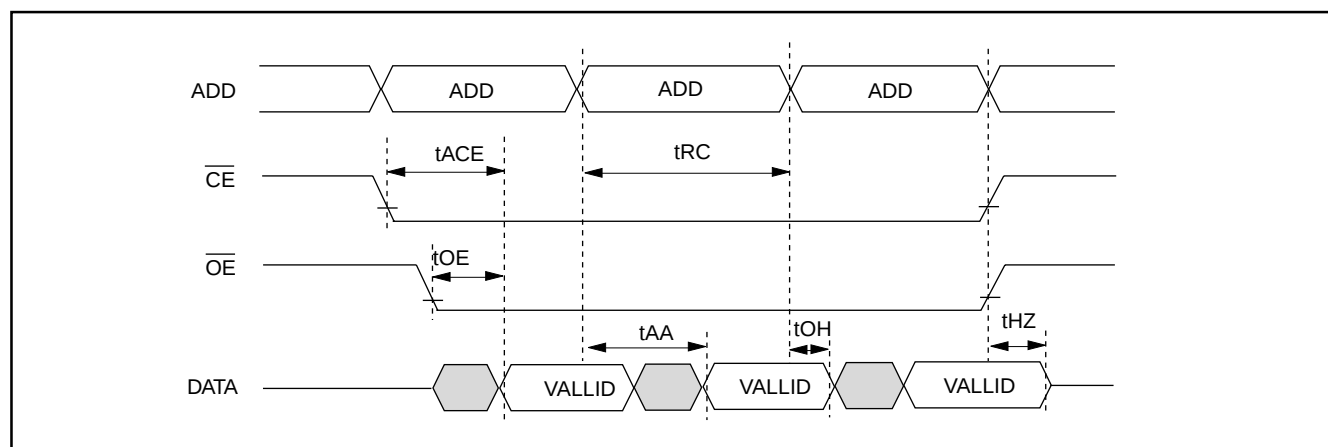
Note: No output loading is present in tester load board.

Active loading is used and under software programming control.

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

TIMING DIAGRAM

RANDOM READ



REVISION HISTORY**Supply Voltage**

The supply voltage is changed as 2.7V~3.6V instead of 3.0V~3.6V.

DC Characteristics

The input low voltage VIL Max. value is changed as 0.2xVCC instead of 0.8V.

The standby current ISTB2 is changed as 5uA instead of 15uA.

The operating current ICC1 is changed as 40mA instead of 25mA.

AC Characteristics

Added 120ns and 150ns speed grade items.

The output high Z delay is changed as 20ns instead of 70ns.

AC Test Conditions

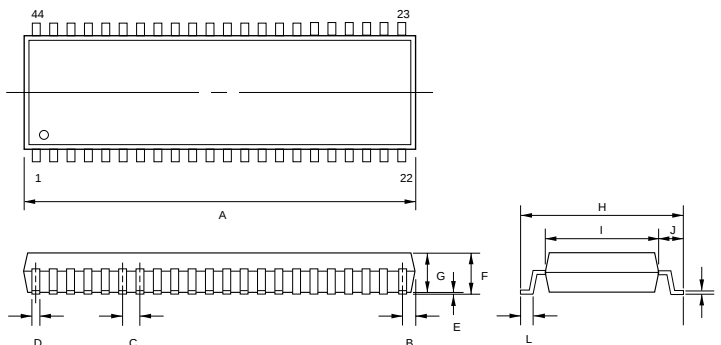
The output timing level is changed as 1.4V instead of 0.8V and 2.0V.

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

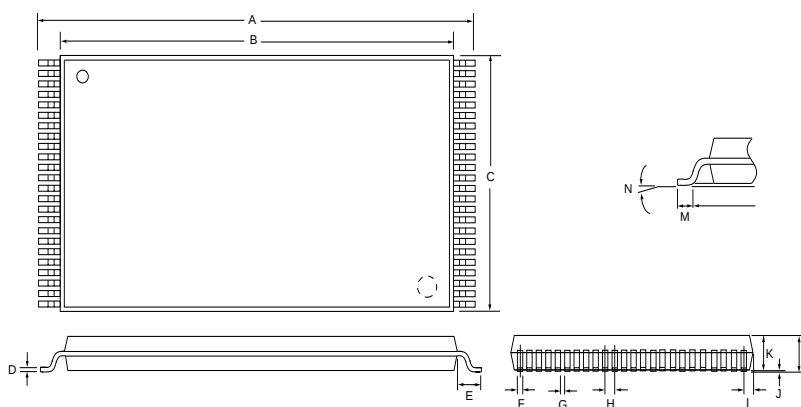
NOTE: Each lead centerline is located within .25 mm [.01 inch] of its true position [TP] at maximum material condition.



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
2.5	AC CHARACTERISTICS tOH 10ns-->0ns	P4	JAN/29/1999



MX23L3210

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