



MX23L3210

32M-BIT (4M x 8 / 2M x 16) Mask ROM

FEATURES

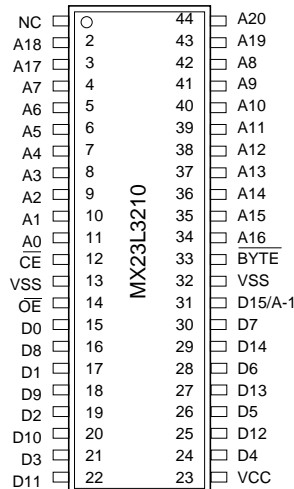
- Bit organization
 - 4M x 8 (byte mode)
 - 2M x 16 (word mode)
- Fast access time
 - Random access: 100ns (max.) for 3.0V~3.6V
 - 150ns (max.) for 2.7V~3.6V
- Current
 - Operating: 40mA
 - Standby: 15uA
- Supply voltage
 - 2.7V~3.6V
- Package
 - 44 pin SOP (500mil)
 - 48 pin TSOP (12mm x 20mm)
 - 44 pin TSOP (Type II)

ORDER INFORMATION

Part No.	Access Time	Package
MX23L3210MC-10	100ns	44 pin SOP
MX23L3210MC-12	120ns	44 pin SOP
MX23L3210MC-15	150ns	44 pin SOP
MX23L3210TC-10	100ns	48 pin TSOP
MX23L3210TC-12	120ns	48 pin TSOP
MX23L3210TC-15	150ns	48 pin TSOP
MX23L3210RC-10	100ns	48 pin TSOP (Reverse type)
MX23L3210RC-12	120ns	48 pin TSOP (Reverse type)
MX23L3210RC-15	150ns	48 pin TSOP (Reverse type)
MX23L3210YC-10	100ns	44 pin TSOP
MX23L3210YC-12	120ns	44 pin TSOP

PIN CONFIGURATION

44 SOP/ 44 TSOP



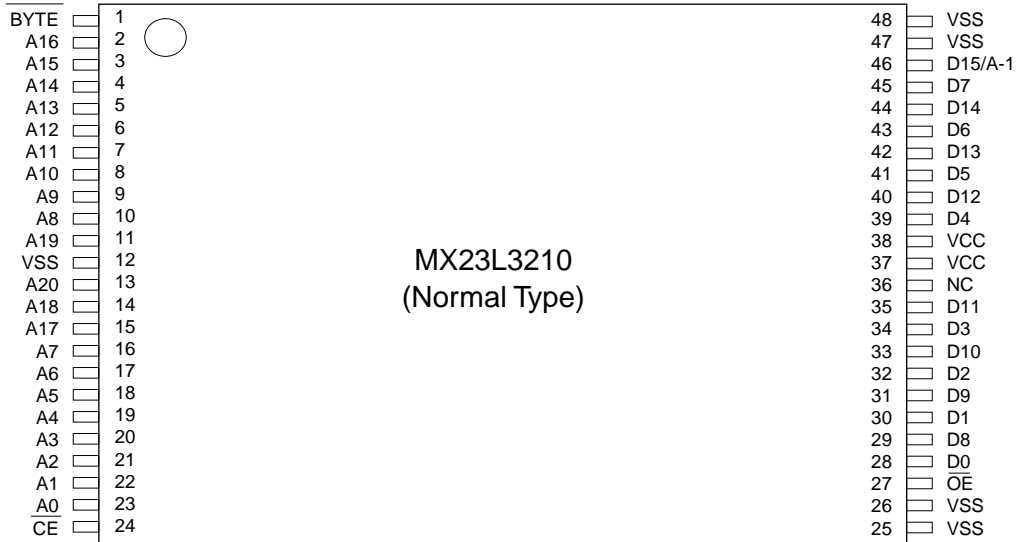
PIN DESCRIPTION

Symbol	Pin Function
A0~A20	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

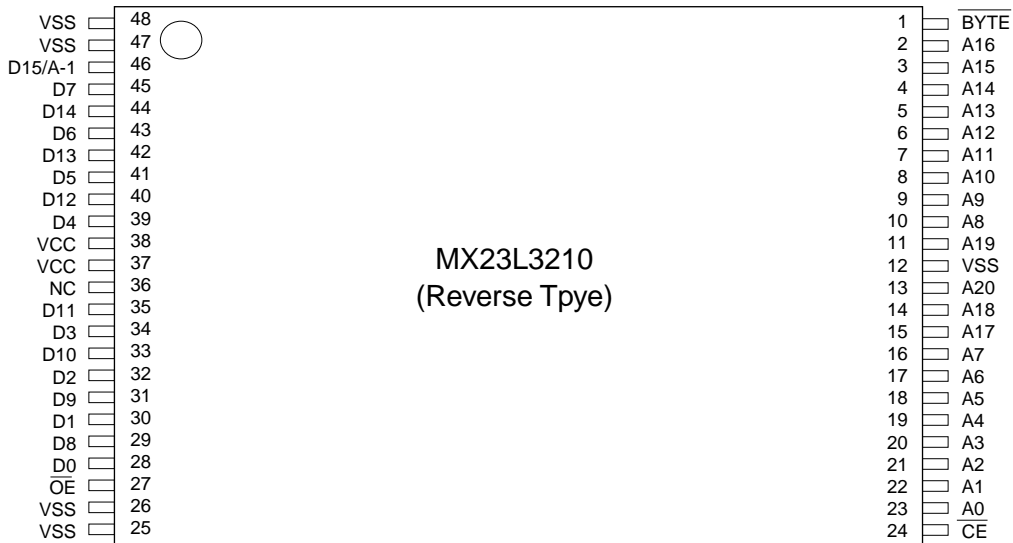
MODE SELECTION

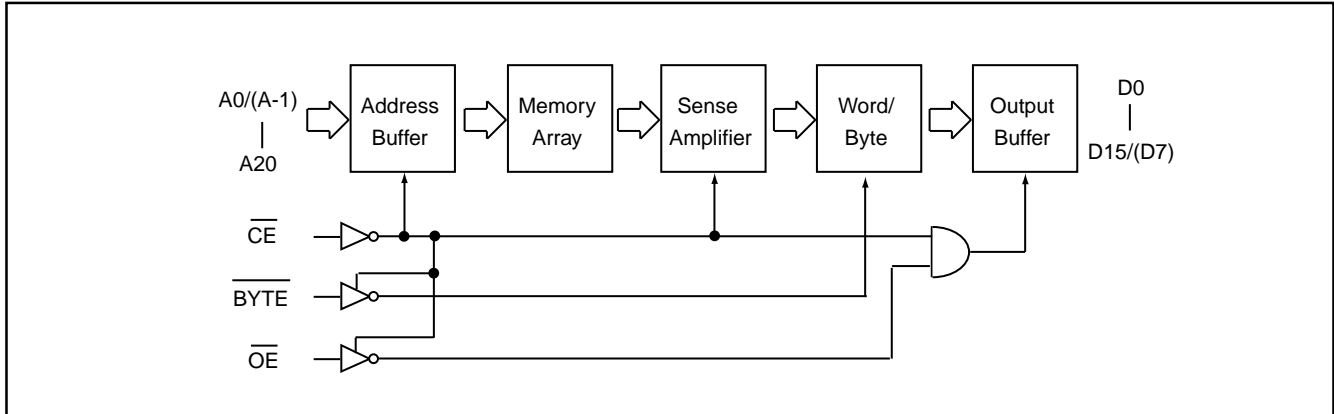
CE	OE	Byte	D15/A-1	D0~D7	D8~D15	Mode	Power
H	X	X	X	High Z	High Z	-	Stand-by
L	H	X	X	High Z	High Z	-	Active
L	L	H	Output	D0~D7	D8~D15	Word	Active
L	L	L	Input	D0~D7	High Z	Byte	Active

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	CE = VIH
Standby Current (CMOS)	ISTB2	-	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)

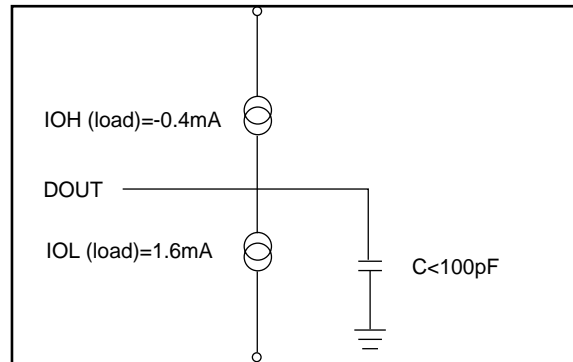
Item	Symbol	23L3210-10*		23L3210-12*		23L3210-15	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	100ns	-	120ns	-	150ns	-
Address Access Time	tAA	-	100ns	-	120ns	-	150ns
Chip Enable Access Time	tACE	-	100ns	-	120ns	-	150ns
Output Enable Time	tOE	-	50ns	-	60ns	-	70ns
Output Hold After Address	tOH	0ns	-	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns	-	20ns

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

* 100/120ns for 3.0V~3.6V

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



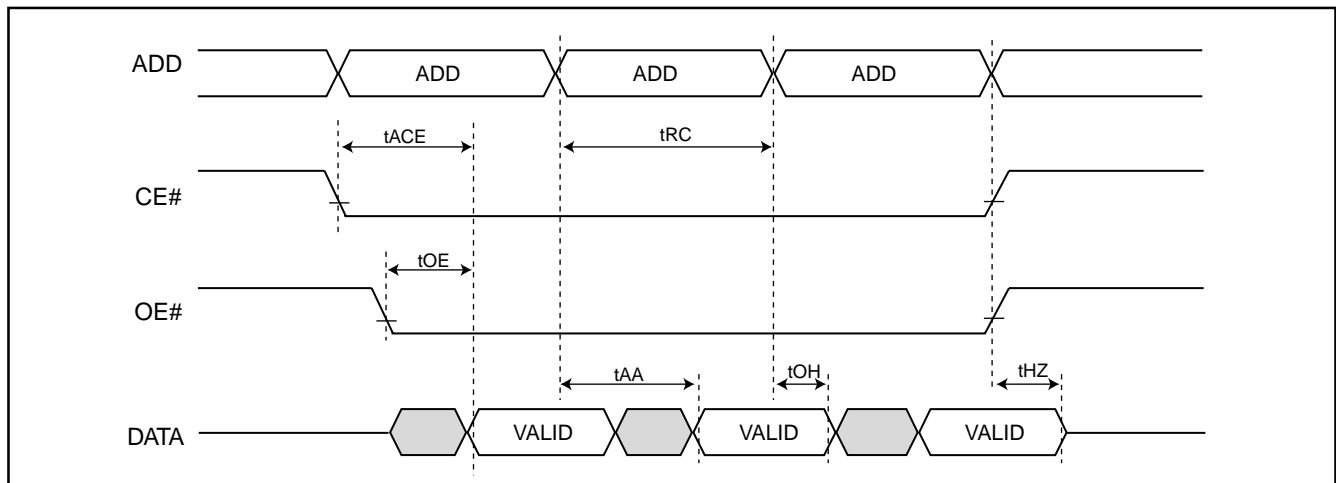
Note: No output loading is present in tester load board.

Active loading is used and under software programming control.

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

TIMING DIAGRAM

RANDOM READ



PACKAGE INFORMATION

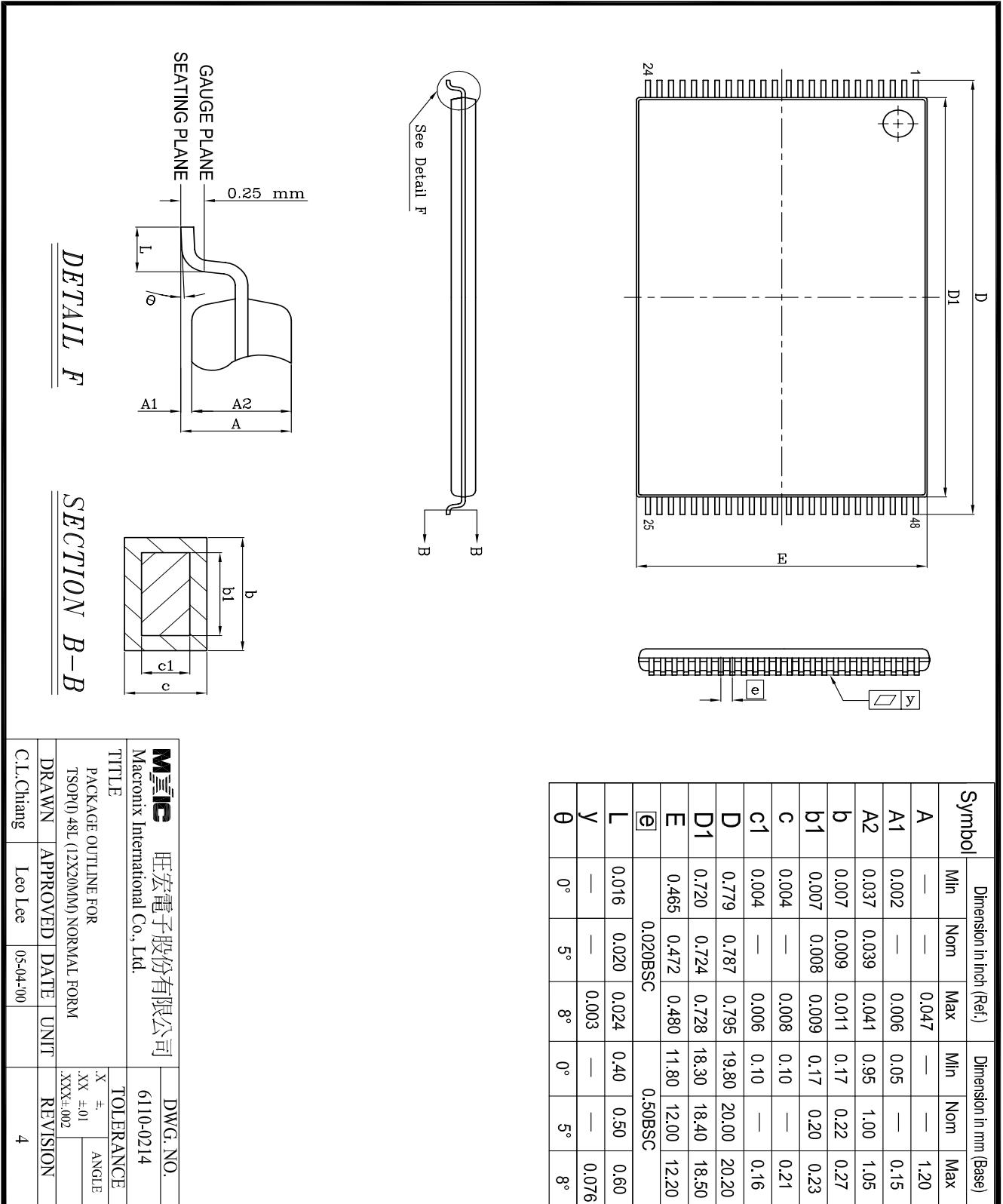
44-PIN PLASTIC SOP

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

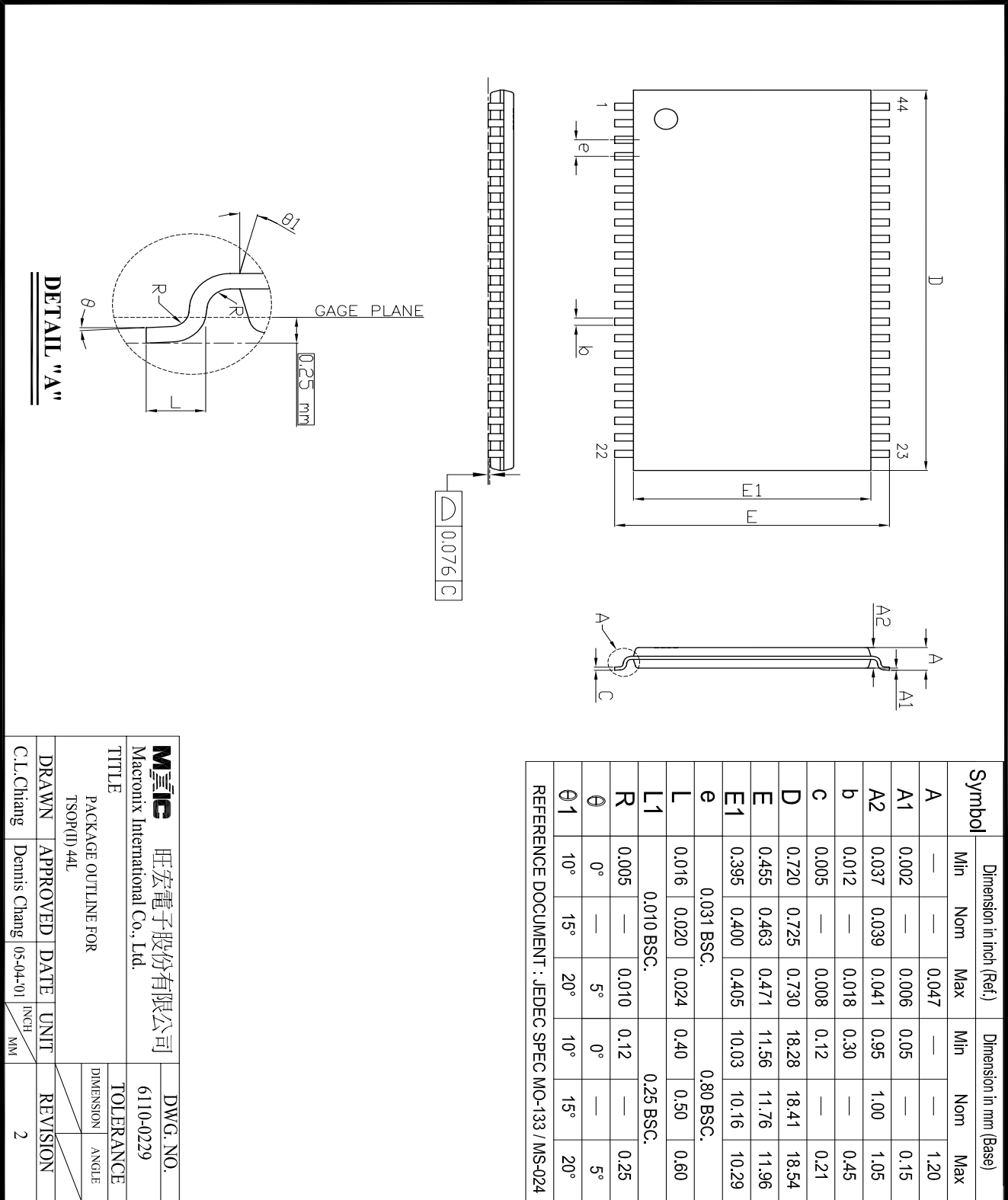
MEXIC 旺宏電子股份有限公司				DWG. NO.	
Macronix International Co., Ltd.				6110-0207	
TITLE PACKAGE OUTLINE FOR SOP 44L (500 MILL)				TOLERANCE	
DRAWN C.L.Chang				.X ±.01 ANGLE	
APPROVED Dennis Chang				.XXX±.002 ROUGHNESS	
DATE 05-03-01				REVISION	
UNIT INCH				2	

48-PIN PLASTIC TSOP



Mxic 旺宏電子股份有限公司 Macronix International Co., Ltd.		DWG. NO. 6110-0214	
TITLE PACKAGE OUTLINE FOR TSOP(D) 48L (12X20MM) NORMAL FORM			
DRAWN C.L.Chang		APPROVED Leo Lee	
DATE 05-04-100		UNIT 4	
REVISION		REVISION	
TOLERANCE .X ±. .XX ±.01 .XXX±.002		ANGLE	

44-PIN TSOP (Type II)



DETAIL "A"

Mxic 旺宏電子股份有限公司 Macronix International Co., Ltd.		DWG. NO. 6110-0229	
TITLE PACKAGE OUTLINE FOR TSOP(II) 44L			
DRAWN	APPROVED	DATE	UNIT
C.L.Chang	Dennis Chang	05-04-01	INCH MM
REVISION		2	
TOLERANCE		ANGLE	
DIMENSION		ANGLE	



REVISION HISTORY

REVISION	DESCRIPTION	PAGE	DATE
2.5	AC CHARACTERISTICS tOH 10ns-->0ns	P4	JAN/29/1999
2.6	Add 120ns (max.) for 3.0V~3.6V ; 150ns(max.) for 2.7V~3.6V DC characteristics Standby current (ISTB2):5uA-->15uA AC characteristics 120ns for 3.0V~3.6V	P1, P1,3 P4	Dec/24/1999
2.7	1.Added access time:100ns 2.Modify Package Information	P1,4 P5,6	JUN/28/2001
2.8	1.Added 44-pin TSOP(II)	P1,7	JUL/17/2001



MX23L3210

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