



MX23C3211

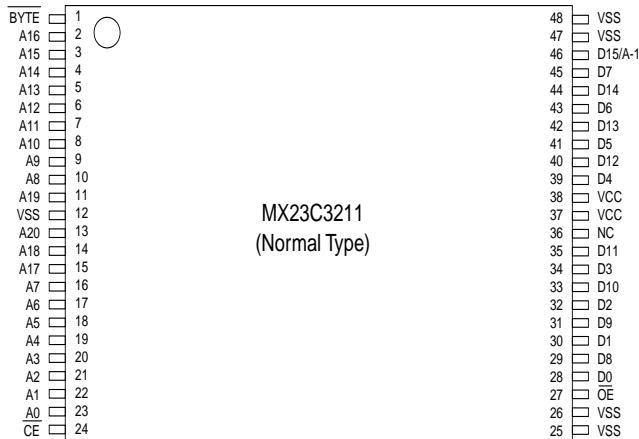
5 Volt 32-Mbit (4M x 8/2M x 16) Mask ROM with Page Mode

FEATURES

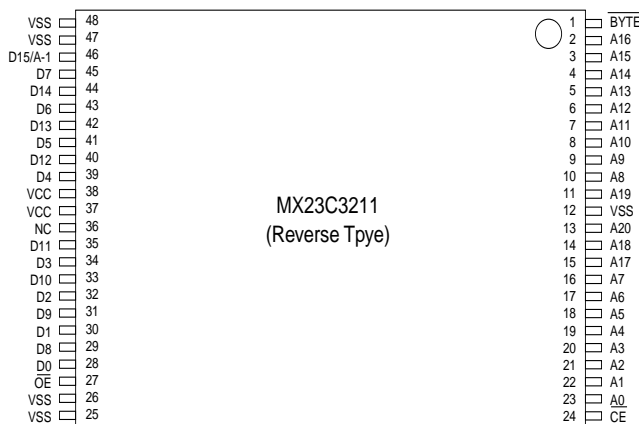
- Bit organization
 - 4M x 8 (byte mode)
 - 2M x 16 (word mode)
- Fast access time
 - Random access: 100ns (max.)
 - Page access: 30ns (max.)
- Page Size
 - 8 words per page
- Current
 - Operating: 60mA
 - Standby: 50uA
- Supply voltage
 - 5V±10%
- Package
 - 44 pin SOP (500mil)
 - 48 pin TSOP (12mm x 20mm)

PIN CONFIGURATION

48 TSOP (Normal Type)



48 TSOP (Reverse Type)



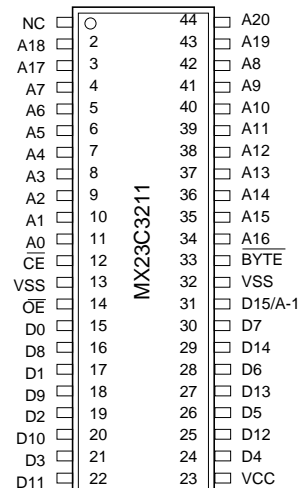
ORDER INFORMATION

Part No.	Access Page Access		Package
	Time	Time	
MX23C3211MC-10	100ns	30ns	44 pin SOP
MX23C3211MC-12	120ns	50ns	44 pin SOP
MX23C3211TC-10	100ns	30ns	48 pin TSOP
MX23C3211TC-12	120ns	50ns	48 pin TSOP
MX23C3211RC-10	100ns	30ns	48 pin TSOP (Reverse type)
MX23C3211RC-12	120ns	50ns	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)
CE	Chip Enable Input
OE	Output Enable Input
Byte	Word/ Byte Mode Selection
VCC	Power Supply Pin
VSS	Ground Pin
NC	No Connection

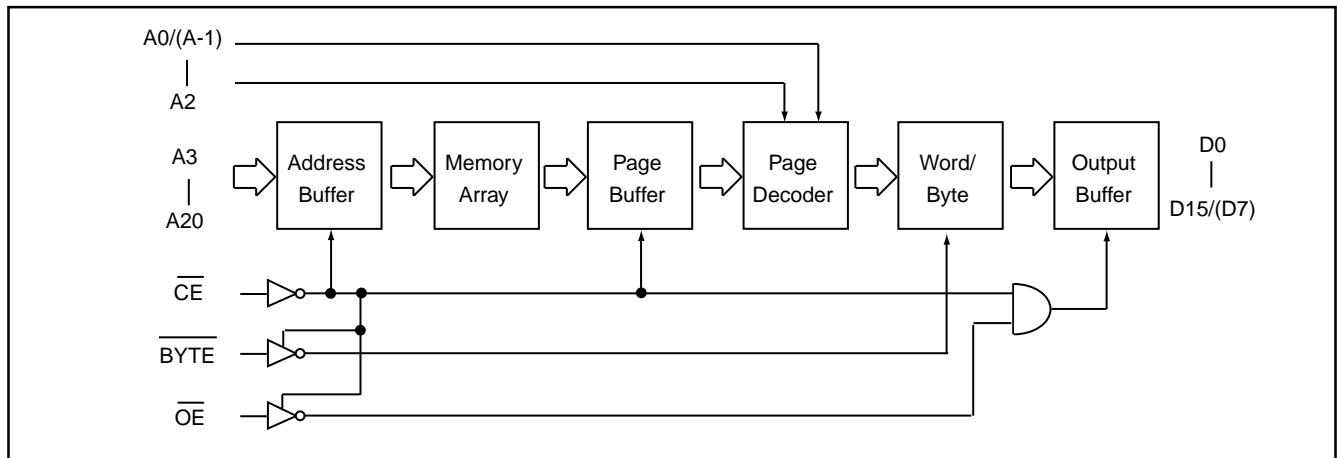
44 SOP



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

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°C to 70°C
Storage Temperature	Tstg	-65°C to 125°C

Note: Minimum DC voltage on input or I/O pins is -0.5V. During voltage transitions, inputs may undershoot VSS to -1.3V 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°C ~ 70°C, VCC = 5V±10%)

Item	Symbol	MIN.	MAX.	Conditions
Output High Voltage	VOH	2.4V	-	IOH = -1.0mA
Output Low Voltage	VOL	-	0.4V	IOL = 2.1mA
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 = 100ns, all output open
Standby Current (TTL)	ISTB1	-	1mA	$\overline{CE} = VIH$
Standby Current (CMOS)	ISTB2	-	50uA	$\overline{CE} > VCC - 0.2V$
Input Capacitance	CIN	-	10pF	Ta = 25°C, f = 1MHZ
Output Capacitance	COUT	-	10pF	Ta = 25°C, f = 1MHZ

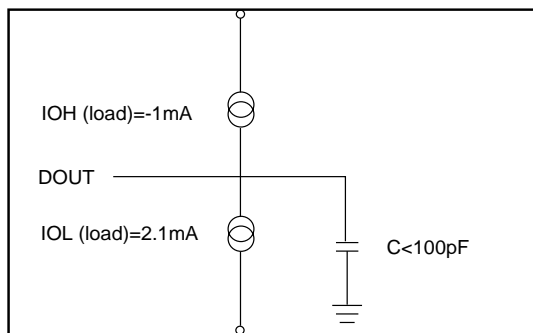
AC CHARACTERISTICS (Ta = 0°C ~ 70°C, VCC = 5V±10%)

Item	Symbol	23C3211-10		23C3211-12	
		MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	100ns	-	120ns	-
Address Access Time	tAA	-	100ns	-	120ns
Chip Enable Access Time	tACE	-	100ns	-	120ns
Page Mode Access Time	tPA	-	30ns	-	50ns
Output Enable Time	tOE	-	30ns	-	50ns
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

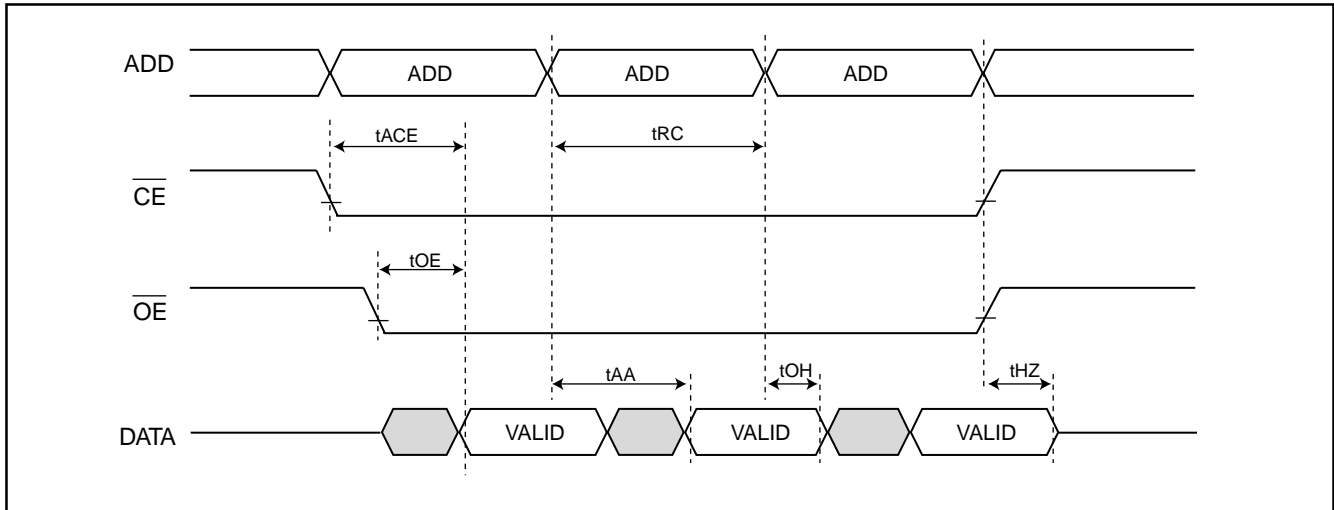
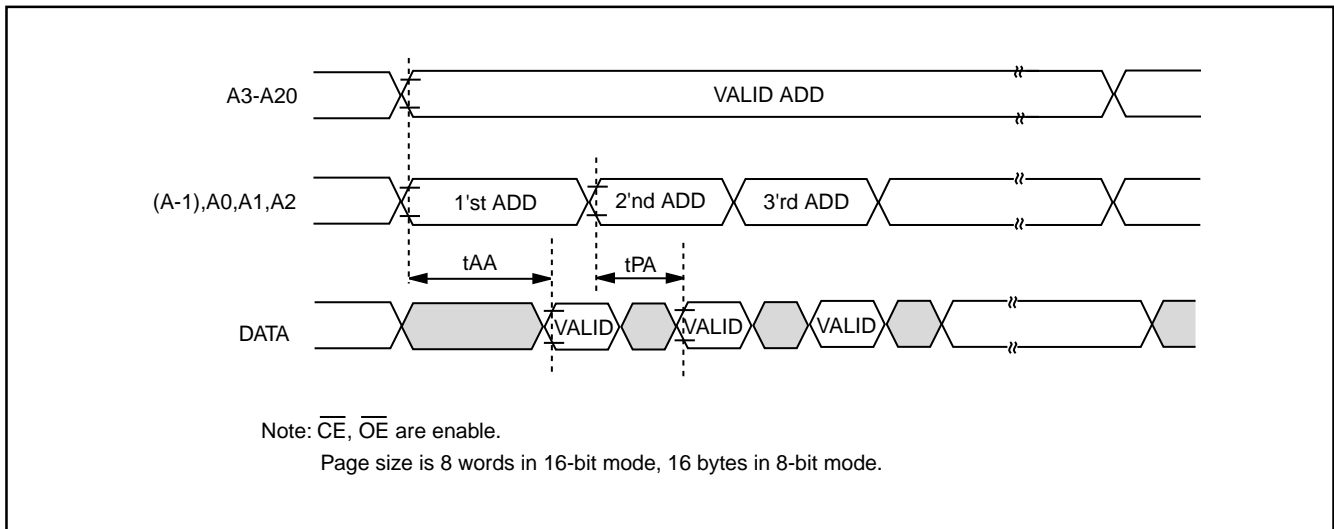
Input Pulse Levels	0.4V~ 3.3V
Input Rise and Fall Times	10ns
Input Timing Level	1.5V
Output Timing Level	0.8V and 2.0V
Output Load	See Figure



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

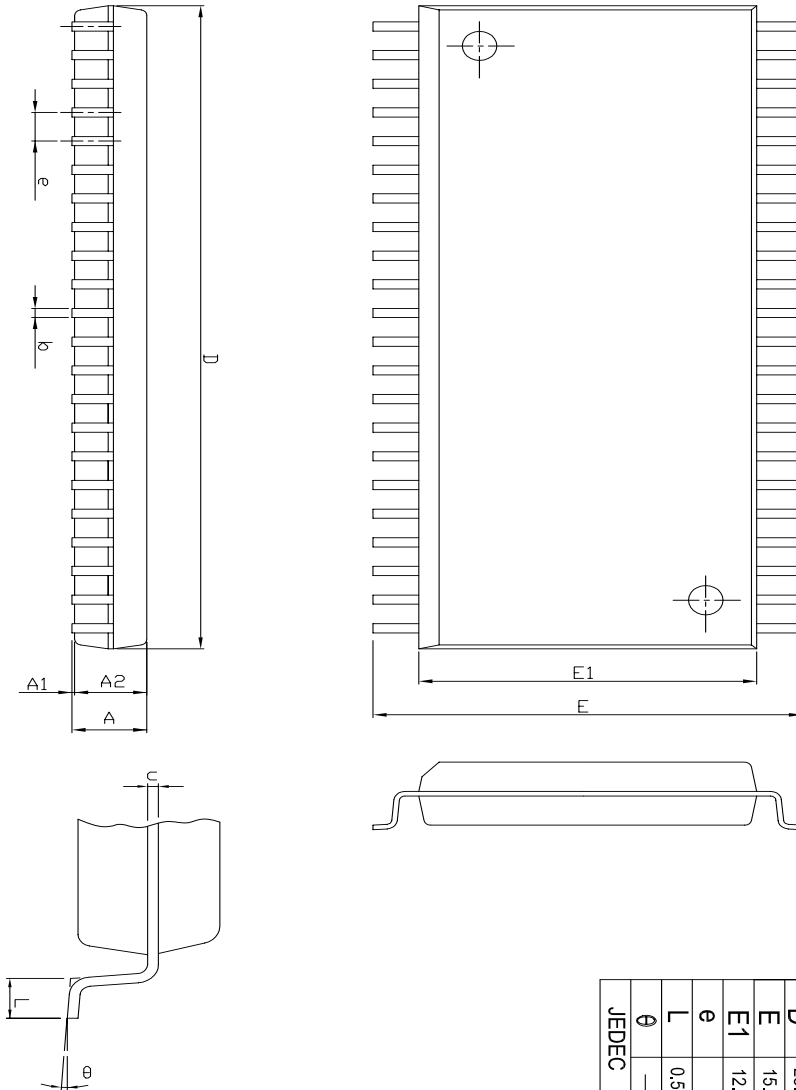
Active loading is used and under software programming control.

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

TIMING DIAGRAM
RANDOM READ

PAGE READ


PACKAGE INFORMATION

44-PIN PLASTIC SOP

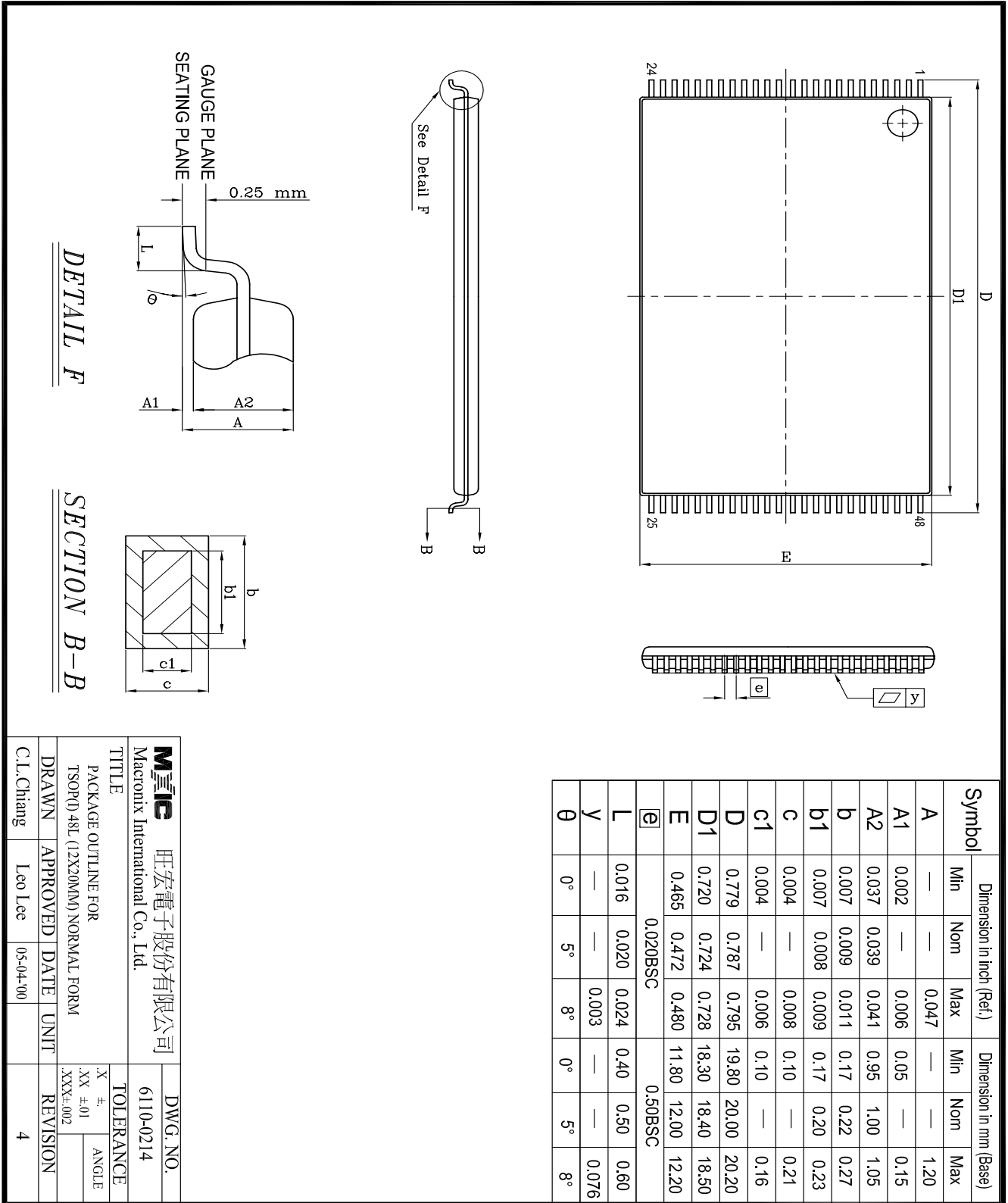


Symbol	Dimension in mm (Base)			Dimension in inch (Ref.)		
	Min	Nom	Max	Min	Nom	Max
A	—	—	3.00	—	—	0.118
A1	0.10	—	—	0.004	—	—
A2	2.57	2.69	2.82	0.101	0.106	0.111
b	0.41REF			0.016REF		
C	0.20 REF			0.008 REF		
D	28.37	28.50	28.63	1.117	1.122	1.127
E	15.77	16.03	16.28	0.621	0.631	0.641
E1	12.47	12.60	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

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

48-PIN PLASTIC TSOP



DETAIL F

SECTION B-B

旺宏電子股份有限公司 Macronix International Co., Ltd.		DWG. NO. 61110-0214	
TITLE PACKAGE OUTLINE FOR TSOP(D) 48L (12X20MM) NORMAL FORM			
TOLERANCE	X ±	XX ±.01	ANGLE
DRAWN	APPROVED	DATE	REVISION
C.L.Chang	Leo Lee	05-04-00	4



REVISION HISTORY

Revision	Description	Page	Date
2.7	AC Characteristics: tOH : 10ns --> 0ns	P3	FEB/01/1999
2.8	Typing error correction	P1,2	JAN/18/2000
2.9	Add AC Characteristics-- tPA	P3	OCT/03/2000
	Modify AC Characteristics-- tACE	P3	
3.0	Modify Package Information	P5,6	JUL/17/2001



MX23C3211

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