



MX23L3214

32M-BIT MASK ROM

FEATURES

- Bit organization
 - 2Mb x 16 (word mode only)
- Fast access time
 - Random access: 70ns(max.)
- Current
 - Operating: 15mA
 - Standby: 15uA(max.)
- Supply voltage
 - VCC : 2.7 ~ 3.6V
 - VCCQ : 2.7 ~ 3.6V
- Package
 - 48 ball mini BGA (7.0mm X 7.0mm, ball pitch 0.75mm)
 - 48 ball mini BGA (7.95mm X 9.95mm, ball pitch 0.75mm)
 - 48 pin TSOP (12mm X 20mm)
- Temperature
 - -40~85°C

PIN DESCRIPTION

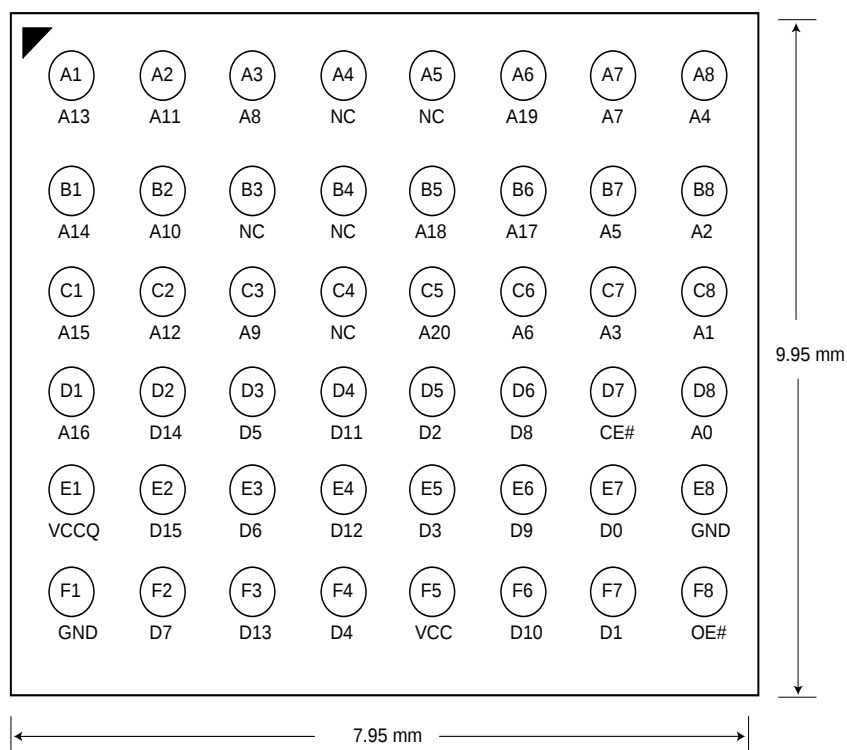
Symbol	Pin Function
A0~A20	Address Inputs
D0~D15	Data Outputs
CE#	Chip Enable Input
OE#	Output Enable Input
VCC	Power Supply Pin
VCCQ	Output VCC Pin
GND	Ground Pin
NC	No Connection

MODE SELECTION

CE#	OE#	D0~D15	Power
H	X	High Z	Stand-by
L	H	High Z	Active
L	L	D0~D15	Active

PIN CONFIGURATION

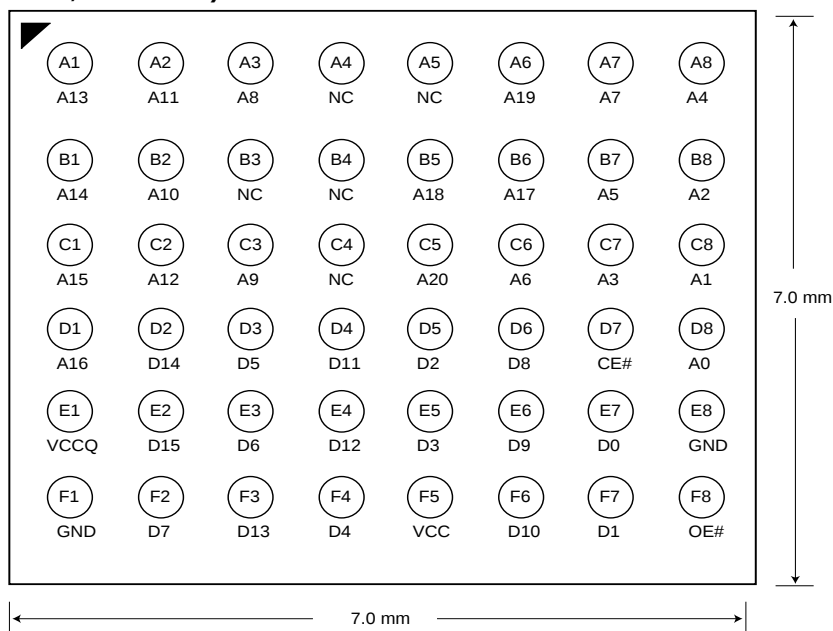
48 Mini BGA (Top View, Ball Down)





MX23L3214

48 Mini BGA (Top View, Ball Down)



48 Pin TSOP (Top View)



ORDER INFORMATION

Part No.	Speed	Package	Grade	Remark
MX23L3214TI-80	80ns	48 pin TSOP	Industrial	
MX23L3214TI-90	90ns	48 pin TSOP	Industrial	
MX23L3214XI-70	70ns	48 ball mini BGA	Industrial	
MX23L3214XI-90	90ns	48 ball mini BGA	Industrial	
MX23L3214XI-10	100ns	48 ball mini BGA	Industrial	
MX23L3214XI-90G	90ns	48 ball mini BGA	Industrial	Pb-free

Note: Industrial grade temperature: -40 ~ 85° C
Commercial grade temperature: 0 ~ 70° C

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ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings
Voltage on any Pin Relative to VSS	VIN	-0.3V to 3.9V
Ambient Operating Temperature	Topr	-40° C to 85° C
Storage Temperature	Tstg	-65° C to 125° C

DC CHARACTERISTICS (Ta = -40° C ~ 85° 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	2.2V	VCCQ+0.3V	
Input Low Voltage	VIL	-0.4V	0.4V	
Input Leakage Current	ILI	-	5uA	0V, VCC
Output Leakage Current	ILO	-	5uA	0V, VCC
Operating Current	ICC	-	15mA	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 = -40° C ~ 85° C, VCC = 2.7V~3.6V)

Item	Symbol	23L3214-70		23L3214-80		23L3214-90		23L3214-10	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Read Cycle Time	tRC	70ns	-	80ns	-	90ns	-	100ns	-
Address Access Time	tAA	-	70ns	-	80ns	-	90ns	-	100ns
Chip Enable Access Time	tACE	-	70ns	-	80ns	-	90ns	-	100ns
Output Enable Time	tOE	-	20ns	-	20ns	-	20ns	-	30ns
Output Hold After Address	tOH	0ns	-	0ns	-	0ns	-	0ns	-
Output High Z Delay	tHZ	-	20ns	-	20ns	-	20ns	-	20ns

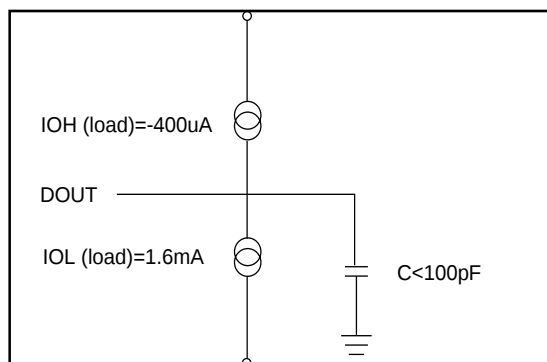
Note: Output high-impedance delay (tHZ) is measured from OE# or CE# going high, and this parameter guaranteed by design over the full voltage and temperature operating range - not tested.



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AC Test Conditions

Input Pulse Levels	0.4V~2.4V
Input Rise and Fall Times	5ns
Input Timing Level	1.5V
Output Timing Level	1.5V
Output Load	See Figure 100pF output load capacitance



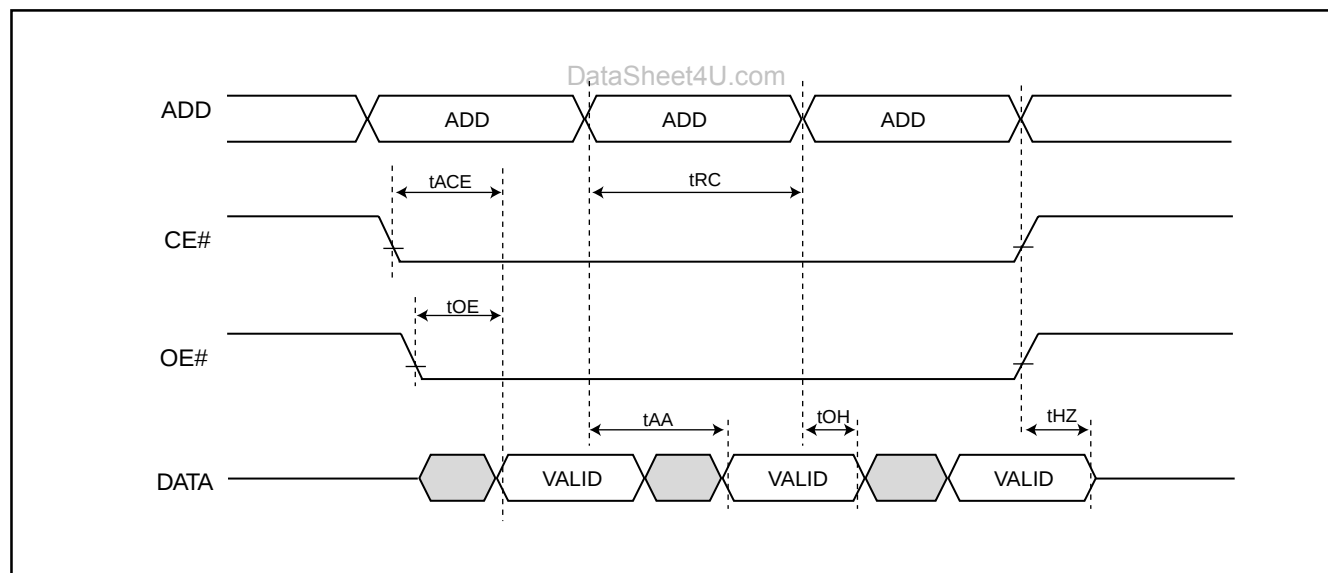
Note: No output loading is present in tester load board.

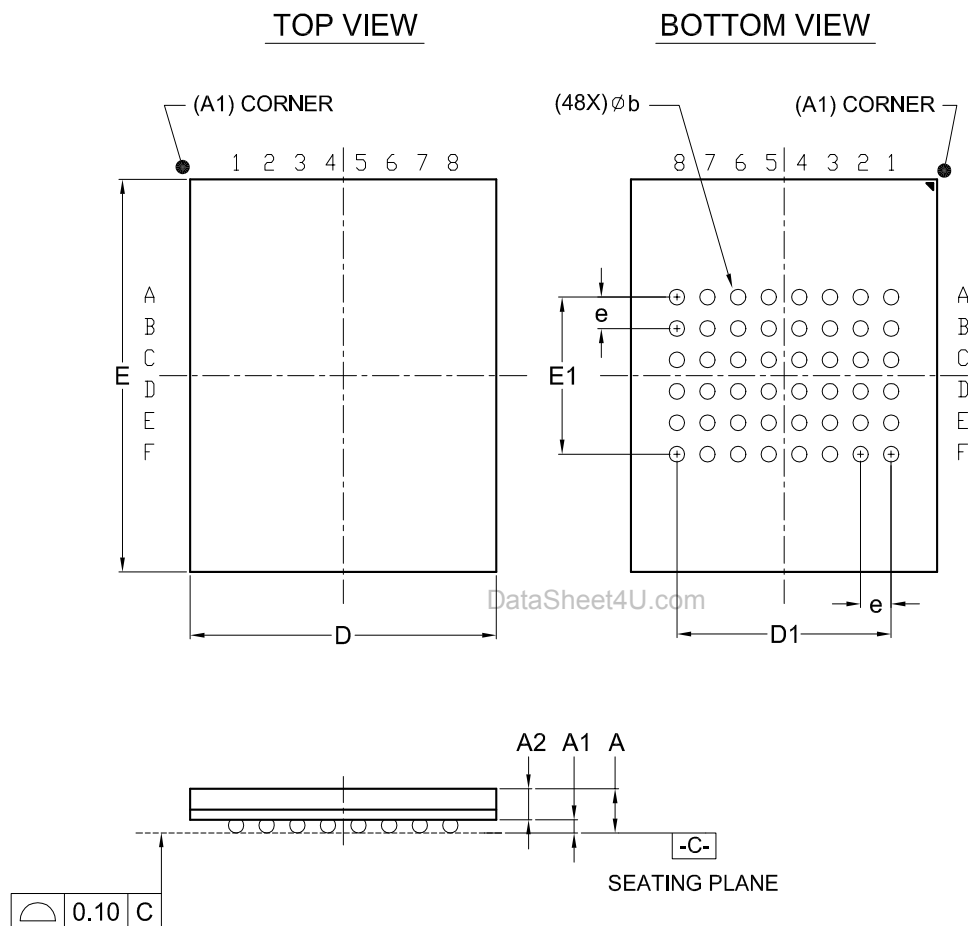
Active loading is used and under software programming control.

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

TIMING DIAGRAM

RANDOM READ




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PACKAGE INFORMATION
Title: Package Outline for CSP 48BALL(7.95X9.95X1.2MM,BALL PITCH 0.75MM,BALL DIAMETER 0.35MM)


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

SYMBOL		A	A1	A2	b	D	D1	E	E1	e
mm	Min.	---	0.22	0.65	0.30	7.85		9.85		
	Nom.	---	0.27	---	0.35	7.95	5.25	9.95	3.75	0.75
	Max.	1.20	0.32	---	0.40	8.05		10.05		
Inch	Min.	---	0.009	0.026	0.012	0.309		0.388		
	Nom.	---	0.011	---	0.014	0.313	0.207	0.392	0.148	0.030
	Max.	0.047	0.013	---	0.016	0.317		0.396		

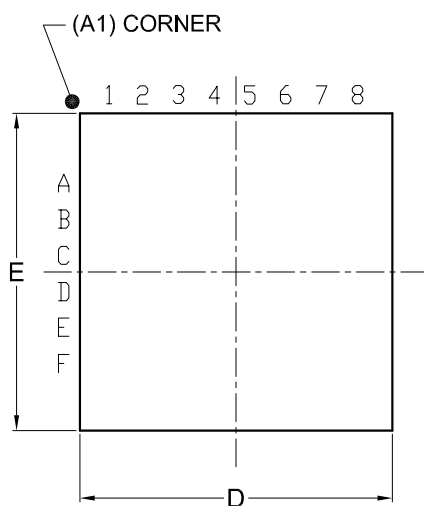
DWG.NO.	REVISION	REFERENCE			ISSUE DATE
		JEDEC	EIAJ		
6110-4207	4	MO-207			12-15-03



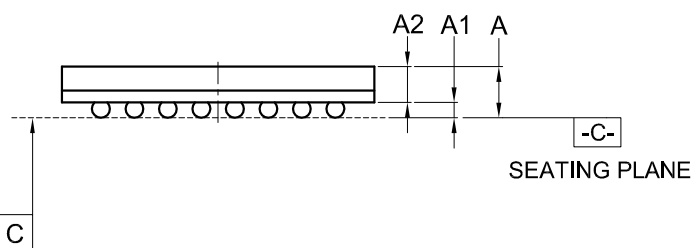
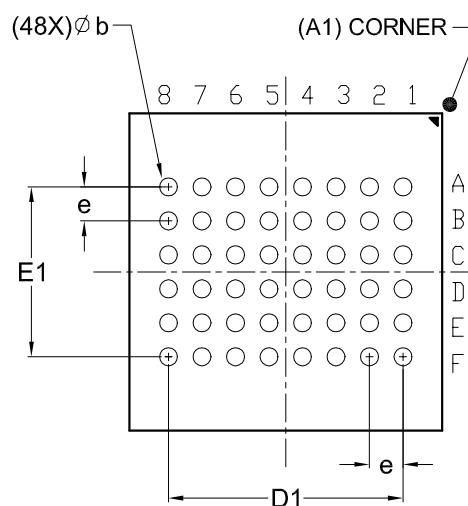
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Title: Package Outline for CSP 48BALL(7X7X1.2MM,BALL PITCH 0.75MM,BALL DIAMETER 0.35MM)

TOP VIEW



BOTTOM VIEW



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

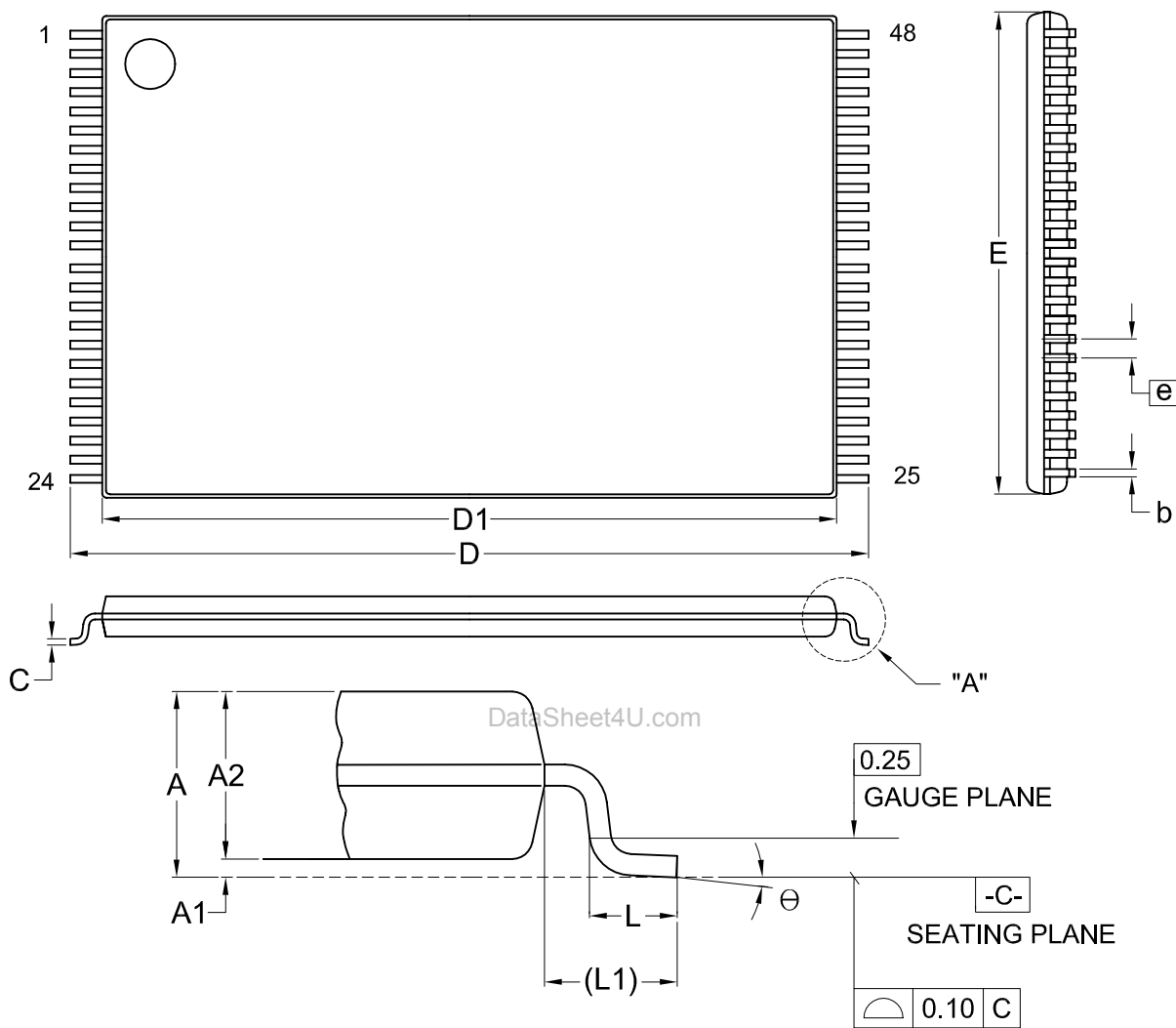
SYMBOL		A	A1	A2	b	D	D1	E	E1	e
mm	Min.	---	0.22	0.65	0.30	6.90		6.90		
	Nom.	---	0.27	---	0.35	7.00	5.25	7.00	3.75	0.75
	Max.	1.20	0.32	---	0.40	7.10		7.10		
Inch	Min.	---	0.009	0.026	0.012	0.272		0.272		
	Nom.	---	0.011	---	0.014	0.276	0.207	0.276	0.148	0.030
	Max.	0.047	0.013	---	0.016	0.280		0.280		

DWG.NO.	REVISION	REFERENCE			ISSUE DATE
		JEDEC	EIAJ		
6110-4203	6	MO-207			12-12-'03



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



DETAIL "A"

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



REVISION HISTORY

Revision #	Description	Page	Date
0.1	Modify Mode Selection-- L, H, High Z, Active	P1	DEC/14/2000
1.0	Change from Advanced Information to Preliminary	P1	DEC/29/2000
1.1	Modify Fast access time:80ns-->70ns	P1,2	JAN/18/2001
1.2	Delete Preliminary	P1	APR/09/2001
	Modify 48 ball mini BGA(8.0mm X 10.0mm)-->(7.95mm X 9.95mm)	P1	
1.3	Add Package Information	P4	APR/13/2001
1.4	Modify Package Information	P4	JUN/20/2001
1.5	Add 48-Pin TSOP & Package Information	P1,2,6	JUN/28/2001
	Modify Supply Voltage--VCC/VCCQ:2.7~3.3V-->2.7~3.6V	P1,3	
1.6	Added Order Information	P2	JUL/11/2001
1.7	Added 48 ball mini BGA (7.0mm x 7.0mm, ball pitch 0.75mm), under development	P1	JUL/13/2001
1.8	1.Modify DC Characteristics--VOH:VCCQ-0.1V-->2.4V, IOH=-100uA-->-400uA, VOL:0.1V-->0.4V, IOL:100uA-->1.6mA, VIH:VCCQ-0.4V-->2.2V	P3	SEP/10/2001
	2.Modify AC Test Conditions--Input Pulse Levels:0~VCCQ-->0.4V~2.4V, Input/Output Timing Level:VCCQx0.5-->1.5V, Output Load:50pF-->100pF output load capacitance	P4	
1.9	Modify Order Information	P2	SEP/27/2001
	Add Access Time:80ns in AC Characteristics	P3	
	Add CE#=VIL, OE#=VIH in DC Characteristics's ICC	P3	
2.0	Modify 48-ball BGA Package Information	P5	MAR/12/2002
2.1	1. To modify Package Information	P5,6,7	MAR/31/2003
2.2	1. Added Pb-free package information	P2	MAY/30/2005

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MACRONIX INTERNATIONAL Co., Ltd.

Headquarters:

TEL:+886-3-578-6688

FAX:+886-3-563-2888

Europe Office :

TEL:+32-2-456-8020

FAX:+32-2-456-8021

Hong Kong Office :

TEL:+86-755-834-335-79

FAX:+86-755-834-380-78

Japan Office :

Kawasaki Office :

TEL:+81-44-246-9100

FAX:+81-44-246-9105

Osaka Office :

TEL:+81-6-4807-5460

FAX:+81-6-4807-5461

Singapore Office :

TEL:+65-6346-5505

FAX:+65-6348-8096

Taipei Office :

TEL:+886-2-2509-3300

FAX:+886-2-2509-2200

MACRONIX AMERICA, INC.

TEL:+1-408-262-8887

FAX:+1-408-262-8810

DataSheet4U.com

[http : //www.macronix.com](http://www.macronix.com)

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