

MACRONIX **PRODUCT SELECTION GUIDE**

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Except for specially designed product, Macronix' products shall not be used for applications relating to nuclear facility, military, life saving, life sustaining, aircraft, or systems where failure or malfunction may result in personal injury.

- Serial NOR Flash Memory
- Parallel NOR Flash Memory
- NAND Flash Memory
- Read-Only Memory

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Your Partner in Innovation for Today and Tomorrow





- ROM(Read-Only Memory)

Unique 3DVG NAND Design

Self-Healing Flash

About Macronix

Macronix, the leading provider of innovative Non-Volatile Memory (NVM) semiconductor solutions, is the largest supplier of ROM products and Serial NOR Flash worldwide. The company currently produces a wide range of ROM, NOR Flash and NAND Flash memories across various densities in embedded, consumer, enterprise, wireless, and automotive applications. Flash products are also available in packages with a small footprint and thin profile for space- constrained applications.

Macronix is one of the few IDM companies worldwide with complete capabilities of Design, Manufacturing and Marketing with own Brand. Macronix dedicates itself to developing top-notch home-grown technologies and improving its manufacturing capability to offer its customers high quality products and services.



SERVICE

Macronix is committed to providing reliable and stable support to satisfy customers' expectation for a longlasting partnership. Macronix customers are served by efficient global logistic coverage, a dedicated service team, a dependable product roadmap, and innovative technology for next generation requirements.

MANUFACTURING

Macronix has over 20 years of IDM experience with manufacturing excellence and in-house design capabilities which facilitate continuous improvement processes in all aspects of the development and production cycle. We provide high quality parts that make driving more reliable, comfortable and eco-friendly; this is our passion and common goal that we share with our customers.

QUALITY

Our stringent quality standards, based on the ISO 9001 philosophy, have resulted in TS16949 certification. With the mind-set of building up a responsible business, Macronix is ISO14001(Environmental Management), IECQ QC 080000(Hazardous Substances Management), and SA 8000(Social Accountability Management) certified.

Our Green Product Management system has been highly recognized by our customers, thereby, Macronix is SONY's Green Partner, and has green partnership approvals from Nintendo, Samsung, LG and Canon. All Macronix products do not use the so called "Conflict Metals" as the raw materials; and our products are ROHS compliant, Halogen-Free, Phthalate-Free, and are free of SVHC (Substances of Very High Concern). Macronix has a well- run program working with our supply chain partners to fully comply with green product requirements.



- Green Product Certifications from well-known electronics
- Social Accountability Management SA 8000 Certificate
- ISO 14064 GreenHouse Gases Emissions Verification

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Serial NOR

Macronix offers industry standard densities and also provides bac Flash MXSMIO® family and MXSM

Macronix offers industry standard Serial Flash products from 512Kb to 512Mb densities and also provides backward compatible high performance Serial Flash MXSMIO[®] family and MXSMIO[®] Duplex (DTR) family as below:

MX25xxx06 - Standard Serial Interface Series

The MX25xxx06 series provides Standard Serial Interface x1 or x2 I/O [Single I/O or Dual I/O] at single 3V or 2.5V power-supply voltage. These products are offered with 4KB sectors and 64KB blocks, ranging from 512Kb to 64Mb density.

MX25xxx08 - Unique ID Series

The MX25xxx08 series provides 512-bit secured area, independent from main array, to store unique ID data for system identifier. These products are offered from 8Mb to 64Mb density.

MX25xxx26 - Default Lock Protection Series

The default lock protection series is optimized for Parameter Protection applications. These products utilize the BP volatile protection bits to protect selected boot areas of memory against misuse of program and erase instructions in the protected area.

MX25xxx35/36/45 - MXSMIO[®] (Multi-I/O) & MXSMIO[®] Duplex (DTR) Series

Macronix Serial Multi-I/O (MXSMIO[®]) Flash provides two kinds of Multi-I/O interfaces. One of them is MX25xxx35 series, which offers Multi-in / Multi-out interface. The other is MX25xxx36 series, which offers Single-in / Multi-out interface.

Both series are available on Quad I/O operation which quadruples the read performance of systems for high-end consumer applications. The MX25xxx35 and MX25xxx36 families are provided from 2Mb to 512Mb.

Furthermore, the MXSMIO[®] Duplex family, MX25xxx45 series, offers Quad I/O interface with Double Transfer Rate (DTR) mode operation providing fast data transfer rate up to 400MHz, which makes it the fastest Serial Flash in the industry. MXSMIO[®] Duplex family offers 64Mb to 128Mb density with independent block lock protection on boot sector .



Serial Flash Function List

Device						3	V						1.	3V
Function	xx06E	xx08E	xx26E	xx33E	8035E/1635E	3235E/6435E	xx35F	8036E/1636E	xx73E/F	xx45E	xx55F	3255E/6456E	U2033E/4033E/8033E	U1635F
H/W Reset Pin							•				•			•
H/W Hold# Pin	•	•	•			•						٠		
11/0 (1-1-1)	•	•	•	•	٠	•	٠	•	•	•	٠	٠	•	•
11/20 (1-1-2)	•	•	•			•	•	٠	•		٠	٠		
21/0 (1-2-2)**				٠	٠	•	٠	٠	•	•	٠	٠	•	•
11/40 (1-1-4)**						•	•		•		•	٠		
41/0 (1-4-4)**				•	•	•	•	•	•	•	•	•	•	•
QPI (4-4-4)**							٠		•*		•			•
DTR function										•				
BPx Bits (NVM)	•	•		٠	٠	٠	٠	٠	٠	•	٠	٠	٠	•
BPx Bits (SRAM)			•											
WPSEL Mode (BPx mode individual WP mode)						٠	٠		٠	٠	•	•	٠	٠
Security Function (BPG, read lock)											•	٠		
Security OTP & Register	•	•		•	•	•	•	•	•	•	•	•	•	•
Unique ID		•												
CP mode						•				•		•		
VI/O														
Note * 128Mb Only														

** I/O Nomenclature defined in Command, Address (Input), Data (Output) Configuration For eg: 1-1-1 denotes 1-Command, 1-Address (Input), 1-Data (Output)

Serial Flash Portfolio Table

		512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb
	MX25Lxx06 Standard Serial Interface	•	•	•	•	•	•	•	٠			
-	MX25Lxx08 Unique ID series					•	•	•	٠			
-	MX25Lxx26 Default Lock Protection series		•	•	•			•				
3V	MX25Lxx35/36/45 MX66Lxx35 MXSMIO [®] & MXSMIO [®] Duplex series					•	•	•	٠	•	•	•
	MX25Lxx55 MXSMIO [®] Secure series						•	•	٠	•	•	
_	MX25Lxx73 MXSMIO [®] series (Quad I/O Permanent Enable)					•	٠	•	٠	•		
2 EV/	MX25Vxx05/06 Standard Serial Interface	•	•	•	•	•						
2,31 -	MX25Vxx35 MXSMIO [®] series				•	•						
1.8V	MX25Uxx35/33 MXSMIO [®] series			•	٠	٠	•	٠	٠	•	•	



SERIAL NOR FLASI



3V Serial Flash Family:

Part number	Density	Organization	I/O Bus	Frequency (MHz)	Package	Voltage	Automotive Grade
Standard Serial	Interface S	Series:					
MX25L512E	512Kb	4KB / 64KB	Single / Dual	104(x1), 80(x2)	150mil 8-SOP, 8-TSSOP, 8-USON(2x3mm), WLCSP	2.7~3.6V	
MX25L5121E	512Kb	4KB / 64KB	Single	45	150mil 8-SOP, 173mil 8-TSSOP, 8-USON(2x3mm)	2.7~3.6V	
MX25L1006E	1Mb	4KB / 64KB	Single / Dual	104(x1), 80(x2)	150mil 8-SOP, 8-USON(2x3mm), WLCSP	2.7~3.6V	-40°C to 105°C
MX25L1021E	1Mb	4KB / 64KB	Single	45	150mil 8-SOP	2.7~3.6V	
MX25L2006E	2Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 8-USON(2x3mm) 8-WSON(6x5mm)	2.7~3.6V	-40°C to 125°C
MX25L4006E	4Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 200mil 8-SOP, 300mil 8-PDIP, 8-USON(2x3mm) 8-WSON(6x5mm)	2.7~3.6V	-40°C to 125°C
MX25L8006E	8Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 200mil 8-SOP, 300mil 8-PDIP, 8-WSON(6x5mm), 8-USON(4x4mm)	2.7~3.6V	-40°C to 125°C
MX25L1606E	16Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 200mil 8-SOP, 300mil 16-SOP, 300mil 8-PDIP, 8-WSON(6x5mm), 8-USON(4x4mm)	2.7~3.6V	-40°C to 125°C
MX25L3206E	32Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	200mil 8-SOP, 300mil 16-SOP, 300mil 8-PDIP, 8-WSON(6x5mm), 8-USON(4x4mm) 24-TFBGA(6x8mm)	2.7~3.6V	-40°C to 125°C
MX25L6406E	64Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(8x6mm), 200mil 8VSOP, 24-TFBGA(6x8mm)	2.7~3.6V	
Default Lock Pr	otection Se	eries				1	
MX25L1026E	1Mb	4KB / 64KB	Single / Dual	104(x1), 86(x2)	150mil 8-SOP	2.7~3.6V	
MX25L2026E	2Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP	2.7~3.6V	
MX25L4026E	4Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP	2.7~3.6V	

3V MXSMIO[®] & MXSMIO[®] Duplex Family (Multi-in, Multi-out):

Part number	Density	Organization	I/O Bus	Frequency(MHz)	Package	Voltage	Features	Automotive Grade
MX25L8035E	8Mb	4KB / 64KB	Single / Dual / Quad	108(x1, x4), 80(x2)	200mil 8-SOP	2.7~3.6V		
MX25L8036E	8Mb	4KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP	2.7~3.6V		
MX25L8073E	8Mb	4KB / 64KB	Single / Dual / Quad	108(x1, x4), 80(x2)	200mil 8-SOP	2.7~3.6V		
MX25L1633E	16Mb	4KB / 64KB	Single / Dual / Quad	104(x1), 85(x2, x4)	200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm)	2.7~3.6V		-40°C to 125°C
MX25L1635E	16Mb	4KB / 64KB	Single / Dual / Quad	108(x1, x4), 80(x2)	200mil 8-SOP	2.7~3.6V		
MX25L1636E	16Mb	4KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP	2.7~3.6V		
MX25L1673E	16Mb	4KB / 64KB	Single / Dual / Quad	104(x1), 85(x2, x4)	200mil 8-SOP, 8-WSON(6x5mm)*, , 8-USON(4x4mm)*	2.7~3.6V		
MX25L3235E	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(6x5mm), 24-TFBGA(6x8mm)	2.7~3.6V		-40°C to 105°C
MX25L3273E	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 200mil 8-VSOP, 300mil 16-SOP*, 8-WSON(6x5mm)*	2.7~3.6V		
MX25L6435E	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(6x5mm), 24-TFBGA(6x8mm)	2.7~3.6V		-40°C to 105°C
MX25L6473E	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 200mil 8-VSOP, 300mil 16-SOP*, 8-WSON(6x5mm)	2.7~3.6V		
MX25L12835F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP 300mil 16-SOP 8-WSON(6x5mm) 8-WSON(8x6mm)	2.7~3.6V		-40°C to 105°C
MX25L12873F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(6x5mm)	2.7~3.6V		
MX25L25635F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP 8-WSON(8x6mm)	2.7~3.6V	QPI	-40°C to 105°C
MX25L25735F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP 8-WSON(8x6mm)	2.7~3.6V	QPI	
MX66L51235F	512Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP 8-WSON(8x6mm) 24-TFBGA(6x8mm)	2.7~3.6V	QPI	

* Advance Information

2.5V Serial Flash Family: Standard Serial Interface Series

Part Number	Density	Organization	I/O Bus	Frequency (MHz)	Package
MX25V512E	512Kb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	173mil 8-TSSOP, 8-WSON(2x3mm)
MX25V1006E	1Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	173mil 8-TSSOP, 8-WSON(2x3mm)
MX25V2006E	2Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSON(6x5mm)
MX25V4006E	4Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSON(6x5mm)
MX25V8006E	8Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSON(6x5mm)

C SERIAL NOR FLASH

2.5V Serial Flash Family: MXSMIO[®] Series

Part Number	Density	Organization	I/O Bus	Frequency (MHz)	Package
MX25V4035	4Mb	4KB /32KB / 64KB	Single / Dual / Quad	66(x1), 50(x2, x4)	150mil 8-SOP, 8-WSON(6x5mm)
MX25V8035	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	66(x1), 50(x2, x4)	150mil 8-SOP, 8-WSON(6x5mm)

1.8V MXSMIO[®] Family:

Part Number	Density	Organization	I/O Bus	Frequency (MHz)	Package	Feature
MX25U2033E	2Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 8-WSON(6x5mm), 8USON(4x4mm), WLCSP	
MX25U4033E	4Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 8-WSON(6x5mm), 8USON(4x4mm), WLCSP	
MX25U8033E	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 8-WSON(6x5mm), 8USON(4x4mm), WLCSP	
MX25U1635F	16Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	150mil 8-SOP,200mil 8-SOP, 8-WSON(6x5mm),8-USON(4x4mm) WLCSP	QPI
MX25U3235F	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(6x5mm)	QPI
MX25U6435F	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(6x5mm)	QPI
MX25U12835F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	300mil 16-SOP, 8-WSON(6x5mm)	QPI
MX25U25635F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSON(8x6mm) 8-WSON(8x6mm) 3.4X4.3EP	QPI

Applications

Segment	Application	512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb
	Mobile PC				•	•	•	•	•			
	DeskTop PC					•	•	•	•			
	Server						•	•	•	•	•	•
Computer	Printer						•	•	•	•	•	•
	Graphics	•	•	•								
	HDD		•	•	•	•						
	ODD			•	•	•	•	•				
	DSL					•	•	•	•			
	Cable Modem						•	•	•	•		
Communication	IAD/Home Gateway								•	•	•	•
communication	WiMAX							•	•	•	•	•
	IP Phone							•	•	•		
	AP Router				•	•	•	•	•			
	Digital TV					•	•	•	•			
Consumer	Digital Audio/ DAM		•	•	•							
consumer	DVD Player					•	•	•				
	Set Top Box					•	•	•	•	•	•	•
Automotive	After Market/In Cabin	•	•	•	•	•	•	•	•	•	•	•

			Seria	l Flas	h I
	MX	<u>25L</u>	<u>512</u>	<u>35</u>	F
DEVICE :					
25L/66L: 3V, Serial Flash	1				
25U: 1.8V, Serial Flash					
25V: 2.5V, Serial Flash					
	DENSITY				
	512: 512K	b			
	10: 1Mb				
	20: 2Mb				
	40: 4Mb				
	80: 8Mb				
	16: 16Mb				
	32: 32Mb				
	04; 04/VID	46			
	256/257	256Mb			
	512: 512N	1b			
	512151210	1.0			

MODE : -

06: Single-in, Dual-out 06: Single-in, Dual-out 26: Default lock protection 33/35: MXSMIO[®]- Multi-in, Multi-out 36: MXSMIO[®]- Single-in, Multi-out 55: MXSMIO[®]- Security type 73: MXSMIO[®] Duplex- Multi I/O, Quad I/O Permanent Enable



PACKAGE TYPE :

P: PDIP ZN: 8-WSON (6x5mm) Z2: 8-WSON (8x6mm) ZU: 8-USON M: SOP O: 173mil 8-TSSOP X: BGA



Parallel NOR Flash

Macronix's industry standard Parallel Flash memories offer an extensive line of 3V products from 4Mb to 1Gb densities. Macronix Flash memory provides customers with cost-effective, high performance and reliable products that offer low-power consumption and high endurance. 4Mb and 8Mb products are also offered in 4mm x 6mm BGA packages for space-constrained applications.

Macronix also offers a family of 1.8V products from 4Mb to 128Mb, whereas the 16Mb and 32Mb products interface an I/O voltage of 1.8V and the 32Mb to 128Mb products are featured by AD-Mux and Burst Mode. These products are used in applications like Bluetooth, MP3 Players, GPS as well as other portable applications.

Standard Read Access

The standard read access Parallel Flash series (MX29F, MX29LV and MX29SL) offer Boot and Uniform Sector architectures in selectable x8, x16 and x8/x16 configurations at single 5V, 3V and 1.8V power-supply voltages.

Page Mode Read Access

The MX29GL product series provide an advanced page mode interface to optimize the system performance for both read and program operations.

Bluetooth								
AP Router			•	•	•			
WiMAX				•	•	•		
IAD/Home Gateway			•	•	•	•	•	•
Switching Router				•	•	•	•	•
Digital TV		•	•	•	•	•		
Set Top Box			•	•	•	•	•	•
G-PON			•	•	•	•		
Telematics	•				•	•	•	•
IP Phone			•	•	•			
DSC			•	•	•	•	•	
Gaming				•	•	•	•	•
Automotive	•		•	•	•	•	•	•

Applications <8Mb 16Mb 32Mb 64Mb 128Mb 256Mb 512Mb 1Gb



OPTION : SPEED : G: RoHS Compliant 55: 55ns Q: Restricted 70: 70ns Vcc : (3.0V-3.6V), 90: 90ns RoHS Compliant 10: 100ns 11: 110ns TEMPERATURE RANGE : C: Commercial(0°C to 70°C) PACKAGE TYPE : I: Industrial(-40°C to 85°C) P: PDIP S: Automotive Grade 3(-40°C to 85°C) M: SOP R: Automotive Grade 2(-40°C to 105°C) Q: PLCC Q: Automotive Grade 1(-40°C to 125°C) T: TSOP X: BGA TTYPE : I

B: Bottom Boot H: Uniform Sector, Highest Address Sector Protected L: Uniform Sector, Lowest Address Sector Protected U: VI/O=1.65 to VCC, VCC=2.7 to 3.6V, Highest Address Sector Protected D: VI/O=1.65 to VCC, VCC=2.7 to 3.6V, Lowest Address Sector Protected

Standard Read Access Family:

Part Number	Density	Bus Width	Access Time(ns)	Package	Vcc.	Features	Automotive Grade
5V Series							
MX29F200CT/B	2Mb	x8/ x16	70 / 90	44-SOP, 48-TSOP	5V	Boot Sector	
MX29F040C	4Mb	x8	70 / 90	32-TSOP, 32-PLCC	5V	Uniform Sector	
MX29F400CT/B	4Mb	x8/ x16	70 / 90	44-SOP, 48-TSOP	5V	Boot Sector	
MX29F800C T/B	8Mb	x8/ x16	70 / 90	44-SOP, 48-TSOP, 48-LFBGA	5V	Boot Sector	
3V Series							
MX29LV040C	4Mb	x8	55 / 70 / 90	32-TSOP, 32-PLCC	3V	Uniform Sector	
MX29LV400CT/B	4Mb	x8/ x16	55 / 70 / 90	44-SOP, 48-TSOP, 48-WFBGA 48-TFBGA, 48-LFBGA	3V	Boot Sector	
MX29LV800CT/B	8Mb	x8/ x16	55 / 70 / 90	44-SOP, 48-TSOP, 48-WFBGA 48-TFBGA, 48-LFBGA, 48-XFLGA	3V	Boot Sector	-40°C to 105°C
MX29LV160DT/B	16Mb	x8/ x16	70	48-TSOP, 48-WFBGA, 48-TFBGA, 48-LFBGA, 48-XFLGA	3V	Boot Sector	-40°C to 85°C
MX29LV161DT/B	16Mb	x16	90	48-TSOP, 48-WFBGA, 48-TFBGA, 48-XFLGA	3V	Boot Sector; V I/O=1.8V	
MX29LV320ET/B	32Mb	x8/ x16	70	48-TSOP, 48-TFBGA, 48-LFBGA, 44-SOP	3V	Boot Sector	-40°C to 105°C
MX29LV321DT/B	32Mb	x16	90	48-TSOP, 48-TFBGA	3V	Boot Sector; V I/O=1.8V	
MX29LV640ET/B	64Mb	x8/ x16	70	48-TSOP, 48-TFBGA	3V	Boot Sector	
1.8V Series							
MX29SL402CT/B	4Mb	x8/ x16	90	48-TSOP, 48-WFBGA, 48-TFBGA, 48-LFBGA, 48-XFBGA	1.8V	Boot Sector	
MX29SL800CT/B	8Mb	x8/ x16	90	48-TSOP, 48-WFBGA, 48-TFBGA, 48-LFBGA,48-XFBGA	1.8V	Boot Sector	

1.8V AD-Mux Parallel Family:

Part Number	Density	Bus Width	Access Time(ns)	Package	Features
MX29NS320E	32Mb	x16	80	56 TFBGA	AD-Mux; Burst Mode
MX29NS640E	64Mb	x16	80	56 TFBGA	AD-Mux; Burst Mode
MX29NS128E	128Mb	x16	80	56 TFBGA	AD-Mux; Burst Mode
MX29VS128F	128Mb	x16	80	56 TFBGA	AD-Mux; Burst Mode Read While Write

Page Mode Read Access Family:

Part Number	Density	Bus Width	Access Time(ns)	Package	Vcc.	Features	Automotive Grade
MX29GL320EH/L	32Mb	x8/ x16	70	56-TSOP, 64-LFBGA	3V	Uniform Sector	-40°C to 105°C
MX29GL320ET/B	32Mb	x8/ x16	70	48-TSOP, 48-LFBGA	3V	Boot Sector	-40°C to 105°C
MX29GL640EH/L	64Mb	x8/ x16	70	56-TSOP, 64-LFBGA	3V	Uniform Sector	-40°C to 105°C
MX29GL640ET/B	64Mb	x8/ x16	70	48-TSOP, 48-LFBGA	3V	Boot Sector	-40°C to 105°C
MX29GL128EH/L	128Mb	x8/ x16	90	56-TSOP, 64-FBGA, 64-LFBGA,70-SSOP	3V	Uniform Sector	-40°C to 105°C
MX29GL128FH/L	128Mb	x8/ x16	70/90	56-TSOP, 56-FBGA ,64-LFBGA, 70-SSOP	3V	Uniform Sector	
MX29GL128FU/D	128Mb	x8/ x16	110	56-TSOP, 56-FBGA, 64-LFBGA	3V	V I/O=1.8V;Uniform Sector	
MX29GL256FH/L	256Mb	x8/ x16	90	56-TSOP, 56-FBGA, 64-LFBGA	3V	Uniform Sector	-40°C to 105°C
MX29GL256FU/D	256Mb	x8/ x16	110	56-TSOP, 56-FBGA, 64-LFBGA	3V	V I/O=1.8V; Uniform Sector	
MX29GL512FH/L	512Mb	x8/ x16	100	56-TSOP, 56-FBGA, 64-LFBGA	3V	Uniform Sector	-40°C to 105°C
MX29GL512FU/D	512Mb	x8/ x16	110	56-TSOP, 64-LFBGA	3V	Uniform Sector	
MX68GL1G0FH/L	1Gb	x8/x16	110	56-TSOP, 64-LFBGA	ЗV	Uniform Sector	-40°C to 85°C
MX68GL1G0FU/D	1Gb	x8/x16	120	56-TSOP, 64-LFBGA	3V	Uniform Sector	



D PARALLEL NOR FLASH

Secure Flash

Several customers have sensitive data stored in their systems on flash memory. To protect this data from hostile access, Macronix provides several Secure Flash products. We provide products from 32Mb to 1Gb densities in Parallel Flash, and from 16Mb to 256Mb densities in Serial Flash - typically used in applications like Set-Top Boxes, Digital TVs and other systems requiring security of their code and data.

Please contact our regional sales representatives for detailed specifications.

Parallel Secure NOR Flash Family:

Part Number	Density	Organization	Access Time(ns)	Package	Vcc.	Features
Standard Read Access Seri	es					
MX29LA320DH/L	32Mb	x8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA320EH/L	32Mb	X8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA321DH/L	32Mb	x8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA640EH/L	64Mb	x8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA641DH/L	64Mb	x8 / x16	90	64-FBGA	3V	Uniform Sector
Page Mode Read Access Se	eries					
MX29GA320E H/L	32Mb	x8 / x16	70	64-FBGA	3V	Uniform Sector
MX29GA321E H/L	32Mb	x16	70	64-FBGA	3V	Uniform Sector
MX29GA640E H/L	64Mb	x8 / x16	90	64-FBGA	3V	Uniform Sector
MX29GA641E H/L	64Mb	x16	90	64-FBGA	3V	Uniform Sector
MX29GA128F H/L	128Mb	x8 / x16	90	64-FBGA	3V	Uniform Sector
MX29GA129F H/L	128Mb	x16	90	64-FBGA	3V	Uniform Sector
MX29GA256F H/L	256Mb	x8 / x16	90Q	64-FBGA	3V	Uniform Sector
MX29GA257F H/L	256Mb	x16	90Q	64-FBGA	3V	Uniform Sector
MX29GA512F H/L	512Mb	x8 / x16	110	64-FBGA	3V	Uniform Sector
MX68GA1G0F H/L	1Gb	x8 / x16	110	64-FBGA	3V	Uniform Sector

Serial Secure NOR Flash Family:

Part No.	Density	Organization	I/O Bus	Clock Speed(MHz)	Packages	Vcc.
MX25L1608E	16Mb	4KB / 64KB	Single/ Dual	86(x1), 80(x2)	200mil 8-SOP	3V
MX25L1655D	16Mb	4KB / 64KB	Single/Dual/Quad	104(x1), 75(x2, x4)	200mil 8-SOP, 24-BGA(6x8mm)	3V
MX25L3208E	32Mb	4KB / 64KB	Single/ Dual	86(x1), 80(x2)	200mil 8-SOP	3V
MX25L3255E	32Mb	4KB / 32KB / 64KB	Single/Dual/Quad	104(x1 x4), 86(x2)	200mil 8-SOP, 24-BGA(6x8mm)	3V
MX25L6408E	64Mb	4KB / 64KB	Single/ Dual	86(x1), 80(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(8x6mm)	3V
MX25L6456E	64Mb	4KB / 32KB / 64KB	Single/Dual/Quad	104(x1 x4), 86(x2)	200mil 8-SOP,24-BGA(6x8mm)	3V
MX25L12855F	128Mb	4KB / 32KB / 64KB	Single/Dual/Quad	133(x1,x2,x4)	300mil 16-SOP,24-BGA(6x8mm)	3V
MX25L25655F	256Mb	4KB / 32KB / 64KB	Single/Dual/Quad	133(x1,x2,x4)	300mil 16-SOP,24-BGA(6x8mm)	3V

KGD (Known Good Die)

We also offer Known Good Die for System in Package (SiP) solutions. Please contact Macronix regional sales for datasheet & technical support.

KGD Flash Portfolio

Parallel Flash

Vcc.	Product Series	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb
21/	MX29LV (Boot Sector)	•	•	•	•	•			
24	MX29GL (Uniform Sector)				•	•	•	•	•*
	MX29SL	•	•						
1.8V	MX29NS				•	•	•		
	MX29VS						•		

Serial Flash

Vcc.	Product Series	512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb
21/	MX25L(Single I/O)	•	•	•	•	•	•	•	•	•	•*
21	MX25L(Multi I/O)	•	•	•	•	•	•	•	•	•	•*
2.5	MX25V	•	•	•	•	•					
1.8V	MX25U			•	•	•	•	•	•	•*	•*

* Advance Information



N GOOD DIE)



NAND Flash

Macronix is a leader in the embedded NOR Flash market. Over the years as the NOR requirements evolved - from Parallel to Serial interface or 3V to low power products - Macronix has enhanced it's product portfolio to meet the market demand. Today, as embedded applications get more complex, the flash density requirements have grown as well. An increasing number of system designers are looking for choices when selecting higher flash memory densities to store their code and/or applications. Macronix has once again met their demand with the introduction of a SLC NAND product line to complement it's existing high density NOR products. Focusing on the low density NAND market, Macronix now offers 512Mb and 1Gb SLC NAND products with industry standard packages and features.

Part number	Density	Cell Type	Page Size	Bus Width	Sequential Read Speed(ns)	Package	Vcc.	Temperature Range
MX30LF1208AA	512Mb	SLC	2KB	x8	30ns	48-TSOP(12x20mm) 63-VFBGA(9x11mm)	3V	-40°C~85°C
MX30LF1G08AA	1Gb	SLC	2KB	x8	30ns	48-TSOP(12x20mm) 63-VFBGA(9x11mm)	3V	-40°C~85°C



015

ROM(Read-Only Memory)

Being the leader in ROM industry, Macronix continues to provide cutting-edge ROM products to our valued customers. Migrating from previous MaskROM to current XtraROM, Macronix has made ROM products more flexible in production and delivery, while keeping high quality and cost advantages.

Macronix ROM products have been widely used from game cartridges to slot machines, from toys to learning devices. In the past decade, we have invested a lot on ROM products; in the future, we commit to develop further advanced technology to make ROM the excellent medium for content publishing.



Mask ROM

Macronix keeps longevity support to our customers. We offer both parallel and serial interface ROM, so that customers can easily migrate between Flash and ROM.

√ Parallel Mask ROM

Part No.	Density	Bus Width	Access Time(ns)	Vcc	Package
MX23L6410A	64Mb	x8, x16	70	2.7~3.6V	48-TSOP
MX23L6423A	64Mb	x8, x16	90	2.7~3.6V	48-TSOP
MX23L12810A	128Mb	x8, x16	100	2.7~3.6V	48-TSOP
MX23L12823A	128Mb	x8, x16	100	2.7~3.6V	56-TSOP

√ Serial Mask ROM

Package
16-SOP
28-SOP
16-SOP
16-SOP
16-SOP

XtraROM

XtaROM is the leading ROM technology from Macronix without mask charge and with shorter TAT (Turn Around Time). With proven record of delivery and quality, XtraROM offers a robust medium for content publishing. The only thing the host MCU needs to do is to READ the contents, there is no need to worry about bad blocks, wear leveling, and ECC. XtraROM is classified into three categories : NAND XtraROM, slot machine XtraROM, and ASIC XtraROM.

√ NAND XtraROM

Part No.	Density	Bus Width	Access Time(ns)	Latency(us)	Vcc	Package
MX23J51243	512Mb	x8	25	25	2,7~3,6V	48-TSOP
MX23J1G43	1Gb	x8	25	80	2,7~3,6V	48-TSOP
MX23J2G43*	2Gb	x8	25	80	2.7~3.6V	48-TSOP
MX23J4G43*	4Gb	x8	25	80	2,7~3,6V	48-TSOP
Advance Information						

* Advance Information

This device is pad compatible to NAND, but much more robust than NAND. It is popularly used as a cartridge for learning platforms.

√ Slot Machine XtraROM

This device, while keeping the checksum of whole content identical during the life time of gambling machines, is widely used in Pachinko and PachinSlot as the storage of video, audio, and code. It is 32 I/O with fast speed, 70-SSOP, up to 32Gb.

√ ASIC XtraROM

Macronix is good at customized XtraROM from IC design, content programming, to quick delivery. We can build your DRM (Digital Right Management) scheme in the circuit of XtraROM to protect your content from pirate. It is used in handheld gaming consoles worldwide.

Package



Macronix provides products with extremely small packages as well as very thin profiles for space-constrained applications.

Serial Packages



8 SOP (150mil)					
Length	6				
Width	5				
Thickness	1.75				
Pitch	1.27				
	(mm)				



(mm)



16 SOP (300mil)					
Length	10.3				
Width	10.3				
Thickness	2.65				
Pitch	1.27				
	(mm)				

	3

	(mm)
Pitch	1.27
Thickness	0.8
Width	5
Length	6
8 WSON (6x5)	

1

Wafer Level Chip Scale Package (WLCSP)

The result package is subject to various die sizes. The smallest chip so far is 1.46mm x 1.40mm.

Parallel Packages



48 TFBGA (Ball Dia.0.3	3)
Length	8
Width	6
Thickness	1.2
Pitch	0.8
	(mm)



56 FBGA (Ball Dia.0.4))
Length	9
Width	7
Thickness	1.2
Pitch	0.8
	(mm)



48 LFBGA (Ball Dia.0.4	-)
Length	8
Width	6
Thickness	1.3
Pitch	0.8
	(mm)



48 WFBGA (Ball Dia. 0.	3)
Length	6
Width	4
Thickness	0.75
Pitch	0.5
	(mm)



Thickness	1.2
Pitch	0.8
	(mm)



63 VFBGA (Ball Dia. 0.	45)
Length	9
Width	11
Thickness	1.0
Pitch	0.8
	(mm)



64 FBGA (Ball Dia. 0	.4)
Length	13
Width	10
Thickness	1.2
Pitch	1.0
	(mm)



64 LFBGA (Ball Dia. 0.6) Length 13 Width 11 Thickness 1.4 Pitch 1.0 (mm)		-
Length13Width11Thickness1.4Pitch1.0(mm)	64 LFBGA (Ball Dia. 0	.6)
Width11Thickness1.4Pitch1.0(mm)	Length	13
Thickness 1.4 Pitch 1.0 (mm)	Width	11
Pitch 1.0 (mm)	Thickness	1.4
(mm)	Pitch	1.0
-		(mm)



24 BGA (Ba	l Dia.0.4)
Length	8
Width	6
Thickness	1.2
Pitch	1.0
	(mm)





1 8 USON (4x4)

Length	4
Width	4
Thickness	0.6
Pitch	0.8
	(mm)



8 WSUN (8x6)		
Length	8	
Width	6	
Thickness	0.8	
Pitch	1.27	
	(mm)	

1

3

2

0.6

0.5

(mm)

8 USON (2x3)

Length

Width

Pitch

Thickness

-	1.705	
2011 1000 2011 10000 2011 10000		di di
Relation		

44 SOP (500mil)

Length	28.5
Width	12.6
Thickness	3
Pitch	1.27
	(mm)



48 TSOP (Standard Type)		
Length	20	
Width	12	
Thickness	1.2	
Pitch	0.5	
	(mm)	



56 TSOP (Standard Type)		
Length	20	
Width	14	
Thickness	1.2	
Pitch	0.5	
	(mm)	



70 SSOP	
Length	28.5
Width	16.03
Thickness	3.05
Pitch	0.8
	(mm)

PACKAGE OPTIONS 019











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