MACRONIX
PRODUCT SELECTION GUIDE

July, 2014


Your
Partner
in Innovation
for Today
and Tomorrow

About Macronix

Macronix, the leading provider of NVM (Non-Volatile Memory) semiconductor solutions, is the world's leading supplier of ROM and Serial NOR Flash products. 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. Our innovative flash products are also available in packages with small footprints and thin profiles for space-constrained applications.

Macronix is one of the few IDM (Integrated Device Manufacturer) companies worldwide with complete Design, Manufacturing, and Marketing capabilities under its own Brand. Macronix dedicates itself to developing superior homegrown technologies and consistently improving its manufacturing processes in order to offer its customers quality products and services.

PRODUCT

Macronix offers a wide range of Serial Flash products with densities from 512Kb to 1 Gb. To meet market trends, we provide Flash products with extremely small and thin packages for space-constrained applications. In addition, our first-generation SLC (Single-Level Cell) NAND Flash product family is ideal for embedded applications demanding high quality and reliability. In our ROM business, XtraROM® products with 45-nanometer process have been delivered. Macronix also offers a KGD (Known Good Die) program for SIP (System In Package) solutions. Always looking ahead, Macronix will maintain its position on the forefront of advanced technology research and development, focusing on NVM (Non-Volatile Memory) products.

SERVICE

Macronix is committed to providing reliable and efficient support to satisfy customers' expectations for long-lasting partnerships. Macronix customers are served by a dedicated service team with extensive global logistics coverage, a dependable product roadmap, and innovative next-generation technology.

MANUFACTURING

Macronix has over 20 years of IDM experience with excellent in-house design and manufacturing capabilities, which facilitate continuous improvement in all aspects of the development and production cycle. We strive to achieve the common goal we share with our customers – to provide high-quality, reliable and eco-friendly products.

QUALITY

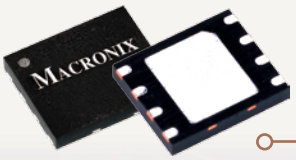
Our stringent quality standards, based on the ISO 9001 philosophy, have resulted in TS 16949 certification. With the mindset of building a responsible business, Macronix is certified in ISO 14001 (Environmental Management), IECQ QC 080000 (Hazardous Substances Management), and SA 8000 (Social Accountability Management).

Our Green Product Management system is highly regarded in the industry as well. Macronix has been granted green partnerships with SONY, Nintendo, Samsung, LG, and Canon. No Macronix products use "Conflict Metals," as they are known, for raw materials. Our products are RoHS-compliant, Halogen-free, Phthalate-free, and SVHC-free (Substances of Very High Concern). To fully comply with Green Product Requirements, Macronix works closely with our supply chain partners under a well-run program.

Macronix has received

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

Serial NOR Flash



Macronix offers industry standard Serial Flash products from 512Kb to 1Gb densities, and also provides backward compatible high performance Serial Flash, MXSMIO® (Multi-I/O) 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 a single 3V or 2.5V power-supply voltage. These products are offered with 4KB sectors and 64KB blocks.

MX25xxx08 - Unique ID Series

The MX25xxx08 series provides a 512-bit secured area, independent from the main array, to store unique ID data for the system identifier.

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 programs, and to erase instructions in the protected area.

MX25xxx33/35/36/45 - MXSMIO®(Multi-I/O) & MXSMIO® Duplex (DTR) Series

Macronix Serial Multi-I/O (MXSMIO®) Flash provides two kinds of Multi-I/O interfaces: the MX25xxx35 series, which offers a Multi-in / Multi-out interface, and the MX25xxx36 series, which offers a 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.

Furthermore, the MXSMIO® Duplex family, the MX25xxx45 series, offers a Quad I/O interface with DTR (Double Transfer Rate) mode operation providing a fast data transfer rate of up to 640 MHz, which makes it the fastest Serial Flash in the industry. The MXSMIO® Duplex family is offered in densities from 64Mb to 1Gb with independent block lock protection on the boot sector.

MX25xxx73 - MXSMIO® Series (Quad I/O Permanent Enable)

The MX25xxx73 series provide Multi-I/O default enable solution. The Multi-I/O interface is available without any setting in Flash side, and it provides user more convenient way to experience the Multi-I/O performance.

Serial Flash Function List

Function \ Device	3V													1.8V	
	xx06E	xx08E	xx26E	xx33E	8035E/1635E	3235E/6435E	xx35F	8036E/1636E	xx73E/F	xx45E	xx45G	xx55F	3255E/6456E	U2033E/4033E/8033E	U1635F
H/W Reset Pin							●				●	●			●
H/W Hold# Pin	●	●	●			●							●		
1I/O (1-1-1)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1I/2O (1-1-2)	●	●	●			●	●	●	●		●	●	●		
2I/O (1-2-2)**				●	●	●	●	●	●	●	●	●	●	●	●
1I/4O (1-1-4)**						●	●		●		●	●	●		
4I/O (1-4-4)**				●	●	●	●	●	●	●	●	●	●	●	●
QPI (4-4-4)**							●		●*			●			●
DTR function										●	●				
BPx Bits (NVM)	●	●		●	●	●	●	●	●	●	●	●	●	●	●
BPx Bits (SRAM)			●												
WPSEL Mode (BPx mode individual WP mode)						●	●		●	●	●	●	●	●	●
Security Function (BPG, read lock)												●	●		
Security OTP & Register	●	●		●	●	●	●	●	●	●	●	●	●	●	●
Unique ID		●													
CP mode						●				●			●		

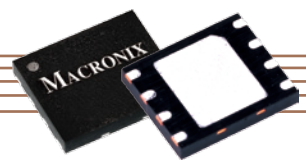
Note
* 128Mb Only
** I/O Nomenclature defined in Command, Address (Input), Data (Output) Configuration
For eg: 1-1-1 denotes 1-Command, 1-Address (Input), 1-Data (Output)

Serial Flash Portfolio

		512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb	1Gb
3V	MX25Lxx05/06 Standard Serial Interface	●	●	●	●	●	●	●	●				
	MX25Lxx08 Unique ID series					●	●	●	●				
	MX25Lxx25/26 Default Lock Protection series		●	●	●								
	MX25L/66Lxx33/35/36/45 MXSMIO®					●	●	●	●	●	●	●	
	MX25L/66Lxx45 MXSMIO® Duplex series								●	●	●	●	●
	MX25L/66Lxx55 MXSMIO® Secure series						●	●	●	●	●	●	●
	MX25Lxx73 MXSMIO® series (Quad I/O Permanent Enable)					●	●	●	●	●			
2.5V	MX25Vxx05/06 Standard Serial Interface	●	●	●	●	●							
	MX25Vxx35 MXSMIO® series				●	●							
1.8V	MX25Uxx35/33 MX66Uxx35 MXSMIO® series			●	●	●	●	●	●	●	●	●	

3V Serial Flash Family

Part number	Density	Organization	I/O Bus	Frequency (MHz)	Package	Voltage	Automotive Grade
Standard Serial Interface Series:							
MX25L512E	512Kb	4KB / 64KB	Single / Dual	104(x1), 80(x2)	150mil 8-SOP, 8-TSSOP, 8-USON(2x3mm)	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℃ to 105℃
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℃ to 125℃
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℃ to 125℃
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℃ to 125℃
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), 24-TFBGA(6x8mm)	2.7~3.6V	-40℃ to 125℃
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℃ to 105℃
MX25L6406E	64Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(6x5mm), 8-WSON(8x6mm), 200mil 8-VSOP, 24-TFBGA(6x8mm)	2.7~3.6V	
Default Lock Protection Series							
MX25L1026E	1Mb	4KB / 64KB	Single / Dual	104(x1), 80(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 Serial Flash Family: MXSMIO® (Multi-I/O) & MXSMIO® Duplex (DTR) Series

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℃ to 125℃
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)	2.7~3.6V		-40℃ to 105℃
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		
MX25L3233F	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	120(x1, x2, x4)	150mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x3mm)	2.65~3.6V		
MX25L6435E	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(6x5mm), 8-WSON(8x6mm), 24-TFBGA(6x8mm), WLCSP	2.7~3.6V		-40℃ to 105℃
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), WLCSP	2.7~3.6V		
MX25L6433F	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	120(x1, x2, x4)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(8x6mm), 8-USON(4x4mm)	2.65~3.6V		
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	QPI	-40℃ to 105℃
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	QPI	
MX25L25635F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSON(8x6mm)	2.7~3.6V	QPI	-40℃ to 105℃
MX25L25735F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSON(8x6mm)	2.7~3.6V	QPI	
MX25L51245G	512Mb	4KB / 32KB / 64KB	Single / Dual / Quad	166 (x1, x2), 133 (x4)	300mil 16-SOP, 8-WSON(8x6mm), 24-TFBGA(6x8mm)	2.7~3.6V	QPI	DTR
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	-40℃ to 125℃
MX66L1G45G	1Gb	4KB / 32KB / 64KB	Single / Dual / Quad	166 (x1, x2), 133 (x4)	300mil 16-SOP, 24-TFBGA(6x8mm)	2.7~3.6V	QPI	DTR

* 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)	150mil 8-SOP, 173mil 8-TSSOP, 8-USON(2x3mm)
MX25V1006E	1Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 173mil 8-TSSOP, 8-USON(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), 8-USON (2x3mm)
MX25V8006E	8Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSON(6x5mm)

2.5V Serial Flash Family: MXSMIO® (Multi-I/O) 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), 8-USON(4x4mm), WLCSP	
MX25U4033E	4Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm), WLCSP	
MX25U8033E	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm), WLCSP	
MX25U8035E	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84 (x2)	150mil 8-SOP, 200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm)	QPI
MX25U1635E	16Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84 (x2)	150mil 8-SOP, 200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm)	QPI
MX25U1635F	16Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-USON(4x3mm), WLCSP	QPI
MX25U3235F	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(6x5mm), WLCSP	QPI
MX25U6435F	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(6x5mm), WLCSP	QPI
MX25U12835F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	300mil 16-SOP, 8-WSON(6x5mm), 8-WSON(8x6mm)	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
MX66U51235F	512 Mb	4KB / 32KB / 64KB	Single / Dual / Quad	108(x1, x2, x4)	300mil 16-SOP, 8-WSON(8x6mm) 3.4X4.3EP, 24-TFBGA(6x8mm)	QPI

Applications

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

Serial Flash Example

MX 25L 256 35 F M I - 10 G

DEVICE :
25L/66L: 3V, Serial Flash
25U/66U: 1.8V, Serial Flash
25V: 2.5V, Serial Flash

DENSITY :
512 : 512Kb
10 : 1Mb
20 : 2Mb
40 : 4Mb
80 : 8Mb
16 : 16Mb
32 : 32Mb
64 : 64Mb
128 : 128Mb
256/257 : 256Mb
512 : 512Mb
1G : 1Gb

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

GENERATION

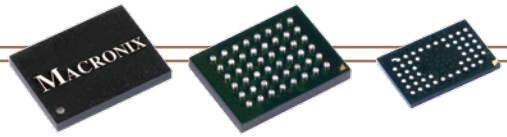
TEMPERATURE RANGE :
I : Industrial (-40℃ to 85℃)
S : Automotive Grade 3 (-40℃ to 85℃)
R : Automotive Grade 2 (-40℃ to 105℃)
Q : Automotive Grade 1 (-40℃ to 125℃)

PACKAGE TYPE :
P : PDIP
ZN : 8-WSON
Z2 : 8-WSON (8x6mm)
Z3 : 8-WSON (6x5mm)
Z4 : 8-WSON (8x6mm) 3.4X4.3EP
ZU : 8-USON
ZB : 8-USON (4x3mm)
M : SOP
MB : 200mil 8-VSOP
O : 173mil 8-TSSOP
X : BGA
BA/BB/BC : WLCSP

OPTION :
G : RoHS Compliant

SPEED :
08 : 133MHz
10 : 104MHz/108MHz
12 : 80MHz/86MHz
13 : 75MHz
15 : 66MHz
20 : 45MHz

Parallel NOR Flash



Macronix offers a variety of 3V Parallel Flash memories in densities from 4Mb to 1Gb. Our solutions provide 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 densities of 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 in AD-Mux and Burst Mode. These products are used in 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 x8, x16, and x8/x16 configurations at single 5V, 3V, and 1.8V.

Page Mode Read Access

The GL Page Mode Read Access family (MX29GL and MX68GL) offers enhanced performance products with faster effective programming and read time, which makes GL family ideal for applications demanding for higher density, better performance and lower power consumption.

Burst Mode Read Access

The MX29NS and MX29VS product families offer leading edge performance with 1.8V, Burst mode and Address-Data Multiplexing (AD-Mux). The MX29NS is a single-bank product, while the MX29VS offers multi-bank architecture for simultaneous read-write capability. With 1.8V operation, faster effective programming and burst read time, the MX29NS & MX29VS families are ideal for applications demanding high performance and low power consumption.

Applications	≤8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb	1Gb
Bluetooth	●	●						
AP Router		●	●	●	●			
Wimax/LTE				●	●	●		
IAD/Home Gateway			●	●	●	●	●	●
Switching Router				●	●	●	●	●
Enterprise	●	●	●	●	●	●	●	●
Digital TV		●	●	●	●	●		
Set Top Box			●	●	●	●	●	●
G-PON			●	●	●	●		
Telematics	●				●	●	●	●
IP Phone			●	●	●			
DSC			●	●	●	●	●	
Gaming				●	●	●	●	●
Automotive	●	●	●	●	●	●	●	●

Parallel Flash Example

MX 29GL 512 F H XF I - 90 Q

DEVICE :
29F: 5V
29LV/29GL/68GL: 3V
29NS/29VS/29SL: 1.8V
29LA/29GA: Security type

DENSITY :
20x : 2Mb
40x/040 : 4Mb
80x : 8Mb
16x : 16Mb
32x : 32Mb
64x : 64Mb
12x : 128Mb
25x : 256Mb
51x : 512Mb
1Gx : 1Gb

GENERATION

BLOCK TYPE :
T : Top Boot
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

PACKAGE TYPE :
P : PDIP
M : SOP
Q : PLCC
T : TSOP
X : BGA

SPEED :
55 : 55ns
70 : 70ns
90 : 90ns
10 : 100ns
11 : 110ns

TEMPERATURE RANGE :
C : Commercial (0℃ to 70℃)
I : Industrial (-40℃ to 85℃)
S : Automotive Grade 3 (-40℃ to 85℃)
R : Automotive Grade 2 (-40℃ to 105℃)
Q : Automotive Grade 1 (-40℃ to 125℃)

OPTION :
G: RoHS Compliant
Q: Restricted
Vcc : (3.0V~3.6V),
RoHS Compliant

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	-40℃ to 85℃
MX29F800CT/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, 48-XFLGA	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℃ to 105℃
MX29LV160DT/B	16Mb	x8 / x16	70	48-TSOP, 48-WFBGA, 48-TFBGA, 48-LFBGA, 48-XFLGA	3V	Boot Sector	-40℃ to 85℃
MX29LV161DT/B	16Mb	x16	90	48-TSOP, 48-WFBGA, 48-TFBGA, 48-XFLGA	3V	Boot Sector; V I/O=1.8V	-40℃ to 85℃
MX29LV320ET/B	32Mb	x8 / x16	70	48-TSOP, 48-TFBGA, 48-LFBGA, 44-SOP	3V	Boot Sector	-40℃ to 105℃
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-LFBGA	3V	Boot Sector	-40℃ to 85℃
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
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	3V	Uniform Sector	-40℃ to 105℃
MX29GL320ET/B	32Mb	x8 / x16	70	48-TSOP, 48-LFBGA	3V	Boot Sector	-40℃ to 105℃
MX29GL640EH/L	64Mb	x8 / x16	70	56-TSOP, 64-LFBGA	3V	Uniform Sector	-40℃ to 105℃
MX29GL640ET/B	64Mb	x8 / x16	70	48-TSOP, 48-LFBGA	3V	Boot Sector	-40℃ to 105℃
MX29GL128EH/L	128Mb	x8 / x16	90	56-TSOP, 64-FBGA, 64-LFBGA, 70-SSOP	3V	Uniform Sector	-40℃ to 105℃
MX29GL128FH/L	128Mb	x8 / x16	70 / 90	56-TSOP, 56-FBGA, 64-LFBGA, 70-SSOP	3V	Uniform Sector	-40℃ to 105℃
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℃ to 105℃
MX29GL256GH/L*	256Mb	x8 / x16	90	56-TSOP, 56-FBGA, 64-LFBGA	3V	Uniform Sector; extended page/ buffer	-40℃ to 85℃
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℃ to 105℃
MX29GL512GH/L	512Mb	x8 / x16	100	56-TSOP, 56-FBGA, 64-LFBGA	3V	Uniform Sector; extended page/ buffer	-40℃ to 85℃
MX29GL512FU/D	512Mb	x8 / x16	110	56-TSOP, 64-LFBGA	3V	Uniform Sector	-40℃ to 105℃
MX68GL1G0FH/L	1Gb	x8 / x16	110	56-TSOP, 64-LFBGA	3V	Uniform Sector	-40℃ to 105℃
MX68GL1G0GH/L	1Gb	x8 / x16	100	56-TSOP, 64-LFBGA	3V	Uniform Sector; extended page/ buffer	-40℃ to 85℃
MX68GL1G0FU/D	1Gb	x8 / x16	120	56-TSOP, 64-LFBGA	3V	Uniform Sector	

* Advance Information

NAND Flash Memory

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 SLC NAND products from 512Mb to 8Gb densities with industry-standard packages and features.

Part Number	ONFI	Density	Cell Type	Page Size	Bus Width	ECC requirement	Access time from array to cache (max.)	Sequential Read Speed (min.)	Package	Vcc.	Temperature Range	Automotive Grade
3V Series												
MX30LF1208AA	N/A	512Mb	SLC	2KB	x8	1-bit ECC	25µs	30ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	-40℃ to 105℃
MX30LF1G08AA	N/A	1Gb	SLC	2KB	x8	1-bit ECC	25µs	30ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	-40℃ to 105℃
MX30LF2G28AB	ONFI 1.0	2Gb	SLC	2KB	x8	8-bit ECC	25µs	20ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	
MX30LF2G18AC*	ONFI 1.0	2Gb	SLC	2KB	x8	4-bit ECC	25µs	20ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	
MX30LF2GE8AB*	ONFI 1.0	2Gb	SLC	2KB	x8	ECC-free	70µs	20ns	48-TSOP(12x20mm)	3V	-40℃ to 85℃	
MX30LF4G28AB	ONFI 1.0	4Gb	SLC	2KB	x8	8-bit ECC	25µs	20ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	
MX30LF4G18AC*	ONFI 1.0	4Gb	SLC	2KB	x8	4-bit ECC	25µs	25ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	
MX30LF4GE8AB*	ONFI 1.0	4Gb	SLC	2KB	x8	ECC-free	70µs	20ns	48-TSOP(12x20mm)	3V	-40℃ to 85℃	
MX60LF8G28AB	ONFI 1.0	8Gb	SLC	2KB	x8	8-bit ECC	25µs	20ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	3V	-40℃ to 85℃	
1.8V Series												
MX30UF1G18AB*	ONFI 1.0	1Gb	SLC	2KB	x8	4-bit ECC	25µs	25ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF1G16AB*	ONFI 1.0	1Gb	SLC	2KB	x16	4-bit ECC	25µs	25ns	63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF2G28AB	ONFI 1.0	2Gb	SLC	2KB	x8	8-bit ECC	25µs	25ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF2G26AB	ONFI 1.0	2Gb	SLC	2KB	x16	8-bit ECC	25µs	25ns	63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF2G18AB*	ONFI 1.0	2Gb	SLC	2KB	x8	4-bit ECC	25µs	25ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF2G16AB*	ONFI 1.0	2Gb	SLC	2KB	x16	4-bit ECC	25µs	25ns	63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF4G28AB	ONFI 1.0	4Gb	SLC	2KB	x8	8-bit ECC	25µs	25ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF4G26AB	ONFI 1.0	4Gb	SLC	2KB	x16	8-bit ECC	25µs	25ns	63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF4G18AC*	ONFI 1.0	4Gb	SLC	2KB	x8	4-bit ECC	25µs	25ns	48-TSOP(12x20mm), 63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	
MX30UF4G16AC*	ONFI 1.0	4Gb	SLC	2KB	x16	4-bit ECC	25µs	25ns	63-VFBGA(9x11mm)	1.8V	-40℃ to 85℃	

* Advance Information

NAND Flash Example

MX 30 L F 1G 0 8 A A - XK I x

TYPE:
30=SLC NAND
60=SLC NAND (stacked die)

VOLTAGE:
L=2.7V to 3.6V
U=1.7V to 1.95V

CLASSIFICATION:
F=SLC+Large Block

DENSITY:
12=512Mb
1G=1Gb
2G=2Gb
4G=4Gb
8G=8Gb

ECC :
0=1bit
1=4bit
2=8bit
E=ECC-free

Bus Width :
8=x8
6=x16

MODE:
A=Die#, CE#:1, R/B#:1
S=Die#, CE#:1, R/B#:1, security feature supported

GENERATION

PACKAGE TYPE :
T : TSOP
XK: VFBGA(0.8 mm ball pitch, 0.45mm ball size)
RoHS Compliant

OPERATING TEMPERATURE :
I : Industrial (-40℃ to 85℃)
S : Automotive Grade 3 (-40℃ to 85℃)
R : Automotive Grade 2 (-40℃ to 105℃)

RESERVED

Secure Flash

Nowadays, security is at the forefront of many applications. Several Flash memory products are now equipped with various security features. Macronix provides an expansive product portfolio of security solutions, which enable customers to protect confidential/sensitive and private data stored in Flash memory from malicious overwrites and attacks.

The Macronix Secure Flash portfolio includes a broad offering of NOR and NAND memories: Parallel NOR available in densities from 32Mb to 1Gb, Serial NOR 16Mb to 1Gb, and SLC NAND 2Gb to 4Gb. Secure Flash is primarily used for the applications that require data and code security, such as the Set-Top Box, Digital TV... etc.

Serial Secure RPMC NOR Flash Family

Part Number	Density	Organization	I/O Bus	Clock Speed(MHz)	Packages
MX25L6450F	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	84 (x1, x2, x4)	200mil 8-SOP, 8-WON(6x5mm), 300mil 8-PDIP
MX25L12850F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	84 (x1, x2, x4)	200mil 8-SOP, 8-WON(6x5mm), 300mil 8-PDIP

Serial Secure NOR Flash Family

Part Number	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, 8-WSON(6x5mm)	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
MX25L51255F	512Mb	4KB / 32KB / 64KB	Single / Dual / Quad	166 (x1, x2), 133 (x4)	300mil 16-SOP, 24-BGA(6x8mm)	3V
MX66L51255F	512Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133 (x1, x2, x4)	300mil 16-SOP, 24-BGA(6x8mm)	3V
MX66L1G55G	1Gb	4KB / 32KB / 64KB	Single / Dual / Quad	166 (x1, x2), 133 (x4)	300mil 16-SOP, 24-BGA(6x8mm)	3V

Parallel Secure NOR Flash Family

Part Number	Density	Organization	Access Time(ns)	Package	Vcc.	Features
Standard Read Access Series						
MX29LA320DH/L	32Mb	x 8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA320EH/L	32Mb	x 8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA321DH/L	32Mb	x 8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA640EH/L	64Mb	x 8 / x16	70	64-FBGA	3V	Uniform Sector
MX29LA641DH/L	64Mb	x 8 / x16	90	64-FBGA	3V	Uniform Sector
Page Mode Read Access Series						
MX29GA320EH/L	32Mb	x 8 / x16	70	64-FBGA	3V	Uniform Sector
MX29GA321EH/L	32Mb	x16	70	64-FBGA	3V	Uniform Sector
MX29GA640EH/L	64Mb	x 8 / x16	90	64-FBGA	3V	Uniform Sector
MX29GA641EH/L	64Mb	x16	90	64-FBGA	3V	Uniform Sector
MX29GA128FH/L	128Mb	x 8 / x16	90	64-FBGA	3V	Uniform Sector
MX29GA129FH/L	128Mb	x16	90	64-FBGA	3V	Uniform Sector
MX29GA256FH/L	256Mb	x 8 / x16	90Q	64-FBGA	3V	Uniform Sector
MX29GA257FH/L	256Mb	x16	90Q	64-FBGA	3V	Uniform Sector
MX29GA512FH/L	512Mb	x 8 / x16	110	64-FBGA	3V	Uniform Sector
MX68GA1G0FH/L	1Gb	x 8 / x16	110	64-FBGA	3V	Uniform Sector

Secure SLC NAND Flash Family

Part Number	Density	Cell Type	Page Size	Bus Width	Sequential Read Speed (ns)	Package	Vcc.	Temperature	Feature
MX30LF2G28SB	2Gb	SLC	2KB	x8	20ns	63-VFBGA(9x11mm)	3V	-40℃ to 85℃	PBL (Permanently Block-Locked)
MX30LF4G28SB	4Gb	SLC	2KB	x8	20ns	63-VFBGA(9x11mm)	3V	-40℃ to 85℃	PBL (Permanently Block-Locked)

WLCSP (Wafer-Level Chip Scale Package)

WLCSP is a true chip-scale package, offering an extremely small footprint. The key advantages include low chip-to-PCB inductance, reduced package size, and enhanced thermal conduction. WLCSP is the ideal solution for mobile or portable form factor applications, such as mobile phones, tablets, digital cameras, smart watches, bluetooth headsets, and GPS navigation devices.

Serial Flash WLCSP Portfolio

Vcc.	Product Series	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb
3V	MX25L	●						●
1.8V	MX25U		●	●	●	●	●	●

KGD (Known Good Die)

We also offer Known Good Die for System in Package (SiP) solution, which can be applied to set top boxes, GPS, networking, ODD, DSC, industrial, handsets, tablets, automotive, and wearable devices.

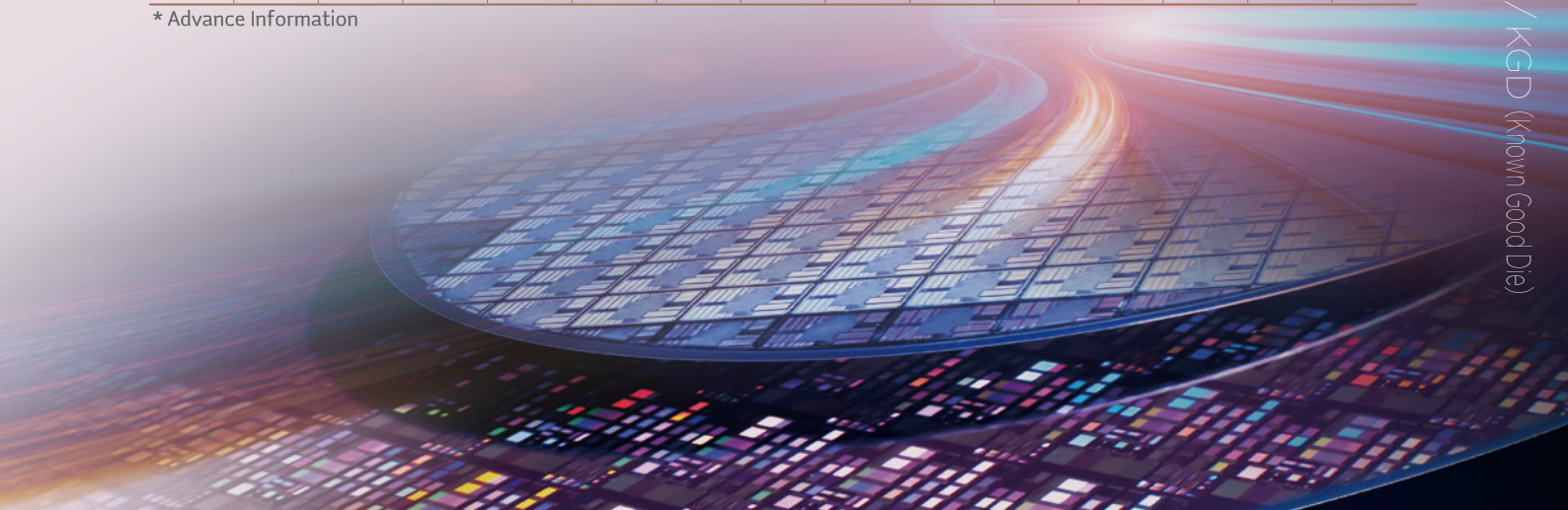
- **Stringent KGD production flow control**
- **Comprehensive OQC(output quality control) and probe mark control**
- **Complete function / data retention / reliability testing**
- **Professional engineering team**
- **UV light protection shipping**

Please contact Macronix regional sales for datasheet and technical support.

KGD Flash Portfolio

	512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb	1Gb	2Gb	4Gb
Serial NOR Flash														
3V	●	●	●	●	●	●	●	●	●	●	●*			
2.5V	●	●	●	●	●									
1.8V	●	●	●	●	●	●	●	●	●	●*				
Parallel NOR Flash														
3V				●	●	●	●	●	●	●	●*			
1.8V				●	●			●	●					
SLC NAND Flash														
3V											●	●	●*	●*
1.8V													●*	●*

* Advance Information



MCP Solutions

Macronix is especially leading the 1.8V Serial flash specification for power saving and space constraint needs. Made by state-of-art manufacturing capability and quality controls, our MCP solution portfolio provides flexible choices and fast time-to-market advantages for both embedded and wireless application usage. With a small footprint and backward compatible pinout, customers can choose different densities to meet their cost effective solutions.

NOR MCP

Part Number	Product Type	NOR Density	pSRAM Density	NOR Voltage	pSRAM Voltage	NOR Bus Width	pSRAM Bus Width	Package Type	Package Dimension
MX69GL640E	De-Mux Page Mode	64Mb	32Mb	3V	3V	x16	x16	56TFBGA	7.0x9.0
MX69GL126E	De-Mux Page Mode	128Mb	32Mb	3V	3V	x16	x16	56TFBGA	7.0x9.0
MX69V28E64	AD-Mux	128Mb	64Mb	1.8V	1.8V	x16	x16	56TFBGA	6.2x7.7
MX69N64E32	AD-Mux	64Mb	32Mb	1.8V	1.8V	x16	x16	56TFBGA	6.2x7.7
MX65U64F32	QPI Mode	64Mb	32Mb	1.8V	1.8V	x4	x16	56TFBGA	6.2x7.7
MX65U28F64	QPI Mode	128Mb	64Mb	1.8V	1.8V	x4	x16	56TFBGA	6.2x7.7

NAND MCP

Part Number	NAND Product Type	LPDDR Product Type	NAND Density	LPDDR Density	NAND Voltage	LPDDR Voltage	NAND Bus Width	LPDDR Bus Width	Package Type	Package Dimension
MX63U4GA2GBAXMI00	ONFi	LPDDR2	4Gb	2Gb	1.8V	1.8V	x8	x32	162TFBGA	8.0X10.5
MX63U4GB2GBAXMI00	ONFi	LPDDR2	4Gb	2Gb	1.8V	1.8V	x16	x32	162TFBGA	8.0X10.5
MX63U2GA1GCAXMI00	ONFi	LPDDR2	2Gb	1Gb	1.8V	1.8V	x8	x32	162TFBGA	8.0X10.5
MX63U2GB1GCAXMI00	ONFi	LPDDR2	2Gb	1Gb	1.8V	1.8V	x16	x32	162TFBGA	8.0X10.5
MX63U1GB1GCAMXI00*	ONFi	LPDDR2	1Gb	1Gb	1.8V	1.8V	x16	x32	163TFBGA	8.0X10.6

* Advance Information

ROM (Read-Only Memory)

As the leader in the ROM industry, we continue to provide cutting-edge ROM products to our valued customers. Migrating from Mask ROM to XtraROM, Macronix has made ROM products more flexible in production and delivery, while preserving high quality and cost advantages.

Macronix ROM products have been widely used, from game cartridges to slot machines to toys to learning devices. In the past decade, we have invested much on ROM products. In the future, we will continue developing advanced technology to make ROM a preferred medium for content publishing.

XtraROM

XtraROM is the leading ROM technology from Macronix without mask charge and with short TAT (Turn Around Time). With a proven record of delivery and quality, XtraROM offers a robust medium for content publishing. The host MCU solely must READ the contents; it need not worry about bad blocks, wear leveling, and ECC. XtraROM is classified into three categories: NAND XtraROM, Gaming Machine XtraROM, and ASIC XtraROM.

√ NAND XtraROM

Part Number	Density	Bus Width	Access Time(ns)	Latency(µs)	Vcc.	Package
MX23J51243	512Mb	x8	25	25	2.7~3.6V	48-TSOP
MX23J1G43	1Gb	x8	25	80	2.7~3.6V	48-TSOP

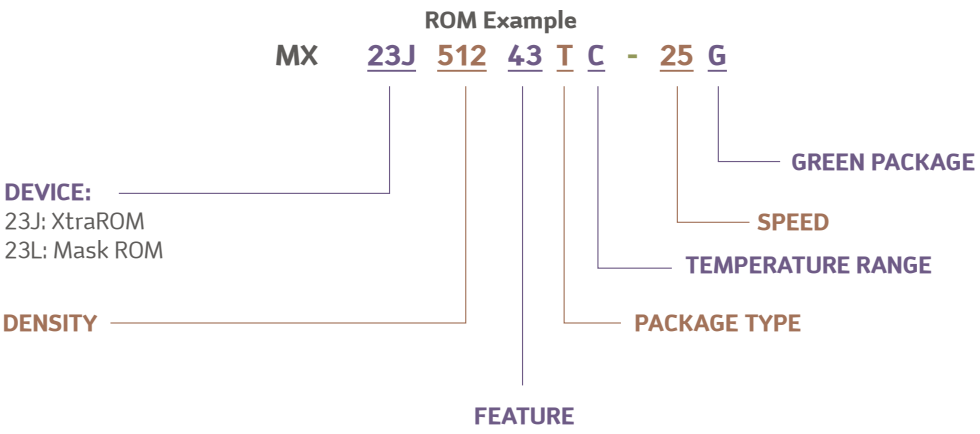
This device is pad compatible to NAND, but much more robust than NAND. It is popularly used as a cartridge for learning platforms.

√ Gaming Machine XtraROM

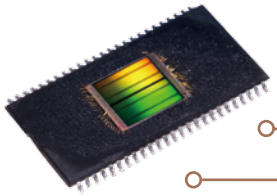
This device, while maintaining the same checksum of the content during lifetime of gaming machines, is widely used in Pachinko and PachinSlot for video/audio, and code storage. It features 32 I/O for fast speed, 70-SSOP package, and up to 32Gb in density.

√ ASIC XtraROM

Macronix excels at customized XtraROM from IC design to content programming to quick delivery. We can build your DRM (Digital Right Management) scheme in the circuit of XtraROM to protect your content against piracy. Our designs are used in handheld gaming consoles over the world.



Package Options



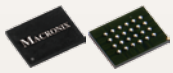
Macronix provides products with extremely small packages as well as very thin profiles for space-constrained applications.

Serial Packages

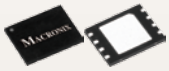
8 SOP (150mil)	
Length	6
Width	5
Thickness	1.75
Pitch	1.27
	(mm)

8 SOP (200mil)	
Length	7.9
Width	5.23
Thickness	2.16
Pitch	1.27
	(mm)

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



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



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

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

8 USON (4x4)	
Length	4
Width	4
Thickness	0.6
Pitch	0.8
	(mm)

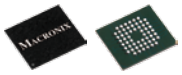
8 USON (2x3)	
Length	3
Width	2
Thickness	0.6
Pitch	0.5
	(mm)

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)	
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)

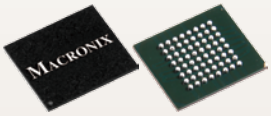
44 SOP (500mil)	
Length	28.5
Width	12.6
Thickness	3
Pitch	1.27
	(mm)

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

63 VFBGA (Ball Dia. 0.45)	
Length	9
Width	11
Thickness	1.0
Pitch	0.8
	(mm)

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

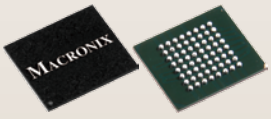
48 WFBGA (Ball Dia. 0.3)	
Length	6
Width	4
Thickness	0.75
Pitch	0.5
	(mm)



64 FBGA (Ball Dia. 0.4)	
Length	13
Width	10
Thickness	1.2
Pitch	1.0
	(mm)

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

48 XFLGA (Land Open 0.25)	
Length	6
Width	4
Thickness	0.5
Pitch	0.5
	(mm)



64 LFBGA (Ball Dia. 0.4)	
Length	13
Width	10
Thickness	1.2
Pitch	1.0
	(mm)

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