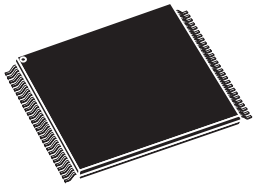
M29DW128G

128 Mbit (8 Mb x 16, multiple bank, page, dual boot) 3 V supply Flash memory

Data Brief

Features

- Supply voltage
  - V_{CC} = 2.7 to 3.6 V for Program, Erase and Read
  - V_{PP} =12 V for Fast Program (optional)
- Asynchronous Random/Page Read
  - Page width: 8 words
  - Page access: 25 ns
  - Random access: 60 ns
- Programming time
  - 15 µs per byte/word (typical)
  - 32-word write buffer
- Erase verify
- Memory blocks
  - Quadruple bank memory array: 16 Mbit+48 Mbit+48 Mbit+16 Mbit
  - Parameter blocks (at top and bottom)
- Dual operation
  - While Program or Erase in one bank, Read in any of the other banks
- Program/Erase Suspend and Resume modes
  - Read from any block during Program Suspend
  - Read and Program another block during Erase Suspend
- Unlock Bypass Program
  - Faster production/batch programming
- Common Flash interface
  - 64 bit security code
- 100,000 Program/Erase cycles per block



TSOP56 (NF)
14 x 20 mm

TBGA64 (ZA)
10 x 13 mm

- Low power consumption
  - Standby and automatic standby
- Hardware block protection
  - $V_{PP}/\overline{WP}$ pin for fast program and write protect of the four outermost parameter blocks
- Security features
  - Standard protection
  - Password protection
  - Additional block protection
- Extended memory block
  - Extra block used as security block or to store additional information
- Electronic signature
  - Manufacturer code: 0020h
  - Device code: 227Eh+2220h+2200h
- ECOPACK® packages available

Contents

List of tables

List of figures

1 Description

The M29DW128G is a 128 Mbit (8 Mb x 16) non-volatile memory that can be read, erased and reprogrammed. These operations can be performed using a single low voltage (2.7 to 3.6 V) supply. At Power-up the memory defaults to its Read mode.

The M29DW128G features an asymmetrical block architecture, with 8 parameter and 62 main blocks, divided into four banks, A, B, C and D, providing multiple bank operations. While programming or erasing in one bank, read operations are possible in any other bank. The bank architecture is summarized in *Table 2*. Four of the parameter blocks are at the top of the memory address space, and four are at the bottom.

Program and Erase commands are written to the command interface of the memory. An on-chip Program/Erase controller simplifies the process of programming or erasing the memory by taking care of all of the special operations that are required to update the memory contents. The end of a program or erase operation can be detected and any error conditions identified. The command set required to control the memory is consistent with JEDEC standards.

The Chip Enable, Output Enable and Write Enable signals control the bus operations of the memory. They allow simple connection to most microprocessors, often without additional logic.

The device supports Asynchronous Random Read and Page Read from all blocks of the memory array.

The M29DW128G has one extra 256 words block (extended block, 128 words factory locked and 128 words customer lockable) that can be accessed using a dedicated command. The extended block can be protected and so is useful for storing security information. However the protection is irreversible, once protected the protection cannot be undone.

Each block can be erased independently, so it is possible to preserve valid data while old data is erased.

The device features different levels of hardware and software block protection to avoid unwanted program or erase (modify):

- Hardware protection:
  - The $V_{PP}/\overline{WP}$ provides a hardware protection of the four outermost parameter blocks (two at the top and two at the bottom of the address space).
- Software protection
  - Standard protection
  - Password protection
- Additional protection features are available upon customer request.

The memory is offered in TSOP56 (14 x 20 mm) and TBGA64 (10 x 13 mm, 1 mm pitch) packages.

In order to meet environmental requirements, Numonyx offers the M29DW128G in ECOPACK® packages. ECOPACK packages are Lead-free. The category of second Level Interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. The memory is supplied with all the bits erased (set to '1').

Table 1. Signal names

Signal name	Function	Direction
A0-A22	Address inputs	Inputs
DQ0-DQ15	Data inputs/outputs	I/O
$\overline{E}$	Chip Enable	Input
$\overline{G}$	Output Enable	Input
$\overline{W}$	Write Enable	Input
$\overline{RP}$	Reset/Block Temporary Unprotect	Input
$R\overline{B}$	Ready/Busy output	Output
V_{CC}	Supply voltage	
$V_{PP}/\overline{WP}$	V_{PP}/Write Protect	
V_{SS}	Ground	
NC	Not connected internally	

Figure 1. Logic diagram

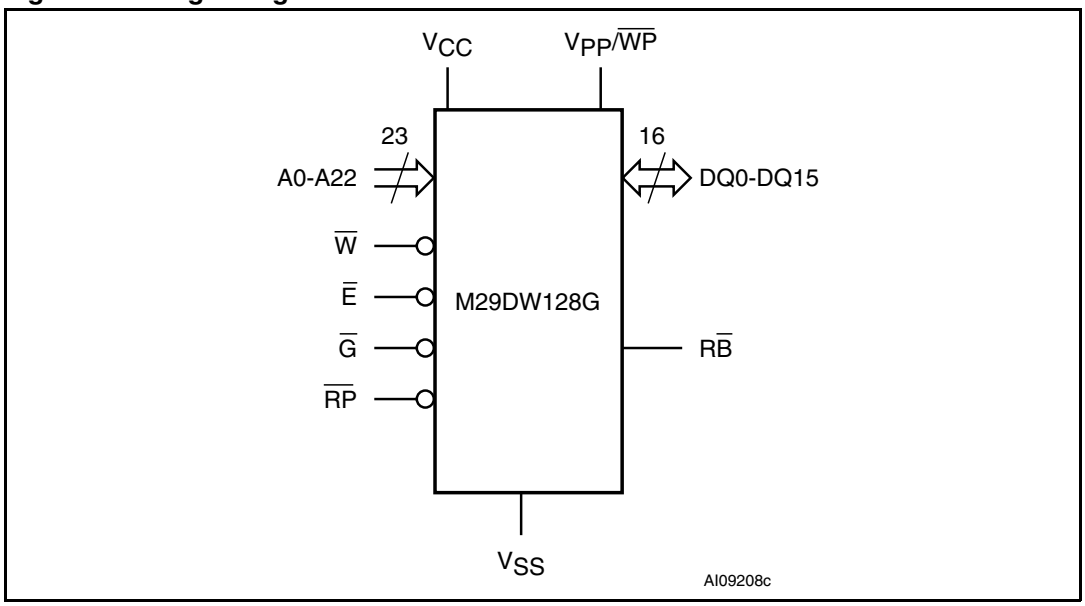


Table 2. Bank architecture

Bank	Bank size	Parameter blocks		Main blocks	
		N. of blocks	Block size	N. of blocks	Block size
A	16 Mbit	4	64 Kbytes/ 32 Kwords	7	256 Kbytes/ 128 Kwords
B	48 Mbit	—	—	24	256 Kbytes/ 128 Kwords
C	48 Mbit	—	—	24	256 Kbytes/ 128 Kwords
D	16 Mbit	4	64 Kbytes/ 32 Kwords	7	256 Kbytes/ 128 Kwords

Figure 2. TSOP connections

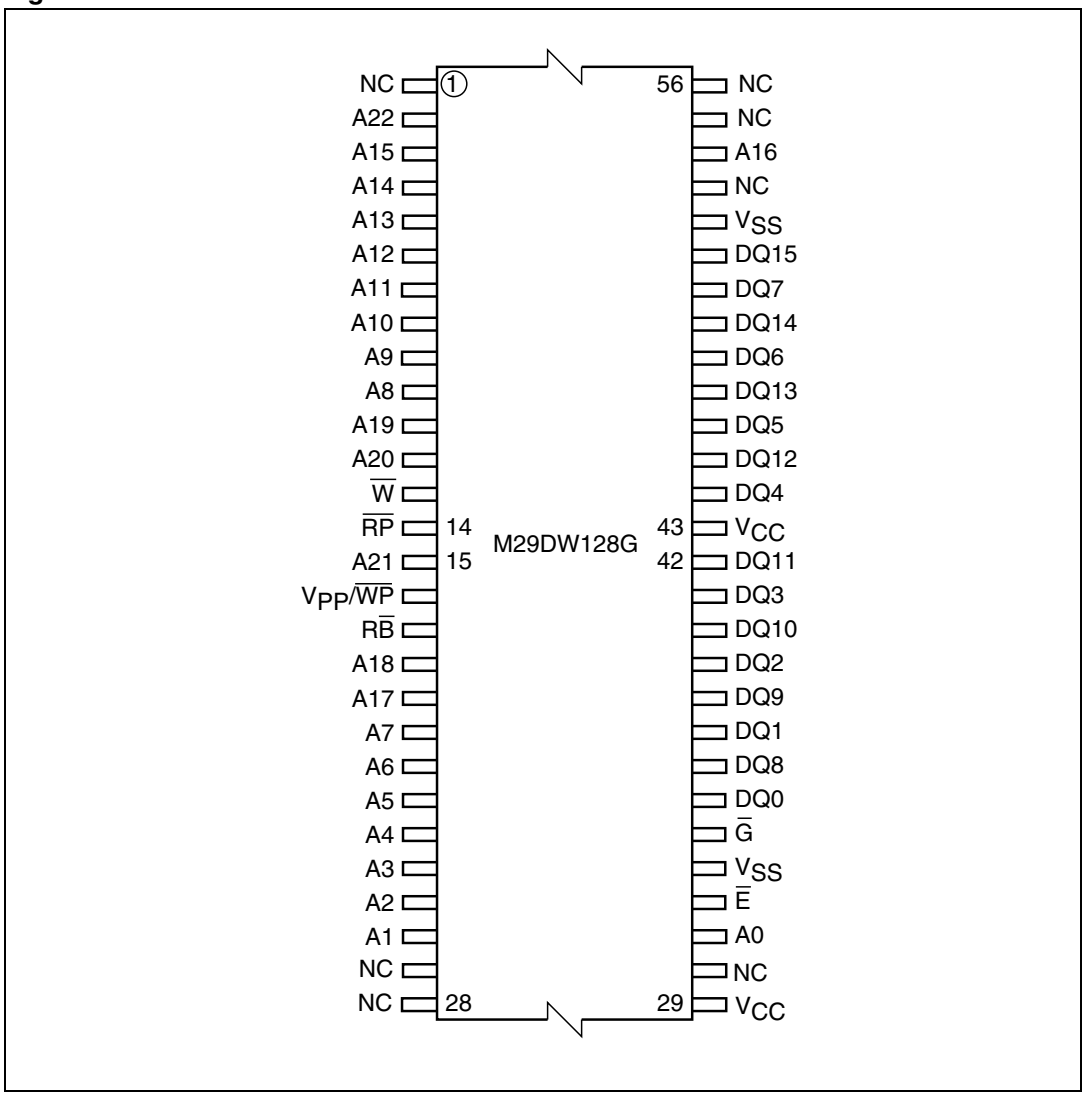
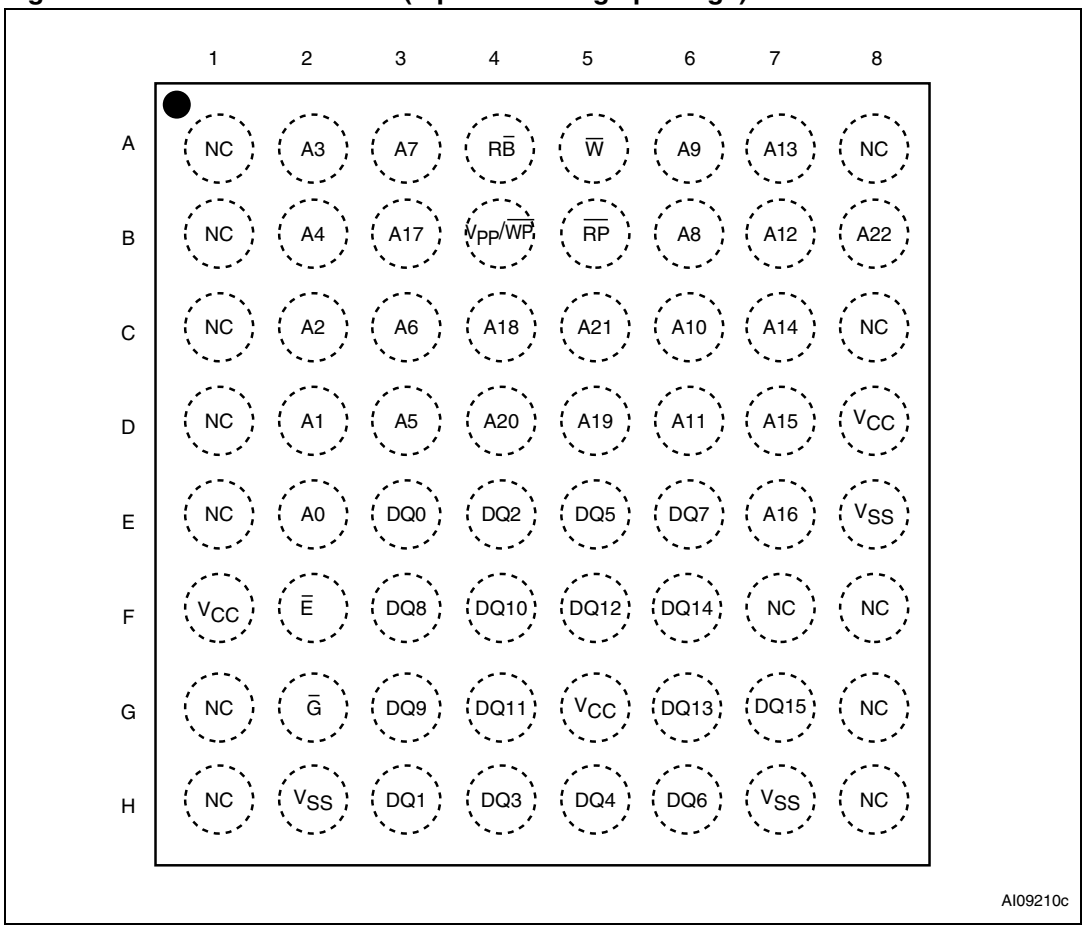


Figure 3. TBGA connections (top view through package)



2 Part numbering

Table 3. Ordering information scheme

Example: M29 D W 128G 60 NF 6 E

Device type

M29

Architecture

D = Dual operation

Operating voltage

W = V_{CC} = 2.7 to 3.6 V

Device function

128G = 128 Mbit (x 16), page, dual boot

Speed

60= 60 ns

Package

NF = TSOP56: 14 x 20 mm

ZA = TBGA64: 10 x 13 mm - 1 mm pitch

Temperature range

6 = -40 to 85 °C

Option

E = ECOPACK package, standard packing

F = ECOPACK package, tape & reel packing

Note: This product is also available with the extended block factory locked.

Devices are shipped from the factory with the memory content bits erased to ’1’.

For a list of available options (speed, package, etc.) or for further information on any aspect of this device, please contact your nearest Numonyx Sales Office.

3 Revision history

Table 4. Document revision history

Date	Version	Revision details
17-Sep-2007	1	Initial release.
10-Dec-2007	2	Applied Numonyx branding.

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