



# M29W004T M29W004B

## 4 Mbit (512Kb x8, Boot Block) Low Voltage Single Supply Flash Memory

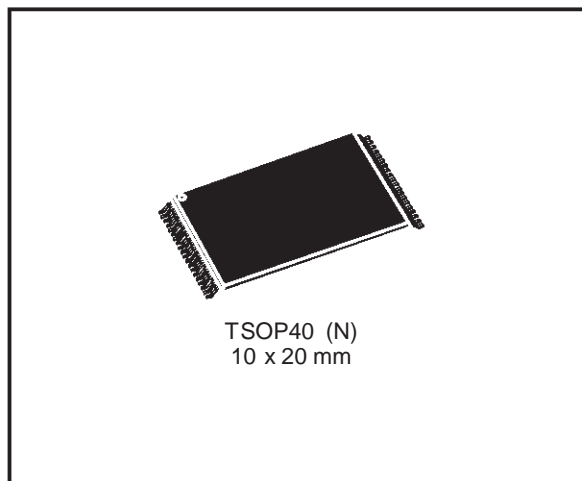
### DATA BRIEFING

- 2.7V to 3.6V SUPPLY VOLTAGE for PROGRAM, ERASE and READ OPERATIONS
- FAST ACCESS TIME: 100ns
- FAST PROGRAMMING TIME: 10µs typical
- PROGRAM/ERASE CONTROLLER (P/E.C.)
  - Program Byte-by-Byte
  - Status Register bits and Ready/Busy Output
- MEMORY BLOCKS
  - Boot Block (Top or Bottom location)
  - Parameter and Main blocks
- BLOCK, MULTI-BLOCK and CHIP ERASE
- MULTI BLOCK PROTECTION/TEMPORARY UNPROTECTION MODES
- ERASE SUSPEND and RESUME MODES
  - Read and Program another Block during Erase Suspend
- LOW POWER CONSUMPTION
  - Stand-by and Automatic Stand-by
- 100,000 PROGRAM/ERASE CYCLES per BLOCK
- 20 YEARS DATA RETENTION
  - Defectivity below 1ppm/year
- ELECTRONIC SIGNATURE
  - Manufacturer Code: 20h
  - Device Code, M29W004T: EAh
  - Device Code, M29W004B: EBh

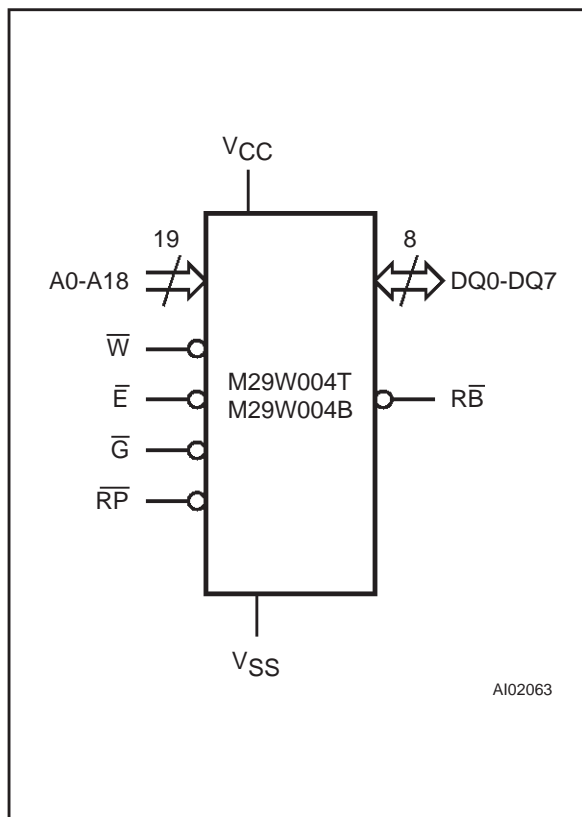
### DESCRIPTION

The M29W004 is a non-volatile memory that may be erased electrically at the block or chip level and programmed in-system on a Byte-by-Byte basis using only a single 2.7V to 3.6V  $V_{CC}$  supply. For Program and Erase operations the necessary high voltages are generated internally. The device can also be programmed in standard programmers.

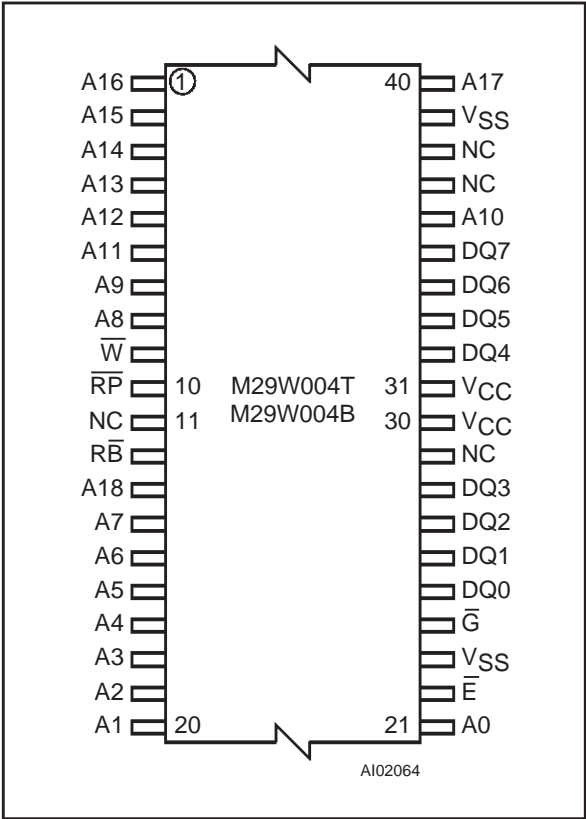
The array matrix organisation allows each block to be erased and reprogrammed without affecting other blocks. Blocks can be protected against programming and erase on programming equipment, and temporarily unprotected to make changes in the application. Each block can be programmed and erased over 100,000 cycles.



### Logic Diagram



TSOP Pin Connections



Warning: NC = Not Connected.

Signal Names

A0-A18	Address Inputs
DQ0-DQ7	Data Input/Outputs, Command Inputs
$\overline{E}$	Chip Enable
$\overline{G}$	Output Enable
$\overline{W}$	Write Enable
$\overline{RP}$	Reset / Block Temporary Unprotect
$\overline{RB}$	Ready/Busy Output
V <sub>CC</sub>	Supply Voltage
V <sub>SS</sub>	Ground

Ordering Information Scheme

For a list of available options or for further information on any aspect of this device, please contact the STMicroelectronics Sales Office nearest to you.

Example: M29W004T -90 N 1 TR

Operating Voltage

W 2.7V to 3.6V

Array Matrix

T Top Boot  
B Bottom Boot

Speed

-90 90ns  
-100 100ns  
-120 120ns  
-150 150ns

Package

N TSOP40  
10 x 20mm

Temp. Range

1 0 to 70 °C  
5 -20 to 85 °C  
6 -40 to 85 °C

Option

TR Tape & Reel  
Packing

**Note:** Devices are shipped from the factory with the memory content erased (to FFh).