

TOSHIBA MOS DIGITAL INTEGRATED CIRCUIT SILICON GATE CMOS

4 GBIT (512M × 8 BIT) CMOS NAND E²PROM**DESCRIPTION**

The TC58NVG2S0F is a single 3.3V 4 Gbit (4,529,848,320 bits) NAND Electrically Erasable and Programmable Read-Only Memory (NAND E²PROM) organized as (4096 + 224) bytes × 64 pages × 2048 blocks.

The device has two 4320-byte static registers which allow program and read data to be transferred between the register and the memory cell array in 4320-byte increments. The Erase operation is implemented in a single block unit (256 Kbytes + 14 Kbytes: 4320 bytes × 64 pages).

The TC58NVG2S0F is a serial-type memory device which utilizes the I/O pins for both address and data input/output as well as for command inputs. The Erase and Program operations are automatically executed making the device most suitable for applications such as solid-state file storage, voice recording, image file memory for still cameras and other systems which require high-density non-volatile memory data storage.

FEATURES

- Organization

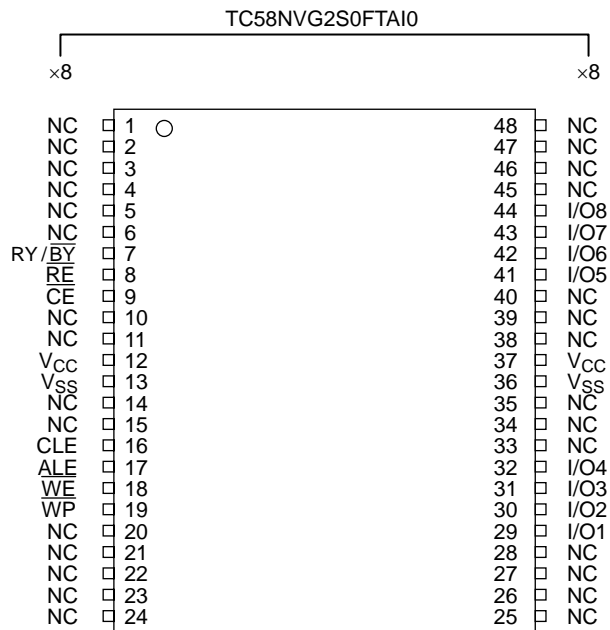
	x8
Memory cell array	4320 × 128K × 8
Register	4320 × 8
Page size	4320 bytes
Block size	(256K + 14K) bytes
- Modes
 - Read, Reset, Auto Page Program, Auto Block Erase, Status Read, Page Copy, Multi Page Program, Multi Block Erase, Multi Page Copy, Multi Page Read
- Mode control
 - Serial input/output
 - Command control
- Number of valid blocks
 - Min 2008 blocks
 - Max 2048 blocks
- Power supply
 - V_{CC} = 2.7V to 3.6V
- Access time

Cell array to register	30 μs max
Serial Read Cycle	25 ns min (CL=100pF)
- Program/Erase time

Auto Page Program	300 μs/page typ.
Auto Block Erase	3 ms/block typ.
- Operating current

Read (25 ns cycle)	30 mA max.
Program (avg.)	30 mA max
Erase (avg.)	30 mA max
Standby	50 μA max
- Package
 - TSOP I 48-P-1220-0.50 (Weight: 0.53 g typ.)
- 4bit ECC for each 512Byte is required.

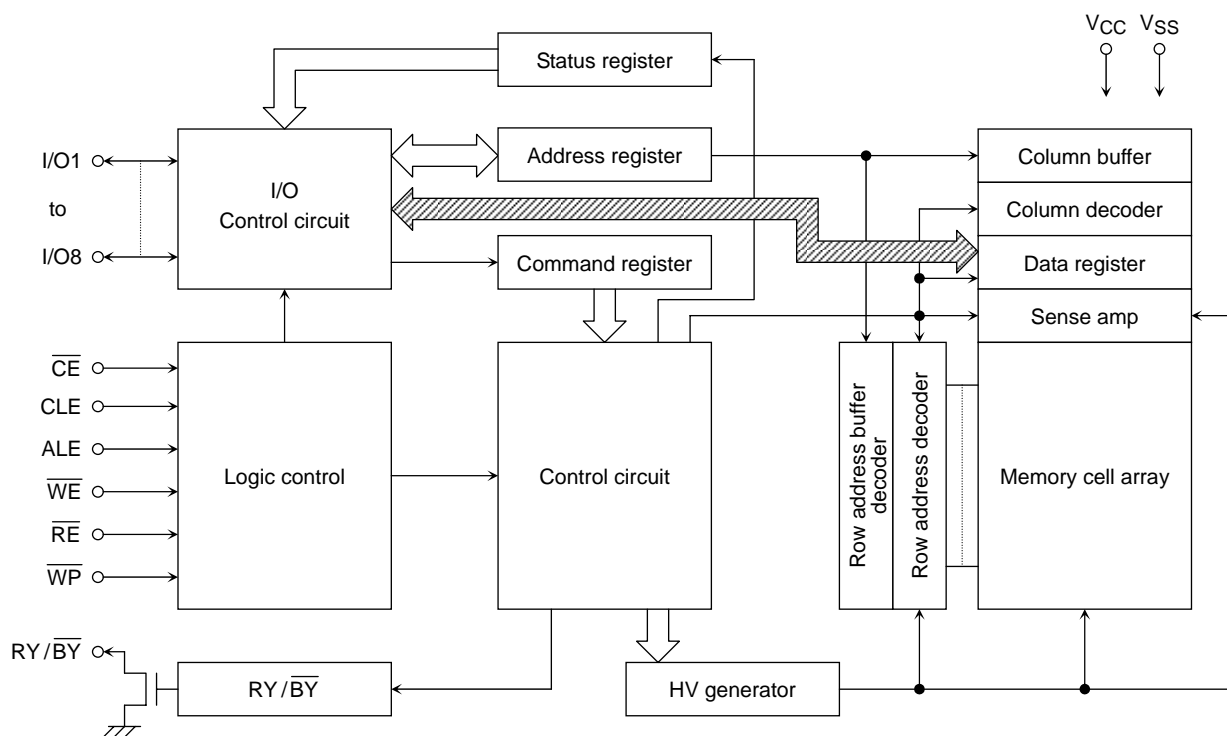
PIN ASSIGNMENT (TOP VIEW)



PINNAMES

I/O1 to I/O8	I/O port
\overline{CE}	Chip enable
\overline{WE}	Write enable
\overline{RE}	Read enable
CLE	Command latch enable
ALE	Address latch enable
\overline{WP}	Write protect
RY/ \overline{BY}	Ready/Busy
V _{CC}	Power supply
V _{SS}	Ground

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

SYMBOL	RATING	VALUE	UNIT
V _{CC}	Power Supply Voltage	-0.6 to 4.6	V
V _{IN}	Input Voltage	-0.6 to 4.6	V
V _{I/O}	Input /Output Voltage	-0.6 to V _{CC} + 0.3 (≤ 4.6 V)	V
P _D	Power Dissipation	0.3	W
T _{SOLDER}	Soldering Temperature (10 s)	260	°C
T _{STG}	Storage Temperature	-55 to 150	°C
T _{OPR}	Operating Temperature	-40 to 85	°C

CAPACITANCE *(Ta = 25°C, f = 1 MHz)

SYMBOL	PARAMETER	CONDITION	MIN	MAX	UNIT
C _{IN}	Input	V _{IN} = 0 V	—	10	pF
C _{OUT}	Output	V _{OUT} = 0 V	—	10	pF

* This parameter is periodically sampled and is not tested for every device.