SPANSION™

AL004D90BAI01
XXBYY H
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S29AL004D Floating Gate Flash Memory
4 Megabit (256 K x 16-Bit / 512 K x 8-Bit)

Spansion™ Overview

Spansion™, the Flash memory subsidiary of AMD and Fujitsu, is the world's leading manufacturer of NOR Flash Memory. Spansion is committed to delivering outstanding customer service and expert technical support, as well as providing the highest level of quality and reliability in its products. All Spansion production fabs are certified to the demanding ISO/TS16949:2002 global technical specification, ISO9001:2000 quality standards, and the ISO14001 environmental standard.

General Description

Spansion S29AL004D devices, manufactured using 200-nanometer, high-volume production technology, are standard interface devices offering high reliability and performance. Several packages are available, offering the widest variety for all applications.

Target Applications

- DVD Players
- Printers
- MP3 Players
- LCD Projectors
- Optical Disk Drives
- Modems
- Mobile Devices

PERFORMANCE CHARACTERISTICS

ACCESS SPEED		
Max. Access Time (ns)	70	90
Max. CE# Access Time (ns)	70	90
Max. OE# Access Time (ns)	25	25

CURRENT CONSUMPTION	
Active Read (@ 10 MHz) (mA)	18
Program (mA)	20
Erase (mA)	20
Standby Mode (µA)	0.2

Note: Typical values shown.

PROGRAM & ERASE PERFORMANCE	
Byte Program Time (µs)	5
Word Program Time (µs)	7
Sector Erase Time (sec)	0.7

Note: Typical values shown.

FEATURES AND BENEFITS

- **Based on Proven, High-Volume Production Floating Gate Technology**
- **High Quality and Reliability**
- **High Performance**

DISTINCTIVE CHARACTERISTICS

ARCHITECTURAL
- Established 200nm Floating Gate technology
- Single 3.0V power supply
- Boot sector architecture
- Industrial operating temperature range -40 °C to +85 °C
- JEDEC pinout and software standards compliant

SOFTWARE AND HARDWARE
- Erase, Suspend and Resume

SECURITY
- Sector Protection/Unprotection
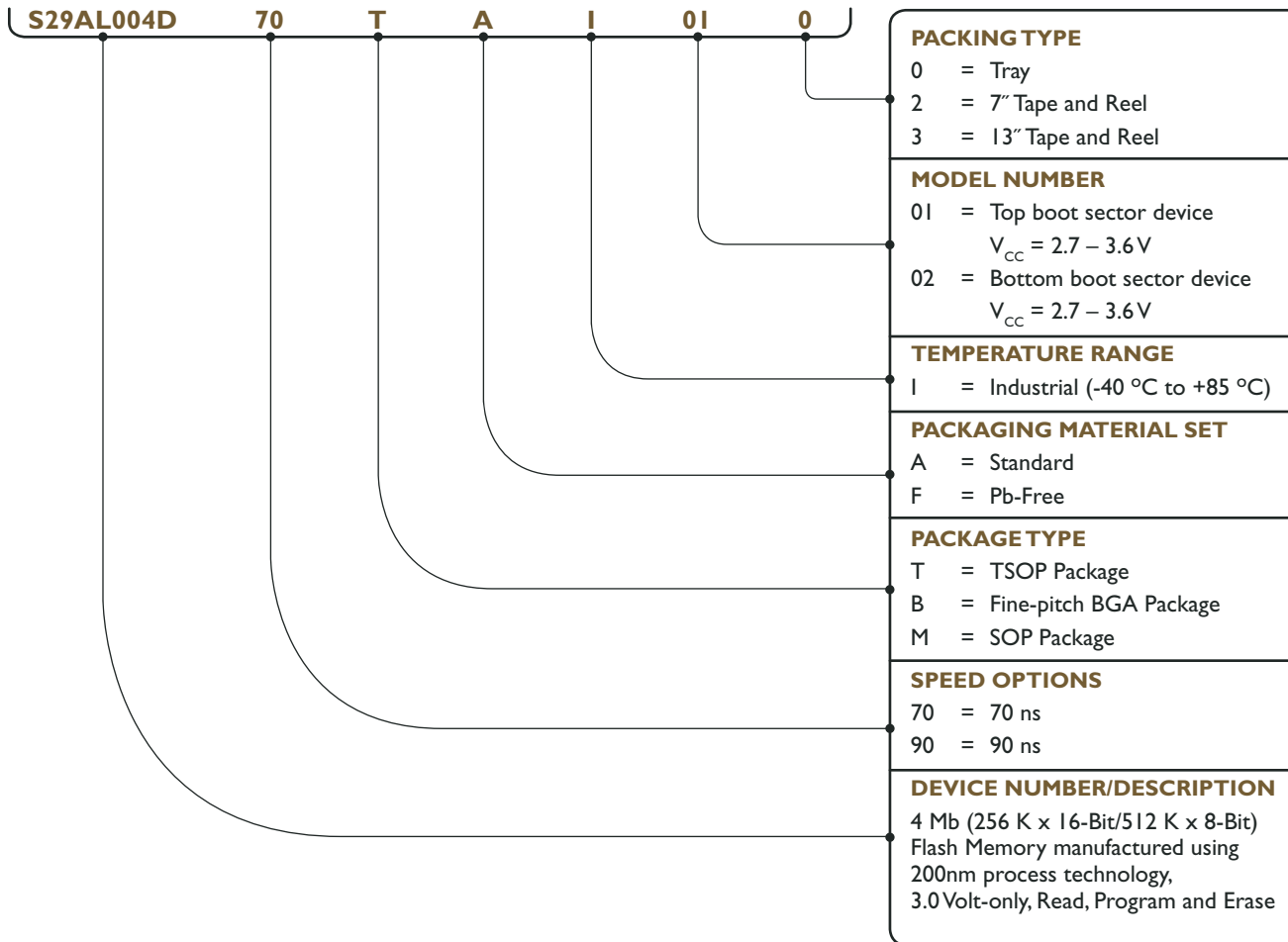- 128-word/256-byte one-time programmable Secured Silicon Sector

QUALITY AND RELIABILITY
- Cycling endurance: 1,000,000 cycles per sector typical
- Data retention: 20 years typical

PACKAGING
- 48-pin TSOP Package
- 48-ball Fine-pitch BGA Package
- 44-pin SOP Package
- Standard and Pb-Free packages available

For more information about Spansion Flash memory solutions, please visit www.spansion.com.

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Ordering Information

S29AL004D   70   T   A   I   01   0

PACKING TYPE
0 = Tray
2 = 7″ Tape and Reel
3 = 13″ Tape and Reel

MODEL NUMBER
01 = Top boot sector device
     V_{CC} = 2.7 – 3.6 V
02 = Bottom boot sector device
     V_{CC} = 2.7 – 3.6 V

TEMPERATURE RANGE
I = Industrial (-40 °C to +85 °C)

PACKAGING MATERIAL SET
A = Standard
F = Pb-Free

PACKAGE TYPE
T = TSOP Package
B = Fine-pitch BGA Package
M = SOP Package

SPEED OPTIONS
70 = 70 ns
90 = 90 ns

DEVICE NUMBER/DESCRIPTION
4 Mb (256 K x 16-Bit/512 K x 8-Bit)
Flash Memory manufactured using
200nm process technology,
3.0 Volt-only, Read, Program and Erase

AVAILABLE ORDERING PART NUMBERS FOR S29AL004D FLASH MEMORY

Device Number	Speed Option	Package & Material Temperature	Model Number	Packing Type	Package Description
S29AL004D	70, 90	TAI, TFI	01, 02	0, 2, 3[1]	TS048 (TSOP)[2]
		BAI, BFI			VBK048 (Fine-pitch BGA)[3]
		MAI, MFI			SO044 (SOP)[2]

PRODUCT SELECTION GUIDE[4]

Part Number for New Designs	Legacy Part Numbers
S29AL004D	Am29LV400T/B
	MBM29LV400T/BC

Notes:
1. Type 0 is standard. Specify others as required: TSOPs and SOs can be packed in Types 0 and 3; BGAs can be packed in Types 0, 2, or 3.
2. TSOP and SOP package markings omits packing type designator from ordering part numbers
3. BGA package marking omits leading "S29" and packing type designator from ordering number. For example, the package marking for Part Number S29AL004D10BA1010 is AL004D10BAI01.
4. Refer to related Spansion OPN map for feature mapping.