

AMD Advanced Architecture Flash Memory Devices

DESCRIPTION

AMD's technology leadership and innovation have produced the next generation of low-voltage Flash Memory devices – the Am29BDS323, Am29BDS643 and Am29PDS322. These Flash Memory devices include AMD's award-winning Simultaneous Read/Write functionality, and offer Burst or Page mode interfaces to significantly improve system performance. These high performance devices operate from a single 1.8 volt supply, reducing the active read current to just 2.0 mA (at 1.0MHz). The reduced energy consumption and fast access time combine to make these devices an ideal choice for cost-sensitive, battery-powered, cutting edge design applications.

LOW ENERGY CONSUMPTION

AMD's advanced architecture Flash Memory is an ideal solution for designers of cellular phones, handheld GPS terminals, pagers, PDAs or other portable products because AMD Flash Memory meets designers' primary objective – to continuously enhance battery life. Portable devices spend a large part of their time in a standby mode; meaning the device is powered on, but in an inactive state. Low energy consumption translates to longer standby times. AMD's 1.8 Volt-only advanced architecture Flash Memory requires a very low standby current of only 0.2 uA (Am29BDS323 and Am29BDS643) and 0.1uA (Am29PDS322). This is the lowest known standby current consumption for any Burst or Page mode Flash Memory device.

BURST MODE

AMD's Burst mode 32 Mbit and 64 Mbit 1.8 Volt devices, the Am29BDS323 and Am29BDS643 respectively, offer improvements in system speed and performance by reducing sequential read access times. Burst read capability offers an average access time reduction of more than 60 percent for an eight-word sequential read at 40 MHz compared to when the device is not used in Burst mode (asynchronous read). The total time to access eight words in asynchronous mode (non-Burst) is much longer than the Burst mode read time which comprises an initial synchronous random access for the first word and then seven very fast Burst read times.

The Am29BDS323 provides an average Burst access of 20ns with an initial synchronous access times of 120ns, while the Am29BDS643 offers an average Burst access time of 13.5ns with an initial synchronous access time of 106ns.

SIMULTANEOUS READ/WRITE

Both devices also offer AMD's award-winning Simultaneous Read/Write functionality. AMD pioneered the Simultaneous

Read/Write functionality by providing Flash with two memory banks. The simultaneous operation helps improve overall system performance by allowing a host system to program or erase in one bank, while simultaneously reading from the other bank, with zero latency. The Am29BDS323 and Am29BDS643 Burst mode devices provide convenient interfacing with Burst mode processors like the PowerPC, Coldfire, 68K, MIPS and Tri-core.

PAGE MODE

AMD's Page mode 32 Mbit 1.8 Volt-only device, Am29PDS322, combines Simultaneous Read/Write with Page mode functionality. A page is a small group of memory words that are accessed in parallel rather than one at a time. The time to reach the first word in the group is called the initial access time. Since all the words in the group are stored in an internal buffer following the initial access time, other words in the group can be delivered with a much reduced access time. Am29PDS322 has an initial page access speed of 40ns. The Am29PDS322 is mask ROM pinout – compatible and well-suited for code changes during an early product life cycle.

Our reliable and versatile products empower you to create advanced, feature-rich designs. Succeed with AMD Flash technology leadership.

APPLICATIONS

AMD's low-voltage, feature-rich Flash Memory devices offer an ideal solution for a variety of applications. The following lists some of the most valued features for a few of these applications:

- **Digital Cellular Phones** – Extremely low power consumption, Burst mode interface, industrial temperature grade product, pin-compatible density upgrades, very high performance, Simultaneous Read/Write operation, and small form-factor packaging known as Fine-Pitch Ball Grid Array (FBGA).
- **Personal Information Devices** – Flexibility of in-system re-programmability, full operation at 1.8 Volts, low energy consumption, 16 bit I/O bus, and high-speed data access.
- **Handheld Global Positioning Systems (GPS) and Automotive Instrumentation** – Industrial temperature grade operation, full operations at 1.8 Volts, Burst or Page mode interface, and high performance.

AMD's Flash Memory products are designed to meet the needs of the market with innovative and value-added design features, leading-edge process technologies, and state-of-the-art manufacturing capabilities.



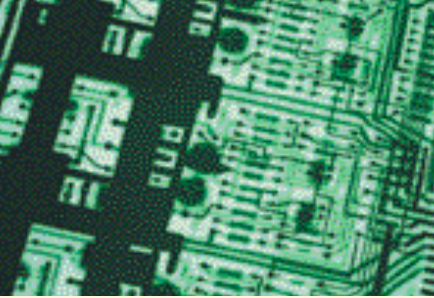
ADVANCED ARCHITECTURE FLASH MEMORY

Am29BDS323

Am29BDS643

Am29PDS322





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FEATURES AND BENEFITS

- 1.8 Volt-only for Read, Program and Erase
- Extended Operating Range
- Read Mode Power Consumption as low as 27mW (typical) Zero Power Operation consumes 0.2uA (typical)
- Choice of Architectures
- Initial Read Access Times as fast as 40ns (PDS) and asynchronous 90ns (BDS)
- Minimum 1,000,000 Program/Erase Cycles 20 Year Data Retention at 125°C
- Accelerated (factory) Programming Mode
- SecSi™ (Secure Silicon) Sector Protection (PDS only)
- Handshaking feature (BD643 only)
- Helps lower overall system cost and power consumption by eliminating 5.0 Volt and 3.0 Volt power supplies
- Facilitates battery selection by providing operation over an unregulated 1.7 - 1.9 Volt range. Meets commercial and industrial temperature range requirements
- Extends system usage time between battery charges
- Simplifies design by offering world-wide data bus, and standard and Simultaneous Read/Write, Burst, or Page Mode operation
- Helps improve system performance
- Reliable operation over time
- Can decrease programming time (by up to 50 percent)
- Provides system security by permanently locking (one time only) an ID number into a special sector (prevents product cloning)
- Allows the host system to simply monitor RDY signal from the device to optimize read of the initial word of burst data

ORDERING INFORMATION

Product	Density	Max Clock Rate	Packaging Options
<u>Burst Mode Simultaneous Read/Write</u>			
Am29BDS323	32 Mbit	40 MHz	47-ball FBGA 0.5mm pitch (multiplexed pins)
Am29BDS643	64 Mbit	54 MHz	48-ball FBGA 0.5mm pitch (multiplexed pins)
<u>Page Mode Simultaneous Read/Write</u>			
Am29PDS322	32 Mbit	40ns	48-ball FBGA 0.8mm pitch