



Increase Reliability, Conserve Space

BURST MODE FLASH MEMORY

Succeed with Flash Technology Leadership from AMD

AMD's Burst Mode Family of Flash Memory Devices

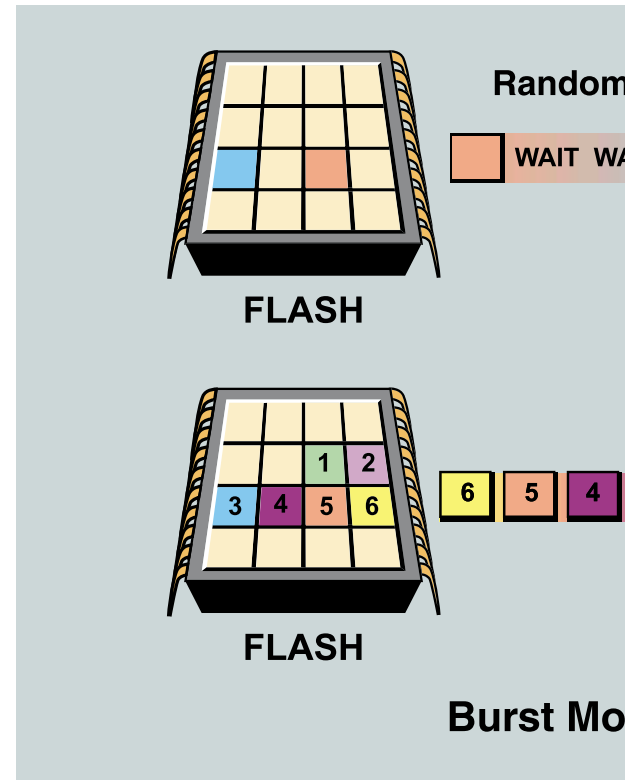
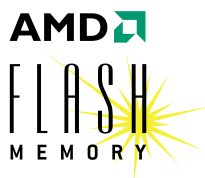
DESCRIPTION

New performance-driven applications increasingly demand Flash memory devices that provide higher speed access, greater density, and lower voltage. AMD, the technology leader in Flash memories, has designed an architectural approach—Burst mode—that enables a new generation of high-performance, single-power-supply Flash memory devices.

AMD's family of Burst mode products offers devices to power many high-performance applications. From automotive controllers to cellular handsets, AMD's family of uniquely engineered Burst mode Flash devices offers the fastest, most reliable devices available.

BURST MODE FLASH

AMD's Burst mode Flash devices significantly improve data access performance during sequential reads and are designed for use with high-speed microcontrollers. AMD offers a range of devices that support 25, 40, 52, and 66 MHz environments. Burst mode operation consists of a two-state process: During initial access, the first word is retrieved. Every subsequent word is accessed at a significantly faster rate. For example, the Am29BDD160 features an initial access time of 54 ns and a sequential access time as fast as 8 ns. A synchronous interface enhances performance by looking up the next unit of data while outputting the current unit of data. This feature offers increased zero-wait-state performance, when compared to standard asynchronous Flash devices. In fact, Burst read capability offers an average access time reduction of more than 65 percent for an eight-word sequential read at 66 MHz.



A synchronous interface increases performance by looking up the next unit of data while outputting the current unit of data, resulting in much higher zero-wait-state performance. The average access speeds offered by Burst mode Flash may be five times faster than those of asynchronous Flash.

AMD's Burst mode devices require the following three extra control pins:

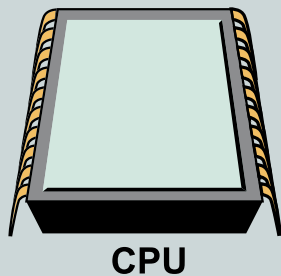
1. Clock (CLK): Provides a signal that synchronizes the clock of the system CPU to the Flash, and also the fundamental timing of the device.
2. Load Burst Address (LBA#): Indicates that the valid address is present on the address inputs.
3. Burst Address Advance (BAA#): Increments the address during the Burst mode operation.

The following pin is provided for the convenience of customers but is not necessarily required:

End of Burst Indicator (IND#): At a logic low level, indicates when the last word in the Burst sequence is at the data outputs.

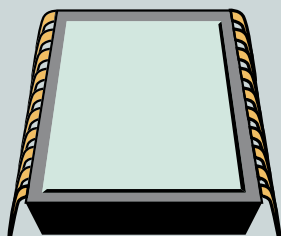
Access

WAIT



CPU

3 2 1



CPU

de Flash

BURST MODE FLASH READ MODES

Depending on the specific device, AMD Burst mode Flash offers a number of read modes to interface with a wide range of microcontrollers and to suit any application: linear Burst, x86 interleaved Burst, continuous sequential Burst, and random asynchronous access. In the linear and x86 interleaved Burst modes, the device quickly delivers a stream of words or doublewords following the initial access; the data is repeated after Burst stream is completed. In continuous sequential Burst mode, the device reads sequentially through the entire address range. Some Burst mode devices offer the ability to configure various Burst parameters – such as Burst mode, Burst length, clocks per sequential read, rising/falling-edge data delivery, and initial access Burst delay – as needed for speedy and glueless interfacing to many of today's high-performance microcontrollers.

INCREASE RELIABILITY, CONSERVE SPACE

AMD's high-performance Burst mode products reduce the need for code shadow DRAM since the code can be executed directly from Flash memory. This not only maximizes the CPU's read cycle utilization but conserves space, reduces power consumption, and increases system reliability as well by eliminating some or all of the DRAM.

In addition, many of today's systems still operate at mixed voltages, requiring voltage translators to shift higher system bus voltage down to lower voltages tolerated by the memory device. AMD Burst mode devices provide 5 Volt I/O and control signal tolerance, eliminating the need for DC-to-DC converters that drive up system cost.

APPLICATIONS

AMD's Burst mode devices are ideal for accelerating the performance of applications that require low power and high-speed access such as:

- Cellular handsets
- Automotive control
- High-performance embedded systems
- Digital set-top boxes
- Telecom/internetworking

AMD continues to deliver the highest reliability and data retention in the industry with a current guarantee of at least 1 million program/erase cycles per sector and 20-year data retention at 125°C (currently available for Am29BDD160/320 and Am29BDS323/643 devices; under qualification for Am29BL802/BL162).

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, high-volume manufacturing capabilities.

[AM29BL802C](#)

[AM29BL162C](#)

[AM29BDS323D](#)

[AM29BDS643D](#)

[AM29BDS640G](#)

[AM29BDD160G](#)



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FEATURES

- Industry's highest performance
- Low power consumption of 50 mA max
- 5.0 Volt tolerant inputs and outputs
- Glueless memory interface to leading CPUs
- Designed with inputs from industry-leading microprocessor manufacturers
- Zero Power Operation
- Temperature ranges from -55°C to +125°C
- Guarantee of at least 1 million program/erase cycles per sector and 20-year data retention at 125°C (currently for Am29BDS323/643 and Am29BDD160/320 devices; under qualification for Am29BL802/BL162)
- Support by AMD's Data Management Software (DMS)

BENEFITS

- Removes performance bottlenecks for applications that demand the highest possible speed
- Extends system usage time between battery charges
- Simplifies operation in 5.0 Volt systems without requiring a separate 5.0 Volt I/O power source
- Reduces development time
- Simplifies the design process and operates seamlessly with a wide range of burst capable microprocessors
- Allows devices to go into "sleep" mode during inactive periods thus consuming virtual zero power
- High endurance to operate in a wide range of environments
- Highest reliable operation and data retention in the industry
- Facilitates the easy storage of code and data in a single Flash memory device

ORDERING INFORMATION

| Product | Density | Speed Ratings (ns) | Package Options |
|---|---------|--|-----------------------------|
| 3.0 Volt-Only Burst Mode Boot sector word-wide (x16) | | | |
| Am29BL802C | 8 Mbit | 65, 70, 90, 120 ns | 56-pin SSOP |
| Am29BL162C | 16 Mbit | 65, 70, 90, 120 ns | 56-pin SSOP |
| 1.8 Volt-only Super Low Voltage, Burst Mode, Simultaneous Operation Boot sector word-wide (x16) | | | |
| Am29BDS323D | 32 Mbit | Burst access times: 20 ns at 30 pF (industrial temp range) Asynchronous random access times: 90 ns at 30 pF Synchronous random access times: 120 ns at 30 pF | 47-ball FBGA |
| Am29BDS643D | 64 Mbit | Burst access times: 13.5/20 ns at 30 pF (industrial temp range) Asynchronous random access times: 90/90 ns at 30 pF Synchronous random access times: 106/120 ns at 30 pF | 48-ball FBGA |
| Am29BDS640G | 64 Mbit | Burst access times: 13.5/20 ns Asynchronous random access times: 70 ns Synchronous random access times: 87.5/95 ns | 60-ball FBGA 56-pin SSOP |
| 2.5 Volt-only Burst Mode and Simultaneous Operation | | | |
| Am29BDD160G | 16 Mbit | 54 ns initial/random access 8 ns burst access | PQFP-80, KGD |