Migrating from Am29DL32xD Family to Am29DL32xG Family

Application Note

July 2003

The following document refers to Spansion memory products that are now offered by both Advanced Micro Devices and Fujitsu. Although the document is marked with the name of the company that originally developed the specification, these products will be offered to customers of both AMD and Fujitsu.

Continuity of Specifications

There is no change to this document as a result of offering the device as a Spansion product. Any changes that have been made are the result of normal documentation improvements and are noted in the document revision summary, where supported. Future routine revisions will occur when appropriate, and changes will be noted in a revision summary.

Continuity of Ordering Part Numbers

AMD and Fujitsu continue to support existing part numbers beginning with "Am" and "MBM". To order these products, please use only the Ordering Part Numbers listed in this document.

For More Information

Please contact your local AMD or Fujitsu sales office for additional information about Spansion memory solutions.

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Application Note

AMD introduced the Secured Silicon (SecSi™) Sector to enable customers to increase system security and lower system costs. The addition of a SecSi Sector provided a secure means to provide an Electronic Serial Number (ESN). Customers can save in system costs by using the SecSi Sector to replace discrete ID chips to provide an ESN.

The implementation of the SecSi Sector in the Am29DL322D, Am29DL323D and Am29DL324D devices using Process Revision D technology is comprised of 64 Kbytes capable of multiple program-and-erase cycles. The implementation using Process Revision G technology introduces three fundamental changes to the previous implementation:

■ The size of the SecSi Sector is now 256 Bytes.

■ The mapping of the SecSi Sector has been changed to match the new size and is now located at the lowest or highest addresses in the device for bottom or top boot devices respectively.

■ The SecSi Sector can not be erased after being programmed, that is, it is One Time Programmable (OTP).

These changes are to provide a less complex implementation of the SecSi Sector. This Application Note discusses these implementation changes and their potential effects to customer system design.

Implementation of SecSi Sector in Process Revision D

The Am29DL322D, Am29DL323D and Am29DL324D devices offer the SecSi Sector for top boot and bottom boot sector architectures. The size of the SecSi Sector is 64 Kbytes. The system accesses the SecSi Sector through a command sequence.

After the system has written the "Enter SecSi Sector" command sequence, it may read the SecSi Sector by using the addresses normally occupied by the boot sectors. This mode of operation continues until the system issues the "Exit SecSi Sector" command sequence, or until power is removed from the device. On power-up, or following a hardware reset, the device reverts to normal read mode.

Thus, for a Bottom Boot device the SecSi Sector overlays (replaces) sectors SA0 to SA7 at byte addresses 000000h–00FFFFh. For a Top Boot device the SecSi Sector overlays sectors SA63 to SA70 at byte addresses 3F0000h–3FFFFFh. In addition, devices that have a factory programmed ESN, a Bottom Boot device will have the 16-byte ESN at byte addresses 00E000h–00E00Fh. A Top Boot device will have the ESN at byte addresses 3FE000h–3FE00Fh (see Figure 1).

The SecSi Sector can be read, programmed or erased just like any other sector, providing additional storage for code or data if needed.
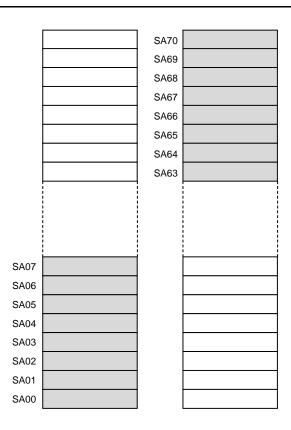

Figure 1. Process Revision D Mapping SecSi Sector to Bottom (Left) and Top (Right) Boot Devices

Implementation of SecSi Sector in Process Revision G

The implementation of the SecSi Sector in Process Revision G technology is designed to streamline its functionality. The size of the SecSi Sector has been reduced to 256 bytes, thus its address mapping has also changed. Furthermore, the SecSi Sector does not accept the Erase command, so that once a value is programmed it can not be changed.

The SecSi Sector overlays only the first 256 bytes of Sector 0 in a bottom boot device at byte addresses 000000h–0000FFh or the first 256 bytes of sector 70 in a top boot device at byte addresses 3FE000h–3FE0FFh. Accessing data outside the 256 byte range will return the data normally found within the boot sectors at the location accessed.
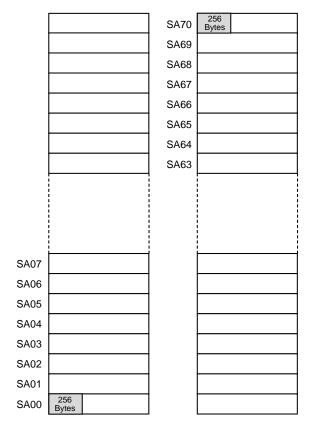
System Design Implications

Restrict the use of the SecSi Sector to store only those values that will not change during the life of the system. There is no ability to erase information in the SecSi Sector after programming. There is only the ability to protect the information from further programming.

The reduction in size to 256 bytes from 64 Kbytes makes it difficult to store a significant amount of code in the SecSi Sector. Therefore, code that formerly used the SecSi Sector may need to be moved to another sector.

Code which references SecSi Sector information will have to take into account the new address mapping of the SecSi Sector.

Conclusion

Review system designs in order to determine the need to adapt to the changes introduced by the process revision G implementation of the SecSi Sector:

- ■ SecSi Sector is now 256 bytes
- ■ Address mapping has changed accordingly
- ■ SecSi Sector is One Time Programmable (OTP)

Figure 2. Process Revision G Mapping SecSi Sector to Bottom (Left) and Top (Right) Boot Devices