AN1556
APPLICATION NOTE

Design-in of the M29F800D 8Mbit Flash Memory

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The M29F800D is an addition to the family of industry standard Flash Memories from STMicroelectronics, suited for use in most applications. The purpose of this document is facilitate a smooth transition when migrating from STMicroelectronics M29F800A to the M29F800D.

MAIN FEATURES OF THE M29F800D

The M29F800D is an upgrade of the STMicroelectronics M29F800A 8 Mbit Flash memory. It is part of a family of standard Flash memory devices that includes the following devices: 32 Mbit, 16 Mbit, 8 Mbit, 4 Mbit, 2 Mbit and 1 Mbit.

The M29F800D is available with access times of 55ns (4.5V-5.5V, SRAM interface) and 70ns (4.5V-5.5V) within the specified temperature range.

The “D” suffix in the M29F800D sales type indicates that this device is manufactured on a 0.18 µm process.

The block organization consists of fifteen 64 KByte, one 32 KByte, two 8 KByte and one 16 KByte blocks available in top boot (M29F800DT) and bottom boot (M29F800DB) configurations.

An additional feature of the M29F800D is the CFI (Common Flash Interface), which was not available on the M29F800A. The CFI data of the M29F800D also includes 64 bits of unique security data, written into each device. This security data can be read through the CFI command, to give individual identity to each device independently of what is normally written in the main memory area.

The M29F800D has an unlock bypass programming feature that was not available on the M29F800A. The unlock bypass programming feature can be used to speed up programming, mainly on third party programmers, by reducing the number of instruction cycles required for programming.

The most popular package, in the terms of design-ins of the M29Wxxx family, is the TSOP48. The M29F800D continues to support the same packages as the M29F800A: namely, the TSOP48 and SO44.

MIGRATING FROM THE M29F800A TO THE M29F800D FROM STMICROELECTRONICS

Migrating from the 0.35 µm M29F800A to the 0.18 µm M29F800D is straightforward. However, certain differences are clarified in this section.

What are the differences to be aware of? The upper byte of the device electronic signature has been changed from 00h to 22h. The lower byte remains unchanged (Table 1). If the same software is to be used, regardless of which device is being used, the upper byte of the electronic signature needs to be ignored.

Table 1. Electronic Signature

	M29F800A	M29F800D
Bottom Device Code	0058h	2258h
Top Device Code	00ECh	22ECh

What about third party programmers? Third party programmers can use the upper byte of the electronic signature to distinguish between the M29F800D and M29F800A. If the M29F800D is detected then the faster unlock bypass programming routine can be implemented.

How about the differences in access times? The M29F800D is manufactured using a 0.18µm technology and is available with the same 70ns access time as was already available for the M29F800A, and addionally offers the 55ns speed class with an SRAM Interface.

Are there any other differences? The Ready/Busy Output ($R\overline{B}$) has the same functionality with respect to program and erase operations. In the M29F800D the Reset/Block Temporary Unprotect ($\overline{RP}$) signal does not affect the Ready/Busy Output ($R\overline{B}$) if it was already High (it will remain High if Reset/Block Temporary Unprotect ($\overline{RP}$) goes Low). In the M29F800A the Ready/Busy Output ($R\overline{B}$) will remain Low as long as Reset/Block Temporary Unprotect ($\overline{RP}$) is Low.

In the M29F800D, once the Auto Select command is issued, the memory remains in Auto Select mode until a Read/Reset command (F0h) is issued. In the M29F800A, once the Auto Select command is issued, the memory remains in Auto Select mode until another command is issued.

Issuing a Read/Reset command, on the M29F800A, while a Block Erase or Erase Suspend operation is in progress, causes the operation to be aborted, and invalid data to be left in the memory. Instead in the M29F800D, the Read/Reset Command can be issued only between Bus Write cycles before the start of a program or erase operation, to return the device to read mode. Hence, once the program or erase operation has started, the Read/Reset command is no longer accepted. The Read/Reset command cannot abort an Erase operation when issued during an Erase Suspend.

PROGRAMMING AND ERASE CONSIDERATIONS FOR THIRD PARTY PROGRAMMERS

As with all the other members of the STMicroelectronics Flash memory family, when a program or erase command is issued, the memory invokes a complex set of internal algorithms that ensure the correct programming and erasing of the memory cells, with sufficient margin for them to be read reliably under all conditions.

Third party programmers should set the voltage supply to 5.0 V (typical) for read, program and erase operations. It is not recommended to set the supply voltages to values other than the typical ones when using gang programmers, or third party programmers with universal sockets designed to handle many different devices.

Since the M29F800D can be distinguished from the M29F800A by the upper byte of the device signature, as shown in Table 1, it is possible to make use of the faster cycles, and the unlock-bypass command of the M29F800D, to reduce time and the total number instruction cycles needed.

CONCLUSION

The M29F800D is an addition to the family of industry standard Flash memories from STMicroelectronics. It is manufactured on a 0.18µm process to ensure a competitive cost versus its fast access times. The M29F800D replaces the previous generation 0.35 µm M29F800A.

For current information on ST Flash Memory products, please consult our pages on the world wide web:

www.st.com/flash

If you have any questions or suggestions concerning the matters raised in this document, please send them to the following electronic mail addresses:

ask.memory@st.com (for general enquiries)

Please remember to include your name, company, location, telephone number and fax number.