

Supported Flash Devices

The flash memories listed in this document have been qualified for use with Rabbit 2000 and/or 3000 microprocessors. Only some of these devices have been fully tested with Dynamic C, but specifications for the others indicate compatibility with Dynamic C's flash driver; the lists' footnotes explain restrictions.

The terms "small sector flash" and "large sector flash" as used in industry are somewhat arbitrary. This document uses the following definitions:

- A *small sector flash* has uniform (equally sized) sectors of 128, 256, 512, 1024, or 4096 bytes.
- A *large sector flash* is a sector-erase, byte-write device with either nonuniform (unequally sized) sectors, or uniform sectors of a size larger than 4096 bytes.

Starting with Dynamic C version 7.20, certain large sector flash devices are supported for program loads; version 7.30 and later may also provide limited support for large sector flash writes at run time. To incorporate a large sector flash into an end product, the best strategy is have a small sector development board.

Because it is not usually possible to erase a flash sector only partially, and due to limited back-fill memory resources, the FS2 file system does not support large sector flash and Dynamic C's flash driver has the following limitations when large sector flash is used:

- Flash sectors are not automatically erased before each flash write.
- The size of the combined ID/User Blocks is determined by the size(s) of the top-most sectors. See the pertinent comments in `LIB\BIOSLIB\FLASHWR.LIB`'s `GetIDBlockSize` function for details.
- The flash must have either uniform sectors or a fully sector-erasable top boot block in order to use a rewritable (mirrored) User Block; thus the total flash consumption is twice the size returned by the `GetIDBlockSize` function.
- Bottom boot block flash types are generally restricted to a "write once read many" User Block.

Due to the general necessity of disabling interrupts to prevent undesired flash memory access while updating flash content, any run time flash write seriously impacts on a Dynamic C application's real time performance. The interrupts disabled duration depends directly on the amount of time it takes to complete the flash write command. In addition to the flash driver's overhead (e.g., memory back-fill, flash busy polling, etc.), refer to the flash memory device's data sheet for either the maximum sector write time or the maximum sector erase time plus byte write time multiplied by the sector size.

IMPORTANT: The rapidly changing market for flash devices may affect availability. The inclusion of a flash device in the following tables does not speak to its availability.

Small Sector Flash

Table 1. Small Sector Flash Memories

| Vendor | Device Name | Device Size (bytes) | Write Mode | Operating Voltage (V) | Dynamic C Support as of Version ^b | Rabbit 2000 | Rabbit 3000 ^c |
|---------------|-------------|---------------------|------------|-----------------------|--|-------------|--------------------------|
| Atmel | AT29C010A | 128K | sector | 4.5–5.5 | All | x | |
| Atmel | AT29C020 | 256K | sector | 4.5–5.5 | 6.50 ^d | x | |
| Atmel | AT29C040A | 512K | sector | 4.5–5.5 | 6.50 ^{a,d} | x | |
| Atmel | AT29LV010A | 128K | sector | 3.0–3.6 | All | x | x |
| Atmel | AT29LV020 | 256K | sector | 3.0–3.6 | 6.50 | x | x |
| Atmel | AT29LV040A | 512K | sector | 3.0–3.6 | 6.50 ^a | x | x |
| Atmel | AT29BV010A | 128K | sector | 2.7–3.6 | All ^a | x | x |
| Atmel | AT29BV040A | 512K | sector | 2.7–3.6 | 6.50 ^a | x | x |
| Atmel | AT29BV020 | 256K | sector | 2.7–3.6 | 6.50 ^a | x | x |
| Mosel/Vitelic | V29C51001B | 128K | byte | 4.5–5.5 | 6.50 | x | |
| Mosel/Vitelic | V29C51001T | 128K | byte | 4.5–5.5 | 6.50 | x | |
| Mosel/Vitelic | V29LC51001 | 128K | byte | 4.5–5.5 | 7.02 ^a | x | |
| Mosel/Vitelic | V29C51002B | 256K | byte | 4.5–5.5 | 6.50 ^d | x | |
| Mosel/Vitelic | V29C51002T | 256K | byte | 4.5–5.5 | 6.50 ^d | x | |
| Mosel/Vitelic | V29LC51002 | 256K | byte | 4.5–5.5 | 7.02 ^a | x | |
| Mosel/Vitelic | V29C51004B | 512K | byte | 4.5–5.5 | 6.50 ^a | x | |
| Mosel/Vitelic | V29C51004T | 512K | byte | 4.5–5.5 | 6.50 ^a | x | |
| Mosel/Vitelic | V29C31004B | 512K | byte | 3.0–3.6 | 7.02 ^a | x | x |
| Mosel/Vitelic | V29C31004T | 512K | byte | 3.0–3.6 | 7.02 ^a | x | x |
| SST | SST29EE512 | 64K | sector | 4.5–5.5 | 6.50 | x | |
| SST | SST29SF512 | 64K | byte | 4.5–5.5 | 7.20 ^{a,e,g} | x | |
| SST | SST39SF512 | 64K | byte | 4.5–5.5 | 7.20 ^a | x | |
| SST | SST29EE010 | 128K | sector | 4.5–5.5 | All ^d | x | |
| SST | SST29SF010 | 128K | byte | 4.5–5.5 | 7.20 ^{a,e,g} | x | |
| SST | SST39SF010 | 128K | byte | 4.5–5.5 | 7.02 ^a | x | |
| SST | SST29EE020 | 256K | sector | 4.5–5.5 | 7.02 ^a | x | |
| SST | SST29SF020 | 256K | byte | 4.5–5.5 | 7.20 ^{a,e,g} | x | |
| SST | SST39SF020A | 256K | byte | 4.5–5.5 | 6.50 ^d | x | |

Table 1. Small Sector Flash Memories

| Vendor | Device Name | Device Size (bytes) | Write Mode | Operating Voltage (V) | Dynamic C Support as of Version ^b | Rabbit 2000 | Rabbit 3000 ^c |
|---------|-------------|---------------------|------------|-----------------------|--|-------------|--------------------------|
| SST | SST29SF040 | 512K | byte | 4.5–5.5 | 7.20 ^{a,e,g} | x | |
| SST | SST39SF040 | 512K | byte | 4.5–5.5 | 7.02 ^{a,d} | x | |
| SST | SST29LE512 | 64K | sector | 3.0–3.6 | 6.50 | x | x |
| SST | SST39LF512 | 64K | byte | 3.0–3.6 | 7.20 ^a | x | x |
| SST | SST29LE010 | 128K | sector | 3.0–3.6 | All | x | x |
| SST | SST39LF010 | 128K | byte | 3.0–3.6 | 7.21 ^a | x | x |
| SST | SST29LE020 | 256K | sector | 3.0–3.6 | 7.02 ^a | x | x |
| SST | SST39LF020 | 256K | byte | 3.0–3.6 | 7.21 ^{a,d} | x | x |
| SST | SST39LF040 | 512K | byte | 3.0–3.6 | 7.21 ^{a,d} | x | x |
| SST | SST29VE512 | 64K | sector | 2.7–3.6 | 6.50 ^a | x | x |
| SST | SST29VF512 | 64K | byte | 2.7–3.6 | 7.20 ^{a,e,g} | x | x |
| SST | SST39VF512 | 64K | byte | 2.7–3.6 | 7.20 ^a | x | x |
| SST | SST29VE010 | 128K | sector | 2.7–3.6 | All ^a | x | x |
| SST | SST29VF010 | 128K | byte | 2.7–3.6 | 7.20 ^{a,e,g} | x | x |
| SST | SST39VF010 | 128K | byte | 2.7–3.6 | 7.21 ^a | x | x |
| SST | SST29VE020 | 256K | sector | 2.7–3.6 | 7.02 ^a | x | x |
| SST | SST29VF020 | 256K | byte | 2.7–3.6 | 7.20 ^{a,e,g} | x | x |
| SST | SST39VF020 | 256K | byte | 2.7–3.6 | 7.21 ^a | x | x |
| SST | SST29VF040 | 512K | byte | 2.7–3.6 | 7.20 ^{a,e,g} | x | x |
| SST | SST39VF040 | 512K | byte | 2.7–3.6 | 7.21 ^a | x | x |
| Winbond | W29EE011 | 128K | sector | 4.5–5.5 | 7.02 ^a | x | |
| Winbond | W29C020C | 256K | sector | 4.5–5.5 | All ^d | x | |
| Winbond | W29C040 | 512K | sector | 4.5–5.5 | 7.02 ^{a,d} | x | |

Large Sector Flash

Table 2. Large Sector Flash Memories

| Vendor | Device Name | Device Size (bytes) | Write Mode | Operating Voltage (V) | Dynamic C Support as of Version ^{b,e,f} | Rabbit 2000 | Rabbit 3000 ^c |
|-----------------|-------------|---------------------|------------|-----------------------|--|-------------|--------------------------|
| AMD | AM29F002BB | 256K | byte | 4.5–5.5 | 7.25 ^a | x | |
| AMD | AM29F002BT | 256K | byte | 4.5–5.5 | 7.25 ^a | x | |
| AMD | AM29F004BB | 512K | byte | 4.5–5.5 | 7.25 ^a | x | |
| AMD | AM29F004BT | 512K | byte | 4.5–5.5 | 7.25 ^a | x | |
| AMD | AM29F040B | 512K | byte | 4.5–5.5 | 7.30 ^a | x | |
| AMD | AM29LV001BB | 128K | byte | 2.7–3.6 | 7.20 ^a | x | x |
| AMD | AM29LV001BT | 128K | byte | 2.7–3.6 | 7.20 ^a | x | x |
| AMD | AM29LV002BB | 256K | byte | 2.7–3.6 | 7.25 ^a | x | x |
| AMD | AM29LV002BT | 256K | byte | 2.7–3.6 | 7.25 ^a | x | x |
| AMD | AM29LV004BB | 512K | byte | 2.7–3.6 | 7.25 ^a | x | x |
| AMD | AM29LV004BT | 512K | byte | 2.7–3.6 | 7.25 ^a | x | x |
| Fujitsu | MBM29F002BC | 256K | byte | 4.5–5.5 | 7.30 ^a | x | |
| Fujitsu | MBM29F002TC | 256K | byte | 4.5–5.5 | 7.30 ^a | x | |
| Hynix / Hyundai | HY29F002T | 256K | byte | 4.5–5.5 | 7.20 ^a | x | |
| Hyundai | HY29F002B | 256K | byte | 4.5–5.5 | 7.20 ^a | x | |
| Macronix | MX29F002B | 256K | byte | 4.5–5.5 | 7.30 ^a | x | |
| Macronix | MX29F002T | 256K | byte | 4.5–5.5 | 7.30 ^a | x | |
| ST | M29F040B | 512K | byte | 4.5–5.5 | 7.30 ^a | x | |
| ST | M29W010B | 128K | byte | 2.7–3.6 | 7.30 ^a | x | x |
| ST | M29W040B | 512K | byte | 2.7–3.6 | 7.30 ^a | x | x |
| Winbond | W39L020 | 256K | byte | 3.0–3.6 | 8.00 ^{a,h} | x | x |

- a.** These flash devices are recognized as of the Dynamic C version listed, but have not all been tested with those versions. 512KB flash in particular may not work with versions prior to 7.04, but a software patch is available from Rabbit tech support for 512KB flash support under versions 6.57 and 7.03.
- b.** **Dynamic C Versions 6.04-6.1x:**
The `FLASH_SIZE` parameter in the `JRABBIOS.C` file needs to be changed to reflect the correct number of 4K pages for the selected device. By default, the `FLASH_SIZE` parameter contains a `0x20` that corresponds to a 128K x 8 device with thirty-two 4K pages of flash. Dynamic C versions 6.5x and greater determine the flash size automatically and no code change is required.
- c.** Please note that the Rabbit 3000 requires Dynamic C version 7.25 or later.
- d.** Tested with Dynamic C version 7.32P to verify basic program load functionality.
- e.** For flash program loading (and where practical, flash writes at run time) to these flash devices, Dynamic C versions 7.3x through 8.1x require `TN226.zip`. See the `read_me.txt` file in `TN226.zip` for installation and usage instructions.
- f.** Dynamic C versions prior to 7.30 do not support large sector flash writes at run time.
- g.** These flash devices use `0x20` as their sector erase command byte. For Dynamic C versions 7.3x through 8.1x, see the `read_me.txt` file in `TN226.zip` for instructions regarding use of that ZIP's `BIOS\pilot_0x20.bin` file.
- h.** These flash devices use `0x30` as their sector erase command byte, but also accept `0x50` as a page erase command byte. Because the pages have a uniform 4KB size, using the `0x50` page erase command allows these flash devices to be treated as a small sector flash type. For Dynamic C versions 7.3x through 8.1x, see the `read_me.txt` file in `TN226.zip` for instructions regarding use of that ZIP's `BIOS\pilot_0x50.bin` file.