SUPERTALENT ULTRADRIVE GX/GX2 FIRMWARE RELEASE NOTES

2.5" SATA-II SOLID STATE DRIVE

1.0 FIRMWARE VERSION 2030 (AFTER 1916)

Release Date: 6/24/10

Serial Numbers: xxxxxxx-xJBx/xJCx/xJDx/xJDx-xxxxxxx

Change Log:

- Feature Add: User data scrambling capability was added. Original 1916 release did not have it. Later, it was applied as hot fix to 1916 firmware.

- Feature Add: Vendor command (0xFE) was added to support LBA to NAND bank mapping capability.

- Bug Fix: End user updater failure problem was fixed.

- Bug Fix: More read fail scenarios were added to firmware bad block management.

- Bug Fix: ATA Security bug fixes. Following improvements were made.

  - Ignoring user password at SEC1

  - IDENTIFY will reflect current ATA security status more correctly.

  - Changed master password revision code to FFFE

- Bug Fix: SMART self test progress status nibble value was wrong when completed. It should remain at 0, not going back to 9.

- Bug Fix: In some rare situation, SSD power cycling may not be accompanied with IDENTIFY. In such case, SMART power cycle count was not increased.

- Bug Fix: The status for SMART Enable/Disable and SMART attribute autosave were changed by power cycling. It should retain the last change status permanently.

- Other: For SATA Gen 1 setting, Gen 2 support bit is better to be cleared.

- Other: For sleep/standby command, idle time garbage collection is better to be not started.

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Page 2

- Other: When DIPM is disabled by FW build option, IDENTIFY word 78 bit 3 is better to be cleared.

- Other: Changed word 60 bit 14 to 0, meaning trim is not deterministic for smaller size than 16KB trim request.

- Other: Update Maximum PE cycles value as following. Samsung 5x nm NAND : 10k -> 5k, Samsung 4x nm NAND : 10k -> 3k, Intel/Micron 3x nm NAND : 10k -> 5k, Hynix 41nm : 10k -> 5k, Hynix 32nm : 5k -> 3k

2.0 FIRMWARE VERSION 1916 (AFTER 1819)

Release Date: 1/4/10

Serial Numbers: xxxxxxx-xIBx/xICx/xIDx-xxxxxxx

Change Log:

- Feature Add: Garbage Collection enabled
- Feature Add : Firmware download through SCSI interface

- Bug Fix: Early performance drop issue in quite clean state. This problem is fixed with changing weak dynamic wear leveling parameter
- Bug Fix: Occasional firmware download failure bug fixed (Due to FPDMA problem of SCSI/AHCI)
- Bug Fix: IRQ stack overflow bug fixed. Runtime bad block structure was too big. It caused 256GB block 0 to be corrupted.
- Bug Fix: With 1819 firmware, Wiper performance was slower than 1571 firmware revision.
- Bug Fix: Power cycle count was always 0 in 1819 firmware.
- Bug fix: Specific SATA Gen I host (ex. SB400) caused SATA hardware buffer ID error.
- Bug Fix: L63B (256 pages/block) wear leveling bug fixed.

- Bug Fix: Bug fix found during simulation. Free block count may become 0 after a lot of power cycling. It was not witnessed in the real life.

- Bug Fix: SMART information – Remaining life was not 100% even right after firmware download.

- Bug Fix: Flush should not check IDNF.

- Other: Toshiba NAND has additional blocks over 4095th block. These blocks can be used.

- Other: For Intel/Micron 34nm NAND, NAND BIST is performed always. NAND BIST is flash cell test. It uses AA5555AA pattern and uses 2 plane mode.

- Other: To support Intel/Micron 34nm NAND, copy back delay was adjusted.

- Other: Erase count distribution is made better.

3.0 FIRMWARE VERSION 1819 (AFTER 1571)

Release Date: 10/19/09

Serial Numbers: xxxxxxx-xFBX–xxxxxxx

Change Log:

1. Updater runs out of DOS instead of Windows

    1.1 Added ATA8 ACS2 TRIM Support

    1.2 SATA Rx SSC is turn off by default, Now Rx and Tx SSC both off

    1.3 IDENTIFY word 69 bit 14 is cleared (Non deterministic trim)

    1.4 IDENTIFY word 60-61 are changed (User addressable logical sectors for LBA28)

    1.5 FPDMA error return code was not adequate

    1.6 SMART related changes were made (BBM error log was removed)

    1.7 SATA error handling code was enhanced

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Page 4

1.8 Added paired page calculation for Micron 34nm MLC NAND

2. Bug Fix: Fixed a bug in error handling in Set Multiple mode command

3. Bug Fix: Fixed a bug that caused 1.5Gbps diagnostic failure

4. Bug Fix: SMART related bugs were fixed

5. Bug Fix: Toshiba 43nm NAND has address hole and previous firmware couldn't handle it.

6. Bug Fix: SMART related bugs were fixed. (MLC Max PE count was displayed as 100K)

7. Bug Fix: Current ATA security state was not reflected in IDENTIFY information.

8. Bug Fix: Performance boost routine reused the recently used block and it did harm to wear leveling.

9. Bug Fix: During SATA protocol, abrupt OOB made Barefoot hang.

10. Bug Fix: End user update failed between 1571 and 1711.

11. Bug Fix: In bad block management, wrong number of free blocks is used and it led to timeout and hang.

12. Bug Fix: After STANDBY_IMMEDIATE, most host controllers wait for OOB reply only for 100ms. Sometimes Barefoot firmware couldn't answer to COMRESET because FTL initialization took longer time. This bug caused Windows Sleep/Hibernate test failure.

13. Bug Fix: Various read fail scenario were found with FTL simulation.

14. Barefoot ECO chip support code was added.

15. More NAND ICs supported

4.0 FIRMWARE VERSION 1571

Release Date: 5/28/09

Serial Numbers: xxxxxxx-xDIX-xxxxxxx

Change Log:

1. Updater runs out of DOS instead of Windows

    1.1 Enables fixing of failed firmware installation characterized by "Yatapdong Barefoot ROM ATA"

    1.2 Enables firmware updates on Apple Mac

    1.3 Updater no longer requires AHCI mode

    1.4 Updater compatibility instability with nVidia chipsets fixed

2. Bug Fix: ATA Security command now working in AHCI mode

3. Bug Fix: When receiving invalid SMART subcommands, abort is now sent to host to minimize long delays

4. Bug Fix: Corrected values of some SMART attribute data initialization

5. Bug Fix: ATA Security Command now returning correct values

6. Enables life expectancy calculation

7. Other internal bug corrections

5.0 FIRMWARE VERSION 1370

Release Date: 5/14/09

Serial Numbers: xxxxxxx-xCIX-xxxxxxx

Change Log:

1. Adds support for TRIM command

2. Firmware Update now preserves serial number

3. Bug Fix: Apple Mac Pro sleep/wake test now passes

4. Other internal bug corrections