

**SM2246EN Flash F/W & ISP Release Information – O0617A**
**Introduction**

This purpose of this document is to provide release information on the SM2246EN F/W and ISP release information

**Fix Coverage**

- stands for the “new fix” or “new support” in the category
- stands for the “no-update” in the category

■ <b>Tester FW</b>	■ <b>Controller ISP</b>
<ul style="list-style-type: none"> <li>□ <b>Yield Issue</b></li> <li>■ <b>Flash Issue</b> <ul style="list-style-type: none"> <li>□ SLC Flash <ul style="list-style-type: none"> <li>□ Samsung Flash</li> <li>□ Toshiba/Sandisk Flash</li> <li>□ Intel/Micron Flash</li> <li>□ Hynix Flash</li> <li>□ Others</li> </ul> </li> <li>■ MLC Flash <ul style="list-style-type: none"> <li>■ Samsung Flash</li> <li>■ Toshiba/Sandisk Flash</li> <li>■ Intel/Micron Flash</li> <li>■ Hynix Flash</li> </ul> </li> </ul> </li> <li>□ <b>Compatibility issue</b></li> <li>□ <b>Tester Bug Fix</b></li> <li>■ <b>AP Bug Fix &amp; New Function</b></li> <li>■ <b>Feature Enhance</b></li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Yield Issue</b></li> <li>■ <b>Flash Issue</b> <ul style="list-style-type: none"> <li>□ SLC Flash <ul style="list-style-type: none"> <li>□ Samsung Flash</li> <li>□ Toshiba/Sandisk Flash</li> <li>□ Intel/Micron Flash</li> <li>□ Hynix Flash</li> <li>□ Others</li> </ul> </li> <li>■ MLC Flash <ul style="list-style-type: none"> <li>■ Samsung Flash</li> <li>■ Toshiba/Sandisk Flash</li> <li>■ Intel/Micron Flash</li> <li>■ Hynix Flash</li> </ul> </li> </ul> </li> <li>□ <b>Compatibility issue</b></li> <li>■ <b>ISP Bug Fix</b></li> <li>□ <b>Feature Enhance</b></li> </ul>

**ISP Revision History**

Version	MP Tool version	ISP version	Note
O0617A	O0618A	O0617A	<ol style="list-style-type: none"> <li>1. <b>This FW can support security and non-security FW that are corresponding to SM2246EN_AB and SM2246EN_AA.</b></li> <li>2. <b>MP will detect the controller automatically. If the controller is SM2246AA, MP will block security related functions. If the controller is SM2246AB, MP will show the options of security related functions.</b></li> <li>3. <b>Fix the issue related to read command access interface of TCG.</b></li> <li>4. <b>Make sure that the related hardware settings constrained to change AES keys are fully performed.</b></li> <li>5. <b>Fix the bug that when issuing. SMART_EXECUTE_OFFLINE_IMMEDIATE command which may cause the FW not be able to enter low-power mode.</b></li> <li>6. <b>Make sure that partial / slumber mode can be low-power.</b></li> <li>7. <b>Capacity of SSD would not be influenced when supporting TCG function.</b></li> </ol>
N1126K	O0522A	N1126K	<ol style="list-style-type: none"> <li>1. Modified SMART attribute reset: ID 0xA4~0xA7, 0xAF, 0xC7 and 0xF5</li> <li>2. Returned status would include <ul style="list-style-type: none"> <li>● Pure spare count if the threshold is not exceeded</li> <li>● Erase count if the threshold is exceeded</li> </ul> </li> <li>3. Fixed trim bug: when LBA of trim command is higher than total LBA, this command should be returned</li> <li>4. Turn LED off when trim command is processed</li> <li>5. Solved device sleep DRAM backup issue: flash retry FIFO should not be overlapped by DRAM data</li> <li>6. Solved spare block run out issue: successive Map block can be used</li> </ol>
N1126F	O0327A	N1126F	<ol style="list-style-type: none"> <li>1. Fix overflow issue of read – retry table that Hynix NAND flash use.</li> <li>2. Fix U-link NCQ-03 script issue</li> <li>3. Support Sandisk 1znm flash.</li> <li>4. Support Hynix 16nm F-die flash.</li> <li>5. Add CID options for enabling DRAM SRT feature.</li> </ol>
N1114H	N1114A	N1114H	<ol style="list-style-type: none"> <li>1. Fix DEVSLP issue</li> <li>2. Fix time-out issue of downloading microcode.</li> </ol>
N1114B	N1114A	N1114B	<ol style="list-style-type: none"> <li>1. Support 4Die/1CE Flash</li> <li>2. Support new VU command for Serial Number change</li> <li>3. Support disk self-destroy function (erase all disk data via GPIO)</li> <li>4. Extend # of bad block combination to 2048 to improve 1TB initialization</li> <li>5. Modify Pretest Bad Block Threshold as configurable from 0 to 255</li> <li>6. Bug fix of Trim command and potential command timeout/abort.</li> <li>7. Support Samsung K9QDGD8U5M</li> </ol>
N1007C	N0918A	N1007C	<ol style="list-style-type: none"> <li>1. Support TSB 15nm MLC.</li> <li>2. Support of Sanitize (erase all block feature).</li> </ol>

			<ol style="list-style-type: none"> <li>3. Improve command response time with background map rebuild.</li> <li>4. Improve Macbook installation compatibility.</li> <li>5. Improve Pretest flow in the cases of reference original and runtime bad.</li> <li>6. Enhance error/event log structure and content.</li> <li>7. Enable CDI interrupt iff DEVSLP had been configured and enabled by CID and host.</li> <li>8. Resolve bugs/issues of NCQ read flow, Flash setting at DEVSLP resume, Trim command handling, program fail handling in swapping active block.</li> </ol>
N0815B	N0815A	N0815B	<ol style="list-style-type: none"> <li>1. Fix of program fail handling on pure SLC Flash.</li> <li>2. Improvement to resolve read disturbance on Hynix 16nm MLC Flash.</li> <li>3. Improvement to speed up boot time by storing WPRO page index information.</li> <li>4. Bug fix of program fail.</li> <li>5. Fix of SPOR timeout issue on 512GB/1TB disk.</li> <li>6. Bug fix of LTS and RDT.</li> <li>7. Bug fix of pretest failure on Samsung 21nm Flash.</li> <li>8. Improvement of random read performance in internal interleave mode.</li> <li>9. Support of full disk SLC mode on Micron Flash.</li> </ol>
N0711A	N0704B	N0711A	<ol style="list-style-type: none"> <li>1. Fix cache program bug since N0704A.</li> <li>2. Fix program fail handle bug for internal interleave mode since N0704A</li> <li>3. Fix an IPM issue since FW N0516D which automatically change Partial to Slumber in HIPM if DIPM was enabled.</li> <li>4. Extend bad block combination number from 512 to 1024.</li> <li>5. Decide Hynix read-retry count by using OPT command instead of predefine value from MP package.</li> <li>6. Support Internal Interleave.</li> <li>7. Support program fail handling</li> <li>8. Modify trim flow for the performance with Marvell RAID chip</li> <li>9. Support Hynix 16nm 64Gb MLC: H27QCG8T2E5R, H27QEG8VEE5R</li> <li>10. Support Hynix 16nm 128Gb MLC: H27QEG8UDB8R, H27QFG8VEB8R-BCF, H27Q1T8YEB9R (CS sample and after )</li> </ol>
N0530C	N0529A	N0530C	<ol style="list-style-type: none"> <li>1. ISP Bug fix: Erase count miss-match after doing security erase</li> <li>2. Pretest Bug fix: Load L85A reclaim flash original bad bug found in N0530A</li> <li>3. Fix an IPM issue since FWN0516D, which cannot enter IPM mode normally.</li> </ol>

N0530A	N0529A	N0530A	<ol style="list-style-type: none"> <li>1. Support auto partial to slumber in HIPM</li> <li>2. Fill up the active block's valid pages word line when receiving Standby Immediately and swapping active block after power on</li> <li>3. Save SMART attribute every 20 minutes</li> <li>4. Save SMART info when receiving Standby Immediately</li> <li>5. Fine tune a read cache judgment</li> </ol>
N0402C	N0415A	N0402C	<ol style="list-style-type: none"> <li>1. Support 4CH8WAY interleave for 512page/block flash (L85A/L95B)</li> <li>2. Support 1TB capacity</li> <li>3. Fix DEVSLP bugs</li> <li>4. Support the entrance of device sleep without slumber mode first. (CID 0x4D.bit7)</li> <li>5. Fix the bug of occasional ISP hangs-up if power off while security erase</li> <li>6. Fix the bug of building the wrong mapping table after resuming from device sleep</li> <li>7. RDT update: Show the wrong fail message at MP result window</li> <li>8. Update L95B ECC to 60b in database</li> </ol>
N0307A	N0307A	N0307A	<ol style="list-style-type: none"> <li>1. Speed up boot up time by saving spare bitmap table, and shortening mapping table reset time.</li> <li>2. Re-issue flash multi-plane ALE after disabling read-retry.</li> <li>3. Issue one plane ALE instead of multi-plane in read-retry.</li> <li>4. Extend the ALE, CLE and write pulse width when setting read-retry sequence in EDO mode.</li> <li>5. Enable hardware write protect.(GPIO p1.bit1)</li> <li>6. Enable quick erase.(GPIO P1.bit5)</li> <li>7. Fix the SMART value (attribute ID 0x05) miss-match issue</li> <li>8. Fix a markbad bug. (N0227A issue from VCT)</li> <li>9. Fix SMART info miss match issue.</li> <li>10. Fix read and write log DMA extend command bug.</li> <li>11. Fix RDT firmware cannot recognize MP vendor command issue.</li> <li>12. Support 16k 4plane flash.</li> </ol>
N0103B	N0114A	N0103B	<ol style="list-style-type: none"> <li>1. Fix the bug of issuing Samsung 19nm read try command by EDO mode</li> <li>2. Support DMA read log extend and DMA write log extend.</li> <li>3. Support DMA read buffer and DMA write buffer.</li> <li>4. Mark bad block by single block instead of super block and use rest good block to re-combine super block.</li> <li>5. Support DMA download microcode</li> <li>6. Add full dram size test in pretest</li> </ol>
M1213C	M1226A	M1213C	<ol style="list-style-type: none"> <li>1. Support Micron/Intel L85A, L84C,</li> <li>2. Support Micron/Intel L95B</li> </ol>

			<ol style="list-style-type: none"> <li>3. Support Samsung 19nm MLC</li> <li>4. Fix seek &amp; read verify sector command bug</li> <li>5. Support PIO Multiple mode to 2</li> <li>6. Fix SCT write same bug</li> <li>7. Enhance SPOR protection</li> <li>8. Write performance enhancement</li> <li>9. Fix a FW bug of WHCK Trim test</li> <li>10. Reduce DEVSLP power consumption</li> <li>11. Fix a read try bug for Micron/Intel NAND</li> <li>12. Support Download Micro Code</li> </ol>
M1024C	M1024A	M1024C	<ol style="list-style-type: none"> <li>1. Fix ATACT seek &amp; read verify sector command bug.</li> <li>2. Fix the error of scaling down the number of interleave</li> <li>3. Add QC tool functions</li> </ol>
M1011A	M1009B	M1011A	<ol style="list-style-type: none"> <li>1. Enhance ATA command support for Ulink test</li> <li>2. Disable all flash CE if channel is idle.</li> <li>3. Fix a power-cycling bug</li> <li>4. Fix SN number issue when KeepSN is not 20 byte length.</li> </ol>
M1003B	M1003A	M1003B	<ol style="list-style-type: none"> <li>1. Fix IM20nm read retry bug and add more options for read retry. Issue flash reset command before retry sequence.</li> <li>2. Fix build-link bug in 4ch8way</li> <li>3. Fix SPOR function bugs</li> <li>4. Disable dram compensation</li> <li>5. Lower schmitt trigger windows)</li> <li>6. Fix seek, read verify sector, and RW multiple command bug</li> <li>7. Fix a wear leveling bug</li> <li>8. Support Few Samsung &amp; Hynix dram.</li> <li>9. Support LTS and fix bugs of RDT function. Add the loop option in RDT</li> <li>10. Add Micron20nm SLC read-retry table.</li> <li>11. Add Dram 380Mhz option.</li> <li>12. Enable write cache as a default.</li> <li>13. Modify dram VDT from 1.4 to 1.3v.</li> </ol>
M0808A	M0808B	M0808A	<ol style="list-style-type: none"> <li>1. Fix Toshiba &amp; Sandisk flash read-retry error.</li> <li>2. Enhance SATA error handling</li> <li>3. Switch to dummy write if the number of spare block decreases to zero, and do not mark bad block</li> <li>4. Modify SMART command for WAF</li> <li>5. Extend the number of write log page to 32</li> <li>6. Fix strong page size bug on M0719</li> <li>7. Fix pretest bug for manual toggle flash.</li> <li>8. Add RDT function.</li> </ol>

			9. Don't reset DRAM when resume
M0719A	M0716B	M0719A	<ol style="list-style-type: none"> <li>1. Support Samsung 21nm K9GCG MLC</li> <li>2. Support Toshiba 19nm 16KB 2Plane MLC</li> <li>3. Support Hynix H27QCGDT2BLR, H27QEGDVEBLR</li> <li>4. Support Micron L84A Onfi MLC</li> <li>5. Support Micron L85A Onfi MLC</li> </ol>

**Note:**

1. F/W and ISP update is recommended.
2. History # is denoted by "Version-Date" .

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