SM2258XT IM3D(B0KB) NAND Flash F/W & ISP Release Information – Q1124A0

Introduction

This purpose of this document is to provide release information on the SM22X family 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

■ **MP Tool**	■ **Controller ISP**
☐ **Yield Issue**	■ **Yield Issue**
☐ **Flash Issue**	☐ **Flash Issue**
☐ TLC Flash	☐ TLC Flash
☐ Samsung Flash	☐ Samsung Flash
☐ Toshiba/Sandisk Flash	☐ Toshiba/Sandisk Flash
☐ Intel/Micron Flash	☐ Intel/Micron Flash
☐ Hynix Flash	☐ Hynix Flash
☐ Others	☐ Others
☐ 3D NAND Flash	■ 3D NAND Flash
☐ Samsung Flash	☐ Samsung Flash
☐ Toshiba/Sandisk Flash	☐ Toshiba/Sandisk Flash
☐ Intel/Micron Flash	■ Intel/Micron Flash
☐ Hynix Flash	☐ Hynix Flash
☐ Others	☐ Others
☐ **MP Tool Bug Fix**	■ **ISP Bug Fix**
☐ **MP Tool New Function**	■ **Feature Enhance**
☐**Feature Enhance**	

ISP Revision History

Package	ISP version	MP Tool Version	RDT version	Note
Q1206A (validate with BOKB)	Q1124A0	Q1121A	Q1123A0	ISP 1. Support 2CH8Way RDT: 1. Set limitation for max active die number to prevent VDT40 interrupt.
FWQ1128A (validate with L06B)	Q1117B0	Q1121A	Q1116A0	ISP: 1. Assign read count threshold by using cbCidTable[0x56]*10000. 2. AES: enable read count. 3. Fix not loading read count table when gsd/ugsd issue. 4. Add extra Read Count for Active Block. 5. Shrink Reclaim ECC correct bit from 30 to 5 when Active Block read over 1 Million times. 6. Fixed MP FFU reset cpu issue. 7. Modified reclaim for active block. 8. Fixed Save Read count table issue. 9. Program read count table before Program QBoot 10. Add SMART ID C5 return 0 by MP Tool. 11. Fixed Secure Erase Issue. 12. Modify the copy cid table sequence for FFU issue 13. Add timer for read reclaim. 14. Disable program suspend by parameter 0xD0 bit0 15. Add the enable authentication function by CID table. 16. For customized request to modified R/W unit of SMART ID. RDT: 1. Modify unbalanced card mode parameter. (Must match with Q1116A SWPtest.dll) MPTool: 1. More display which CH-CE occur Flash Time out at [RDT Result] page. 2. Add "Disable Program Suspend" option. 3. Support "Reset SMART Tool". Just reset smart data and can't reset cpu. 4. Add to set "Read Count Threshold" default value. 5. Enable Shallow Erase fixed check for B16A and B05A. 6. Check Channel0-CE0 flash exist or not? If not, stop thread. 7. More display shallow erase fixed status at SSD Information dialog. 8. Enable "RDT Read Retry" option for IM3D flash series at RDT Q1116A0 or later version. 9. Check that new RDT Q1116A0 need to use SWPtest.dll Q1116A or later version.
Q0919A	Q0831C0	Q0914B	Q0908A0	ISP: 1. Fix bug for Unbalance mode. 2. Fix bug for AS SSD Write access time test hang. 3. Add GC Idle condition 4. Fix 1K RetryFail bug 5. Fix WL can't find TLC block issue.

				6. Support unbalance mode 2+1+1 7. Fix read scrub bug. 8. Sync code from other project 9. Support B0KB28 unbalance mode 2+1. 10. Restore "g16MaxDualMoPeThr" to original setting. 11. Modify read reclaim flow. 12. Modify the variable of SMART read error rate RDT 1. Modify RDT test flow to cover Jira-183 issue. 2. Add RDT setting option "Bypass read check for first 2 loop" 3. Add bypass Erase/Program fail status option. 4. Fixed CH remapping bug. 5. Add bypass fail bit for last test block 6. Add force single plane program option. 7. Fixed Reverse block order test mode bug. 8. Modify TranADJ fail issue when use "Reference RDT Bad" option to initial card at DDR200. MPTool: 1. Add Flash Clock "DDR-300" option. 2. Add Check RDT setting dialog. 3. Add "New bad block" display at SSD information dialog. 4. Mask Date is wrong if mask start pos = 1. 5. Add "Max Data Size for GC" option. 6. Support that Micron B16A Distinguish ES function. 7. IDEMA add to support 15GB/220GB/460GB. 8. Add "Bypass TranADJ" function. 9. Display RDT Bad block counts by plane. 10. Add "Check FlashID counts" function. 11. Display GenChCeMap fail information.
Q0620A	Q0616B0	Q0619A	Q0607A0	ISP: 1. Add unbalance mode's code check by using mChkCardMode(cUnbalanceMo) 2. Avoid enter back ground GC flow at PwOnExtraGc state. 3. Fix unbalance mode bugs 4. Prevent disconnect issue in 110V SPOR: avoid enter back ground GC before return identify. 5. Fix bug: L06B hang in GC state 3. RDT: 1. Fixed unbalanced card mode bug MPTool: 1. Add "Max Test Block Cnt" option at RDT setting dialog. 2. More parsing bad block counts by plane information. 3. Add "FFU Keep Device CID" checkbox to set CID[0x41].b0 4. Modify CID default setting rule.

Q0613A	Q0606B0	Q0606A	Q0531A0	ISP 1. Add SMART tag for flash type and retry id. 2. Add the keep some CID table info from download microcode. 3. Modify the define format from the OPT.h 4. Fix GC TLC source do not set skipSlcRam bug. 5. Fix read retry from loop 1. 6. Add customized SMART attribute and IDtable. 7. Add the WAF info (SLC and MLC erase count) 8. Modified the enSysTmr function variable type "BYTE" to "WORD" 9. Fix Ulink NCQ case read log time out issue. 10. Sync with other project 20170601 11. Add System Idle time option at CID[0x2B] for customer's requirement. 12. Add background gc stop condition. 13. Modified break background gc function threshold. 14. Modified background gc threshold for background gc checking and dynamic to static checking. 15. Loosen break background gc condition MPTool: 1. Add IDEMA 90GB support. 2. When server send "@TIME_OUT+" command, MPTool report all timeout errorcode (FFFFFF) to server. 3. Add "System Idle Time for background GC" option. 4. More save FlashID.bin after download MPISP for Linux Tool used.
Q0517A	Q0517A0	Q0517A	Q0503A0	ISP 1. Fixed Tlc Wearleveling Gc select slc source block. 2. Using Slc erase cmd if previous and current block role are slc mode. 3. Enlarge Gc H2f CmdFifo Depth for multi die operation. 4. Extend power gc time form 8s t0 12s for capacity more than 480GB. 5. Add customized SMART attribute ID. 6. Add the target PE cycle setting by CID table 7. Add background GC for customer's requirement. 8. Fixed HDT Full test performance unstable issue. 9. Modified Gc S2t priority higher than wearleveling. 10. Fixed newly added background Gc will stuck at power on Gc. 11. Add judge auto partial timer condition for Trim command issue. BootISP: 1. Shorten the time of flashHardReset for DevSlp.

				RDT: 1. Add die select function for multi die operation. MPTool: 5. Add "Error Code Define" button to display error code description. 6. Add "Random SN" support. 7. Fix bug: TCPIP message would check fail when sever send command "@TIME OUT+". 8. Fix bug: Erase system block need to use "one plane" mode. 9. When InfoBlock didn't exist, use *.ini to get PlaneNum and DieNum at Erase system block funciton. 10. Extend "Flash Part Name" information from 64 to 80 bytes of MPINFO. 11. Add "Keep CID Table at Download Microcode" function.
Q0502B	Q0414B0	Q0424A	Q0420A0	ISP: 1. Modified Multi Die Cmd threshold. 2. Modified g16MaxDualMoPeThr as wearleveling threshold 3. Modified BOKB wearleveling threshold from 400 to 600. 4. Modified getH2fTabBlkPageInfo judge UECC policy. 5. Shrink the Retry Table size to 768. 6. Reset vendor command count for EzTool. MPISP: 1. Remove 0xDA in setParaPrefixSlcCmd, use set feature to find the parameter table. 2. Do flashHardReset in setCardMode in case that it was different way of switching. 3. Modify flashSetFeature, flashHardReset and setDefaultBPC for multi-die. 4. Fix bug that Force I/M set feature didn't work in DDR200. 5. Modify readMPInfo() function. 6. Support ONFI mode in Read_Phy_Page(). RDT: 1. Enable Unc stop to prevent uncorrectable hardware status under multi-plane read. 2. Add grading flow. 3. Fixed IM set bit per cell issue MPTool: 12. Add "8P RDT Result" page. 13. Add "Production Number" setting. (SMARTID=2)

				14. Add customized functions: ● "customized ID" setting. ● "Block Endurance" setting. ● "Trim Return Zero" checkbox to set Word69.b5 of IDTable. ● "Write UNC Ext Command" checkbox to set Word119.b2 of IDTable. 15. Add "RDT Grading" function. 16. Add option for Don't keep RDT Result at "Ref RDT Bad" pretest option. 17. Add to record "RDT Read Retry" flag to MPInfo[0xA1]. 18. Check FW signature to distinguish new or old bad info format at "Ref. Runtime Bad" function. 19. Add to set FormFactor setting to MPINFO[0xA0]. 20. IM3D RDT didn't support Read Retry function. 21. Take off "Disable TranADJ" option. (Not support) 22. Disable "Program Mode" function. (Not support)
Q0412A	Q0330A0	Q0407A	Q0412A0	ISP 1. Fixed the NCQ script 06 item 2. Enable TxSAS 3. Enable SeqLink2 4. Improve wear leveling algorithm. 5. Fix PWR bug 6. Fix miss-mapping UECC block 7. Fix bug - SMART Erase count using WORD type 8. Fix after R/W commands, drive doesn't issue SATA partial and slumber when both TxSAS and DIPM were enabled 9. Modify Program suspend for multi-die. 10. Modified mark bad block spare count calculation. 11. Fixed Bad block with VPC at rdlink3 function bug. 12. Added Gc PWR UECC Block to bad block. MPISP 1. Fix bug that some Drive that will hang on TranAdj. 2. Add CtrlODT, FlashODT, FlashDriving, SmithWindow input from DriveSettingTable. 3. Roll back EDO mode from async mode. RDT 1. Fixed Multi-Plane Read issue 2. Fixed reference mistake block status table at 1P read 3. Fix bug: Multi-die issue MPTool 1. Add "Keep SN" function at ISP Mode. 2. Support customerized WWN format.
Q0313A	Q0216C	Q0310A	Q0308A0	ISP

				1. Add the CID table control SMART attribute return 0 for C3 and C4 2. Improve GC performance. 3. Support devslp. MPISP 1 Support verifying Intel/Micron SLC command (0xDA/0xDF) 2 Fix the bug of verifying I/M SLC command. 3 Verify L06bToB0kb via checking flash ID instead of get-feature. 4 Support erase interval 5 Fix bug that can't read multi-die id. 6 Fix bug: Initial card would hang on Reset Drive after Download ISP 7 Fix bug that cannot find RDT result 8 Fix bug that some Drive that will hang on TranAdj RDT 1 Fixed load RDT result failed issue 2 Fixed Multi-Plane Read issue 3 Fixed reference mistake block status table at 1P read MPTool 1 Add "SMART 0xC3 be 0" option. 2 Add "SMART 0x05/0xC5 be 0" option. 3 Maximum capacity support is 640GB. 4 Fix bug: Initial card with CID.bin default setting if user didn't change any setting. 5 Output Driving combo selection more display Hex value. 6 More display "Flash ODT","Control ODT", "Schmitt trigger window", "Flash Output Driving" information for 3D package at CID dialog. 7 Add "DAS LED Invert" option. 8 Adjust Driving and ODT setting according to different capacity and flash when user didn't change corresponding setting. 9 Save final MPCID.bin to "Linux File" for Linux Tool used. 10 Pop-up warning message when user didn't select any capacity option then want to do "Gen Linux File" or "Gen FFU File" only. 11 Fix bug: When enable "ENFWTAG" function, initial card would fail issue. 12 Fix bug: 4-partition scan fail issue. 13 Fix bug: Enable "QC" function just after download normal ISP. 14 Mask WWN support bit of IDTable if user didn't enable WWN or WWN16 checkbox. 15 Add IDEMA 16GB/32GB option. 16 Distinguish different SMART table and display at dialog bar. ([FUNCTION] : SMARTID) 17 (Customized) SMARTID=1 need to set IDTable: Word 0 = 0040, Word 106 = 6003 18 (Customized) Display "Max ECC bits" information for each die at [RDT Result] page. 19 Add RDT Result fail case : Flash Timeout

				(ErrorCode=0x0002)
Q0202B	Q0120B	Q0202A	Q0111A0	ISP 1. Add force clean if spare block less than half of threshold. 2. Add the judge condition for SMART remain life 3. Add TLC write function for debug tool 4. Update CIDtable.bin for using controller/flsah clock reg instead of frequency. 5. Set FlashDrive, FlashODT, CPUClock, ControllODriving, DataDQSDriving, ControlODT, SchmittWindow from CIDTable. 6. Fix bug: h2f block may could not be pop cause by pop denied flag MPISP: 1. Use setBitPerCell() to replace flashSetFeature(0x91) for avoiding command queue full. 2. Switch back to TLC mode after finding parameter table at the begin of mpisp. 3. Add chkFlashUSTP() for checking L06b to B0kb 4. Remove redundant semicolon after macro 5. Support multiple flash clock 6. Support Sandisk Bics2 initialization from ISP mode. 7. Sync system pll clock setting with OEM project 8. Fix that cannot find parameter table in the case of initializing from ISP mode. RDT 1. Modify Flash setting parameter(Clk/driving/odt..)by cid table MPTool: 1. Enable "Reserved RDT" function for 3D package. 2. Modify "CPU Clock", "Flash Clock" parsing by register for 3D package at CID dialog. 3. Disable Toggle mode (CID[0x31,0x32]) when flash clock run at 100Mhz. 4. Change IM3D default clock setting. 5. Add IDEMA 80GB/100GB/640GB and remove 360GB/720GB support.
P1222A	P1222A	P1231A	P1225A0	ISP 1 First formal release to support Intel L06B to B0KB and Micron B0KB flash.

Note:

1. F/W and ISP update is recommended.

2. History # is denoted by “Version-Date” .