MEDIATEK

Download Tool User Guide SOP









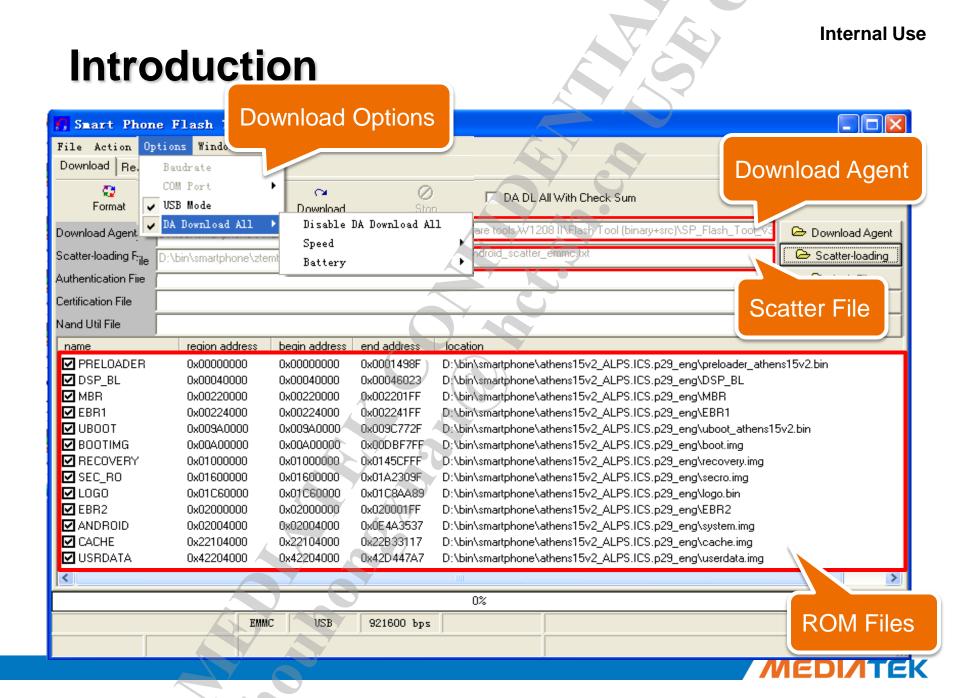


4/10/2012

NOTE

- About EMMC Download and Firmware upgrade
 - Tool Support
 - Download tool W1204 and after can support EMMC download
- About 6575 change feature
 - MT6575 support USBDL Auto Detect Trigger Feature.
 - MT6575 Meta mode related and Modem related tool is the same as MT6573. you can keep your 6573's tool.
 - HW Test Tool
 - SP/MAUI Meta
 - ATE
 - SN Writer Tool





Preparation

- **Download Agent**
 - The agent on target to perform the download procedure upon tool request
 - FlashTool will load MTK_AllInOne_DA.bin automatically
- Scatter-loading
 - Describe the start address of each partition to download to
 - The storage type & chip is embedded into scatter file name

eg:MT6575

- Naming Rule is define in .\image_map.xml
- For downloading NAND images
 - MT6575 Android scatter.txt
- For downloading eMMC images
 - MT6575_Android_scatter_emmc.txt
- In alps/out/target/product/[project] folder
- **ROM Files**
 - In alps/out/target/product/[project] folder



NAND Partition Layout

Pre-loader

- Pre-loader image
- Handles all the download and secure boot procedures

DSP_BL

DSP boot loader

U-boot

- Second loader image
- Handles most hardware initializations and bring-up entire Linux kernel

Boot

Linux kernel image and it's root file system

Recovery

- Recovery kernel image and it's root file system
- Handles all the system recovery and firmware update functionalities

System (Android)

Android system image

Logo

Boot-up logo image

Index	Partition	Туре
1	PRELOADER	RAW
2	DSP_BL	RAW
3	NVRAM	RAW
4	SECCFG	RAW
5	UBOOT	RAW
6	BOOT	RAW
7	RECOVERY	RAW
8	SEC_RO	YAFF2
9	MISC	RAW
10	LOGO	RAW
11	EXPDB	RAW
12	ANDROID	YAFFS2
13	CACHE	YAFFS2
14	USRDATA	YAFFS2

NAND Partition Layout (cont.)

NVRAM

 Stores the hardware related information, such as calibration data MAC address, IMEI ... etc.

Cache

- For Android internal used
- Store Android internal cache data or web cache data

Misc

Used for the recovery procedure (power loss).

User

 Used for Android system to store user data such as user contacts, settings, installed applications ... etc.

SECCFG and SEC_RO

Reserved for the security platform used

EXPDB

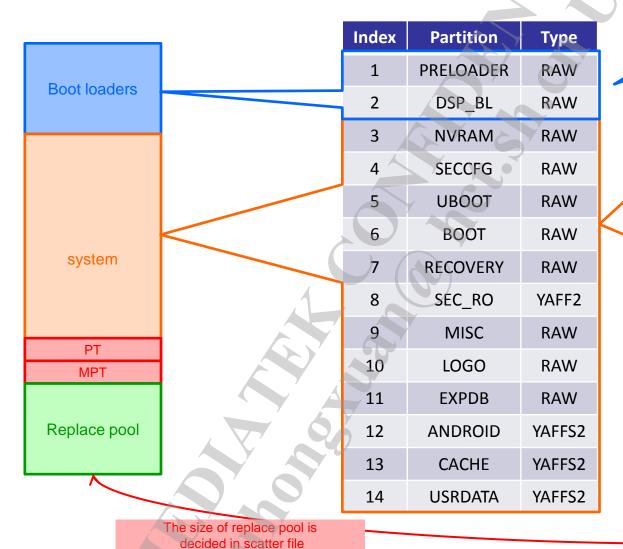
Used to store the kernel panic debug messages

Index	Partition	Туре
1	PRELOADER	RAW
2	DSP_BL	RAW
3	NVRAM	RAW
4	SECCFG	RAW
5	UBOOT	RAW
6	BOOT	RAW
7	RECOVERY	RAW
8	SEC_RO	YAFF2
9	MISC	RAW
10	LOGO	RAW
11	EXPDB	RAW
12	ANDROID	YAFFS2
13	CACHE	YAFFS2
14	USRDATA	YAFFS2

Internal Use

MT6575_Android_scatter.txt

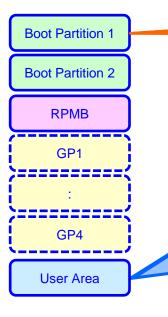
NAND Device Layout



0 , . . . 1.0. . . . , . . . 2.0. . PRELOADER 0x0 DSP BL 0x40000 NODL NVRAM 0x60000 NODL SECCFG 0x360000 UBOOT 0x380000 BOOTIMG 0x3e0000 RECOVERY 0xde0000 SEC RO 0x13e0000 NODL MISC 0x1500000 LOGO 0x1560000 NODL EXPDB 0x1860000 ANDROID 0x1900000 NODL CACHE 0x11300000 USRDATA 0x14f00000 NODL BMTPOOL 0xFFFF0050

eMMC Device Layout (cont.)

Scatter File Mapping



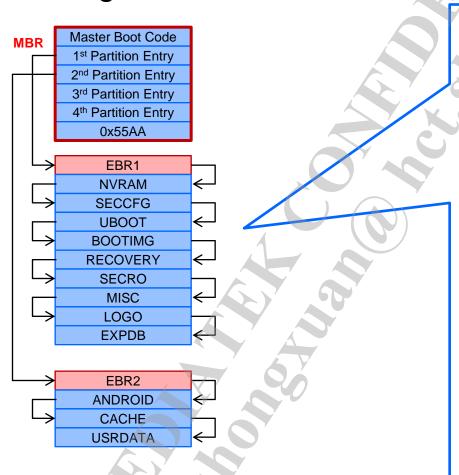
	Index	Partition	Туре
	1	PRELOADER	RAW
	2	DSP_BL	RAW
A	3	MBR	RAW
	4	EBR1	RAW
	5	NVRAM	RAW
	6	SECCFG	RAW
	7	UBOOT	RAW
	8	BOOTIMG	RAW
	9	RECOVERY	RAW
	10	SECRO	RAW
	11	MISC	RAW
	12	LOGO	RAW
	13	EXPDB	RAW
	14	EBR2	RAW
	15	ANDROID	EXT4
	16	CACHE	EXT4
	17	USRDATA	EXT4

```
MT6575_Android_scatter_emmc.txt
 0,,,,,,,,,10,,,,,,,20,,,,
  PRELOADER 0x0
  DSP BL 0x40000
 MBR 0x220000
  EBR1 0x224000
   NODL NVRAM 0x280000
   NODL SECCFG 0x580000
  UBOOT 0x5a0000
BOOTIMG 0x600000
  RECOVERY 0xc00000
8 SEC RO 0x1200000
   NODL_MISC 0x1800000
4 LOGO 0x1860000
   NODL EXPDB 0x1b60000
0 EBR2 0x1c00000
3 ANDROID 0x1c04000
6 CACHE 0x11604000
9 USRDATA 0x15204000
   NODL BMTPOOL 0xFFFF0050
```

Type

eMMC Device Layout (cont. Index

The organization of User Area

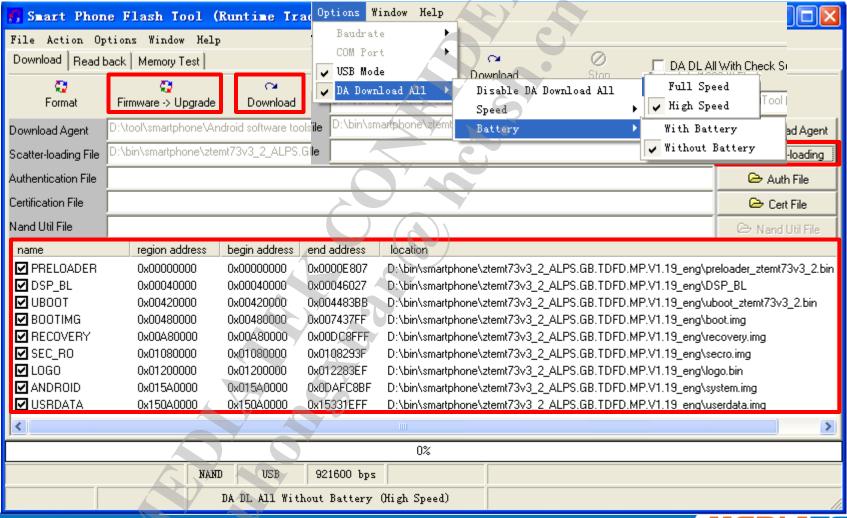


		. 7 6 -
1	PRELOADER	RAW
2	DSP_BL	RAW
3	MBR	RAW
4	EBR1	RAW
5	NVRAM	RAW
6	SECCFG	RAW
7	UBOOT	RAW
8	BOOTIMG	RAW
9	RECOVERY	RAW
10	SECRO	RAW
11	MISC	RAW
12	LOGO	RAW
13	EXPDB	RAW
14	EBR2	RAW
15	ANDROID	EXT4
16	CACHE	EXT4
17	USRDATA	EXT4

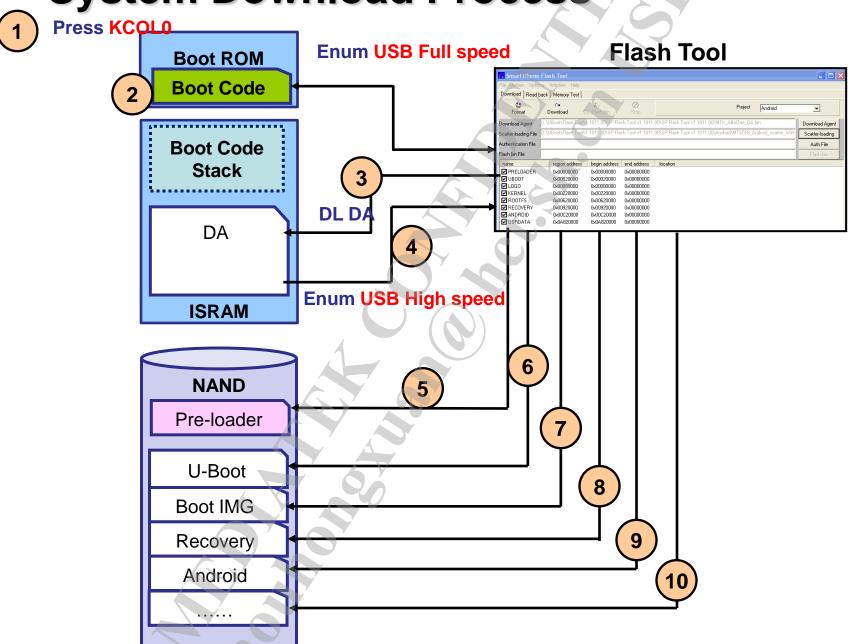
Partition



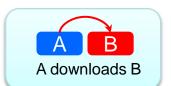
SP Flash Tool UI - Download



System Download Process

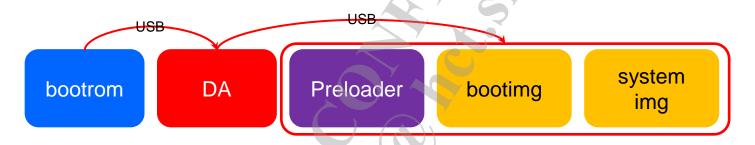


Internal Use



Download Methods (cont.)

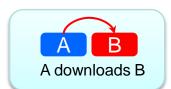
- DA Download All (Full Speed Only)
 - USB DL mode only
 - Full speed is slow, but stable.



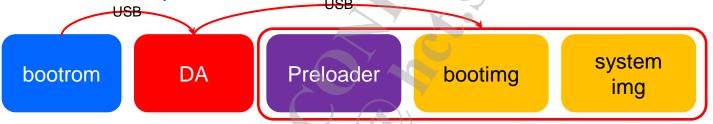
USB-FS: VID=0x0E8D, PID=0x0003

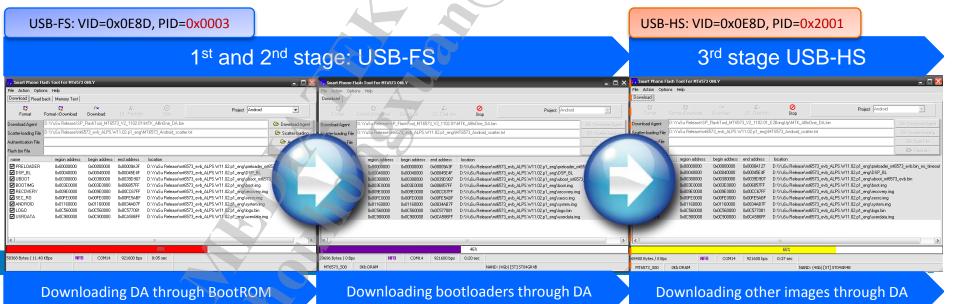


Download Methods (cont.)



- DA Download All (Full Speed → High Speed)
 - USB DL mode only
 - Please uninstall and reinstall your PC BROM USB driver in Factory. It will be stable.





USBDL Trigger Diff

Feature	MT6573	MT6575
Blank device USB DL	O	Ο
Auto-detection	X*	Ο
USB DL Key	0	0

- X*: MT6573 preloader can support Preloader DL DA in Auto Detection mode.
 - Preloader Download DA Feature: FlashTool 1148 supported, MDT not supported
 - Patch ID : ALPS00087511

USB DL and Bootup Mode

USB DL Download Flow

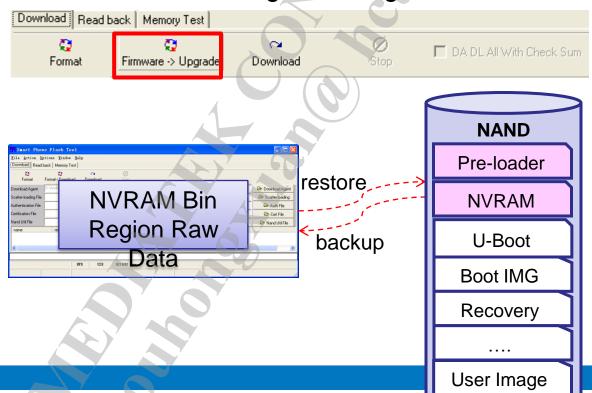
Trigger Condition	Battery	Mode	Note
Step1: KCOL0 = LOW Step2: Plug-in USB cable	Yes	USBDL	No Timeout
Step1: KCOL0 = LOW Step2: Press PWR_KEY	Yes	USBDL	No Timeout
Step1: KCOL0 = LOW Step2: Plug-in USB cable	N.A.	USBDL(recommend)	1. No Timeout 2. Without VBAT 限制: 需要按下KCOL0 3~5 s
Step1: KCOL0 = HIGH Step2: Plug-in USB cable	N.A. or YES	USBDL(MT6575 emmc default support)	 AutoDetect +5V 30s timeout, if no preloader Custom timeout, if exist preloader
Step1: KCOL0 = HIGH Step2: Press PWR_KEY	Yes	Normal Boot	Normal boot-up

Note

- Preserve UART1/Uart4/USB test points always.
- KCOL0 should be easy to pressed in production line
- KCOL0 should NOT be pressed, when Normal Boot



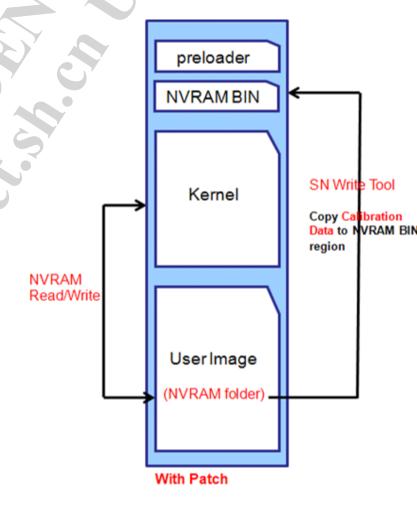
- Firmware Upgrade -- Format+Download
 - ReadBack NVRAM Bin region to PC
 - Format the flash from Preloader to User Image
 - Download all image
 - Restore NVRAM Bin region to target



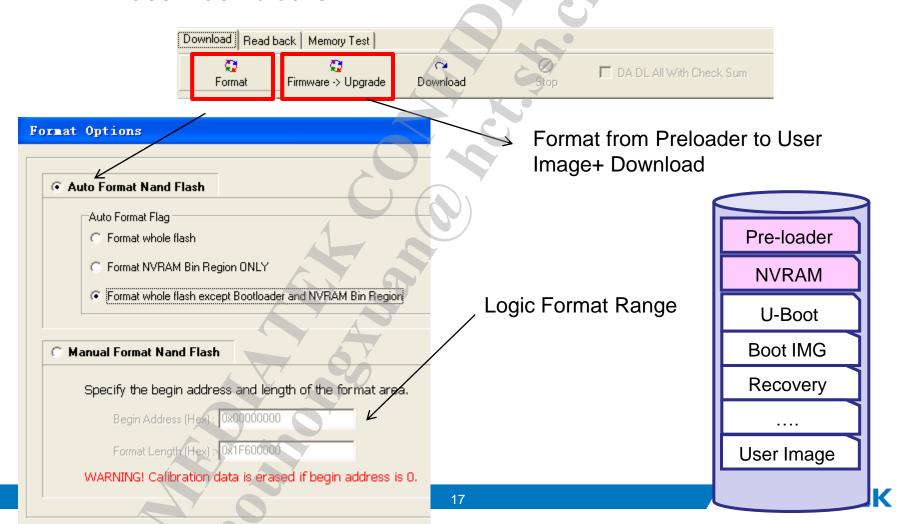
Internal Use

Firmware Upgrade

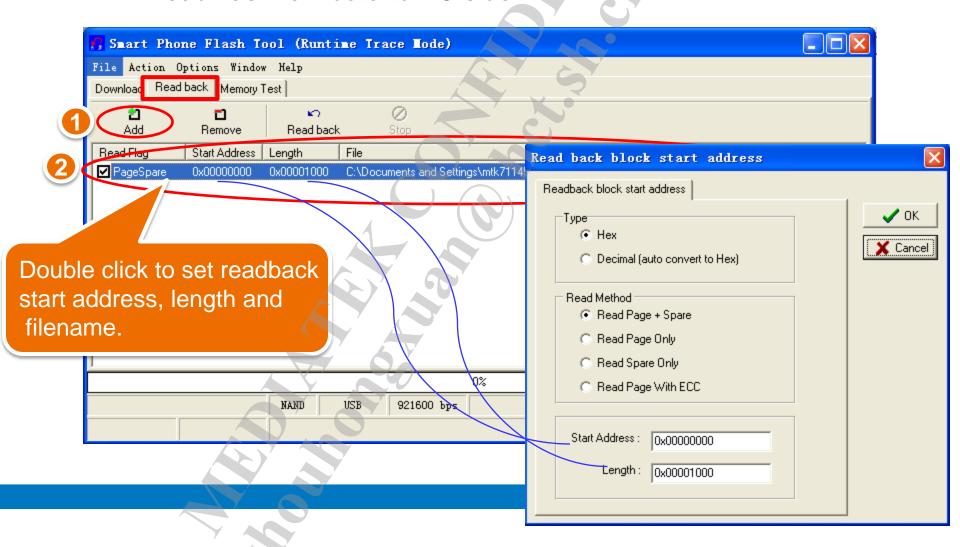
- NVRAM and BIN Region
 - Backup Bin region
 - Tool: SPMETA_Clean_Boot()
 - ATE backup, when passed;
 - SN backup, if option checked
 - Clean Boot
 - Delete nvram in User Image, Recovery next Bootup
 - Setting -> Reset to Factory
 - Factory Mode->Clear Flash
 - Recovery Mode->Clear User Data
- Firmware Method:
 - USB download ROM
 - USB Backup->DL->Restore
 - SD Update
 - Preserve preloader and NVRAM
 - Support NAND layout change and Partial Update



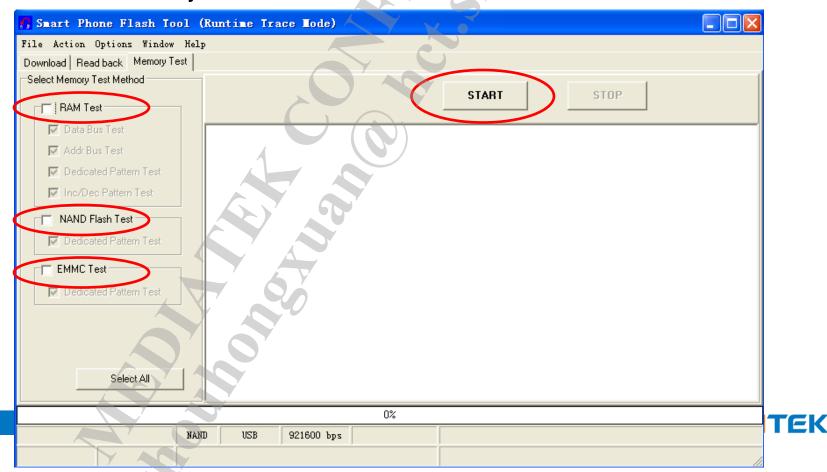
- Format:
 - Erase Flash blocks

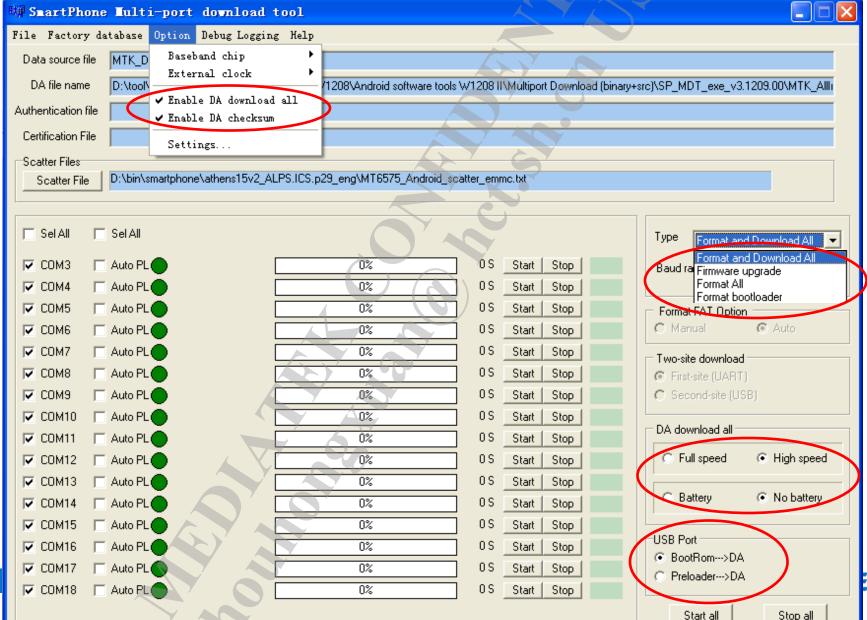


- ReadBack:
 - Read flash raw data to PC side

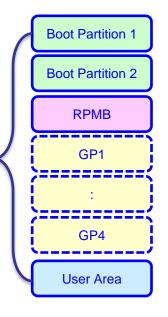


- Memory Test:
 - Basic DRAM/NAND/eMMC r/w IO Test
 - Verify the correctness and stability of memory devices and schematic layout on a PCB.



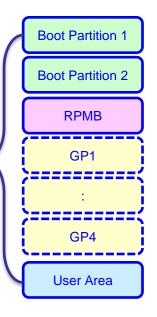


- Format and Download All
 - Format flash
 - NAND: format the whole flash
 - EMMC: format the region
 - Boot Partition1/2+RPMB+GP1/2/3/4+User Area
 - Download all



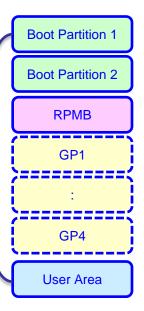


- Firmware Upgrade
 - ReadBack NVRAM bin region to PC
 - Format flash
 - NAND: format the whole flash
 - EMMC: format the region
 - Boot Partition1/2+RPMB+GP1/2/3/4+User Area
 - Download all
 - Restore NVRAM bin region to target





- Format All
 - NAND: format the whole flash
 - EMMC: format the region
 - Boot Partition1/2+RPMB+GP1/2/3/4+User Area
- Format bootloader
 - Format preloader in flash



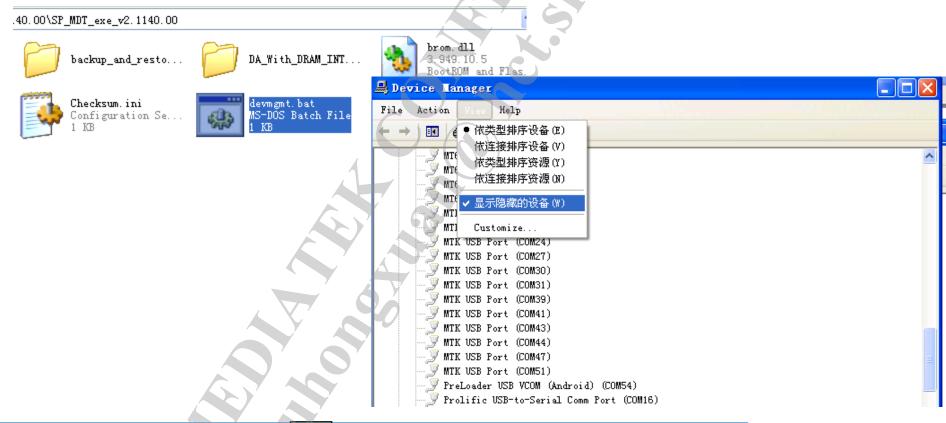


- BootRom->DA
 - 第一次download, flash为空
 - 非第一次download,下载时需按 KCOL0(BROM USB DL Key)
- Preloader->DA
 - 手机中有preloader,下载时不需按
 - MT6575 emmc默认支持preloader DL DA
 - MT6573 支持preloader DL DA,需要申请patch: ALPS0008751
 - FlashTool from 1148 supported , MDT not supported



How to reinstall your PC driver

- CMD to show all Comport device
 - Click devmgmt.bat in MDT Tool folder.
 - Check view->显示隐藏设备.



How to reinstall your PC driver

Uninstall PC driver

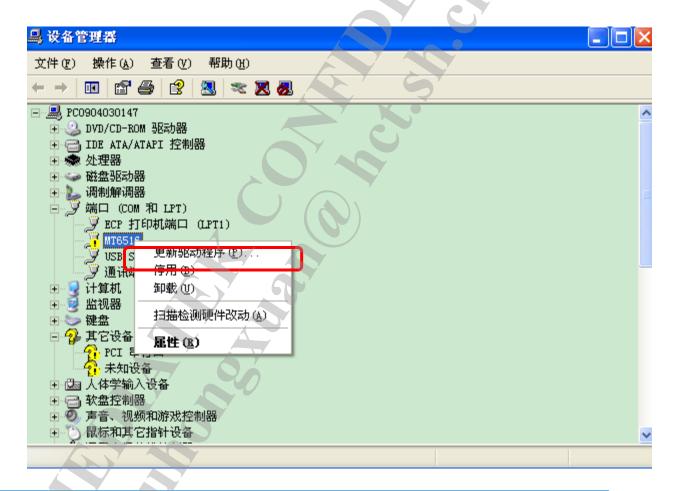


Re-Install PC driver



How to reinstall your PC driver

Right Click -> Update Driver,





Feature Support – DA CheckSum

Background

- 有些image太大,可能会在pc buffer里面内容就发生错误。这可能会导致下载时,电脑出现卡机画面司机,或者不能进入META。

Methods

- 申请patch ALPS00117556,压缩image大小
- 在工具中加入CheckSum4PCMemoryBuffer功能
 - 将工具包中的CheckSum_Generate.exe复制到load所在的文件夹 (即scatter file所在的文件夹)
 - 双击CheckSum_Generate.exe在此文件夹中生成CheckSum.ini文件
 - 在工具中勾选Enable DA CheckSum

Purpose

- 确保PC buffer中的内容不会发生错误,保证下载的内容一定是正确的。

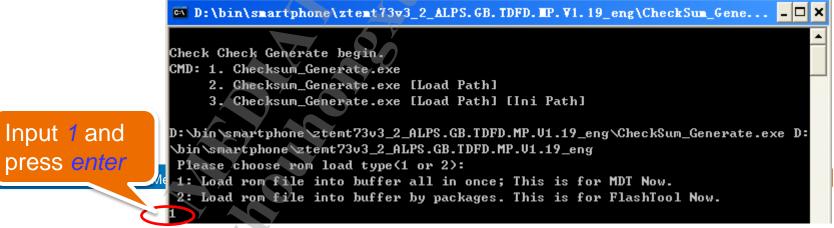


How to generate checksum.ini

Copy CheckSum_Generate.exe to image folder



Double Click CheckSum_Generate.exe





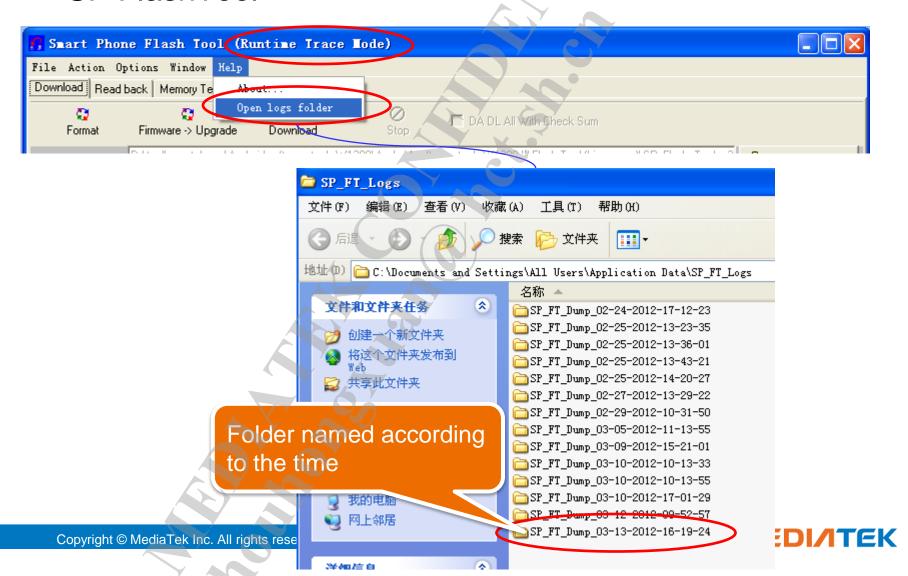
How to generate checksum.ini





Feature Support – How to find logs

SP FlashTool

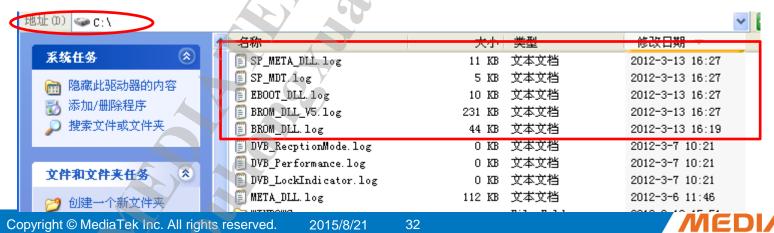


Feature Support – How to find logs

- MDT
 - Before downloading , please set the UI as following:



After downloading, you can find the logs here.



DL and Firmware Update Summary

- 1.工廠端,第一次download使用: FORMAT +Download;
 - =>[Download] DA完成对整个NAND的erase操作,并将image 下载到手机中去 [Bootup] 此后开机bootup到bootimg
- 2. 工厂,售后,透过DL Tool进行 USB update image,选择 Firmware Update.
 - =>[Update] USB download 覆盖上一个版本的相关image区域, 保留nvram区域. 如果您还在flash tool勾选了user image, user data数据会被擦除更新掉,否则不会.
 - [Bootup] 此后开机bootup到新bootimg
- 3. 客戶或工厂,使用 Android 內的 Setting -> privacy -> restore factory 的選項reset Factory (Clean Boot)
 - => [Recovery] 重新Reset, bootup到 Recovery image, 清除 user data, Cache 区域. 保留NVRAM参数. 时间大约20 s.
 - 然后重新bootup到bootimg(有断电处理,当看到下一次开机跑bootloader,就可以关机了)
- 4.End User端,透过SD image update
 - =>[update] 按特定key, 进入recovery image, 升级Boot.img, recovery.img, system.img, 保留nvram, user data区域(有断电处理)
 - ▶ [Bootup] 此后开机bootup到新bootimg



МЕДІЛІЕК

FAQ











FAQ(1)

- 通用串行总线为82801的电脑,使用USB下载时,如果选择USB FS+HS的方式,当下完DA之后,无法切换到HS模式,会导致下载失败。
 - [Cause]
 - 82801总线对USB设备支持不太好,这是common问题
 - [Solution]
 - 购买NEC PCI卡进行download



FAQ(2)

- MT6573可以先插入USB,再press USB DL key进行 download,但是MT6575不能这样操作
 - [Cause]
 - MT6575有PMIC供电功能,插上USB线后就会开机
 - MT6573/MT6513没有这个功能
 - [Solution]
 - MT6575如果进行USB按键下载,需要先Press USB DL Key,再插入USB线



FAQ(3)

- MT651X/MT657X如何实现Auto Detection下载, 不用按 DL key
 - [Solution]

	Without battery	Auto detection
MT6513/73	需按KCOL0	申请patch ALPS00087511手机端上电下载beforeW1224,请申请临时tool版本支持
MT6515/75	BAT_ON pin接GND	 NAND: 1.将platform.h文件中宏 CFG_LEGACY_USB_DOWNLOAD 设置为0 2. Before W1224,请申请临时tool版本支持 EMMC: default on
MT6517/77	X	Default on



FAQ(3)

- MT651X/MT657X如何实现Auto Detection下载, 不用按 DL key
 - [Solution]

	Without battery	Auto detection
MT6513/73	需按KCOL0	申请patch ALPS00087511手机端上电下载beforeW1224,请申请临时tool版本支持
MT6515/75	BAT_ON pin接GND	 NAND: 1.将platform.h文件中宏 CFG_LEGACY_USB_DOWNLOAD 设置为0 2. Before W1224,请申请临时tool版本支持 EMMC: default on
MT6517/77	X	Default on



FAQ(4)

- Get DRAM Setting Fail (for eMMC project)
 - [Cause]
 - FlashToolLib会check Scat file 是否有"emmc",用于标记storage type (HW_STORAGE_EMMC)
 - 因为没有正确标记storage type,第一个动作,get DRAM setting会失败
 - 虽然从DA report我们可以明确知道HW是eMMC,但为了防呆,防止客户把Nand的image下载到eMMC,特别定下一条rule:必须用"emmc" naming scatter file.

– [Solution]

- Scat file必须带 "emmc" / "EMMC"字样,例如
 - 6575_Android_scatter_emmc.txt



FAQ(5)

- Get DRAM Setting Fail or Set DRAM Setting Fail
 - [Cause]
 - Get dram setting fail一般是preloader中的flash id配置不正确,或者是emi timing配置错误
 - [Solution]
 - · 请客户的驱动工程师检查memory的配置



FAQ(6)

■ Title: How to know the real FlashID and is it support or not?

– [Cause]

- 对于Nand Flash,需要DA Nand table 有支持才能进行下载
- 对于DA没有support的FlashID,也可以从DA report知道实际的FlashID

[Solution]

Check DA report in BROM_DLL_V5.log

```
SyncWithDA(): DA_REPORT: NAND: m_nand_ret="S_DA_NAND_UNSUPPORTED_DEV_ID"(3010) SyncWithDA(): DA_REPORT: NAND: m_nand_chip_select="CS_0"(0x00) SyncWithDA(): DA_REPORT: NAND: m_nand_flash_id(0xFFFF)="NAND_UNKNOWN" SyncWithDA(): DA_REPORT: NAND: m_nand_flash_size(0x00000000) SyncWithDA(): DA_REPORT: NAND: m_nand_flash_dev_code_1(0x00EC)
```

Syncvitida(). DA_REPORT. NAND. III_lialid_liasii_dev_code_i(**0x00EC**)

SyncWithDA(): DA_REPORT: NAND: m_nand_flash_dev_code_2(**0x00BC**)

SyncWithDA(): DA_REPORT: NAND: m_nand_flash_dev_code_3(0x0000)

SyncWithDA(): DA_REPORT: NAND: m_nand_flash_dev_code_4(0x006A)

SyncWithDA(): DA_REPORT: NAND: m_nand_flash_dev_code_5(**0x0056**)

Note: we could know that: the FlashID(ECBC006A56) is not supported by current DA.



FAQ(7)

- 无法加载preloader.bin
 - [Cause]
 - 编译环境问题,查看Preloader log, 会有一行错误./wine is not owned by you
 - [Solution]
 - · 对wine所在的目录添加777的权限



FAQ(8)

- Flashtool报错
 S_DA_UPDATE_BOOTLOADER_FILE_SIZE_EXCEEDS_BOUN
 DARY_ADDR
 - [Cause]
 - Nand flash配置为4G+4G, 但是memory配置仍为4G+2G
 - [Solution]
 - 修改手机memory配置为4G+4G



FAQ(9)

- Flashtool format whole flash和MDT format and download all的区别
 - [Cause]
 - 对nand flash, 两者的行为有差异
 - [Solution]
 - Flashtool做logical format, length 为0x1F5C0000
 - MDT做physical format, length为整个flash大小,即0x20000000



FAQ(10)

- 1208多路下载工具,勾选Auto PL后,下载成功后,如果几秒之内不拔下手机,还会继续重新下载。
 - [Cause]
 - Flashtool lib API (Flashtool_disconnect) 功能修改导致
 - [Solution]
 - 升级到1212多口工具解决问题



FAQ(11)

■ H9DP32A4JJAC 206A下载的时候出现错误: S_DL_GET_DRAM_SETTING_FAIL

– [Cause]

– [Solution]

• 请与MCP Vendor联系, Vendor会帮忙处理



FAQ(12)

■ 使用Flash tool, Firmware>upgrade功能,发现nvram里的射频参数、IMEI号全部被删除了,请问是否正常

– [Cause]

- Firmware upgrade的feature是把NVRAM BIN REGION的数据拷贝出来,最后再restore会去
- 使用前提是已经做过校准参数备份,如果使用我们的tool,在两种情况下去备份:
- 1. ATE校准的最后一个步骤会去备份
- 2. SN Writer,如果勾上Set clean boot,则会去备份
- 请先确保做过上面的操作,如果没有做过操作,NVRAM Bin region 便是空的,即便是选择firmware upgrade,最后restore的数据也是错误的

[Solution]

- 1. 使用ATE校准
- 2. 使用SN Writer, 勾上Set clean boot
- 3. 最后再使用flash tool的firmware upgrade



FAQ(13)

- How to customize flash download tool
 - [Solution]
 - · 参考DCC(或者DMS)的文档:
 - 路径:/Product Line/WCX/3G Phone Data/Smart Phone/Software_Customer/Standard Package/MT6575 SW Doc Package/Tools
 - 文档名称: SP_BROM_DLL_Development_Kit_User_Manual.doc



МЕДІЛІЕК

www.mediatek.com









