

EM4412 Burn Linux Image Manual

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1. Burn uboot

(1) Make SD card to support SD card boot as follows.(uboot already exist in iNand can skip this step)

Put SD card into SD reader and connect SD card reader with PC.

Run WinImage tool (there are WinImage install package in development CD)

In the menu of WinImage, go Disk -> Restore Virtual Hard Disk image on physical drive ...

Select the physical Disk which is corresponding to the SD card inserted.

Click **OK** button and browse to locate file **bootloader_sd.vhd** which will be written to SD card.

Finish Making SD card.

Following screen shot show the procedure of making SD card.





🕞 WinImage	23
File Image Disk Options Help	
Restore Virtual Hard Disk image on physical drive	pel :
Select a physical drive in the list:	Modif
Disk 1: 1,920,000 KB - Generic- Multi-Card 1.00	
Include non removable hard disk(s)	
WARNING: restoring Virtual Hard Disk image on physical drive will fully erase the physical drive content. Only proceed if you know exactly what you are doing.	
	,
<	•

Select the file **bootloader_sd.vhd.**

E V	VinImage			
File	Image Disk Options H 局打开	<u>leln</u>		×
	· images		▼ ∮ 搜索 images	۹
Se	组织 ▼ 新建文件夹			
	☆ 收藏夹	名称	修改日期	类型
	🚺 下载	bootloader_sd.vhd	2014/5/27 10:50	VHD 文件
	三 桌面 🔤			
	🖳 最近访问的位置			
	篇 库			
	🌗 暴风影视库			
W. ph	🛃 视频			
	■ 图片			
	■文档	•		-
	文件タ	(N): beetleader ed vid	- Virtual Hard Disks (*)	(hd) -
	XITE	(IN): bootloader_sd.vnd		
			打开(O)	取消



Note: After making SD card with WinImage, if open the SD card disk in Windows PC, Windows may say need to format; in this case user have to format the SD card to store files.

(2) Set Boot from iNand/SD card.

For boot from iNand/SD card, Set DIP to [OFF ON OFF ON] as follows,

Boot Mode	1	2	3	4
iNand/SD card	OFF	ON	OFF	ON

Note: In iNand/SD card boot mode, EXYNOS 4412 internal program will firstly try to load u-boot image from first boot source iNand, But when there is no u-boot image exists in the iNAND, the loading will fail, in this case EXYNOS 4412 internal program are going on to try the second boot source, namely SD card.

- (3) Connect 12V/2A Power adaptor and serial cable (COM1), Insert SD card prepared in step (1).
- (4) Open DNW(Configuration->Options to config serial port, Serial Port->connect to connect)
- (5) Press and hold on the ON/OFF key for 3 5 seconds.

EM4412 will boot from SD card if there is no u-boot exists in the iNAND.

And stop at the uboot command line, input the following command.

SMDK4412# dnw 40008000; emmc open 0; mmc write 0 0x40008200 0x0 0x800; emmc close 0



(6) Connect EM4412 board and Windows PC with USB OTG cable.

If have not install usb_download_driver this PC, Windows PC will prompt "Found New Hardware" pops up message and requires installing USB driver, as follows:



Found New Hardware Wiz	ard
	Welcome to the Found New Hardware Wizard This wizard helps you install software for: SEC SOC SMDK Board If your hardware came with an installation CD or floppy disk, insert it now. What do you want the wizard to do? Install the software automatically [Recommended] Install from a list or specific location (Advanced] Click Next to continue.
	< Back Next > Cancel
Found New Hardware Wize	ard
Found New Hardware Wize Please choose your searc	ard ch and installation options.
Found New Hardware Wize Please choose your search Search for the best drive	ard ch and installation options.
Found New Hardware Wize Please choose your search Search for the best driv Use the check boxes to paths and removable in Search removable Include this local CNDocuments and	and th and installation options. wer in these locations. below to limit or expand the default search, which includes local hedia. The best driver found will be installed. he media (floppy, CD-ROM) tion in the search: and Settings\Administrator\Desktop\t v Browse
Found New Hardware Wize Please choose your search Search for the best driv Use the check boxes to paths and removable in Search removable C:\Documents Don't search. I will cho	and th and installation options. wer in these locations. below to limit or expand the default search, which includes local hedia. The best driver found will be installed. he media (floppy, CD-ROM) tion in the search: and Settings\Administrator\Desktop\t v Browse hose the driver to install.
Found New Hardware Wize Please choose your search Search for the best dir Use the check boxes to paths and removable in Search removable Include this local C:\Documents Don't search I will choose the the driver you choose to	end installation options. Wer in these locations. were in these locations. below to limit or expand the default search, which includes local hedia. The best driver found will be installed. We media (floppy, CD-ROM) tion in the search: and Settings'Administrator'Desktop't () Browse ose the driver to install elect the device driver from a list. Windows does not guarantee that will be the best match for your hardware.



Found N	ew Hardware Wizard
Selec	t the device driver you want to install for this hardware.
¢	Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show	compatible hardware
Model	
SEC	SOC SMDK Board SOC SMDK Board
<mark>. </mark>	s driver is not digitally signed! <u>me why driver signing is important</u> <u>< Back</u> <u>Next</u> > Cancel
Install F	rom Disk.
F	Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below. Cancel
	Copy manufacturer's files from:

Select Tools\usb_download_driver\USB_Driver\secusb2.inf



Locate File						? 🔀
Look jn:	CONTRACTION CONTRACTICO CONTRA			 O Ø 	📂 🛄•	
D Recent	secusb2.inf					
Desktop						
My Documents						
My Computer						
	File <u>n</u> ame:	secusb2.inf			~	<u>O</u> pen
My Network	Files of type:	Setup Informa	tion (".inf)		v (Cancel
10.0 MILL 100		192				
Found New H	ardware Wiza	ra				
Select the	device driver yo	ou want to ir	nstall for thi	s hardware.		
Select have	t the manufacturer a disk that contain:	and model of y s the driver you	vour hardware u want to insta	device and the all, click Have D	en click Nex iisk.	t. If you
Show comp	atible hardware					
Model						
SEC SOC	SMDK Board					
This driv Tell me wh	er is not digitall v driver signing is i	y signed! mportant			<u>H</u> av	e Disk
			< <u>B</u> ack	<u>N</u> ext		Cancel



If USB driver install successfully, the USB state of DNW will have a process from **[USB:x]** to **[USB:OK]**





(7) Download and write uboot to iNand.

Does USB Port->Transmit and browse to locate file bootloader_sd.vhd.

At the same time in uboot console will report the progress of writing.

Note: To erase uboot exists in iNand use following command,

SMDK4412#mmc erase boot 0 0 0





E Serial-COE1 - SecureCRT	\mathbf{X}
<u>E</u> ile <u>E</u> dit <u>V</u> iew <u>Options</u> <u>Transfer</u> <u>Script</u> Too <u>l</u> s <u>H</u> elp	
43 33 C) 43 X Pe R Q G R A A R A R A R A R A R A R A R A R A	
Serial-COM1	×
NAME: S5P_MSHC4 MMC pevice 0: 3728 MB [00748000][00000200] MMC pevice 1: 1898 MB [003b5000][00000200] MMC pevice 2 not found Hit any key to stop autoboot: 0 SMDK4412 # dnw 40080000; emmc open 0; mmc write 0 0x40008200 0x0 0x800; emmc close 0 OTG cable Connected! Now, Waiting for DNW to transmit data Checksum is being calculated Checksum o.K. Download Done!! Download Address: 0x40008000, Download Filesize:0x100000 eMMC OPEN Success.!! !!Notice!!! !You must close eMMC boot Partition after all image writing! !eMMC boot partition has continuity at image writing time.!	<
MMC write: dev # 0, block # 0, count 2048 2048 blocks written: OK eMMC CLOSE success.:: SMDK4412 #	<
Ready Serial: COM1 20, 12 20 Rows, 85 Cols Linux NUM	A

2. Download Kernel and File System

(1) Power off the board (press RESET key), unplug USB OTG cable. Press ON/OFF

key 3 seconds.

EM4412 board will boot from iNand and output uboot start up information from debug serial port, the serial port will output the following information and stop at the uboot command line:





(2) Erase iNand user space.

SMDK4412# mmc erase user 0 0 0

Serial-COM1 - SecureCRT	
<u>File Edit V</u> iew Options <u>T</u> ransfer <u>Script Tools H</u> elp	
43 33 G 43 X Pr C 4 G 5 G 4 C 3 K 1 8 2	
Serial-COM1	×
Wrong Image Format for bootm command ERROR: can't get kernel image! SMDK4412 # mmc erase user 000 Erase all from 0 block START: 0 BLOCK: 7634943 high_capacity: 1 Capacity: 7634944	<
Erase 	
SUDVA4T5 #	~
Ready Serial: COM1 35, 12 35 Rows, 85 Cols Linux	NUM

(3) Create partitions and reset EM4412 board.

SMDK# fdisk -c 0 300 1000 200

(4) Reboot the board and enter uboot command, input fastboot command.

🕞 Serial-CO	∎1 - SecureC	RT			
<u>F</u> ile <u>E</u> dit <u>V</u> ie	ew <u>O</u> ptions <u>T</u> rar	nsfer <u>S</u> cript Too <u>l</u> s <u>H</u> el	P		
11 12 C) 🗶 h n n 🤇) 5 5 5 6 12 <u>%</u>	1 🤋 🗖		
Serial-COM1					×
3.640 GB e MMC erase 5 SMDK4412 # Count: 1000 Count: 9999 NAME: S5P_M fdisk is co	rase Done uccecc.!! fdisk –c 0 3 v SHC4 mpleted	00 1000 200			
partion # 1 2 3 4 SMDK4412 #	size(MB) 2090 302 1001 200	block start # 3214398 134244 753258 2804208	block count 4280892 619014 2050950 410190	partition_Id 0x0C 0x83 0x83 0x83 0x83	
<					>
Ready		Serial: COM1	15, 12 15 Rows,	85 Cols Linux	NUM

SMDK4412# fastboot

Boardcon Embedded Design

🖬 Serial-COHI - SecureCRI	$\mathbf{\times}$
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>Options Transfer Script Tools Help</u>	
19 X (J X X Pe R Q G S 🖨 E X 1 ? E	
Serial-COM1	×
<pre>SMDK4412 # fastboot [Partition table on MoviNAND] ptn 0 name='fwbli' start=0x0 len=N/A (use hard-coded info. (cmd: movi)) ptn 1 name='bl2' start=N/A len=N/A (use hard-coded info. (cmd: movi)) ptn 2 name='bootloader' start=N/A len=N/A (use hard-coded info. (cmd: movi)) ptn 3 name='tzsw' start=N/A len=N/A (use hard-coded info. (cmd: movi)) ptn 4 name='kernel' start=N/A len=N/A (use hard-coded info. (cmd: movi)) ptn 4 name='tarmdisk' start=N/A len=N/A (use hard-coded info. (cmd: movi)) ptn 5 name='ramdisk' start=N/A len=0x0(~8388608KB) (use hard-coded info. (cmd: movi)) ptn 6 name='logo' start=N/A len=0x0(~4194304KB) (use hard-coded info. (cmd: movi)) ptn 7 name='recovery' start=N/A len=0x0(~8388608KB) (use hard-coded info. (cmd: movi)) ptn 8 name='system' start=0x0 len=0x0(~8388608KB) ptn 9 name='userdata' start=0x0 len=0x0(~1050086400KB) ptn 10 name='cache' start=0x0 len=0x0(~210017280KB) ptn 11 name='fat' start=0x0 len=0x0(~2103150592KB) OTG cable Connected!</pre>	
	~
×]	
Ready Serial: COM1 18, 1 18 Rows, 85 Cols Linux NUM	l .;;

Then connect USB OTG cable with PC again, if the PC has not install **usb_fastboot_driver**, Windows will prompt have detected new device and requires installing the USB fastboot driver. Installation steps are as follows.



Found New Hardware Wizard	
Please choose your search and installa	tion options.
 Search for the best driver in these locat Use the check boxes below to limit or erpaths and removable media. The best descent Search removable media (floppy. Include this location in the search C:\Documents and Settings\Adm Don't search. I will choose the driver to Choose this option to select the device the driver you choose will be the best media 	ons. spand the default search, which includes local river found will be installed. CD-ROM) inistrator\Desktop\t V Browse install. driver from a list. Windows does not guarantee that atch for your hardware.
	< <u>B</u> ack <u>N</u> ext> Cancel
Found New Hardware Wizard	
Found New Hardware Wizard Select the device driver you want to ins	stall for this hardware.
Found New Hardware Wizard Select the device driver you want to ins Select the manufacturer and model of you have a disk that contains the driver you	etall for this hardware.
Found New Hardware Wizard Select the device driver you want to ins Select the manufacturer and model of you have a disk that contains the driver you Show compatible hardware Model Android Bootloader Interface	etall for this hardware.
Found New Hardware Wizard Select the device driver you want to ins Select the manufacturer and model of you have a disk that contains the driver you have a disk that contains the driver you Show compatible hardware Model Android Bootloader Interface Inis driver is not digitally signed! This driver is not digitally signed! Tell me why driver signing is important	etall for this hardware.







Install From Disk		
F	Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.	OK Cancel
	Copy manufacturer's files from: C:\Documents and Settings\Administrator\Desktop 🗸	Browse
Found Ne	w Hardware Wizard	
Select	the device driver you want to install for this hardw Select the manufacturer and model of your hardware device a	and then click Next. If you
S 1	have a disk that contains the driver you want to install, click H	lave Disk.
Show g	compatible hardware	
Model		
Andre Andre This <u>Tell n</u>	oid Composite ADB Interface driver is not digitally signed! ne why driver signing is important	<u>H</u> ave Disk
	< <u>B</u> ack	Next > Cancel



Found New Hardware Wizard			
	Completing the Found New Hardware Wizard The wizard has finished installing the software for: Android Composite ADB Interface		
	< Back Finish Cancel		
Computer Management Image: Computer Management Image: Elle Action View Window Help Image: Computer Management (Local) Image: Computer Management (Local) Image: Computer Management (Local) Image: System Tools Image: Computer Management Viewer Image: Computer Viewer Image: Computer Action Viewer			
Shared Folders Shared Folders Local Users and Groups Performance Logs and Alert: Device Manager Storage Storage Disk Defragmenter Disk Management Services and Applications	Batteries Computer Josplay adapters Josplay adapters Josplay disk controllers Josplay disk controllers Josplay disk drives Josplay disk drives		
	 Keyboards Mice and other pointing devices Network adapters Ports (COM & LPT) Processors SCSI and RAID controllers Sound, video and game controllers System devices Universal Serial Bus controllers 		

After finished installation, Device Manager Window will display <**Android Composite ADB Interface**>

Also in the uboot console will display following messages,



OTG cable Connected! LCD_turnon(); Default Lcd !

(5) Run batch file write_all.bat to download images and write to iNand.

Copy images folder to Windows PC from Development CD/Linux/images, run batch file write_all.bat to download and write zImage, ramdisk-uboot.img and system.img to iNand.

At the same time, in the uboot console will report the progress.







Also user can write single image to iNand use fastboot command in Window command line as follows.

fastboot flash kernel zImage

fastboot flash ramdisk ramdisk-u.img

fastboot -w

fastboot flash system system.img

fastboot flash userdata userdata.img

After the programming is completed, user can reset the board and enjoy the Linux on the EM4412 board.