

DB202 System Software Burn-in Guide

V1.0



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Revision History

Date	Modification Type	Version	Description	Author
2023/3/29	Important basic functions	1.0	Initial Version	

1. Hardware Device

• Debug Tool

If you need to use SSD platform tools for debugging, burning, reading and writing register operations (such as Flash_Tool), you need to purchase a special Debug Tool, Debug Tool purchase address:

https://www.alibaba.com/product-detail/IDO-SOM2D02-IDO-SOM2D01-New-Pushing_1600788577396.html?spm=a27 00.galleryofferlist.normal_offer.3.62a048c3cFhYxe



- Windows PC
- DB202 PCBA



• 12V power supply



2. Software Download

2.1 Flash_Tool

Software download address: https://mega.nz/file/ITd3QIzT#PiNMB-bgawqAy8ZZ3REF-hqxMUCXZdE_CBnOF3Yie88

2.2 Tftp32

Software download address: https://mega.nz/file/5SExiQYZ#OZ0zDym5aC4Za0jJCewYG0-ef3QsOzEUGa6gQmsd09A

2.3 Factory firmware

Download address: https://mega.nz/file/UGU1wRqa#-KUe32_uY5Jre3Pu5KVutg37Eb5kZUUyyI52E2AMU0Y

2.4 SPINANDINFO file

Spinandinfo latest file download address: <u>https://mega.nz/file/RbVIAZDK#zEcrSE9A0Y22pZmvftTHTg5CbNorvyig_dnmoNUq-Zs</u>

3. Hardware connection method

3.1 Debug tool and board connection

3.1.1 The pin definition of debug tools is shown in the following figure

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3.1.2 The four pins of the debug tools need to be connected to the four pins of the onboard debug serial port (J1).





3.1.3 Details of the connection are as follows

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3.1.4 The parameters for the serial port settings are shown in the following figure (Cosole default baud rate 115200): Tera Term: Serial port setup ×

FUR.	COM18 ~	ОК
Baud rate:	115200 ~	
Data:	8 bit \sim	Cancel
Parity:	none v	
Stop:	1 bit \sim	Help
Elous control:	none v	

3.2 Flash_Tool(ISP_Tool) burn-in

This method is used when the board is burned empty or when the board cannot access the Uboot console and is burned in other ways.

3.2.1 Enter Uboot Debug mode

Open the serial debug software, power on the board, and enter the Uboot console by pressing the Enter key when the LOG message is shown below to enter Debug mode.



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3.2.3 Close the serial debugging tool

4. Flash_Tool software use

The software uses ISP_5.16_Release and the interface is shown below:



4.1System burn-in

4.1.1 Connecting Devices

As shown in the figure below, first select SPI, then select SPINAND, and finally click connect, if the left side shows Connected, it means there is no abnormal hardware connection.

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eMMC NAND SPI Domp I	Trase SPI To	ol Device Config	More >> 3 Connect Dis Co
E:\firmware\SSD20K\images E:\firmware\SSD20K\images Checksum:0xC4CC (< Less	\boot\GCIS.bin	Hex files Unused Bytes: 0x00 © 0xFF	File Status Start Addr. : 0x000000 End Addr. : 0x0007FF
Src: [2021/7/20 10:08:20] Connected 4 Program File Ready !! detected: UNKNOWN(F0) Old-style Chip ID: 0xFFFFFFFF SNI VERSIDN:(10.6) flash MX35LF1GE 4AB [128M] (C2-12) Program File Ready !!	•	 ReConnect Multi Flashes Block Run Flow Erase Device All Chip File Area Erase Area First 512 KBytes Partial Erase Setup 	Blank HDCP Key HDCP Key #:0 Program Verify Exit ISP Type: SPINAND V
	*	Base shift at 0x00000000 Chip Reset After Finish SpiFlash_X Flash_0 Flash_1 F	Hot Key Ctrl+R

4.1.2 Erase Falsh content

	て秋日	\ssd202-buildroot_RCB20200701_ssc	1202-lvds_hwV1.0_20221220180547
Checksum : 0x0000		Hex files F Unused Bytes: 0x00 0xFF	File Status Start Addr. : 0x000000 End Addr. : 0xFFFFFFFFFF
rc: [2022-12-20 18:05:48] Connected		ReConnect Multi Flashes Block Run Flow Frase Device	Blank HDCP Key HDCP Key #:0 Program
Program File Ready !! Jetected: UNKNOWN(F0) Did-style Chip ID: 0xFFFFFFF NI VERSION:(1.0.6) Jash MX35LF2GE4AD [256M] (C2-26-03)	~	 All Chip File Area Erase Area First 512 KBytes Partial Erase Setup 	☑ Verify ☑ Exit ISP Type: SPINAND ✓
		Base shift at 0x00000000 Chip Reset After Finish	Hot Key Ctrl+R V Disable hot key
	3	Shiriasti_V	

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4.1.3 The operation steps are as follows:

emmc nand spi	Dump Erase	SPI Tool Device	Config	More >>	Connect Dis Co
SPI flash Erase/I	Blank Address		1		
Start Addr. :	0x000000				
End Addr. :	0x7FFFFF En	d of Chip 🗸 👖			
NOTE: ind	ependent to setti	nas of SPI page			
💥 Erase 2		Erase Mess	age :		
Sh pi-i		Blank Messa	nde .		
Nº Blank		Didin: moore	-go .		
Below are for d	ebug only, not er	abled in product	ion version		
		Program Ma			
Program		r iogiain me	ssaye.		
Verify		Verify Mess	age :		
P Pin & CS Pin: Default					
apsed lime:	12C: (92, 82), USB	402KHZ 00000000	0000	Connect	Status: Success

4.1.4 When the erase is complete, Erase OK is displayed.

eMMC NAND SPI	S Dump	Erase SPI To	a 📏 pol Device	Config	More >>	Connect	Dis Co
SPI flash Erase/	Blank Addre	\$\$					
Start Addr. :	0x000000						
End Addr. :	0x7FFFFF	End of Chi	ip ~				
NOTE: ind	ependent	to settings of	SPI page				
	1			_			
🔆 Erase		E	rase Mess	age : Erase	OK.		
A Blank		B	lank Mess	aqe :			
				-			
				and the second se			
Below are for d	lebug only	, not enabled	in produc	tion version			
Below are for d	lebug only	, not enabled	<mark>in produc</mark> rogram Ma	tion version			
Below are for d	lebug only	, not enabled	in produc rogram Me	tion version			
Below are for d Program Verify	lebug only	, not enabled Pi	in produc rogram Me erify Mess	tion version essage : age :			
Below are for d Program Verify	lebug only	, not enabled	in produc rogram Me erify Mess	tion version essage : age :			
Below are for d Program Verify	lebug only	, not enabled	in produc rogram Me erify Mess	tion version essage : age :			
Below are for d Program Verify	lebug only	, not enabled Pi	in produc rogram Me erify Mess	tion version essage : age :			
Below are for d Program	lebug only	, not enabled Pi	in produc rogram Me erify Mess	tion version essage : age :			
Below are for d Program	lebug only	, not enabled	in produc rogram Me erify Mess	tion version essage : age :			

4.1.5 Burn GCIS.bin

The file path images\boot\GCIS.bin, follow the steps below, it will show Pass and burn successfully

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4.1.6 Burn IPL.bin

The file path images\boot\IPL.bin, follow the steps below, it will show Pass and burn successfully

🗃 Image E:\firmwa	are\SSD20X\images\boot\IPL.bin	1	
Run Scheck	sum : 0x4230	Hex files Unused Bytes:	File Status Start Addr. : 0x000000 End Addr. : 0x0054BF
re: [2021/7/20 11:38:02] Pass 4		ReConnect Multi Flashes Block Run Flow Flashe Device	Blank HDCP Key HDCP Key #:0 Program
Start time: 11:43:27 Program File Ready !! Erase Message : Erasing Erase OK. Program Message : Program Verify Message : Verifying Verify OK. End time: 11:43:33	nming	All Chip File Area Frise Area Frist 512 KBytes Partial Erase Setur	 ✓ Verify ✓ Exit ISP Type: SPINAND ▼
Program File Heady !!		Chip Reset After Finish	D Hot Key Ctrl+R ▼ Disable hot key

4.1.7 Burn IPL.bin

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The file path images\boot\IPL_CUST.bin, follow the steps below, it will show Pass and burn successfully

emmc NAND SPI	Dump Erase SPI	Tool Device Config	More >> ▼ Connect Dis Co
Image E:\firmware\Start Run Checksun Checksun 3 < <less !!="" 11:38:02]="" 11:47:44="" 11:47:46<="" 20="" 4="" 7="" :="" [2021="" end="" file="" kessage="" message="" ok.="" pass="" program="" programming="" ready="" src:="" start="" th="" time:="" verify="" verifying=""><th>SD20X\images\boot\IPL_CL a : 0x4B17 </th><th>JST.bin Hex files Unused Bytes: Ox00 OxFF ReConnect Multi Flashes Block Run Flow Erase Device All Chip File Area First 512 KBytes Partial Erase Sett V Base shift at Ox2000 Chip Reset After Finish SpiFlash_X Flash_0 Flash_1</th><th>File Status Start Addr. : 0x000000 End Addr. : 0x0000522F Blank HDCP Key HDCP Key #:0 Program Verify Exit ISP Type: SPINAND Hot Key Ctrl+R Disable hot key Flash_2 Flash_3</th></less>	SD20X\images\boot\IPL_CL a : 0x4B17 	JST.bin Hex files Unused Bytes: Ox00 OxFF ReConnect Multi Flashes Block Run Flow Erase Device All Chip File Area First 512 KBytes Partial Erase Sett V Base shift at Ox2000 Chip Reset After Finish SpiFlash_X Flash_0 Flash_1	File Status Start Addr. : 0x000000 End Addr. : 0x0000522F Blank HDCP Key HDCP Key #:0 Program Verify Exit ISP Type: SPINAND Hot Key Ctrl+R Disable hot key Flash_2 Flash_3
VP Pin & CS Pin: Default	2C: (92 B2) USB 402K	Hz 00000000000	Flash Status: 00

4.1.8 Burning u-boot

The file path images\boot\u-boot_spinand.xz.img.bin, follow the steps below, it will show Pass and burn successfully

😤 Image E:\firmv	vare\SSD20X\images\boot\u-boot	spinand.xz.img.bin	
Run Chec	ksum : 0x16CC 3	Hex files Unused Bytes: Ox00 OxFF	Status 0x000000 End Addr. 0x00039B5F
re: [2021/7/20 11:38:02]		ReConnect	Blank HDCP Key HDCP
itart time: 11:49:27 hogram File Ready !! forgaram Message : Progra farity Message : Verifying farity OK. nd time: 11:49:41	smming	All Chip Generation File Area File Area First 512 KBytes Partial Erase Setup	Verify Exit ISP Type: SPINAND V
		Base shift at 0x2C0000 Chip Reset After Finish SpiFlash_X	Hot Key Ctrl+R

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4.1.9 So far uboot has been burned into the development board, the process of burning uboot is only needed when the board is empty for the first time, with uboot we can use TFTP to update firmware, no need to use debug tools to burn

4.2 Burn-in uboot FAQ

4.2.1 When you click Connect, if it shows "Connected, but no SPI flash found", it means the connection to Flash failed.



4.2.2 The following tests are required:

1) Whether to use a dedicated Debug Tool tool

2) If the RX/TX line is connected correctly, if there is a system in the flash, you can open the serial software and see if there is LOG information output to judge, if LOG information output is normal, it means the RX/TX is connected correctly.

3) Not in Debug mode (see Entering Uboot Debug Mode)

4) In the Flash_Tool software, click Device

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emmc NAND	SPI Dump Erase	SPI To	ool Device Eonfig	More >>
	Jsers\g.bernardi\Desktop\ISP	5.16 Re	ase\ISP 5.16 Release\SpiFlash.b	in
	ecksum : 0x186E	/	Hex files Unused Bytes:	File Status Start Addr. : 0x000000 End Addr. : 0x0002EFFF
ire: [18/06/2020 13:5 Connect SNI VERSION:(1.0.6) Device Type is [SPIN/ Can't Find the Device detected: UNKNOWN Did-style Chip ID: 0xFF SNI VERSION:(1.0.6) Device Type is [SPIN/ Can't Find the Device NI VERSION:(1.0.6) Device Type is [SPIN/ Can't Find the Device	ed, but no S AND] Unknown flash (FF-FF) Type !! (4400) FFFFFF AND] Unknown flash (FF-FF) Type !! (4400) FFFFFF AND] Unknown flash (FF-FF) Type !!	SPI f	ReConnect Multi Flashes Block Bun Flow Frase Device All Chip File Area First 512 KBytes Partial Erase Setup Base shift at Ox00000000 Chip Reset After Finish SpiFlash_X	Blank HDCP Key HDCP Key #:0 ✓ Program ✓ Verify ✓ Exit ISP Type: SPINAND ✓ Hot Key Ctrl+R ✓ Disable hot key
			Griash_U_Oriash_1_Of	
D Din & CS Din: Def	ault			

5) In SPINAND, check if the Flash model in the following list includes the Flash model on the hardware core board. If no corresponding model is found, the corresponding Flash model is not added in Flash_Tool.

SPINOR SPINAND GD5F4GQ4UAYIG GD5F1GQ4UAYIG GD5F1GQ4UBYIG GD5F1GQ4UBYIG GD5F1GQ4UBYIG GD5F1GQ4UBYIG GD5F1GQ4UBYIGH GD5F2GQ5UEYIGP W25N512GV W25N01GV W25N01GV W25N01GV W25N02GV MX35LF1GE4AB MX35LF2GE4AB TC58CVG0S3H	SNI-V: 1.0.6 Manufacture: Device Size: flash ID: Burn CIS	Flash Write Protection Control WP in Auto Procedure Status Register setting: O Previous in Flash New Setting Disable WP	UWP Log
Security Open Secure Panel		SPI Flash Query JEDEC ID 0x00 0x00 0x00 0x00 Device ID 0xFF 0xFF Query	
/P Pin & CS Pin: Default lapsed Time:	12C: (92, B2), USB 402	KHz 0000000000	Connect Status: Success

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6) At this time, you need to update the SPINANDINFO.sni file, after updating this file, close the Flash_Tool software and open the software again to connect normally.

Flash_Tool_5.0.16.exe	2020-05-21 9:56	应用程序	2,120 KB	
SpiFlash.bin	2020-06-18 20:55	BIN 文件	188 KB	
SpinandBurnImgConfig.cfg	2020-03-10 14:12	Configuration 源	1 KB	
SPINANDINFO.sni	2020- <mark>0</mark> 5-21 9:56	SNI 文件	18 KB	
SpinorBurnImgConfig.cfg	2020- <mark>0</mark> 3-10 14:12	Configuration 源	1 KB	
SPINORINFO.nri	2020-05-21 9:56	NRI 文件	24 KB	

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7) For example, the model number on the core board is MX35LF2GE4AD, but there is only MX35LF2GE4AB in the software, so the software does not support this Flash chip, you need to update the SPINANDINFO.sni file.

SPINOR SPINAND		Flash Write Protection
GD5F1GQ4UAW GD5F1GQ4UBYIG GD5F2GQ4UBYIG GD5F1GQ4UBYIGNG GD5F1GQ4UEYIH GD5F2GQ5UEYIGR W25N512GV W25N512GV W25N01GV W25M02GV MX35LF1GE4AB MX35LF1GE4AB MX35LF2GE4AB TC58CVG0S3H	A SNI-V: 1.0.6 Manufacture: Device Size: flash ID:	Control WP in Auto Procedure UWP Log Status Register setting: ● Previous in Flash O New Setting Below
MT29F1G01AAADD	~ Burn Cis	Disable WP
Open Secure Panel		JEDEC ID 0x00 0x00 0x00 Device ID 0xFF 0xFF Query



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Note: SPINANDINFO.sni file is the list file of Flash chips supported by Flash_Tool, you need to update this file at the same time if the Flash chips are updated.

8) The following figure is an example of a properly connected update to the SPINANDINFO.sni file:



 WP Pin & CS Pin: Default
 WP Pin & CS Pin: Default

 Elapsed Time:
 12C: (92, B2), USB 402KHz 00000000000
 Connect Status: Success



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5.Burning kernel

5.1 Enter uboot

5.1.1 After burning the uboot, connect the debug serial port baud rate of 115200, you can see the following print message



5.1.2 Connecting the network cable

Connect one end of the cable to the USB2.0 port on the development board, and the other end to a network that is connected to the computer and on the same network segment.

5.1.3 Set up the FTP server in the following way

Set up the FTP server in the following way

5.1.4 The burn file points to the images folder.

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Tftpd32 by Ph. Jou	nin mware\SSD20X\images S8.4.174 Bealtek PCIe GbE Family Controller	•	Browse	×
Tftp Server Tftp Client	Syslog server DNS server Log viewer			
peer	file	start time	progress	b
•	m			•
About	Settings		Help	

5.1.5 Configure board parameters

Configure the board parameters as follows, where ipaddr is the board's IP, please make sure that the IP is not used by other devices before setting;

Configure the board parameters as follows, where ipaddr is the board's IP,
please make sure that the IP is not used by other devices before setting;
serverip is the FTP SERVER IP
SigmaStar # setenv gatewayip 10.168.4.1
SigmaStar # setenv ipaddr 10.168.4.88
SigmaStar # setenv netmask 255.255.255.0
SigmaStar # setenv serverip 10.168.4.174
SigmaStar # saveenv
Saving Environment to NAND
SPINAND: MDrv_SPINAND_GetPartOffset: UBOOT_PBA==0 and no PNI: 0 0 0
SPINAND: MDrv_SPINAND_GetPartOffset: use offset 440000
SPINAND: MDrv_SPINAND_GetPartOffset: UBOOT_PBA==0 and no PNI: 0 0 0
SPINAND: MDrv_SPINAND_GetPartOffset: use offset 480000
Erasing redundant NAND
Erasing at 0x480000 100% complete.
Writing to redundant NAND OK
SigmaStar #

5.1.6 Automatic burning

After executing the command estar, the board will automatically downloadtheimage and upgrade; SigmaStar # estar

5.1.7 At this point, the printed LOG message on the serial port indicates that the system is being burned.

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COM18:115200baud - Tera Term VT \square \times Help File Edit Setup Control Window ~ 1.6 MiB/s done Bytes transferred = 11427840 (ae6000 hex) >> ubi write 0x21000000 rootfs \${filesize} 11427840 bytes written to volume rootfs >> estar scripts/[[miservice.es Using sstar_emac device TFTP from server 10.168.4.148; our IP address is 10.168.4.88 Filename 'scripts/[[miservice.es'. Load address: 0x23acaca0 Loading: # 2 KiB/s done Bytes transferred = 185 (b9 hex) >> ubi part UBI UBI: detaching mtd2 from ubi0 UBI: mtd2 is detached from ubi0 UBI: parsing mtd_dev string 'mtd=12' UBI: attaching mtd2 to ubi0 UBI: scanning is finished UBI: attached mtd2 (name "mtd=12", size 240 MiB) to ubi0 UBI: PEB size: 131072 bytes (128 KiB), LEB size: 126976 bytes UBI: min./max. I/O unit sizes: 2048/2048, sub-page size 2048 UBI: VID header offset: 2048 (aligned 2048), data offset: 4096 UBI: good PEBs: 1926, bad PEBs: 0, corrupted PEBs: 0 UBI: user volume: 4, internal volumes: 1, max. volumes count: 128 UBI: max/mean erase counter: 2/1, WL threshold: 4096, image sequence number: 0 UBI: available PEBs: 228, total reserved PEBs: 1698, PEBs reserved for bad PEB handling: 40 >> tftp 0x21000000 miservice.ubifs Using sstar_emac device TFTP from server 10.168.4.148; our IP address is 10.168.4.88 Filename 'miservice.ubifs'. Load address: 0x21000000 ******* *******************************

5.1.8 The software progress is also displayed on Tftp32.

rootfs.ubifs to 10	0.168.4.88	× 烧录	→ Brog	wse
File size : 11427840			✓ Show	w Di
3951856 Bytes sent 1975928 Bytes/sec		ver	Log viewer	
		time	progress	
<				

5.2 Burn-in kernelt FAQ

5.2.1 If the following LOG message appears when burning kernel after inputting estar, it means the kernel is not burned

successfully.

SigmaStar # estar
Jsing sstar_emac device
FTP from server 10.168.4.148; our IP address is 10.168.4.88
llename 'auto_update.txt'.
Loading: #
6 8 KiR/s
ione
Bytes transferred = 449 (lcl hex)
>> estar scripts/[[cis.es
Jsing sstar_emac device
TFTP from server 10.168.4.148; our IP address is 10.168.4.88
filename 'scripts/[[cis.es'.
Load address: 0x23acacd0
Loading: #
1000 Bytes/s
None Butes transferred - 208 (d0 her)
Syces transferred = 200 (do new)
>> tftp 0x21000000 boot/SPINANDINF0.spi
Jsing sstar emac device
TFTP from server 10.168.4.148; our IP address is 10.168.4.88
Filename 'boot/SPINANDINFO.sni'.
Load address: 0x21000000
Loading: ##
162.1 KiB/s
ione
Bytes transferred = 18432 (4800 hex)
>> tftp 0x21800000 boot/PARTINFO ppi
Ising setar amag davice
TFTP from server 10.168.4.148; our IP address is 10.168.4.88
Filename 'boot/PARTINFO.pni'.
Load address: 0x21800000
Loading: #
3.9 KiB/s
lone
Bytes transferred = 512 (200 hex)
>> writecis 0x21000000 0x21800000 10 0 0 5
SPINAND: MDrv_SPINAND_GET_INFO: Found SPINAND INFO
(UXC2) (UX26) (UX3)
SPINAND: MDYV SPINAND SearchCIS in DRAM: Search CIS in DRAM
SPINAND: MDrv SPINAND SearchCIS in DRAM: No available SNI match with current SPINAND flash
STIMAN, WriteSpinandCIS: SearchCIS in DRAM fail
writecis - Search CIS in dram then write to spinand.
Jsage:
writecis 0xSNI_ADDR 0xPNI_ADDR [BL0_PBA [BL1_PBA [UBOOT_PBA [COPIES]]]]
estar - script via network
Jsage :
estar
estar - script via network
10000
usage:
SigmaStar # []

5.2.2 At this point you need to copy the latest SPINANDINFO.sni to the images\boot directory and replace the SPINANDINFO.sni file.

> ssd202-buildroot_RCB20200701_ssd202-lvds_hwV1.0_20221220180547 > images > boot				
名称 ^	修改日期	类型	大小	
GCIS.bin	2022-12-20 18:05	BIN 文件	2 KB	
IPL.bin	2022-12-20 18:05	BIN 文件	22 KB	
IPL_CUST.bin	2022-12-20 18:05	BIN 文件	21 KB	
PARTINFO.pni	2022-12-20 18:05	PNI 文件	1 KB	
SpinandBurnImgConfig.cfg	2022-12-20 18:05	Configuration 源	1 KB	
SPINANDINFO.sni	2020-05-21 9:56	SNI 文件	18 KB	
u-boot_spinand.xz.img.bin	2022-12-20 18:05	BIN 文件	231 KB	



5.3Not the first burn-in

Non-first time burn refers to the board that has already burned uboot and can boot to Uboot normally, only need to burn kernel, no need to repeat burn uboot, refer to burn Kernel steps.