



MBS-SAM9G15/9G25 /9G35/9X25/9X35 MDK User Manual

Rev: V1.1 Date: 2012.05.15





Revision History

Rev	Date	Description	Ву
1.0	2012-03-07	Initial version	huangyin
1.1	2012-5-15	Examples added	huangyin

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Chapter 1 The List of Programs

n voie ata	ARM9 products								
projects	9G15	9G25	9G35	9x25	9x35				
adc	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
can	×	×	×	\checkmark	\checkmark				
dma	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
eeprom	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Emac(eth0)	×	\checkmark	\checkmark	\checkmark	\checkmark				
Emac(eth1)	×	×	×	\checkmark	×				
getting-started	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Hsmci_multimedia_card	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Hsmci_sdcard	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Hsmci_sdio	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
LCD_4.3	\checkmark	×	\checkmark	×	\checkmark				
LCD_7.0	\checkmark	×	\checkmark	×	\checkmark				
LCD_10.2	\checkmark	×	\checkmark	×	\checkmark				
periph_protect	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
pmc_clock_switching	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
pwm	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
qtouch	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Rs485_loopback	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Rs485_twoport	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Smc_nandflash	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Spi_serialflash	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Ssc_dma_audio	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
sysc	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
tc_capture_waveform	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
Touchscreen_4.3	\checkmark	×	\checkmark	×	\checkmark				

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Touchscreen_7.0	\checkmark	×	\checkmark	×	\checkmark
twi	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Usart_serial_COM0	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Usart_serial_COM3	×	\checkmark	×	\checkmark	×
Usart_hw_handshaking_COM3	×	\checkmark	×	\checkmark	×
usb_audio_looprec	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_cdc_serial	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_core	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_hid_keyboard	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_hid_mouse	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_hid_msd	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_hid_transfer	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_iad_cdc_cdc	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_iad_cdc_hid	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_iad_cdc_msd	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
usb_masstorage	\checkmark			\checkmark	\checkmark



Chapter 2 Compile

- (1) Install the keil RealView MDK, (in 04-tools\RealView MDK\MDK4.22a)
- (2) The projects are in 05-MDK_Source directory. We choose adc as an example: open

adc_adc10\Project\adc_adc10.uvproj, and compile it(project- \rightarrow rebuild all target files) as shown below:



Figure 1-1 compilation



Chapter 3 Download

(1) Install the SAM-BA(in 03-Tools\);

Note: If SAM-BA 2.10 or less is installed, we should uninstall it before installation.(uninstall both SAM-BA software and board USB driver)

(2) Power on and connect the board and PC with micro USB;

(3) Turn off the the number 1 and nuber 2 switch of SW, and reset the board. And we should install the driver at the first time. The driver can be found under its installation directory:



(4) Check it in the device manager, it should be like this:



Now we can download the program in auto or manual way. Auto download is strongly recommended.

3.1 Auto download

1) install the sam-ba(in detals to 03-tools\SAM-BA\sam-ba install)

2) disable the JP3, and reset the board, you can see the flag as follows:



3) connet the JP3

- 4) open the package of 01_audio\download.and click the file of SAM9G45_MDK_nandflash.bat, let it download
- 5) reset the board, you can see the output of the board

3.2 Manual download

- (1) Take 9G15-adc as an example, after building the program, open the folder
- 05_MDK_Source\adc_adc10\Download\9g15, it should be like this:



Here, the COM8 is the virtual serial port COM of the USB. Select the corresponding board, here is 9G15, and click connect button to connect.(according to your own board's kind to choose the right type)

(3) Configure the environment when connected:

- Step1: choose the serialflash AT25/AT26 tab;
- Step2: choose the enable serialflash to enable dataflash;
- Step3: click execute button;
- Step4: dataflash enabled.

SRMICC by Embest

	at91sam9g15-el	5			
File Script File	Link Help				
-at91sam9g15 Memory	Display				
Start Address : 0	x300000 Ref	resh	format		Applet traces on DBGH
Size in byte(s) : 0	x100	C ascii	C 8-bit C 16-	-bit 💽 32-bit	Apply
0x00300000	0xEA000020	OxFFFFFFFF	0x00000000	0x08000000	<u> </u>
0x00300010	0x00000000	0x00000000	0x00000001	0x00000020	
0x00300020	0x00000000	0x00000000	0x00000000	0x00000000	
0x00300030	0x00000000	0x00000000	0x00000000	0x00000000	•
•				;	step 1
Send File Name Receive File Name step 2 Address	: : : : 0x0	Size (For Receive	File) : Ox1000	byte(s)	Send File Receive File pare sent file with memo
Savinte					
Enable Serialflas	h (SPIO CSO)	_	• Execute	step 3	

(4) After enabled, send the boot file of dataflash:

Step1: choose send boot file;

Step2:click execute button and select the boot file at91sam9x5ek-dataflashboot.bin;

Step3:boot file sent successfully.

SAMICE by Embest

駵 SAN-BA 2.11 – at91sam9g15-ek _ 🗆 × File Script File Link Help -at91sam9g15 Memory Display Display format Applet traces on DBGH Start Address : 0x300000 Refresh infos Apply 🔿 ascii 🔿 8-bit 🔿 16-bit 🖲 32-bit Size in byte(s) : Ox100 0x00300000 . OxEA000020 OxFFFFFFFF 0x00000000 0x08000000 0x00300010 0x00000000 0x00000000 0x00000001 0x00000020 0x00300020 0x00000000 0x00000000 0x00000000 0x00000000 0x00300030 0x00000000 0x00000000 0x00000000 0x00000000 • + DDRAM | DataFlash AT45DB/DCB | EEPROM AT24 | NandFlash | One-wire EEPROM | SRAM | SerialFlash AT25/AT26 -Download / Upload File Send File Name : 2 Send File Receive File Name : Pr -Receive File Address : 0x0 Size (For Receive File) : 0x1000 byte(s) npare sent file with memo step 1 step 2 Scripts-Send Boot File Execute -I- Memory Size : 0x400000 bytes * -I- Buffer address : 0x20009A14 step 3 -I- Buffer size: 0x4000 bytes -I- Applet initialization done (sam-ba_2.11) 1 % VIRRearial VOMB Roard · at91 cam9015-ab 🔄 SAM-BA 2.11 - at91sam9g15-e - O × File Script File Link Help ? × 打开 - at91: 查找范围(I): 🔁 9g15 - 🔇 🜶 📂 🖽aces on DBGH Sta ▼ Apply Size . svn 🔊 at91sam9x5ek-dataflashboot. bin 0 -💣 ddram. bin 0 12 0 0 卓面 4 • **r**26 DDRAM Dov ile File Rec e with memo 図ト -Sei Sen at91sam9x5ek-dataflashboot.bin -打开(0) 文件名 (N): 文件类型(T): Bin Files (*. bin) -取消 ٠ -I- Buffer adaress , ozeocoz -I- Buffer size: 0x4000 bytes -I- Applet initialization done (sam-ba_2.11) 1 % GENERIC::SendBootFileGUI (sam-ba_2.11) 1 % VIRRearial VOMA Board + at 91 cam 9 of 5-ab

(5) Send the image file ddram.bin:

Step1:select ddram.bin;

Step2:enter the download address 0x8400;

Step3:send file;

Step4:download successfully.

SAN-BA 2.11 -	at91sam9g15-el	s			
File Script File	Link Help				
-at91sam9g15 Memory	Display				
Start Address : 0	x300000 Ref	iresh Display	format		Applet traces on DBG
Size in byte(s) : 0	x100	(ascii	() 8-bit () 16	-bit (• 32-bit	Intos
0x00300000	0xEA000020	Oxffffffff	0x00000000	0x0800000	<u> </u>
0x00300010	0x00000000	0x00000000	0x0000001	0x00000020	
0x00300020	0x00000000	0x00000000	0x00000000	0x00000000	
0x00300030	0x00000000	0x00000000	0x00000000	0x00000000	
•) I
Receive File Name step 2 Address	: 0x8400	Size (For Receive	File) : 0x1000	byte(s)	Receive File
Scripts					
Send Boot File			▼ Execute	1	
	(wells any man (ada	adat0 Daumlaad	Oct 5 (dduous lain	at address 0v0400	
File size : 0x3850 ł	/muk_source/auc ovte(s)	_aucio/bowrnoau,	/9y15/uuram.bin	at aduress oxoyou	1
Writing: 0x3 0x3850 byte am-ba 2,11) 1 %	850 bytes at 0x84 s written by apple	100 (buffer addr :) et	0x20009A14)	step 4	

Chapter 4 Programs Testing

4.1 ADC_adc10

- > Test description: This program describes how to use the function of ADC.
- Configuration: default
- Test phenomenon:
 - The HyperTerminal will show the information as below:
 - -- ADC12 Example 2.0 --
 - -- SAM9XX5-EK
 - -- Compiled: Mar 27 2012 17:47:23 --

 - d: DMA Enable/Disable
 - s: Channel sequence switch
 - 0, 1, 2, 3: TRIGGER mode:
 - SW EXT Periodic Continuous

Refresh slow --> fast

- = DMA: Enabled; Trigger mode: 0
- = Sequence: 09 00 02

4.2 CAN

- > Test description: This program shows how to transform USB to RS-232 serial port.
- Configuration: default. disconnect JP9. connect USART0 with serial cable as DBGU, connect J18 and J19
- ➢ Test phenomenon:
 - the HyperTerminal displays:
 - -- CAN Example 2.0 --
 - -- SAM9XX5-EK
 - -- Compiled: May 3 2012 09:12:59 --
 - Test start, DBGU not available now

-I-0: 210000

- CAN0 Sync OK
- -I-1: 210000
- CAN1 Sync OK

-I- 0:20a00002

-I-1: a00060 -I- 0:20a00006 -I-1: a00060 -I-1:40a00040 - CAN0.1: Simple test data received - CAN0.2: Messages to 1 Mailbox received -I-0: a0000e - CAN0.3: Messages to 1 Mailbox(OVR) received -I-1:20a00060 -I-0: a0001e - CAN1.5: Remote requested data received -I-1:20a00062 -I-0: a0007e -I-1:20a00066 -I-0: a0007e -I- 0:40a0005e - CAN1.1: Simple test data received - CAN1.2: Messages to 1 Mailbox received -I-1: a0006e - CAN1.3: Messages to 1 Mailbox(OVR) received -I- 0:20a0007e -I-1: a0007e - CAN0.5: Remote requested data received -I-0: 10007e -I-1: 10007e

4.3 DMA

- > Test description: This program describes the function of DMA
- Configuration: default
- Test phenomenon:
 - The HyperTerminal will show
 - -- DMA Example 2.0 --
 - -- SAM9XX5-EK
 - -- Compiled: Mar 27 2012 17:50:19 --

Menu :

- 1-9, A, B: Programming DMAC for Multiple Buffer Transfers
 - 1: Single Buffer or Last buffer of a multiple buffer transfer
 - 2: Multi Buffer transfer with contiguous DADDR
 - 3: Multi Buffer transfer with contiguous SADDR
 - 4: Multi Buffer transfer with LLI support
 - 5: Multi Buffer transfer with DADDR reloaded

6: Multi Buffer transfer with SADDR reloaded

7: Multi Buffer transfer with BTSIZE reloaded and contiguous DADDR

8: Multi Buffer transfer with BTSIZE reloaded and contiguous SADDR

9: Automatic mode channel is stalling BTsize is reloaded

A: Automatic mode BTSIZE, SADDR and DADDR reloaded

B: Automatic mode BTSIZE, SADDR reloaded and DADDR contiguous

- s: Start DMA transfer

- h: Display this menu

Choose 1~9, A, Multiple Buffer Transfer:

Programming DMAC for Multiple Buffer Transfers in row 1 Programming DMAC for Multiple Buffer Transfers in row 2

Programming DMAC for Multiple Buffer Transfers in row 3

Programming DMAC for Multiple Buffer Transfers in row 4

Programming DMAC for Multiple Buffer Transfers in row 5

Programming DMAC for Multiple Buffer Transfers in row 6

Programming DMAC for Multiple Buffer Transfers in row 7

Programming DMAC for Multiple Buffer Transfers in row 8

Programming DMAC for Multiple Buffer Transfers in row 9

Programming DMAC for Multiple Buffer Transfers in row 10

Programming DMAC for Multiple Buffer Transfers in row 11

Choose s, start the DMA transfer:

			-,-												
-I- \$	Start	DMA	A trar	nsfer											
-I- 7	The S	Sourc	e Bu	ffer c	conte	nt bei	fore t	ransf	er						
00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
00	03	06	09	0c	0f	12	15	18	1b	1e	21	24	27	2a	2d
00	04	08	0c	10	14	18	1c	20	24	28	2c	30	34	38	3c
-I- 7	Гhe I	Desti	natio	n But	ffer c	onter	nt bef	ore to	ransf	er					
5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a
5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a
5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a
5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a	5a

-I- The Source Buffer content after transfer

00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f 00 02 04 06 08 0a 0c 0e 10 12 14 16 18 1a 1c 1e 03 0c 0f 00 06 09 12 15 18 1b1e 21 24 27 2a 2d 00 04 08 0c10 14 18 20 24 28 2c 30 38 1c 34 3c

-I-	The I	Destir	atior	n Buf	fer co	onten	t afte	r tran	sfer		
00	01	02	03	00	01	02	03	00	01	02	03

00	01	02	03	00	01	02	03	00	01	02	03	5a	5a	5a	58
5a															

00 01 02 03

4.4 EEPROM

- > Test description: This program tests the EEPROM module.
- Configuration: default
- Test phenomenon:
- -- EEPROM Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 6 2012 10:42:02 --
- -I- Filling page #0 with zeroes ...
- -I- Filling page #1 with zeroes ...
- -I- Read/write on page #0 (polling mode)
- -I- 0 comparison error(s) found
- -I- Read/write on page #1 (IRQ mode)
- -I- Callback fired !
- -I- Callback fired !
- -I- 0 comparison error(s) found

4.5 EMAC0 (eth0) test

Test description: This routine tests the respond to the ping command issued by the PC through the Ethernet MAC (EMAC) interface and onboard network transceiver.

➢ Configuration: default. Connect the board to the net (if the board is connected to the PC directly, we must use crossover cable).

- > Test phenomenon:
 - the HyperTerminal displays:
- -- EMAC Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: May 3 2012 10:31:32 --
- -- MAC 0:45:56:78:9a:bc
- -- IP 192.168.2.115
- -I- ** Valid PHY Found: 0

Open command window, and input" ping 192.168.2.115".

C: \Documents and Settings \huangyin >ping 192.168.2.115 Pinging 192.168.2.115 with 32 bytes of data: Reply from 192.168.2.115: bytes=32 time<1ms TTL=64 Ping statistics for 192.168.2.115: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 0ms, Average = 0ms C: \Documents and Settings \huangyin>

Test OK!

4.6 EMAC1 (eth1) test

Test description: This routine tests the respond to the ping command issued by the PC through the Ethernet MAC (EMAC) interface and onboard network transceiver.

Configuration: default. Connect the board to the net (if the board is connected to the PC directly, we must use crossover cable).

Test phenomenon:

the HyperTerminal displays:

-- EMAC Example 2.0 --

```
-- SAM9XX5-EK
```

```
-- Compiled: May 3 2012 10:31:32 --
```

- -- MAC 0:45:56:78:9a:bc
- -- IP 192.168.2.115
- -I- ** Valid PHY Found: 0

Open command window, and input" ping 192.168.2.115".

```
C: \Documents and Settings \huangyin >ping 192.168.2.115

Pinging 192.168.2.115 with 32 bytes of data:

Reply from 192.168.2.115: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.2.115:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms

C: \Documents and Settings\huangyin>
```

Test OK!

4.7 getting-started

- > Test description: This program shows the blink of LEDs
- Configuration: default
- Test phenomenon:
 The D1 and D2 blink alternately. On the HyperTerminal, enter 1 to control D1, and enter 2 to control D2.

4.8 hsmci_multimedia_card

- > Test description: This program describes the identification, initialization and function testing of SD card.
- ➢ Configuration: default.

Note: SD and MicroSD cards are needed. Insert the card after the HyperTerminal shows the message.

> Test phenomenon:

The HyperTerminal will show:

- -I- I cache is already enabled.
- -- Basic MultiMedia Card Project 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 28 2012 14:26:08 --
- -I- Cannot check if SD card is write-protected

Enter "1": the main menu

-!- MCK is 133MHz

-!- Buffer@2000b748,size 0x400000

- # i,I : Re-initialize card
- # t : Disk R/W/Verify test
- # T : Disk performance test
- # p : Change number of blocks in one access for test
- # m : Change MCI interface used

Enter "m", choose the card: MCI0 refers to microSD, and MCI1 refers to SD. Take MCI1 as an example. When card is chosen, it will be identified and initialized, we can get the information through the HyperTerminal:

-I- SdMmcIdentify.Cmd5: 3
-I- SD MEM
-I- Card Type 2, CSD_STRUCTURE 0
-W- SD 4-bit mode
-I- HS Not Supported in SD Rev 0x0
-I- SE SD/MMC clock to 22222K
-I- SD/MMC card initialization successful
-I- MEM Card OK, size: 123 MB, 246016 * 512B

-IMID Manufacturer ID 03
Enter "1" again, test SD as the same way:
Enter "i" or "I", initialize the SD card.
Enter "t", test read and write functions of SD
-!- Test code: 1.clr, 2.wr, 3.rd
-I- Testing block [239128 - 246015]All block tested!
Enter T:
-I- Performance test, size 4096K, Multi 8192, MCK 133MHz
-I- Read by Multi block, size 512
-I- Write by Multi block, size 512
Write test Done, Bad 0, Speed 2820K
Read test Done, Bad 0, Speed 10131K
Data verify OK
Enter p:
-!- Performance Multi set to 1
-!- Performance Multi set to 2
-!- Performance Multi set to 4
-!- Performance Multi set to 8
-!- Performance Multi set to 16
-!- Performance Multi set to 32
-!- Performance Multi set to 64
-!- Performance Multi set to 128
-!- Performance Multi set to 256
-!- Performance Multi set to 512
-!- Performance Multi set to 1024
-!- Performance Multi set to 2048
-!- Performance Multi set to 4096
-!- Performance Multi set to 8192
Testing succeed

4.9 hsmci_sdcard

- > Test description: This program tests the SD module.
- > Configuration: default; insert the SD card in the slot

> Test phenomenon:

- -- Basic HSMCI SD/MMC Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 21 2012 16:45:22 --
- -I- Cannot check if SD card is write-protected

```
-- Please insert a card
```

```
插入 SD 卡后:
```


-I- SdMmcIdentify.Cmd5: 3 -E- Acmd41.cmd55:3 -E- SdMmcIdentify.Cmd1: 3 -E- SD Init.Identify: 5 -I- SdMmcIdentify.Cmd5: 3 -I- SD MEM -I- Card Type 2, CSD_STRUCTURE 0 -W-SD 4-bit mode -I- HS Not Supported in SD Rev 0x0 -I- Set SD/MMC clock to 22222K -I- SD/MMC card initialization successful -I- Card size: 123 MB, 246016 * 512B -I- .MID Manufacturer ID 03 -I- .CBX Card/BGA (eMMC) 3 -I- .OID OEM/Application ID (SD) SD -I- .OID OEM/Application ID (MMC) 44 -I- .PNM Product name (SD) **SD128** -I- .PNM Product name (MMC) SD128€ 80 -I- .PRV Product revision (SD) -I- .PRV Product revision (MMC) 90 -I- .PSN Product serial number (SD) 90182858 -I- .PSN Product serial number (MMC) 18285800 -I- .MDT Manufacturing date (SD) 2006/11 -I- .MDT Manufacturing date (MMC) 2003/11 49 -I- .CRC checksum -I- ====== CSD =====-I- === _____ -I- .CSD STRUCTURE 0x0 -I- .SPEC_VERS (eMMC) 0x0 -I- .TAAC 0x26 -I- .NSAC 0x0 -I- .TRAN_SPEED 0x32 -I- .CCC 0x5F5 -I- .READ_BL_LEN 0x9 -I- .READ_BL_PARTIAL 0x1 -I- .WRITE_BLK_MISALIGN 0x0 -I- .READ BLK MISALIGN 0x0 -I- .DSR_IMP 0x0 0xF03 -I- .C SIZE -I- .C_SIZE_HC **0xFEFA** -I- .VDD_R_CURR_MIN 0x7 -I- .VDD_R_CURR_MAX 0x6 -I- .VDD_W_CURR_MIN 0x7

-I-	.VDD_W_CURR_MAX	0x6
-I-	.C_SIZE_MULT	0x4
-I-	.ERASE_BLK_EN	0x1
-I-	.SECTOR_SIZE	0x1F
-I-	.WP_GRP_SIZE	0x7F
-I-	.WP_GRP_ENABLE	0x1
-I-	.R2W_FACTOR	0x4
-I-	.WRITE_BL_LEN	0x9
-I-	.WRITE_BL_PARTIAL	0x0
-I-	.FILE_FORMAT_GRP	0x0
-I-	.COPY	0x1
-I-	.PERM_WRITE_PROTE	ECT 0x0
-I-	.TMP_WRITE_PROTEC	CT 0x0
-I-	.FILE_FORMAT	0x0
-I-	.ECC (MMC)	0x0
-I-	.CRC	0x5A
-I-	.MULT	0x40
-I-	.BLOCKNR	0x3C100
-I-	.BLOCKNR_HC	0x3FBEC0
-I-	.BLOCK_LEN	0x200
-I-	-TOTAL_SIZE	0x7820000
-I-	-TOTAL_SIZE_HC	0xF7D80000

-!- MCI 1, code: 1.clr, 2.wr, 3.rd

-I- Testing block [246000 - 246015] ...All block tested!

4.10 hsmci_sdio

- > Test description: This program tests the SDIO module of SD
- > Configuration: default; insert the SDIO in the SD slot
- > Test phenomenon: the HyperTerminal displays:

```
-- MSMCI SDIO Example 2.0 --
```

```
-- SAM9XX5-EK
```

- -- Compiled: Apr 17 2012 15:41:54 --
- -I- Cannot check if SD card is write-protected

-I- SDIO

- -I- Card Type 8, CSD_STRUCTURE 0
- -I- HS Mode not supported by SDIO
- -I- Set SD/MMC clock to 33333K
- -I- SD/MMC card initialization successful
- -I- ** SDIO ONLY card
- -I- ===== CCCR =====
- -I- .SDIO 01

-ICCCR	01
-ISD	01
-IIOE	00
-IIOR	02
-IIEN	00
-IINT	0
-ICD	0
-ISCSI	0
-IECSI	0
-IBUS_WIDTH	H 0
-I4BLS	0
-ILSC	0
-IE4MI	0
-IS4MI	0
-ISBS	0
-ISRW	0
-ISMB	1
-ISDC	0
-ICIS_PTR	001000
-IBR	0
-IBS	0
-IDF	0
-IFS	0
-IEX	0
-IEXM	0
-IRF	0
-IRFM	0
-IFN0_SIZE	0(0000)
-IEMPC	0
-ISMPC	0
-IEHS	0
-ISHS	0
-I- ==== CISTPL	MANFID ====
-IMANF 03B	В
-ICARD 0000)
-I- == CISTPL_F	FUNCE Fun0 ==
-IFN0_BLK_	SIZE 512(0x0200)
-IMAX_TRA	N_SPEED 5A
R/W Direct test:	

R/W Direct test: CIA: -I- buffer 20: 0: 11 01 00 02 00 00 00 00 02 00 10 00 00 00 00 00

10: 00 00 00 00 Write 0x03 to IEN(CIA.4): rc 0 IEN After Write:0x03 -- test OK R/W Extended test: Dump CIA: -I- buffer 20: 0: 11 01 00 02 00 00 00 02 00 10 00 00 00 00 00 10: 00 00 00 00 Modify Some R/W bytes (2,4) for FN0 and write: CIA after write: -I- buffer 20: 0: 11 01 02 02 02 00 00 00 20 10 00 00 00 00 00 10: 00 00 00 -- test OK

4.11 LCD_4.3

- ➤ Test description: This program tests the display of the LCD module.(including 4.3", 7.0", 10.2")
- Configuration: default
- > Test phenomenon: the LCD displays pictures

4.12 LCD_7.0

- > Test description: This program tests the display of the LCD module.(including 4.3", 7.0", 10.2")
- Configuration: default
- > Test phenomenon: the LCD displays pictures

4.13 LCD_10.2

- > Test description: This program tests the display of the LCD module.(including 4.3", 7.0", 10.2")
- Configuration: default
- > Test phenomenon: the LCD displays pictures

4.14 periph_protect

- > Test description: This program shows how to prevent programs from interfering with the PIO controller.
- ➢ Configuration: default
- > Test phenomenon:

The HyperTerminal displays:

- -- Peripheral Protect Example 2.0 --
- -- SAM9XX5-EK

-- Compiled: Apr 6 2012 11:45:15 --Enter 'l' to enable Write Protect and enter 'u' to disable Write Protect. Select the register to be written by a value(0x12345678). (0x0000) 0 : PIO Enable Register 1: PIO Disable Register (0x0004) 2 : PIO Output Enable Register (0x0010) 3 : PIO Output Disable Register (0x0014) 4 : PIO Input Filter Enable Register (0x0020) 5 : PIO Input Filter Disable Register (0x0024) 6 : PIO Multi-driver Enable Register (0x0050) 7 : PIO Multi-driver Disable Register (0x0054) 8 : PIO Pull Up Disable Register (0x0060) 9: PIO Pull Up Enable Register (0x0064) a: PIO Peripheral ABCD Select Register 1 (0x0070) b: PIO Peripheral ABCD Select Register 2 (0x0074) c : PIO Output Write Enable Register (0x00A0) d : PIO Output Write Disable Register (0x00A4) e : PIO Pad Pull Down Disable Register (0x0090) f: PIO Pad Pull Down Enable Register (0x0094) Press "1" No write protect violation is detected. Press "u" The Write Protect is disabled.

4.15 pmc_clock_switching

- > Test description: This program shows how to switch system clock(PLLA, UPLL, SLCK, MAINCK).
- Configuration: default; baud rate: 1200; debug in SRAM mode only
- Test phenomenon:

(1) the HyperTerminal displays:

** Switch to 1200 bps for DBG **

-- PMC Clock Switching example 2.0 --

- -- SAM9XX5-EK
- -- Compiled: Apr 17 2012 15:13:31 --

--- Current PMC clock from lowlevel pmc configuration ---

The slow clock source is internal 32 kHz RC oscillator

PLLA clock is 800 MHz

PLLA clock is the source of Master clock

MCK Master Clock is prescaler output clock divided by 3

-I- Select main clock as the master clock

-I- Please measure the clock on PCK to make sure it is 12000000 Hz...

-I- Press ` to switch next clock configuration...

Press "`" to switch system clock:

- -I- Select PLLA clock as the master clock
- -I- Please measure the clock on PCK to make sure it is 12500000 Hz...
- -I- Press ` to switch next clock configuration ...

Press "`" to switch system clock:

- -I- Select UTMI PLL clock as the master clock
- -I- Please measure the clock on PCK to make sure it is 7500000 Hz...
- -I- Press ` to switch next clock configuration...

Press "`" to switch system clock:

- -I- Switch the XTAL 32K crystal oscillator to be the source of the slow clock
- -I- Please measure the clock on PCK to make sure it is 32768 Hz...
- -I- Debuging in EWARM IAR C_SPY, the JLINK will disconnect on some PC!
- -I- Press ` to switch next clock configuration ...

4.16 PWM

- > Test description: This program tests the PWM module.
- Configuration: default
- Test phenomenon:
- (1) Connect pin18 of J22 to pin6 of J23, the D13 blinks at the frequency of f1;
- (2) Connect pin17 of J22 to pin6 of J23, the D13 blinks st the frequency of f2; f2 > f1

4.17 qtouch

- > Test description: This program tests the function of qtouch.
- Configuration: default
- Test phenomenon

The HyperTerminal displays:

Example 2.0 --

-- SAM9XX5-EK

-- Compiled: Apr 6 2012 11:14:19 --

-I- QT1070 Chip ID is 2e, Firmware version is 15

Press K3, it shows:

-I- Key 03 detected , signal 2bf

Press K4, it shows:

-I- Key 02 detected, signal 314

Press K5, it shows:

-I- Key 01 detected, signal 32b

Press K6, it shows:

-I- Key 00 detected, signal 327

4.18 Rs485_loopback

- > Test description: This program tests the RS485 mode of the USART module.
- Configuration: Jumpers JP2, JP3, JP4 should be open , others default
- ➢ Test phenomenon

The HyperTerminal displays:

RomBOOT Start AT91Bootstrap... Init DDR... Done! Loading 1-Wire info... Enumerate all roms: Rom#0x0: 0x8f 0x0 0x0 0x3 0x6 0xe1 0x9e 0x2d Rom#0x1: 0x3f 0x0 0x0 0x2 0x55 0xaa 0xe3 0x2d Done, 0x2 1-wire chips found!

Board name: SAM9G15-CM [B1]; Vendor name: EMBEST Board name: SAM9x5-EK [B0]; Vendor name: FLEX sn: 0x4000022; rev: 0x8401 Downloading image... detected dataflash id = 0x1f 0x47 0x1 0x0 0x0. : Apr 28 2012 09:46:33 --RS485 TEST OK!

4.19 Rs485_twoport

> Test description: This program tests the RS485 mode of the USART module.

Configuration: Jumpers JP2, JP3, JP4 should be open , others default. J16 and J17 connected Docking by two wires.

> Test phenomenon

The HyperTerminal displays:

-- Compiled: Apr 28 2012 11:11:45 --

USART0 Sent :Hi,I am USART0.Who are you?

USART1 Received:Hi,I am USART0.Who are you?

USART1 Sent :Hello USART0,I am USART1.

USART0 Received:Hello USART0,I am USART1.

4.20 smc_nandflash

- > Test description: This program tests the nandflash module.
- Configuration: default; enable the nandflash
- ➢ Test phenomenon:

The HyperTerminal will show:

-I- I cache is already enabled.

-- SMC NandFlash Example 2.0 --

-- SAM9XX5-EK

-- Compiled: Mar 28 2012 14:46:08 --

-I- Nandflash ID is 0x9580DA2C

Menu :

- i: Dump Nand flash information

- d: Enable or disable DMA
- r: Performance test (Raw without ECC)
- s: Performance test (Software ECC)
- p: Performance test (PMECC)
- h: Display this menu

Enter "h", display the menu;

Enter "i":

- -I- Size of the whole device in bytes : 0x10000000
- -I- Size in bytes of one single block of a device : 0x20000
- -I- Number of blocks in the entire device : 0x800
- -I- Size of the data area of a page in bytes : 0x800
- -I- Number of pages in one block : 0x40

Enter "d":

- -I- Initialize DMA done.
- -I- Disable DMA done.
- -I- Initialize DMA done.
- -I- Disable DMA done.

Enter "r":

- -I- Erase block 10
- -I- Write block 10
- -I- Raw block write speed 4228K/s
- -I- Read block 10
- -I- Raw block Read speed 6553K/s

Enter "s":

- -I- Disable PMECC using Software ECC.
- -I- Erase block 10
- -I- Write block 10
- -I- Raw block write speed 1506K/s
- -I- Read block 10
- -I- Raw block Read speed 1899K/s

Enter "p":

- -I- Initialize PMECC.
- -I- Erase block 10
- -I- Write block 10
- -I- Raw block write speed 3449K/s
- -I- Read block 10
- -I- Raw block Read speed 5041K/s

4.21 spi_serialflash

- > Test description: This program tests the dataflash module.
- Configuration: default; enable the dataflash.
- ➢ Test phenomenon:

The HyperTerminal shows:

- ith Serialflash Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 28 2012 15:50:29 --

DMA driver initialized with IRQ

SPI and AT25 drivers initialized

ID read: 1471f

AT25DF321A serial flash detected

Flash unprotected

Chip is being erased...

Checking erase ...

Checking page #16383king page #16097

Erase successful.

Programming a walking 1 on all pages ...

Programming page #16383gramming page #8175

Walking 1 test successful.

4.22 ssc_dma_audio

- > Test description: This program tests the audio module.
- Configuration: default.
- Test phenomenon:

The HyperTerminal shows:

dc-audio Example 2.0 --

-- SAM9XX5-EK

-- Compiled: Mar 28 2012 16:01:26 -

-- ssc_dma_audio --Menu : ------

- x: Receive WAV file with XModem Protocol
- X: Receive WAV file through DBGU

这里选择 x:XModem Protocol 传输,如下图所示:

査找范围(∐):	🚞 ssc_dma_audio	<u> </u>	▶ 🛄 🗸
). svn			
Download			
Project			
🗋 Readme			
User			
DUser sample.wav			
Duser sample.wav	1		
DUser sample.wav (件名(M):	sample.wav		发送
Duser sample.way (件名(M):	sample.wav		发送

Transfer wav file with 1K XModem, Ctrl + D to cancel

正在开始 xmodem 传输。 按 Ctrl+C 取消。 正在传输 sample.wav... 100% 274 KB 8 KB/s 00:00:34 0 错误 发送完毕后,超级终端显示选择目录: [2J-- ssc_dma_audio --Menu : _____ W: Play the WAV file loaded I: Display the information of the WAV file x: Receive WAV file with XModem Protocol X: Receive WAV file through DBGU 按照提示行选择,选择W,可以用耳机听到播放的音乐,同时超级终端显示: -- ssc_dma_audio --Menu: I: Display the information of the WAV file

SAMICE by Embest

S: Stop playback 选择 I, 可以看到 WAV 文件的信息: -- WAV file @ 22000000 Wave file header information

- Chunk ID	= 0x46464952
- Chunk Size	= 281028
- Format	= 0x45564157
- SubChunk ID	= 0x20746D66
- Subchunk1 Size	= 16
- Audio Format	$= 0 \times 0001$
- Num. Channels	= 2
- Sample Rate	= 48000
- Byte Rate	= 192000
- Block Align	= 4
- Bits Per Sample =	= 16
- Subchunk2 ID	= 0x61746164
- Subchunk2 Size	= 280992
Press any key to ret	turn to menu
选择 x:重新传输 WA	V 文件;
选择X重新通过DB	GU 传送 WAV 文件。
Transfer way file thro	ugh RAW binary mode

```
-- Please start binary data in 20 seconds:
*********?????
```

4.23 sysc

- \geqslant Test description: This program tests the sysc
- Configuration: default; baudrate: 1200; disconnect the JP1 \succ
- Test phenomenon: \geq

The HyperTerminal displays:

```
-- SYSC Example 2.0 --
```

- -- SAM9XX5-EK
- -- Compiled: Mar 15 2012 10:50:59 --

Menu: press a key to select a mode.

Mode:

N : Normal Mode

I : Idle Mode

B : Backup Mode
(Entered 1 times, last wakeup/reset status 0x00020000).
Quit:
Q : Quit test.
* Current RTC Time: 9:48:10
Press "N", enter the normal mode:
Enter in Normal Mode
- Press a key to go out
Exit Normal mode
Press "I", enter the interrupt mode:
Enter in Idle Mode
- Wait for interrupt
- Press a key to go out
Exit Idle Mode
Press "B", enter the backup mode:
Enable RTC Alarm(Y/N)?Y
Select Alarm Time:
1. In 2 seconds
2. In 3 seconds
3. In 5 seconds
4. In 10 seconds
Selection: 2
* Current time: 9:52:12
Enter in Backup Mode
- Press WAKE UP button to wakeup

4.24 tc_capture_waveform

> Test description: This routine describes in capture model, the TC functions of measure pulse frequency and calculate the values.

- Configuration: default; connect pin13 and pin14 of J28
- ➢ Test phenomenon

```
The HyperTerminal displays:
```

```
-- Capture waveform example 2.0 --
```

- -- SAM9XX5-EK
- -- Compiled: Apr 6 2012 11:55:07 --

Configure TC0 channel 1 as waveform operating mode

Start waveform: Frequency = 178 Hz,Duty Cycle = 30%

Configure TC0 channel 2 as capture operating mode

Please Connect PA22 to PA23 on SAM9xx5-EK for wave capture test.

Menu :

Output waveform property:

- 0: Set Frequency = 178 Hz, Duty Cycle = 30%
- 1: Set Frequency = 375 Hz, Duty Cycle = 50%
- 2: Set Frequency = 800 Hz, Duty Cycle = 75%
- 3: Set Frequency = 1000 Hz, Duty Cycle = 80%
- 4: Set Frequency = 4000 Hz, Duty Cycle = 55%

c: Capture waveform from TC 0 channel 2

- s: Stop capture and display informations what have been captured
- h: Display menu

Start waveform: Frequency = 178 Hz,Duty Cycle = 30%
Start waveform: Frequency = 375 Hz,Duty Cycle = 50%
Start waveform: Frequency = 800 Hz,Duty Cycle = 75%
Start waveform: Frequency = 1000 Hz,Duty Cycle = 80%
Start waveform: Frequency = 4000 Hz,Duty Cycle = 55%
Start capture, press 's' to stop
Captured 17787 pulses from TC0 channel 2, RA = 1874, RB = 4166
Captured wave frequency = 4000 Hz , Duty cycle = 55%

4.25 Touchscreen_4.3

- > Test description: This program tests the touch of the LCD module.(including 4.3", 7.0")
- Configuration: default
- Test phenomenon: follow the instructions to calibrate the LCD

4.26 Touchscreen_7.0

- ➤ Test description: This program tests the touch of the LCD module.(including 4.3", 7.0")
- Configuration: default
- > Test phenomenon: follow the instructions to calibrate the LCD

4.27 TWI

Test description: This program tests the slave mode of the TWI module. It simulates the function of the serial memory, TWI host can read and write data in the internal SRAM.

- Configuration: there should be 2 board: a master and a slave Connect the TWD0 (SDA) to each other: pin 18 of the J25 Connect the TWCK0 (SCL) to each other: pin 17 of the J25 Connect the GND to each other: pin 29 or 30 of the J25
- > Test phenomenon:

The HyperTerminal dispays:

- ROM Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Apr 28 2012 15:29:31 --
- -I- Filling page #0 with zeroes ...
- -I- Filling page #1 with zeroes ...
- -I- Read/write on page #0 (polling mode)
- -I- 0 comparison error(s) found
- -I- Read/write on page #1 (IRQ mode)
- -I- Callback fired !
- -I- Callback fired !
- -I- 0 comparison error(s) found

4.28 Usart_serial_COM0

> Test description: This routine simulate USART0 as DBGU port to transfer data.

- Configuration: default; connect USART0(J13) to PC with serial cable.
- > Test phenomenon:

(1) the HyperTerminal displays:

Start waiting data by using DMA:

(2) we can enter characters through keyboard, they will be displayed on the HyperTerminal:

Start waiting data by using DMA:

Hello, this is usart0 test!

(3) we can transfer files to USART0. Create a .TXT file on PC:

▲ usrat0_test.txt - 记事本 文件 ② 编辑 ③ 格式 ④ 查看 ④ 帮助 ④
↓sart0 test OK! usart0 test OK!

Send the file to HyperTerminal through UASRTO, the HyperTerminal will displays the content.

usart0 test OK!

4.29 Usart_serial_COM3

- > Test description: This routine simulate USART0 as DBGU port to transfer data.
- Configuration: default; connect USART0(J14) to PC with serial cable.
- Test phenomenon:

(1) the HyperTerminal displays:

Start waiting data by using DMA:

(2) we can enter characters through keyboard, they will be displayed on the HyperTerminal:

Start waiting data by using DMA:

Hello, this is usart0 test!

4.30 Usart_hw_handshaking_COM3

- > Test description: This routine tests USART Hardware Handshaking
- Configuration: default; connect USART3(J14) to PC with serial cable.
- Test phenomenon:

The HyperTerminal displays:

- -- USART Serial Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: May 2 2012 16:46:15 --
- -- Start to echo serial inputs --4.29 Usart_hw_handshaking_COM3
- > Test description: This routine tests the USART Hardware Handshaking.
- Configuration:

HyperTerminal configuration: default; data flow control: hardware.

Connect the USART3 and PC (TXD to RXD, RTS to CTS, GND to GND) with a serial cable which support hardware control.

- Test phenomenon:
 - The HyperTerminal displays:
- -- USART Hardware Handshaking Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: May 2 2012 16:39:45 -

-- Bps: 0; Tot: 0

Send (without any protocol) a TXT file to the board. Choose "Transmit -> Send a text file" (This option does not support binary file transfer). After beginning bps and total size will be shown on the screen.

When succeed, the number of bytes received should be the size of the file (If it is a text file, the number of bytes received may not equal to the size of the file. Refer to Readme.txt).

4.31 USB_Audio

Test description: This routine tests the USB Audio Loopback-Recorder

Configuration: default

Test phenomenon: This routine simulates a USB Desktop Speaker which has a microphone. It can only echo the voice as a microphone input, and can not speak. The board running this routine connected to a host (such as PCs) via a USB cable is the host of the desktop speaker. You can play sound in host side through the USB Audio Device. When playing sound, you can also record through the USB Audio Device on the host.

The HyperTerminal displays:

ice Audio LoopREC Example 2.0 ---- SAM9XX5-EK -- Compiled: May 2 2012 16:59:01 --

USBD_Init

When connecting USB cable to windows, the LED blinks, and the host reports a new USB device attachment (if it's the first time you connect an audio speaker demo board to your host). You can find new "USB Composite Device" and "USB Audio Device" appear in the hardware device list.

4.32 USB_CDC_serial

- > Test description: This program shows how to transform USB to RS-232 serial port.
- Configuration: default
- Test phenomenon:
- (1) Follow the instructions to install the CDC driver. (libraries\usb\device\cdc-serial\drv)

(2) After the driver installed successfully, there will be a new serial COM in the device manager:

4.33 USB_core

- > Test description: This program tests the USB module.
- Configuration: default; connect the board and PC with USB cable.

> Test phenomenon: the PC prompted the discovery of new hardware, and we can find new USB device through the Device Manager:

4.34 USB_HID_mouse

> Test description: control the mouse using the board USB module keys

Configuration: default; connect the board and PC with USB cable;

> Test phenomenon: the PC prompted the discovery of new hardware, and we can find new USB device through the Device Manager:

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The HyperTerminal displays:

-- Device HID Mouse Project 2.0 --

-- SAM9XX5-EK

-- Compiled: Mar 28 2012 17:35:02 --

-- Press W S A D to move cursor

-I- HIDDFunction_Initialize

USBD_Init

-I- VBus configuration

-I- conn

Press W, S, A, D to move cursor

4.35 USB_HID_keyboard

- > Test description: control the keyboard using the board USB module
- Configuration: default; connect the board and PC with USB cable;

> Test phenomenon: the PC prompted the discovery of new hardware, and we can find new USB device through the Device Manager:

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The HyperTerminal displays:

- -- Device HID Keyboard Project 2.0 --
- -- SAM9XX Mar 28 2012 17:32:58 --
- -- : DBG key 1 2 used as buttons
- --: 1st press to push, 2nd press to release
- -I- HIDDFunction_Initialize

USBD_Init

-I- VBus configuration

-I- conn

•••••

Press "1" on the keyboard, the HyperTerminal will continue to enter "a"; when press "1" again, it will stop:

-I- Key 0 pressed

4.36 USB_HID_MSD

- > Test description: This program tests the storage function of usb_hid
- Configuration: default
- Test phenomenon:

(1) the HyperTerminal displays:

SB HIDMSD Device Project 2.0 --

-- SAM9XX5-EK

-- Compiled: Mar 28 2012 17:37:09 --

- --: DBG key 1 2 used as buttons
- -- : 1st press to push, 2nd press to release

-I- LUN init

RamDisk @ 22000000, size 10485760

-I- RAM Disk init

- -I- LUN init
- -I- LUN: blkSize 1, size 20480
- -I- HIDDFunction_Initialize
- -I- MSDFun init

MSDReset USBD_Init

-I- VBus configuration

-I- conn

.....

(2) We can see another virtual COM through the Device Manager:

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(3) There will be a 10M removable disk. We can use it as an ordinary disk after format it.

4.37 USB_HID_transfer

- > Test description: This program tests the HID transfer.
- Configuration: default; after reset the board, double click hidTest.exe
- Test phenomenon:
- (1) One more HID virtual COM is found in the Device Manager:

(2) Click read button to get the ID of HID; and the D1, D2 are control by "LED1", "LED2" respectively.

Sample HID client app	×
Device Information	
HID Device	
Device 176, UsagePage Offff, Usage Off	•
Item Type	Item attributes
DEVICE ATTRIBUTES	Vendor ID: 0x3eb
Items	Version Number 0x100
Output (Pipe OUT):	Hex Write SetReport
Enter Output	
Input (Pipe IN): Monitor BUTTONs	HID设备ID编号 / Hex Read
80 D2 E6 00 00 3A 65 36 64 32 3A 35 39 30 39 30 21	00 00 00 00 00 00 00 00 00 00 00 00 00
BUTTON 1 BUTTON 2 LED 1	LED 2 About Exit

4.38 USB_IAD_CDC_CDC

- > Test description: This routine tests the function of USB virtual port.
- Configuration: default
- > Test phenomenon:
- (1) the HyperTerminal displays:
- -- Vitual CDC Device Project 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 23 2012 17:09:23 --
- -I- DUALCDCDDriver_Initialize
- -I- CDCDSerialPort_Initialize
- -I- CDCDSerialPort_Initialize

USBD_Init

- -I- VBus configuration
- -I- conn

.....

(2) there will be two more USB virtual ports in the device manager:

□ 『 端口 (COM 和 LPT) □ 『 AT91 USB to Serial Converter (COM11) ② AT91 USB to Serial Converter (COM12)

4.39 USB_IAD_CDC_HID

- > Test description: This routine tests the function of USB_IAD_CDC key.
- ➢ Configuration: default
- > Test phenomenon:
- (1) the HyperTerminal will displays:
- -- Device Project 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 27 2012 18:35:20 --
- -- : DBG key 1 2 used as buttons
- --: 1st press to push, 2nd press to release
- -I- CDCDSerial_Initialize
- -I- CDCDSerialPort_Initialize
- -I- HIDDFunction_Initialize

USBD_Init

-I- VBus configuration

-I- conn

.....

(2) We can find another USB virtual port in the device manager:

- 白-罗端口 (COM 和 LPT) - - ア AT91 USB to Serial Converter (COM13)
- (3) Press "1" on the keyboard, the HyperTerminal will continue to enter "a"; when press "1" again, it will stop:

-I- Key 0 pressed

4.40 USB_IAD_CDC_MSD

- > Test description: This routine tests the storage function of USB_CDC.
- Configuration: default
- ➢ Test phenomenon:
- (1) the HyperTerminal displays:
- -- USB CDCMSD Device Project 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 27 2012 18:08:04 --
- -I- LUN init

RamDisk @ 22000000, size 10485760

- -I- RAM Disk init
- -I- LUN init
- -I- LUN: blkSize 1, size 20480
- -I- CDCDSerial_Initialize

-I- CDCDSerialPort_Initialize
-I- MSDFun init
MSDReset USBD_Init
-I- VBus configuration
-I- conn

(2) We can find another USB virtual port in the device manager:

□ 罗端口 (COM 和 LPT) AT91 VSB to Serial Converter (COM14)

(3) There will be a 10M removable disk. We can use it as an ordinary disk after format it.

4.41 USB_massstorage

> Test description: This program tests the function of usb_massstorage.

- Configuration: default
- > Test phenomenon:

(1) the HyperTerminal displays:

- -- USB Device Mass Storage Example 2.0 --
- -- SAM9XX5-EK
- -- Compiled: Mar 23 2012 17:17:49 --
- -I- LUN init

RamDisk @ 22000000, size 10485760

- -I- RAM Disk init
- -I- LUN init
- -I- LUN: blkSize 1, size 20480
- -I- MSDFun init
- MSDReset USBD_Init
- -I- VBus configuration
- -I- conn
-

(2) There will be a 10M removable disk. We can use it as an ordinary disk after format it.

Appendix 1 Configuration

Note: here we take the 9G15 as example. If you own other kinds of the 9X5 serial, you just need to change 9G15 to your kind.

The environment is set by default, we can download the program directly. We must check out the configuration

unless it cannot be compiled or download.

(1) Choose Project/Options for Target Audio, select AT91SAM9G15 as figure 1.1:

Z Options for Target (BS-SAM) Device Target Output Listing U	G15' ser C/C++ Asm Linker Debug Vtilities
Database: Generic CPU Data	3ase 💌
Device: AT91SAM9G15 Toolset: ARM	
AT91SAM9260 AT91SAM9261 AT91SAM9261S AT91SAM9263 AT91SAM9263 AT91SAM9618 AT91SAM9618 AT91SAM9658 AT91SAM9645 AT91SAM98665 AT91SAM98665 AT91SAM98665 AT91SAM98665 AT91SAM9865 AT9	ARM926EJ-S based High-performance 32-bit RISC Microcontroller with Thumb extensions, 16KB Data Cache, 16KB Instruction Cache, max clock s High Bandwidth Multi-port DDR2 Controller, 32-bit External Bus Interface, Reset Controller, Shutdown Controller, Periodic Interval Timer, Watchdog Timer, Real-Time Timer, Real Time Clock, Two dual port 8-channel DMA Cc Management Controller, LCD Controller, USB High Speed Host Controller, USB High Speed Device 1
ОК	Cancel Defaults Help

Figure 1.1 device selection

(2) The items under target are configured Automatically when the device has been chosen. As figure 1.2 shown:

mel A I 915AM	19615	∐tal (MHz):	2.0		ieneration	-	Ê	
perating syste	m: None		•		se Cross-Mo	dule Optimiz	ation	
ystem-Viewer	, File (.Sfr):			ΓU	se MicroLIB		🗖 Big Endian	
SFD\Atmel\SA	M9G15VAT91SA	M9G15.sfr						
Read/Only M default off-c	emory Areas hip Start 11:	Size	Startup C	- Read∕ default	Write Memo off-chip RAM1:	ry Areas Start	Size	Nolnit
RUN RON on-c	12: 13: hip				RAM2: RAM3: on-chip			
	11: 0x100000	0x10000	0		IRAM1:	x300000	0x8000	

Figure 1.2 target configuration

(3) The items under output are configured as figure 1.3 shown:

Device Target	arget 'HBS-SAM9G15' Output Listing User C/C++ Asm Linker Debug Utilities	×
Select Folde	er for <u>O</u> bjects <u>N</u> ame of Executable: ddram	
© Create Exe ☑ Debug I ☑ Create H	Browse for Folder ?X Folder: 9g15 • + E 🕂 III • h File	
C Create Libr		
	Path: F发板组\9x5_mdk\kdc_adc10\Project\9g15\	
	OK Cancel Defaults Help	

Figure 1.3 output configuration

(4) Click listing tab, select the folder project/9g15 as shown in figure 1.4:

	isting User C/C++	Asm Linker Debug Utilities	
Select Folder for Listings	s Page <u>v</u>	Vidth: 79 🛨 Page Length: 66 🛨	
Assembler Listing: .\9g1 Cross Reference	15*.lst		
C Compiler Listing: .\9g	15*.txt		-
	\9a15*;		
1 Childpicesson Eloung.	. logion li		
✓ Linker Listina: \9a15\d	ldram map		
✓ Linker Listing: .\9g15\d ✓ Memory Map	ldram.map I⊄ Symbols	☑ Size Info	
 ✓ Linker Listing: .\9g15\d ✓ Memory Map ✓ Callgraph 	ldram.map I✓ Symbols I✓ Cross <u>B</u> eference	☑ Size Info ☑ Iotals Info	
 ✓ Linker Listing: .\9g15\d ✓ Memory Map ✓ Callgraph 	ldram.map I Symbols I Cross <u>R</u> eference	I Size In <u>f</u> o I _ Iotals Info I _ Unused Sections Info	
 ✓ Linker Listing: .\9g15\d ✓ Memory Map ✓ Callgraph 	ldram.map I Symbols I Cross <u>R</u> eference	✓ Size Info ✓ Iotals Info ✓ Unused Sections Info ✓ Veneers Info	
 ✓ Linker Listing: .\9g15\d ✓ Memory Map ✓ Callgraph 	ldram.map ☑ Symbols ☑ Cross <u>R</u> eference	 ✓ Size Info ✓ Iotals Info ✓ Unused Sections Info ✓ Yeneers Info 	

Figure 1.4 Listing configuration

(5) the User tab are configured as figure 1.5 to convert ddram.axf to ddram.bin, and deposits it into the download folder.

Options for Target	'∎BS-SA∎9G15'	
evice Target Output	Listing User C/C++ Asm Linker Debug Utilitie	s
- Run User Programs Befo	re Compilation of a C/C++ File	
E Bun #1		
E 0		
jnun #2.		
– Run User Programs Befo	e Build/Rebuild	
		DOS16
E Bun #2		
- Bun User Programs After	Build/Bebuild	
Runs #1:	xxebin -o/Download/9g15/ddram bin _/9g15/ddram axf	
IRun #2:		IDUSIB
Beep When Complete	e 🔽 <u>S</u> tart Debugging	
	OK Cancel Defaults	Help
	Calcel	

Figure 1.5 User configuration

(6) the items of C/C++ tab are configured as figure 1.6-1.7:

V Options for Target 'MBS-SAM9G15 Device Target Output Listing User	5' C/C++	X
Preprocessor Symbols Define: sam9g15 ddram TRACE_LEVE Undefine: sam9g15 ddram TRACE_LEVE Language / Code Generation sam9g15 ddram TRACE_LEVE	EL=4	
 Enable ARM/<u>I</u>humb Interworking Optimization: Level 0 (-00) Optimize for Time Split Load and Store Multiple One ELF Section per Function 	Strict <u>A</u> NSI C Read-Only Position Independent <u>Read-Write Position Independent</u>	Warnings: <unspecified></unspecified>
Include Paths Controls Compiler control string	am9xx5;\\libraries\libchip_sam9xx5\includ apcs=interworksplit_sections -I\User -I\ i\include -I\\libraries\libboard_sam9xx5-e	le;,.\\libraries\libboard_ssi
OK	Cancel Defaults	Nelp

Figure 1.6 C/C++ configuration(1)

- Preproces	or Symbols Folder Setup		?×
Undefine	Setup Compiler Include Paths:	🛅 🗙 🗲	•
Languagi Enabl Optimizati Optim Split L	<u>Vubraries\libchip_sam9xx5</u> \\libraries\libchip_sam9xx5\include \\libraries\libboard_sam9xx5-ek \\libraries\libboard_sam9xx5-ek\include		
Cone <u>I</u> Include Paths <u>Misc</u> Controls	ок	Cancel	
compiler control_ string			

Figure 1.7 C/C++ configuration(2)

(7) Configure the Link tab as figure 1.8 shown:

SRMICC by Embest

evice Tar	get Output	Listing	Vser	C/C++ As	n Lir	uker Debu;	; Util	ities	
🔲 <u>U</u> se Me	mory Layout fr	om Target Dial	log						
П Ма <u>к</u>	e RW Section	ns Position Inde	ependent		R/0 8	Base:			-
∏ M <u>a</u> k	e RO Section	s Position Inde	pendent		- B/W	Base			-
🗖 Do <u>n</u>	't Search Star	idard Libraries			· · · · <u>· ·</u>				
🔽 Rep	ort 'might fail'	Conditions as E	rrors	gi	sable Warn	iings.			
Scatter File		s\libboard_sam	19xx5-ek\r	esources/mc	k\sam9g1	5\ddram.sct			E dit
Scatter File <u>M</u> isc controls		Nibboard_sam	ı9xx5-ek∖r	esources\mc	k\sam9g1	5\ddram.sct]		Edit

Figure 1.8 Link configuration

(8) Choose project- \rightarrow rebuild all target files to rebuild all target files:

🔣 E : \	开发板	狙\9 x5	_mdk\adc_adc10\Project\adc_adc10.uvproj = #Vision4								
<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	Pro	ject	F1 <u>a</u> sh	<u>D</u> ebug	Pe <u>r</u> ipherals	<u>T</u> ools	<u>s</u> vcs	Window	<u>H</u> elp
1 🗋 🛛	<i>i</i>	Ø 🛛		New µ	Vision	Projec	t				
1 🧆 (ا		New Mu	ulti-Pr	oject <u>W</u>	orkspace				
Projec	t			<u>O</u> pen H	Project						
	MBS-SA	M9G15		<u>C</u> lose	Projec	t					
Ē	te 🔁	artup		Export	t						
		board_ cp15_a		Manage	e						
l P		iplibra cn15 c		<u>S</u> elect	t Devic	e for T	arget 'MBS-SAM	(9G15'			
	🗄	adc. c		Remov	e Item						
		pit.c	×	O <u>p</u> tion	ns for	Target	'MBS-SAM9G15'.				
		pio_it		Clean	<u>t</u> arget						
		pmc.c wdt.c		<u>B</u> uild	target						
	🗄	aic.c		<u>R</u> ebuil	1d all	target	files				
		dmac.c		Batc <u>h</u>	Build.						
	📩	board		Tr <u>a</u> nsl	late E:	\开发板	徂\9x5_mdk\adc	_adc10\U	ser\ma	in.c	
		board_		Stop B	b <u>u</u> ild						
		dbgu_c dbg_ut	\checkmark	<u>1</u> E:\;	开发板组	\9x5_md	ik\adc_adc10\P	roject\a	dc_adc	10. uvproj	
		timeti		<u>2</u> E:\B	EMBS\EM	-STM321	OC\07-EMAC_Te	st\uIP\P	roject	Webserve	r_Demo_uIP\RVMDK\Project
	<u>L</u>	retarg		3 8-13	II 49 kH 48	Av5 md	lb\esttine-cta	rted\Pro	iect\e	attine-et	erted uvoroj

Appendix 2 Debug

Note: here we take the 9G15 as example. If you own other kinds of the 9X5 serial, you just need to change 9G15 to your kind.

The basis of the following steps is you purchase or already have the appropriate hardware emulator ULink2.

1) Choose the emulator and initial the script

Options for	Target 'BS-SAB9G15'	x
Device Target	t Output Listing Vser C/C++	Asm Linker Debug Ttilities
O Use <u>S</u> imulat □ Limit Speed	tor Settings to Real-Time	✓ Use: ULINK ARM Debugger ▼ Settings
Load Applic	ation at Startup 🔽 Run to main() : Edit	Load Application at Startup Run to main() Initialization File: Fek\resources\mdk\sam9xx5-ek-ddram.ini Edit Edit
Restore Debu Breakpo Watch V Memory	ug Session Settings pints I⊄ Toolbox Windows & Performance Analyzer Display	Restore Debug Session Settings Breakpoints IV Toolbox Watch Windows Memory Display
CPU DLL:	Parameter:	Driver DLL: Parameter:
SARM.DLL	-cAT91SAM9G	SARM.DLL
Dialog DLL: DARMATS9.D	Parameter: L p91SAM9G15	Dialog DLL: Parameter: TARMATS9.DLI -p91SAM9G15
·	OK Ca	ncel Defaults Help

2) Check the ULINK2, this step is optional.

Connect the ULINK2 to board via USB cable, if the RUN and COM indicator light first turns blue then turns off, and the USB indicator light is red, then there is no problem with ULINK2.

Click the Setting menu under Debug, if it is shown as below, the ULINK2 works well.

ABM Target Driver Setup		X
ULINK USB - JTAG Adapter	_JTAG Device Chain	
Serial No: V0012B9E	TDO 0x0792603F ARM926EJ-S Core 4	ve S Win
Firmware Version: V1.42 Max JTAG Clock: 1MHz	Automatic Detection ID CODE: Manual Configuration Device Name: Add Delete Update IR Ien:	
Debug Cache Options I Cache <u>C</u> ode I Cache <u>M</u> emory	Download Options Misc Options □ Verify Code Download ✓ □ Download to Elash ✓	
	OK Cancel <u>H</u> elp	

3) Check the ULINK2 can detect the board, this step is optional.

Click the Setting menu under Debug, if it is shown as below, the ULINK2 works well.

ABM Target Driver Setup	
ULINK USB - JTAG Adapter	JTAG Device Chain
Serial No: VOOT289E ULINK Version: ULINK2 Device Family: ARM Firmware Version: V1.42 Max JTAG Clock: 1MHz Use nTRST	IDCODE Device Name IR len Move TD0 0x0792603F ARM926EJ-S Core 4 Up TD1 Down © Automatic Detection ID CODE: © Manual Configuration Device Name: Add Delete Update
Debug Cache Options I♥ Cache <u>C</u> ode I♥ Cache <u>M</u> emory	Download Options Misc Options ✓ Yerify Code Download ✓ ✓ Download to Flash ✓ OK Cancel

4) Click or click Debug->Start/Stop Debug Session to debug:

Appendix 3 Contact Us

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