AT91SAM9G45-EVK MDK User Manual







Revision History

Rev	Date	Description
1.0	2011-05-24	Initial version

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Chapter 1 Configuring and compilation in MDK project

Initially install the keil RealView MDK (in 04-tools\Realview MDK 4.01 directory). Then open 04-MDK_Source\MDK4.01_Examples\01_audio directory, double click Audio.uvproj. You can set the project (NOTE: the project is set to OK in default, you can compile and download it directly. If you can't compile this project, you can check these settings.)

1)	Choose Project/Options for	Target Audio,	open the dialog :
----	----------------------------	---------------	-------------------

Options	for Ta	irget 'Au	dio'						
Device	Target (Output List	ing User	C/C++ /	lsm I	linker []	Debug Vtili	ties	
Atmel AT91SAM9G45									
			<u>Xtal (MHz):</u> 12.	0		eneration			
Operati	na system:	None	,	_		se Cross-I	Module Optimizat	tion	
		1			V	se MicroL	IB L	Big Endian	
						se Link-Ti	me Code Genera	ation	
- Read/	Only Memo	ry Areas	Size	Chartup	-Read/	Write Men	nory Areas	Cizo	Naloit
deradul	on-chip	Juan	- JIZE	Stattup	deradit	on-chip		Jize	
	ROM1:			0		RAM1:			
	ROM2:			0		RAM2:			
	ROM3:			C	Г	RAM3:			
	on-chip					on-chip			
	IROM1:	0x400000	0x10000	œ		IRAM1:	0x300000	0x10000	
	IROM2:			0	Г	IRAM2:			
								-	
			OK	Can	cel	Det	faults		Help

Figure 1-1 Target Tab

2) Click User tab in Figure 1-1, it is used to build .bin file, as follows:

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tions for	Target 'Audio'	×
evice Target	Output Listing User C/C++ Asm Linker Debug Utilities	
-Run User Progr	ams Before Compilation of a C/C++ File	_
🔲 Run #1:	🗖 DOS16	
🔲 Run #2:	🗆 DOS16	
E Run #1:	DOS16	
Run User Progr	ams After Build/Rebuild	
Run #1:	rrometr.exe -bin -o/download/Audio.bin ./RUN_IN_DDRAM/Audio.axt DOS16	
I Run #2: ✓ <u>B</u> eep Wher	Complete Start Debugging	
	OK Cancel Defaults Help	

Figure 1-2 User Tab

3) Then click C/C++ tab as follows:

Options for Target 'Audio'	×						
Device Target Output Listing User C/C++ Asm Linker Debug Utilities							
Preprocessor Symbols Define at91sam9g45 ddram NOFPUT_TRACE_LEVEL=4 Undefine: Undefine:							
Language / Code Generation							
I ■ Enable ARM/I_humb Interworking I ■ Strict ANSI C Warnings: Optimization: Level 0 (-00) ■ Enum Container always int <unspecified></unspecified>							
Optimize <u>f</u> or Time Plain Char is Signed Thumb Mode Thumb Mode							
Image: Section per Function Image: Bead-Write Position Independent							
Include Paths \inc;\\common\at91lib;\\common\at91lib\boards;\\common\at91lib\drivers;\\common\a							
OK Cancel Defaults Help							

Figure 1-3 C/C++ Tab

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4) Set Linker tab as follows:

Options for Target 'EM_SAM9645_TEST'	×
Device Target Output Listing User C/C++ Asm Linker Debug Utilities □ Use Memory Layout from Target Dialog □	
Scatter Common\at91lib\boards\at91sam9g45\ddram.sct Edit	
Misc controls Image: Second controls Linker control device DARMATS9 *.ostrictscatter ''\\common\at91lib\boards\at91sam9g45\ddram.sct'' device DARMATS9 *.ostrictscatter ''\\common\at91lib\boards\at91sam9g45\ddram.sct'' device DARMATS9 *.ostrictscatter ''\\common\at91lib\boards\at91sam9g45\ddram.sct'' autoatsummary_stderrinfo summarysizesmapxrefcallgraphsymbols	
OK Cancel Defaults Help	

Figure 1-4 User Tab

5) Select project- \rightarrow rebuild all target files to compile the MDK project

🛛 E	: \E	-9G45	\Exa	որ	Les\0	1_audi	o\projec	t \Aud	io.uv	proj -	µVision4	
Eile	<u>E</u> dit	<u>V</u> iew	Proje	ect	Fl <u>a</u> sh	<u>D</u> ebug	Pe <u>r</u> ipherals	<u>T</u> ools	<u>S</u> VCS	<u>W</u> indow	<u>H</u> elp	
:	2			New	ι μ <u>V</u> ision	Project						
		#		New	/ Multi-Pi	roject <u>W</u> o	orkspace					
: ×				Ope	n Projec	:t						
Projec	τ			<u>C</u> los	e Projec	t						
	🛃 Aud	lio stortur		Exp	ort							•
		at911il		Mar								
	• · · · ·	fatfs		Man	age							
6	- 😑	user		<u>S</u> ele	ct Devic	e for Tar	get 'Audio'					
	+	'≛] maij ↓] see		Rem	no <u>v</u> e Ite	m						
	÷.	. 📩 wm8'	Ň	Opti	ions for	Target 'A	udio'					Alt+F7
6	- -	Readme		~								
] Rea		Clea	in <u>t</u> arge	t						
				Build	l target							F7
				Reb	uild all ta	arget files						
				Bato	<u>h</u> Build.							



Chapter 2 Downloading of MDK project

2.1 Debug the routine using ULINK2

The precondition for the next step is that you already have bought or owned a corresponding hardware Emulator.

1) Choose Emulator and the initialization script.

Options for Target 'Audio'	
Device Target Output Listing User C/C++ A	sm Linker Debug Vtilities
C Use <u>S</u> imulator Settings ☐ Limit Speed to Real-Time	Euse: ULINK ARM Debugger ✓ Settings ULINK ARM Debugger Signum Sustems IT A Siet
✓ Load Application at Startup ✓ Run to main() Initialization File:	Load J-LINK / J-CRACE main()
Edit	\at91sam9g45-ek-ddram.ini Edit
Restore Debug Session Settings Breakpoints Watchpoints & PA Memory Display	Restore Debug Session Settings Breakpoints Watchpoints Memory Display
CPU DLL: Parameter:	Driver DLL: Parameter:
SARM.DLL -cAT91SAM9G	SARM.DLL
Dialog DLL: Parameter: DARMATS9.DL -p91SAM9G45	Dialog DLL: Parameter: TARMATS9.DLI -p91SAM9G45
OK Can	cel Defaults Help

2) Check the ULINK2, optional.

When ULINK2 connects to the development board and if the RUN and COM indicator lights first change to blue and then go out with the USB indicator light has always been red, this indicates that ULINK2 has no problem.

In addition, there is another way to check ULINK2. Click the Settings button in the Debug tab, if the red marked part appears, it signs that ULINK2 has no problem.

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ARI Target Driver Setup ULINK USB - JTAG Adapter Serial No: V0000859E ULINK Version: ULINK2 Deutee Family: ARM	JTAG Device Chain IDCODE Device Name IR len Move TDO Ox0792603F ARM926EJ-S Core 4 Up Down
Firmware Version: V1.37	Automatic Detection ID CODE: Manual Configuration Device Name: Add Delete Update IR len:
Debug Cache Options ✓ Cache <u>C</u> ode ✓ Cache <u>M</u> emory	Download Options Misc Options ✓ Verify Code Download ✓ Use Reset at Startup ✓ Download to Flash ✓ Use Reset at Startup
	OK Cancel <u>H</u> elp

3) Check that whether ULINK2 can detect the development board or not which is optional. Click the Settings button in the Debug tab, if the red marked part appears, it proves that ULINK2 has detected the development board.

ARE Target Driver Setup	
ULINK USB - JTAG Adapter Serial No: V0008S9E V ULINK Version: ULINK2 Device Family: ARM Firmware Version: V1.37 Max JTAG Clock: RTCK V	JTAG Device Chain IDCODE Device Name IB len Move TD0 IDCODE IDCODE ID ID
Debug Cache Options ✓ Cache <u>C</u> ode ✓ Cache <u>M</u> emory	Download Options Misc Options Verify Code Download Image: Use Reset at Startup Download to Elash Image: Use Reset at Startup OK Cancel

4)Start to Debug the routine by clicking shortcut button or clicking Debug->Start/Stop Debug Session, the status of the debug as follows:

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2.2 Downloading of the project

2.2.1 Manual Download

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

2) Disable the JP2, and reset the board

3) Click "Start" -> "All programs" -> ATMEL Corporation -> AT91-ISP V1.13 -> SAM-BA v2.9, then open the SAM-BA, with the below pop-up dialog:



Then click 'Connect', it will display the below screen:

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SAT-BA 2.0	- at01cam0c45	-ok				
	atsisalisgio	C.K.				
File ScriptFile L	ink Help					
at91sam9m10 Memory	Display					
Start Address : 0x3000	000 Refresh	Display format				et traces on DBGU
Size in byte(s) : 0x100		C ascii C 8-	bit 🔿 16-bit 💌 32	?-bit	linfo	s <u> </u>
0x00300000	OxEA000014	OxEAFFFFFE	0xEA000063	OXEAFFFFFE		
0x00300010	OXEAFFFFFE	OxEAFFFFFE	OXEAFFFFFE	OxE3A0D008		
0x00300020	OxE58BD128	OxE59AD04C	OxE59CD004	OxE21DD001		
0x00300030	0x125EF004	OxE59AD03C	OxE21DDD40	0x03A0D004		
0x00300040	0x0589D000	0x15998010	0x11CC80B2	0x13A0D001		
0v00300050	0v15800004	0vF25FF004	0v53689C24	0v3DF2F176		>
Download / Upload Send File Name : Receive File Name :	File				Send File Receive File	
Address :	0x0 Size	(For Receive File) :	0x1000 byte(s)		Compare sent file with memo	ory
Scripts						
Enable Dataflash (SF	90 CSO)		 Execute 	1		
loading history file SAM-BA console disp (AT91-ISP v1.13) 1 % (AT91-ISP v1.13) 1 %	0 events added lay active (Tcl8.4.1 6 6	3 / Tk8.4.13)				
					\usb\ARM0 Bo	ard : at91sam9g45-ek 🤍

Now to download the application using SAM-BA.

1 Enable the NandFlash

Close the JP2 wire, click the NandFlash tab in the last figure, it will display the below screen as follows:

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-						
SAII-BA 2.9	- at91sam9g45	-ek				
File Script File L	ink Help					
- at91sam9m10 Memory	Display					
Start Address : 0x3000	00 Befresh	Display format			Γ ⁴	Applet traces on DBGU
Size in byte(s) : 0x100		Cascii C 8-	bit 🔿 16-bit 🖲 32	?-bit	ſ	infos 💌 Apply
0x00300000	0xEA000014	OxEAFFFFFE	0xEA000063	OXEAFFFFFE	L	
0x00300010	OXEAFFFFFE	OXEAFFFFFE	OXEAFFFFFE	OxE3A0D008		
0x00300020	OxE58BD128	OxE59AD04C	OxE59CD004	OxE21DD001		
0x00300030	0x125EF004	OxE59ADO3C	OxE21DDD40	OxO3A0D004		
0x00300040	0x0589D000	0x15998010	0x11CC80B2	0x13A0D001		
0v00300050	0v158CD004	0xF25FF004	0v53689024	0v3DF2F176		<u> </u>
						2
DDRAM DataFlash /	AT45DB/DCB EEPF	ROM AT 24 NandF	lash NorFlash Sf	RAM SerialFlash A	T25/AT26	
- Download / Upload	File					
Send File Name :				ഷി	Send File	1
Receive File Name :	, [<u> </u>	Receive File	
Address :	0x0 Size	(For Receive File) :	0x1000 byte(s)		Compare sent file with m	iemory
Cuint.	,					
Scripts				-1		
Enable NandFlash			Execute			
loading history file	0 events added					~
SAM-BA console disp	lay active (Tcl8.4.1	3 / Tk8.4.13)				
(AT91-ISP v1.13) 1 9	6					
(A191-ISP V1.13) 1 9	0					
					VKADMO	Depends av01 and 0 a 4E als
					AUSD VARMU	board : atorsamog45-ek

Choose "Enable NandFlash" from the Scripts lists, then Press 'execute' to enable NandFlash.

2 Download nandflash_at91sam9g45ekes.bin boot file in the 02-Images\MDK\SAM-BA directory.

NOTE: Download nandflash_at91sam9g45ekes.bin in order to boot the application. System will cope nandflash_at91sam9g45ekes.bin from NandFlash to DDRAM, then nandflash_at91sam9g45ekes.bin will copy 258KB content from 0x20000 address to DDRAM.

Choose 'Send Boot File' in the Scripts lists, as follow:



SAT-BA 2.9	- at91sam9g45	-ek					
Eile Script Eile Li	ink Help						
at91sam9m10 Memoru	Displau						
Start Address : 0x3000 Size in byte(s) : 0x100	00 Refresh	Display format Cascii C 8-	bit 🔿 16-bit 🖲 32	-bit		Applet trac	es on DBGU
0x00300000	0xEA000014	OxEAFFFFFE	0xEA000063	OxEAFFFFFE			<u>^</u>
0x00300010	OXEAFFFFFE	OxEAFFFFFE	OXEAFFFFFE	OxE3A0D008			
0x00300020	OxE58BD128	OxE59AD04C	OxE59CD004	OxE21DD001			_
0x00300030	0x125EF004	OxE59AD03C	OxE21DDD40	OxO3AODOO4			
0x00300040	0x0589D000	0x15998010	0x11CC80B2	0x13A0D001			
0v00300050	0v158CD004	OvF25FF004	0v536B9C24	Ov3DF2F176			>
Send File Name : Receive File Name : Address :	0x0 Size	e (For Receive File) : [0x1000 byte(s)	2 2 	Send File Receive File Compare sent file wit	e h memory	
Scripts Send Boot File Execute							
-I- Loading applet isp- I- Memory Size : 0x1 -I- Buffer address : 0x -I- Buffer size: 0x2000 -I- Applet initialization (AT91-ISP v1.13) 1 %	nandflash-at91sar .0000000 bytes (70003AA0 00 bytes 1 done	m9g45.bin at addr	ress 0x70000000				
					\usb\ARM	10 Board : a	t91 sam9g45-ek 🗸

Click "execute" button, choose nandflash_at91sam9g45ekes.bin from the open dialog. ③ Download your application, take file Audio.bin for example.

Choose Audio.bin in the Send File Name, fill in 0x20000 in the Address textbox, as follow:

File Script File Li	nk Help						
at91sam9m10 Memory I	Display						
Start Address : 0x3000 size in byte(s) : 0x100	00 Refresh	Display format	ы С 16-ы Ф 32	sex.		Applet trace	Apply
0x00300000	0xEA000014	OXEAFFFFFE	0×E4000063	OXEAFFFFFE		1 contraction of the second se	
0x00300010	OXEAFFFFFE	OXEAFFFFFE	OXEAFFFFFE	OxE3 AODOO8			
0x00300020	OxE58BD128	OxE59AD04C	0xE59CD004	OxE21DD001			
0x00300030	0x125EF004	OxE59AD03C	OxE21DDD40	0x03A0D004			
0x00300040	0x0589D000	0x15998010	0x11CC80B2	0x13A0D001			
0~00300050	0v15800004	OVE25FE004	0755855130	OVFRRDADO3			>
DRAM DataFlash A Download / Upload I Send File Name :	T45DB/DCB EEPF File are/Examples/01_au	10M AT24 NandFl dio/project/RUN_IN_	lash NorFlash SF	AM SeriaFlach AT25/	AT26	_	
Address	0x20000 Size	(For Receive File):	0x1000 byte(s)	<u> </u>	Necerve File Compare sent file with	h memory	
Scripts				-1			
			annual contract of the second s				

Then click "Send File" to download the Audio.bin.

5) After resetting the board, the application will run.

NOTE: If you want to download the application to NandFlash again, you need first clean up the data in the NandFlash, otherwise SAM-BA will not start up. In order to clean up the NandFlash, press the "USER2" button in the board, at the same time, press NRST button repeatedly until there is nothing display in the Serial Port.

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2.2.2 Auto download

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

2) Disable the JP2, and reset the board, you can see the flag as follows:



3) Connect the JP2

4) Open the package 01_audio\download. And click the file SAM9G45_MDK_nandflash.bat. Wait till it is downloaded.

5) Resetting the board, you can see the output on the board

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Chapter 3 Peripherals Testing

3.1Audio test

- Source code location: 04-MDK_Source\MDK4.01_Examples\01_audio \geq
- Test description: This routine describes how to read the wav file from a Micro SD Card, and then output it through PHONE. NOTE: before testing you should cope the sample.wav in the 01_audio directory to the root directory of a Micro SD Card, and then insert this Micro SD Card to the board. And you also should insert an earphone to the PHONE interface.
- Test phenomenon: Download the program to target board. Open PC \geq HyperTerminal and press NRST button, you will see the below operation as per below screen shot:
- -- Basic Audio Project 1.7 --
- -- AT91SAM9G45-EK
- -- Compiled: Jan 18 2010 17:14:14 --
- -I- Please connect a SD card ...
- -I- SD card connection detected
- -I- Init media Sdcard
- -I- MEDSdcard init
- -I- DMAD_Initialize channel 0
- -I- Card Type 1, CSD_STRUCTURE 0
- -I- SD/MMC TRANS SPEED 25000 KBit/s
- -I- SD 4-BITS BUS
- -I- SD/MMC TRANS SPEED 25000 KBit/s
- -I- SD/MMC card initialization successful
- -I- Card size: 121 MB
- -I- Mount disk 0
- -I- File Found!

Wave file header information

- Chunk ID	= 0x46464952
- Chunk Size	= 6801444
- Format	= 0x45564157
- SubChunk ID	= 0x20746D66
- Subchunk1 Size	= 16
- Audio Format	= 0x0001
- Num. Channels	= 2
- Sample Rate	= 24000
- Byte Rate	= 96000

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- Block Align = 4
- Bits Per Sample = 16
- Subchunk2 ID = 0x61746164
- Subchunk2 Size = 6801408

Press a key to return to the menu ...

Then, you press any keys, HyperTerminal will display:

-I- PCM Load to 70100100, size 6801408

Menu :

- P: Play the WAV file
- D: Display the information of the WAV file

Then, you press 'P, you will listen to a music from the earphone.

Reference manual: XWM8731EDS.pdf, AT91SAM9G45 Reference Manual.pdf

3.2 LCD Test

- Source code location: 04-MDK_Source\MDK4.01_Examples\02_lcd
- Test description: This routine will display the two pre-loaded pictures on the LCD. Before testing you need to download the files image1_rgb.raw and image2_rgb.raw in the 02_lcd directory to the address 0x70100000 and 0x70200000 of the DDRAM with SAM-BA.
- Test phenomenon: Download the program to target board. Open PC HyperTerminal and push NRST button. The application displays two preloaded images on the board LCD, alternating between each image every other second.
- Reference manual: AT91SAM9G45 Reference Manual.pdf (LCDC part)

3.3 Touchscreen test

- Source code location: 04-MDK_Source\MDK4.01_Examples\03_touchscreen
- > Test description: This routine displays how to calibrate touch screen.
- Test phenomenon: Download the program to target board. Press the NRST button, the LCD will display as follows:

LCD calibration

Touch the dots to calibrate the screen

Then in the LCD will appear five red dots, press the red dot on touch-screens to calibrate touch screen, if the calibration is successful, LCD will display:

-I- Calibration successful !

 $Otherwise, \ \ LCD \ need \ \ calibrate \ \ again \ , and \ \ \ LCD \ will \ \ display:$

-E- Error too big ! Retry...

Reference manual: AT91SAM9G45 Reference Manual.pdf





3.4 NandFlash test

- Source code location: 04-MDK_Source\MDK4.01_Examples\04_nandflash \geq
- \triangleright Test description: This routine display some information about the NandFlash in the board, then read, writes, and erases to test NandFlash.
- ≻ Test phenomenon: Download the program to target board. Open PC HyperTerminal and press NRST button. First it will display the NandFlash's ID, Bus width, block numbers, and block size. Then read, write, erase to test NandFlash. The HyperTerminal will display as per below screen shot:
 - -- Basic NandFlash Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 11 2010 11:29:19--
 - -I- Nandflash ID is 0x9510DAEC
 - -|-Nandflash driver initialized
 - -I- Size of the whole device in bytes: 0x1000000
 - -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 the entire device: 0x40
 - -I- Bus width: 0x8
 - -I- SkipBlockNandFlash_EraseBlock: Block is BAD 44:
 - -I- Skip bad block
 - -I- Test in progress on block: 95
 - -I- Test passed
- Reference manual: AT91SAM9G45 Reference Manual. PDF (SMC part)

3.5 NorFlash test

- Source code location: 04-MDK_Source\MDK4.01_Examples\05_Norflash \triangleright
- Test description: The routine display some information about the NorFlash in the \triangleright board, then read, writes, and erases to test NorFlash.
- Test phenomenon: Download the program to target board. Open PC \geq HyperTerminal and press NRST button. Firstly it will display the NorFlash's ID, and Device ID. Then read, write, erase to test NorFlash. HyperTerminal displays as per below screen shot::
 - -- Basic NorFlash Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: May 23 2011 20:51:04 --
 - NorFlash Manu ID = 0x1, Device ID = 0x225b
 - Nor Flash is erasing...
 - Nor Flash is writing...
 - Nor Flash is reading...

Nor Flash operation success!

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Reference manual: AT91SAM9G45 Reference Manual. PDF (SMC part) \geq

3.6 FatFS test

- Source code location: 04-MDK_Source\MDK4.01_Examples\06_FatFS \geq
- Test description: The routine display some information about the FatFS in the board, then read and write to test filesystem.
- Test phenomenon: First it initializes the FatFS, then read and write the file, the results are as follows:
 - -- Basic FatFS Full Version with External RAM Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: May 23 2011 20:58:27 --
 - -I- MEDDdram init
 - -I- DDRAM initialized
 - -I- Mount disk 0
 - -I- Format disk 0
 - -I- Please wait a moment during formatting...
 - -I- Format disk finished !
 - -I- Create a file : "0:Basic.bin"
 - -I- Write file
 - -I- ByteWritten=512
 - -I- f_write ok: ByteWritten=512
 - -I- Close file
 - -I- Open file : 0:Basic.bin
 - -I- Read file
 - -I- Close file
 - -I- File data Ok !
 - -I- Test passed !
- Reference manual: AT91SAM9G45 Reference Manual. PDF

3.7 filesystem test

- Source code location: 04-MDK_Source\MDK4.01_Examples\07_filesystem
- Test description: Make the 10MB DDRAM into a RAM, mount to the PC, access it through the USB, In addition, program can test RAM disc and formatting through the FAT file system, and also can test RAM disc and format through the EFSL file system .
- Test phenomenon: Before running the program, we should connect the ≻ development board to PC by USB cable. After the operation, we can see there appears a 10MB disk in the "my computer", and operate it as a ordinary disk. Beside this we can format the disk through the FAT or EFSL file system in the process. Input "F" in serial to switch file system, input "R" to test the file system. you will see the operation as per below screen shot::

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- -- Basic File System Project 1.7 --
- -- AT91SAM9G45-EK
- -- Compiled: Jan 11 2010 17:05:06-
- *** Using EFSL ***
- --- File System Test (EFSL) ---
- 1. FS Mount : PASS
- 2. Create file test.bin : OK
- 3. Write 4194304 bytes: Done, Speed 5363 KB/s
- 4. Copy file test.bin to copy.bin: Done, Speed 2728 KB/s
- 5. Verify file copy.bin: OK, Speed 1518 KB/s
- 6. Read file test.bin: OK, Speed 5577 KB/s

F to change File System Type

R to run the test again

- -----
- Reference manual: AT91SAM9G45 Reference Manual.pdf(External Memories)

3.8 Dataflash test

- Source code location: 04-MDK_Source\MDK4.01_Examples\08_dataflash
- Test description: The demonstration program tests the dataflash present on the evaluation kit by erasing and writing each one of its pages.
- Test phenomenon: Download the program to target board. Open PC HyperTerminal and press RESET button, you will see the phenomenon below.
 - -- Basic Dataflash Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 19 2010 21:13:58 --
 - -I- Initializing the SPI and AT45 drivers
 - -I- At45 enabled
 - -I- SPI interrupt enabled
 - -I- Waiting for a dataflash to be connected ...
 - -I- AT45DB321D detected
 - -I- Device identifier: 0x0001271F
 - -I- Test in progress on page: 219
 - -I- Test passed.
- Reference manual: AT91SAM9G45 Reference Manual.pdf

3.9 Twi eeprom test

- Source code location: 04-MDK_Source\MDK4.01_Examples\09_twi_eeprom
- Test description: This software performs simple tests on the first and second page of the EEPROM.



Test phenomenon: Connect TWD (SDA) for the 2 boards: pin 8 of connector J9, Connect TWCK(SCL) for the 2 boards: pin 7 of connector J9,Connect GND for the 2 boards: pin 30 of connector J9,Add a pull up of 2,2KOhms on TWD and TWCK (pin 1 of J9 is 3,3V).

Download the program to target board. initialize PC HyperTerminal and press the RESET button, you will see the phenomenon below.

- -- Basic TWI EEPROM Project 1.7 --
- -- AT91SAM9G45-EK
- -- Compiled: Jan 12 2010 20:50:27 --
- -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
- -I- Callback fired !
- Reference manual: AT91SAM9G45 Reference Manual.pdf, SAM9G45 Board Schematic.pdf

3.10 RTT test

- Source code location: 04-MDK_Source\MDK4.01_Examples\10_rtt
- Test description: This example enables the user to set an alarm and watch it being triggered when the timer reaches the corresponding value.
- Test phenomenon: This program displays a timer count and a menu on the DBGU, enabling the user to choose between several options. Download the program to target board. Open PC HyperTerminal and press the RESET button, you will see the phenomenon below.

Start AT91Bootstrap...

- -- Basic RTT Project 1.7 --
- -- AT91SAM9G45-EK

-- Compiled: Jan 9 2010 17:47:26 -

Time: 2

Menu:

- r Reset timer
- s Set alarm
- Choice?

You can choose 'r' to reset or choose 's' to set alarm. If you choose 's' and enter 8, it may display "!!! ALARM !!!" when time gets to 8. Phenomenon is as follows. Time: 8

!!! ALARM !!!

Menu:



- r Reset timer
- s Set alarm
- c Clear alarm notification

Choice?

You may choose 'c' to clear message "!!! ALARM !!!".

> Reference manual: AT91SAM9G45 Reference Manual.pdf

3.11 RTC test

- Source code location: 04-MDK_Source\MDK4.01_Examples\11_rtc
- Test description: This basic example shows how to use the Real-Time Clock (RTC) peripheral available on the newest Atmel AT91 microcontrollers.
- Test phenomenon: Download the program to target board. Initialize PC HyperTerminal and press the RESET button, you will see the phenomenon below.

-- Basic RTC Project 1.7 --

- -- AT91SAM9G45-EK
- -- Compiled: Jan 11 2010 15:58:15 --

Menu:

- t Set time
- d Set date
- i Set time alarm
- m Set date alarm
- q Quit!

[Time/Date: 00:08:35, 01/14/2010 Thu][Alarm status:]

Setting the time, date and time alarm is done by using Menu option "t", "d", the display is updated accordingly.

Reference manual: AT91SAM9G45 Reference Manual.pdf

3.12 TWI test

- Source code location: 04-MDK_Source\MDK4.01_Examples\12_twi
- > Test description: This routine displays the state when the TWI is in slave mode.
- Test phenomenon: Build the program and download it to the evaluation board. Initialize the PC HyperTerminal and press the RESET button. If HyperTerminal display shows as per below screen, it means the test is successful follows prove test success.
 - -- Basic TWI Slave Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 11 2010 15:58:15 --
 - -I- Configuring the TWI in slave mode



> Reference manual: AT91SAM9G45 Reference Manual.pdf

3.13 DMA_screen test

- Source code : 04-MDK_Source\MDK4.01_Examples\13_dma_screensaver
- > Test description: Use the DMA controller to transfer the picture
- Test phenomenon: If you use the 320x240 LCD screen, you should download Image320x240.bmp into the DDRAM. The offset is 0x100000,the absolute address is 0x70100000; If you use the 480x272 LCD screen, you should download Image480x272.bmp into the DDRAM with the offset 0x100000 and the absolute address is 0x70100000; Build the program and download it to the evaluation board. Initialize the PC HyperTerminal and press the RESET button. If terminal display shows as follows, it means the test is successful.
 - -- Basic DMA Screensaver Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: May 24 2011 09:20:55 --
 - -I- DMAD_Initialize channel 1
 - -I- Callback fired !
 - -I- DMAD_Initialize channel 0
 - -I- Callback fired !
 - -I- DMAD_Initialize channel 1
 - -I- Callback fired !
 - -I- DMAD_Initialize channel 0
 - -I- Callback fired !
 - -I- DMAD_Initialize channel 1
 - -I- Callback fired !
 - -I- DMAD_Initialize channel 0
 - -I- Callback fired !
 - -I- DMAD_Initialize channel 1

.....

> Reference manual: AT91SAM9G45 Reference Manual.pdf

3.14 EMAC test

- Source code location: 04-MDK_Source\MDK4.01_Examples\14_emac
- Test description: This project uses the Ethernet MAC (EMAC) and the on-board Ethernet transceiver available on the evaluation board. It enables the device to respond to a ping command sent by a host computer. Upon startup, the program will configure the EMAC with a default IP and MAC addresses and then ask the transceiver to auto-negotiate the best mode of operation. Once this is done, it will start monitoring incoming packets and processing them whenever appropriate. The basic will only answer to two kinds of packets: the ARP requests with its MAC address and ICMP ECHO request. To test that the board responds



correctly to ping requests, type "ping 192.168.2.19" command-line on a computer connected to the same network as the board..

Test phenomenon: Build the program and download it inside the evaluation board. Connect an Ethernet cable between the evaluation board and the network. The board may be connected directly to a computer; in this case, make sure to use a cross/twisted wired cable such as the one provided with the evaluation kit. Open PC HyperTerminal and push RESET button. The program will then auto-negotiate the mode of operation and start receiving packets, displaying feedback on the DBGU. To display additional information, press any key in the terminal application. The below screen shot shows the operation:

Start AT91Bootstrap...

- -- Basic EMAC Project 1.7 --
- -- AT91SAM9G45-EK

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- -- Compiled: Jan 13 2010 09:54:58 --
- -- MAC 0:45:56:78:9a:ac
- -- IP 192.168.2.19
- -I- ** Valid PHY Found: 3
- -I- MACB_ResetPhy
- -I- AutoNegotiate complete
- P: Link detected

Press a key for statistics

- === EMAC Statistics ===
- .tx_packets = 3
- $.tx_comp = 3$

.....

To test that the board responds to ICMP ECHO requests, type the command "ping 192.168.2.19" in a shell.

Reference manual: AT91SAM9G45 Reference Manual.pdf,DM9161AEP.pdf

3.15 EMAC Uip Helloworld test

- Source code : 04-MDK_Source\MDK4.01_Examples\15_emac_uip_helloworld
- Test description: This basic example shows that development board can respond to Telnet connection of default port 1000.
- Test phenomenon: Build the program and download it inside the evaluation board. Connect an Ethernet cable between the evaluation board and the network. The board can be connected directly to a computer, Open PC HyperTerminal and push RESET button. Phenomenon is as follows:
 - Start AT91Bootstrap...
 - -- Basic EMAC uIP Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 13 2010 11:07:43 --
 - MAC 0:45:56:78:9a:ac
 - Host IP 192.168.2.19

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- Router IP 192.168.2.1
- Net Mask 255.255.255.0
- -I- ** Valid PHY Found: 3
- -I- MACB_ResetPhy
- -I- AutoNegotiate complete
- P: Link detected
- P: clock time initialize TC0
- P: APP Init ... hello-world

Open the PC command-line, input "Telnet", press enter key, input " open 192.168.2.19 1000".

If connect success, then in the command line will display a message: "Hello. Getting your name?"

> Reference manual: AT91SAM9G45 Reference Manual.pdf, DM9161AEP.pdf

3.16 EMAC Uip Telnet test

- Source code location: 04-MDK_Source\MDK4.01_Examples\16_emac_uip_ telnet
- Test description: This routine code displays a telnet application of development board. In the program we can customize shell commands. The routine just accepts four command format: Stats, conn, help/? and exit. It shows network statistics, show TCP connections, show help, exit shell. Among the corresponding function only last exit command realized change shell' status and help command realized that show available command menu function. The function of other command is the same as help command's function.
- Test phenomenon: Build the program and download it to the evaluation board. Connect an Ethernet cable between the evaluation board and the network, The board can be connected directly to a computer, Open PC HyperTerminal and press the RESET button. You Can press any key display EMAC statistical information .The phenomenon is as follows:
 - Start AT91Bootstrap...
 - -- Basic EMAC uIP Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 13 2010 11:45:22 --
 - MAC 0:45:56:78:9a:ac
 - Host IP 192.168.2.19
 - Router IP 192.168.2.1
 - Net Mask 255.255.255.0
 - -I- ** Valid PHY Found: 3
 - -I- MACB ResetPhy
 - -I- AutoNegotiate complete
 - P: Link detected
 - P: clock time initialize TC0
 - P: APP Init ... telnet

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```
=== EMAC Statistics ===
.tx_packets = 0
.tx_comp = 0
.tx_errors = 0
.collisions = 0
.tx_exausts = 0
```

Open the command-line, input "Telnet", press enter key, input " open 192.168.2.19 1000", default in port 23 to connect.

If the connection is successful, the window will display Corresponding message ,input "?" according to relevant information , there will returns all available commands of help information. As below:



- Input "stats", "conn. "or"am /?", the command-line display help menu. don't show any information when input 'exit', just set shell state is close.
- > Reference manual: AT91SAM9G45 Reference Manual.pdf, DM9161AEP.pdf

3.17 EMAC Uip Web Server test

- Source code : 04-MDK_Source\MDK4.01_Examples\17_emac_uip_webserver
- Test description: The demonstration program is a web server application for the development board. In the process have set uip, including IP address, routers IP and subnet mask, when the program is running, the evaluation board can be used as a Web server, you can access it by typing ip in the pc's browser.
- Test phenomenon: Build the program and download it to the evaluation board. Connect an Ethernet cable between the evaluation board and the network, The board can be connected directly to a computer, Open PC HyperTerminal and press the RESET button. You Can press any key display EMAC statistical information .The phenomenon is as follows:

Start AT91Bootstrap...

- -- Basic EMAC uIP Project 1.7 --
- -- AT91SAM9G45-EK
- -- Compiled: Jan 13 2010 17:00:36 --
- MAC 0:45:56:78:9a:ac
- Host IP 192.168.2.19
- Router IP 192.168.2.1

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Net Mask 255.255.255.0
-I- ** Valid PHY Found: 3
-I- MACB_ResetPhy
-I- AutoNegotiate complete
P: Link detected
P: clock time initialize - TCO
P: APP Init ... web server
=== EMAC Statistics ===
.tx_packets = 0
.tx_comp = 0
.tx_errors = 0
.collisions = 0

If display "Link detected", proved that link success, open the browser in PC, input http://192.168.219. press "enter" key, open a web page, as follows:

Front page	File statistics	Network statistics	Network connections
These web pages are serv	ved by a small web server ru	unning on top of the <u>uIP embed</u>	Ided TCP/IP stack.
All and the failer all and date	unch common statistics		

If the phenomenon is the same of the above, it proved test success.

Reference manual: AT91SAM9G45 Reference Manual.pdf, DM9161AEP.pdf

3.18 SDMMC test

- Source code location: 04-MDK_Source\MDK4.01_Examples\18_sdmmc
- Test description: This basic example shows how to read or write the SD/MMC Card. Before testing, you should insert a SD into the board.
- Test phenomenon: Download the program to target board. Open PC HyperTerminal and push NRST button, you will see the phenomenon below.
 - -- Basic SD/MMC MCI Mode Project xxx --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 11 2010 15:58:15 --
 - -I- Cannot check if SD card is write-protected
 - -I- DMAD_Initialize channel 0
 - TC Start ... OK

-I- Card Type 1, CSD_STRUCTURE 0

- -I- SD 4-BITS BUS
- -I- CMD6(1) arg 0x80FFFF01
- -I- SD HS Not Supported
- -I- SD/MMC TRANS SPEED 25000 KBit/s



-I- SD/MMC card initialization successful

-I- Card size: 483 MB, 990976 * 512B

...

Press Enter key, it will display help menu:

- # 0,1,2 : Block read test
- # w,W : Write block test(With data or 0)
- # b,B : eMMC boot mode or access boot partition change
- # 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
- # s : Change MCI Clock for general test
- Reference manual: AT91SAM9G45 Reference Manual.pdf, SAM9G45 Board Schematic.pdf

3.19 SD Card Device Core test

- Source code location: 04-MDK_Source\MDK4.01_Examples\19_sdcard
- > Test description: The program tests the speed of read/write SD card.
- Test phenomenon: Download the program to target board. Open PC HyperTerminal and press the NRST button, you will see the phenomenon below.
 - -- Basic FatFS Full Version with SDCard Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 15 2010 14:22:48 --
 - -I- Please connect a SD card ...
 - -I- SD card connection detected
 - -I- Init media Sdcard
 - -I- MEDSdcard init
 - -I- DMAD_Initialize channel 0
 - -I- Card Type 1, CSD_STRUCTURE 0
 - -I- SD/MMC TRANS SPEED 25000 KBit/s
 - -I- SD 4-BITS BUS
 - -I- CMD6(1) arg 0x80FFFF01
 - -I- SD HS Enable
 - -I- SD/MMC TRANS SPEED 50000 KBit/s
 - -I- SD/MMC card initialization successful
 - -I- Card size: 972 MB
 - -I- Mount disk 0
 - auto_mount_test-I- The disk is already formatted.
 - -I- Display files contained on the SDcard :

auto_mount_test0:/BASIC.bin

-I- Do you want to erase the sdcard to re-format disk ? (y/n)!

Reference manual: AT91SAM9G45 Reference Manual.pdf, EM_AT91SAM9G45



Board Schematic.pdf

3.20 FATFS SD Card test

- Source code location: 04-MDK_Source\MDK4.01_Examples\20_fatfs_sdcard
- Test description: This basic example shows how to use SD card through FAT file system.
- Test phenomenon: Download the program to target board. Initialize the PC HyperTerminal and press the NRST button, you will see the phenomenon below.
 - -- Basic FatFS Full Version with SDCard Project 1.7 --
 - -- AT91SAM9G45-EK
 - -- Compiled: Jan 15 2010 14:22:48 --
 - -I- Please connect a SD card ...
 - -I- SD card connection detected
 - -I- Init media Sdcard
 - -I- MEDSdcard init
 - -I- DMAD_Initialize channel 0
 - -I- Card Type 1, CSD_STRUCTURE 0
 - -I- SD/MMC TRANS SPEED 25000 KBit/s
 - -I- SD 4-BITS BUS
 - -I- CMD6(1) arg 0x80FFFF01
 - -I- SD HS Enable
 - -I- SD/MMC TRANS SPEED 50000 KBit/s
 - -I- SD/MMC card initialization successful
 - -I- Card size: 972 MB
 - -I- Mount disk 0

auto_mount_test-I- Format disk 0

- -I- Please wait a moment during formatting...
- -I- Format disk finished !
- -I- Create a file : "0:Basic.bin"
- -I- Write file
- -I- ByteWritten=2064
- Reference manual: AT91SAM9G45 Reference Manual.pdf, EM_AT91SAM9G45 Board Schematic.pdf

3.21 USB Device Core test

- Source code : 04-MDK_Source\MDK4.01_Examples\21_usb_device_core
- Test description: This project helps you to be familiar with the USB Framework that is used for rapid development of USB-compliant class drivers such as USB Communication Device class (CDC).You can find the information about Sample usage of USB Device Framework, USB enumerate sequence, the standard and



class-specific descriptors and requests handling and the initialize sequence and usage of UDP interface.

Test phenomenon: Download the program to target board. Connect board to PC using USB cable. Open PC HyperTerminal and press the RESET button, you will see the phenomenon below.

Start AT91Bootstrap...

- -- USB Device Core Project 1.7 --
- -- AT91SAM9G45-EK
- -- Compiled: Jan 11 2010 10:51:06 --

When connect USB cable to PC, the LED blinks, and the host reports a new USB device attachment.

> Reference manual: AT91SAM9G45 Reference Manual.pdf,SP2526A-2EN.pdf

3.22 USB Device Hid Transfer test

Source

code :04-MDK_Source\MDK4.01_Examples\22_usb_device_hid_transfer

- Test description: This process realizes a USB device HID transmission example. The program includes USB HID drive and corresponding PIO configuration. and can test USB device through hidTest.exe
- Test phenomenon: Download the program to target board. Connect board to PC using USB cable. Open PC HyperTerminal and press the RESET button, you will see the phenomenon as below.

Start AT91Bootstrap...

-- USB Device HID Transfer Project 1.7 --

-- AT91SAM9G45-EK

-- Compiled: Jan 12 2010 17:30:14 --

-W- HIDDTransferDriver_RequestHandler: request 0x0A

-W- Sta 0x8085F400 [0] -W- _

At the same time, the PC prompt find the USB devices, and the USB devices can be find in PC equipment management.

Insert or pull the USB attachment, the led in board will flash.

open project directory, test USB HID device.

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Sample HID client app	\mathbf{X}
Device Information	
HID Device	
Device 156, UsagePage Offf, Usage Off	•
Item Type Item attributes	
DEVICE ATTRIBUTES	
Items Version Number 0x100	
Enter Output	
Input (Pipe IN): Monitor BUTTONs	Hex Read
BUTTON 1 BUTTON 2 LED 1 LED 2	
	About Exit

Choice DEVICE ATTRIBUTES in Item Type, in the right flank we can see the VID of device is 0x03EB,PID is 0x6201. In the Output edit box input the message you want to send. Click the right buttons, you can Write and send the message and check this information by super terminal. For example, sending information "ABCDEFG", click button "Write", super terminal will show information as follows.

-W- Sta 0x8085F400 [0] -W- _ Data In(32):

41 42 43 44 45 46 47 00 00 00 00

We can also click Monitor BUTTON on the Input edit box to monitor Equipment data. Then press the key BP3 and BP4 on the Development board. BUTTON1 and BUTTON2 gray button will have a corresponding change. If you press the LED button on the interface, the LED will brighten or off.

Reference manual: AT91SAM9G45 Reference Manual.pdf, SP2526A-2EN.pdf \triangleright

3.23 USB Device CDC Serial test

- \triangleright Source code location: 04-MDK_Source\MDK4.01_Examples\23_usb_device_cdc_serial
- Test description: The project displays a USB virtual serial function applications.
- Test phenomenon: Download the program to target board. Connect board to PC \triangleright using USB cable. push RESET button, PC will prompt to install driver, don't automatically search installation. But designated driver locations as the following directory : 03-software\Examples\23_usb_device_cdc_serial\drive. After install driver ,open "computer management" ->" Equipment management", there will appear a "AT91 USB to Serial Converter (COM11)" item in the "com and LPT" of



the right side interface.

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At the same time, open serial port 11 and port1 on tool SSCOM3.2.select the serial port used and set the following parameters (to set status: Baud rate (115200), data bits (8 bits), stop bits (1 bit), parity bit (no), data flow control (no)).then serial port 1 can send string to serial port 11,and Serial port 11 can receive it normal. By doing this, you can virtual the communication between serial port 1 and port 11.

> Reference manual: AT91SAM9G45 Reference Manual.pdf, SP2526A-2EN.pdf

3.24 USB Device Hid Keyboard

- Source code location: 04-MDK_Source\MDK4.01_Examples\24_usb_device_hid_keyboard
- Test description: This routine realized a USB HID keyboard example. The Program has provide USB HID drive, corresponding PIO configuration process and UDB interface initialization, etc. you can input character through this keyboard, control Num Lock lamp, etc..
- Test phenomenon: Download the program to target board. Connect board to PC using USB cable. Open PC HyperTerminal and push RESET button, PC will prompt have find a "USB HID Keyboard Device", the corresponding USB Device can be opened in the PC device manager. When connect USB cable to PC, the LED blinks

At the same time, create a new file in the PC desktop, you can sent 'a 'character to the file by press BP4 button on the development board, Press BP3 button, can control the Num Lock LED and LED3 will flash.

Reference manual: AT91SAM9G45 Reference Manual.pdf, SP2526A-2EN.pdf

3.25 Buzzer test

- Source code location: 04-MDK_Source\MDK4.01_Examples\25_buzzer
- > Test description: This routine is used to test buzzer.
- Test phenomenon: Download the program to target board. After press RESET button, you will listen to the beep from the buzzer.
- > Reference manual: AT91SAM9G45 Reference Manual.pdf.

3.26 USART0 test

- Source code location: 04-MDK_Source\MDK4.01_Examples\26_USART0
- Test description: This routine is used to test the serial port of USARTO
- Test phenomenon: Download the program to target board. Use the wire to connect the PC com to the J16 interface;the process is :use PC com port 2(RXD) to connect the 2(R1out) pin of J16, use PC com port 3(TXD) to connect the



1(R1in) pin of J16,then press RESET button, you can see the phenomenon in the terminal:

TEST USART0...

Please input:

Then you can use the keyboard to input the characters that is successful.

> Reference manual: AT91SAM9G45 Reference Manual.pdf.

3.27 USART1 test

- Source code location: 04-MDK_Source\MDK4.01_Examples\27_USART1
- Test description: This routine is used to test the serial port of USART1
- Test phenomenon: Download the program to target board. Use the wire to connect the PC com to the J13 interface;the process is :use PC com port 2(RXD) to connect the 3(R1out) pin of J13, use PC com port 3(TXD) to connect the 1(R1in) pin of J13, use PC com port 7(RTS) to connect the 2(R2out) pin of J13, use PC com port 8(CTS) to connect the 4(R2in) pin of J13(Notice: you must enable the RXD1 and CTS1 pin of sw1),then press RESET button, you can see the phenomenon in the terminal:

Test USART1(don't use hardware handshaking)... Please input:

Then you can use the keyboard to input the characters, that is successful.

> Reference manual: AT91SAM9G45 Reference Manual.pdf.

3.28 USART2 test

- Source code location: 04-MDK_Source\MDK4.01_Examples\28_USART2
- > Test description: This routine is used to test the serial port of USART2
- Test phenomenon: Download the program to target board. Use the wire to connect the PC com to the J15 interface;the process is :use PC com port 2(RXD) to connect the 3(R1out) pin of J15, use PC com port 3(TXD) to connect the 1(R1in) pin of J15, use PC com port 7(RTS) to connect the 2(R2out) pin of J15, use PC com port 8(CTS) to connect the 4(R2in) pin of J15(Notice: you must enable the RXD2 and CTS1 pin of sw1),then press RESET button, you can see the phenomenon in the terminal:

Test USART2(don't use hardware handshaking)... Please input:

Then you can use the keyboard to input the characters, that is successful.

Reference manual: AT91SAM9G45 Reference Manual.pdf.



Chapter 4 List of programs

01-Audio	The audio test
02-LCD	Use LCD to appear the picture
03_touchscreen	The touchscreen calibrate
04_nandflash	Read、write、erase the Nandflash
05_norflash	Read, write, erase the Norflash
06_fatfs	display some information about the FatFS in the board
07_filesystem	test RAM disc and formatting through the FAT file system
08_dataflash	tests the dataflash present on the evaluation kit by erasing
	and writing
09_twi_eeprom	simple tests on the first and second page of the EEPROM
10_rtt	The application of RTT
11_rtc	The application of RTC
12_twi	the state when the TWI is in slave mode
13_dma_screensaver	Use the DMA controller to transfer the picture
14_emac	EMAC test
15_emac_uip_helloworld	Telnet connection of default port 1000
16_emac_uip_telnetd	a telnet application of development board
17_emac_uip_webserver	a development board's web server application
18_sdmmc	how to read or write the SD/MMC Card
19_sdcard	test the speed of read/write SD card
20_fatfs_sdcard	how to use SD card through FAT file system
21_usb_device_core	the initialize sequence and usage of UDP interface
22_usb_device_hid_transfer	USB device HID transmission
23_usb_device_cdc_serial	USB virtual serial function applications
24_usb_device_hid_keyboard	USB HID keyboard example
25_buzzer	is used to test buzzer
26_usart0	test the serial port of USART0
27_usart1	test the serial port of USART1
28_usart2	test the serial port of USART2

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Appendix A: After-sales Service

Customer Service

Please contact Premier Farnell local sales and customer services staffs for the help. Website: http://www.farnell.com/

Technical Support

Please contact Premier Farnell local technical support team for any technical issues through the telephone, live chat & mail, or post your questions on the below micro site, we will reply to you as soon as possible.

Centralized technical support mail box: knode_tech@element14.com

Community: http://www.element14.com/community/community/knode/dev_platforms_kits

Please visit the below micro site to download the latest documents and resources code: http://www.element14.com/community/community/new_technology/at91sam9g45-evk

Notes

This board was designed by element14's design partner- Embest, you can contact them to get the technical support as well.

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