

MIPI_MONITOR

C2307A Series

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C2307A MIPI Monitor Manual

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1. Overview

This document is a guide to the use of the C2307A MIPI Monitor (bus monitoring) function.

1.1 Function Introduction

The C2307A MIPI Monitor (bus monitoring) function can monitor and decode the bus transmission content of the standard MIPI_RFFE protocol. Development of this function is based on C2307A and needs to be used with C2307A.

1.2 Hardware/software Requirements

Ha	rdware require	nent
Equipment	Quantity	Description
C2307A	1	Data monitoring
PC with wired network card	1	Receive and display analysis result
RJ45 network cable	1	Data transmission
Writer (USB CABLE)	1	Flashing firmware
USB cable(type-B) or power	1	Power supply
adapter(5V@1A)	Ţ	lower Suppry
Sc	oftware require	nent
Software		Description
MIPI_Monitor.exe		Software for upper computer
Vivado Lab 2022.2or Vivado 2022.2		Flashing firmware





2. Equipment Construction

This section will introduce connection and c onstruction methods when using this function.

2.1 Device connection diagram



P2.1 Device connection diagram

2.2 Connection between C2307A and PC

- 1) C2307A power supply: use USB-B type cable or power adapter (5V@1A), generally choose one of them.
- 2) Data transmission: a network cable with RJ45 interface, one end is connected to the RJ45 interface of the C2307A, and the other end is connected to the wired network card of the PC.
- 3) Flashing the firmware: one end of the programmer is connected to the JTAG interface of C2307A with a 2×5 Pin 2.54mm cable, and the other end is connected to the USB interface of the PC through a USB-Mini cable.



P2.2.1 Device connection diagram



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2.3 Connection between C2307A and MIPI bus

C2307A and MIPI bus need to be connected with 3 wires, SCLK, SDATA, and GND. The SCLK to be monitored needs to be connected to the SCLK on the upper row of the MIPI1 interface; the SDATA to be monitored needs to be connected to the SCLK on the upper row of the MIPI2 interface; the GND to be monitored can be connected to any GND of the MIPI1 or MIPI2 interfaces.

MIPI Monitor



P2.3 Connection between C2307A and MIPI bus

3. Software Installation and Setup

This section will detail the software installation and setup methods. It is strongly recommended to use a computer with administrator privileges for setup.

3.1 MIPI_Monitor.exe setup

MIPI_Monitor.exe can be started by double-clicking, no need to install additional drivers. If the software cannot be started, please check whether the computer has the operating environment of Microsoft. NET Framework 4.6 or above version.



P3.1 UI of MIPI_Monitor.exe

3.2 Vivado Lab 2022.2 setup

At present, the default firmware main function of C2307A is MIPI RFFE Master (MIPI box). If you want to switch to the MIPI Monitor bus monitoring function mentioned in this article, you need to use a writer, and complete firmware flashing with Vivado Lab 2022.2 to switch the main function.



Vivado Lab 2022.2software installation steps:

Step 1: Double-click to run xsetup.exe in the installation package directory.

	 soft > Xilinx_Viva 	do_Lab_Win_2022.2_101	4_8888			
	名称		修改日期	类型 ^	大小	
	🗖 bin		2022/10/15 16:01	文件夹		
	🗖 data		2022/10/15 16:33	文件夹		
	🗀 lib		2022/10/15 15:58	文件夹		
	🚞 payload		2022/10/15 16:26	文件夹		
	scripts		2022/10/15 16:03	文件夹		
	🚞 tps		2022/10/15 15:58	文件夹		
	🐁 installLibs.sh		2022/10/15 20:13	Shell Script		4 KB
	🍒 xsetup.exe		2022/10/14 20:07	应用程序		432 KB
	🔋 api-ms-win-core	-console-I1-1-0.dll	2022/10/14 19:12	应用程序扩展		19 KB
Step 2: Click	"Next"					
	E Vivado Lab Edition 20	22.2 Installer - Welcome			- 1	n x
	UNIFIED Xilinx Installer	Welcome We are glad you have chosen : Edition Environment. Supported operating systems : - Windows 10 Professional an Note: This release requires i your license admin that the r running the tools. Note: This installation prog separately, with administrat To reduce installation time, disable any power saving set	Xilinx as your platform development for 2022.2 are: nd Enterprise versions 1903, 1909, upgrading your license server tools correct version of the license serv ram will not install cable drivers - ive privileges. we recommend that you disable any lings of your machine dautomatic sl	partner. This program can : 2004, 20H2 and 21H1: 64-bit to the Flex 11.17.2 version er tools are installed and i on Linux. This item will new anti-virus software before exp mode) when running the :	nstall the Viv is. Please conf vailable, befo d to be instal continuing. Ple sstaller.	ado Lab irm with re led ase
	E XILINX.	linx, Inc. All rights reserv	red.	Preferences < Back	Next >	<u>C</u> ancel

Step 3: Keep the default option, click "Next"

Vivado Lab Edition (Standalone)			
Customize your installation by (de)selecting items in the tree below. Moving cursor over selections below padditional information.	provide		-IINĂ:
Installs only the Xilium Yivado Lab Edition. This standalone product includes Yivado Design Programmer. tools. Standalone Lab Edition is intended for use in Lab environments where the full-featured Yivado ML Edit Programmer and Analyzer are also installed with all Yivado ML Enterprise Editions and Yivado ML Standard pp	vado Logic / ition not re roducts	Analyzer and U equired. Note:	pdateMEM Device
Derign Tools Unitation Options Install Cable Drivers (You MUST disconnect all Xilinx Platform Cable USB II cables before proce	eeding)		
Download Size: NA		Prost to D	faulte
Disk Space Required: 6.36 GB		Teser to De	inuits
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Step 4: Tick "I agree", click "Next"

Vivado Lab Edition 20222 Installer - Accept License Agreements

Accept License Agreements

Piesce read the following terms and conditions and indicate that you agree by checking the J Agree checkbore.

Nillins Inc. Ind User License Agreement for Lab Edition

By checking "I Agree" below, or OTERNISE ACCESSING, DONLADING, INSTALLING or USING THE SOFTWARE, I AGREE on behalf of licensee to

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Step 5: Select the installation path and choose to install for all users. After clicking "Next", wait for the progress bar to finish running to complete the installation.

Vivado Lab Edition 2022.2 Installer - Select Destination Directory		-		×
Select Destination Directory Choose installation options such as location and shortcuts.	3	XI		٩X
Installation Options Select the installation directory C:Villinx Installation location(s) C:Villinx(Vivado_Lab/2022.2) Disk Space Required Download Size: NA Disk Space Required: 6.36 G8 Final Disk Usage: 5.76 G8 Disk Space Available: 25.16 G8 Will users: 5.76 G8 Disk Space Available: 25.16 G8 Program group entry, Xilinx Design Tools, already exists for 2022.2. Specify a different program group entry.				
Copyright © 1986-2023 Xilinx, Inc. All rights reserved.	N	ext >	Ce	ncel







4.1 Equipment construction

For details, please refer to Section 2 of this document.

4.2 Firmware flashing

4.2.1 Temporarily effective flashing method

Note: The firmware flashed by this method will be reset after power off, and the C2307A will return to the default function MIPI RFFE Master (MIPI box) after power on again. If you want to use other functions again, you need to perform the flash operation again.



Step 2: Click "Open target", a drop-down menu appears, click "Auto Connect", the software will automatically connect to available devices.



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Step 3: If the device is successfully connected, the red box in the left picture below will appear; if the connection fails, please troubleshoot according to the right picture and try again.

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Step 4: Right-click "xc7al00t_0", and select "Program Device" after the menu appears.





Step 5: The pop-up window selects the *.Bit file to be loaded (the firmware you want to switch to).

🍌 Program Device			×			
Select a bitstream program select a debug probes file programming file.	mming file and that correspor	download it to your hardware device. You can optionally dis to the debug cores contained in the bitstream	A		?	_ 0
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ROR: [Labtoolstcl 44-5]	. ne Marine.					
	Files of type:	Bitstream Files (.bit, bin, rbt)				~
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Step 6: Finally click "Program" and wait for the progress bar to complete, then the flashing operation will be completed.

🝌 Program Device		×
Select a bitstream prog select a debug probes programming file.	ramming file and download it to your hardware device. You can optionally file that corresponds to the debug cores contained in the bitstream	4
Bitstream file:	ionitor_ver_0_4/mipi_bus_monitor.runs/impl_1/top_mipi_bus_monitor.bit 😒	
Debug probes file:		
Enable end of s	tartup check	
?	Program	cel

4.2.2 Permanent flashing method

This method is to flash the content of the flash memory. After the operation, the new firmware will become the default boot function of the device.

Step 1: Follow 4.2.1 to step3 to complete the device connection.

Step 2: Right-click "xc7a100t_0", and select "Add Configuration Memory Device" after the menu appears.



Hardware	? _	. o c x	hw_ila_1
Q ≚ ♦ Ø ► ≫ ■		•	Waveform - hw ila 1
Name	S	tatus	
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✓	P	roorammed	oar
I XADC (System Monitor)		Hardware D	Device Properties Ctrl+E
1 hw_ila_1 (ILA)		Program De	evice
		Verify Devic	ce
<	•	Run Trigge	r
Hardware Device Properties	>>	Run Triage	r Immediate
		Stop Trigge	5r
Name: xc7a100t_0 Part: xc7a100t ID code: 13631093		Enable Auto Disable Auto Create Use Show Bus F	o Re-trigger o Re-trigger r Defined Probe Plot
IR length: 6	C	Refresh De	vice
()		Add Configu	uration Memory Device (2)
General Properties		Boot from C	Configuration Memory Device
Tcl Console × Messages Seria	1.1/	Program BE	BR Key
Q X \$ 11 0 18 0		Clear BBR	Key
WARNING: [Labtools 27-1974] Misma	itc	Program eF	USE Registers
The device design has 1 ILA core Resolution:	5)	Export to Sp	preadsheet



Step 3: Type "mt25ql128" in the Search column, select the only device that appears below, and click "OK" twice.

Add Configura	dd Configuration Memory Device X Choose a configuration memory part. ie: @ xc7a100_0 danufacturer Al Viden Al V Al Viden Al Vi					
Choose a co	nfiguration memor	y part.				
Device: 🕲 xc7a1i er	00t_0					
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Density (Mb)	All	`	~	Width	All	~
Name		Part	Manufac	Alias		Fan
🦻 mt25ql128-sp	oi-x1_x2_x4	mt25ql128	Micron	n25q128-3.3v-spi-x1_x2	2_x4	mt2
?					ок (3)	Cancel
	Add Cor	figuration Memo	ry Device	Completed	×	
	3	Do you want to pr	ogram the	configuration memory	device now?	
		on't show this dialo	g again			
				OK	Cancel	

Step 4: In the pop-up interface, fill in the paths of *.mcs and *.prm files in the red box in sequence in the figure, and finally click "OK". After the progress bar is finished, the firmware flashing operation will be completed.

elect a configuration file and set programming options.	e 🕨	» 📕 🖪	ର୍ ପ୍	20	* *	r 1	() H	12	tr +	[e +
Memory Device: @mt25ql128-spl-x1_x2_x4 ····	🔥 Specify F	ile								
Configuration file: o/Master/OUTPUT/C2307A_master_E12.mcs 🛞 🚯	Look jn: 🕞	OUTPUT			~	1 4	s 📮 3	± Α σ	≥ <mark>×</mark> c	
PRM file: IT/C2307A_master_E12.pm () State of non-config mem I/O pins: Pull-none	☐ history .) C2307A_r	master_E10.mcs		Re	cent Di	irector	ies			
Program Operations	© C2307A_r	master_E11.mcs master_E12.mcs	2	Fil	e Previ	iew	atenot	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Address Range: Configuration File Only V Crase Blank Check Pogram Venty	.∂ mipi_mast	ter_ver_3_9_C230	7A.mcs	F D C A N S T O	ile: C23 irectory reated: ccesse lodified ize: 10.3 ype: Mo wner: \$	307A_m y: D:/Vi : Sunda d: Frid I: Sund 3 MB CS SMART	naster_ lvado/N ay 23/0 lay 23/0 lay 23/0 rermin	E12.mc (aster/0 1/29 11)2/03 1 01/29 1 CRO\S1	s DUTPUT I:44 AM 1:30 AM 1:44 AM	
Verify Checksum	File name:	C2307A_master_	E12.mcs							_
SVF Options	Files of type:	Configuration Fi	les (.mcs, b	in)						
Create SVF Only (no program operations) SVF File:	-	_		_	_			O	×3	Cance
? OK (S) Cancel Apply	[[get_hw_de t_hw_devices	evices xc7a100t_0 s xc7a100t_0] 0]]	0] 0]]							

Step 5: After the flashing is completed, the following interface will pop up, click "OK", then unplug the writer cable, power on the C2307A again, and the new firmware will be loaded after the device restarts.

Warning Mes	sage		
while Pro	gram Configuration Me	emory Device.	
[Labtools 27 at location 'u cannot be for	-3413] Dropping logic uid_50A7651265DB5i und on the programme	core with cellname."Inst_t B40B8CEBD84B1BF2B0 ad device.	udp_transmit/inst_lia_0' 7' from probes file, since it
		ок	Open Messages View

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4.3 Set the IP address of the wired network card

The MIPI_Monitor.exe program communicates with C2307A using the UDP protocol. The IP address of the computer must be set to 192.168.10.2 (the gateway can be empty).

4.4 MIPI_RFFE bus monitoring

Step 1: Run MIPI_Monitor.exe to enter the main interface, the program will automatically obtain the current IP address.



Step 2: Click the "Start Monitoring" button, the button turns green, and the MIPI_RFFE bus monitoring function will be started; the "Data Reservation" column is the maximum number of entries for the reserved monitoring data packets, which can be filled in according to requirements.





4.5 Preview

Hest IP 192:168.10.2 Not Fort 61440 Slave Dr 61440 Duffer 100 Doffer 1000 Stave Port 61440 Duffer 1000 Stave Port 6440 Address 02 Stave Port 6440 Address 05 Stave Port 64 Address 05 Stave Port 64 Beg_write 5 Stave Port 66 Ext_reg_write 3 Base Ext_reg_write 3 Base Ext_reg_write 5 Stave Port 5 0A Base Ext_reg_write 5 Base Ext_reg_write 5 Base Ext_reg	⊆ C2307A_MIPI_Monitor Ver.beta − □							
Not f Port 61440 Slave DP 192.168.10.1 Slave Port 61440 Puffer 1000 3 Reg_write 3 Reg_write 4 04 4 Reg_write 5 Ext_reg_write 6 Ext_reg_write 6 Ext_reg_write 6 Ext_reg_write 7 Ext_reg_write 8 Ext_reg_write 9 Ext_reg_write 9 Ext_reg_write 9 Ext_reg_write 5 0A 9 Ext_reg_write 10 0A 9 Ext_reg_write 5 0A 9 Ext_reg_write 9 Ext_reg_write 10 0A 9 Ext_reg_write 10 0A 9 Ext_reg_write 10 0A 10 1 10 10 11 10 11 10 12 10	Host IP 192.168.10.2		Number	Command type	USID	Address	Data	Mask
Slave Dr 122.108.10.1 Slave Port 6140 Puffer 100 Stop malyzing 4 Add Regwrite 3 Stop malyzing 4 Stop malyzing 4 Add Regwrite 5 Stop malyzing 4 Add Regwrite 6 Stop malyzing 4 Add Regwrite 0 Stop malyzing 4 Add Regwrite 1 Add Regwrite 3 Add Regwrite 5 Add Regwrite	Host Port 61440	•	0	Reg_write	1	01	11	
Slave Fort 61440 2 Reg_write 3 03 33 1 Buffer 1000 3 Reg_write 4 04 44 1 Stop Analyzing 4 Reg_write 5 05 55 1 Stop Analyzing 4 Reg_write 2 07 22 1 6 Ext_reg_write 2 07 22 1 1 06 11 1 6 Ext_reg_write 3 06 33 22 1 </td <td>Slave IP 192.168.10.1</td> <td></td> <td>1</td> <td>Reg_write</td> <td>2</td> <td>02</td> <td>22</td> <td></td>	Slave IP 192.168.10.1		1	Reg_write	2	02	22	
Buffer 1000 3 Reg_write 4 04 44 1 Stop Analyzing 4 Reg_write 5 05 55 1 Stop Analyzing 4 Reg_write 5 06 11 1 1 Stop Analyzing 6 Ext_reg_write 2 07 22 1 1 6 Ext_reg_write 3 08 33 1 <td< td=""><td>Slave Port 61440</td><td></td><td>2</td><td>Reg_write</td><td>3</td><td>03</td><td>33</td><td></td></td<>	Slave Port 61440		2	Reg_write	3	03	33	
Stop Analyzing 4 Reg_write 5 06 55	Buffer 1000		3	Reg_write	4	04	44	
VDP count: 1 0 1 06 11 1	Stop Analyzing		4	Reg_write	5	05	55	
Image: Second			5	Ext_reg_write	1	06	11	
VDP count: 1 CMD count: 10 ERKOR count: 0 Must be allowed to pass			6	Ext_reg_write	2	07	22	
Image: Second			7	Ext_reg_write	3	08	33	
9 Ext_reg_write 5 0A 55 Image: State of the state of th			8	Ext_reg_write	4	09	44	
* WDP count: 1 CMD count: 10 ERKOR count: 0 Must be allowed to pass			9	Ext_reg_write	5	0A	55	
DDP count: 1 CDD count: 10 ERROR count: 0 Must be allowed to pass	慧智微	•						
Must be allowed to pass	VDP count: 1 CMD count: 10 ERROR count: 0							
Clear list	Must be allowed to pass through the firewall. Clear list							

P4.5 Software running interface



序号	Date	Illustrate	Updated by
1	23.02.2023	Initial establishment	温兴
2	24.02.2023	Initial version in English.	刘畅
3	27.02.2023	Update	温兴