

User Manual for iMX27 based CE-ATA solution

iW-EMBQF-UM-01

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1 Introduction

1.1 Purpose

The purpose of this document is to explain the procedure to power-on and test the iMX27 based CE-ATA solution board.

1.2 Scope

This document describes the Hardware connection procedure to power-on and perform the GUI diagnostic tests to verify the working of CE-ATA and WinCE using the Touchscreen.

1.3 Setup Details

Each setup consists of One board with the LCD and CE-ATA hard disk connected. The entire set up is as shown in the Figure 1.

1. Processor Board (iW-EMBQF-AP-01-XX).





Figure 1: iMX27 based CE-ATA Board Setup



The accessories along with the board setup is shown in the Figure 2



Figure 2: Accessories with iMX27 based CE-ATA Board Setup

The Accessories is as follows

- Power Supply
- CE-ATA card
- Serial Cable for the Flash programming
- Customized cable for programming Actel FPGA. This cable to be connected between JTA programmer and Board JTAG connector
- Serial to USB convertor, with the CD (if DB-9 port not available in the PC/laptop)



2 Procedure to setup Hardware for Demo

2.1 Details regarding the power cable insertion

2.1.1 Power cable Connection procedure

Insert the power cable into the power connector of the Mother-board as shown in the Figure 3



Figure 3: Power Connection



2.2 Actel JTAG programming



Figure 4: FPGA programming connection





Figure 5: FPGA programming connection1



Select Programmer settings from Tools menu

le Edit View	1									فلعر
	Tools Programmers Configuratio	on Customize	telp	-	1					
	Mode _	1 56								
	gerialization	•			a car a car					
	Ste Programmer Settings	+ Proje	α []	-	Configure Device	2	PROCE			
	Connect Parallel Port Cable	o Pasie		~	View Descence of		Fhudra	AM S		
	Bun Ctri+i	Enter			Them in ogrammens - Sa	2				
1		P	rogrammer Name				Programmer Type	Port	Programmer Status	Programmer
04433						FL	schPro3	usb04433 [USB 1.1]		4
					Refresh/Rescen for Program	mers				
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Set TCK frequency to 1MHz under FlashPro3 tab



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	OK Cancel	нер		
Software Version: 8.0.0.40 PDB file 'C:\Documents and Settings\khi DESIGN : ceatahost: CHECKSUM : 0326: Driver : 2.0.4 build 2 programmer: '04433' : flashFr03 Opened 'C:\Documents and Settings\khade {]] All {Error, }Warning, http://	ndeer\Desktop\t\ceatahost.pdb' has been PDB_VEPSION : 1.0 eer\Desktop\t\t.pro'	loaded successfully.		
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Start 🔄 🧔 🖄 🗋 🎽 🖏 Inbox - Outlook Express	Document1 - Microsoft W	Sd mmc ceata	Select programmer settin	Ø M 2:00 Pr

Then Program the FPGA.



2.3 Serial Cable connection



Figure 6: Serial cable connection during the programming of flash

- DB-9 connector needs to be connected to the PC/laptop. If serial connection not available use the Serial to USB convertor (Installation CD also available with the accessories).
- The other end of the serial cable needs to be connected to the Board. Please see the connector position as shown above in the Figure 6



2.4 Programming Flash through Serial interface procedure

2.4.1 Hyperterminal Setup

1.Go to Start \rightarrow Programs \rightarrow Accessories \rightarrow Communication \rightarrow Hyperterminal on the host PC. 2.Select COM1 or COM2 port depending on to which port you have connected the serial cable. 3.Click Configure button.Now configure as below.

Bits per Second (Baud Rate)	: 115200
Data bits	: 8
Parity	: None
Stop Bits	:1
Flow Control	: None

4. Go to File→ Properties→Settings→ASCII Setup. There select Echo Typed Characters locally.



2.4.2 Steps

- 1. Switch ON the Board.
- 2. Now Hyperterminal shows as below

iWave Systems Rainbow G3 Mo Version 0.1 i.MX27 RAINBO	Tech. Pvt. Lt nitor W G3	************ d. *****			
	BOARD INFO				
Area	Start address	End address	Size		
SDRAM Data section UsrStack IRQStack FIQStack UndefStack	0xa000_0000 0xa3e0_0000 0xa3f0_0000 0xa3f1_0000 0xa3f1_0000 0xa3f2_0000 0xa3f3_0000	0xa3ff_ffff 0xa3ef_ffff 0xa3f0_ffff 0xa3f1_ffff 0xa3f2_ffff 0xa3f3_ffff	64 MB 1 MB 64 KB 64 KB 64 KB 64 KB		
AbortStack SVCStack SYSStack Flash Bootloader Kernel Initrd Filesystems	0xa3f4_0000 0xa3f5_0000 0xa3f6_0000 0xc000_0000 0xc000_0000 0xffff_ffff 0xffff_ffff 0xffff_ffff	0xa3f4_ffff 0xa3f5_ffff 0xa3f6_ffff 0xc1ff_ffff 0xffff_fffe 0xffff_fffe 0xffff_fffe 0xffff_fffe 0xc1ff_ffff	64 KB 64 KB 64 KB 32 MB 1023 MB 0 MB 0 MB 3104 MB		
Going to boot FPGA support Enabling I2C The PCCRO is Switched on LI Drawing Scree draw_screen m loop starts loop ends now Drawing Scree draw_screen m	linux from fl ed Controller : 0xb10c480fSw CD n 1 ax_control = 1 in current me n 2 ax_control = 2	ash. Press any itching on LCL Drawn Screen enuGoing to new Drawn Screen	y key with) «t Screen	in 10 sec for a	diagnostics



- 3. Press any Key to continue in Diagnostic Menu.
- 4. Now Press **D** to download the file

SDRAM	0xa000_0000	0xa3ff_fff	64 MB
Data section	0xa3e0_0000	0xa3ef_ffff	1 MB
Us r Stack	0xa3f0_0000	0xa3f0_ffff	64 KB
IRQStack	0xa3f1_0000	0xa3f1_ffff	64 KB
FIQStack	0xa3f2_0000	0xa3f2_ffff	64 KB
UndefStack	0xa3f3_0000	0xa3f3_ffff	64 KB
AbortStack	0xa3f4_0000	0xa3f4_ffff	64 KB
SVCStack	0xa3f5_0000	0xa3f5_ffff	64 KB
SYSStack	0xa3f6_0000	0xa3f6_ffff	64 KB
Flash	0xc000_0000	0xc1ff_fff	32 MB
Bootloader	0xc000_0000	Øxffff_ffe	1023 MB
Kernel	0xffff_fff	0xffff_ffe	ØMB
Initrd	0xffff_fff	0xffff_ffe	ØMB
Filesystems	0xffff_fff	0xc1ff_fff	3104 MB

Going to boot linux from flash. Press any key with in 10 sec for diagnostics

FPGA supported Enabling I2C Controller The PCCRO is: 0xb10c480fSwitching on LCD Switched on LCD Drawing Screen 1 draw_screen max_control = 1Drawn Screen

loop starts loop ends now in current menuGoing to next Screen Drawing Screen 2 draw_screen max_control = 2Drawn Screen inside powr off A RAM test B Read-Write Memory C CSPI Test Download File D E G Environment variable Flash Program Gui Menu LCD Test SD/MMC Test L M Load WinCE from SD card Run From Address Ν R Touch Panel Test Boot Linux from Flash T X Launch Linux form SD Card Please select an option RainbowG3> d Enter the SDRAM download address : _

Connected 2:22:14 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo



5. Give SDRAM download address as A3000000 and then Press Y.

Data section 0xa3e0_0000 0xa3ef_ffff 1 MB UsrStack 0xa3f0_0000 0xa3f0_ffff 64 KB IRQStack 0xa3f1_0000 0xa3f2_ffff 64 KB FIQStack 0xa3f2_0000 0xa3f2_ffff 64 KB UndefStack 0xa3f3_0000 0xa3f3_ffff 64 KB UndefStack 0xa3f3_0000 0xa3f3_ffff 64 KB SVCStack 0xa3f5_0000 0xa3f3_ffff 64 KB SVCStack 0xa3f5_0000 0xa3f5_ffff 64 KB SVSStack 0xa3f6_0000 0xa3f5_ffff 64 KB SVSStack 0xa3f6_0000 0xa3f6_ffff 64 KB SVSStack 0xa3f6_0000 0xa3f6_ffff 64 KB SVSStack 0xa3f6_0000 0xa3f6_ffff 64 KB SVSStack 0xa3f6_0000 0xa1ff_ffff 32 MB Bootloader 0xc000_0000 0xffff_fff 32 MB Kernel 0xffff_ffff 0xffff_fff 0xffff_fff Initrd 0xffff_ffff 0xffff_ffff 0xdfff_fff Filesystems 0xffff_ffff 0xclff_ffff 3104 MB						
Going to boot linux from flash. Press any key with in 10 sec for diagnostics						
FPGA supported Enabling I2C Controller The PCCR0 is: 0xb10c480fSwitching on LCD Switched on LCD Drawing Screen 1 draw_screen max_control = 1Drawn Screen						
loop starts						
loop ends now in current menuGoing to next Screen Drawing Screen 2						
draw_screen max_control = 2Drawn Screen						
<pre>inside powr off A RAM test B Read-Write Memory C CSPI Test D Download File E Environment variable F Flash Program G Gui Menu L LCD Test M SD/MMC Test N Load WinCE from SD card R Run From Address T Touch Panel Test X Boot Linux from Flash Z Launch Linux form SD Card Please select an option RainbowG3> d Enter the SDRAM download address : a3000000</pre>						
Download File on to a3000000. Proceed <y n="">?</y>						



6. Goto **Transfer** \rightarrow **Sent Text File** in the hyper-terminal Send Text File ? × Look in: 🔄 HyperTerminal - 🖬 🖆 🚽 3 0 sec for diagnostics c:\imx_diag.uue • <u>O</u>pen File <u>n</u>ame: • Cancel Files of type: Text file (*.TXT) Switched on LCD Drawing Screen 1 draw_screen max_control = 1Drawn Screen LUD loop starts loop ends now in current menuGoing to next Screen Drawing Screen 2 draw_screen max_control = 2Drawn Screen inside powr off A RAM test B Read-Write Memory C CSPI Test Ď Download File D Download File E Environment variable F Flash Program G Gui Menu L LCD Test M SD/MMC Test N Load WinCE from SD card R Run From Address I Touch Panel Test X Boot Linux from Flash Z Launch Linux form SD Card Please select an option RainbowG3> RainbowG3> Enter the SDRAM download address : Download File on to a30000000. Proceed <y/n>? Send the UVE encoded file Connected 0:00:26 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print ech



7.Give the location of the file **imx_diag.uue** and then give open. 8.After downloading press any key to continue.

File Edit View Call Transfer Help 🗅 😅 🍘 🔏 💷 🎦 Drawing Screen 1 draw_screen max_control = 1Drawn Screen loop starts loop ends now in current menuGoing to next Screen Drawing Screen 2 draw_screen max_control = 2Drawn Screen inside powr off A RAM test B Read-Write Memory C CSPI Test D Download File EF Environment variable Flash Program Gui Menu Gui Menu LCD Test SD/MMC Test Load WinCE from SD card Run From Address Touch Panel Test Boot Linux from Flash Laupch Linux form SD Car G M N R Ň Launch Linux form SD Card Please select an option RainbowG3> Enter the SDRAM download address : Download File on to a3000000. Proceed <y/n>? Send the UUE encoded file Downloaded 14ec0 bytes on to a3000000 Press any key to continue A RAM test Read-Write Memory CSPI Test В CDEFGLMN Download File Environment variable Flash Program Gui Menu LCD Test SD/MMC Test Load WinCE from SD card Run From Address R Touch Panel Test Boot Linux from Flash Ť Ň Z Launch Linux roim of Please select an option Launch Linux form SD Card Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo Connected 0:02:53



9.Press F to enter in to Flash programming menu. D Download File E Environment variable

```
F
      Flash Program
Gui Menu
 F
 G
      LCD Test
SD/MMC Test
Load_WinCE from SD card
 М
 Ν
      Run From Address
Touch Panel Test
Boot Linux from Flash
Launch Linux form SD Card
 R
 Х
 Please select an option .....
 RainbowG3>
Enter the SDRAM download address :
Download File on to a3000000. Proceed <y/n>?
Send the UVE encoded file
. . . . . . . . . . . . . . .
                        Downloaded 14ec0 bytes on to a3000000
Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
Ď
      Download File
Ε
      Environment variable
       Flash Program
      Gui Menu
LCD Test
SD/MMC Test
Load WinCE from SD card
Run From Address
G
M
Ň
R
      Touch Panel Test
Boot Linux from Flash
 Τ
Ň
      Launch Linux form SD Card
Please select an option .....
RainbowG3> f
      Flash Programming utility
            ***********
A
             Program the diagnostic code
B
C
             Program the zImage
             Program the initrd
Program the FFS area
Ď
             Exiť
Ε
 Select an option : _
```

Connected 0:03:43 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo



10.Press A to program the diagnostic code.

```
File Edit View Call Transfer Help
🗅 😂 🍙 🐉 🗈 🎦 😭
           Flash Program

Gui Menu

LCD Test

SD/MMC Test

Load WinCE from SD card

Run From Address

Touch Panel Test

Boot Linux from Flash

Launch Linux form SD Card

ase select an option .....
     G
     M
    Ν
    R
    Х
    Please select an option ....
RainbowG3>
    Rainbow53>
Enter the SDRAM download address :
Download File on to a3000000. Proceed <y/n>?
Send the UUE encoded file
                                  Downloaded 14ec0 bytes on to a3000000
    Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
    Ē
            Download File
    E
F
             Environment variable
            Flash Program
   G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option ......
RainhowG3> f
    RainbowG3> f
                   ******
            Flash Programming utility
   ***
    A
                    Program the diagnostic code
                    Program the zImage
Program the initrd
Program the FFS area
    B
C
D
E
                    Exit
    Select an option : a
    Have you downloaded the file in SDRAM location 0xA3000000 (y/n) : _
                          Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print ech
Connected 0:04:26
```



11.Press **Y** and then give **00020000** as size.

File Edit View Call Transfer Help					
B Read-Write Memory C CSPI Test D Download File E Environment variable F Flash Program G Gui Menu L LCD Test M SD/MMC Test N Load WinCE from SD card R Run From Address T Touch Panel Test X Boot Linux form SD Card Please select an option RainbowG3> Select a valid option. Press any key to continue A RAM test B Read-Write Memory C CSPI Test D Download File E Environment variable F Flash Program G Gui Menu L LCD Test	1				
M SD/MMC Test N Load WinCE from SD card R Run From Address T Touch Panel Test X Boot Linux from Flash Z Launch Linux form SD Card Please select an option RainbowG3> f					

A Program the diagnostic code B Program the zImage C Program the initrd D Program the FFS area E Exit					
Select an option : a					
Have you downloaded the file in SDRAM location 0xA3000000 (y/n) : y Enter the size of the data : 00020000 Proceed <y n="">?</y>					
Connected 0:08:39 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo					



12.Now press Y to program the flash. 13.After Flash programming is over,Hyperterminal shows as below

File Edit View Call Transfer Help 🗅 😂 🍙 🕉 🗈 🎦 😭 Gui Menu LCD Test SD/MMC Test Load WinCE from SD card G M N R Run From Address Touch Panel Test Boot Linux from Flash Launch Linux form SD Card Х Z Launch Linux form SD Card Please select an option RainbowG3> Select a valid option. Press any key to continue A RAM test B Read-Write Memory C CSPI Test D Download File Ē Environment variable Flash Program Gui Menu LCD Test SD/MMC Test Load WinCE from SD card Run From Address Touch Panel Test Boot Linux from Flash G MN R T ×. Z Launch Linux Iorm of Please select an option RainbowG3> f ********************************* Flash Programming utility ********* A Program the diagnostic code Program the zImage B C D E Program the initrd Program the FFS area Exit Select an option : a Have you downloaded the file in SDRAM location 0xA3000000 (y/n) : y Enter the size of the data : 00020000 Proceed $\langle y/n \rangle$? y verified Flash Programming Done Connected 0:11:14 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

14.Now Switch off the board and then switch ON the board.



3 GUI Diagnostic Tests

The GUI menu will be displayed as below when the set up is powered ON. The display menu on the LCD is as shown below.

i₩av	e Systems Tech.Pvt. Ltd	
	Main Menu	
CE-A1	TA Test	
Laund	ch WinCE from Flash	

Now touch **CE-ATA Test** using stylus to enter in to the CE-ATA test.

iWave Systems Tech.Pvt. Ltd
CE-ATA Test
Intialising
Exit

iWave Systems Technologies Pvt. Ltd. (Confidential)



If CE-ATA is Present GUI shows Model No, Serial No, Card Size as below. Press Exit to go to the Main Menu.



If CE-ATA is not Present GUI as below. Press Exit to go to the Main Menu.

iWave Systems Tech.Pvt. Ltd
CE-ATA Test
Device initialition failed
Exit



3.1 Launch WINDOWS CE

In the Main Menu touch Launch WinCE fron Flash to Launch WinCE.

iWave Systems Tech.Pvt. Ltd	
Main Menu	
CE-ATA Test	
Launch Wince from Flash	



4 Windows CE Operating System

4.1 Browsing the device contents

Various folders and files present in the device can be accessed from the **My Device** icon on the WinCE Desktop.

- 1. Double click on the **My Device** icon on the desktop.
- 2. The Explorer window will pop up. The contents of the device can be browsed just like using the Explorer in a Windows PC.
- 3. Double Click the Windows folder.
- 4. Now double click the Beta Player to play movies.
- 5. Then Media player window will popup.
- 6. Go to File \rightarrow Open \rightarrow Windows \rightarrow Matix to play movie.