Enabling SPI Flash Disk on Vortex86

Many Vortex86 modules include an SPI flash device which can be enabled in the BIOS as the boot device. The flash device on the module comes pre-loaded with FreeDos so application development can begin out of the box.

This application note will give a step-by-step procedure for enabling the device and booting into FreeDos. Updating or changing the OS would mean formatting the virtual FDD and installing the new OS.

Prepare the unit

If the module has a graphics card then connect to a VGA monitor and a PS2 or USB keyboard. Otherwise connect a PC running a terminal program to the remote console serial port. The remote console port generally by default is COM1 and is enabled by connecting GPIO 3.7 to GND (Refer to the user manual for the specific module to confirm these details).

The terminal program needs the communications to be set to 115200 BAUD, 8 data bits, No parity and 1 stop bit.

Power up

As the unit boots you should see the BOOT information screen, the final display should be similar to figure 1.



Running the BIOS setup program

Power cycle the module to re-boot and during the boot process press the DEL key if using a PS2 or USB keyboard, if you are using the remote console press the F4 function key.

The display should say 'Entering Setup', followed by the screen shown in figure 2

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
********	1 Overview	*******	******	*********	********	**************
* ******		*******	******	*****	••••• * • • * * *	
* Proces	sor				*	
	(86DX A9121				×	
* Speed	:800MHz				*	
*					: *	
* System	n Memory				*	
* Size	:256MB				*	
* Speed	:300MHz				*	
*	— ••			2 2 2 2 3	*	
* System				8:261	*	
* System	ı Date		llue	09/02/2008]	*	
*			ы жы		2. **	0 1 1 0
		0 Hour(s)	Remainir	ig	* **	Select Screen
	ı Fault :0 Ti	me(s)			* **	Select Item
*					* +	Change Field
*					* Tab	Select Field
×					* F1	General Help
*					* F10	Save and Exit
*					* ESC	Exit
******	v02.69 (C)Copyrigh	t 1985-2	2010, America	n Megatren	**************************************

Navigate the setup menu using the left / right arrow keys to highlight 'Boot', the 'Boot settings Configuration' line should be highlighted.

Main	Advanced	PCIPnP	Boot	Security	Chipse
******	*********	********	******	********	******
* Boot S	Settings				*
* *****	**********	*********	*******	**********	***
* * Boot	: Settings Co	nfiguratio	n		*
					*
* * *					×
×					ः ¥
*					*

Figure 3

Press 'Enter'

Use Up/down keys to highlight 'OnBoard Virtual Flash FDD'

	Boot		
* Boot Settings Configuration	***	Options	
* ************************************	***************************************	* *	Di
* Quick Boot * Quiet Boot	[Enabled] [Disabled]	×	Disabled Inte r nal
* AddOn ROM Display Mode * Bootup Num-Lock	[Keep Current] [On]		Internal Read Only External
∗ PS/2 Mouse Support	[Auto]		External Read Only
∗ Boot To O\$/2 ∗ Interrupt 19 Capture	[No] [Enabled]	*	
∗ Beep Function ∗ MTBF Function	[Disabled] [Enabled]	*	
* OnBoard Virtual Flash FDD	[Disabled]	*	
не 		*	** Select Screen
			Select Screen

Figure 4

Press 'Enter'

A Pop-up Box will appear with the available options:

	LVIII	
PS/2 Mouse Support	*** Options ***	* *
Boot To OS/2	* Disabled *	+ *
Interrupt 19 Capture	* Internal *	+ ×
Beep Function	* Internal Read Only *	es 😣
MTBF Function	* External *	* *
OnBoard Virtual Flash FDD	▼ External Read Only →	* *
	**********************	• *

Figure 5

There is a small SPI flash internal to the Vortex86 processor, but the device we wish to select is the larger, external device that is designed into the modules.

Use the up /down keys to select 'External' then press 'Enter'.

Press the 'Esc' key to navigate back to the top menu

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
******	**********	********	*******	********	*********	**********
∗ Boot S	ettings				*	
* *****	*******	*******	******	******	*** *	
* * Boot	Settings Co	nfiguratio	n		*	
÷					*	
e.					*	
			Figure 6	5		

Use left / right keys to navigate to the exit, menu. 'Save changes and Exit' should be highlighted.

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
*******	*********	********	*******	***********	*********	**************
* Exit Op	otions				*	
* ******	*********	*******	******	**********	** *	
* Save Ch	nanges and E	xit			*	
∗ Discaro	l Changes an	d Exit			×	
* Discard	l Changes				*	
×					×	

Figure 7

Press 'Enter'

			-		
) ******	*****	********	*****	*****	***
×					×
* Save	configuration	changes and	l exit	setup?	*
e*		1		100	*
e <mark>*****</mark> *	******	********	*****	*****	***
¥	[0k]	[Car	ncell		*
******	******	********	*****	*****	***
			×	**	Se1

Figure 8

Press 'Enter' again and the unit should reboot.

The unit should now detect the drive and boot into FreeDos.

FreeDOS kernel build 2036 cvs [version Aug 18 2006 compiled Aug 18 2006] Kernel compatibility 7.10 - WATCOMC - 80386 CPU required - FAT32 support (C) Copyright 1995-2006 Pasquale J. Villani and The FreeDOS Project. All Rights Reserved. This is free software and comes with ABSOLUTELY NO WARRANTY; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2, or (at your option) any later version. - InitDiskno hard disks detected FreeCom version 0.84-pre2 XMS_Swap [Aug 28 2006 00:29:00] Current date is Tue 09-02-2008 Enter new date (mm-dd-[cc]yy): Current time is 1:15:12.29 pm Enter new time: A:\> All information contained in this application note is believed to be accurate and reliable. However, we assume no responsibility for its use. Since conditions of product use are outside our control, we make no warranties express or implied in relation thereto. We therefore cannot accept any liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under or recommendation to infringe any patents.

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