



Vega86-6270

VIA Mark CoreFusion 533MHz

PC/104 CPU Module

with 2S/2USB/VGA/LCD/LAN/Audio

128MB /256 SDRAM Onboard

User's Manual

(Revision 1.2A)

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Table of Contents

Table of Contents.....	iii
Chapter 1 Introduction.....	1
1.1 Packing List.....	1
1.2 Product Description.....	2
1.3 Specification.....	3
1.4 Board Dimension.....	4
Chapter 2 Installation.....	5
2.1 Board Outline.....	5
2.2 Connectors & Jumpers Location.....	7
2.3 Connectors & Jumpers Summary.....	9
2.4 Pin Assignments & Jumper Settings.....	10
2.5 System Mapping.....	18
Chapter 3 Driver Installation.....	20
Appendix.....	21
A. STN Flat Panel Data Output.....	21
B. TFT Flat Panel Data Output.....	22
C.Flat Panel BIOS setting.....	23
D.Flat Panel Wiring and Lighting.....	25
Warranty.....	26

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Chapter 1

Introduction

1.1 Packing List

Product Name	Package
Vega86-6270	<ul style="list-style-type: none">● Embedded Vega86 CPU All-in-One Board● Manual & Drivers CD x 1● RS232 cable x 2● PRINTER cable x1● FDD cable x 1● IDE cable x 1● USB cable x 1 (USB port x 2)● VGA cable x 1● LAN cable x 1● Audio cable x 2● PS/2 Mouse cable x 1● PS/2 Keyboard cable x 1

1.2 Product Description

The Vega86 Single-Board-Computer series (powered by VIA Mark CoreFusion processor) offers high performance, cost-effective and energy efficient processor with integrated ProSavage4 SA graphics controller, which is the powerful embedded x86 platform for Windows XP Embedded, WEPOS, and embedded Linux application.

The complete board consists of the Mark CoreFusion processor and the VT82C686B PCI-ISA South Bridge, Realtek RTL8100B 10/100 Fast Ethernet Controller, etc. The processor integrates VIA's high-performance ProSavage4 3D / 2D graphics controller, LCD and Flat Panel display interfaces, with further superior performance between the CPU, DRAM and PCI bus with pipelined, burst, and concurrent operation. The South Bridge is PC98 / PC99 compliant with integrated UltraDMA-66 / 33 IDE, 2 (or 3) USB (1.1) ports, Super-I/O functions (floppy disk drive interface and serial / parallel ports), and AC-97 link supporting digital audio functions.

The Vega86 SBC supports SDRAMs up to 256MB. As to the SDRAM controller, it meets the standard PC133 Synchronous DRAM (SDRAM). The Synchronous DRAM interface allows zero wait state bursting between the SDRAM and the data buffers at 133MHz.

The Vega86 SBC integrates S3 Graphics and 128-bit ProSavage4 graphics accelerators that bring mainstream graphics performance to the Value PC with leading-edge 2D, 3D and DVD video acceleration into a cost effective package. Vega86 SBC also combines the industry's first integrated AGP 4X solution with Microsoft Direct-X texture compression and massive 2Kx2K textures to deliver unprecedented 3D performance and image quality for the Value PC mobile market.

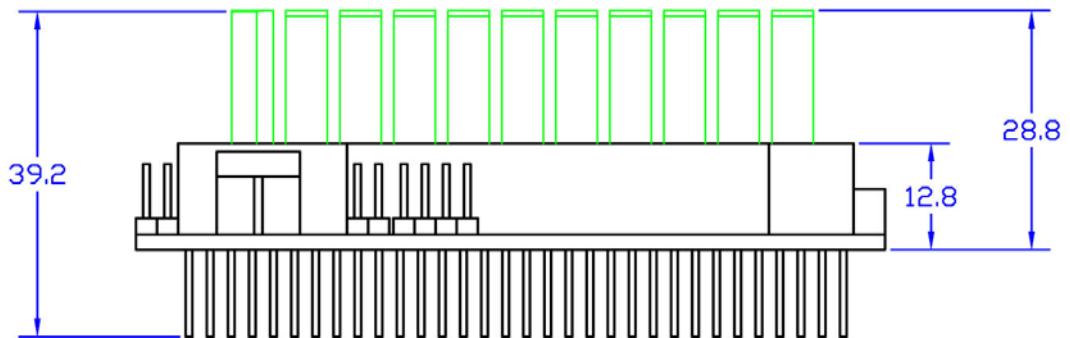
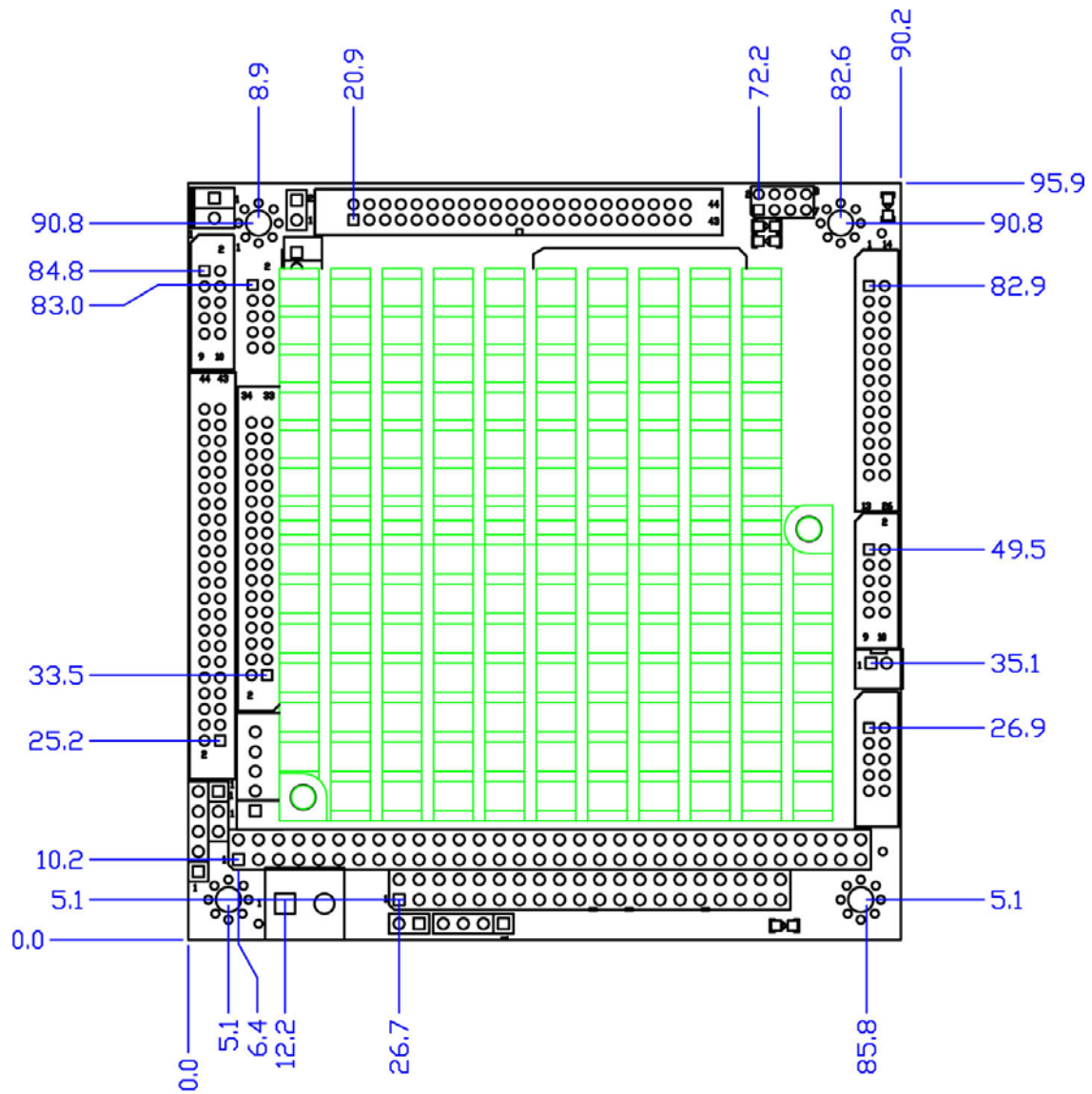
Vega86 SBC's South Bridge supports four levels (doubleword) of line buffers, DMA transfers and delay transaction to allow efficient PCI bus utilization and (PCI-2.2 compliant). The VT82C686B also includes an integrated Super I/O, integrated DS12885 style real time clock with extended 256 byte CMOS RAM, integrated master mode enhanced IDE controller with full scatter / gather capability, integrated two (or three) USB (1.1) interface with root hub and two function ports with built-in physical layer transceivers, Distributed DMA support and integrated AC-97 link for basic audio functions.

Regarding the network architecture application, Vega86 SBC equips with the Realtek RTL8100B, which is a highly integrated, cost-effective single-chip Fast Ethernet controller able to provide 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.3u 10/100Base-T specifications and IEEE 802.3x Full Duplex Flow Control.

1.3 Specification

Features	Vega86-6270
CPU	VIA Mark CoreFusion 533MHz
Chipset	VIA VT82C686B
BIOS	AMI BIOS
System Memory	128MB /256MB SDRAM onboard
Cache	L1:64KB L2:64KB
Bus Interface	PC/104 Standard Compliant
Watchdog Timer	None
VGA	Integrated 2D/3D AGP2X graphics with MPEG2 Accelerator, Shared system memory 8M/16M/32M VGA, SVGA, XGA, SXGA and DSTN/TFT Flat Panel interface support
LAN	Realtek 8100B 10/100Mbps Ethernet Controller Half/Full duplex capability
Audio	VIA VT1612A, AC97 2.2 Specification.
I/O Interface	<ul style="list-style-type: none"> ● Enhanced IDE interface x1 ● RS232 port x2 ● RS-232/485 port x1 (RS485 with Auto Direction) ● Parallel port x1 ● FDD interface x1 ● USB port x2 (USB 1.1 version)
Connectors	<ul style="list-style-type: none"> ● 2.00 mm Ø 44-pin box header for IDE x1 ● 2.00 mm Ø 34-pin box header for FDD x1 ● 2.00 mm Ø 26-pin box header for Printer x1 ● 2.00 mm Ø 10-pin box header for RS-232 x2 ● 2.00 mm Ø 10-pin header for USB (for 2 USB ports) x1 ● 2.00 mm Ø 44-pin box header for LCD x 1 ● 2.00 mm Ø 10-pin box header for VGA x1 ● 2.00 mm Ø 4-pin header for Audio x 2 ● 2.00 mm Ø 8-pin header for LAN x 1 ● 2.54 mm Ø 2-pin header for RS-485 x1 ● 2.54 mm Ø 5-pin header for keyboard x1 ● 2.54 mm Ø 5-pin header for Mouse x1 ● 2.54 mm Ø 2-pin header for Reset x1
Flash Disk Support	<ul style="list-style-type: none"> ● 44-pin IDE Flash Disk(EmbedDisk 16MB or above)
Power Requirement	Single Voltage +5V @2.2A
Dimension	90mm X 96mm (3.54 x 3.77 inches)
Weight	210g
Operating Temperature	-20°C ~ +60°C

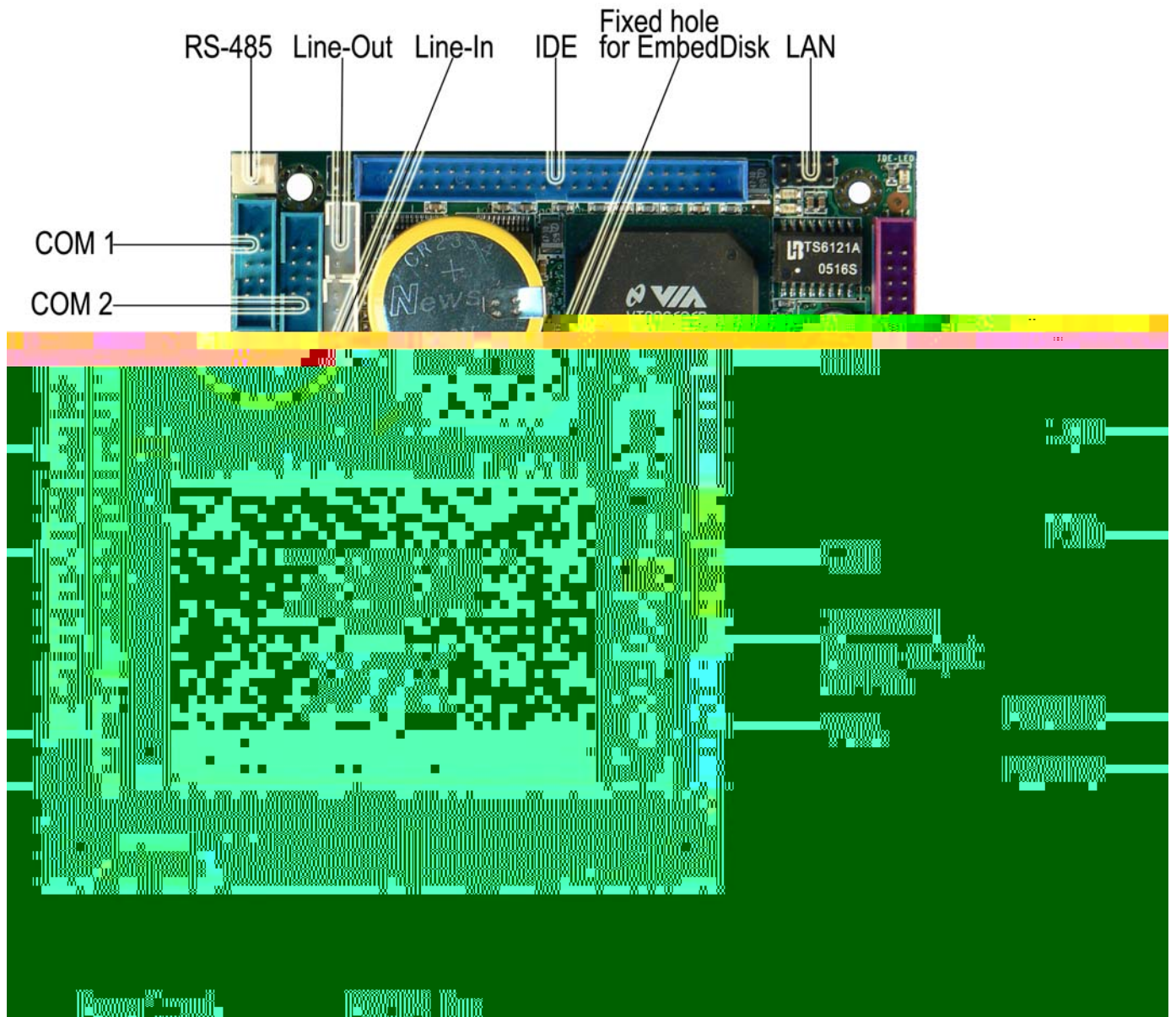
1.4 Board Dimension



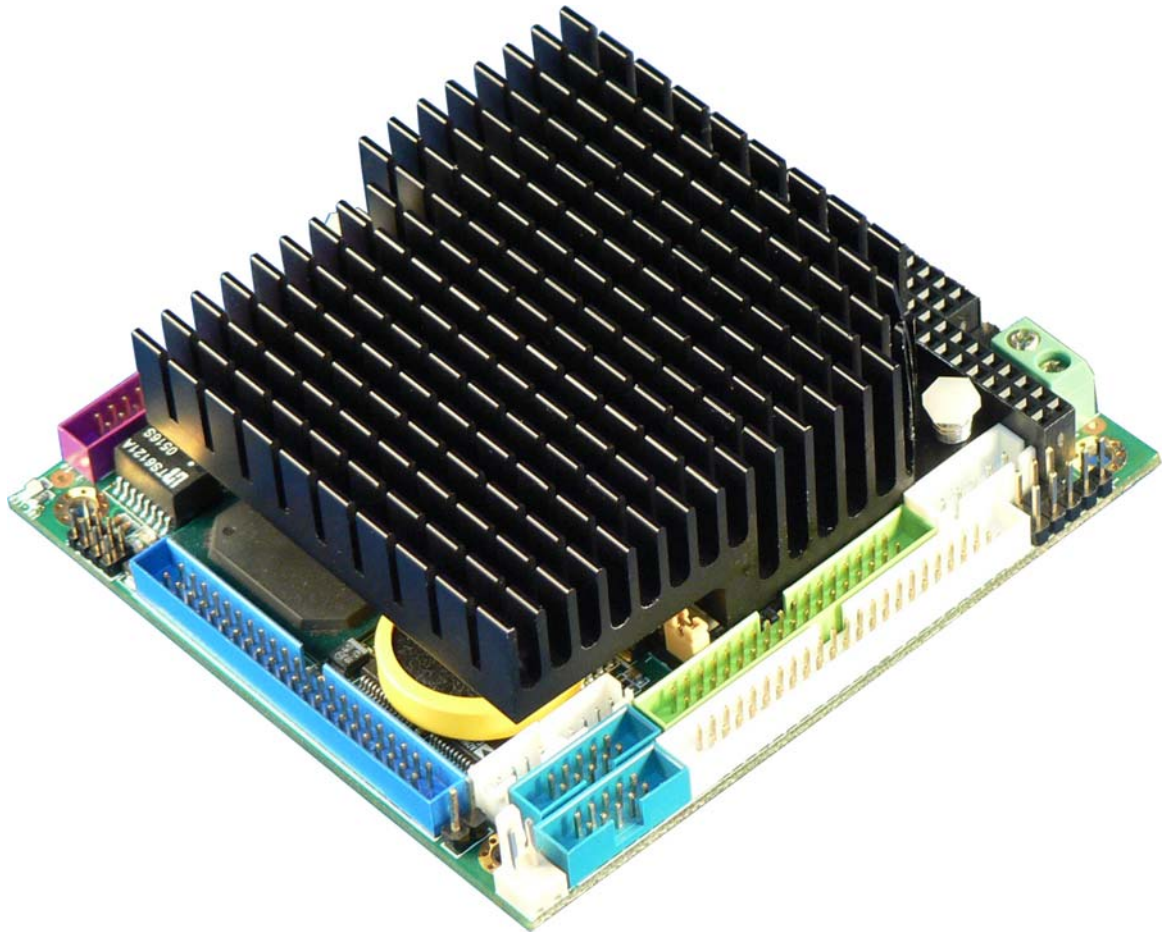
Chapter 2

Installation

2.1 Board Outline

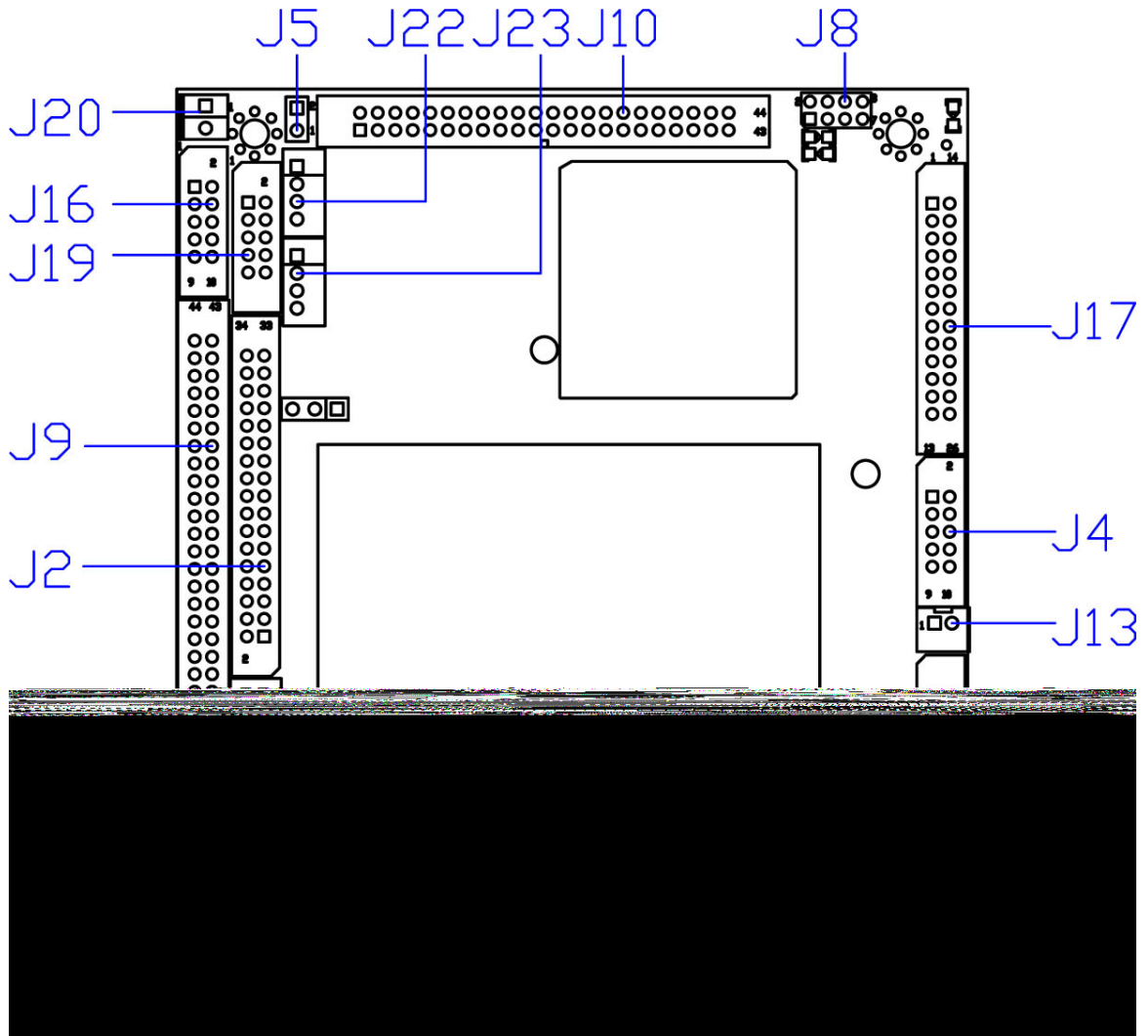


To guarantee the stability & maximum performance of original design, Vega86-6270 must be used with the manufacturer designated passive heat sink shown as below photo.

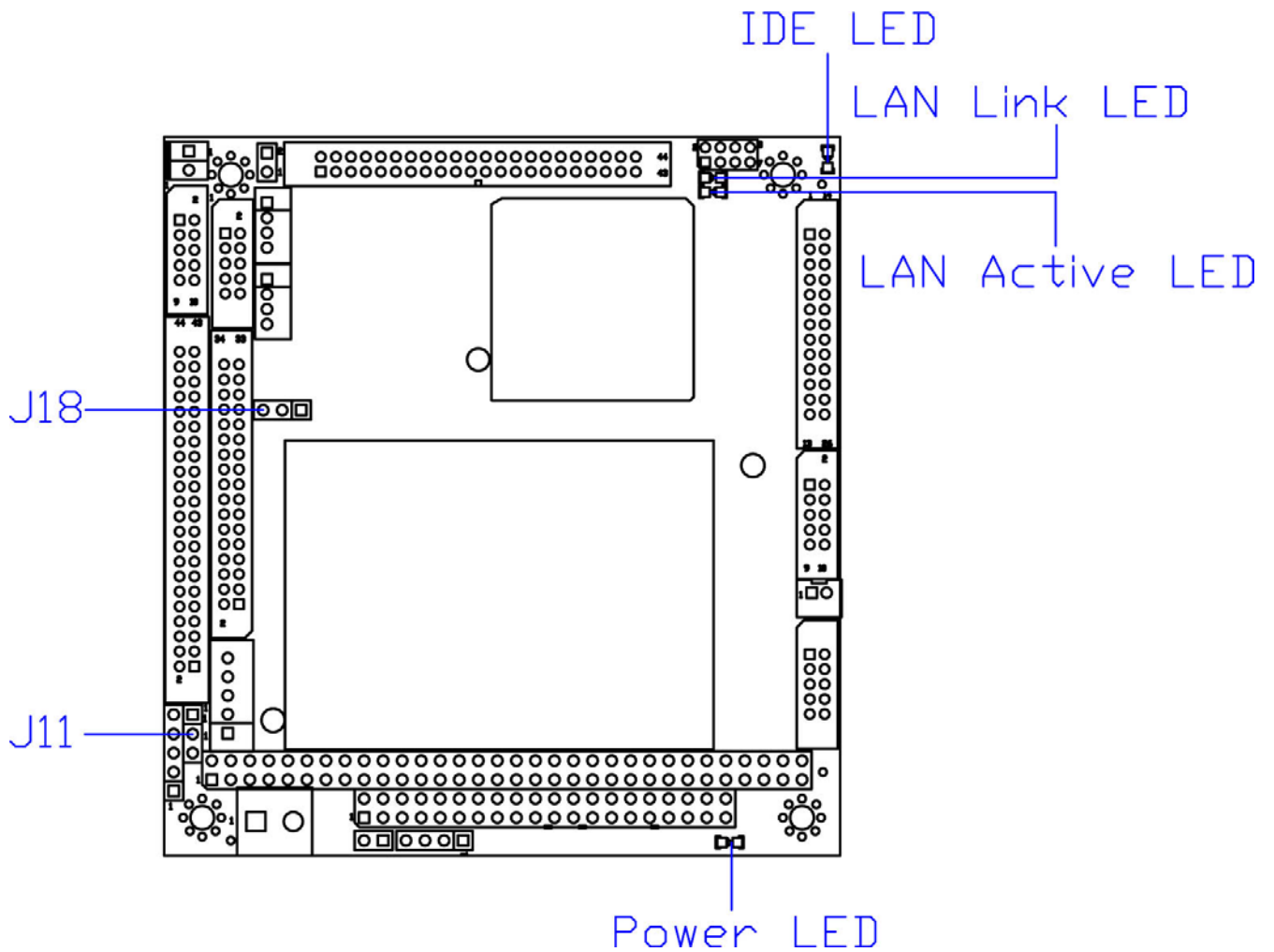


2.2 Connectors & Jumpers Location

Connectors



Jumpers & LEDs



2.3 Connectors & Jumpers Summary

Summary Table

Nbr	Description	Type of Connections	Pin nbrs.
J1	VGA	Pin Header, 2.0Ø ,5x2	10-pin
J2	FDD	Pin Header, 2.0Ø ,17x2	34-pin
J3	Reset	Pin Header, 2,54Ø,1x2	2-pin
J4	USB	Box Header,2.0Ø , 5x2	10-pin
J5	Speaker	Pin Header, 2.54Ø,2x1	2-pin
J6	Keyboard	Pin Header, 2,54Ø,1x5	5-pin
J7	Mouse	Pin Header, 2,54Ø,1x5	5-pin
J8	LAN	Pin Header, 2.0Ø , 4x2	8-pin
J9	LCD Connector	Box Header,2.0Ø , 22x2	44-pin
J10	IDE	Box Header, 2.0Ø ,22x2	44-pin
J11	LCD Volts Sel. (5V or 3.3V)	Pin Header, 2.54Ø ,3x1	3-pin
J12	Power Connector	Terminal Block 5.0Ø,2x1	2-pin
J13	FAN (Reserved Power-output for FAN)	Molex Header,2.0Ø , 2x1	2-pin
J14	PC104 Connector – 64 pin	Box Header, 2.54Ø 32x2	64-pin
J15	PC104 Connector – 40 pin	Box Header, 2.54Ø 20x2	40-pin
J16	COM1	Pin Header, 2.0Ø 5x2	10-pin
J17	PRINT	Pin Header, 2.0Ø , 13x2	26-pin
J18	RS232/RS485 Select (COM 2)	Pin Header, 2.54Ø, 3x1	3-pin
J19	COM2	Pin Header, 2.0Ø 5x2	10-pin
J20	RS-485	Molex Header,2.0Ø , 2x1	2-pin
J22	LINE OUT	Molex Header, 2.0Ø, 4x1	4-pin
J23	LINE IN	Molex Header, 2.0Ø, 4x1	4-pin
J24	4P Power Source (Interconnect to PC/104 - J15)	Pin Header, 2.54Ø , 4x1	4-pin
IDE-LED	IDE Active LED (Yellow)	LED-SMD	
PWR-LED	Power Active LED	LED-SMD	
LED 0	LAN Active LCD (Green)	LED-SMD	
LED 1	LAN 1 Link LED (Yellow)	LED-SMD	

2.4 Pin Assignments & Jumper Settings

J1: VGA

Pin #	Signal Name	Pin #	Signal Name
1	R OUT	2	GND
3	G OUT	4	GND
5	B OUT	6	GND
7	HSYNC	8	GND
9	VSYNCD	10	GND

J2: FDD

Pin #	Signal Name	Pin #	Signal Name
34	DSKCHG\	33	GND
32	HDSEL\	31	GND
30	RD\	29	GND
28	WP\	27	GND
26	TR0\	25	GND
24	WG\	23	GND
22	WD\	21	GND
20	STEP\	19	GND
18	DIR\	17	GND
16	MTR1\	15	GND
14	DS0\	13	GND
12	DS1\	11	GND
10	MTR0\	9	GND
8	INDEX\	7	GND
6	DRV1	5	GND
4	NC	3	GND
2	DENSEL	1	GND

J3: RESET

Pin #	Signal Name	Pin #	Signal Name
1	RST_SW	2	GND

J4: USB

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	VCC
3	-DATA1	4	-DATA0
5	+DATA1	6	+DATA0
7	GND	8	GND
9	GND	10	GND

J5: Speaker

Pin #	Signal Name	Pin #	Signal Name
1	SPKR	2	VCC

J6: Keyboard

Pin #	Signal Name	Pin #	Signal Name
1	KBCLK	2	KBDAT
3	NC	4	GND
5	+5V		

J7: Mouse

Pin #	Signal Name	Pin #	Signal Name
1	MSCLK	2	IRQ12
3	NC	4	GND
5	+5V		

J8: LAN

Pin #	Signal Name	Pin #	Signal Name
1	TX+	2	TX-
3	RX+	4	LED0
5	LED0+	6	RX-
7	LED1+	8	LED1

J9: LCD Connector

Pin #	Signal Name	Pin #	Signal Name
1	LCDVCC	2	LCDVCC
3	FPD0	4	FPD1
5	FPD2	6	FPD3
7	FPD4	8	FPD5
9	FPD6	10	FPD7
11	FPD8	12	FPD9
13	FPD10	14	FPD11
15	FPD12	16	FPD13
17	FPD14	18	FPD15
19	FPD16	20	FPD17
21	FPD18	22	FPD19
23	FPD20	24	FPD21
25	FPD22	26	FPD23
27	FP24	28	FP25
29	FPD26	30	FPD27
31	FPD28	32	FPD29
33	GND	34	GND
35	FPD30	36	FPCLK
37	FPD31	38	FPDEN
39	FPD32	40	FPHS
41	FPD34	42	FPVS
43	ENVEE	44	ENVDD

(Please refer to Appendix A, B for STN and TFT Flat Panel Data Output)

J10: IDE

Pin #	Signal Name	Pin #	Signal Name
1	PCIRST-	2	GND
3	IDED7	4	IDED8
5	IDED6	6	IDED9
7	IDED5	8	IDED10
9	IDED4	10	IDED11
11	IDED3	12	IDED12
13	IDED2	14	IDED13
15	IDED1	16	IDED14
17	IDED0	18	IDED15
19	GND	20	NC
21	IDEREQ	22	GND
23	IDEIOW-	24	GND
25	IDEIOR-	26	GND
27	ICHRDY	28	GND
29	IDEACK-	30	GND
31	IRQ14	32	NC
33	IDESA1	34	PD_80P
35	IDESA0	36	IDESA2
37	IDECS-0	38	IDECS1
39	DASP	40	GND
41	VCC	42	VCC
43	GND	44	NC

J11: LCD Volts Sel.

Pin #	Signal Name	Pin #	Signal Name
1-2	+5V	2-3	+3.3V

J12: Power Connector

Pin #	Signal Name
1	+5V
2	GND

J13: FAN

Pin #	Signal Name
1	+5V
2	GND

J14: PC104 Connector – 64pin

Pin #	Signal Name	Pin #	Signal Name
1	IOCHCHK *	2	GND
3	SD7	4	RESETDRV
5	SD6	6	+5V
7	SD5	8	IRQ9
9	SD4	10	-5V
11	SD3	12	DRQ2
13	SD2	14	-12V
15	SD1	16	OVS
17	SD0	18	+12V
19	IOCHRDY	20	GND
21	AEN	22	SMEMW *
23	SA19	24	SMEMR *
25	SA18	26	IOW *
27	SA17	28	IOR *
29	SA16	30	DACK3 *
31	SA15	32	DRQ3
33	SA14	34	DACK1 *
35	SA13	36	DRQ1
37	SA12	38	REFRESH *
39	SA11	40	SYSCLK
41	SA10	42	IRQ7
43	SA9	44	IRQ6
45	SA8	46	IRQ5
47	SA7	48	IRQ4
49	SA6	50	IRQ3
51	SA5	52	DACK2 *
53	SA4	54	TC
55	SA3	56	BALE
57	SA2	58	+5V
59	SA1	60	OSC
61	SA0	62	GND
63	GND	64	GND

J15: PC104 Connector – 40pin

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	GND
3	MEMCS16 *	4	SBHE *
5	IOCS16 *	6	SA23
7	IRQ10	8	SA22
9	IRQ11	10	SA21
11	IRQ12	12	SA20
13	IRQ15	14	SA19
15	IRQ14	16	SA18
17	DACK0 *	18	SA17
19	DRQ0	20	MEMR *
21	DACK5 *	22	MEMW *
23	DRQ5	24	SD8
25	DACK6 *	26	SD9
27	DRQ6	28	SD10
29	DACK7 *	30	SD11
31	DRQ7	32	SD12
33	+5V	34	SD13
35	MASTER *	36	SD14
37	GND	38	SD15
39	GND	40	NC

J16: COM1

Pin #	Signal Name	Pin #	Signal Name
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1	10	VCC

J17: PRINT

Pin #	Signal Name	Pin #	Signal Name
1	STB-	2	PD0
3	PD1	4	PD2
5	PD3	6	PD4
7	PD5	8	PD6
9	PD7	10	ACK-
11	BUSY	12	PE
13	SLCT	14	AFD-
15	ERR-	16	PRINIT-
17	SLIN-	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	25	GND

J18: RS232/RS485 Select (COM2)

Pin #	Signal Name
1-2	COM2 RS232
2-3	RS485

J19: COM2

Pin #	Signal Name	Pin #	Signal Name
1	DCD2	2	RXD2
3	TXD2	4	DTR2
5	GND	6	DSR2
7	RTS2	8	CTS2
9	RI2	10	VCC

J20: RS-485 (Auto direction)

Pin #	Signal Name
1	RS485+
2	RS485-

J22: LINE OUT

Pin #	Signal Name
1	LOUTR
2	GND
3	GND
4	LOUTL

J23: MIC IN

Pin #	Signal Name
1	VDD5
2	GND
3	GND
4	MICIN

J24: 4P Power Source (Interconnect to PC/104 - J15)

Pin #	Signal Name
1	+12V
2	-12V
3	-5V
4	GND

2.5 System Mapping

System Mapping (系統佔用位址說明)

Memory Mapping

Address	Description	Usage
0000:0000-9000:FFFF	System RAM	*
A000:0000-A000:FFFF	EGA/VGA Video Memory	*
B000:0000-B000:7FFF	MDA RAM, Hercules graphics display RAM	*
B000:8000-B000:FFFF	CGA display RAM	*
C000:0000-C000:DFFF	EGA/VGA BIOS ROM	*
CE00:0000-CE00:FFFF	Boot ROM enable.	*

3C0h - 3CFh	VGA/EGA Adapter	*
3D0h - 3DFh	CGA Adapter	*
3E8h - 3EFh	Serial Port 3	
3F0h - 3F7h	Floppy Controller #1	*
3F8h - 3FFh	Serial Port 1	*

IRQ Mapping

IRQ#	Description	Usage
IRQ0	System Timer	*
IRQ1	Keyboard Controller	*
IRQ2	Cascade for IRQ8 - 15	
IRQ3	Serial Port 2	*
IRQ4	Serial Port 1	*
IRQ5	Unassigned	
IRQ6	Floppy Disk Controller	*
IRQ7	Parallel Port 1	*
IRQ8	Real Time Clock	*
IRQ9	Ethernet 10/100M LAN	*
IRQ10	Codec AC'97	*
IRQ11	USB	*
IRQ12	Mouse	*
IRQ13	Math Coprocessor	*
IRQ14	Hard Disk Controller	*
IRQ15	Unassigned	

DMA Mapping

DMA#	Description	Usage
DMA0		
DMA1		
DMA2	Floppy Disk Controller	*
DMA3		
DMA5		
DMA6		
DMA7		

Chapter 3

Driver Installation

VGA

The Mark CoreFusion processor also integrates S3 Graphics' 128-bit ProSavage4 graphics accelerator that brings mainstream graphics performance to the Value PC with leading-edge 2D, 3D and DVD video acceleration into a cost effective package. Mark CoreFusion also combines the industry's first integrated AGP 4X solution with Microsoft Direct-X texture compression and massive 2Kx2K textures to deliver unprecedented 3D performance and image quality for the Value PC mobile market.

LAN

The Realtek RTL-8100B 10/100Mbps Ethernet controller board supports both 10/100BASE-T and allows direct connection to your 10/100Mbps Ethernet based Local Area Network for full interaction with local servers, wide area networks such as the Internet.

I/O and IRQ settings can be done by software with the supplied utility software, or it can be set for Plug and Play compatibility. The controller supports: Half / Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

Audio.

The VIA VT1612A Audio Codec conforms to the AC'97 2.2 specification providing 18-bit resolution performance. With 2 channel outputs the VIA VT1612A provides high-performance stereo quality for headphones or speaker connections. Furthermore, an integrated headphone amplifier with thermal shutdown reduces the need for further external components. The VIA VT1612A includes analog mixer circuitry for stereo enhancement to provide a pleasing 3D surround sound effect for stereo media. For a completely digital audio path the VIA VT1612A includes an integrated IEC958 line driver for S/PDIF compressed digital or LPCM audio out.

The Vega86-6270 PC/104 CPU board provides the VGA, LAN and Audio drivers for Windows CE.NET 4.2, Windows CE 5.0, Windows 98, Windows XP and Windows XP Embedded. Please get the drivers from the Driver CD which attached with the standard packing of Vega86-6270 board or please get it from VIA Mark CoreFusion official website:

<http://www.viaarena.com/default.aspx?PageID=2> .

Vega86-6270 also supports most of the popular Linux distributions, for example XFree86, Fedora, Mankrake, SuSE and so on. To get the most update Linux driver, please get it from VIA Mark CoreFusion official website <http://www.viaarena.com/default.aspx?PageID=2&Type=3> .

Appendix

A. STN Flat Panel Data Output

Pin Name	STN8	STN16	STN24	DSTN8	DSTN16	DSTN24	DSTN16	DSTN24
FPD0	R0	R0	R0	LR0	LR0	LR0		LB3
FPD1	G0	G0	G0			LR3		LB2
FPD2	B0	B0	B0	LG0	LG0	LG0	LB1	LB1
FPD3	R1	R1	R1				LB0	LB0
FPD4	G1	G1	G1	LB0	LB0	LB0		UB3
FPD5	B1	B1	B1					UB2
FPD6	R2	R2	R2	LR1	LR1	LR1	UB1	UB1
FPD7	G2	G2	G2			LG3	UB0	UB0
FPD8		B2	B2		LG1	LG1		LG3
FPD9		R3	R3				LG2	LG2
FPD10		G3	G3		LB1	LB1	LG1	LG1
FPD11		B3	B3				LG0	LG0
FPD12		R4	R4		LR2	LR2		UG3
FPD13		G4	G4			LB3	UG2	UG2
FPD14		B4	B4		LG2	LG2	UG1	UG1
FPD15		R5	R5				UG0	UG0
FPD16			G5			LB2		LR3
FPD17			B5				LR2	LR2
FPD18			R6	UR0	UR0	UR0	LR1	LR1
FPD19			G6			UR3	LR0	LR0
FPD20			B6	UG0	UG0	UG0		UR3
FPD21			R7				UR2	UR2
FPD22			G7	UB0	UB0	UB0	UR1	UR1
FPD23			B7				UR0	UR0
FPD24				UR1	UR1	UR1		
FPD25						UG3		
FPD26					UG1	UG1		
FPD27								
FPD28					UB1	UB1		
FPD29						UB3		
FPD30					UR2	UR2		
FPD31						UB3		
FPD32					UG2	UG2		
FPD33								
FPD34						UB2		
FPD35								

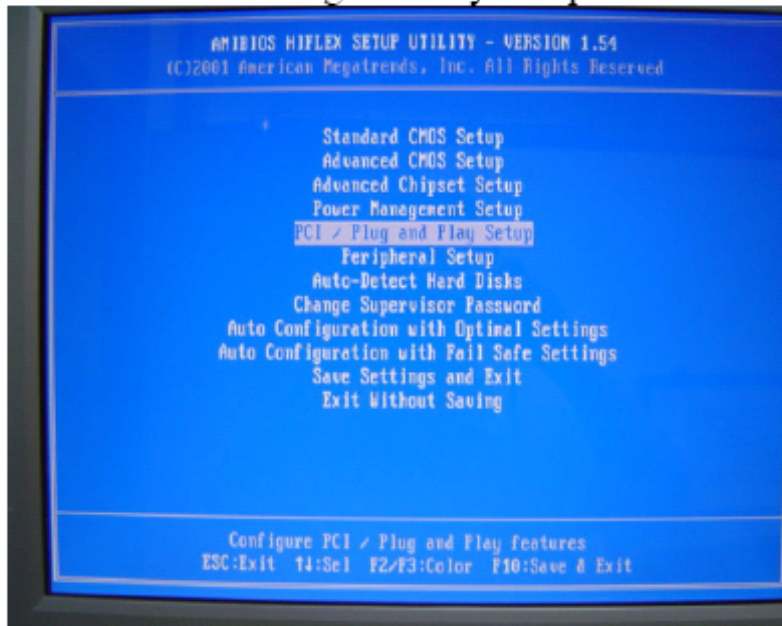
B. TFT Flat Panel Data Output

Pin Name	TFT18	TFT2x18	TFT24
FPD0		R14	B0
FPD1		R15	B1
FPD2	B0	B00	B2
FPD3	B1	B01	B3
FPD4	B2	B02	B4
FPD5	B3	B03	B5
FPD6	B4	B04	B6
FPD7	B5	B05	B7
FPD8		R12	G0
FPD9		R13	G1
FPD10	G0	G00	G2
FPD11	G1	G01	G3
FPD12	G2	G02	G4
FPD13	G3	G03	G5
FPD14	G4	G04	G6
FPD15	G5	G05	G7
FPD16		R10	R0
FPD17		R11	R1
FPD18	R0	R00	R2
FPD19	R1	R01	R3
FPD20	R2	R02	R4
FPD21	R3	R03	R5
FPD22	R4	R04	R6
FPD23	R5	R05	R7
FPD24		G10	
FPD25		G11	
FPD26		G12	
FPD27		G13	
FPD28		G14	
FPD29		G15	
FPD30		B10	
FPD31		B11	
FPD32		B12	
FPD33		B13	
FPD34		B14	
FPD35		B15	

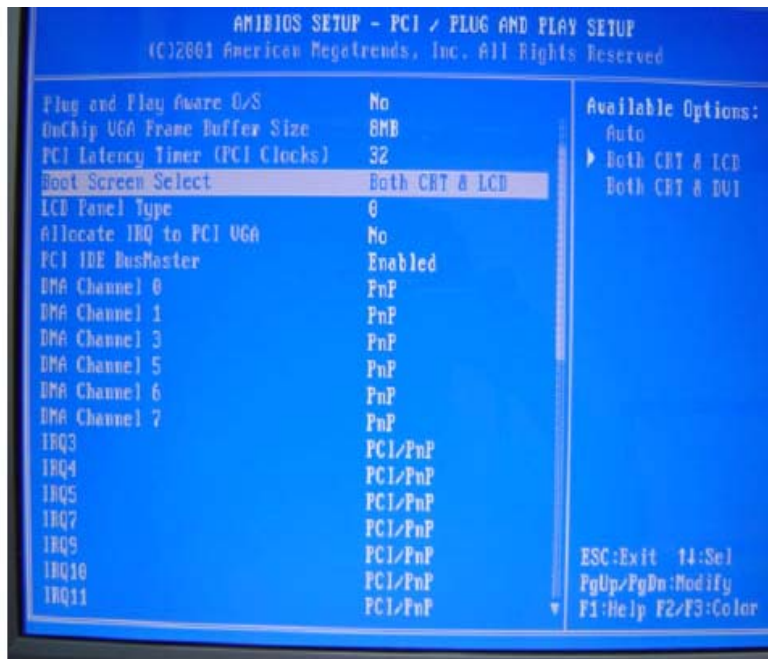
C. Flat Panel BIOS Setting

The Vega86-6270 offers the BIOS setting for the various LCD Flat Panel support. Before you connect the LCD Flat Panel to CPU Board, please go to BIOS→Enter “the PCI /Plug and Play Setup” → Adjust “Boot Screen” from “Auto “to “Both CRT & LCD”→choose” LCD Panel type”. This can be seen in the following description:

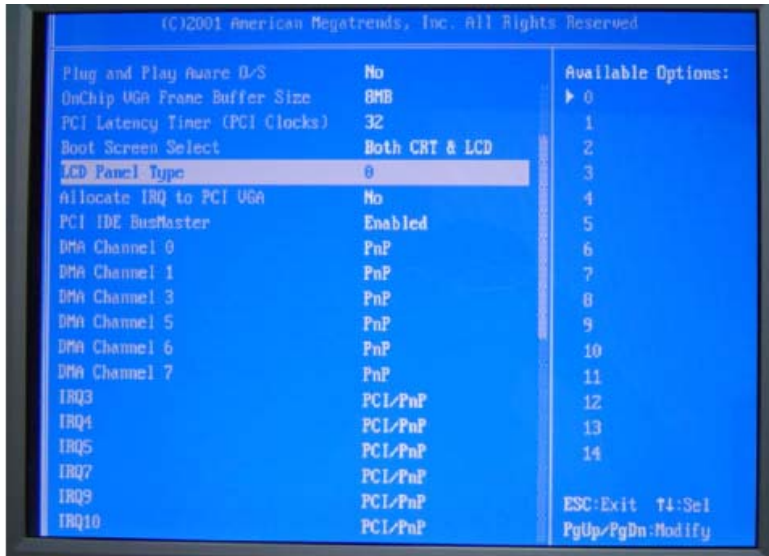
Enter the “PCI / Plug and Play Setup”



Adjust the “Boot Screen Select” from “Auto” to “Both CRT & LCD”



Make sure the “LCD Panel Type”



LCD Panel Type	Function	
0	640x480	TFT at 24MHz (18bit,24bit)
1	800x600	TFT (for some special panel use)
2	1024x768	TFT 2 pixel / CLK at 32Mhz (36bit)
3	1280x1024	TFT 2 pixel / CLK at 81MHz (24bit)
4	640x480	DSTN at 25MHz (16bit)
5	800x600	DSTN at 40MHz (16bit)
6	1024x768	DSTN 2 pixel / CLK at 81MHz (24bit)
7	1024x768	TFT 1pixel / CLK at 65Mhz (18bit,24bit)
8	640x480	TFT not use (for special panel use)
9	800x600	TFT at 40MHz (18bit,24bit)
10	1024x768	TFT at 60MHz (18bit,24bit)
11	1280x1024	TFT 2 pixel / CLK at 54MHz (18bit,24bit)
12	1400x1050	TFT 2 pixel / CLK at 54Mhz
13	800x600	DSTN at 40MHz (24bit)
14	1024x768	DSTN at 65MHz (16bit)

D. Flat Panel Wiring and Lighting

Before you connect the LCD Flat Panel with Vega86-6270, please make sure that the LCD Flat Panel use 3.3V or 5V, then place the [J11 \(see page 13\)](#) on the correct position.

For the Wiring, please refer to [page 12\(J9: LCD connector \)](#)and [Page 21~24](#),. Or for more LCD lighting and integration service, please contact our regional sales or mail to info@icop.com.tw if you have any questions.

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.