CES-471

COM Express Module

User's Manual

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2009/05/04

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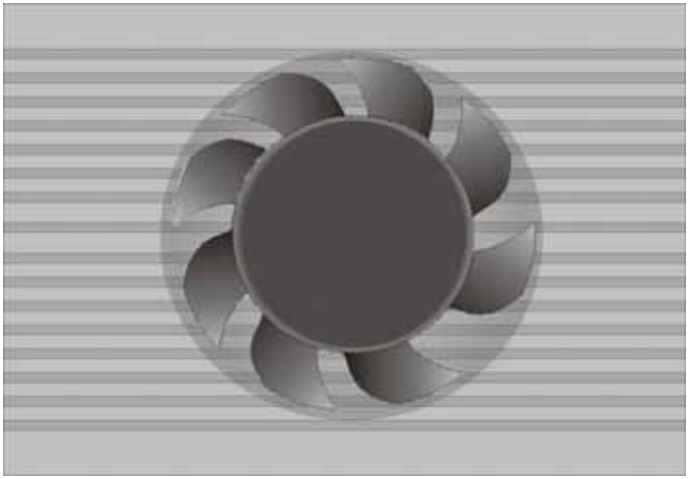
Packing List:

Please check the package content before you starting using the board.

Hardware:

CES-471 COM Express module x 1

Attached:



CES-471 heat sink x 1

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Drivers & User's Manual

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Chapter 1 <Introduction>

1.1 <Product Overview>

CES-471 is the new generation of the COM express module, with supporting last Intel Core 2 Duo ***socket-P*** processors for 533/667/800 MHz front side bus, Intel GME965 and ICH8-M chipset, integrated GMA X3100 graphics, DDR2 SO-DIMM memory, support High Definition Audio, Serial ATA, PCI Express x16, x1 interface and one Gigabit LAN

Intel Merom dual core Processor

The board supports last Intel Core 2 Duo ***socket-P*** processors with 533/667/800MHz front side, 2MB L2 cache, to provide more powerful performance than before.

New features for Intel GME965 chipset

The module integrates Intel GME965 and ICH8-M chipset, to provide new generation of the mobile solution, supports Intel GMA X3100 graphics, DDR2 SO-DIMM 533/667 memory, built-in high speed mass storage interface of serial ATA, High Definition Audio interface.

All in One multimedia solution

Based on Intel GME965 and ICH8-M chipset, the module provides high performance onboard graphics, 24-bit dual channel LVDS interface, to meet the very requirement of the multimedia application.

Flexible Extension Interface

The module support one PCI-Express x16 slot, five PCI-Express x1, it also support four PCI slots, one Mini PCI.

1.2 <Product Specification>

General Specification	
Form Factor	COM Express Module
CPU	Intel® Core 2 Duo Mobile processor Package type: FCPGA478 L2 Cache: All specification depend on the CPU. (1M/2M/3M/4M) Front side bus: 533/667/800 MHz (Socket-P)
Memory	1 x 200-pin DDR2 SO-DIMM 533/667MHz SDRAM up to 2GB Unbufferred, none-ECC memory supported only
Chipset	Intel® GME965 (Northbridge) and ICH8-M (Southbridge)
BIOS	Phoenix-Award v6.00PG 8Mb SPI flash BIOS
Green Function	Power saving mode includes doze, standby and suspend modes. ACPI version 1.0 and APM version 1.2 compliant
Watchdog Timer	System reset programmable watchdog timer.
Real Time Clock	Intel® ICH8-M built-in RTC
Enhanced IDE	Support UltraDMA100 IDE interface supports up to 2 ATAPI devices
Serial ATA	Intel® ICH8-M integrates support 3 x Serial ATA interfaces Up to 300MB/s of transfer rate
VGA Display Interface	
Chipset	Intel GME965 GMCH (Graphic Memory Controller Hub)
Frame Buffer	Up to 384MB shared with system memory
Display Type	Support CRT, LCD monitor with analog display Support 24-bit dual channel LVDS interface, HDTV
Ethernet Interface	
Controller	Intel 82573L Gigabit Ethernet controller
Type	Triple speed 10/100/1000Base-T Auto-switching Fast Ethernet Full duplex, IEEE802.3U compliant
Expansive Interface	
PCI-Express	Support one x16 PCI-Express slot (***compatible with x1 slot***) and five x1 PCI-Express slots PCI-Express x16 Up to 8GB/s of transfer bandwidth PCI-Express x1 Up to 5Gb/s of transfer bandwidth Power supply: +3.3V, +12V
PCI	Support four PCI slots, Power supply: +12V, +5VSB
Audio	Support ICH8-M HD Audio
Power and Environment	
Dimension	125(L) x 95 (W) mm
Temperature	Operating within 0 ~ 60°C (32 ~ 140°F) Storage within -20 ~ 85°C (-4 ~ 185°F)

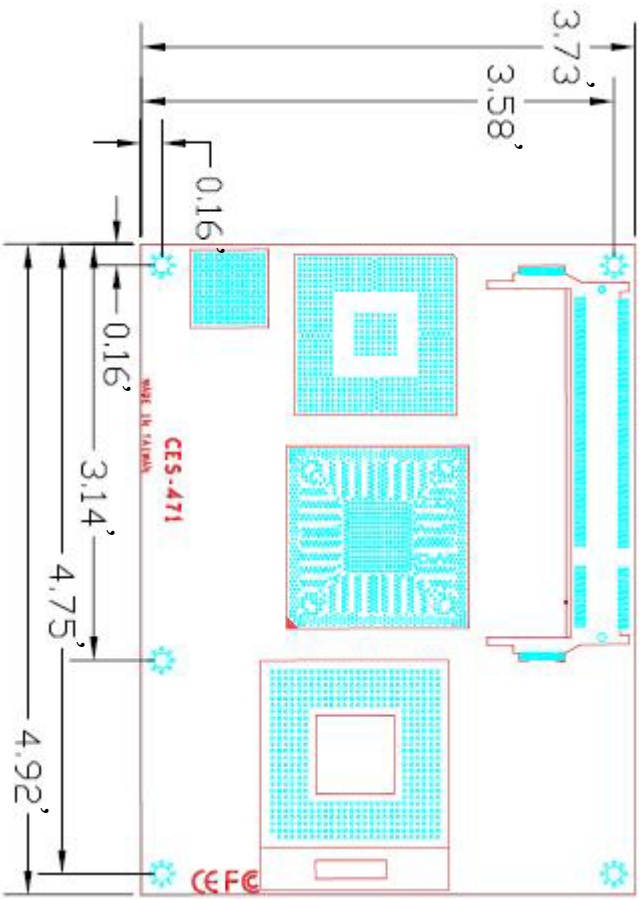
Ordering Code

CES-471	COM Express module for Intel Core 2 Duo Processor

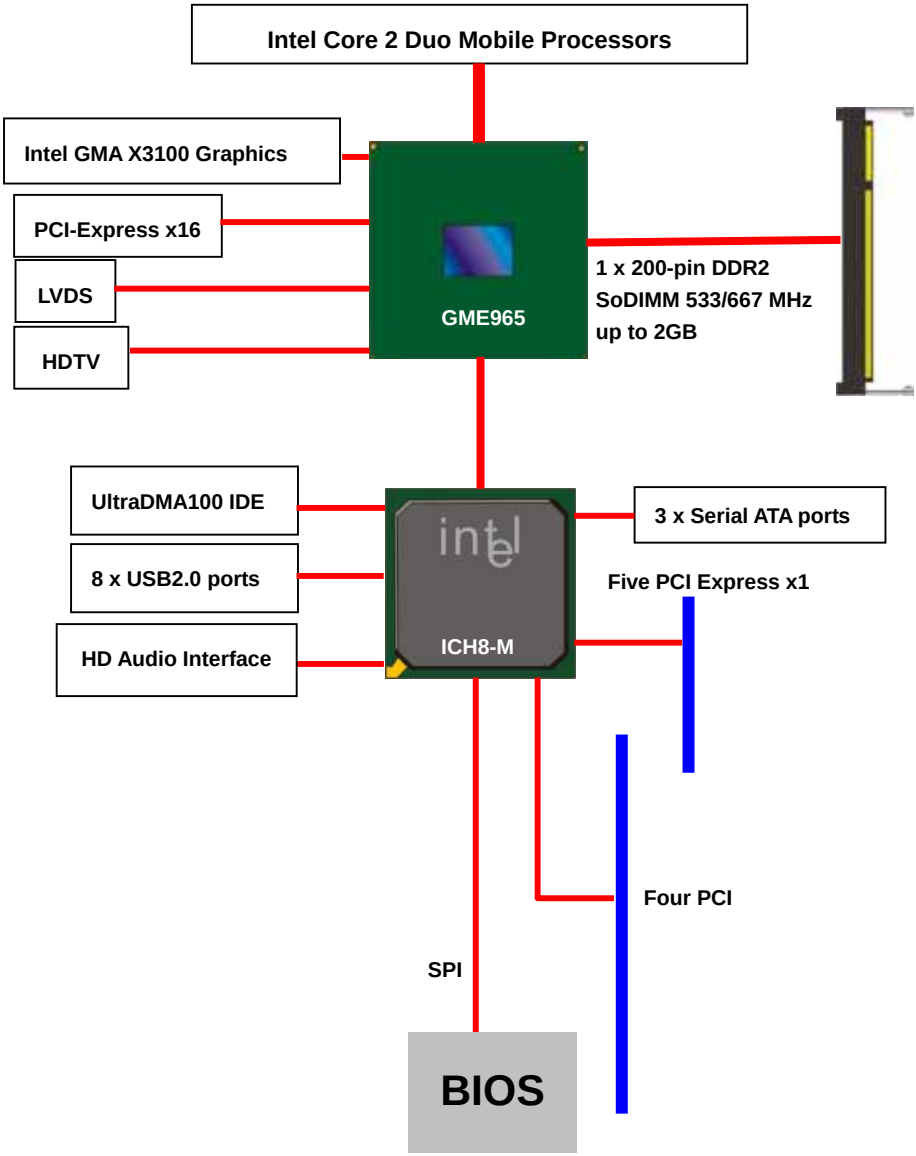
The specifications may be different as the actual production.

For further product information please visit the website at http://www.commell.com.tw

1.3 <Mechanical Drawing>



1.4 <Block Diagram>



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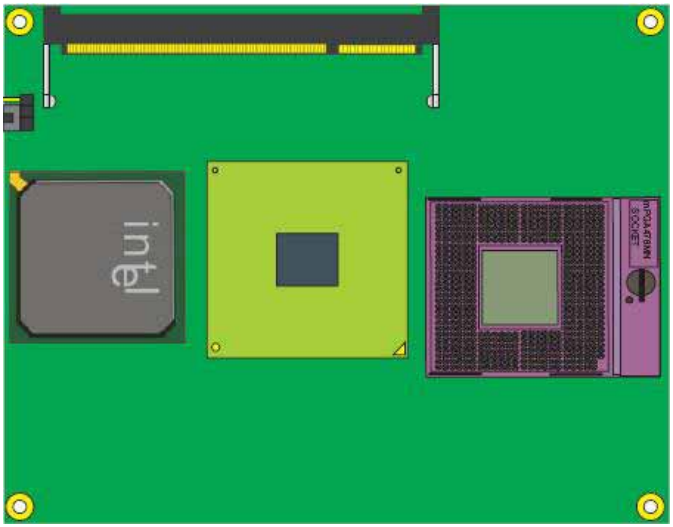
Chapter 2 <Hardware Setup>

2.1 <Connector Location>

DDRII SoDIMM



CPU

2.2 <Connector Reference>

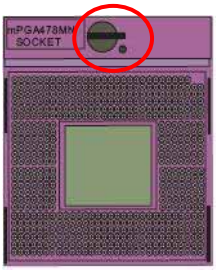
2.2.1 <Internal Connectors>

Connector	Function	Remark
CPU	Socket478 for CPU	Standard
DDRII	200 -pin DDR2 SoDIMM slot	Standard

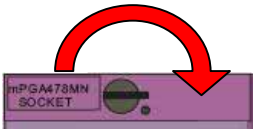
2.3 <CPU and Memory Setup>

2.3.1 <CPU Setup>

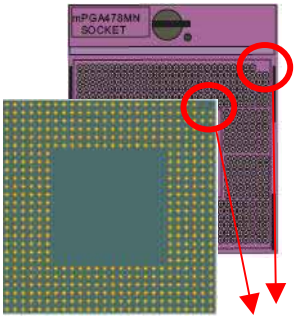
The module comes with the socket478 for Intel Core 2 Duo Mobile processor, it supports new generation of Intel Core 2 Duo Mobile processors with 533/667/800 MHz of front side bus and 2MB L2 cache. Please follow the instruction to install the CPU properly.



1. Use the flat-type screw drive to unlock the CPU socket

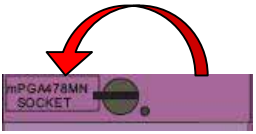


Unlock way



Check point

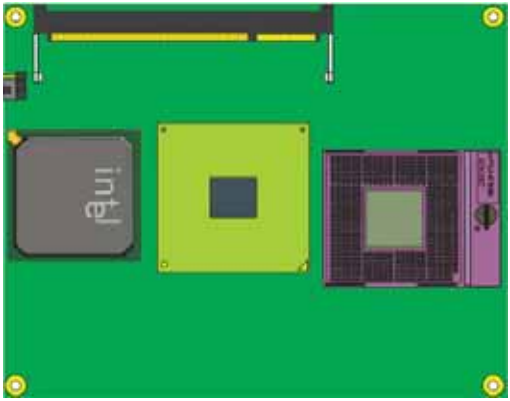
2. Follow the pin direction to install the processor on the socket



3. Lock the socket

2.3.2 <Memory Setup>

The module provides one 200-Pin DDRII SoDIMM slot 533/667 memory modules up to 2GB of capacity. Non-ECC, unbuffered memory is supported only.



(1. Insert the DDRII So-DIMM module into the socket at 45 degree)

(2. Press down the module with a click sound)

2.4 <CMOS Setup>

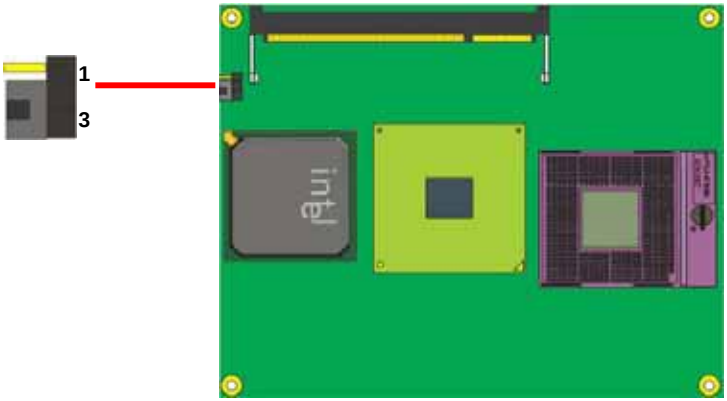
The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

Jumper: JRTC

Type: Onboard 3-pin jumper

JRTC	Mode
1-2	Clear CMOS
2-3	Normal Operation

Default setting



2.5 <Ethernet Interface>

The Intel 82573L supports triple speed of 10/100/1000Base-T, with IEEE802.3 compliance and Wake-On-LAN supported.

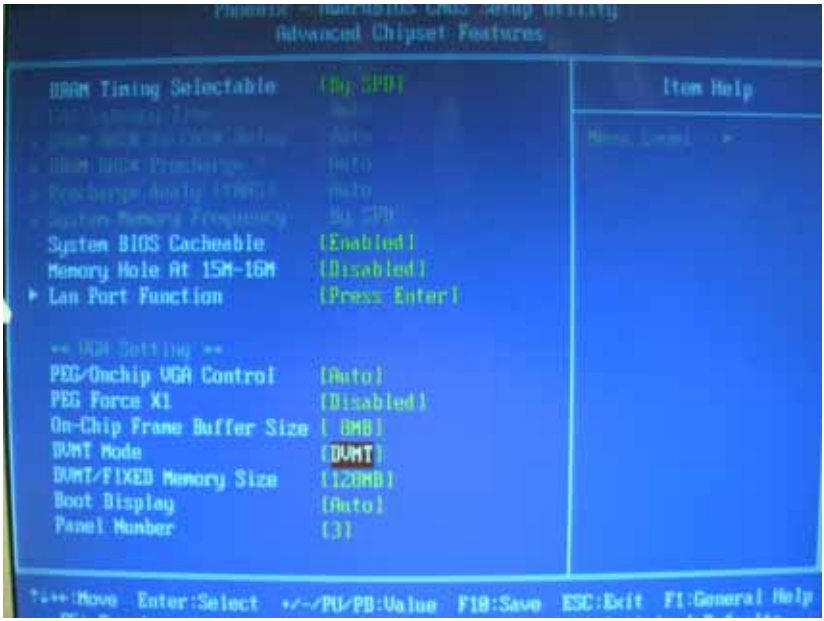
Chapter 3 <System Configuration>

3.1 <Video Memory Setup>

Based on Intel® GME965 chipset with GMA (Graphic Media Accelerator) X3100, the board supports Intel® DVMT (Dynamic Video Memory Technology) 4.0, which would allow the video memory be triggered up to 384MB.

To support DVMT, you need to install the Intel® GMA X3100 Driver with supported OS.

BIOS Setup:



On-Chip Video Memory Size: This option combines three items below for setup.

On-Chip Frame Buffer Size:

This item can let you select video memory which been allocated for legacy VGA and SVGA graphics support and compatibility. The available option is **1MB** and **8MB**.

DVMT Mode: This item can let you select graphics memory which Fixed or DVMT.

DVMT/FIXED Memory Size:

This item can let you select a maximum size of dynamic amount usage of video memory, the system would configure the video memory depends on your application, this item is strongly recommend to be selected as **MAX**.

Chapter 4 <BIOS Setup>

The motherboard uses the Award BIOS for the system configuration. The Award BIOS in the single board computer is a customized version of the industrial standard BIOS for IBM PC AT-compatible computers. It supports Intel x86 and compatible CPU architecture based processors and computers. The BIOS provides critical low-level support for the system central processing, memory and I/O sub-systems.

The BIOS setup program of the single board computer let the customers modify the basic configuration setting. The settings are stored in a dedicated battery-backed memory, NVRAM, retains the information when the power is turned off. If the battery runs out of the power, then the settings of BIOS will come back to the default setting.

The BIOS section of the manual is subject to change without notice and is provided here for reference purpose only. The settings and configurations of the BIOS are current at the time of print, and therefore they may not be exactly the same as that displayed on your screen.

To activate CMOS Setup program, press ＜DEL＞ key immediately after you turn on the system. The following message "Press DEL to enter SETUP" should appear in the lower left hand corner of your screen. When you enter the CMOS Setup Utility, the Main Menu will be displayed as **Figure 4-1**. You can use arrow keys to select your function, press ＜Enter＞ key to accept the selection and enter the sub-menu.

Figure 4-1 CMOS Setup Utility Main Screen

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Appendix A <Flash BIOS>

A.1 <Flash Tool>

The board is based on Award BIOS and can be updated easily by the BIOS auto flash tool. You can download the tool online at the address below:

http://www.phoenix.com/en/home/
http://www.commell.com.tw/Support/Support_SBC.htm

File name of the tool is "awdflash.exe", it's the utility that can write the data into the BIOS flash ship and update the BIOS.

A.2 <Flash BIOS Procedure>

1. Please make a bootable floppy disk.
2. Get the last .bin files you want to update and copy it into the disk.
3. Copy awardflash.exe to the disk.
4. Power on the system and flash the BIOS. (Example: C:/ awardflash XXX.bin)
5. Restart the system.

Any question about the BIOS re-flash please contact your distributors or visit the web-site at below:

http://www.commell.com.tw/support/support.htm

Appendix B <COM Express Pin assignment>

COM A

A1	GND	A26	SATA2RX-	A51	GND	A76	ATX2-	A101	+12V
A2	MDI13-	A27	BATLOW#	A52	N/C	A77	LVDD EN	A102	+12V
A3	MDI13+	A28	ATA_ACT#	A53	N/C	A78	ATX3+	A103	+12V
A4	RLINK100#	A29	AC_SYNC	A54	N/C	A79	ATX3-	A104	+12V
A5	RLINK1000#	A30	AC_RST#	A55	PCIE_TX5+	A80	GND	A105	+12V
A6	MDI12-	A31	GND	A56	PCIE_TX5-	A81	ACLK+	A106	+12V
A7	MDI12+	A32	AC_BITCLK	A57	GND	A82	ACLK-	A107	+12V
A8	RLINK#	A33	AC_SDOUT	A58	PCIE_TX4+	A83	LVDDCLK	A108	+12V
A9	MDI11-	A34	N/C	A59	PCIE_TX4-	A84	LVDDDAT	A109	+12V
A10	MDI11+	A35	-THERMTRIP	A60	GND	A85	N/C	A110	GND
A11	GND	A36	USBP6-	A61	PCIE_TX3+	A86	-RCIN		
A12	MDI10-	A37	USBP+	A62	PCIE_TX3-	A87	A20GATE		
A13	MDI10+	A38	-USBOC6	A63	N/C	A88	PCIECLK		
A14	GBE_CTREF	A39	USBP4-	A64	PCIE_TX2+	A89	-PCIECLK		
A15	-SLPS3	A40	USBP4+	A65	PCIE_TX2-	A90	GND		
A16	SATA0TX+	A41	GND	A66	GND	A91	N/C		
A17	SATA0TX-	A42	USBP2-	A67	N/C	A92	N/C		
A18	-SLPS4	A43	USBP2+	A68	PCIE_TX+1	A93	N/C		
A19	SATA0RX+	A44	-USBOC2	A69	PCIE_TX-1	A94	N/C		
A20	SATA0RX-	A45	USBP0-	A70	GND	A95	N/C		
A21	GND	A46	USBP0+	A71	ATX0+	A96	GND		
A22	SATA2TX+	A47	RTCVCC	A72	ATX0-	A97	+12V		
A23	SATA2TX-	A48	N/C	A73	ATX1+	A98	+12V		
A24	-SLPS5	A49	N/C	A74	ATX1-	A99	+12V		
A25	SATA2RX-	A50	LPC_SERIRQ	A75	ATX2+	A100	GND		

COM B

B1	GND	B26	NC	B51	GND	B76	BTX2-	B101	+12V
B2	ACTLED	B27	WDT	B52	N/C	B77	BTX3+	B102	+12V
B3	-LFRAME	B28	AC SDIN2	B53	N/C	B78	BTX3-	B103	+12V
B4	LAD0	B29	AC SDIN1	B54	N/C	B79	BKL EN	B104	+12V
B5	LAD1	B30	AC SDIN0	B55	PCIE_RX5+	B80	GND	B105	+12V
B6	LAD2	B31	GND	B56	PCIE_RX5-	B81	BCLK+	B106	+12V
B7	LAD3	B32	ICHSPKR	B57	N/C	B82	BCLK-	B107	+12V
B8	-LDRQ0	B33	I2C_CK	B58	PCIE_RX4+	B83	BKL CRTL	B108	+12V
B9	-LDRQ1	B34	I2C_DAT	B59	PCIE_RX4-	B84	5VDU	B109	+12V
B10	LPC33CLK	B35	THERM#	B60	GND	B85	5VDU	B110	GND
B11	GND	B36	USBP7-	B61	PCIE_RX3+	B86	5VDU		
B12	-ICHBTN	B37	USBP7+	B62	PCIE_RX3-	B87	5VDU		
B13	SMBCLK	B38	-USBOC4	B63	N/C	B88	N/C		
B14	SMBDATA	B39	USBP5-	B64	PCIE_RX2+	B89	CRT R		
B15	GPI11	B40	USBP5+	B65	PCIE_RX2-	B90	GND		
B16	SATA1TX+	B41	GND	B66	-PCIEWK	B91	CRT G		
B17	SATA1TX-	B42	USBP3-	B67	-LPCME	B92	CRT B		
B18	-SUSTAT	B43	USBP3+	B68	PCIE RX1+	B93	CRT HS		
B19	SATA1RX+	B44	-USBOC0	B69	PCIE RX1-	B94	CRT VS		
B20	SATA1RX-	B45	USBP1-	B70	GND	B95	CRTDCLK		
B21	GND	B46	USBP1+	B71	BTX0+	B96	CRTDDAT		
B22	NC	B47	N/C	B72	BTX0-	B97	TVA PB		
B23	NC-	B48	N/C	B73	BTX1+	B98	TVB Y		
B24	PWR_GD	B49	-SYSRST	B74	BTX1-	B99	TVC PR		
B25	NC	B50	-CBRST	B75	BTX2+	B100	GND		

COM C

C1	GND	C26	AD4	C51	GND	C76	GND	C101	PEG RXP15
C2	PDD7	C27	AD6	C52	PEG RX0+	C77	N/C	C102	PEG RXN16
C3	PDD6	C28	AD8	C53	PEG RX0-	C78	PEG RX8+	C103	GND
C4	PDD3	C29	AD10	C54	N/C	C79	PEG RX8-	C104	+12V
C5	PDD15	C30	AD12	C55	PEG RX1+	C80	GND	C105	+12V
C6	PDD8	C31	GND	C56	PEG RX1-	C81	PEG RX9+	C106	+12V
C7	PDD9	C32	AD14	C57	N/C	C82	PEG RX9-	C107	+12V
C8	PDD2	C33	-CBE1	C58	PEG RX2+	C83	N/C	C108	+12V
C9	PDD13	C34	-PERR	C59	PEG RX2-	C84	GND	C109	+12V
C10	PDD1	C35	-PLOCK	C60	GND	C85	PEG RX10+	C110	GND
C11	GND	C36	-DEVSEL	C61	PEG RX3+	C86	PEG RX10-		
C12	PDD14	C37	-IRDY	C62	PEG RX3-	C87	GND		
C13	PIORDY	C38	-CBE2	C63	N/C	C88	PEG RX11+		
C14	-PDIOR	C39	AD17	C64	N/C	C89	PEG RX11-		
C15	-PME	C40	AD19	C65	PEG RX4+	C90	GND		
C16	-GNT2	C41	GND	C66	PEG RX4-	C91	PEG RX12+		
C17	-REQ2	C42	AD21	C67	N/C	C92	PEG RX12-		
C18	-GNT1	C43	AD23	C68	PEG RX5+	C93	GND		
C19	-REQ1	C44	-CBE3	C69	PEG RX5-	C94	PEG RX13+		
C20	-GNT0	C45	AD25	C70	GND	C95	PEG RX13-		
C21	GND	C46	AD27	C71	PEG RX6+	C96	GND		
C22	-REQ0	C47	AD29	C72	PEG RX6-	C97	N/C		
C23	-PCIRST	C48	AD31	C73	SDVODAT	C98	PEG RX14+		
C24	AD0	C49	-PIRQA	C74	PEG RX7+	C99	PEG RX14-		
C25	AD2	C50	-PIRQB	C75	PEG RX7-	C100	GND		

COM D

D1	GND	D26	-CBE0	D51	GND	D76	GND	D101	PEG TX15+
D2	PDD5	D27	AD9	D52	PEG TX0+	D77	P66DET	D102	PEG TX15-
D3	PDD10	D28	AD11	D53	PEG TX0-	D78	PEG TX8+	D103	GND
D4	PDD11	D29	AD13	D54	CFG9	D79	PEG TX8-	D104	+12V
D5	PDD12	D30	AD15	D55	PEG TX1+	D80	GND	D105	+12V
D6	PDD4	D31	GND	D56	PEG TX1-	D81	PEG TX9+	D106	+12V
D7	PDD0	D32	PAR	D57	N/C	D82	PEG TX9-	D107	+12V
D8	PDDREQ	D33	-SERR	D58	PEG TX2+	D83	N/C	D108	+12V
D9	-PDIOW	D34	-STOP	D59	PEG TX2-	D84	GND	D109	+12V
D10	-PDDACK	D35	-TRDY	D60	GND	D85	PEG TX10+	D110	GND
D11	GND	D36	-FRAME	D61	PEG TX3+	D86	PEG TX10-		
D12	IDEIRQ	D37	AD16	D62	PEG TX3-	D87	GND		
D13	PAD0	D38	AD18	D63	N/C	D88	PEG TX11+		
D14	PAD1	D39	AD20	D64	N/C	D89	PEG TX11-		
D15	PAD2	D40	AD22	D65	PEG TX4+	D90	GND		
D16	-PCS1	D41	GND	D66	PEG TX4-	D91	PEG TX12+		
D17	-PCS3	D42	AD24	D67	GND	D92	PEG TX12-		
D18	IDERST	D43	AD26	D68	PEG TX5+	D93	GND		
D19	-GNT3	D44	AD28	D69	PEG TX5-	D94	PEG TX13+		
D20	-REQ3	D45	AD30	D70	GND	D95	PEG TX13-		
D21	GND	D46	-PIRQC	D71	PEG TX6+	D96	GND		
D22	AD1	D47	-PIRQD	D72	PEG TX6-	D97	N/C		
D23	AD3	D48	N/C	D73	SDVOCLK	D98	PEG TX14+		
D24	AD5	D49	N/C	D74	PEG TX7+	D99	PEG TX14-		
D25	AD7	D50	PCISCLK	D75	PEG TX7-	D100	GND		

Contact Information

Any advice or comment about our products and service, or anything we can help you please don't hesitate to contact with us. We will do our best to support you for your products, projects a business.

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