

**ATX motherboard supports 22nm LGA1150 Intel® Core™ i7/i5/i3/
Pentium® and Celeron® CPU per Intel® Q87, DDR3, Three
Independent Displays VGA/DVI-I/HDMI/iDP, Dual Intel® GbE, USB 3.0,
SATA 6Gb/s, Audio, iRIS-2400 and RoHS**

IMBA-Q870-i2

Quick Installation Guide

Version 1.0

Mar 19, 2019.

Package List

IMBA-Q870-i2 package includes the following items:

- 1 x IMBA-Q870-i2 single board computer
- 1 x I/O shielding (P/N: 45014-0046C0-00-RS)
- 2 x SATA cable (P/N: 32000-062800-RS)
- 1 x QIG (Quick Installation Guide)



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Specifications

- CPU:
LGA1150 Intel® 4th generation Core™ i7/i5/i3/Pentium®/Celeron® processor supported
- System Chipset: Intel® Q87
- Memory:
Four 240-pin 1600/1333MHz dual-channel DDR3 SDRAM unbuffered DIMMs support up to 32GB
- BIOS: UEFI BIOS
- Graphic Engine:
Intel® HD Graphics Gen 7.5 support for DX11.1 and OpenCL 1.2, OpenGL 3.2 Full MPEG2, VC1, AVC Decode
- Display Output:
VGA (Up to 1920x1200 @ 60 Hz)
DVI-I (Up to 2560x1600 @ 60 H)
HDMI (Up to 2560x1600 @ 60 Hz)
iDP interface for HDMI, LVDS, VGA, DVI, DP (Up to 3840x2160 @60 Hz)
- Ethernet:
LAN1: Intel® I210 PCIe controller
LAN2: Intel® I217LM with Intel® AMT 9.0 support
- Super IO: Fintek F81866
- EC: IWDD
- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)
- Audio:
Realtek ALC662 HD Audio codec (Line-in, Line-out, Mic)
- I/O Interface:
5 x RS-232
1 x RS-422/485
6 x SATA 6GB/s
1 x LPT
4 x USB 3.0 (2 on rear, 2 by pin header)

- 8 x USB 2.0 (4 on rear, 4 by pin header)
- 1 x mSATA (colay SATA port)
- 1 x 6-pin wafer for PS/2 KB/MS
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- FAN:
 - 1 x 4-pin CPU fan connector
 - 2 x 3-pin system fan connectors
- Front Panel:
 - 1 x Front Panel
 - (Power LED, HDD LED, Speaker, Power Button, Reset Button)
- LAN LED: 2 x 2-pin (1x2) header for LAN1 LED, LAN2 LED
- Front Audio: 1 x 10-pin (2x5) header
- TPM: 1 x 20-pin (2x10) header
- SMBus: 1 x 4-pin (1x4) wafer
- I2C: 1 x 4-pin (1x4) wafer
- IPMI: 1 x DDR3 SO-DIMM slot supports iRIS-2400
- Expansion:
 - 1 x PCIe x16 slot
 - 1 x PCIe x1 slot
 - 1 x PCIe x4 slot (with PCIe x1 signal)
 - 4 x PCI slots
- Power supply: ATX Power Supply
- Power Consumption:
 - 3.3V@0.66A, 5V@4.34A, 12V@0.16A, Vcore@4.01A, 5VSB@0.21A
 - (Intel® 2.60GHz CPU with four 1333MHz 2GB DDR3 memory)
- Operation Temperature: -20°C ~ 60°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 244mm x 305mm
- Weight GW/NW: 1200g / 700g

Ordering Information

- **IMBA-Q870-i2-R10:**
ATX motherboard supports 22nm LGA1150 Intel® Core™ i7/i5/i3/Pentium® and Celeron® CPU per Intel® Q87, DDR3, Three Independent Displays VGA/DVI-I/HDMI/iDP, Dual Intel® GbE, USB 3.0, SATA 6Gb/s, Audio, iRIS-2400 and RoHS
- **19800-003100-200-RS:** Dual ports USB cable with bracket
- **19800-010500-100-RS:** USB 3.0 cable with bracket
- **32205-003800-100-RS:** RS-422/485 cable, 200mm
- **19800-000051-RS:** RS-232 cable, 230mm (P=2.54)
- **32102-000100-200-RS:**
SATA power cable, MOLEX 5264-4P to SATA15P
- **19800-000075-RS:** PS/2 KB/MS Y-cable with bracket, 220mmz
- **19800-000049-RS:** LPT Cable
- **CF-1156A-RS-R11:**
High performance LGA1155/LGA1156 cooler kit, 1U chassis compatible, 73W
- **CF-1156E-R11:**
High performance LGA1155/LGA1156 cooler kit, 95W
- **DP-LVDS-R10:**
DisplayPort to 24 bit dual channel LVDS converter board
(For iEi IDP connector)
- **DP-HDMI-R10:**
DisplayPort to HDMI converter board (For iEi IDP connector)
- **DP-DVI-R10:**
DisplayPort to DVI-D converter board (For iEi IDP connector)
- **DP-VGA-R10:**
DisplayPort to VGA converter board (For iEi IDP connector)
- **DP-DP-R10:**
DisplayPort to DisplayPort converter board (For iEi IDP connector)
- **TPM-IN01-R11:** 20-Pin Infineon TPM module, software management tool, firmware V3.17

Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
PCIE x16 Power	PCIEX16 channel mode setting
USB SW1, USB SW2	USB power setting
J_FLASH1	Flash descriptor security override
BAT1	Battery connector
CHASSIS1	Chassis status connector
CPU_FAN1	CPU fan connector
CPU12V1	+12V power source connector
ATX1	24-pin ATX power source connector
CHA_DIMM1, CHA_DIMM2 CHB_DIMM1, CHB_DIMM2	DDR3 DIMM slots
DIO1	Digital I/O connector
DP1	Display port connector
F_PANEL1	Front panel connector
FRONT_PANEL1	Front panel audio connector
IPMI1	Collocation IPMI module (iRIS-2400)
CN5	I2C Connector
KB_MS1	Keyboard and mouse connector
LED_LAN1	LAN1 link LED connector
LED_LAN2	LAN2 link LED connector
LPT1	Internal parallel port connector
CN2	M-SATA card connector
COM2, COM3, COM5, COM6	Internal RS-232 serial port connectors
COM4	Internal RS-422/485 serial port connector
SATA1, SATA2, SATA3 SATA4, SATA5, SATA6	Serial ATA 3.0 connectors
CN1	SMBUS connector
SPDIF1	SPDIF connector
SYS_FAN1, SYS_FAN2	System fan connector
TPM1	TPM connector
USB1, USB2	Internal USB 2.0 connectors

CN4	Internal USB 3.0 connector
AUDIO_CV1	HD audio connector
COM1	External RS-232 serial port connector
LAN1_USB1	RJ45 LAN and USB 3.0 connectors
LAN2_USB2	RJ45 LAN and USB 2.0 connectors
K/M_USB1	Keyboard & Mouse and USB 2.0 connectors
HDMI1	HDMI connector
VIDEO1	VGA and DVI-I connectors

J_ATX_AT1: AT/ATX mode select switch

PIN NO.	DESCRIPTION
Short 1 - 2	ATX Mode (default)
Short 2 - 3	AT Mode

J_CMOS1: Clear CMOS button

PIN NO.	DESCRIPTION
NC (default)	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

J_FLASH1: Flash descriptor security override

PIN NO.	DESCRIPTION
Short 1 - 2	Disabled (default)
Short 2 - 3	Enabled

PCIEX16 channel mode setting	
PCIEX16	DESCRIPTION
1 x16 PCIe (default)	(Normal Operation)
2 x8 PCIe	
1 x8 , 2x4 PCIe	

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Chipset

Auto Power Button Status	[Disabled(ATX)]	
Restore AC Power Loss	[Last State]	-----
> PCI Express Configuration		
> PCI Azalia Configuration		
Power Saving Function(ERP)	[Disabled]	
PCIEX16 Power	[1 x16 PCIe]	
USB SW1	[+5V DUAL]	
USB SW2	[+5V DUAL]	

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USB SW1, USB SW2: USB power setting	
PCIEX16	DESCRIPTION
+5V DUAL (default)	(Normal Operation)
+5V	

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Chipset

Auto Power Button Status	[Disabled(ATX)]	
Restore AC Power Loss	[Last State]	-----
> PCI Express Configuration		
> PCI Azalia Configuration		
Power Saving Function(ERP)	[Disabled]	
PCIEX16 Power	[1 x16 PCIe]	
USB SW1	[+5V DUAL]	
USB SW2	[+5V DUAL]	

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BAT1: Battery connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBATT	2	GND

CHASSIS1: Chassis status connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VSB	2	CHASSIS OPEN

CPU_FAN1: CPU fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

CPU12V1: +12V power source connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

ATX1: 24-pin ATX power source connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

DIO1: Digital I/O connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

DP1: Display port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	LANE1N
3	LANE1P	4	GND
5	LANE3N	6	LANE3P
7	GND	8	AUX_CTRL_DET_D
9	GND	10	HPD
11	AUXP	12	AUXN
13	GND	14	LANE2P
15	LANE2N	16	GND
17	LANE0P	18	LANE0N
19	+3.3V	20	NC

FRONT_PANEL1: Front audio connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC2-L	2	GND
3	MIC2-R	4	Presence#
5	LINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LINE2-L	10	LINE2-JD

F_PANEL1: Front panel connector					
	PIN	DESCRIPTION	PIN	DESCRIPTION	
PWR LED	1	+5V	2	BEEP_PWR	SPKR
	3	NC	4	IPMI ID_LED+	IPMI LED
	5	GND	6	IPMI ID_LED-	
PWR BTN	7	PWRBTN_SW#	8	PC_BEEP	SPKR
	9	GND	10	NC	
HDD LED	11	+5V	12	EXTRST-	RESET
	13	SATA_LED#	14	GND	

CN5: I2C Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	PCH_GP38
3	PCH_GP39	4	+5V

KB_MS1: Keyboard and mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	MSDATA
3	MSCLK	4	KBDATA
5	KBCLK	6	GND

LED_LAN1: LAN1 link LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

LED_LAN2: LAN2 link LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

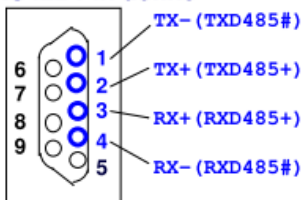
LPT1: Internal parallel port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	2	DATA0
3	DATA1	4	DATA2
5	DATA3	6	DATA4
7	DATA5	8	DATA6
9	DATA7	10	ACKNOWLEDGE#
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE#
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	NC

CN2: M-SATA card connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	+3.3V
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	MSATA_CLK#	12	N/C
13	MSATA_CLK	14	N/C
15	GND	16	N/C
17	PLTRST_N	18	GND
19	N/C	20	+3.3V
21	GND	22	PLTRST_N
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	SATA_TX-	32	SMB_DATA
33	SATA_TX+	34	GND
35	GND	36	USB_DATA-
37	GND	38	USB_DATA+
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	+3.3V	44	N/C
45	CLINK_CLK	46	N/C
47	CLINK_DATA	48	1.5V
49	CLINK_RST#	50	GND
51	MSATA_DET	52	+3.3V

COM2, COM3, COM5, COM6: Internal RS-232 serial port connectors				
Function	PIN	DESCRIPTION	PIN	DESCRIPTION
COM2	1	DCD	2	DSR
	3	RXD	4	RST
	5	TXD	6	CTS
	7	DTR	8	RI
	9	GND	10	GND
COM3	11	DCD	12	DSR
	13	RXD	14	RST
	15	TXD	16	CTS
	17	DTR	18	RI
	19	GND	20	GND
COM5	21	DCD	22	DSR
	23	RXD	24	RST
	25	TXD	26	CTS
	27	DTR	28	RI
	29	GND	30	GND
COM6	31	DCD	32	DSR
	33	RXD	34	RST
	35	TXD	36	CTS
	37	DTR	38	RI
	39	GND	40	GND

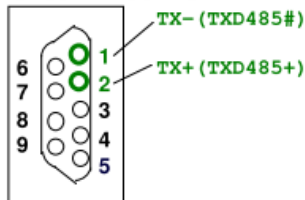
COM4: RS-422/485 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

RS422 Pin define



D-SUB 9PIN MALE

RS485 Pin define



D-SUB 9PIN MALE

SATA1, SATA2, SATA3, SATA4, SATA5, SATA6: Serial ATA 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA_TX+
3	SATA_TX-	4	GND
5	SATA_RX-	6	SATA RX+
7	GND		

CN1: SMBUS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

SPDIF1: SPDIF connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	NC
3	SPDIFOUT	4	GND
5	SPDIFIN		

SYS_FAN1, SYS_FAN2: System fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FANIO	2	+12V (PWM)
3	GND		

TPM1: TPM connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND
3	LFRAME#	4	NC
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

USB1, USB2: Internal USB 2.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

CN4: Internal USB 3.0 connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	USB3_RX-
3	USB3_RX+	4	GND
5	USB3_TX-	6	USB3_TX+
7	GND	8	USB_DATA-
9	USB_DATA+	10	NC
11	USB_DATA+	12	USB_DATA-
13	GND	14	USB3_TX+
15	USB3_TX-	16	GND
17	USB3_RX+	18	USB3_RX-
19	VCC	20	NC

COM1: External RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND1	6	DSR1
7	RTS1	8	CTS1
9	RI1		

LAN1_USB1: Ethernet and USB 3.0 connectors			
USB1: External USB 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+
LAN1: RJ45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MDI0P	24	LAN1_MDI2P
21	LAN1_MDI0N	25	LAN1_MDI2N
22	LAN1_MDI1P	26	LAN1_MDI3P
23	LAN1_MDI1N	27	LAN1_MDI3N

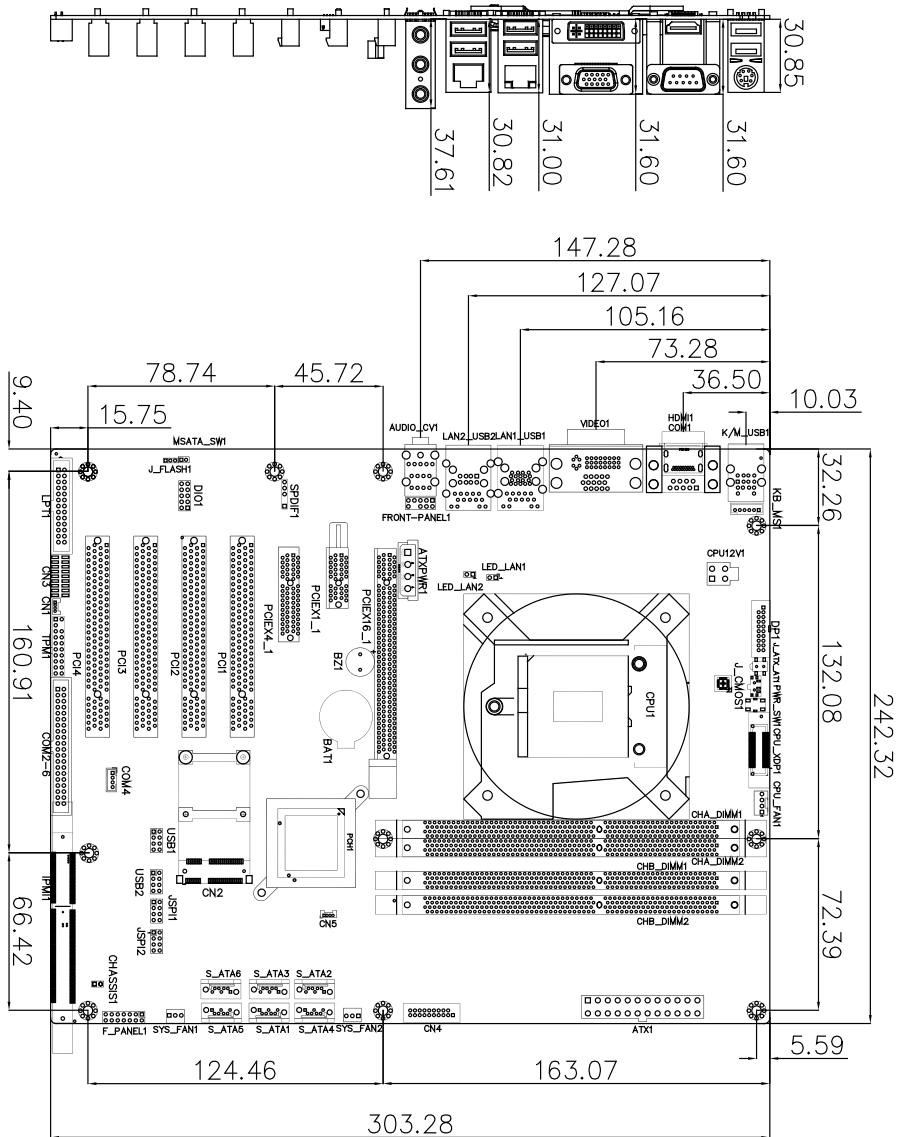
LAN2_USB2: Ethernet and USB 2.0 connectors			
USB2: External USB 2.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USB_DATA-	6	USB_DATA-
3	USB_DATA+	7	USB_DATA+
4	GND	8	GND
LAN2: RJ45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P2	TRD2P0	P6	TRD2P2
P3	TRD2N0	P7	TRD2N2
P4	TRD2P1	P8	TRD2P3
P5.	TRD2N1	P9	TRD2N3

K/M_USB1: Keyboard & Mouse and USB 2.0 connectors			
USB1: External USB 2.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USB_DATA-	6	USB_DATA-
3	USB_DATA+	7	USB_DATA+
4	GND	8	GND
KB_MS1: Keyboard / Mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	GND	10	KEYBOARD DATA
11	MOUSE DATA	12	VCC
13	KEYBOARD CLOCK	14	MOUSE CLOCK

HDMI1: HDMI connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

VIDEO1: VGA and DVI-I connectors			
VGA: VGA connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDCDA
13	HSYNC	14	VSYNC
15	DDCCLK		
DVI-I: DVI-I connector			
C1	RED	10	DVI_DATA1
C2	GREEN	11	GND
C3	BLUE	12	N/C
C4	HS	13	N/C
C5	GND	14	+5V
C6	NC	15	Hot Plug Detect
1	DVI_DATA2#	16	HPDET
2	DVI_DATA2	17	DVI_DATA0#
3	GND	18	DVI_DATA0
4	N/C	19	GND
5	N/C	20	N/C
6	DDC CLK	21	N/C
7	DDC DATA	22	N/C
8	VS	23	DVI_CLK
9	DVI_DATA1#	24	DVI_CLK#

Board Layout: Jumper and Connector Locations



(Unit: mm)