

**EPIC SBC supports AMD® Embedded G-Series SoC with
VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA 6Gb/s,
mSATA, COM, iRIS-1010, HD Audio and RoHS**

NANO-KBN-i1

Quick Installation Guide

Version 1.0

Mar 11, 2014.

Package List

NANO-KBN-i1 package includes the following items:

- 1 x NANO-KBN-i1 single board computer
- 2 x SATA with power cable kit (P/N: 32801-000201-100-RS)
- 1 x Audio cable (P/N: 32007-002600-200-RS)
- 1 x Power cable (P/N: 32100-087100-RS)
- 2 x RS-232 cable (P/N: 32205-002700-100-RS)
- 1 x QIG (Quick Installation Guide)
- 1 x Utility CD
- 1 x One key recovery CD



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Specifications

- SoC:
 - AMD® Embedded G-Series SoC
 - GX-415GA on-board SoC (1.5GHz, quad-core, 2MB cache, TDP=15W)
 - GX-210HA on-board SoC (1.0GHz, dual-core, 1MB cache, TDP=9W)
 - GX-420CA on-board SoC (2.0GHz, quad-core, 2MB cache, TDP=25W) (by request)
 - GX-217GA on-board SoC (1.65GHz, dual-core, 1MB cache, TDP=15W) (by request)
- Memory:
 - One 204-pin 1600/1333 MHz dual-channel DDR3 & DDR3L SDRAM unbuffered SO-DIMM support up to 8GB
- BIOS: UEFI BIOS
- Ethernet:
 - GbE1: Intel® I210-AT PCIe controller with NCSI support
 - GbE2: Intel® I211-AT PCIe controller
- Graphics Engine:
 - GPU frequency 500MHz (Radeon™ HD 8330E) for GX-415GA
 - GPU frequency 450MHz (Radeon™ HD 8310E) for GX-210HA
 - GPU frequency 600MHz (Radeon™ HD 8400E) for GX-420CA
 - GPU frequency 300MHz (Radeon™ HD 8280E) for GX-217GA
 - Support DX11.1, OpenGL 4.1 and OpenCL1.2
 - UVD4.2 decode for H.264, MPEG2/4, VC1, MVC
 - VCE 2.0 encode for H.264, VCE
- Display Output:
 - 1 x VGA (2560x1600)
 - 1 x HDMI via v1.4a compliant (2560x1600)
 - 1 x 24-bit dual channel LVDS by CH7511B DP to LVDS converter (1920x1200)
- Super IO: Fintek F81866

- Digital I/O: 8-bit digital I/O (4-bit input, 4-bit output)
- Audio:
 - Realtek ALC892 HD codec
 - 1 x SPDIF by 4-pin (1x4) header for digital audio
 - 1 x Analog audio by 10-pin (2x5) header
- I/O Interface:
 - 1 x 6-pin wafer for PS/2 KB/MS
 - 2 x SATA 6G/s with 5V SATA power connector
 - 2 x USB 3.0 (on rear I/O)
 - 6 x USB 2.0 (2 on rear I/O, 4 by pin header)
 - 1 x RS-422/485 (1 by pin header)
 - 5 x RS-232 (5 by pin header)
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- IPMI: 1 x Mini-PCIE slot supports iRIS-1010
- TPM: 1 x 20-pin (2x10) header
- SMBUS: 1 x 4-pin (1x4) wafer
- I2C: 1 x 4-pin (1x4) wafer
- FAN: 1 x 4-pin system fan connector
- LAN LED: 2 x 2-pin (1x2) header
- Front Panel:
 - 1 x 6-pin (1x10) wafer for power LED & HDD LED
 - 1 x 2-pin (1x2) wafer for power button
 - 1 x 2-pin (1x2) wafer for power reset
- Expansion:
 - 1 x Full-size PCIe Mini card slot (supports mSATA co-lay SATA port 2)
- Power supply:
 - 12V DC input only (AT/ ATX support)
 - 1 x 4-pin (2x2) internal power jack
- Operation Temperature: 0°C ~ 60°C
- Storage Temperature: -20°C ~ 85°C

- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115mm x 165mm
- Weight GW/NW: 850g / 350g

Ordering Information

- **NANO-KBN-i1-4151-R10:**
EPIC SBC supports AMD 28nm quad-core GX-415GA 1.5GHz (15W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA 6Gb/s, mSATA, COM, iRIS-1010, HD Audio and RoHS
- **NANO-KBN-i1-2101-R10:**
EPIC SBC supports AMD 28nm dual-core GX-210HA 1.0GHz (9W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA 6Gb/s, mSATA, COM, iRIS-1010, HD Audio and RoHS
- **32000-070301-RS:** Dual port USB cable
- **32205-003800-100-RS:** RS-422/485 cable, 200mm
- **32006-001100-100-RS:** PS/2 KB/MS cable
- **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 |
| JP1 | LCD voltage selection |
| SW1 | LVDS Panel Resolution Selection |
| AUDIO1 | Audio connector |
| BAT1 | Battery connector |
| CN6 | Brightness button connector |
| CHASSIS1 | Chassis intrusion connector |
| DIMM1 | DDR3 SO-DIMM slot |
| DIO1 | Digital I/O connector |
| F_PANEL1 | Front panel connector |
| IPMI1 | IPMI iRIS-1010 module slot |
| ID_LED1 | IPMI LED connector |
| KB_MS1 | Keyboard and mouse connector |
| LED_LAN2, LED_LAN3 | LAN LED connectors |
| LVDS1 | LVDS LCD connector |
| CN5 | LVDS LED connector |
| INV1 | LVDS backlight inverter connector |
| M_PCIE2 | PCIe mini card slot |
| PWR_BTN1 | Power button connector |
| CN1 | Power connector (12V) |
| RST_BTN1 | Reset button connector |
| COM1, COM2, COM3, COM4, COM5 | RS-232 serial port connectors |
| COM6 | RS-422/485 serial port connector |
| SATA1, SATA2 | Serial ATA 3.0 connectors |
| SATA_PWR1, SATA_PWR2 | SATA power connectors |
| CN3, CN4 | SMBUS connectors |
| SPDIF1 | SPDIF connector |
| SPI1 | SPI Flash connector |
| SYS_FAN | System fan connector |
| TPM1 | TPM connector |

| | |
|------------|-----------------------------|
| USB3, USB4 | Internal USB 2.0 connectors |
| HDMI1 | HDMI connector |
| LAN1, LAN2 | LAN connectors |
| USB1 | USB 3.0 connectors |
| USB2 | USB 2.0 connectors |
| VGA1 | VGA connector |

J_ATX_AT1: AT/ATX mode select switch

| PIN NO. | DESCRIPTION |
|-------------|--------------------|
| Short A - B | ATX Mode (default) |
| Short B - C | AT Mode |

J_CMOS1: Clear CMOS button

| PIN NO. | DESCRIPTION |
|---------|----------------------------|
| Open | Normal Operation (default) |
| Push | Clear CMOS Setup |

SW1: LVDS panel resolution selection

* ON=0, OFF=1; Single=S, Dual=D

| 4-3-2-1 | DESCRIPTION |
|---------|---------------------------|
| 0000 | 800x600 18bit S (default) |
| 0001 | 1024x768 18bit S |
| 0010 | 1024x768 24bit S |
| 0011 | 1280x768 18bit S |
| 0100 | 1280x800 18bit S |
| 0101 | 1280x960 18bit S |
| 0110 | 1280x1024 24bit D |
| 0111 | 1366x768 18bit S |
| 1000 | 1366x768 24bit S |
| 1001 | 1440x960 24bit D |
| 1010 | 1400x1050 24bit D |
| 1011 | 1600x900 24bit D |
| 1100 | 1680x1050 24bit D |
| 1101 | 1600x1200 24bit D |
| 1110 | 1920x1080 24bit D |
| 1111 | 1920x1200 24bit D |

| JP1: LCD voltage selection | |
|-----------------------------------|--------------------|
| PIN NO. | DESCRIPTION |
| Short 1 - 2 | +3.3 V |
| Short 2 - 3 | +5 V (Default) |

| AUDIO1: Audio connector | | | |
|--------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | LINEOUT1R | 2 | LINE1R |
| 3 | GND | 4 | GND |
| 5 | LINEOUT1L | 6 | LINE1L |
| 7 | GND | 8 | GND |
| 9 | FMIC1R | 10 | FMIC1L |

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

| CN6: Brightness button connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | PWRON | 2 | GND |
| 3 | BLUP | 4 | GND |
| 5 | BLDN | 6 | GND |

| CHASSIS1: Chassis intrusion connector | | | |
|--|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | +V3.3A_EC | 2 | CHASSIE_EC |

| DIO1: Digital I/O connector | | | |
|------------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | GND | 2 | +5V |
| 3 | DOUT3 | 4 | DOUT2 |
| 5 | DOUT1 | 6 | DOUT0 |
| 7 | DIN3 | 8 | DIN2 |
| 9 | DIN1 | 10 | DIN0 |

| CN2: Front panel connector | | | |
|-----------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | VCC | 2 | GND |
| 3 | PWR_LED+ | 4 | PWR_LED- |
| 5 | HDD_LED+ | 6 | HDD_LED- |

| ID_LED1: IPMI LED connector | | | |
|------------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | ID_LED+ | 2 | ID_LED- |

| LVDS1: LVDS LCD connector | | | |
|----------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | GND | 2 | GND |
| 3 | A0P_L | 4 | A0M_L |
| 5 | A1P_L | 6 | A1M_L |
| 7 | A2P_L | 8 | A2M_L |
| 9 | CLK1P_L | 10 | CLK1M_L |
| 11 | A3P_L | 12 | A3M_L |
| 13 | GND | 14 | GND |
| 15 | A4P_L | 16 | A4M_L |
| 17 | A5P_L | 18 | A5M_L |
| 19 | A6P_L | 20 | A6M_L |
| 21 | CLK2P_L | 22 | CLK2M_L |
| 23 | A7P_L | 24 | A7M_L |
| 25 | GND | 26 | GND |
| 27 | VCC | 28 | VCC |
| 29 | VCC | 30 | VCC |

| KB_MS1: Keyboard and mouse connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | VCC5_KBMS | 2 | MSDATA |
| 3 | MSCLK | 4 | KBDATA |
| 5 | KBCLK | 6 | KBMS_GND |

| CN5: LVDS LED connector | | | |
|--------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | VCC33 | 2 | OLED |
| 3 | VCC33 | 4 | GLED |

| INV1: LVDS backlight inverter connector | | | |
|--|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | BRIGHTNESS2 | 2 | GND |
| 3 | 12V | 4 | GND |
| 5 | ENABKL2 | | |

| PWR_BTN1: Power button connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | PWRBTSW# | 2 | GND |

| CN1: Power connector (12V) | | | |
|-----------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | GND | 2 | GND |
| 3 | 12V-IN | 4 | 12V-IN |

| RST_BTN1: Reset button connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | PM_SYSRST# | 2 | GND |

| COM1: RS-232 serial port connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | NDCD1 | 2 | NDSR1 |
| 3 | NRX1 | 4 | NRTS1 |
| 5 | NTX1 | 6 | NCTS1 |
| 7 | NDTR1 | 8 | NR11 |
| 9 | GND | 10 | GND |

| COM2: RS-232 serial port connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | NDCD2 | 2 | NDSR2 |
| 3 | NRX2 | 4 | NRTS2 |
| 5 | NTX2 | 6 | NCTS2 |
| 7 | NDTR2 | 8 | NRI2 |
| 9 | GND | 10 | GND |

| COM3: RS-232 serial port connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | NDCD3 | 2 | NDSR3 |
| 3 | NRX3 | 4 | NRTS3 |
| 5 | NTX3 | 6 | NCTS3 |
| 7 | NDTR3 | 8 | NRI3 |
| 9 | GND | 10 | GND |

| COM4: RS-232 serial port connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | NDCD4 | 2 | NDSR4 |
| 3 | NRX4 | 4 | NRTS4 |
| 5 | NTX4 | 6 | NCTS4 |
| 7 | NDTR4 | 8 | NRI4 |
| 9 | GND | 10 | GND |

| COM5: RS-232 serial port connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | NDCD5 | 2 | NDSR5 |
| 3 | NRX5 | 4 | NRTS5 |
| 5 | NTX5 | 6 | NCTS5 |
| 7 | NDTR5 | 8 | NRI5 |
| 9 | GND | 10 | GND |

| COM6: RS-422/485 serial port connector | | | |
|---|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | RXD485# | 2 | RXD485+ |
| 3 | TXD485+ | 4 | TXD485# |

| SATA1, SATA2: 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 | | |

| SATA_PWR1, SATA_PWR2: SATA power connectors | | | |
|--|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | +5V | 2 | GND |

| CN3, CN4: SMBus connectors | | | |
|-----------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | GND | 2 | SDATA |
| 3 | SCLK | 4 | +5V |

| SPDIF1: SPDIF connector | | | |
|--------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | +5V | 2 | NC |
| 3 | SPDIF OUT | 4 | GND |
| 5 | SPDIF IN | | |

| SPI1: SPI Flash connector | | | |
|----------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | SPI_POWER | 2 | SPI_CS# |
| 3 | SPI_DATAIN | 4 | SPI_CLK |
| 5 | SPI_DATAOUT | 6 | GND |

| SYS_FAN: System fan connector | | | |
|--------------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | GND | 2 | +12V |
| 3 | FANIN | 4 | FANOUT |

| TPM1: TPM connector | | | |
|----------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | LPC_CLK1 | 2 | GND |
| 3 | LFRAME# | 4 | NC |
| 5 | LPC_RST# | 6 | +5V |
| 7 | LAD3 | 8 | LAD2 |
| 9 | +3.3V | 10 | LAD1 |
| 11 | LAD0 | 12 | GND |
| 13 | SCLK0 | 14 | SDATA0 |
| 15 | +3.3V_DUAL | 16 | SERIRQ |
| 17 | GND | 18 | LPC_CLKRUN# |
| 19 | LPCPD# | 20 | LDRQ#0 |

| USB3, USB4: 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 |

| HDMI1: HDMI connector | | | |
|------------------------------|--------------------|------------|--------------------|
| PIN | DESCRIPTION | PIN | DESCRIPTION |
| 1 | HDMI_TMDS_C_DATA2 | 2 | GND |
| 3 | HDMI_TMDS_C_DATA2# | 4 | HDMI_TMDS_C_DATA1 |
| 5 | GND | 6 | HDMI_TMDS_C_DATA1# |
| 7 | HDMI_TMDS_C_DATA0 | 8 | GND |
| 9 | HDMI_TMDS_C_DATA0# | 10 | HDMI_TMDS_C_CLK |
| 11 | GND | 12 | HDMI_TMDS_C_CLK# |
| 13 | NC | 14 | NC |
| 15 | HDMI_DDC_SCLK | 16 | HDMI_DDC_SDATA |
| 17 | GND | 18 | +5V_HDMI |
| 19 | HDMI_HPD | | |

| LAN1: LAN connector | | | |
|----------------------------|--------------------|------------|--------------------|
| PIN | DESCRIPTION | PIN | DESCRIPTION |
| 1 | LAN1_MDI0+ | 2 | LAN1_MDI0- |
| 3 | LAN1_MDI1+ | 4 | LAN1_MDI1- |
| 5 | GND | 6 | GND |
| 7 | LAN1_MDI2+ | 8 | LAN1_MDI2- |
| 9 | LAN1_MDI3+ | 10 | LAN1_MDI3- |
| 11 | GND | 12 | GND |
| 13 | NC | 14 | NC |
| L1 | LAN1_LINK100 | L2 | LAN1_LINK1000 |
| L3 | LAN1_ACT-1 | L4 | POWER |

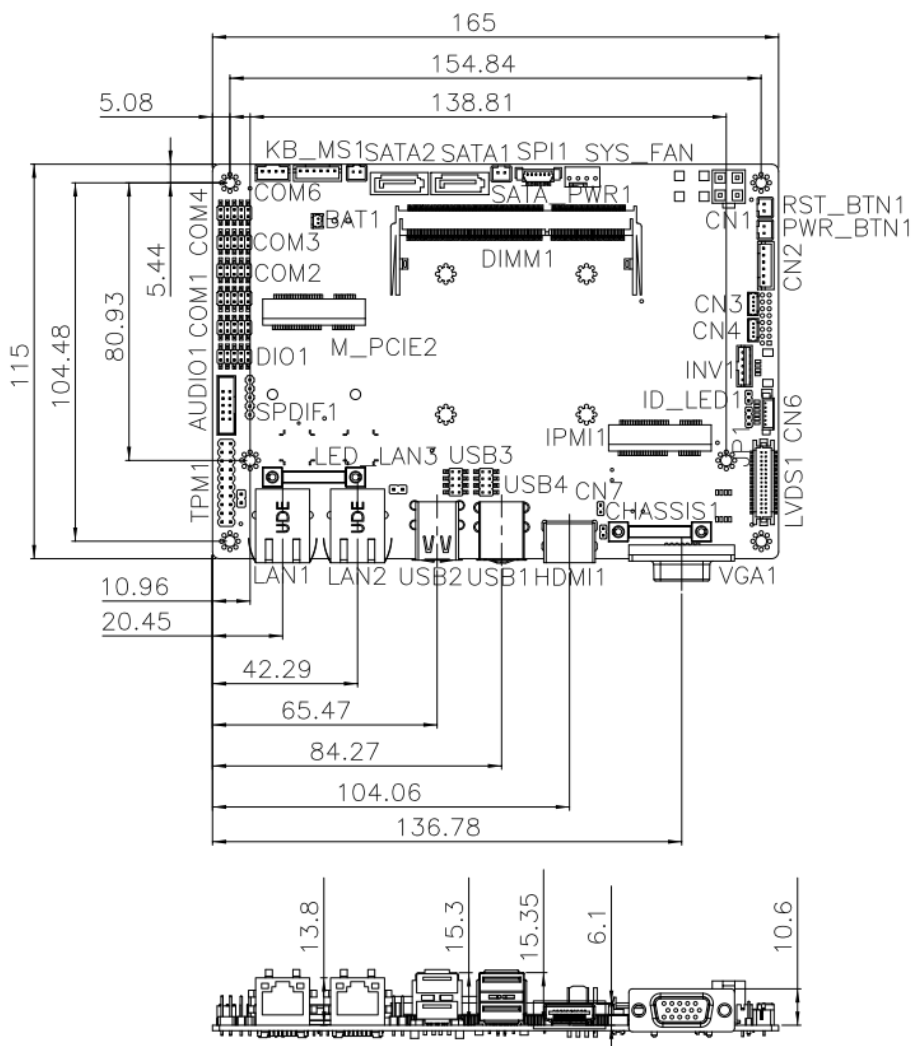
| LAN2: LAN connector | | | |
|----------------------------|--------------------|------------|--------------------|
| PIN | DESCRIPTION | PIN | DESCRIPTION |
| 1 | LAN2_MDI0+ | 2 | LAN2_MDI0- |
| 3 | LAN2_MDI1+ | 4 | LAN2_MDI1- |
| 5 | GND | 6 | GND |
| 7 | LAN12_MDI2+ | 8 | LAN2_MDI2- |
| 9 | LAN2_MDI3+ | 10 | LAN2_MDI3- |
| 11 | GND | 12 | GND |
| 13 | NC | 14 | NC |
| L1 | LAN12_LINK100 | L2 | LAN2_LINK1000 |
| L3 | LAN2_ACT-1 | L4 | POWER |

| USB1: USB 3.0 connectors | | | |
|---------------------------------|--------------------|------------|--------------------|
| PIN | DESCRIPTION | PIN | DESCRIPTION |
| 1 | USB_3P0_VCC1 | 2 | USB2P8_DM0_L |
| 3 | USB2P8_DP0_L | 4 | GND |
| 5 | USB3P0_RXDN0_C | 6 | USB3P0_RXDP0_C |
| 7 | GND | 8 | USB3P0_TXDN0_C |
| 9 | USB3P0_TXDP0_C | 10 | USB_3P0_VCC2 |
| 11 | USB2P9_DM1_L | 12 | USB2P9_DP1_L |
| 13 | GND | 14 | USB3P0_RXDN1_C |
| 15 | USB3P0_RXDP1_C | 16 | GND |
| 17 | USB3P0_TXDN1_C | 18 | USB3P0_TXDP1_C |

| USB2: USB 2.0 connectors | | | |
|---------------------------------|--------------------|----------------|--------------------|
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
| 1 | POWER | 2 | DATA0_N |
| 3 | DATA0_P | 4 | GND |
| 5 | POWER | 6 | DATA1_N |
| 7 | DATA1_P | 8 | GND |

| VGA1: 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 | CRT_VCC | 10 | GND |
| 11 | NC | 12 | 5VDDCDA |
| 13 | VGA_HSYNC | 14 | VGA_VSYNC |
| 15 | 5VDDCLK | | |

Board Layout: Jumper and Connector Locations



(Unit: mm)