

**FEOW 5.25" SBC,Intel Dual Core Atom D425/D525 1.8GHz,DDR3,18+48 bits LVDS/VGA,Dual PCIe Mini,Dual PCIe GbE,USB2.0,SATAII,Audio,RoHS**

# **NOVA-PV-D5251-G4 NOVA-PV-D5251-G2L2**

## **Quick Installation Guide Version 1.2**

Aug 06, 2015.

### **Package List**

NOVA-PV-D5251 package includes the following items:

- 1 x NOVA-PV-D5251 Single Board Computer
- 1 x PS/2 KB/MS Y Cable
- 1 x VGA Cable
- 1 x Audio Cable
- 1 x Quad Ports RS-232 Adapter Cable
- 1 x SATA with +5V Power Output Cable kit
- 1 x Dual Ports USB Cable
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x One key recovery CD
- 1 x QIG (Quick Installation Guide)



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## Specifications

- CPU:
  - 1.8 GHz Intel® Atom™ D525 dual-core CPU with 1 MB L2 cache
- System Chipset: Intel® ICH8M
- BIOS: UEFI BIOS
- System memory: 2 x 204-pin DDR3 800MHz SO-DIMMs SDRAM slot up to 4GB
- Ethernet: Four Realtek RTL8111E PCIe GbE Controllers (PCIe x1 Interface), LAN1 with ASF2.0 support
- I/O Interface:
  - 5 x RS-232 for NOVA-PV-D5251-G4-R11
  - 4 x RS-232 for NOVA-PV-D5251/D4251-G2L2-R11
  - 1 x RS-232/422/485 with Auto Flow control
  - 2 x SATA 3Gb/s (with 2 x SATA 5V output by 1 x 2-pin wafer)
  - 8 x USB 2.0
  - 1 x LPT
  - 1 x IDE
  - 1 x PS/2 KB/MS (by 1 x 6-pin wafer)
  - 1 x CF Type II socket
- Expansion:
  - 2 x PCIe mini card slot (PCIe x1 + USB Signal)
  - 1 x PCI slot
  - 1 x PCI-104 slot
- Audio: On board Realtek ALC662 HD Audio codec
- Digital I/O: 24-bit digital I/O, 12-bit input/ 12-bit output by CPLD
- Super I/O : Fintek F81865
- SMBus
  - 1 x 4-pin wafer connector
- TPM
  - 1 x 20-pin LPC pin header

- Display Interface:
  - Graphic engine by Intel GMA3150
  - Analog CRT supports resolution up to 2048x1536
  - 18-bit single-channel LVDS, resolution support up to WXGA 1366x768 or XGA 1024x768
  - 24-bit dual-channel LVDS by Novatek 68660BUFG, resolution support up to 1920x1080
- Watchdog timer:
  - Software programmable supports 1~255 sec. system reset by Super I/O: Fintek F81865
- Power Supply:
  - DC 12V Input, AT/ATX Mode by jumper support
- Power Consumption:
  - 12V@1.46A (Intel® Atom™ D525 1.8GHz with DDR3 1GB\*2)
- FAN:
  - 1 x 4-pin CPU FAN Connector
  - 1 x 3-pin System FAN Connector
- Operating Humidity: 5% ~ 95%, non-condensing
- Operating Temperature:
  - 20°C ~ 60°C with free air, -20°C ~ 70°C with force air for D525 processor
- Dimension: 203 mm x 146 mm
- Weight: GW: 1000g; NW: 400g

## Ordering Information

- **NOVA-PV-D5251-G4-R12:**  
5.25" SBC, Intel Dual Core Atom D525 1.8GHz, DDR3, 18 bits LVDS/VGA, Dual PCIe Mini, Quad PCIe GbE, USB2.0, SATAII, Audio, RoHS.
- **NOVA-PV-D5251-G2L2-R12:**  
5.25" SBC, Intel Dual Core Atom D525 1.8GHz, DDR3, 18+48 bits LVDS/VGA, Dual PCIe Mini, Dual PCIe GbE, USB2.0, SATAII, Audio, RoHS.
- **32200-000009-RS:** 44 pin 2.5" IDE cable
- **32200-015100-RS:** LPT cable
- **32205-000300-100-RS:** RS-232/422/485 cable
- **19FFD124010HB2A7-000001-RS:** CPU Cooler
- **TPM-IN01-R11:**  
20-Pin Infineon TPM module, software management tool, firmware V3.17

## Jumpers setting and connectors

LABEL	FUNCTION
J_AUTOPWR1	AT/ATX Power Mode Setting
J_COMS1	Clear CMOS Setup
J_LCD_TYPE1	LVDS Panel Resolution type selection
J_VLVDS1.2	LVDS Voltage Selection
JCF1	CF Card setting
JP5	COM6 RS232 or RS-422 or RS-485 type selection
JP6	PCI-104+ VIO Voltage Selection
JP7	CPU Fan setting
JP10	LVDS2 Panel Resolution type selection
AUDIO1	Audio Connector
BAT1	Battery Connector
CN2	Front Panel
CN3	I2C BusConnector
COM1	Internal 1~4 Port Serial Port Connectors
COM5	External Serial Port D-sub Connector (RS-232)
COM6	Internal Serial Port Connector(RS-232/422/485)
CPU_FAN1	Fan Connector
DIO1	Digital I/O Connector
FAN2	Fan Connector
INVERTER1,2	LVDS Panel Voltage Supply
J3	Reserve for NT68667UF debug use
IDE2	IDE connector
JSPI1	Flash SPI ROM
KB/MS1	PS/2 MOUSE & KEYBOARD Connector
KEY1	KEYPAD Connector
LAN1~4	RJ45 LAN Connector
LPT1	Internal LPT port
LVDS2	LVDS Panel Connector
LVDS3	LVDS Panel Connector
VGA1	VGA 10-pin Connector
MINI-PCIE1	PCI-E Mini Card

MINI-PCIE2	PCI-E Mini Card
P_DIO1	Digital I/O Programming connector
PWR_BTN1	Power bottom connector
PWRIN1	Power Supply DC12V Power IN
RST_BTN1	Reset bottom connector
S_ATA1,2	Serial ATA Connectors
SATA_PWR1~2	Serial ATA Power Connectors
TPM1	Trusted Platform Module connector
USB1,2,3,4	Internal USB Connectors

<b>J_AUTOPWR1: AT/ATX Power Mode Setting</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
<b>1-2 (default)*</b>	<b>ATX mode</b>
<b>Short 2-3</b>	<b>AT mode</b>

<b>J_CMOS1: Clear CMOS Setup</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
<b>1-2(default)*</b>	<b>Keep CMOS Setup(Normal Operation)</b>
<b>Short 2-3</b>	<b>Clear CMOS Setup</b>

<b>J_LCD_TYPE1: LVDS Panel Resolution type selection</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
OFF	640 X 480 (18bit)
1-2	800 X 400 (18bit)
<b>3-4 (Default)</b>	<b>800 X 600 (18bit)</b>
1-2 & 3-4	1024 X 768 (18bit)
5-6	1280 X 1024 (18bit)
1-2 & 7-8	1366 X 768 (18bit)
1-2 & 5-6 & 7-8	1280 X 800 (18bit)
3-4 & 5-6 & 7-8	1280 X 600 (18bit)

<b>J_VLVDS1,2: LVDS Voltage Selection</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
<b>1-2</b>	<b>5V</b>
<b>Short 2-3(default)*</b>	<b>3.3V</b>

<b>JCF1: CF Card Setting</b>	
<b>JCF1</b>	<b>DESCRIPTION</b>
<b>Open (Default)</b>	<b>Slave</b>
<b>Short 1-2</b>	<b>Master</b>

<b>JP5:COM6 RS232 or RS-422 or RS-485 type selection</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
<b>Short 1-2(default)</b>	<b>RS - 232</b>
<b>Short 3-4</b>	<b>RS - 422</b>
<b>Short 5-6</b>	<b>RS - 485</b>
<b>Short 7-8</b>	<b>RS-485 with RTS control</b>

<b>JP6: PCI-104+ VIO Voltage Selection</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
<b>Short 1-2 (default)</b>	<b>+5V</b>
<b>Short 2-3</b>	<b>+3.3V</b>

<b>JP7: CPU fan setting</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
<b>Short 1-2 (default)</b>	<b>3-pin</b>
<b>Short 2-3</b>	<b>4-pin</b>

<b>JP10: LVDS2 Panel Resolution type selection</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1-2	800 x 600
3-4	1024 x 768
1-2 & 3-4	1280 x 1024
5-6	1366 x 768
1-2 & 5-6	1920 x 1080

<b>AUDIO1 : Audio Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	Line out-R	2	Line in-R
3	GND	4	GND
5	Line out-L	6	Line in-L
7	GND	8	GND
9	MIC in-R	10	MIC in-L

<b>BAT1: +3V Battery Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	BAT (+3.3V)
2	GND

<b>CN2: Front Panel</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC
2	GND
3	PWR_LED+
4	PWR_LED-
5	HDD_LED+
6	HDD_LED-

<b>CN3: I2C BUS Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	Ground
2	SMB_DATA
3	SMB_CLK
4	+5V



<b>COM1 : Internal 1~4 Port Serial Port Connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	DATA CARRIER DETECT (DCD1#)	2	DATA SET READY (DSR1#)
3	RECEIVE DATA (RXD1)	4	REQUEST TO SEND (RTS1#)
5	TRANSMIT DATA (TXD1)	6	CLEAR TO SEND (CTS1#)
7	DATA TERMINAL READY (DTR1#)	8	RING INDICATOR (RI1#)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD2#)	12	DATA SET READY (DSR2#)
13	RECEIVE DATA (RXD2)	14	REQUEST TO SEND (RTS2#)
15	TRANSMIT DATA (TXD2)	16	CLEAR TO SEND (CTS2#)
17	DATA TERMINAL READY (DTR2#)	18	RING INDICATOR (RI2#)
19	GND	20	GND
21	DATA CARRIER DETECT (DCD3#)	22	DATA SET READY (DSR3#)
23	RECEIVE DATA (RXD3)	24	REQUEST TO SEND (RTS3#)
25	TRANSMIT DATA (TXD3)	26	CLEAR TO SEND (CTS3#)
27	DATA TERMINAL READY (DTR3#)	28	RING INDICATOR (RI3#)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD4#)	32	DATA SET READY (DSR4#)
33	RECEIVE DATA (RXD4)	34	REQUEST TO SEND (RTS4#)
35	TRANSMIT DATA (TXD4)	36	CLEAR TO SEND (CTS4#)
37	DATA TERMINAL READY (DTR4#)	38	RING INDICATOR (RI4#)
39	GND	40	GND

<b>COM5: External Serial Port D-sub Connector (RS-232)</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	DATA CARRIER DETECT (DCD#)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR#)
5	GND (GND)
6	DATA SET READY (DSR#)
7	REQUEST TO SEND (RTS#)
8	CLEAR TO SEND (CTS#)
9	RING INDICATOR (RI#)

<b>COM6 : Internal Serial Port Connectors (RS-232/422/485)</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	DATA CARRIER DETECT (DCD#)	2	DATA SET READY (DSR#)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS#)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS#)
7	DATA TERMINAL READY (DTR#)	8	RING INDICATOR (RI#)
9	GND	10	GND
11	TXD485+	12	TXD485#
13	RXD485+	14	RXD485#

<b>CPU_FAN1 : CPU Fan Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	Ground
2	+12V
3	CPUFANIN
4	CPUFANOUT

<b>DIO1 : Digital Input / Output Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	VCC (+5V)
3	IN0	4	OUT0
5	IN1	6	OUT1
7	IN2	8	OUT2
9	IN3	10	OUT3
11	8IN0	12	8OUT0
13	8IN1	14	8OUT1
15	8IN2	16	8OUT2
17	8IN3	18	8OUT3
19	8IN4	20	8OUT4
21	8IN5	22	8OUT5
23	8IN6	24	8OUT6
25	8IN7	26	8OUT7

<b>FAN2 : System Fan Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	SYSFANIN0
2	+12V
3	GND

<b>INVERTER1.2: LVDS2 Panel Backlight +12V Power Source connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	BRIGHTNESS
2	GND1
3	12V
4	GND2
5	BL_EN

<b>J3 : NT68667UF debug use</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+5V
2	TX#D
3	RX#D
4	GND

**IDE2 : IDE Interface Connector**

<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	BALE – DEFAULT
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	PDIAG#
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND
41	VCC	42	VCC
43	GND	44	N/C

**JSPI1: Flash BIOS SPI ROM Connector**

<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	SPI_VCC(5V)	2	GND
3	SPI_CS#0	4	SPI_CLK
5	SPI_SO0	6	SPI_SI
7	N/C	8	N/C

<b>KB/MS1: 6-pin PS/2 Keyboard/Mouse Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC (+5V)
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GND

<b>KEY1: KEYPAD Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	LED_BKL	2	NC
3	LED_AM	4	MENU/ENTER
5	DOWN	6	UP
7	ATUO/EXIT	8	POWER
9	GND		

<b>LAN1~4: RJ-45 LAN Connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	MDI0+	2	MDI0+
3	MDI1+	4	MDI1-
5	NC	6	NC
7	MDI2+	8	MDI2-
9	MDI3+	10	MDI3-

<b>LPT1: Parallel Port Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	STROBE#	14	AUTO FORM FEED #
2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	PRINTER SELECT	26	N/C

<b>LVDS2: 18/24-bit dual-channel LVDS Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	LVDS_DAP0	4	LVDS_DAN0
5	LVDS_DAP1	6	LVDS_DAN1
7	LVDS_DAP2	8	LVDS_DAN2
9	LVDS_CLKA	10	LVDS_CLKA#
11	LVDS_DAP3	12	LVDS_DAN3
13	GND	14	GND
15	LVDS_DBP0	16	LVDS_DBN0
17	LVDS_DBP1	18	LVDS_DBN1
19	LVDS_DBP2	20	LVDS_DBN2
21	LVDS_CLKB	22	LVDS_CLKA#
23	LVDS_DBP3	24	LVDS_DBN3
25	GND	26	GND
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

<b>LVDS3: 18 single-channel LVDS Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	LVDS_DAP0	4	LVDS_DAN0
5	LVDS_DAP1	6	LVDS_DAN1
7	LVDS_DAP2	8	LVDS_DAN2
9	LVDS_CLKA	10	LVDS_CLKA#
11	NC	12	NC
13	GND	14	GND
15	Rev(DDC_DAT)	16	Rev(DDC_CLK)
17	VCC_LCD	18	VCC_LCD
19	VCC_LCD	20	VCC_LCD

<b>VGA1: VGA 10-pin Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	RED	2	VDDCLK
3	GREEN	4	VDDCDA
5	BLUE	6	GND
7	HSYNC	8	GND
9	VSYNC	10	CRT_PLUG#

**MINI-PCIE1: PCIe Mini Card Slot**

<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	N/C
43	GND	44	N/C
45	SATA_RX(A+)	46	N/C
47	SATA_RX(A-)	48	NC
49	SATA_TX(B-)	50	GND
51	SATA_TX(B+)	52	+3.3Vaux

<b>MINI-PCIE2: PCIe Mini Card Slot</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB-
37	N/C	38	USB+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

<b>P_DIO_1 : Digital I/O Programming connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	3.3V	2	D_TDO
3	D_TDI	4	NC
5	NC	6	D_TMS
7	GND	8	D_TCK

<b>PWR_BTN1: Power bottom Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PWRBTN# signal
2	GND



<b>PWRIN1: +12V Main Power Input connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND
2	GND
3	+12V
4	+12V

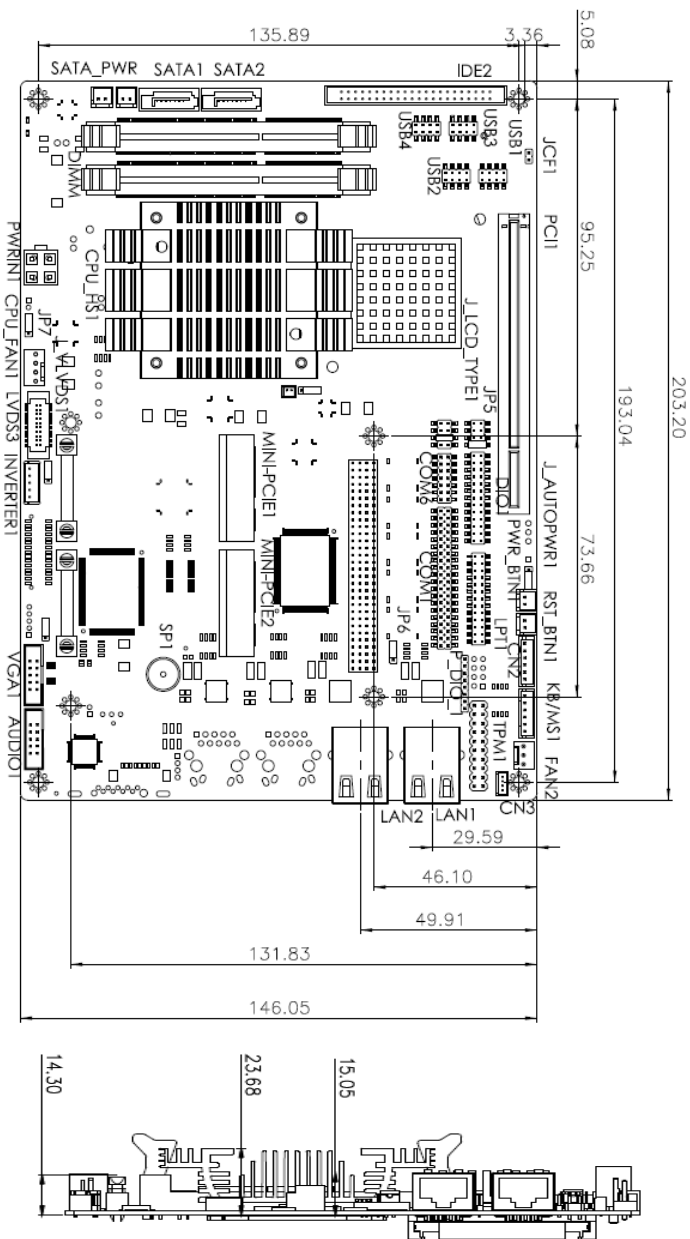
<b>RST_BTN1: Rest bottom Connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	RSSET# signal
2	GND

<b>SATA_PWR1~2: Serial ATA Power Output Connectors</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+5V
2	GND

<b>TPM1: Trusted Platform Module connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	FWHPCLK	2	GND
3	LFRAME#	4	NC (KEY)
5	PCIRST#	6	VCC (+5V)
7	LAD3	8	LAD2
9	VCC3 (+3.3V)	10	LAD1
11	LAD0	12	GND
13	SMBCLK	14	SMBDATA
15	3VDUAL	16	SERIRQ
17	GND	18	CLKRUN#
19	LPCPD#	20	LDRQ#

<b>USB1,USB2, USB3,USB4: Internal 8 ports USB Connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC (+5V)	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC (+5V)

# Board Layout: Jumper and Connector Locations



(Unit: mm)