

EPIC SBC supports Intel® 22nm 4th generation mobile Core™ i7/i5/i3 and Celeron® on-board processors with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio

NANO-QM871

Quick Installation Guide

Version 1.0

Dec 13, 2013.

Package List

NANO-QM871 package includes the following items:

- 1 x NANO-QM871 single board computer
- 2 x SATA with power cable kit (P/N: 32801-000201-100-RS)
- 1 x Audio cable (P/N: 32000-072100-RS)
- 1 x Power cable (P/N: 32100-087100-RS)
- 2 x RS-232 cable (P/N: 32200-000049-RS)
- 1 x CPU cooler
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)
- 1 x One Key Recovery CD



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Specifications

- CPU:
 - Intel® mobile Core™ i7-4700EQ on-board processor (2.4GHz, Quad-core, TDP=47W)
 - Intel® mobile Core™ i5-4400E on-board processor (2.7GHz, Dual-core, TDP=37W)
 - Intel® mobile Core™ i5-4402E on-board processor (1.6GHz, Dual-core, TDP=25W)
 - Intel® mobile Core™ i3-4100E on-board processor (2.4GHz, Dual-core, TDP=37W)
 - Intel® mobile Core™ i3-4102E on-board processor (1.6GHz, Dual-core, TDP=25W)
 - Intel® mobile Celeron® on-board processor
- PCH: Intel® QM87
- Memory:
 - One 204-pin 1600/1333MHz dual-channel DDR3/DDR3L SO-DIMM (system max. 8GB)
- BIOS: UEFI BIOS
- Graphic Engine:
 - Gen 7.5 Intel® HD Graphics with DirectX 11.1, OpenGL 3.2, OpenCL 1.2 support
- Display Output:
 - 1 x VGA (1920x1200@60)
 - 1 x 18/24-bit dual channel LVDS (2500x1600@60)
 - Dual HDMI via v1.4a compliant (2500x1600@60)
- Ethernet:
 - LAN1: Intel® I217 PHY with Intel® AMT 9.0 support
 - LAN2: Intel® I211AT PCIe GbE controller
- Super IO: Fintek F81866
- Embedded Controller: iWDD
- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)
- Audio:
 - Realtek ALC662 HD codec

- I/O Interface:
 - 2 x RS-232
 - 1 x RS-422/485
 - 1 x 6-pin wafer for PS/2 KB/MS
 - 2 x USB 2.0 (by pin header)
 - 2 x USB 2.0 (on rear I/O)
 - 2 x USB 3.0 (on rear I/O)
 - 2 x SATA 6G/s with 5V SATA power connector (RAID 0, 1, 5, 10)
- TPM: 1 x 20-pin (2x10) header
- SMBUS: 1 x 4-pin (1x4) wafer
- Front Panel:
 - 1 x 6-pin (1x6) wafer for power LED & HDD LED
 - 1 x 2-pin (1x2) wafer for power button
 - 1 x 2-pin (1x2) wafer for power reset
- LAN LED: 1 x 4-pin (2x2) header for LAN1 LED, LAN2 LED
- Expansion:
 - 1 x Full-size PCIe Mini card slot with mSATA support
 - 1 x PCIe/104 Type 2 slot
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- FAN:
 - 1 x 4-pin CPU fan connector
 - 1 x 4-pin system fan connector
- Power supply: 12V only, AT/ATX support
- Operating Temperature: -10°C ~ 60°C
- Storage Temperature: -20°C ~ 85°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115 mm x 165 mm
- Weight(GW/ NW): 850g / 350g

Ordering Information

- **NANO-QM871-i7-R10:**
EPIC SBC supports Intel® 22nm Mobile Core™ i7-4700EQ on-board processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio
- **NANO-QM871-i5-R10:**
EPIC SBC supports Intel® 22nm Mobile Core™ i5-4400E on-board processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio
- **NANO-QM871-i5E-R10:**
EPIC SBC supports Intel® 22nm Mobile Core™ i5-4402E on-board processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio
- **NANO-QM871-i3-R10:**
EPIC SBC supports Intel® 22nm Mobile Core™ i3-4100E on-board processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio
- **NANO-QM871-i3E-R10:**
EPIC SBC supports Intel® 22nm Mobile Core™ i3-4102E on-board processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio
- **NANO-QM871-C-R10:**
EPIC SBC supports Intel® 22nm Celeron® on-board processor (37W) with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio

- **NANO-QM871-CE-R10:**
EPIC SBC supports Intel® 22nm Celeron® on-board processor (25W) with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, PCIe/104, SATA 6Gb/s and Audio
- **32000-070301-RS:** Dual port USB cable
- **32100-043403-RS:** ATX power cable
- **32200-074800-RS:** RS-422/485 cable, 200mm
- **32000-023800-RS:** PS/2 KB/MS Y-cable with bracket, 135mm
- **TPM-IN01-R11:**
20-pin Infineon TPM module, software management tool, firmware V3.17

Jumpers setting and connectors

LABEL	FUNCTION
J_ATXCTL1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
JP1	LCD voltage selection
SW1	LVDS panel resolution selection
AUDIO1	Audio Source Connector
BAT1	Battery connector
CPU_FAN1	CPU fan connector
DIMM1	DDR3 SO-DIMM slot
DIO1	Digital I/O connector
LPT_DB1	EC debug connector
KB_MS1	Keyboard and mouse connector
LAN_ACT_LED1	LAN active LED connector
LVDS1	LVDS connector
INV1	LVDS backlight connector
M-SATA1	PCIe mini card slot
PCIE-104	PCIe/104 slot
PWR_BTN1	Power button
PWR1	Power supply DC12V power in
F_PANEL1	Power LED and HDD LED connector
RST_BTN1	Reset button
COM1, COM2	RS-232 serial port connectors
COM3	RS-422/485 serial port connector
S_ATA1, S_ATA2	Serial ATA 3.0 connectors
SATA_PWR1, SATA_PWR2	SATA power connectors
SMB1	SMBUS connector
SPI1	SPI Flash connector
SPI2	SPI Flash connector (EC)
SYS_FAN1	System fan connector
TPM1	TPM connector
USB1	Internal USB 2.0 connectors
LAN1, LAN2	Ethernet connectors

HDMI1, HDMI2	HDMI connectors
USB_CON2	USB 2.0 connectors
USB_CON1	USB 3.0 connectors
VGA1	VGA connector

J_ATXCTL1: 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
Push	Clear CMOS

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

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

AUDIO1: Audio Source Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPK_OUT-R	2	LINE_IN-R
3	GND	4	GND
5	SPK_OUT-L	6	LINE_IN-L
7	GND	8	GND
9	MIC-R	10	MIC-L

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

CPU_FAN1: CPU fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V12S
3	Rotation Signal	4	PWM Control Signal

DIO1: Digital I/O connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DOOUT3	4	DOOUT2
5	DOOUT1	6	DOOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

LPT_DB1: EC debug connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	KSI0	2	KSO0
3	KSO1	4	KSO2
5	KSO3	6	KSO4
7	KSO5	8	KSO6
9	KSO7	10	KSO8
11	KSO9	12	KSO10
13	KSO12	14	KSI1
15	KSO11	16	KSI2
17	KSI3	18	GND
19	GND	20	GND

KB_MS1: Keyboard and mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC5_KBMS	2	MSDATA
3	MSCCLK	4	KBDATA
5	KBCLK	6	KBGND

LAN_ACT_LED1: LAN active LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LAN1_LINK_ACT-	2	V_3P3_LAN
3	LAN2_LINK_ACT-	4	+3.3A

LVDS1: LVDS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	A_Y3	12	A_Y3#
13	GND	14	GND
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	B_Y3	24	B_Y3#
25	GND	26	GND
27	VCC	28	VCC
29	VCC	30	VCC

INV1: LVDS backlight connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	BRIGHTNESS	2	GND
3	+V12S_LCD_BKL	4	GND
5	ENABKL		

M-SATA1: PCIe mini card slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
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(SATA_RX4+)	24	3VDual
25	PERP2(SATA_RX4-)	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2(SATA_TX4-)	32	SMBDATA
33	PETP2(SATA_TX4+)	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	SATA_DET4_R_N	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	MSATA_SEL#	52	VCC3

PCIE-104: PCIe/104 slot				
PIN NO.	DESCRIPTION		DESCRIPTION	PIN NO.
1	USB_OC#	+5 Volts	PE_RST#	2
3	3.3V		3.3V	4
5	USB_1p		USB_0p	6
7	USB_1n		USB_0n	8
9	GND		GND	10
11	PEx1_1Tp		PEx1_0Tp	12
13	PEx1_1Tn		PEx1_0Tn	14
15	GND		GND	16
17	PEx1_2Tp		PEx1_3Tp	18
19	PEx1_2Tn		PEx1_3Tn	20
21	GND		GND	22
23	PEx1_1Rp		PEx1_0Rp	24
25	PEx1_1Rn		PEx1_0Rn	26
27	GND		GND	28
29	PEx1_2Rp		PEx1_3Rp	30
31	PEx1_2Rn		PEx1_3Rn	32
33	GND		GND	34
35	PEx1_1Clkp		PEx1_0Clkp	36
37	PEx1_1Clkn		PEx1_0Clkn	38
39	+5V_SB		+5V_SB	40
41	PEx1_2Clkp		PEx1_3Clkp	42
43	PEx1_2Clkn		PEx1_3Clkn	44
45	DIR		PWRGOOD	46
47	SMB_DAT		PEx_x4_Clkp	48
49	SMB_CLK		PEx_x4_Clkn	50
51	SMB_ALERT		PSOEN#	52

53	STK0 / WAKE#	+5 Volts	STK1 / PEG_ENA#	54
55	GND		GND	56
57	PEx4_1T(0)p		PEx4_0T(0)p	58
59	PEx4_1T(0)n		PEx4_0T(0)n	60
61	GND		GND	62
63	PEx4_1T(1)p		PEx4_0T(1)p	64
65	PEx4_1T(1)n		PEx4_0T(1)n	66
67	GND		GND	68
69	PEx4_1T(2)p		PEx4_0T(2)p	70
71	PEx4_1T(2)n		PEx4_0T(2)n	72
73	GND		GND	74
75	PEx4_1T(3)p		PEx4_0T(3)p	76
77	PEx4_1T(3)n		PEx4_0T(3)n	78
79	GND		GND	80
81	SATA_T1p		SATA_T0p	82
83	SATA_T1n		SATA_T0n	84
85	GND		GND	86
87	SSTX1p		SSTX0p	88
89	SSTX1n		SSTX0n	90
91	GND		GND	92
93	Reserved		Reserved	94
95	Reserved	Reserved	96	
97	GND	GND	98	
99	SATA_DET#1	SATA_DET#0	100	
101	SATA_PWREN#1	SATA_PWREN#0	102	
103	GND	GND	104	

105	STK2 / SDVO_DAT	+12 Volts	LPC_CLK	106
107	GND		GND	108
109	PEx4_1R(0)p		PEx4_0R(0)p	110
111	PEx4_1R(0)n		PEx4_0R(0)n	112
113	GND		GND	114
115	PEx4_1R(1)p		PEx4_0R(1)p	116
117	PEx4_1R(1)n		PEx4_0R(1)n	118
119	GND		GND	120
121	PEx4_1R(2)p		PEx4_0R(2)p	122
123	PEx4_1R(2)n		PEx4_0R(2)n	124
125	GND		GND	126
127	PEx4_1R(3)p		PEx4_0R(3)p	128
129	PEx4_1R(3)n		PEx4_0R(3)n	130
131	GND		GND	132
133	SATA_R1p		SATA_R0p	134
135	SATA_R1n		SATA_R0n	136
137	GND		GND	138
139	SSRX1p		SSRX0p	140
141	SSRX1n		SSRX0n	142
143	GND		GND	144
145	LPC_AD0	LPC_DRQ#	146	
147	LPC_AD1	LPC_SERIRQ#	148	
149	GND	GND	150	
151	LPC_AD2	LPC_FRAME#	152	
153	LPC_AD3	LPC_Battery	154	
155	GND	GND	156	

PWR_BTN1: Power button			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWR_BTN+	2	PWR_BTN-

PWR1: Power supply DC12V power in			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

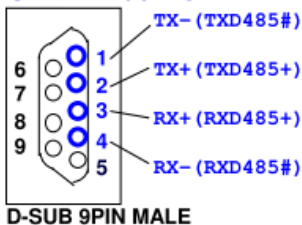
F_PANEL1: Power LED and HDD LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	PWR_LED+	4	PWR_LED-
5	HDD_LED+	6	HDD_LED-

RST_BTN1: Reset button			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RST_BTN+	2	RST_BTN-

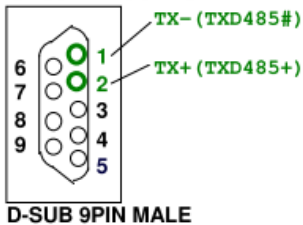
COM1, COM2: RS-232 serial port connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	-ND CD	2	-NDSR
3	NSIN	4	-NRTS
5	NSOUT	6	-NCTS
7	-NDTR	8	-XRI
9	GND	10	GND

COM3: RS-422/485 serial port connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	RXD485-	2	RXD485+
3	TXD485+	4	TXD485-

RS422 Pin define



RS485 Pin define



S_ATA1, S_ATA2: Serial ATA 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

SATA_PWR1, SATA_PWR2: SATA power connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V5S	2	GND

SMB1: SMBUS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+V5S

SPI1: SPI Flash connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3M_SPI_CON	2	SPI_CS#0_CN
3	SPI_SO_SW	4	SPI_CLK_SW
5	SPI_SI_SW	6	GND

SPI2: SPI Flash connector (EC)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3M_SPI_CON_EC	2	SPI_CS#0_CN_EC
3	SPI_SO_SW_EC	4	SPI_CLK_SW_EC
5	SPI_SI_SW_EC	6	GND

SYS_FAN1: System fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V12S
3	Rotation Signal	4	PWM Control Signal

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	+3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

USB1: Internal USB 2.0 connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	-DATA	4	+DATA
5	+DATA	6	-DATA
7	GND	8	VCC

LAN1, LAN2: Ethernet connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDIA3-	2	MDIA3+
3	MDIA2-	4	MDIA2+
5	MDIA1-	6	MDIA1+
7	MDIA0-	8	MDIA0+

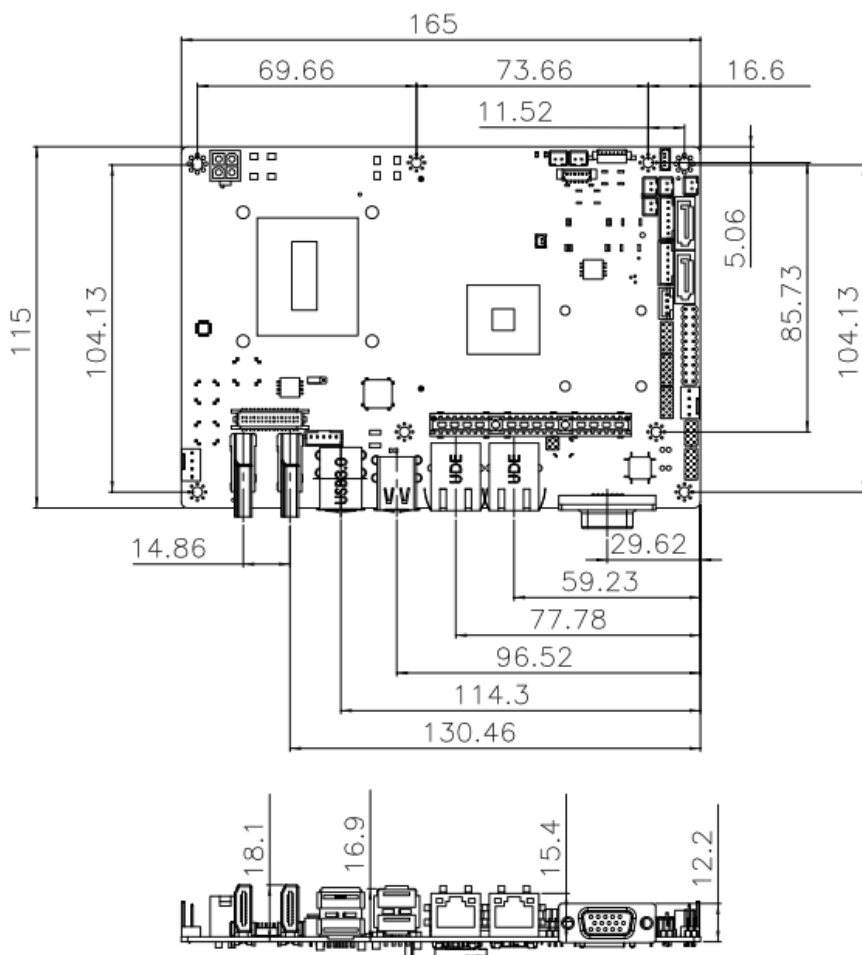
HDMI1, HDMI2: HDMI connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2+	2	GND
3	HDMI_DATA2#-	4	HDMI_DATA1+
5	GND	6	HDMI_DATA1#-
7	HDMI_DATA0+	8	GND
9	HDMI_DATA0#-	10	HDMI_CLK+
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5VCC
19	HDMI_HPD		

USB_CON2: USB 2.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBUS	2	D-
3	D+	4	GND

USB_CON1: USB 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBUS	2	D-
3	D+	4	GND
5	STDA_SSRX_N	6	STDA_SSRX_P
7	GND_DRAIN	8	STDA_STX_N
9	STDA_STX_P		

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	5V	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Board Layout: Jumper and Connector Locations



(Unit: mm)