

EPIC SBC supports Intel® 14nm Generation Pentium® or Celeron® on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS

NANO-AL

Quick Installation Guide

Version 1.0

Sep 13, 2018.

Package List

NANO-AL package includes the following items:

- 1 x NANO-AL single board computer with Heatsink
- 1 x SATA with power cable kit
- 1 x RS-232 cable
- 1 x QIG (Quick Installation Guide)



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Specifications

- SoC:
 - Intel® Atom® x7-E3950 on-board SoC (up to 2.0GHz, quad-core, 2M Cache, TDP=12W)
 - Intel® Atom® x5-E3940 on-board SoC (up to 1.8GHz, quad-core, 2M Cache, TDP=9W)
 - Intel® Atom® x5-E3930 on-board SoC (up to 1.8GHz, dual-core, 2M Cache, TDP=6W)
 - Intel® Pentium® N4200 on-board SoC (up to 2.5GHz, quad-core, 2M Cache, TDP=6W)
 - Intel® Celeron® N3350 on-board SoC (up to 2.4GHz, dual-core, 2M Cache, TDP=6W)
- BIOS: AMI UEFI BIOS
- Memory:
 - One 204-pin 1866/1600MHz Dual-channel DDR3L DIMMs support up to 8GB
- Graphics Engine:
 - Intel® HD Graphics Gen9 Low Power, 18 Execution Units
 - 4K Codec Decode & Encode for HEVC 4 , H.264, VP8, SVC, MVC
- Display Output:
 - Triple Independent Displays
 - 1 x LVDS: 18/24-bit dual-channel LVDS by CH7511B DP to LVDS converter (up to 1920x1200@60Hz)
 - 2 x HDMI (up to 3840x2160 @ 30Hz)
 - 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 4096 x 2304 @60Hz) (colay with HDMI1)
- Ethernet: Intel® I211-AT PCIe controller
- External I/O Interfaces:
 - 2 x USB 3.0
 - 2 x USB 2.0
- Internal I/O Interfaces:
 - 1 x KB/MS (1x6 pin)

- 2 x RS-232/422/485 (2x5 pin, P=2.0)
- 2 x SATA 6G/s with 5V SATA power connector (no RAID)
- 2 x USB 2.0 (2x4 pin, P=2.0)
- 4 x RS-232 (2x5 pin, P=2.0)
- SMBus: 1 x SMBus (1x4 pin)
- I²C: 1 x I²C (1x4 pin)
- Audio:
 - Realtek ALC662 HD codec
 - 2 x Audio Jacks (Mic-in, Line-out)
 - 1 x Analog audio (2x5 pin)
- Front Panel:
 - 1 x Power LED & HDD LED (1x6 pin)
 - 1 x Power button (1x2 pin)
 - 1 x Reset button (1x2 pin)
- LAN LED: 2 x LAN LED (1x2 pin)
- Expansion :
 - 1 x Full/Half-size PCIe Mini slot (w/ Micro SIM holder(Optional))
 - 1 x M.2 (B Key) (2242, SATA, USB2.0, USB3.0 signal only)
 - 1 x Micro SD (Optional)
- Digital I/O: 1 x 8-bit digital I/O (2x5 pin)
- Fan Connector:
 - 1 x Smart fan connector (1x4 pin)
- Power supply:
 - 9V~30V DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- Operating Temperature:
 - 20°C ~ 60°C

- Storage Temperature: -40°C ~ 85°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115mm x 165mm
- Weight: GW:850g/NW:350g

All the drivers and One Key Recovery utility for the NANO-AL are available on IEI Resource Download Center. Type NANO-AL and press Enter to find all the relevant software, utilities, and documentation. To install software from the downloaded ISO file, mount the file as a virtual drive to view its content.

IEI Resource Download Center

<https://download.ieiworld.com>



Ordering Information

- **NANO-AL-N2-R10:**
EPIC SBC supports Intel® 14nm quad-core Pentium® N4200 2.5GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS
- **NANO-AL-N1-R10:**
EPIC SBC supports Intel® 14nm dual-core Celeron® N3350 2.3GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS
- **NANO-AL-E3W2-R10:**
EPIC SBC supports Intel® 14nm quad-core Atom® x7-E3950 2.0GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C

**MOQ 100 pcs

- **NANO-AL-E2W2-R10:**
EPIC SBC supports Intel® 14nm quad-core Atom® x5-E3940 1.8GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C
***MOQ 100 pcs*
- **NANO-AL-E1W2-R10:**
EPIC SBC supports Intel® 14nm dual-core Atom® x5-E3930 1.8GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C
***MOQ 100 pcs*
- **32000-070301-RS:** Dual-port USB cable, 210mm, P=2.0
- **32000-023800-RS:** PS/2 KB/MS cable, 135mm, P=2.0

Jumpers setting and connectors

LABEL	FUNCTION
J_CMOS1	Clear CMOS Switch
J_ATX_AT1	AT/ATX Power Mode Setting
J_HDMI_DP1	HDMI1/IDP1 Mode Setting
J_SATA2	M.2 SATA or SATA2 Select
USB SW1, USB SW2	USB power setting
J_TXE1	Flash Descriptor Override
SW1	LVDS Panel Resolution Selection
JP2	LVDS1 Voltage Selection
CN1	Front Panel Connector
HDMI1, HDMI2	HDMI Connectors
DP1	DP Connector
LAN1, LAN2	RJ45 LAN Connectors
USB3-1	External USB 3.0 Connector
USB2-1	USB 2.0 Connector
USB2-2	USB 2.0 Pin header
KB/MS1	PS/2 Keyboard & Mouse Connector
Audio1	Audio Connector
SATA1, SATA2	Serial ATA 3.0 Connector
M2_1	M.2 Slot
COM1,COM2,COM3,COM4	Internal RS-232 Serial Port Connectors
COM5, COM6	Internal RS-232/RS-422/RS-485 Serial Port Connector
MPCIE1	PCIe Mini Card Slot
CPU_FAN1	CPU Fan Connector
DIO1	Digital Input / Output Connector
CPU12V1	+12V Power Connector
CN1	EC Debug Port Connector
JSPI1	Flash SPI ROM Connector
JSPI2	Flash EC ROM Connector
SMB1	SMBus Connector
I2C1	I2C Connector (to EC)
LED_LAN1, LED_LAN2	LAN Link LED Connector

CHASSIS1	Chassis Status Connector
LVDS1	LVDS connector
INV1	5-pin Header Inverter Connector
RST_BTN1	Reset Button Connector
PWR_BTN1	Power Button Connector
SIM1	SIM Card Connector (Optional)
80PORT1	80 Port Connector

J_CMOS1: Clear CMOS Switch

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

J_ATX_AT1: AT/ATX Power Mode Setting

PIN NO.	DESCRIPTION
Short A-B(Left)	ATX Power Mode (default)
Short B-C(Right)	AT Power Mode

J_HDMI_DP1: HDMI1/IDP1 Mode Setting

PIN NO.	DESCRIPTION
Short A-B(Left)	HDMI1 (default)
Short B-C(Right)	IDP1

J_SATA2: M.2 SATA or SATA2 Select

PIN NO.	DESCRIPTION
Short A-B(Right)	SATA2 (default)
Short B-C(Left)	M.2 SATA

USB SW1, USB SW2: USB power setting	
PCIE x16	DESCRIPTION
+5V DUAL	5V DUAL (default)
+5V	+5V

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

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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J_TXE1: Flash Descriptor Override	
PIN NO.	DESCRIPTION
Open	No Override (Normal Operation) (default)
Short	Override

JP2: LVDS1 Voltage Selection	
PIN NO.	DESCRIPTION
Short 1-2	+3.3V LVDS (default)
Short 2-3	+5V LVDS

SW1: LVDS Panel Resolution Selection	
* ON=0, OFF=1	
4-3-2-1	DESCRIPTION
0000	800x600 18bit
0001	1024x768 18bit
0010	1024x768 24bit
0011	1280x768 18bit
0100	1280x800 18bit
0101	1280x960 18bit
0110	1280x1024 48bit
0111	1366x768 18bit
1000	1366x768 24bit
1001	1440x960 48bit
1010	1400x1050 48bit
1011	1600x900 48bit
1100	1680x1050 48bit
1101	1600x1200 48bit
1110	1920x1080 48bit
1111	1920x1200 48bit

CN1: Front Panel Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	4	PWR_LED-
2	GND	5	HDD_LED+
3	PWR_LED+	6	HDD_LED-

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	+5V
19	HDMI_HPD	20	HDMI_GND
21	HDMI_GND	22	HDMI_GND
23	HDMI_GND		

DP1: DP Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HPD	2	AUX+
3	GND	4	AUX-
5	CAD	6	GND
7	GND	8	Lane2+
9	Lane3+	10	Lane2-
11	Lane3-	12	GND
13	GND	14	Lane0+
15	Lane1+	16	Lane0-
17	Lane1-	18	VCC3
19	VCC5	20	N/C

LAN1, LAN2: RJ45 LAN Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
G1	IO_GND	R2	TRD1N0
G2	IO_GND	R3	TRD1P1
L1	L1_100-	R4	TRD1N1
L2	L1_1000-	R5	N95788738
L3	L1_LINK_ACT-	R6	N95788617
L4	N100494685	R7	TRD1P2
N1	NC	R8	TRD1N2
N2	NC	R9	TRD1P3
R1	TRD1P0	R10	TRD1N3

USB3-1: External USB 3.0 Connector			
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+

USB2-1: USB 2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USB3_PWR1	4	GND
2	DATA1_N	5	USB_GND
3	DATA1_P	6	USB_GND

USB2-2: USB 2.0 Pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+VCC_USB45	2	GND
3	DATA4-	4	DATA5+
5	DATA4+	6	DATA5-
7	GND	8	+VCC_USB45

KB/MS1: PS/2 Keyboard & Mouse Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	4	KBDATA
2	MSDATA	5	KBCLOCK
3	MSCLK	6	GND

Audio1: Audio Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUTR	2	LINEIN_R
3	ANALOG_GND	4	ANALOG_GND
5	LINE_OUTL	6	LINEIN_L
7	ANALOG_GND	8	ANALOG_GND
9	MICIN1	10	MICIN2

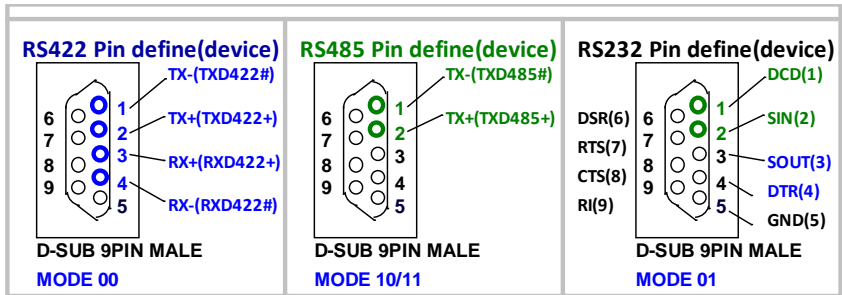
SATA1, SATA2: Serial ATA 3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	RX+
3	SATA_TX-	7	SATA_RX+
4	GND		

M2_1: M.2 Slot			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	GND	6	NC
7	USB2_DP	8	NC
9	USB2_DN	10	NC
11	GND	12	
13		14	
15		16	
17		18	
19		20	NC
21	GND	22	NC
23	WWAN_WAKE_N	24	NC
25	NC	26	NC
27	GND	28	NC
29	USB3P0_RXDN(Reserved)	30	NC
31	USB3P0_RXDP(Reserved)	32	NC
33	GND	34	NC
35	USB3P0_TXDN(Reserved)	36	NC
37	USB3P0_TXDP(Reserved)	38	SATA_DEVSLP1
39	GND	40	NC
41	SATA_RX+	42	NC
43	SATA_RX-	44	NC
45	GND	46	NC
47	SATA_TX+	48	NC
49	SATA_TX-	50	NC
51	GND	52	WAKE_N
53	NC	54	NC
55	NC	56	NC

57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SUSCLK
67	BUF_PLT_RST#	68	NC
69	NC	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

COM1,COM2,COM3,COM4: Internal RS-232 Serial Port Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM5,COM6: Internal RS-232/RS-422/RS-485 Serial Port Connector			
Mode	RS-232	RS-422	RS-485
PIN NO.	DESCRIPTION	DESCRIPTION	DESCRIPTION
1	DCD	TXD-	DATA-
2	DSR	N/A	N/A
3	RXD	TXD+	DATA+
4	RTS	N/A	N/A
5	TXD	RXD+	N/A
6	CTS	N/A	N/A
7	DTR	RXD-	N/A
8	RI	N/A	N/A
9	GND	N/A	N/A



MPCIE1: PCIe Mini Card Slot			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	PCIE_WAKE#	2	+3.3V
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	+VCC_SIM
9	GND	10	SIM_IO
11	MSATA_CLK#	12	SIM_CLK
13	MSATA_CLK	14	SIM_RST
15	GND	16	SIM_VPP
17	PLTRST_N	18	GND
19	N/C	20	+3.3V
21	GND	22	PLTRST_N
23	PCIE_RXN	24	+3.3V
25	PCIE_RXP-	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	PCIE_TXN	32	SMB_DATA
33	PCIE_TXP	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	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	MSATA_DET	52	+3.3V

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

DIO1: Digital Input / Output 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

CPU12V1: +12V Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

CN1: EC Debug Port Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

JSPI1: Flash SPI ROM Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	NC
5	GND	6	SPI_CLK
7	SPI_SI	8	NC

JSPI2: Flash EC ROM Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	NC
5	GND	6	SPI_CLK
7	SPI_SI	8	NC

SMB1: SMBus Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

I²C1: I²C Connector (to EC)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	I2C_DAT
3	I2C_CLK	4	+5V

LED_LAN1: LAN Link LED Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

LED_LAN2: LAN Link LED Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

CHASSIS1: Chassis Status Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VSB	2	CHASSIS OPEN

LVDS1: LVDS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	A_Y0#	4	A_Y1#
5	A_Y0	6	A_Y1
7	GND	8	GND
9	A_Y2#	10	A_CK#
11	A_Y2	12	A_CK
13	GND	14	GND
15	A_Y3#	16	B_Y0#
17	A_Y3	18	B_Y0
19	GND	20	GND
21	B_Y1#	22	B_Y2#
23	B_Y1	24	B_Y2
25	GND	26	GND
27	B_CK#	28	B_Y3#
29	B_CK	30	B_Y3
31	GND	32	GND
33	LVDS Detect (GND)*	34	GND
35	LVDS_VCC	36	LVDS_VCC
37	LVDS_VCC	38	LVDS_VCC
39	LVDS_VCC	40	LVDS_VCC

* LVDS Detect must be connected to GND.

INV1: 5-pin Header Inverter Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCD_BKLTCTL	2	GND
3	+12V	4	GND
5	BACKLIGHT ENABLE		

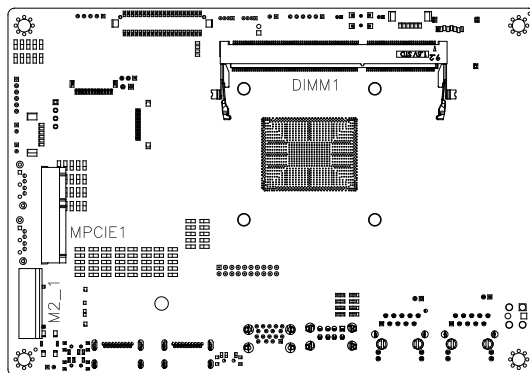
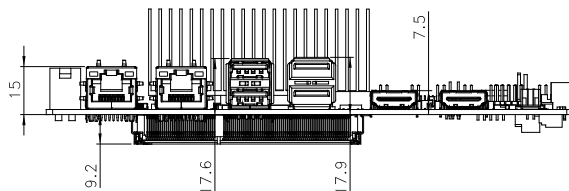
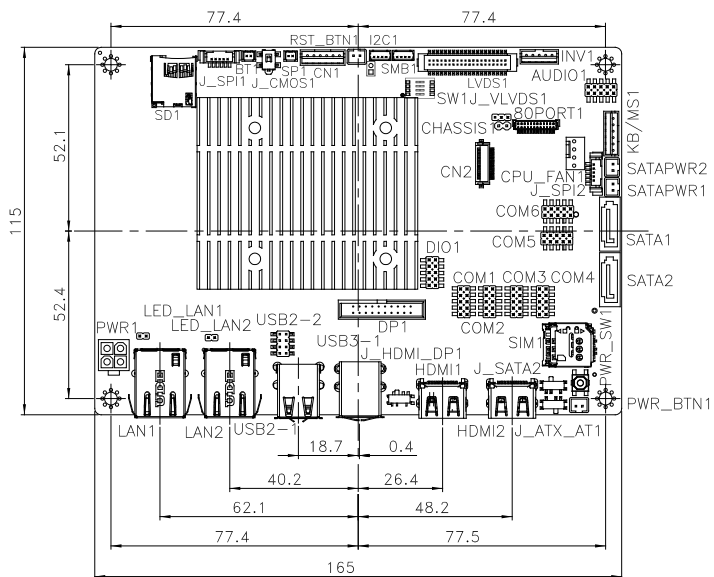
RST_BTN1: Reset Button Connector		
	PIN	DESCRIPTION
RESET	1	RESET+
	2	RESET-

PWR_BTN1: Power Button Connector		
	PIN	DESCRIPTION
PB_SW1	1	PWR_BTN+
	2	PWR_BTN-

SIM1: SIM Card Connector (Optional)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SIM_VCC	2	SIM_RST
3	SIM_Clock	5	GND
6	SIM_VPP	7	SIM_DATA

80PORT1: 80 Port Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V(Reserved)	2	+3.3V
3	GND	4	LPC_SERIRQ
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	LPC_FRAME_N	10	PLT_RST#
11	LPC_CLOCK		

Board Layout: Jumper and Connector Locations



(Unit: mm)