

**Mini-ITX SBC with AMD® Embedded G-Series SoC with VGA/Dual
HDMI, Dual GbE, Dual PCIe Mini, USB 3.0, SATA 6GB/s,
HD Audio, IPMI and RoHS**

KINO-KBN-i2

Quick Installation Guide

Version 1.0

Mar 13, 2014.

Package List

KINO-KBN-i2 package includes the following items:

- 1 x KINO-KBN-i2 single board computer
- 2 x SATA with power output cable kit (P/N:32801-000100-300-RS)
- 1 x I/O shielding (P/N: 45014-0029C0-00-RS)
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)
- 1 x One key recovery CD



©2006 Copyright by IEI Integration corp.
All rights reserved.

Specifications

- SoC:
 - AMD® Embedded G-Series SoC
 - GX-415GA on-board SoC (1.5GHz, quad-core, 2MB cache, TDP=15W with fan solution)
 - GX-210HA on-board SoC (1.0GHz, dual-core, 1MB cache, TDP=9W with fanless solution)
 - GX-420CA on-board SoC (2.0GHz, quad-core, 2MB cache, TDP=25W with fan solution) (by request)
 - GX-217GA on-board SoC (1.65GHz, dual-core, 1MB cache, TDP=15W with fanless solution) (by request)
- Memory:
 - Two 204-pin 1600/1333 MHz dual-channel DDR3 & DDR3L SDRAM unbuffered SO-DIMMs support up to 16GB
- BIOS: UEFI BIOS
- Ethernet:
 - GbE1: Intel® I210-AT PCIe controller with NCSI support
 - GbE2: Intel® I211-AT PCIe controller
- Graphics:
 - 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:
 - 2 x HDMI (2560x1600)
 - 1 x VGA (2560x1600)
- Super IO: Fintek F81866
- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)

- Audio:
 - Realtek ALC892HD Audio codec
 - 1 x SPDIF for digital audio
 - 1x Line-out / Mic-In audio jack on rear IO
- I/O Interface:
 - 1 x RS-232 on rear I/O
 - 3 x RS-232 by 10-pin (2x5) header
 - 1 x RS-422/485 by 4-pin (1x4) wafer
 - 2 x USB 3.0 on rear I/O
 - 2 x USB 2.0 on rear I/O
 - 2 x USB 2.0 by 8-pin (2x4) header
 - 1 x 6-pin wafer for PS/2 KB/MS
 - 2 x SATA 6Gb/s with 5V/12V SATA power connector
 - 1 x SD card
 - 1 x IPMI 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
- Front Panel:
 - 1 x Front Panel
 - (Power LED, HDD LED, Speaker, Power Button, Reset Button)
- Expansion:
 - 1 x Full-size PCIe Mini card slot (supports mSATA co-lay SATA port 2)
 - 1 x half-size PCIe Mini card slot
 - 1 x PCIe x4 slot
- 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: 170mm x 170mm
- Weight GW/NW: 600g / 250g

Ordering Information

- **KINO-KBN-i2-4151-R10:**
Mini-ITX SBC supports AMD® 28nm Quad-Core GX-415GA 1.5GHz (15W) on-board SoC with VGA/Dual HDMI, Dual GbE, Dual PCIe Mini, USB 3.0, SATA 6GB/s, iRIS-2400, audio and RoHS
- **KINO-KBN-i2-2101-R10:**
Mini-ITX SBC supports AMD® 28nm Dual-Core GX-210HA 1.0GHz (9W) on-board SoC with VGA/Dual HDMI, Dual GbE, Dual PCIe Mini, USB 3.0, SATA 6GB/s, iRIS-2400, audio and RoHS
- **19800-003100-200-RS:** Dual ports USB cable with bracket
- **32205-003800-100-RS:** RS-422/485 cable, 200mm
- **19800-000300-200-RS:** RS-232 cable with bracket, 300mm

Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
BAT1	Battery connector
CHASSIS1	Chassis intrusion connector
J_CMOS1	Clear CMOS button
FAN1	CPU fan connector
PWR1	CPU power connector
DIMM1, DIMM2	DDR3 SO-DIMM slots
DIO1	Digital I/O connector
LPT_DB1	EC debug connector
F_PANEL1	Front panel connector
IPMI1	IPMI slot
ID_BT_FP1	IPMI LED connector
KB_MS1	Keyboard and mouse connector
LED_LAN2, LED_LAN3	LAN LED connectors
PCIEX4	PCIe x4 slot
M_PCIE1, M_PCIE2	PCIe Mini Card Slots
COM2, COM3, COM5	RS-232 serial port connector
COM6	RS-422/485 serial port connector
SATA1, SATA2	SATA 6Gb/s drive connectors
SATA_PWR1, SATA_PWR2	SATA power connectors
SD1	SD card slot
CN1, CN2	SMBus connectors
SPDIF1	SPDIF connector
SPI1, SPI2	SPI Flash connectors
FAN2	System fan connector
TPM1	TPM connector
USB3	USB connector
AUDIO_CV2	Audio jacks
LAN1_USB2	Ethernet and USB 2.0 ports
LAN2_USB2	Ethernet and USB 3.0 ports
PWR2	Power connector

COM1, HDMI1	Serial port and HDMI connectors
VGA1, HDMI2	VGA and HDMI connectors

J_ATX_AT1: AT/ATX mode select switch	
PIN NO.	DESCRIPTION
Short 1 - 2	AT Mode
Short 2 - 3	ATX Mode (default)

BAT1: Battery Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+VBAT	2	GND

CHASSIS1: Chassis Intrusion Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3A_EC_PLL	2	CHASSIE_EC

J_CMOS1: Clear CMOS button	
PIN NO.	DESCRIPTION
Open	Normal Operation (default)
Push	Clear CMOS Setup

FAN1: CPU fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FAN1IN	4	FAN1OUT

PWR1: CPU power connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND_VIN	2	GND_VIN
3	12VIN_1	4	12VIN_1

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

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

F_PANEL1: Front panel connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	PWRBTN+
3	GND	4	HDD LED+
5	HDD LED-	6	PWR LED+
7	PWR LED+	8	PWR LED-
9	RST BTN+	10	GND

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

LED_LAN2, LED_LAN3: LAN LED connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWR	2	L1/2_LINK_ACT-

ID_BT_FP1: IPMI LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3A_EC_PLL	2	ID_BT_FP#

IPMI1: IPMI slot			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	VGA_G2	103	NC_SI_RXD1
2	NC	104	NC_SI_TXD1
3	VGA_R2	105	+5V_DUAL
4	NC	106	+5V_DUAL
5	VGA_B2	107	NC
6	NC	108	NC_SI_CRD_DV
7	NC	109	NC_SI_CLK_IN
8	NC	110	NC_SI_TX_EN
9	VSYNC2	111	+5V_DUAL
10	NC	112	+5V_DUAL
11	HSYNC2	113	APU_VDD_RUN
12	NC	114	NC
13	VI_DDCDAT	115	+0.95V_ALW
14	NC	116	APU_VDDIO_SUS
15	VI_DDCCLK	117	+5V
16	NC	118	+5V
17	NC	119	NC
18	NC	120	APU_VTT_SUS
19	GND	121	NC
20	GND	122	SPI_SWITCH
21	SMB_PCIE_3V3_CLK	123	+3.3V
22	SMB_IPMB_3VSB_CLK	124	+3.3V
23	SMB_PCIE_3V3_DATA	125	ID_BT_FP#
24	SMB_IPMB_3VSB_DATA	126	NC
25	GND	127	GND
26	GND	128	IPMI_DET#
27	BMC_SPKR	129	SPI_BMC_BIOS_CS0_N
28	GND	130	SPI_PATBRG_R_CS0_N
29	APU_VDD_PWRGD_IPMI	131	SPI_BMC_BIOS_CLK
30	NC	132	SPI_PATBRG_R_CLK
31	GND	133	GND
32	GND	134	GND
33	SMB_TEMP_3VSB_CLK	135	SMI_ACTIVE#

34	NC	136	GND
35	SMB_TEMP_3VSB_DATA	137	NMI_EVENT#
36	NC	138	GND
37	GND	139	GND
38	GND	140	SPI_PATBRG_R_MOSI
39	SCLK1_BMC	141	SPI_BMC_BIOS_MOSI
40	ACLK_LAN2	142	SPI_PATBRG_MISO
41	SDATA1_BMC	143	SPI_BMC_BIOS_MISO
42	SDATA1_LAN2	144	GND
43	GND	145	GND
44	GND	146	NC
45	SYS_PWRGD_IPMI	147	NC
46	GND	148	NC
47	SYS_PWRGD_IPMI	149	NC
48	GND	150	GND
49	GND	151	GND
50	NC	152	PBG_SYS_RESET_N_BMC
51	ACLK_LAN1	153	GND
52	NC	154	PMBUS_ALERT#
53	SDATA1_LAN1	155	GND
54	GND	156	GND
55	GND	157	NC
56	DATA5_P	158	NC
57	DATA4_P	159	NC
58	DATA5_N	160	NC
59	DATA4_N	161	GND
60	GND	162	GND
61	GND	163	RTS#4
62	APU_PROCHOT#_IPMI	164	RXD4
63	GND	165	DTR#4
64	+3.3V	166	TXD4
65	GND	167	GND
66	GND	168	GND
67	NC	169	-CASEOPEN
68	NC	170	GND

69	NC	171	SYS_RST#
70	NC	172	GND
71	GND	173	GND
72	GND	174	BMC_TXD5
73	APU_VDD_RUN	175	DSR#4
74	NC	176	BMC_RXD5
75	+3.3V_DUAL	177	CTS#4
76	+3.3V_DUAL	178	GND
77	NC	179	GND
78	AMBER_LED-_BMC	180	LAD2
79	NC	181	LAD0
80	GREEN_LED-_BMC	182	LAD3
81	+3.3V_DUAL	183	LAD1
82	+3.3V_DUAL	184	GND
83	NC	185	GND
84	ID_LED#_BMC	186	PWRBTSW#
85	PCIE_RST#	187	GND
86	PCIE_WAKE_UP#	188	PWRBTSW_BMC
87	+3.3V_DUAL	189	GND
88	+3.3V_DUAL	190	GND
89	NC	191	NC
90	GPP_CLK3N	192	LFRAME#
91	NC	193	LPC_CLK0_IPMI
92	GPP_CLK3P	194	SERIRQ
93	+3.3V_DUAL	195	GND
94	+3.3V_DUAL	196	GND
95	IPMI_RXN	197	PM_RSMRST#_SIO
96	IPMI_TXN	198	PME#
97	IPMI_RXP	199	NC
98	IPMI_TXP	200	SLP_S3#
99	+5V_DUAL	201	SLP_S4#
100	+5V_DUAL	202	SLP_S5#
101	NC_SI_RXD0	203	BMC_PSON
102	NC_SI_TXD0	204	PS_ON#

PCIEX4: PCIe x4 slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	NC	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	NC	B5	SCLK1
A6	NC	B6	SDATA1
A7	NC	B7	GND
A8	NC	B8	+3.3V
A9	+3.3V	B9	NC
A10	+3.3V	B10	+3.3V_DUAL
A11	PCIE_RST#	B11	PCIE_WAKE_UP#
A12	GND	B12	NC
A13	GFX_CLK0P	B13	GND
A14	GFX_CLK0N	B14	P_GFX_TXP0
A15	GND	B15	P_GFX_TXN0
A16	P_GFX_RXP0	B16	GND
A17	P_GFX_RXN0	B17	NC
A18	GND	B18	GND
A19	NC	B19	P_GFX_TXP1
A20	GND	B20	P_GFX_TXN1
A21	P_GFX_RXP1	B21	GND
A22	P_GFX_RXN1	B22	GND
A23	GND	B23	P_GFX_TXP2
A24	GND	B24	P_GFX_TXN2
A25	P_GFX_RXP2	B25	GND
A26	P_GFX_RXN2	B26	GND
A27	GND	B27	P_GFX_TXP3
A28	GND	B28	P_GFX_TXN3
A29	P_GFX_RXP3	B29	GND
A30	P_GFX_RXN3	B30	NC
A31	GND	B31	NC
A32	NC	B32	GND

M_PCIE1: PCIe Mini Card Slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	27	GND
2	VCC3_MINI_1	28	+V1.5_MINI_1
3	NC	29	GND
4	GND	30	SCLK1
5	NC	31	MPCIE_TXDN
6	+V1.5_MINI_1	32	SDATA1
7	NC	33	MPCIE_TXDP
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB6N
11	GPP_CLK2N	37	GND
12	NC	38	USB6P
13	GPP_CLK2P	39	VCC3_MINI_1
14	NC	40	GND
15	GND	41	VCC3_MINI_1
16	NC	42	NC
17	PCIE_RST#	43	NC
18	GND	44	NC
19	NC	45	NC
20	N48174558	46	NC
21	GND	47	NC
22	PCIE_RST#	48	+V1.5_MINI_1
23	MPCIE_RXDN	49	NC
24	+3.3V_DUAL	50	GND
25	MPCIE_RXDP	51	mSATA_DET#
26	GND	52	VCC3_MINI_1

M_PCIE2: PCIe Mini Card Slot			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	NC	27	GND
2	VCC3_MINI_2	28	+V1.5_MINI_2
3	NC	29	GND
4	GND	30	SCLK1
5	NC	31	MINISLOT1_TXDN
6	+V1.5_MINI_2	32	SDATA1
7	MINI_PCIE_SLT1_CLKREQ#	33	MINISLOT1_TXDP
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB7N
11	NC	37	GND
12	NC	38	USB7P
13	NC	39	VCC3_MINI_2
14	NC	40	GND
15	GND	41	VCC3_MINI_2
16	NC	42	NC
17	PCIE_RST#	43	NC
18	GND	44	NC
19	NC	45	NC
20	WL_DISABLE1#	46	NC
21	GND	47	NC
22	PCIE_RST#	48	+V1.5_MINI_2
23	MINISLOT1_RXDN	49	NC
24	+3.3V_DUAL	50	GND
25	MINISLOT1_RXDP	51	NC
26	GND	52	VCC3_MINI_2

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	NR12
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	NR13
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	NR15
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#

SATA_PWR1, SATA_PWR2: SATA power connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+12V	2	GND
3	GND	4	+5V

CN1: SMBus connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SDATA0
3	SCLK0	4	+5V

CN2: SMBus connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SDATA1
3	SCLK1	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#_CONN
3	SPI_DATAIN_CONN	4	SPI_CLK_CONN
5	SPI_DATAOUT_CONN	6	GND

SPI2: SPI Flash connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_SPI_VCC	2	FSCE#
3	FMISO	4	FSCK
5	FMOSI	6	GND

FAN2: System fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FAN2IN	4	FAN2OUT

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: USB connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV2L	2	GND
3	DATA2_N	4	DATA3_P
5	DATA2_P	6	DATA3_N
7	GND	8	USBV2L

LAN1_USB2: Ethernet and USB 2.0 ports			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV0L	16	NC
2	DATA0_N	P1	1.5VLAN1
3	DATA0_P	P2	TRD1P0
4	GND	P3	TRD1N0
5	USBV0L	P4	TRD1P1
6	DATA1_N	P5	TRD1N1
7	DATA1_P	P6	TRD1P2
8	GND	P7	TRD1N2
9	NC	P8	TRD1P3
10	NC	P9	TRD1N3
11	NC	P10	GND
12	NC	P11	L1_100-
13	NC	P12	L1_1000-
14	NC	P13	L1_LINK_ACT-
15	NC	P14	+V3.3LAN1

LAN2_USB2: Ethernet and USB 3.0 ports			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
G1	IO_GND_1	R8	TRD2P3
G2	IO_GND_1	R9	TRD2N3
G3	IO_GND_1	U1	USB_3P0_VCC1
G4	IO_GND_1	U2	USB2P8_DM0_L
G5	IO_GND_1	U3	USB2P8_DP0_L
G6	IO_GND_1	U4	GND
G7	IO_GND_1	U5	USB3P0_RXDN0_C
G8	IO_GND_1	U6	USB3P0_RXDP0_C
L1	L2_100-	U7	GND
L2	L2_1000-	U8	USB3P0_TXDN0_C
L3	L2_LINK_ACT-	U9	USB3P0_TXDP0_C
L4	+V3.3LAN2	U10	USB_3P0_VCC2
R1	1.5VLAN2	U11	USB2P9_DM1_L
R10	GND	U12	USB2P9_DP1_L
R2	TRD2P0	U13	GND
R3	TRD2N0	U14	USB3P0_RXDN1_C
R4	TRD2P1	U15	USB3P0_RXDP1_C
R5	TRD2N1	U16	GND
R6	TRD2P2	U17	USB3P0_TXDN1_C
R7	TRD2N2	U18	USB3P0_TXDP1_C

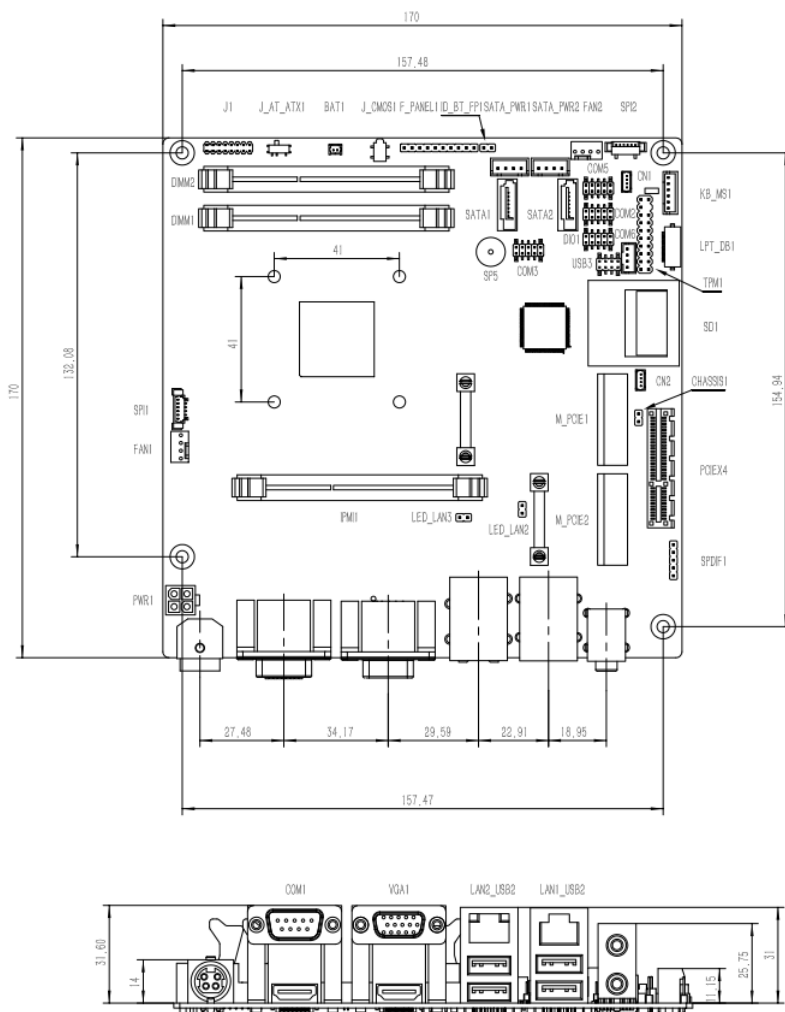
PWR2: Power connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	12VIN_2	2	GND_VIN
3	12VIN_2	4	GND_VIN
5	GND_VIN		

COM1: RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD1	2	NRX1
3	NTX1	4	NDTR1
5	GND	6	NDSR1
7	NRTS1	8	NCTS1
9	NRI1		

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		

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		

Board Layout: Jumper and Connector Locations



(Unit: mm)