

Mini-ITX SBC supports LGA1150 Intel® Core™ i7 /i5/ i3 and Celeron® CPU, DDR3, VGA/DVI-D, 6COM, Intel GbE, SATA 6Gb/s, USB3.0, HD Audio and RoHS

KINO-AQ870

Quick Installation Guide

Version 1.0

July 15, 2013.

Package List

KINO-AQ870-R10 package includes the following items:

- 1 x KINO-AQ870 Single Board Computer
- 1 x I/O shielding (P/N: 45014-0008C0-00-RS)
- 4 x SATA Cable (P/N: 32801-000703-200-RS)
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)
- 1 x One Key recovery CD



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

Specifications

- CPU:
LGA1150 socket supports 4th generation Intel® Core™ i7/i5/i3/Pentium® and Celeron® processor
- System Chipset: Intel® Q87
- BIOS: UEFI BIOS
- System Memory:
Two 240-pin 1066/1333/1600 MHz dual-channel DDR3 SDRAM supported (system max. 16 GB)
- Ethernet:
Intel® I211 PCIe controller
Intel® I217 PHY with Intel® AMT 9.0 support
- Graphic Engine:
Support for DX11.1 and OpenGL3.2, full MPEG2, VC1, AVC Decode
- I/O Interface:
5 x RS-232
1 x RS-422/485
1 x TPM pin header
6 x USB 2.0 (2 by rear IO, 4 by pin header)
4 x USB 3.0 (2 by rear IO, 2 by pin header)
4 x SATA 6Gb/s with Raid 0,1,5,10 support
1 x PS/2 KB/MS
- Super I/O: Fintek F81866
- GPIO: Programmable 8-bit GPIO
- Display: DVI-D / VGA / IDP integrated in Intel® Q87
- Audio: Realtek ALC662 HD Audio codec
- Watchdog Timer: Software programmable support 1~255 sec. system reset
- Expansions:
1 x PCIe x4 slot
1 x mini PCIe / mSATA slot

- FAN:
 - 1 x 4-pin CPU fan connector
 - 1 x 4-pin system fan connector
- Power Supply:
 - ATX Power Supply
- Power Consumption:
 - 3.3V@1.11A, 5V@3.01A, 12V@0.12A, Vcore@6.32A, 5VSB@0.15A (Intel® 2.60GHz CPU with two 1600MHz 2GB DDR3 memory)
- Operation Temperature: -10°C ~ 60°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 170mm X 170mm
- Weight GW/NW: 1100g / 700g

Ordering Information

- **KINO-AQ870-R10:**
Mini-ITX SBC supports LGA1150 Intel® 4th Core™ i7/i5/i3 CPU, DDR3, DVI-D/VGA/IDP, Dual Intel PCIe GbE, USB 3.0, SATA 6Gb/s, HD Audio and RoHS
- **32000-070301-RS:** Dual-port USB cable with bracket
- **32200-000049-RS:** RS232 cable, 200mm
- **32200-074800-RS:** RS-422/485 cable, 200mm
- **TPM-IN01-R11:** 20-pin Infineon TPM module, software management tool, firmware V3.17
- **CF-1150SA-RS:** High-performance LGA1150 cooler kit, 95W
- **CF-1150SB-RS:** High-performance LGA1150 cooler kit, 65W
- **CF-1150SC-RS:** LGA1150 cooler kit, 1U chassis compatible, 65W
- **CF-1150SD-RS:** LGA1150 cooler kit, 1U chassis compatible, 35W
- **DP-HDMI-R10:** DisplayPort to HDMI converter board (For iEi IDP connector)
- **DP-LVDS-R10:** DisplayPort to LVDS converter board (For iEi IDP connector)
- **DP-DVI-R10:** DisplayPort to DVI converter board (For iEi IDP connector)
- **DP-VGA-R10:** DisplayPort to VGA converter board (For iEi IDP connector)

Jumpers setting and connectors

LABEL	FUNCTION
ATX1	ATX power connector
CPU12V1	CPU power connector
JSPI1	BIOS SPI ROM Programming connector
JSPI2	EC SPI ROM Programming connector
DIO1	Digital I/O connector
CPU_FAN1	CPU fan connector
PCH_FAN	PCH fan connector
F_PANEL2	Front Panel connector
CN1	SMBus connector
TPM1	TPM connector
USB1, USB2	Internal USB 2.0 connector
LED_LAN1	LAN1 link LED connector
LED_LAN2	LAN2 link LED connector
LAN1_USB1	RJ-45 LAN and USB 3.0 connector
LAN2_USB2	RJ-45 LAN and USB 2.0 connector
KB_MS1	Keyboard/Mouse connector
KB_MS2	Keyboard/Mouse PIN header
COM1~2	DB-9 Male RS-232 serial port (Rear I/O)
COM3~5	RS232 Serial port (Pin header)
COM6	RS422/485 Serial port (Pin header)
CN4	Internal USB 3.0 connector
CRT	VGA connector
DVI-D	DVI connector
DP1	iEi Internal Display port connector
CN2	Mini-PCIe / mSATA connector (Full size)

ATX1 : ATX Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3 V	2	+3.3 V
3	GND	4	+5 V
5	GND	6	+5 V
7	GND	8	PWRGD_PS
9	5VSB	10	+12 V
11	+12 V	12	+3.3 V
13	+3.3 V	14	-12 V
15	GND	16	IO_PSON#
17	GND	18	GND
19	GND	20	N/A
21	+5 V	22	+5 V
23	+5 V	24	GND

CPU12V1: CPU Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	VREG_12V	4	VREG_12V

JSPI1: BIOS SPI ROM Programming Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+SPI_VCC	2	SPI_CS0#_CN
3	SPI_SO0_CN	4	SPI_CLK0_CN
5	SPI_SI0_CN	6	GND

JSPI2: EC SPI ROM Programming Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+SPI_VCC_EC	2	SPI_CS0#_CN_EC
3	SPI_SO0_CN_EC	4	SPI_CLK0_CN_EC
5	SPI_SI0_CN_EC	6	GND

DIO1 : Digital I/O Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	+5V
2	DGPO3	6	DGPO2
3	DGPO1	7	DGPO0
4	DGPI3	8	DGPI2
9	DGPI1	10	DGPI0

CPU_FAN1: CPU Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO1	4	FANOUT1

SYS_FAN1: System Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO2	4	FANOUT2

F_PANEL2: Front Panel Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	PWRBTN_SW
3	GND	4	HDDLED+
5	HDDLED-	6	PWRLED+
7	PWRLED-	8	GND
9	EXTRST-	10	GND

CN1: SMBUS Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMBDATA
3	SMBCLK	4	+5V

TPM1: TPM Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TPMPCLK	2	GND
3	LPC_FRAME#	4	N/A
5	BUF_PCIRST#	6	+5V
7	LPC_AD3	8	LPC_AD2
9	+3.3V	10	LPC_AD1
11	LPC_AD0	12	GND
13	SMBCLK_RESUME	14	SMBDATA_RESUME
15	+3V_DUAL	16	SERIRQ
17	GND	18	+3.3V
19	LPCPD_N	20	LDRQ0#

USB 1, USB2: Internal USB 2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	USB20_C_N2	4	USB20_C_P3
5	USB20_C_P2	6	USB20_C_N3
7	GND	8	+5V

LED_LAN1: LAN1 link LED connector			
PIN NO.	DESCRIPTION	IN NO.	DESCRIPTION
1	+3.3VLAN	2	LAN1_LED_LINK#

LED_LAN2: LAN2 link LED connector			
PIN NO.	DESCRIPTION	IN NO.	DESCRIPTION
1	+3.3VLAN	2	LAN2_LED_LINK#

LAN2_USB2: Ethernet and USB2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P1	+1.5V_LAN2	P2	LAN2_MDIP0
P3	LAN2_MDIN0	P4	LAN2_MDIP1
P5	LAN2_MDIN1	P6	LAN2_MDIP2
P7	LAN2_MDN2	P8	LAN2_MDIP3
P9	LAN2_MDIN3	P10	GND
P11	LAN2_LINK100	P12	LAN2_LINK1000
P13	LAN2_ACT-1	P14	+V3.3A_LAN2
U1	+USB_PWR1	U2	USB20_C_N10
U3	USB20_C_P8	U4	GND
U5	+USB_PWR1	U6	USB20_C_N11
U7	USB20_C_P9	U8	GND

LAN1_USB1: Ethernet and USB3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USB3_PWR1	2	USB2P0_DM1
3	USB2P0_DP1	4	GND
5	USB3P0_RXDN1	6	USB3P0_RXDP1
7	GND	8	USB3P0_TXDN1
9	USB3P0_TXDP1	10	USB3_PWR2
11	USB2P0_DM2	12	USB2P0_DP2
13	GND	14	USB3P0_RXDN2
15	USB3P0_RXDP2	16	GND
17	USB3P0_TXDN2	18	USB3P0_TXDP2
19	+0.9V_LAN1	20	LAN1_MDIP0
21	LAN1_MDIN0	22	LAN1_MDIP1
23	LAN1_MDIN1	24	LAN1_MDIP2
25	LAN1_MDIN2	26	LAN1_MDIP3
27	LAN1_MDIN3	28	GND
29	+3.3V_LAN1	30	LAN1_LINK_ACT#
31	LAN1_100#	32	LAN1_1000#

KB_MS1: Keyboard/Mouse Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	KBDATA	A2	N/A
A3	GND	A4	+5V_KBMS
A5	KBCLK	A6	N/A
B1	MSDATA	B2	N/A
B3	GND	B4	+5V_KBMS
B5	MSCLK	B6	N/A

KB_MS2: Keyboard/Mouse Connector (Pin header)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V_KBMS	2	MSDATA
3	MSDATA	4	KBDATA
5	KBCLK	7	KBGND

COM 1~2: RS-232 Serial Port (Rear I/O)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD#	2	NRXD
3	NTXD	4	NDTR#
5	GND	6	NDSR#
7	NRTS#	8	NCTS#
9	NRI#		

COM 3~5: RS-232 Serial Port (Pin header)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD#	2	NDSR#
3	NRXD	4	NRTS#
5	NTXD	6	NCTS#
7	NDTR#	8	NRI#
9	GND	10	GND

COM6: RS-422/485 Serial Port (Pin header)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

CN4 : USB3 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC_USB3.0	2	USB3P1_RXDN1
3	USB3P1_RXDP1	4	GND
5	USB3P1_TXDN1	6	USB3P1_TXDP1
7	GND	8	USB2P1_DM1
9	USB2P1_DP1	10	NC
11	USB2P1_DP2	12	USB2P1_DM2
13	GND	14	USB3P1_TXDP2
15	USB3P1_TXDN2	16	GND
17	USB3P1_RXDP2	18	USB3P1_RXDN2
19	VCC_USB3.0	20	NC

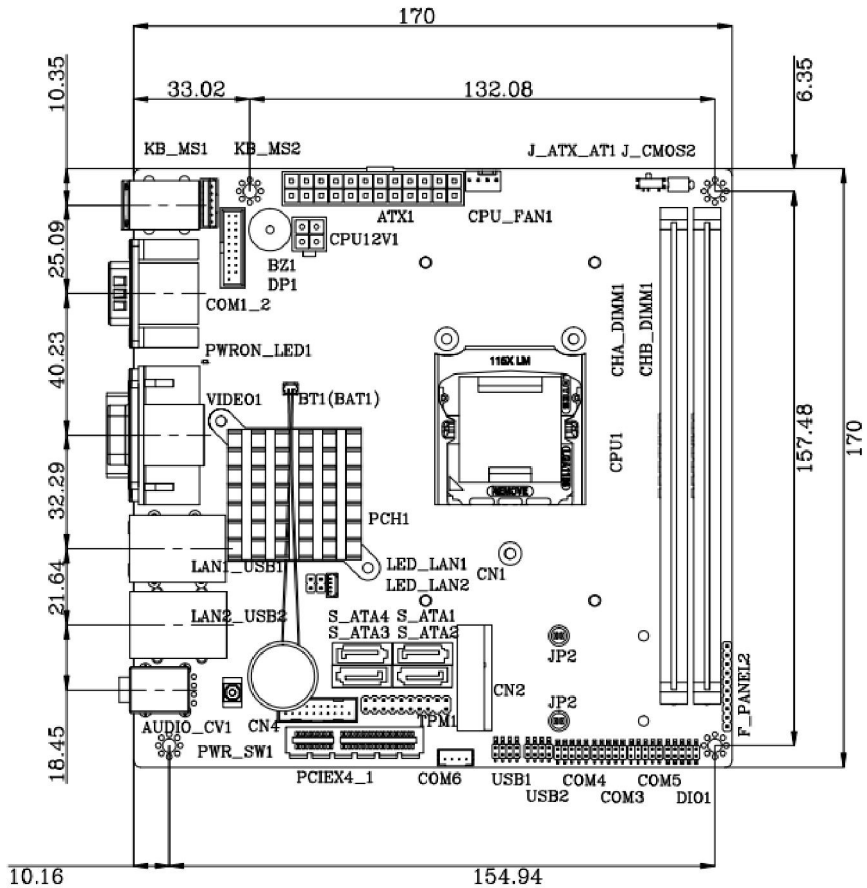
CRT: VGA Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	VGAVCC	10	HOTPLUG
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

DVI-D: DVI Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DVI_TMDS_C_DATA2#	2	DVI_TMDS_C_DATA2
3	GND	4	NC
5	NC	6	DVI_DDC_SCLK
7	DVI_DDC_SDATA	8	NC
9	DVI_TMDS_C_DATA1#	10	DVI_TMDS_C_DATA1
11	GND	12	NC
13	NC	14	+5V_DVI
15	GND	16	DVI_HPD
17	DVI_TMDS_C_DATA0#	18	DVI_TMDS_C_DATA0
19	GND	20	NC
21	NC	22	GND
23	DVI_TMDS_C_CLK	24	DVI_TMDS_C_CLK#
C1	NC	C2	NC
C3	NC	C4	NC

DP1 : iEi Internal Display Port			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	DPD_OB_LANE1_N
3	DPD_OB_LANE1_P	4	GND
5	DPD_OB_LANE3_N	6	DPD_OB_LANE3_P
7	GND	8	AUX_CTRL_DET_D
9	GND	10	DDI1_HPD#
11	DPD_AUX_CTRL_P2	12	DPD_AUX_CTRL_N2
13	GND	14	DPD_OB_LANE2_P
15	DPD_OB_LANE2_N	16	GND
17	DPD_OB_LANE0_P	18	DPD_OB_LANE0_N
19	+3.3V		

CN2: Mini-PCle / mSATA slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	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	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Board Layout: Jumper and Connector Locations



(Unit: mm)