

EPIC SBC supports AMD® Embedded G-Series SoC with  
VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA 6Gb/s,  
mSATA, COM, iRIS-1010, HD Audio and RoHS

# NANO-KBN-i1

## Quick Installation Guide

Version 1.0

Jan 15, 2014.

### Package List

NANO-KBN-i1 package includes the following items:

- 1 x NANO-KBN-i1 single board computer
- 2 x SATA with power cable kit (P/N: 32801-000201-100-RS)
- 1 x Audio cable (P/N: 32007-002600-100-RS)
- 1 x Power cable (P/N: 32100-087100-RS)
- 2 x RS-232 cable (P/N: 19800-000300-200-RS)
- 1 x QIG (Quick Installation Guide)
- 1 x Utility CD
- 1 x One key recovery CD



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## Specifications

- SoC:
  - AMD® Embedded G-Series SoC
  - GX-415GA on-board SoC (1.5GHz, quad-core, 2MB cache, TDP=15W)
  - GX-210HA on-board SoC (1.0GHz, dual-core, 1MB cache, TDP=9W)
  - GX-420CA on-board SoC (2.0GHz, quad-core, 2MB cache, TDP=25W) (by request)
  - GX-217GA on-board SoC (1.65GHz, dual-core, 1MB cache, TDP=15W) (by request)
- Memory:
  - One 204-pin 1600/1333 MHz dual-channel DDR3 & DDR3L SDRAM unbuffered SO-DIMM support up to 8GB
- BIOS: UEFI BIOS
- Ethernet:
  - GbE1: Intel® I210-AT PCIe controller with NCSI support
  - GbE2: Intel® I211-AT PCIe controller
- Graphics Engine:
  - 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:
  - 1 x VGA (2560x1600)
  - 1 x HDMI via v1.4a compliant (2560x1600)
  - 1 x 24-bit dual channel LVDS by CH7511B DP to LVDS converter (1920x1200)
- Super IO: Fintek F81866

- Digital I/O: 8-bit digital I/O (4-bit input, 4-bit output)
- Audio:
  - Realtek ALC892 HD codec
  - 1 x SPDIF by 4-pin (1x4) header for digital audio
  - 1 x Analog audio by 10-pin (2x5) header
- I/O Interface:
  - 1 x 6-pin wafer for PS/2 KB/MS
  - 2 x SATA 6G/s with 5V SATA power connector
  - 2 x USB 3.0 (on rear I/O)
  - 6 x USB 2.0 (2 on rear I/O, 4 by pin header)
  - 1 x RS-422/485 (1 by pin header)
  - 5 x RS-232 (5 by pin header)
- Watchdog Timer:
  - Software programmable support 1~255 sec. system reset
- IPMI: 1 x Mini-PCIE slot supports iRIS-1010
- TPM: 1 x 20-pin (2x10) header
- SMBUS: 1 x 4-pin (1x4) wafer
- I2C: 1 x 4-pin (1x4) wafer
- FAN: 1 x 4-pin system fan connector
- LAN LED: 2 x 2-pin (1x2) header
- Front Panel:
  - 1 x 6-pin (1x10) wafer for power LED & HDD LED
  - 1 x 2-pin (1x2) wafer for power button
  - 1 x 2-pin (1x2) wafer for power reset
- Expansion:
  - 1 x Full-size PCIe Mini card slot (supports mSATA co-lay SATA port 2)
- 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: 115mm x 165mm
- Weight GW/NW: 850g / 350g

## Ordering Information

- **NANO-KBN-i1-4151-R10:**  
EPIC SBC supports AMD 28nm quad-core GX-415GA 1.5GHz (15W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA 6Gb/s, mSATA, COM, iRIS-1010, HD Audio and RoHS
- **NANO-KBN-i1-2101-R10:**  
EPIC SBC supports AMD 28nm dual-core GX-210HA 1.0GHz (9W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA 6Gb/s, mSATA, COM, iRIS-1010, HD Audio and RoHS
- **32000-070301-RS:** Dual port USB cable
- **32205-003800-100-RS:** RS-422/485 cable, 200mm
- **32006-001100-100-RS:** PS/2 KB/MS cable
- **TPM-IN01-R11:** 20-Pin Infineon TPM module, software management tool, firmware V3.17

## Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
JP1	LCD voltage selection
AUDIO1	Audio connector
BAT1	Battery connector
CN6	Brightness button connector
DIMM1	DDR3 SO-DIMM slot
DIO1	Digital I/O connector
F_PANEL1	Front panel connector
IPMI1	IPMI iRIS-1010 module slot
KB_MS1	Keyboard and mouse connector
LED_LAN2, LED_LAN3	LAN LED connectors
LVDS1	LVDS LCD connector
CN5	LVDS LED connector
INV1	LVDS backlight inverter connector
M_PCIE2	PCIe mini card slot
PWR_BTN1	Power button connector
CN1	Power connector (12V)
RST_BTN1	Reset button connector
COM1, COM2, COM3, COM4, COM5	RS-232 serial port connectors
COM6	RS-422/485 serial port connector
SATA1, SATA2	Serial ATA 3.0 connectors
SATA_PWR1, SATA_PWR2	SATA power connectors
CN3, CN4	SMBUS connectors
SPDIF1	SPDIF connector
SPI1	SPI Flash connector
SYS_FAN	System fan connector
TPM1	TPM connector
USB3, USB4	Internal USB 2.0 connectors
HDMI1	HDMI connector
LAN1, LAN2	LAN connectors

USB1	USB 3.0 connectors
USB2	USB 2.0 connectors
VGA1	VGA connector

<b>J_ATX_AT1: AT/ATX mode select switch</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short A - B	ATX Mode (default)
Short B - C	AT Mode

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

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

<b>AUDIO1: Audio connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	LINEOUT1R	2	LINE1R
3	GND	4	GND
5	LINEOUT1L	6	LINE1L
7	GND	8	GND
9	FMIC1R	10	FMIC1L

<b>BAT1: Battery connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBATT	2	GND

<b>CN6: Brightness button connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PWRON	2	GND
3	BLUP	4	GND
5	BLDN	6	GND

<b>DIO1: Digital I/O connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	+5V
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

<b>CN2: Front panel connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</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>LVDS1: LVDS LCD connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	A0P_L	4	A0M_L
5	A1P_L	6	A1M_L
7	A2P_L	8	A2M_L
9	CLK1P_L	10	CLK1M_L
11	A3P_L	12	A3M_L
13	GND	14	GND
15	A4P_L	16	A4M_L
17	A5P_L	18	A5M_L
19	A6P_L	20	A6M_L
21	CLK2P_L	22	CLK2M_L
23	A7P_L	24	A7M_L
25	GND	26	GND
27	VCC	28	VCC
29	VCC	30	VCC

<b>KB_MS1: Keyboard and mouse connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC5_KBMS	2	MSDATA
3	MSCLK	4	KBDATA
5	KBCLK	6	KBMS_GND

<b>CN5: LVDS LED connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC33	2	OLED
3	VCC33	4	GLED

<b>INV1: LVDS backlight inverter connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	BRIGHTNESS2	2	GND
3	12V	4	GND
5	ENABKL2		

<b>PWR_BTN1: Power button connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PWRBTSW#	2	GND

<b>CN1: Power connector (12V)</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	12V-IN	4	12V-IN

<b>RST_BTN1: Reset button connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PM_SYSRST#	2	GND



<b>COM1: RS-232 serial port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	NDCD1	2	NDSR1
3	NRX1	4	NRTS1
5	NTX1	6	NCTS1
7	NDTR1	8	NRI1
9	GND	10	GND

<b>COM2: RS-232 serial port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	NDCD2	2	NDSR2
3	NRX2	4	NRTS2
5	NTX2	6	NCTS2
7	NDTR2	8	NRI2
9	GND	10	GND

<b>COM3: RS-232 serial port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	NDCD3	2	NDSR3
3	NRX3	4	NRTS3
5	NTX3	6	NCTS3
7	NDTR3	8	NRI3
9	GND	10	GND

<b>COM4: RS-232 serial port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	NDCD4	2	NDSR4
3	NRX4	4	NRTS4
5	NTX4	6	NCTS4
7	NDTR4	8	NRI4
9	GND	10	GND

<b>COM5: RS-232 serial port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	NDCD5	2	NDSR5
3	NRX5	4	NRTS5
5	NTX5	6	NCTS5
7	NDTR5	8	NR15
9	GND	10	GND

<b>COM6: RS-422/485 serial port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

<b>SATA1, SATA2: Serial ATA 3.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	SATA_TX+
3	SATA_TX-	4	GND
5	SATA_RX-	6	SATA_RX+
7	GND		

<b>SATA_PWR1, SATA_PWR2: SATA power connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+5V	2	GND

<b>CN3, CN4: SMBus connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	SDATA
3	SCLK	4	+5V

<b>SPDIF1: SPDIF connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+5V	2	NC
3	SPDIF OUT	4	GND
5	SPDIF IN		

<b>SPI1: SPI Flash connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	SPI_POWER	2	SPI_CS#
3	SPI_DATAIN	4	SPI_CLK
5	SPI_DATAOUT	6	GND

<b>SYS_FAN: System fan connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	+12V
3	FANIN	4	FANOUT

<b>TPM1: TPM connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
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

<b>USB3, USB4: Internal USB 2.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

<b>HDMI1: HDMI connector</b>			
<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>
1	HDMI_TMDS_C_DATA2	2	GND
3	HDMI_TMDS_C_DATA2#	4	HDMI_TMDS_C_DATA1
5	GND	6	HDMI_TMDS_C_DATA1#
7	HDMI_TMDS_C_DATA0	8	GND
9	HDMI_TMDS_C_DATA0#	10	HDMI_TMDS_C_CLK
11	GND	12	HDMI_TMDS_C_CLK#
13	NC	14	NC
15	HDMI_DDC_SCLK	16	HDMI_DDC_SDATA
17	GND	18	+5V_HDMI
19	HDMI_HPD		

<b>LAN1: LAN connector</b>			
<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>
1	LAN1_MDI0+	2	LAN1_MDI0-
3	LAN1_MDI1+	4	LAN1_MDI1-
5	GND	6	GND
7	LAN1_MDI2+	8	LAN1_MDI2-
9	LAN1_MDI3+	10	LAN1_MDI3-
11	GND	12	GND
13	NC	14	NC
L1	LAN1_LINK100	L2	LAN1_LINK1000
L3	LAN1_ACT-1	L4	POWER

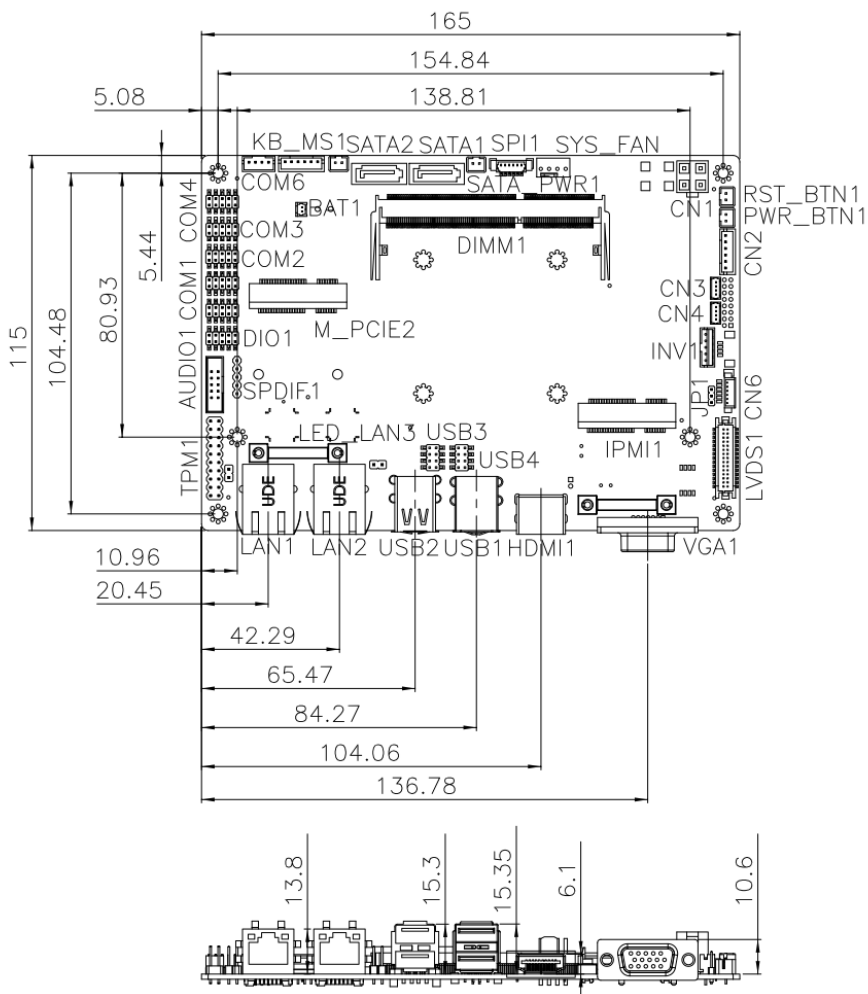
<b>LAN2: LAN connector</b>			
<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>
1	LAN2_MDI0+	2	LAN2_MDI0-
3	LAN2_MDI1+	4	LAN2_MDI1-
5	GND	6	GND
7	LAN12_MDI2+	8	LAN2_MDI2-
9	LAN2_MDI3+	10	LAN2_MDI3-
11	GND	12	GND
13	NC	14	NC
L1	LAN12_LINK100	L2	LAN2_LINK1000
L3	LAN2_ACT-1	L4	POWER

<b>USB1: USB 3.0 connectors</b>			
<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>
1	USB_3P0_VCC1	2	USB2P8_DM0_L
3	USB2P8_DP0_L	4	GND
5	USB3P0_RXDN0_C	6	USB3P0_RXDP0_C
7	GND	8	USB3P0_TXDN0_C
9	USB3P0_TXDP0_C	10	USB_3P0_VCC2
11	USB2P9_DM1_L	12	USB2P9_DP1_L
13	GND	14	USB3P0_RXDN1_C
15	USB3P0_RXDP1_C	16	GND
17	USB3P0_TXDN1_C	18	USB3P0_TXDP1_C

<b>USB2: USB 2.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	POWER	2	DATA0_N
3	DATA0_P	4	GND
5	POWER	6	DATA1_N
7	DATA1_P	8	GND

<b>VGA1: VGA connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
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		

## Board Layout: Jumper and Connector Locations



(Unit: mm)