



VAB-820

ARM-based Pico-ITX board

Quick Guide

Key Features:

- Compact 10cm x 7.2cm Pico-ITX form factor
- 1.0GHz NXP i.MX 6QuadPlus (or i.MX 6Quad) Cortex-A9 quad-core SoC
- Flawless HD video performance up to 1080p
- Wide operating temperature range, -20°C~70°C
- Fanless and ultra low power consumption
- Linux and Android solution packs available

1.01-11072016-172500

Powered by a 1.0GHz NXP i.MX 6QuadPlus Cortex-A9 ARM SoC with enhanced graphics and memory performance or a 1.0GHz NXP i.MX 6Quad Cortex-A9 SoC, the VAB-820 provides the perfect blend of high performance and low power consumption to meet the high end demands of advanced industrial, energy management and in-vehicle applications.

Specifications:

- **Processor**
 - 1.0GHz NXP i.MX 6QuadPlus (or i.MX 6Quad) Cortex-A9 quad-core SoC
- **System Memory**
 - 1GB DDR3 SDRAM onboard
- **Storage**
 - 4GB eMMC Flash memory
- **Boot Load**
 - 4MB SPI Flash ROM
- **Graphics**
 - Support three integrated, independent 3D/2D and video graphics processing units
 - Supports OpenGL® ES 3.0, OpenCL and OpenVG™ 1.1 hardware acceleration
 - Supports MPEG-2, VCI and H.264 video decoding up to 1080p
 - Supports SD encoding
- **LAN**
 - Micrel KSZ9031RX Gigabit Ethernet transceiver with RGMII support
- **Audio**
 - NXP SGTL5000 low power stereo codec
- **HDMI**
 - Integrated HDMI Transmitter
- **USB**
 - SMSC USB2514 USB 2.0 High Speed 4-port hub controller
- **Expansion I/O**
 - 1 x miniPCIe slot
- **Onboard I/O**
 - 1 x COM connector with power supply (supports 8-wire DTE mode)
 - 1 x COM/CAN connector with power supply (supports one RS-232 (TX/RX) and two FlexCAN TX/RX ports)
 - 1 x RTC battery connector
 - 1 x MIPI CSI-2 connector (supports two data lanes)
 - 1 x SPI master connector (supports two SPI slave devices)
 - 1 x S-Video input pin header
 - 1 x Front audio pin header for Line-in, Line-out and Mic-in
 - 1 x Boot flash select jumper (for SPI or micro SD)
 - 1 x USB 2.0 and USB 2.0 OTG pin header
 - 1 x Miscellaneous pin header (for one I²C pair, DIO (4 GPI + 4 GPO), system reset button and LEDs for power/WPAN/Wi-Fi/WWAN)
 - 1 x Dual-channel, 18/24-bit LVDS panel connector
 - 1 x LVDS Inverter connector
 - 1 x LVDS power select jumper
 - 1 x DC-in connector (12V)
 - 1 x miniPCIe slot (supports multiple connections and buses including JTAG)
 - 2 x PoE pin headers (support optional PD power board)
- **Front Panel I/O**
 - 1 x Micro SD Card slot
- **Back Panel I/O**
 - 1 x HDMI port
 - 2 x USB 2.0 ports
 - 1 x Gigabit Ethernet port (supports optional IEEE802.3at type 2)
 - 1 x Composite input RCA jack
- **Watchdog Timer**
 - Integrated watchdog timer supports two comparison points. Each comparison point can interrupt ARM core, and a second comparison point capable of generating external interrupts on WDOG line
- **Power Supply**
 - 12V DC-in

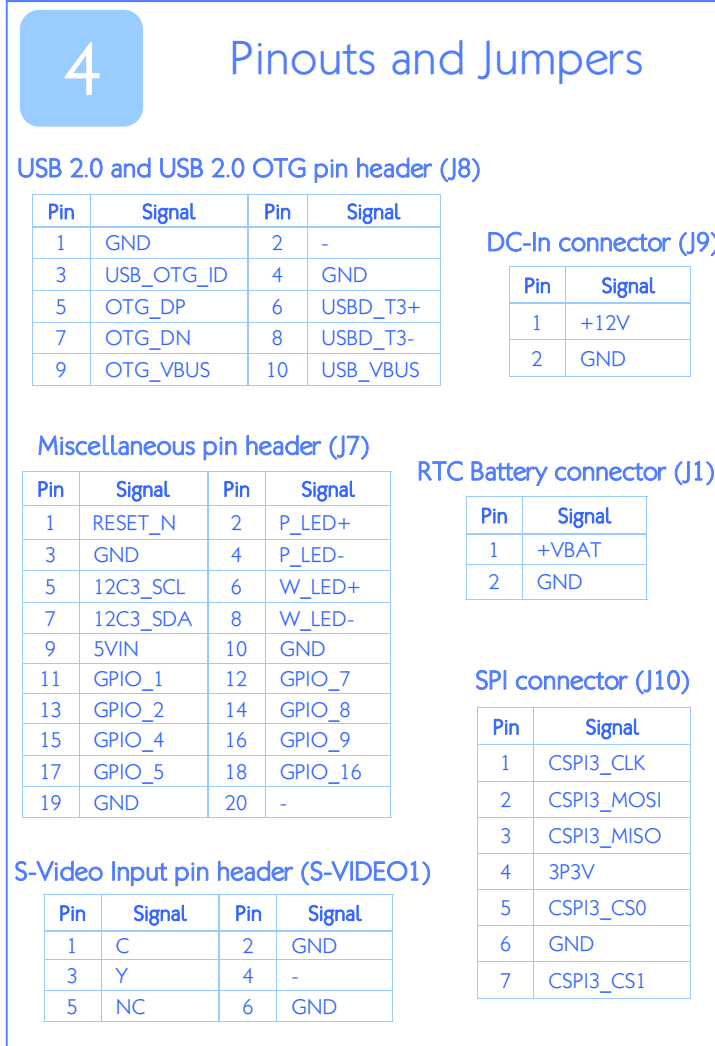
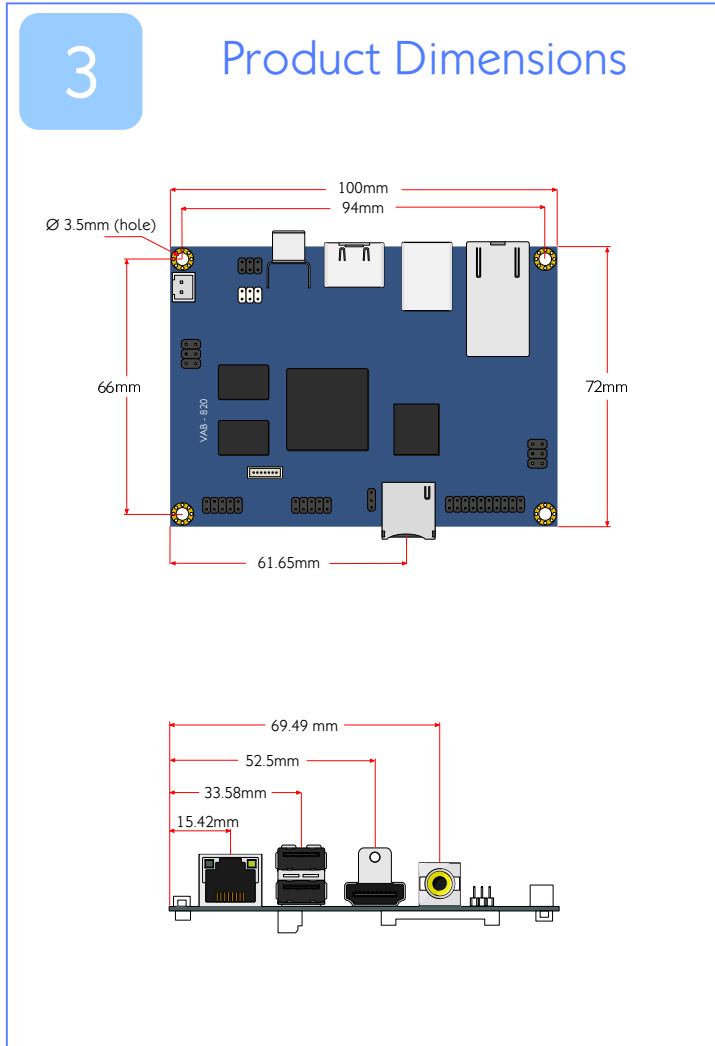
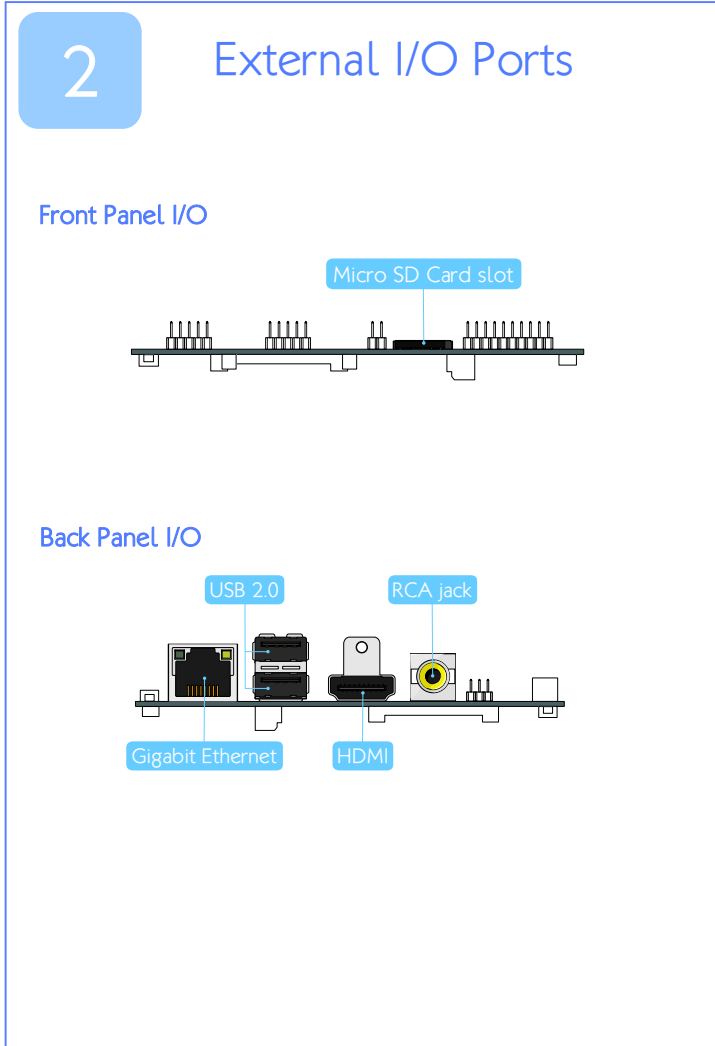
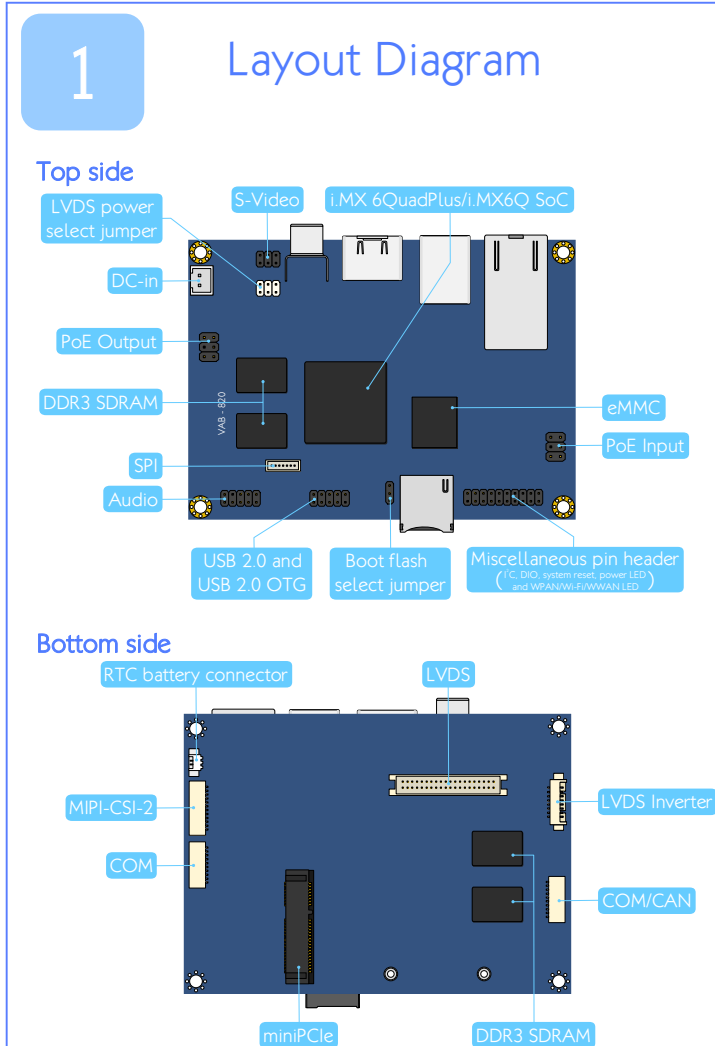
- **Operating Temperature**
 - -20°C ~ 70°C (3G and Wi-Fi not included)
- **Operating Humidity**
 - 0% ~ 95% (non-condensing)
- **Form Factor**
 - Pico-ITX
 - 10cm x 7.2cm (100mm x 72mm)
- **Operating System**
 - Android 6.0 and Android 5.0
 - Linux Kernel 4.1.15 and Linux Kernel 3.14.28
- **Compliance**
 - CE, FCC

Note:
For the software evaluation, please visit VIA website: <http://www.viatech.com>

Box Contents

- 1 x VAB-820 mainboard
- 1 x DC power cable
- 1 x Audio cable
- 1 x USB cable
- 1 x Console cable (3-wired for debugging the console)

Note:
Please ensure that all items in the box are present before using this product. If any of the items are missing or damaged, contact your distributor or sales representative immediately.



COM connector (J4)

Pin	Signal
1	5VIN
2	COM_RXD1
3	COM_TXD1
4	COM_DCD1
5	COM_RI1
6	GND
7	COM_DTR1
8	COM_CTS1
9	COM_RTS1
10	COM_DSR1

COM/CAN connector (J5)

Pin	Signal
1	5VIN
2	COM2_RX
3	COM2_TX
4	NC
5	NC
6	GND
7	CAN_RX2
8	CAN_TX2
9	CAN_TX1
10	CAN_RX1

MIPI CSI-2 connector (J18)

Pin	Signal
1	5VIN
2	I2C2_SCL
3	I2C2_SDA
4	GND
5	CSI_CLK0P
6	CSI_CLK0M
7	GND
8	CSI_D0P
9	CSI_D0M
10	GND
11	CSI_D1M
12	CSI_D1P

LVDS Inverter connector (INVERTER)

Pin	Signal
1	IVDD
2	IVDD
3	LVDS_EN
4	DISPO_CONTRAST
5	LVDS_EN
6	DISPO_CONTRAST
7	GND
8	GND

PoE Input pin header (J13)

Pin	Signal	Pin	Signal
1	WIRE1	2	WIRE2
3	NC	4	-
5	WIRE3	6	WIRE4

PoE Output pin header (J14)

Pin	Signal	Pin	Signal
1	POE_12V	2	POE_12V
3	NC	4	-
5	GND	6	GND

LVDS connector (LVDS1)

Pin	Signal	Pin	Signal
1	LVDS1_TX0_NC	2	PVDD
3	LVDS1_TX0_PC	4	PVDD
5	GND	6	GND
7	LVDS1_TX1_NC	8	GND
9	LVDS1_TX1_PC	10	LVDS0_TX0_NC
11	GND	12	LVDS0_TX0_PC
13	LVDS1_TX2_NC	14	GND
15	LVDS1_TX2_PC	16	LVDS0_TX1_NC
17	GND	18	LVDS0_TX1_PC
19	LVDS1_CLK_NC	20	GND
21	LVDS1_CLK_PC	22	LVDS0_TX2_NC
23	GND	24	LVDS0_TX2_PC
25	LVDS1_TX3_NC	26	GND
27	LVDS1_TX3_PC	28	LVDS0_CLK_NC
29	GND	30	LVDS0_CLK_PC
31	5VIN	32	GND
33	3P3V	34	LVDS0_TX3_NC
35	NC	36	LVDS0_TX3_PC
37	NC	38	LVDS0_EDID_SCL
39	NC	40	LVDS0_EDID_SDA

MiniPCIe slot

Pin	Signal	Pin	Signal
1	PCIE_WAKE_B	2	MPCIE_3V3
3	GND	4	GND
5	JTAG_TCK	6	VCC15
7	JTAG_TMS	8	-
9	GND	10	NC
11	PCie_CREFCLKM	12	NC
13	PCie_CREFCLKP	14	NC
15	GND	16	-
17	JTAG_TD1	18	GND
19	JTAG_TD0	20	PCIE_DIS_B
21	GND	22	PCIE_RST_B
23	PCie_CRXM	24	MPCIE_3V3
25	PCie_CRXP	26	GND
27	GND	28	VCC15
29	GND	30	PCie_SMB_CLK
31	PCie_CTXM	32	PCie_SMB_DATA
33	PCie_CTXP	34	GND
35	GND	36	PCIE_USB_DM
37	GND	38	PCIE_USB_DP
39	MPCIE_3V3	40	GND
41	MPCIE_3V3	42	LED_WWAN_B
43	GND	44	LED_WLAN_B
45	JTAG_nTRST	46	LED_WPAN_B
47	JTAG_nSRST	48	VCC15
49	GND	50	GND
51	NC	52	MPCIE_3V3

Front Audio pin header (AUDIO1)

Pin	Signal	Pin	Signal
1	HEAD_RIGHT	2	HEAD_LEFT
3	LINE_IN_R	4	LINE_IN_L
5	MIC_IN	6	MIC_IN
7	-	8	NC
9	GND_ANALOG	10	GND_ANALOG

LVDS power select jumper (J3)

Inverter power	Pin 1	Pin 3	Pin 5
+12V (default)	Short	Short	Open
+5V	Open	Short	Short

Panel power	Pin 2	Pin 4	Pin 6
+3.3V (default)	Short	Short	Open
+5V	Open	Short	Short

Boot flash select jumper (J11)

Boot select	Pin 1	Pin 2	Pin 3
Micro SD (default)	Short	Short	Open
SPI	Open	Short	Short

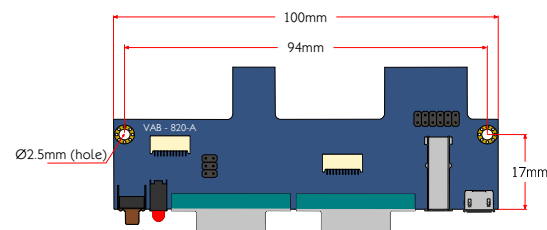
VAB-820-A

Daughterboard for VAB-820 mainboard

VAB-820-A Specifications:

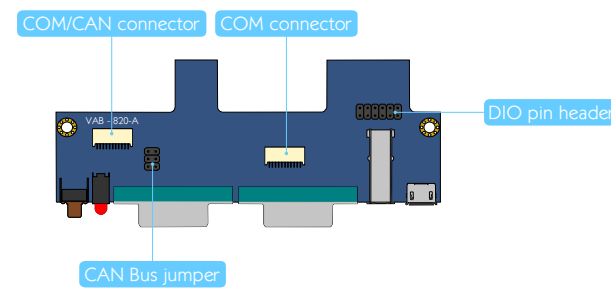
- PCB Size**
 - 10cm x 3.7cm (100mm x 37mm)
- I/O Coastline**
 - 1 x Reset button
 - 1 x Power LED
 - 1 x WPAN/Wi-Fi/WWAN LED
 - 1 x COM port (supports 8-wire DTE mode)
 - 1 x COM/CAN port (supports one RS-232 (TX/RX) and two CAN Bus (Supporting CAN Protocol specification Version 2.0 B) through a COM/CAN converter cable)
 - 1 x USB 2.0 port
 - 1 x Micro USB 2.0 OTG port (Type B connector supporting OTG)
- Onboard Connectors and Jumper**
 - 1 x COM connector (J4)
 - 1 x COM/CAN connector (J5)
 - 1 x DIO pin header (4GPI + 4GPO) (DIO)
 - 1 x CAN Bus jumper (J2)
- CAN Bus Transceiver**
 - TI SN65HVD1050 EMC Optimized CAN transceiver

VAB-820-A Dimensions

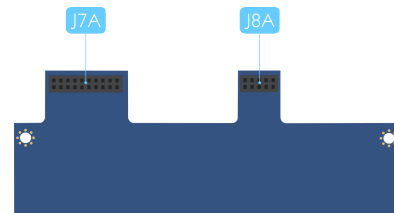


VAB-820-A Layout Diagram

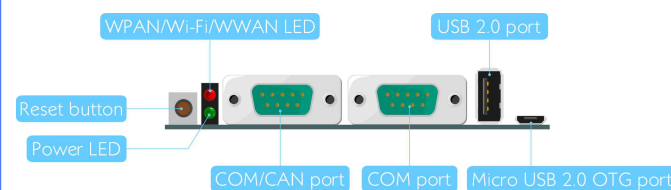
Top side



Bottom side



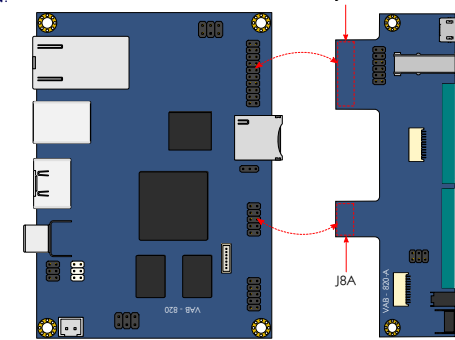
I/O Coastline



Installing VAB-820-A Daughter board to VAB-820 Mainboard

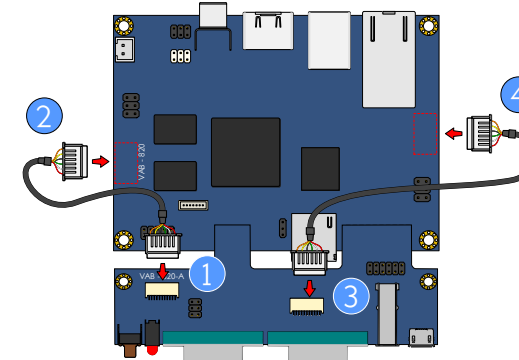
Step 1

Firmly attach the two connectors J7A and J8A on the bottom of the VAB-820-A daughter board with the pin headers J7 and J8 on the VAB-820 mainboard.



Step 2

Plug one end of the transmittal cable to the COM connector on the VAB-820-A daughter board, and the other end of the transmittal cable to the COM connector on the bottom side of the mainboard.



VAB-820-A Onboard Connector Pinouts and Jumper

DIO pin header

Pin	Signal	Pin	Signal
1	NC	2	NC
3	GPIO_1	4	GPIO_7
5	GPIO_2	6	GPIO_8
7	GPIO_4	8	GPIO_9
9	GPIO_5	10	GPIO_16
11	GND	12	GND

COM connector (J4)

Pin	Signal
1	-
2	COM_RXD1
3	COM_TXD1
4	COM_DCD1
5	COM_RI1
6	GND
7	COM_DTR1
8	COM_CTS1
9	COM_RTS1
10	COM_DSR1

COM/CAN connector (J5)

Pin	Signal
1	-
2	COM2_RX
3	COM2_TX
4	-
5	-
6	GND
7	CAN_RX2
8	CAN_TX2
9	CAN_TX1
10	CAN_RX1

CAN Bus jumper (J2)

CAN Bus setting	Pin 1	Pin 3	Pin 5	Pin 2	Pin 4	Pin 6
Enabled CAN Termination (default)	Short	Short	Open	Short	Short	Open

VIA Technologies, Inc.
1F, 531, Zhong-zheng Road, Xindian District,
New Taipei City 231, Taiwan
Tel: 886-2-2218-5452
Fax: 886-2-2218-9860

For more information on this product, please visit
www.viatech.com