OPERATING GUIDE

ALTA DS 2

Fanless ultra-compact dual screen Android digital signage system

1.61-06142016-160600

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Regulatory Compliance
FCC-A Radio Frequency Interference Statement
This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

Notice 3
The product described in this document is designed for general use, VIA Technologies assumes no responsibility for the conflicts or damages arising from incompatibility of the product. Check compatibility issue with your local sales representatives before placing an order.

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE US

Battery Recycling and Disposal

- ☐ Only use the appropriate battery specified for this product.
- ☐ Do not re-use, recharge, or reheat an old battery.
- ☐ Do not attempt to force open the battery.
- ☐ Do not discard used batteries with regular trash.
- ☐ Discard used batteries according to local regulations.

Safety Precautions

- ☐ Always read the safety instructions carefully.
- ☐ Keep this User's Manual for future reference.
- ☐ All cautions and warnings on the equipment should be noted.
- ☐ Keep this equipment away from humidity.
- ☐ Lay this equipment on a reliable flat surface before setting it up.
- ☐ Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- ☐ Place the power cord in such a way that people cannot step on it.
- ☐ Always unplug the power cord before inserting any add-on card or module.
- ☐ If any of the following situations arises, get the equipment checked by authorized service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not worked well or you cannot get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- ☐ Do not leave this equipment in an environment unconditioned or in a storage temperature above 75°C (167°F). The equipment may be damaged.
- ☐ Do not leave this equipment in direct sunlight.
- ☐ Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- ☐ Do not place anything over the power cord.
- ☐ Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating.

Revision History

Revision	Date	Remarks
1.50	2015/05/15	External release
1.51	2015/08/28	Updated Android version Removed Linux Kernel support Added bookmarks Updated Contact VIA page
1.60	2015/12/29	Removed HDMI-In from the document
1.61	2016/06/14	Updated the logo Changed format to A4 size Modified the set of styles and fonts size Updated Contact VIA page

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1. Introduction

The VIA ALTA DS 2 is an ultra-compact and completely fanless Android digital system measuring 175 mm x 118 mm x 25 mm. It supports dual independent Full HD screen that makes it ideal for various digital signage applications such as kiosk, POS system and menu boards to TVOIP, cloud streaming, and Out of Home Advertising.

The ALTA DS 2 has ARM based system mainboard powered by VIA Elite E1000 1GHz ARM Cortex-A9 Dual-Core RISC processor which is excellent in high power computing with low power consumption.

The ALTA DS 2 supports dual-sided external I/O ports such as SD card slot, USB 2.0 ports, audio jacks, Gigabit Ethernet LAN port, HDMI-Out ports, and Mini USB 2.0 ports. In addition, ALTA DS 2 also offers an onboard 4GB of eMMC Flash, 2.5" SATA HDD connector and Wi-Fi module connector for optional WLAN USB (Wi-Fi) connectivity.

2. Product Specification

Processor

- VIA Elite E1000 SoC
  - ARM Cortex-A9 Dual Core @ 1.0 GHz processor
  - 512KB cache memory
  - NEON/FPU on all cores
  - 64 interrupts
  - Multiple voltage domains with clock gating and power gating

Graphics

- Supports DVP Digital Video Out for external HDMI
- Supports up to (H.264 1920 x 1080p @ 30Hz)
- 2D/3D graphics

Memory

- DDR3-DRAM 1333 2GB
- eMMC 4GB
- SPI flash 4MB

NAND Flash

- Samsung eMMC flash ROM support

Ethernet

- Realtek RTL8111G-CG integrated 10/100/1000M Ethernet controller for PCI Express applications

Video

- H.264 video encoding
- MPEG-1, MPEG-2 MP@ML
- VC1, others

Audio

- Audio port with Line-Out and Mic-In
- Wolfson WM8960 Audio Codec

Wi-Fi Module

- VNT9271B6050 complied with IEEE 802.11b/g/n standard from 2.4~2.5 GHz (optional)

Power Supply

- DC 12V
- 1 x 6.0/2.5 Ø DC jack connector

Front Panel I/O

- 2 x USB 2.0 ports
- 1 x SD 2.0 card slot
- 1 x Line-Out jack
- 1 x Mic-In jack (share for CIR, optional)
- 1 x CIR pin header (optional)

Rear Panel I/O

- 2 x Mini USB 2.0 ports
  - one for Wi-Fi
  - one for UART1 TX/RX
- 2 x HDMI-Out port
- 1 x RJ-45 Gigabit Ethernet port
- 1 x DC-In jack

Boot Loader

- Onboard 4MB SPI Flash ROM

Operating System

- Android 4.4.2

Environmental Specification

- Operating Temperature: 0°C ~ 40°C
- Storage Temperature: -20°C to 70°C @ 90%
- Relative Humidity: 0% ~ 90% @ 40°C, non-condensing
- EMC Approved: CE, FCC Class B
- Environment: EnergyStar Compliant
- Safety: TUV-GS/UL-GS/cULus/CB (optional)

Dimension

- 175 mm x 118 mm x 25 mm

Weight

- 555 grams

Notes:

1. The specification is subject to change without prior notice.
2. As the operating temperature provided in the specifications is a result of the test performed in VIA's chamber, a number of variables can influence this result. Please note that the working temperature may vary depending on the actual situation and environment. It is highly suggested to execute a solid testing and take all the variables into consideration when building the system. Please ensure that the system runs well under the operating temperature in terms of application.
3. Please note that the lifespan of the onboard eMMC memory chip may vary depending on the amount of access. More frequent and larger data access on eMMC memory makes its lifespan shorter. Therefore, it is highly recommended to use a replaceable external storage (e.g., Micro SD card) for large data access.

3. Mainboard Block Diagram

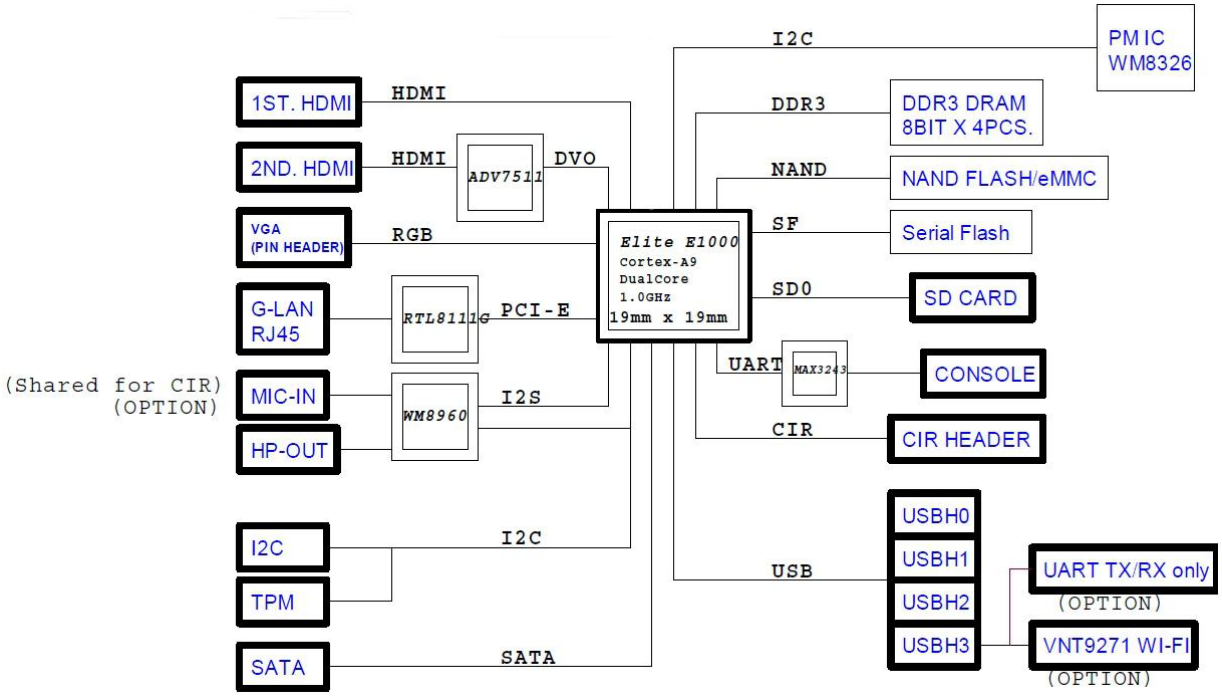

Figure 1: Mainboard block diagram

4. ALTA DS 2 Placement View

4.1. System Outline View

Figure 2: Front side vertical view

Figure 3: Front side horizontal view

4.2. System Panel Layout

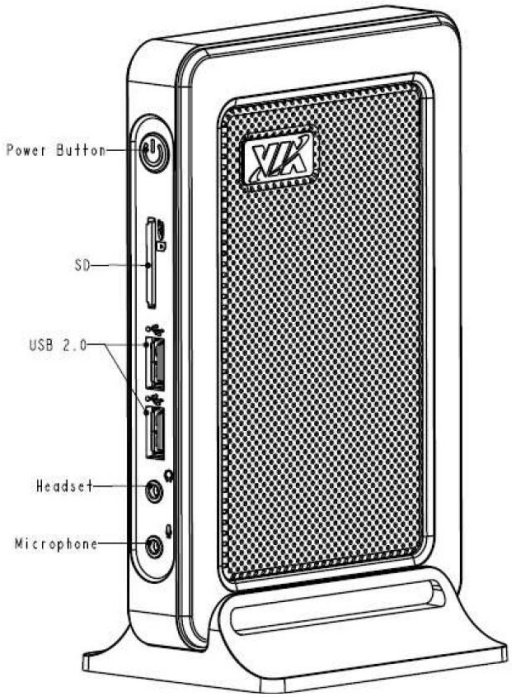

Figure 4: Front panel layout

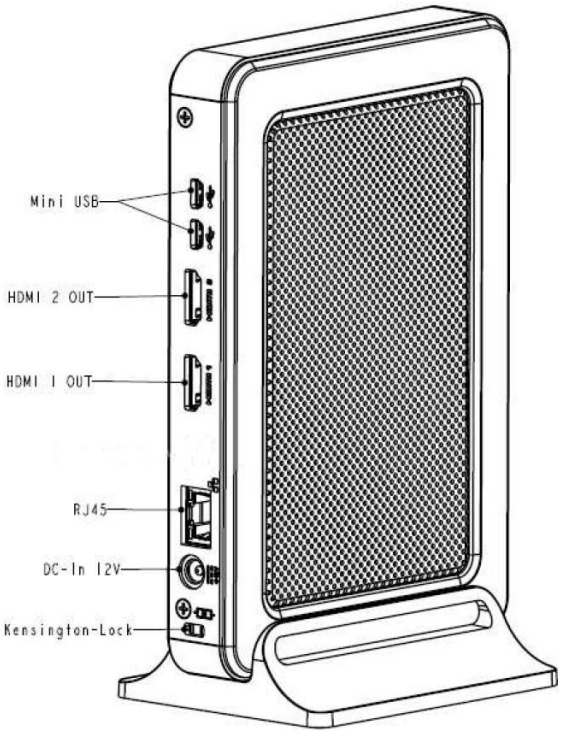

Figure 5: Rear panel layout

4.3. Mainboard Top Side View

Figure 6: Mainboard top side view

4.4. Mainboard Bottom Side View

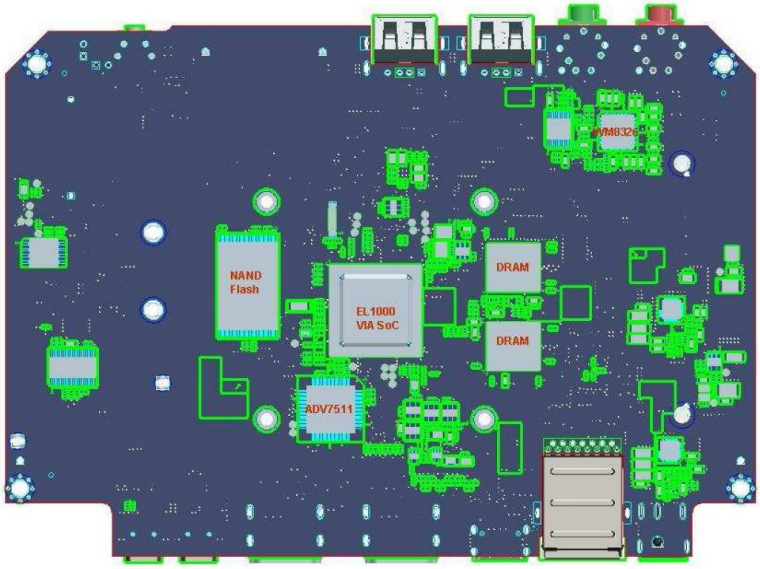

Figure 7: Mainboard bottom side view

5. Onboard Pin Header and Connector Lists

Items		Function
1	SW1	Power On/Off button
2	LED1	Power LED
3	CIR1	CIR Receiver module pin header (optional)
4	SD1	SD Card slot
5	USB1, USB2	USB 2.0 port (front panel)
6	LINEOUT1	Line-Out jack
7	MIC1	Mic-In jack
8	BAT1	RTC battery
9	SPI1	Serial Flash ROM Programming connector
10	J3	DC-In +12V jack
11	SATA1	SATA HDD connector
12	LAN1	RJ-45 Gigabit Ethernet port
13	HDMI1, HDMI2	HDMI-Out port
14	VGA1	VGA pin header
15	USB3, USB4	Mini USB 2.0 port (rear panel)
16	J1	Interface connector for WM8326 Power IC
17	J2	VNT9271 Wi-Fi module connector (optional)
18	CON1	RS232/Console connector
19	I^2C1	I^2C signal connector (optional)

Table 1: Pin header and connector list table

6. Onboard Pin Header and Connector Pin Assignment

6.1. SW1: Power On/Off Button

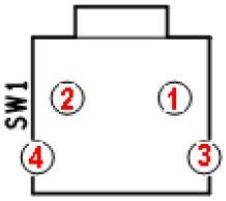

Figure 8: Power On/Off button diagram

Pin	Signal
1	GND
2	PWRBTN-
3	GND
4	GND

Table 2: Power On/Off Button pinout

6.2. LED1: Power LED

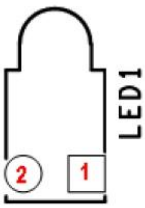

Figure 9: Power LED diagram

Pin	Signal
1	VCC (+)
2	GND (-)

Table 3: Power LED pinout

6.3. SD1: SD Card Slot

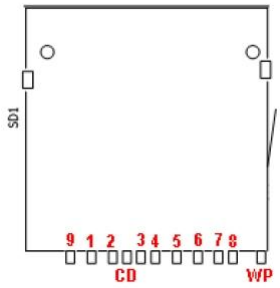

Figure 10: SD card slot diagram

Pin	Signal
1	SD0DATA3
2	SD0CMD
3	GND
4	VDD (3.3V)
5	SD0CLK
6	GND
7	SD0DATA0
8	SD0DATA1
9	SD0DATA2
CD	SD0WP
WP	SD0CD

Table 4: SD card slot pinout

6.4. CIR1: CIR Receiver Module Pin Header (optional)

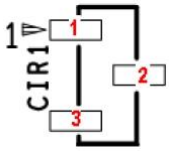

Figure 11: CIR receiver module pin header diagram

Pin	Signal
1	CIR
2	GND (-)
3	VDD33_SUS

Table 5: CIR receiver module pin header pin out

6.5. USB1 and USB2: USB 2.0 Port Connector

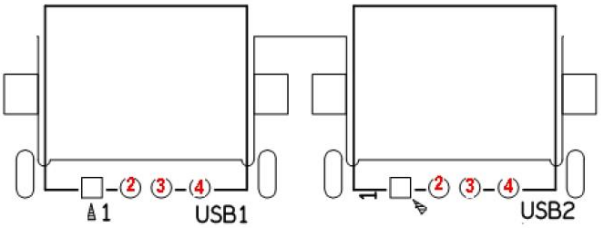

Figure 12: USB 2.0 ports diagram

USB1	
Pin	Signal
1	VCC (+5V)
2	USBH1-
3	USBH1+
4	GND

USB2	
Pin	Signal
1	VCC (+5V)
2	USBHD0-
3	USBHD0+
4	GND

Table 6: USB 2.0 ports pinout

Notes:
1. USB1 connector designed for USB storage 2 under Android showing.
2. USB2 connector designed for USB storage 1 under Android showing.

6.6. LINEOUT1: Line-Out Jack

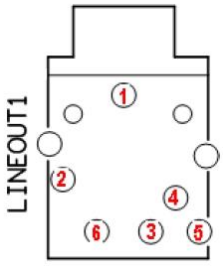

Figure 13: Line-Out jack diagram

Pin	Signal
1	GND
2	HPOUTL
3	HPOUTR
4	HP_DET
5	GND
6	GND

Table 7: Line-Out jack pinout

6.7. MIC1: Mic-In Jack

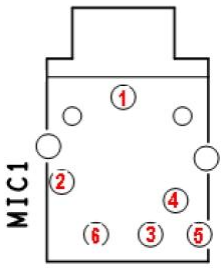

Figure 14: Mic-In jack diagram

Pin	Signal
1	GND
2	MIC_IN1 (CIR1)
3	MIC_IN2 (VDD33)
4	GND
5	GND
6	GND

Table 8: Mic-In jack pinout

6.8. SPI1: Serial Flash ROM Programming Connector

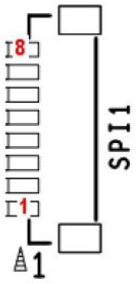

Figure 15: Serial Flash ROM programming connector diagram

Pin	Signal
1	NA
2	SF_CS1-
3	SFDO
4	SFDI
5	SFCLK
6	SFCS0-
7	GND
8	VPROG_SPI (3.3V)

Table 9: Serial Flash ROM programming connector pinout

6.9. J3: DC-In +12V Jack

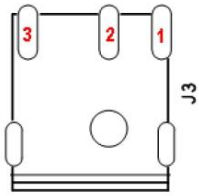

Figure 16: DC-In jack diagram

Pin	Signal
1	DCIN (+12V)
2	GND
3	GND

Table 10: DC-In jack pinout

6.10. SATA1: SATA HDD Connector

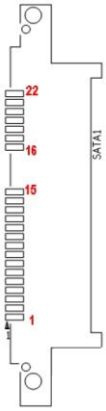

Figure 17: SATA HDD connector diagram

Pin	Signal
1	VDD12
2	VDD12
3	VDD12
4	GND
5	NA
6	GND
7	VDD5
8	VDD5
9	VDD5
10	GND
11	GND
12	GND
13	VDD33
14	VDD33
15	VDD33
16	GND
17	SATA_RXP
18	SATA_RXN
19	GND
20	SATA_TXN
21	SATA_TXP
22	GND

Table 11: SATA HDD connector pinout

6.11. LAN1: RJ-45 Gigabit Ethernet Port

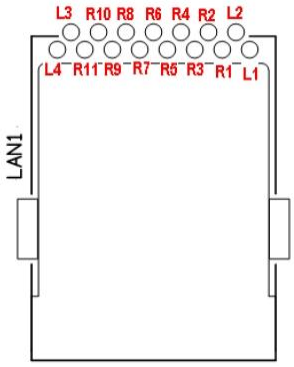

Figure 18: RJ-45 Gigabit Ethernet port diagram

Pin	Signal
R1	Short with R11
R2	MDI_0+
R3	MDI_0-
R4	MDI_1+
R5	MDI_1-
R6	GND
R7	MDI_2+
R8	MDI_2-
R9	MDI_3+
R10	MDI_3-
R11	Short with R1
L1	LED2 (LINK)
L2	VDD33_SUS
L3	LED0 (SPEED)
L4	LED1 (SPEED)

Table 12: RJ-45 Gigabit Ethernet port pinout

6.12. HDMI1 and HDMI2: HDMI-Out Ports

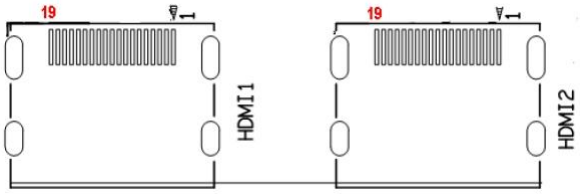

Figure 19: HDMI-Out ports diagram

HDMI1		HDMI2	
Pin	Signal	Pin	Signal
1	HDMI1DO2+	1	HDMI_TX2P
2	GND	2	GND
3	HDMI1DO2-	3	HDMI_TX2N
4	HDMI1DO1+	4	HDMI_TX1P
5	GND	5	GND
6	HDMI1DO1-	6	HDMI_TX1N
7	HDMI1DO0+	7	HDMI_TX0P
8	GND	8	GND
9	HDMI1DO0-	9	HDMI_TX0N
10	HDMI1CLK+	10	HDMI_TXCP
11	GND	11	GND
12	HDMI1CLK-	12	HDMI_TXCN
13	HDMI_CECIN	13	NA
14	NA	14	NA
15	DDCSCL	15	HDMI_SCL
16	DDCSDA	16	HDMI_SDA
17	GND	17	GND
18	5V_HDMI	18	5V_HDMI
19	HPD	19	HDMI_HPD

Table 13: HDMI-Out ports pinout

6.13. VGA1: VGA Pin Header

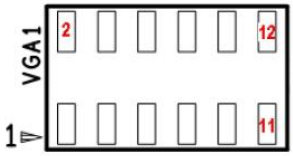

Figure 20: VGA pin header diagram

Pin	Signal	Pin	Signal
1	REDN	2	VDD5
3	GREENN	4	GND
5	BLUEN	6	CRTSDA
7	GND	8	CRTSCL
9	(CVBSN, Reserve)	10	VS
11	HS	12	GND

Table 14: VGA pin header pinout

6.14. USB3 and USB4: Mini USB 2.0 Ports

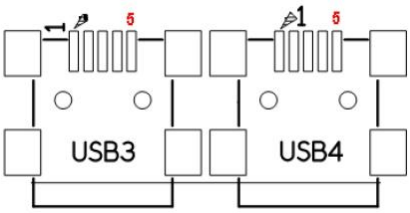

Figure 21: Mini USB 2.0 ports diagram

USB3		USB4	
Pin	Signal	Pin	Signal
1	VDD5_SUS	1	VDD5_SUS
2	USBH2-	2	USBH3-
3	USBH2+	3	USBH3+
4	GND	4	GND
5	GND	5	GND

Table 15: Mini USB 2.0 ports pinout

Note:
USB4 signal shared with J2 USB interface connector.

6.15. J1: Interface Connector for WM8326 Power IC

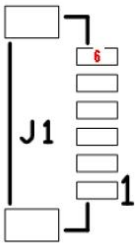

Figure 22: Diagram of interface connector for WM8326 power IC

Pin	Signal
1	VPMIC
2	VDD65_PMIC_OTP
3	PMIC_CONF_SCL
4	PMIC_CONF_SDA
5	GND
6	NA

Table 16: Pinout of interface connector for WM8326 power IC

6.16. J2: VNT9271 Wi-Fi Module Connector (optional)

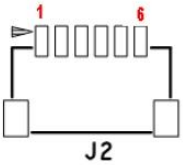

Figure 23: VNT9271 Wi-Fi module connector diagram

Pin	Signal
1	VDD5
2	USBH3-
3	USBH3+
4	GND
5	USB_WIFI_LED
6	GPIO2

Table 17: VNT9271 Wi-Fi module connector pinout

6.17. CON1: RS232/Console Connector

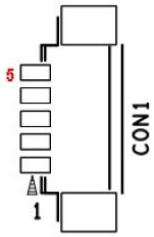

Figure 24: RS232/Console connector diagram

Pin	Signal
1	DB9_TXD1
2	DB9_RXD1
3	GND
4	DB9_TXD_2
5	DB9_RXD_2

Table 18: RS232/Console connector pinout

6.18. I²C1: I²C Connector (optional)

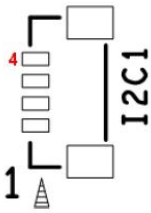

Figure 25: I²C connector diagram

Pin	Signal
1	VDD33
2	I2C0_SCL
3	I2C0_SDA
4	GND

Table 19: I²C connector pinout

7. Pin Header and Connector Specification Lists

Location	Description	Vendor	Part Number
SW1	Switch Push Button DTSA-62N-S-V(676) DIP 4PIN RIGHT ANGLE BROWN	Diptronics	DTSA-62N-S-V(676)
LED1	LED LAMP VA 12D8H BLUE DIP 2PIN, LENGTH = 3.5mm W/HOLDER, (5.3*4*6.4mm)	VICTORY	12D8H
SD1	SD CARD CONN C40FDH-111T-114L 11PIN SMD BLACK,LCP H=2.8mm PUSH TYPE	KTS	C40FDH-111T-114L
USB1, USB2	CONN USB C023620-01 SINGLE A TYPE 1*4PIN RIGHT ANGLE DIP BLACK,LCP	CHUNFENG	C023620-01
USB3, USB4	CONN USB 5075ABMR-05-SM-CR MINI USB 5PIN RIGHT ANGLE SMD BLACK,LCP	Neltron	5075ABMR-05-SM-CR
LINEOUT1	CONN JACK JZ0060-70S0-0R AUDIO JACK 6PIN,DIP GREEN,PA10T Φ3.6mm RIGHT ANGLE	KORTAK	JZ0060-70S0-0R
MIC1	CONN JACK JZ0060-P0S0-0R AUDIO JACK 6PIN,DIP PINK,PA10T Φ3.6mm RIGHT ANGLE	KORTAK	JZ0060-P0S0-0R
SPI1	WIRE TO BOARD CONN 87212-08G0 1*8PIN/1.0mm SMD IVORY,PA46 W/CAP STRAIGHT	ACES	87212-08G0
J2	WIRE TO BOARD CONN 87213-0600G 1*6PIN/1.0mm SMD IVORY,PA46 MALE RIGHT ANGLE	ACES	87213-0600G
LAN1	CONN RJ RS3-26401D1F RJ45 PORT W/LED(L)GREEN/ORANGE,(R)YELLOW 1PORT 15PIN,30u"GOLD DIP,BLACK RIGHT ANGLE	UDE	RS3-26401D1F
HDMI1, HDMI2	HDMI CONN 099AAAC19CBACNN 19PIN/0.5mm SMD RIGHT ANGLE BLACK,LCP	Dragonstate	099AAAC19CBACNN
VGA1	CONN HEADER 2208SM-12G-BK-CP 2*6PIN/2.00mm SMD BLACK,PA6T W/CAP	Neltron	2208SM-12G-BK-CP
J1	CONN WAFER 1600S-06-SM-TR 1*6PIN/1.0mm SMD STRAIGHT IVORY,PA46	Neltron	1600S-06-SM-TR
CON1	WIRE TO BOARD CONN 85205-0500N 1*5PIN/1.25mm SMD IVORY,PA46 MALE STRAIGHT	ACES	85205-0500N

Table 20: Pin header and Connector specification lists table

8. Dimension

8.1. System Dimension

Figure 26: System Dimension

Appendix A. .

A.1. Replaceable Batteries

If equipment is provided with a replaceable battery, and if replaced by an incorrect type could result in an explosion (for example, with some lithium batteries), the following applies:

- if the battery is placed in an OPERATOR ACCESS AREA, there shall be a marking close to the battery or a statement in both the operating and the servicing instructions.
- if the battery is placed elsewhere in the equipment, there shall be a marking close to the battery or a statement in the servicing instructions.

This marking or statement shall include the following or similar text:

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

A.2. Classification of the Assessment Methods

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user. Warning the statement to the user for keeping at least 20 cm separation distance and the prohibition of operating to a person has been printed on the user's manual. So, this product under normal use is located on electromagnetic far field between the human bodies.

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