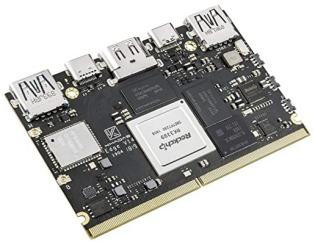


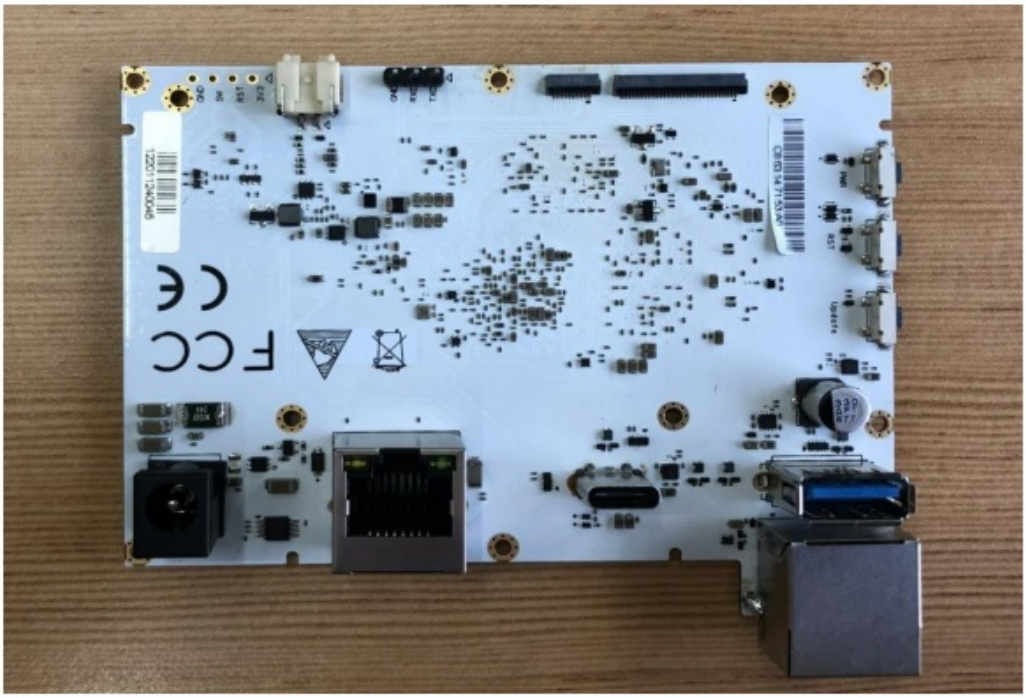
KHADAS SBC2.0a Edge Basic Single Board Computer with Rockchip Instructions

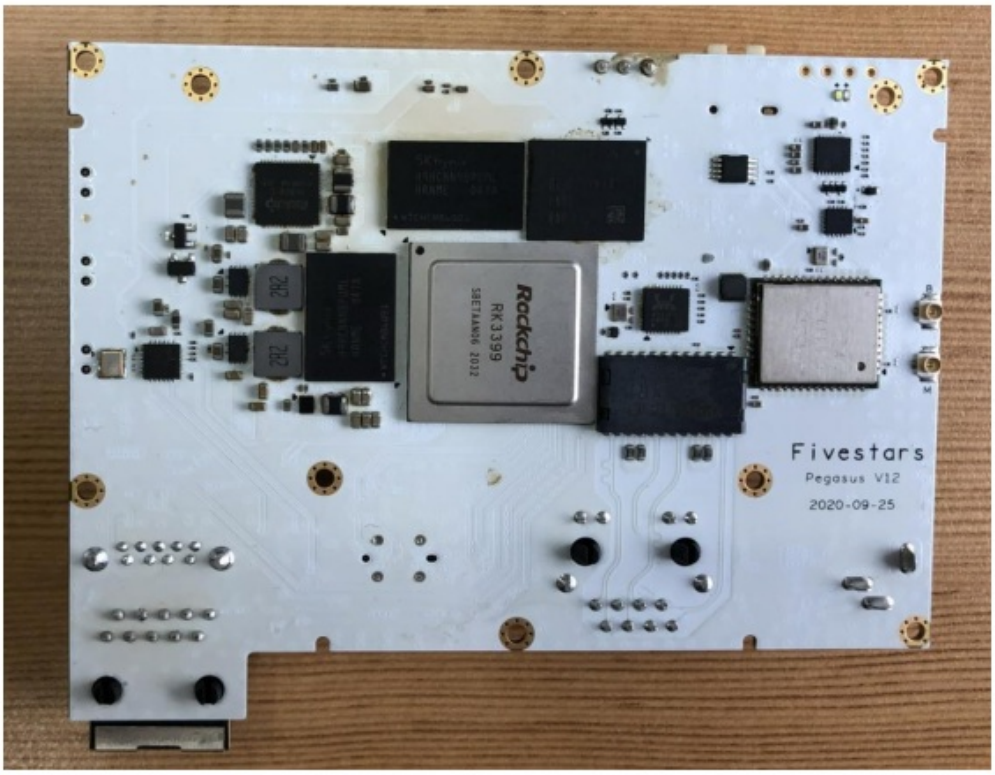
Fivestars-Pegasus Instructions

Contents

General Description

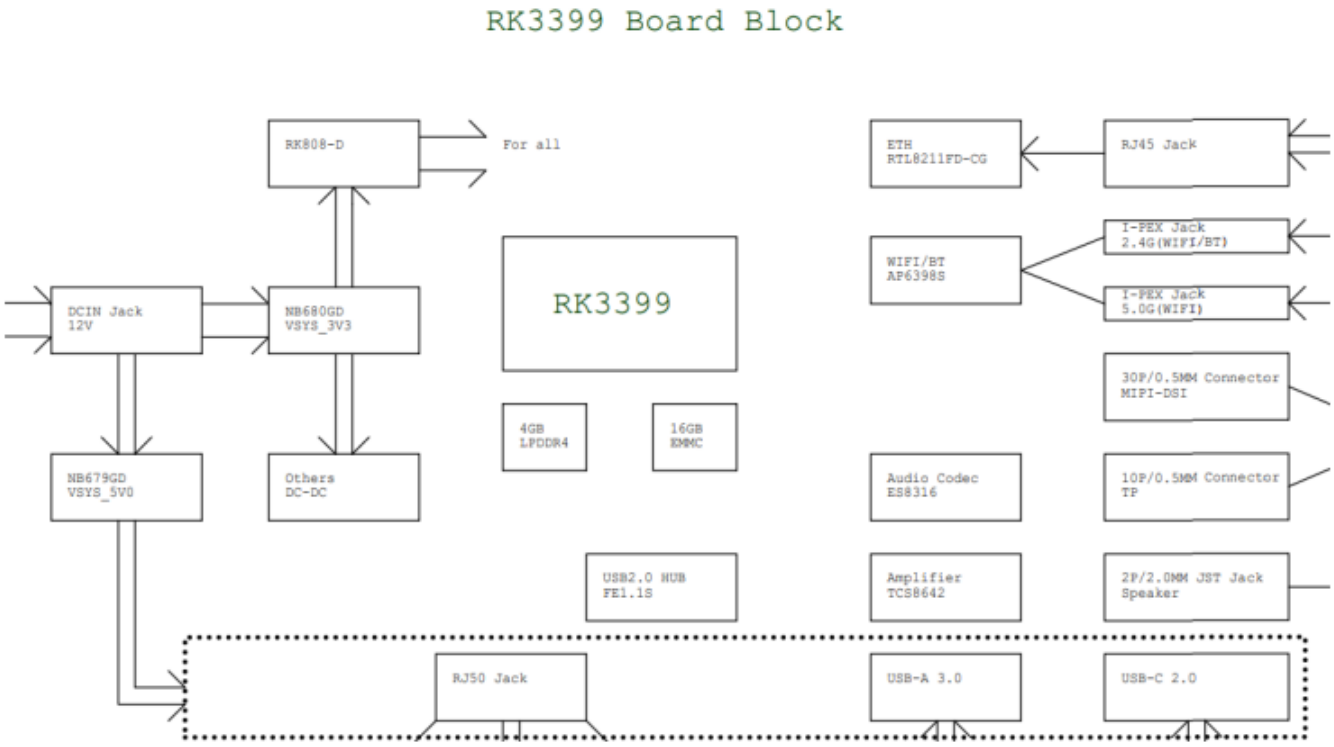
SBC2.0a model is just a semi-finished product, and it can be applied to industrial and consumer.





Product Specification

2.1 Function Block diagram



2.2 Function Specification

Item	Description
Model	SBC2.0a
Major Chipset	RK3399
Emmc Storage	16GB
RAM	4GB
Ethernet	Gigabit LAN
WiFi/BT	AP6398S 2T2R 802.11 a/b/g/n/ac + Bluetooth5.0
DC input	DC Jack, 2.1×5.5mm Standard

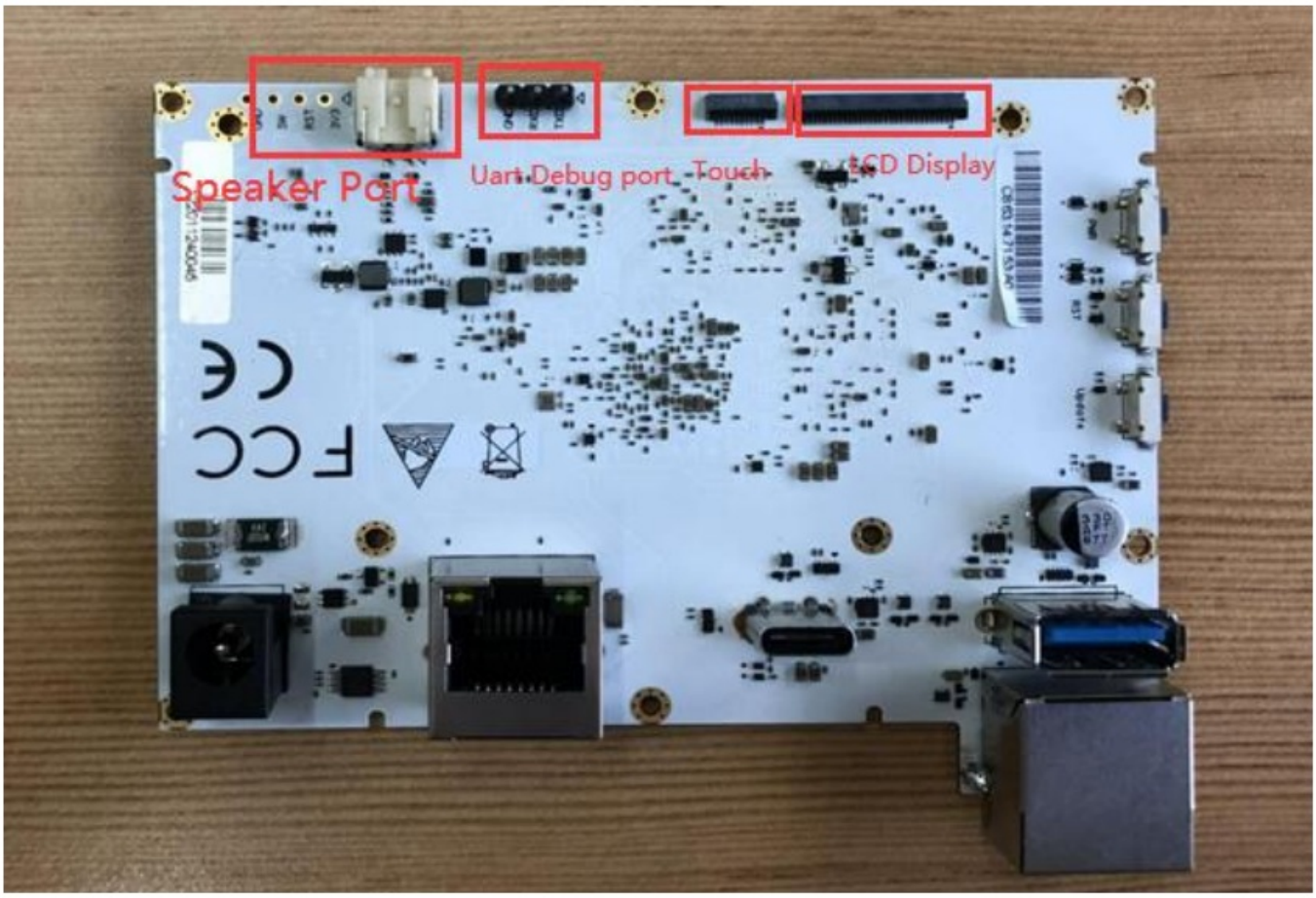
Spearker	2P/2.0MM JST Jack
LCD Connector	1) MIPI-DSI Interface 2) Touch with I2C interface
USB Ports	1) USB-C 3.0 OTG *1 2) USB-A 3.0 HOST*1 3) Micro USB2.0 HOST*2
RF Power(Typical)	BLE: -2.0dBm(Max) 2.4GWiFi:16.0dBm(Max)for ant 0 2.4GWiFi:17.0dBm(Max) for ant 1 5.2GWiFi:11.0dBm(Max) for ant 0 5.2GWiFi:14.0dBm(Max) for ant 1 5.8GWiFi:12.0dBm(Max) for ant 0 5.8GWiFi:12.0dBm(Max) for ant 1
Frequency Range	2402MHz – 2480MHz, 2412 – 2462 MHz, 5180MHz-5240MHz,5745MHz-5825MHz

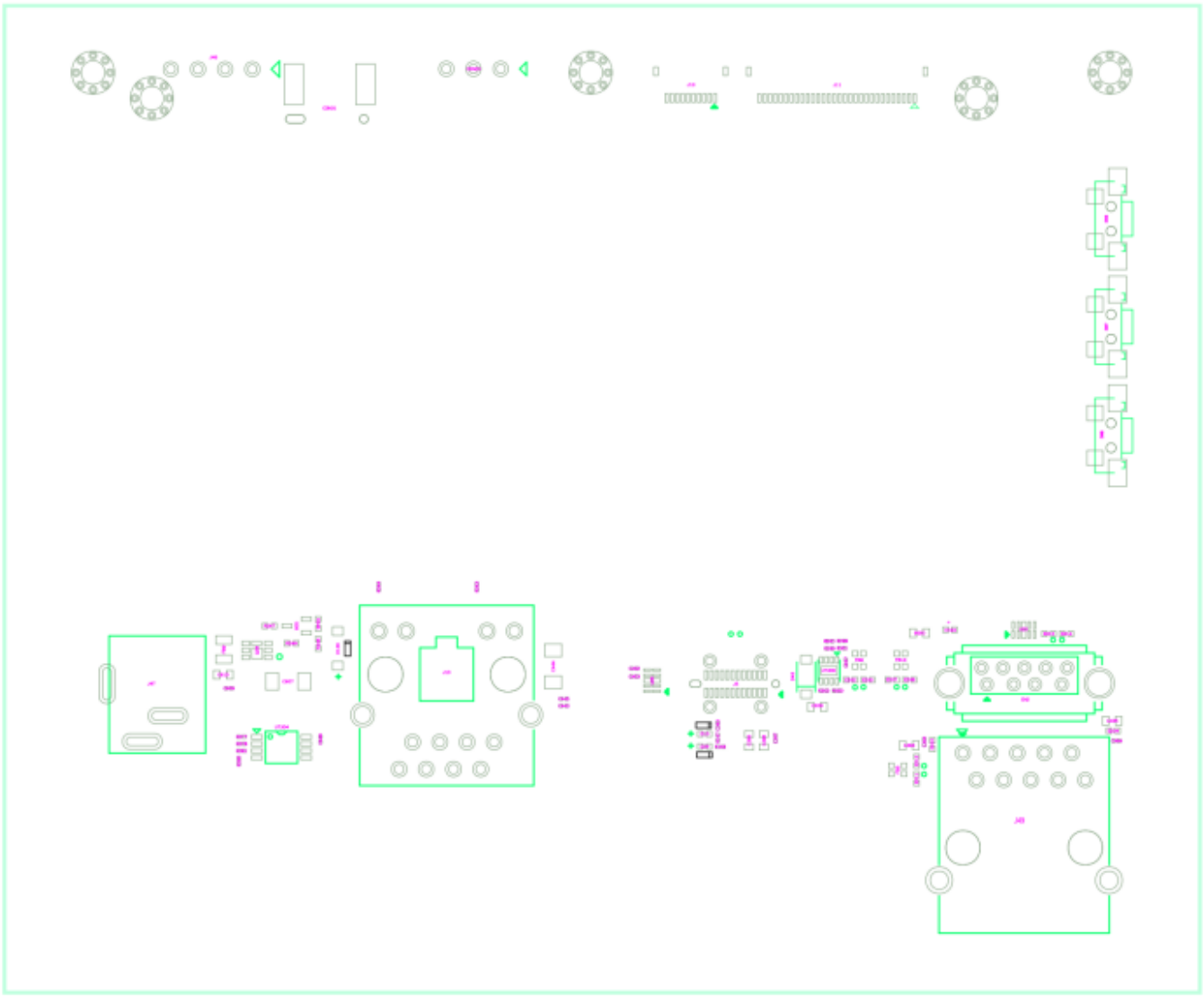
Modulation Type	GFSK for Bluetooth IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK) IEEE 802.11a/n/ac: OFDM (64QAM, 16QAM, QPSK, BPSK)

2.3 Interface Instructions

1. Ethernet
   Connect the ethernet cable from the SBC2.0a to your network.
   Make sure both ends of the network cable are plugged in, and that the corresponding network port is patched at the switch.
2. Display
   Connect the FPC port on SBC2.0a with your LCD Display device. The LCD display device must be MIPI interface.
3. AC Power
   Once the Box is plugged in, it will boot up. Make sure all of the other connections are in place first. Power can be provided by the AC power adapter (12V 2A DC).

2.4 Product Pin Definition


Speaker Port
Uart Debug port
Touch
LCD Display



Placement	Pin No.	Function	Description
CON31	1	ED35 AZ5725-01F ESD0402	ED35 AZ5725-01F ESD0402
	2	ED36 AZ5725-01F ESD0402	ED36 AZ5725-01F ESD0402
	3	GND	Ground
	4	GND	Ground
	5	NC	NC

	6	NC	NC
CON23	1	UART_TX	UART_TX
	2	UART_RX	UART_RX
	3	GND	Ground
J13	1	VCC_TP	VCC_TP
	2	VCC_TP	VCC_TP
	3	I2C2_SDA_3V3	I2C2_SDA_3V3
	4	I2C2_SDA_3V3	I2C2_SDA_3V3
	5	GND	Ground
	6	GND	Ground
	7	TP_INT	TP_INT
	8	TP_RST	TP_RST
	9	MCU_TX	MCU_TX

	10	VCC1V8_S3	VCC1V8_S3
	G1	GND	Ground
	G2	GND	Ground
	1	GND	Ground
	2	MIPI_TX0_D3N	MIPI_TX0_D3N
	3	MIPI_TX0_D3P	MIPI_TX0_D3P
	4	GND	Ground
	5	MIPI_TX0_D2N	MIPI_TX0_D2N
	6	MIPI_TX0_D2P	MIPI_TX0_D2P
	7	GND	Ground
	8	MIPI_TX0_CLKN	MIPI_TX0_CLKN
	9	MIPI_TX0_CLKP	MIPI_TX0_CLKP
	10	GND	Ground

J11	11	MIPI_TX0_D1N	MIPI_TX0_D1N
	12	MIPI_TX0_D1P	MIPI_TX0_D1P
	13	GND	Ground
	14	MIPI_TX0_D0N	MIPI_TX0_D0N
	15	MIPI_TX0_D0P	MIPI_TX0_D0P
	16	GND	Ground
	17	VCC3V3_S0	VCC3V3_S0
	18	VCC3V3_S0	VCC3V3_S0
	19	LCD_EN	LCD_EN
	20	LCD_RST	LCD_RST
	21	LCD_BL_PWM	LCD_BL_PWM
	22	GND	Ground
	23	GND	Ground
	24	GND	Ground

	25	GND	Ground
	26	DC12V	Power
	27	DC12V	Power
	28	DC12V	Power
	29	DC12V	Power
	30	DC12V	Power
	G1	GND	Ground
	G2	GND	Ground
J47		Power	Power in
J5		TYPE-C	
CN2		USB Port	
J49		RJ50	Connect LAN

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including

interference that may cause undesired operation.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

  important announcement Important Note:

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 20cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Country Code selection feature to be disabled for products marketed to the US/Canada.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna,
3. For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change. (if modular only test Channel 1-11)

As long as the three conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.
Important Note:
In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.
End Product Labeling
The final end product must be labeled in a visible area with the following" Contains FCC ID: 2A2OC-PEGV14
Manual Information to the End User
The OEM integrator has to be aware not to provide information to the end-user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end-user manual shall include all required regulatory information/warning as show in this manual.
Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01
2.2 List of applicable FCC rules
CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter
2.3 Specific operational use conditions
This module is stand-alone modular. If the end product will involve Multiple simultaneously transmitting conditions or different operational conditions for a stand-alone modular transmitter in a host, the host manufacturer has to

consult with the module manufacturer for the installation method in the end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 20cm between the radiator & your body.

2.7 Antennas

This radio transmitter 2A2OC-PEGV14 has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited from use with this device.

Antenna No.	Model No. of antenna:	Type of antenna:	Gain of the antenna (Max.)	Frequency range:
BT/2.4GWIFI/5GWIFI Antenna 0	/	PCB antenna	2.65dBi	2400-2500MHz
			1.83dBi	5100-5250MHz
			3.00dBi	5700-5850MHz
2.4GWIFI/5GWIFI Antenna 1	/	PCB antenna	2.65dBi	2400-2500MHz
			1.83dBi	5100-5250MHz
			3.00dBi	5700-5850MHz

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2A2OC-PEGV14 ".

2.9 Information on test modes and additional testing requirements

Host manufacturer which installs this modular with single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C:15.247/FCC part 15E:15.407 and 15.209 requirement, only if the test result complies with FCC part 15.247/FCC part 15E:15.407 and 15.209 requirements, then the host can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15B

ISED Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause interference rence, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The digital apparatus complies with Canadian CAN ICES-003 (B)/NMB-3(B).

This radio transmitter (ISED certification number: 27739-PEGV14) has been approved by Industry Canada to operate with the antenna types listed with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Radiation Exposure Statement

To comply with FCC RF exposure compliance requirements, this grant is applicable to only mobile configurations. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the ISED authorization is no longer
considered valid and the ISED Certification Number cannot be used on the final product.

In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate ISED authorization.

End Product Labeling

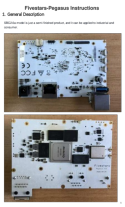
The final end product must be labeled in a visible area with the following" Contains IC: 27739-PEGV14".

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end-user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end-user manual shall include all required regulatory information/warning as show in this manual.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Documents / Resources

	KHADAS SBC2.0a Edge Basic Single Board Computer with Rockchip [pdf] Instructions PEGV14, 2A2OC-PEGV14, 2A2OCPEGV14, SBC2.0a Edge Basic Single Board Computer with Rockchip, Edge Basic Single Board Computer with Rockchip