Seeed Eagleye 530s User Guide

VERSION HISTORY

Revision	Date	Description	Maturity
V1.0	2018.04.25	Eagleye 530s User Guide.	Release

HANDLING GUIDE

Precaution against Electrostatic Discharge

When using the Eagleye 530s ensure that the environment is protected against static electricity:

Contamination

Do not use the Eagleye 530s in an environment exposed to dust or dirt adhesion.

Temperature/Humidity

The Eagleye 530s Development Board is sensitive to:

1. Environment
2. Temperature
3. Humidity

High temperature or humidity deteriorates the characteristics of Eagleye 530s, therefore, do not store or use the Eagleye 530s under such conditions.

Mechanical Shock

Do not to apply excessive mechanical shock or force to the Eagleye 530s.

Chemical

Do not expose the Eagleye 530s to chemicals. Exposure to chemicals leads to reactions that deteriorate the characteristics of the Eagleye 530s.

EMS (Electro Magnetic Susceptibility)

Strong electromagnetic waves or magnetic fields may affect the characteristics of the Eagleye 530s during the operation under insufficient PCB circuit design for Electro Magnetic Susceptibility (EMS).

EAGLEYE 530S OVERVIEW

FEATURES

Figure 1 shows the form factors of the various boards that make up the Eagleye 530s.
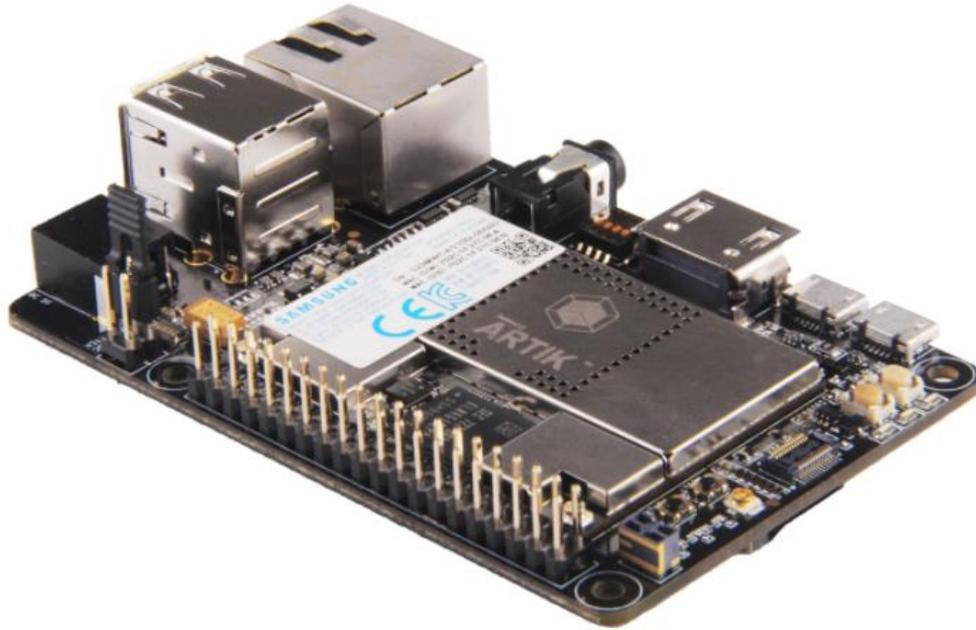
Figure 1. Preview of the Eagleye 530S

BLOCK DIAGRAM

Figure 2 shows the block diagram of the Eagleye 530s.
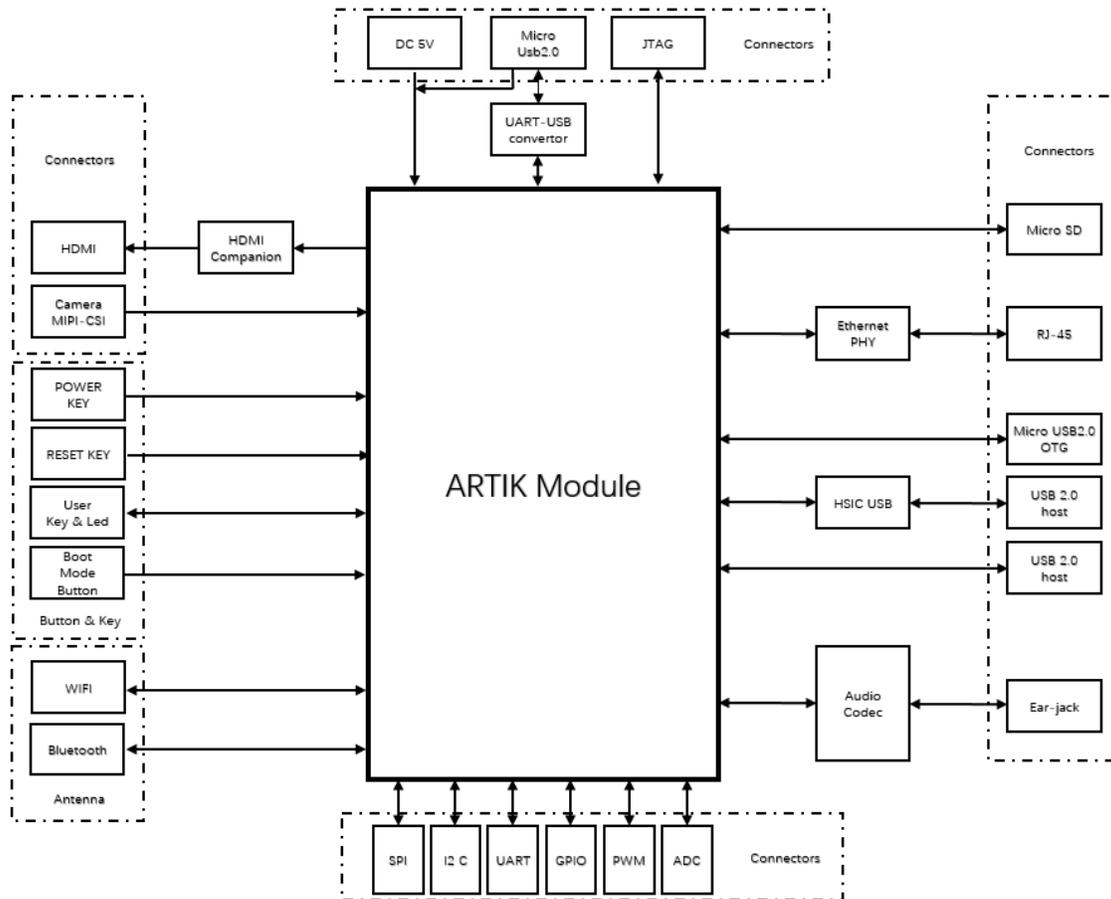
Figure 2. The block diagram of Eagleye 530s

MECHANICAL DRAWINGS

Figure 3 and Figure 4 show the Mechanical structure and size of the Eagleye 530s
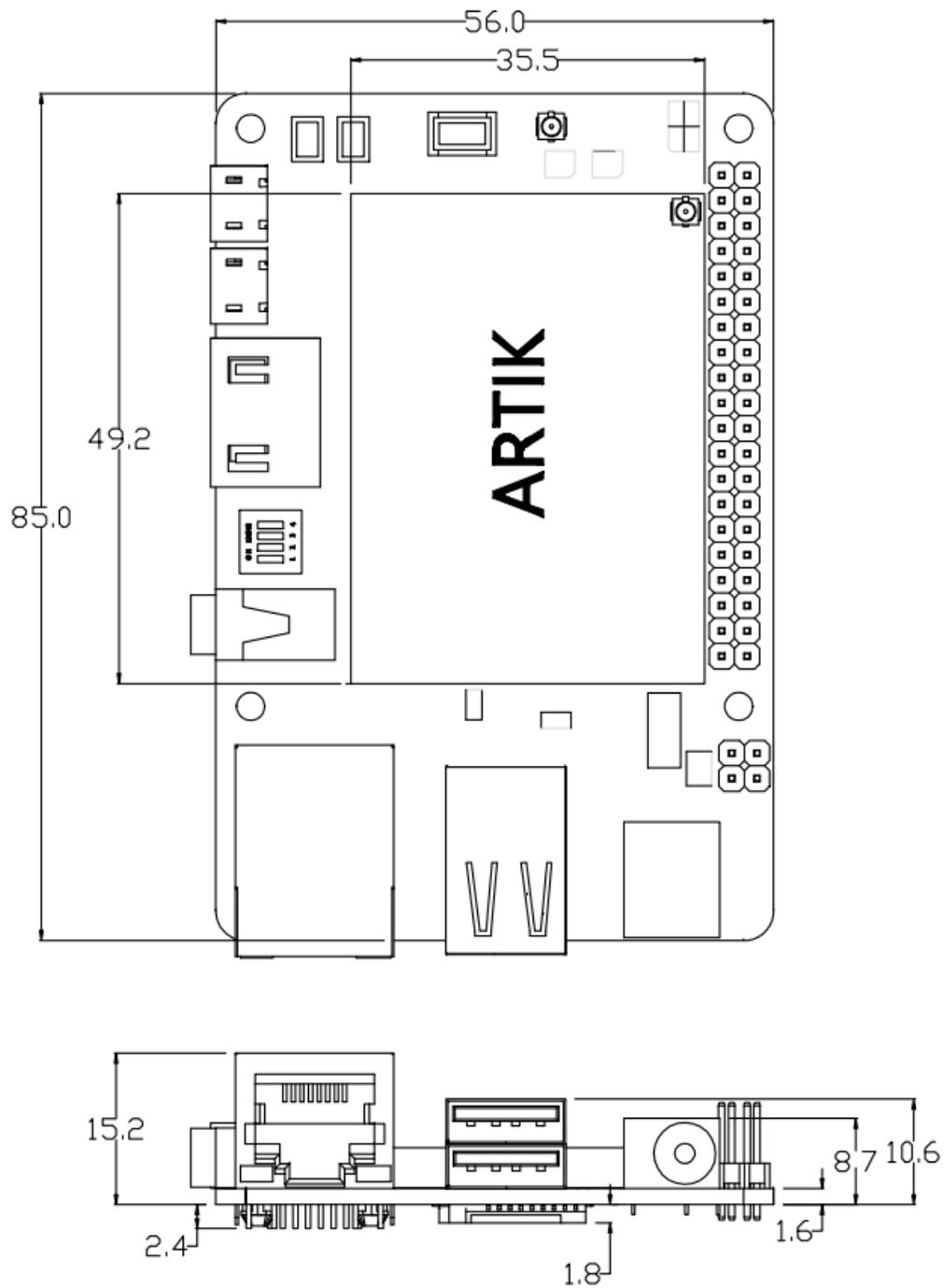
Figure 3. Mechanical Drawing Eagleye 530s all dimensions are in [mm]
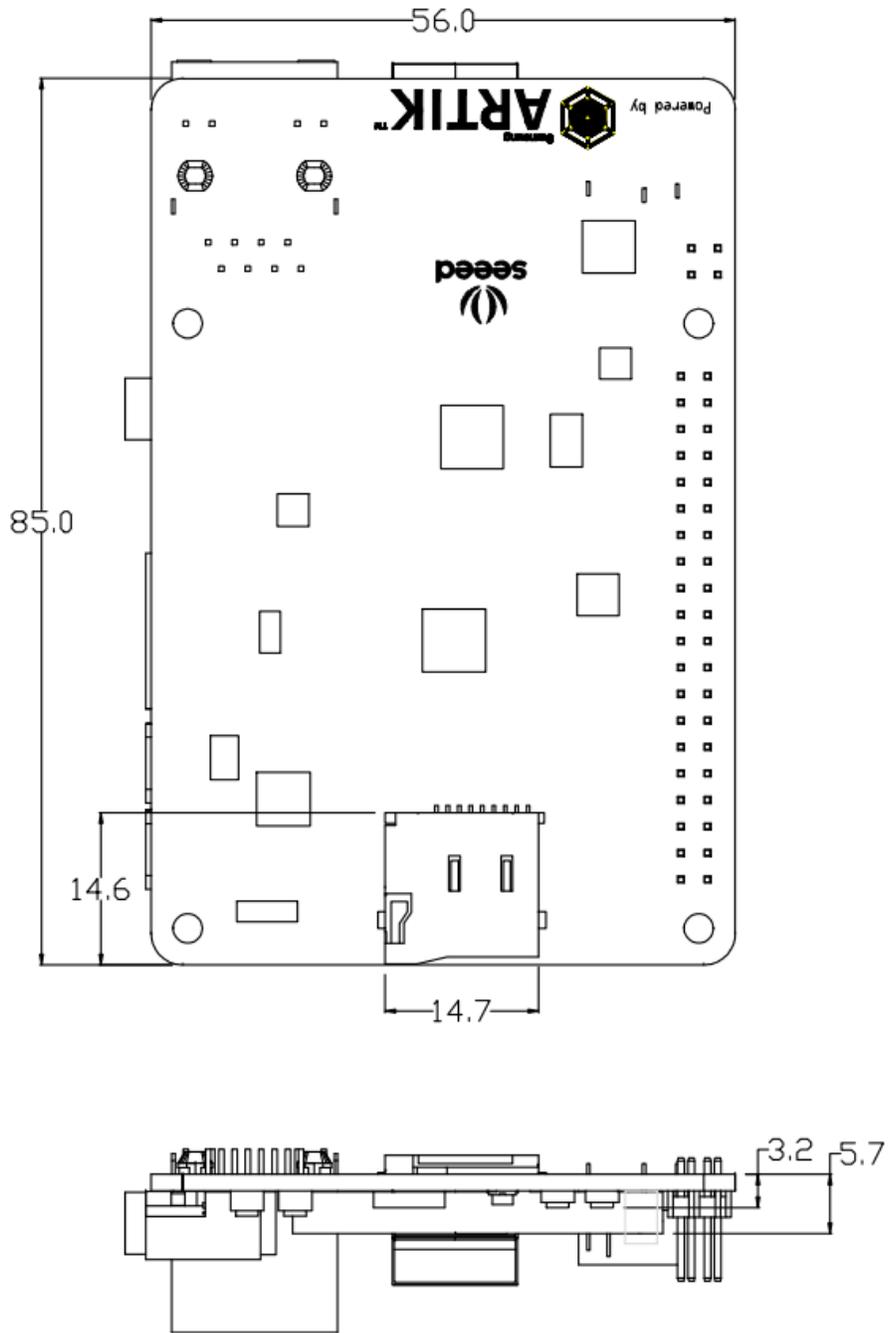
Figure 4. Mechanical Drawing Eagleye 530s all dimensions are in [mm]

EAGLEYE 530S MAIN FEATURES

The Eagleye 530s contains an ARTIK 530 Module. This section will describe some of the main features Eagleye 530s.

RF MODULE SPECIFICATION

Eagleye 530s is designed for IoT devices and it contains a lot of functions based on a Linux® system. Not only multimedia functions but also network functions for example 802.11 or ZigBee®. In addition Eagleye 530s has mass storage functionality and its own security solution. Table 1 shows the main features of the Eagleye 530s.

Table 1. Main Features of the Eagleye 530s

Processor	
CPU	Quad core ARM® Cortex®-A9@1.2GHz
GPU	3D graphics accelerator
Media	
Camera I/F	4-lane MIPI CSI up to 5M (1920x1080@30fps)
Display	4-lane MIPI DSI and HDMI1.4a (1920x1080p@60fps) or LVDS (1280x720p@60fps)
Audio	Two I²S audio input/output
Memory	
DRAM	1GB DDR3
FLASH	4GB eMMC v4.5
Security	
Secure Element	Secure point to point authentication and data transfer
Radio	
WLAN	IEEE 802.11a/b/g/n, dual band SISO
Bluetooth®	4.2 (BLE+Classic)
802.15.4	ZigBee®/Thread
Power Management	
PMIC	Provides all power of the ARTIK 530s Module using on board bucks and LDO's
Interfaces	
Ethernet	10/100/1000Base-T MAC (External PHY required)
Analog and Digital I/O	GPIO, UART, I²C, SPI, USB Host, USB OTG, HSIC, ADC, PWM, I²S, JTAG

RF PARAMETERS (FOR EU)

Bluetooth: 2402MHz to 2480MHz, Maximum E.I.R.P. 9.83dBm

Wi-Fi 2.4G: 2412MHz to 2472MHz, Maximum E.I.R.P. 17.36dBm

Wi-Fi 5G: 5180-5240MHz, Maximum E.I.R.P. 16.36dBm; 5745- 5795MHz, 12.9dBm

Zigbee: 2405MHz to 2480MHz, Maximum E.I.R.P. 8.58dBm

EAGLEYE 530S

Figure 5 and Figure 6 show the overall preview of the Eagleye 530s's TOP and BOTTOM

1. DC Power
2. USB Port
3. Ethernet
4. Ear Jack
5. Boot Switch
6. HDMI
7. OTG
8. USB UART
9. User Button
10. User Button
11. Power ON
12. Power In
13. SD Card In
14. MIPI DSI
15. PWR
16. RST
17. ANT(802.11)
18. ANT(ZigBee)
19. User GPIO
20. Power Switch
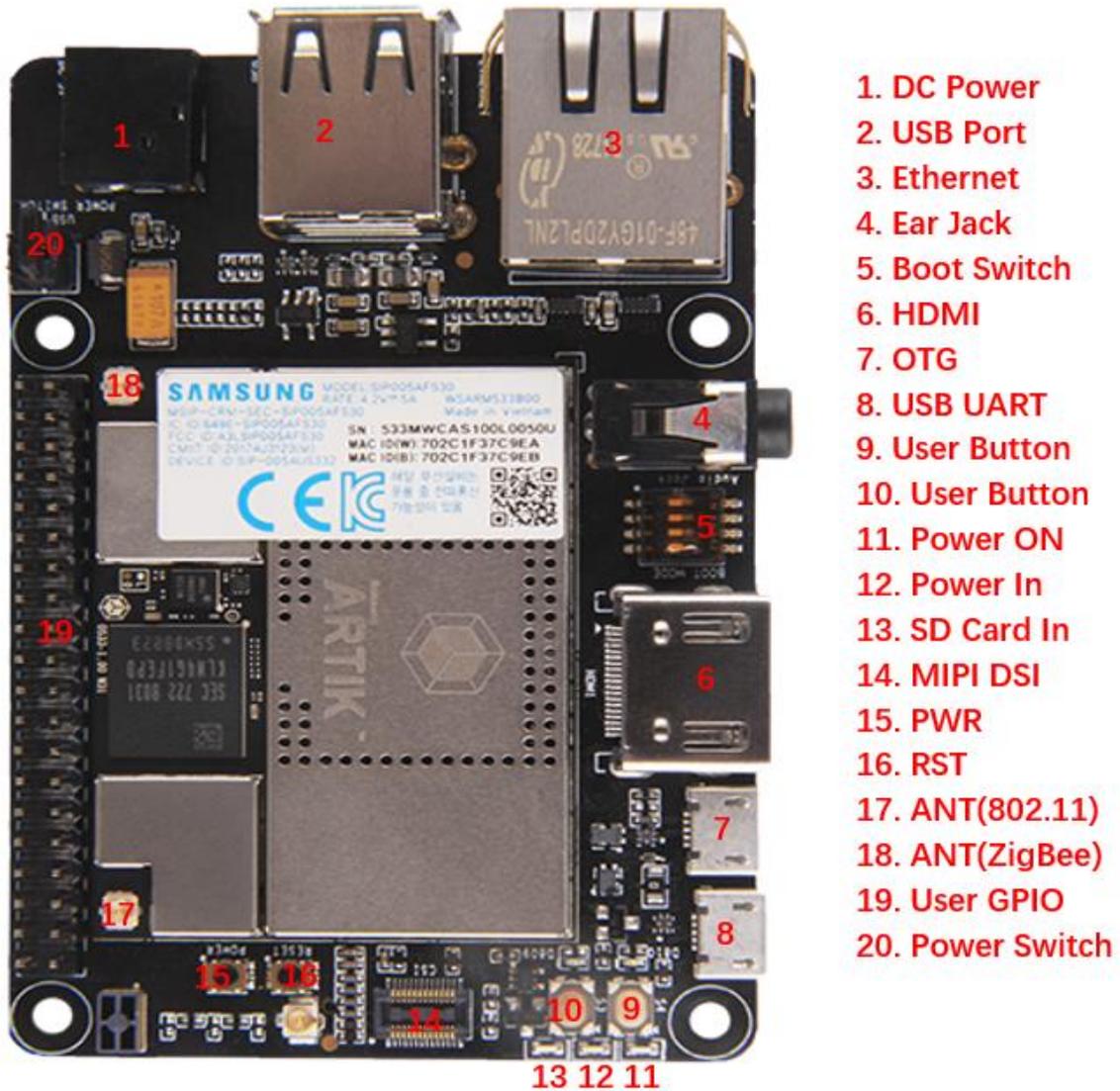
Figure 5. Top of Eagleye 530s
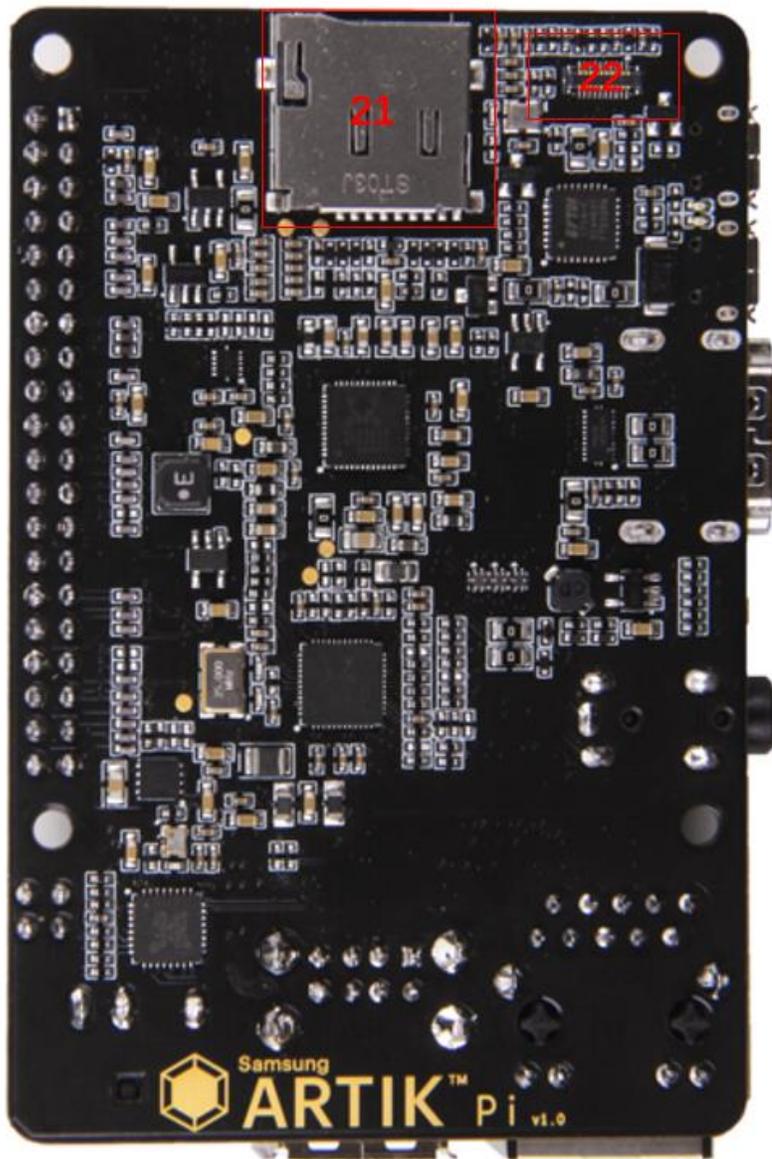
Figure 6. Bottom of Eagleye 530s

EAGLEYE 530S BOOT MODE CONFIGURATION

This section describes the various boot modes that are supported on the Eagleye 530s. _Table 2_ and Figure 7 show how to manipulate SW402 and where SW402 is located on the Interposer Board to set the various booting options that are available on the Eagleye 530s.

When 'eMMc 1st Boot' is selected as a booting option, the system will first try to boot from eMMc, if this fails the system will search for an SD Card to boot from. If booting from the SD-Card also fails the system tries to boot from USB. When choosing the SD-Card booting option, the system starts with booting from SD, and if this fails will continue to try a USB boot. When USB is selected as the booting mechanism of choice, only a USB boot will be attempted.

Table 2. Boot option that can be set on the Eagleye 530s

SW402	eMMc 1st Boot	SD Card 1st Boot	USB 1st Boot
1	Off	Off	On
2	Off	Off	On
3	X	X	X
4	Off	On	X
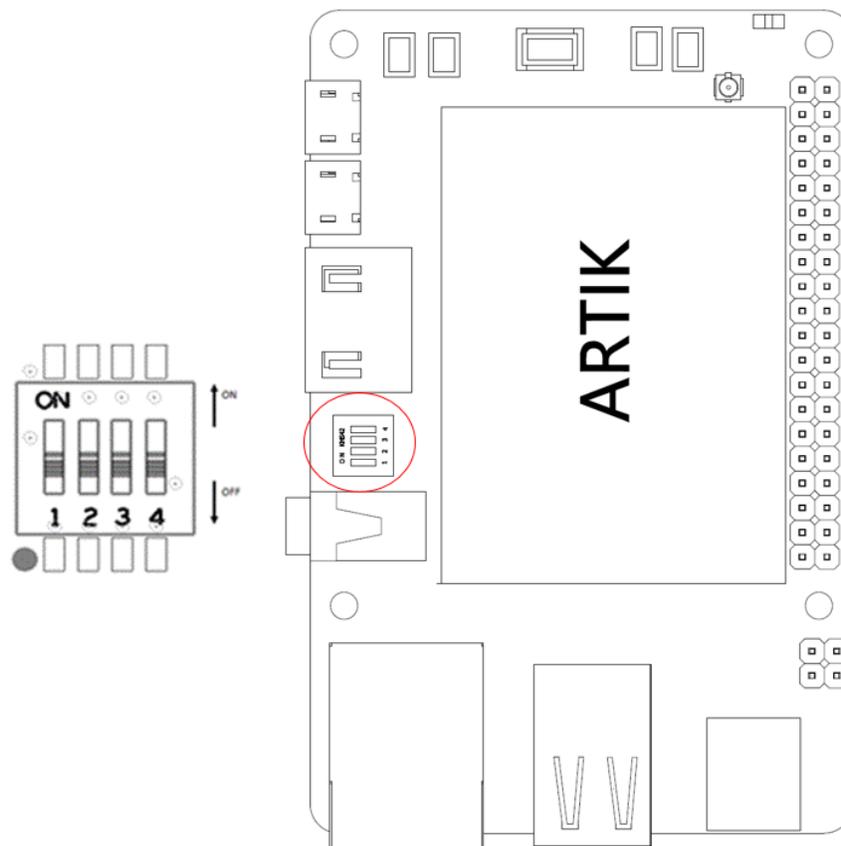
Figure 7. Eagleye 530s Booting Switch Location

USB OTG

The Eagleye 530s has one USB OTG connector located as can be seen in Figure 8
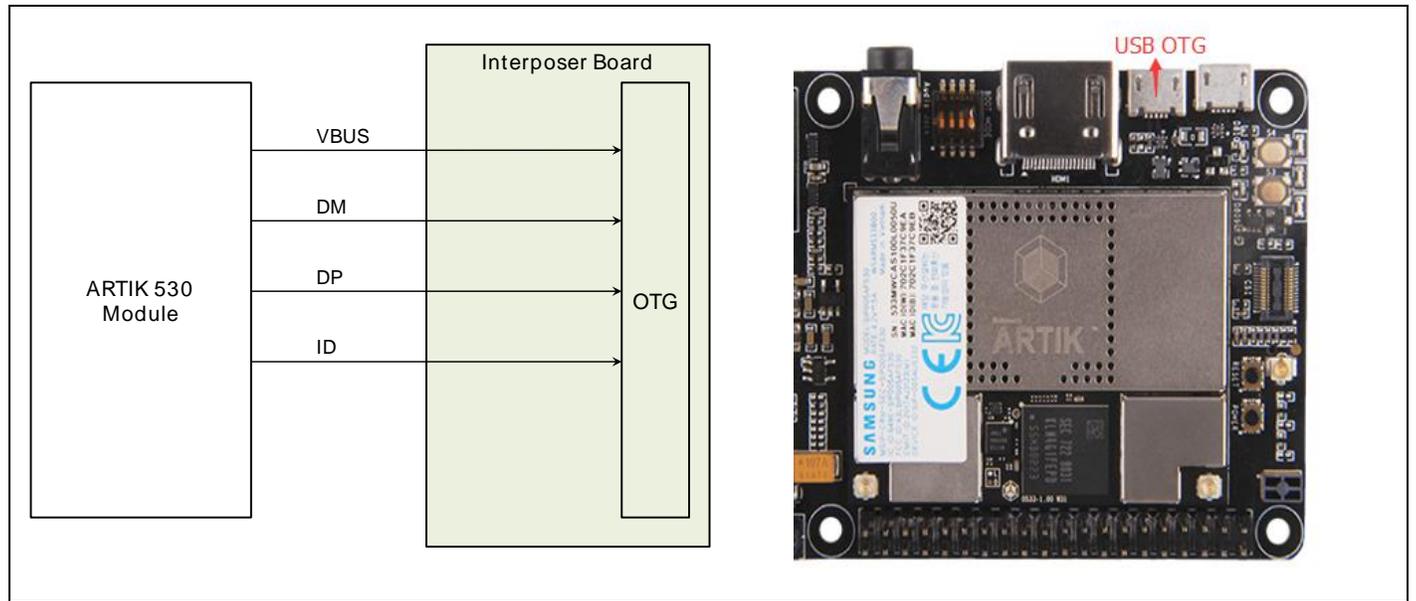
Figure 8. USB OTG Interface location on the Eagleye 530s

HDMI 1.4A

The Eagleye 530s has one HDMI 1.4a connector located as can be seen in Figure 9. The following video formats are supported:

1. 480p/480i @59.94Hz/60Hz, 576p/576i@50Hz
2. 720p/720i @50Hz/59.94Hz/60Hz
3. 1080p/1080i @50Hz/59.94Hz/60Hz
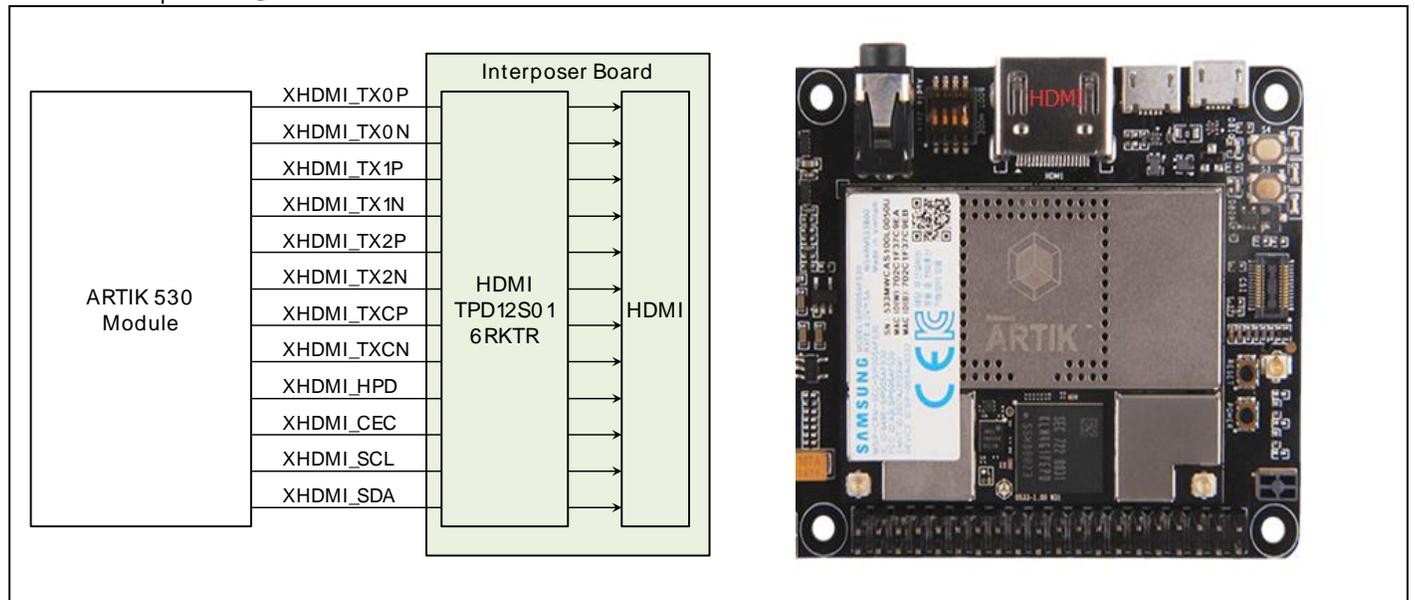
Figure 9. HDMI 1.4a Interface location on the Eagleye 530s

ETHERNET

The Eagleye 530s has one Ethernet Interface, its location can be seen in Figure 10. The Ethernet Interface is based on 802.3az-2010 complying to the Energy Efficient Ethernet (EEE) standard. The maximum theoretical speed of the interface is 1000Mbps.
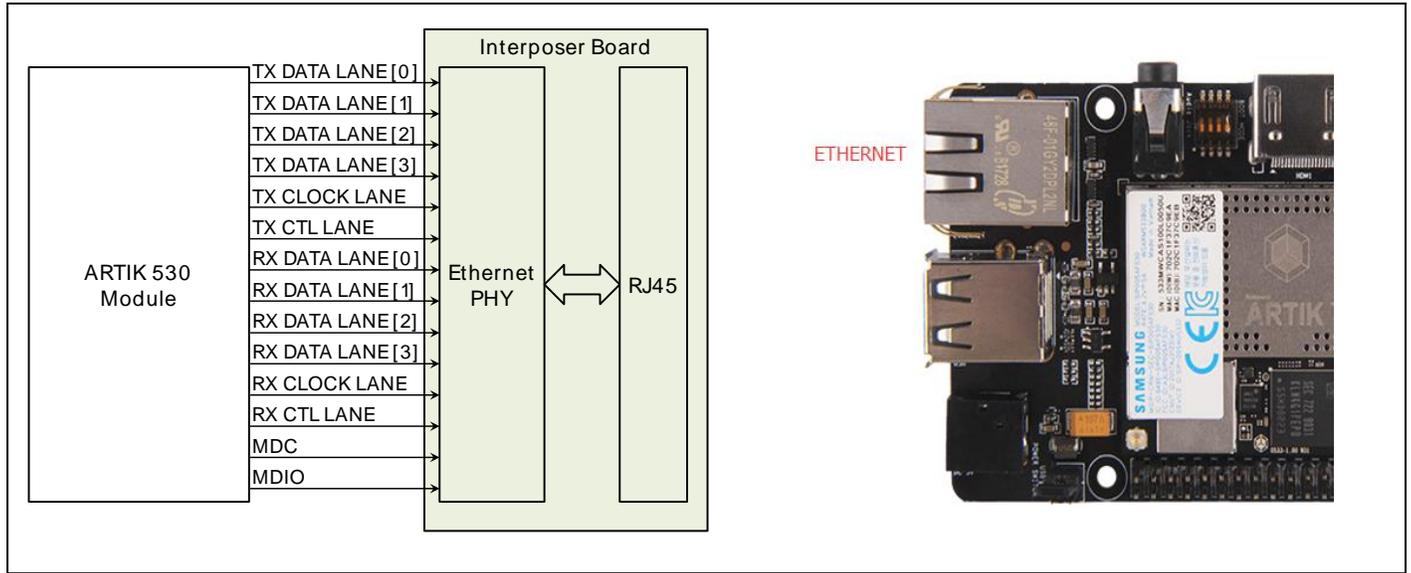
Figure 10. Ethernet Interface location on the Eagleye 530s

ANTENNA

If 802.11 or Bluetooth® functionality is required, the antenna which is enclosed as part of the Eagleye 530s has to be attached to the module as depicted in Figure 11.
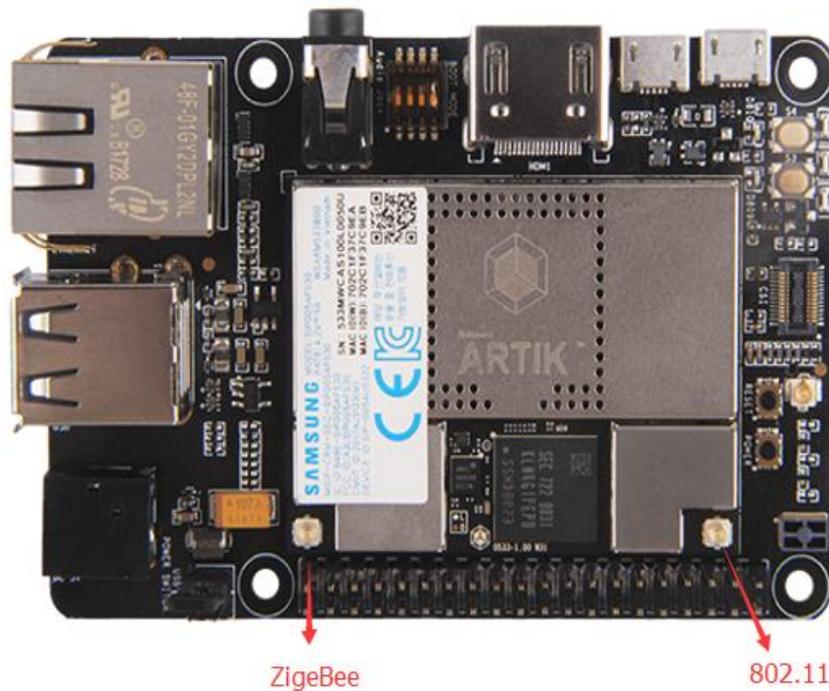
Figure 11. Antenna location on the Eagleye 530s

CONFIGURATION OF EXTERNAL POWER SOURCE

Through selection of the Jumpers JP1and JP2, the power source can be selected. When power is provided from a DC-5V Adapter , jumpers JP2 will be placed and 3-4 position will be connected.

When the jumpers JP1 are in the 1-2 position, the power is provided from the Micro USB.

Figure 12 shows the default settings and how to switch between the settings. When the Eagleye 530s is used with an external power adapter make certain that you use a 5V-2.5A adapter with a 2.1x5.5mm plug.
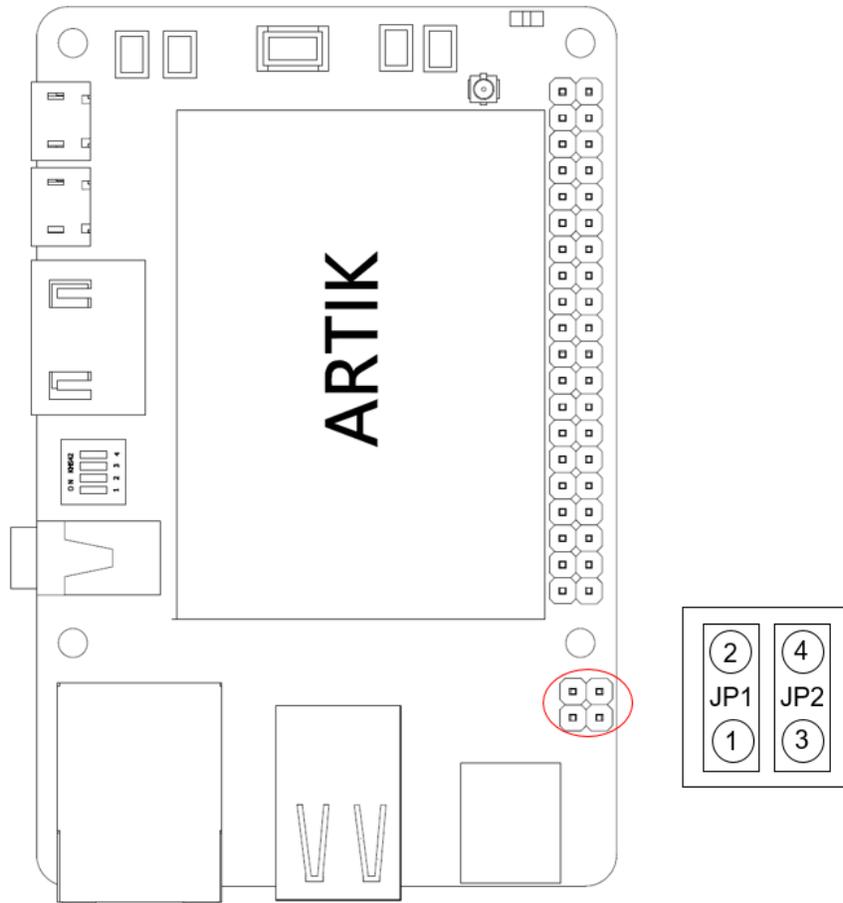
Figure 12. Jumper Interface locations JP1 or JP2 on Connectors

Warning : NEVER connect both at the same time!

SD-CARD INTERFACE

The Eagleye 530s has one SD-CARD interface supporting SD3.0 located as can be seen in Figure 13
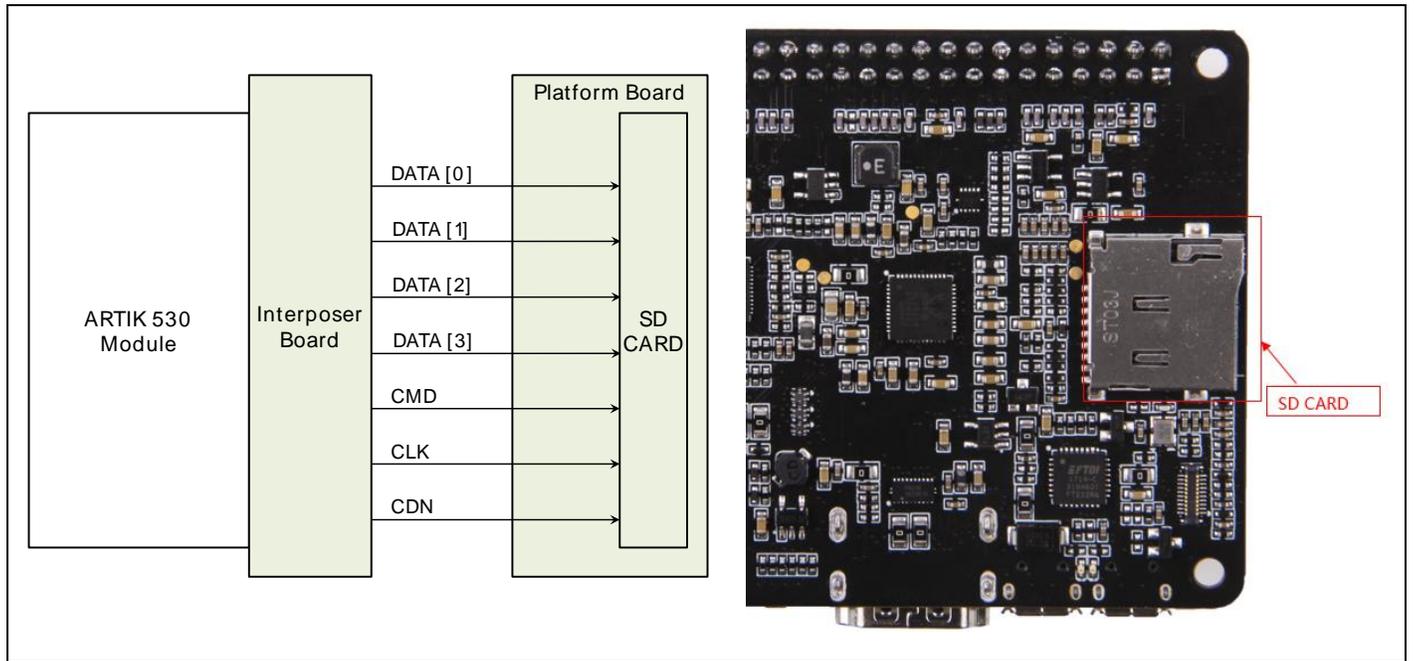
Figure 13. SD-Card Interface location on the Eagleye 530s

EARJACK INTERFACE

The Eagleye 530s has one 4 pin ear jack interface supporting stereo audio as can be seen in Figure 14
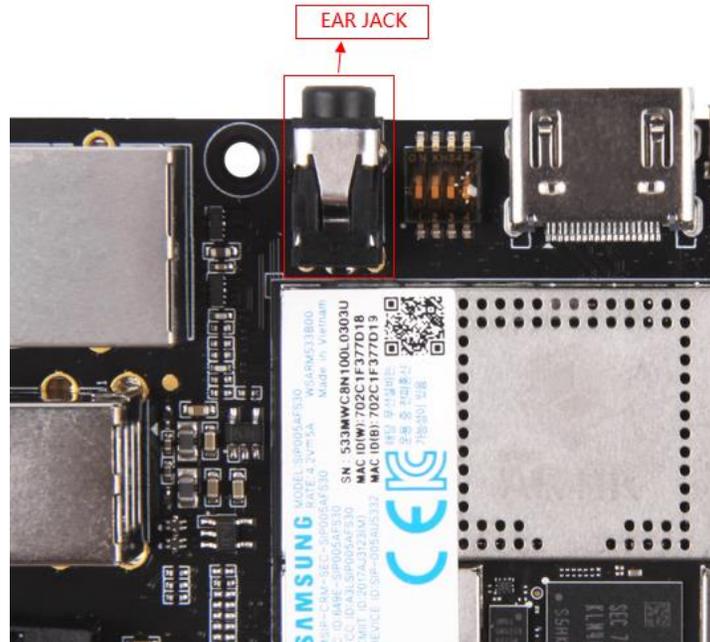
Figure 14. Ear Jack Interface location on the Eagleye 530s

MIPI CSI INTERFACE

The Eagleye 530s has one MIPI CSI interface. The location of the MIPI CSI interface can be seen in Figure 15. The MIPI CSI interface can have a static resolution of 5M pixels or a dynamic resolution for video capturing of 1080P.
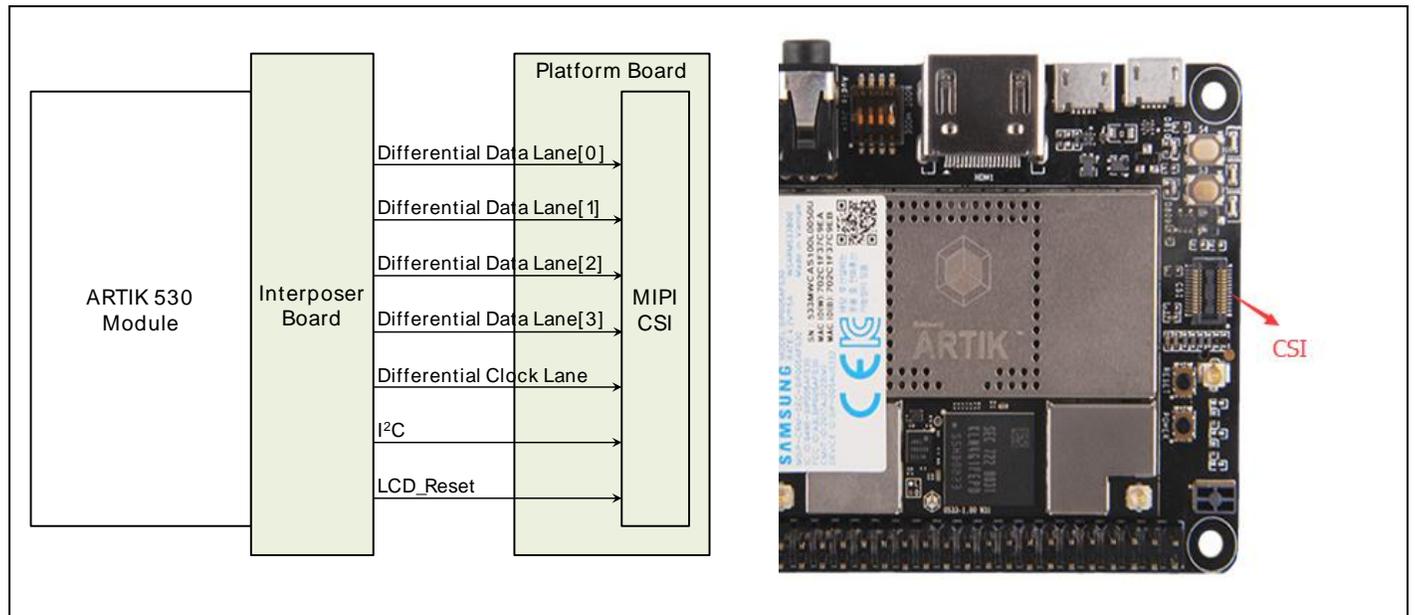
Figure 15. MIPI CSI Interface Location on the Eagleye 530s

USB HOST 2.0 INTERFACE

The Eagleye 530s has two USB 2.0 Interface. The location of the USB 2.0 interface can be seen in Figure 16
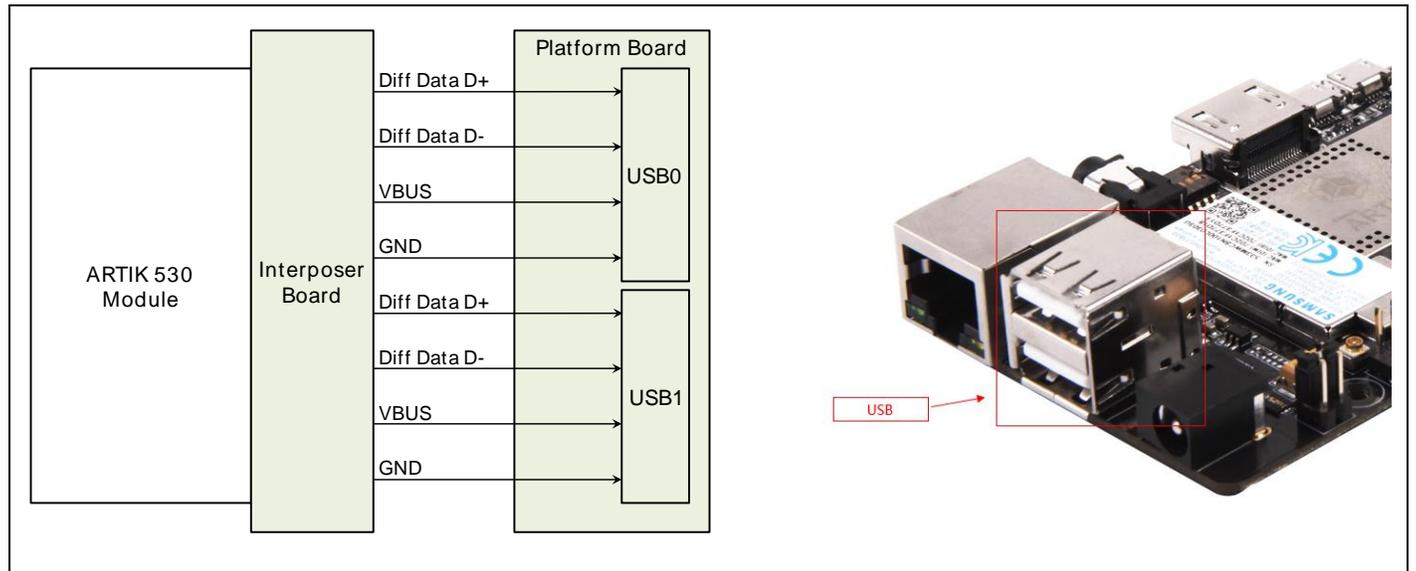
Figure 16. USB2.0 Interface location on the Eagleye 530s

THE CONNECTOR INTERFACE

The Eagleye 530s has one expansion connector that can be seen in Figure 17 This connector enables for expansion possibilities.

GPIO
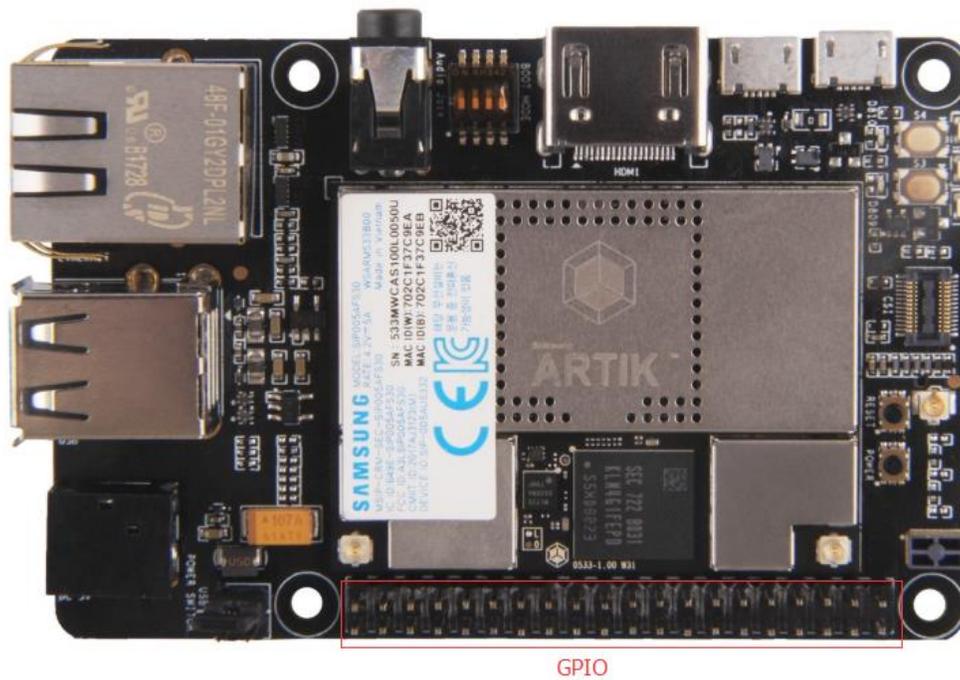
Figure 17. Expansion Connector Interface location on the Eagleye 530s

Figure 18 shows the expansion connector.

In addition

Table 3 show the pinout of the connectors with its meaning.
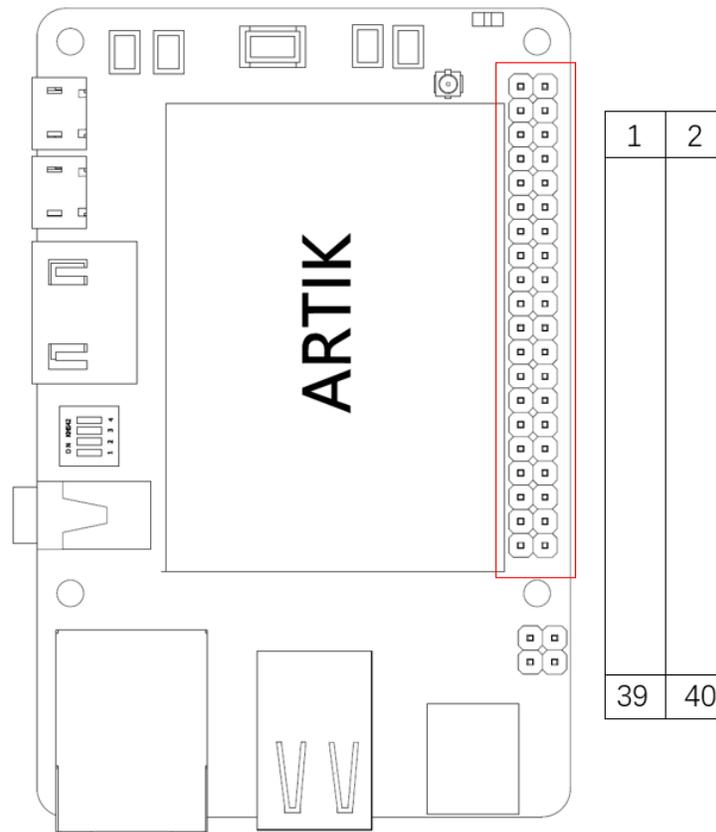
Figure 18. The expansion connector on the Eagleye 530s

Table 3. The pinout of the connectors with its meaning

Pin Name	Pin Number	Pin Number	Pin Name
3.3V	1	2	5V
XI2C0_SDA	3	4	5V
XI2C0_SCL	5	6	GND
XAGPIO0	7	8	XUART0_TX
GND	9	10	XUART0_RX
XGPIO0	11	12	I2SBCK1
XGPIO1	13	14	GND
PWM2	15	16	XGPIO2
3.3V	17	18	XGPIO3
XSPIO_MOSI	19	20	GND
XSPIO_MISO	21	22	PWM0
XSPIO_CLK	23	24	XSPIO0_CS
GND	25	26	XGPIO4
NC	27	28	NC
XGPIO9	29	30	GND
XGPIO6	31	32	XGPIO7
XGPIO8	33	34	GND
I2SLRCLK1	35	36	XADC0
XADC1	37	38	I2SDIN1
GND	39	40	I2SDOUT1

EAGLEYE 530S BOOTING

This section will describe how to start working with your Eagleye 530s Development Environment by setting up a serial connection on your development PC and booting up the Eagleye 530s Development Environment.

SERIAL PORT CONNECTION

As a first step we will select a serial console to communicate with Eagleye 530s Development Environment. You can use a typical windows serial console as depicted in Figure 19. Eagleye 530s have a onboard USB to Serial converter. Just connect a Micro USB cable to debug port. To use the serial USB cable you need to install the associated device driver. Figure 20 depicts the USB serial cable and where it is hooked up to the Eagleye 530s.
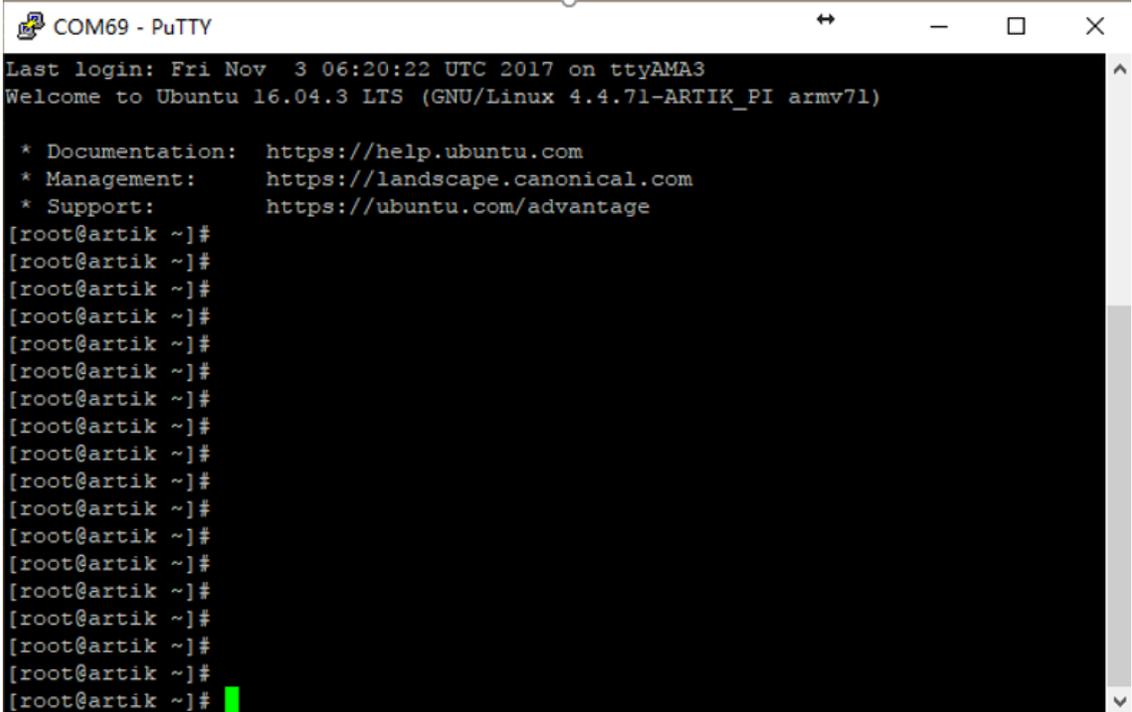
Figure 19. Typical Linux® Serial Console
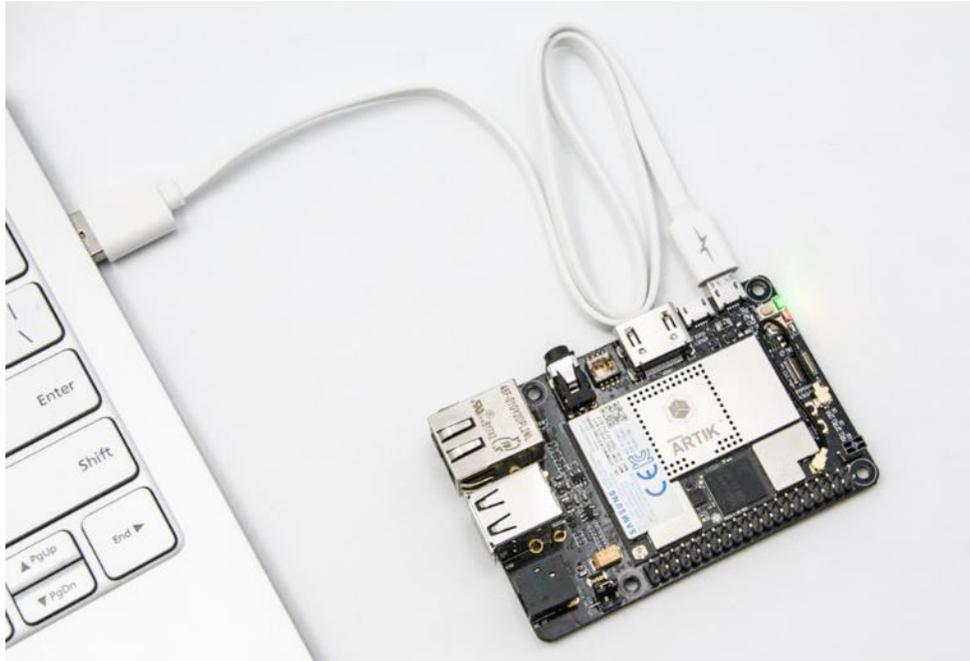
Figure 20. USB Cable hooked up to the Eagleye 530s

TERMINAL EMULATOR INSTALLATION

Setting up a connection with the ARTIK 530 Module can be done in a wired or wireless manner. Here we choose to install PuTTY a free serial console. The software can be downloaded from *http://www.putty.org/*. Once downloaded go through the following steps:

1. Open the device manager on the control panel.
2. When using a PC install the USB to Serial driver. The driver can be found at the following location: (*http://www.ftdichip.com/Drivers/CDM/CDM21218_Setup.zip*). For other drivers please visit (*http://www.ftdichip.com/Drivers/D2XX.htm*).
3. Check the COM port number on your PC when you connect the USB serial cable. In our case the COM port allocated is COM9.

4. Set the PuTTY configuration as follows:
    a. Set the "Serial line" as the COM port number found in step 3.
    b. Set the COM speed to "115200".
    c. Set the connection type to "Serial".
    d. Save the session under ARTIK-Pro.
5. Select your saved session and click the "Open" button.
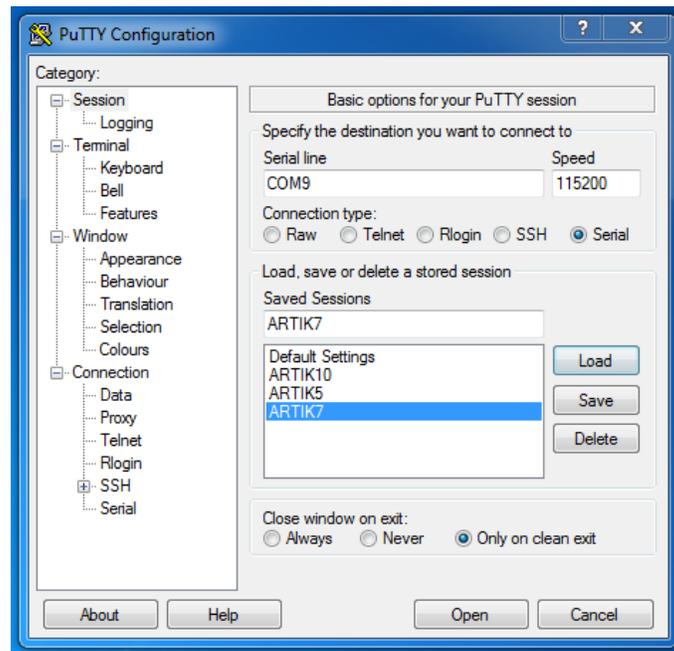
POWER ON THE EAGLEYE 530S

To power up the Eagleye 530s Development Environment you first have to connect the power adapter as shown in Figure 21. In addition make certain that the jumpers JP2 located on the Eagleye 530s are set in state with 3-4 position be connected *Configuration of External Power Source* section for details.
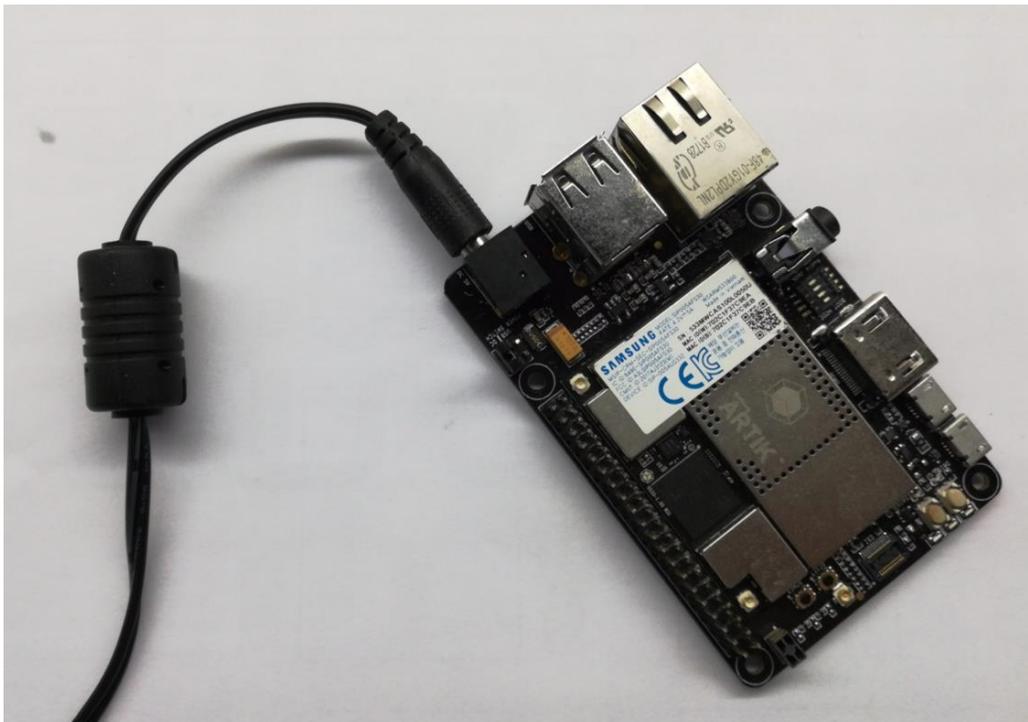
Figure 21. Connection Power adaptor with the Eagleye 530s

Turn on the power switch as shown in Figure 22
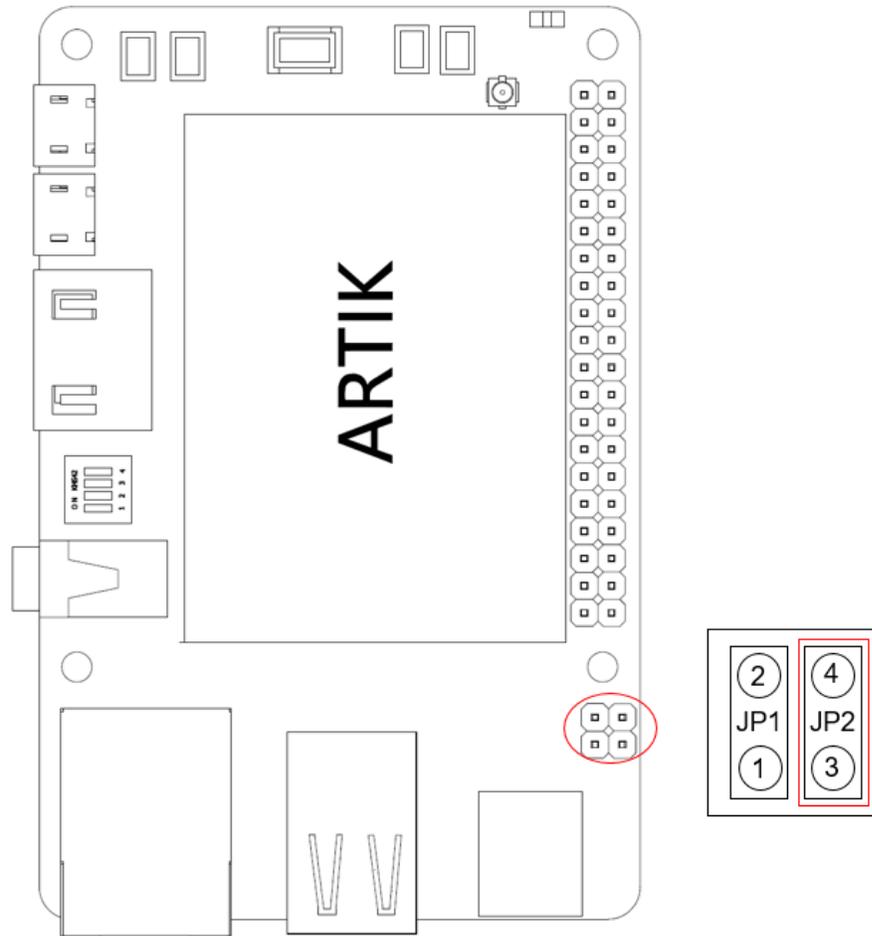
Figure 22. Power switch location on the Eagleye 530s

Once the power switch is turned on, push the power button (S1), as depicted in Figure 23, for about 1 second. Once released the booting process will start and you should see booting messages from your console, using the serial connection that you previously established.

Figure 23. Power button location on the Eagleye 530s

FCC regulatory compliance information

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.

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

End Device Labelling

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID:XXXXX" any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device. Integrator shall bear the following statement in a conspicuous location on the device:

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.

For special device, please refer to § 15.19 (a)(5). For E-label approach, please refer to §2.935.

RF Exposure Compliance

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 of 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Installation Notice

The module is limited to OEM installation ONLY. The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application; A separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and difference antenna configurations.

FCC Part 15B Compliance of End Device

The OEM integrator is responsible for ensuring that the host product which is installed and operating with the module is in compliant with Part 15B unintentional Radiator requirements, please note that For a Class B digital device or peripheral, the instructions furnished the user manual of the end-user product shall include the following or similar statement, placed in a prominent location in the text of the manual:

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.

Industry Canada Regulatory Compliance Information

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, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

End Device Labelling

Please notice that if the IC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: 21046-EAGLEYE530S" any similar wording that expresses the same meaning may be used.
L'étiquette d'homologation d'un module d'Innovation, Sciences et Développement économique Canada devra être posée sur le produit hôte à un endroit bien en vue, en tout temps. En l'absence d'étiquette, le produit hôte doit porter une étiquette sur laquelle figure le numéro d'homologation du module d'Innovation, Sciences et Développement économique Canada, précédé du mot « contient », ou d'une formulation similaire allant dans le même sens et qui va comme suit : Contient IC : 21046-EAGLEYE530S est le numéro d'homologation du module.

Notice to End Device Integrator

The host product 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 shown in this manual.
Le produit hôte intégrateur doit être conscient de ne pas fournir d'informations à l'utilisateur final sur la manière d'installer ou de retirer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module. Le manuel de l'utilisateur final doit inclure toutes les informations / avertissements réglementaires requis, comme indiqué dans ce manuel.

RF Exposure Compliance

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.
Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

The host product and all the separately certified modules therein shall jointly meet the radio frequency (RF) exposure compliance requirements of RSS-102.
Le produit hôte, de même que tous les modules homologués séparément qu'il comporte, devront être conjointement conformes aux exigences d'exposition aux radiofréquences du CNR-102.

5G Wi-Fi Use Notice

LE-LAN devices are restricted to indoor operation in the band 5150-5250 MHz to reduce the potential for harmful interference to co-channel mobile satellite systems. However, original equipment manufacturer (OEM) devices, which are installed in vehicles by vehicles manufacturers, are permitted.
Les appareils LE-LAN sont limités à un fonctionnement en intérieur dans la bande 5150-5250 MHz afin de réduire le risque de brouillage préjudiciable aux systèmes mobiles par satellite dans le même canal. Cependant, les dispositifs du fabricant d'équipement d'origine (OEM), qui sont installés dans les véhicules par les fabricants de véhicules, sont autorisés.

the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.
le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Manufacturer Information

Company Name: Seeed Technology Co., Ltd.
Company Address: 1F, Tower B, Building 2, Shanshui Building, NanshanYungu Innovation Industry Park,
Liuxian Ave, Nanshan District, Shenzhen, Guangdong ，P.R.C.

Zip：518055

Tel：0086 755 86524359

Fax：0086 755 26978025

CE Doc

Hereby, Seeed Technology Co., Ltd. declares that the radio equipment type [Eagleye 530s] is in compliance with Directive

2014/53/EU.The full text of the EU declaration of conformity is available at the following internet address:

https://www.seeedstudio.com/Eagleye-530s-p-3035.html