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HANDLING GUIDE

Precaution against Electrostatic Discharge

When using the ARTIK 530 Board, ensure that the environment is protected against static electricity:

Contamination

Do not use the ARTIK 530 Board in an environment exposed to dust or dirt adhesion.

Temperature/Humidity

The ARTIK 530 Board is sensitive to:

1. Environment
2. Temperature
3. Humidity

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

Mechanical Shock

Do not to apply excessive mechanical shock or force on the ARTIK 530 Board.

Chemical

Do not expose the ARTIK 530 Board to chemicals. Exposure to chemicals leads to reactions that deteriorate the characteristics of the ARTIK 530 Board.

EMS (Electro Magnetic Susceptibility)

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



ARTIK 530 DEVELOPMENT BOARD OVERVIEW

FEATURES

The ARTIK 530 Development Board consists of 1x Interposer Board , 1x Platform Board, and 1x IF Board. The Interposer Board does include the ARTIK 530 Module. The ARTIK 530 Development Board is an affordable approach for developing an IoT solution. *Figure 1* show the locations of the various boards that make up the ARTIK 530 Development Board.

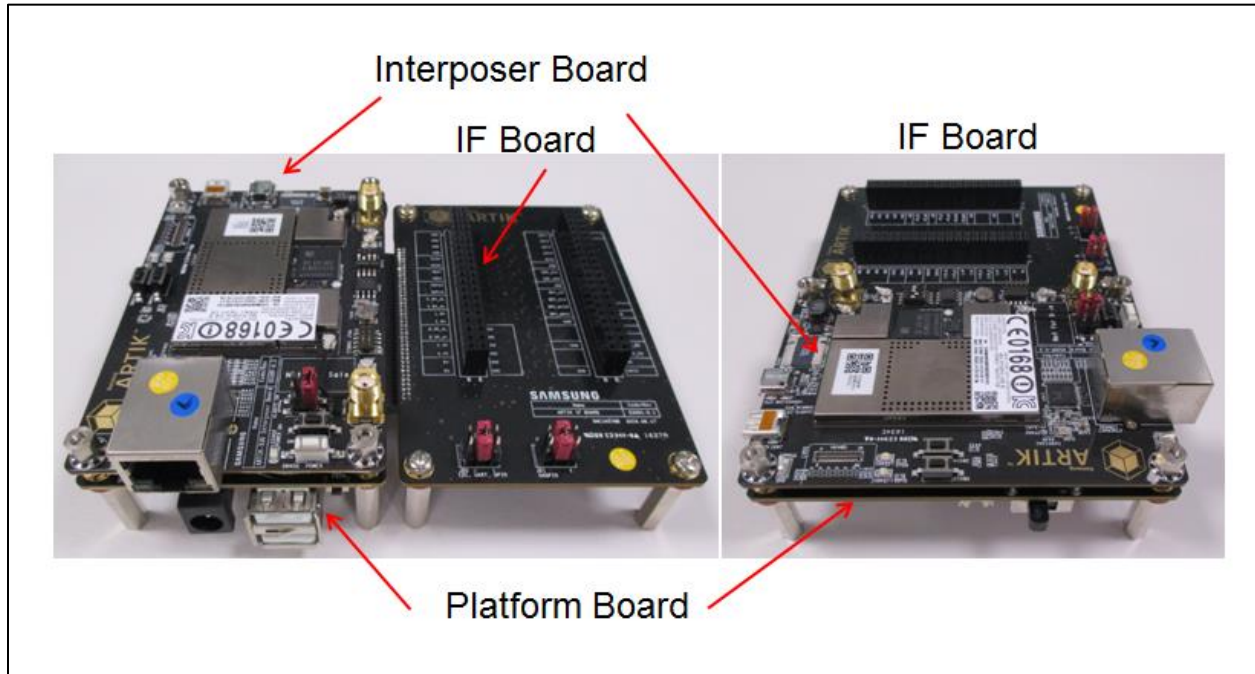


Figure 1. Preview of the ARTIK 530 Board

BLOCK DIAGRAM

Figure 2 shows the block diagram of the ARTIK 530 Development Board, if you want more information on the ARTIK 530 Module please consult the ARTIK 530 Module Datasheet.

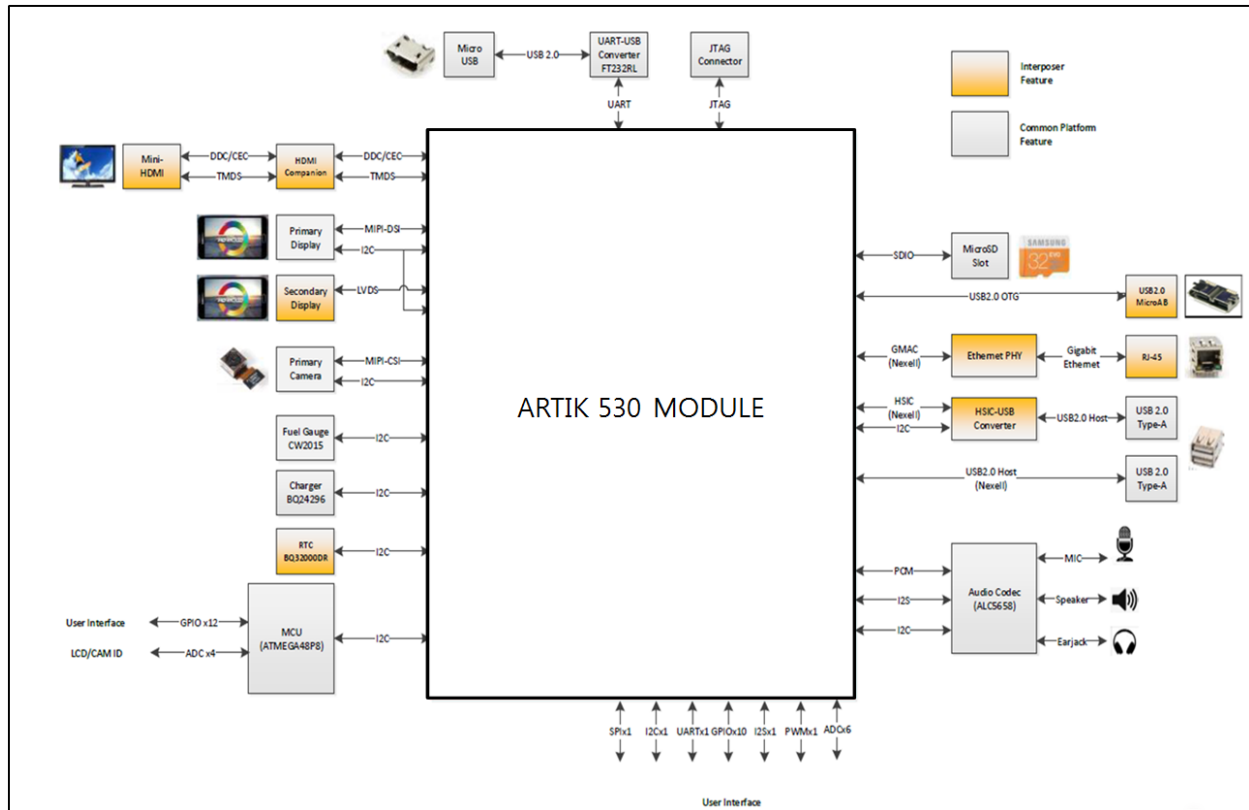


Figure 2. ARTIK 530 Development Board

MECHANICAL DRAWINGS

Figure 3 and Figure 4 show the ARTIK 530 Development Board Interposer Board and the Platform Board respectively.



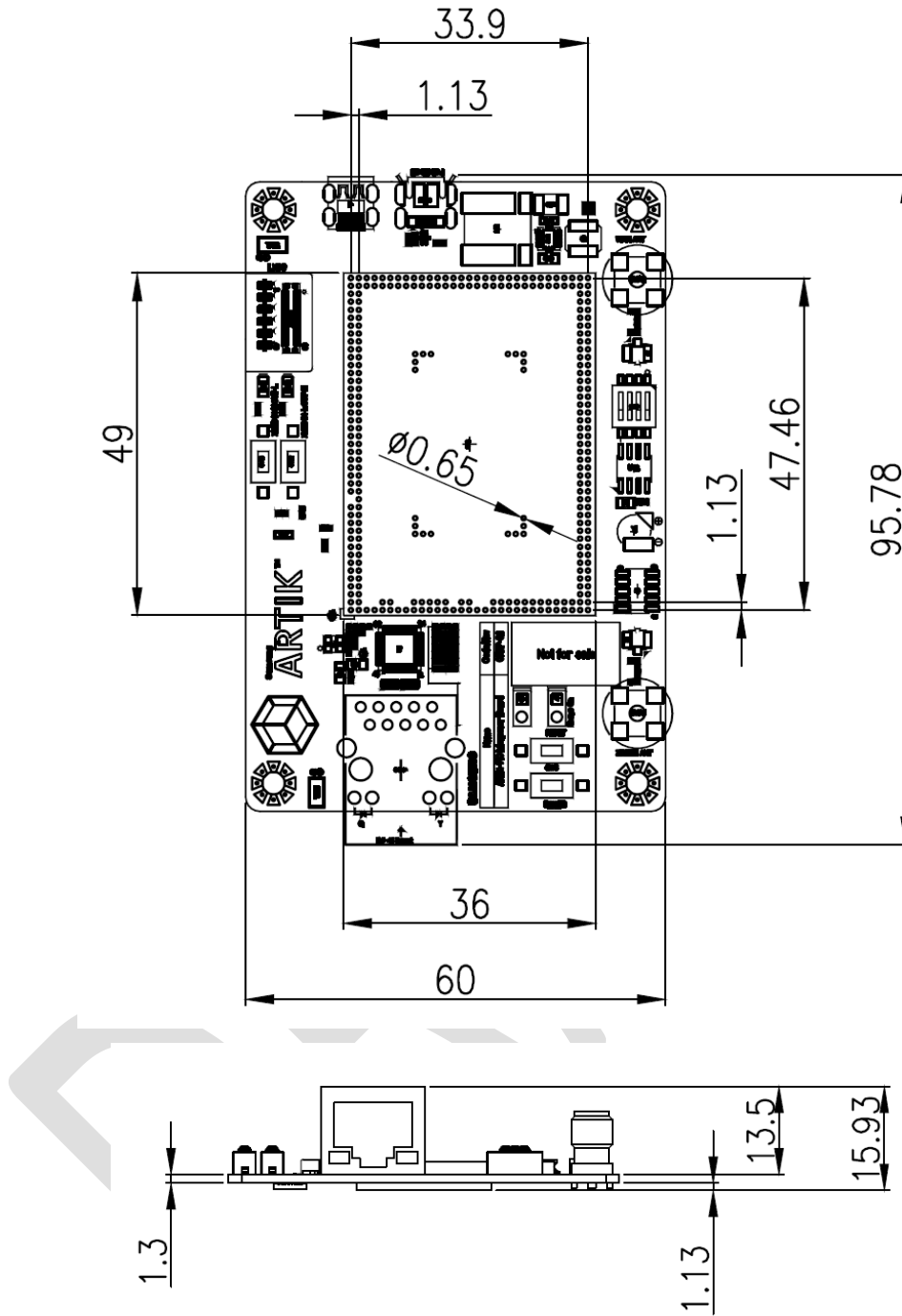


Figure 3. Mechanical Drawing ARTIK 530 Development Board Interposer Board all dimensions are in [mm]



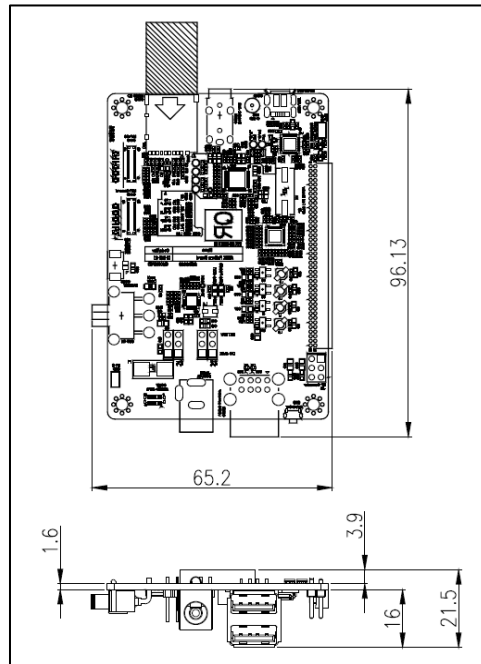


Figure 4. Mechanical Drawing ARTIK 530 Development Board Platform Board all dimensions are in [mm]

ARTIK 530 MODULE

The ARTIK 530 Development Board contains the ARTIK 530 Module. This section will describe some of the main features of this module. For more information on the ARTIK 530 Module please consult the ARTIK 530 Module datasheet.

ARTIK 530 MODULE SPECIFICATION

The ARTIK 530 Module 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 Wi-Fi or ZigBee. In addition the ARTIK 530 Module has mass storage functionality and its own security solution. Table 1 shows the main features of the ARTIK 530 Module that is part of the ARTIK 530 Development Board.

Table 1. Main Features of the ARTIK 530 Module

Processor		
	CPU	4x ARM® Cortex-A9@1.2GHz
	GPU	3D graphics accelerator
Media		
	Camera I/F	4-Lane MIPI CSI
	Display	4-Lane MIPI DSI up to FHD@24bpp
	Audio	I ² S audio interface
Memory		
	DRAM	512MB DDR3 @ 800MHz
	FLASH	4GB eMMC
Security		
	Secure Element	Secure point to point authentication and data transfer
	Trusted Execution Environment	Trustware
Radio		
	WLAN	IEEE 802.11a/b/g/n
	Bluetooth	4.2+LE
	802.15.4	ZigBee + Thread
Power Management		
	PMIC	Provides all power of the ARTIK 530 Module using on board bucks and LDOs
Interfaces		
	Analog and Digital I/O	GPIO, I ² C, SPI, UART, SDIO, USB 2.0, JTAG, Analog Input



ARTIK 530 DEVELOPMENT BOARD INTERPOSER BOARD

The Interposer Board as depicted in *Figure 5* highlights the most important components on the Interposer board.

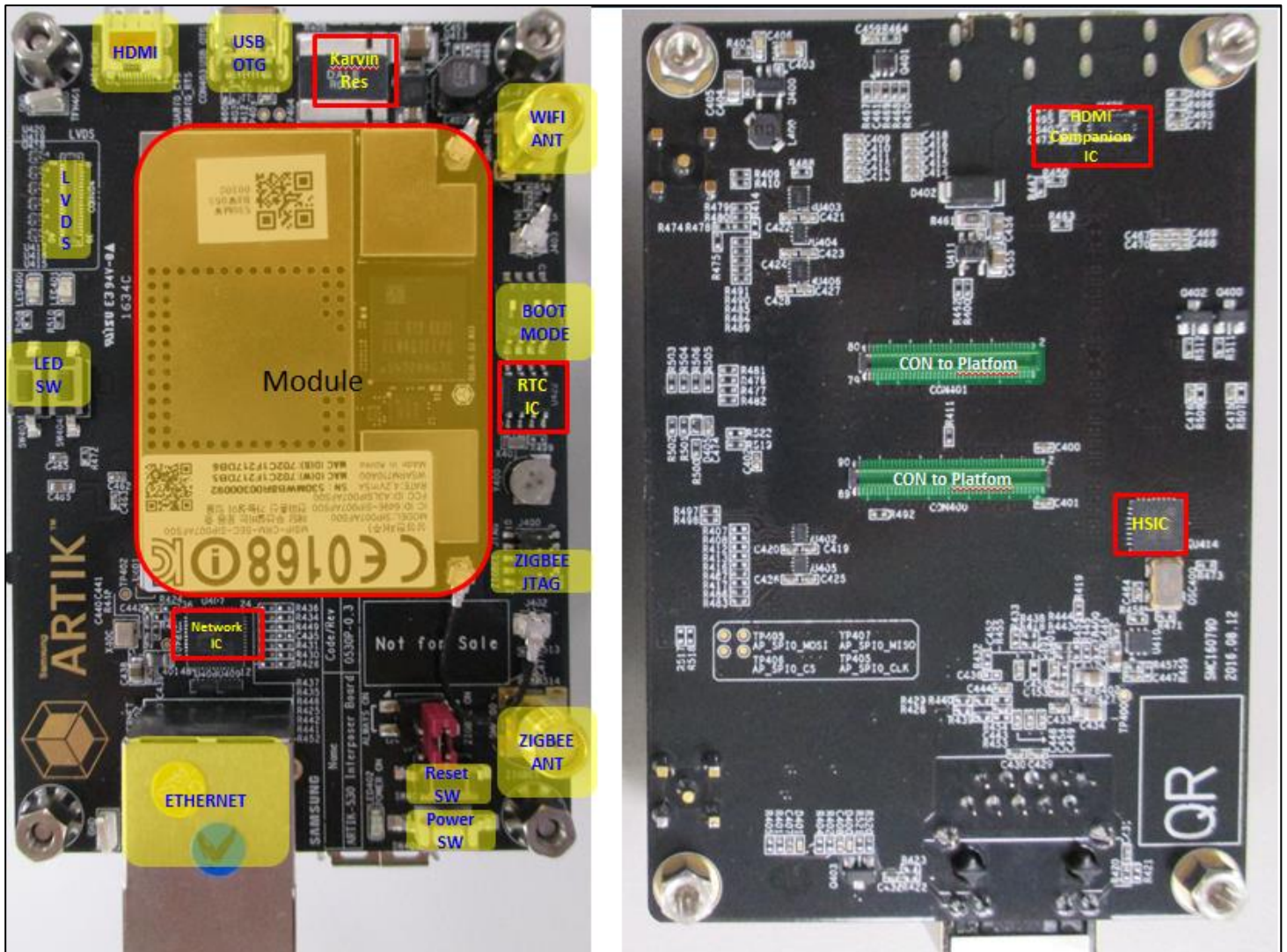


Figure 5. ARTIK 530 Development Board Interposer Board Left Top Side, Right Bottom Side



INTERPOSER BOARD BOOT MODE CONFIGURATION

This section describes the various boot modes that are supported on the ARTIK 530 Development Board. [Table 2](#) and [Figure 6](#) show how to manipulate SW4 and where SW4 is located on the Interposer Board to set the various booting options that are available on the ARTIK 530 Development Board.

Table 2. Boot option that can be set on the Interposer Board

SW4	eMMC 1 st Boot	SD Card 1 st Boot	USB 1 st Boot
AP_GPB13_SD0_BOOT	Off	Off	On
AP_GPB15_SD1_BOOT	Off	Off	On
AP_GPB4_VID1_3_BOOT	Off	On	X

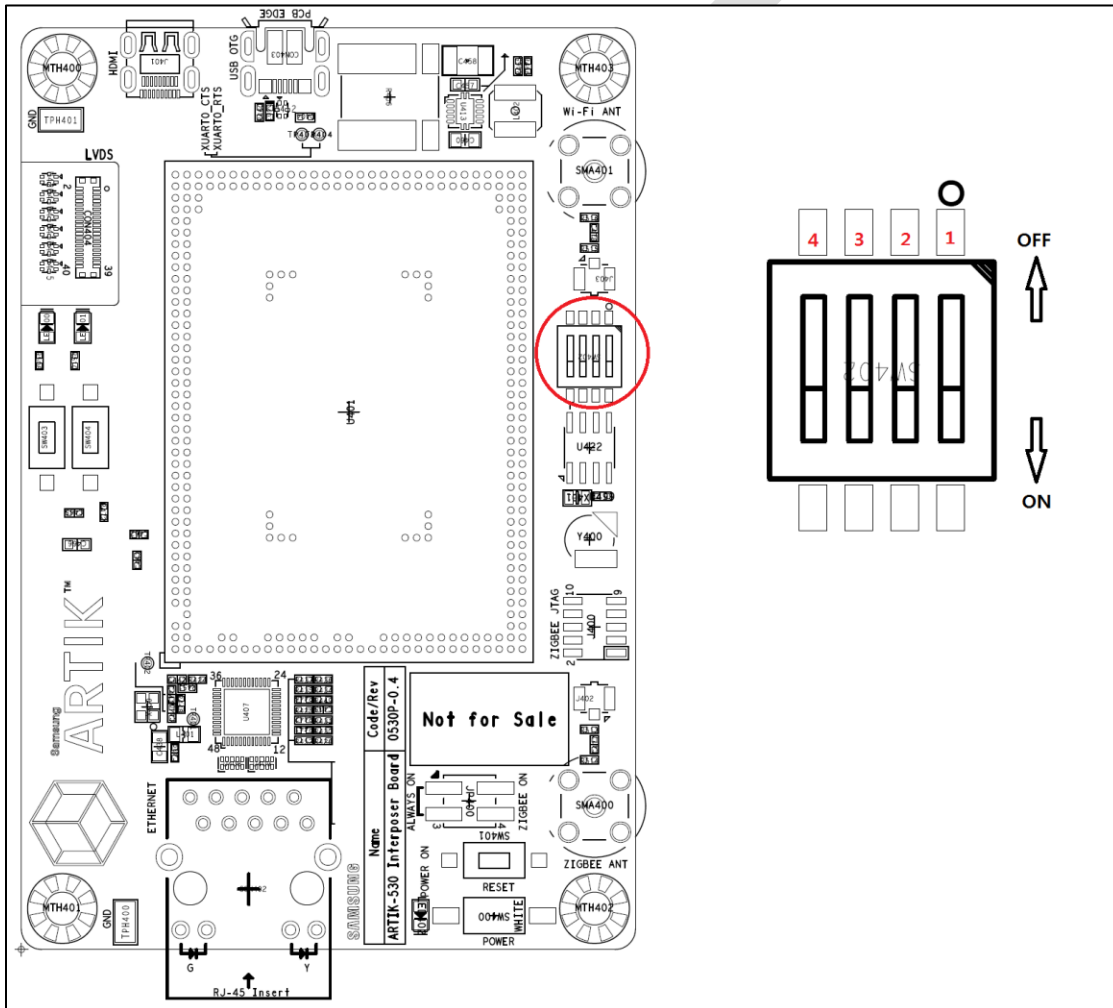


Figure 6. ARTIK 530 Development Board Booting Switch Location



USB OTG

The Interposer board has 1x USB OTG connector located as can be seen in [Figure 7](#).

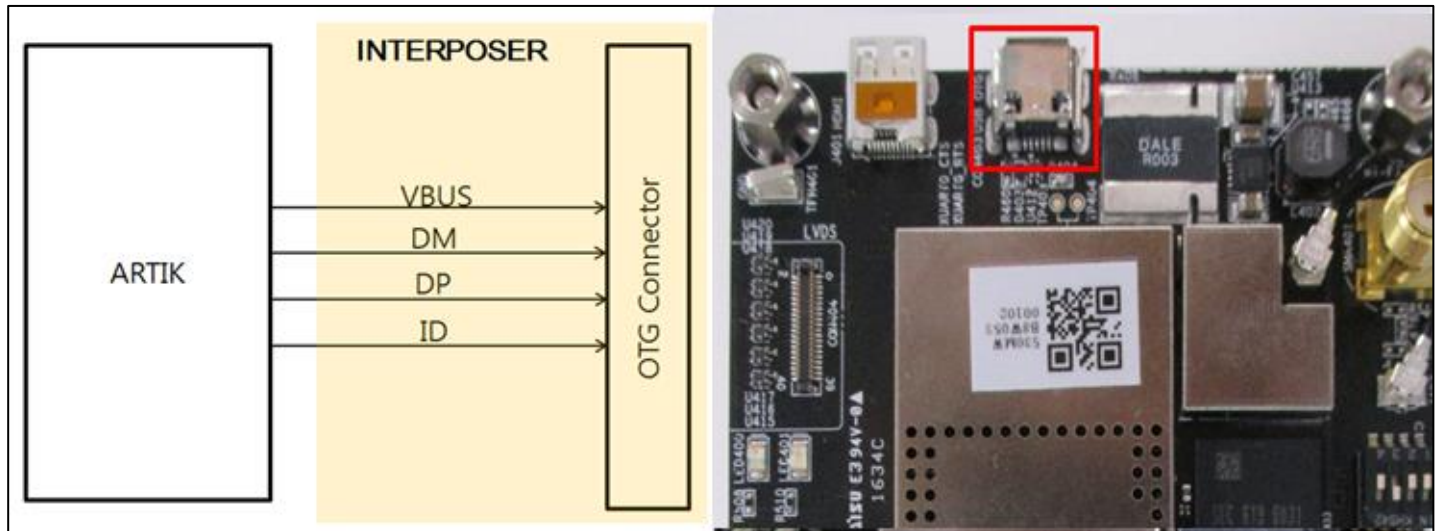


Figure 7. USB OTG Interface location on the Interposer Board

HDMI 1.4A

The Interposer board has 1x HDMI 1.4a connector (Micro D-Type) located as can be seen in [Figure 8](#). 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

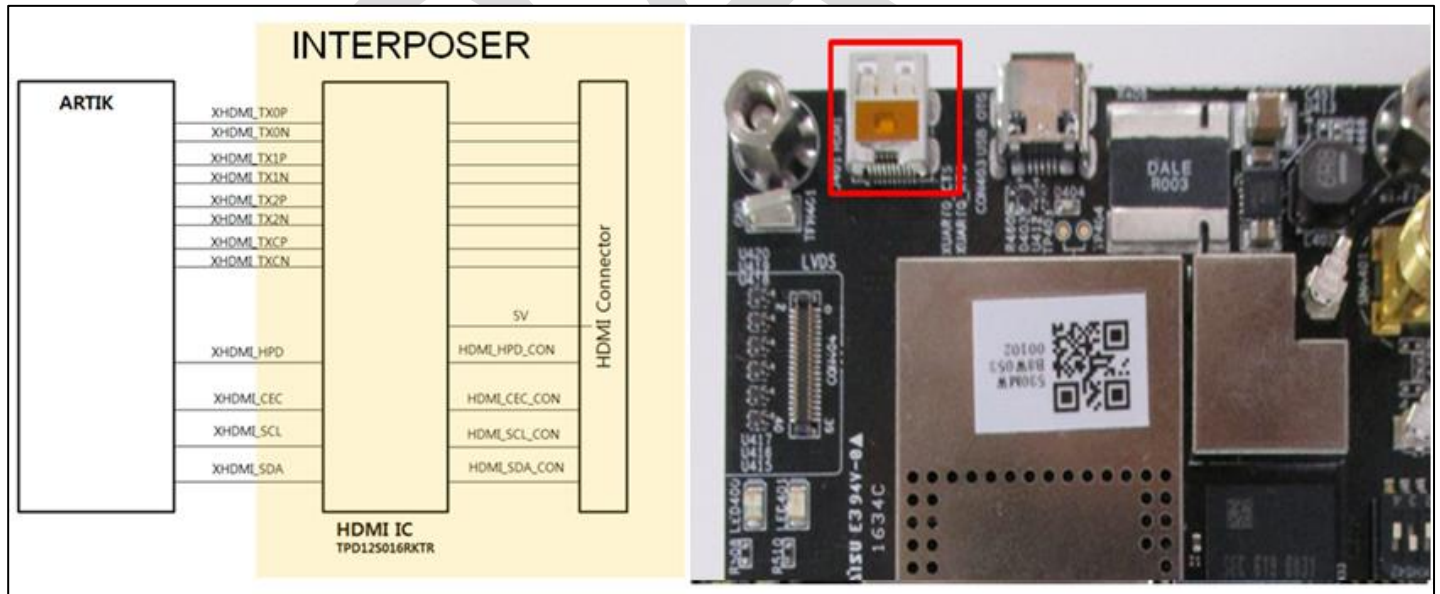


Figure 8. HDMI 1.4a Interface location on the Interposer Board



LVDS

The Interposer board has 1x LVDS Interface containing 5x data channels and 1x clock channel, its location can be seen in [Figure 9](#). The available maximum resolution is 1920x1080@60fps.

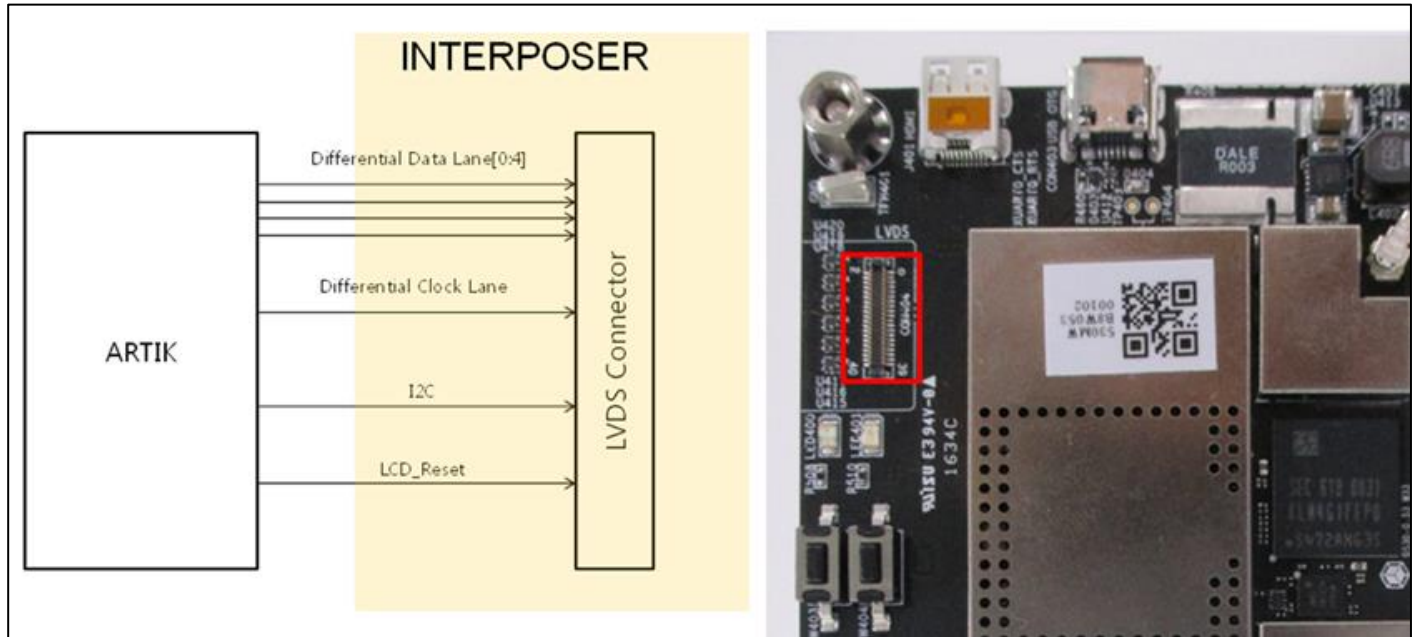


Figure 9. LVDS Interface location on the Interposer Board

ETHERNET

The Interposer board has 1x 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.

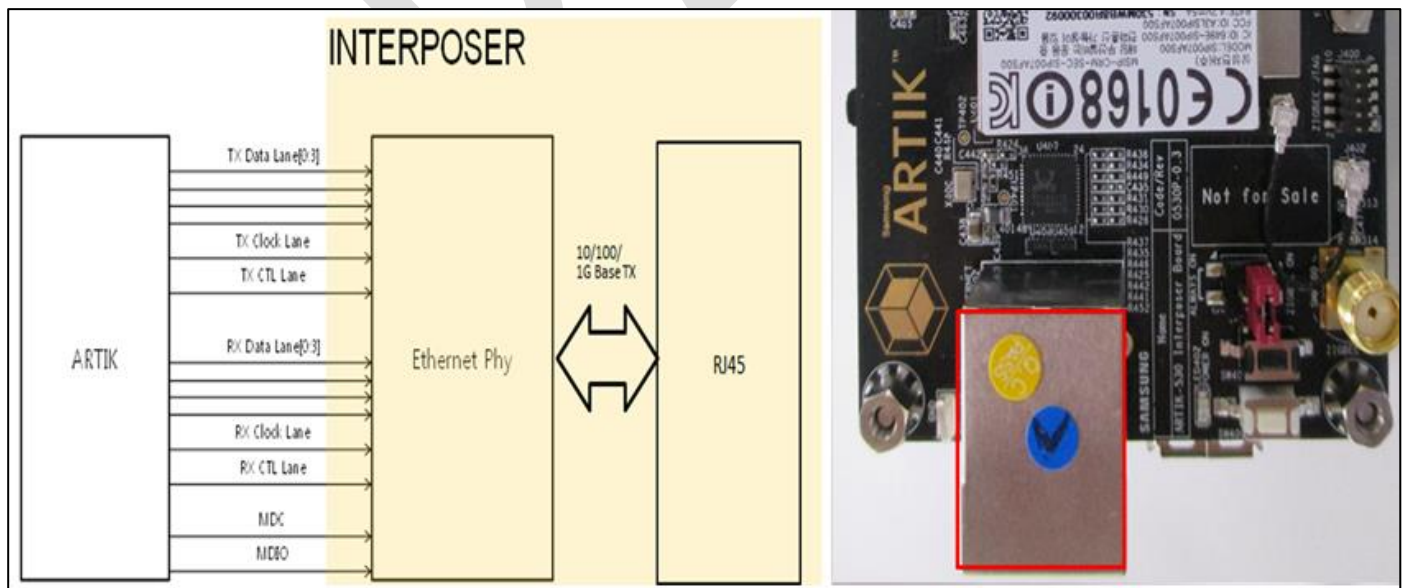


Figure 10. Ethernet Interface location on the Interposer Board



ANTENNA

Antenna which is enclosed in KIT has to be assembled on Interposer board if use Wifi/BT and Zigbee.

Antena spec can be seen in [Table 3](#)

Table 3 Antenna spec

Antenna type	Dipole Antenna
Antenna peak gain	+1.43(2.4GHz)/ +0.91(5GHz)
Frequency	2.4GHz, 5GHz (for Wi-Fi, BT, ZigBee)
Connector type	SMA-M
ANT.Size	108.7mm

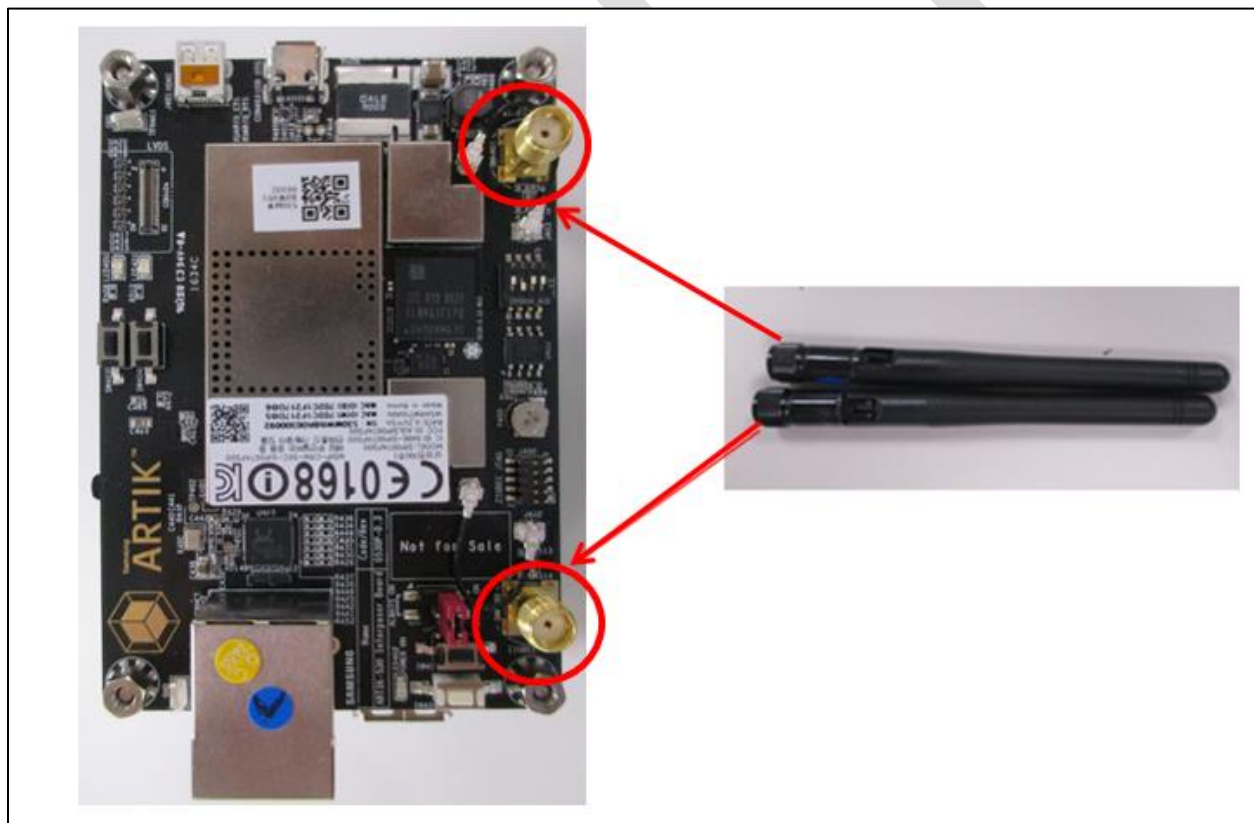


Figure 11. Antenna location on the Interposer Board



ARTIK 530 DEVELOPMENT BOARD PLATFORM BOARD

The Platform Board as depicted in *Figure 12* highlights the most important components on the Interposer board.

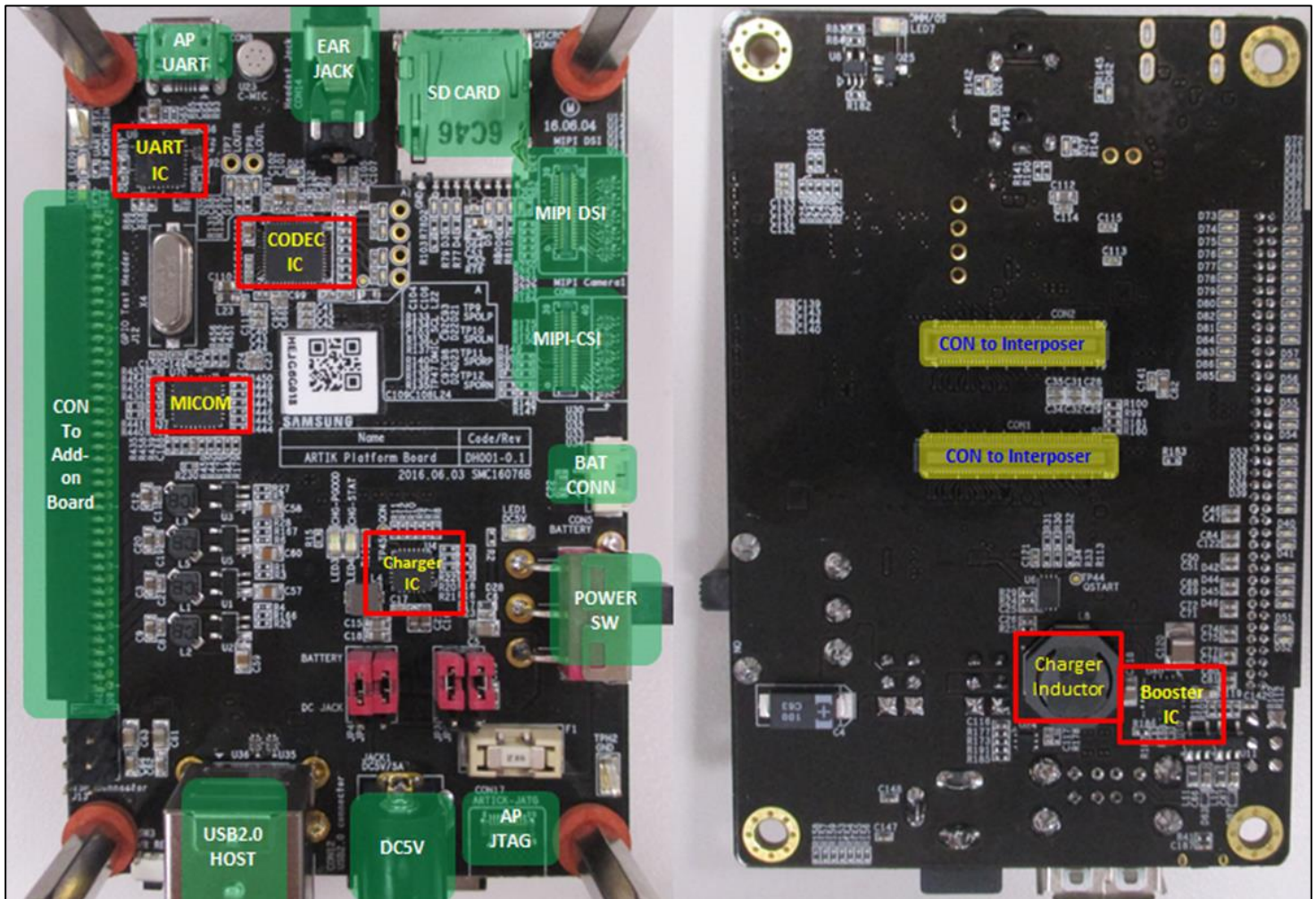


Figure 12. ARTIK 530 Development Board Platform Board Left Bottom Side, Right Top Side



CONFIGURATION OF EXTERNAL POWER SOURCE

Through selection of the Jumpers JP1-JP4 the IO power source can be selected to either DC-5V or to Charger Output. *Figure 13* shows how to set the various jumpers to switch between power sources.

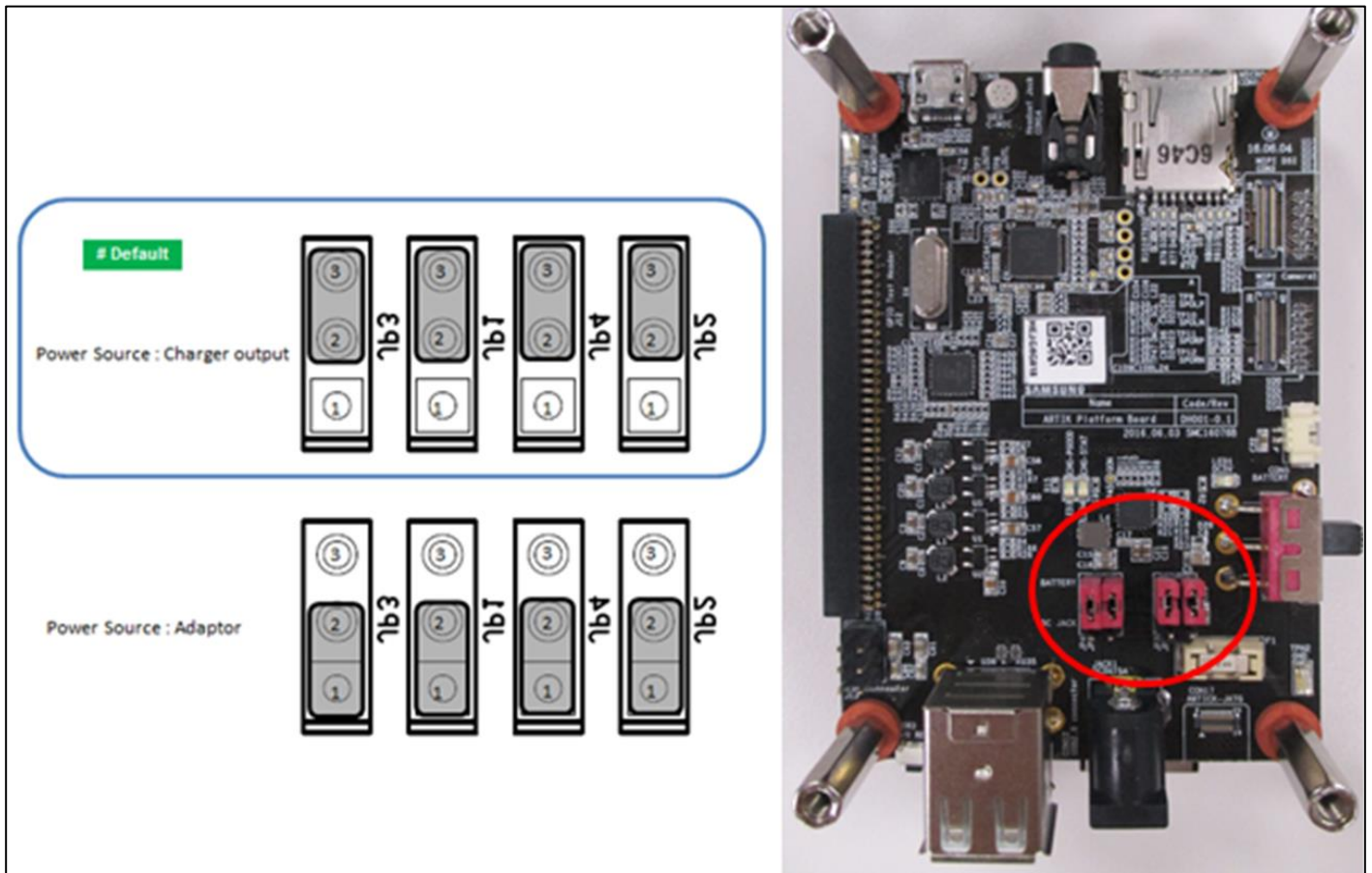


Figure 13. Jumper Interface locations JP1-JP4 on the Platform Board

SD-CARD INTERFACE

The Platform board has 1x SD-CARD interface supporting SD3.0 located as can be seen in *Figure 14*.

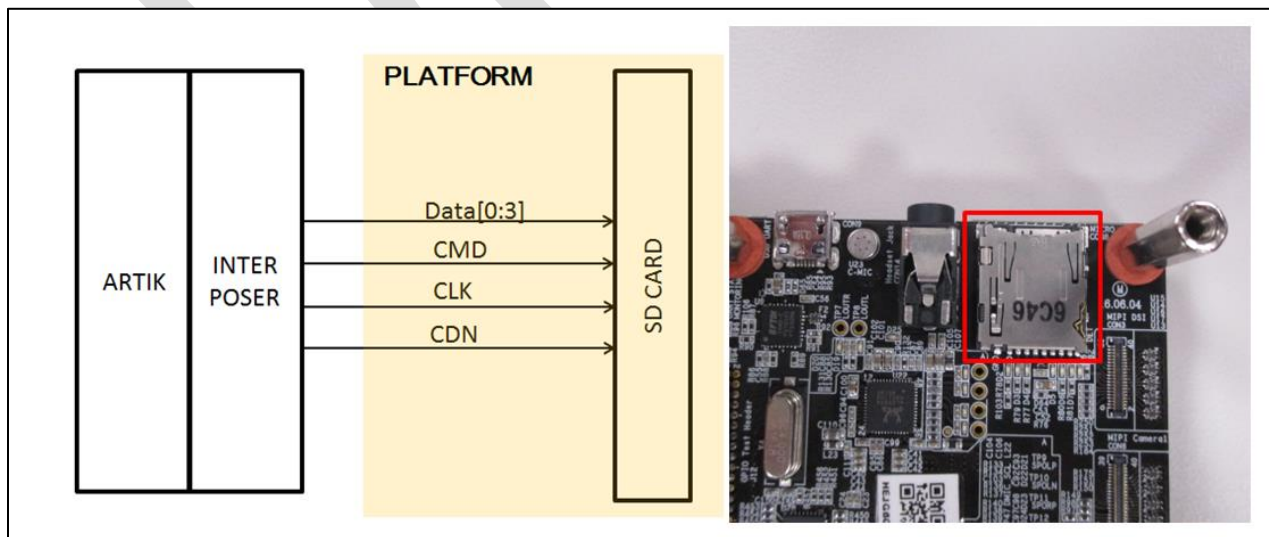


Figure 14. SD-Card Interface location on the Platform Board



EARJACK INTERFACE

The Platform board has 1x 4 pin ear jack interface supporting stereo audio as can be seen in [Figure 15](#).

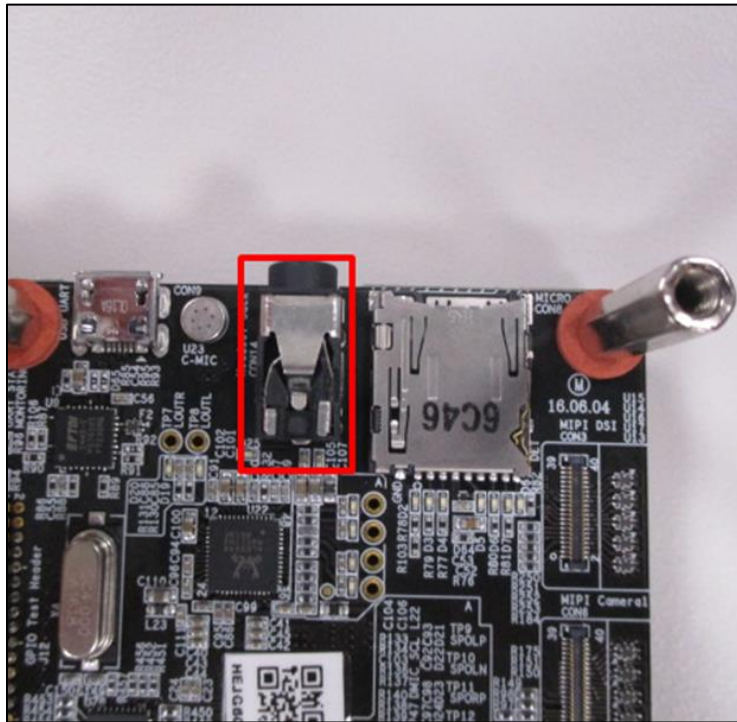


Figure 15. Ear Jack Interface location on the Platform Board

MIPI DSI/CSI INTERFACE

The Platform board has 1x MIPI DSI and 1x MIPI CSI interface. The location of the DSI Display interface can be seen in [Figure 16](#). The location of the MIPI CSI interface can be seen in [Figure 17](#). The MIPI DSI interface can operate at a maximum resolution of WUXGA (1920x1200), whereas the MIPI CSI interface can have a static resolution of 5M pixels or a dynamic resolution for video capturing of 1080P.

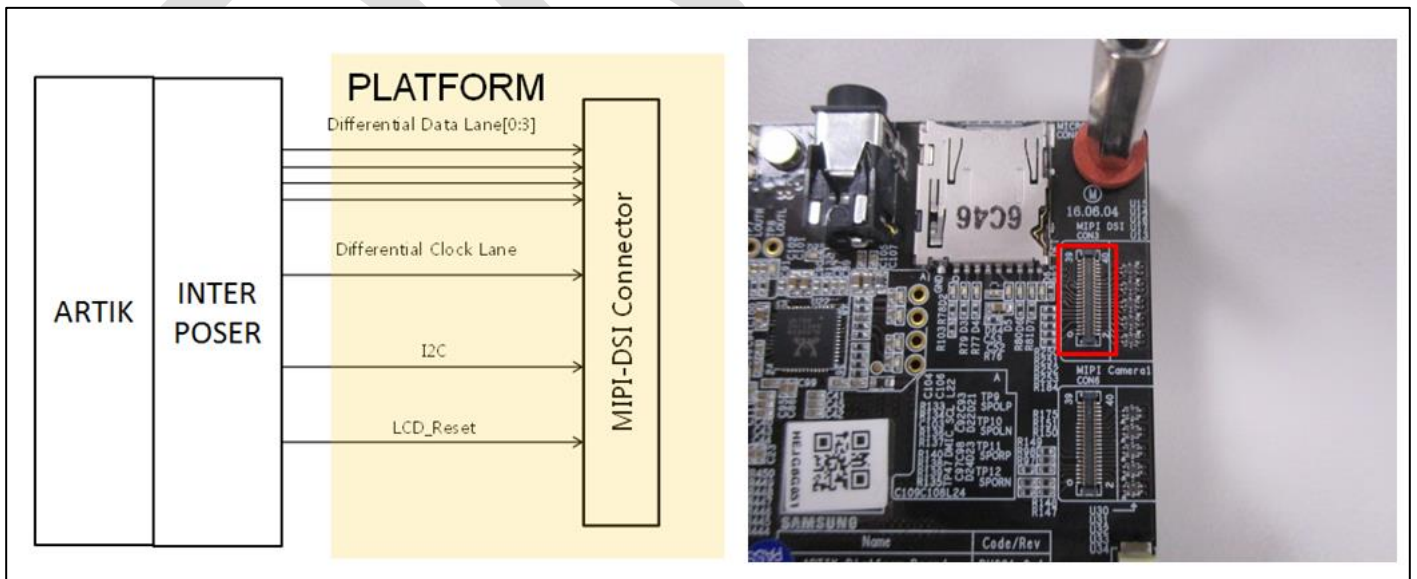


Figure 16. MIPI DSI Interface location on the Platform Board



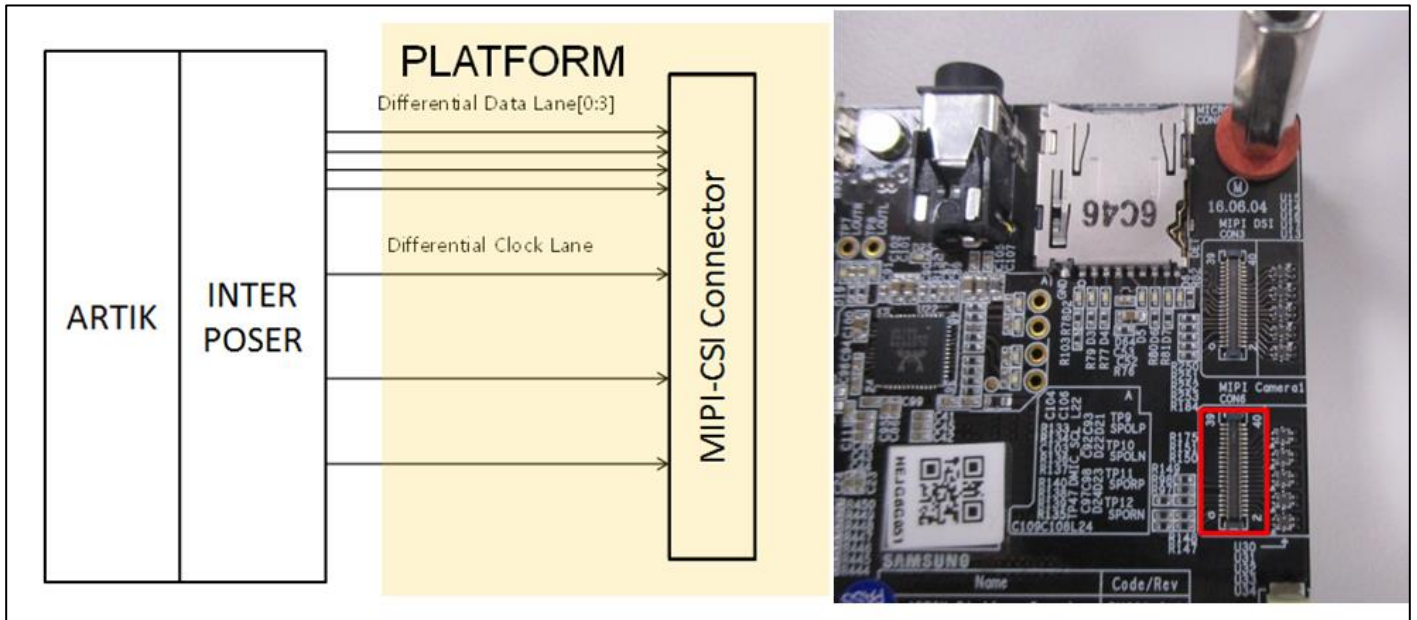


Figure 17. MIPI CSI Interface Location on the Platform Board

USB Host 2.0 INTERFACE

The Platform board has 1x USB 2.0 Interface. The location of the USB 2.0 interface can be seen in .

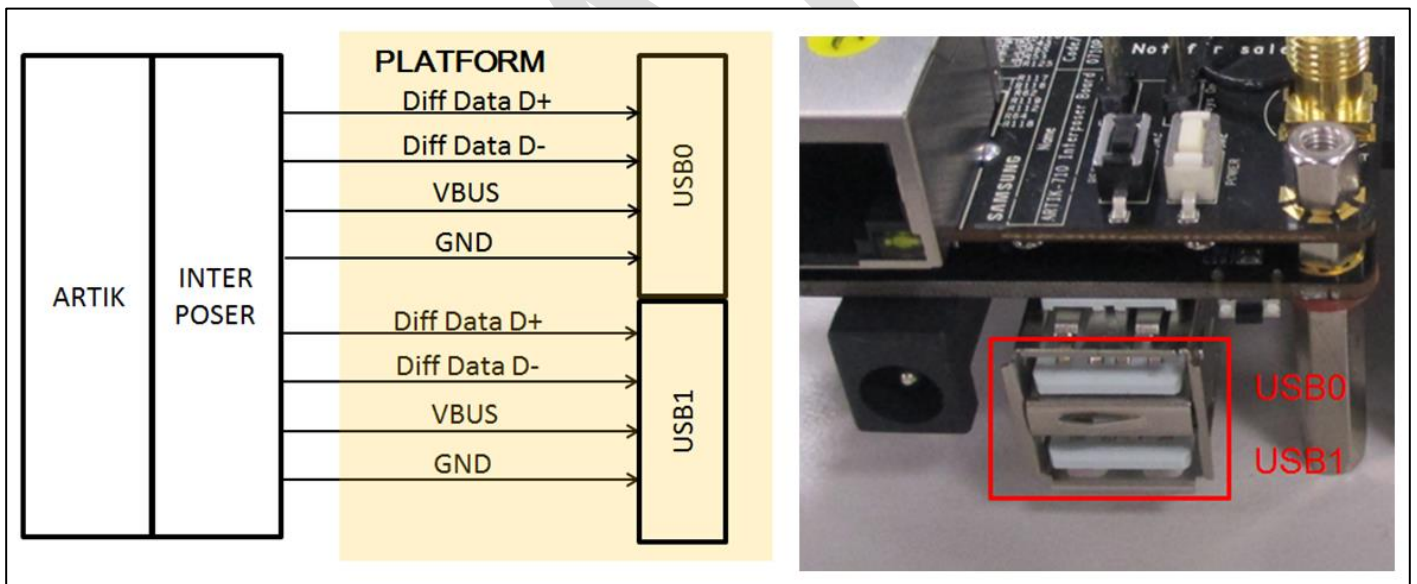


Figure 18 USB2.0 Interface location on the Platform Board



CONNECTOR TO IF BOARD INTERFACE

The Platform board has 1x expansion connector that can be seen in *Figure 19*. This connector enables expansion

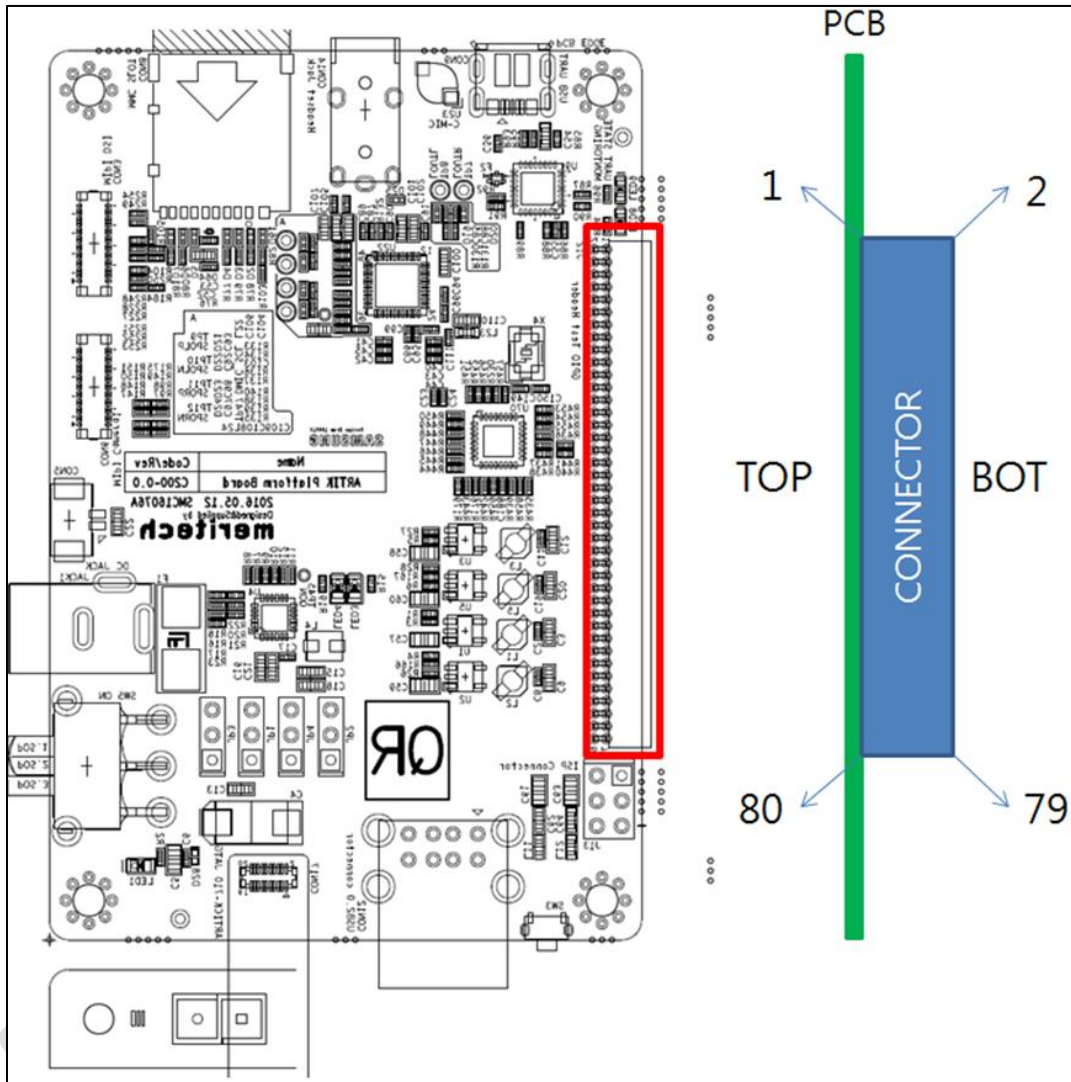


Figure 19. Expansion Connector Interface location on the Platform Board



ARTIK 530 DEVELOPMENT BOARD IF BOARD

PREVIEW ON THE ARTIK IF BOARD

Figure 20 shows the highlights of the connector IF board. In addition Table 4 with J2 and Table 5 with J3 show the pinout of the connectors with its meaning.

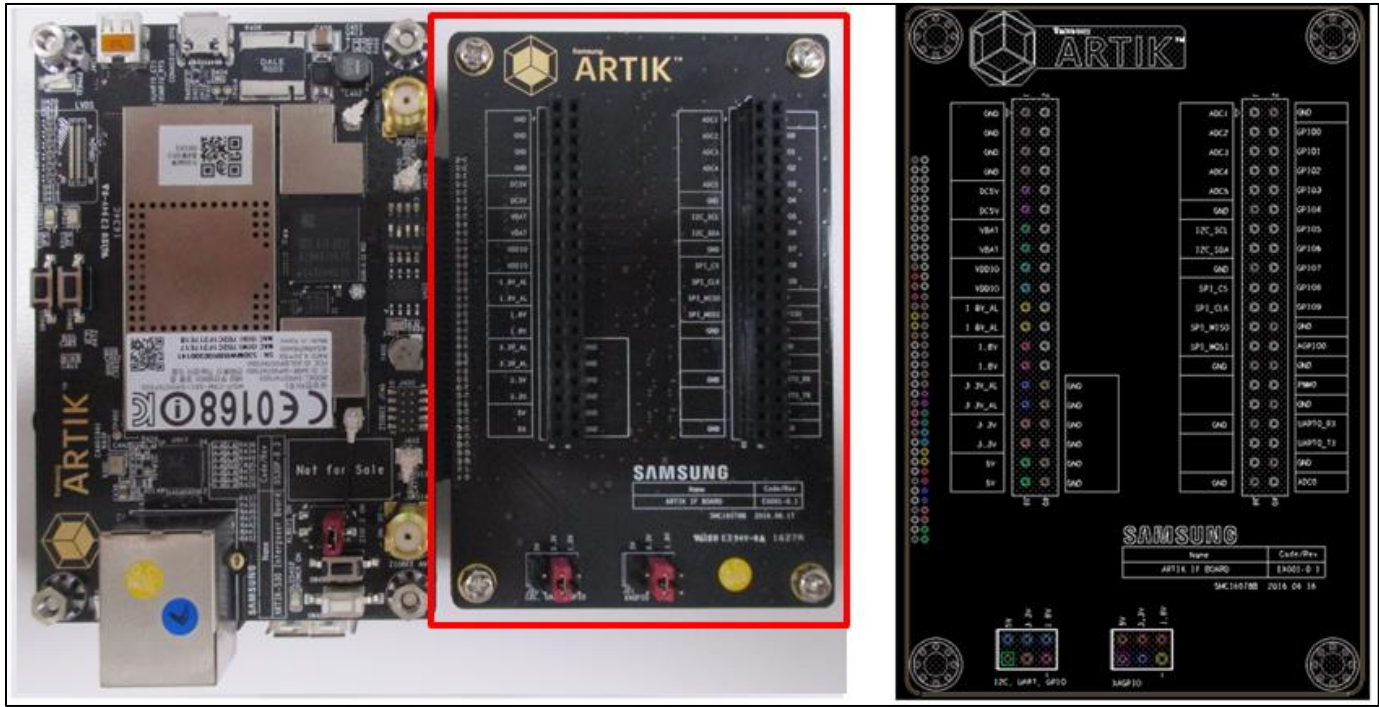


Figure 20. ARTIK 530 Development Board IF Board

Table 4. Connector J2

Pin Name	Pin Number	Pin Number	Pin Name
XADC1	1	2	GND
XADC2	3	4	ADD_XGPIO0
XADC3	5	6	ADD_XGPIO1
XADC4	7	8	ADD_XGPIO2
XADC5	9	10	ADD_XGPIO3
GND	11	12	ADD_XGPIO4
ADD_XI2C0_SCL	13	14	ADD_XGPIO5
ADD_XI2C0_SDA	15	16	ADD_XGPIO6
GND	17	18	ADD_XGPIO7
ADD_XSPI0_CS	19	20	ADD_XGPIO8
ADD_XSPI0_CLK	21	22	ADD_XGPIO9
ADD_XSPI0_MISO	23	24	GND
ADD_XSPI0_MOSI	25	26	ADD_XAGPIO0
GND	27	28	GND
NC	29	30	ADD_XPWM0_OUT
MICOM_GPIO1	31	32	GND
GND	33	34	ADD_XUART0_RX
NC	35	36	ADD_XUART0_TX
NC	37	38	GND
GND	39	40	XADC0



Table 5. Connector J3

Pin Name	Pin Number	Pin Number	Pin Name
GND	1	2	MICOM_GPIO1
GND	3	4	MICOM_GPIO2
GND	5	6	MICOM_GPIO3
GND	7	8	MICOM_GPIO4
DC5V	9	10	MICOM_GPIO5
	11	12	MICOM_GPIO6
VBAT_MAIN	13	14	MICOM_GPIO7
	15	16	MICOM_GPIO8
AP_VDDIO	17	18	MICOM_GPIO9
	19	20	MICOM_GPIO10
VDD_EXT1P8_ALIVE	21	22	MICOM_GPIO11
	23	24	MICOM_GPIO12
VDD_EXT1P8	25	26	MICOM_GPIO13
	27	28	MICOM_GPIO14
VDD_EXT3P3_ALIVE	29	30	GND
	31	32	GND
VDD_EXT3P3	33	34	GND
	35	36	GND
VDD_EXT5P0_1	37	38	GND
	39	40	GND

CONFIGURATION OF EXTERNAL POWER SOURCE

Through selection of the Jumpers J20 and J21 you can choose the IO power source (I²C, UART GPIO) or the XGPIO power source of either, 1.8V, 3.3V or 5V. *Figure 21* shows how to set the various jumpers to switch between power sources.

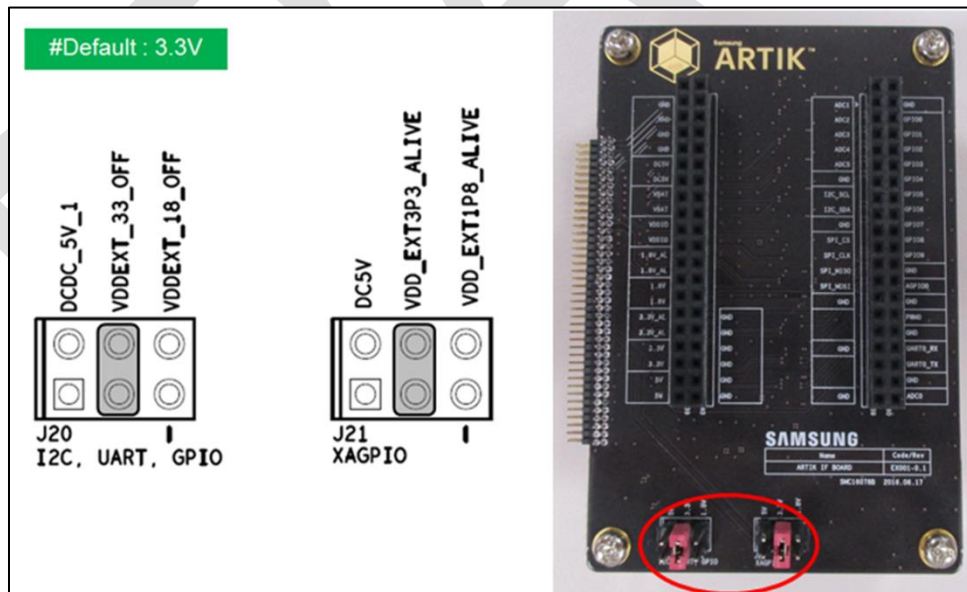


Figure 21. Jumper Interface locations J20, J21 on the IF Board

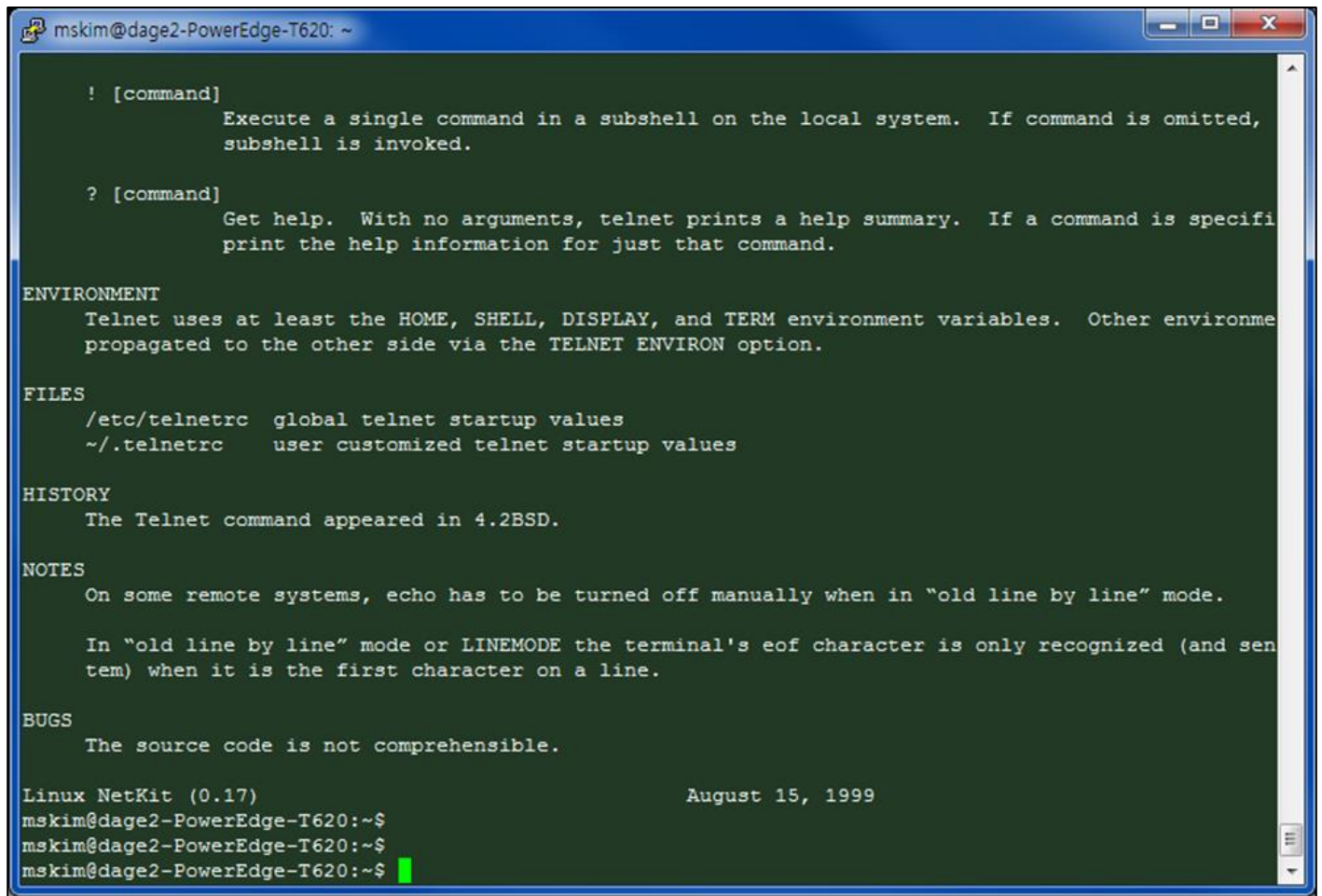


ARTIK 530 DEVELOPMENT BOARD BOOTING

This section will describe how to setup a connection with the ARTIK 530 Module using the Serial Port Connection and a variety of tools.

SERIAL PORT CONNECTION

You can use a typical Linux serial console as depicted in [Figure 22](#), using the serial connector. If your PC does not have a serial port use the USB serial cable instead. To use the serial USB cable you need to install the device driver that is associated with your particular USB serial cable. [Figure 23](#) depicts the USB serial cable and where it is hooked up to the Platform Board.



```
mskim@dage2-PowerEdge-T620: ~  
  
! [command]  
    Execute a single command in a subshell on the local system.  If command is omitted,  
    subshell is invoked.  
  
? [command]  
    Get help.  With no arguments, telnet prints a help summary.  If a command is specifi  
    print the help information for just that command.  
  
ENVIRONMENT  
    Telnet uses at least the HOME, SHELL, DISPLAY, and TERM environment variables.  Other environme  
    propagated to the other side via the TELNET ENVIRON option.  
  
FILES  
    /etc/telnetrc  global telnet startup values  
    ~/.telnetrc   user customized telnet startup values  
  
HISTORY  
    The Telnet command appeared in 4.2BSD.  
  
NOTES  
    On some remote systems, echo has to be turned off manually when in "old line by line" mode.  
  
    In "old line by line" mode or LINEMODE the terminal's eof character is only recognized (and sen  
    tem) when it is the first character on a line.  
  
BUGS  
    The source code is not comprehensible.  
  
Linux NetKit (0.17)                                August 15, 1999  
mskim@dage2-PowerEdge-T620:~$  
mskim@dage2-PowerEdge-T620:~$  
mskim@dage2-PowerEdge-T620:~$ █
```

Figure 22. Typical Linux Serial Console





Figure 23. USB Serial Cable hooked up to the Platform Board

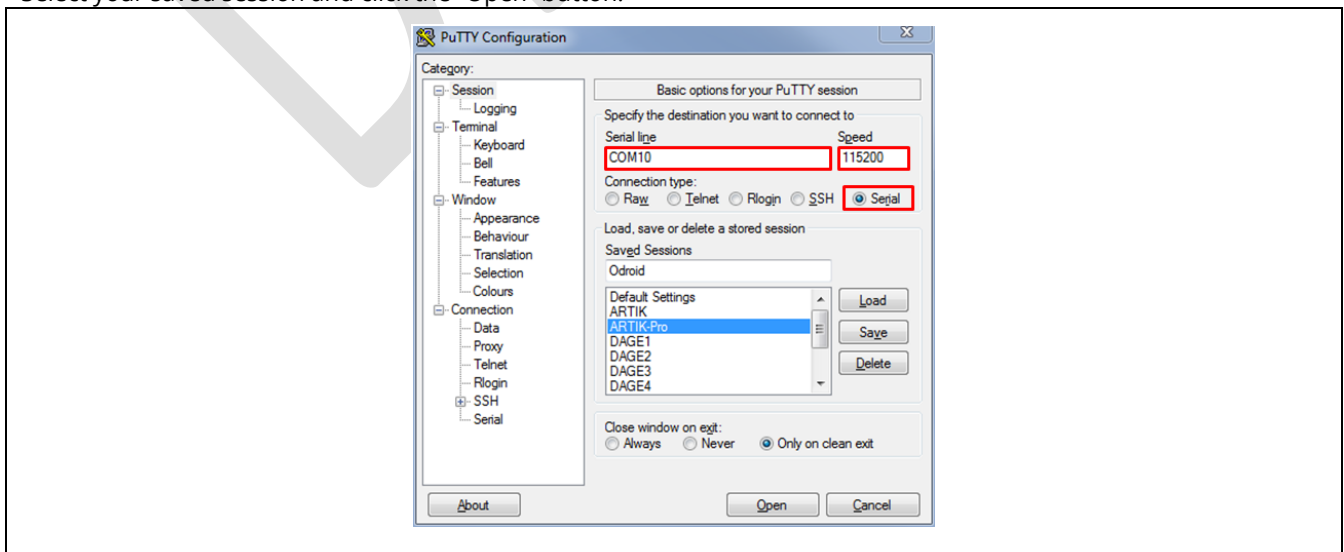
TERMINAL EMULATOR INSTALLATION

Setting up a connection with the ARTIK 530 Module can be done in a variety of ways. 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. Check the COM port number on your PC when you connect the USB serial cable. In our case the COM port allocated is COM13.



3. Set the PuTTY configuration as follows:
 - a. Set the "Serial line" as the COM port number found in step 2.
 - b. Set the COM speed to "115200".
 - c. Set the connection type to "Serial".
 - d. Save the session under ARTIK-Pro.
4. Select your saved session and click the "Open" button.



5. Power on the ARTIK 530 Development Board and hold the power button for about 1 second.
6. You should see booting messages from the ARTIK 530 Module
7. Once booting is completed you can exercise the ARTIK 530 Module using Fedora Linux commands.

POWER ON THE ARTIK 530 DEVELOPMENT BOARD

go through the following steps:

1. Connect Power adaptor and Platform board as depicted in [Figure 24](#)

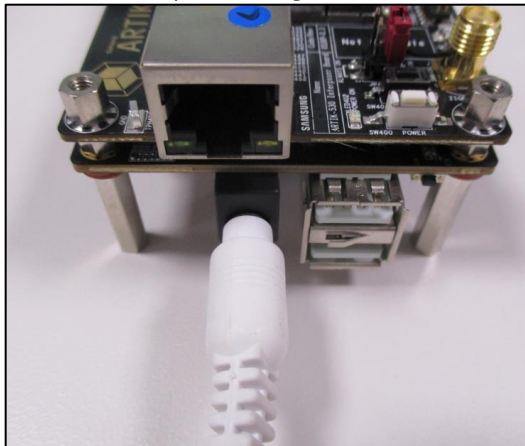


Figure 24 Connection Power adaptor with development Board

2. Turn on Power switch .

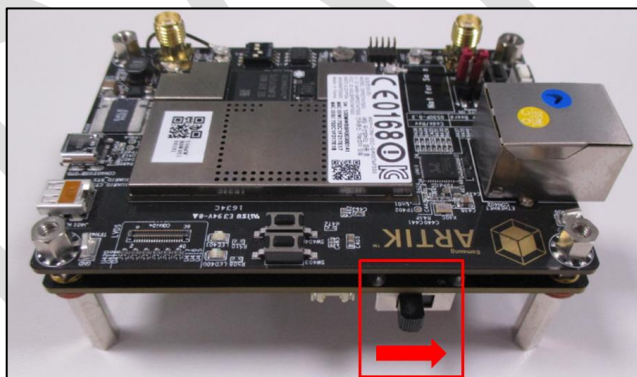


Figure 25. Power switch location on the development Board

3. Hold the power button for about 1 second.



Figure 26. Power button location on the development Board

DRAFT



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