Realtek Ameba RTL8721A DEV User Manual

This document define pin out of Ameba RTL8721A DEV

Version 1.1

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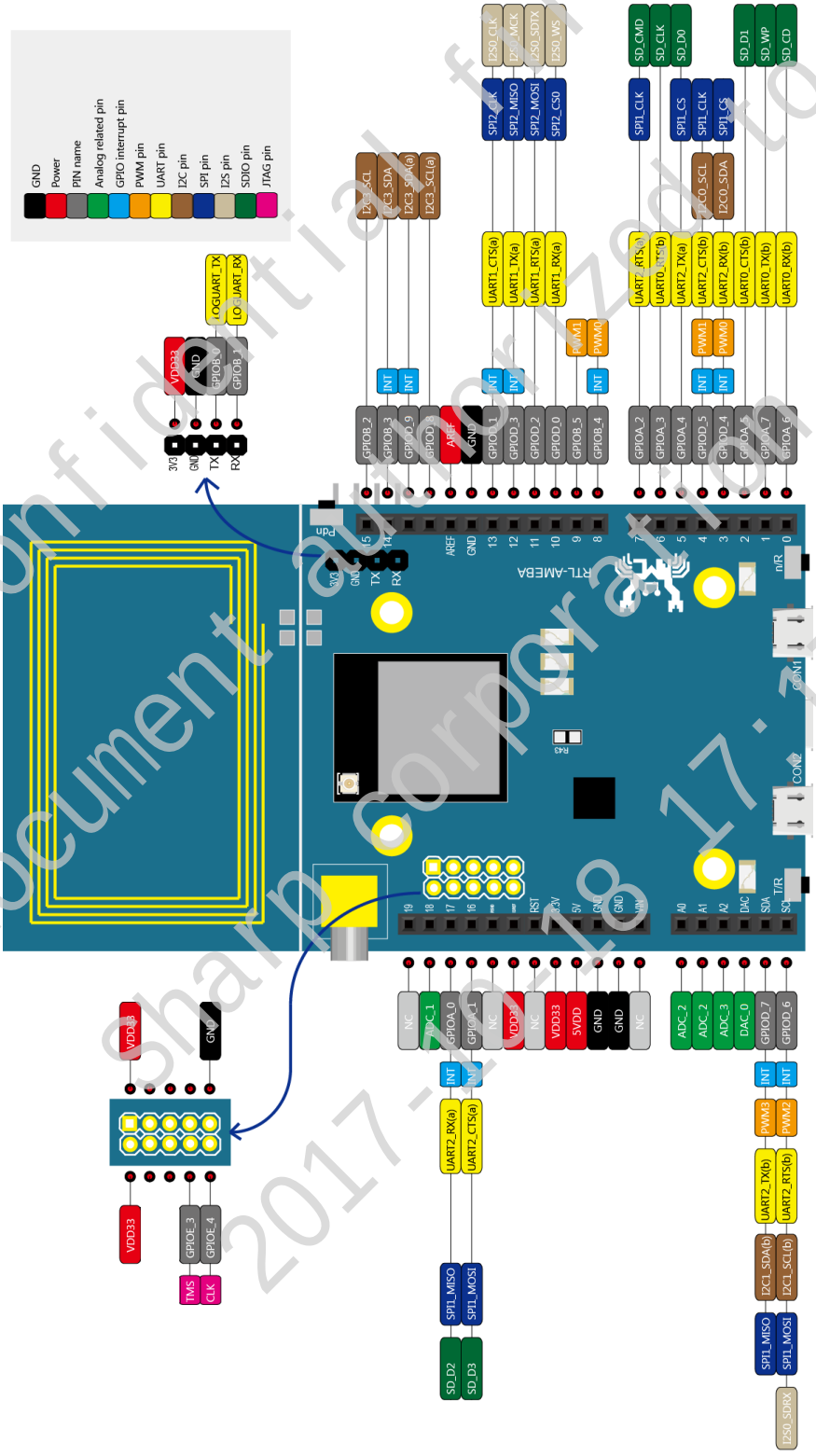
1 System requirements

- Windows PC (XP, Vista, 7)
- USB type A to Micro-B USB cable x 1
- RS-232 to UART board(debug) x 1, JTAG cable x1 (option)

2 Hardware information

- IC: RTL8721A
- DEV HDK version: RTL-AMEBA_DEV01

3 Pin out reference

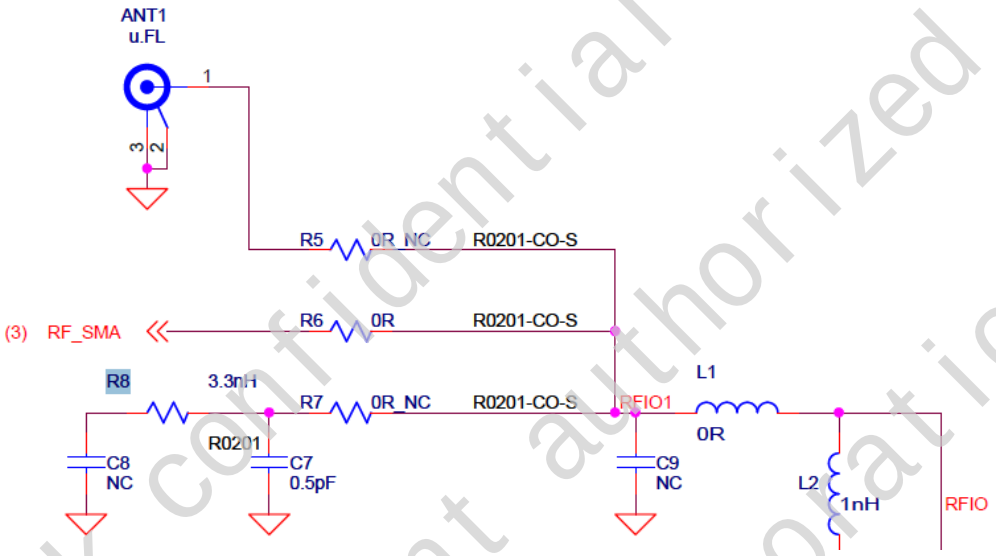


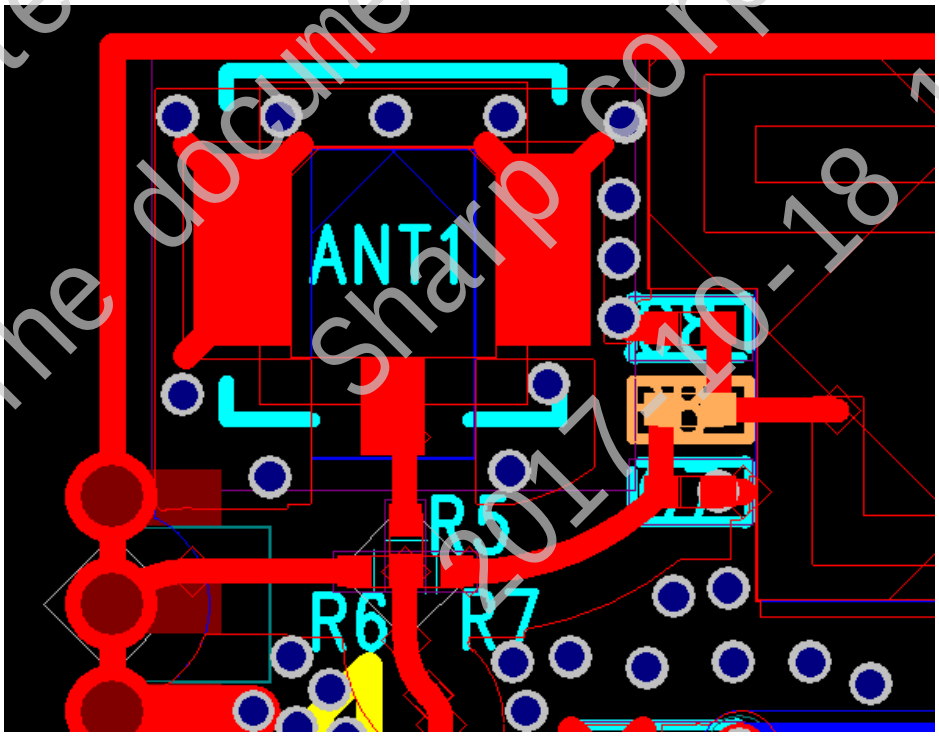
Realtek HDK Schematic Pin Name Comparison

Pin No	RTL8721A module	RTL-AMEBA_DEV01_1V0
19	GPIOA_0	GPIOA_0
20	GPIOA_1	GPIOA_1
21	GPIOA_2	GPIOA_2
22	GPIOA_3	GPIOA_3
23	GPIOA_4	GPIOA_4
24	GPIOA_5	GPIOA_5
26	GPIOA_6	GPIOA_6
25	GPIOA_7	GPIOA_7
45	GPIOB_0	GPIOB_0
44	GPIOB_1	GPIOB_1
43	GPIOB_2	GPIOB_2
42	GPIOB_3	GPIOB_3
46	GPIOB_4	GPIOB_4
47	GPIOB_5	GPIOB_5
39	GPIOD_0	GPIOC_0
38	GPIOD_1	GPIOC_1
37	GPIOD_2	GPIOC_2
36	GPIOD_3	GPIOC_3
3	GPIOD_4	GPIOD_4
4	GPIOD_5	GPIOD_5
5	GPIOD_6	GPIOD_6
6	GPIOD_7	GPIOD_7
40	GPIOD_8	GPIOC_4
41	GPIOD_9	GPIOC_5
10	GPIOE_3	GPIOE_3
9	GPIOE_4	GPIOE_4
8	ADC_1	GPIOE_5
14	ADC_2	ADC_CH1
15	ADC_3	ADC_CH2
16	DAC_0	DAC_CH0

4 Antenna hardware setup

- I-PEX/U.FL connector: R5
- External antenna: R6
- PCB antenna: R7





5 Peripherals support

- Debug UART: GPIOB_[0..1]
- JTAG: GPIOE_[3..4]

5.1 Pin Function Table

- Multiple functions are supported by group setup.
- For example: GPIOA_6(Rx), GPIOA_7(Tx), GPIOA_3(RTS) and GPIOA_5(CTS) are used if UART0 function. GPIOA_3(RTS) and GPIOA_5(CTS) can not be used as other functions.

PIN name	JTAG	SDD	SDH	UART Group	I2C Group	SPI Group	I2S Group	PCM Group	PWM	WKDT
GPIOA_0		SD_D2	SD_D2	UART2_IN		SPI1_MISO				
GPIOA_1		SD_D3	SD_D3	UART2_CTS		SPI1_MOSI				
GPIOA_2		SD_CMD	SD_CMD	UART2_RTS		SPI1_CLK				
GPIOA_3		SD_CLK	SD_CLK	UART0_RTS			SPI			
GPIOA_4		SD_D0	SD_D0	UART2_OUT		SPI1_CS				
GPIOA_5		SD_D1	SD_D1	UART0_CTS						W-STBY0
GPIOA_6		SD_INT	SD_CD	UART0_IN						
GPIOA_7			SD_WP	UART0_OUT	UART					
GPIOB_0				UART_LOG_OUT						
GPIOB_1				UART_LOG_IN						W-DSLP
GPIOB_2		Debug console			I2C3_SCL					
GPIOB_3					I2C3_SDA	I2C				
GPIOB_4				UART1_IN				I2S	PWM0	
GPIOB_5				UART1_OUT					PWM1	
GPIOD_0				UART1_IN		SPI2_CS	I2S0_WS	PCM0_SYNC		
GPIOD_1				UART1_CTS		SPI2_CLK	I2S0_CLK	PCM0_CLK		
GPIOD_2				UART1_RTS		SPI2_MOSI	I2S0_SD_TX	PCM0_OUT		
GPIOD_3				UART1_OUT		SPI2_MISO	I2S0_MCK	PCM0_IN		
GPIOD_4				UART2_IN	I2C0_SDA	SPI1_CS		PCM1_SYNC	PWM0	
GPIOD_5				UART2_CTS	I2C0_SCL	SPI1_CLK		PCM1_CLK	PWM1	W-STBY2
GPIOD_6				UART2_RTS	I2C1_SCL	SPI1_MOSI	I2S0_SD_RX	PCM1_OUT	PWM2	
GPIOD_7				UART2_OUT	I2C1_SDA	SPI1_MISO		PCM1_IN	PWM3	PWM
GPIOD_8	SWD				I2C3_SCL					
GPIOD_9					I2C3_SDA					
GPIOE_3	JTAG_TMS								PWM3	W-STBY3
GPIOE_4	JTAG_CLK									

NOTE1: PH = Pull-High, HI = High-impedance
NOTE2: GPIOA_1 needs external Circuit to do the pull high control; others' pull control can be done by register setting (including GPIOA_1's PD).

5.2 Peripheral Descriptions

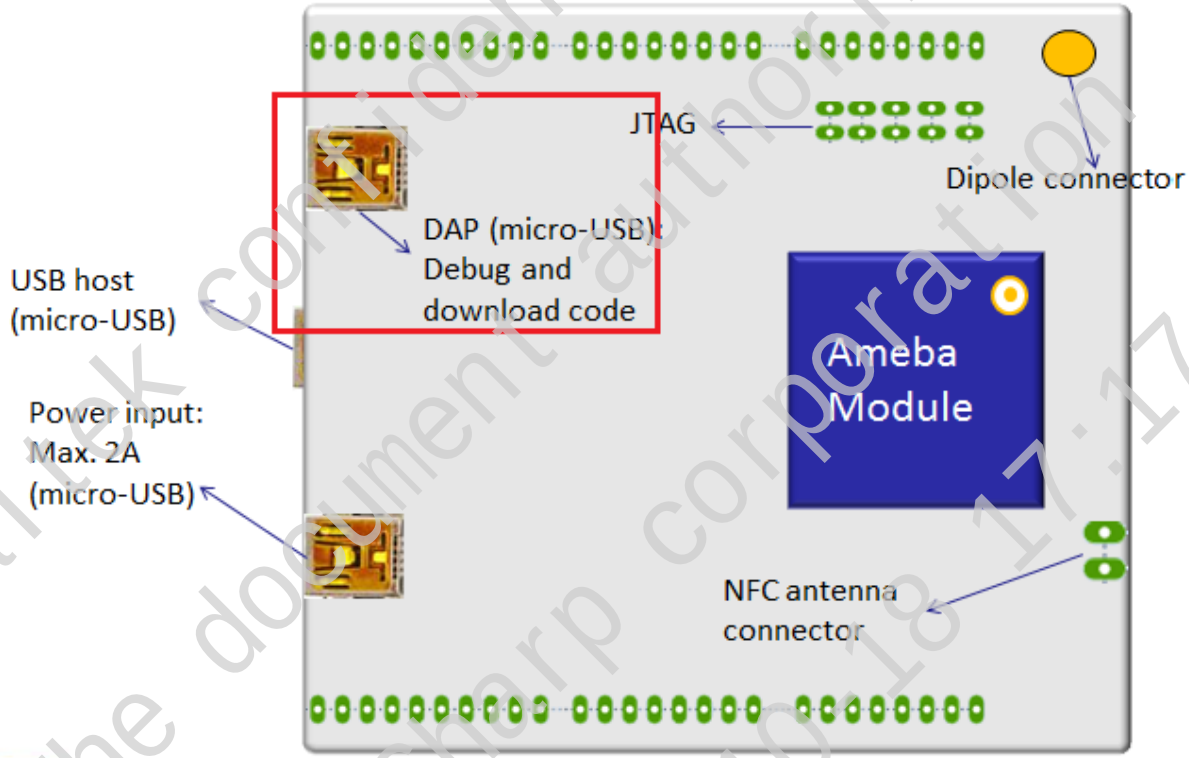
		Baud rate
UART	UART_LOG	38400 Hz
	UART0	4 MHz
	UART2	4 MHz
		Clock rate
SPI	SPI0_Master	20.8 MHz
	SPI0_Slave_TRx	4.1 MHz
	SPI1_Master	41.6 MHz
	SPI1_Slave_TRx	--
		Clock rate
I2C	Standard mode	0~100 kb/s
	Fast mode	<400 kb/s
	High-speed mode	<3.4Mb/s

6 Hardware configuration

6.1 CMSIS-DAP

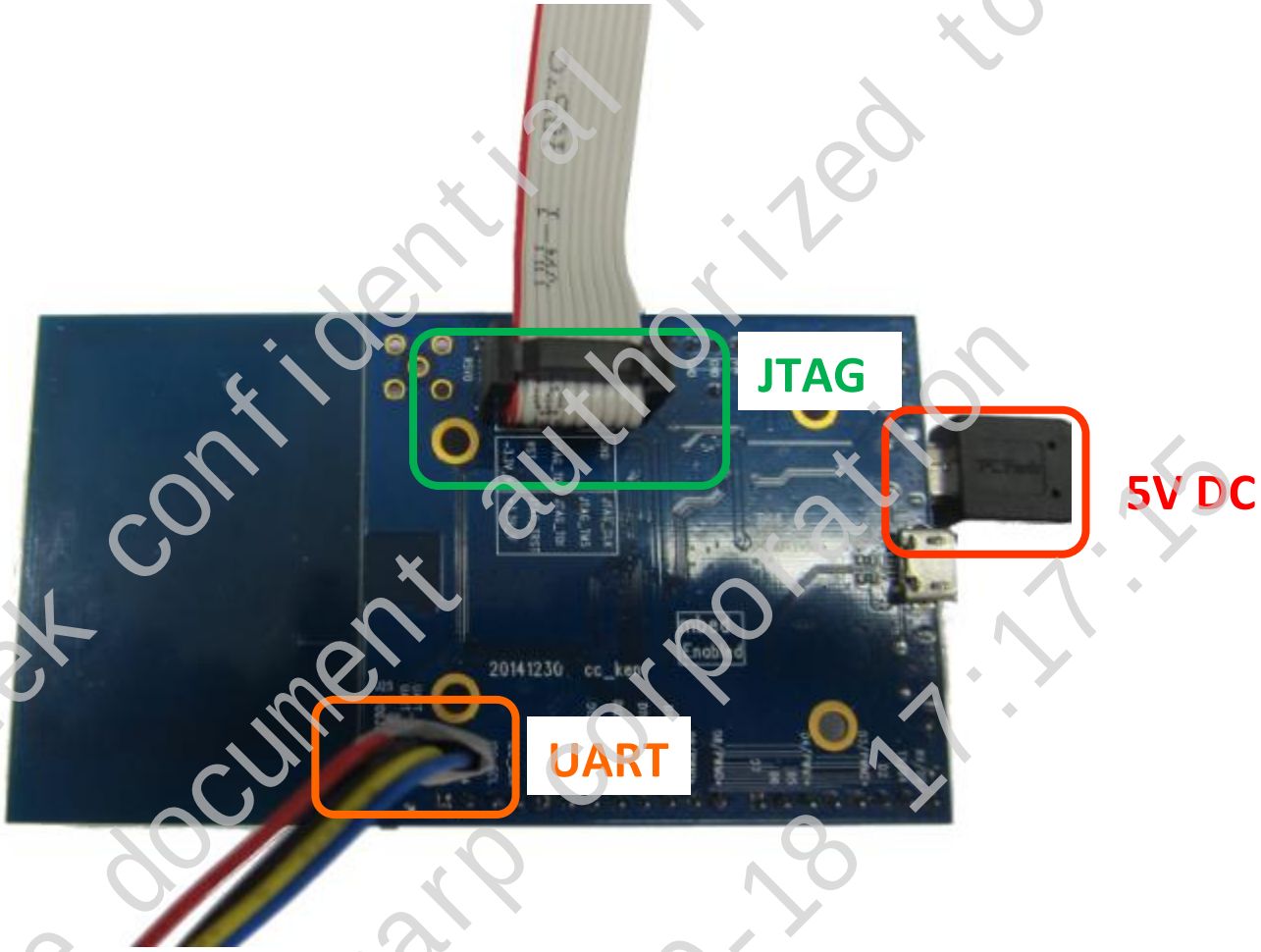
RTL-AMEBA_DEV01 supports CMSIS-DAP debugger. It requires installing “serial to USB driver”at first. Serial to USB driver can be found in tools\serial_to_usb\mbedWinSerial_16466.

Connect board to the PC with micro-USB cable.



6.2 J-Link/JTAG

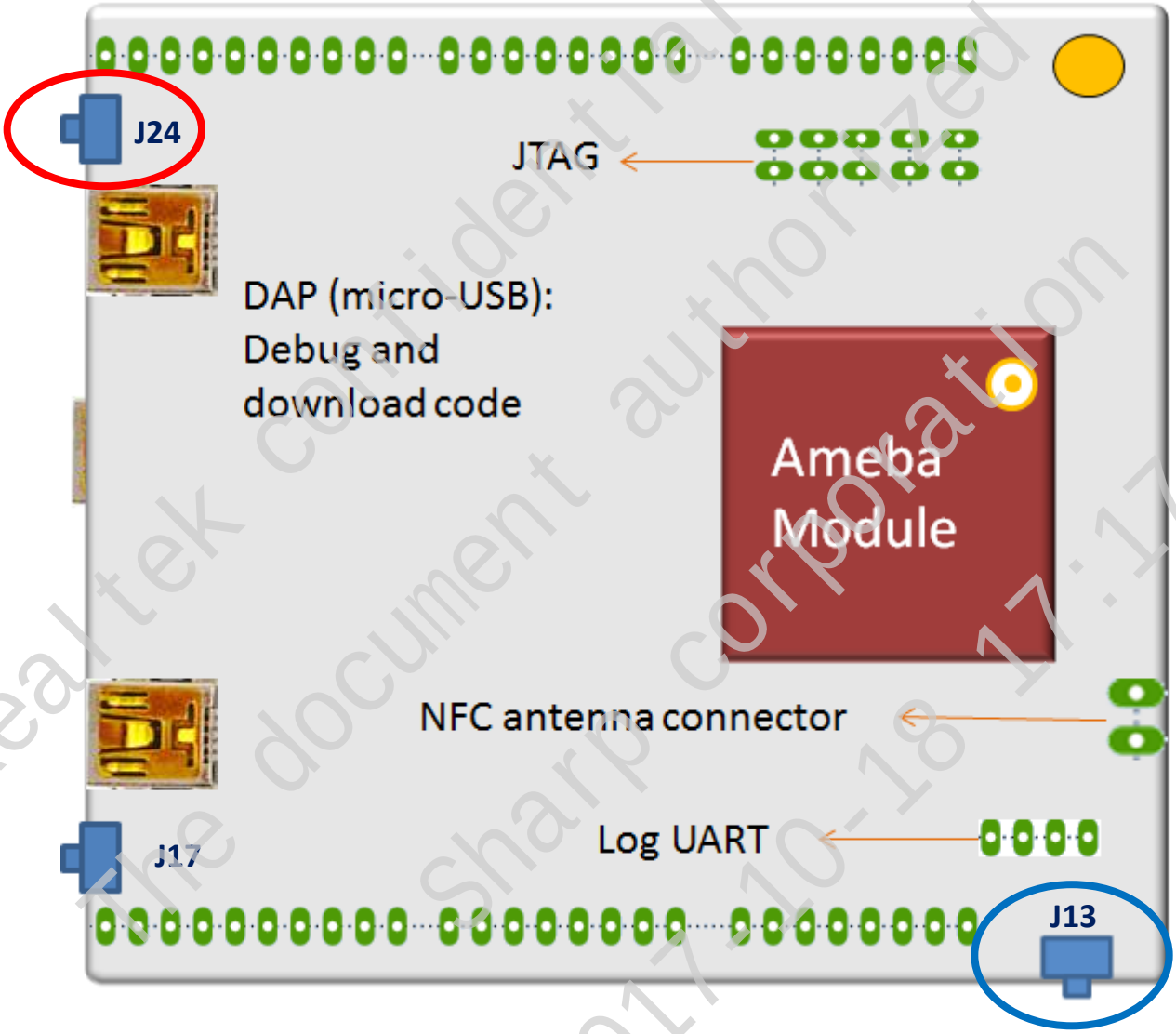
Weld JTAG and log UART connectors to HDK board and connect with pitch 2.54mm 2x5pins connector. It is recommended to weld the connector on the bottom side. Users can connect extension boards from top side.



Dupont Line or 2.54mm 2x5 pins connector.

Power On(Disable DAP mode)

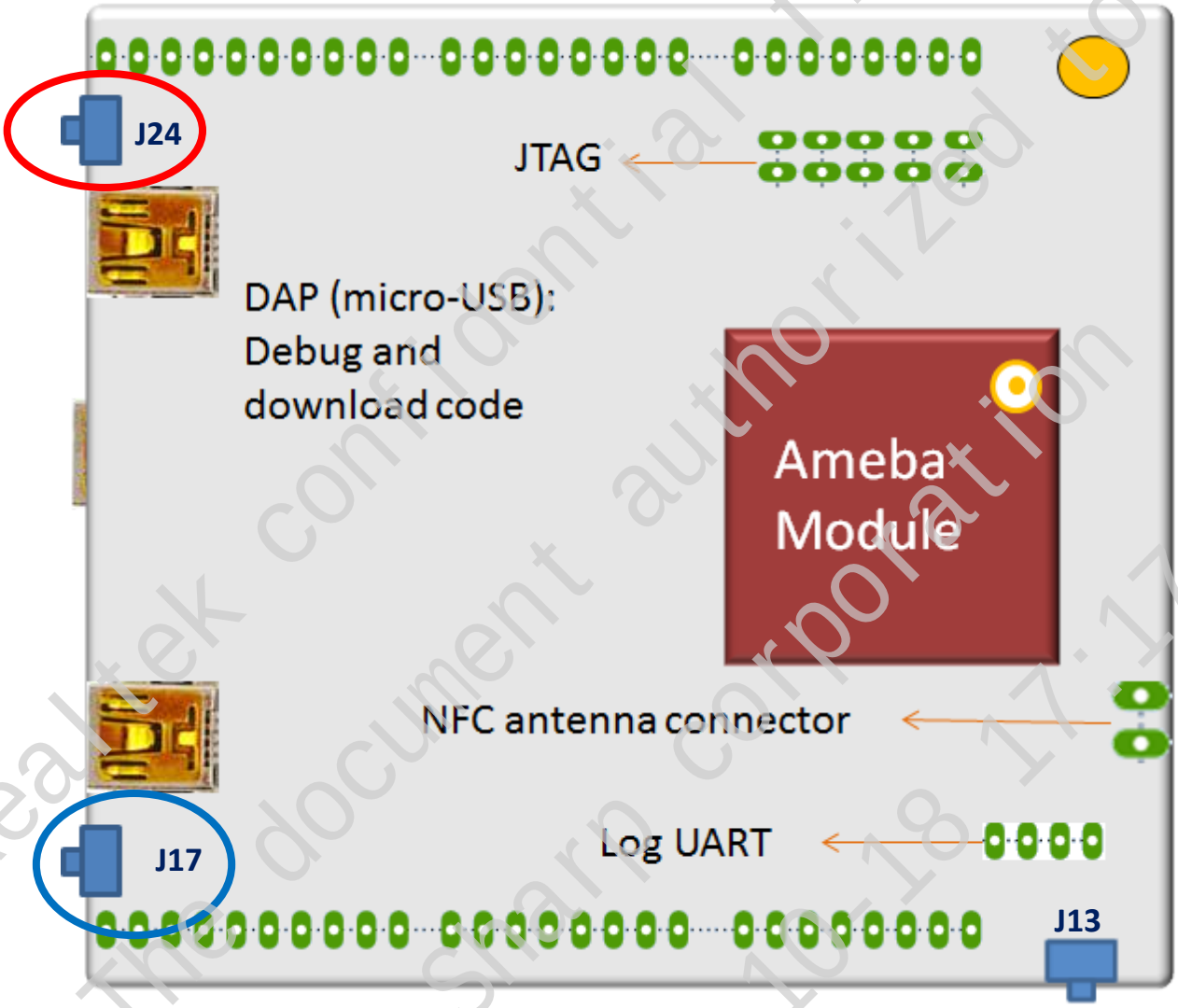
Holding TGT_NRESET button (J24, red-circled) then press Pdn button (J13, blur-circled). Release the button after power on.



6.3 DAP mode

In DAP mode, the DAP firmware can be updated.

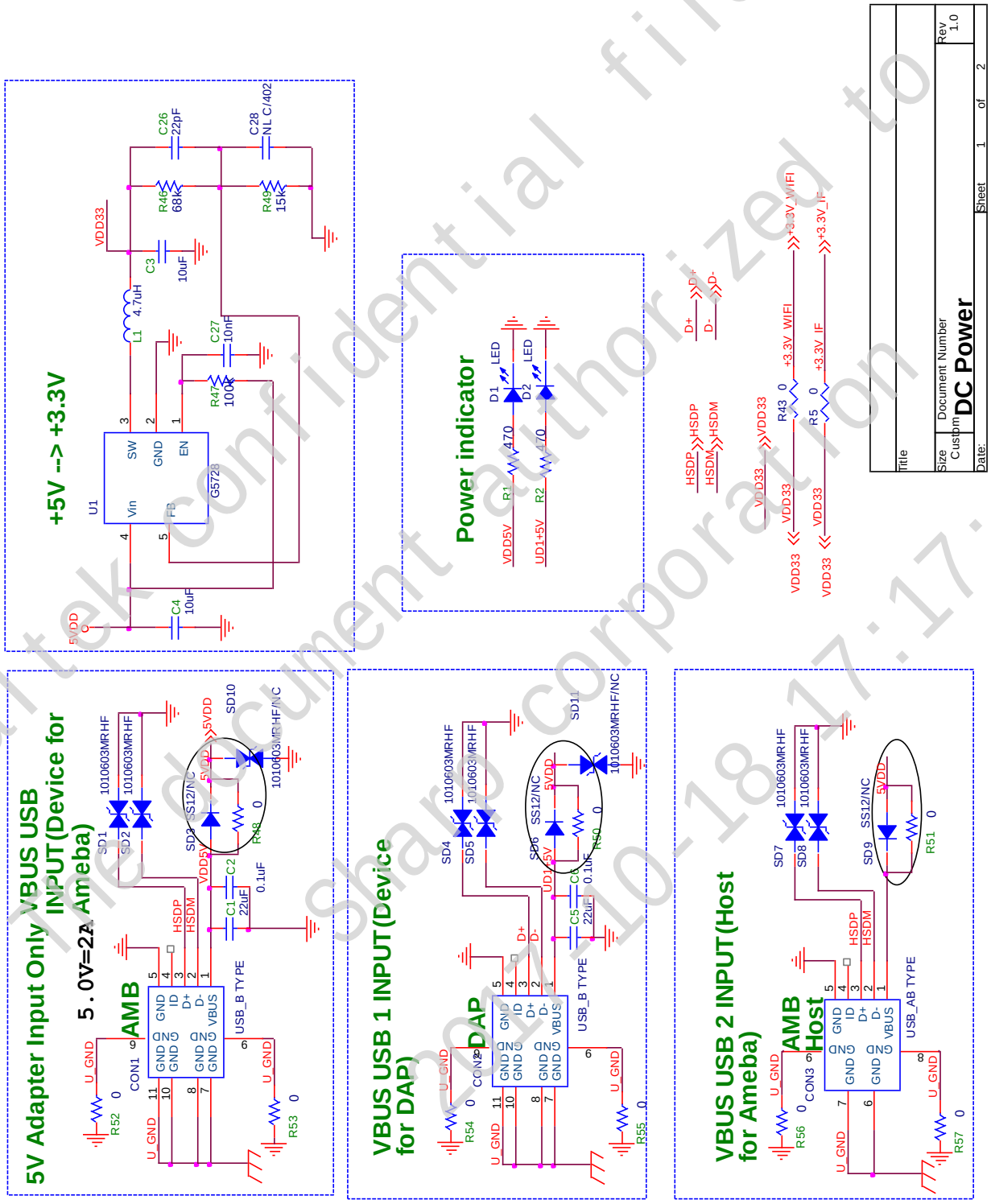
Holding TGT_NRESET button (J24, red-circled) then press nRESET button (J17, blur-circled). Then the DAP mode window will show up.



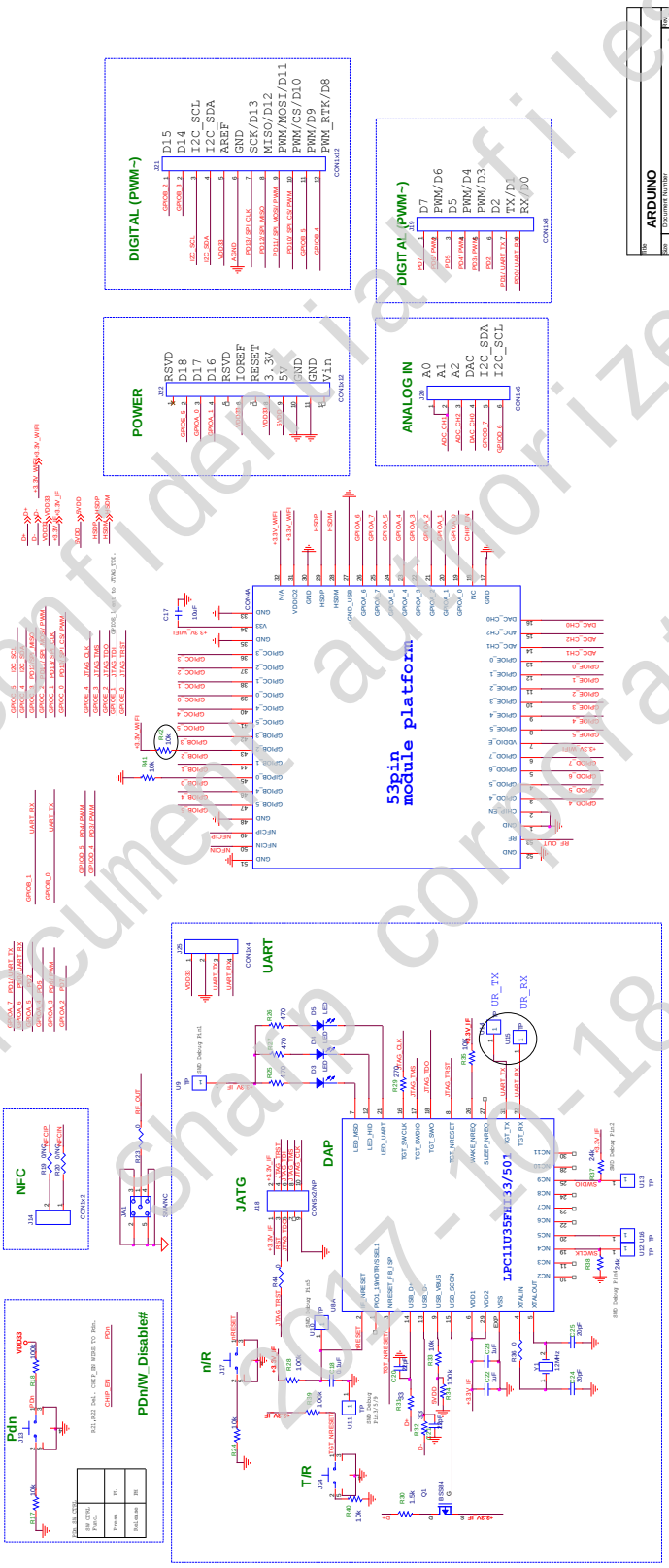
DAP window will show up when entering DAP mode.

7 Reference electrical schematics

RTL-AMEBA_DEV01 Schematic



RTL-AMEBA_DEV01 Schematic



RTL8721A Module Schematic