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WACDNA_UR

HOMEKIT

DATASHEET

VERSION HISTORY

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	*SC Liu*	*2015/07/07*			Initial Design Definition draft
1.1	*SC Liu*	2015/09/04			WACDNA Homekit for Stacking
1.2	*SC Liu*	2015/10/08			WACDNA picture update

Feature

Phytrex WiFi WACDNA Solution is a small-sized , It combines 802.11 1T1R b/g/n that achieves a data rate up to 150Mbps, it's short guard interval (400ns).

WLAN MAC supports 802.11e for multimedia applications, 802.11i for security. Power saving Mechanisms such as legacy power Save, and U-APSD, reduce the power wasted during idle item, and compensates for the extra power required to transmit OFDM.

This module supports WiFi Station/Soft AP /con-current mode. It is ideal for multi-purpose installation for Machine to Machine (M2M) device. It runs FreeRTOS for Cortex M3 MCU insides.

By supporting encryption 64/128-bits WEP/ TKIP and authenaticon , 802,11i (WPA, WPA2, Open), helps to protect your data and privacy during transmission.

This module could be smaller, thinner, less weight

- Realtek RTL8711AM single chip with I2C/I2S/SPI/UART/PWM/JTAG/ GPIOs interface
- IEEE802.11 bgn 1T1R ARM Cortex M3 166MHz
- ROM/RAM inside (1MB/2M+512kB)
- Internal 1MB Flasf.
- FreeRTOS & Lightweight TCP/IP (lwIP)
- IAR/DAP deveopment tool
- LGA module 53-pin
- I2S with 8/16/32/48/44.1KHz sample rate
- Max 3 I2Cs interface
- Max 2 SPIs supported, one supports buad rate up to 41.5MHz, the other one supports buad rate up to 15MHz
- PCM with 8/16KHz sample rate
- Support 4 PWMs with configurable duration and duty cycle from 0~100%
- Max 2 high speed UARTs with buad rate up to 4MHz
- 1 log/debug UART with standard buad rate
- 21 GPIOs

Federal Communication Commission Interference Statement

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 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.

FCC Caution:

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

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.

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 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.

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

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: Contains FCC ID: Z5N-WACDNA.

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.

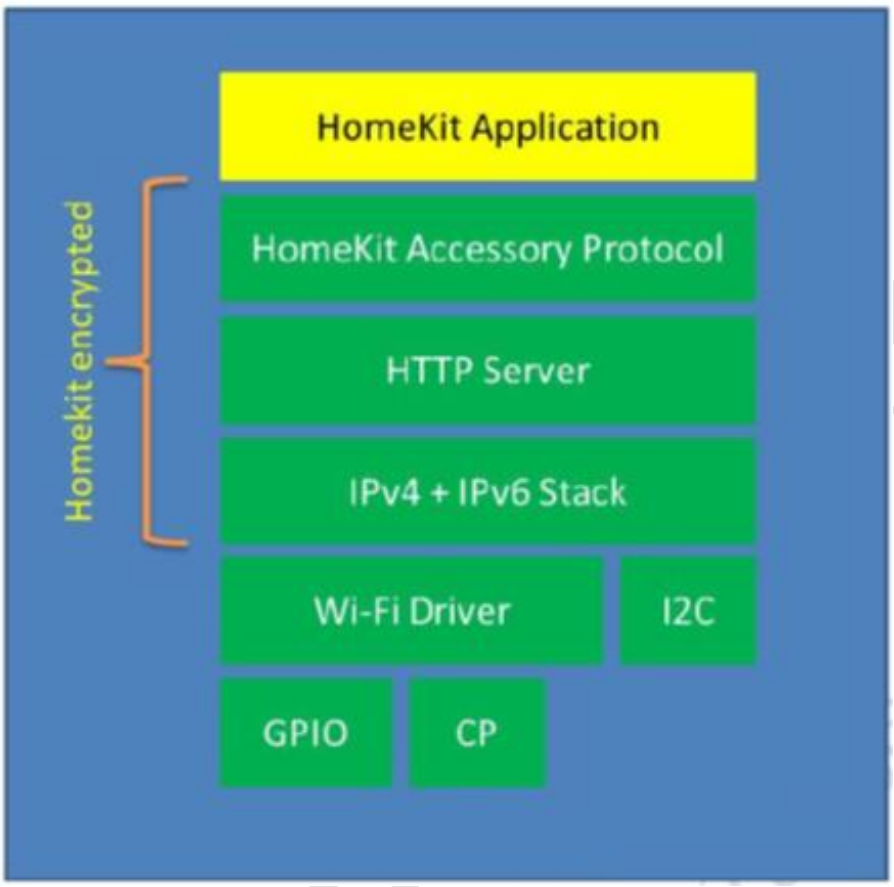
The end user manual shall include all required regulatory information/warning as show in this manual.

Antenna Information

The WACDNA_UR has been designed to pass certification with the antenna listed below. The required antenna impedance is 50 ohms.

Model	Type	Connector	Peak gain (dBi) 2400 – 2483.5 MHz
2504900073	PCB	R-SMA/I-PEX	-2.58

WACDNA Homekit for Stacking



Standards Supported

- 802.11b/g/n compatible WLAN
- 802.11e QoS Enhancement (WMM)
- 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services
- WIFI WPS support
- WIFI Direct support
- Light Weight TCP/IP protocol

WLAN MAC Features

- Frame aggregation for increased MAC efficiency (A-MSDU, A-MPDU)
- Low latency immediate High-Throughput Block Acknowledgement (HT-BA)
- Long NAV for media reservation with CF-End for NAV release
- PHY-level spoofing to enhance legacy compatibility
- Power saving mechanism

WLAN PHY Features

- 802.11n OFDM
- One Transmit and one Receive path (1T1R)
- 20MHz and 40MHz bandwidth transmission
- Short Guard Interval(400ns)
- DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble
- OFDM with BPSK, QPSK, 16QAM, and 640QAM modulation. Convolutional Coding Rate: 1/2, 2/3, 3/4, and 5/6
- Maximum data rate 54Mbps in 802.11g and 150Mbps in 802.11n
- Fast receiver Automatic Gain Control (AGC)
- On-chip ADC and DAC

Peripheral Interfaces

- SDIO 2.0 SDR25 supported
- Maximum 2 high speed UART interface with baud rate up to 4MHz
- 1 log UART with standard baud rate support
- Maxumum 3 I^2C interface
- I^2S with 8/16/32/48/44.1 KHz sampling rate
- PCM with 8/16KHz sample rate
- Maximum 2 SPI supported. One supports baud rate up to 41.5MHz; the other one supports baud rate up to 15MHz
- Support 4 PWM with configurable duration and duty cycle from 0 ~ 100%
- Support External Timer Trigger Event (ETE function) with configurable period in low power mode
- Maximum 21 GPIO pins

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 x 1 (option)

Con	EVB name	Pin	Net name	Con	EVB name	Pin	Net name
J20	I2C_SCL*	6	GPIOD_6	J19	RX/D0	8	GPIOA_6
	I2C_SDA*	5	GPIOD_7		TX/D1	7	GPIOA_7
	DAC	4	DAC_CH0		D2	6	GPIOA_5
	A2	3	ADC_CH2		D3/PWM2*	5	GPIOD_4
	A1	2	ADC_CH1		D4/PWM1*	4	GPIOD_5
	A0	1	ADC_CH1		D5	3	GPIOA_4
					D6	2	GPIOA_3
					D7	1	GPIOA_2
Con	EVB name	Pin	Net name	Con	EVB name	Pin	Net name
sJ22	VIN	12	NC	J21	D8/PWM0*	12	GPIOB_4
	GND	11	GROUND		D9/PWM1*	11	GPIOB_5
	GND	10	GROUND		D10/CS/PWM0	10	GPIOC_0
	5V	9	5VDD		D11/MOSI/PWM2	9	GPIOC_2
	3.3V	8	VDD33		D12/MISO/PWM3	8	GPIOC_3
	RESET	7	NC		D13/SCK/PWM1	7	GPIOC_1
	IOREF	6	VDD33		GND	6	GND
	RSVD	5	NC		AREF	5	VDD33
	D16	4	GPIOA_1		I2C_SDA	4	GPIOC_4
	D17	3	GPIOA_0		I2C_SCL	3	GPIOC_5
	D18	2	GPIOE_5		D14	2	GPIOB_3
	RSVD	1	NC		D15	1	GPIOB_2

Peripherals support

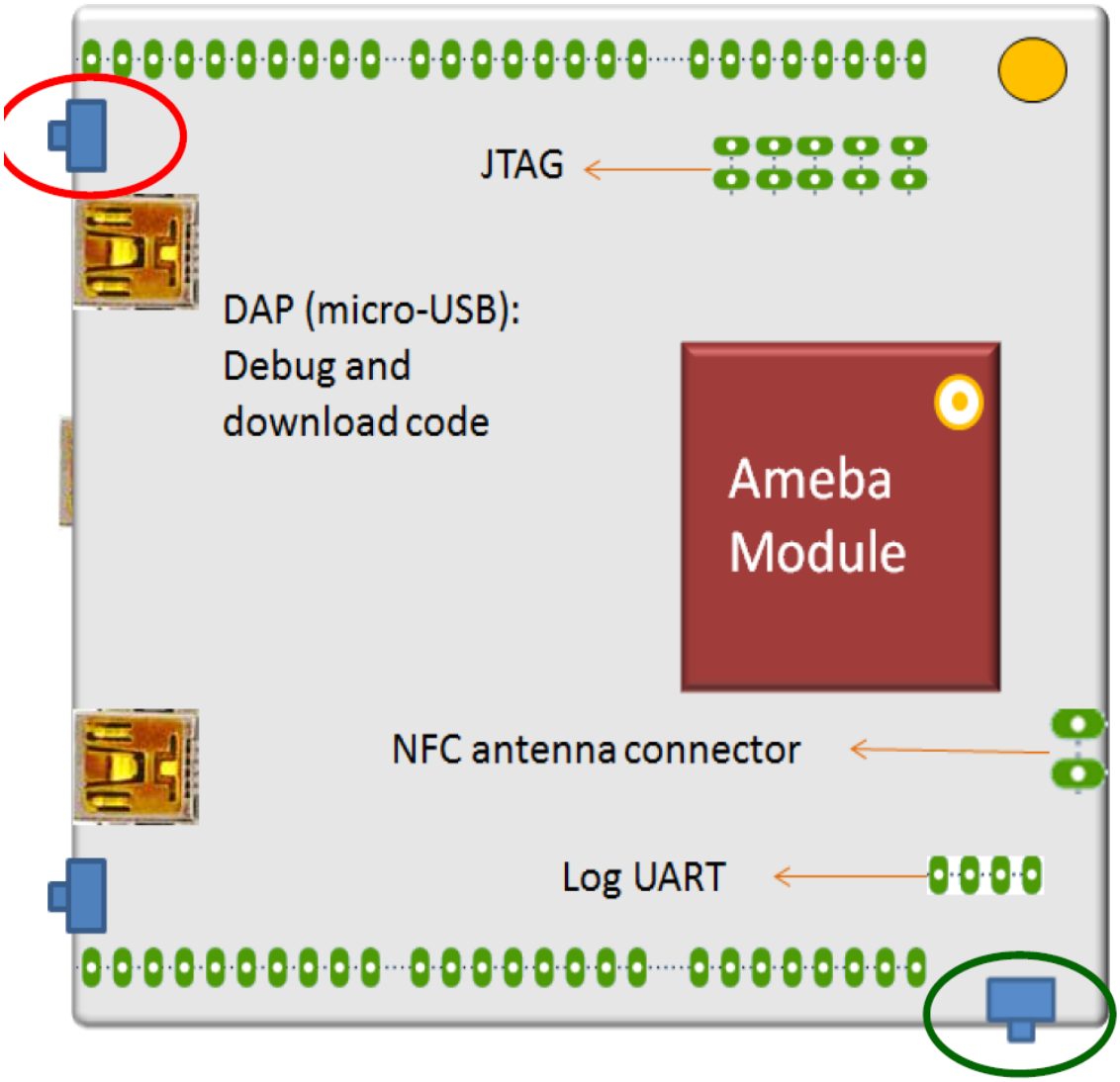
- Debug UART: GPIOB_[0..1]
- JTAG: GPIOE_[0..4]
- UART
- I2C / I2S/SPI
- PWM/PCM

Reference setup

PIN name	JTAG	UART Funtion	I2C Group	SPI Group	I2S GROUP	PCM Group	WL_LED0	PWM	WKDT	GPIO_INT
GPIOA_0		UART2_IN		SPI1_MISO						GPIO_INT
GPIOA_1		UART2_CTS		SPI1_MOSI						GPIO_INT
GPIOA_2		UART2_RTS		SPI1_CLK						
GPIOA_3		UART0_RTS			SPI					
GPIOA_4		UART2_OUT		SPI1_CS						
GPIOA_5		UART0_CTS							WKDT0	
GPIOA_6		UART0_IN	UART							
GPIOA_7		UART0_OUT								
GPIOB_0		UART_LOG_OUT								
GPIOB_1		UART_LOG_IN					WL_LED0			
GPIOB_2			I2C3_SCL							
GPIOB_3		Debug console	I2C3_SDA							GPIO_INT
GPIOB_4							WL_LED0	PWM0		GPIO_INT
GPIOB_5			I2C				WL_LED0	PWM1		
GPIOC_0		UART0_IN		SPI0_CS0	I2S1_WS	PCM1_SYNC		PWM0		
GPIOC_1		UART0_CTS		SPI0_CLK	I2S1_CLK	PCM1_CLK		PWM1		GPIO_INT
GPIOC_2		UART0_RTS	SPI	SPI0_MOSI	I2S1_SD_TX	PCM1_OUT		PWM2	PWM	
GPIOC_3		UART0_OUT		SPI0_MISO	I2S1_MCK	PCM1_IN		PWM3		GPIO_INT
GPIOC_4			I2C1_SDA	SPI0_CS1	I2S1_SD_RX	I2S				GPIO_INT
GPIOC_5		I2C	I2C1_SCL	SPI0_CS2						GPIO_INT
GPIOD_4		UART2_IN	I2C0_SDA	SPI1_CS		PCM1_SYNC		PWM0		GPIO_INT
GPIOD_5		UART2_CTS	I2C0_SCL	SPI1_CLK		PCM1_CLK		PWM1	WKDT2	GPIO_INT
GPIOD_6	JTAG	UART2_RTS	I2C1_SCL	SPI1_MOSI	I2S0_SD_RX	PCM1_OUT		PWM2		GPIO_INT
GPIOD_7		UART2_OUT	I2C1_SDA	SPI0_MISO		PCM1_IN		PWM3		GPIO_INT
GPIOE_0	JTAG_TRST	UART0_OUT	I2C2_SCL	SPI0_CS0	I2S0_WS	PCM0_SYNC		PWM0		
GPIOE_1	JTAG_TDI	UART0_RTS	I2C2_SDA	SPI0_CLK	I2S0_CLK	PCM0_CLK		PWM1		GPIO_INT
GPIOE_2	JTAG_TDO	UART0_CTS	I2C3_SCL	SPI0_MOSI	I2S0_SD_TX	PCM0_OUT		PWM2		GPIO_INT
GPIOE_3	JTAG_TMS	UART0_IN	I2C3_SDA	SPI0_MISO	I2S0_MCK	PCM0_IN		PWM3	WKDT3	GPIO_INT
GPIOE_4	JTAG_CLK		I2C3_SCL	SPI0_CS1						
GPIOE_5			I2C3_SDA	SPI0_CS2						GPIO_INT

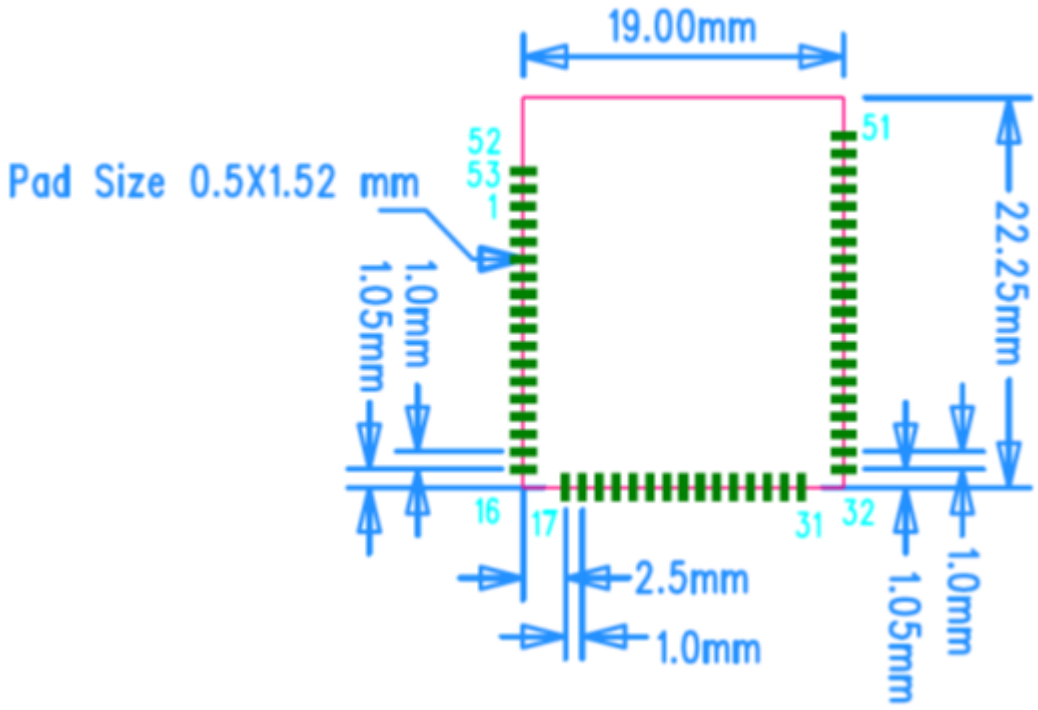
Power On

Holding button (red-circled) then plugging power to disable CMSIS-DAP function. Release the button after power on.



Note: To reset main chip, it is recommended to press Reset button (green-circled) instead of re-plugged in the power cable.

Suggest PAD size of main board to mount WACDNA Drawing:



ENVIRONMENTAL

Operating

Operating Temperature:	0°C to +70 °C
Relative Humidity:	5-90% (non-condensing)

Storage

Temperature:	-40°C to +80°C (non-operating)
Relevant Humidity:	5-95% (non-condensing)

Antenna specificaiton

Item	Antenna type	manufactur	Part No	Gain
1	PCB	CHENGYU	2504900073	-2.58 dBi