PRODUCTS SPECIFICATION

Model：WXT5CM2803

1. General Description

.This Card is based on MediaTek MT7921ASN chipset .It is a complete tri-band WIFI 2×2 MIMO MAC/PHY/Radio System-on-a-Chip. This module provides a high level of integration with adual-stream IEEE 802.11ax MAC baseband /radio.The WLAN operation supports 20MHz,40MHz and 80MHz channels for data rates up to 1201Mbps. It is also backward complied with IEEE 802.11a standardfrom 5.15~5.85GHz wideband and IEEE 802.11b/g standard from 2.4~2.5GHz. It can be used to provideup to 54Mbps for IEEE 802.11a and IEEE 802.11g, 11Mbps for IEEE 802.11b and 300Mbps for IEEE802.11n. With seamless roaming, fully interoperability and advanced security with WEP standard, 802.11 a/b/g/n/ac/ax SDIO 3.0 Module offers absolute interoperability with different vendors 802.11a/b/g/n/ac/ax. Access Points through the wireless LAN.

2. Working Principle

The main chip of the module is MT7921ASN, which is designed to provide highly integrated application functions. The WXT5CM2803 can be connected to corresponding products through reserved test and function ports, It also contains 3V3 voltage and GND voltage, connected to the corresponding product, which can power the WXT5CM2803 module.This document is to specify the product requirements for 802.11a/b/g/n/ac/ax SDIO Module，This module can be inserted into a mainboard by M.2 connector, and works with the mainboard.

2.1Features

★ IEEE 802.11a: 6-54 Mbps
★ IEEE 802.11b: 1-11 Mbps
★ IEEE 802.11g: 6-54 Mbps
★ IEEE 802.11n: MCS0-MCS7
★ Support 20MHz, 40MHz, 80MHz bandwidth in 5GHz band
★ IEEE 802.11ac: MCS0-MCS9
★ IEEE 802.11ax: MCS0-MCS11
★ Support 20MHz, 40MHz, 80MHz bandwidth in 5GHz band
★ Operation at 2.4~2.5GHz and 5.15~5.85GHz and 5.925~7.125GHz frequency band to meet worldwide regulations
★ Security support for WFA WPA/WPA2/WPA3 personal, WPS2.0, WAPI
★ High speed SDIO3.0 interface
★ HSF compliant

3. Application Diagrams

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3.1 General Requirements

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

9.6 This module does not have RF shielding and is tested and approved as a standalone configuration, additional evaluation may be required for any system integrated with this radio module.

	Feature	Detailed Description
3.2.1.1	Standard	• IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	• DQPSK，DBPSK and CCK with DSSS
3.2.1.3	Operating Frequency	• 2400 ～ 2483.5MHz ISM band
3.2.1.4	Channel Numbers	• 13 channels for Worldwide
3.2.1.5	Data Rate	• at most 11Mbps
3.2.1.6	Media Access Protocol	• CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	• Typical RF Output Power at each RF chain，at room Temp. 25℃ • 14±2 dBm at 11Mbps
3.2.1.8	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate≤8% at room Temp 25℃ • -83 dBm for 11Mbps

3.1.2 IEEE 802.11g Section

	Feature	Detailed Description
3.2.2.1	Standard	• IEEE 802.11g
3.2.2.2	Radio and Modulation Type	• QPSK，BPSK，16QAM，64QAM with OFDM
3.2.2.3	Operating Frequency	• 2400 ～ 2483.5MHz ISM band
3.2.2.4	Channel Numbers	• 13 channels for Worldwide
3.2.2.5	Data Rate	• at most 54Mbps
3.2.2.6	Media Access Protocol	• CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	• Typical RF Output Power at each RF chain，at room Temp. 25℃ • 14±2 dBm at 54Mbps
3.2.2.8	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate≤10% at room Temp 25℃ • -71 dBm for 54Mbps

3.1.3 IEEE 802.11a Section

	Feature	Detailed Description
3.2.3.1	Standard	• IEEE 802.11a
3.2.3.2	Radio and Modulation Type	• QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	• 5.15~5.25GHz • 5.25~5.35GHz • 5.47~5.725GHz • 5.725~5.85GHz
3.2.3.4	Data Rate	• at most 54Mbps
3.2.3.5	Media Access Protocol	• CSMA/CA with ACK
3.2.3.6	Transmitter Output Power at Antenna Connector	• Typical RF Output Power at each RF chain，at room Temp. 25℃ • 14±2 dBm at 54Mbps
3.2.3.7	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate≤10% at room Temp 25℃ • -71 dBm for 54Mbps

3.1.4 IEEE 802.11n Section

	Feature	Detailed Description	
3.2.4.1	Standard	• IEEE 802.11n	
3.2.4.2	Radio and Modulation Type	• BPSK , QPSK , 16QAM ,64QAM with OFDM	
3.2.4.3	Operating Frequency	• 2.4GHz :2400 ~ 2483.5MHz for ISM band • 5GHz : 5.15~5.25GHz； 5.25~5.35GHz； 5.47~5.725GHz； 5.725-5.85GHz；	
3.2.4.4	Data Rate	• at most 300 Mbps	
3.2.4.5	Media Access Protocol	• CSMA/CA with ACK	
3.2.4.6	Transmitter Output Power at Antenna Connector	• Typical RF Output Power at each RF chain， at room Temp.25℃	
		• 2.4GHz Band/HT20 14±2dBm at MCS7	• 2.4GHz Band/HT40 14±2dBm at MCS7
		• 5GHz Band/HT20 14±2dBm at MCS7	• 5GHz Band/HT40 14±2dBm at MCS7
3.2.4.7	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs)Error Rate≤10% at room Temp 25℃	
		• 2.4GHz Band/HT20 -68dBm at MCS7	• 2.4GHz Band/HT40 -66dBm at MCS7
		• 5GHz Band/HT20 -68dBmat MCS7	• 5GHz Band/HT40 -66dBm at MCS7

3.1.5 IEEE 802.11ac Section

	Feature	Detailed Description	
3.2.5.1	Standard	• IEEE 802.11ac	
3.2.5.2	Radio and Modulation Type	• QPSK , BPSK , 16QAM ,64QAM,256QAM with OFDM	
3.2.5.3	Operating Frequency	• 2.4GHz :2400 ~ 2483.5MHz for ISM band • 5GHz : 5.15~5.25GHz； 5.25~5.35GHz； 5.47~5.725GHz； 5.725~5.85GHz；	
3.2.5.4	Data Rate	• at most 866.7 Mbps	
3.2.5.5	Media Access Protocol	• CSMA/CA with ACK	
3.2.5.6	Transmitter Output Power at Antenna Connector	• Typical RF Output Power at each RF chain，at room Temp. 25℃ • 12±2dBm VHT80 at MCS9	
3.2.5.7	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs)Error Rate≤10% at room Temp 25℃	
		• 2.4GHz Band/VHT20 -64dBm at MCS8	• 2.4GHz Band/VHT40 -58dBm at MCS9
		• 5GHz Band / VHT20 -64dBm at MCS8	• 5GHz Band / VHT40 -58dBm at MCS9
		• 5GHz Band / VHT80 -55dBm at MCS9	

3.1.6 IEEE 802.11ax Section

	Feature	Detailed Description	
3.2.5.1	Standard	• IEEE 802.11ax	
3.2.5.2	Radio and Modulation Type	• QPSK , BPSK , 16QAM ,64QAM,256QAM, 1024QAM with OFDMA	
3.2.5.3	Operating Frequency	• 2.4GHz: 2400 ~ 2483.5MHz ISM band • 5GHz : 5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.725GHz; 5.725~5.85GHz; • 6GHz : 5.925-7.125GHz	
3.2.5.4	Data Rate	• at most 1201 Mbps	
3.2.5.5	Media Access Protocol	• CSMA/CA with ACK	
3.2.5.6	Transmitter Output Power at Antenna Connector	• Typical RF Output Power at each RF chain,at room Temp. 25℃ • 12±2dBm HE80 at MCS11	
3.2.5.7	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs)Error Rate≤10% at room Temp 25℃	
		• 2.4GHz Band / HE20 -57dBm at MCS11	• 2.4GHz Band / HE40 -55dBm at MCS11
		• 5GHz Band / HE20 -57dBm at MCS11	• 5GHz Band / HE40 -55dBm at MCS11
		• 5GHz Band / HE80 -53dBm at MCS11	
		• 6GHz Band / HE20 -57dBm at MCS11	• 6GHz Band / HE40 -55dBm at MCS11
		• 6GHz Band / HE80 -53dBm at MCS11	

4. Electrical and Thermal Characteristics

4.1 Temperature Limit Ratings

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	+125	C
Ambient Operating Temperature	-10	70	C
Junction Temperature	0	125	C

4.2 General Section

	Feature	Detailed Description
5.2.1	Antenna Type	• IPEX MHF I connector
5.2.2	Operating Voltage	• 3.3V±10%
5.2.3	Current Consumption	• ＜300mA@RX • ＜2000mA@TX
5.2.4	Form Factor and Interface	• SDIO3.0 Interface

4.3 Software

Driver	Win10,Win8,Win7
Security	64/128-bits WEP, WPA, WPA2

4.4 DC Characteristics

Symbol	Parameter	Min	TYPE	Max	Unit
VIL	Input Low Voltage	-0.3	-	DVDDIO*0.25	V
VIH	Input High Voltage	DVDDIO*0.625	-	DVDDIO+0.3	V
VOL	Output Low Voltage	-0.3	-	DVDDIO*0.125	V
VOH	Output High Voltage	DVDDIO*0.75	-	DVDDIO+0.3	V

5. Mechanical Characteristics

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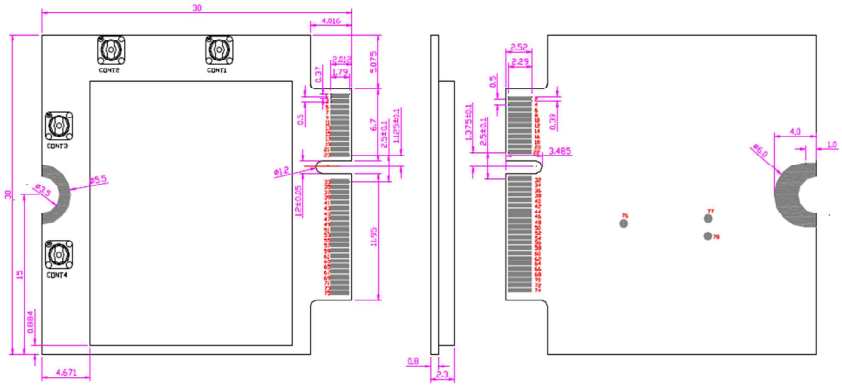
5.1 Mechanical Requirements

	Feature	Detailed Description
5.1.1	Length	• 30 mm
5.1.2	Width	• 30 mm
5.1.3	Height	• 0.8 mm(PCB)

5.2 Mechanical Dimensions



Tolerance:

DIM (mm)	Tolerance (mm)
0-5	±0.15
5-10	±0.20
10-50	±0.30
>50	±0.40

5.3 PIN Description

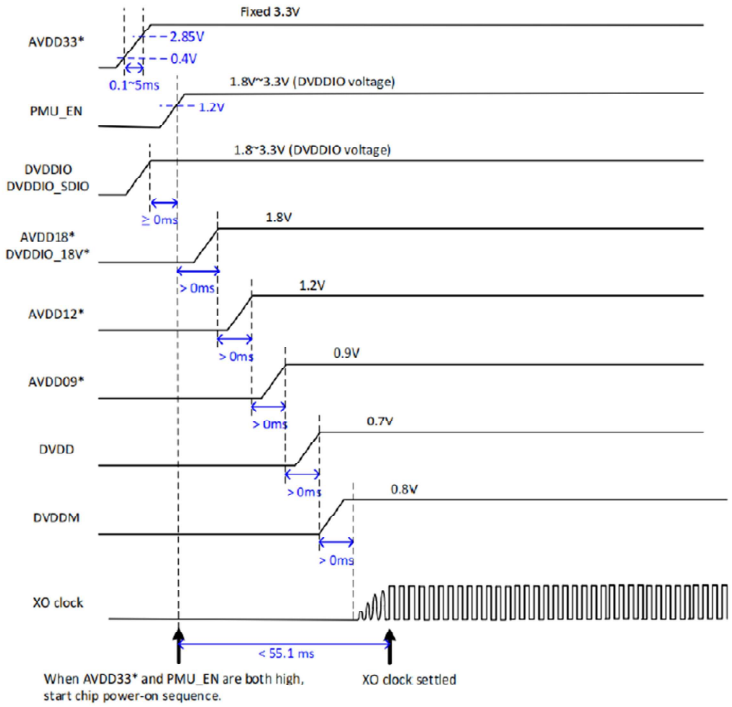
NO.	Pin Name	Pin description	I/O
1	GND	Ground	Ground
2	3V3	Power Supply for 3.3V	Power
3	NC	NC	/
4	3V3	Power Supply for 3.3V	Power
5	NC	NC	/
6	WGPIO1	For WiFi to wake up the host, requires the platform to add a 10K resistor to pull up to 3.3V, active low level	I/O
7	GND	Ground	Ground
8	NC	NC	/
9	SDIO-CLK	SDIO clock	I
10	NC	NC	/
11	SDIO-CMD	SDIO command	I/O
12	NC	NC	/
13	SDIO-D0	SDIO data bit 0	I/O
14	NC	NC	/
15	SDIO-D1	SDIO data bit 1	I/O
16	GND	Ground	Ground
17	SDIO-D2	SDIO data bit 2	I/O
18	GND	Ground	Ground
19	SDIO-D3	SDIO data bit 3	I/O
20	NC	NC	/
21	NC	NC	/

22	NC	NC	/
23	NC	NC	/
32	NC	NC	/
33	GND	Ground	Ground
34	NC	NC	/
35	NC	NC	/
36	NC	NC	/
37	NC	NC	/
38	NC	NC	/
39	GND	Ground	Ground
40	NC	NC	/
41	NC	NC	/
42	NC	NC	/
43	NC	NC	/
44	NC	NC	/
45	GND	Ground	Ground
46	NC	NC	/
47	NC	NC	/

6. Component preparation

	Material Name	Company	Using State
1	Integrated Circuit	MediaTek	Using
2	Capacitor	MURATA/WALSIN/TAIYO	Using
3	Inductor	MURATA/CHILISIN/FENGHUA	Using
4	Resistor	YAGEO/TA-I/WALSIN/RALEC	Using
5	Crystal XTAL	HARMONY/CREC/Kingbri Frequency/East Crystal	Using
6	Chip Power Inductors	CHILISIN/FENGHUA	Using
7	PCB	FZX-PCB/BXXW-PCB	Using
8	Duplexer	WALSIN	Using

7. Power on Sequence Timing



8. Installation Instruction

In order to maximize the radiation effect of the antenna, it is recommended that:The three-dimensional distance between the module antenna area and the metal parts of the user's product is at least 6~15mm(such as housing positioning screws, power wires, signal wires, hardware, etc.)； The user PCB board should not be wired or covered with copper in the area directly below the module antenna area and the surrounding 6mm area;

The module is located in one corner or one side of the product, and the antenna area is external and to the user.

8.1 Operational use Conditions

When the module is used with the host product, the corresponding package should be reserved on the host product, respectively, the schematic package and PCB package sizes.

9. Regulatory compliance

9.1 We do not release the firmware on our website for downloading. Our direct host manufacturer (OEM) can request the firmware from us and it will be made available via secure server.

9.2 Radio frequency parameters are limited by US regulatory domain and country code to limit frequency and transmit power levels. These limits are stored in non-volatile memory by the module manufacturer at the time of production. They will not exceed the authorized values.

9.3 The firmware is installed on each single module during manufacturing process. The correct firmware is verified and installed by the module manufacturer. In addition, the firmware updates can only be stored in non-volatile memory when the firmware is authenticated.

9.4 third parties don’t have the capability to access and change radio parameters. US sold modules are factory configured to US.

9.5 Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

9.6 This module have RF shielding and is tested and approved as a standalone configuration

10.FCC Statement

This radio module must not be installed to co-locate and operating simultaneously with other radios in the host system, additional testing and equipment authorization may be required to operate simultaneously with other radios.

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 re ceived, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, p ursuant 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 fr equency energy and, if not installed and used in accordance with the instructions, may cause harmful in terference 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 recepti on, which can be determined by turning the equipment off and on, the user is encouraged to try to corr ect 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:

10.1 label

Product: WiFi module
Model No.: WXT5CM2803
FCC ID: ZLZ-WXT5CM2803

11 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 modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The module is limited to OEM installation only The OEM integrator is responsible for ensuring that the end-user has no manual instructions to remove or install module If the FCC dentification 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 Transmitter Module FCC ID: WXT5CM2803 Or Contains FCC ID: WXT5CM2803

When the module is installed inside another device, the user manual of the host must contain below warning statements;

11.1 List of applicable FCC rules
FCC Part 15 Subpart C 15.247 & 15.209

12.2 Specific operational use conditions
The module is a Wi-Fi 6E Module

Wi-Fi Module	Operation Frequency	Number of Channel	Modulation	Antenna Spec.

WXT5CM2803	2412-2462MHz 2422~ 2452MHz	11	DSSS, OFDM	FPC antenna, 2.45dBi Max.
	5150~5250 MHz 5250~5350 MHz 5450~5725 MHz 5725~5850 MHz	26	OFDM/BPSK/QPSK /16QAM/64QAM/ 256QAM/1024QAM	FPC antenna, 3.29dBi Max.
	5925~6425MHz 6425~6525MHz 6525~6875MHz 6875~7125MHz	35	OFDM/BPSK/QPSK /16QAM/64QAM/ 256QAM/1024QAM	FPC antenna, 4.92dBi Max.

The module can be used for mobile or portable applications with a maximum wifi 2.4G 2dBi antenna,wifi 5G 3.29dBi , wifi 6G 4.92dBi The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operaition. The host manufacturer 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.

1.3 Limited module procedures Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

1.4 Trace antenna designs
Not applicable. The module has its own antenna, and doesn’t need a host’s printed board microstrip trace antenna etc.