WM0006B & WM0006C Operation description

This product is for 802.11n WiFi mobile AP (Model No: WM0006-03). The WM0006B & WM0006C are based on MediaTek MT7628 chip solution and complied with IEEE802.11b/g/n standard from 2.4~2.5GHz.

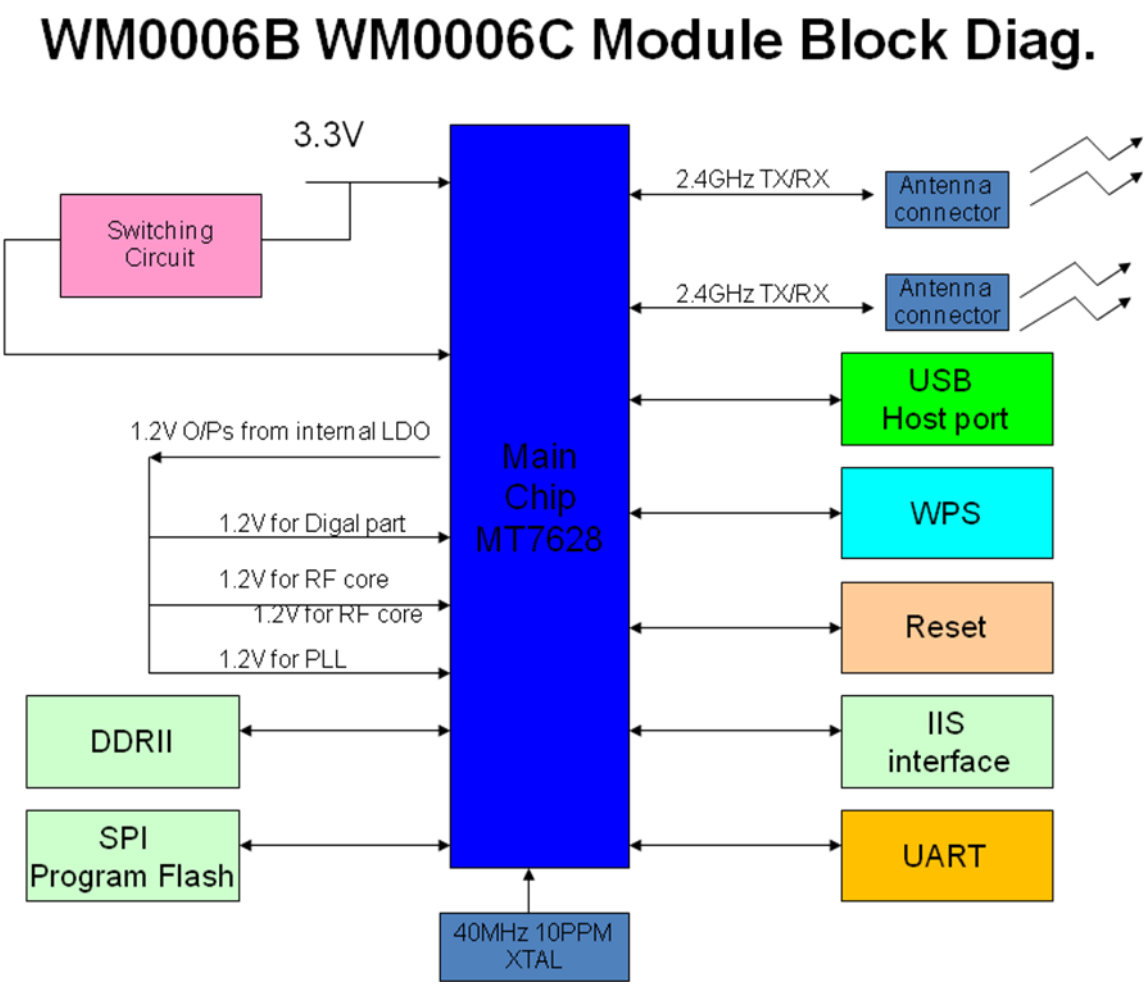
WM0006B & WM0006C offers absolute interoperability with different vendors' 802.11b/g/n STA through the wireless LAN with seamless roaming, fully interoperability, and advanced security with WEP/WPA/WPA2 standard.

WM0006 is build-in 10/100 Ethernet PHY/switch for the wire LAN application.

WM0006 is 18-pin & 32-pin connector supporting USB 2.0 interface for the external storage application, such as the USB flash driver, USB memory card reader and USB HDD.

WM0006B & WM0006C build-in the hi-efficiency Chip antenna with Omni-direction receive angle.

Module Block Diagram:



Product Features

1、Compatible with IEEE 802.11b/g/n standard.

2、Operation at 2.4-2.4835GHz frequency band to meet worldwide regulations

3、Maximum reliability, throughput and connectivity with automatic data rate switching

4、Supports WEP, WPA, WPA2 mode.

5、Friendly user configuration and utilities.

6、Support 3.3v DC power input.

7、Software AP support iOS4 or later, Android 3.4.x or later.

8、Build-in the USB 2.0 interface

9、Build- in the Ethernet 10/100 PHY/switch interface.

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Specification.

Standard IEEE 802.11b/g/n

Frequency Band 2400~2483.5MHz ISM band

Data transfer rate

11n: 300/270/243/216/162/108/81/54/27Mbps;
135/121.5/108/81/54/40.5/27/13.5Mbps;
130/117/104/78/52/39/26/13Mbps;
65/58.5/52/39/26/19.5/13/6.5Mbps;

11g: 54/48/36/24/18/12/9/6M (adaptive);

11b: 11/5.5/2/1M (adaptive)

RF Output Power (Typical)

802.11n: 15dBm for OFDM mode;

802.11g: 17dBm for OFDM mode;

802.11b: 20dBm for CCK mode

Receiver sensitivity

300M_2.4G:-70dBm;

270M_2.4G:-70dBm;

195M_2.4G:-71dBm;

130M_2.4G:-74dBm;

54M_2.4G:-79dBm;

6M_2.4G:-94dBm

Wireless Security
Wireless MAC address filtering ;
Wireless security function switch ;
64/128/152 bit WEP encryption ;
WPA-PSK/WPA2-PSK, WPA/WPA2 security mechanism ;
WPS fast security settings

Channel: 11 Channels for United State(FCC)
13 Channels for Europe (ETSI)
13 Channels for Japan (TELEC)
Extend Frequency: DSSS
Modulation Type: OFDM

Wireless: 64/128 bit
WEP,WPA-PSK/WPA2-PSK
Antenna connector Type: 2 coaxial cable antenna connector
TX/RX ANT *1,
TX/RX ANT *1.

Operating Humidity: 10% to 90% RH non-condensing

Storage humidity: 5% to 90% RH non-condensing

Operating Voltage: 3.3VDC +/- 10%
Operation Temperature: -20ºC to +55ºC.

WM0006B Pin definition

J3: General interface

Pin no.	Name	In/Out/P/G	Function	Multi pin
1	3.3VD	P	3.3V power input	--
2	3.3VD	P	3.3V power input	--
3	GND	G	Ground pin	--
4	GND	G	Ground pin	--
5	EPHY_LED4_N	I/O, PU	General purpose IO 39	GPIO#39
6	GND	G	Ground pin	--
7	WPS_PBC	Input	WPS switch input	
8	EPHY_LED1_N	I/O, PU	General purpose IO 42	GPIO#42
9	EPHY_LED0_N	I/O, PU	General purpose IO 43	GPIO#43
10	EPHY_LED3_N	I/O, PU	General purpose IO 40	GPIO#40
11	WLAN_LED	Output	2.4G Wireless LED control	
12	GND	G	Ground pin	--
13	GND	G	Ground pin	--
14	UPHY0_PADM	I/O	USB data pin Data-	--
15	EPHY_LED2_N	I/O, PU	General purpose IO 41	GPIO#41
16	UPHY0_PADP	I/O	USB data pin Data+	--
17	GPIO11	I/O	General purpose IO11	GPIO#11
18	GND	G	Ground pin	--

J1: Console & SD interface

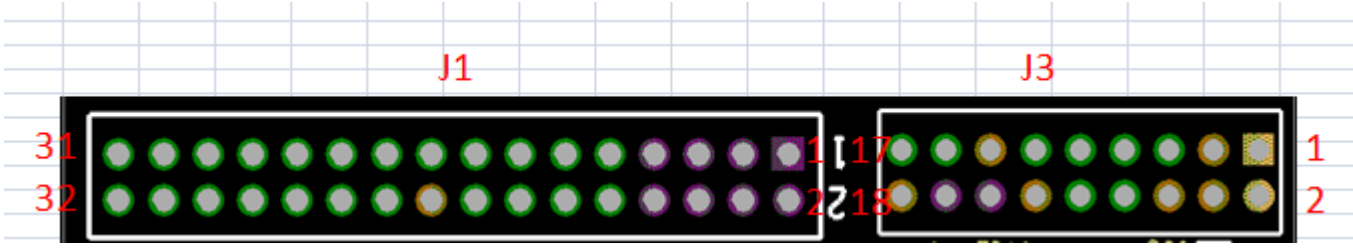
Pin no.	Name	In/Out/P/G	Founction
1	SD_D6	I/O	GPIO
2	UART_TX	O	UART Lite TXD
3	SD_D7	I/O	GPIO
4	UART_RX	I	UART Lite RXD
5	SD_CD	I	SD Card detect
6	SD_WP	I	SD Write Protect
7	SD_D0	I/O	4 Bidirectional data signals.
8	SD_D1	I/O	4 Bidirectional data signals.
9	SD_CMD	I/O	Bidirectional Command/Response signal

10	SD_CLK	I/O	Host to card clock signal
11	SD_D2	I/O	4 Bidirectional data signals.
12	SD_D3	I/O	4 Bidirectional data signals.
13	SD_D5	I/O	GPIO
14	SD_D4	I/O	GPIO

J4: WAN port / RJ45 interface /

Pin no.	Name	In/Out/P/G	Founction
1	TXOP0	O	10/100 PHY Port TXP
2	TXON0	O	10/100 PHY Port TXN
3	RXIP0	I	10/100 PHY Port RXP
4	RXIN0	I	10/100 PHY Port RXN
5	NC	X	
6	GND	G	Ground pin
7	3.3VD	P	3.3V power input

WM0006C Pin definition



J3: General interface

WM0006C

J3		
Pin NO.	Pin Name	Function
1	3.3VD	3.3V power-supply
2	3.3VD	3.3V power-supply
3	GND	Ground pin
4	GND	Ground pin
5	GPIO_39	GPIO 39
6	GND	Ground pin
7	WPS_RST_Button	WPS
8	GPIO_42	GPIO 42
9	GPIO_43	GPIO 43
10	GPIO_40	GPIO 40
11	WLAN_LED_OUT	Wireless LAN LED
12	GND	Ground pin
13	GND	Ground pin
14	USB_DM	USB DN
15	GPIO_41	GPIO 41
16	USB_DP	USB DP
17	GPIO11	GPIO 11
18	GND	Ground pin

J1		
Pin NO.	Pin Name	Function
1	RXIP0	Ethernet Port 0
2	RXIN0	
3	TXOP0	
4	TXON0	
5	TXOP1	Ethernet Port 1
6	TXON1	
7	RXIP1	

8	RXIN1	
9	SD_D6	SD Interface
10	SD_D5	
11	SD_D7	
12	SD_D4	
13	SD_WP	
14	SD_D1	
15	SD_CD	
16	SD_CLK	
17	SD_D0	
18	GND	Ground pin
19	SD_CMD	SD Interface
20	SD_D3	
21	SD_D2	
22	UART_TXD0	UART0
23	UART_RXD0	
24	UART_RXD1	UART1
25	UART_TXD1	
26	REF_CLKO	I2S Interface
27	I2C_SD	I2C Interface
28	I2C_SCLK	
29	I2S_CLK	I2S Interface
30	I2S_WS	
31	I2S_DO	
32	I2S_DI	

FCC WARNING

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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

15.105 Information to the user.

(b) For a Class B digital device or peripheral, the instructions furnished the user 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 usedin 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.

This equipment complies with FCC radiation exposure limits set forth for an uncon- trolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Radiation Exposure Statement:

This equipment complies with FCC 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 availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination.

The firmware setting is not accessible by the end user.

The final end product must be labelled in a visible area with the following:

“Contains Transmitter Module “FCC ID: QUY-WM0006”

Requirement per KDB996369 D03

2.2 List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power,spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See alsoSection

2.10 below concerning the need to notify host manufacturers that further testing is required.3

Explanation: This module meets the requirements of FCC part 15C (15.247).it Specifically identified AC Power Line Conducted Emission, Radiated Spurious emissions, Band edge and RF Conducted Spurious Emissions, Conducted Peak Output Power, Bandwidth, Power Spectral Density, Antenna Requirement.

2.3 Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to- point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

Explanation: The product antenna uses an irreplaceable antenna with a gain of 5.42dBi (Max)

2.4 Single Modular

If a modular transmitter is approved as a "Single Modular ," then the module manufacturer isresponsible for approving the host environment that the Single Modular is used with. The manufacturer of a Single Modular must describe, both in the filing and in the installation instructions, the alternative means that the Single Modular manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.

A Single Modular manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited

module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.

This Single Modular procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited

module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module. **Explanation:** The module is a single module.

2.5 Trace antenna designs

For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects: layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.

a) Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna); b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered); c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout; d) Appropriate parts by manufacturer and specifications; e) Test procedures for design verification; and f) Production test procedures for ensuring compliance

The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application

2.6 **RF exposure considerations**

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the applicationconditions

(mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

Explanation: The module complies with FCC radiofrequency radiation exposure limits for uncontrolled environments. The device is installed and operated with a distance of more than 20 cm between the radiator and your body." This module follows FCC statement design,

FCC ID: QUY-WM0006

2.7 Antennas

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni-directional antenna” is not considered to be a specific “antenna type”).

For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product.

The module manufacturers shall provide a list of acceptable unique connectors.

Explanation: The product antenna uses an irreplaceable antenna with a gain of 5.42dBi (Max)

2.8 **Label and compliance information**

Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating “Contains FCC ID” with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748.

Explanation: The host system using this module, should have label in a visible area indicated the following texts: "Contains FCC ID: QUY-WM0006

2.9 **Information on test modes and additional testing requirements5** Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host. Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer’s determination that a module as installed in a host complies with FCC requirements.

Explanation: Trend Electronics Co., Ltd. can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

2.10 **Additional testing, Part 15 Subpart B disclaimer**

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product

as being Part 15
Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Explanation: The module without unintentional-radiator digital circuity, so the module does not require an evaluation by FCC Part 15 Subpart B. The host shoule be evaluated by the FCC Subpart B.