

# Industrial WiFi module

## WM-AN-AT-01 User Manual

### 1. Scope

This document is to define the product specification for 802.11a/b/g/n WiFi module of WM-AN-AT-01. All the data in this document is based on Qualcomm Atheros (QCA) AR6003X data sheet issued in January 2010, and other documents provided from Qualcomm Atheros.

### 2. General Features

Item	Description
Standard	Complies with the latest IEEE 802.11a/b/g/n wireless LAN
Chip Set	Qualcomm Atheros AR6003X single-chip client
Data Rate	802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto rate 802.11b: 11, 5.5, 2, 1Mbps, auto rate 802.11/n 2.4GHz : HT20 -MCS 0 - 7 802.11/n 5GHz : HT20 & 40 -MCS 0 - 7
Modulation	OFDM (54, 48, 36, 24, 18, 12, 9, 6Mbps) OFDM (MCS0, MCS1, MCS2, MCS3 MCS4, MCS5, MCS6, MCS7) CCK (11Mbps, 5.5Mbps) DQPSK (2Mbps) DBPSK (1Mbps)
Operating Frequency	2.4GHz band: 2.4 12– 2.483 GHz 5GHz U-NII 1 band: 5.15 – 5.25 GHz 5GHz U-NII 2A band: 5.25 – 5.35 GHz 5GHz U-NII 2C Band: 5.47 ~ 5.725 GHz 5GHz U-NII 3 band: 5.725 – 5.825 GHz
FCC Regulatory Domain	FCC 15.247 DTS FCC 15.407 UNII

### 3. Specifications

When you enable the application program of WIFI, many wireless applications will become possible, such as: Communicate with each other wirelessly, including shares or exchanges of data.

The WM-AN-AT-01 module consists of a WiFi chipset (AR6003), a 2.4GHz Power Amplifier, a 2.4GHz Band-Pass-Filter, a 5G FEM, a RF Diplexer, and a 26MHz crystal, the wifi communication is performed by AR6003 chipset and host CPU which is controlled by SDIO interface.

#### 3.1 Power Management

The WM-AN-AT-01 has an integrated Power Management Unit (PMU) which generates all the power supplies required by its internal circuitry from external 3.3V and 1.8V

supplies. The main components of the PMU are as follows:

- A linear regulator (SREG) which converts the host IO supply to a 1.2V supply for some small control blocks which are turned on when CHIP\_PWD\_L is de-asserted.
- A linear regulator (DREG) which converts the 1.8V input to 1.2V for the bulk of AR6003X core digital circuitry.
- A linear regulator (AREG) which converts the 1.8V input to 1.2V for the AR6003X core analog circuitry.

## 3.2 Power Transition Diagram

The WM-AN-AT-01 provides integrated power management and control functions and extremely low power operation for maximum battery life across all operational states by:

- Gating clocks for logic when not needed
- Shutting down unneeded high speed clock sources
- Reducing voltage levels to specific blocks in some states

## 3.3 Operational Description

The WM-AN-AT-01 is designed for installation into mobile or fixed devices such as data terminals which typically operate at distances greater than 20 cm from the human body.

## 4. Others

- 1) This device is intended for OEM integrators only.
- 2) OEM integrators is responsible for ensuring that the end-user has no manual instructions to remove or install module.
- 3) Separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations.
- 4) Please see the full Grant of Equipment document for other restrictions.

## 5. Regulatory

### **FEDERAL COMMUNICATIONS 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 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.

### **CAUTION**

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

### **LABEL REQUIREMENT**

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.

### **RF exposure warning**

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance

### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20cm 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: SLE-WM-AN-AT-01 "**.

### **Information for the OEMs and Integrators**

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- 1) This device is intended for OEM integrators only.

2) Please see the full Grant of Equipment document for other restrictions.

#### ANTENNA USED

This radio transmitter **FCCID: SLE-WM-AN-AT-01** has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	KINSUN	ANT-WDB-ARM-02	Dipole	2.04 dBi for 2.4 GHz 0.81 dBi for 5.15-5.25 GHz 0.38 dBi for 5.25-5.35 GHz -1.39 dBi for 5.47-5.725 GHz -0.39 dBi for 5.725-5.85 GHz

#### NCC 警語

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。