

## Introduction

ATA8510 SoC is a low-power, Ultra-High Frequency (UHF) Amplitude Shift Keying (ASK)/Frequency Shift Keying (FSK) Radio Frequency (RF) transceiver with an integrated 8-bit AVR microcontroller.

The ATA8510M is a fully RF certified wireless module based on ATA8510 SoC. The Module is designed for the Sub-GHz radio frequency 433.92MHz. By combining outstanding RF performance with highly sophisticated baseband signal processing, robust wireless communication can be easily achieved. Users can configure the ATA8510M module by using the SDK or ATA5831 EEPROM Configuration Tool (Config Tool).

ATA8510M module is available with the following antenna options:

- PCB Antenna (ATA8510MPE)
- U.FL Connector (ATA8510MUE) for External Antenna.

**Note:** ATA8510M module loads certified frequency bands by default. Mechanisms such as EEPROM write protection, firmware frequency band restrictions, and official tool access control are used to prevent users from unauthorized setting of non-certified channels.

## ATA8510M Features

- AVR microcontroller core with 1-Kbyte SRAM and 24-Kbyte RF library in firmware (ROM)
- ATA8510 – 20-Kbyte of user Flash
- Supported frequency ranges
  - Low-band –418-477 MHz
  - 433.92 MHz with one 24.305 MHz crystal
- Low current consumption
  - 9.8 mA for RXMode (Low-Band), 1.2 mA for 21 ms cycle three-channel polling
  - 9.4 mA/13.8 mA for TXMode (Low-Band, POUT = 6 dBm)
- Typical OFFMode current of 5 nA (maximum 600 nA at Vs = 3.6V and T = 85°C)
- Programmable output power -12 dBm to +4 dBm (0.4 dB step)
- Supports the 0 dBm class of ARIB STD-T96
- ASK shaping to reduce the spectral bandwidth of modulated PA output signal
- Input 1 dB compression point
  - -48 dBm (full sensitivity level)
  - -20 dBm (active antenna damping)
- Programmable channel frequency with fractional-N PLL

- 93 Hz resolution for Low-Band
  - 185 Hz resolution for High-Band
- FSK deviation  $\pm 0.375$  kHz to  $\pm 93$  kHz
- FSK sensitivity (Manchester coded) at 433.92 MHz
  - -108.5 dBm at 20 Kbit/s,  $\Delta f = \pm 20$  kHz and BWIF = 165 kHz
  - -111 dBm at 10 Kbit/s,  $\Delta f = \pm 10$  kHz and BWIF = 165 kHz
  - -114 dBm at 5 Kbit/s,  $\Delta f = \pm 5$  kHz and BWIF = 165 kHz
  - -122.5 dBm at 0.75 Kbit/s,  $\Delta f = \pm 0.75$  kHz and BWIF = 25 kHz
- ASK sensitivity (Manchester coded) at 433.92 MHz
  - -110.5 dBm at 20 Kbit/s BWIF = 80 kHz
  - -125 dBm at 0.5 Kbit/s BWIF = 25 kHz
- Programmable RX-IF bandwidth 25 kHz to 366 kHz (approximately 10% steps)
- Blocking (BWIF = 165 kHz): 64 dBc at frequency offset = 1 MHz and 48 dBc at 225 kHz
- High image rejection: 55 dB at 315 MHz/433.92 MHz and 47 dB at 868.3 MHz/915 MHz without calibration
- Supported data rate in buffered mode 0.5 Kbit/s to 80 Kbit/s (120 Kbit/s NRZ)
- Supports pattern-based wake-up and start of frame identification
- Flexible service configuration concept with on-the-fly (OTF) modification (in IDLEMode) of SRAM service
- parameters (data rate, ...)
  - Each service consists of
    - One service-specific configuration part
    - Three channel-specific configuration parts
  - Three service configurations are located in EEPROM
  - Two service configurations are located in SRAM and can be modified via SPI or embedded application software
- Digital RSSI with very high relative accuracy of  $\pm 1$  dB thanks to digitized IF processing
- Programmable clock output derived from crystal frequency
- 1024-byte EEPROM data memory for transceiver configuration
- SPI interface for RX/TX data access and transceiver configuration
- 500-Kbit SPI data rate for short periods on the SPI bus and host controller
- On demand services (SPI or API) without polling or telegram reception
- Integrated temperature sensor
- Self-check and calibration with temperature measurement
- Configurable EVENT signal indicates the status of the IC to an external microcontroller
- Automatic antenna tuning at TX center frequency for loop antenna
- Automatic low-power channel polling
- Flexible polling configuration concerning timing, order and participating channels
- Fast RX/TX reaction time

- Power-up (typical 1.5 ms OFFMode -> TXMode, OFFMode -> RXMode)
- RXMode <-> TXMode switching (typical 500  $\mu$ s)
- Supports mixed ASK/FSK telegrams
- Non-byte aligned data reception and transmission
- Software customization
- Antenna diversity with external switch via GPIO control
- Antenna diversity with internal SPDT switch

#### **Operating Conditions**

- Operating Voltage: 1.9-3.6V and 2.4-5.5V
- Operating Temperature: -40°C to +85°C

#### **Module Variants**

- PCB Antenna:
  - ATA8510MPE
- U.FL Connector for External Antenna:
  - ATA8510MUE

#### **Package**

- 30-Pin SMD Package with Shield CAN
- Size: 27mm x 32mm x 1mm,

#### **Compliance**

- ATA8510M Module is planned to Certify to the United States (FCC), Canada (ISED), Europe (CE), Korea (KCC), Taiwan (NCC) and Japan (MIC) Radio Regulations.
- RoHS and REACH Compliant

#### **Application**

- Home and building automation
- Wireless sensor networks
- Weather stations
- Battery-operated remote controls
- Smoke detectors
- Wireless alarm and security systems
- Remote control systems, e.g., garage door openers
- Smart RF applications
- Telemetry systems

## Table of Content

Introduction .....	1
ATA8510M Features .....	1
1. Ordering Information .....	6
2. Device Overview .....	7
2.1 PIN Details of ATA8510M Module .....	8
2.3 Basic Connection Requirement .....	11
2.3.1 Power Supply Pin .....	11
2.3.2 Reset Pin (NRESET) .....	11
2.3.3 Programming interface .....	11
2.4 ATA8510M Module Placement Guidelines .....	12
2.5 ATA8510M Module Routing Guidelines .....	12
2.6 ATA8510M Module RF Considerations .....	12
2.7 ATA8510M Module Antenna Considerations .....	13
2.7.1 ATA8510M PCB ANTENNA .....	13
2.7.2 External Antenna Placement Recommendations .....	14
2.7.3 External Antennas .....	14
2.8 ATA8510M Module Reflow Profile Information .....	14
2.8.1 Cleaning .....	15
2.9 ATA8510M Module Assembly Considerations .....	15
2.9.1 Conformal Coating .....	15
3. Packaging Information .....	16
4. Electrical Characteristics .....	18
5. Appendix A: Regulatory Approval .....	20
5.1 United States .....	20
5.1.1 Labeling and User Information Requirements .....	20
5.1.2 RF Exposure .....	21
5.1.3 Helpful Web Sites .....	21
5.2 Canada .....	22
5.2.1 Labeling and User Information Requirements .....	22

5.2.2	RF Exposure .....	23
5.2.3	Helpful Web Sites .....	23
5.3	Europe .....	23
5.3.1	Labeling and User Information Requirements.....	24
5.3.2	Conformity Assessment .....	24
5.3.3	Simplified EU Declaration of Conformity .....	24
5.3.4	Helpful Websites .....	25
5.4	Korea .....	25
5.4.1	Labeling and User Information Requirements.....	25
5.4.2	Helpful Websites .....	25
5.5	Taiwan.....	25
5.5.1	Labeling and User Information Requirements.....	26
5.5.2	Helpful Web Sites .....	27
6.	Document Revision History .....	28
	Microchip Information .....	29

## 1. Ordering Information

This chapter provides the ordering information of the ATA8510M module.

### 1.1 ATA8510M Module Ordering Information

The following table describes the ordering information of the ATA8510M module.

**Table 1-2.** ATA8510M Module Ordering Details

Model Number	Module SoC	Description	Ordering Code
ATA8510M	ATA8510	Sub-GHz RF Transceiver Module with PCB antenna	ATA8510MPE-I
ATA8510M		Sub-GHz RF Transceiver Module with U.FL connector for external antenna	ATA8510MUE-I

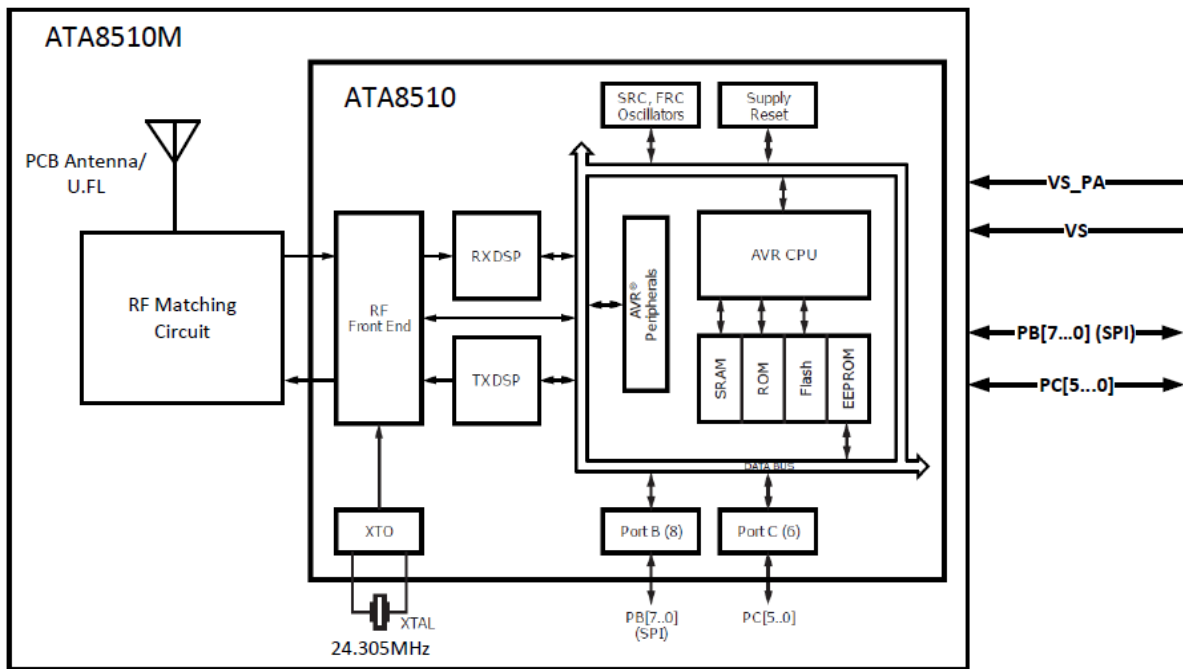
## 2. Device Overview

The ATA8510M module is a fully RF certified wireless module. The ATA8510 module is available with the following antenna variants:

- PCB antenna (ATA8510MPE)
- U.FL connector (ATA8510UE) for external antenna

The following figure illustrates the ATA8510M module block diagram and various peripherals supported by the module.

**Figure 2-1.** ATA8510M Module Block Diagram



There are two modes of operation supported by A

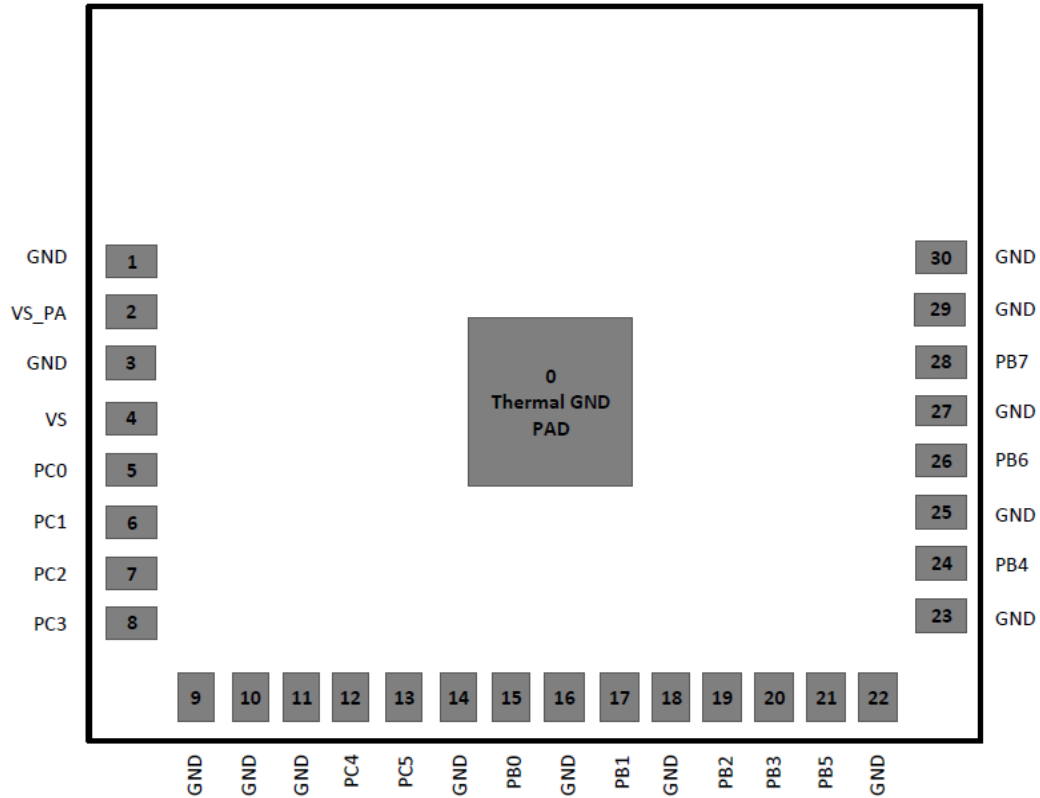
- Host mode:
  - Interfaces with an external MCU over SPI for application specific system control.
  - ATA8510M can be attached to an external MCU and operates as a Receiver and another ATA8510M device can be as a Transmitter or vice-versa.
- Standalone mode:
  - No external MCU involved.
  - ATA8510M can be a transmitter and another ATA8510M device can be receiver or vice-versa.

**Note:** The SDK and Config Tool are available for download at:  
<https://www.microchip.com/en-us/product/ata8510>

## 2.1 PIN Details of ATA8510M Module

This section provides details on pin diagrams and pinout table of ATA8510M module.

**Figure 2-2. ATA8510M Module Pin Diagram**





## 2.2 Pinout Table of ATA8510M Module

This section provides the pinout tables of the ATA8510M module.

**Table 2-1. ATA8510M Module Pin Description**

Pin Number	Pin Name	Pin Type	Description
1	GND	P	GND
2	VS_PA	P	Supply to Power Amplifier 3V application: supply voltage (VS) input 5V application: internal voltage regulator output
3	GND	P	GND
4	VS	P	Main supply voltage input
5	PC0	I/O	Main: Port C0 Alternate: PCINT8/NRESET/Debug/WIRE
6	PC1	I/O	Main: Port C1 Alternate: NPWRON1/PCINT9/EXT_CLK
7	PC2	I/O	Main: Port C2 Alternate: NPWRON2/PCINT10/TRPA
8	PC3	I/O	Main: Port C3 Alternate: NPWRON3/PCINT11/TMDO/TxD
9	GND	P	GND
10	GND	P	GND
11	GND	P	GND
12	PC4	I/O	Main: Port C4 Alternate: NPWRON4/PCINT12/INT0/TMDI/RxD
13	PC5	I/O	Main: Port C3 Alternate: NPWRON5/PCINT13/TRPB/TMDO_CLK
14	GND	P	GND
15	PB0	P	Main: Port C3 Alternate: PCINT0/CLK_OUT
16	GND	P	GND
17	PB1	I/O	Main: Port C3 Alternate: PCINT1/SCK
18	GND	P	GND
19	PB2	I/O	Main: Port C3 Alternate: PCINT2/MOSI (SPI Host Out Client In)
20	PB3	I/O	Main: Port C3 Alternate: PCINT3/MISO (SPI Host In Client Out)
21	PB5	I/O	Main: Port C3 Alternate: PCINT5/INT1/NSS
22	GND	P	GND
23	GND	P	GND

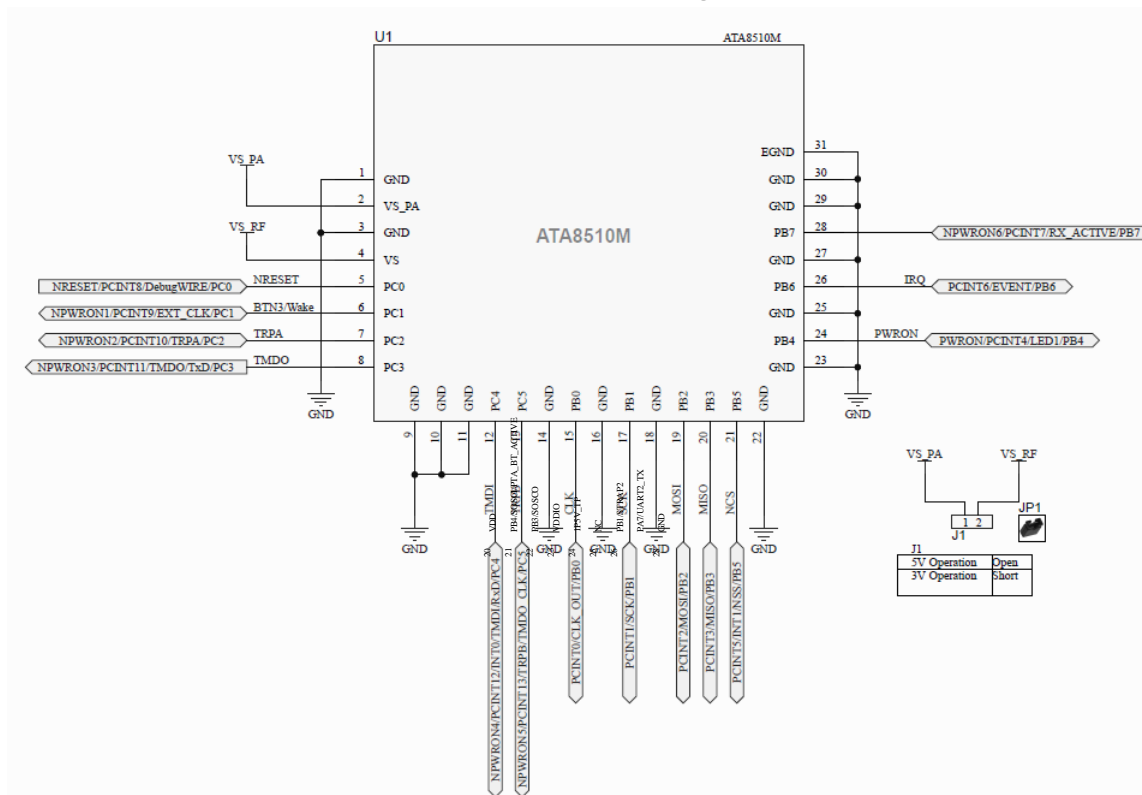
.....continued

Pin Number	Pin Name	Pin Type	Description
24	PB4	I/O	Main: Port C3 Alternate: PWRON/PCINT4/LED1 (strong high side driver)
25	GND	P	GND
26	PB6	I/O	Main: Port C3 Alternate: PCINT6/EVENT (firmware controlled external microcontroller event flag)
27	GND	P	GND
28	PB7	I/O	Main: Port C3 Alternate: NPWRON6/ PCINT7/RX_ACTIVE (strong high side driver)/LED0 (strong low side driver)
29	GND	P	GND
30	GND	P	GND

## 2.3 Basic Connection Requirement

The ATA8510M module requires attention to a minimal set of device pin connections before proceeding with development

**Figure 2-3.** ATA8510M Module Basic Connection and Interface Diagram



### 2.3.1 Power Supply Pin

There are two power Pins

VS (Pin4), when 5V supply is selected, the internal 3V LDO can be activated to supply VS\_PA.

VS\_PA (Pin2, VS Power Amplifier) can be supplied with voltage through external Supply 3V or Internal LDO can be activated.

### 2.3.2 Reset Pin (NRESET)

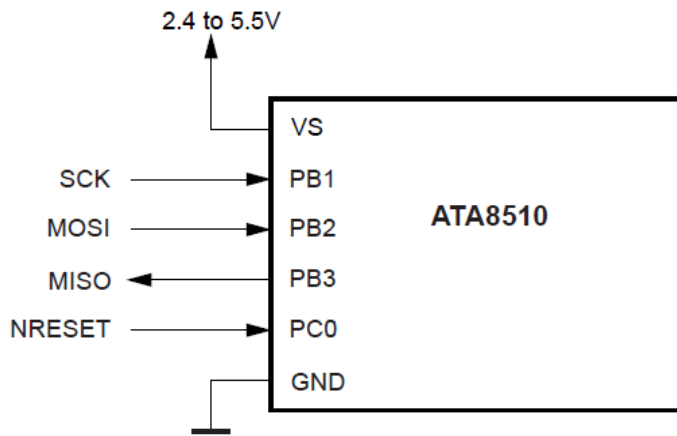
PC0 can be configured connected to an external switch, by fuse setting an nreset input for the AVR can be configured.

If the nreset functionality is enabled, a low level on this pin for longer than 10us generates a reset, even if the clock is not running. Shorter pulses could also trigger reset.

### 2.3.3 Programming interface

In the ATA8510, the internal microcontroller with the 20-Kbyte user Flash can be used to add custom extensions to the firmware.

The debugWIRE and ISP (In-System Programming) interface are available for programming purposes. Both the Flash and EEPROM memory arrays can be programmed using the serial SPI bus while NRESET is pulled to GND. This serial programming mode is called in-system programming (ISP). The interface consists of the pins SCK, MOSI (input) and MISO (output) as depicted in the following figure.



For more information on programming requirements, refer to the following documents available from the Microchip website.

[https://ww1.microchip.com/downloads/en/DeviceDoc/ATA8510\\_15\\_User\\_Guide\\_50003142A.pdf](https://ww1.microchip.com/downloads/en/DeviceDoc/ATA8510_15_User_Guide_50003142A.pdf)

## 2.4 ATA8510M Module Placement Guidelines

- For any wireless product, the antenna placement affects the performance of the whole system. The antenna requires free space to radiate RF signals, and it must not be surrounded by the ground plane. Thus, for the best PCB antenna performance, the ATA8510MPE Module must be placed at the edge of the host board.
- The ATA8510MPE Module ground outline edge must be aligned with the edge of the host board ground plane (see the following figure).

A low-impedance ground plane for the ATA8510M Module ensures the best radio performance (best range and lowest noise). The ground plane can be extended beyond the minimum recommendation as required for the host board EMC and noise reduction.

- For best performance, keep metal structures and components (such as mechanical spacers, bump- on, and so on) at least 31.75 mm away from the PCB trace antenna as illustrated in the following figure.
- The antenna on the ATA8510M Module must not be placed in direct contact with or close proximity to plastic casing or objects. Keep a minimum clearance of 10 mm in all directions around the PCB antenna (see the following figure).
- Microchip uses the following module placement for EV82M22A
- The ATA8510MUE Module on the host board can be placed aligned to each other (see figure).

## 2.5 ATA8510M Module Routing Guidelines

- Use the multi-layer host board for routing signals on the inner layer and the bottom layer.
- The top layer (underneath the Module) of the host board must be ground with as many GND vias as possible.
- Avoid fan-out of the signals under the Module or antenna area. Use a via to fan-out signals to the edge of the ATA8510 Module.

## 2.6 ATA8510M Module RF Considerations

The overall performance of the system, RF is significantly affected by the product design, environment and application. The product designer must ensure system level shielding (if required) and verify the performance of the product features and applications.

Consider the following guidelines for optimal RF performance:

- The ATA8510M Module must be positioned in a noise free RF environment and must be kept far away from high frequency clock signals and any other sources of RF energy
- The antenna must not be shielded by any metal objects
- Power supply must be clean and noise-free
- Make sure that the width of the traces routed to GND, VDD rails are sufficiently large for handling peak TX current consumption.

**Note:** The ATA8510M Module includes RF shielding on top of the board as a standard feature

## 2.7 ATA8510M Module Antenna Considerations

### 2.7.1 ATA8510M PCB ANTENNA

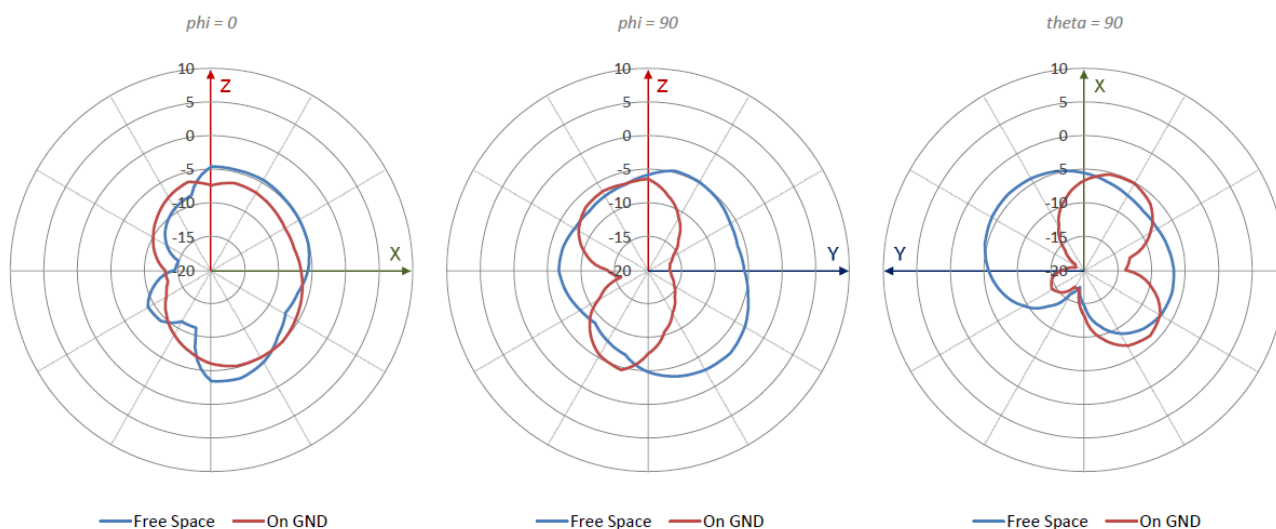
For the ATA8510MPE Module, the PCB antenna is fabricated on the top copper layer and covered in solder mask. The layers below the antenna do not have copper trace. It is recommended that the module is mounted on the edge of the host board and there is no PCB material below the antenna structure of the module and no copper traces or planes on the host board in that area. It is recommended to verify that antenna tuning is maintained when the module is integrated onto a host board or end-product.

The following table lists the technical specification of the PCB antenna, which is tested with the ATA8510M module mounted on a Evaluation Board of 1.6mm PCB thickness.

**TABLE 2-7: ATA8510M PCB ANTENNA SPECIFICATIONS**

Parameter	Specification
Operating frequency	410 ~ 450MHz
Peak gain	-1.82 dBi at 433 MHz
Efficiency (avg.)	22.5% at 433MHz

- PCB Antenna Radiation Pattern



## 2.7.2 External Antenna Placement Recommendations

The user must ensure the following for the placement of the antenna and its cable:

- Do not route the antenna cable over circuits generating electrical noise on the host board or alongside or underneath the module. The recommendation is to route the cable straight out of the module.
- Do not place the antenna in direct contact or in close proximity of the plastic casing/objects.
- Do not enclose the antenna within a metal shield.
- The user must keep any components capable of radiating noise, signals or harmonics in the 433Hz frequency range away from the antenna and, if feasible, provide shielding for such components. Any noise radiated from the host board in this frequency band degrades the sensitivity of the module.
- Place the antenna at a distance greater than 5 cm away from the module. The following figure illustrates the antenna keepout area (do not place the antenna in this area). This recommendation is based on an open-air measurement and does not take into account any metal shielding of the customer end product. When a metal enclosure is used, the antenna can be located closer to the ATA8510M Module.

## 2.7.3 External Antennas

The ATA8510MUE modules have a small surface mount U.FL connector for an external antenna connection. The choice of antenna is limited to the antenna types that the module is tested and approved for regulatory certification.

The ATA8510MUE modules are approved to use with the antennas listed in the following table. It is permissible to use a different antenna, provided it is the same antenna type, has the same antenna gain (equal or less than) and similar in-band and out-of-band characteristics are present (refer to antenna specification sheet for cutoff frequencies).

If other antenna types are used, the OEM installer must conduct the necessary assessments and authorize the antenna with the respective regulatory agencies and ensure compliance.

**Table 2-4. Approved External Antenna List with Antenna Gain for ATA8510MUE Module**

Sr. No.	Manufacturer	Manufacturer Part Number	Frequency	Ant. Type	Peak Gain	Average Gain
1	TAOGLAS	FXP450.07.0100C	410-470MHz	FPC	-1.57dBi	-5.35dBi
2	Aristotle	RFA-04-AP296	430-470MHz	FPC	0.41dBi	-3.1dBi
3	Aristotle	RFA-433-C58-100-D034	433MHz	Dipole	1dBi	-2dBi
4	Aristotle	RFA-04-T118H1-70B150	433MHz	Dipole	1.29dBi	-2.86dBi

## 2.8 ATA8510M Module Reflow Profile Information

The ATA8510M module was assembled using the IPC/JEDEC J-STD-020 standard lead-free reflow profile. The ATA8510M module can be soldered to the host board using standard leaded or lead-free solder reflow profiles. To avoid damaging the module, adhere to the following recommendations:

- For solder reflow recommendations, refer to the AN233 Solder Reflow Recommendation Application Note (DS00233).
- Do not exceed a peak temperature (TP) of 250°C.
- For specific reflow profile recommendations from the vendor, refer to the Solder Paste Data Sheet.
- Use no-clean flux solder paste.
- Do not wash as moisture can be trapped under the shield.

- Use only one flow. If the PCB requires multiple flows, apply the module on the final flow.

### 2.8.1 Cleaning

The exposed GND pad helps to self-align the module, avoiding pad misalignment. The recommendation is to use the no clean solder pastes. Ensure full drying of no-clean paste fluxes as a result of the reflow process. As per the recommendation by the solder paste vendor, this requires longer reflow profiles and/or peak temperatures toward the high end of the process window. The uncured flux residues can lead to corrosion and/or shorting in accelerated testing and possibly the field.

## 2.9 ATA8510M Module Assembly Considerations

The ATA8510M module is assembled with an Electro-Magnetic Interference (EMI) shield to ensure compliance with EMI emission and immunity rules. The EMI shield is made of a tin-plated steel (SPTE) and is not hermetically sealed. Solutions like IPA and similar solvents can be used to clean the ATA8510M module. However, do not use the cleaning solutions that contain acid on the module.

### 2.9.1 Conformal Coating

The modules are not intended for use with a conformal coating, and the customer assumes all risks (such as the module reliability, performance degradation and so on) if a conformal coating is applied to the modules.

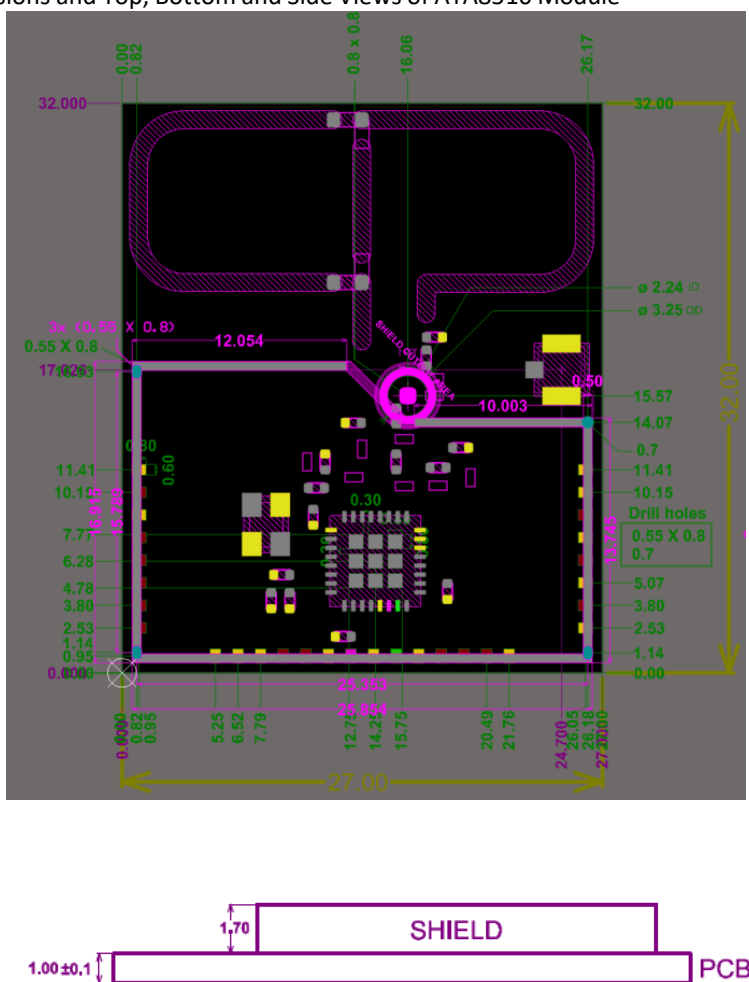
### 3. Packaging Information

This chapter provides information on package markings, dimensions, and footprint of the ATA8510M Module.

#### 3.1 ATA8510M Modules Packaging Information

The following images illustrate the packaging information of the ATA8510M Module, which is a 30-lead PCB 32 mm x 17 mm x 2.7 mm with a metal shield and coaxial connector.

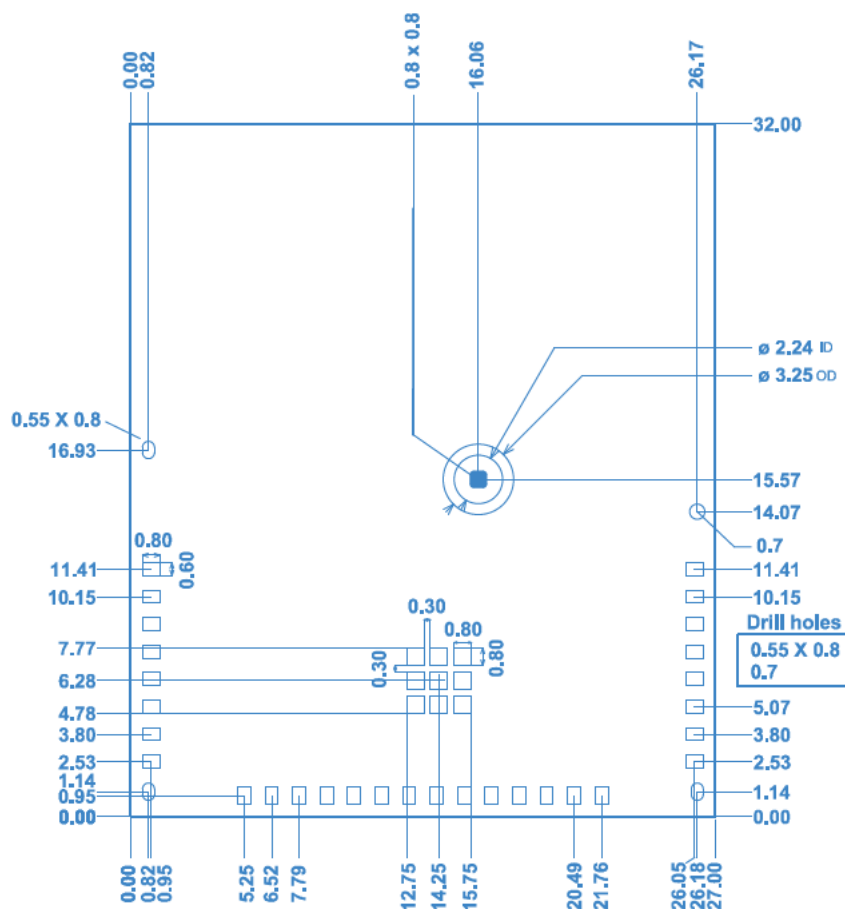
**Figure 3-1.** Dimensions and Top, Bottom and Side Views of ATA8510 Module



**Note:** All Dimensions are in millimeter.



Figure 3-2. Recommended Land Pattern of ATA8510M Module



## 4. Electrical Characteristics

This chapter provides the Electrical Specification and Characteristic of ATA8510M Module across the operating temperature range of the product.

### 4.1 Absolute Maximum Ratings

Absolute maximum ratings for WILCS02 SoC are listed below. Exposure to these maximum rating conditions for extended periods may affect device reliability. Functional operation of the device at these or any other conditions above the parameters indicated in the operation listings of this specification is not implied.

**Table 8-1.** Absolute Maximum Ratings

Parameter	Value
Ambient temperature under bias <sup>(Note)</sup>	-40°C to +85°C
Storage temperature	-55°C to +125°C
Voltage on V <sub>DD</sub> with respect to GND	-0.3V to +6.0V
Supply voltage PA (1.9...3.6V application) (V <sub>Vs_PA</sub> )	-0.3V to +4.0V
Supply voltage PA (2.4...5.5V application) (V <sub>Vs_PA</sub> )	-0.3V to +6.0V
<b>ESD Qualification</b>	
Human Body Model (HBM) per JESD22-A114	-/+4000V
Charged Device Model (CDM) (All pins / Corner pins)	-/+2000V

#### Notes:

- Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.
- Maximum allowable current is a function of device maximum power dissipation (See the *Thermal Operating Conditions* table in the *Thermal Specifications* from Related Links). TBD

### 4.2 Thermal Specifications

**Table 8-2.** Thermal Operating Conditions

Rating	Symbol	Min.	Typ	Max.	Unit
<b>Industrial Temperature Devices:</b>					
Operating ambient temperature range	T <sub>A</sub>	-40	—	+85	°C
Operating junction temperature range	T <sub>J</sub>	-40	—	+125	°C

.....continued

Rating	Symbol	Min.	Typ	Max.	Unit
Operating junction temperature range	$T_J$	-40	—	+125	°C
Maximum allowed power dissipation	$P_{DMAX}$	$(T_J - T_A)/\theta_{JA}$			W

### 4.3 Radio Specifications

**Table 9-9. RF receiving Characteristics**

Parameter <sup>(2,3)</sup>	Test Conditions	Min.	Typ.	Max.	Unit
RF operating frequency range 433 MHz Low-band	FECD.LBNHB = 1 FECD.S4N3 = 1	418	433.92	477	MHz

**Table 9-10. RF transmit Characteristics**

Parameter <sup>(2,3)</sup>	Bluetooth Specification	Min.	Typ.	Max.	Unit
Transmit power BDR	-6 to 4	1.5	2	2.5	dBm
Transmit power EDR 2M	-6 to 4	0	0.5	1	dBm
Transmit power EDR 3M	-6 to 4	0	0.5	1	dBm

## 5. Appendix A: Regulatory Approval

The ATA8510MPE module has received regulatory approval for the following countries:

United States/FCC ID: 2ADHKATA8510M

Canada/ISED:

- IC: 20266-ATA8510M
- HVIN: ATA8510MPE

Europe/CE

Great Britain/UKCA: TBD

The ATA8510MUE module has received regulatory approval for the following countries:

United States/FCC ID: 2ADHKATA8510M

Canada/ISED:

- IC: 20266-ATA8510M
- HVIN: ATA8510MUE

Europe/CE

Great Britain/UKCA: TBD

### 5.1 United States

The ATA8510MPE/ATA8510MUE modules have received Federal Communications Commission (FCC) CFR47 Telecommunications, Part 15 Subpart C “Intentional Radiators” single-modular approval in accordance with Part 15.212 Modular Transmitter approval. Single-modular transmitter approval is defined as a complete RF transmission sub-assembly, designed to be incorporated into another device, that must demonstrate compliance with FCC rules and policies independent of any host. A transmitter with a modular grant can be installed in different end-use products (referred to as a host, host product, or host device) by the grantee or other equipment manufacturer, then the host product may not require additional testing or equipment authorization for the transmitter function provided by that specific module or limited module device.

The user must comply with all of the instructions provided by the Grantee, which indicate installation and/or operating conditions necessary for compliance.

A host product itself is required to comply with all other applicable FCC equipment authorization regulations, requirements, and equipment functions that are not associated with the transmitter module portion. For example, compliance must be demonstrated: to regulations for other transmitter components within a host product; to requirements for unintentional radiators (Part 15 Subpart B), such as digital devices, computer peripherals, radio receivers, etc.; and to additional authorization requirements for the non-transmitter functions on the transmitter module (i.e., Suppliers Declaration of Conformity (SDoC) or certification) as appropriate (e.g., Bluetooth and Wi-Fi transmitter modules may also contain digital logic functions).

#### 5.1.1 Labeling and User Information Requirements

The ATA8510MPE/ATA8510MUE module has been labeled with its own FCC ID number, and if the FCC ID is not visible when the module is installed inside another device, then the outside of the finished product into which the module is installed must display a label referring to the enclosed module. This exterior label should use the following wording:

Contains Transmitter Module FCC ID: 2ADHKATA8510M

or

Contains FCC ID: 2ADHKATA8510M

**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.**

The user's manual for the finished product should include the following 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:

Additional information on labeling and user information requirements for Part 15 devices can be found in KDB Publication 784748, which is available at the FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB) <https://apps.fcc.gov/oetcf/kdb/index.cfm>.

### 5.1.2 RF Exposure

All transmitters regulated by FCC must comply with RF exposure requirements. KDB 447498 General RF Exposure Guidance provides guidance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to Radio Frequency (RF) fields adopted by the Federal Communications Commission (FCC).

From the FCC Grant: Output power listed is conducted. This grant is valid only when the module is sold to OEM integrators and must be installed by the OEM or OEM integrators. This transmitter is restricted for use with the specific antenna(s) tested in this application for Certification and must not be co-located or operating in conjunction with any other antenna or transmitters within a host device, except in accordance with FCC multi-transmitter product procedures.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body.

### 5.1.3 Helpful Web Sites

- Federal Communications Commission (FCC): <http://www.fcc.gov>.
- FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB) [https:// apps.fcc.gov/oetcf/kdb/index.cfm](https://apps.fcc.gov/oetcf/kdb/index.cfm).

## 5.2 Canada

The ATA8510M module have been certified for use in Canada under Innovation, Science, and Economic Development Canada (ISED, formerly Industry Canada) Radio Standards Procedure (RSP) RSP-100, Radio Standards Specification (RSS) RSS-Gen and RSS-210. Modular approval permits the installation of a module in a host device without the need to recertify the device. Host products alone (without modular products) are not required to be certified separately provided that all the intentional radio emissions are generated by the certified modules.

### 5.2.1 Labeling and User Information Requirements

Labeling Requirements (from RSP-100 - Issue 11, Section 3): The host product shall be properly labeled to identify the module within the host device.

The Innovation, Science and Economic Development Canada certification label of a module shall be clearly visible at all times when installed in the host device; otherwise, the host product must be labeled to display the Innovation, Science and Economic Development Canada certification number of the module, preceded by the word "Contains" or similar wording expressing the same meaning, as follows:

**Contains IC: 20266-ATA8510M**

User Manual Notice for License-Exempt Radio Apparatus (from Section 8.4 RSS-Gen, Issue 4, November 2014): User manuals for license-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both:

**This device complies with Industry Canada's license exempt RSS standard(s). Operation is subject to the following two conditions:**

- (1) This device may not cause interference, and**
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.**

**Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:**

- (1) l'appareil ne doit pas produire de brouillage, et**
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.**

Guidelines on Transmitter Antenna for License Exempt Radio Apparatus:

**Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.**

**Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.**

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each.

## 5.2.2 RF Exposure

All transmitters regulated by Innovation, Science and Economic Development Canada (ISED) must comply with RF exposure requirements listed in RSS-102 - Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).

This transmitter is restricted for use with a specific antenna tested in this application for certification and must not be co-located or operating in conjunction with any other antenna or transmitters within a host device, except in accordance with Canada multi-transmitter product procedures.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body.

Cet équipement est conforme aux limites d'exposition aux radiations définies par la FCC et l'ISED pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et le corps humain.

## 5.2.3 Helpful Web Sites

Innovation, Science and Economic Development Canada (ISED): <http://www.ic.gc.ca/>.

## 5.3 Europe

The ATA8510MPE/ATA8510MUE is/are a Radio Equipment Directive (RED) assessed radio module that is CE marked and has been manufactured and tested with the intention of being integrated into a final product.

The ATA8510MPE/ATA8510UE module has been tested to RED 2014/53/EU Essential Requirements for Health and Safety (Article (3.1(a)), Electromagnetic Compatibility (EMC) (Article 3.1(b)), and Radio (Article 3.2), which is summarized in the following European Compliance Testing table.

The ETSI provides guidance on modular devices in the *"Guide to the application of harmonised standards covering articles 3.1b and 3.2 of the RED 2014/53/EU (RED) to multi-radio and combined radio*

and non-radio equipment" document available at  
[http://www.etsi.org/deliver/etsi\\_eg/203300\\_203399/20\\_3367/01.01.01\\_60/eg\\_203367v010101p.pdf](http://www.etsi.org/deliver/etsi_eg/203300_203399/20_3367/01.01.01_60/eg_203367v010101p.pdf).

**Note:** To maintain conformance to the testing listed in the following European Compliance Testing table, the module shall be installed in accordance with the installation instructions in this data sheet and shall not be modified. When integrating a radio module into a completed product, the integrator becomes the manufacturer of the final product and is therefore responsible for demonstrating compliance of the final product with the essential requirements against the RED.

### 5.3.1 Labeling and User Information Requirements

The label on the final product that contains the ATA8510PE/ATA8510UE modules must follow CE marking requirements.

**Table 12-1. European Compliance Information**

Certification	Standard	Article	Laboratory	Report Number	Date
Safety	EN60950-1:2006/ A11:2009/ A1:2010/ A12:2011/ A2:2013	3.1(a)	TUV Rheinland, Taiwan		
Health	EN300328 V2.1.1/ EN62479:2010				
EMC	EN301489-1 V2.1.1	3.1(b)			
	EN301489-1 V2.2.0				
	EN301489-17 V3.1.1				
	EN301489-17 V3.2.0				
Radio	EN300328 V2.1.1	3.2			

### 5.3.2 Conformity Assessment

From ETSI Guidance Note EG 203367, section 6.1, when non-radio products are combined with a radio product:

If the manufacturer of the combined equipment installs the radio product in a host non-radio product in equivalent assessment conditions (i.e. host equivalent to the one used for the assessment of the radio product) and according to the installation instructions for the radio product, then no additional assessment of the combined equipment against article 3.2 of the RED is required.

The European Compliance Information listed in the preceding table was performed using the integral chip antenna.

### 5.3.3 Simplified EU Declaration of Conformity

Hereby, Microchip Technology Inc. declares that the radio equipment type ATA8510M is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity for this product is available at



<http://www.microchip.com/design-centers/wireless-connectivity/>.

### 5.3.4 Helpful Websites

A document that can be used as a starting point in understanding the use of Short Range Devices (SRD) in Europe is the European Radio Communications Committee (ERC) Recommendation 70-03 E, which can be downloaded from the European Communications Committee (ECC) at:

<http://www.ecodocdb.dk/>.

Additional helpful web sites are:

- Radio Equipment Directive (2014/53/EU):  
[https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/red\\_en](https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/red_en)
- European Conference of Postal and Telecommunications Administrations (CEPT): <http://www.cept.org>
- European Telecommunications Standards Institute (ETSI): <http://www.etsi.org>
- The Radio Equipment Directive Compliance Association (REDCA): <http://www.redca.eu/>

## 5.4 Korea

The ATA8510M module has received certification of conformity in accordance with the Radio Waves Act. Integration of this module into a final product does not require additional radio certification provided installation instructions are followed, and no modifications of the module are allowed.

### 5.4.1 Labeling and User Information Requirements

The label on the final product which contains the ATA8510M module must follow KC marking requirements. The integrator of the module should refer to the labeling requirements for Korea available on the Korea Communications Commission (KCC) website.

The ATA8510M module is labeled with its own KC mark. The final product requires the KC mark and certificate number of the module:



XXXX-XXX-xxx-XXXXXXXXXXXXX

### 5.4.2 Helpful Websites

- Korea Communications Commission (KCC): <http://www.kcc.go.kr>.
- National Radio Research Agency (RRA): <http://rra.go.kr>.

## 5.5 Taiwan

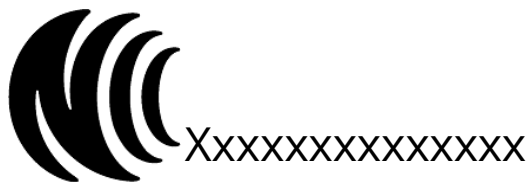
The ATA8510MPE/ATA8510UE module has received compliance approval in accordance with the Telecommunications Act. Customers seeking to use the compliance approval in their product should contact Microchip Technology sales or distribution partners to obtain a Letter of Authority.

Integration of this module into a final product does not require additional radio certification provided installation instructions are followed, and no modifications of the module are allowed.

### 5.5.1 Labeling and User Information Requirements

For the ATA8510M module, due to the limited module size, the NCC mark and ID are displayed in the data sheet only and cannot be displayed on the module label:

For the ATA8510M module, due to the limited module size, the NCC mark and ID are displayed in the data sheet only and cannot be displayed on the module label:



The user's manual should contain following warning (for RF device) in traditional Chinese:

注意！

依據 低功率電波輻射性電機管理辦法

第十二條 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。

第十四條 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，指依電信規定作業之無線電信。

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。

## 5.5.2 Helpful Web Sites

National Communications Commission (NCC): <http://www.ncc.gov.tw>

## 6. Document Revision History

**Table 9-1.** Document Revision History

Revision	Date	Section	Description
A Draft	03/2025	Document	Initial Revision

## Microchip Information

### The Microchip Website

Microchip provides online support via our website at [www.microchip.com/](http://www.microchip.com/). This website is used to make files and information easily available to customers. Some of the content available includes:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip design partner program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

### Product Change Notification Service

Microchip's product change notification service helps keep customers current on Microchip products. Subscribers will receive email notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, go to [www.microchip.com/pcn](http://www.microchip.com/pcn) and follow the registration instructions.

### Customer Support

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Embedded Solutions Engineer (ESE)
- Technical Support

Customers should contact their distributor, representative or ESE for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in this document.

Technical support is available through the website at: [www.microchip.com/support](http://www.microchip.com/support)

### Microchip Devices Code Protection Feature

Note the following details of the code protection feature on Microchip products:

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner, within operating specifications, and under normal conditions.
- Microchip values and aggressively protects its intellectual property rights. Attempts to breach the code protection features of Microchip product is strictly prohibited and may violate the Digital Millennium Copyright Act.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of its code. Code protection does not mean that we are guaranteeing the product is "unbreakable". Code protection is constantly evolving. Microchip is committed to continuously improving the code protection features of our products.

### Legal Notice

This publication and the information herein may be used only with Microchip products, including to design, test, and integrate Microchip products with your application. Use of this information in any other manner violates these terms. Information regarding device applications is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure

that your application meets with your specifications. Contact your local Microchip sales office for additional support or, obtain additional support at [www.microchip.com/en-us/support/design-help/client-support-services](http://www.microchip.com/en-us/support/design-help/client-support-services).

THIS INFORMATION IS PROVIDED BY MICROCHIP "AS IS". MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTIES RELATED TO ITS CONDITION, QUALITY, OR PERFORMANCE.

IN NO EVENT WILL MICROCHIP BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL LOSS, DAMAGE, COST, OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE INFORMATION OR ITS USE, HOWEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE. TO THE FULLEST EXTENT ALLOWED BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THE INFORMATION OR ITS USE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THE INFORMATION.

Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

### Trademarks

The Microchip name and logo, the Microchip logo, Adaptec, AVR, AVR logo, AVR Freaks, BesTime, BitCloud, CryptoMemory, CryptoRF, dsPIC, flexPWR, HELDO, IGLOO, JukeBlox, KeeLoq, Kleer, LANCheck, LinkMD, maXStylus, maXTouch, MediaLB, megaAVR, Microsemi, Microsemi logo, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, PolarFire, Prochip Designer, QTouch, SAM-BA, SenGenuity, SpyNIC, SST, SST Logo, SuperFlash, Symmetricom, SyncServer, Tachyon, TimeSource, tinyAVR, UNI/O, Vectron, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

AgileSwitch, APT, ClockWorks, The Embedded Control Solutions Company, EtherSynch, Flashtec, Hyper Speed Control, HyperLight Load, Libero, motorBench, mTouch, Powermite 3, Precision Edge, ProASIC, ProASIC Plus, ProASIC Plus logo, Quiet-Wire, SmartFusion, SyncWorld, Temux, TimeCesium, TimeHub, TimePictra, TimeProvider, TrueTime, and ZL are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, Augmented Switching, BlueSky, BodyCom, Clockstudio, CodeGuard, CryptoAuthentication, CryptoAutomotive, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, Espresso T1S, EtherGREEN, GridTime, IdealBridge, In-Circuit Serial Programming, ICSP, INICnet, Intelligent Paralleling, IntelliMOS, Inter-Chip Connectivity, JitterBlocker, Knob-on-Display, KoD, maxCrypto, maxView, memBrain, Mindi, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICKit, PICtail, PowerSmart, PureSilicon, QMatrix, REAL ICE, Ripple Blocker, RTAX, RTG4, SAM-ICE, Serial Quad I/O, simpleMAP, SimpliPHY, SmartBuffer, SmartHLS, SMART-I.S., storClad, SQL, SuperSwitcher, SuperSwitcher II, Switchtec, SynchroPHY, Total Endurance, Trusted Time, TSHARC, USBCheck, VariSense, VectorBlox, VeriPHY, ViewSpan, WiperLock, XpressConnect, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

The Adaptec logo, Frequency on Demand, Silicon Storage Technology, and Symmcom are registered trademarks of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2023, Microchip Technology Incorporated and its subsidiaries. All Rights Reserved.

ISBN:

### **Quality Management System**

For information regarding Microchip's Quality Management Systems, please visit [www.microchip.com/quality](http://www.microchip.com/quality).

# Worldwide Sales and Service

AMERICAS	ASIA/PACIFIC	ASIA/PACIFIC	EUROPE
<b>Corporate Office</b> 2355 West Chandler Blvd. Chandler, AZ 85224-6199 Tel: 480-792-7200 Fax: 480-792-7277 Technical Support: <a href="http://www.microchip.com/support">www.microchip.com/support</a> Web Address: <a href="http://www.microchip.com">www.microchip.com</a>	<b>Australia - Sydney</b> Tel: 61-2-9868-6733 <b>China - Beijing</b> Tel: 86-10-8569-7000 <b>China - Chengdu</b> Tel: 86-28-8665-5511 <b>China - Chongqing</b> Tel: 86-23-8980-9588 <b>China - Dongguan</b> Tel: 86-769-8702-9880 <b>China - Guangzhou</b> Tel: 86-20-8755-8029 <b>China - Hangzhou</b> Tel: 86-571-8792-8115 <b>China - Hong Kong SAR</b> Tel: 852-2943-5100 <b>China - Nanjing</b> Tel: 86-25-8473-2460 <b>China - Qingdao</b> Tel: 86-532-8502-7355 <b>China - Shanghai</b> Tel: 86-21-3326-8000 <b>China - Shenyang</b> Tel: 86-24-2334-2829 <b>China - Shenzhen</b> Tel: 86-755-8864-2200 <b>China - Suzhou</b> Tel: 86-186-6233-1526 <b>China - Wuhan</b> Tel: 86-27-5980-5300 <b>China - Xian</b> Tel: 86-29-8833-7252 <b>China - Xiamen</b> Tel: 86-592-2388138 <b>China - Zhuhai</b> Tel: 86-756-3210040	<b>India - Bangalore</b> Tel: 91-80-3090-4444 <b>India - New Delhi</b> Tel: 91-11-4160-8631 <b>India - Pune</b> Tel: 91-20-4121-0141 <b>Japan - Osaka</b> Tel: 81-6-6152-7160 <b>Japan - Tokyo</b> Tel: 81-3-6880-3770 <b>Korea - Daegu</b> Tel: 82-53-744-4301 <b>Korea - Seoul</b> Tel: 82-2-554-7200 <b>Malaysia - Kuala Lumpur</b> Tel: 60-3-7651-7906 <b>Malaysia - Penang</b> Tel: 60-4-227-8870 <b>Philippines - Manila</b> Tel: 63-2-634-9065 <b>Singapore</b> Tel: 65-6334-8870 <b>Taiwan - Hsin Chu</b> Tel: 886-3-577-8366 <b>Taiwan - Kaohsiung</b> Tel: 886-7-213-7830 <b>Taiwan - Taipei</b> Tel: 886-2-2508-8600 <b>Thailand - Bangkok</b> Tel: 66-2-694-1351 <b>Vietnam - Ho Chi Minh</b> Tel: 84-28-5448-2100	<b>Austria - Wels</b> Tel: 43-7242-2244-39 Fax: 43-7242-2244-393 <b>Denmark - Copenhagen</b> Tel: 45-4485-5910 Fax: 45-4485-2829 <b>Finland - Espoo</b> Tel: 358-9-4520-820 <b>France - Paris</b> Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79 <b>Germany - Garching</b> Tel: 49-8931-9700 <b>Germany - Haan</b> Tel: 49-2129-3766400 <b>Germany - Heilbronn</b> Tel: 49-7131-72400 <b>Germany - Karlsruhe</b> Tel: 49-721-625370 <b>Germany - Munich</b> Tel: 49-89-627-144-0 Fax: 49-89-627-144-44 <b>Germany - Rosenheim</b> Tel: 49-8031-354-560 <b>Israel - Ra'anana</b> Tel: 972-9-744-7705 <b>Italy - Milan</b> Tel: 39-0331-742611 Fax: 39-0331-466781 <b>Italy - Padova</b> Tel: 39-049-7625286 <b>Netherlands - Drunen</b> Tel: 31-416-690399 Fax: 31-416-690340 <b>Norway - Trondheim</b> Tel: 47-72884388 <b>Poland - Warsaw</b> Tel: 48-22-3325737 <b>Romania - Bucharest</b> Tel: 40-21-407-87-50 <b>Spain - Madrid</b> Tel: 34-91-708-08-90 Fax: 34-91-708-08-91 <b>Sweden - Gothenberg</b> Tel: 46-31-704-60-40 <b>Sweden - Stockholm</b> Tel: 46-8-5090-4654 <b>UK - Wokingham</b> Tel: 44-118-921-5800 Fax: 44-118-921-5820