User Manual

CUSTOMER: ASUS

PRODUCT NAME: NFC MODULE

MODEL NAME: AWM-001

ASUS P/N: 0C510-00150200

ACON P/N: AFP00-000298

ADVANCED WIRELESS & ANTENNA INC.

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1. Module Specifications

● *NFC PROTOCOLS SUPPORT*

Main Chip	NXP NPC300
Frequency	13.56MHz
NFC Standards	✓ ISO/IEC 14443A, ISO/IEC 14443B PCD designed according to NFC Forum digital Protocol T4T platform and ISO-DEP ✓ FeliCa PCD mode ✓ MIFARE PCD encryption mechanism (MIFARE 1K and 4K) ✓ NFC Forum tag (MIFARE Ultralight, Jewel, Open FeliCa tag, DESFire) ✓ NFCIP-1, NFCIP-2 protocol ✓ ISO/IEC14443A, ISO/IEC14443B PICC mode designed according to EMVco PICC ✓ FeliCa PICC mode
Host interface	✓ NCI protocol interface according to NFC Forum NCI 1.0 standardization ✓ I2C High-speed mode supported
Host connector	8 pin FPC/FFC
Antenna connector	7 pin FPC/FFC
Operation temperature	0℃~85℃
Assembly type	SMT and FPC cable

● *POWER*

Symbol	Parameter	Min.	Typ.	MAX.	Unit
MOD_VDD	Power supply	2.7	3.3	5.5	V
VDD_IO	I/O Power supply	3	3.3	3.6	
		1.65	1.8	1.95	

Symbol	MAX	Unit
I_{MOD_VDD}	170	mA
I_{VDD_IO}	15	

● *HARDWARE INTERFACE*

HOST Pin define

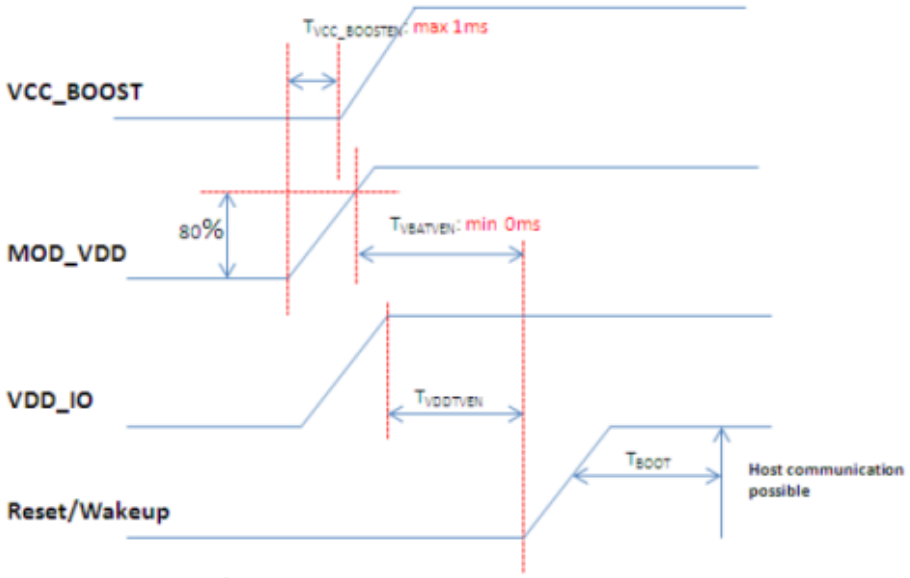
Pin number	Name	Configuration	Description
1	VBAT	Power Supply Input	Module power supply
2	IRQ	Output	Interrupt request from module to platform
3	I2C_SDA	Input/ Output	I2C data
4	I2C_SCL	Input	I2C clock
5	Reset/ WakeUp	Input	Reset pin input from the host to wake up the device from standby and also to reset the device
6	DWL_REQ	Input	Control pin to set the NFC module in firmware download mode
7	VDD_IO	Power supply input	Host IO reference voltage
8	GND	Power Supply Ground	Module ground

Antenna Pin define

Pin number	Name	Configuration	Description
1	ANT1	Output	Connection for antenna load modulation #1
2	RXP	Input	Antenna reception path #1
3	TX1	Output	Antenna transmission line #1
4	GND	Ground	Antenna ground
5	TX2	Output	Antenna transmission line #2
6	RXN	Input	Antenna reception path #2
7	ANT2	Output	Connection for antenna load modulation #2

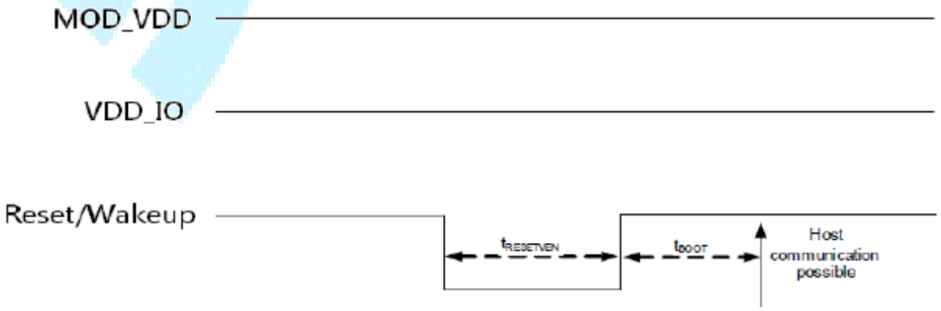
2. Power Sequence Diagram

- ***Power Up***



Symbol	Parameter	Min	Typical	Maximum	Unit
$T_{VBATVEN}$	Minimum time from MOD_VDD to V_{EN} high	0	-	-	ms
$T_{PVDDVEN}$	Minimum time from PVDD high to V_{EN} high	0	-	-	ms

- ***Reset/Wakeup***



Symbol	Parameter	Min	Typical	Maximum	Unit
$T_{RESETVEN}$	VEN pulse width to rest	3	-	-	us
T_{BOOT}	Boot time	-	-	2.5	ms

- ***Download Mode***

To enter this mode, the pin DWL_REQ shall be pulled to PVDD before reset via VEN pin is before reset via VEN pin is before reset via VEN pin is done.

3. Power Consumption:

Power Consumption

Mode	Average Current, mA (3.3V power rails)	Peak Current, mA	Average Power (mW)	Peak Power (mW)
Reader/Writer Actively Communicating	3.3V:8	3.3V:82	27.3	270.6
Field Detection / Polling*	3.3V:10	3.3V:82	33	270.6
Standby	3.3V:0.73	3.3V:0.53	2.4	1.749

*Assuming a 1 Hz polling rate

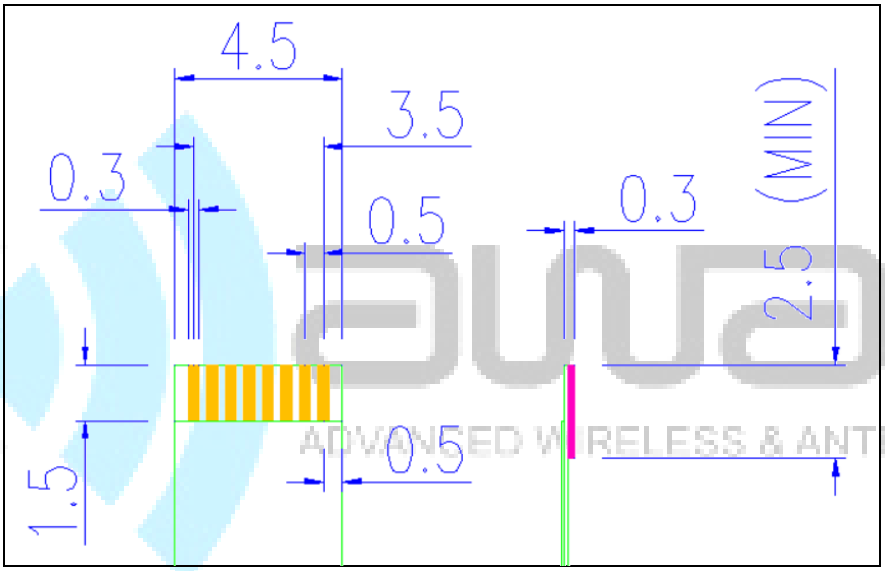
4. Recommended Operation Temperature:

Supply voltage	☐ AC mains	■ DC	
Type of DC Source	☐ Internal DC supply	■ External DC adapter	☐ Battery
Operational Climatic	■ Tnom (20°C)	■ Tmax (85°C)	■ Tmin (-30°C)

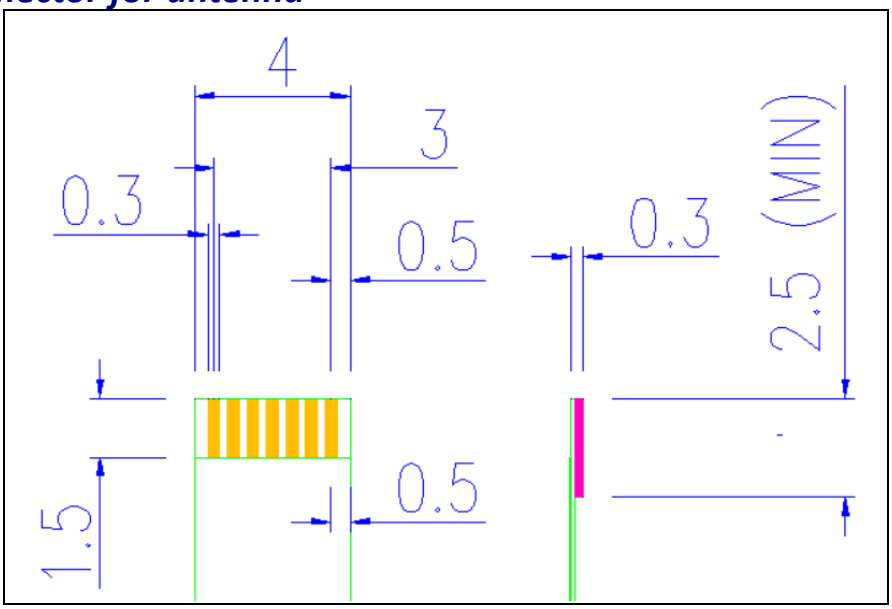
5. Mechanical Specifications:

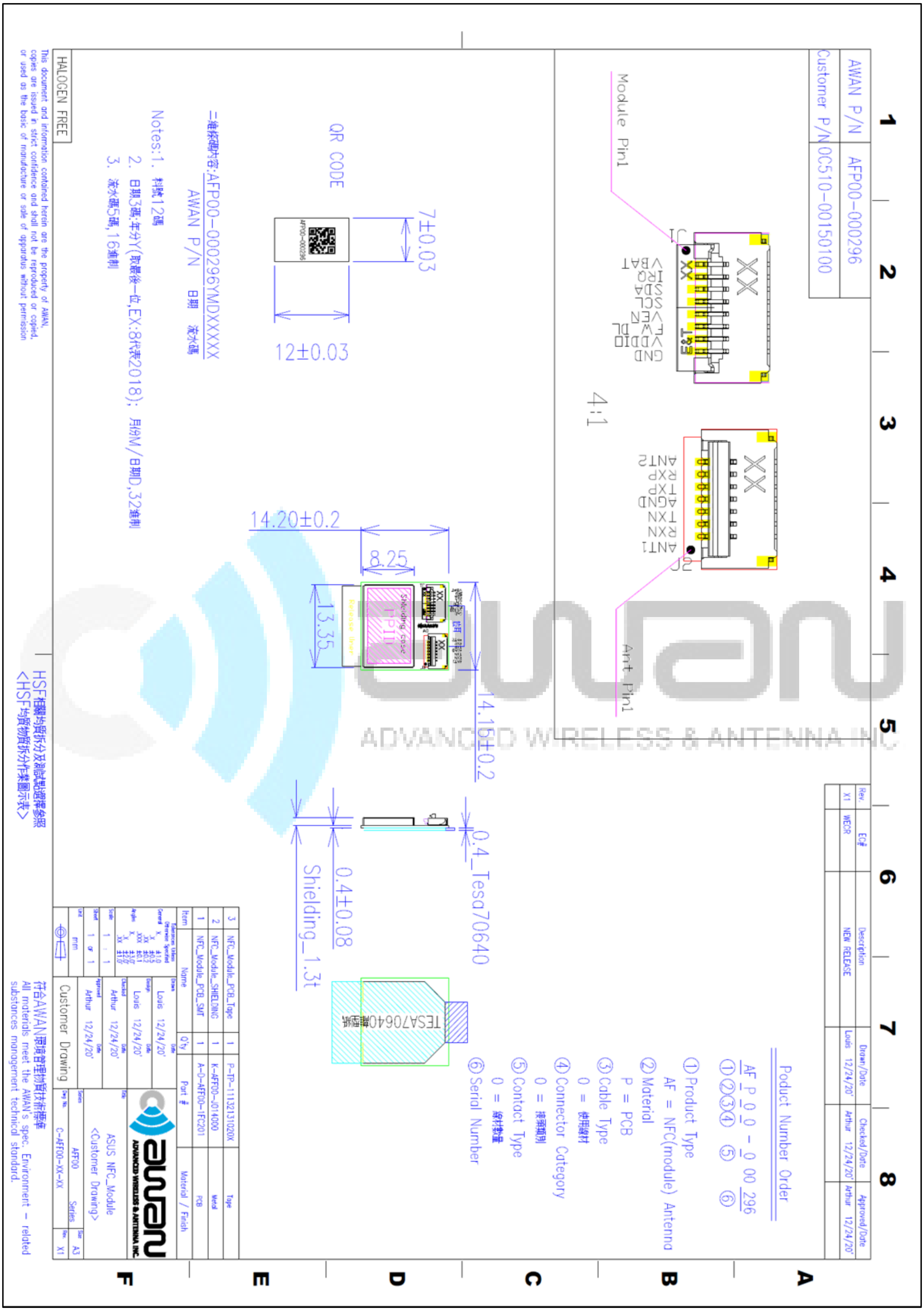
- ***FPC/FFC***

8 Pin connector for host



7 Pin connector for antenna




AWAN P/N AFP00-000296
Customer P/N 0C510-00150100
Module Pin1
Ant Pin1
4:1
QR CODE
7±0.03
12±0.03
14.20±0.2
8.25
13.35
14.16±0.2
0.4_Tesa70640
0.4±0.08
Shielding_1.3t
Notes:1. 料號12碼
2. 日期3碼,年分Y(取最後一位,EX:8代表2018); 月份M/日期D,32進制
3. 流水碼5碼,16進制
二維條碼內容:AFP00-000296YMDXXXXX
AWAN P/N 日期 流水碼
HSF相關均質拆分及測試規範請參照
<HSF均質物質拆分作業圖示表>
HALOGEN FREE
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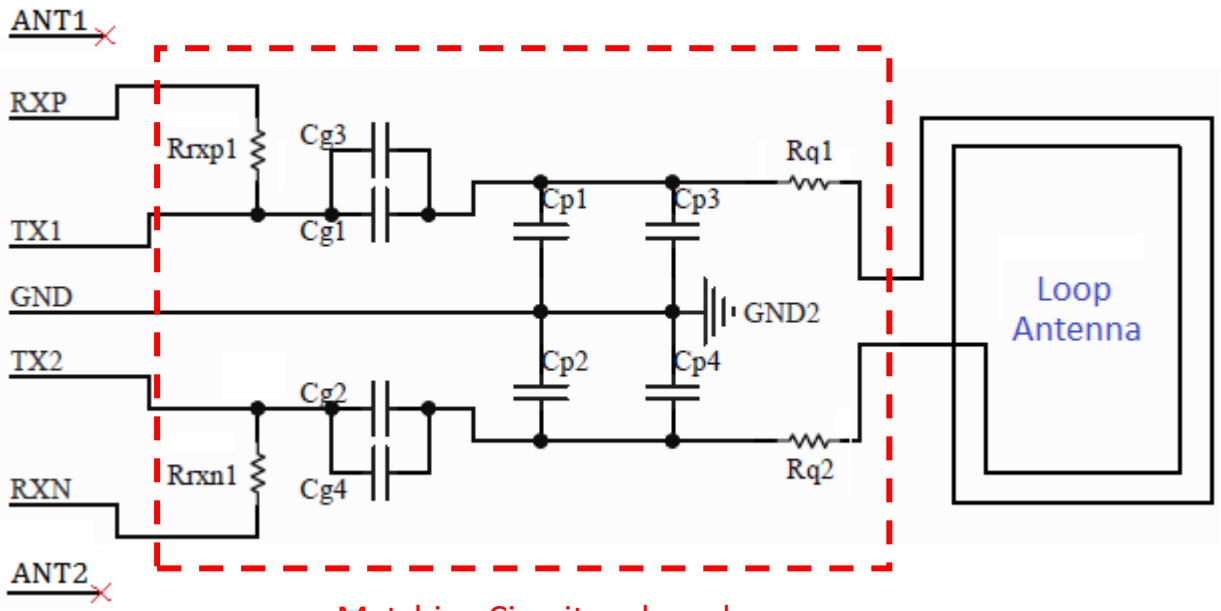
Poduct Number Order
AF P 0 0 - 0 00 296
Product Type
AF = NFC(module) Antenna
Material
P = PCB
Cable Type
Connector Category
Contact Type
Serial Number
符合AWAN環境管理物質技術標準
All materials meet the AWAN's spec. Environment - related substances management technical standard.
Customer Drawing
ASUS NFC_Module
<Customer Drawing>
AFF00
C-AFF00-XX-XX
NEW RELEASE

6. Antenna Matching Circuit:



Matching Circuit on board

FCC ID: MSQ-NFCAWM001
IC ID: 3568A-NFCAWM001

本模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求最終產品平台廠商

(OEM Integrator)於最終產品平台(End Product)上標示”本產品內含射頻模組，

其 NCC 型式認證號碼為: CCXXxxYYyyyZzW

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.

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.

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: XYZMODEL " and "Contains IC: XXXXX-YYYYYYY"

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.

Canada, Industry Canada (IC) Notices
This device complies with Canada licence-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.

Canada, avis d'Industry Canada (IC)
Cet appareil est conforme avec Industrie Canada exemptes de licence RSS standard(s).
Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

AWAN® Innovation Series AWM-001 Information Guide

NFC stands for “Near Field Communication” and, as the name implies, it enables short-range communication between compatible devices. This requires at least one transmitting device, and another to receive the signal. A range of devices can use the NFC standard and will be considered either passive or active. Passive NFC devices include tags, and other small transmitters, that can send information to other NFC devices without the need for a power source of their own. However, they don’t process any information sent from other sources, and can’t connect to other passive components. These often take the form of interactive signs on walls or advertisements. This NFC Module enables the device to be with NFC function. With AWM-001 and AWAN’s NFC Antenna, the user could enjoy more fun, experience and explore more application with NFC.

Information in this document is subject to change without notice.

AWAN Inc. assumes no responsibility for errors or omissions in this document. Nor does AWAN make any commitment to update the information contained herein.

IMPORTANT NOTICE FOR ALL USERS OR DISRIBUTORS:

AWM-001 are engineered, manufactured, tested, and quality checked to ensure that they meet all necessary local and governmental regulatory agency requirements for the regions that they are designed and/or marked to ship into. Because AWM-001 is generally unlicensed device that share spectrum with radars, satellites, and other licensed and unlicensed devices, it is sometimes necessary to dynamically detect, avoid, and limit usage to avoid interference with this device. In many instances AWAN is required to provide test data to prove regional and local compliance to regional and governmental regulations before certification or approval to use the product is granted. AWM-001’s firmware and software driver are designed to carefully control parameters that affect radio operation and ensure electromagnetic compliance (EMC). These parameters include without limitation, RF power, spectrum usage channel scanning, and human exposure.

For these reasons AWAN cannot permit any manipulation by third parties of the software provided in binary format with the AWM-001 (e.g., firmware). Furthermore, if you use any patches, utilities, or code with the AWM-001 that have been manipulated by an unauthorized party [i.e., patches, utilities, or code (including open source code modifications) which have not been validated by AWAN], (i) you will be solely responsible for ensuring the regulatory compliance of the products, (ii) AWAN will bear no liability, under any theory of liability for any issues associated with the modified products, including without limitation, claims under the warranty and/or issues arising from regulatory non-compliance, and (iii) AWAN will not provide or be required to assist in providing support to any third parties for such modified products.

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*Other names and brands may be claimed as the property of others.

REGULATORY INFORMATION

USA – Federal Communications Commission (FCC)

This device complies with FCC 15.225 and it is applied to NFC antenna. To ensure RF exposure compliance, the module must be installed in notebook or tablet PC host platforms to provide a minimum separation distance from all people.

2.6 RF exposure considerations

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users' body.

Information To Be Supplied to the End User by the OEM or Integrator

The following regulatory and safety notices must be published in documentation supplied to the end user of the product, in compliance with local regulations. Host system must be labeled with " contains FCC ID: MSQ-NFCAWM001", FCC ID displayed on label.

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.