

RF Exposure Evaluation Report

Product Name : Industrial WiFi module

Model No. : WM-AN-AT-01

FCC ID : SLE-WM-AN-AT-01

Applicant : Moxa Inc.

Address : FL. 4, NO. 135, LANE 235, BAOQIAO RD., XINDIAN DIST.,
NEW TAIPEI CITY, TAIWAN

Date of Receipt : Apr. 30, 2020

Date of Declaration : Jul. 02, 2020

Report No. : 2040838R-E3082100013

Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

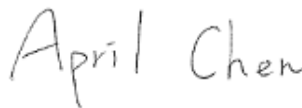
Issued Date: Jul. 02, 2020

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Product Name	Industrial WiFi module	
Applicant	Moxa Inc.	
Address	FL. 4, NO. 135, LANE 235, BAOQIAO RD., XINDIAN DIST., NEW TAIPEI CITY, TAIWAN	
Manufacturer	Moxa Inc.	
Model No.	WM-AN-AT-01	
FCC ID.	SLE-WM-AN-AT-01	
EUT Rated Voltage	DC 3.3V (via PCI Express slot)	
EUT Test Voltage	DC 3.3V (via PCI Express slot)	
Applicable Standard	KDB 447498 D01 v06	<input checked="" type="checkbox"/> Minimum test separation distance ≥ 20 cm <input type="checkbox"/> For low power devices
Test Result	Complied	

Documented By :



(Senior Adm. Specialist / April Chen)

Tested By :



(Senior Engineer / Wen Lee)

Approved By :



(Director / Vincent Lin)

Revision History

Report No.	Version	Description	Issued Date
2040838R-E3082100013	V1.0	Initial issue of report.	2020-07-02

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Industrial WiFi module
Model No.	WM-AN-AT-01
FCC ID.	SLE-WM-AN-AT-01
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW 802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz
Number of Channels	802.11b/g/n-20MHz:11 802.11a/n-20MHz: 24; 802.11n-40MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 72.2Mbps 802.11a: 6 - 54Mbps, 802.11n: up to 150Mbps
Channel separation	802.11a/b/g/n: 5 MHz
Type of Modulation	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g/n: OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna Type	Dipole Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

1.2. Antenna List :

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	KINSUN	ANT-WDB-ARM-02	Dipole	2.04dBi in 2.4GHz 0.81dBi for 5.150-5.250 GHz 0.38dBi for 5.250-5.350 GHz -1.39dBi for 5.470-5.725 GHz -0.39dBi for 5.725-5.850 GHz

2. RF Exposure Evaluation

2.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

2.2. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

2.3. Test Result of RF Exposure Evaluation

Product : Industrial WiFi module
Test Item : RF Exposure Evaluation

WLAN 2.4G Peak Gain: 2.04dBi

Band	Frequency	Conducted Peak Power (dBm)	Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
WLAN 2.4G	2437	22.18	97.04	170.235	0.0542	1	Pass

Note: The conducted output power is refer to report No.: 2040838R-E3032110113 from the DEKRA.

WLAN 5G Peak Gain: 0.81dBi

Band	Frequency	Conducted Peak Power (dBm)	Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
WLAN 5G	5785	15.23	93.35	35.718	0.0086	1	Pass

Note: The conducted output power is refer to report No.: 2040838R-E3032110124 from the DEKRA.