DEKRA

RF Exposure Evaluation Report

Product Name : IEEE802.11a/b/g/n 2.4+5GHz 1T1R Wi-Fi IoT Module
Model No.　　 : ITM-1066A
FCC ID　　　 : 2AWP5WM1066A

Applicant : IOTTECH Corporation
Address　 : No.10-1, Shijian Rd., Hukou Township, Hsinchu County 30352,
　　　　　　 Taiwan (R.O.C.)

Date of Receipt　　 : Jun. 05, 2020
Date of Declaration : Aug. 18, 2020
Report No.　　　　 : 2060198R-E3082100013
Report Version　　 : V1.0

ilac-MRA

TAF
Testing Laboratory
3023

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.
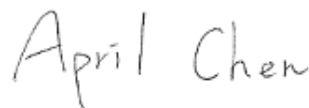
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Product Name	IEEE802.11a/b/g/n 2.4+5GHz 1T1R Wi-Fi IoT Module
Applicant	IOTTECH Corporation
Address	No.10-1, Shijian Rd., Hukou Township, Hsinchu County 30352, Taiwan (R.O.C.)
Manufacturer	IOTTECH Corporation
Model No.	ITM-1066A
FCC ID.	2AWP5WM1066A
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	DC 3.3V
Trade Name	IOTTECH
Applicable Standard	KDB 447498 D01 v06 ☒ Minimum test separation distance ≥ 20 cm ☐ For low power devices
Test Result	Complied

Documented By　　　:

April Chen

(Senior Adm. Specialist / April Chen)

Tested By　　　:

wen Lee

(Senior Engineer / Wen Lee)

Approved By　　　:

(Director / Vincent Lin)

Revision History

Report No.	Version	Description	Issued Date
2060198R-E3082100013	V1.0	Initial issue of report.	2020-08-18

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	IEEE802.11a/b/g/n 2.4+5GHz 1T1R Wi-Fi IoT Module
Trade Name	IOTTECH
Model No.	ITM-1066A
FCC ID.	2AWP5WM1066A
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW, 2422-2452MHz for 802.11n-40BW 802.11a/n-20MHz: 5180-5240MHz, 5745-5825MHz 802.11n-40MHz: 5190-5230MHz, 5755-5795MHz
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7 802.11a/n-20MHz: 9, 802.11n-40MHz: 4
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 150Mbps 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	PCB 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	IOTTECH	ITM-1066A	PCB Antenna	1.376dBi for 2.4GHz -1.840dBi for 5.150-5.250 GHz 0.745dBi for 5.725~5.825GHz

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: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

2.3. Test Result of RF Exposure Evaluation

Product : IEEE802.11a/b/g/n 2.4+5GHz 1T1R Wi-Fi IoT Module

Test Item : RF Exposure Evaluation

WLAN 2.4G Peak Gain: 1.376Bi

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	2462	23.28	97.43	218.427	0.0597	1	Pass

Note: The conducted output power is refer to report No.: 2060198R-E3032110113 from the DEKRA.

WLAN 5G Peak Gain: 0.745dBi

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	5755	13.83	97.95	24.660	0.0058	1	Pass

Note: The conducted output power is refer to report No.: 2060198R-E3032110124 from the DEKRA.