FCC RF EXPOSURE EVALUATION REPORT

FCC ID: 2ADQY525831

Project No.	**: 1909H029**
Equipment	**: Manageable Wireless AC1300 Dual-Band Gigabit PoE Indoor Access Point and Router**
Model	**: 525831**
Applicant	**: Intracom Asia Co,. Ltd**
Address	**: 4F., No. 77, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan**
Exposure category	**: General population/uncontrolled environment**
EUT Type:	**: Production Unit (Engineer Sample)**
Device Type	**: Mobile Device**

1. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

2. Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

3. Refer Evaluation Method

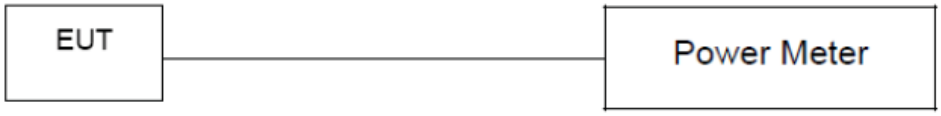
ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
FCC KDB publication 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.
FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.
FCC CFR 47 part2 2.1093: Radiofrequency radiation exposure evaluation: portable devices

4. Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
Where:
S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
R=distance to the center of radiation of the antenna

5. Conducted Power Results

5.1 Test Setup



5.2 Test Equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Peak Power Analyzer	Keysight	8990B	MY51000507	Mar. 29, 2020
2	Wideband Power Sensor	Keysight	N9123A	MY58310003	Mar. 29, 2020

Remark: all calibration period of equipment list is one year.

5.3 Test Procedure

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram Test Setup.
b. Read power sensor values in RMS detector;

5.4 Test Results and Manufacturing Tolerance

2.4G

Mode	Maximum Peak power declared by Manufacturer
	Total
IEEE 802.11b	30.00
IEEE 802.11g	30.00
IEEE 802.11n HT20	30.00
IEEE 802.11n HT40	30.00

5G

Mode	Maximum Average power declared by Manufacturer
	Total
IEEE 802.11a	23.00
IEEE 802.11n HT20	20.00
IEEE 802.11n HT40	20.00
IEEE 802.11ac VHT20	20.00
IEEE 802.11ac VHT40	20.00
IEEE 802.11ac VHT80	20.00

6. Antenna Information

Antenna	Manufacturer	P/N	Antenna Type	Connector	Maximum Peak Gain (dBi)	Band
Antenna 0	N/A	N/A	FPC	N/A	3	2.4GHz
Antenna 1	N/A	N/A	FPC	N/A	3	2.4GHz
Antenna 2	N/A	N/A	FPC	N/A	3	2.4GHz
Antenna 3	N/A	N/A	FPC	N/A	3.3	5GHz
Antenna 4	N/A	N/A	FPC	N/A	3.8	5GHz

7. Evaluation Results

7.1 Standalone Evaluation

2.4G

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
IEEE 802.11b	30.00	1000.0000	3	1.9953	100%	0.39715	1.0000
IEEE 802.11g	30.00	1000.0000	3	1.9953	100%	0.39715	1.0000
IEEE 802.11n HT20	30.00	1000.0000	3	1.9953	100%	0.39715	1.0000
IEEE 802.11n HT40	30.00	1000.0000	3	1.9953	100%	0.39715	1.0000

5G

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
IEEE 802.11a	23.00	199.5262	3.8	2.3988	96.91%	0.09527	1.0000
IEEE 802.11n HT20	20.00	100.0000	3.8	2.3988	99.00%	0.04775	1.0000
IEEE 802.11n HT40	20.00	100.0000	3.8	2.3988	96.83%	0.04775	1.0000
IEEE 802.11ac VHT20	20.00	100.0000	3.8	2.3988	99.00%	0.04775	1.0000
IEEE 802.11ac VHT40	20.00	100.0000	3.8	2.3988	97.80%	0.04775	1.0000
IEEE 802.11ac VHT80	20.00	100.0000	3.8	2.3988	94.67%	0.04775	1.0000

Remark:

1. *Maximum power including tune-up tolerance;*
2. *MPE use distance is 20cm from manufacturer declaration of user manual.*

7.2 Simultaneous Transmission for MPE

The sample include 2.4GHz and 5GHz WLAN modular, need consider simultaneous transmission.

Maximum MPE Ratios for WLAN simultaneous transmission

Maximum MPE Ratio $_{2.4GWLAN}$	Maximum MPE Ratio $_{5GWLAN}$	∑ MPE ratios	Limit	Results
0.39715	0.09527	0.49242	1.0	PASS

Remark:

1. *Maximum power including tune-up tolerance;*
2. *MPE use distance is 20cm from manufacturer declaration of user manual.*

8. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

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