

## RF Exposure Report

**Report No.:** FCC\_RF\_SL19041701-SEV-040\_MPE\_Rev1.0

**FCC ID:** AFJ382500

**Test Model:** IP501M

**Issued Date:** 08/15/2019

**Applicant:** ICOM Incorporated

**Address:** 1-1-32 Kamiminami Hirano-ku Osaka 547-0003 Japan

**Manufacturer:** ICOM Incorporated

**Address:** 1-1-32 Kamiminami Hirano-ku Osaka 547-0003 Japan

**Issued By:** Bureau Veritas Consumer Products Services, Inc.

**Lab Address:** 775 Montague Expressway, Milpitas, CA 95035

**Test Location (1):** 775 Montague Expressway, Milpitas, CA 95035

**FCC Registration /  
Designation Number:** 540430



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### Release Control Record

Issue No.	Description	Date Issued
FCC_RF_SL19041701-SEV-040_MPE	Original Release	07/19/2019
FCC_RF_SL19041701-SEV-040_MPE_Rev1.0	Updated as per reviewer's comments	08/15/2019

## 1 Certificate of Conformity

**Product:** IP Advanced Radio System

**Brand:** Icom

**Test Model:** IP501M

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** ICOM Incorporated

**Test Date:** 06/27/2019 – 06/08/2019

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services, Inc., Milpitas Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :**



**Date:**

08/15/2019

Rachana Khanduri / Test Engineer

**Approved by :**



**Date:**

08/15/2019

Chen Ge / Engineer Reviewer

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

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

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

BT: Chip Antenna, -6.5dBi Gain

WCDMA: Passive Antenna, 0dBi Gain

LTE (Band 2, Band 4, Band 12): Passive Antenna, 0dBi Gain

## 2.5 Calculation Result of Maximum Conducted Power

Type	CH Freq (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Tune-Up Tolerance	Tolerance Max Power (dBm)	Measurement Distance (cm)	Calculated MPE (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )	Pass / Fail
BT (3DH5)	2402	5.03	-6.5	±1dB	6.03	20	0.00018	1	Pass
WCDMA (Band II)	1850	24.79	0	±1dB	25.79	20	0.0755	1	Pass
WCDMA (Band V)	824	24.82	0	±1dB	25.82	20	0.0760	0.549	Pass
LTE (Band II)	1850.0	22.98	0	±1dB	23.98	20	0.0498	1	Pass
LTE (Band IV)	1755.0	23.32	0	±1dB	24.32	20	0.0538	1	Pass
LTE (Band XII)	699.0	21.91	0	±1dB	22.91	20	0.0389	0.466	Pass

### Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

If BT and LTE/WCDMA transmit simultaneously;

Bluetooth =  $(0.00018/1) \times 100 = 0.02 \%$

WCDMA (Band II) =  $(0.0755/ 1) \times 100 = 7.55 \%$

WCDMA (Band V) =  $(0.0760 / 0.549) \times 100 = 13.84 \%$

LTE (Band II) =  $(0.0497 / 1) \times 100 = 4.97 \%$

LTE (Band IV) =  $(0.0538 / 1) \times 100 = 5.38 \%$

LTE (Band XII) =  $(0.0389 / 0.466) \times 100 = 8.35 \%$

Total MPE Percentage (Worst case) =  $0.02 + 13.84 = 13.86 \% < 100\%$

**The Above Result had shown that the Device complied with MPE requirement.**

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