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

ACCREDITED
TESTING CERT # 2742-01

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
FCC_RF_SL19041701-SEV-040_MPE	Orignal 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^2)	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	($180/f^2$)*	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^2

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^2)	MPE Limit (mW/cm^2)	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 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

If BT and LTE/WCDMA transmit simultaneously;
Bluetooth = (0.00018/1) x 100 = 0.02 %
WCDMA (Band II) = (0.0755/ 1) x 100 = 7.55 %
WCDMA (Band V) = (0.0760 / 0.549) x 100 = 13.84 %
LTE (Band II) = (0.0497 / 1) x 100 = 4.97 %
LTE (Band IV) = (0.0538 / 1) x 100 = 5.38 %
LTE (Band XII) = (0.0389 / 0.466) x 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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