RF Exposure Report

Report No.:	SA190628E01
FCC ID:	RAS-MT7663
Test Model:	MT7663
Received Date:	June 28, 2019
Test Date:	Sep. 09, 2019
Issued Date:	Dec. 31, 2019
Applicant:	MediaTek Inc.
Address:	No.1, Duxing 1st Rd., East District, Hsinchu City 300, Taiwan (R.O.C.)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwa.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA190628E01	Original release.	Dec. 31, 2019

1 Certificate of Conformity

Product:	2TX 11ac + BLE Combo Card
Brand:	MTK
Test Model:	MT7663
Sample Status:	ENGINEERING SAMPLE
Applicant:	MediaTek Inc.
Test Date:	Sep. 09, 2019
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.3-2002

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan 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:** Dec. 31, 2019

Joyce Kuo / Specialist

Approved by : _____ , **Date:** Dec. 31, 2019

Clark Lin / Technical Manager

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

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

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 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

Antenna Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length
1	Chain 0	LYNwave	ALA110-222050-300011	3.5	2.4~2.4835	PIFA	i-pex(MHF)	55mm
				5	5.15~5.85			
	Chain 1	LYNwave	ALA110-222050-300011	3.5	2.4~2.4835	PIFA	i-pex(MHF)	55mm
				5	5.15~5.85			
2	Chain 0	Cortec	AN2450-4902BRS	2.42	2.4~2.4835	Dipole	R-SMA	150mm
				3.87	5.15~5.85			
	Chain 1	Cortec	AN2450-4902BRS	2.42	2.4~2.4835	Dipole	R-SMA	150mm
				3.87	5.15~5.85			
3	Chain 0	PSA	RFMTA340718EMLB301	2.92	2.4~2.4835	PIFA	i-pex(MHF)	199.4mm
				4.94	5.15~5.85			
	Chain 1	PSA	RFMTA340718EMLB301	2.92	2.4~2.4835	PIFA	i-pex(MHF)	199.4mm
				4.94	5.15~5.85			
Note: The Max. gain was selected for Radiated Emission Measurement test.								

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN 2.4GHz	2437	195.924	6.51	20	0.17451	1
WLAN U-NII-1	5180	160.801	8.01	20	0.20231	1
WLAN U-NII-2A	5260	157.614	8.01	20	0.19830	1
WLAN U-NII-2C	5580	157.067	8.01	20	0.19761	1
WLAN U-NII-3	5825	186.71	8.01	20	0.23491	1
Bluetooth (BT-EDR)	2402	12.912	3.50	20	0.00575	1
Bluetooth (BT-LE)	2404	7.311	3.50	20	0.00326	1

NOTE:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: Directional gain = 3.5dBi + 10log(2) = 6.51dBi
   5GHz: Directional gain = 5dBi + 10log(2) = 8.01dBi
3. 2.4GHz & 5GHz technology can't transmit at same time.

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + Bluetooth = 0.17451 / 1 + 0.00575 / 1 = 0.18026

WLAN 5GHz + Bluetooth = 0.23491 / 1 + 0.00575 / 1 = 0.24066

Therefore the maximum calculations of above situations are less than the "1" limit.

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