

FCC SAR Test Report

Report No. : SA181204C54A

Applicant : HON HAI Precision Ind. Co., Ltd.

Address : 5F-1, 5 Hsin-An Road Hsinchu, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C

Product : LTE M.2 Module

FCC ID : MCLT77W968

Brand : FOXCONN

Model No. : T77W968

Standards : FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02
KDB 248227 D01 v02r02, KDB 447498 D01 v06, KDB 616217 D04 v01r02
KDB 941225 D01 v03r01, KDB 941225 D05 v02r05, KDB 941225 D05A v01r02

Sample Received Date : May 02, 2019

Date of Testing : May 24, 2019

Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

Test Location : No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, 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 SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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FCC Accredited No.: TW0003

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Release Control Record

Report No.	Reason for Change	Date Issued
SA181204C54A	Initial release	May 29, 2019

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest SAR-1g Body (W/kg)
PCB	WCDMA II	Not Required
	WCDMA IV	Not Required
	WCDMA V	Not Required
	LTE 2 / 25	Not Required
	LTE 4 / 66	Not Required
	LTE 5 / 26	Not Required
	LTE 7	Not Required
	LTE 12 / 17	Not Required
	LTE 13	Not Required
	LTE 14	Not Required
	LTE 30	Not Required
	LTE 38 / 41	Not Required
Equipment Class	Mode	Highest SAR-1g Body (W/kg)
		AX200NGW
DTS	2.4G WLAN	Not Required
NII	5.3G WLAN	Not Required
	5.6G WLAN	Not Required
	5.8G WLAN	Not Required
DSS	Bluetooth	Not Required

Note:

1. The SAR criteria (**Head & Body: SAR-1g 1.6 W/kg, and Extremity: SAR-10g 4.0 W/kg**) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.
2. This device supports both LTE band 12 and band 17. The frequency span of LTE band 12 can completely cover LTE band 17, and they has the same tune-up power. SAR was tested for LTE band 12 only.
3. This device supports both LTE band 66 and band 4. The frequency span of LTE band 66 can completely cover LTE band 4, and they has the same tune-up power. SAR was tested for LTE band 66 only.
4. This device supports both LTE band 25 and band 2. The frequency span of LTE band 25 can completely cover LTE band 2, and they has the same tune-up power. SAR was tested for LTE band 25 only.
5. This device supports both LTE band 41 and band 38. The frequency span of LTE band 41 can completely cover LTE band 38, and they has the same tune-up power. SAR was tested for LTE band 41 only.
6. This device supports both LTE band 26 and band 5. The frequency span of LTE band 26 can completely cover LTE band 5, and they has the same tune-up power. SAR was tested for LTE band 26 only.

2. Description of Equipment Under Test

EUT Type	LTE M.2 Module
FCC ID	MCLT77W968
Brand Name	FOXCONN
Model Name	T77W968
Tx Frequency Bands (Unit: MHz)	WCDMA Band II : 1852.4 ~ 1907.6 WCDMA Band IV : 1712.4 ~ 1752.6 WCDMA Band V : 826.4 ~ 846.6 LTE Band 2 : 1850.7 ~ 1909.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 4 : 1710.7 ~ 1754.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 5 : 824.7 ~ 848.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 7 : 2502.5 ~ 2567.5 (BW: 5M, 10M, 15M, 20M) LTE Band 12 : 699.7 ~ 715.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 13 : 779.5 ~ 784.5 (BW: 5M, 10M) LTE Band 14 : 790.5 ~ 795.5 (BW: 5M, 10M) LTE Band 17 : 706.5 ~ 713.5 (BW: 5M, 10M) LTE Band 25 : 1850.7 ~ 1914.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 26 : 814.7 ~ 848.3 (BW: 1.4M, 3M, 5M, 10M, 15M) LTE Band 30 : 2307.5 ~ 2312.5 (BW: 5M, 10M) LTE Band 38 : 2572.5 ~ 2617.5 (BW: 5M, 10M, 15M, 20M) LTE Band 41 : 2498.5 ~ 2687.5 (BW: 5M, 10M, 15M, 20M) LTE Band 66 : 1710.7 ~ 1779.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M)
Uplink Modulations	WCDMA : QPSK LTE : QPSK, 16QAM, 64QAM
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.6.1 of this report
Antenna Type	Refer to Note as below
EUT Stage	Mass product

Note:

- The EUT is authorized for use in specific End-product. Please refer to below for more details.

Product	Brand	Model
Portable Computer	DELL	P99G

- The WLAN modules (Brand: Intel, Model: AX200NGW) were installed in the End-product. The specification is listed as below.

WLAN module	
Tx Frequency Bands (Unit: MHz)	WLAN : 2412 ~ 2472, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480
Uplink Modulations	802.11b : DSSS 802.11a/g/n/ac/ax : OFDM Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK
Antenna Type	WLAN/BT: PIFA Antenna (Peak Antenna Gain : -3.63 dBi for 2.4GHz, -1.83 dBi for 5GHz)
FCC ID	PD9AX200NG

- The antenna information is listed as below.

Antenna Type	Manufacturer	Parts Number	Antenna Gain (dBi)													
			WCDMA I LTE 2	WCDMA IV LTE 4	WCDMA V LTE 5	LTE 7	LTE 12	LTE 13	LTE 14	LTE 17	LTE 25	LTE 26	LTE 30	LTE 38	LTE 41	LTE 66
PIFA	Ethertronics	Main Antenna: 5003084/DC33002731L	1.85	1.85	-0.74	1.16	1.52	1.52	1.52	1.52	1.85	-0.74	1.16	1.16	1.16	1.85

Antenna Type	Manufacturer	Parts Number	Antenna Gain (dBi)			
			2.400-2.500	5.150-5.350	5.470-5.725	5.725-5.850
PIFA	Ethertronics	5003086/DC33002730L	Main: 1.10 Aux.: 0.27	Main: 0.50 Aux.: 0.99	Main: 1.01 Aux.: 0.28	Main: -0.09 Aux.: -1.16

- The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory of End-product:

4 Cell battery	Brand Name	DELL
	Model Name	MXV9V
	Power Rating	7.6 Vdc, 60 Wh
	Type	Li-ion
3 Cell battery	Brand Name	DELL
	Model Name	OG74G
	Power Rating	11.4 Vdc, 42 Wh
	Type	Li-ion

3. SAR Measurement Evaluation

3.1 Maximum Output Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	WCDMA Band II	WCDMA Band IV	WCDMA Band V
RMC 12.2K	24.5	24.5	24.5
HSDPA / HSUPA / DC-HSDPA	24.5	24.5	24.5

Mode	LTE 2	LTE 4	LTE 5	LTE 7
QPSK	24.5	24.5	24.5	24.5
16QAM	23.5	23.5	23.5	23.5
64QAM	22.5	22.5	22.5	22.5

Mode	LTE 12	LTE 13	LTE 14	LTE 17
QPSK	24.5	24.5	24.5	24.5
16QAM	23.5	23.5	23.5	23.5
64QAM	22.5	22.5	22.5	22.5

Mode	LTE 25	LTE 26	LTE 30	LTE 38
QPSK	24.5	24.5	23.0	24.5
16QAM	23.5	23.5	22.0	23.5
64QAM	22.5	22.5	21.0	22.5

Mode	LTE 41	LTE 66
QPSK	24.5	24.5
16QAM	23.5	23.5
64QAM	22.5	22.5

<AX200NGW>

<WLAN 2.4G>

Mode	Channel	Frequency (MHz)	SISO Ant-0	SISO Ant-1
802.11b	1	2412	21.0	21.0
	6	2437	21.0	21.0
	11	2462	19.0	19.5
	12	2467	18.0	17.0
	13	2472	15.5	14.5
802.11g	1	2412	20.5	21.0
	6	2437	20.5	21.0
	11	2462	15.5	15.0
	12	2467	14.0	14.0
	13	2472	12.0	12.0
802.11n (HT20)	1	2412	20.5	20.5
	6	2437	20.5	20.5
	11	2462	17.0	17.0
	12	2467	14.5	15.0
	13	2472	12.5	12.0
802.11n (HT40)	3	2422	17.0	17.5
	6	2437	17.0	17.5
	9	2452	17.0	17.5
	10	2457	13.0	12.5
	11	2462	12.5	12.0
802.11ac (VHT20)	1	2412	19.5	19.5
	6	2437	19.5	19.5
	11	2462	17.0	17.0
	12	2467	14.5	15.0
	13	2472	12.5	12.0
802.11ac (VHT40)	3	2422	17.0	17.5
	6	2437	17.0	17.5
	9	2452	17.0	17.5
	10	2457	13.0	12.5
	11	2462	12.5	12.0
802.11ax (HE20)	1	2412	19.5	19.5
	6	2437	19.5	19.5
	11	2462	19.5	19.5
	12	2467	15.0	11.5
	13	2472	12.0	11.5
802.11ax (HE40)	3	2422	17.0	17.5
	6	2437	17.0	17.5
	9	2452	17.0	17.5
	10	2457	12.5	12.5
	11	2462	12.0	12.0

Mode	Channel	Frequency (MHz)	MIMO Ant-0	MIMO Ant-1	MIMO Ant-0+1
802.11n (HT20)	1	2412	17.5	17.5	20.5
	6	2437	17.5	17.5	20.5
	11	2462	14.5	14.5	17.5
	12	2467	12.0	12.0	15.0
	13	2472	8.0	8.0	11.0
802.11n (HT40)	3	2422	14.5	14.5	17.5
	6	2437	14.5	14.5	17.5
	9	2452	14.5	14.5	17.5
	10	2457	8.0	8.0	11.0
	11	2462	10.5	10.5	13.5
802.11ac (VHT20)	1	2412	16.5	16.5	19.5
	6	2437	16.5	16.5	19.5
	11	2462	14.5	14.5	17.5
	12	2467	12.0	12.0	15.0
	13	2472	8.0	8.0	11.0
802.11ac (VHT40)	3	2422	14.5	14.5	17.5
	6	2437	14.5	14.5	17.5
	9	2452	14.5	14.5	17.5
	10	2457	8.0	8.0	11.0
	11	2462	10.5	10.5	13.5
802.11ax (HE20)	1	2412	16.5	16.5	19.5
	6	2437	16.5	16.5	19.5
	11	2462	16.5	16.5	19.5
	12	2467	11.0	11.0	14.0
	13	2472	8.0	8.0	11.0
802.11ax (HE40)	3	2422	14.5	14.5	17.5
	6	2437	14.5	14.5	17.5
	9	2452	14.5	14.5	17.5
	10	2457	7.5	7.5	10.5
	11	2462	12.0	12.0	15.0

<WLAN 5.2G>

Mode	Channel	Frequency (MHz)	SISO Ant-0	SISO Ant-1
802.11a	36	5180	16.5	16.5
	40	5200	16.5	16.5
	44	5220	16.5	16.5
	48	5240	16.5	16.5
802.11n (HT20)	36	5180	17.0	17.0
	40	5200	17.0	17.0
	44	5220	17.0	17.0
	48	5240	17.0	17.0
802.11n (HT40)	38	5190	18.0	18.0
	46	5230	18.0	18.0
802.11ac (VHT20)	36	5180	17.0	17.0
	40	5200	17.0	17.0
	44	5220	17.0	17.0
	48	5240	17.0	17.0
802.11ac (VHT40)	38	5190	18.0	18.0
	46	5230	18.0	18.0
802.11ac (VHT80)	42	5210	18.0	18.0
802.11ax (HE20)	36	5180	17.0	17.0
	40	5200	17.0	17.0
	44	5220	17.0	17.0
	48	5240	17.0	17.0
802.11ax (HE40)	38	5190	17.5	17.5
	46	5230	17.5	17.5
802.11ax (HE80)	42	5210	18.0	18.0

Mode	Channel	Frequency (MHz)	MIMO Ant-0	MIMO Ant-1	MIMO Ant-0+1
802.11n (HT20)	36	5180	14.0	14.0	17.0
	40	5200	14.0	14.0	17.0
	44	5220	14.0	14.0	17.0
	48	5240	14.0	14.0	17.0
802.11n (HT40)	38	5190	15.0	15.0	18.0
	46	5230	15.0	15.0	18.0
802.11ac (VHT20)	36	5180	14.0	14.0	17.0
	40	5200	14.0	14.0	17.0
	44	5220	14.0	14.0	17.0
	48	5240	14.0	14.0	17.0
802.11ac (VHT40)	38	5190	15.0	15.0	18.0
	46	5230	15.0	15.0	18.0
802.11ac (VHT80)	42	5210	15.0	15.0	18.0
802.11ax (HE20)	36	5180	14.0	14.0	17.0
	40	5200	14.0	14.0	17.0
	44	5220	14.0	14.0	17.0
	48	5240	14.0	14.0	17.0
802.11ax (HE40)	38	5190	14.5	14.5	17.5
	46	5230	14.5	14.5	17.5
802.11ax (HE80)	42	5210	15.0	15.0	18.0

<WLAN 5.3G>

Mode	Channel	Frequency (MHz)	SISO Ant-0	SISO Ant-1
802.11a	52	5260	21.0	21.0
	56	5280	21.0	21.0
	60	5300	21.0	21.0
	64	5320	18.5	18.5
802.11n (HT20)	52	5260	21.0	21.0
	56	5280	21.0	21.0
	60	5300	21.0	21.0
	64	5320	18.0	18.0
802.11n (HT40)	54	5270	19.0	19.0
	62	5310	19.0	19.0
802.11ac (VHT20)	52	5260	21.0	21.0
	56	5280	21.0	21.0
	60	5300	21.0	21.0
	64	5320	18.0	18.0
802.11ac (VHT40)	54	5270	19.0	19.0
	62	5310	19.0	19.0
802.11ac (VHT80)	58	5290	18.5	18.5
802.11ac (VHT160)	50	5250	14.5	14.5
802.11ax (HE20)	52	5260	21.0	21.0
	56	5280	21.0	21.0
	60	5300	21.0	21.0
	64	5320	18.0	17.5
802.11ax (HE40)	54	5270	20.5	20.5
	62	5310	20.5	20.5
802.11ax (HE80)	58	5290	18.5	18.0
802.11ax (HE160)	50	5250	14.5	15.0

Mode	Channel	Frequency (MHz)	MIMO Ant-0	MIMO Ant-1	MIMO Ant-0+1
802.11n (HT20)	52	5260	18.0	18.0	21.0
	56	5280	18.0	18.0	21.0
	60	5300	18.0	18.0	21.0
	64	5320	15.0	15.0	18.0
802.11n (HT40)	54	5270	16.0	16.0	19.0
	62	5310	16.0	16.0	19.0
802.11ac (VHT20)	52	5260	18.0	18.0	21.0
	56	5280	18.0	18.0	21.0
	60	5300	18.0	18.0	21.0
	64	5320	15.0	15.0	18.0
802.11ac (VHT40)	54	5270	17.0	17.0	20.0
	62	5310	17.0	17.0	20.0
802.11ac (VHT80)	58	5290	15.5	15.5	18.5
802.11ac (VHT160)	50	5250	11.5	11.5	14.5
802.11ax (HE20)	52	5260	18.0	18.0	21.0
	56	5280	18.0	18.0	21.0
	60	5300	18.0	18.0	21.0
	64	5320	15.0	15.0	18.0
802.11ax (HE40)	54	5270	17.5	17.5	20.5
	62	5310	17.5	17.5	20.5
802.11ax (HE80)	58	5290	15.0	15.0	18.0
802.11ax (HE160)	50	5250	12.0	12.0	15.0

<WLAN 5.6G>

Mode	Channel	Frequency (MHz)	SISO Ant-0	SISO Ant-1
802.11a	100	5500	21.0	21.0
	116	5580	21.0	21.0
	120	5600	21.0	21.0
	124	5620	21.0	21.0
	132	5660	21.0	21.0
	140	5700	21.0	21.0
	144	5720	21.0	21.0
802.11n (HT20)	100	5500	21.0	21.0
	116	5580	21.0	21.0
	120	5600	21.0	21.0
	124	5620	21.0	21.0
	132	5660	21.0	21.0
	140	5700	21.0	21.0
	144	5720	21.0	21.0
802.11n (HT40)	102	5510	21.0	21.0
	110	5550	21.0	21.0
	118	5590	21.0	21.0
	126	5630	21.0	21.0
	134	5670	21.0	21.0
	142	5710	21.0	21.0
802.11ac (VHT20)	100	5500	21.0	21.0
	116	5580	21.0	21.0
	120	5600	21.0	21.0
	124	5620	21.0	21.0
	132	5660	21.0	21.0
	140	5700	21.0	21.0
	144	5720	21.0	21.0
802.11ac (VHT40)	102	5510	21.0	21.0
	110	5550	21.0	21.0
	118	5590	21.0	21.0
	126	5630	21.0	21.0
	134	5670	21.0	21.0
	142	5710	21.0	21.0
802.11ac (VHT80)	106	5530	19.5	20.0
	122	5610	19.5	20.0
	138	5690	19.5	20.0
802.11ac (VHT160)	114	5570	15.0	15.5
802.11ax (HE20)	100	5500	21.0	21.0
	116	5580	21.0	21.0
	120	5600	21.0	21.0
	124	5620	21.0	21.0
	132	5660	21.0	21.0
	140	5700	21.0	21.0
	144	5720	21.0	21.0
802.11ax (HE40)	102	5510	21.0	21.0
	110	5550	21.0	21.0
	118	5590	21.0	21.0
	126	5630	21.0	21.0
	134	5670	21.0	21.0
	142	5710	21.0	21.0
802.11ax (HE80)	106	5530	19.0	19.5
	122	5610	19.0	19.5
	138	5690	19.0	19.5
802.11ax (HE160)	114	5570	15.0	15.5

Mode	Channel	Frequency (MHz)	MIMO Ant-0	MIMO Ant-1	MIMO Ant-0+1
802.11n (HT20)	100	5500	18.0	18.0	21.0
	116	5580	18.0	18.0	21.0
	120	5600	18.0	18.0	21.0
	124	5620	18.0	18.0	21.0
	132	5660	18.0	18.0	21.0
	140	5700	18.0	18.0	21.0
	144	5720	18.0	18.0	21.0
802.11n (HT40)	102	5510	18.0	18.0	21.0
	110	5550	18.0	18.0	21.0
	118	5590	18.0	18.0	21.0
	126	5630	18.0	18.0	21.0
	134	5670	18.0	18.0	21.0
	142	5710	18.0	18.0	21.0
802.11ac (VHT20)	100	5500	18.0	18.0	21.0
	116	5580	18.0	18.0	21.0
	120	5600	18.0	18.0	21.0
	124	5620	18.0	18.0	21.0
	132	5660	18.0	18.0	21.0
	140	5700	18.0	18.0	21.0
	144	5720	18.0	18.0	21.0
802.11ac (VHT40)	102	5510	18.0	18.0	21.0
	110	5550	18.0	18.0	21.0
	118	5590	18.0	18.0	21.0
	126	5630	18.0	18.0	21.0
	134	5670	18.0	18.0	21.0
	142	5710	18.0	18.0	21.0
802.11ac (VHT80)	106	5530	17.0	17.0	20.0
	122	5610	17.0	17.0	20.0
	138	5690	17.0	17.0	20.0
802.11ac (VHT160)	114	5570	12.5	12.5	15.5
802.11ax (HE20)	100	5500	18.0	18.0	21.0
	116	5580	18.0	18.0	21.0
	120	5600	18.0	18.0	21.0
	124	5620	18.0	18.0	21.0
	132	5660	18.0	18.0	21.0
	140	5700	18.0	18.0	21.0
	144	5720	18.0	18.0	21.0
802.11ax (HE40)	102	5510	18.0	18.0	21.0
	110	5550	18.0	18.0	21.0
	118	5590	18.0	18.0	21.0
	126	5630	18.0	18.0	21.0
	134	5670	18.0	18.0	21.0
	142	5710	0.0	0.0	3.0
802.11ax (HE80)	106	5530	16.5	16.5	19.5
	122	5610	16.5	16.5	19.5
	138	5690	16.5	16.5	19.5
802.11ax (HE160)	114	5570	12.5	12.5	15.5

<WLAN 5.8G>

Mode	Channel	Frequency (MHz)	SISO Ant-0	SISO Ant-1
802.11a	149	5745	21.0	21.0
	153	5765	21.0	21.0
	157	5785	21.0	21.0
	161	5805	21.0	21.0
	165	5825	21.0	21.0
802.11n (HT20)	149	5745	21.0	21.0
	153	5765	21.0	21.0
	157	5785	21.0	21.0
	161	5805	21.0	21.0
	165	5825	21.0	21.0
802.11n (HT40)	151	5755	21.0	21.0
	159	5795	21.0	21.0
802.11ac (VHT20)	149	5745	21.0	21.0
	153	5765	21.0	21.0
	157	5785	21.0	21.0
	161	5805	21.0	21.0
	165	5825	21.0	21.0
802.11ac (VHT40)	151	5755	21.0	21.0
	159	5795	21.0	21.0
802.11ac (VHT80)	155	5775	21.0	21.0
802.11ax (HE20)	149	5745	21.0	21.0
	153	5765	21.0	21.0
	157	5785	21.0	21.0
	161	5805	21.0	21.0
	165	5825	21.0	21.0
802.11ax (HE40)	151	5755	21.0	21.0
	159	5795	21.0	21.0
802.11ax (HE80)	155	5775	21.0	21.0

Mode	Channel	Frequency (MHz)	MIMO Ant-0	MIMO Ant-1	MIMO Ant-0+1
802.11n (HT20)	149	5745	18.0	18.0	21.0
	153	5765	18.0	18.0	21.0
	157	5785	18.0	18.0	21.0
	161	5805	18.0	18.0	21.0
	165	5825	18.0	18.0	21.0
802.11n (HT40)	151	5755	18.0	18.0	21.0
	159	5795	18.0	18.0	21.0
802.11ac (VHT20)	149	5745	18.0	18.0	21.0
	153	5765	18.0	18.0	21.0
	157	5785	18.0	18.0	21.0
	161	5805	18.0	18.0	21.0
	165	5825	18.0	18.0	21.0
802.11ac (VHT40)	151	5755	18.0	18.0	21.0
	159	5795	18.0	18.0	21.0
802.11ac (VHT80)	155	5775	18.0	18.0	21.0
802.11ax (HE20)	149	5745	18.0	18.0	21.0
	153	5765	18.0	18.0	21.0
	157	5785	18.0	18.0	21.0
	161	5805	18.0	18.0	21.0
	165	5825	18.0	18.0	21.0
802.11ax (HE40)	151	5755	18.0	18.0	21.0
	159	5795	18.0	18.0	21.0
802.11ax (HE80)	155	5775	18.0	18.0	21.0

<Bluetooth>

Mode	Channel	Frequency (MHz)	Tune-up
Bluetooth BDR	0	2402	11.0
	39	2441	11.0
	78	2480	11.0
Bluetooth LE	0	2402	10.5
	19	2440	10.5
	39	2480	10.5

3.1.1 SAR Test Exclusion Evaluations

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

1. For the test separation distance ≤ 50 mm

$$\frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \sqrt{f_{(\text{GHz})}} \leq 3.0 \text{ for SAR-1g, } \leq 7.5 \text{ for SAR-10g}$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2. For the test separation distance > 50 mm, and the frequency at 100 MHz to 1500 MHz

$$\left[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times \left(\frac{f_{(\text{MHz})}}{150} \right) \right]_{(\text{mW})}$$

3. For the test separation distance > 50 mm, and the frequency at > 1500 MHz to 6 GHz

$$[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times 10]_{(\text{mW})}$$

<For WWAN Ant-0>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Bottom Side		Require SAR Testing?
			Ant. to Surface (mm)	Calculated Result	
WCDMA II	24.5	282	198.05	1589 mW	No
WCDMA IV	24.5	282	198.05	1594 mW	No
WCDMA V	24.5	282	198.05	999 mW	No
LTE 2	24.5	282	198.05	1589 mW	No
LTE 4	24.5	282	198.05	1594 mW	No
LTE 5	24.5	282	198.05	1001 mW	No
LTE 7	24.5	282	198.05	1574 mW	No
LTE 12	24.5	282	198.05	884 mW	No
LTE 13	24.5	282	198.05	946 mW	No
LTE 14	24.5	282	198.05	956 mW	No
LTE 17	24.5	282	198.05	884 mW	No
LTE 26	24.5	282	198.05	1001 mW	No
LTE 30	23.0	200	198.05	1579 mW	No
LTE 38	24.5	282	198.05	1573 mW	No
LTE4 1	24.5	282	198.05	1572 mW	No
LTE 66	24.5	282	198.05	1593 mW	No

Note:

Since GSM has multi-slot operation, the maximum tune-up power shown in above table for GSM is source-based time-averaged maximum power.

<AX200NGW>**<For WLAN Ant-0>**

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
WLAN 2.4G	21.0	126	198.05	1576 mW	No
WLAN 5.2G	18.0	63	198.05	1546 mW	No
WLAN 5.3G	21.0	126	198.05	1546 mW	No
WLAN 5.6G	21.0	126	198.05	1543 mW	No
WLAN 5.8G	21.0	126	198.05	1543 mW	No

<For BT/WLAN Ant-1>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
WLAN 2.4G	21.0	126	198.05	1576 mW	No
WLAN 5.2G	18.0	63	198.05	1546 mW	No
WLAN 5.3G	21.0	126	198.05	1546 mW	No
WLAN 5.6G	21.0	126	198.05	1543 mW	No
WLAN 5.8G	21.0	126	198.05	1543 mW	No
BT	11.0	13	198.05	1576 mW	No

<For WLAN Ant-0 + Ant-1>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
WLAN 2.4G	20.5	112	198.05	1576 mW	No
WLAN 5.2G	18.0	63	198.05	1546 mW	No
WLAN 5.3G	21.0	126	198.05	1546 mW	No
WLAN 5.6G	21.0	126	198.05	1543 mW	No
WLAN 5.8G	21.0	126	198.05	1543 mW	No

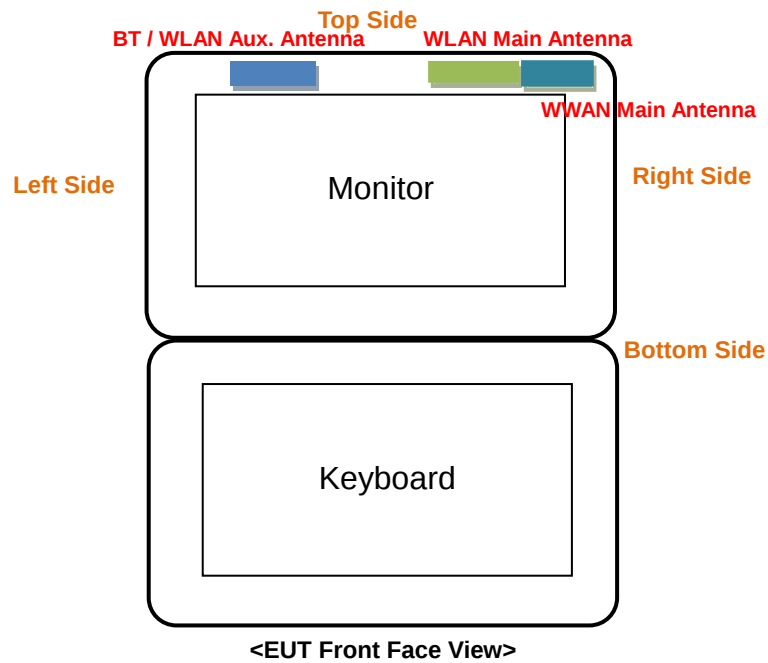
Note:

1. When separation distance ≤ 50 mm and the calculated result shown in above table is ≤ 3.0 , the SAR testing exclusion is applied.
2. When separation distance > 50 mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

Summary:

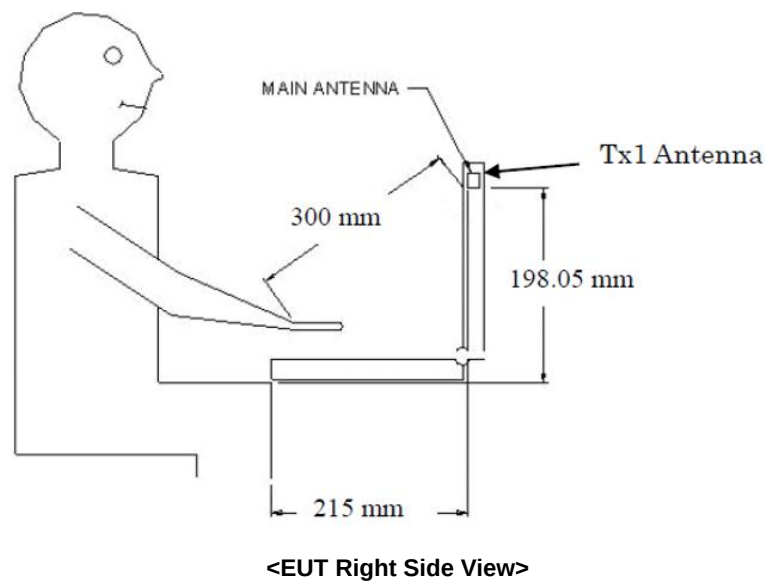
Since the SAR testing for all device orientations apply SAR test exclusion per KDB 447498, SAR testing for this device is not required.

4. Antenna Location



The separation distance for antenna to edge:

Antenna	To Top Side (mm)	To Bottom Side (mm)	To Left Side (mm)	To Right Side (mm)
WWAN Main	5	198.05	213	11
WLAN Main	5	198.05	195	96
BT/WLAN Aux.	5	198.05	96	195



5. Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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The road map of all our labs can be found in our web site also.

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Appendix A. Photographs of EUT

Please refer to attached file - External photo