TEST REPORT

Applicant:	HMD Global Oy
Address:	Bertel Jungin aukio 9, 02600 Espoo, Finland

Manufacturer or Supplier:	HMD Global Oy
Address:	Bertel Jungin aukio 9, 02600 Espoo, Finland
Product:	Tablet PC
Brand Name:	HMD
Model Name:	TA-1597
FCC ID:	2AJOTTA-1597
Date of tests:	Aug. 03, 2022 ~ Sep. 16, 2022 Jan. 26, 2024 ~ Mar. 28, 2024

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

☒ **FCC Part 15, Subpart C, Section 15.247** ☒ **ANSI C63.10-2013**
☒ **FCC Part 15, Subpart E, Section 15.407**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Simon Wang Date: Mar. 28, 2024	Luke Lu Date: Mar. 28, 2024

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P24010017RF05	Original release	Mar. 28, 2024

NOTE: This report the data pls refers to the report of W7L-P22070039RF05 (model: TA-1487, FCC ID: 2AJOTTA-1487), the differences between TA-1487 and TA-1597 are model name, FCC ID, earphone model, brand name and software version. TA-1597 import the 2nd supply material. This report verify RSE worse case, So this report only update the RSE worse case.

List of the verified results (worse case) in the test item as follows：

Test Item / Report No.	W7L-P22070039RF05	W7L-P24010017RF05
Radiated Emission Test (30MHz ~ 1GHz)	Margin:-10.97dB	Margin:-11.16dB
Radiated Emission Test (Above 1GHz)	Margin: -3.18dB	Margin:-6.24dB
Harmonic	Margin: -7.74dB	Margin: -6.07dB
Remark: All validation data are within 3dB variation or better.		

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Tablet PC	
BRAND NAME	HMD	
MODEL NAME	TA-1597	
NOMINAL VOLTAGE	5.0Vdc(adapter or host equipment) 3.85Vdc (Li-ion, battery)	
MODULATION TYPE	**BT_LE**	GFSK
	Bluetooth	GFSK, π/4-DQPSK, 8DPSK
	FM	FM
	WLAN	DSSS, OFDM
	GPS/GALILEO/GLONASS	BPSK
OPERATING FREQUENCY **OPERATING FREQUENCY**	**Bluetooth/BT_LE**	2402MHz ~ 2480MHz
	FM	87.5MHz ~ 108MHz
	WLAN	2412 ~ 2462MHz for 11b/g/n(HT20/40) 5180 ~ 5240MHz, 5260 ~ 5320 MHz, 5500 ~ 5720MHz, 5745 ~ 5825 MHz for 11a/ n(HT20)/ n(HT40) / ac(VHT20)/ ac(VHT40) / ac(VHT80)
	GPS/GALILEO/GLONASS	1559MHz ~ 1610MHz
HW VERSION	EM_U1630_V1.2 L20	
SW VERSION	V2.270_B01	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	USB cable: non-shielded cable, with w/o ferrite core, 1.0 meter Earphone: non-shielded cable, with w/o ferrite core, 1.5 meter	
ACCESSORY DEVICES	Refer to note as below	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

List of Accessory:

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery	HMD	Guangdong Fenghua New Energy Co., Ltd.	WTT80	Capacity：3.8 Vdc, 8000mAh
AC Adapter	HMD	Shenzhen Baijunda Electronic Co., Ltd	AD-010U	I/P: 100-240Vac, 0.35A, O/P: 5.0Vdc, 2.0A
Earphone	N/A	JUWEI ELECTRONICS CO., LTD	JWEP1299-Y50H	Signal Line, 1.5meter
USB Cable	N/A	Saibao (Jiangxi) Industrial Co., Ltd	AC-2A	Signal Line, 1.0meter

2 SUMMARY OF TEST RESULTS

2.1 TEST RESULTS

TEST TYPE	Result
Radiated Emissions	Pass

2.2 MEASREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Radiated emissions & Radiated Power (30MHz~1GHz)	±4.98dB
Radiated emissions & Radiated Power (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.3 TEST INSTRUMENTS

#1

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 19,20	May. 18,23
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 06,22	Mar. 05,23
Horn Antenna	ETS-LINDGREN	3117	00168692	Mar. 06,22	Mar. 05,23
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 28, 21	Aug. 27, 22
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 27, 22	Aug. 26, 23
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 02,22	Jun. 01,23
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 21,22	Feb. 20,23
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 21,22	Feb.20,23
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 25,21	Aug. 24,22
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 24,22	Aug. 23,23
Power Meter	Anritsu	ML2495A	1506002	Feb. 22,22	Feb. 21,23
Power Sensor	Anritsu	MA2411B	1339352	May. 14,22	May. 13,23
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.05,21	Sep. 04,22
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep. 04,22	Sep. 03,23
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.15,22	May.14,23
Test Software	E3	V 9.160323	N/A	N/A	N/A
Temperature Chamber	ESPEC	SH-242	93000855	May. 12,22	May. 11,23
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 18,22	Feb. 17,23

#2

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Nov. 14,23	Nov. 13,26
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 18,23	Feb. 17,24
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 17,24	Feb. 16,25
Horn Antenna	ETS-LINDGREN	3117	00168692	Feb. 18,23	Feb. 17,24
Horn Antenna	ETS-LINDGREN	3117	00168692	Feb. 17,24	Feb. 16,25
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Sep.03, 23	Sep.02, 24
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	JS1120-3	3.2.06	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	N/A	May. 06,23	May. 05,24
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 28,23	Mar. 27,24
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 27,24	Mar. 26,25
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 06,23	May. 05,24
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.10,23	May.09,24
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 17,23	Feb. 16,24
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 16,24	Feb. 15,25
DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 11,23	Aug. 10,24
Power Meter	Anritsu	ML2495A	1506002	Feb. 14,23	Feb. 13,24
Power Meter	Anritsu	ML2495A	1506002	Feb. 13,24	Feb. 12,25
Power Sensor	Anritsu	MA2411B	1339352	Feb. 14,23	Feb. 13,24
Power Sensor	Anritsu	MA2411B	1339352	Feb. 13,24	Feb. 12,25
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.02,23	Sep.01,24

NOTE: 1.The calibration interval of the above test instruments is 12 months or 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Chamber.

3. The test was performed in 3m Semi-anechoic Chamber.

4. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

5. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

2.4 REFERENCED STANDARDS

The fellowing referenced standards are necessary for the report.For undated references in this report,the cited version applies.

No.	Identify	Note
1	FCC Part 15, Subpart C, Section 15.247	For BT/BLE/2.4G WIFI
2	FCC Part 15, Subpart E, Section 15.407	For 5G WIFI

Note: More informations and test procedures pls refer to 15.247/15.407 reports.

2.5 TEST CONFIGURATIONS

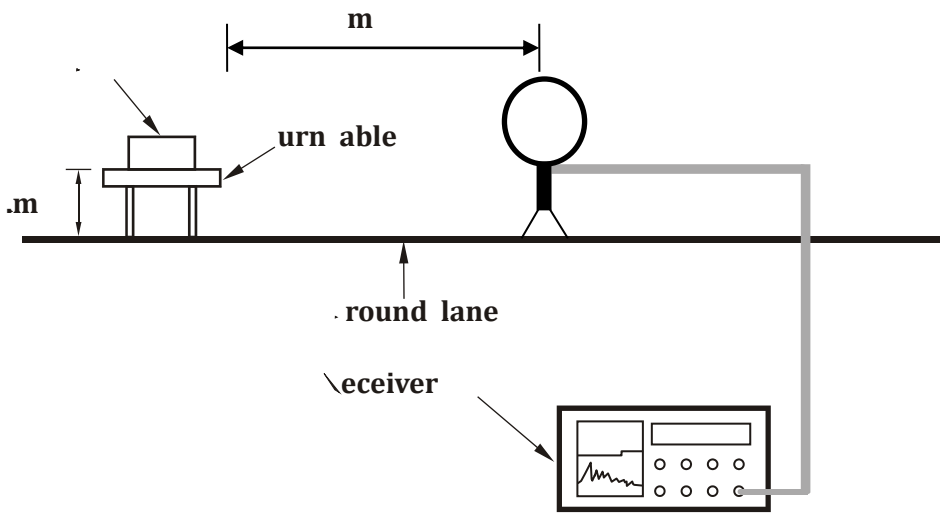
Test Configurations	Description
Worst case test Mode	
1	BT2.0(π/4 DQPSK -CH 78)+5G WIFI(AC80-CH 42)

Note: 1. Test equipment and site refer to Referenced Standards report

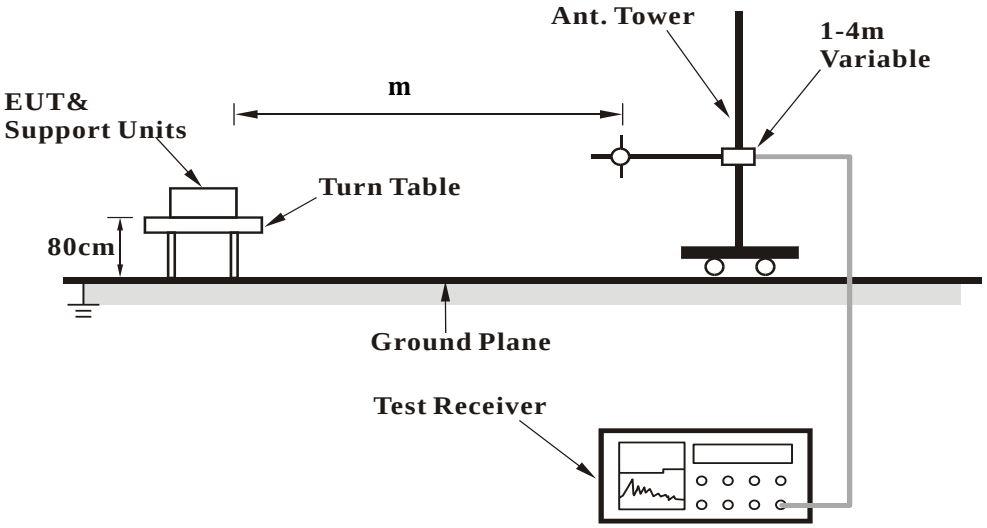
2. For higher frequency, the emission is 20dB below the limit was not record

2.6 TEST DATA

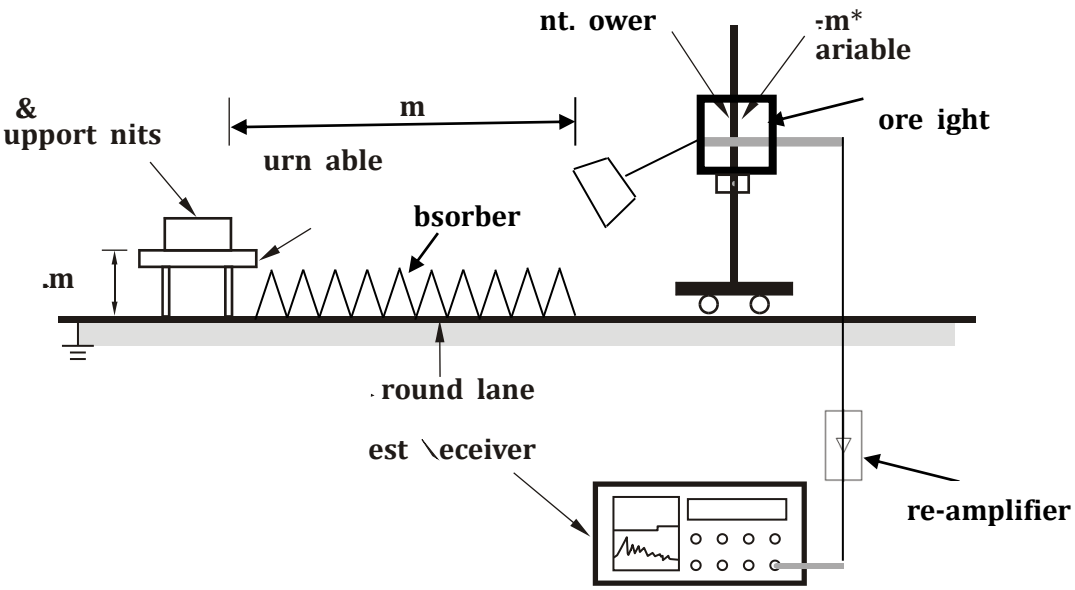
<Frequency Range 9KHz~30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

2.6.1 EUT OPERATING CONDITIONS

a. Set the EUT under full load condition and placed them on a testing table.

b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

c. The necessary accessories enable the EUT in full functions.

2.6.2 TEST RESULTS

NOTE ： The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

BT2.0(π /4 DQPSK-CH 78)+5G WIFI(AC80-CH 42):

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

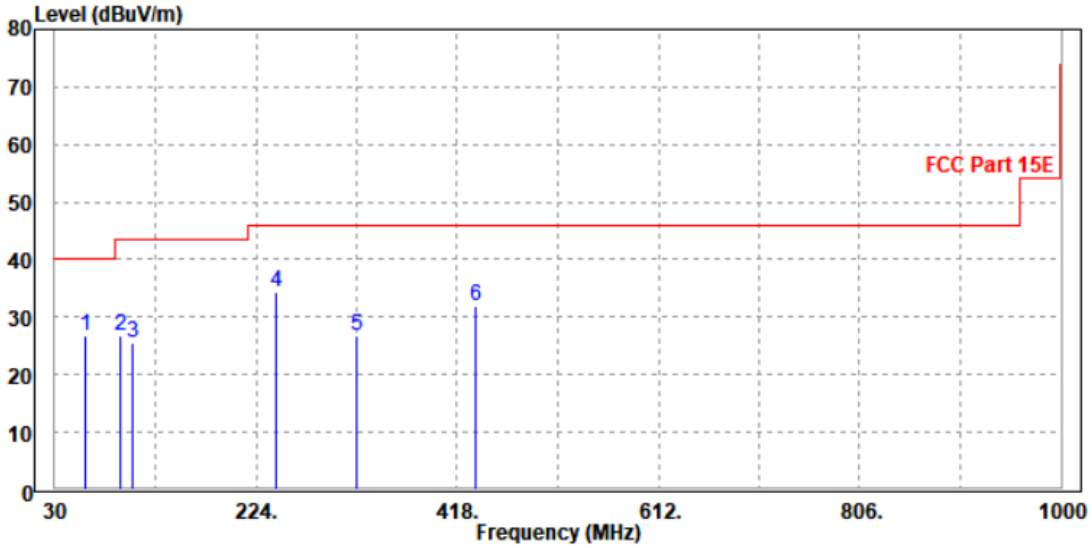
BT2.0(π /4 DQPSK-CH 78)+5G WIFI(AC80-CH 42):

CHANNEL	TX Channel 78(BTπ/4 DQPSK)/ TX Channel 42(5G WIFI AC80)	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
60.318	26.76	50.37	40	-13.24	7.39	6.3	37.3	100	106	QP
92.651	26.69	49.63	43.5	-16.81	7.57	6.51	37.02	120	110	QP
105.328	25.43	47.55	43.5	-18.07	8.33	6.56	37.01	100	30	QP
243.235	34.32	50.63	46	-11.68	13.18	7.13	36.62	100	75	QP
320.664	26.86	41.33	46	-19.14	14.82	7.37	36.66	140	135	QP
436.182	31.97	43.7	46	-14.03	17.49	7.7	36.92	115	160	QP

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.

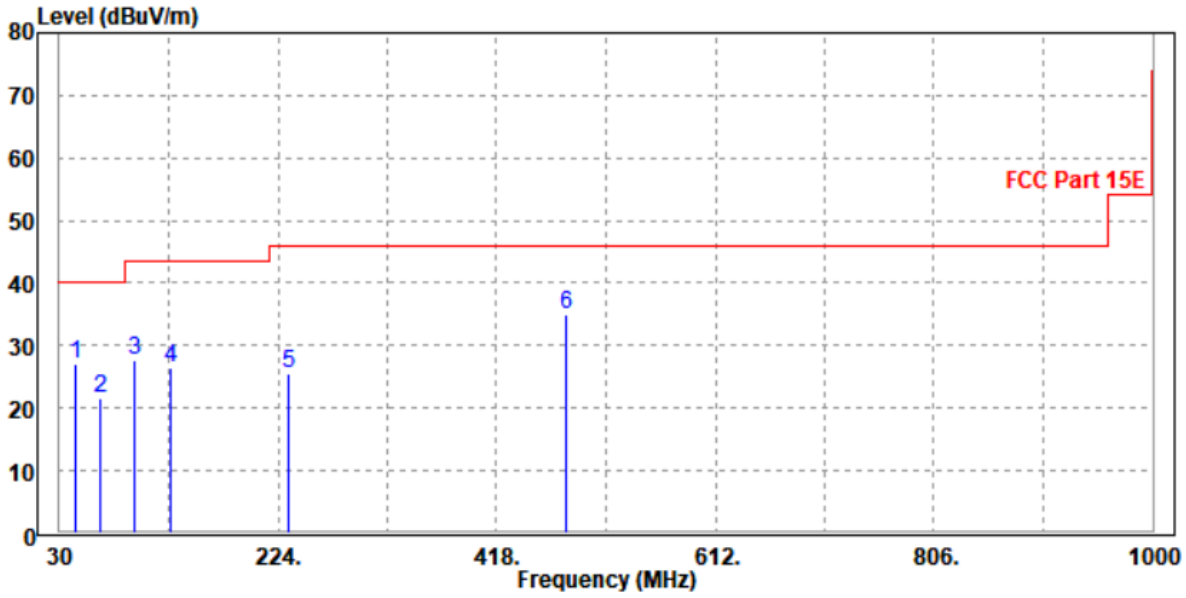


CHANNEL	TX Channel 78(BTπ/4 DQPSK)/ TX Channel 42(5G WIFI AC80)	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
43.625	26.96	46.53	40	-13.04	11.6	6.26	37.43	110	235	QP
65.938	21.65	45.33	40	-18.35	7.16	6.35	37.19	100	156	QP
96.321	27.69	50.26	43.5	-15.81	7.93	6.53	37.03	110	251	QP
127.931	26.47	48.63	43.5	-17.03	8.08	6.68	36.92	100	256	QP
233.647	25.59	42.52	46	-20.41	12.59	7.1	36.62	120	165	QP
478.938	34.84	45.69	46	-11.16	18.3	7.87	37.02	100	158	QP

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

Note: 1. For radiated emissions testing，the full testing range of different modes have been scanned，only the worst case harmonic data is reported in the sheet.

2. All other emissions that more than 20dB below the limit were not recorded

BT2.0(π/4 DQPSK-CH 78)+5G WIFI(AC80-CH 42):

CHANNEL	TX Channel 78(BT π/4 DQPSK)/ TX Channel 42(5G WIFI AC80)	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	51.59	58.16	74	-22.41	31.9	7.74	46.21	100	130	Peak
2390	45.61	52.18	54	-8.39	31.9	7.74	46.21	100	130	Average
2480	103.18	109.44	/	/	32.06	7.87	46.19	100	130	Peak
2480	102.57	108.83	/	/	32.06	7.87	46.19	100	130	Average
2483.5	57.81	64.05	74	-16.19	32.07	7.88	46.19	100	130	Peak
2483.5	45.79	52.03	54	-8.21	32.07	7.88	46.19	100	130	Average
5150	56.38	57.31	74	-17.62	34.42	11.17	46.52	100	150	Peak
5150	47.6	48.53	54	-6.4	34.42	11.17	46.52	100	150	Average
5210	90.21	91.04	/	/	34.47	11.24	46.54	100	150	Peak
5210	82.01	82.84	/	/	34.47	11.24	46.54	100	150	Average
5350	52.57	53.18	74	-21.43	34.58	11.39	46.58	100	150	Peak
5350	45.51	46.12	54	-8.49	34.58	11.39	46.58	100	150	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	**EMISSION LEVEL (dBuV/m)**	**READ LEVEL (dBuV)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA FACTOR (dB /m)**	**CABLE LOSS (dB)**	**PREAMP FACTOR (dB)**	**ANTENNA HEIGHT (cm)**	**TABLE ANGLE (Degree)**	**REMARK**
2390	50.99	57.56	74	-23.01	31.9	7.74	46.21	100	85	Peak
2390	44.29	50.86	54	-9.71	31.9	7.74	46.21	100	85	Average
2480	95.87	102.13	/	/	32.06	7.87	46.19	100	85	Peak
2480	95.02	101.28	/	/	32.06	7.87	46.19	100	85	Average
2483.5	51.44	57.68	74	-22.56	32.07	7.88	46.19	100	85	Peak
2483.5	45.44	51.68	54	-8.56	32.07	7.88	46.19	100	85	Average
5150	53.93	54.86	74	-20.07	34.42	11.17	46.52	100	160	Peak
5150	47.76	48.69	54	-6.24	34.42	11.17	46.52	100	160	Average
5210	84.29	85.12	/	/	34.47	11.24	46.54	100	160	Peak
5210	77.8	78.63	/	/	34.47	11.24	46.54	100	160	Average
5350	52.51	53.12	74	-21.49	34.58	11.39	46.58	100	160	Peak
5350	45.62	46.23	54	-8.38	34.58	11.39	46.58	100	160	Average

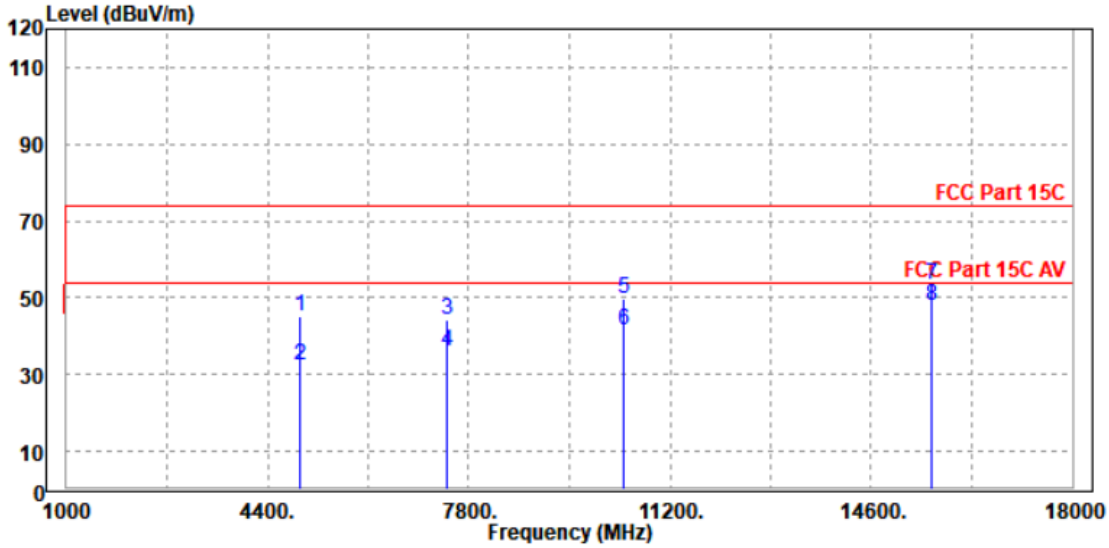
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2480MHz/ 5210MHz: Fundamental frequency.

BT2.0(π/4 DQPSK-CH 78)+5G WIFI(AC80-CH 42)-Harmonic：

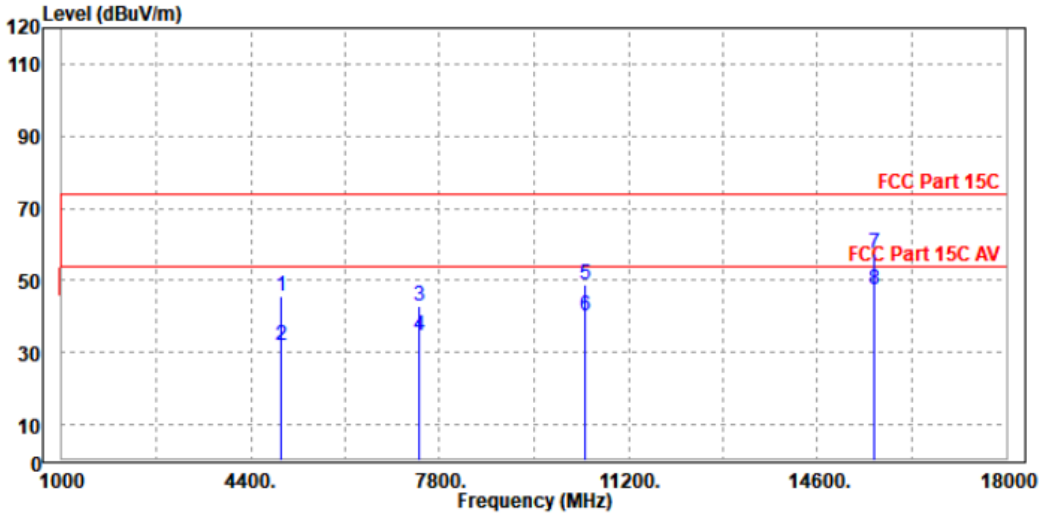
NOTE ： The 18G~40GHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M



	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m		
1	4960.000	45.20	46.52	74.00	-28.80	-1.32	Peak	Horizontal
2	4960.000	32.19	33.51	54.00	-21.81	-1.32	Average	Horizontal
3	7440.000	44.17	41.22	74.00	-29.83	2.95	Peak	Horizontal
4	7440.000	36.20	33.25	54.00	-17.80	2.95	Average	Horizontal
5	10419.000	49.92	41.56	74.00	-24.08	8.36	Peak	Horizontal
6	10419.000	41.61	33.25	54.00	-12.39	8.36	Average	Horizontal
7	PK15630.000	53.40	37.13	74.00	-20.60	16.27	Peak	Horizontal
8	PP15630.000	47.93	31.66	54.00	-6.07	16.27	Average	Horizontal

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M



	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m		
1	4960.000	45.80	47.12	74.00	-28.20	-1.32	Peak	Vertical
2	4960.000	31.96	33.28	54.00	-22.04	-1.32	Average	Vertical
3	7440.000	43.06	40.11	74.00	-30.94	2.95	Peak	Vertical
4	7440.000	34.49	31.54	54.00	-19.51	2.95	Average	Vertical
5	10420.000	48.63	40.27	74.00	-25.37	8.36	Peak	Vertical
6	10420.000	39.95	31.59	54.00	-14.05	8.36	Average	Vertical
7	PK15630.000	57.50	41.23	74.00	-16.50	16.27	Peak	Vertical
8	PP15630.000	47.51	31.24	54.00	-6.49	16.27	Average	Vertical

--END--