

FCC Test Report

Product Name	Mobile Data Terminal
Model No.	MT7030
FCC ID.	2ABTU-MT7030

Applicant	RuggON Corporation
Address	4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan

Date of Receipt	Mar. 31, 2020
Issued Date	Jul. 02, 2020
Report No.	2030836R-RFUSP29V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

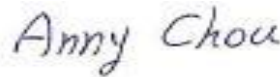
Issued Date: Jul. 02, 2020

Report No.: 2030836R-RFUSP29V00



Product Name	Mobile Data Terminal
Applicant	RuggON Corporation
Address	4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan
Manufacturer	RuggON Corporation
Model No.	MT7030
FCC ID.	2ABTU-MT7030
EUT Rated Voltage	DC 9~36V
EUT Test Voltage	DC 24V
Trade Name	RuggON
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Anny Chou)

Tested By :



(Assistant Engineer / Trista Huang)

Approved By :



(Director / Vincent Lin)

Revision History

Report No.	Version	Description	Issued Date
2030836R-RFUSP29V00	V1.0	Initial issue of report.	2020-07-02

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Mobile Data Terminal
Trade Name	RuggON
Model No.	MT7030
FCC ID.	2ABTU-MT7030
Frequency Range	WLAN : 802.11b/g/n-20: 2412-2472 MHz, 802.11n-40: 2422-2462 MHz 802.11a/ n/ac-20: 5180-5320 MHz, 5500-5720 MHz, 5745-5825MHz 802.11n/ac-40: 5190-5310 MHz, 5510-5670 MHz, 5755-5795MHz 802.11ac-80 MHz: 5210-5290 MHz, 5530-5690 MHz,5775MHz Bluetooth : 2402-2480 MHz
Channel Number	WLAN : 802.11b/g/n-20: 13CH, 802.11n-40: 9CH 802.11a /n/ac-20: 25CH 802.11ac-80 MHz: 5CH Bluetooth : V3.0+HS, V2.1+EDR: 79CH, V4.0: 40CH
Data Rate	WLAN : 802.11b: 1-11Mbps, 802.11a/g: 6-54Mbps, 802.11n: up to 300Mbps 802.11ac-80 MHz: up to 866.7 Mbps Bluetooth: 1-3Mbps
Channel Separation	WLAN : 802.11b/g/n: 5 MHz, 802.11a/n-20 MHz: 20 MHz, 802.11n-40 MHz: 40 MHz 802.11ac-80 MHz: 80 MHz Bluetooth : V3.0: 1 MHz; V5.0: 2 MHz
Type of Modulation	WLAN : 802.11b:DSSS, DBPSK, DQPSK, CCK 802.11a/g/n/ac: OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM Bluetooth : V3.0+HS, V2.1+EDR: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps); V5.0: GFSK(1Mbps)/(2Mbps)
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table "Antenna List"

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	AnJie	AJDQ1J-B0029 (Main) AJDQ1J-W0022 (Aux)	PIFA	2.5dBi for 2.4 GHz 3.7dBi for 5150-5250MHz 3.7dBi for 5250-5350MHz 3.6dBi for 5470-5725MHz 3.9dBi for 5725-5850MHz

Note: The antenna of EUT is conform to FCC 15.203

1.2. Test Summary

Part 15C Requirement

Requirement – Test Item	Result
Spurious emissions	Pass

Part 22H,Part 24E,Part 27,Part 90 Requirement

Requirement – Test Item	Result
Spurious emissions	Pass

Note:

1. The EUT is an Mobile Data Terminal ,contains functions on 2.4G and 5G band WIFI and WWAN with Bluetooth (V5.0 and V3.0+HS, V2.1+EDR) combo card module transceiver.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. This device contains the certified FCC ID: 2ABTU-MS01PRO, This is a WLAN/BT/WWAN Combo Card.
5. The consider Co-Location based on KDB 996369 D02 Question 1 and KDB 996369 D04 for Radiated Spurious Emission & SAR testing.
6. Since the antenna gain and output power are both smaller than the original certification, the final product complies with the KDB 178919 Section II.B) ERP/EIRP rules.
7. The final test results meets all the applicable FCC rules, including FCC Part 15C and Part 22H, Part 24E, Part 27 Part 90.

<p>Test Mode (Simultaneous Transmit)</p>	<p>(1) Select adjacent operating bands. Mode 1: LTE B41 (20MBW 2506MHz)+ WiFi 802.11n20 (2462MHz)+GPS+NFC Mode 2: LTE B7 (20MBW 2510MHz)+Wi-Fi 802.11n40 (2452MHz) +GPS+NFC Mode 3: WiFi 802.11n20 (2412MHz)+BT EDR 3Mbps (2402MHz)+GPS+NFC (2) Select higher power channel from each pair of simultaneous transmission Mode 4: WCDMA Band V (846.6MHz)+2.4GHz WLAN(802.11g 2412MHz)+GPS+NFC Mode 5: LTE Band 14 (10MBW 793MHz)+5GHz WLAN(802.11a 5720MHz)+GPS+NFC Mode 6: LTE Band 41 (5MBW 2547.8MHz)+2.4GHz BT(1Mbps 2480MHz)+GPS+NFC</p>
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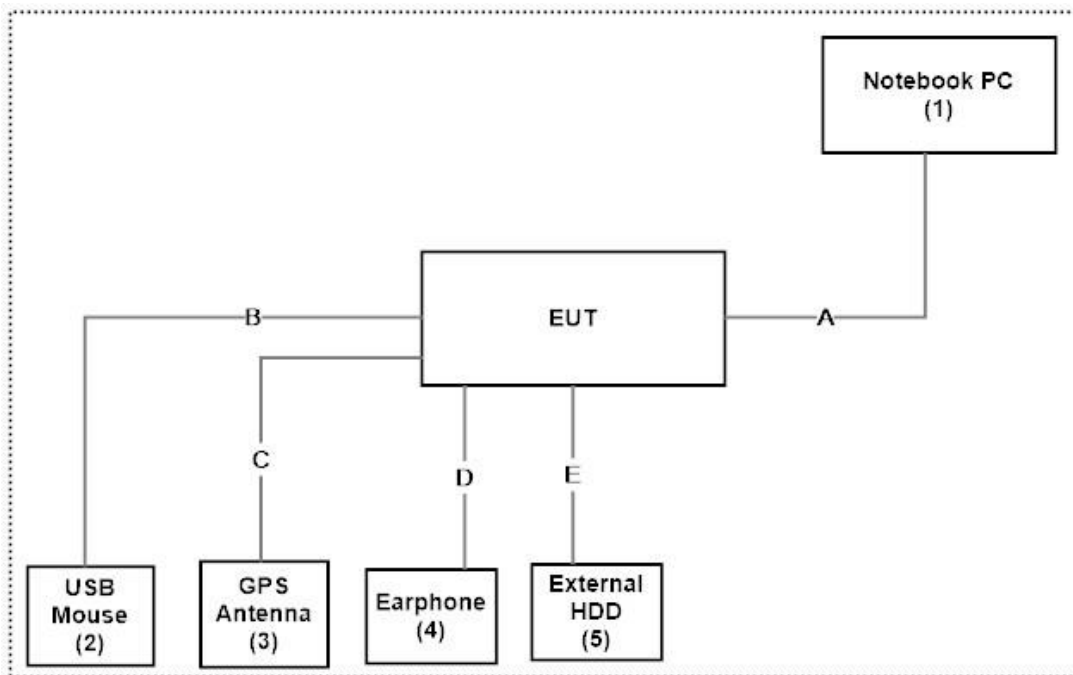
1.4. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	Notebook PC	DELL	Latitude 5580	2HRD7H2	Non-shielded, 1.8m
(2)	USB Mouse	Dell	MS111-L	CN-09RRC7-44751-06T-0G73	N/A
(3)	GPS Antenna	N/A	SG-76G	N/A	N/A
(4)	Earphone	RONEVER	MOE241	N/A	N/A
(5)	External HDD	Transcend	TS1TSJ25H3B	F21786-0019	N/A

Signal Cable Type	Signal cable Description
A	Signal Cable Shielded, 1.0m
B	Signal Cable Non-shielded, 5.0m
C	Mouse Cable Non-shielded, 1.8m
D	Earphone Cable Shielded, 1.2m
E	USB Cable Shielded, 0.5m

1.5. Configuration of Tested System



1.6. EUT Exercise Software

- (1) Setup the EUT as shown on 1.4
- (2) Execute software “QRCT Ver.3.0.2680.0” on the EUT.
- (3) The Communication Analyzer (MT8820C) uses in controlling EUT to transmit continuously.
- (4) Configure the test mode, the test channel, and the data rate.
- (5) Start the continuous transmission.
- (6) Verify that the EUT works properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Radiated Emission	Temperature (°C)	10~40 °C	23.2 °C
	Humidity (%RH)	10~90 %	61.5 %
Conductive	Temperature (°C)	10~40 °C	23.6 °C
	Humidity (%RH)	10~90 %	72.3 %

USA : FCC Registration Number: TW3023

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.

Phone number: 886-2-8601-3788

Fax number: 886-2-8601-3789

Email address: info.tw@dekra.com

Website: <http://www.dekra.com.tw>

1.8. List of Test Item and Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2020/04/06	2021/04/05
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2019/09/25	2020/09/24
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
	EMI Test Receiver	R&S	ESCS 30	100369	2019/11/27	2020/11/26
	LISN	R&S	ENV216	101105	2020/04/27	2021/04/26
	LISN	R&S	ESH3-Z5	836679/014	2020/04/26	2021/04/25
	Coaxial Cable	DEKRA	RG 400	LC018-RG	2020/06/20	2021/06/19

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test SystemV9.0.5.

For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Test Receiver	R&S	ESR7	101602	2019/12/16	2020/12/15
X	Signal Analyzer	R&S	FSV40	101869	2019/07/04	2020/07/03
X	Loop Antenna	Teseq	HLA6121	37133	2020/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2020/01/20	2021/01/19
X	Coaxial Cable	DEKRA	L1907-001C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC001330	980254	2019/08/22	2020/08/21
X	Horn Antenna	ETS-LINDGREN	3117	00228113	2020/05/28	2021/05/27
X	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC05820SE	980362	2019/06/26	2020/06/25
X	Amplifier	EMCI	EMC051845SE	980632	2019/08/08	2020/08/07
X	Horn Antenna	Com-Power	AH-1840	101101	2019/10/31	2020/10/30
X	Amplifier + Cable	EMCI	EMC184045SE	980369	2020/04/23	2021/04/22
	Bilog Antenna	Schaffner Chase	CBL6112B	2925	2020/02/20	2021/02/19
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2020/03/17	2021/03/16
X	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
X	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

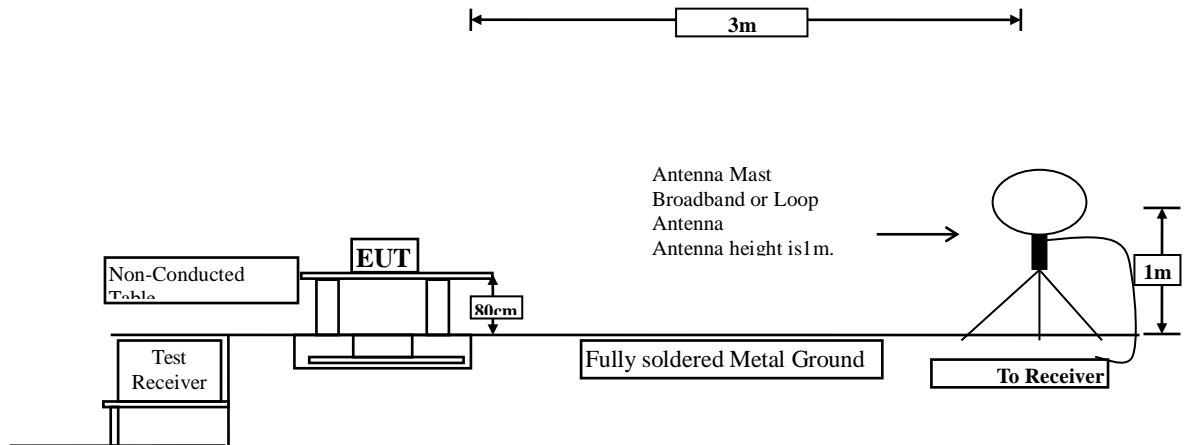
Note:

1. Loop Antenna is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Test SystemV1.1.

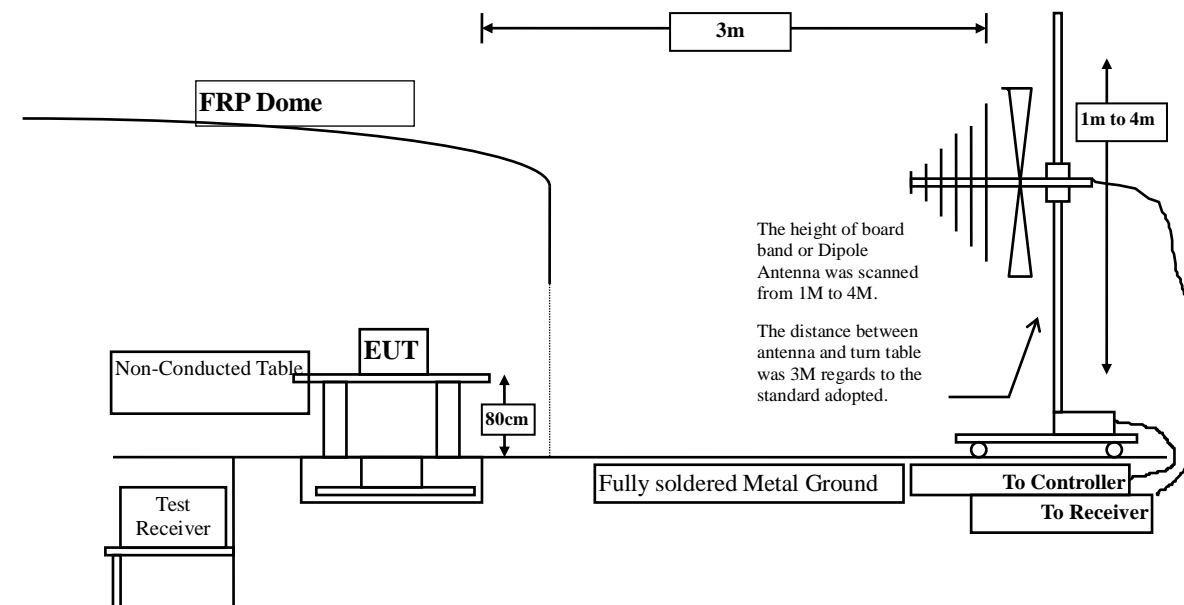
2. Radiated Emission

2.1. Test Setup

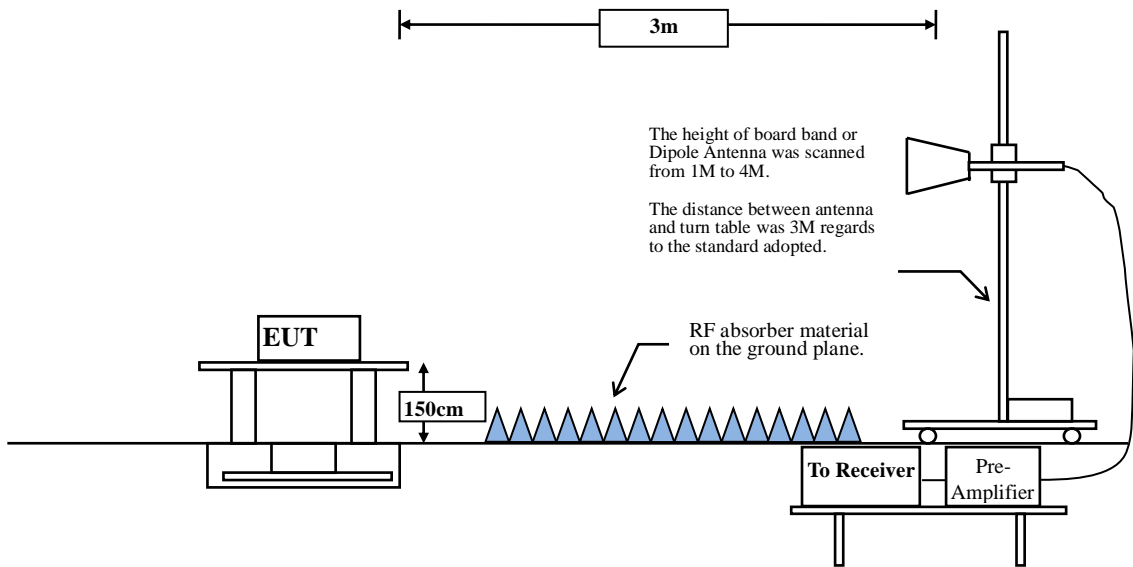
Under 30MHz



Below 1GHz



Above 1GHz



2.2. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

- Remarks:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

The final test results meets all the applicable FCC rules, including FCC Part 15C and Part 22H, Part 24E, Part 27 Part 90.

2.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

2.4. Uncertainty

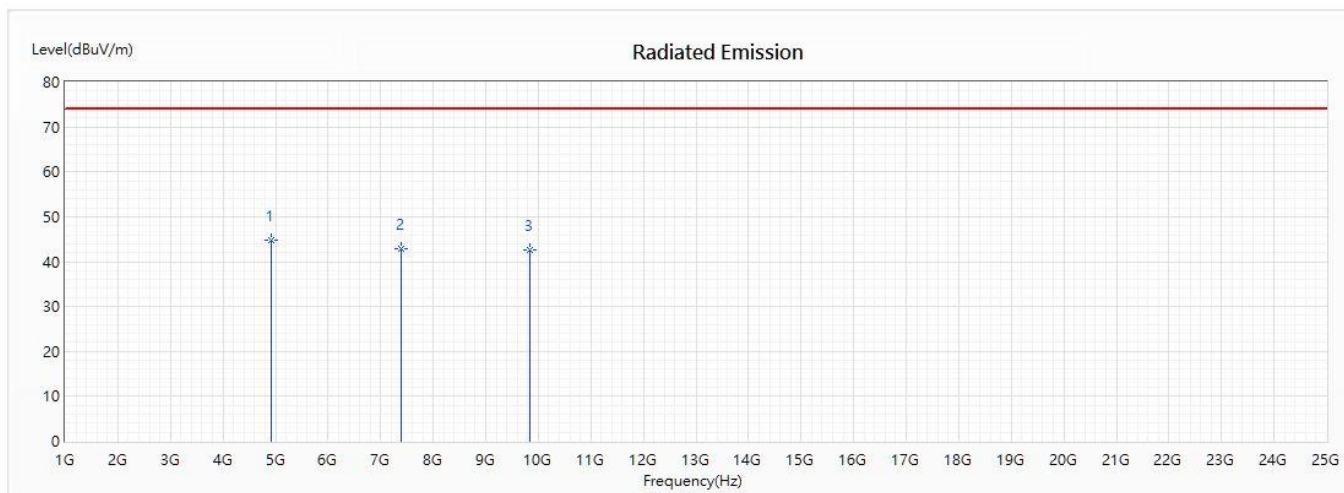
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

2.5. Test Result of Radiated Emission

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 1: LTE B41 (20MBW 2506MHz)+ WiFi 802.11n20 (2462MHz)+GPS+NFC

Horizontal



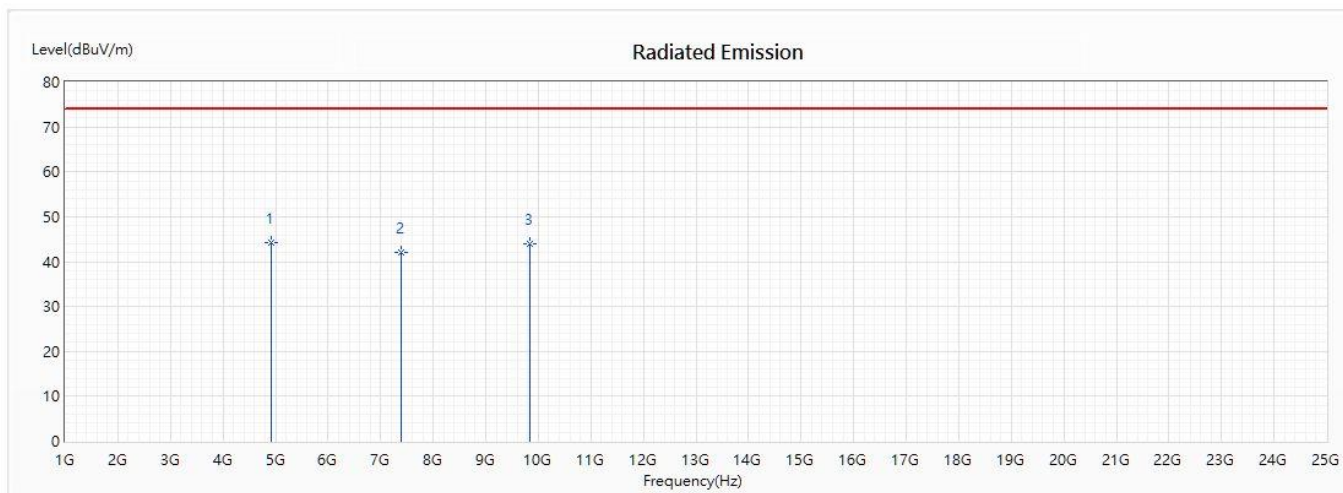
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4924	44.76	74.00	-29.24	56.00	-11.24	PK
2	7386	42.81	74.00	-31.19	56.91	-14.10	PK
3	9848	42.62	74.00	-31.38	56.06	-13.44	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 1: LTE B41 (20MBW 2506MHz)+ WiFi 802.11n20 (2462MHz)+GPS+NFC

Vertical



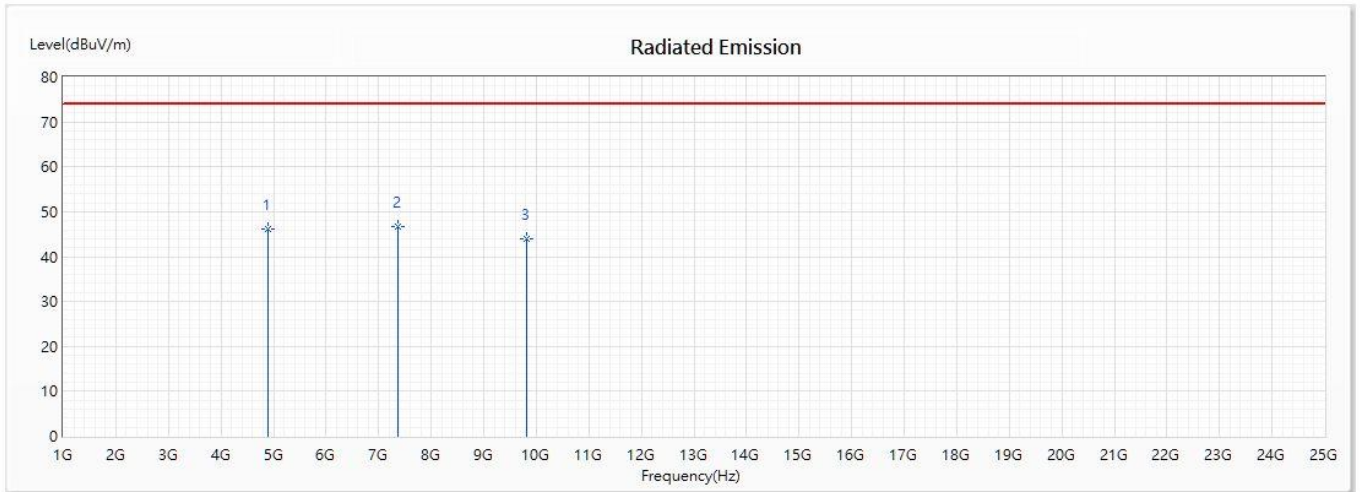
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4924	44.31	74.00	-29.69	55.55	-11.24	PK
2	7386	41.95	74.00	-32.05	56.05	-14.10	PK
3	9848	43.97	74.00	-30.03	57.41	-13.44	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 2: LTE B7 (20MBW 2510MHz)+Wi-Fi 802.11n40 (2452MHz) +GPS+NFC

Horizontal



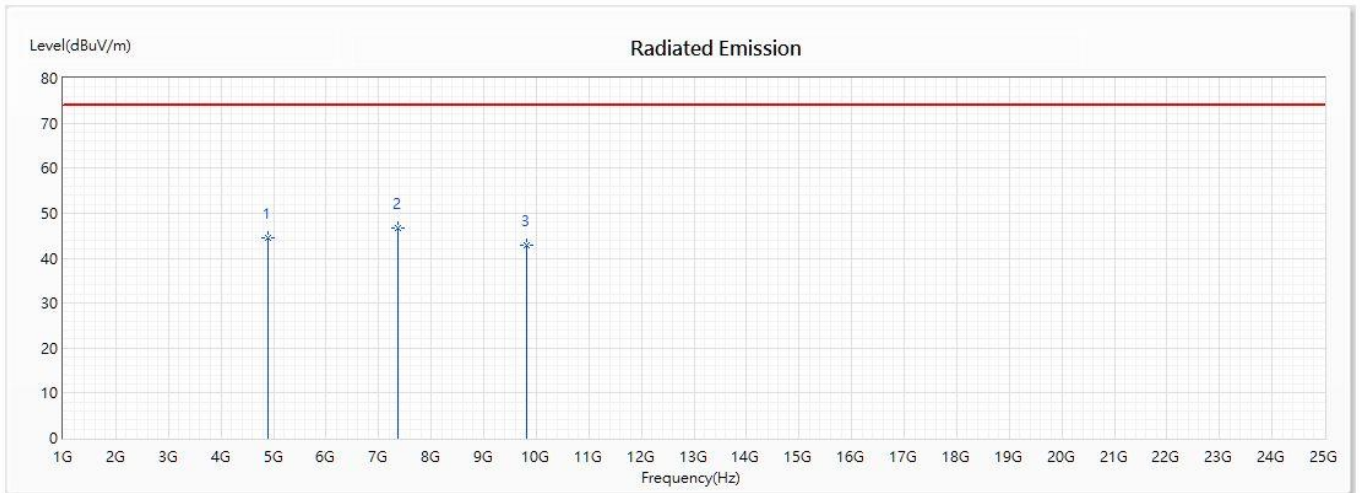
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4904	46.21	74.00	-27.79	57.65	-11.44	PK
* 2	7356	46.62	74.00	-27.38	60.46	-13.84	PK
3	9808	43.93	74.00	-30.07	56.93	-13.00	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 2: LTE B7 (20MBW 2510MHz)+Wi-Fi 802.11n40 (2452MHz) +GPS+NFC

Vertical



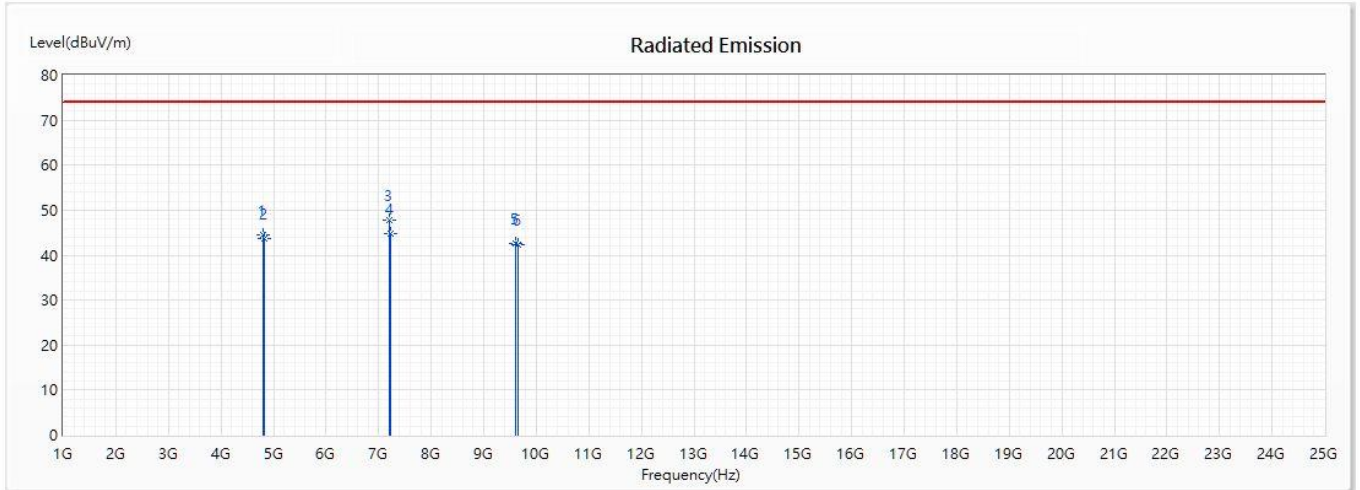
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4904	44.37	74.00	-29.63	55.81	-11.44	PK
* 2	7356	46.75	74.00	-27.25	60.59	-13.84	PK
3	9808	42.92	74.00	-31.08	55.92	-13.00	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 3: WiFi 802.11n20 (2412MHz)+BT EDR 3Mbps (2402MHz)+GPS+NFC

Horizontal



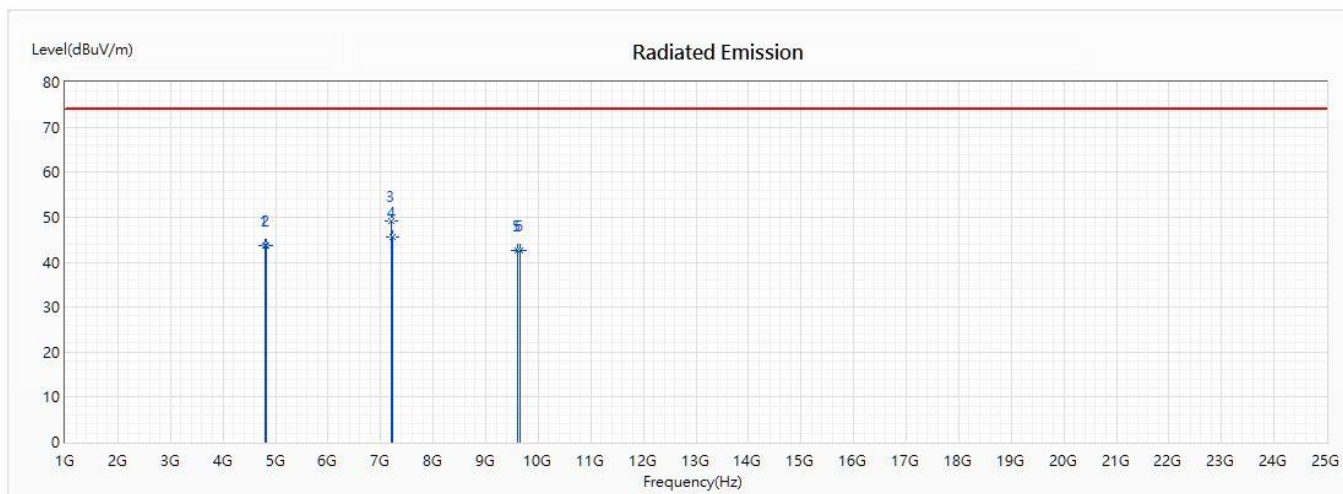
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4804	44.47	74.00	-29.53	56.62	-12.15	PK
2	4824	43.57	74.00	-30.43	55.56	-11.99	PK
* 3	7206	47.65	74.00	-26.35	60.79	-13.14	PK
4	7236	44.75	74.00	-29.25	57.71	-12.96	PK
5	9608	42.72	74.00	-31.28	56.14	-13.42	PK
6	9648	42.35	74.00	-31.65	55.45	-13.10	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 3: WiFi 802.11n20 (2412MHz)+BT EDR 3Mbps (2402MHz)+GPS+NFC

Vertical



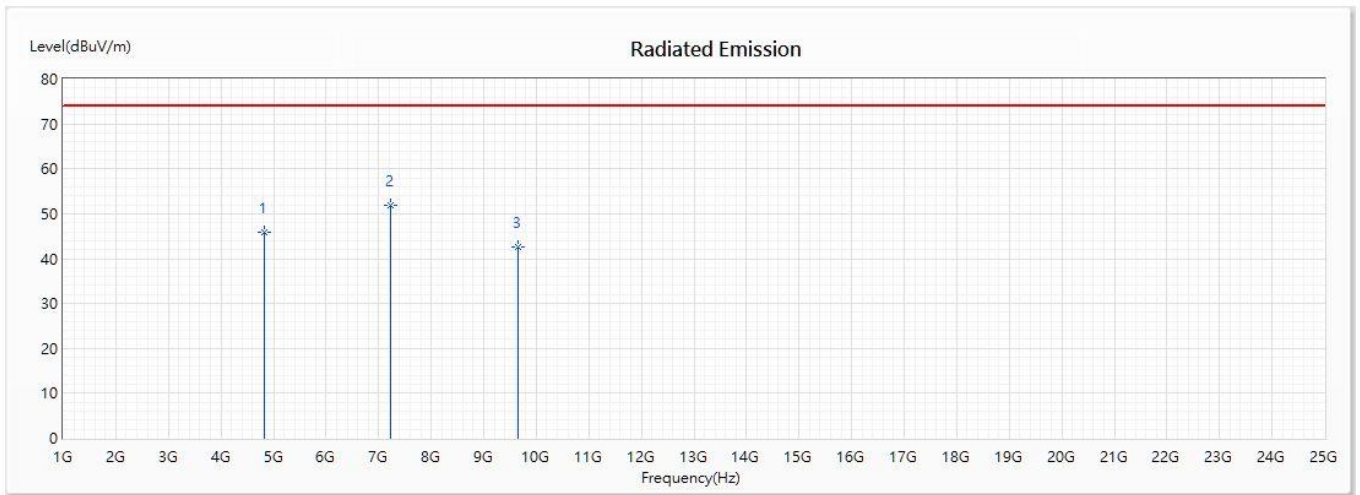
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4804	43.72	74.00	-30.28	55.87	-12.15	PK
2	4824	43.67	74.00	-30.33	55.66	-11.99	PK
* 3	7206	49.08	74.00	-24.92	62.22	-13.14	PK
4	7236	45.58	74.00	-28.42	58.54	-12.96	PK
5	9608	42.55	74.00	-31.45	55.97	-13.42	PK
6	9648	42.66	74.00	-31.34	55.76	-13.10	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 4: WCDMA Band V (846.6MHz)+2.4GHz WLAN(802.11g 2412MHz)+GPS+NFC

Horizontal



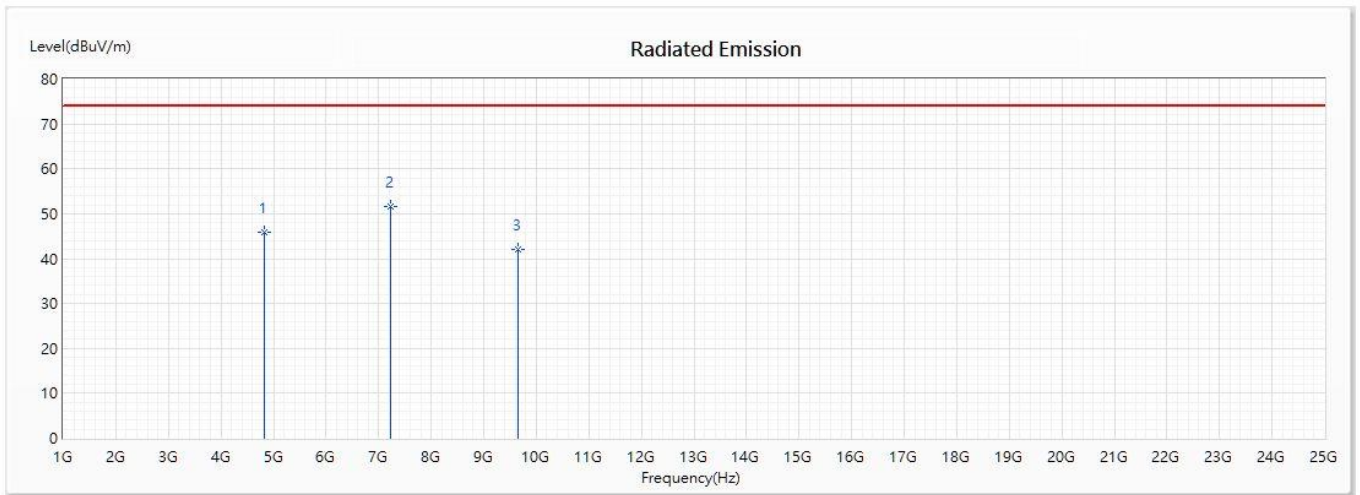
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	45.82	74.00	-28.18	57.81	-11.99	PK
* 2	7236	51.93	74.00	-22.07	64.89	-12.96	PK
3	9648	42.66	74.00	-31.34	55.76	-13.10	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 4: WCDMA Band V (846.6MHz)+2.4GHz WLAN(802.11g 2412MHz)+GPS+NFC

Vertical



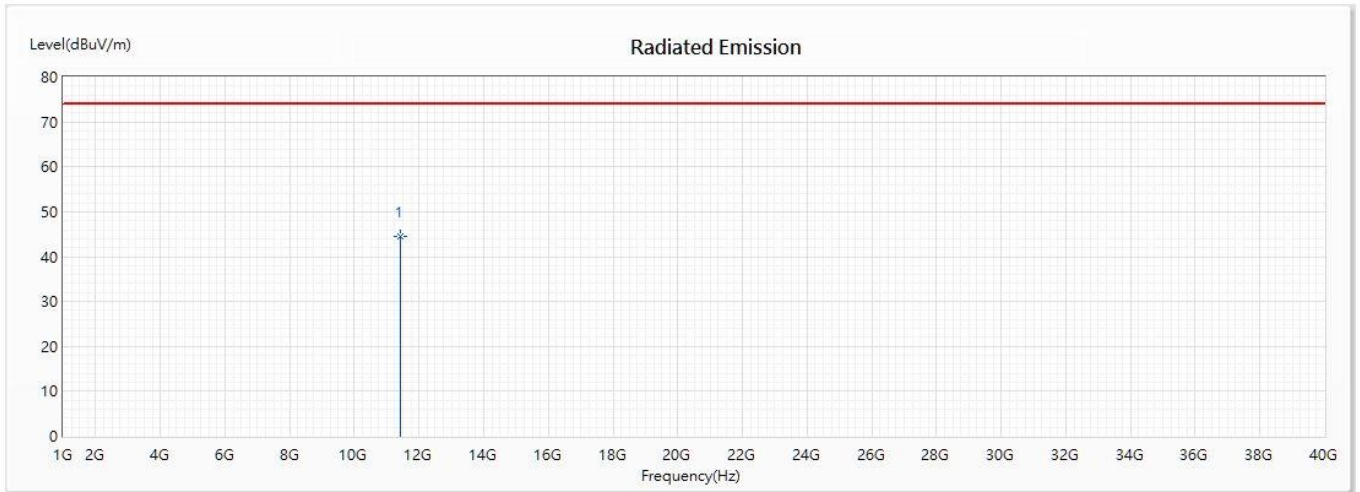
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	45.77	74.00	-28.23	57.76	-11.99	PK
* 2	7236	51.66	74.00	-22.34	64.62	-12.96	PK
3	9648	41.93	74.00	-32.07	55.03	-13.10	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 5: LTE Band 14 (10MBW 793MHz)+5GHz WLAN(802.11a 5720MHz)+GPS+NFC

Horizontal



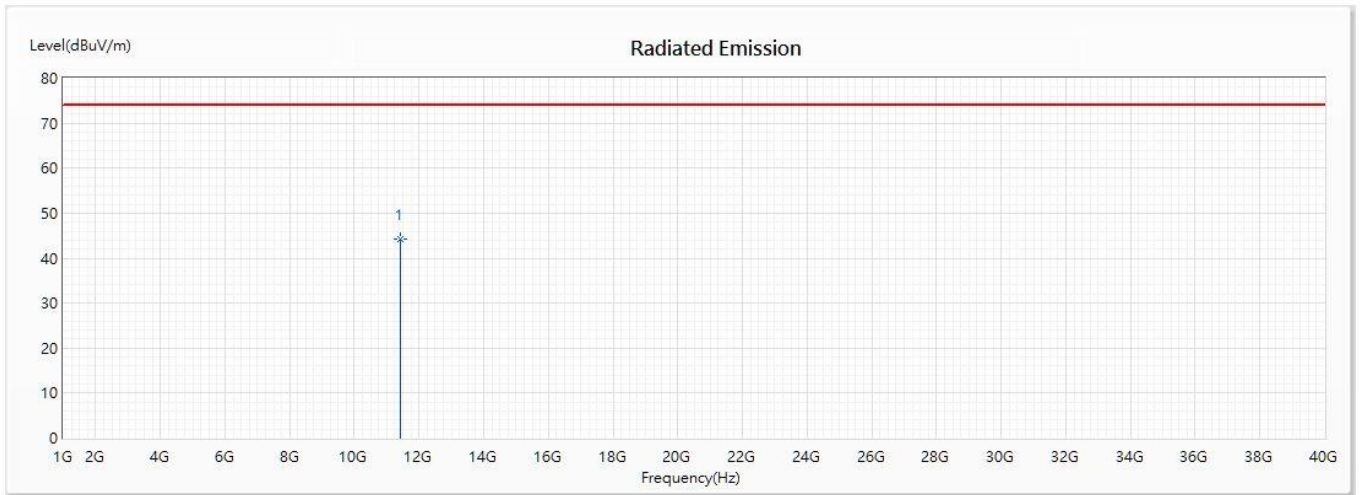
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	11440	44.45	74.00	-29.55	55.96	-11.51	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 5: LTE Band 14 (10MBW 793MHz)+5GHz WLAN(802.11a 5720MHz)+GPS+NFC

Vertical



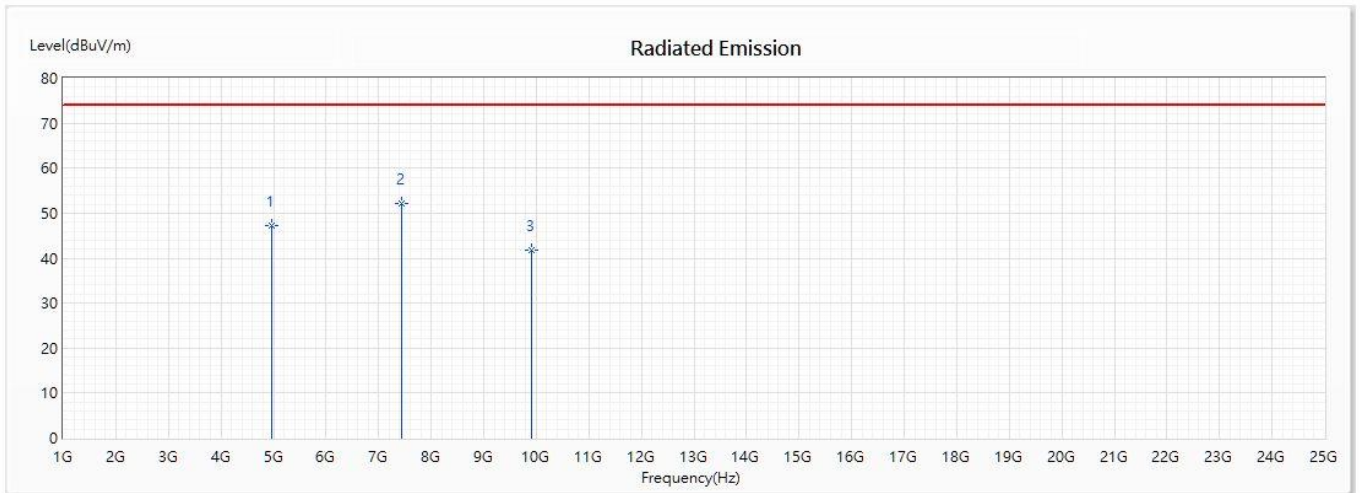
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	11440	44.13	74.00	-29.87	55.64	-11.51	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 6: LTE Band 41 (5MBW 2547.8MHz)+2.4GHz BT(1Mbps 2480MHz)+GPS+NFC

Horizontal



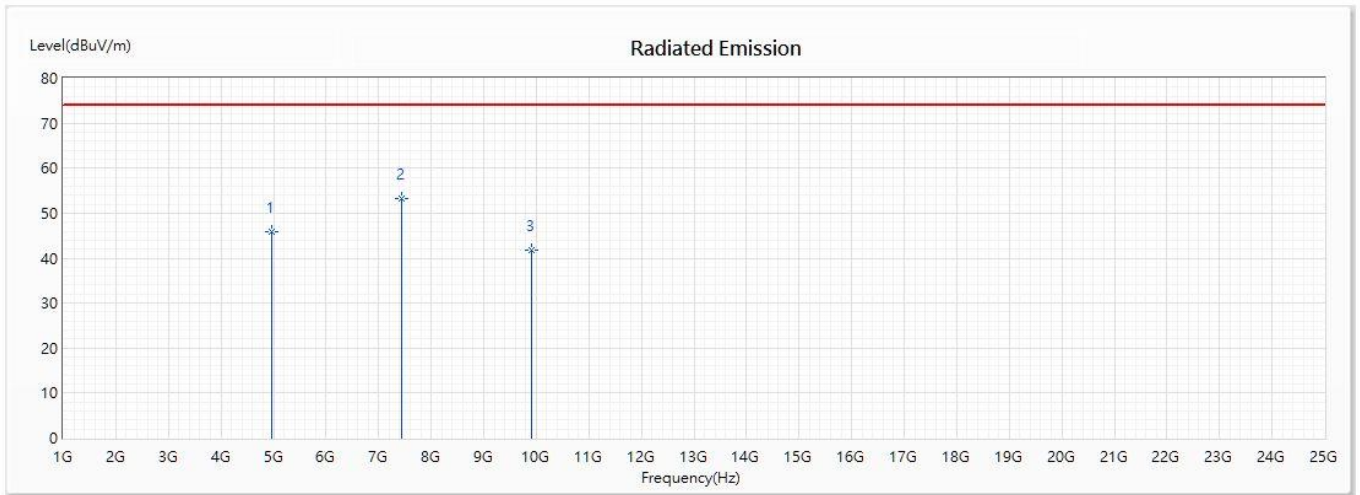
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4960	47.29	74.00	-26.71	58.18	-10.89	PK
* 2	7440	52.22	74.00	-21.78	66.84	-14.62	PK
3	9920	41.83	74.00	-32.17	56.06	-14.23	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 6: LTE Band 41 (5MBW 2547.8MHz)+2.4GHz BT(1Mbps 2480MHz)+GPS+NFC

Vertical



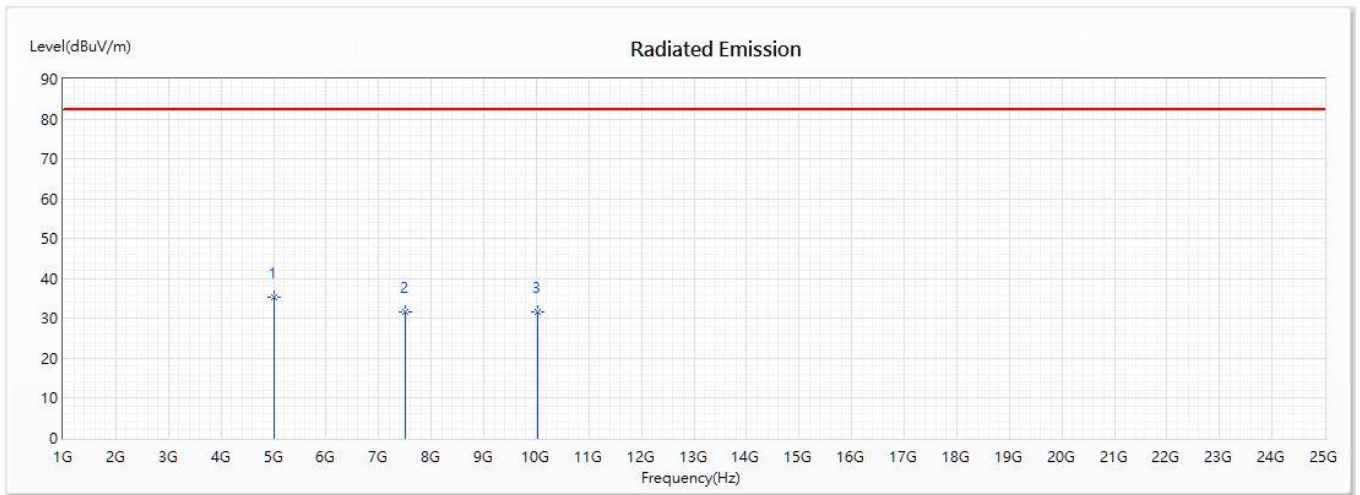
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4960	45.93	74.00	-28.07	56.82	-10.89	PK
* 2	7440	53.29	74.00	-20.71	67.91	-14.62	PK
3	9920	41.75	74.00	-32.25	55.98	-14.23	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 1: LTE B41 (20MBW 2506MHz)+ WiFi 802.11n20 (2462MHz)+GPS+NFC

Horizontal



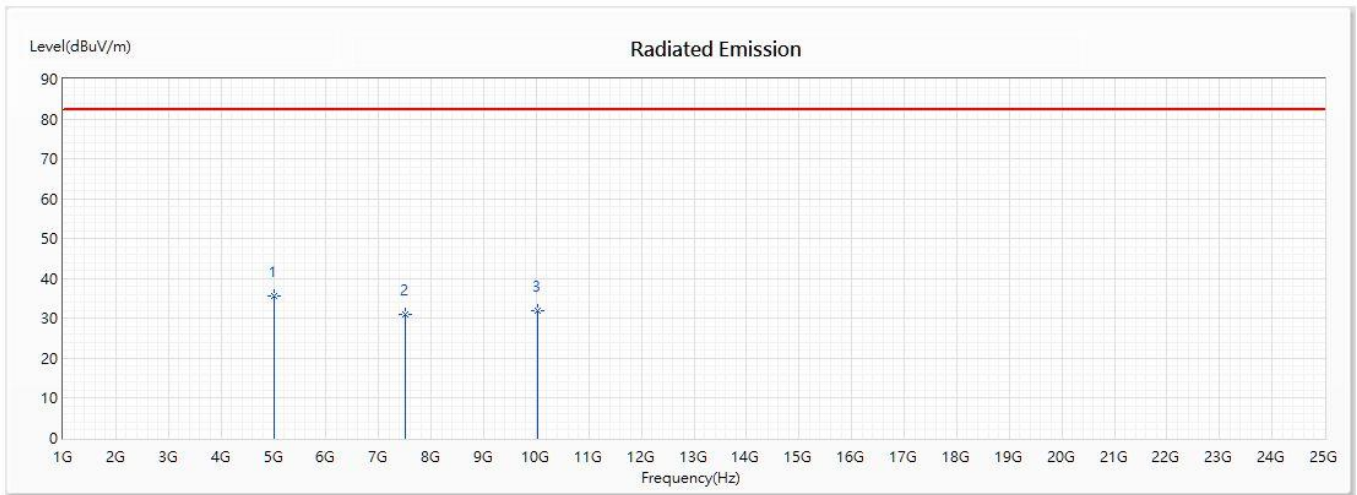
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	5012	35.39	82.23	-46.84	45.97	-10.58	AV
2	7518	31.75	82.23	-50.48	47.04	-15.29	AV
3	10024	31.56	82.23	-50.67	46.31	-14.75	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 1: LTE B41 (20MBW 2506MHz)+ WiFi 802.11n20 (2462MHz)+GPS+NFC

Vertical



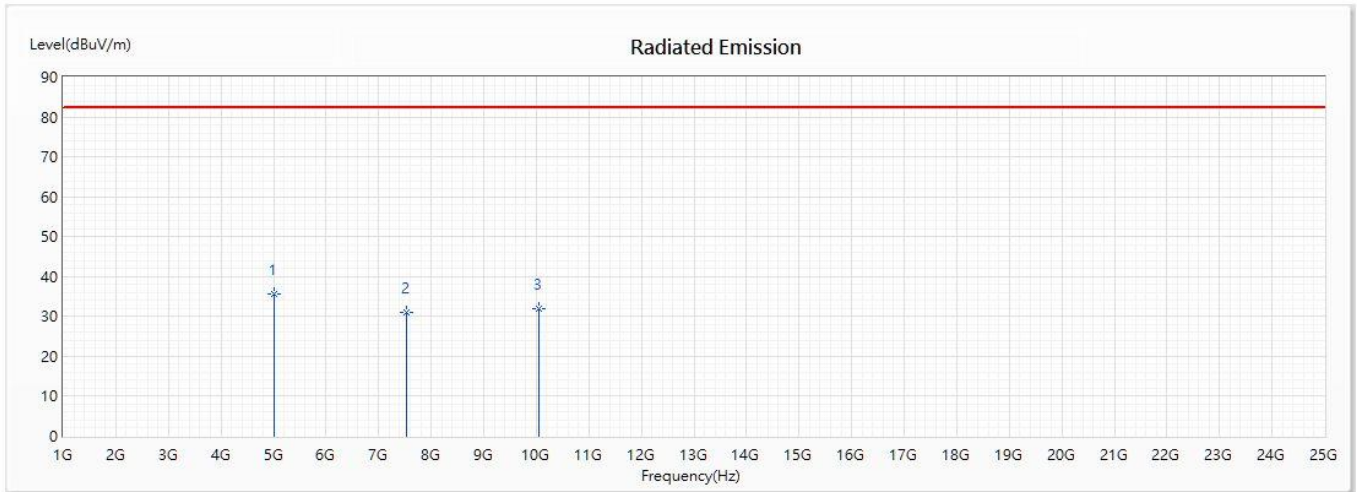
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	5012	35.75	82.23	-46.48	46.33	-10.58	AV
2	7518	30.92	82.23	-51.31	46.21	-15.29	AV
3	10024	32.05	82.23	-50.18	46.80	-14.75	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 2: LTE B7 (20MBW 2510MHz)+Wi-Fi 802.11n40 (2452MHz) +GPS+NFC

Horizontal



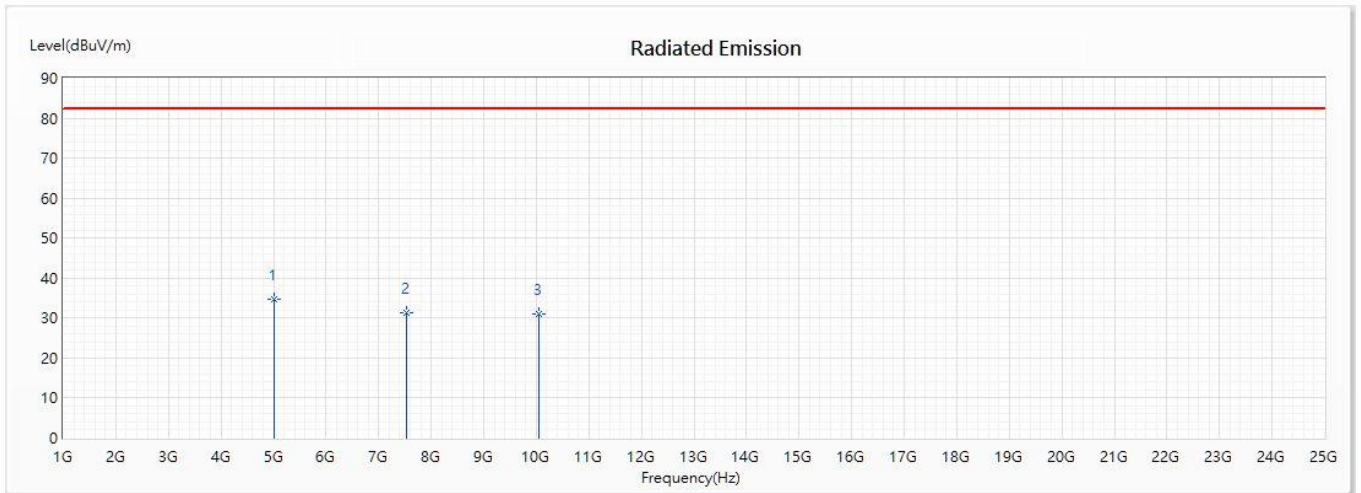
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	5020	35.57	82.23	-46.66	46.22	-10.65	AV
2	7530	31.02	82.23	-51.21	46.35	-15.33	AV
3	10040	31.85	82.23	-50.38	46.29	-14.44	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 2: LTE B7 (20MBW 2510MHz)+Wi-Fi 802.11n40 (2452MHz) +GPS+NFC

Vertical



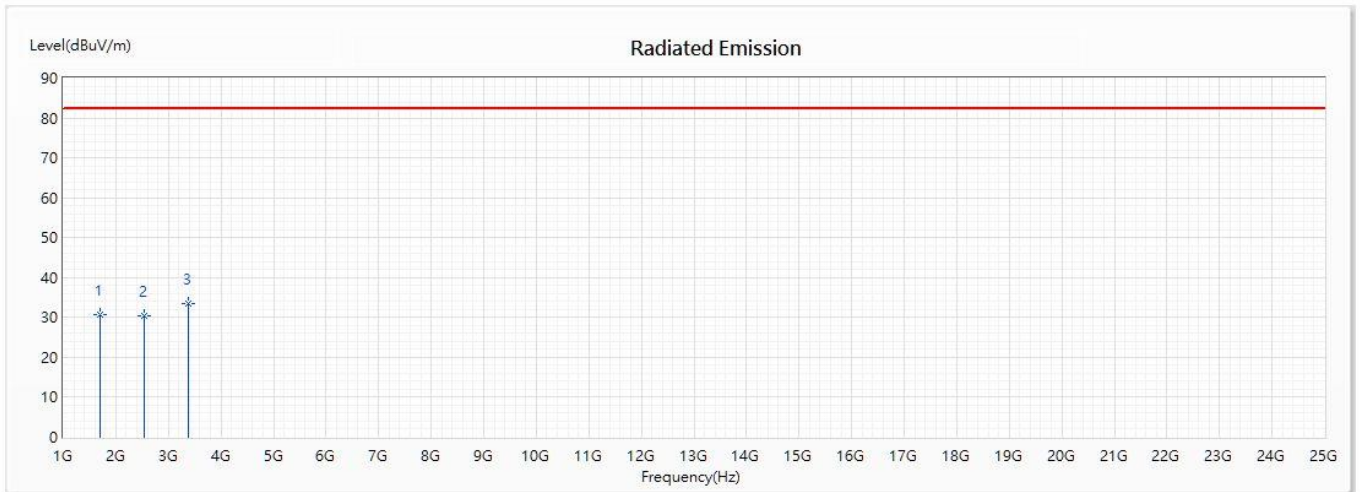
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	5020	34.75	82.23	-47.48	45.40	-10.65	AV
2	7530	31.41	82.23	-50.82	46.74	-15.33	AV
3	10040	31.13	82.23	-51.10	45.57	-14.44	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 4: WCDMA Band V (846.6MHz)+2.4GHz WLAN(802.11g 2412MHz)+GPS+NFC

Horizontal



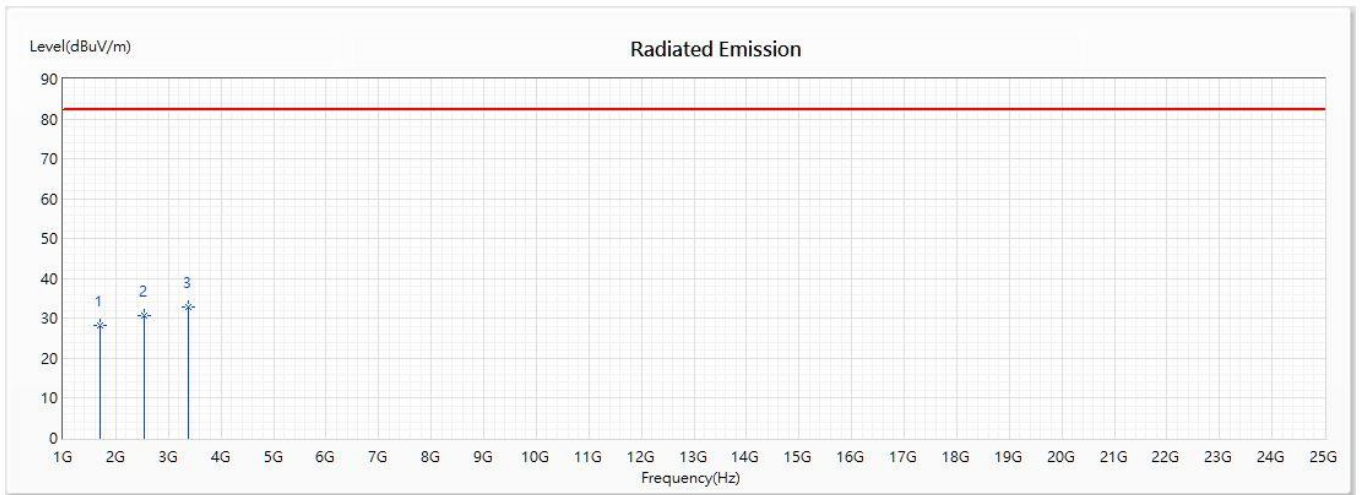
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	1693.2	30.77	82.23	-51.46	49.93	-19.16	AV
2	2539.8	30.32	82.23	-51.91	44.65	-14.33	AV
* 3	3386.4	33.38	82.23	-48.85	46.28	-12.90	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 4: WCDMA Band V (846.6MHz)+2.4GHz WLAN(802.11g 2412MHz)+GPS+NFC

Vertical



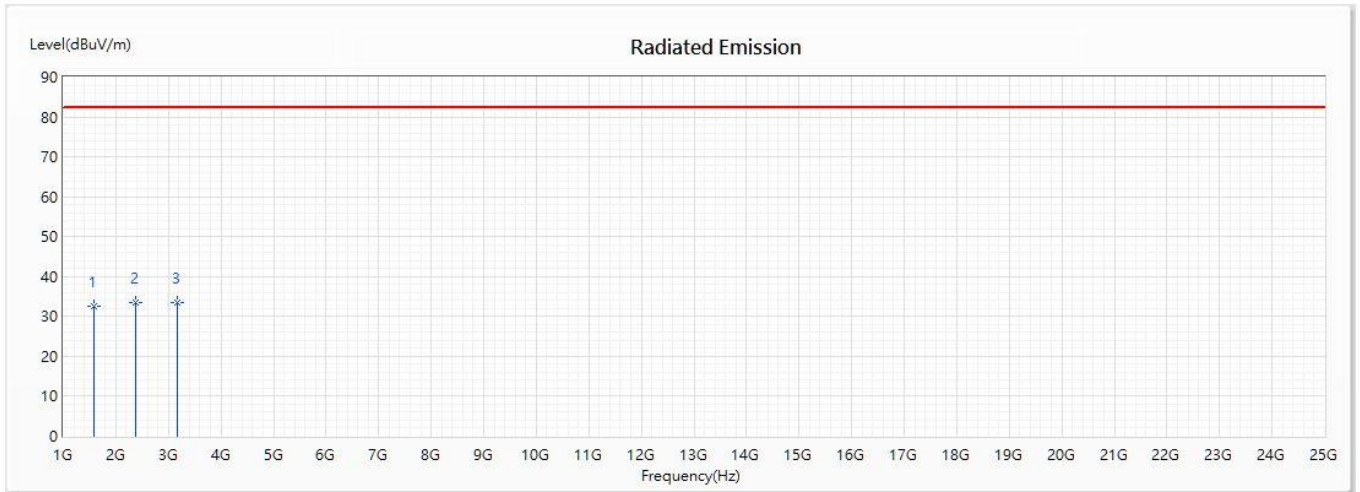
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	1693.2	28.27	82.23	-53.96	47.43	-19.16	AV
2	2539.8	30.58	82.23	-51.65	44.91	-14.33	AV
* 3	3386.4	32.83	82.23	-49.40	45.73	-12.90	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 5: LTE Band 14 (10MBW 793MHz)+5GHz WLAN(802.11a 5720MHz)+GPS+NFC

Horizontal



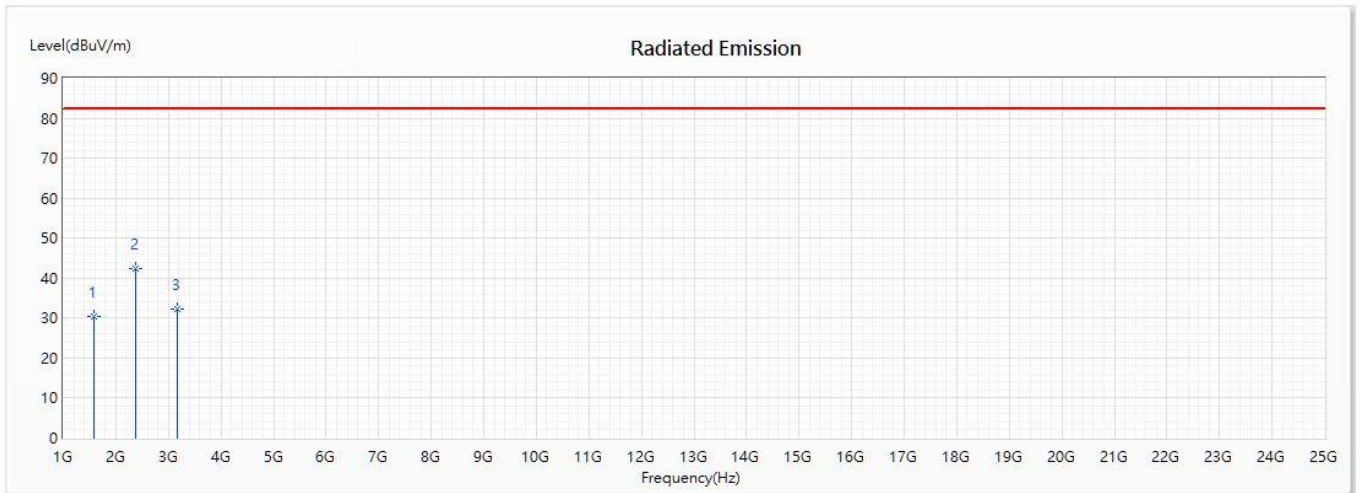
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	1586	32.57	82.23	-49.66	51.72	-19.15	AV
* 2	2379	33.45	82.23	-48.78	48.31	-14.86	AV
3	3172	33.39	82.23	-48.84	46.65	-13.26	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 5: LTE Band 14 (10MBW 793MHz)+5GHz WLAN(802.11a 5720MHz)+GPS+NFC

Vertical



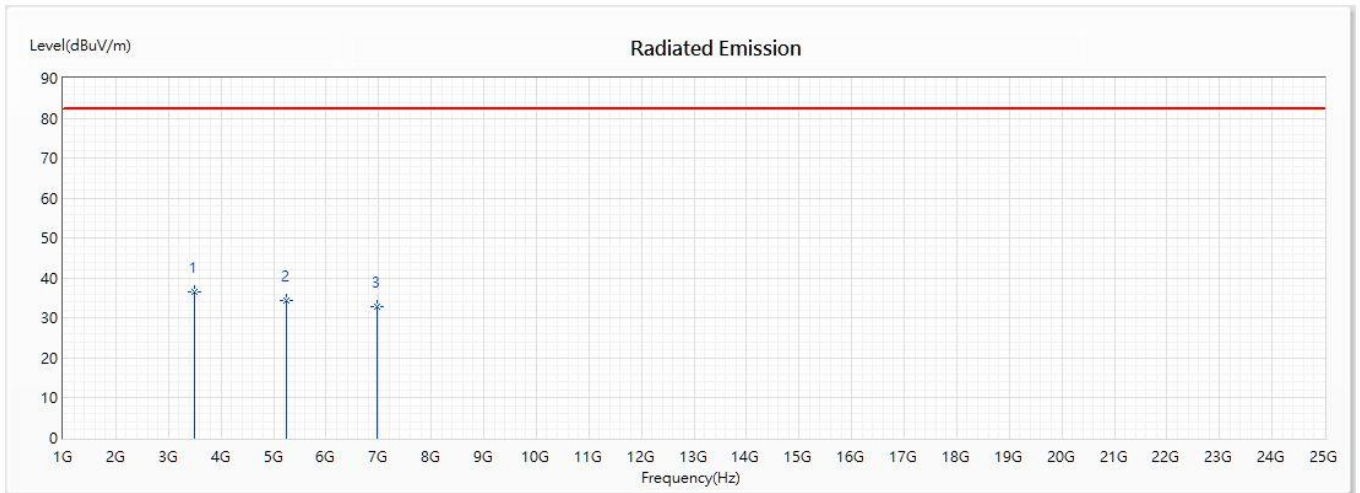
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	1586	30.56	82.23	-51.67	49.71	-19.15	AV
* 2	2379	42.25	82.23	-39.98	57.11	-14.86	AV
3	3172	32.39	82.23	-49.84	45.65	-13.26	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 6: LTE Band 41 (5MBW 2547.8MHz)+2.4GHz BT(1Mbps 2480MHz)+GPS+NFC

Horizontal



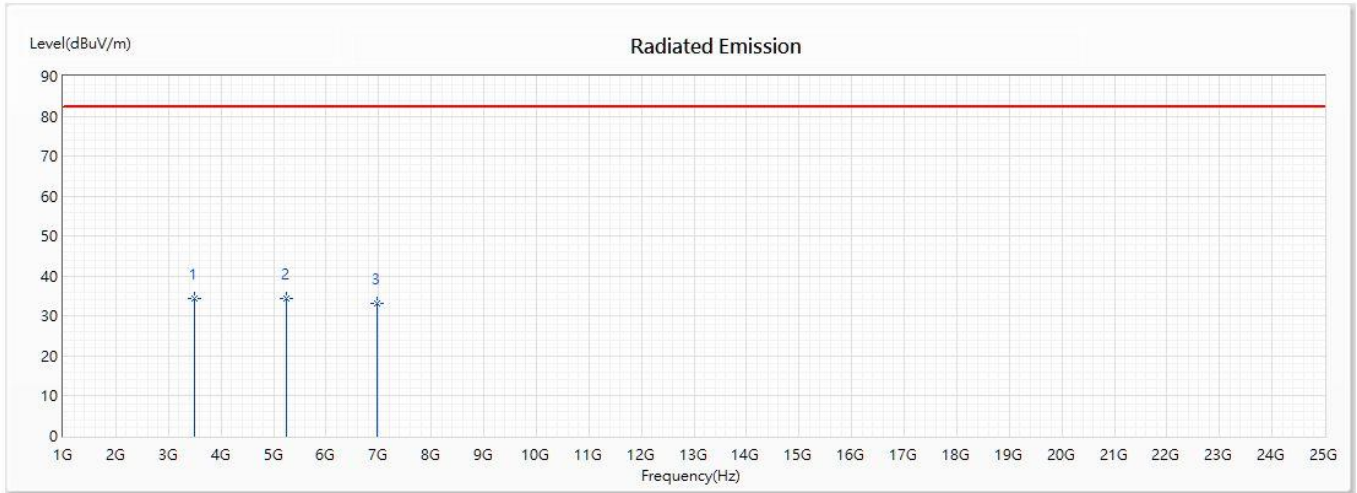
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	3490	36.63	82.23	-45.60	48.72	-12.09	AV
2	5235	34.29	82.23	-47.94	46.25	-11.96	AV
3	6980	32.95	82.23	-49.28	46.61	-13.66	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Data Terminal
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2020/06/03
 Test Mode : Mode 6: LTE Band 41 (5MBW 2547.8MHz)+2.4GHz BT(1Mbps 2480MHz)+GPS+NFC

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	3490	34.26	82.23	-47.97	46.35	-12.09	AV
* 2	5235	34.45	82.23	-47.78	46.41	-11.96	AV
3	6980	33.23	82.23	-49.00	46.89	-13.66	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

3. EMI Reduction Method During Compliance Testing

No modification was made during testing.