FCC Test Report

Product Name	Rugged Tablet
Model No.	PA501BXXXXXXXXX (X for marketing used only: can be alphanumeric or blank)
FCC ID.	2ABTU-PA501B

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

Date of Receipt	May. 30, 2019
Issued Date	Sep. 11, 2019
Report No.	1950454R-RFUSP01V00-A
Report Version	V1.0

Testing Laboratory
3023

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.

Test Report

Issued Date: Sep. 11, 2019
Report No.: 1950454R-RFUSP01V00-A

Product Name	Rugged Tablet
Applicant	RuggON Corporation
Address	4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan
Manufacturer	Intel Mobile Communications
Model No.	PA501BXXXXXXXXX (X for marketing used only: can be alphanumeric or blank)
FCC ID.	2ABTU-PA501B
EUT Rated Voltage	AC 100-240V / 50-60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	RuggON
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v05r02
Test Result	Complied

Documented By : Anny Chou

(Senior Adm. Specialist / Anny Chou)

Tested By : Sam Hsu

(Engineer / Sam Hsu)

Approved By :

(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs
Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Rugged Tablet
Trade Name	RuggON
Model No.	PA501BXXXXXXXXX (X for marketing used only: can be alphanumeric or blank)
FCC ID.	2ABTU-PA501B
Frequency Range	2402 – 2480MHz
Channel Number	V5.0: 40CH
Type of Modulation	V5.0: GFSK(1Mbps)/(2Mbps)
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Power Adapter	MFR: FSP, M/N: FSP065-RBBN3 Input: AC 100-240Vac, 1.5A 50/60Hz Output: 19V⎓3.42A Cable Out: Non-shielded, 1.5m, with one ferrite core bonded.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	AnJie	AJDQ1J-B0024(Main) AJDQ1J-W0001(Aux)	PIFA	Main: 2.94dBi for 2.4 GHz Aux: 3.31dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

1.2. Test Summary

Part 15C Requirement

Requirement – Test Item	Result
Output Power	Pass
Spurious emissions	Pass
Band edge	Pass

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

Requirement – Test Item	Result
EIRP	Pass
Spurious emissions	Pass

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 01:	2404 MHz	Channel 02:	2406 MHz	Channel 03:	2408 MHz
Channel 04:	2410 MHz	Channel 05:	2412 MHz	Channel 06:	2414 MHz	Channel 07:	2416 MHz
Channel 08:	2418 MHz	Channel 09:	2420 MHz	Channel 10:	2422 MHz	Channel 11:	2424 MHz
Channel 12:	2426 MHz	Channel 13:	2428 MHz	Channel 14:	2430 MHz	Channel 15:	2432 MHz
Channel 16:	2434 MHz	Channel 17:	2436 MHz	Channel 18:	2438 MHz	Channel 19:	2440 MHz
Channel 20:	2442 MHz	Channel 21:	2444 MHz	Channel 22:	2446 MHz	Channel 23:	2448 MHz
Channel 24:	2450 MHz	Channel 25:	2452 MHz	Channel 26:	2454 MHz	Channel 27:	2456 MHz
Channel 28:	2458 MHz	Channel 29:	2460 MHz	Channel 30:	2462 MHz	Channel 31:	2464 MHz
Channel 32:	2466 MHz	Channel 33:	2468 MHz	Channel 34:	2470 MHz	Channel 35:	2472 MHz
Channel 36:	2474 MHz	Channel 37:	2476 MHz	Channel 38:	2478 MHz	Channel 39:	2480 MHz

Note:

1. The EUT is an Rugged Tablet ,contains functions on NFC, 2.4G and 5G band WIFI and WWAN with Bluetooth (V5.0 and V3.0+HS, V2.1+EDR) combo card module transceiver,this report for Bluetooth V5.0.
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/WWAN/BT Combo Card, the original certified module uses Dipole Antenna, and final product addition the antenna a PIFA Antenna.
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.

Test Mode	Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC
(Simultaneous Transmit)	Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC

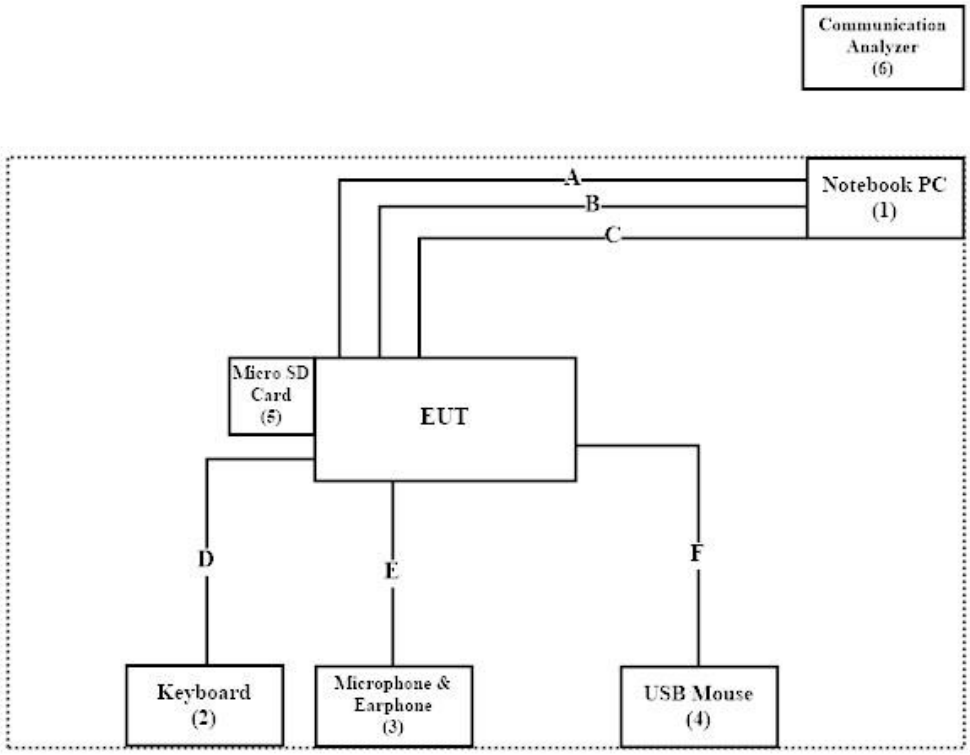
1.4. Tested System Details

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 5491	1PL56S2	N/A
2	Keyboard	DELL	SK-8115	MY-0DJ325-71619-79D-0178	N/A
3	Microphone & Earphone	Ergotech	ET-E201	N/A	N/A
4	USB Mouse	Logitech	M-BE58	HCA30103357	N/A
5	Micro SD Card 1GB	SanDisk	N/A	0801002841D2N	N/A
6	Communication Analyzer	Anritsu	MT8820C	6201091166	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 1.8m
B	USB Cable	Shielded, 2.1m
C	LAN Cable	Shielded, 3m
D	Keyboard Cable	Shielded, 1.8m
E	Microphone & Earphone Cable	Shielded, 2m
F	Mouse Cable	Shielded, 1.8m

1.5. Configuration of Tested System



1.6. EUT Exercise Software

(1) Setup the EUT as shown on 1.4

(2) Execute software “QRCT V3.0.268.0” 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:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.8. List of Test Item and Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/02/26	2020/02/25
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2018/09/27	2019/09/26
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
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19	2019/11/18
X	LISN	R&S	ENV216	101105	2019/04/10	2020/04/09
X	LISN	R&S	ESH3-Z5	836679/014	2019/04/10	2020/04/09
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

For Radiated measurements /Site3/CB8

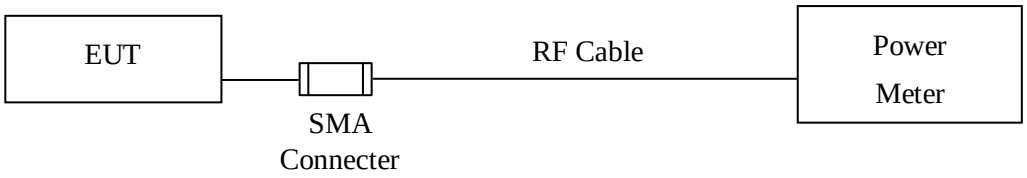
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSP40	100170	2019/03/11	2020/03/10
X	Communication Analyzer	Anritsu	MT8820C	6201091166	2019/03/21	2020/03/20
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2019/06/23	2020/06/22
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2019/06/13	2020/06/12
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330	2019/06/13	2020/06/12
X	Horn Antenna	ETS-Lindgren	3117	00135205	2019/04/30	2020/04/29
X	Horn Antenna	SCHWARZBECK	9120D	576	2018/12/18	2019/12/17
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2019/04/16	2020/04/15
X	Horn Antenna	Com-Power	AH-840	101043	2019/01/19	2020/01/18
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2019/03/27	2020/03/26
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. 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 :QuieTek EMI 2.0 V2.1.113.

2. Peak Power Output

2.1. Test Setup



2.2. Limit

The maximum peak power shall be less 1Watt.
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

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

2.4. Uncertainty

± 1.27 dB

2.5. Test Result of Peak Power Output

Product : Rugged Tablet
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/09/06
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	1.89	1 Watt= 30 dBm	Pass
Channel 19	2440.00	0.54	1 Watt= 30 dBm	Pass
Channel 39	2480.00	1.49	1 Watt= 30 dBm	Pass

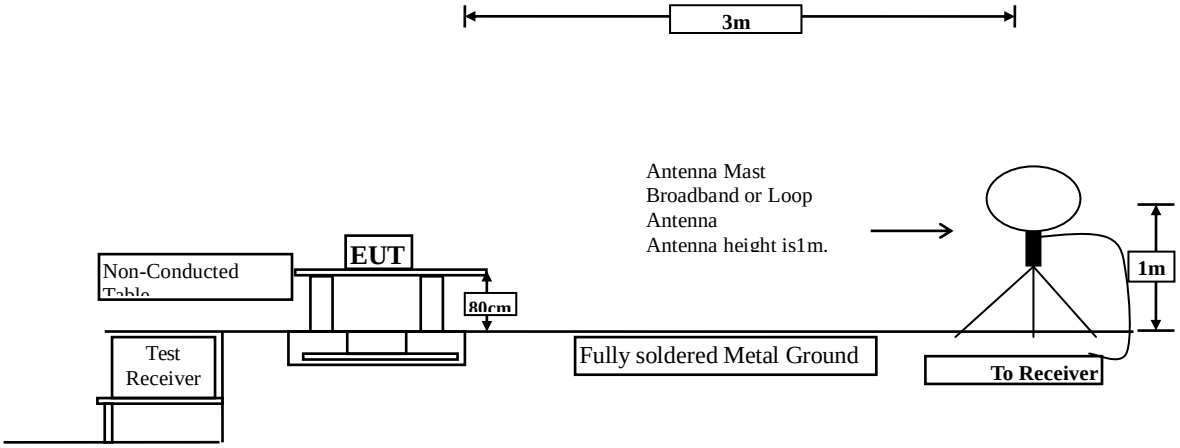
Product : Rugged Tablet
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/09/06
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	2.04	1 Watt= 30 dBm	Pass
Channel 19	2440.00	0.75	1 Watt= 30 dBm	Pass
Channel 39	2480.00	1.65	1 Watt= 30 dBm	Pass

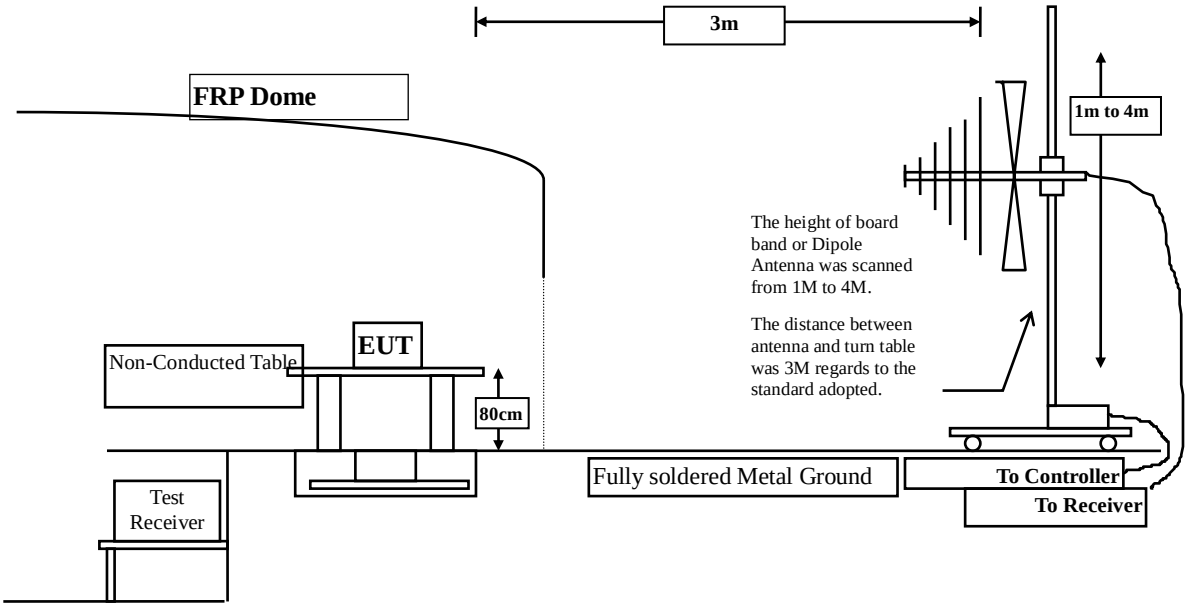
3. Radiated Emission

3.1. Test Setup

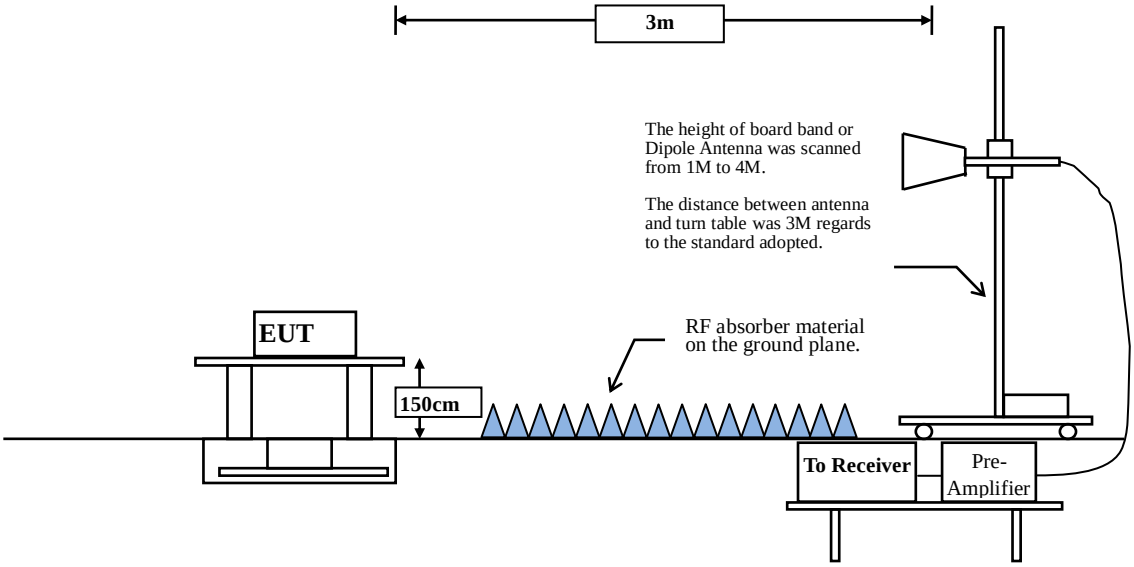
Under 30MHz



Below 1GHz



Above 1GHz


3m
The height of board band or Dipole Antenna was scanned from 1M to 4M.
The distance between antenna and turn table was 3M regards to the standard adopted.
EUT
150cm
RF absorber material on the ground plane.
To Receiver
Pre-Amplifier

3.2. 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.

3.3. 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 form 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to KDB 558074 Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
BLE 1M	62.50	0.3913	2556	3000
BLE 2M	32.71	0.2044	4894	5000

Note: Duty Cycle Refer to Section 5.

3.4. Uncertainty

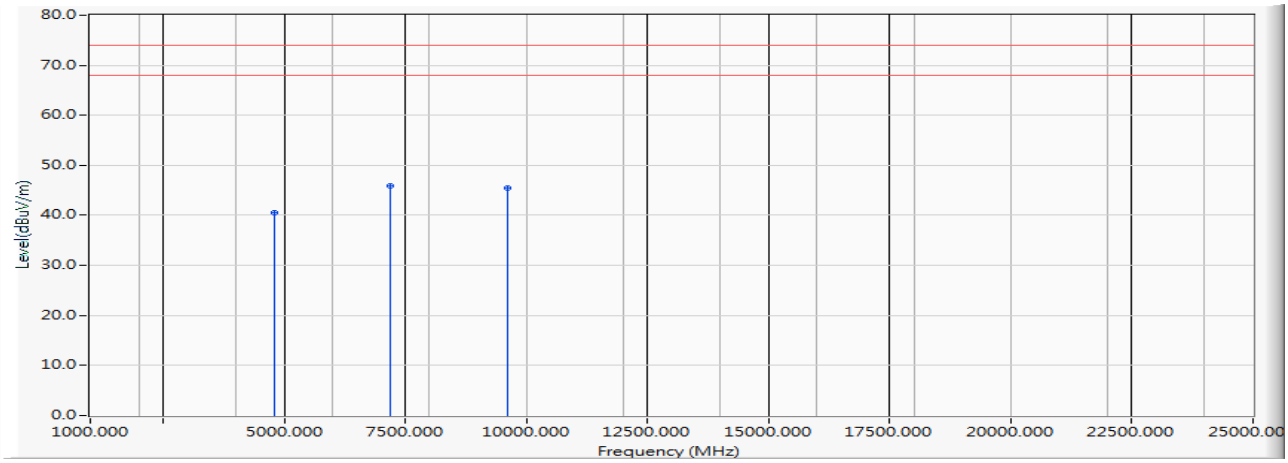
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC(2402MHz)

Horizontal



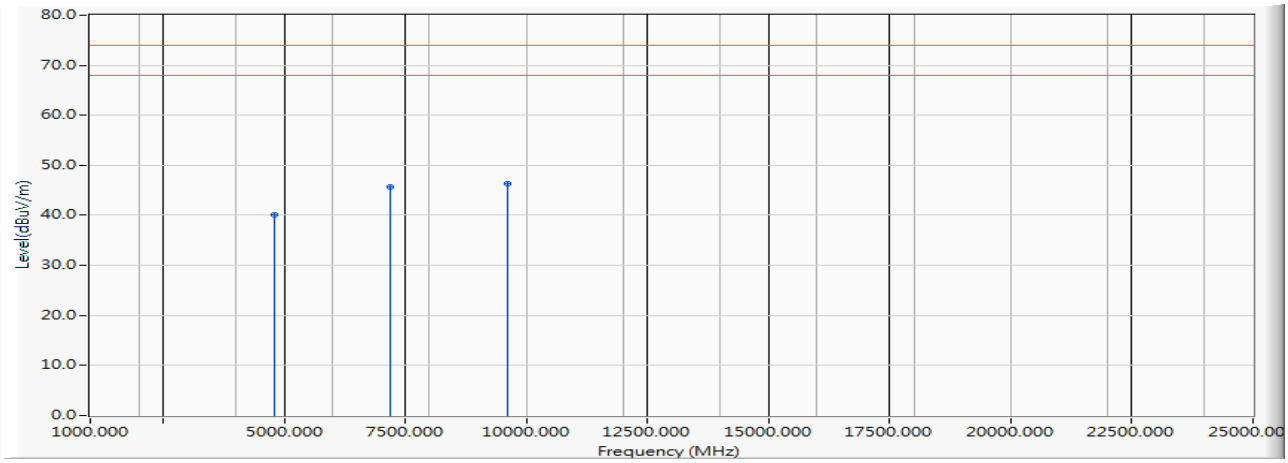
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-15.895	56.450	40.555	-33.445	74.000	PEAK
2	*	7206.000	-12.632	58.430	45.799	-28.201	74.000	PEAK
3		9608.000	-11.950	57.400	45.450	-28.550	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC(2402MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-15.895	56.070	40.175	-33.825	74.000	PEAK
2		7206.000	-12.632	58.250	45.619	-28.381	74.000	PEAK
3	*	9608.000	-11.950	58.320	46.370	-27.630	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
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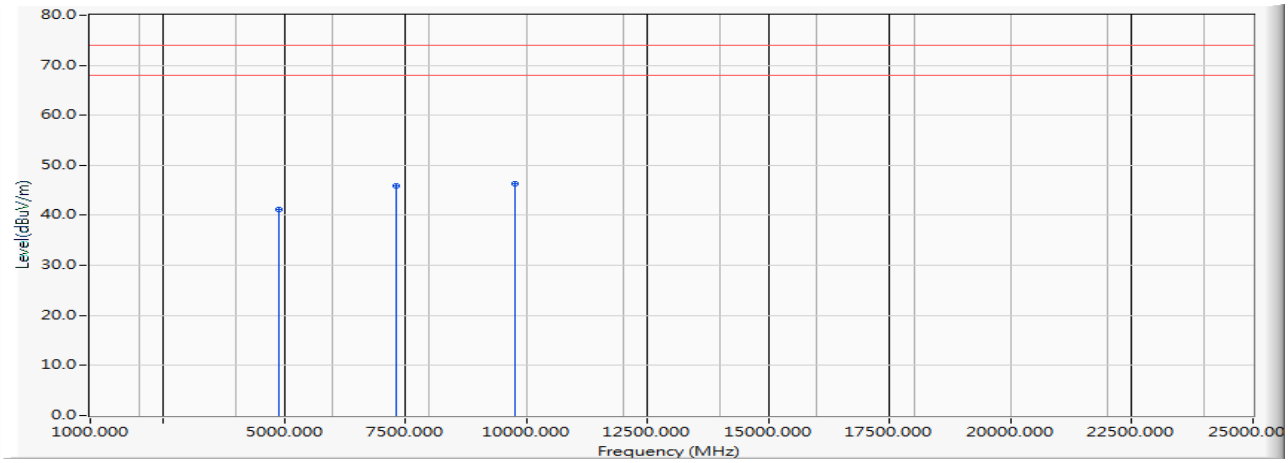
Product : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Horizontal



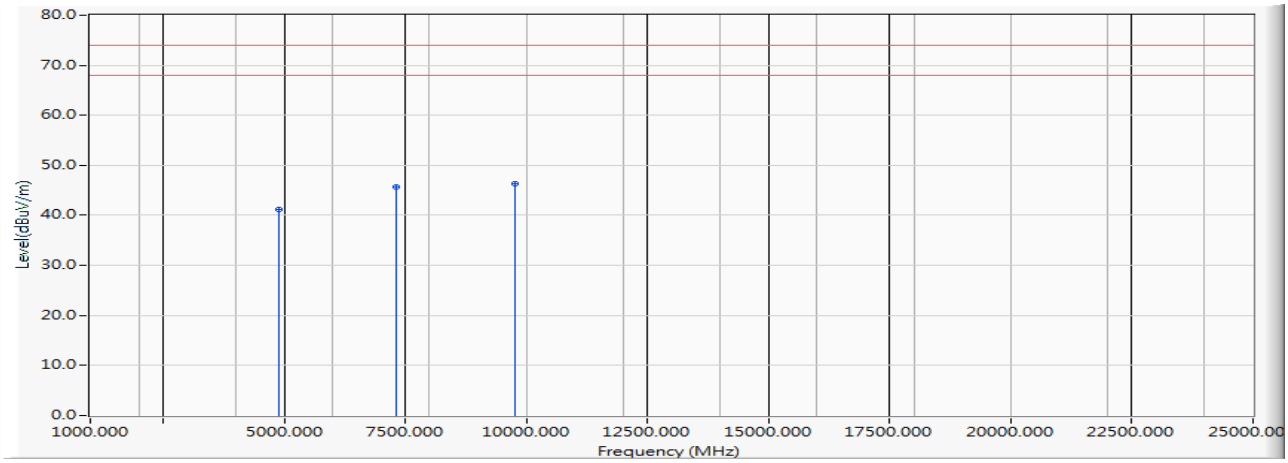
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	-15.053	56.300	41.247	-32.753	74.000	PEAK
2		7320.000	-13.083	58.890	45.807	-28.193	74.000	PEAK
3	*	9760.000	-10.892	57.240	46.348	-27.652	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Vertical



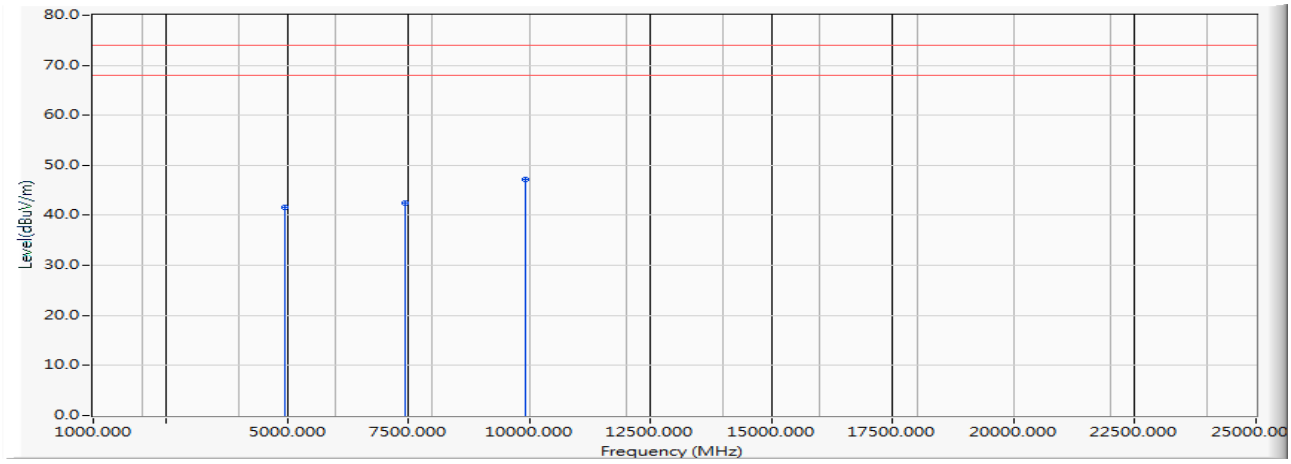
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	-15.053	56.160	41.107	-32.893	74.000	PEAK
2		7320.000	-13.083	58.710	45.627	-28.373	74.000	PEAK
3	*	9760.000	-10.892	57.290	46.398	-27.602	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Horizontal



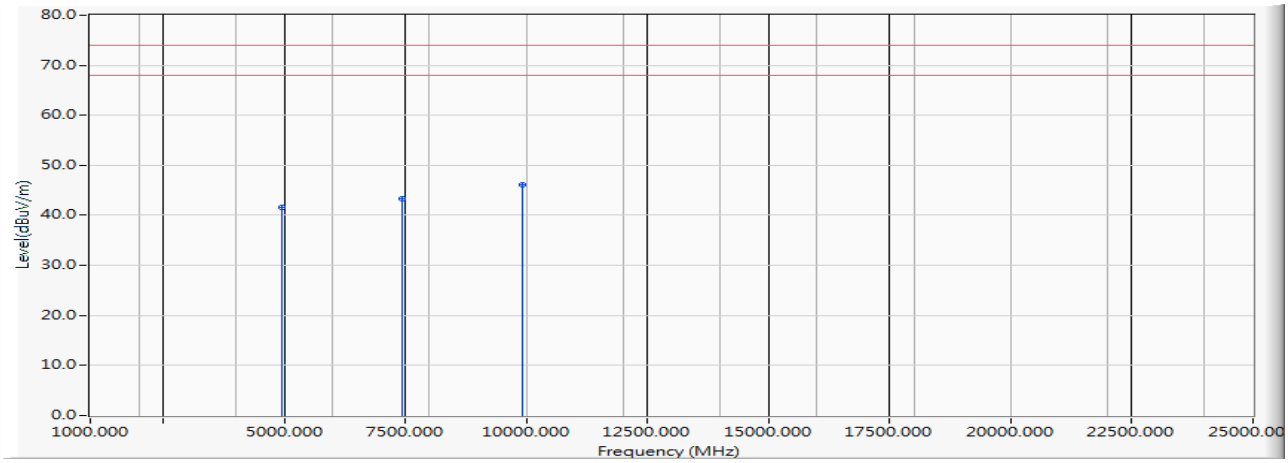
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	-14.106	55.760	41.655	-32.345	74.000	PEAK
2		7440.000	-14.374	56.940	42.565	-31.435	74.000	PEAK
3	*	9920.000	-12.781	59.900	47.119	-26.881	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Vertical



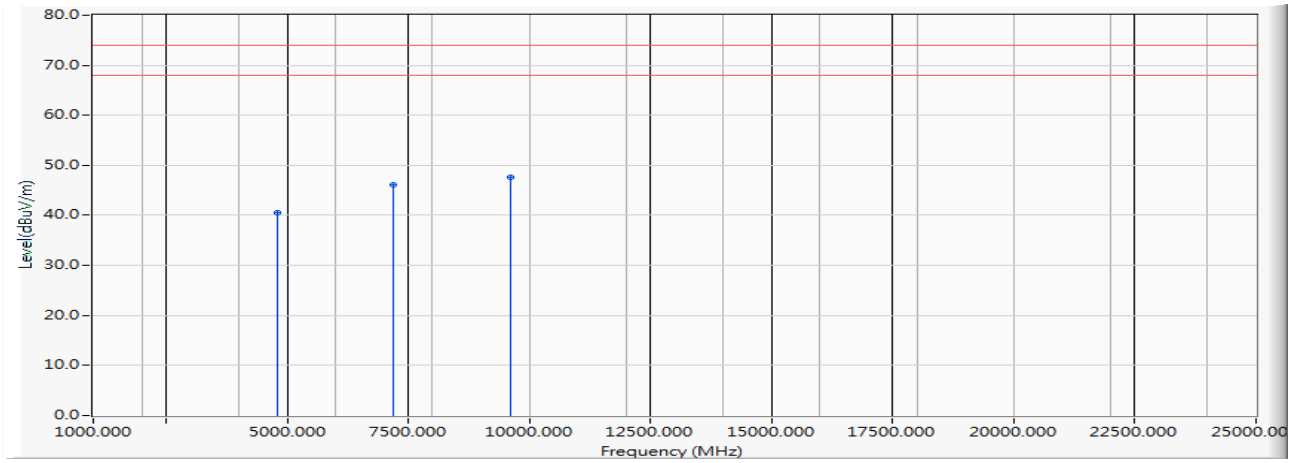
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	-14.106	55.770	41.665	-32.335	74.000	PEAK
2		7440.000	-14.374	57.720	43.345	-30.655	74.000	PEAK
3	*	9920.000	-12.781	58.830	46.049	-27.951	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Horizontal



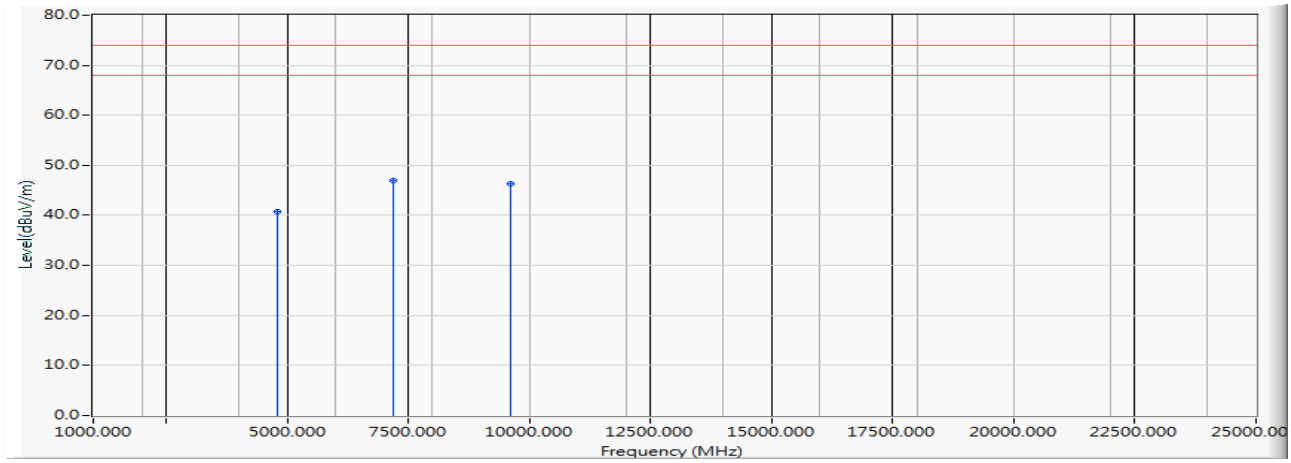
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-15.895	56.380	40.485	-33.515	74.000	PEAK
2		7206.000	-12.632	58.790	46.159	-27.841	74.000	PEAK
3	*	9608.000	-11.950	59.600	47.650	-26.350	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Vertical



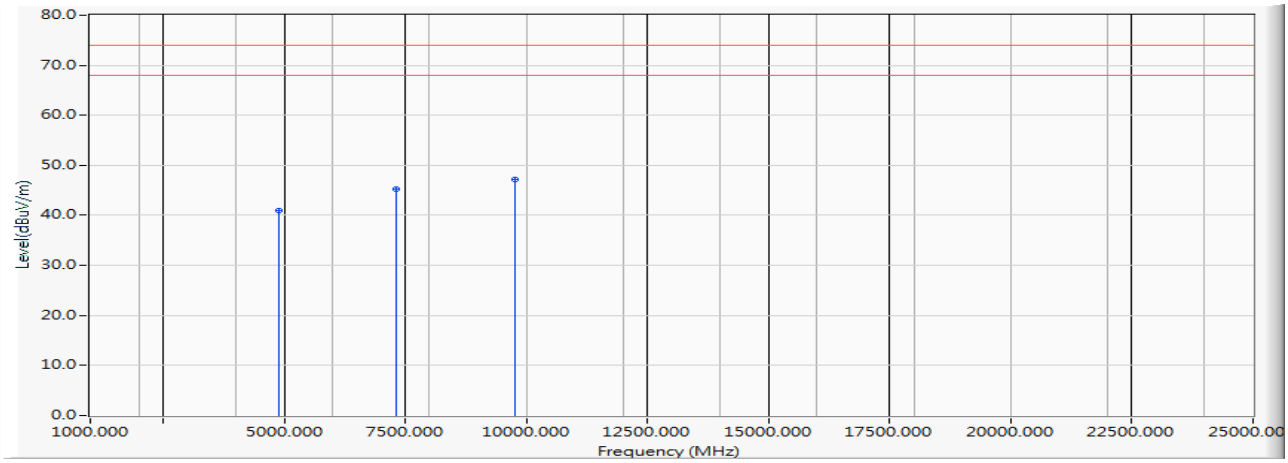
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-15.895	56.540	40.645	-33.355	74.000	PEAK
2	*	7206.000	-12.632	59.680	47.049	-26.951	74.000	PEAK
3		9608.000	-11.950	58.290	46.340	-27.660	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Horizontal



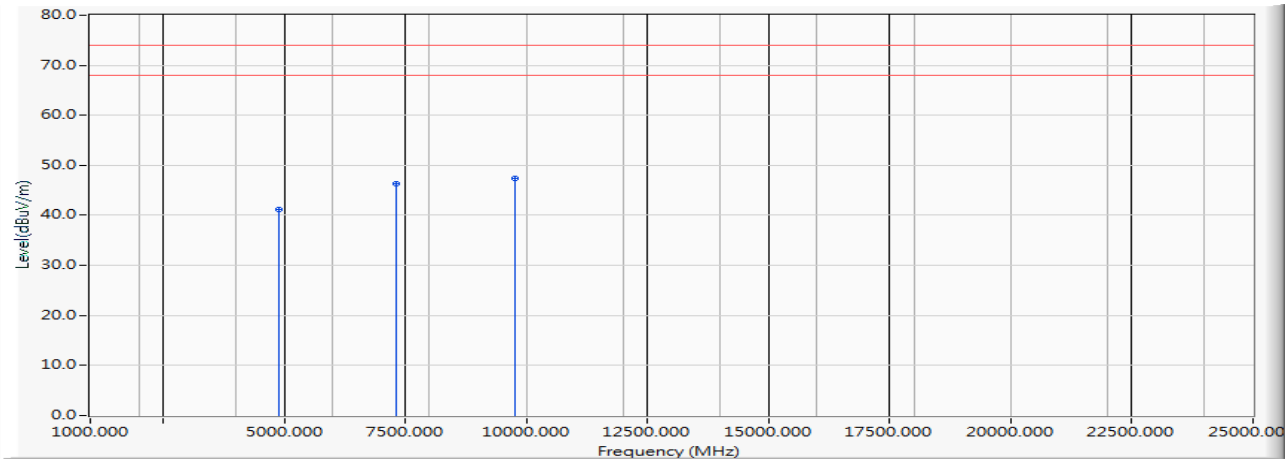
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	-15.053	55.930	40.877	-33.123	74.000	PEAK
2		7320.000	-13.083	58.430	45.347	-28.653	74.000	PEAK
3	*	9760.000	-10.892	58.000	47.108	-26.892	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Vertical



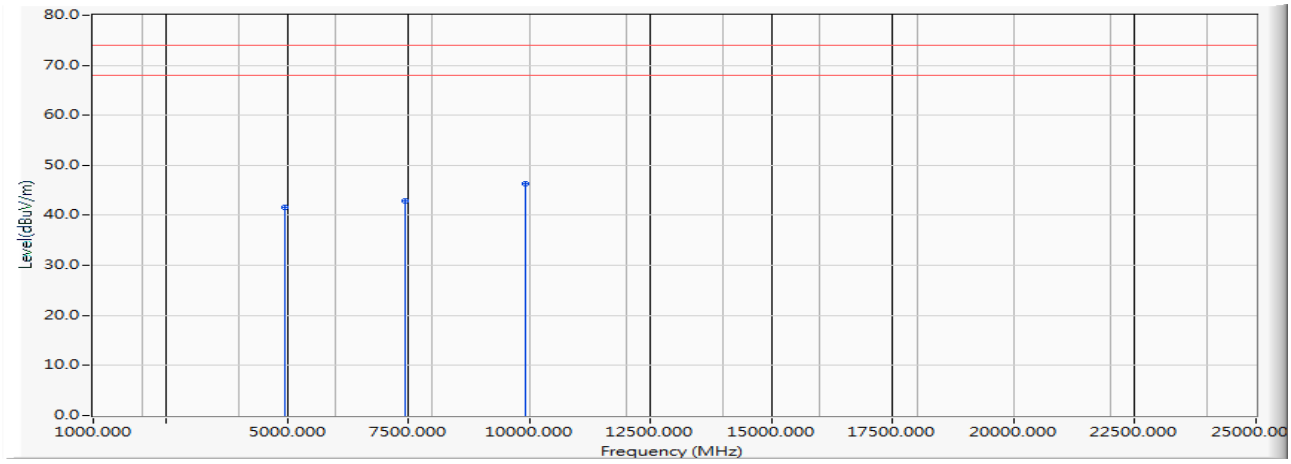
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	-15.053	56.280	41.227	-32.773	74.000	PEAK
2		7320.000	-13.083	59.340	46.257	-27.743	74.000	PEAK
3	*	9760.000	-10.892	58.190	47.298	-26.702	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Horizontal



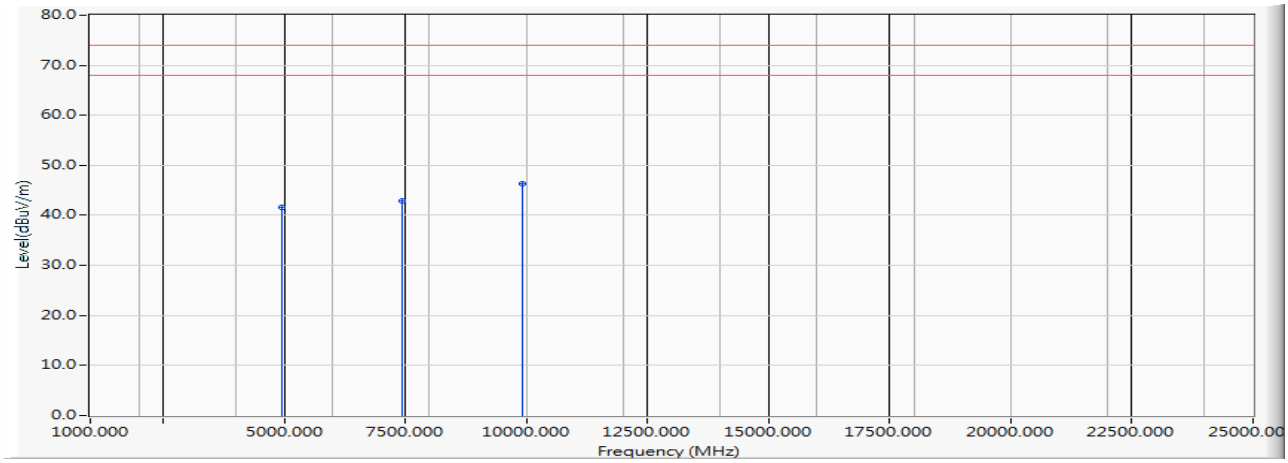
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	-14.106	55.720	41.615	-32.385	74.000	PEAK
2		7440.000	-14.374	57.170	42.795	-31.205	74.000	PEAK
3	*	9920.000	-12.781	59.200	46.419	-27.581	74.000	PEAK

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 : Rugged Tablet
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/30
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Vertical



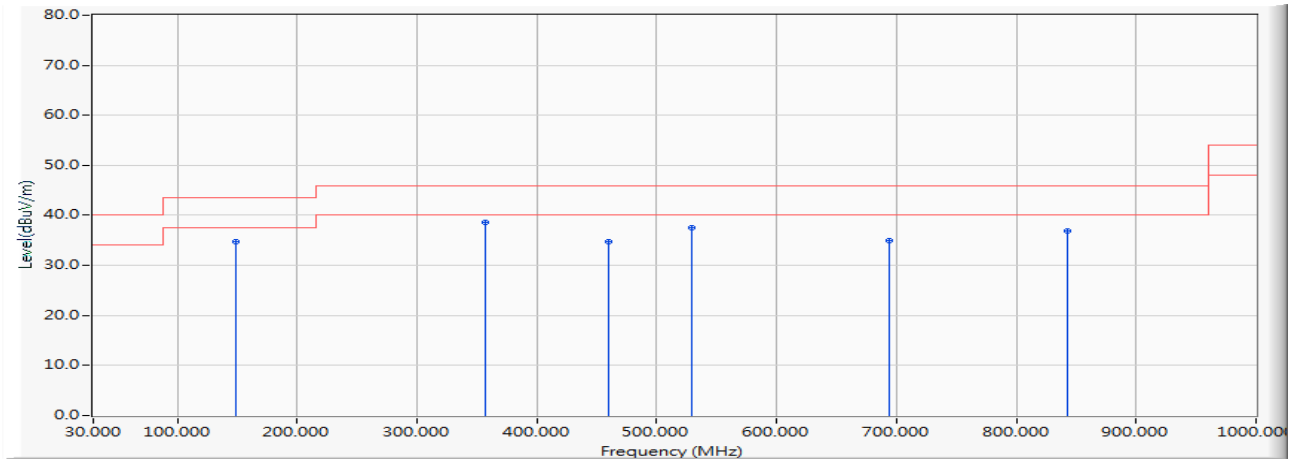
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	-14.106	55.710	41.605	-32.395	74.000	PEAK
2		7440.000	-14.374	57.180	42.805	-31.195	74.000	PEAK
3	*	9920.000	-12.781	59.060	46.279	-27.721	74.000	PEAK

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 : Rugged Tablet
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/29
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Horizontal



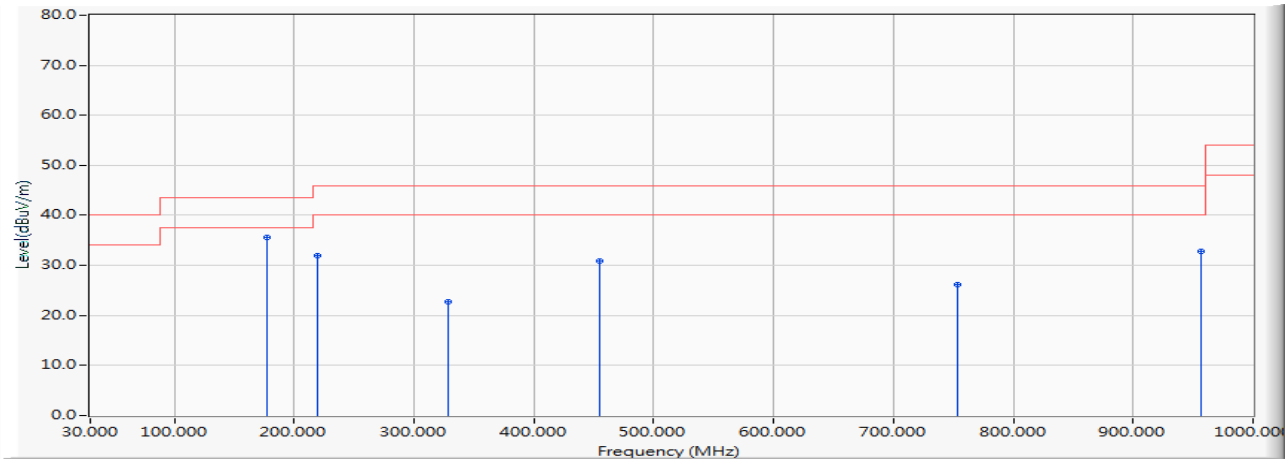
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		149.493	-19.716	54.397	34.681	-8.819	43.500	QUASIPEAK
2	*	357.551	-12.888	51.429	38.541	-7.459	46.000	QUASIPEAK
3		460.174	-10.563	45.407	34.845	-11.155	46.000	QUASIPEAK
4		529.058	-11.313	48.837	37.524	-8.476	46.000	QUASIPEAK
5		693.536	-9.177	44.241	35.064	-10.936	46.000	QUASIPEAK
6		842.551	-8.267	45.093	36.826	-9.174	46.000	QUASIPEAK

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 emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Rugged Tablet
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/29
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Vertical



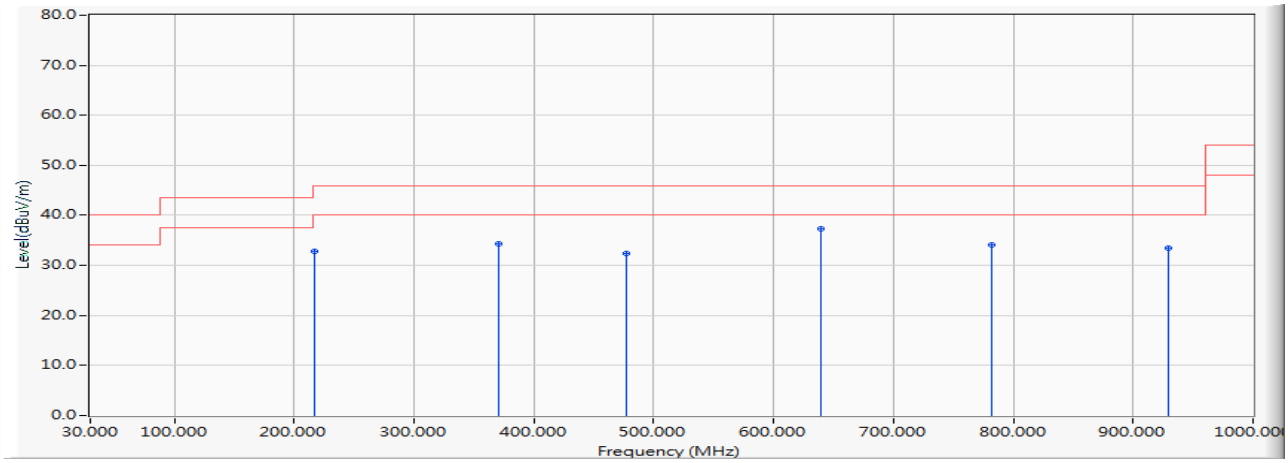
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	177.609	-19.502	55.161	35.658	-7.842	43.500	QUASIPEAK
2		219.783	-18.075	50.041	31.966	-14.034	46.000	QUASIPEAK
3		328.029	-14.040	36.877	22.836	-23.164	46.000	QUASIPEAK
4		454.551	-10.341	41.164	30.823	-15.177	46.000	QUASIPEAK
5		753.986	-6.997	33.079	26.082	-19.918	46.000	QUASIPEAK
6		956.420	-8.440	41.282	32.843	-13.157	46.000	QUASIPEAK

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 emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Rugged Tablet
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/29
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Horizontal



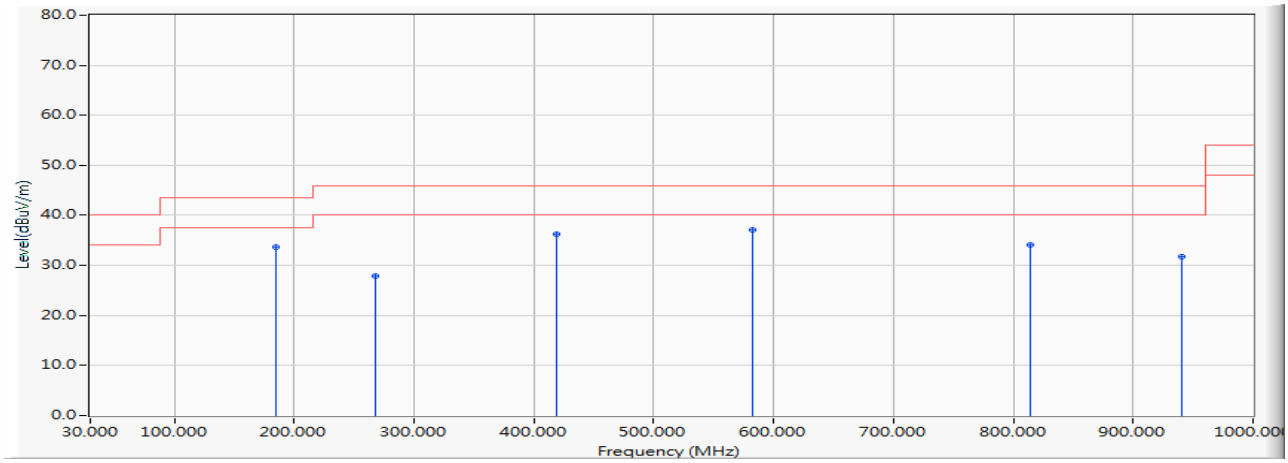
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		216.971	-18.105	50.848	32.743	-13.257	46.000	QUASIPEAK
2		370.203	-12.397	46.682	34.284	-11.716	46.000	QUASIPEAK
3		477.043	-11.954	44.308	32.353	-13.647	46.000	QUASIPEAK
4	*	640.116	-8.788	46.203	37.415	-8.585	46.000	QUASIPEAK
5		782.101	-8.547	42.720	34.173	-11.827	46.000	QUASIPEAK
6		929.710	-9.492	42.914	33.421	-12.579	46.000	QUASIPEAK

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 emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Rugged Tablet
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test date : 2019/08/29
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2440MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		184.638	-19.038	52.685	33.648	-9.852	43.500	QUASIPEAK
2		267.580	-18.564	46.528	27.963	-18.037	46.000	QUASIPEAK
3		419.406	-12.398	48.696	36.298	-9.702	46.000	QUASIPEAK
4	*	582.478	-7.356	44.424	37.068	-8.932	46.000	QUASIPEAK
5		814.435	-8.930	43.130	34.200	-11.800	46.000	QUASIPEAK
6		940.957	-8.723	40.510	31.787	-14.213	46.000	QUASIPEAK

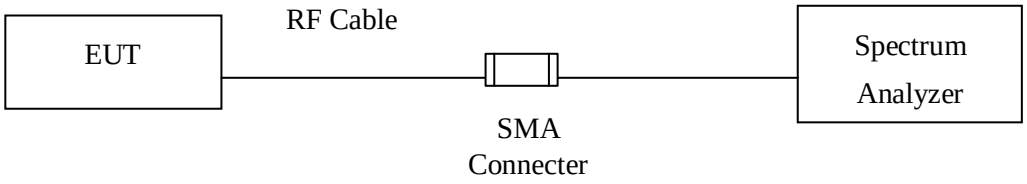
Note:

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 emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

4. Band Edge

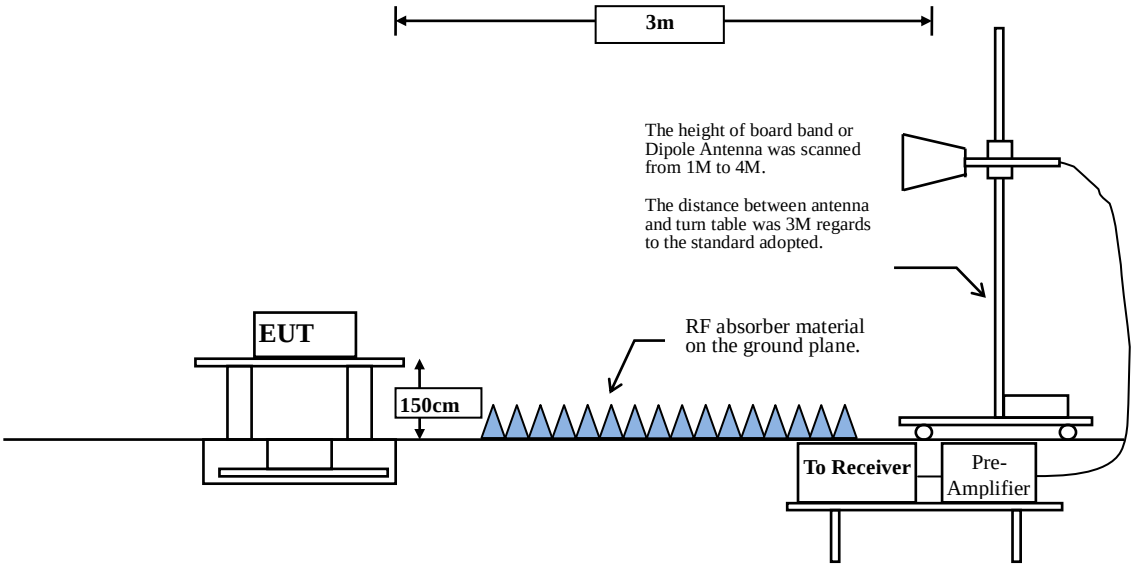
4.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



4.2. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
The final test results meets all the applicable FCC rules, including FCC Part 15C and Part 22H, Part 24E, Part 27 Part 90.

4.3. 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.
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 from 1 meter to 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.

RBW and VBW Parameter setting:

According to KDB 558074 Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
BLE 1M	62.50	0.3913	2556	3000
BLE 2M	32.71	0.2044	4894	5000

Note: Duty Cycle Refer to Section 5.

4.4. Uncertainty

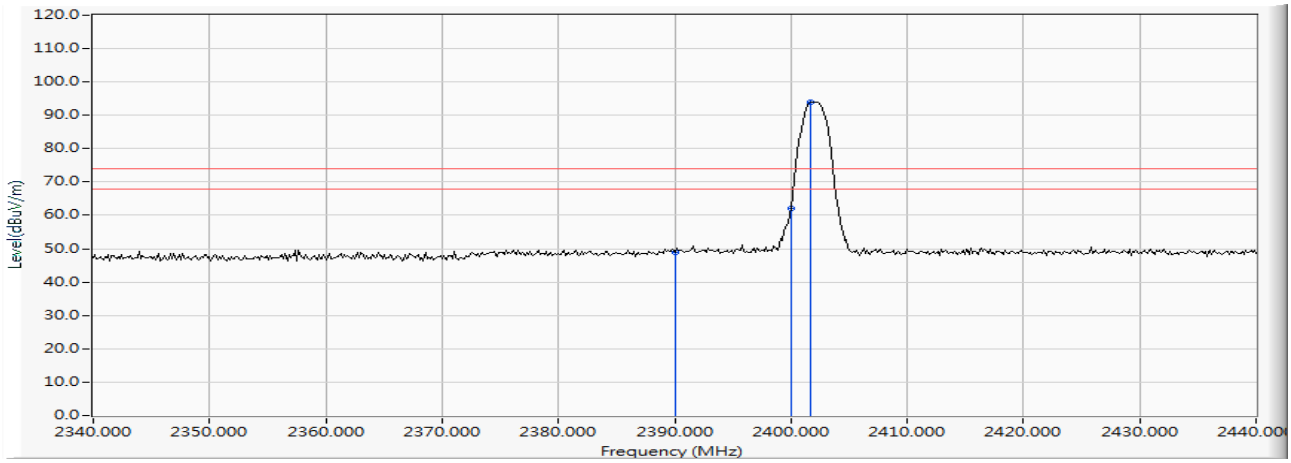
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Band Edge

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Horizontal



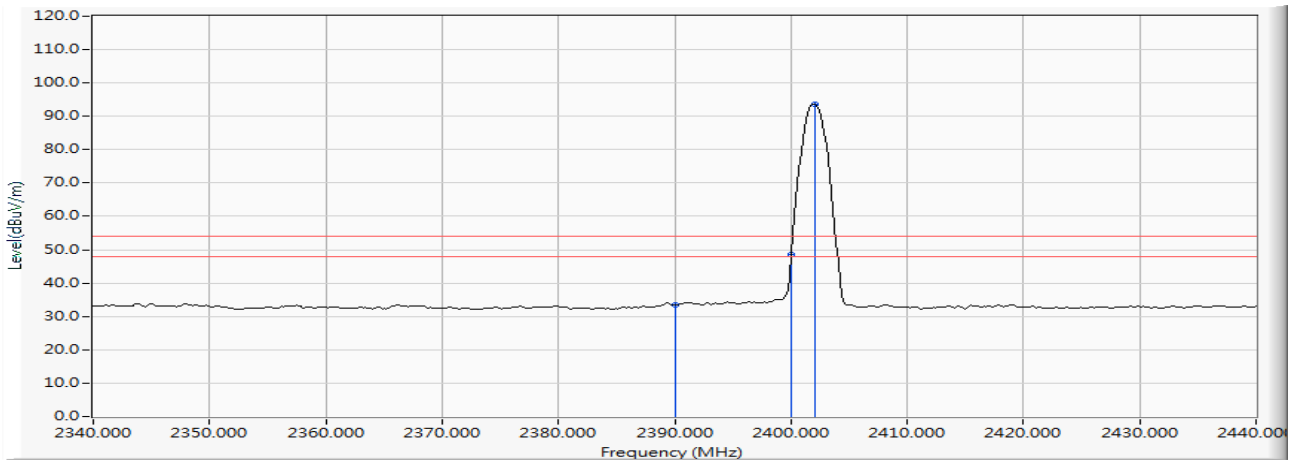
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	40.223	48.986	-25.014	74.000	PEAK
2		2400.000	8.799	53.201	62.000	--	--	PEAK
3	*	2401.739	8.806	85.147	93.952	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Horizontal



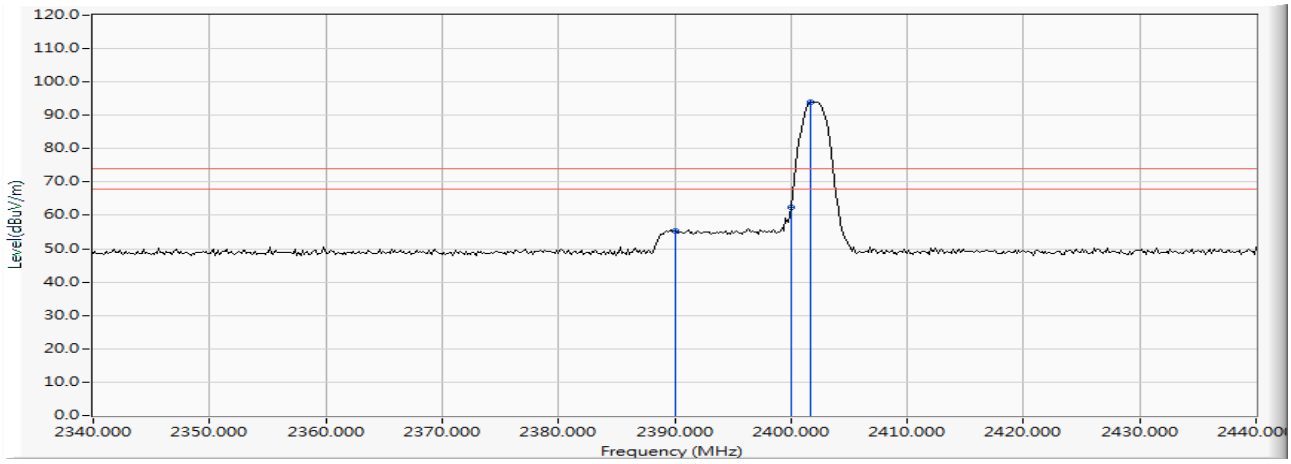
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	24.605	33.368	-20.632	54.000	AVERAGE
2		2400.000	8.799	39.843	48.642	--	--	AVERAGE
3	*	2402.029	8.807	84.769	93.575	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Vertical



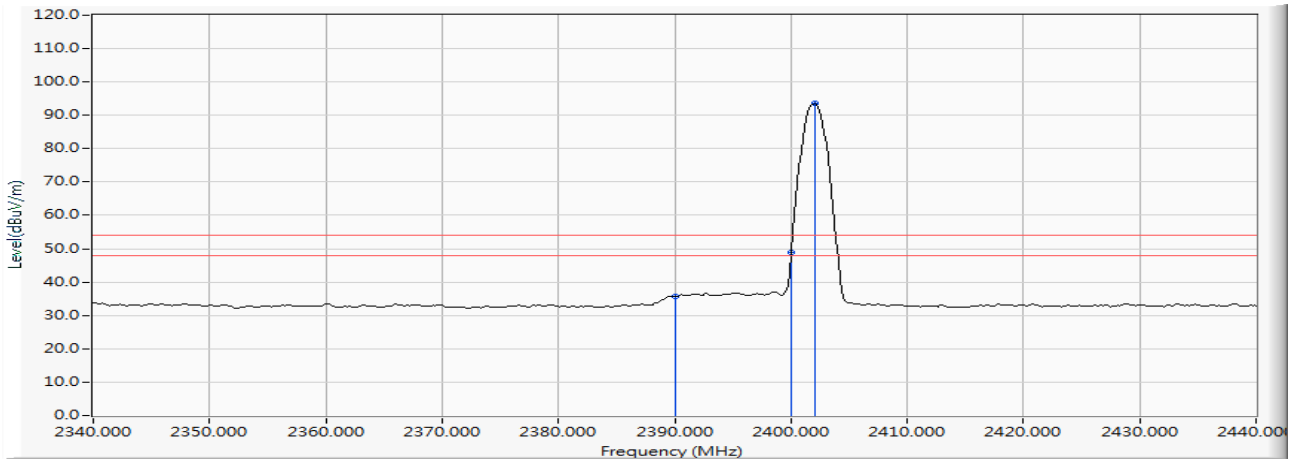
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	46.555	55.318	-18.682	74.000	PEAK
2		2400.000	8.799	53.592	62.391	--	--	PEAK
3	*	2401.739	8.806	85.134	93.939	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Vertical



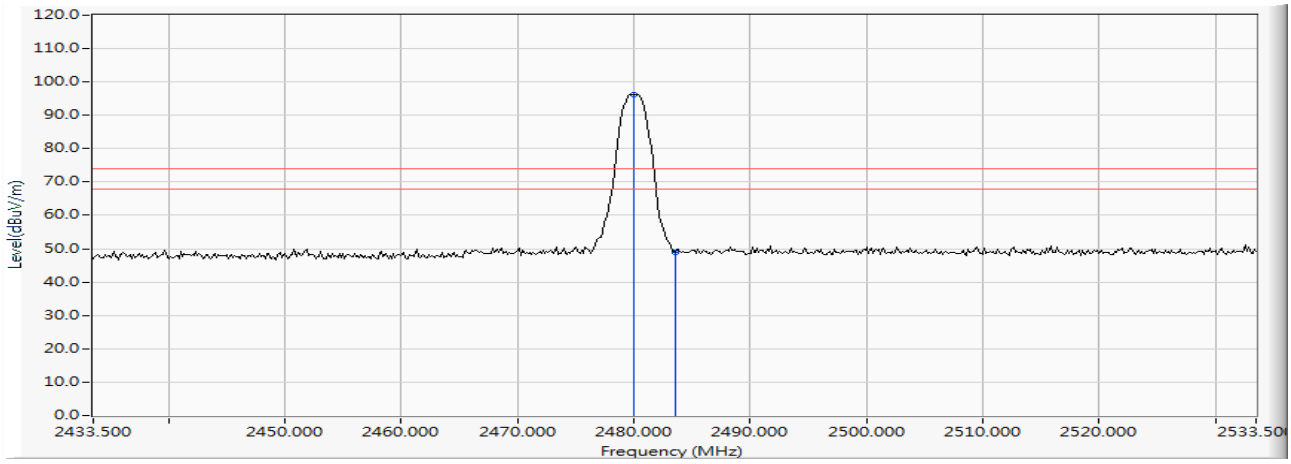
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	26.855	35.618	-18.382	54.000	AVERAGE
2		2400.000	8.799	40.236	49.035	--	--	AVERAGE
3	*	2402.029	8.807	84.693	93.499	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Horizontal



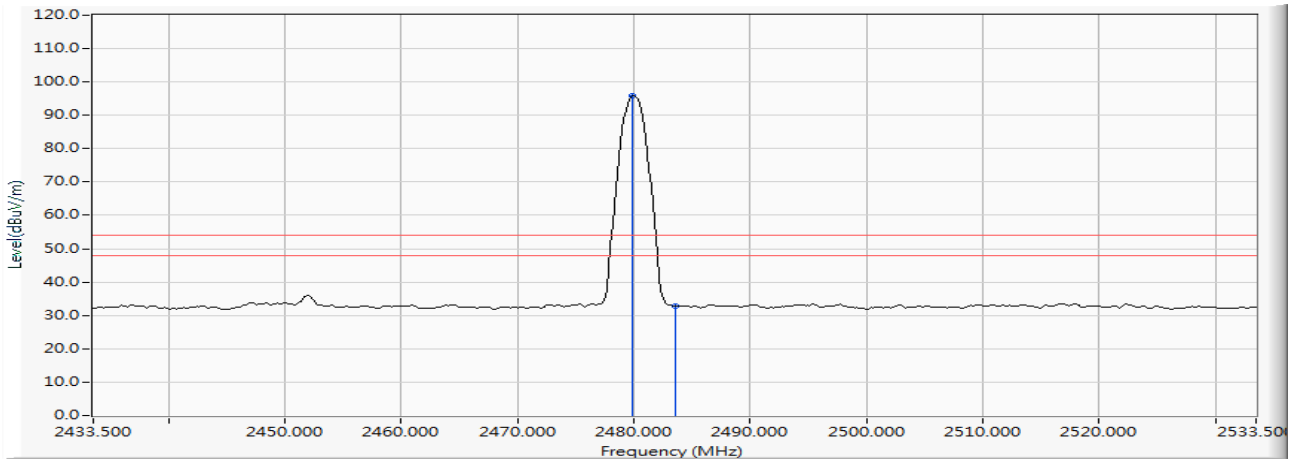
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	9.086	87.110	96.197	--	--	PEAK
2		2483.500	9.100	39.864	48.963	-25.037	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Horizontal



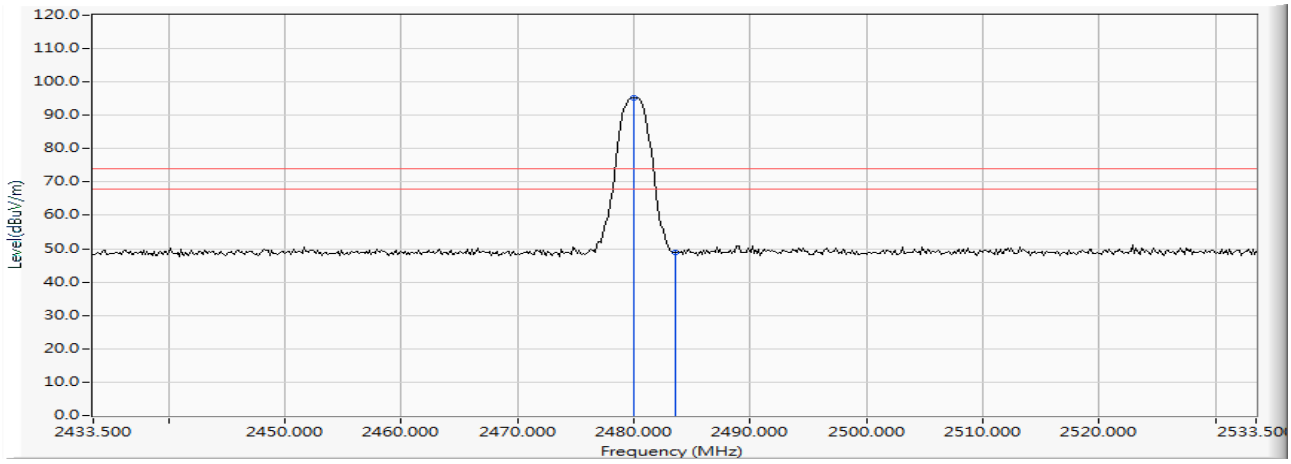
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	9.086	86.725	95.811	--	--	AVERAGE
2		2483.500	9.100	23.653	32.752	-21.248	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Vertical



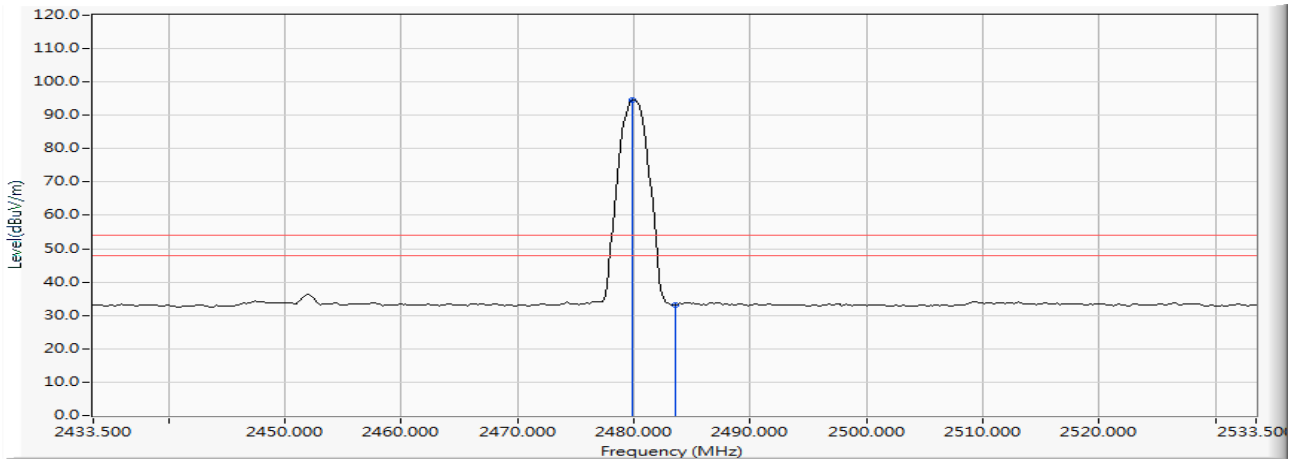
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	9.086	86.031	95.118	--	--	PEAK
2		2483.500	9.100	39.705	48.804	-25.196	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Vertical



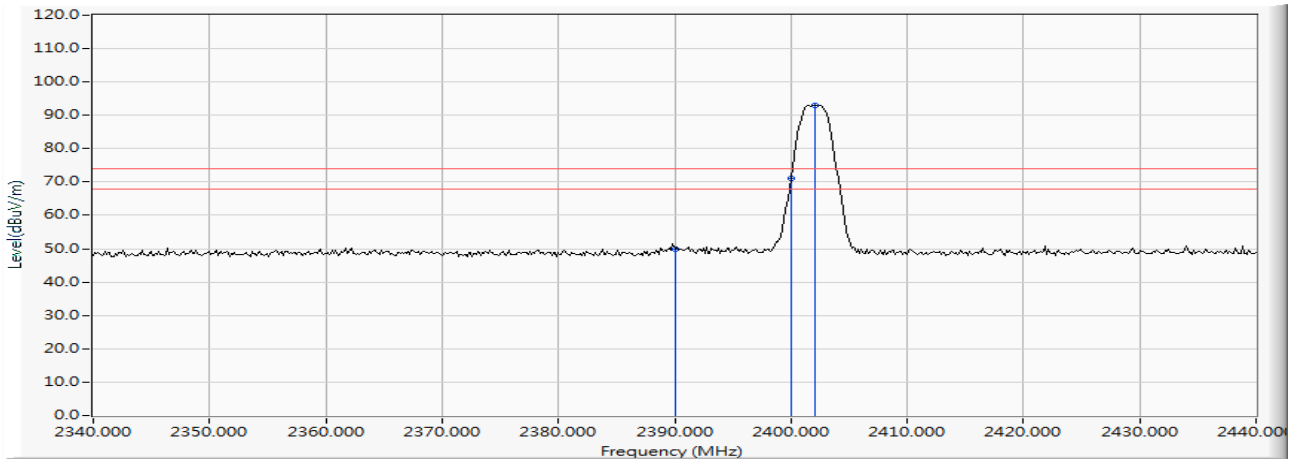
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	9.086	85.603	94.689	--	--	AVERAGE
2		2483.500	9.100	24.088	33.187	-20.813	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Horizontal



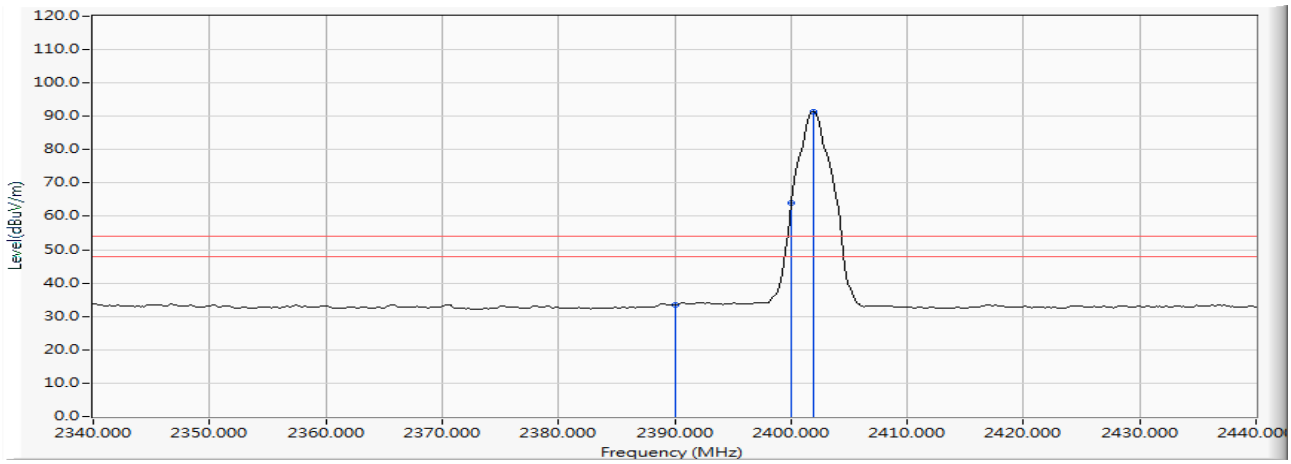
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	41.192	49.955	-24.045	74.000	PEAK
2		2400.000	8.799	62.299	71.098	--	--	PEAK
3	*	2402.029	8.807	84.188	92.994	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Horizontal



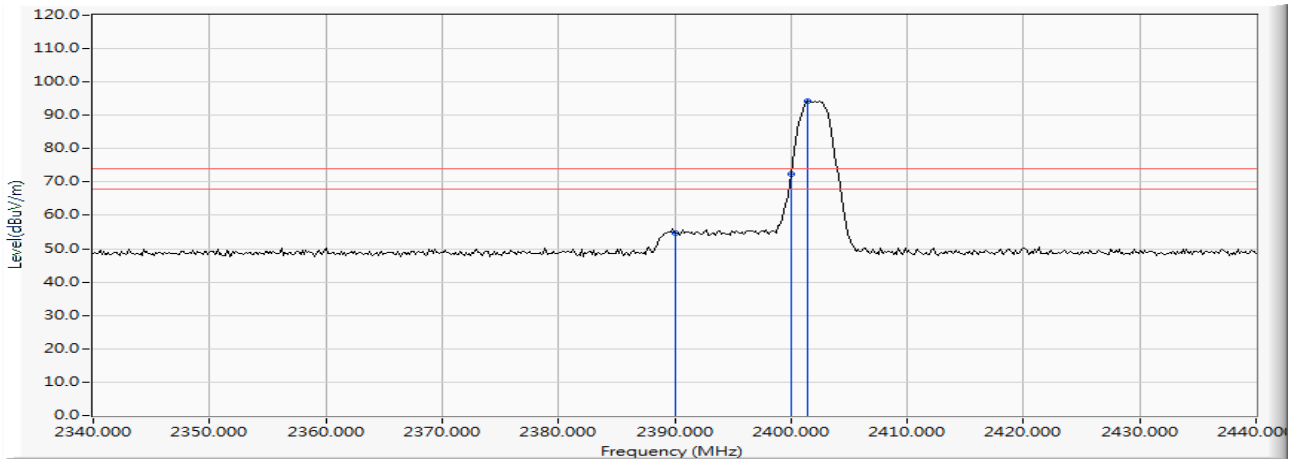
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	24.629	33.392	-20.608	54.000	AVERAGE
2		2400.000	8.799	55.289	64.088	--	--	AVERAGE
3	*	2401.884	8.806	82.520	91.326	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Vertical



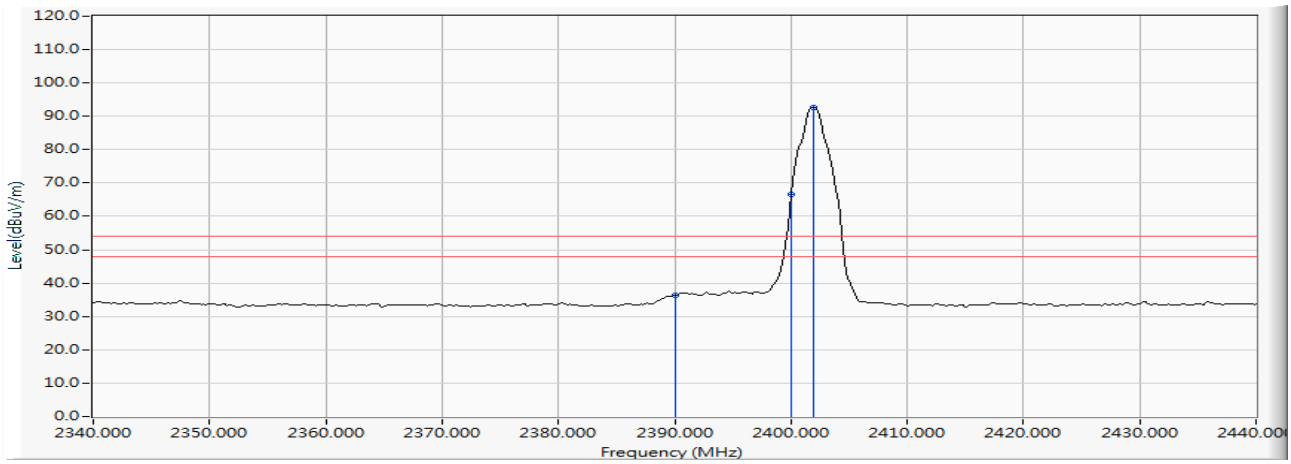
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	46.030	54.793	-19.207	74.000	PEAK
2		2400.000	8.799	63.480	72.279	--	--	PEAK
3	*	2401.449	8.805	85.353	94.157	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2402MHz)

Vertical



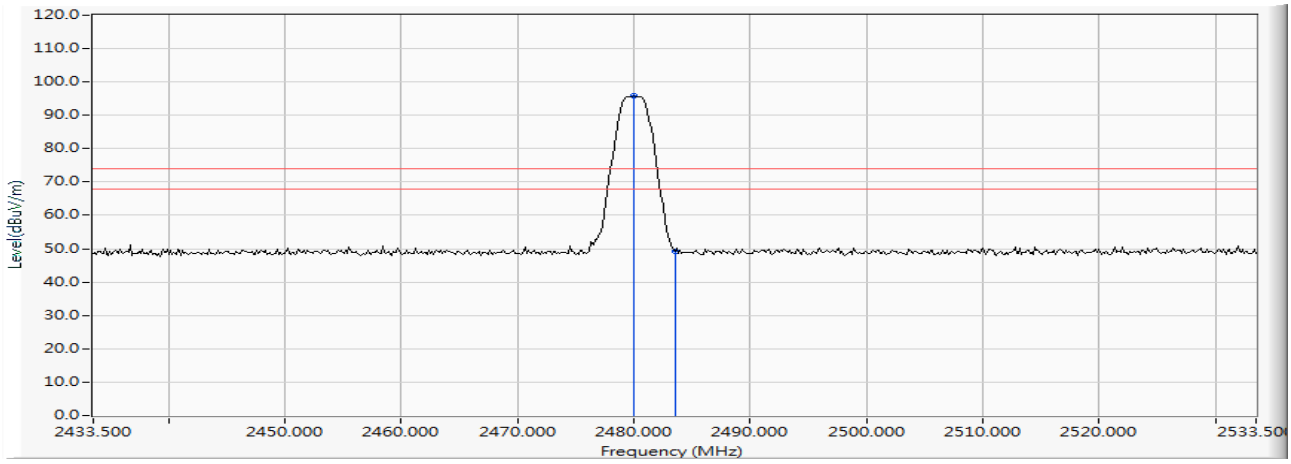
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	8.763	27.691	36.454	-17.546	54.000	AVERAGE
2		2400.000	8.799	57.857	66.656	--	--	AVERAGE
3	*	2401.884	8.806	83.893	92.699	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Horizontal



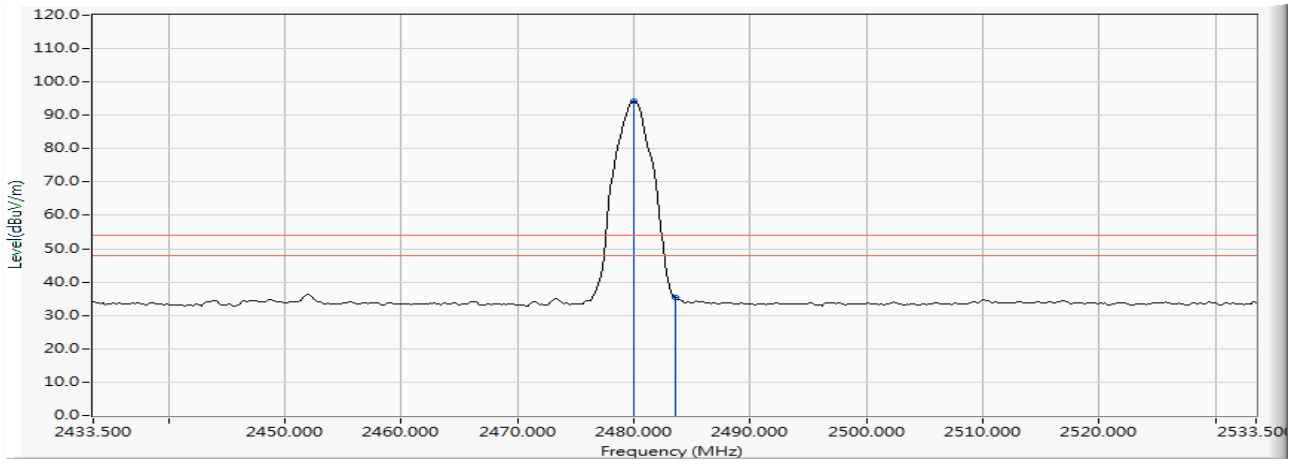
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	9.086	86.654	95.741	--	--	PEAK
2		2483.500	9.100	40.262	49.361	-24.639	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Horizontal



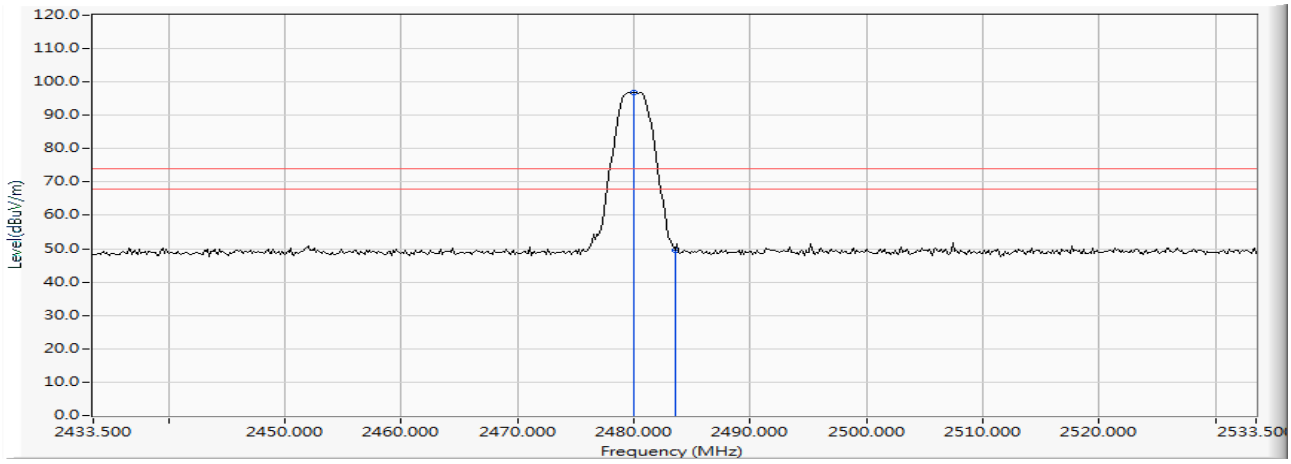
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	9.086	85.016	94.103	--	--	AVERAGE
2		2483.500	9.100	26.179	35.278	-18.722	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Vertical



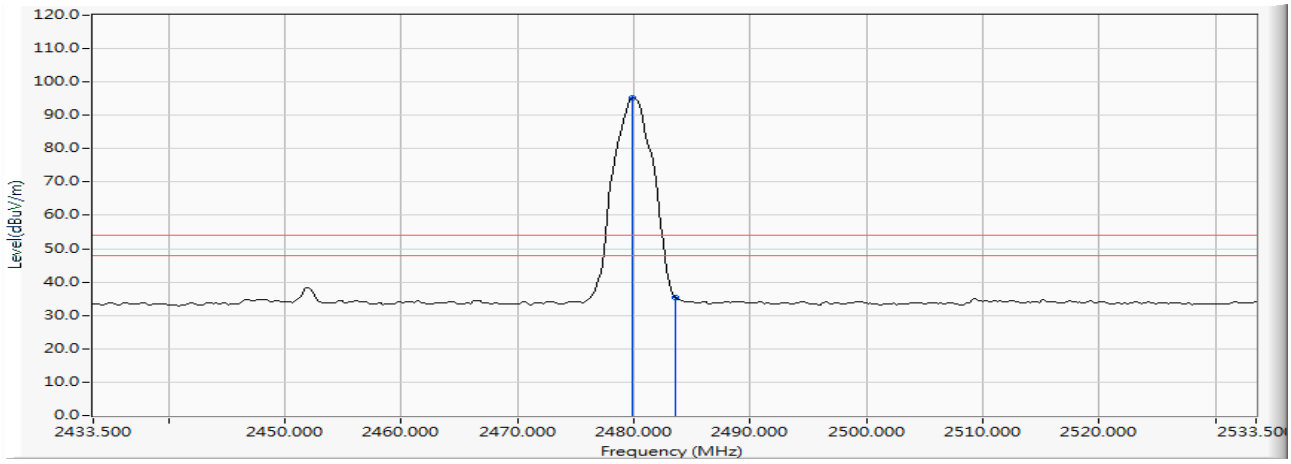
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	9.086	87.770	96.857	--	--	PEAK
2		2483.500	9.100	40.544	49.643	-24.357	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Rugged Tablet
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/09/05
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC (2480MHz)

Vertical



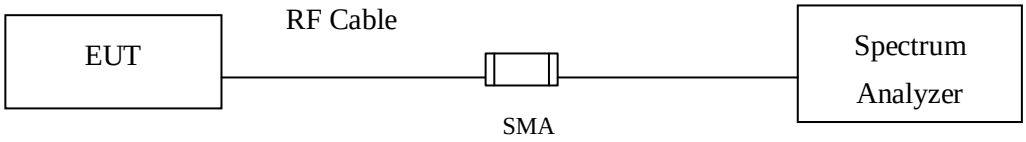
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	9.086	86.190	95.276	--	--	AVERAGE
2		2483.500	9.100	26.358	35.457	-18.543	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

5. Duty Cycle

5.1. Test Setup



5.2. Test Procedure

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

5.3. Uncertainty

± 2.31msec

5.4. Test Result of Duty Cycle

Product : Rugged Tablet
Test Item : Duty Cycle
Test Mode : Mode 1: Bluetooth LE 1Mbps +LTE TDD Band 41_20M 2593MHz+NFC

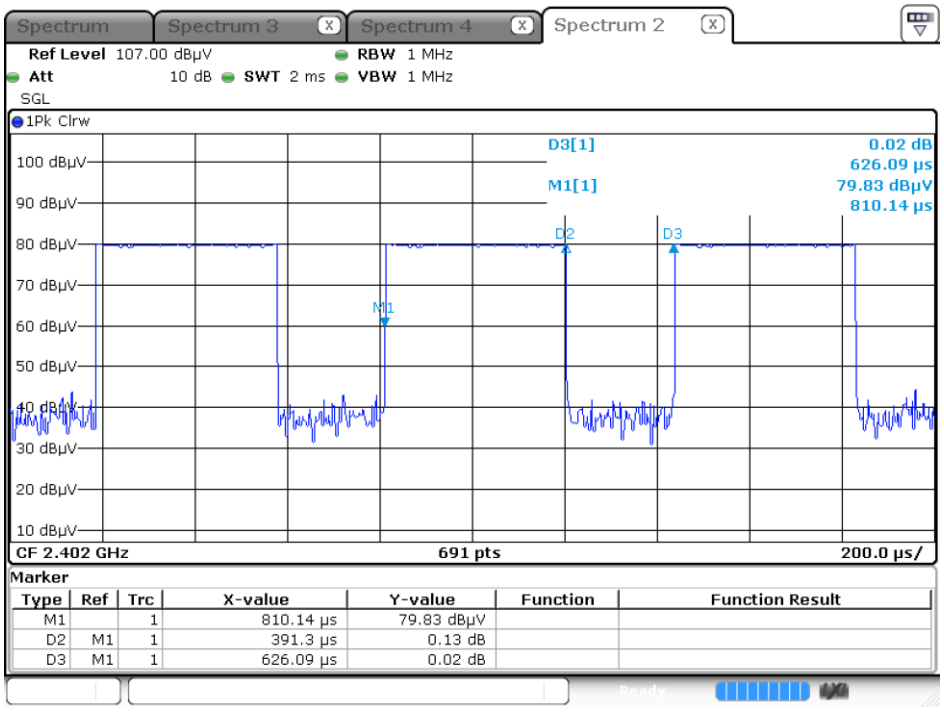
Duty Cycle Formula:

Duty Cycle = Ton / (Ton + Toff)

Duty Factor = 10 Log (1/Duty Cycle)

Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
BLE	0.3913	0.6261	62.50	2.04



Date: 5.NOV.2019 04:08:21

Product : Rugged Tablet
Test Item : Duty Cycle
Test Mode : Mode 2: Bluetooth LE 2Mbps +LTE TDD Band 41_20M 2593MHz+NFC

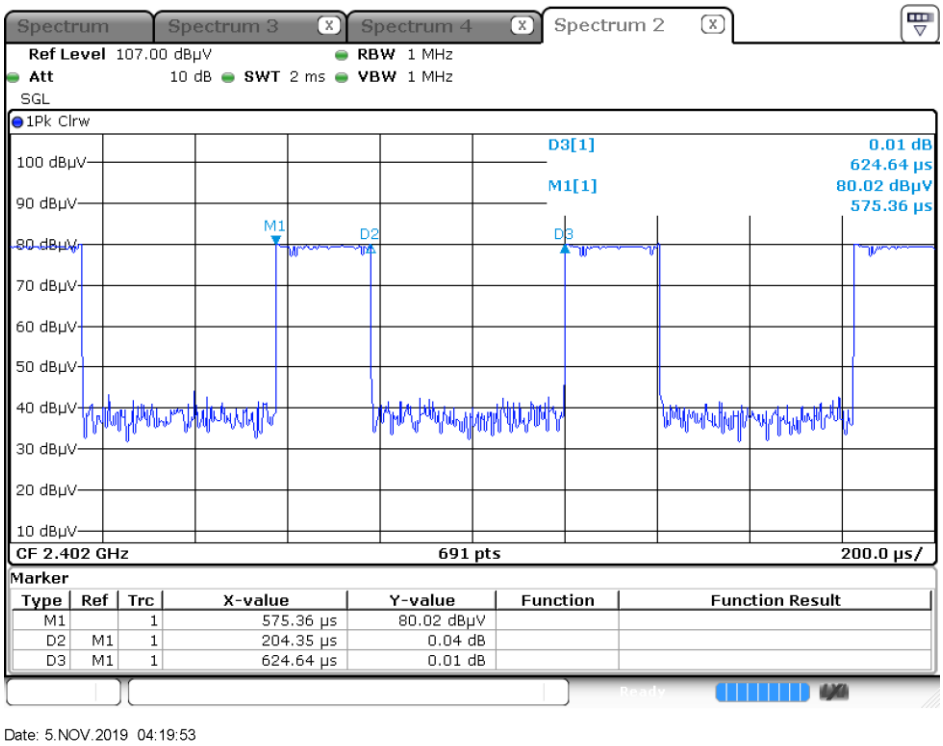
Duty Cycle Formula:

Duty Cycle = Ton / (Ton + Toff)

Duty Factor = 10 Log (1/Duty Cycle)

Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
BLE-2M	0.2044	0.6246	32.71	4.85



Date: 5.NOV.2019 04:19:53

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.