

APPLICATION CERTIFICATION
On Behalf of
Shenzhen MAXIN Technology Industry Co., Ltd.

Bluetooth Keyboard
Model No.: K5102BT, K5108BT, K701BT, K702BT, K703BT, K704BT,
K1001BT, K1002BT, K1003BT, K1004BT

FCC ID: 2ABX3-K5102BT

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Date of Test : Mar 20, 2014-Mar 31, 2014
Date of Report : Mar 31, 2014

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Test Report Certification

Applicant& address : Shenzhen MAXIN Technology Industry Co., Ltd.
Block C3, East Xueziwei Industrial Zone, Yabian, Shajing,
Baoan, Shenzhen, China

Manufacturer& address : Shenzhen MAXIN Technology Industry Co., Ltd.
Block C3, East Xueziwei Industrial Zone, Yabian, Shajing,
Baoan, Shenzhen, China

Product : Bluetooth Keyboard

Trade name : MAXIN

Model No. : K5102BT, K5108BT, K701BT, K702BT, K703BT, K704BT,
K1001BT, K1002BT, K1003BT, K1004BT

(Note: These samples are same except for the model number is different for the marketing requirement. So we prepare the K5102BT for test.)

Measurement Procedure Used:

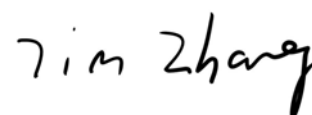
FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.4- 2009

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Mar 20, 2014-Mar 31, 2014

Prepared by :



(Tim.zhang, Engineer)

Approved & Authorized Signer :



(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Bluetooth Keyboard
Model Number	:	K5102BT, K5108BT, K701BT, K702BT, K703BT, K704BT, K1001BT, K1002BT, K1003BT, K1004BT
Frequency Band	:	2402MHz-2480MHz
Number of Channels	:	79
Modulation type	:	GFSK, $\Pi/4$ -DQPSK, 8DPSK
Max Antenna Gain	:	2.78dBi
Bluetooth version	:	Bluetooth V3.0+EDR
Antenna type	:	PCB Antenna
Power Supply	:	DC3.0V(battery)
Applicant	:	Shenzhen MAXIN Technology Industry Co., Ltd.
Address	:	Block C3, East Xueziwei Industrial Zone, Yabian, Shajing, Baoan, Shenzhen, China
Manufacturer	:	Shenzhen MAXIN Technology Industry Co., Ltd.
Address	:	Block C3, East Xueziwei Industrial Zone, Yabian, Shajing, Baoan, Shenzhen, China
Date of sample received	:	Mar 20, 2014
Date of Test	:	Mar 20, 2014-Mar 31, 2014

1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC

The Registration Number is 752051

Listed by Industry Canada

The Registration Number is 5077A-2

Accredited by China National Accreditation Committee
for Laboratories

The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 11, 2014	Jan. 10, 2015
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2014	Jan. 10, 2015
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2014	Jan. 10, 2015
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 11, 2014	Jan. 10, 2015
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2014	Jan. 14, 2015
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan. 15, 2014	Jan. 14, 2015
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2014	Jan. 10, 2015
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2014	Jan. 10, 2015
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 11, 2014	Jan. 10, 2015
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 11, 2014	Jan. 10, 2015

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode

Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2.Configuration and peripherals

EUT

(EUT: Bluetooth Keyboard)

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Power Line Conducted Emission	N/A
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz.

5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

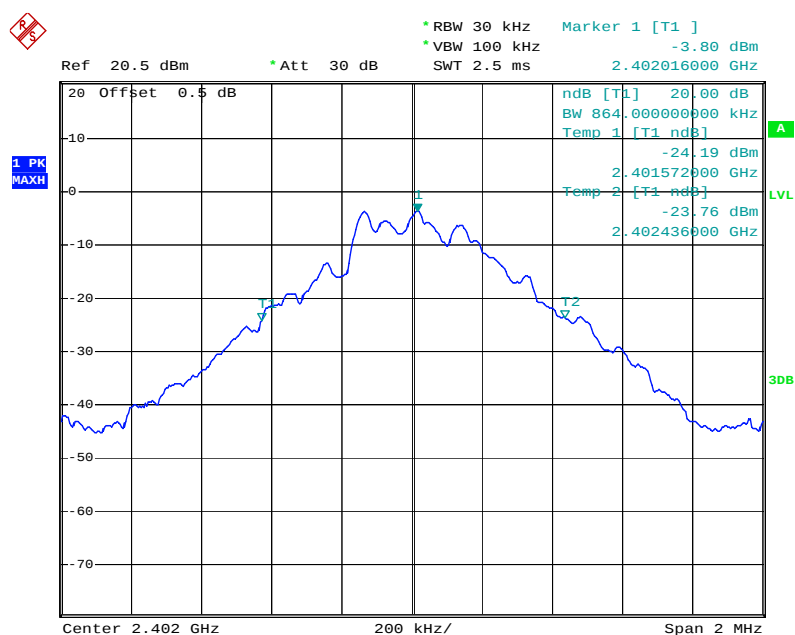
5.6. Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	$\Pi/4$ -DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	0.864	1.220	1.208	Pass
Middle	2441	0.872	1.220	1.212	Pass
High	2480	0.852	1.224	1.212	Pass

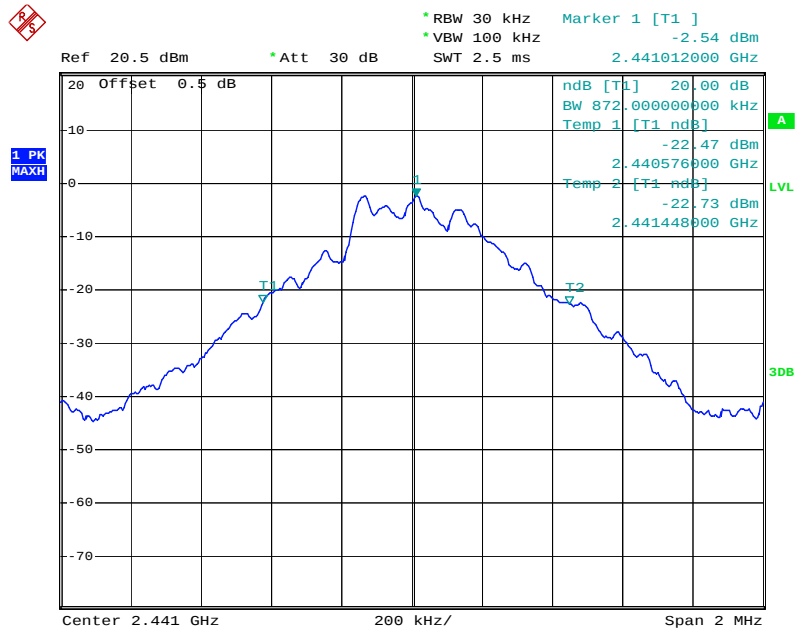
The spectrum analyzer plots are attached as below.

GFSK Mode

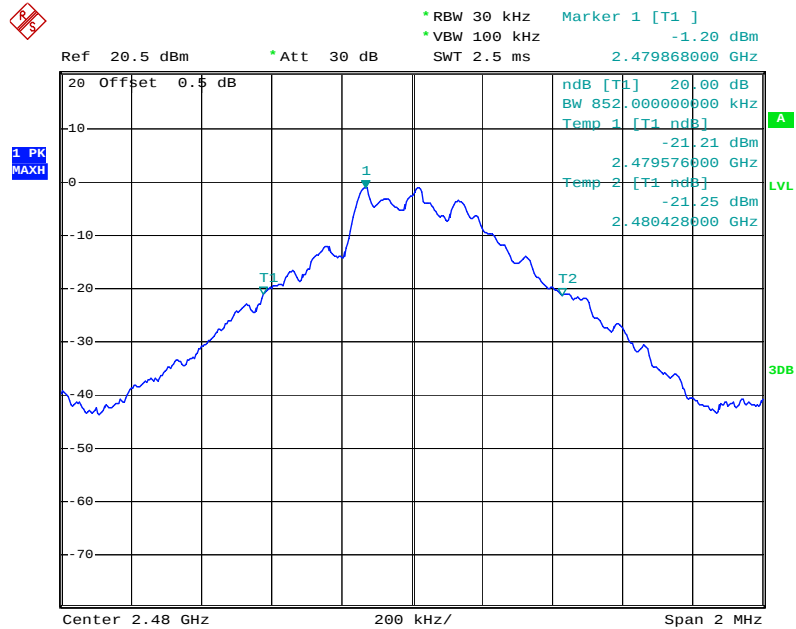
Low channel



Middle channel

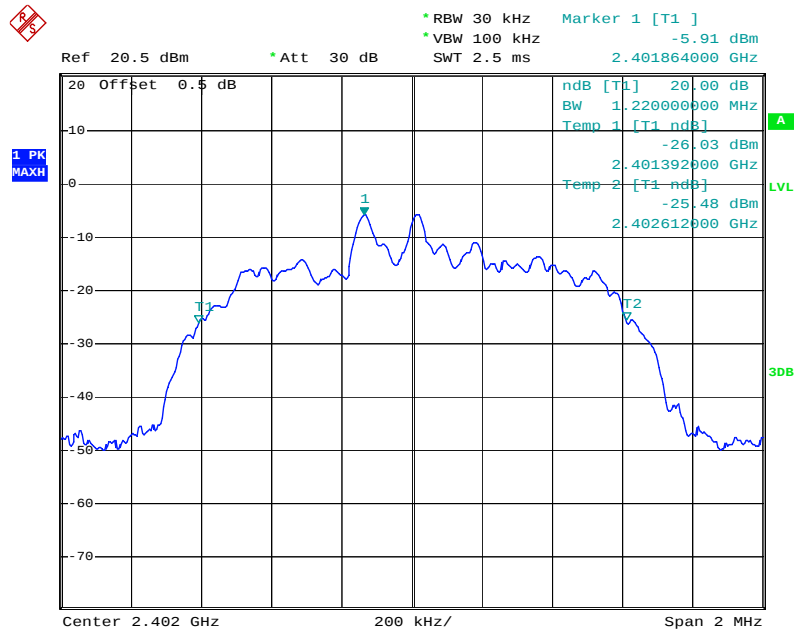


High channel

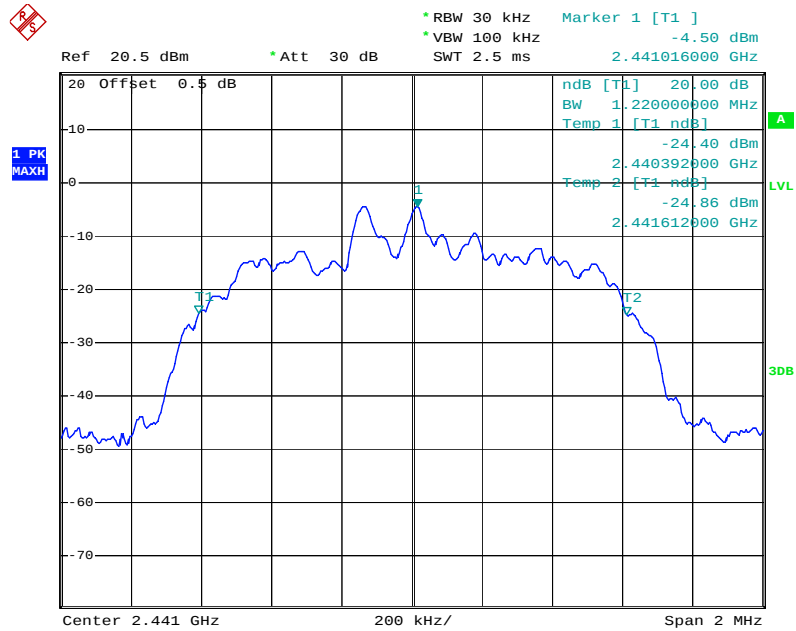


Π/4-DQPSK Mode

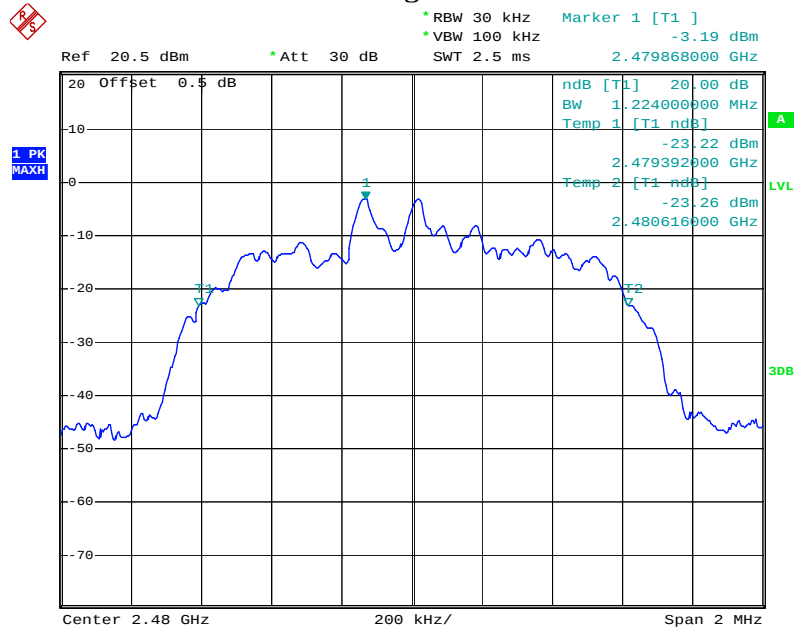
Low channel



Middle channel

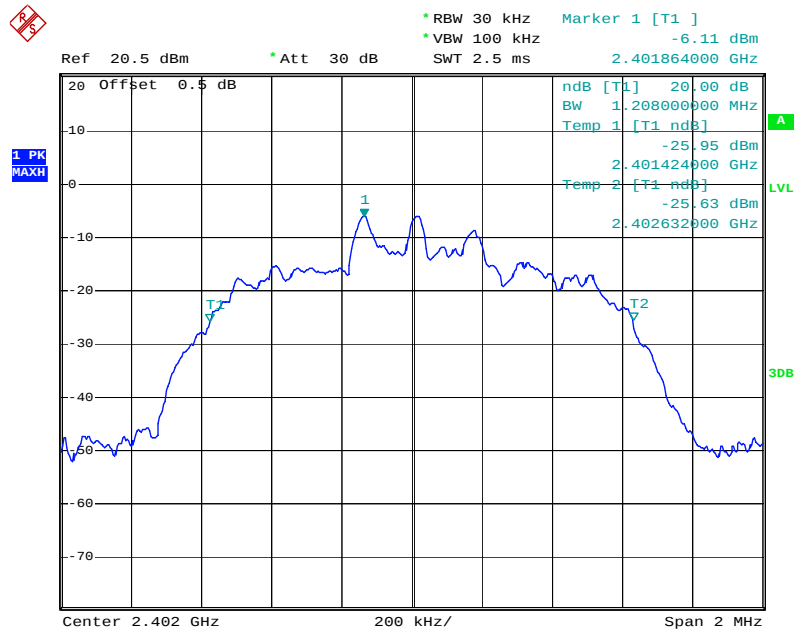


High channel

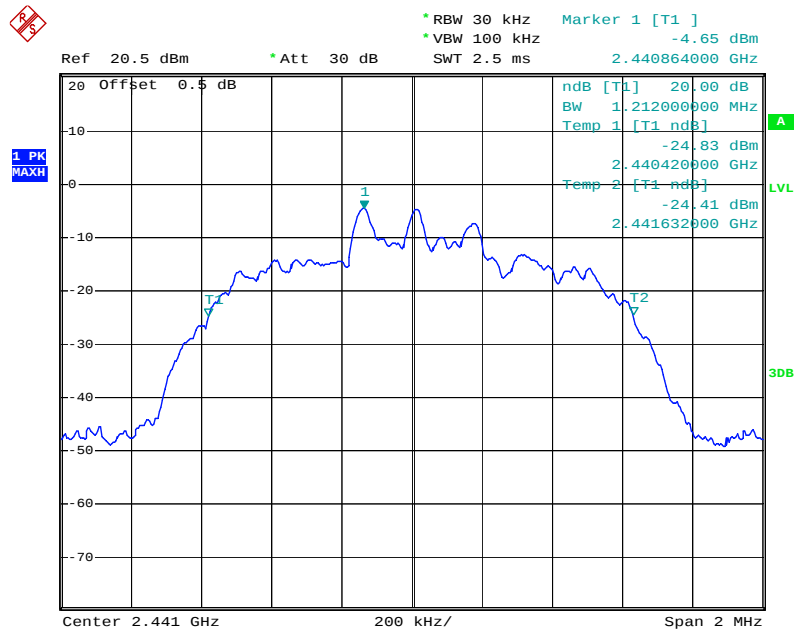


8DPSK Mode

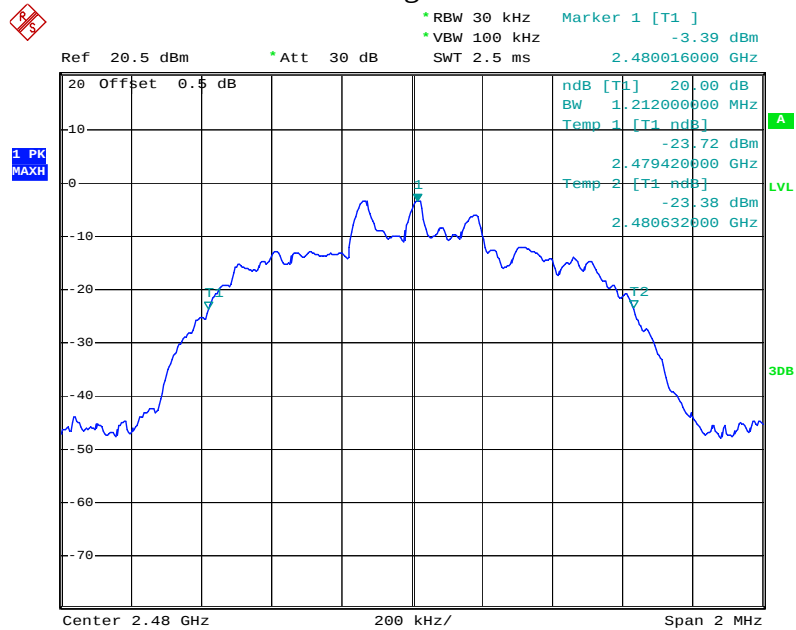
Low channel



Middle channel



High channel



6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5. Test Procedure

- 6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 6.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz. Adjust Span to 3 MHz.
- 6.5.3. Set the adjacent channel of the EUT maxhold another trace.
- 6.5.4. Measurement the channel separation

6.6. Test Result

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.026	25KHz or 20dB bandwidth	PASS
	2403			
Middle	2440	1.008	25KHz or 20dB bandwidth	PASS
	2441			
High	2479	1.002	25KHz or 20dB bandwidth	PASS
	2480			

Π/4-DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.020	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.008	25KHz or 2/3*20dB bandwidth	PASS
	2480			

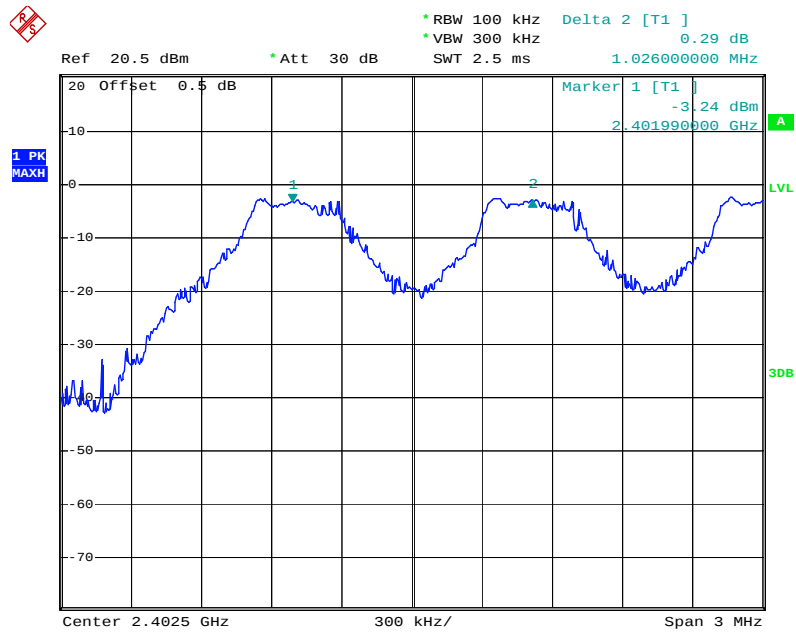
8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.008	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2480			

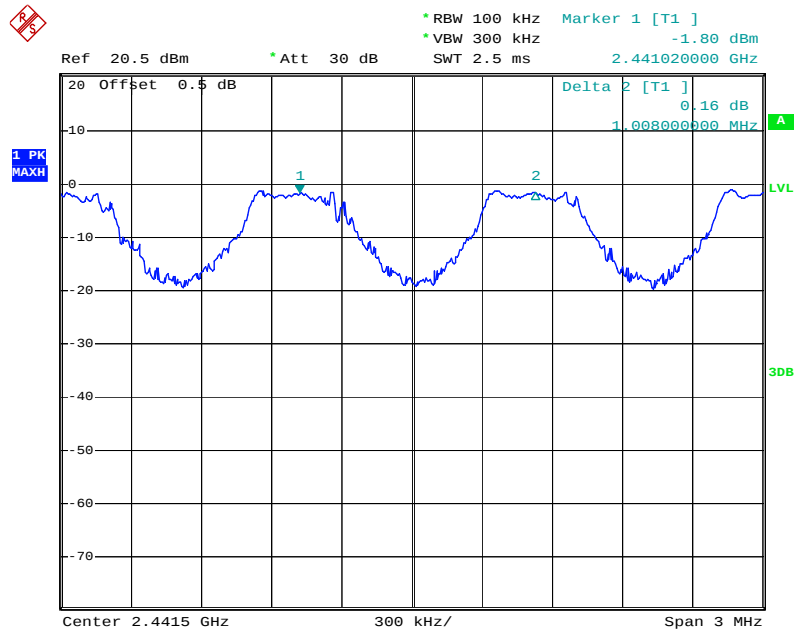
The spectrum analyzer plots are attached as below.

GFSK Mode

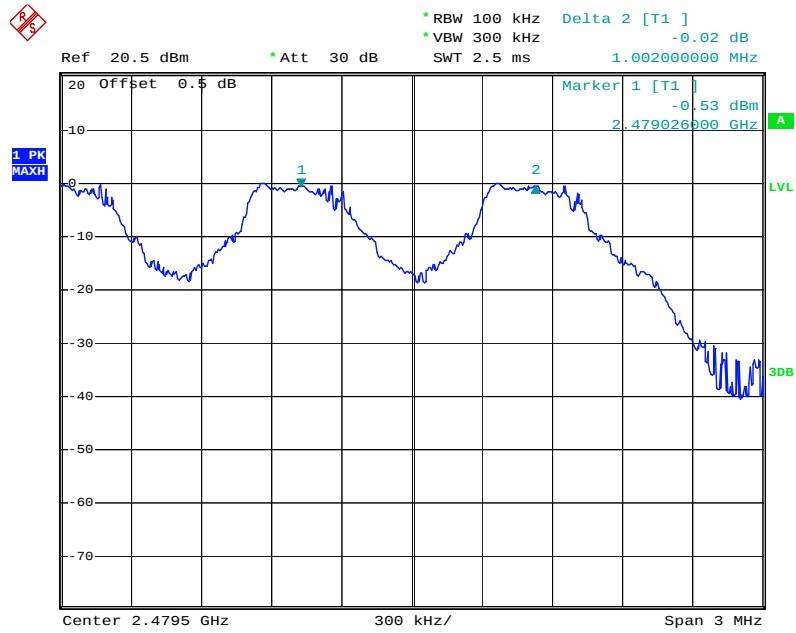
Low channel



Middle channel

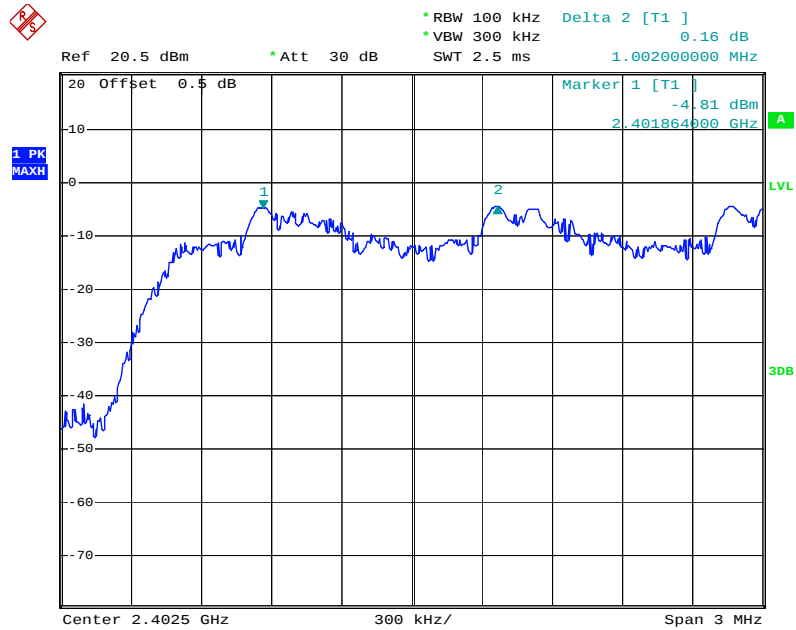


High channel

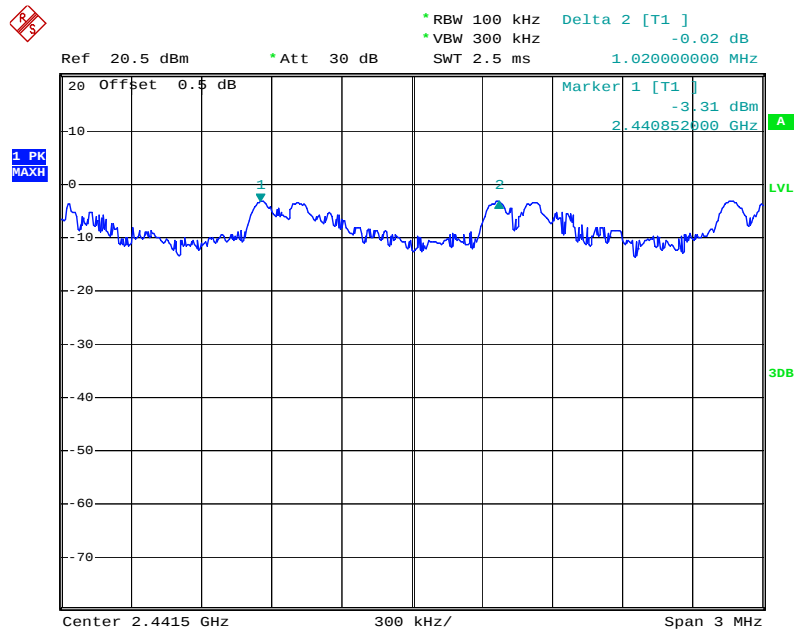


II/4-DQPSK Mode

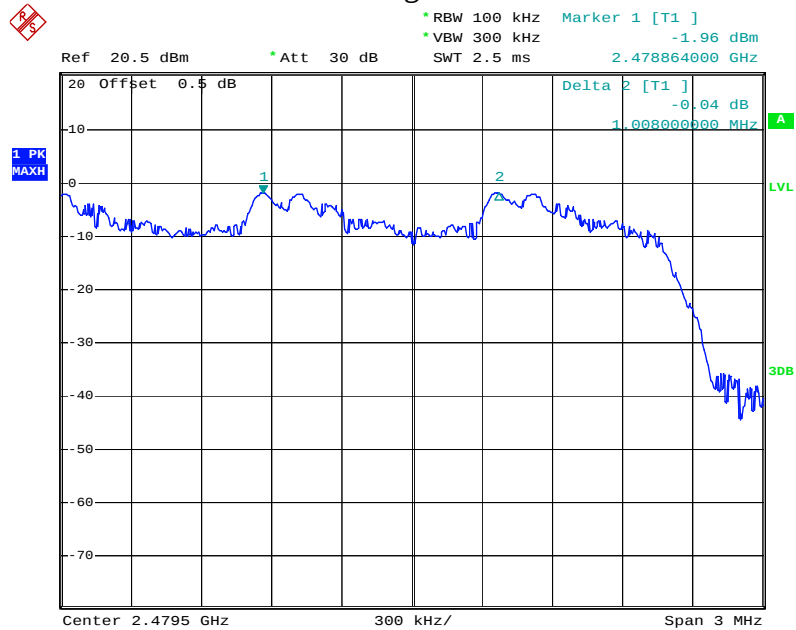
Low channel



Middle channel

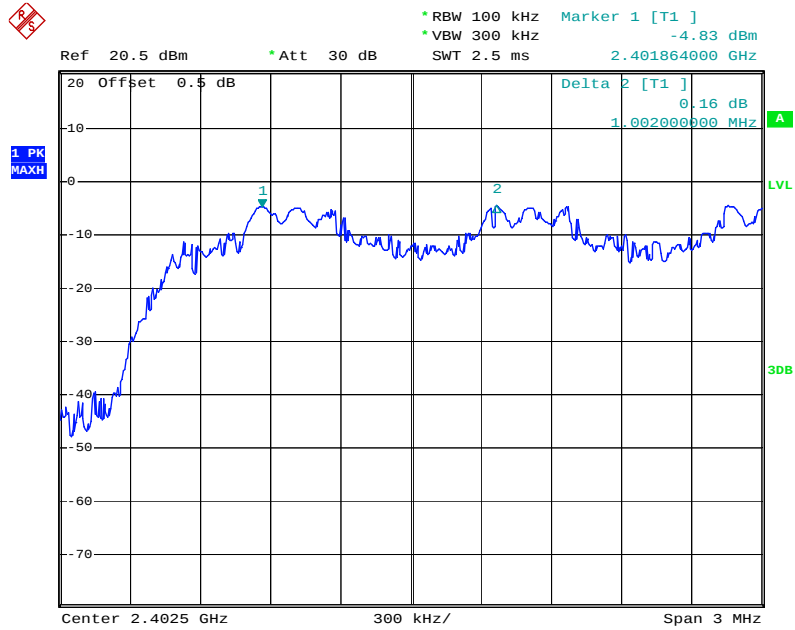


High channel

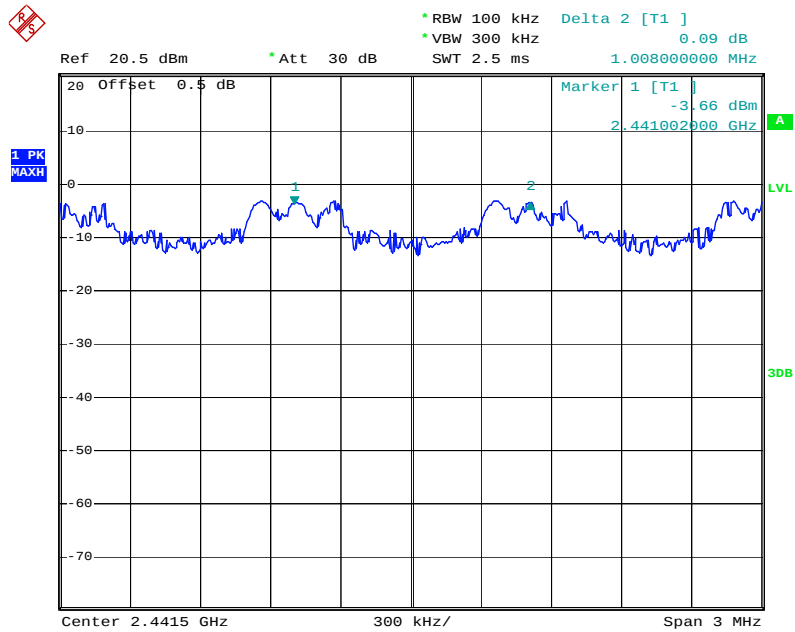


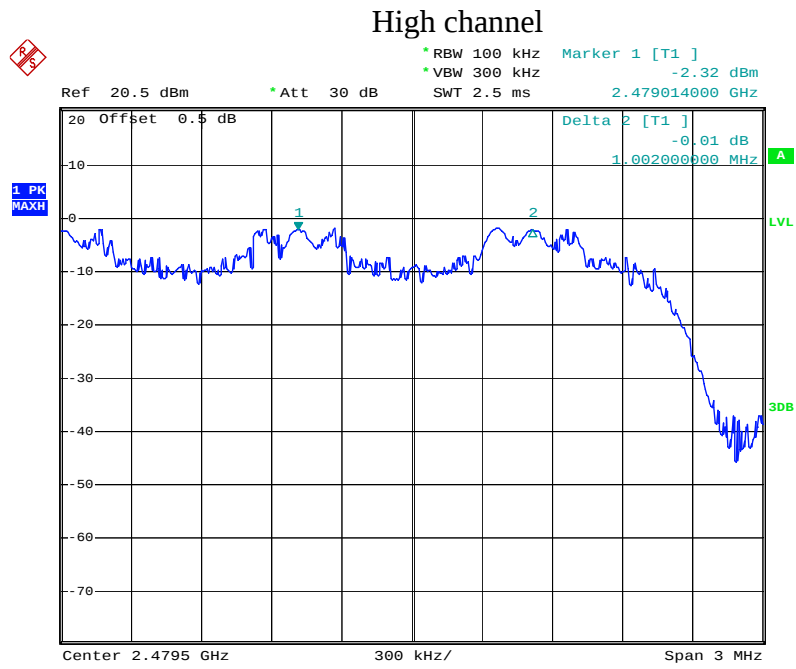
8DPSK Mode

Low channel



Middle channel





7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

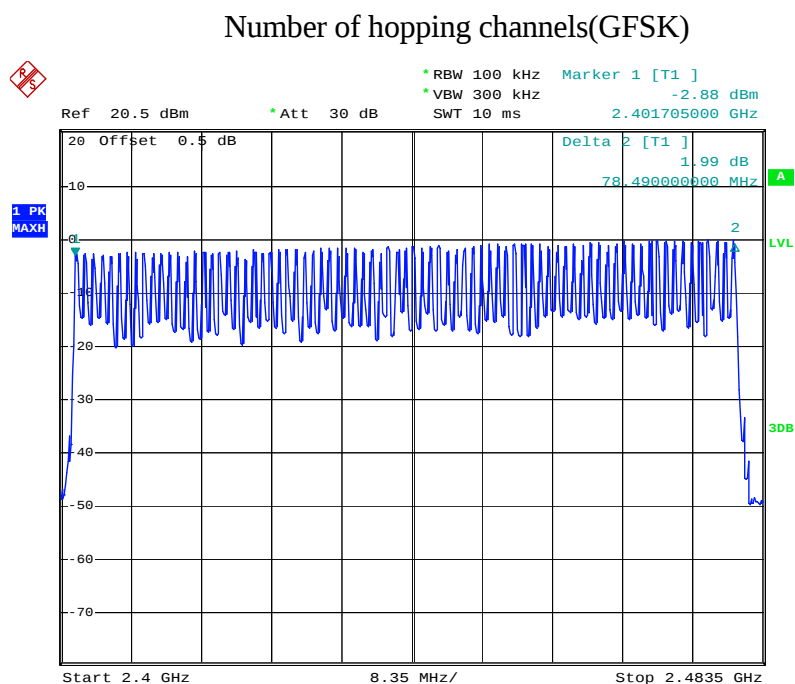
7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

7.5.3. Max hold, view and count how many channel in the band.

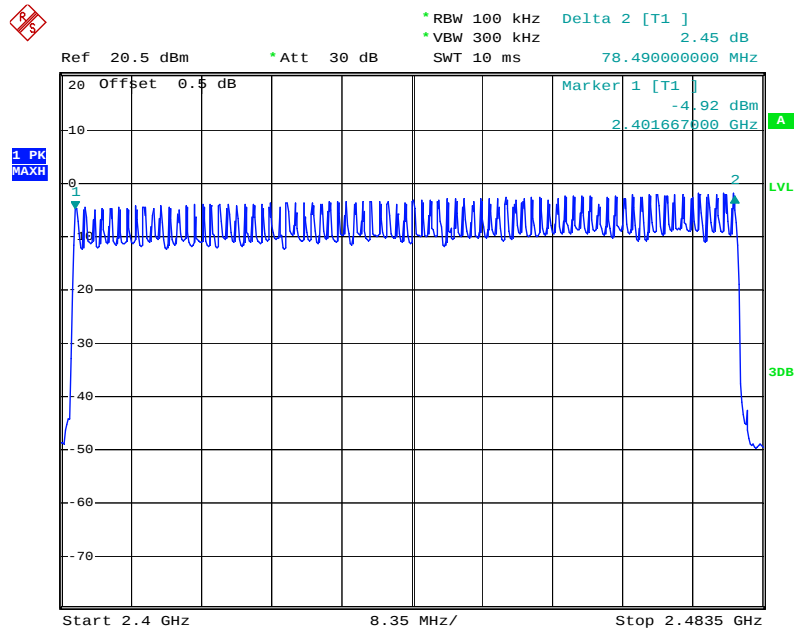
7.6. Test Result

Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	≥ 15

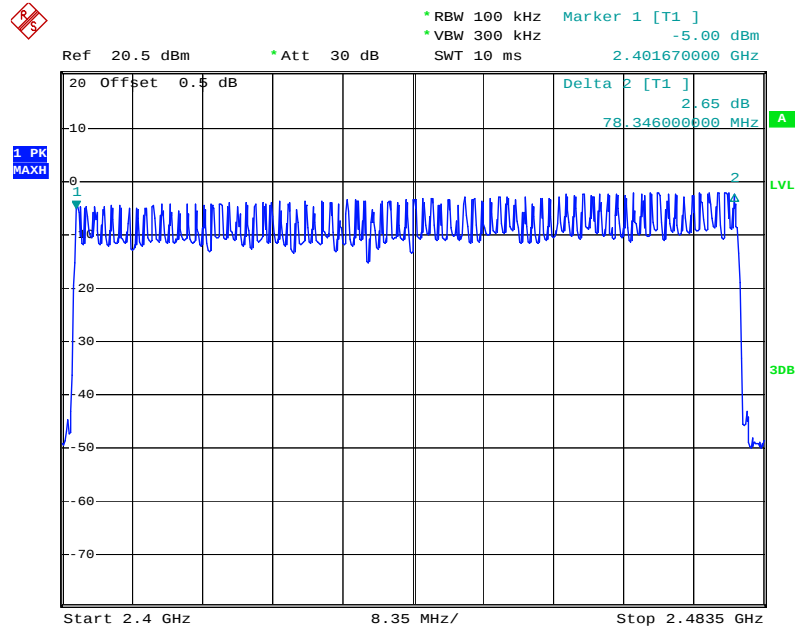
The spectrum analyzer plots are attached as below.



Number of hopping channels($\Pi/4$ -DQPSK)



Number of hopping channels(8DPSK)



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5. Test Procedure

8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2. Set center frequency of spectrum analyzer = operating frequency.

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=5ms, 10ms, 15ms. Get the pulse time.

8.5.4.Repeat above procedures until all frequency measured were complete.

8.6.Test Result

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.415	132.80	400
	2441	0.410	131.20	400
	2480	0.415	132.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.680	268.80	400
	2441	1.695	271.20	400
	2480	1.680	268.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.960	315.73	400
	2441	2.960	315.73	400
	2480	2.960	315.73	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

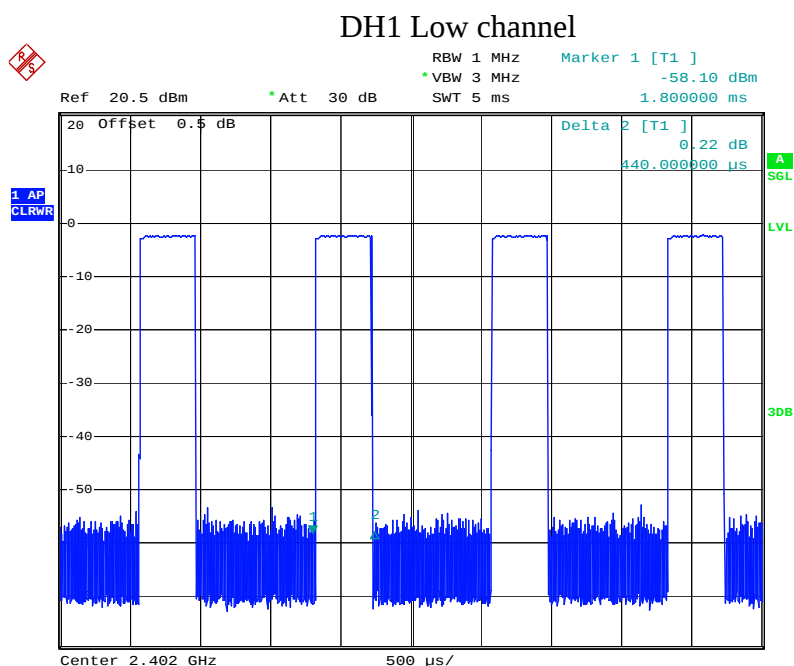
Π/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.450	144.00	400
	2441	0.450	144.00	400
	2480	0.440	140.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.740	278.40	400
	2441	1.740	278.40	400
	2480	1.720	275.20	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.970	316.80	400
	2441	2.970	316.80	400
	2480	2.970	316.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

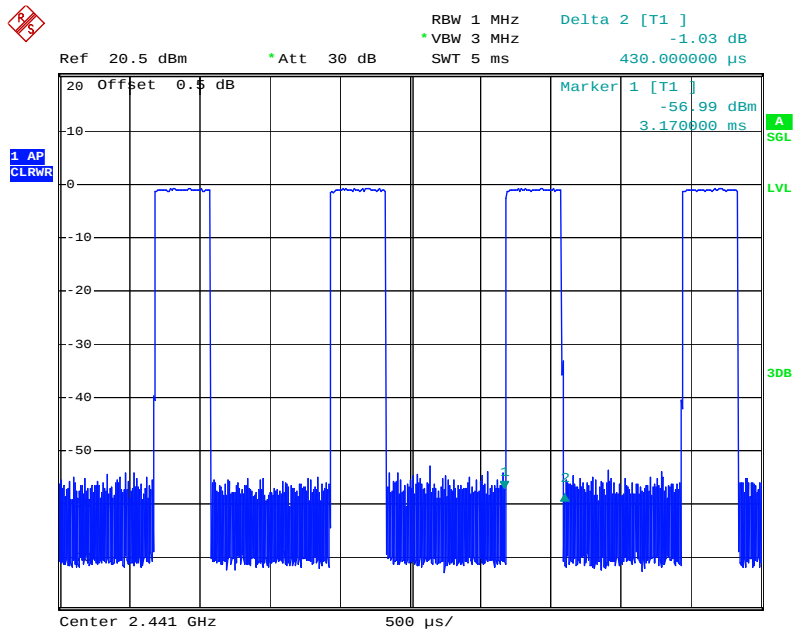
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.440	140.80	400
	2441	0.440	140.80	400
	2480	0.440	140.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.680	268.80	400
	2441	1.720	275.20	400
	2480	1.700	272.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	3.000	320.00	400
	2441	3.000	320.00	400
	2480	3.030	323.20	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

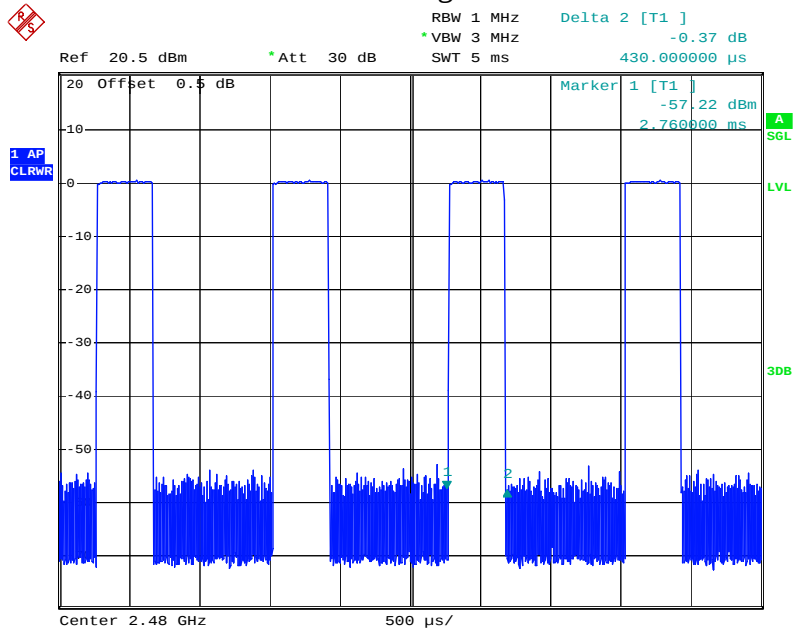
The spectrum analyzer plots are attached as below.



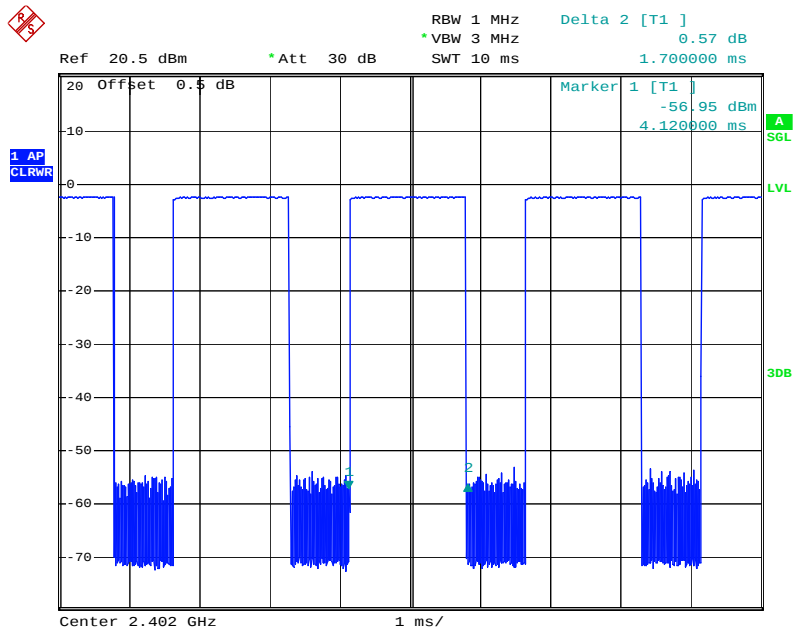
DH1 Middle channel



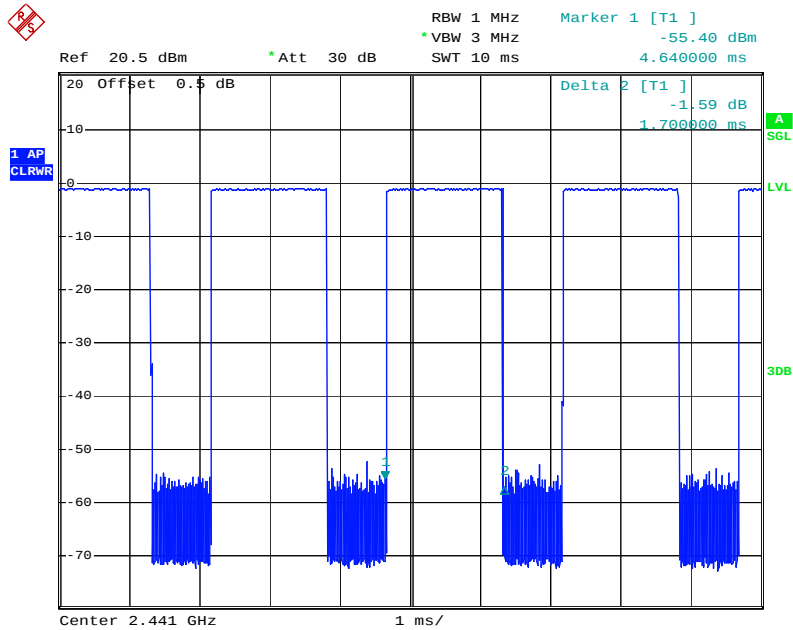
DH1 High channel



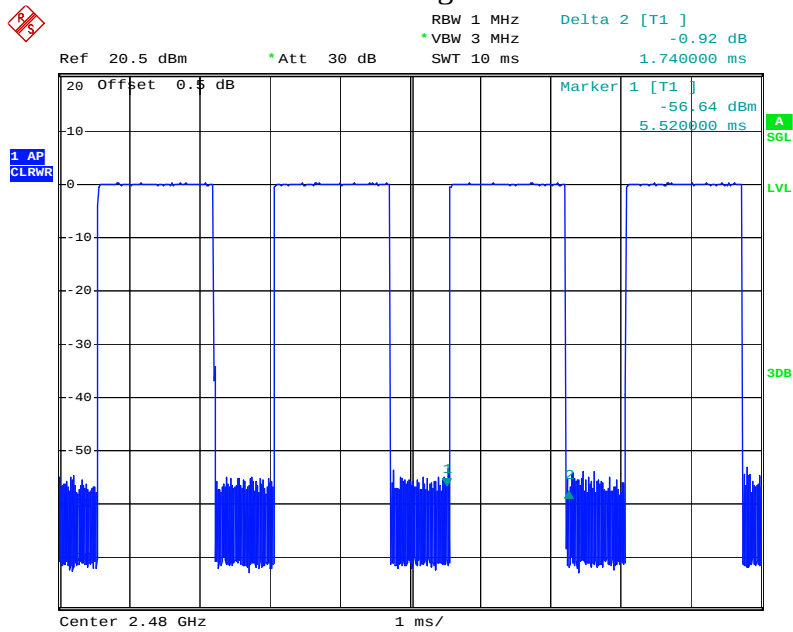
DH3 Low channel



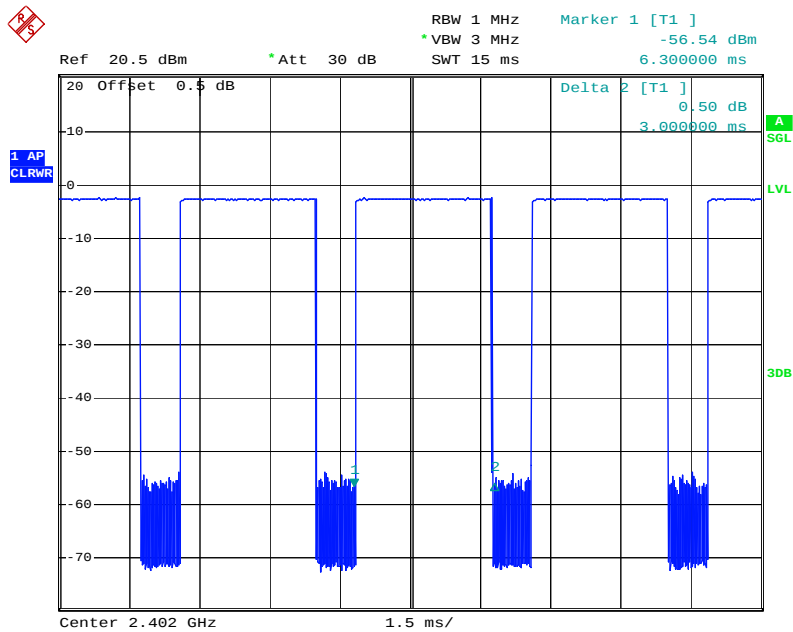
DH3 Middle channel



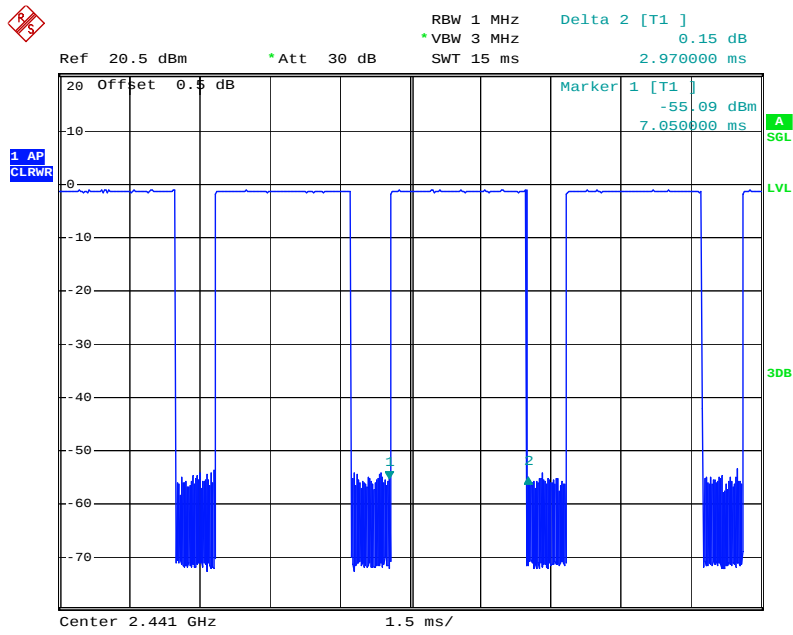
DH3 High channel



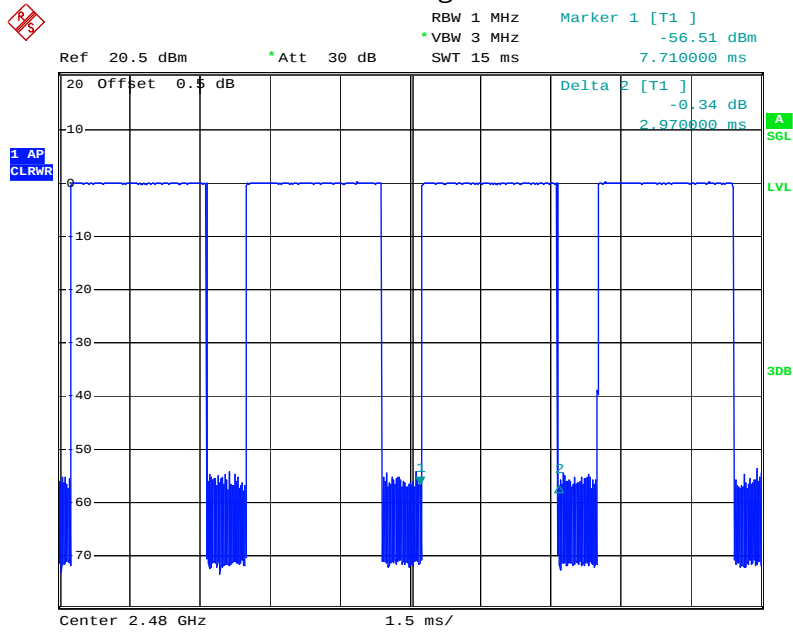
DH5 Low channel



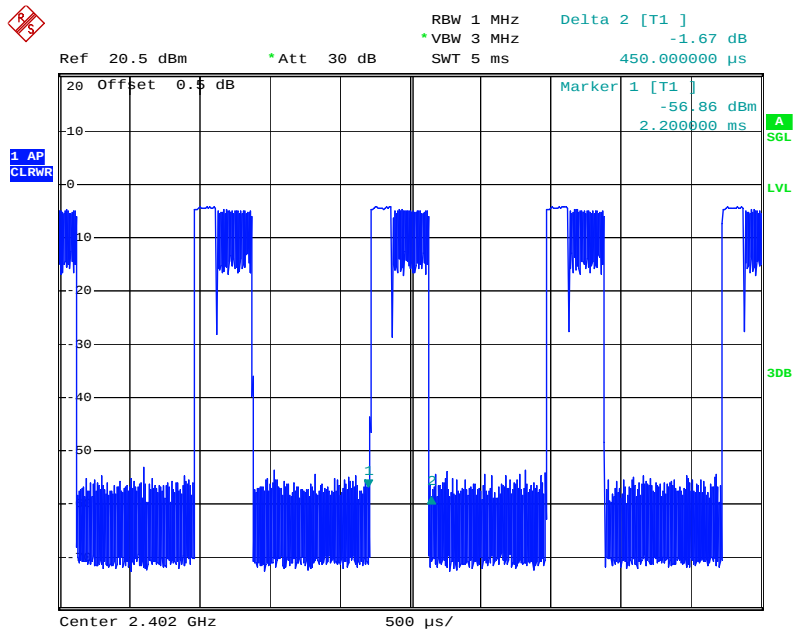
DH5 Middle channel



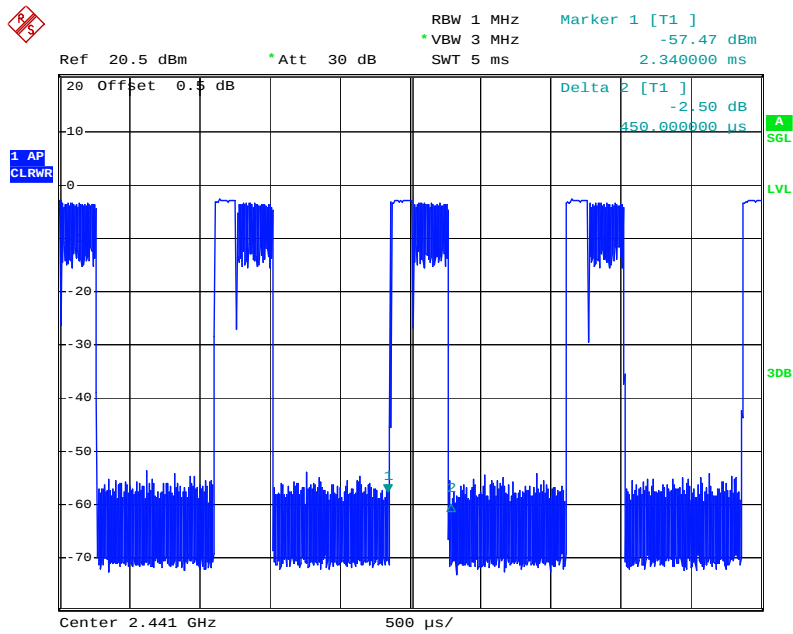
DH5 High channel



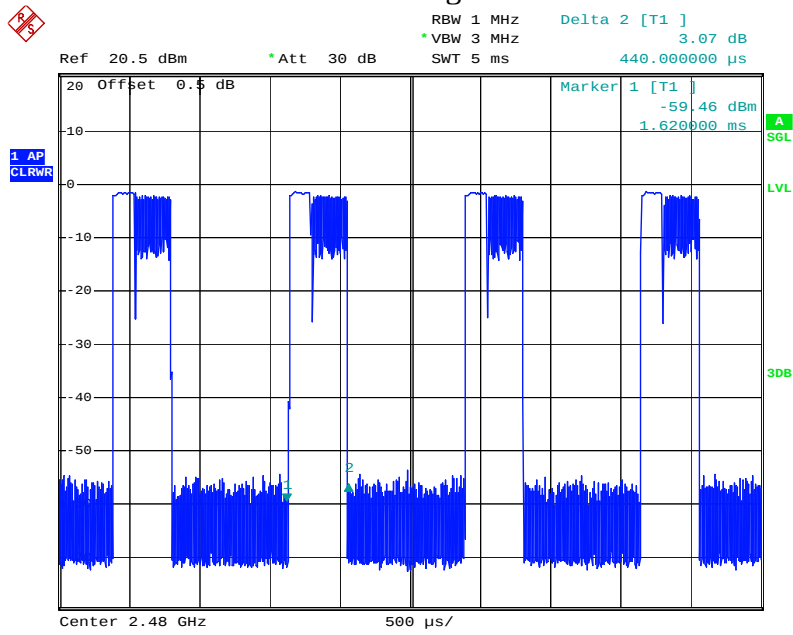
2DH1 Low channel



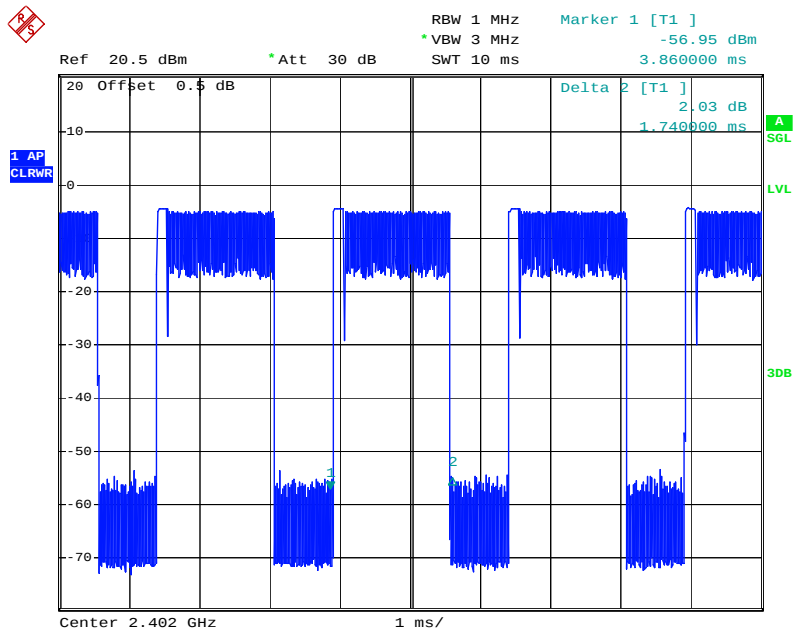
2DH1 Middle channel



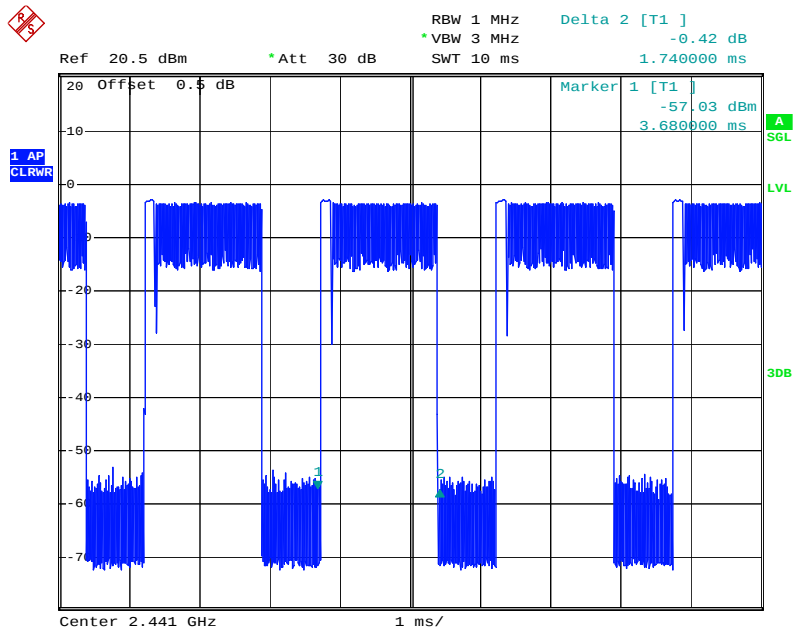
2DH1 High channel



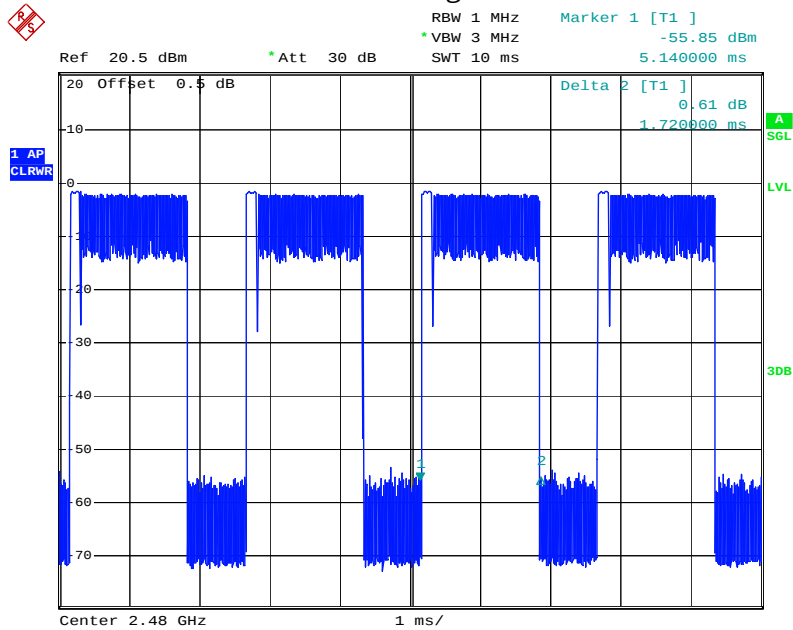
2DH3 Low channel



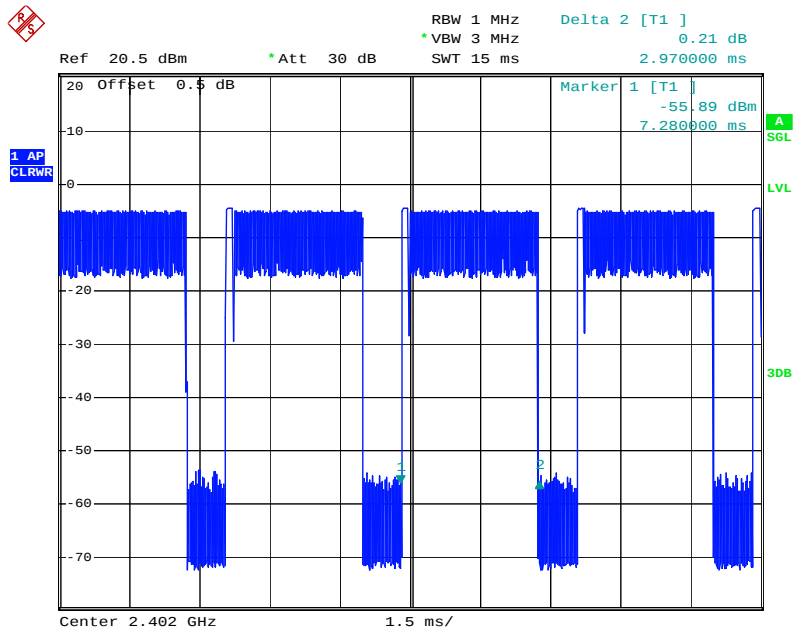
2DH3 Middle channel



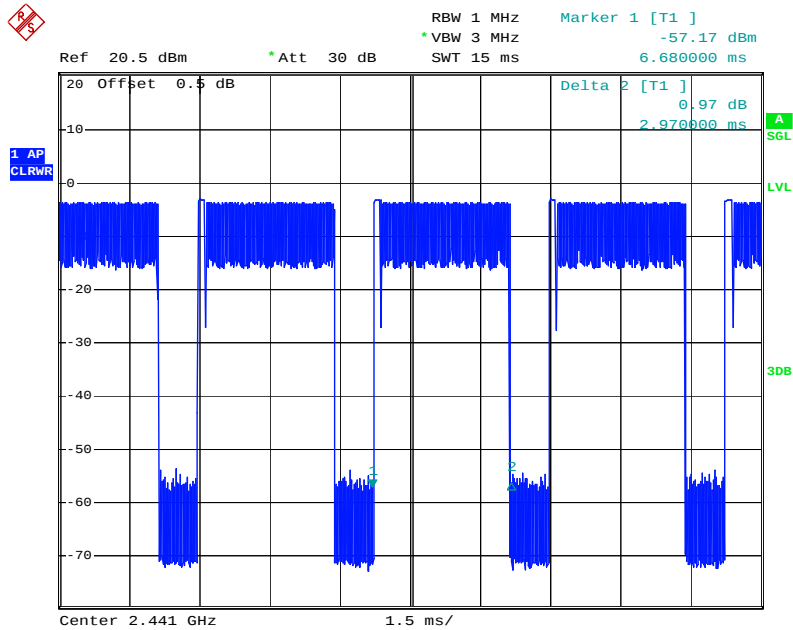
2DH3 High channel



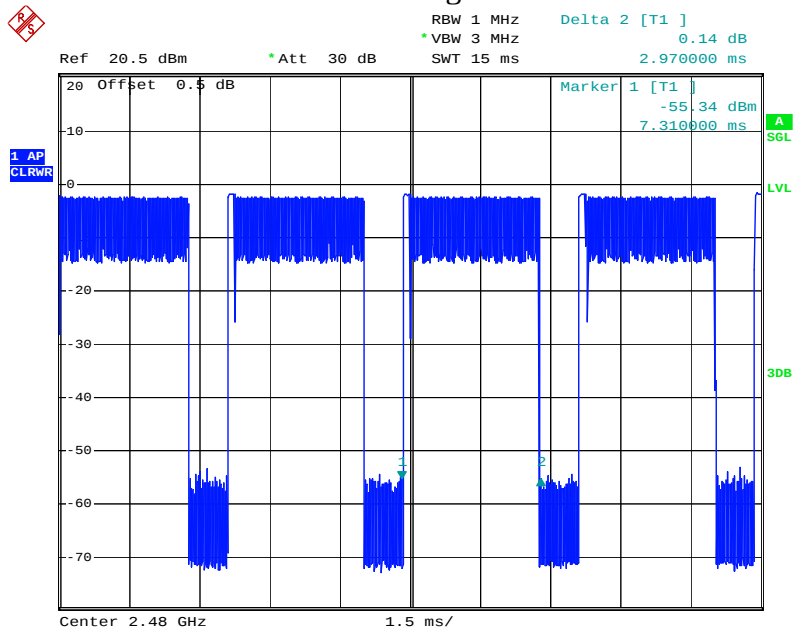
2DH5 Low channel



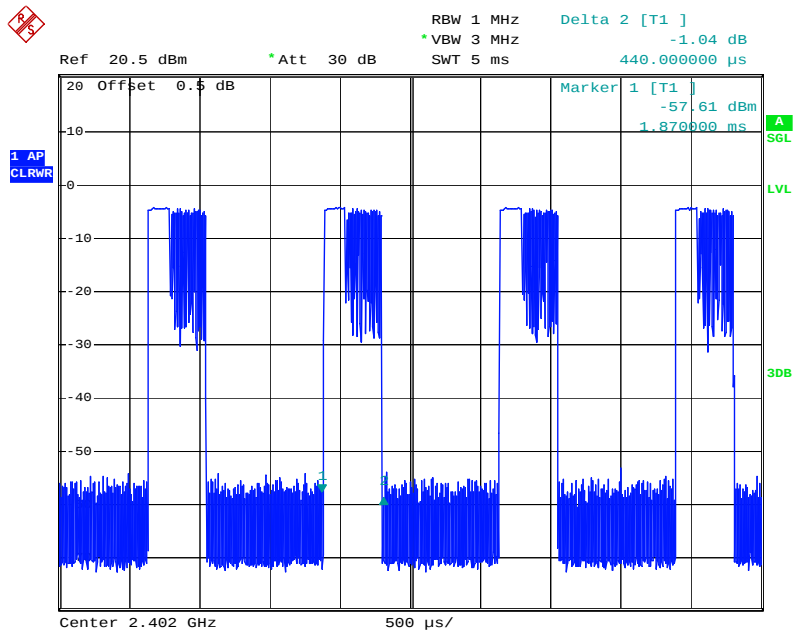
2DH5 Middle channel



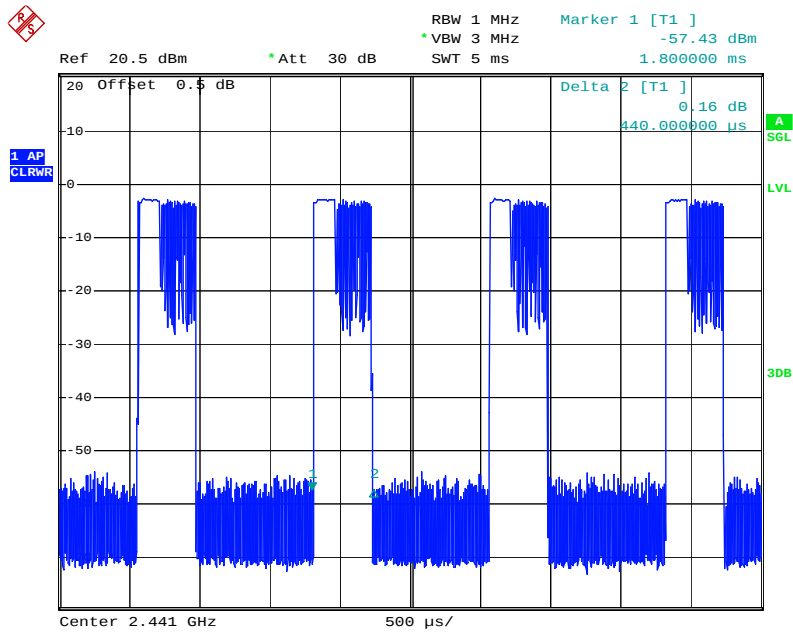
2DH5 High channel



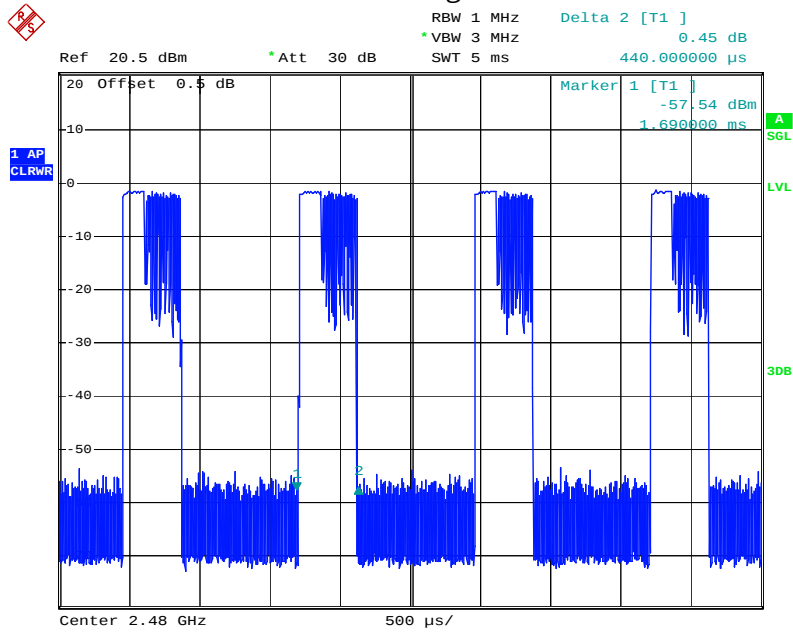
3DH1 Low channel



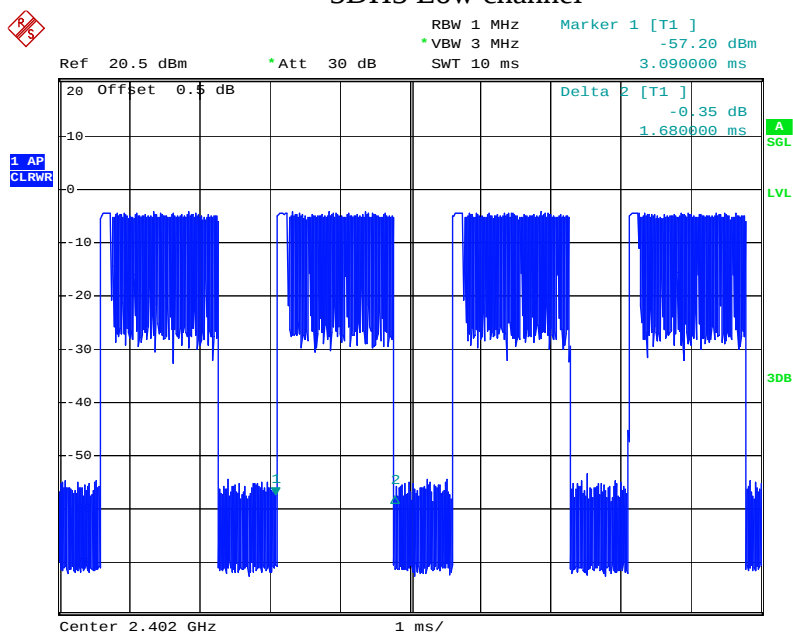
3DH1 Middle channel



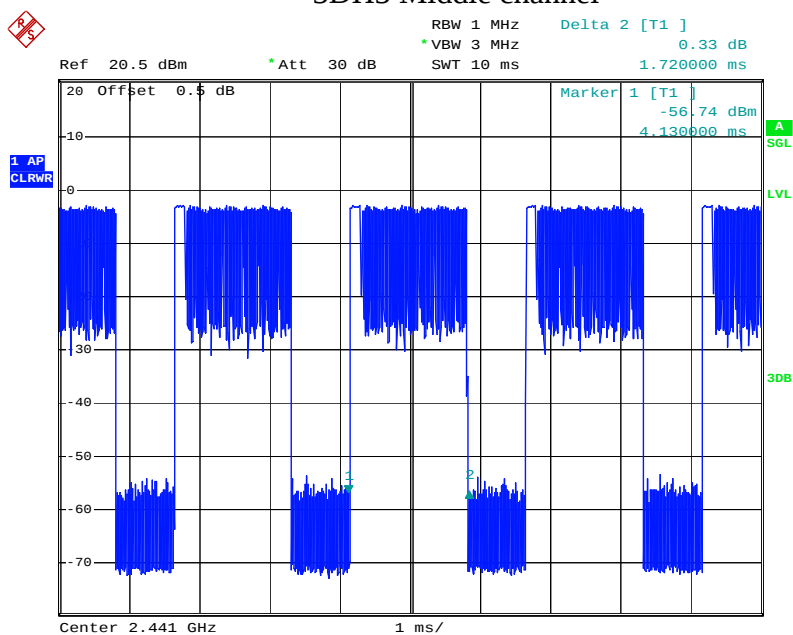
3DH1 High channel



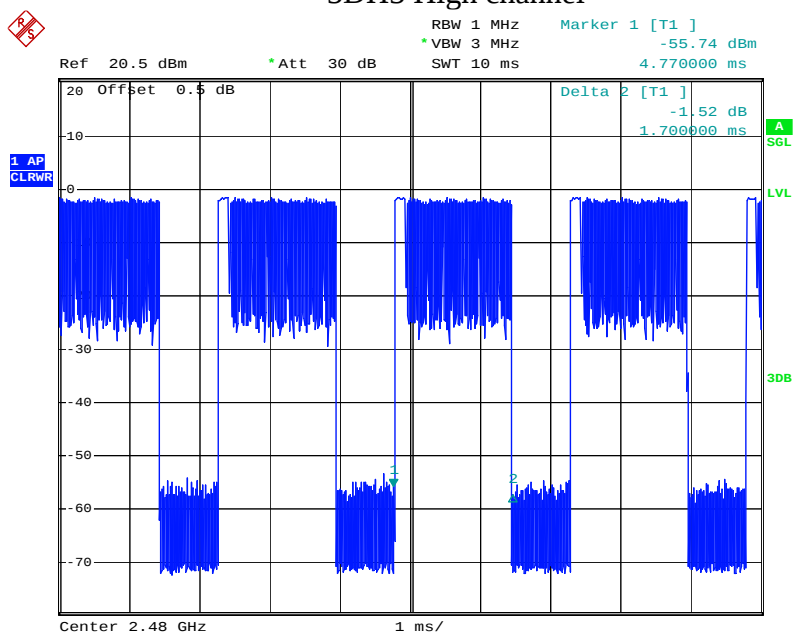
3DH3 Low channel



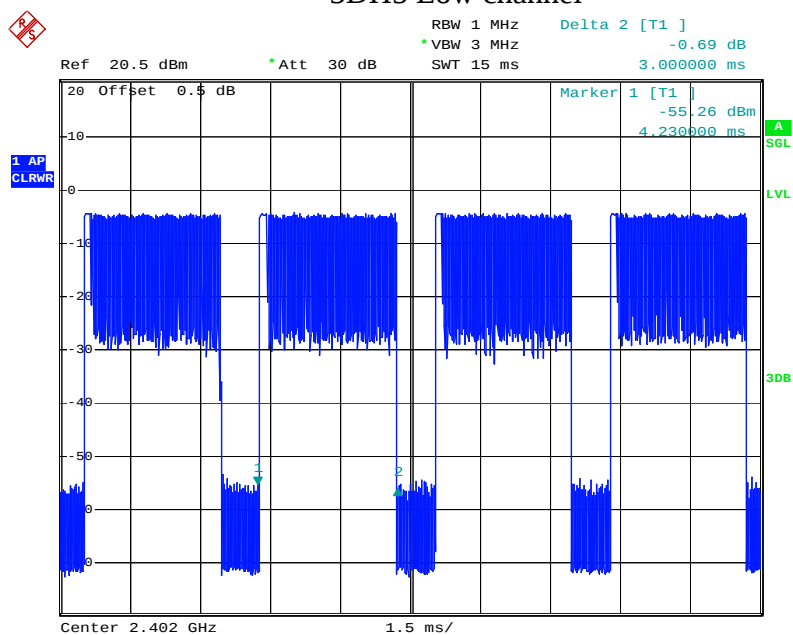
3DH3 Middle channel



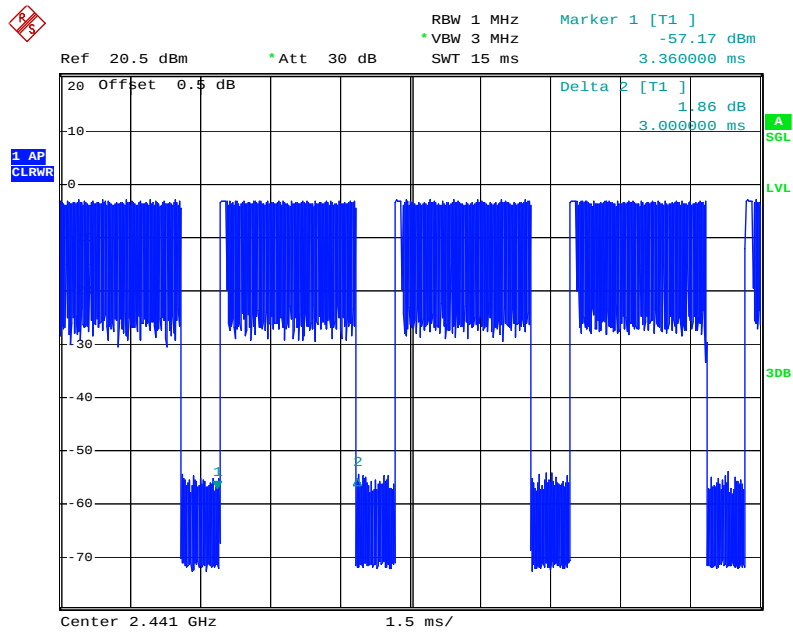
3DH3 High channel



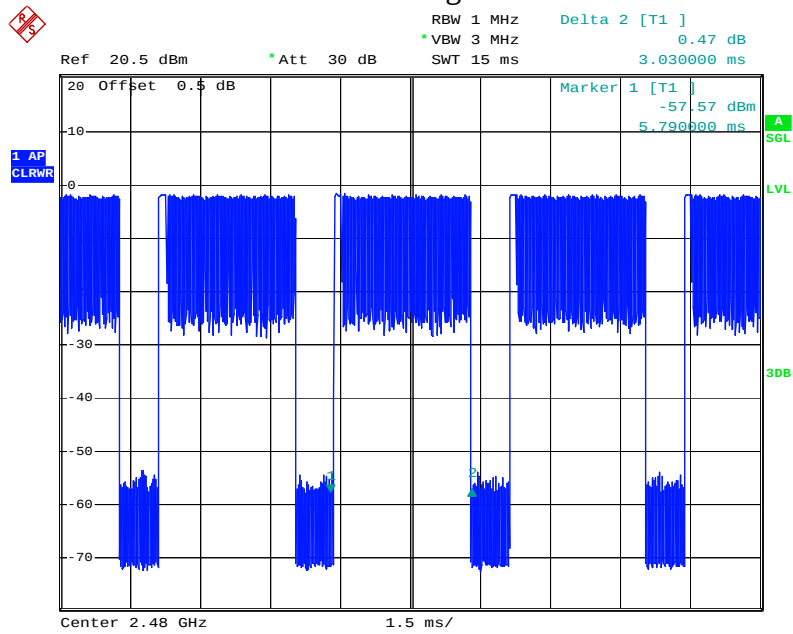
3DH5 Low channel



3DH5 Middle channel

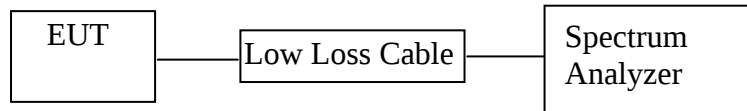


3DH5 High channel



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz for GFSK mode

9.5.3. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz for other mode

9.5.4. Measurement the maximum peak output power.

9.6.Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-2.09/0.0006	30 / 1.0
Middle	2441	-0.72/0.0008	30 / 1.0
High	2480	0.50/0.0011	30 / 1.0

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-3.95/0.0004	21 / 0.125
Middle	2441	-2.53/0.0006	21 / 0.125
High	2480	-1.27/0.0007	21 / 0.125

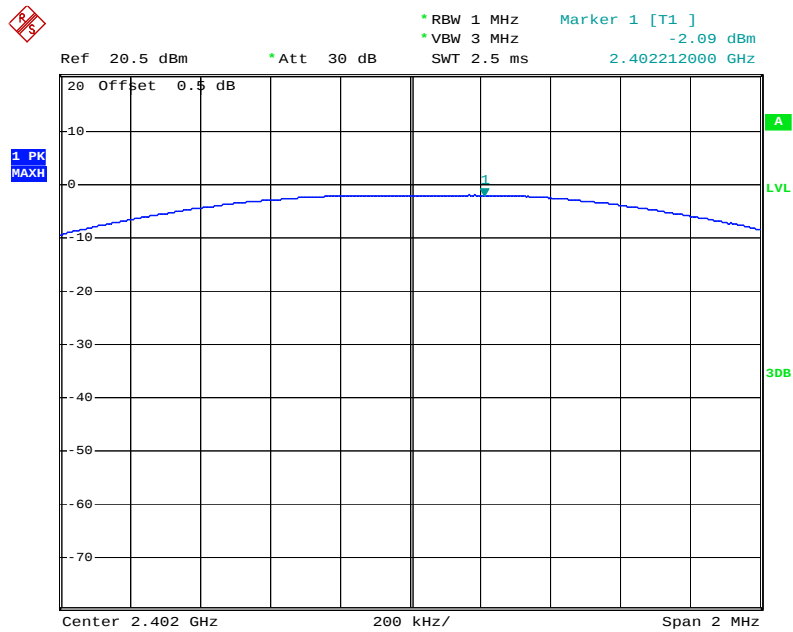
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-3.83/0.0004	21 / 0.125
Middle	2441	-2.43/0.0006	21 / 0.125
High	2480	-1.17/0.0008	21 / 0.125

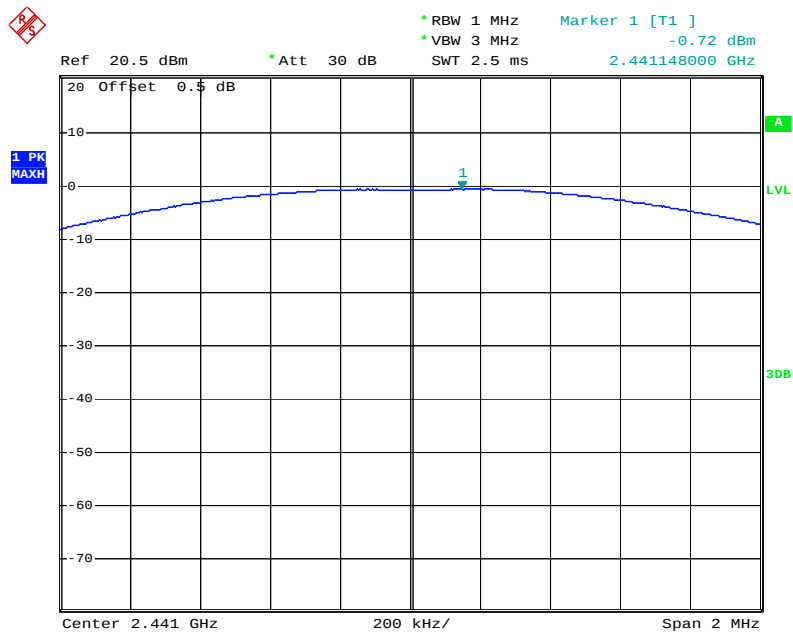
The spectrum analyzer plots are attached as below.

GFSK Mode

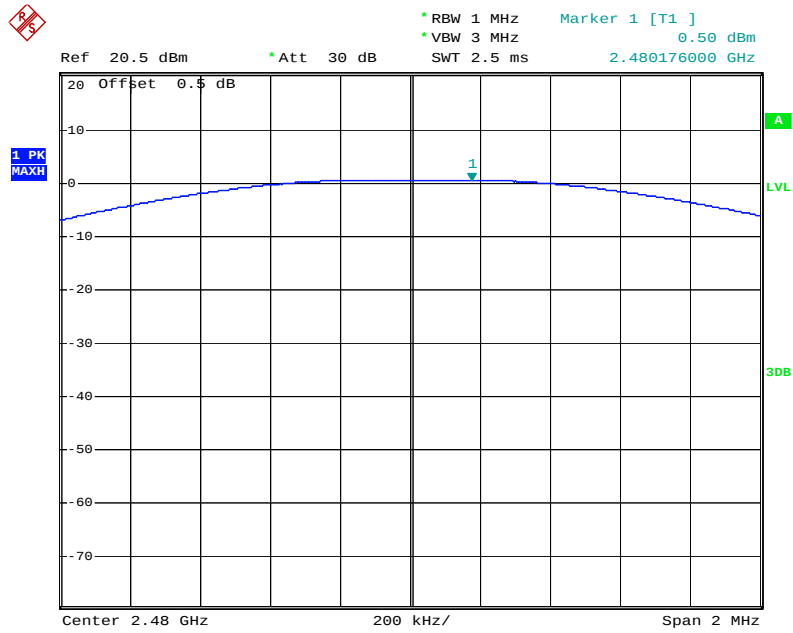
Low channel



Middle channel

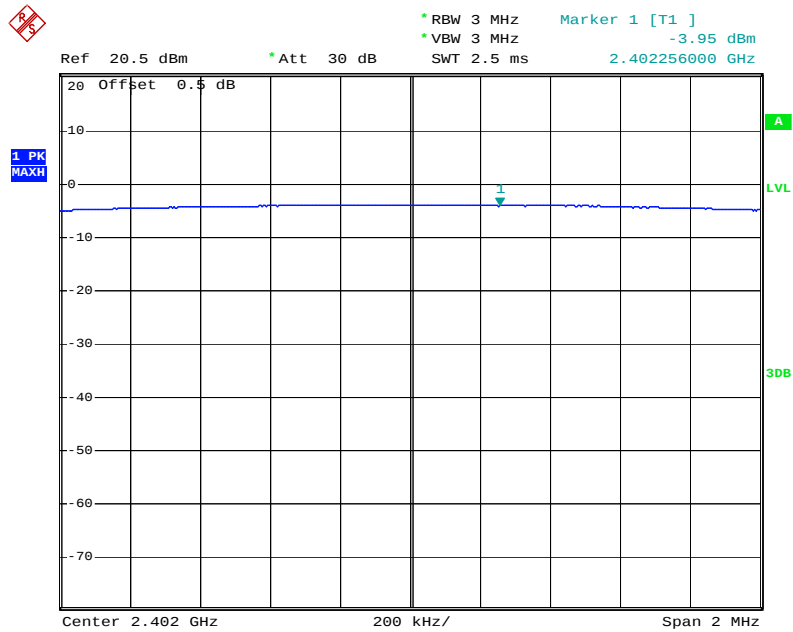


High channel

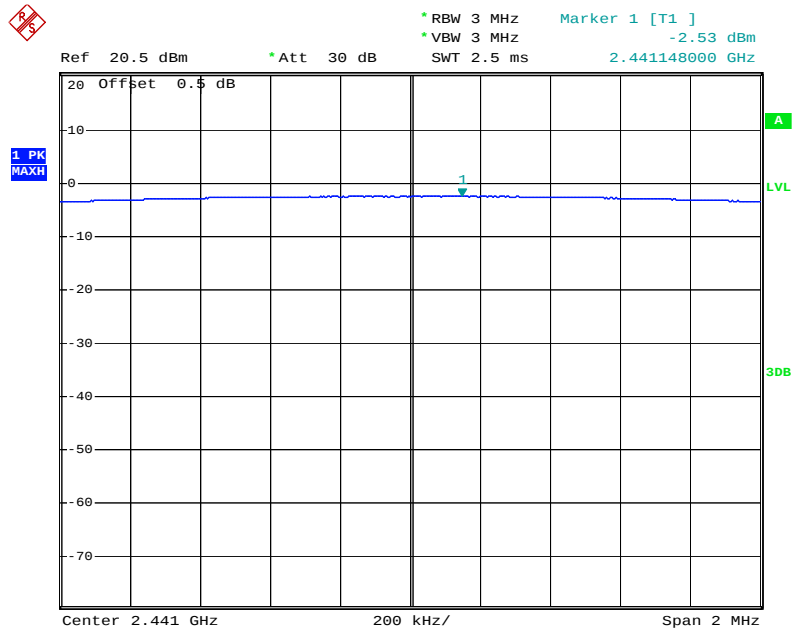


$\Pi/4$ -DQPSK Mode

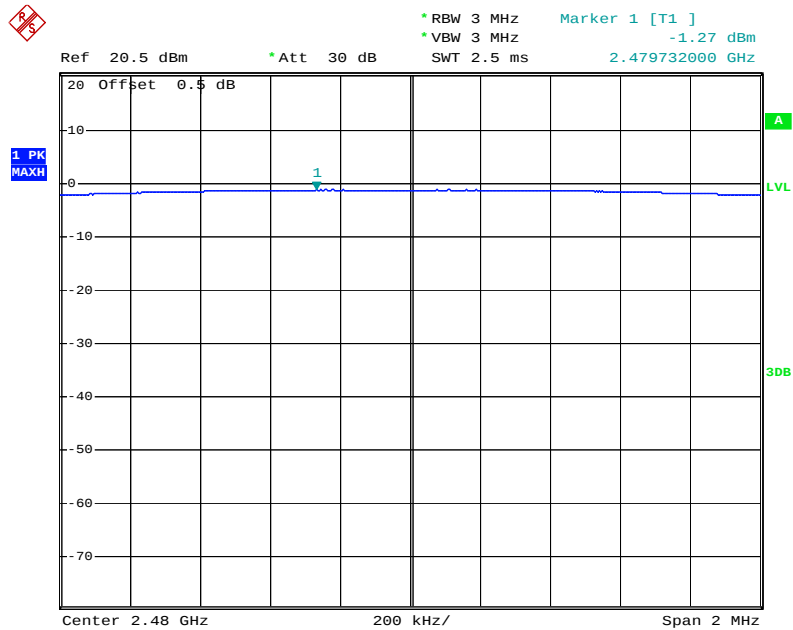
Low channel



Middle channel

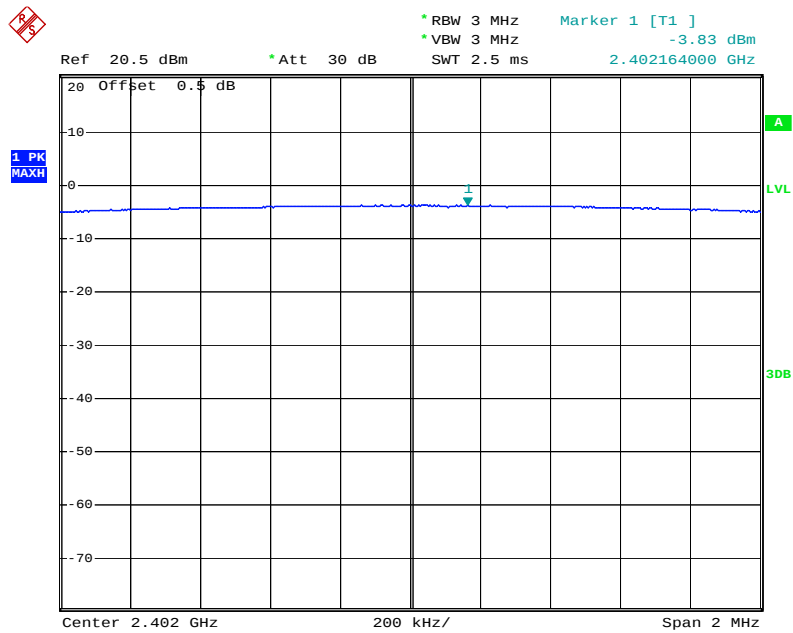


High channel

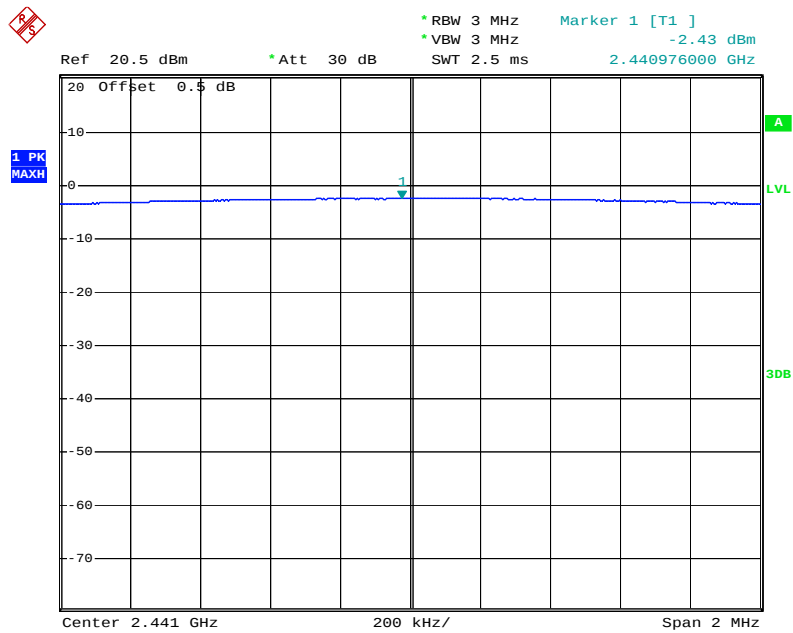


8DPSK Mode

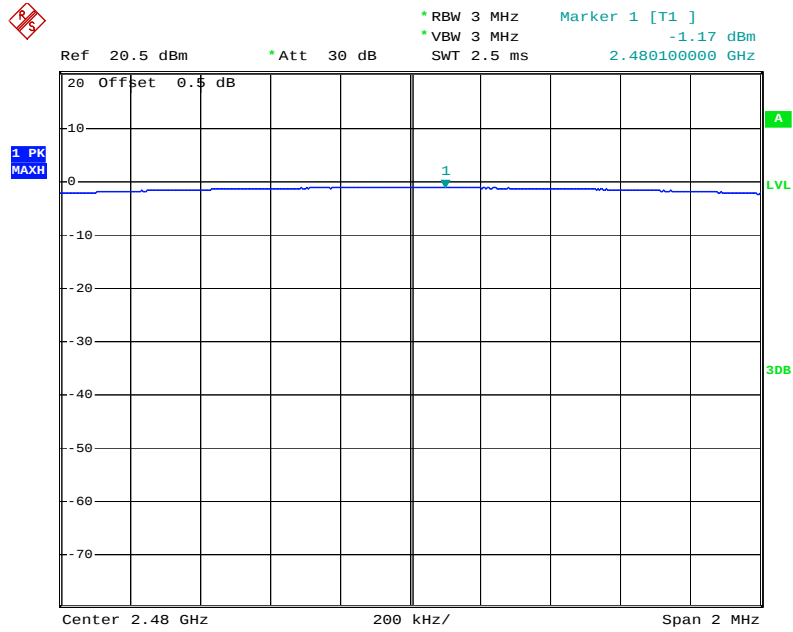
Low channel



Middle channel



High channel



10.RADIATED EMISSION TEST

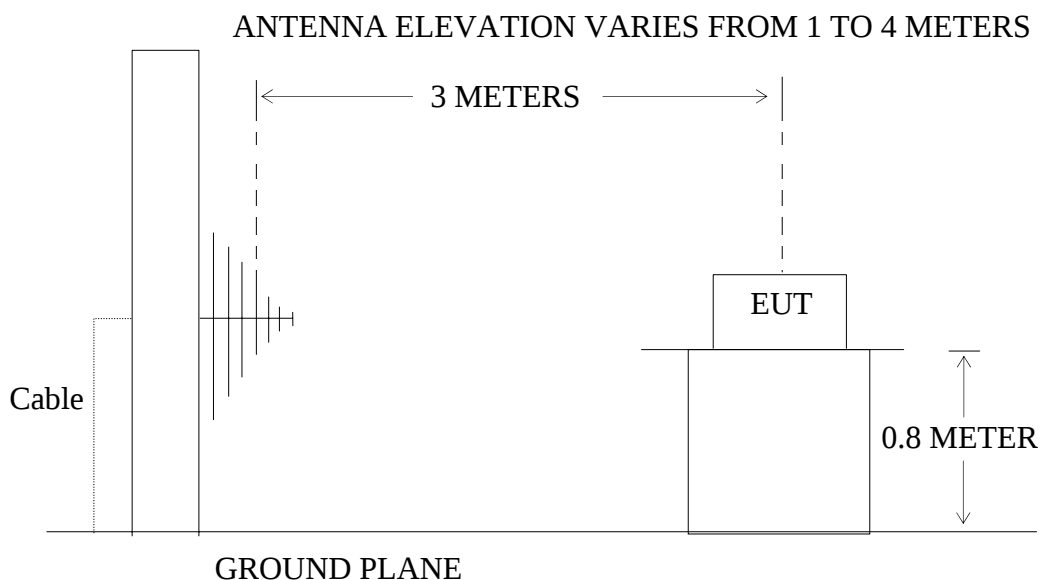
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and simulators



(EUT: Bluetooth Keyboard)

10.1.2.Anechoic Chamber Test Setup Diagram



10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4- 2009 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120 KHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

10.6. The Field Strength of Radiation Emission Measurement Results

Note: 1. We tested GFSK mode, $\pi/4$ -DQPSK Mode & 8DPSK mode and recorded the worst case data (GFSK mode) for all test mode.

2. The 18-25GHz emissions are not reported, because the levels are too low against the limit.

Below 1GHz



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Site: 1# Chamber

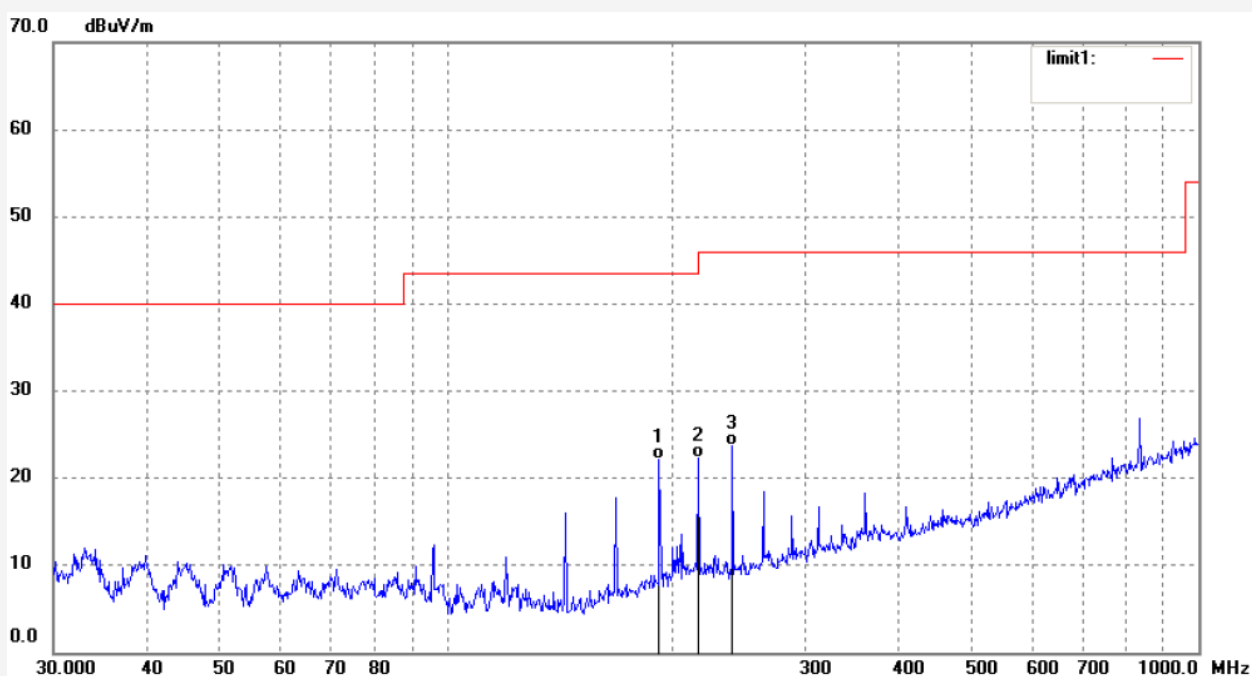
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: alen #3816
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth keyboard
Mode: TX 2402MHz
Model: K5102BT
Manufacturer: MAXIN

Polarization: Horizontal
Power Source: DC 3V
Date: 2014/03/29
Time: 11:52:25
Engineer Signature:
Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	191.7450	42.89	-20.80	22.09	43.50	-21.41	QP			
2	216.0240	42.30	-19.96	22.34	46.00	-23.66	QP			
3	239.9874	43.44	-19.80	23.64	46.00	-22.36	QP			



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Site: 1# Chamber

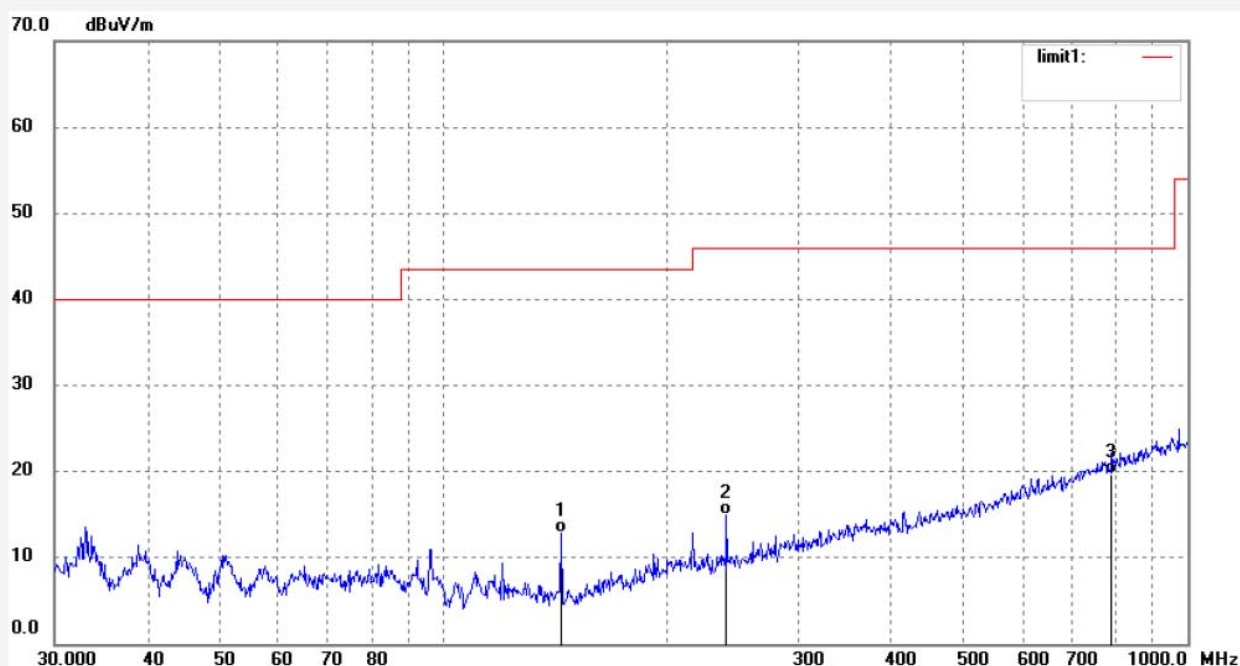
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: alen #3815
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth keyboard
Mode: TX 2402MHz
Model: K5102BT
Manufacturer: MAXIN

Polarization: Vertical
Power Source: DC 3V
Date: 2014/03/29
Time: 11:51:38
Engineer Signature:
Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	143.8294	36.53	-23.64	12.89	43.50	-30.61	QP			
2	239.9874	34.84	-19.80	15.04	46.00	-30.96	QP			
3	790.6187	27.68	-7.92	19.76	46.00	-26.24	QP			

Job No.: alen #3817

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2441MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

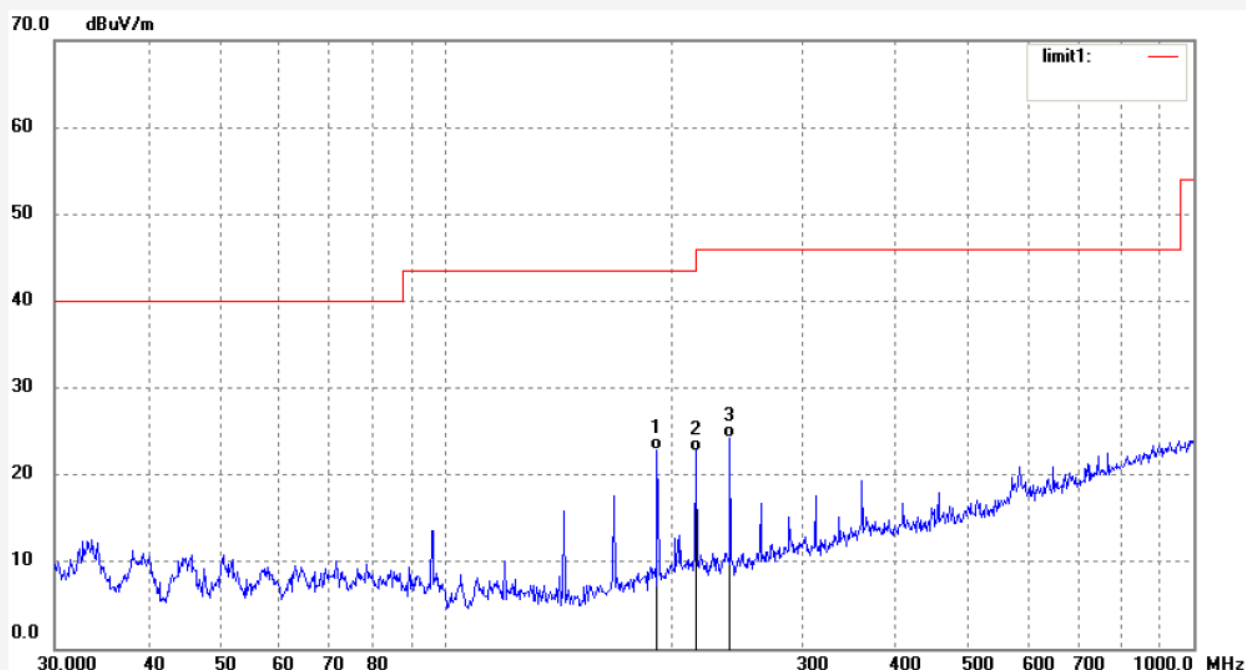
Date: 2014/03/29

Time: 11:55:00

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	191.7450	43.69	-20.80	22.89	43.50	-20.61	QP			
2	216.0240	42.71	-19.96	22.75	46.00	-23.25	QP			
3	239.9874	43.97	-19.80	24.17	46.00	-21.83	QP			



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: alen #3818

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2441MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

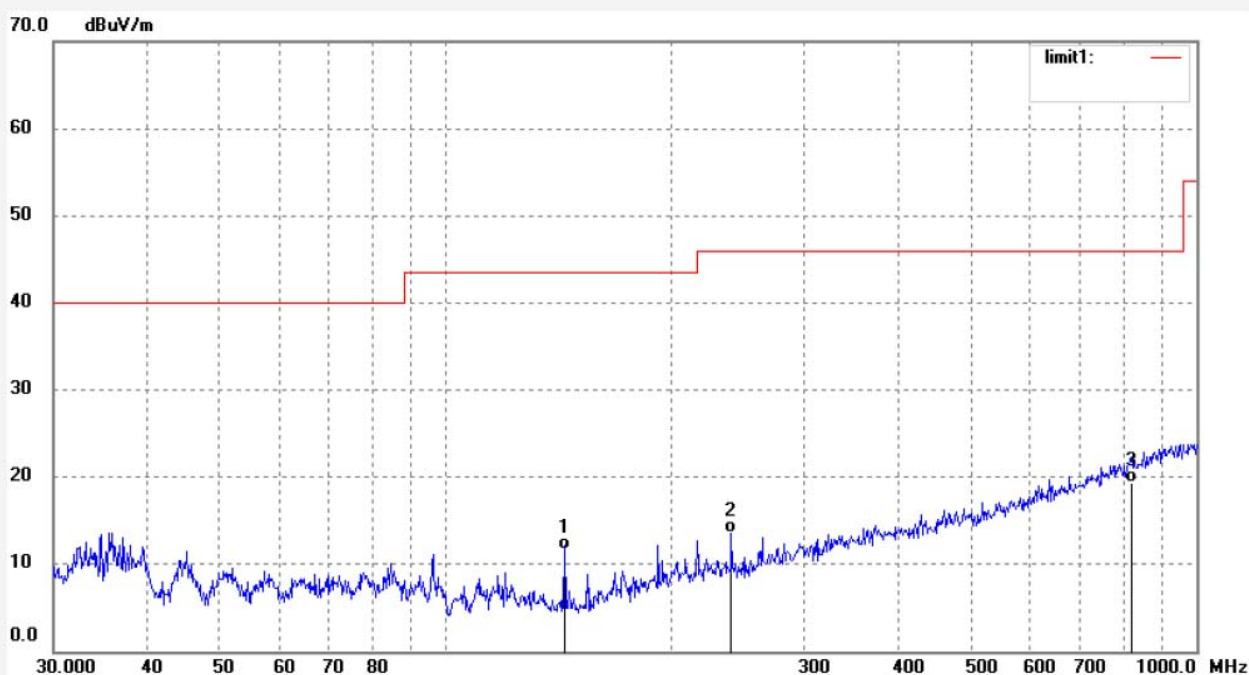
Date: 2014/03/29

Time: 11:55:36

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	143.8294	35.21	-23.64	11.57	43.50	-31.93	QP			
2	239.9874	33.42	-19.80	13.62	46.00	-32.38	QP			
3	813.1115	26.87	-7.55	19.32	46.00	-26.68	QP			

Job No.: alen #3820

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

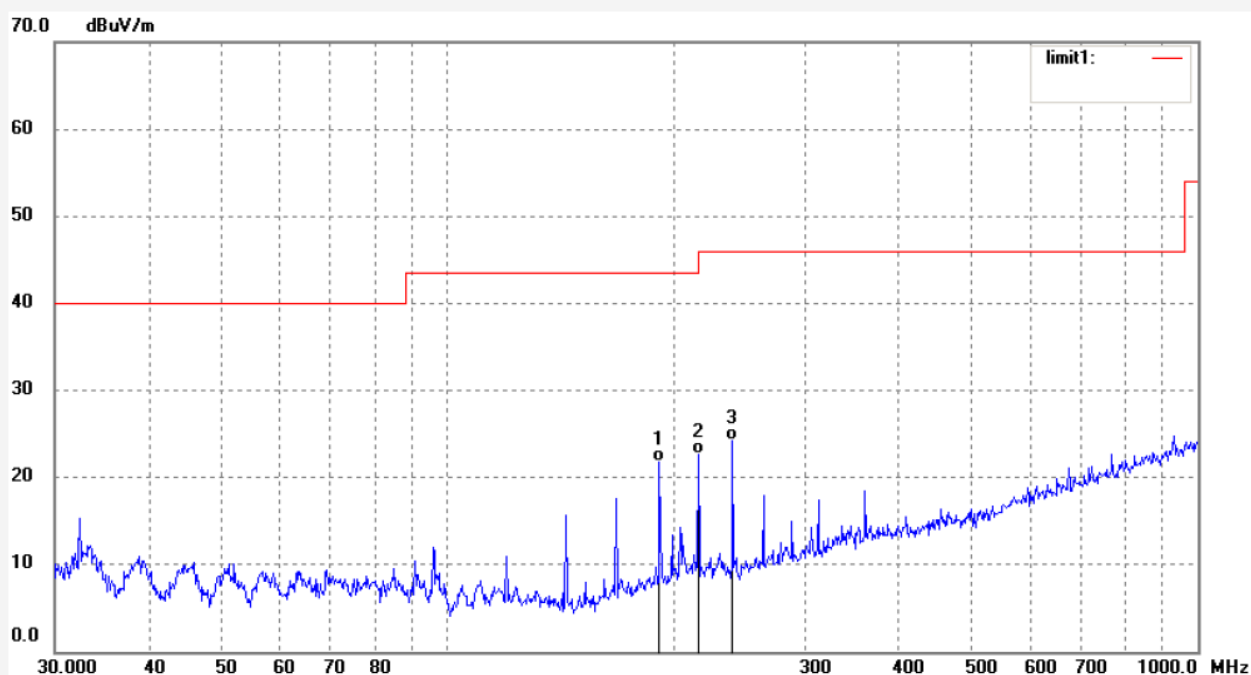
Date: 2014/03/29

Time: 11:56:56

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	191.7450	42.64	-20.80	21.84	43.50	-21.66	QP			
2	216.0240	42.62	-19.96	22.66	46.00	-23.34	QP			
3	239.9874	44.07	-19.80	24.27	46.00	-21.73	QP			

Job No.: alen #3819

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

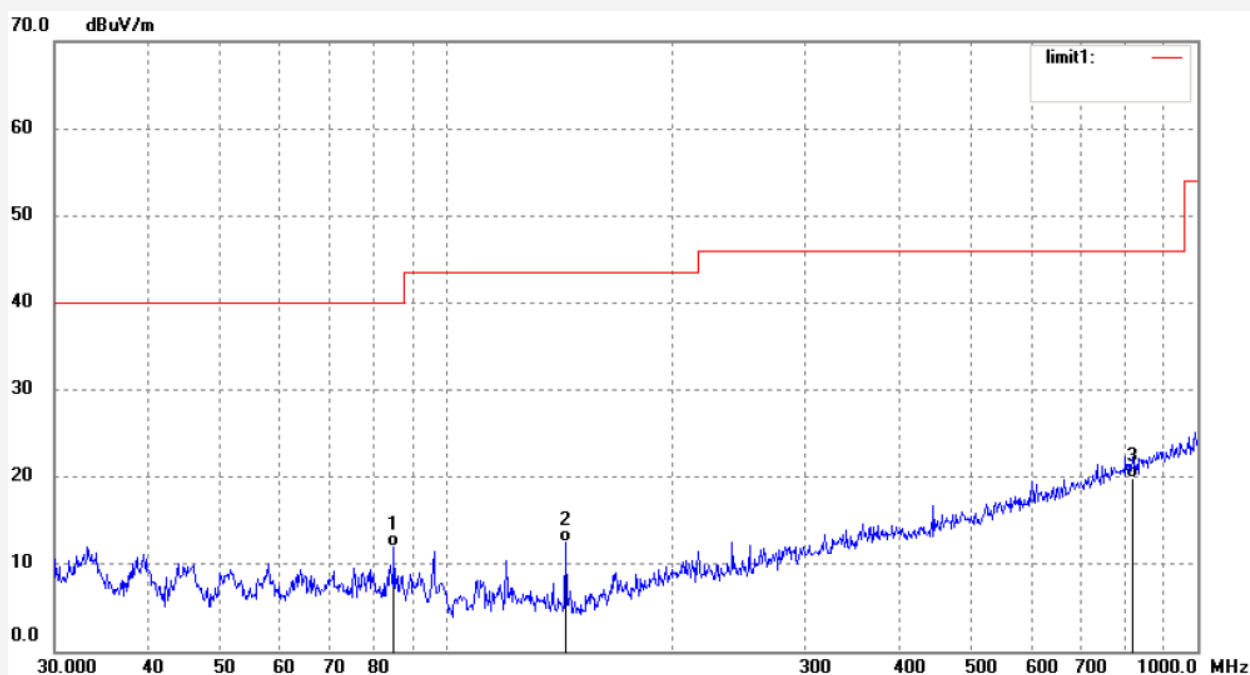
Date: 2014/03/29

Time: 11:56:04

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	84.9993	33.46	-21.55	11.91	40.00	-28.09	QP			
2	143.8294	36.20	-23.64	12.56	43.50	-30.94	QP			
3	818.8341	27.33	-7.47	19.86	46.00	-26.14	QP			

Above 1GHz



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Job No.: alen #3597

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

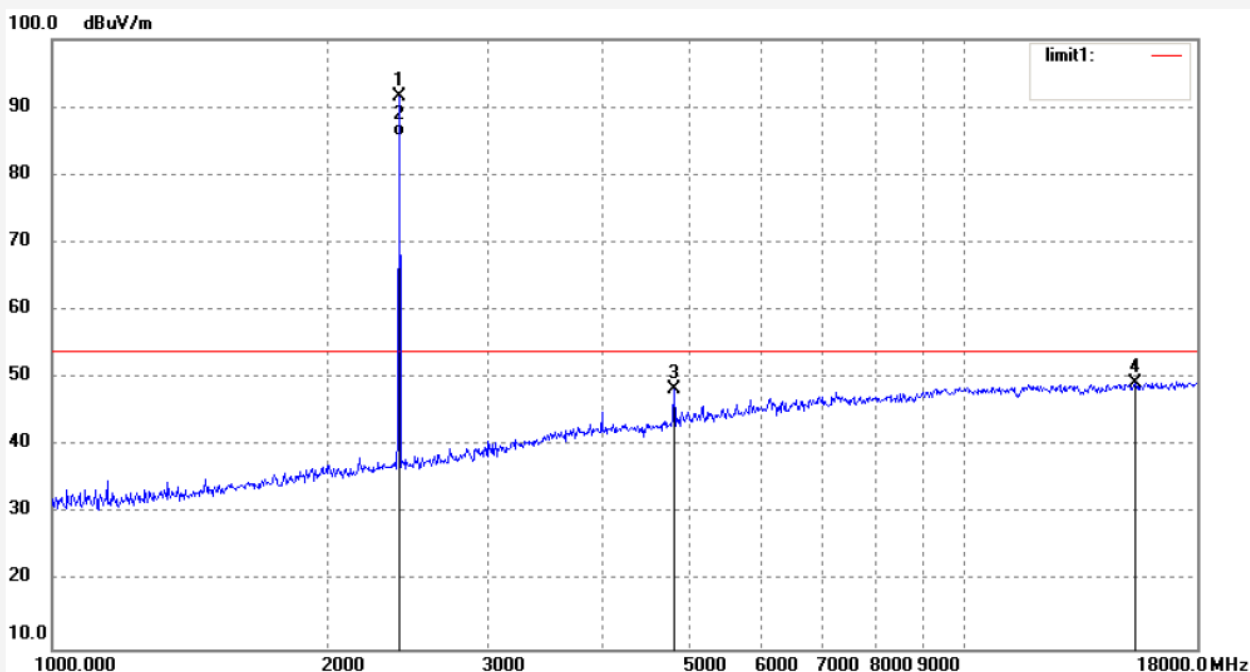
Date: 14/03/29/

Time: 9/39/04

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2400.753	98.29	-6.76	91.53						
2	2400.753	92.45	-6.76	85.69						
3	4804.110	50.01	-1.59	48.42	74.00	-25.58	peak			
4	15398.832	37.81	11.38	49.19	74.00	-24.81	peak			

Job No.: alen #3596

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

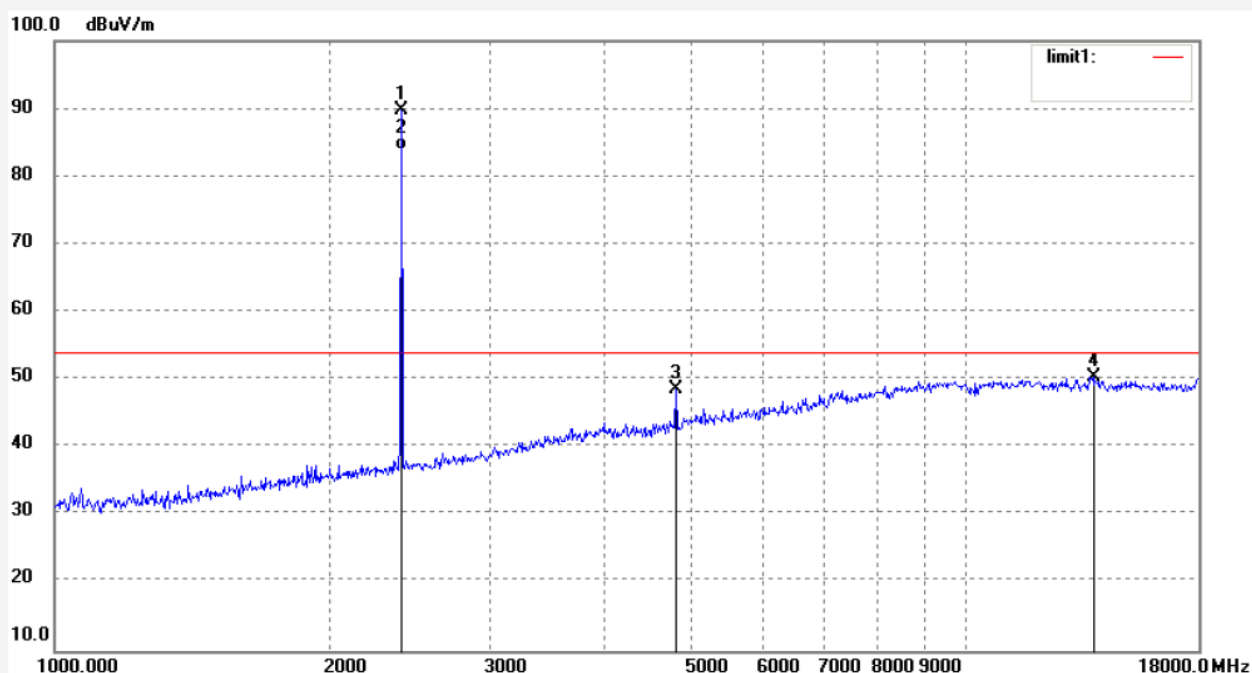
Date: 14/03/29/

Time: 9/37/17

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2400.753	96.53	-6.76	89.77						
2	2400.753	90.78	-6.76	84.02						
3	4804.110	50.14	-1.59	48.55	74.00	-25.45	peak			
4	13797.088	40.50	9.87	50.37	74.00	-23.63	peak			

Job No.: alen #3598

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2441MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

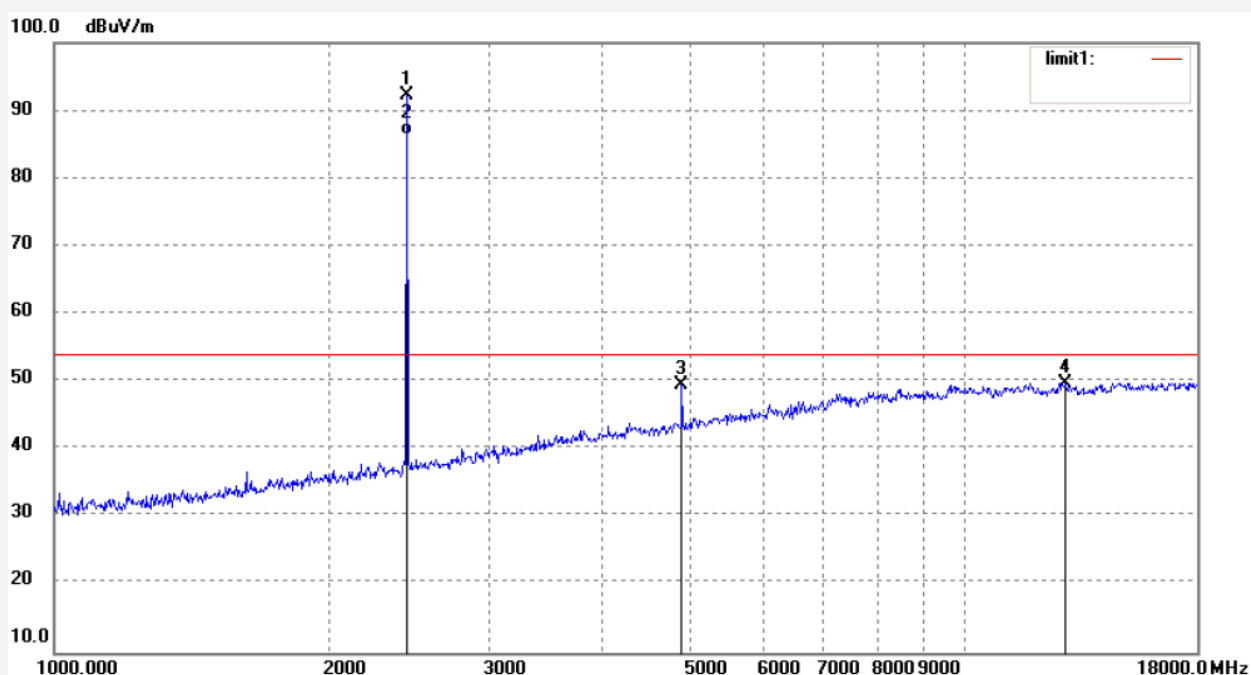
Date: 14/03/29/

Time: 9/42/01

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2442.751	98.80	-6.64	92.16						
2	2442.751	92.96	-6.64	86.32						
3	4888.151	50.83	-1.33	49.50	74.00	-24.50	peak			
4	12909.701	41.96	7.76	49.72	74.00	-24.28	peak			

Job No.: alen #3599

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2441MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

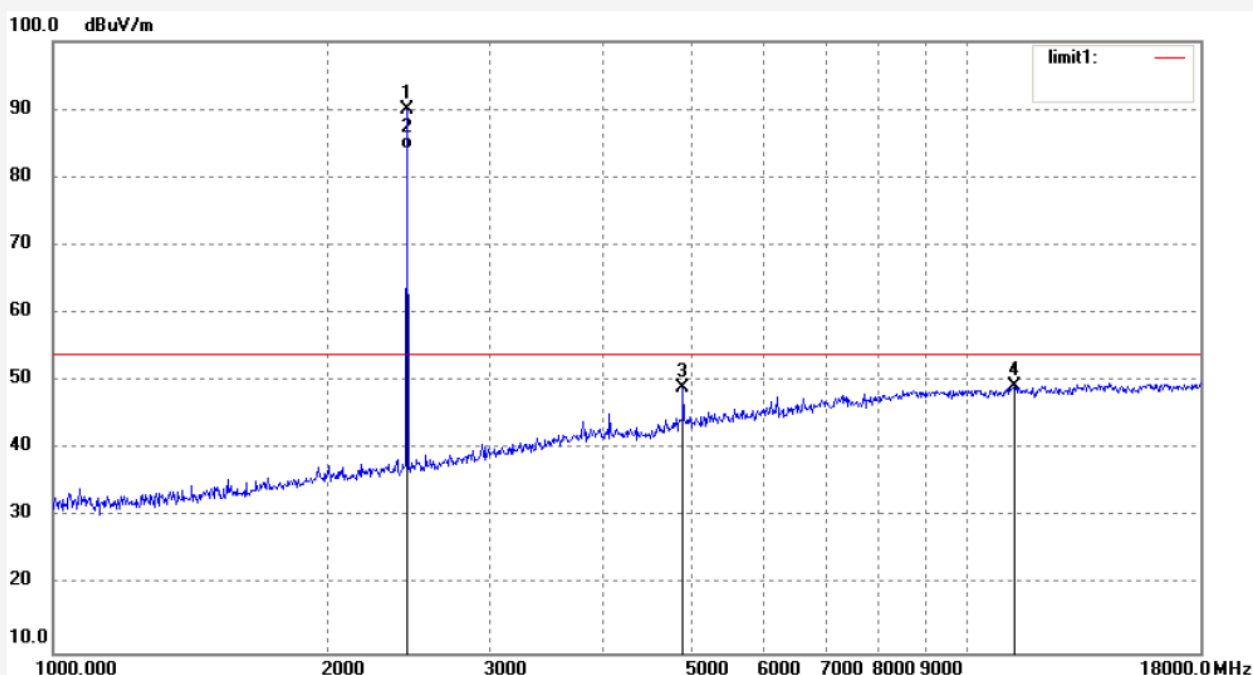
Date: 14/03/29/

Time: 9/43/39

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2435.701	96.72	-6.67	90.05						
2	2435.701	90.89	-6.67	84.22						
3	4888.151	50.43	-1.33	49.10	74.00	-24.90	peak			
4	11269.856	43.38	5.80	49.18	574.0	-24.82	peak			

Job No.: alen #3601

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

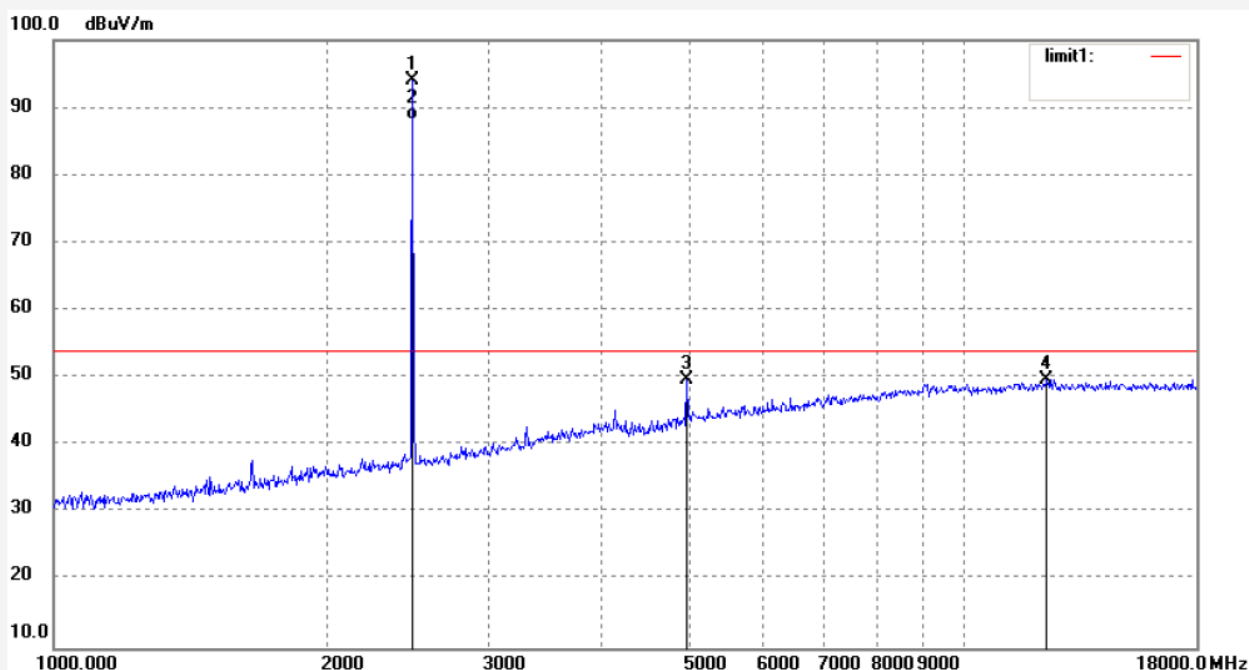
Date: 14/03/29/

Time: 9/47/56

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2478.310	100.60	-6.56	94.04						
2	2478.310	94.65	-6.56	88.09						
3	4959.307	50.87	-1.12	49.75	74.00	-24.25	peak			
4	12326.274	42.87	6.93	49.80	74.00	-24.20	peak			

Job No.: alen #3600

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

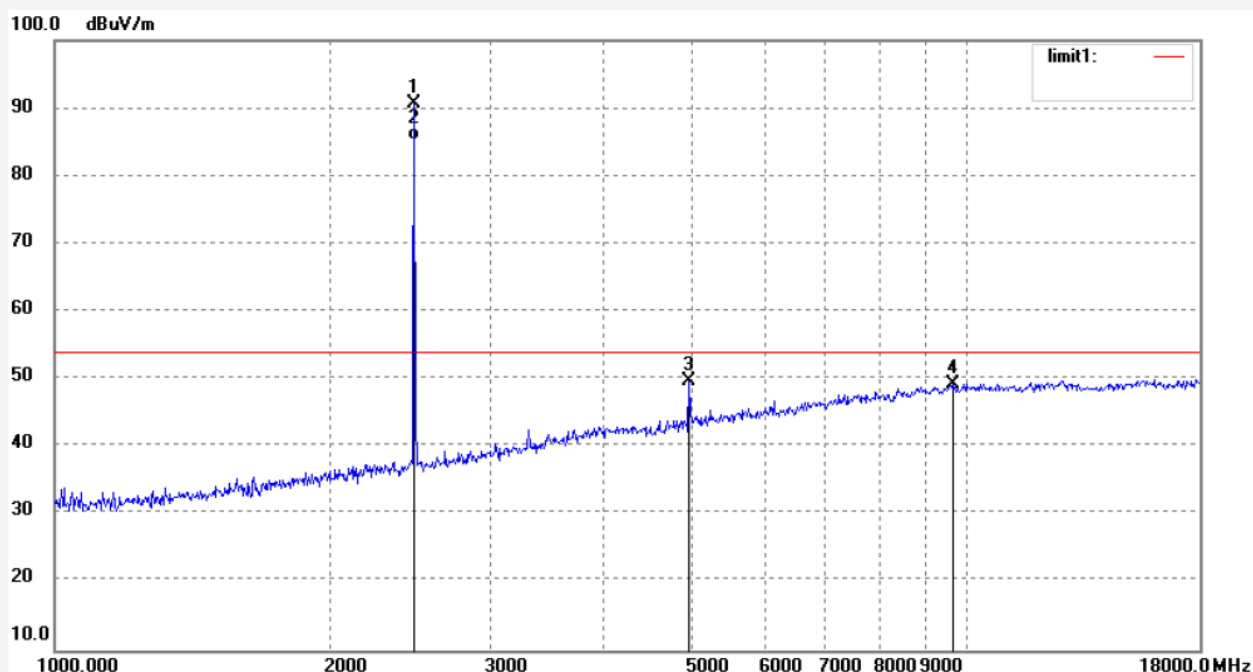
Date: 14/03/29/

Time: 9/46/14

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2478.310	97.23	-6.56	90.67						
2	2478.310	91.74	-6.56	85.18						
3	4959.307	50.87	-1.12	49.75	74.00	-24.25	peak			
4	9669.164	44.24	4.97	49.21	574.00	-24.79	peak			

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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).

11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5. Test Procedure

11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

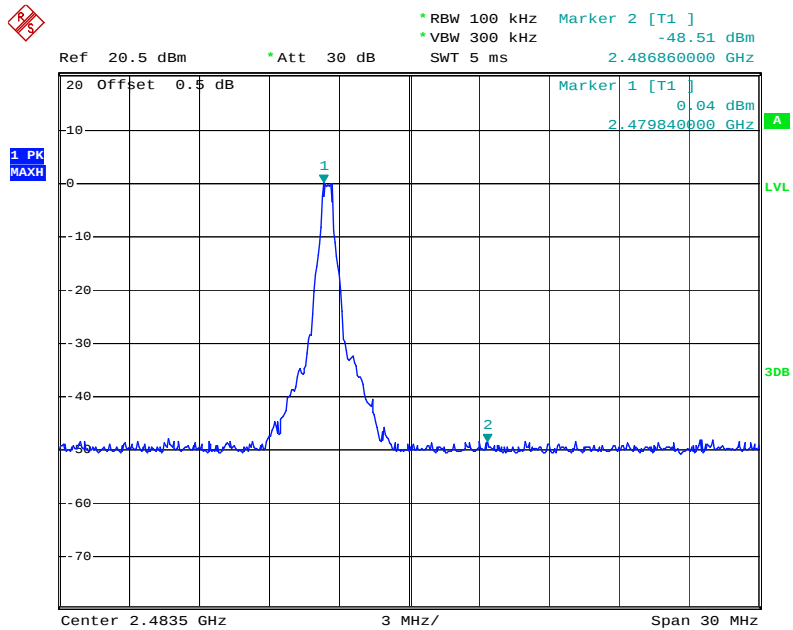
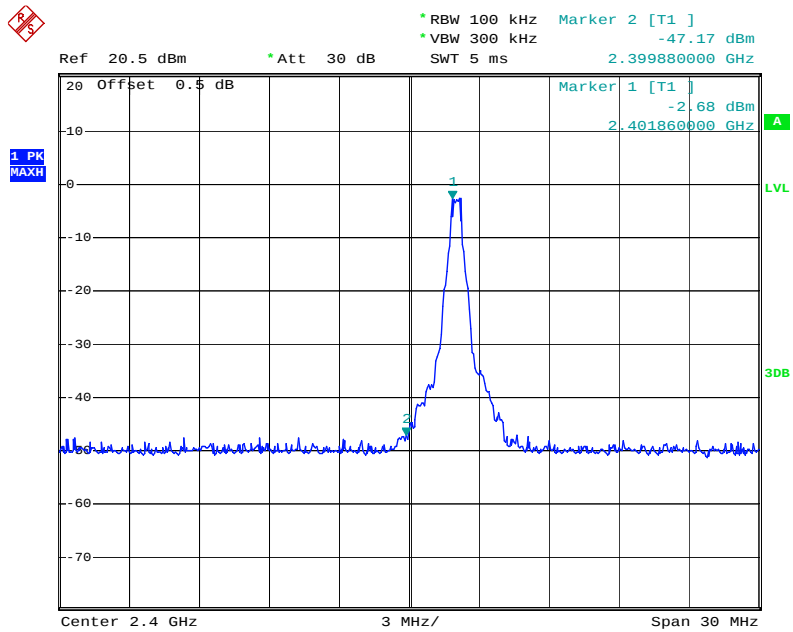
11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

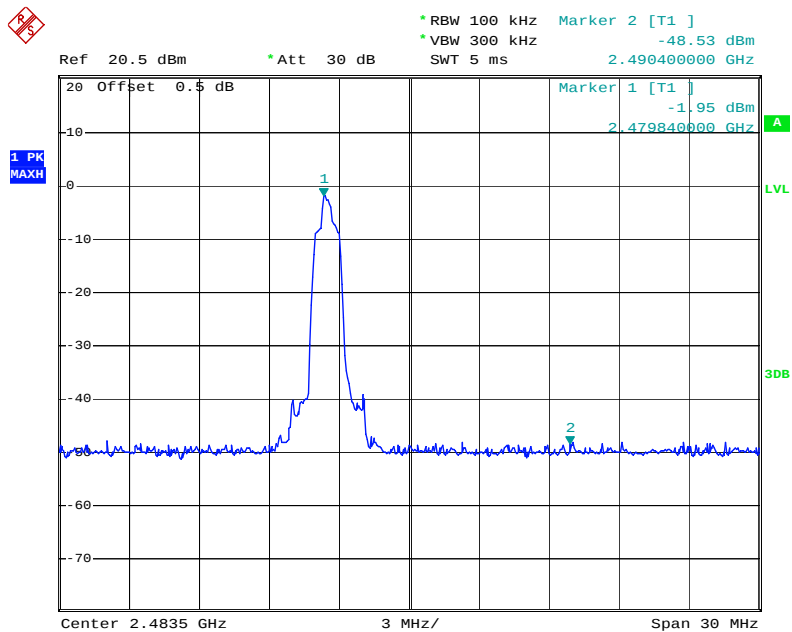
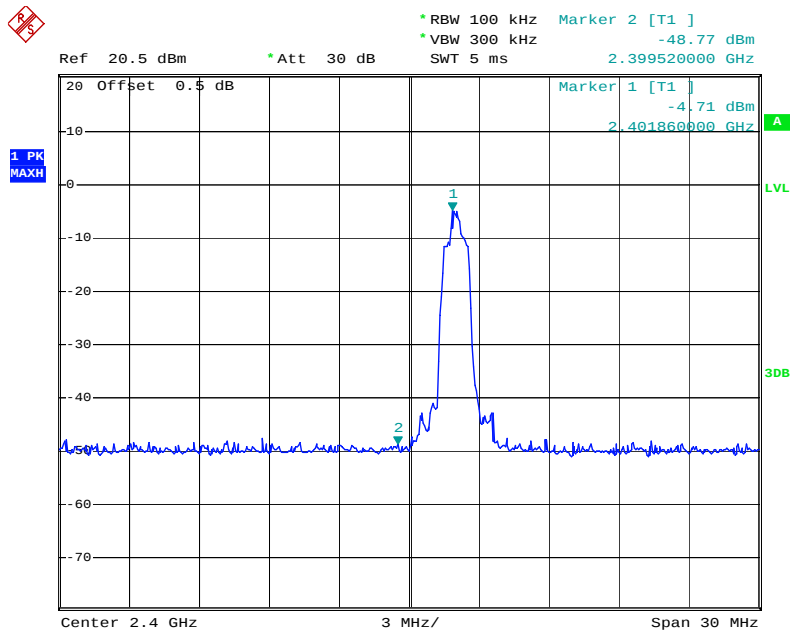
11.6. Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK		
2399.880	44.49	> 20dBc
2486.860	48.55	> 20dBc
Π/4-DQPSK Mode		
2399.520	44.06	> 20dBc
2490.400	46.58	> 20dBc
8DPSK		
2398.920	43.27	> 20dBc
2485.300	46.71	> 20dBc

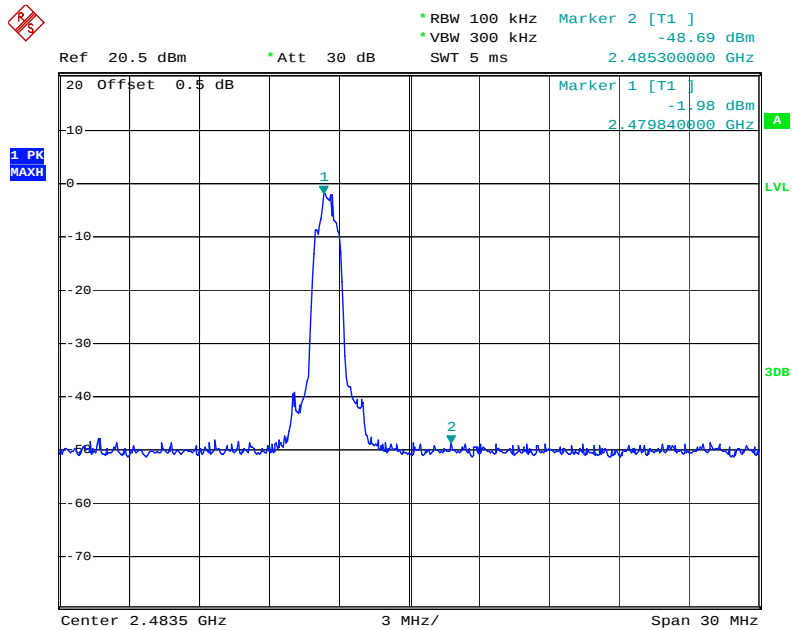
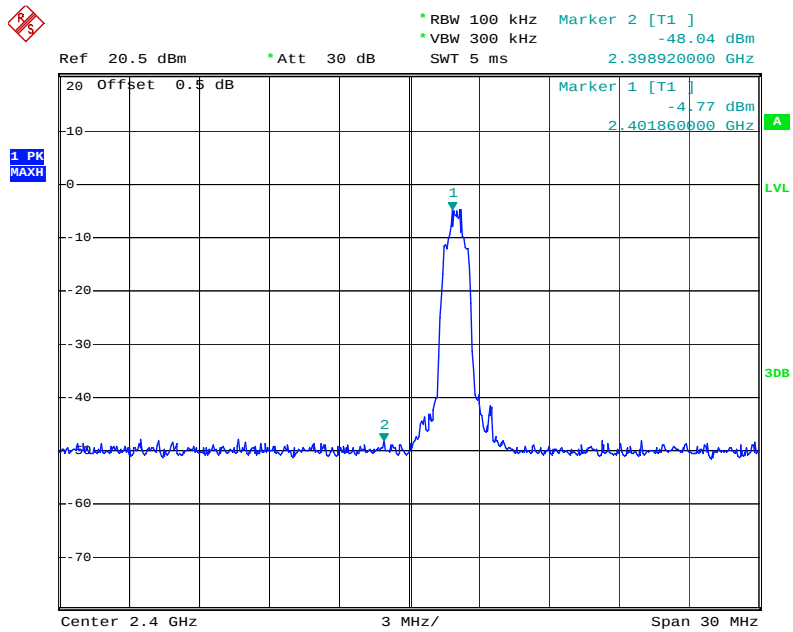
GFSK



Π/4-DQPSK Mode



8DPSK



Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

3. Display the measurement of peak values.

Non-hopping mode



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Fax:+86-0755-26503396

Job No.: alen #3605

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz(GFSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

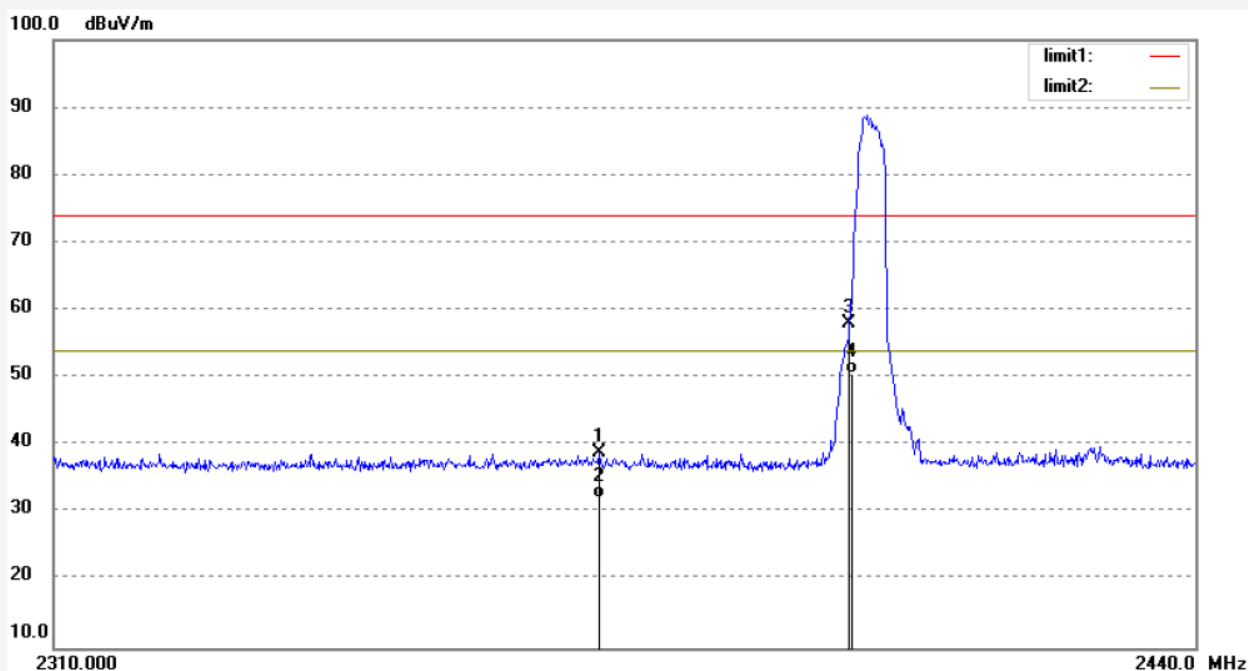
Date: 14/03/29/

Time: 9/55/03

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2371.360	45.78	-6.82	38.96	74.00	-35.04	peak			
2	2371.360	38.89	-6.82	32.07	54.00	-21.93	AVG			
3	2399.960	64.76	-6.76	58.00	74.00	-16.00	peak			
4	2399.960	57.35	-6.76	50.59	54.00	-3.41	AVG			

Job No.: alen #3604

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz(GFSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

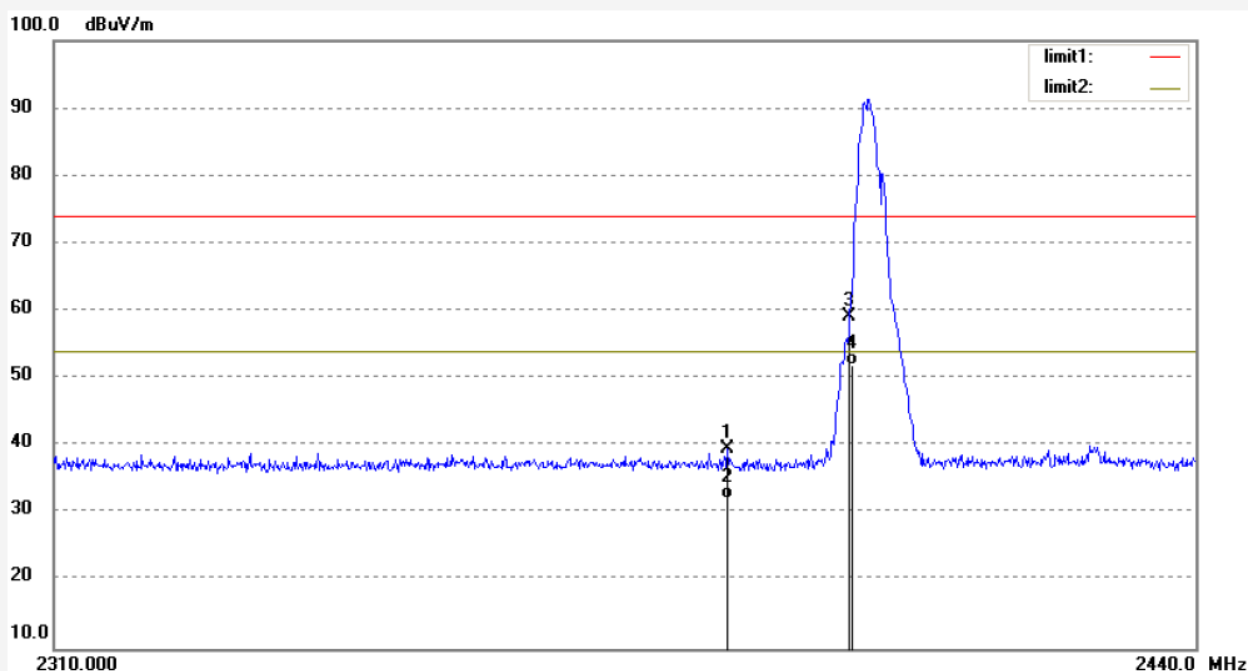
Date: 14/03/29/

Time: 9/53/59

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2385.920	46.35	-6.80	39.55	74.00	-34.45	peak			
2	2385.920	38.86	-6.80	32.06	54.00	-21.94	AVG			
3	2399.960	65.85	-6.76	59.09	74.00	-14.91	peak			
4	2399.960	58.68	-6.76	51.92	54.00	-2.08	AVG			

Job No.: alen #3602

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz(GFSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

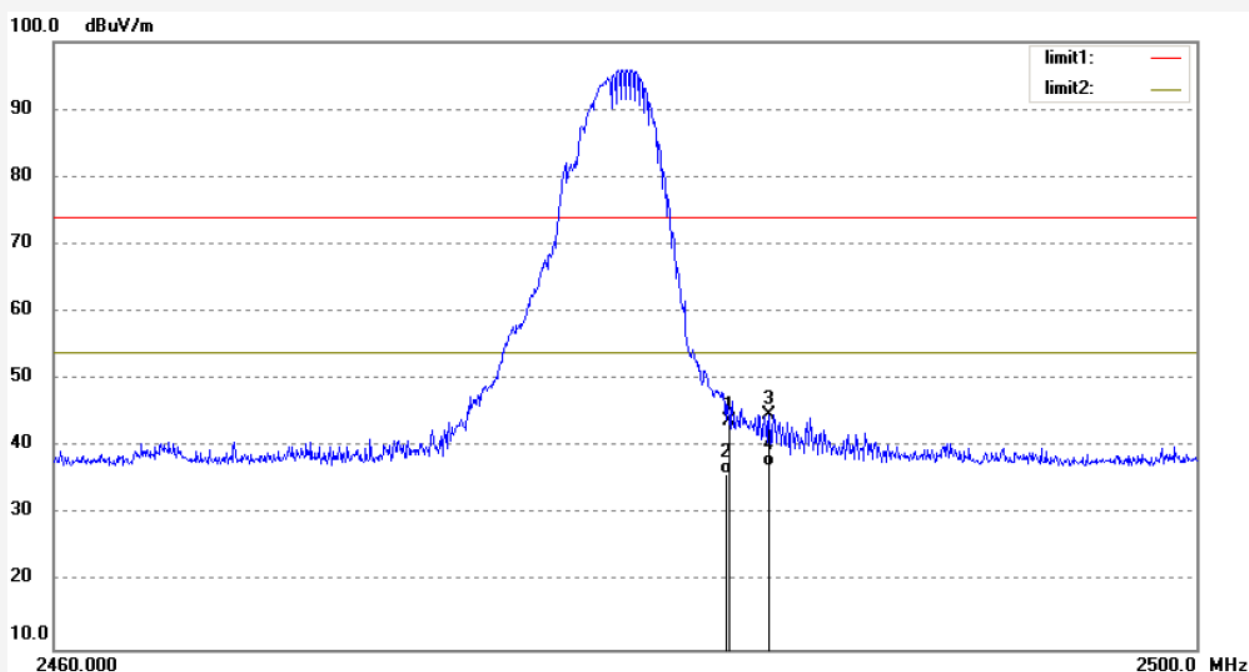
Date: 14/03/29/

Time: 9/50/41

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.600	50.35	-6.54	43.81	74.00	-30.19	peak			
2	2483.600	42.45	-6.54	35.91	54.00	-18.09	AVG			
3	2485.000	51.35	-6.54	44.81	74.00	-29.19	peak			
4	2485.000	43.57	-6.54	37.03	54.00	-16.97	AVG			

Job No.: alen #3603

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz(GFSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

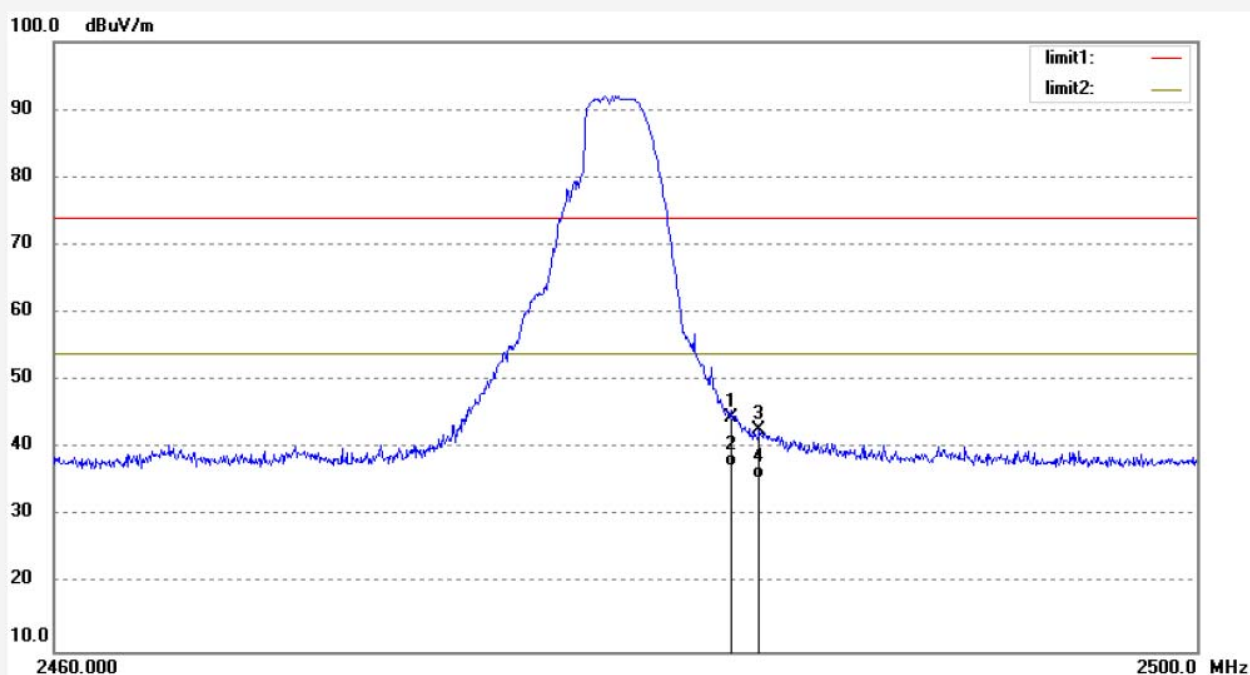
Date: 14/03/29/

Time: 9/52/11

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.600	51.06	-6.54	44.52	74.00	-29.48	peak			
2	2483.600	43.89	-6.54	37.35	54.00	-16.65	AVG			
3	2484.640	49.17	-6.54	42.63	74.00	-31.37	peak			
4	2484.640	42.01	-6.54	35.47	54.00	-18.53	AVG			

Job No.: alen #3618

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz(pi/4DQPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

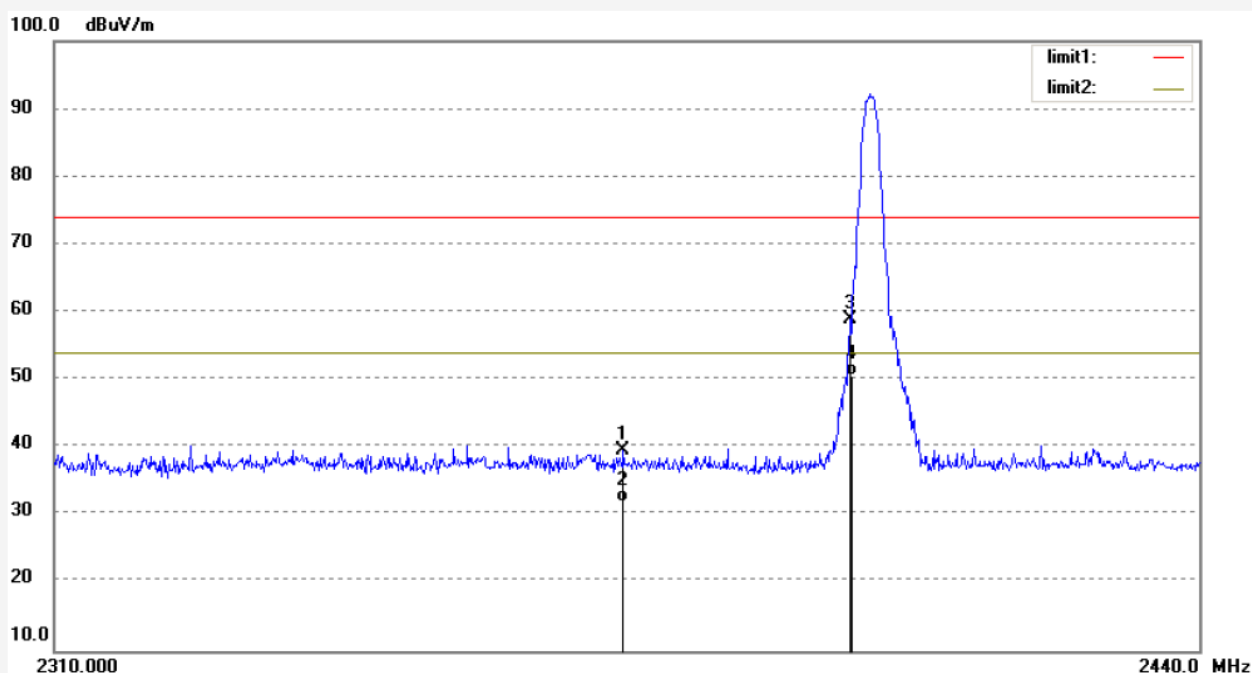
Date: 14/03/29/

Time: 8/43/01

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2373.830	46.34	-6.83	39.51	74.00	-34.49	peak			
2	2373.830	38.68	-6.83	31.85	54.00	-22.15	AVG			
3	2399.700	65.75	-6.76	58.99	74.00	-15.01	peak			
4	2399.700	57.32	-6.76	50.56	54.00	-3.44	AVG			

Job No.: alen #3617

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz(pi/4DQPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

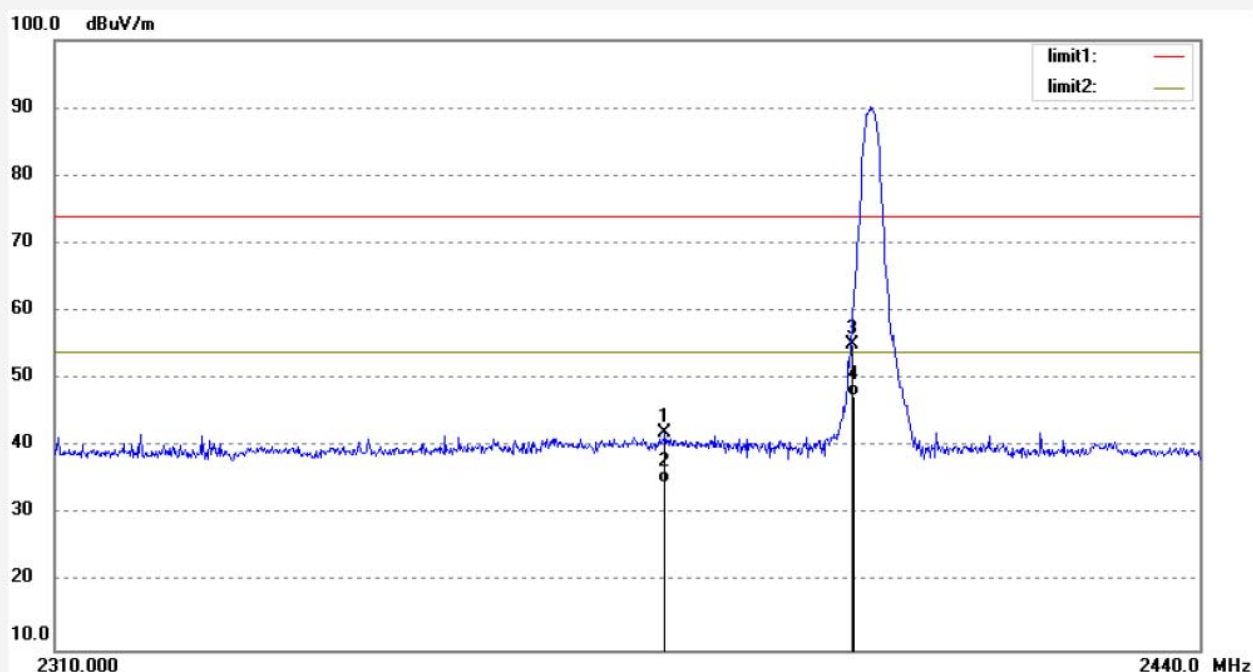
Date: 14/03/29/

Time: 8/41/27

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2378.510	48.97	-6.82	42.15	74.00	-31.85	peak			
2	2378.510	41.44	-6.82	34.62	54.00	-19.38	AVG			
3	2399.700	61.78	-6.76	55.02	74.00	-18.98	peak			
4	2399.700	54.32	-6.76	47.56	54.00	-6.44	AVG			

Job No.: alen #3619

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz(pi/4DQPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

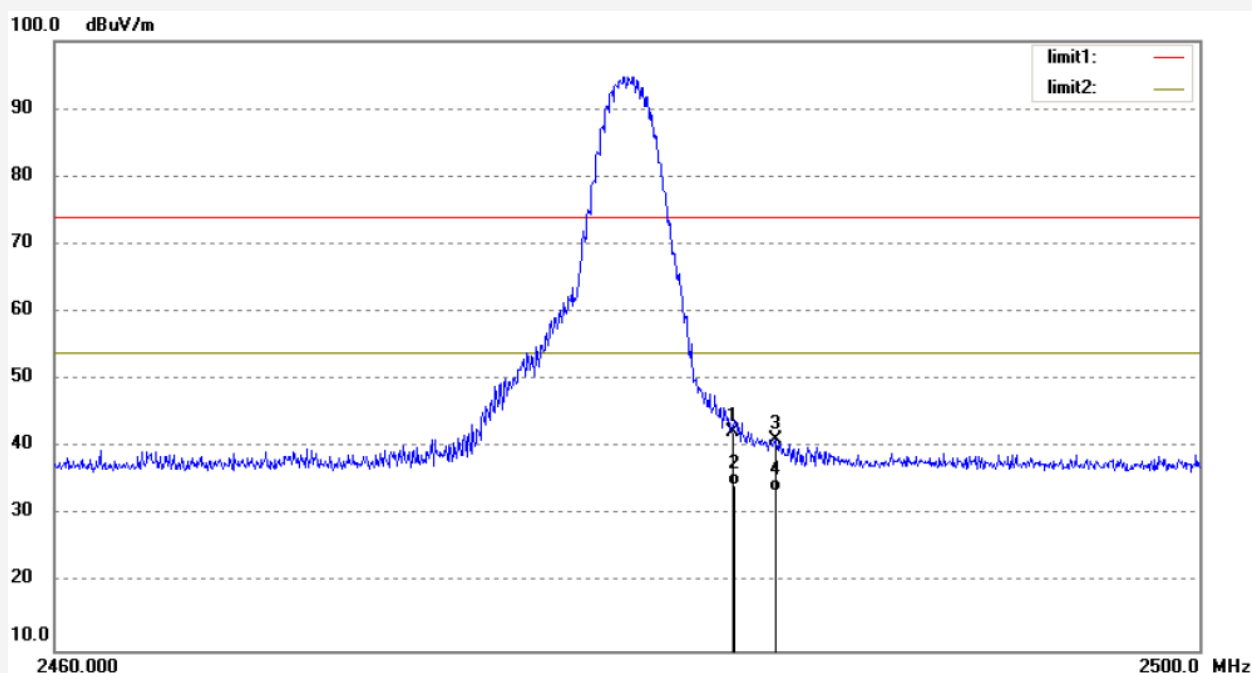
Date: 14/03/29/

Time: 8/44/57

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.600	48.82	-6.54	42.28	74.00	-31.72	peak			
2	2483.600	40.92	-6.54	34.38	54.00	-19.62	AVG			
3	2485.160	47.76	-6.54	41.22	74.00	-32.78	peak			
4	2485.160	40.12	-6.54	33.58	54.00	-20.42	AVG			

Job No.: alen #3620

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz(pi/4DQPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

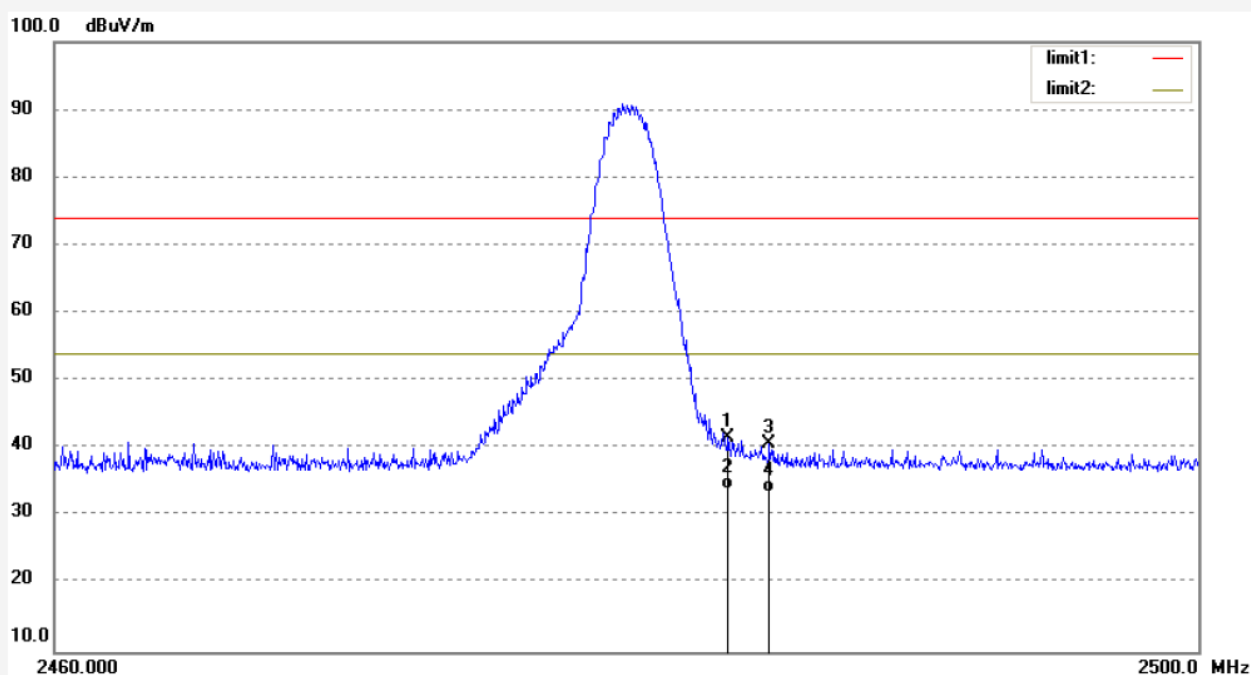
Date: 14/03/29/

Time: 8/46/20

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.520	48.14	-6.54	41.60	74.00	-32.40	peak			
2	2483.520	40.56	-6.54	34.02	54.00	-19.98	AVG			
3	2484.960	47.20	-6.54	40.66	74.00	-33.34	peak			
4	2484.960	40.02	-6.54	33.48	54.00	-20.52	AVG			

Job No.: alen #3626

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz(8DPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

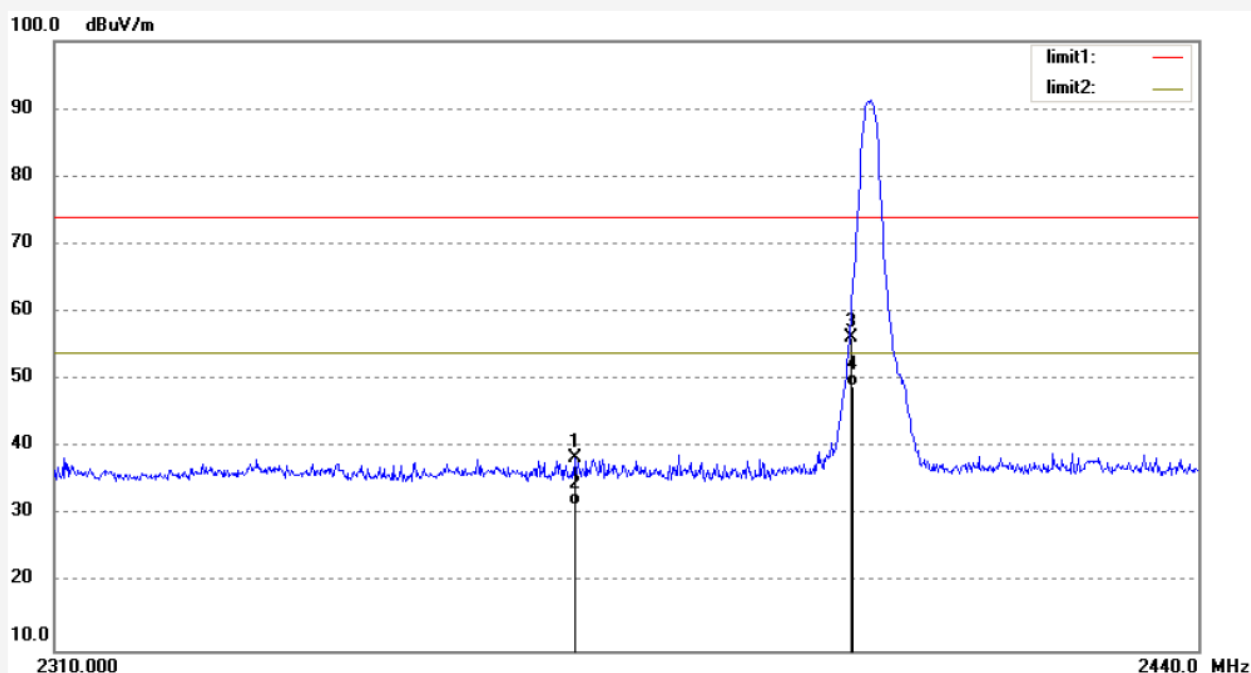
Date: 14/03/29/

Time: 9/05/12

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2368.370	45.19	-6.83	38.36	74.00	-35.64	peak			
2	2368.370	38.21	-6.83	31.38	54.00	-22.62	AVG			
3	2399.700	63.01	-6.76	56.25	74.00	-17.75	peak			
4	2399.700	55.90	-6.76	49.14	54.00	-4.86	AVG			

Job No.: alen #3625

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2402MHz(8DPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

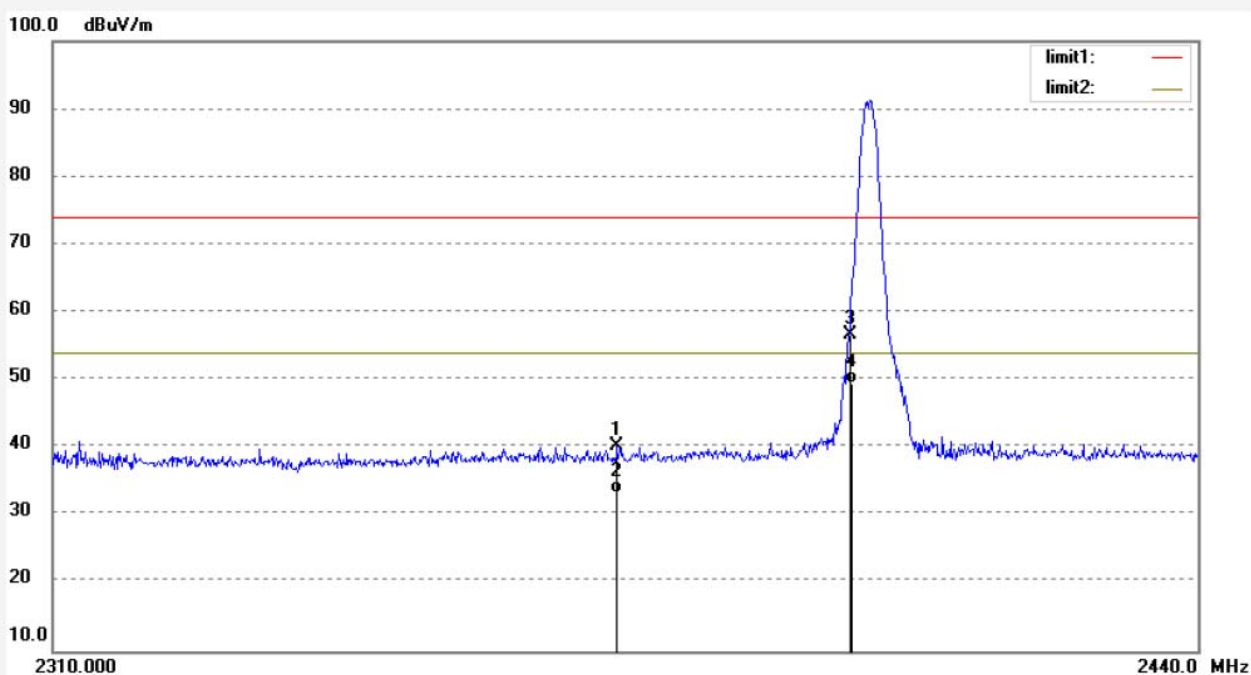
Date: 14/03/29/

Time: 9/04/05

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2373.310	46.98	-6.82	40.16	74.00	-33.84	peak			
2	2373.310	40.01	-6.82	33.19	54.00	-20.81	AVG			
3	2399.700	63.47	-6.76	56.71	74.00	-17.29	peak			
4	2399.700	56.23	-6.76	49.47	54.00	-4.53	AVG			

Job No.: alen #3627

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz(8DPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

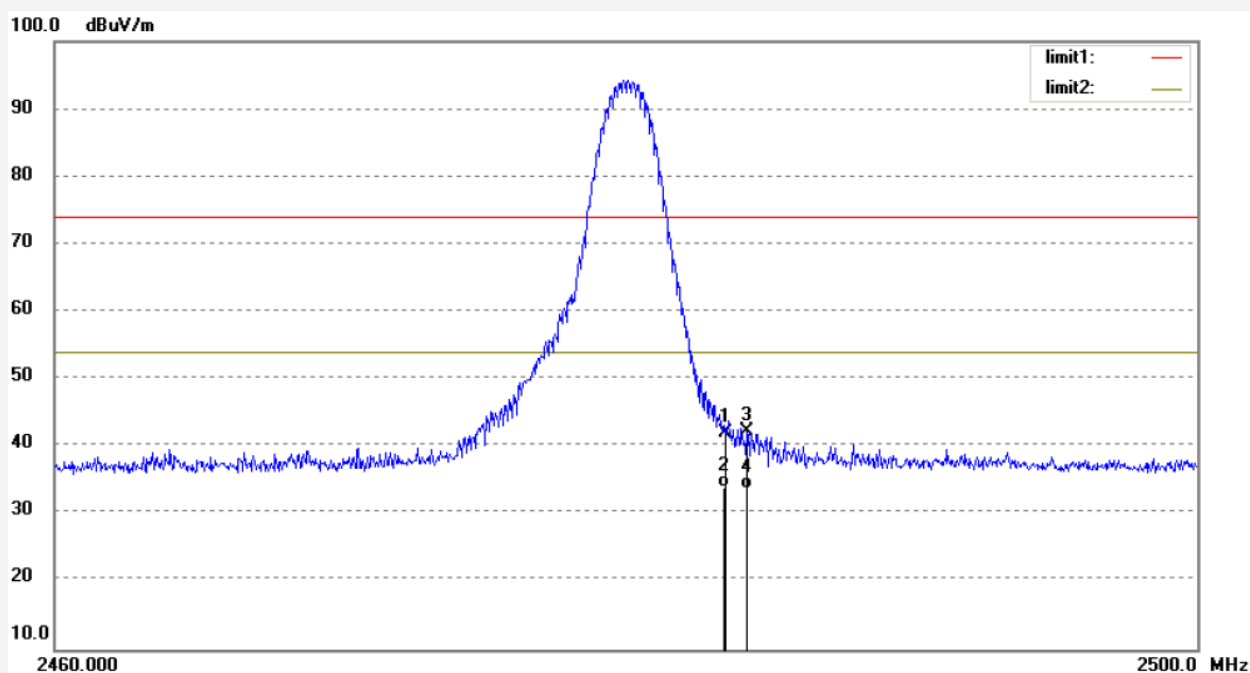
Date: 14/03/29/

Time: 9/06/39

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.440	48.55	-6.54	42.01	74.00	-31.99	peak			
2	2483.440	40.58	-6.54	34.04	54.00	-19.96	AVG			
3	2484.200	48.89	-6.54	42.35	74.00	-31.65	peak			
4	2484.200	40.38	-6.54	33.84	54.00	-20.16	AVG			

Job No.: alen #3628

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX 2480MHz(8DPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

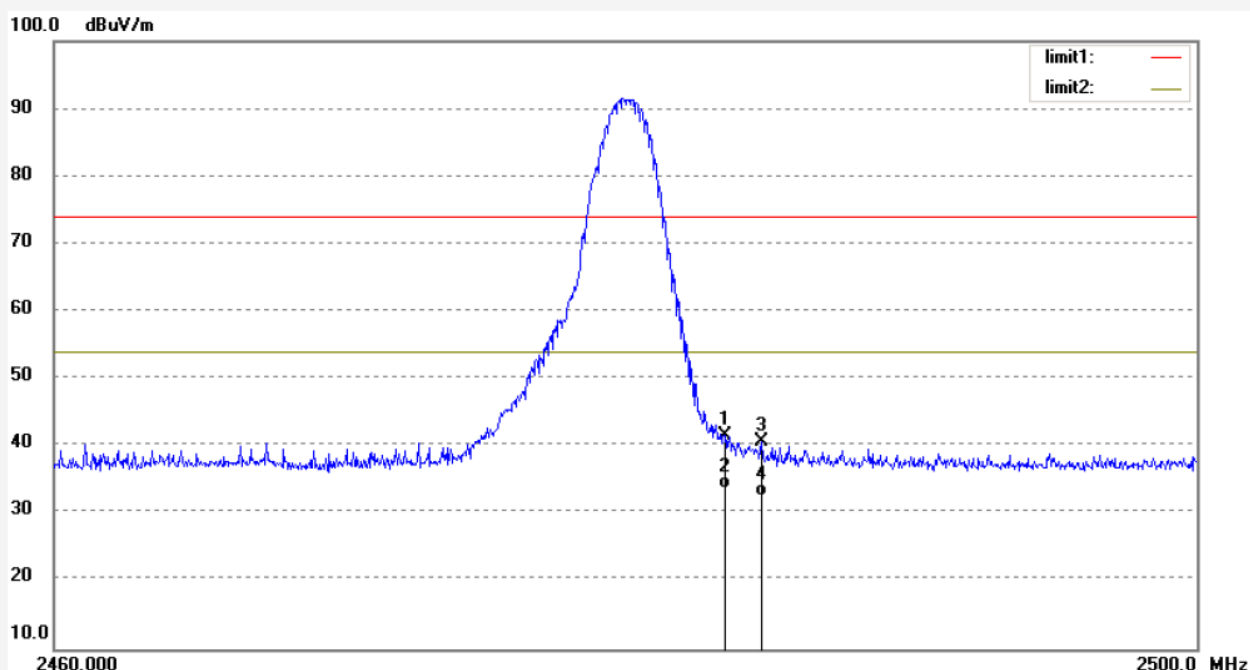
Date: 14/03/29/

Time: 9/08/06

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.440	48.24	-6.54	41.70	74.00	-32.30	peak			
2	2483.440	40.32	-6.54	33.78	54.00	-20.22	AVG			
3	2484.720	47.16	-6.54	40.62	74.00	-33.38	peak			
4	2484.720	39.23	-6.54	32.69	54.00	-21.31	AVG			

Hopping mode

Job No.: alen #3608

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX(GFSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

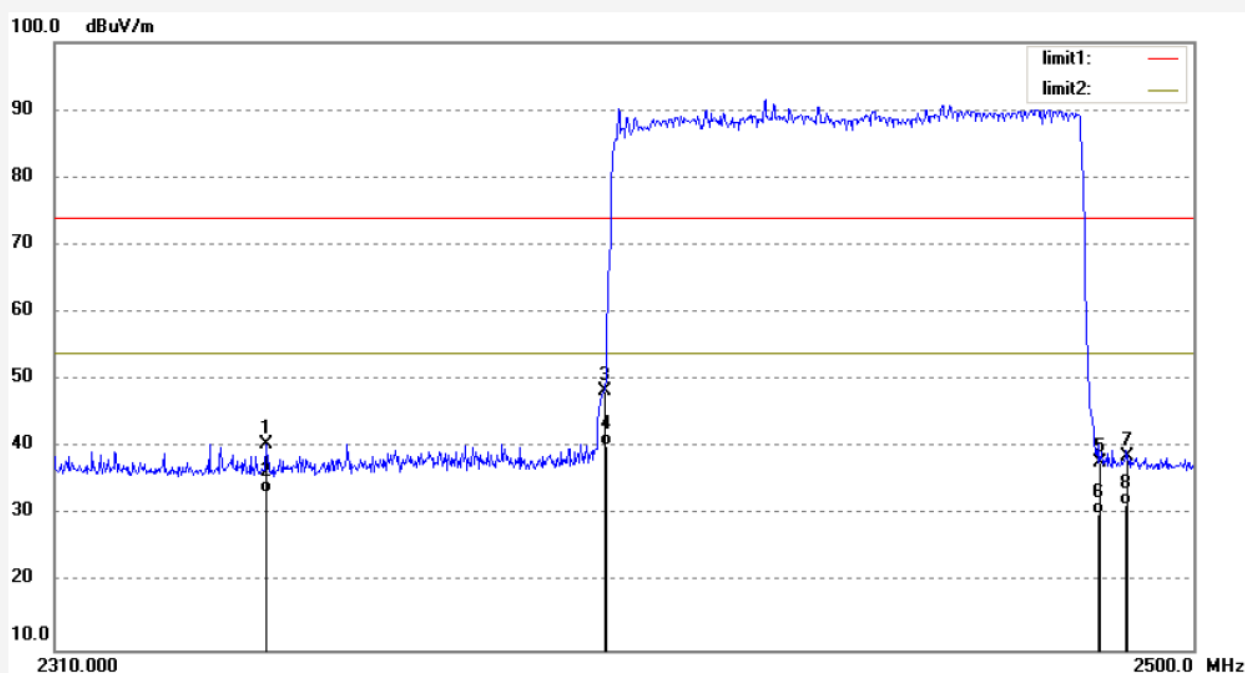
Date: 14/03/29/

Time: 15/38/05

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2344.390	47.47	-6.89	40.58	74.00	-33.42	peak			
2	2344.390	40.23	-6.89	33.34	54.00	-20.66	AVG			
3	2399.870	55.03	-6.76	48.27	74.00	-25.73	peak			
4	2399.870	47.12	-6.76	40.36	54.00	-13.64	AVG			
5	2483.660	44.29	-6.54	37.75	74.00	-36.25	peak			
6	2483.660	36.65	-6.54	30.11	54.00	-23.89	AVG			
7	2488.600	45.20	-6.52	38.68	74.00	-35.32	peak			
8	2488.600	38.01	-6.52	31.49	54.00	-22.51	AVG			

Job No.: alen #3607

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX(GFSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

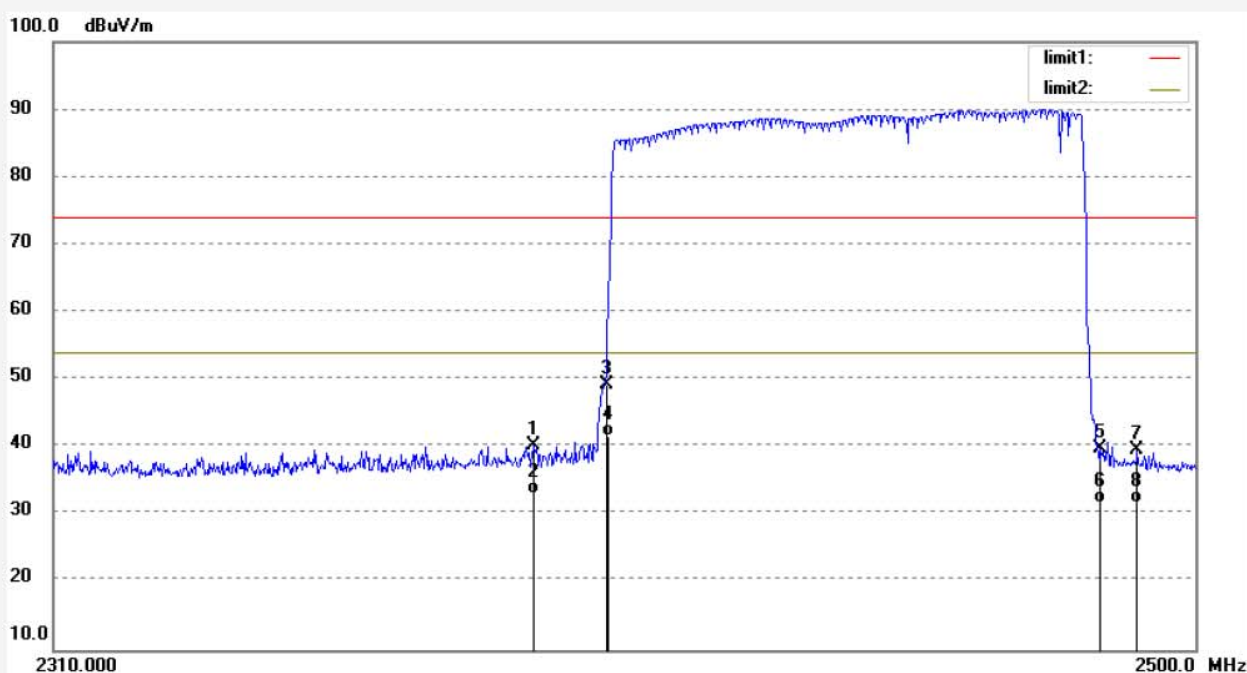
Date: 14/03/29/

Time: 15/33/06

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2388.280	47.07	-6.78	40.29	74.00	-33.71	peak			
2	2388.280	39.85	-6.78	33.07	54.00	-20.93	AVG			
3	2400.060	56.11	-6.76	49.35	74.00	-24.65	peak			
4	2400.060	48.45	-6.76	41.69	54.00	-12.31	AVG			
5	2483.660	46.40	-6.54	39.86	74.00	-34.14	peak			
6	2483.660	38.35	-6.54	31.81	54.00	-22.19	AVG			
7	2490.120	46.05	-6.52	39.53	74.00	-34.47	peak			
8	2490.120	38.24	-6.52	31.72	54.00	-22.28	AVG			

Job No.: alen #3622

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX(pi/4DQPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

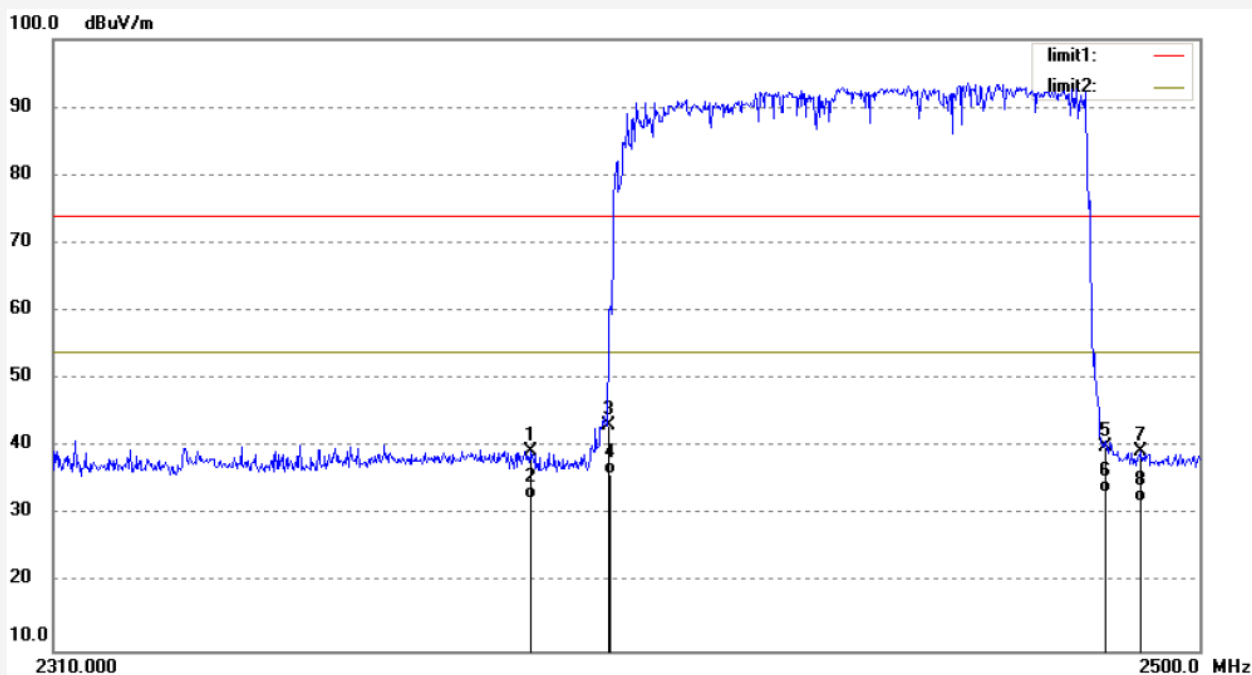
Date: 14/03/29/

Time: 8/55/36

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2387.330	46.20	-6.79	39.41	74.00	-34.59	peak			
2	2387.330	39.25	-6.79	32.46	54.00	-21.54	AVG			
3	2400.060	49.91	-6.76	43.15	74.00	-30.85	peak			
4	2400.060	42.65	-6.76	35.89	54.00	-18.11	AVG			
5	2483.660	46.68	-6.54	40.14	74.00	-33.86	peak			
6	2483.660	39.75	-6.54	33.21	54.00	-20.79	AVG			
7	2490.120	45.90	-6.52	39.38	74.00	-34.62	peak			
8	2490.120	38.54	-6.52	32.02	54.00	-21.98	AVG			

Job No.: alen #3621

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX(pi/4DQPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

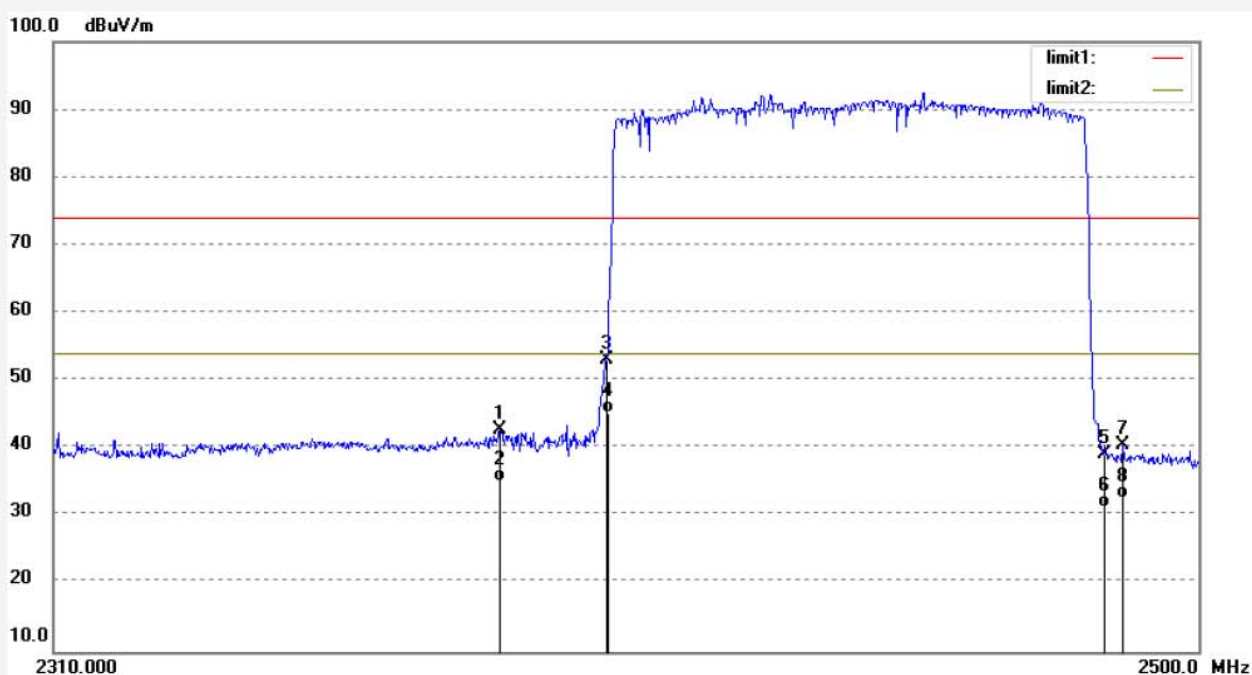
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Time: 8/50/53

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2382.390	49.51	-6.81	42.70	74.00	-31.30	peak			
2	2382.390	41.89	-6.81	35.08	54.00	-18.92	AVG			
3	2399.870	59.85	-6.76	53.09	74.00	-20.91	peak			
4	2399.870	51.88	-6.76	45.12	54.00	-8.88	AVG			
5	2483.660	45.57	-6.54	39.03	74.00	-34.97	peak			
6	2483.660	37.85	-6.54	31.31	54.00	-22.69	AVG			
7	2487.080	47.02	-6.53	40.49	74.00	-33.51	peak			
8	2487.080	39.10	-6.53	32.57	54.00	-21.43	AVG			

Job No.: alen #3623

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX(8DPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Horizontal

Power Source: DC 3V

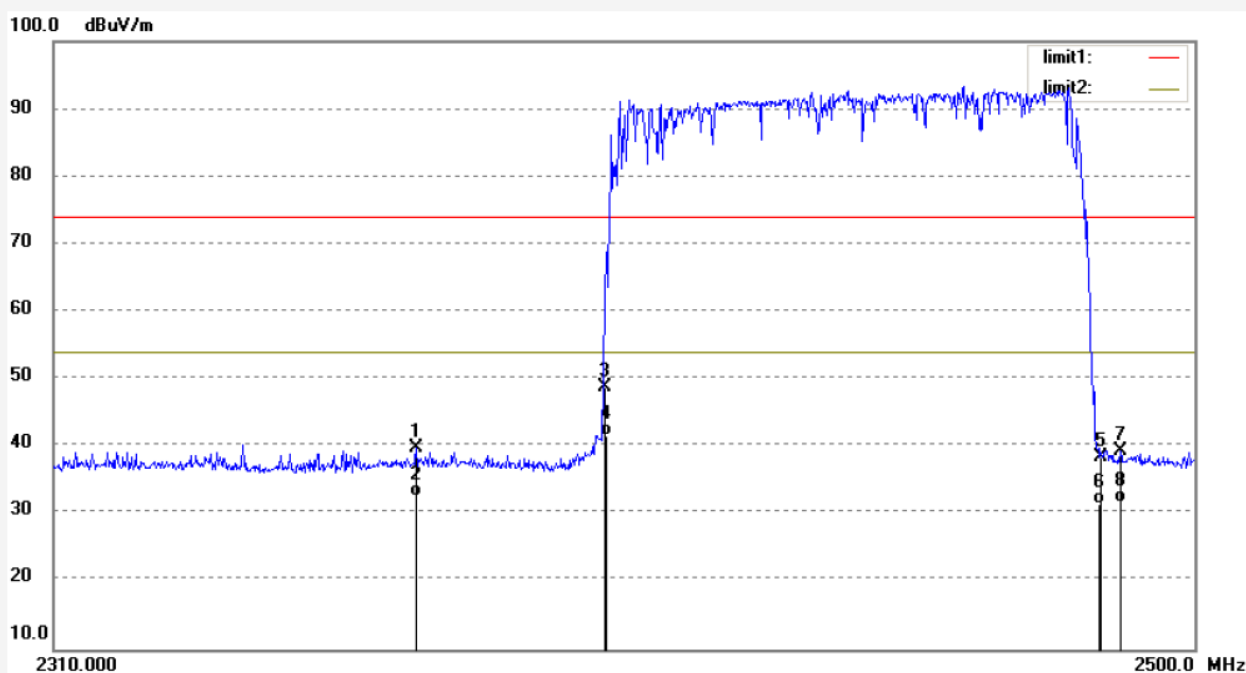
Date: 14/03/29/

Time: 8/59/45

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2368.900	46.54	-6.83	39.71	74.00	-34.29	peak			
2	2368.900	39.41	-6.83	32.58	54.00	-21.42	AVG			
3	2399.870	55.64	-6.76	48.88	74.00	-25.12	peak			
4	2399.870	48.35	-6.76	41.59	54.00	-12.41	AVG			
5	2483.660	45.05	-6.54	38.51	74.00	-35.49	peak			
6	2483.660	37.98	-6.54	31.44	54.00	-22.56	AVG			
7	2487.270	45.86	-6.53	39.33	74.00	-34.67	peak			
8	2487.270	38.35	-6.53	31.82	54.00	-22.18	AVG			

Job No.: alen #3624

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth keyboard

Mode: TX(8DPSK)

Model: K5102BT

Manufacturer: MAXIN

Polarization: Vertical

Power Source: DC 3V

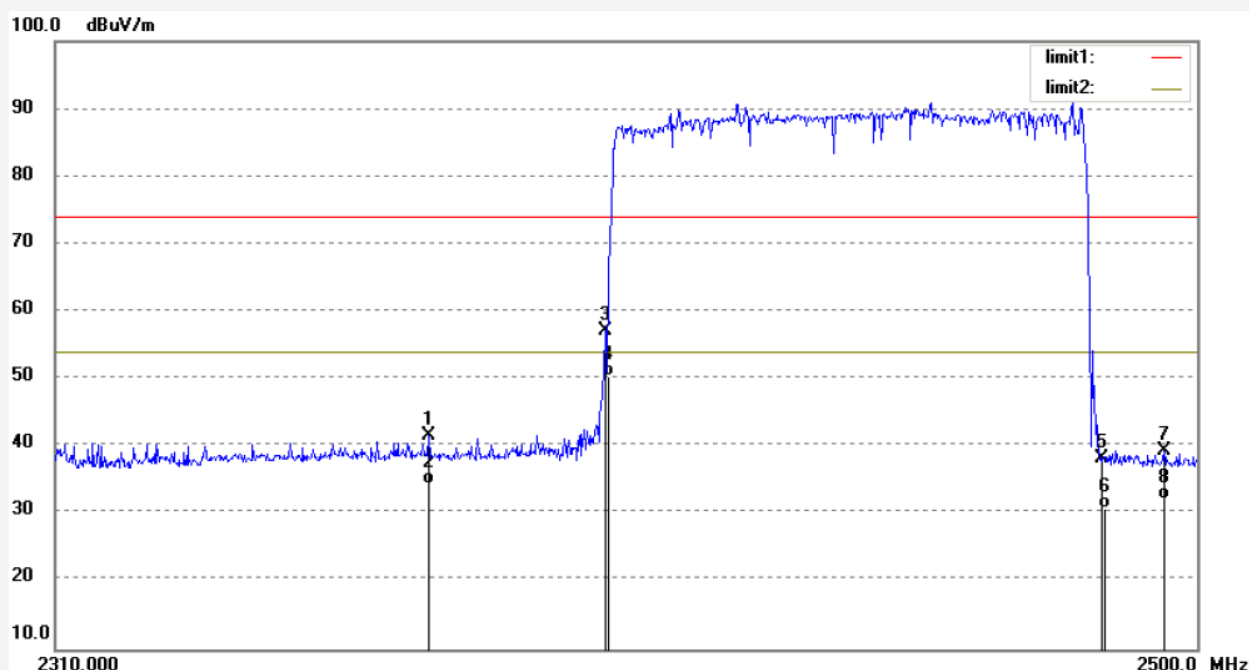
Date: 14/03/29/

Time: 9/02/36

Engineer Signature:

Distance: 3m

Note: Report No:ATE20140347

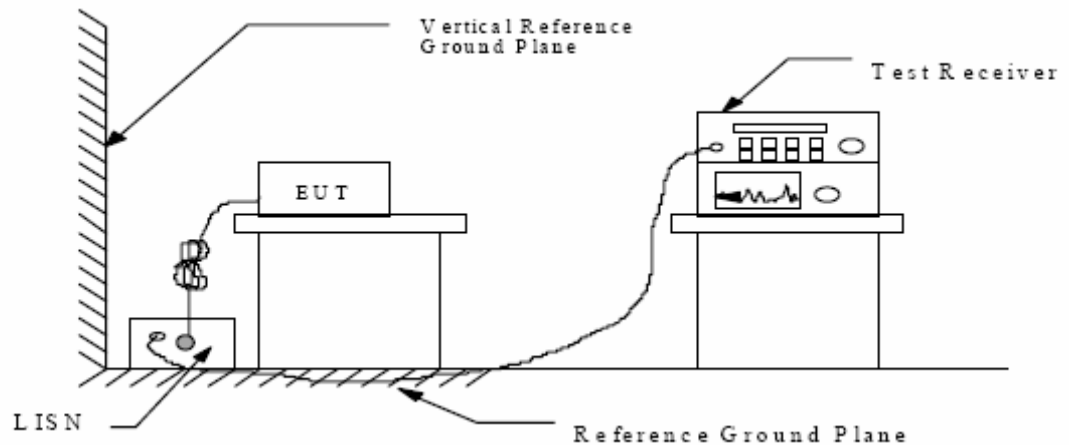


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2370.610	48.51	-6.83	41.68	74.00	-32.32	peak			
2	2370.610	41.24	-6.83	34.41	54.00	-19.59	AVG			
3	2399.870	63.97	-6.76	57.21	74.00	-16.79	peak			
4	2399.870	57.21	-6.76	50.45	54.00	-3.55	AVG			
5	2483.660	44.88	-6.54	38.34	74.00	-35.66	peak			
6	2483.660	37.35	-6.54	30.81	54.00	-23.19	AVG			
7	2494.300	45.90	-6.50	39.40	74.00	-34.60	peak			
8	2494.300	38.56	-6.50	32.06	54.00	-21.94	AVG			

12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

15 SECTION 15.207(A)

12.1.Shielding Room Test Setup Diagram



12.2.The Emission Limit

12.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

Frequency (MHz)	Limit dB(μ V)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

12.3.Power Line Conducted Emission Measurement Results

Not Compliant

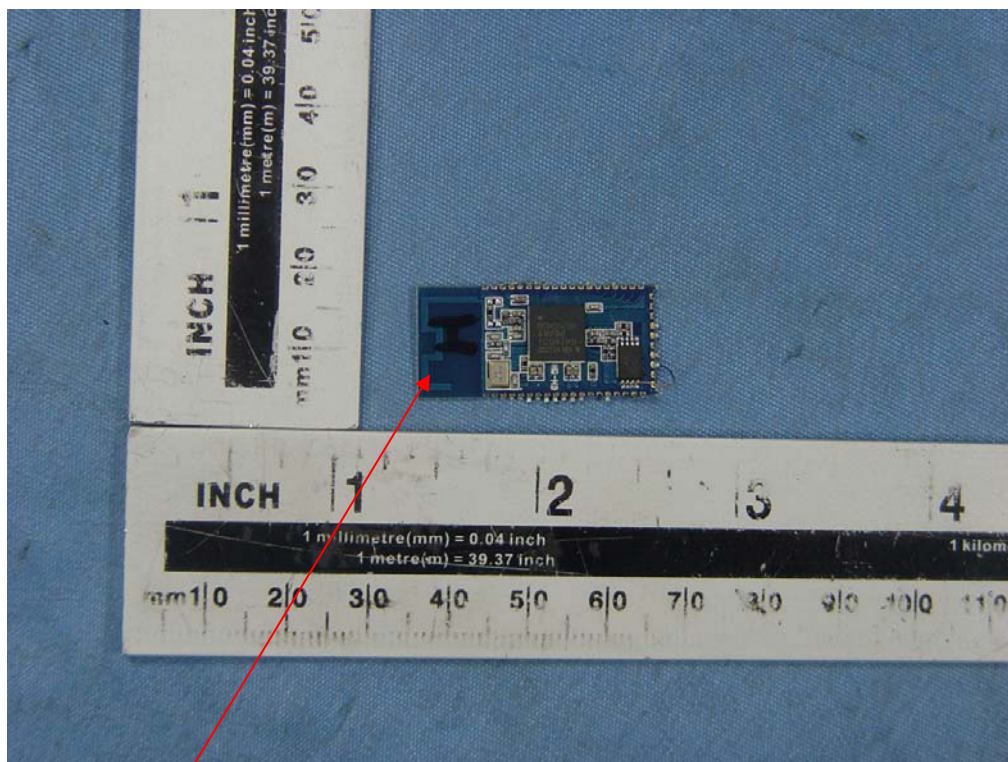
13.ANTENNA REQUIREMENT

13.1.The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

13.2.Antenna Construction

The antenna is PCB Layout antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna