

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Beijing Miiw Technology Co., Ltd.

MIIIW Dual-mode Keyboard
Model No.: MWBK01

FCC ID: 2AR3N-MWBK01

Prepared for : Beijing Miiw Technology Co., Ltd.
Address : RM101, Building A-1, Shunshijiaye Innovation Park,
Beijing, China

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Report Number : ATE20190229
Date of Test : February 14-February 21, 2019
Date of Report : February 28, 2019

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Test Report Certification

Applicant : Beijing Miiiw Technology Co., Ltd.
Address : RM101, Building A-1, Shunshijiaye Innovation Park, Beijing, China
Product : MIIIW Dual-mode Keyboard
Model No. : MWBK01

Measurement Procedure Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.249
ANSI C63.10: 2013**

The EUT was tested according to FCC 47CFR 15.249 for compliance to FCC 47CFR 15.249 requirements

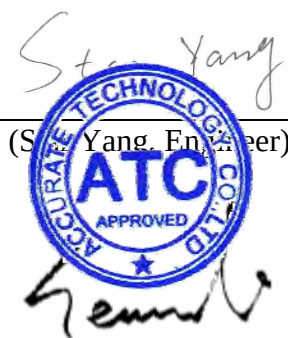
The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.249 limits. The measurement results are contained in this test report and Shenzhen 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 Shenzhen Accurate Technology Co., Ltd.

Date of Test : February 14-February 21, 2019
Date of Report : February 28, 2019

Prepared by :
(Sean Yang, Engineer)

Approved & Authorized Signer :
(Sean Liu, Manager)



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	MIIIW Dual-mode Keyboard
Model Number	:	MWBK01
Frequency Range	:	2402-2480MHz
Number of Channels	:	40
Modulation mode	:	GFSK
Antenna Gain	:	0dBi
Antenna type	:	PCB Antenna
Power Supply	:	DC 3V
Applicant	:	Beijing Miiw Technology Co., Ltd.
Address	:	RM101, Building A-1, Shunshijiaye Innovation Park, Beijing, China

1.2. Frequency List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

1.3. Special Accessory and Auxiliary Equipment

N/A

1.4. Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.5. Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	One Year
EMI Test Receiver	Rohde&Schwarz	ESR	101817	Jan. 05, 2019	One Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 05, 2019	One Year
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 05, 2019	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 05, 2019	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 05, 2019	One Year
Conducted Emission Measurement Software: ES-K1 V1.71					
Radiated Emission Measurement Software: EZ_EMV V1.1.4.2					

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2402MHz

Middle Channel: 2440MHz

High Channel: 2480MHz

3.2.Configuration and peripherals

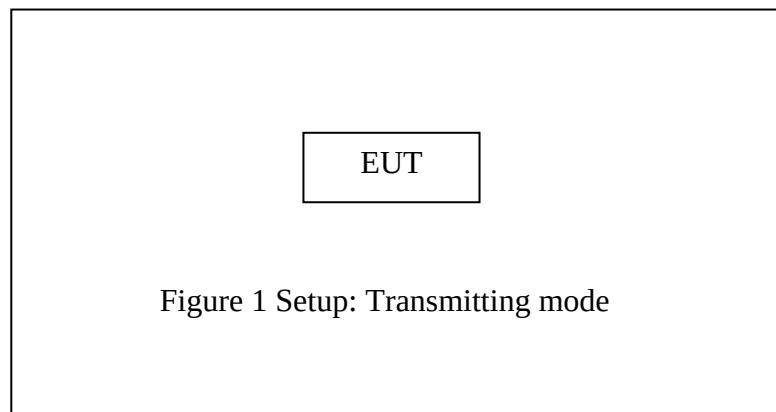


Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.215(c)	20dB Bandwidth	Compliant
Section 15.249(d)	Band Edge Compliance Test	Compliant
Section 15.205(a), Section 15.209(a), Section 15.249, Section 15.35	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	N/A
Section 15.203	Antenna Requirement	Compliant

Note: The power supply mode of the EUT is DC 3V, According to the FCC standard requirements, conducted emission is not applicable.

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



5.2. The Requirement For Section 15.215(c)

Must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.3. Operating Condition of EUT

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

5.3.2. Turn on the power of all equipment.

5.3.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402, 2440, 2480MHz.

5.4. Test Procedure

5.4.1. Place the EUT on the table and set it in transmitting mode.

5.4.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

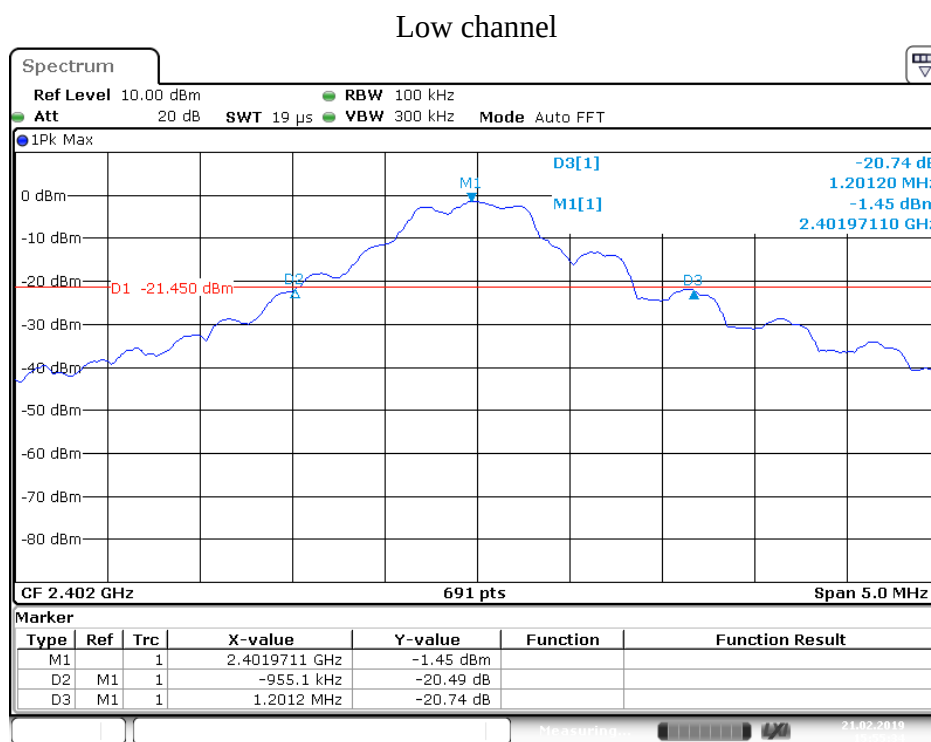
5.4.3. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz, Detector function=peak, Trace=max hold, Sweep=auto.

5.4.4. Set the measured low, middle and high frequency and test 20dB bandwidth with spectrum analyzer.

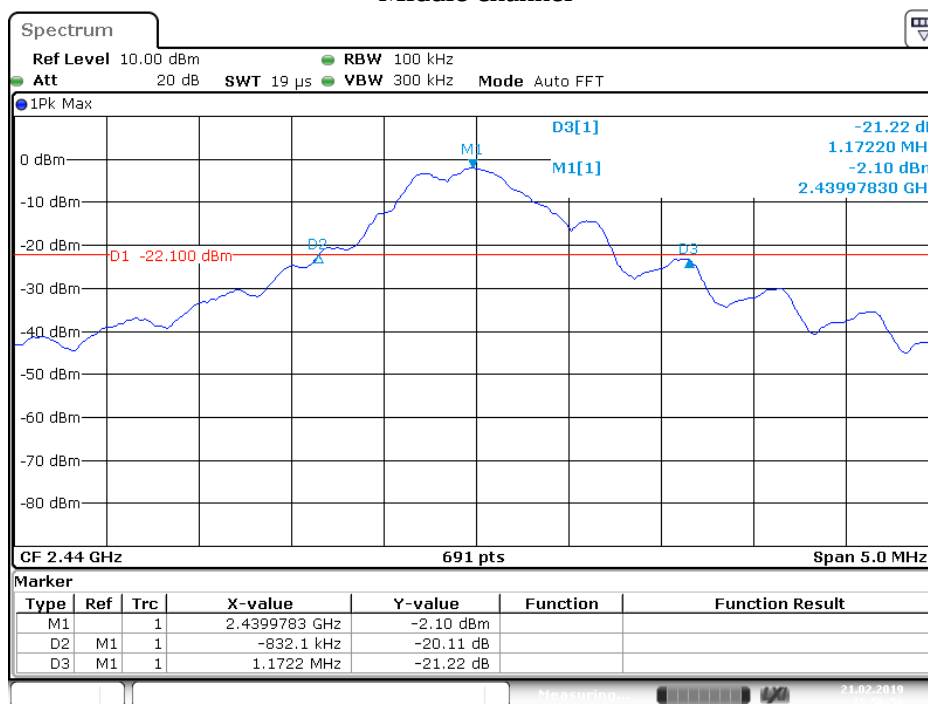
5.5. Test Results

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	2.156
Middle	2440	2.004
High	2480	1.526

The spectrum analyzer plots are attached as below.

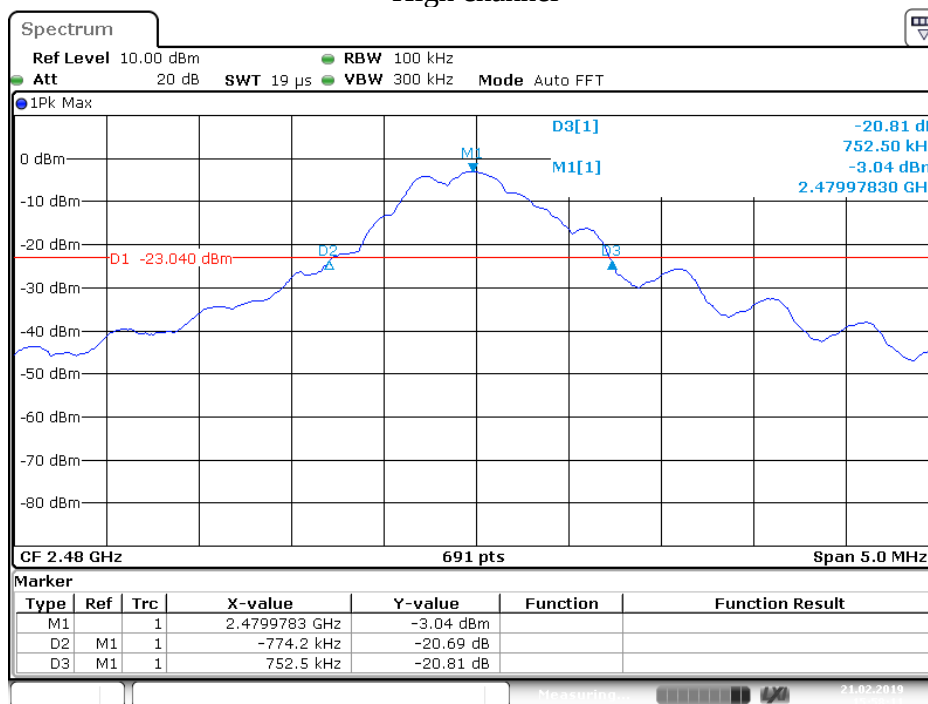


Middle channel



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High channel

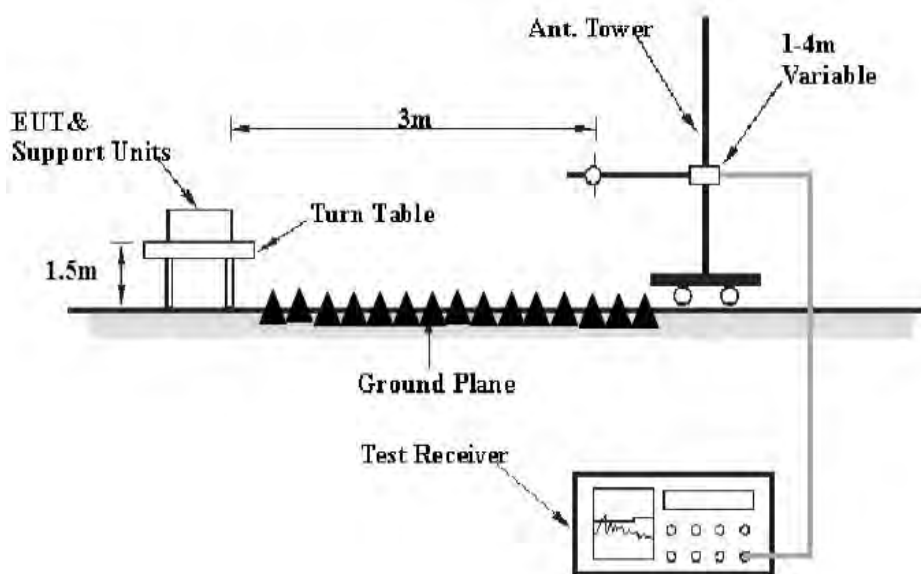


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6. BAND EDGE COMPLIANCE TEST

6.1. Block Diagram of Test Setup

(C) Radiated Emission Test Set-Up. Frequency above 1GHz



6.2. The Requirement For Section 15.249

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 A8.4(4), the attenuation required 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).

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 modes measure it. The transmit frequency are 2402, 2480MHz.

6.5. Test Procedure

Radiate Band Edge:

6.5.1. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

6.5.2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

6.5.3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

6.5.4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

RBW=1MHz, VBW=1MHz

6.5.5. The band edges was measured and recorded.

6.6. Test Results

Pass.

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:

Result = Reading + Corrected Factor

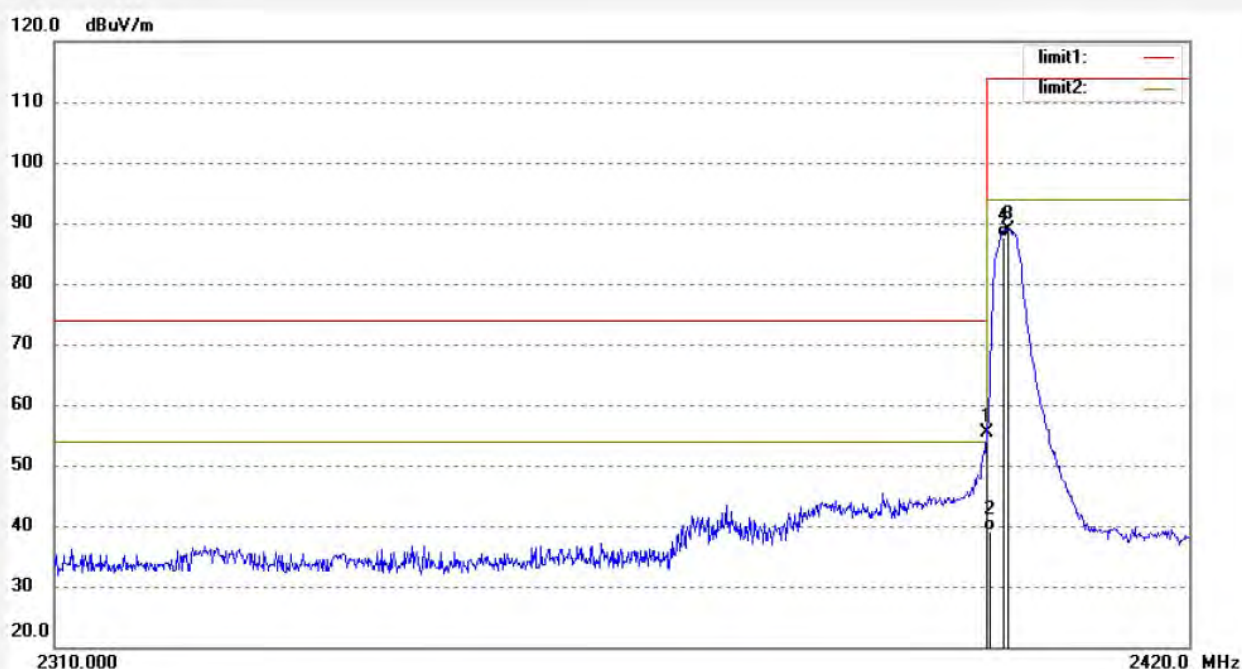
3. Display the measurement of peak values.
4. The average measurement was not performed when peak measured data under the limit of average detection.

The spectrum analyzer plots are attached as below.

Job No.: LGW2019 #367
Standard: FCC (Band Edge)
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: MIIIW Dual-mode Keyboard
Mode: TX 2402MHz
Model: MWBK01
Manufacturer: MIIIW

Polarization: Horizontal
Power Source: DC 3V
Date: 19/02/21/
Time:
Engineer Signature: WADE
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2400.000	54.62	0.88	55.50	74.00	-18.50	peak			
2	2400.000	38.26	0.88	39.14	54.00	-14.86	AVG			
3	2402.000	87.92	0.89	88.81	114.00	-25.19	peak			
4	2402.000	86.62	0.89	87.51	94.00	-6.49	AVG			

Job No.: LGW2019 #366

Standard: FCC (Band Edge)

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2402MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

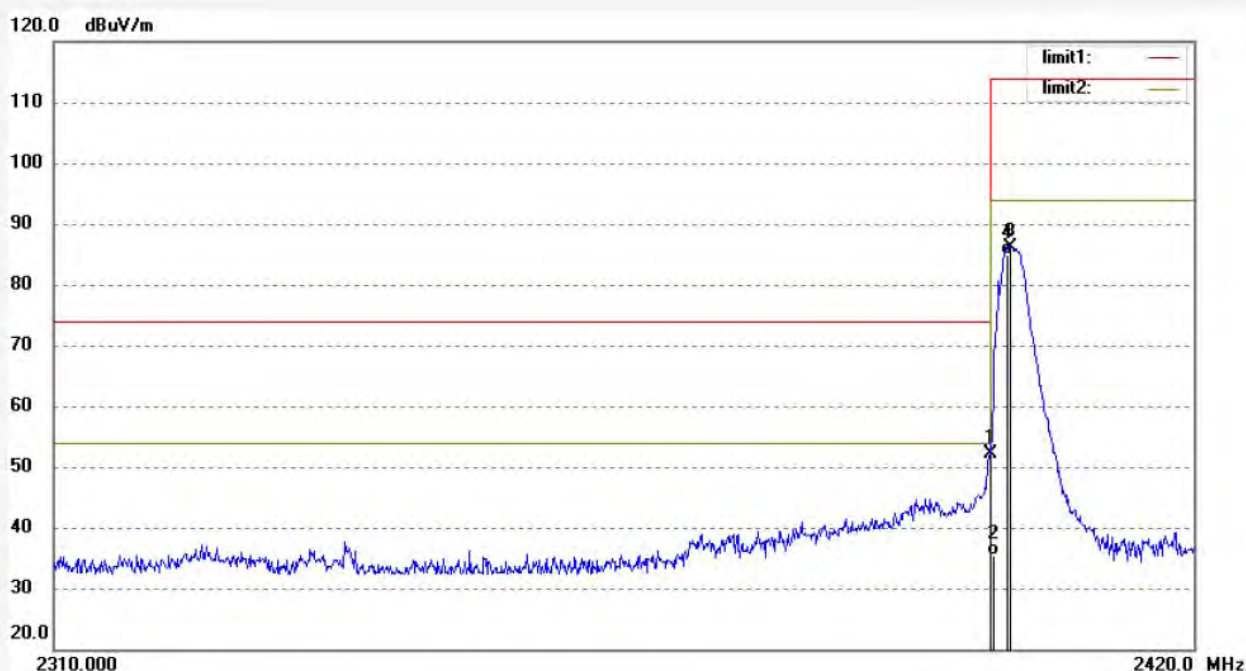
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2400.000	51.15	0.88	52.03	74.00	-21.97	peak			
2	2400.000	34.47	0.88	35.35	54.00	-18.65	AVG			
3	2402.000	85.28	0.89	86.17	114.00	-27.83	peak			
4	2402.000	83.98	0.89	84.87	94.00	-9.13	AVG			

Job No.: LGW2019 #372

Standard: FCC (Band Edge)

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

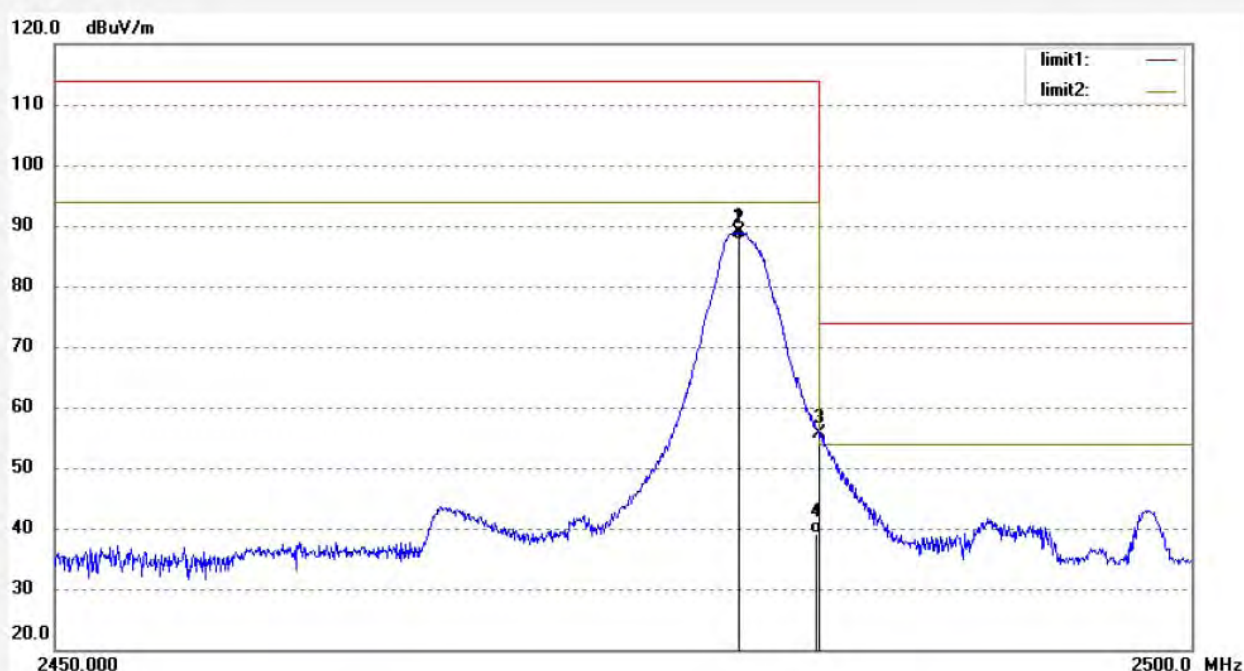
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	87.73	1.10	88.83	114.00	-25.17	peak			
2	2480.000	86.43	1.10	87.53	94.00	-6.47	AVG			
3	2483.500	54.64	1.10	55.74	74.00	-18.26	peak			
4	2483.500	38.02	1.10	39.12	54.00	-14.88	AVG			

Job No.: LGW2019 #373

Standard: FCC (Band Edge)

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

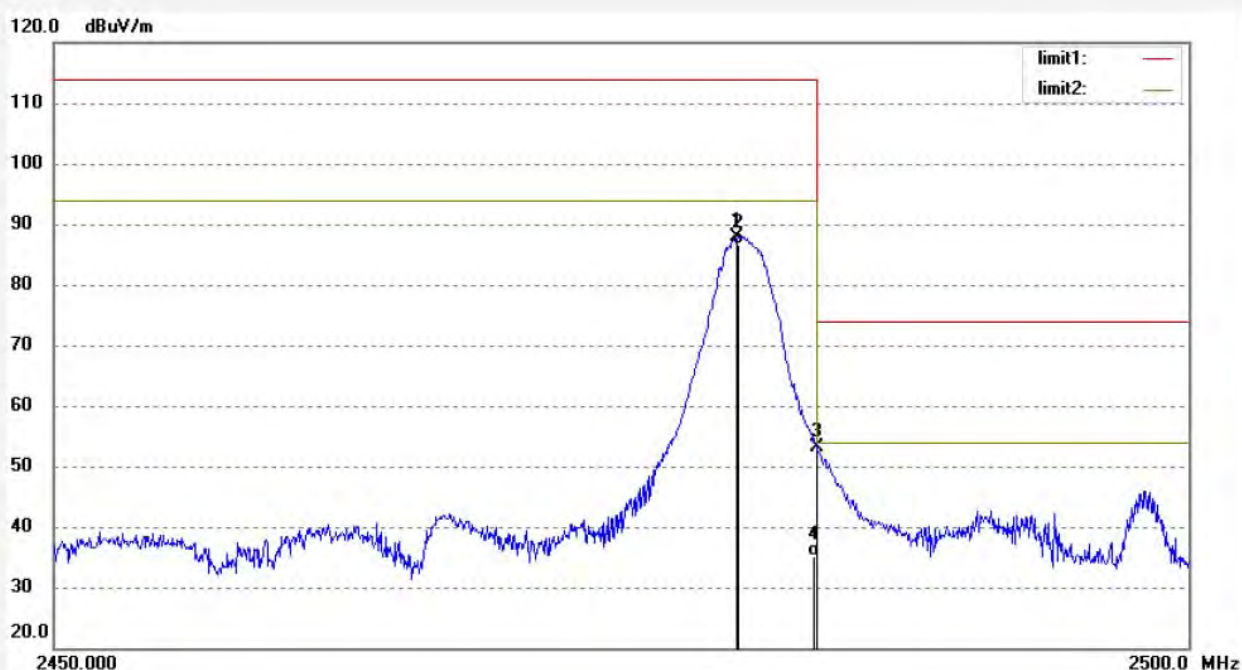
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:

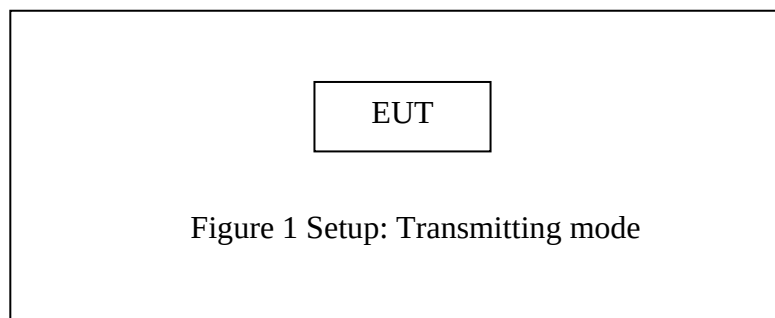


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	86.87	1.10	87.97	114.00	-26.03	peak			
2	2480.000	85.57	1.10	86.67	94.00	-7.33	AVG			
3	2483.500	52.15	1.10	53.25	74.00	-20.75	peak			
4	2483.500	34.14	1.10	35.24	54.00	-18.76	AVG			

7. RADIATED SPURIOUS EMISSION TEST

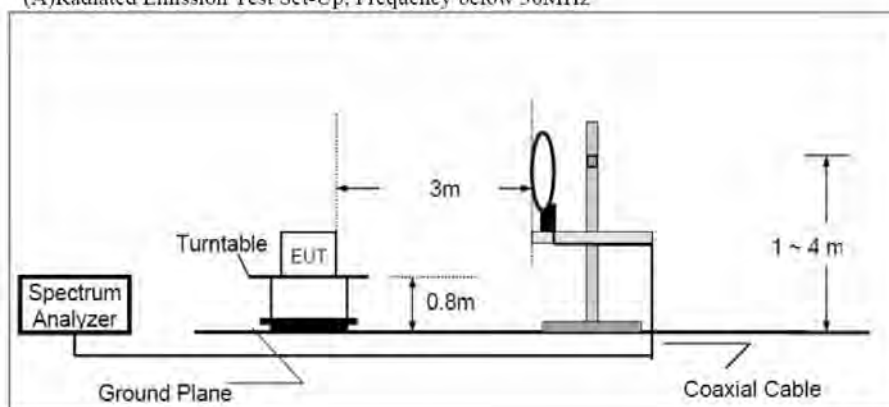
7.1. Block Diagram of Test Setup

7.1.1. Block diagram of connection between the EUT and peripherals

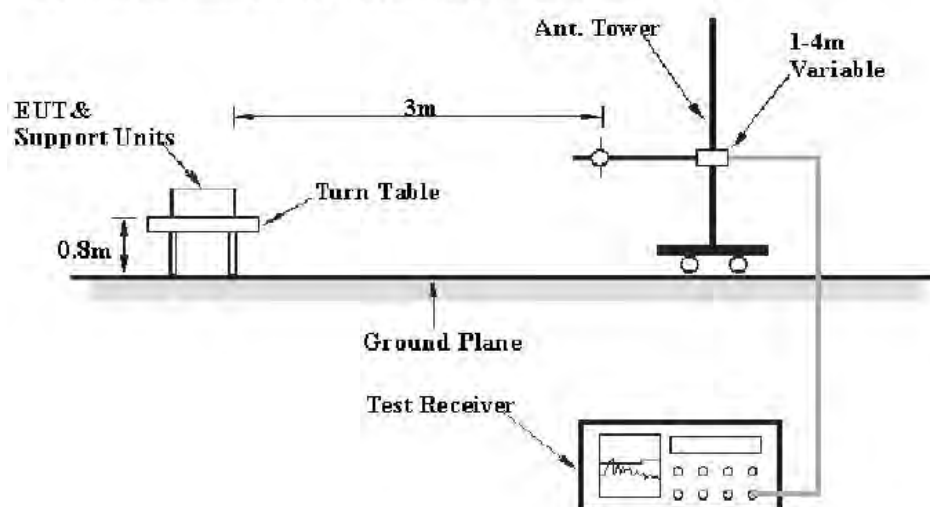


7.1.2. Semi-Anechoic Chamber Test Setup Diagram

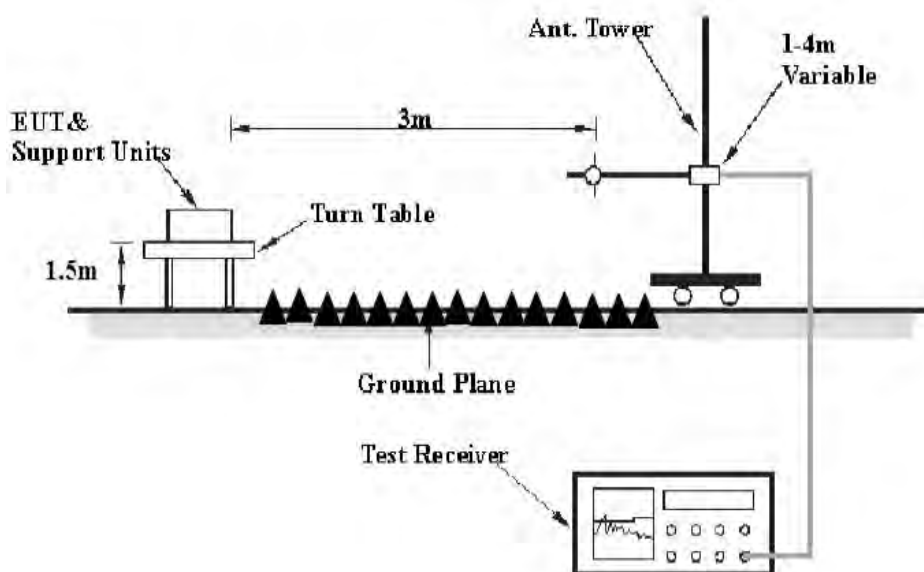
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



7.2.The Limit For Section 15.249

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 A8.4(4), 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).

7.3. Restricted bands of operation

7.3.1.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.

7.4.Configuration of EUT on Measurement

The equipment are 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.

7.5. Operating Condition of EUT

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

7.5.2. Turn on the power of all equipment.

7.5.3. Let the EUT work in TX modes and measure it. The transmit frequency are 2402, 2440, 2480MHz.

7.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8m(Below 1GHz) and 1.5m(above 1GHz) 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 C63.10: 2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9 kHz to 26.5GHz 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.

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz

Peak detector above 1GHz

RBW (1 MHz), VBW (3MHz) for Peak measurement

RBW (1 MHz), VBW (10Hz) for AV measurement

7.7. Data Sample

Frequency (MHz)	Reading (dB μ v)	Factor (dB/m)	Result (dB μ v/m)	Limit (dB μ v/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB μ v/m) = Reading(dB μ v) + Factor(dB/m)

Limit (dB μ v/m) = Limit stated in standard

Margin (dB) = Result(dB μ v/m) - Limit (dB μ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

7.8.Test Results

Pass.

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission in three axes. The worst emissions are reported in all channels.

The spectrum analyzer plots are attached as below.

9KHz to 30MHz Test data

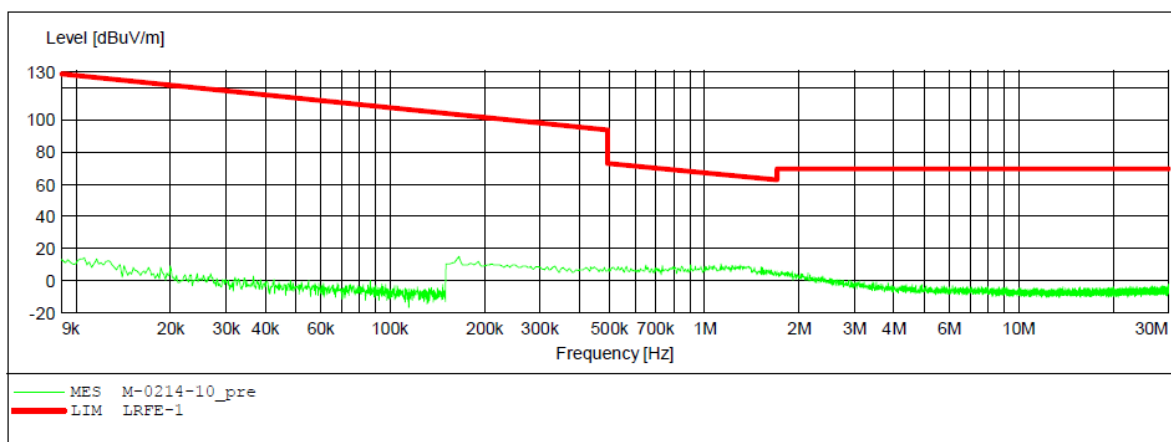
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2402MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: X
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD_VTERM2 1.70				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M	
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M	



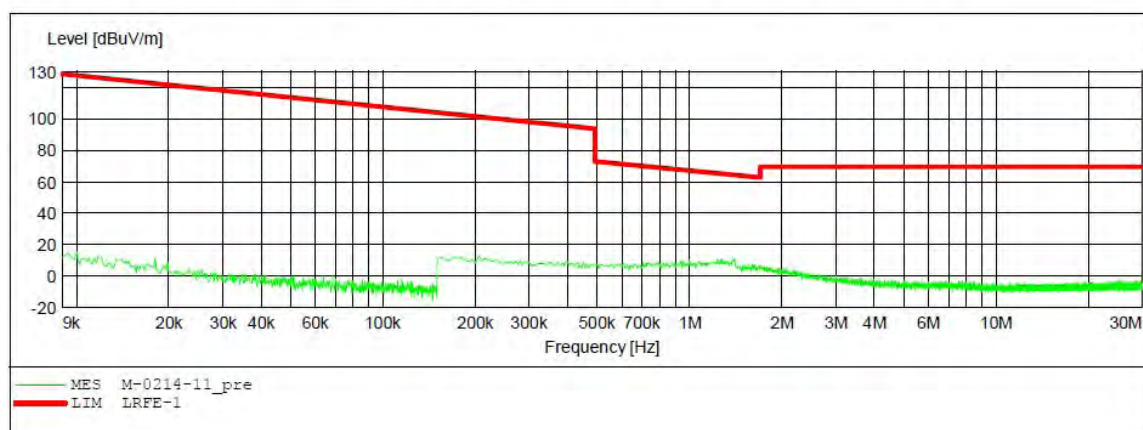
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2402MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: Y
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70						
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



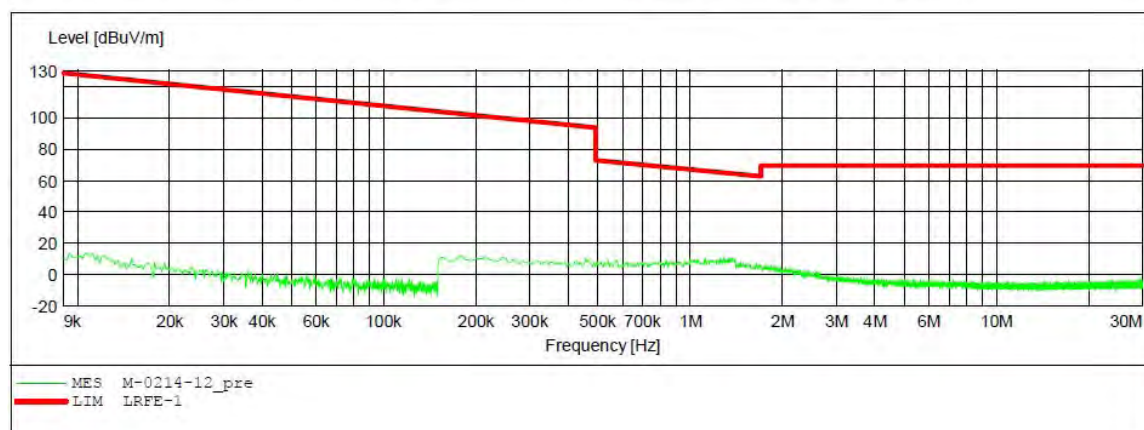
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2402MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: Z
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



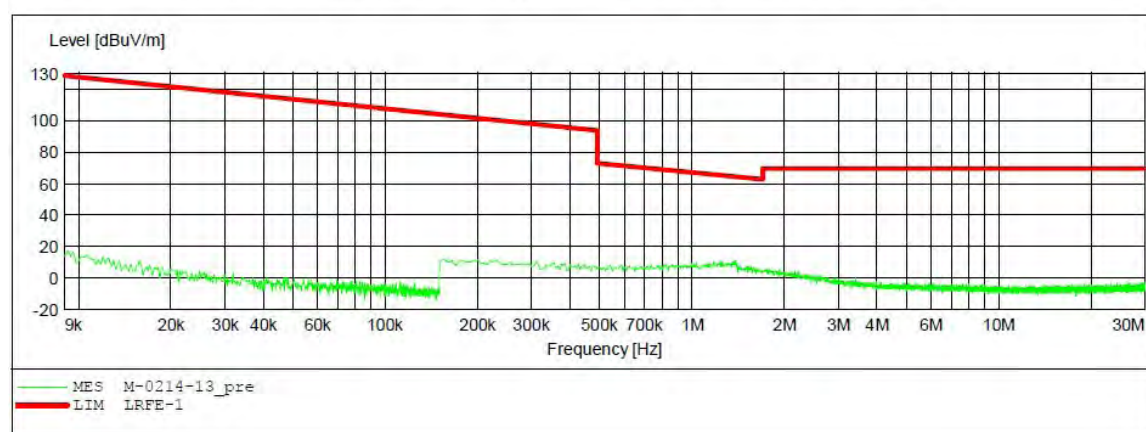
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2440MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: X
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



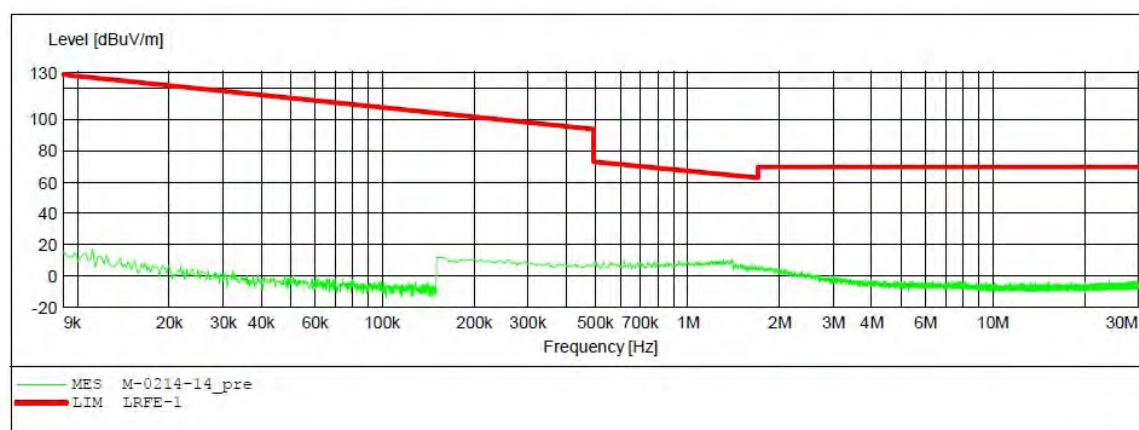
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2440MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: Y
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD_VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



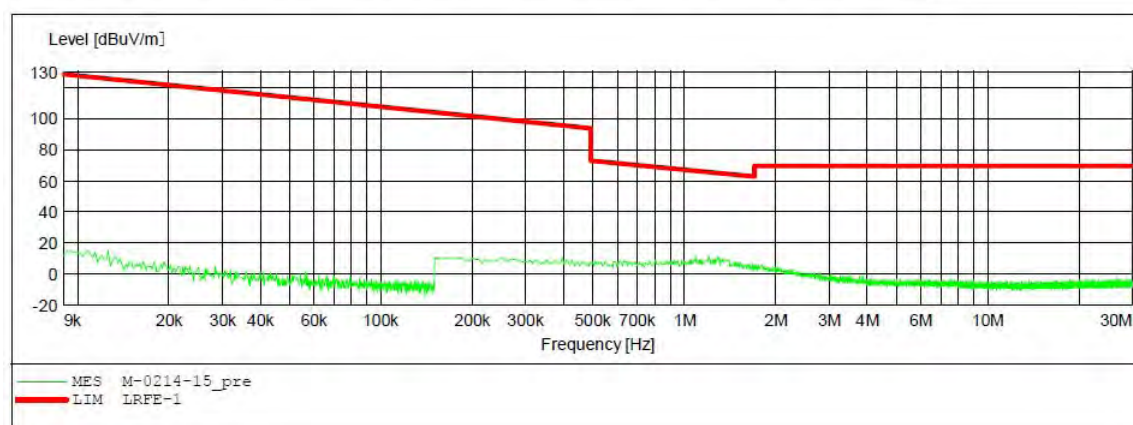
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2440MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: Z
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD VTERM2 1.70				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M	
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M	



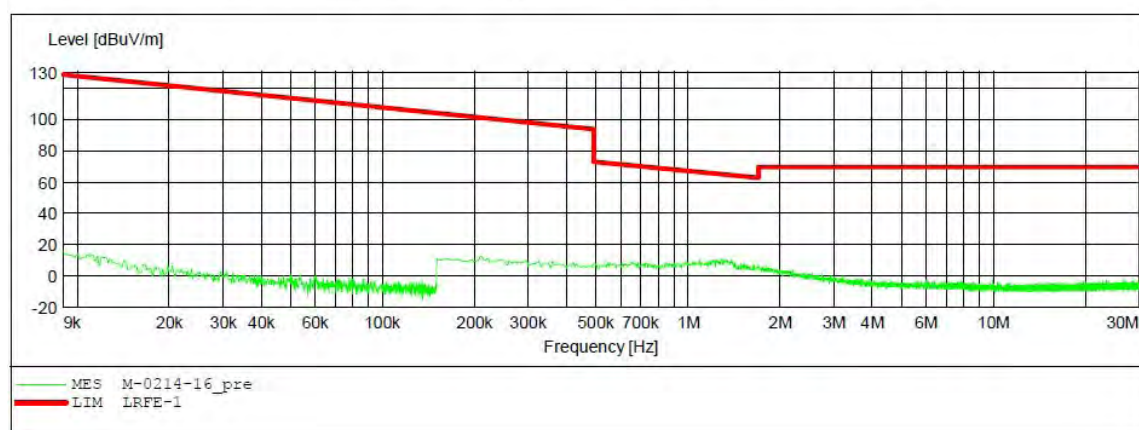
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2480MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: X
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



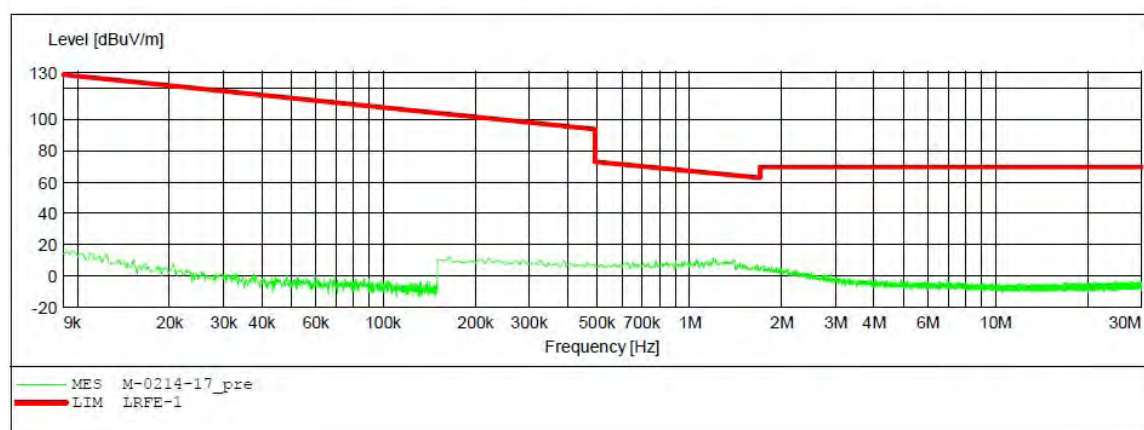
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2480MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: Y
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



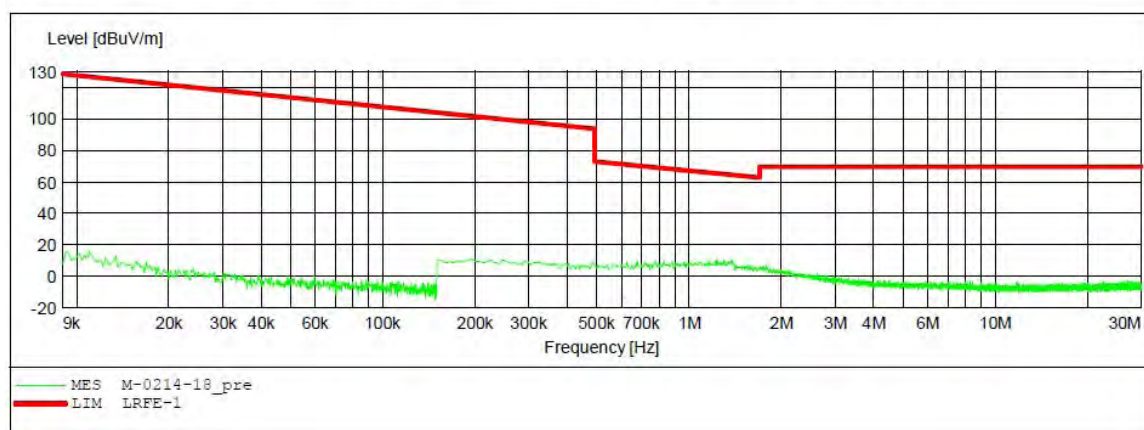
ACCURATE TECHNOLOGY CO.,LTD

FCC Part 15C 3M Radiated

EUT: MIIIW Dual-mode Keyboard M/N:MWBK01
 Manufacturer: MIIIW
 Operating Condition: TX 2480MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3V
 Comment: Z
 Start of Test: 2019-2-14 /

SCAN TABLE: "LFRE Fin"

Short Description:			_SUB_STD_VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M





30MHz to 1GHz Test data

ACCURATE TECHNOLOGY CO., LTD.

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

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #380

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIW Dual-mode Keyboard

Mode: TX 2402MHz

Model: MWBK01

Manufacturer: MIIW

Polarization: Horizontal

Power Source: DC 3V

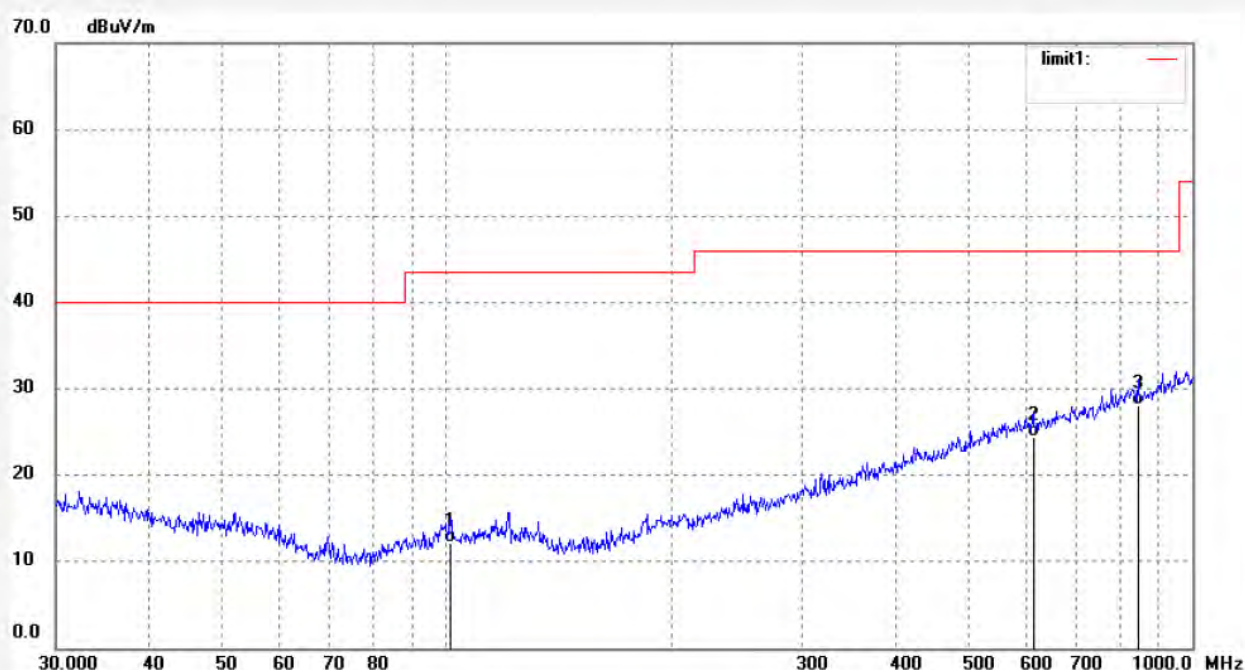
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	101.2883	25.43	-13.26	12.17	43.50	-31.33	QP			
2	612.0642	26.63	-2.18	24.45	46.00	-21.55	QP			
3	845.0878	26.54	1.53	28.07	46.00	-17.93	QP			

Job No.: LGW2019 #381

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2402MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

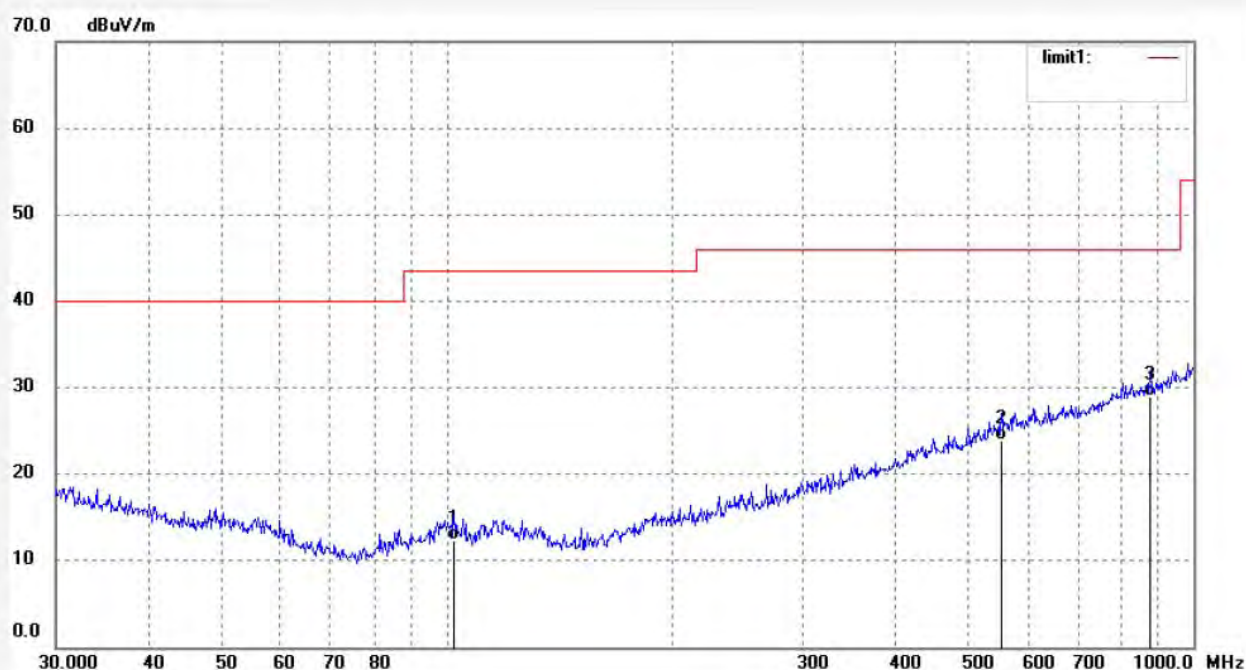
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	102.3597	25.78	-13.44	12.34	43.50	-31.16	QP			
2	552.8832	26.97	-3.00	23.97	46.00	-22.03	QP			
3	875.2469	26.97	1.98	28.95	46.00	-17.05	QP			

Job No.: LGW2019 #383

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2440MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

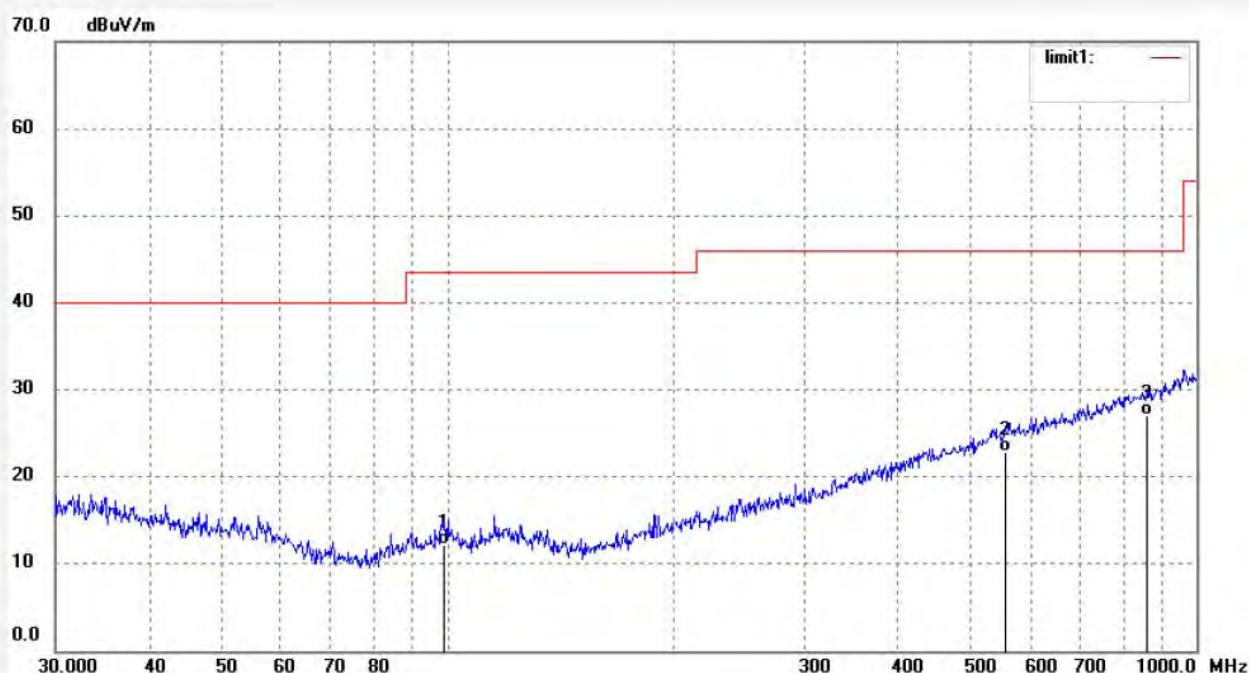
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	98.8324	25.59	-13.44	12.15	43.50	-31.35	QP			
2	554.8252	25.84	-2.96	22.88	46.00	-23.12	QP			
3	860.0352	25.31	1.72	27.03	46.00	-18.97	QP			

Job No.: LGW2019 #382

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2440MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

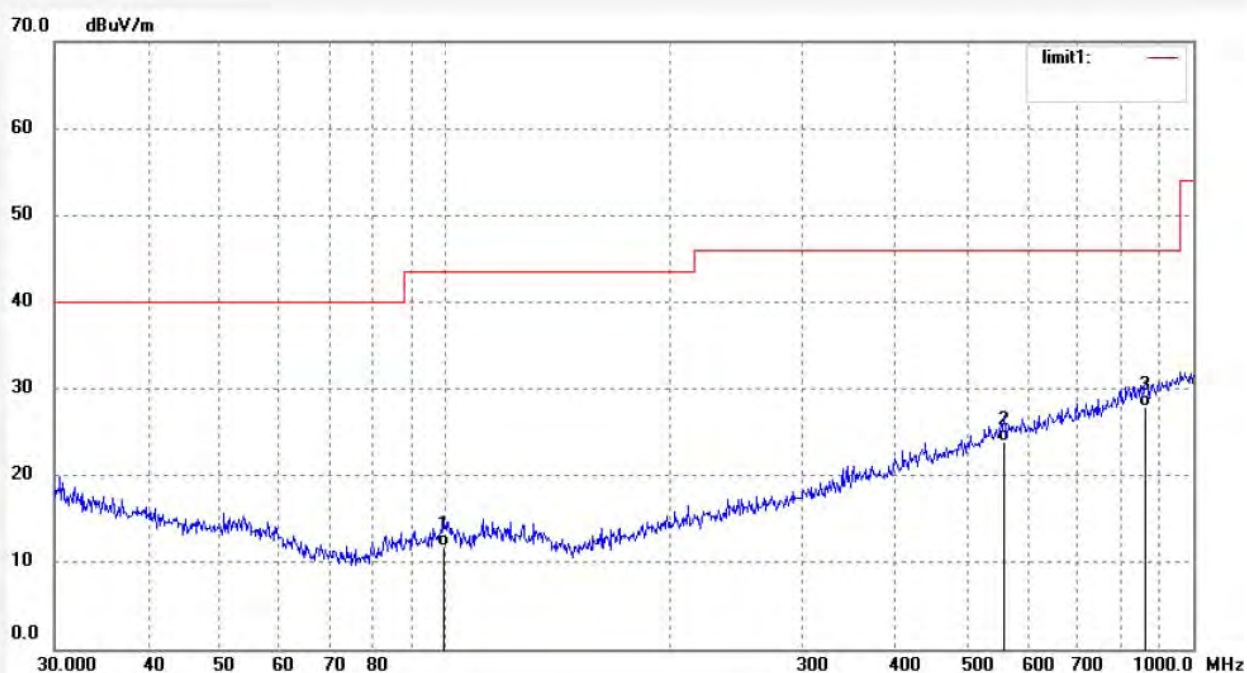
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	99.5279	25.00	-13.21	11.79	43.50	-31.71	QP			
2	558.7301	26.74	-2.92	23.82	46.00	-22.18	QP			
3	863.0561	26.14	1.82	27.96	46.00	-18.04	QP			

Job No.: LGW2019 #384

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

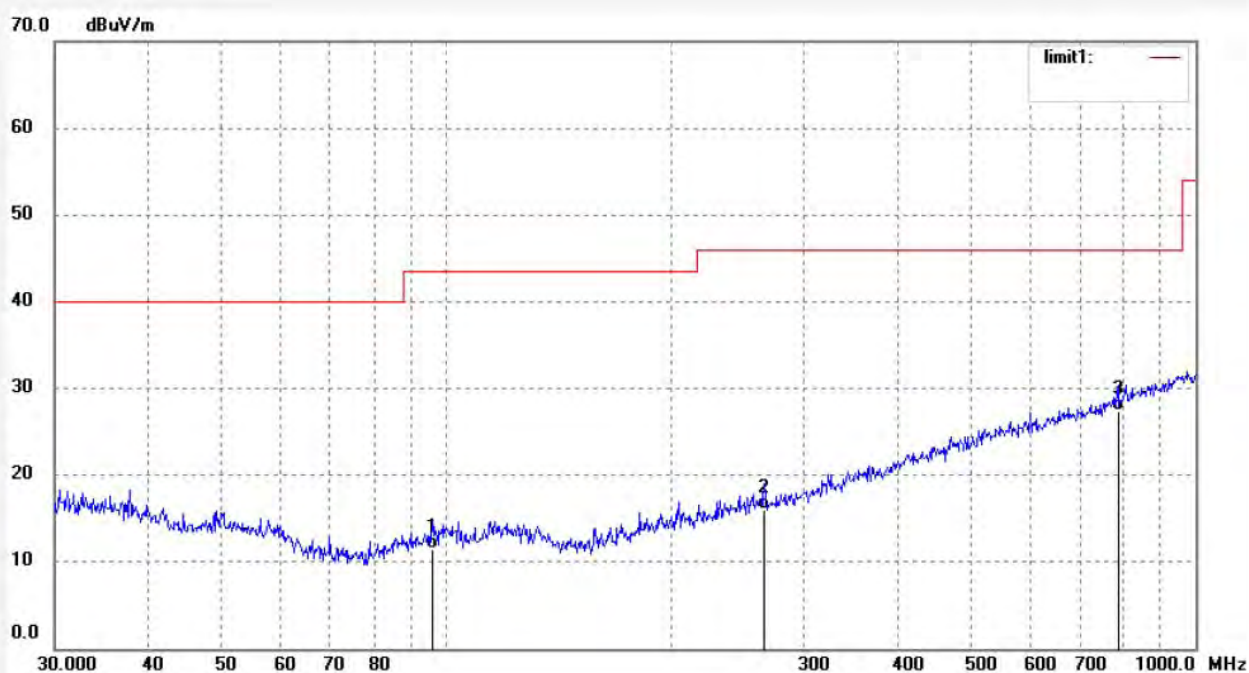
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.7622	26.02	-14.48	11.54	43.50	-31.96	QP			
2	265.6757	26.18	-10.15	16.03	46.00	-29.97	QP			
3	787.8513	26.86	0.55	27.41	46.00	-18.59	QP			

Job No.: LGW2019 #385

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

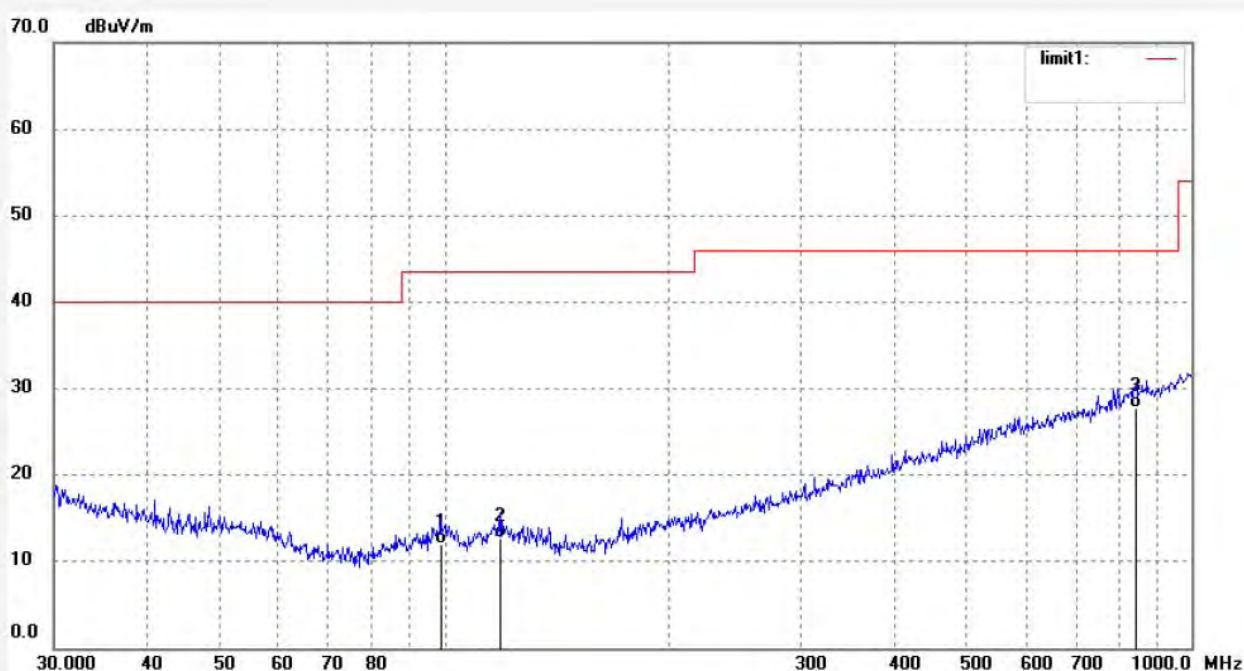
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	98.8324	25.41	-13.44	11.97	43.50	-31.53	QP			
2	118.6013	25.67	-13.05	12.62	43.50	-30.88	QP			
3	842.1295	26.18	1.50	27.68	46.00	-18.32	QP			



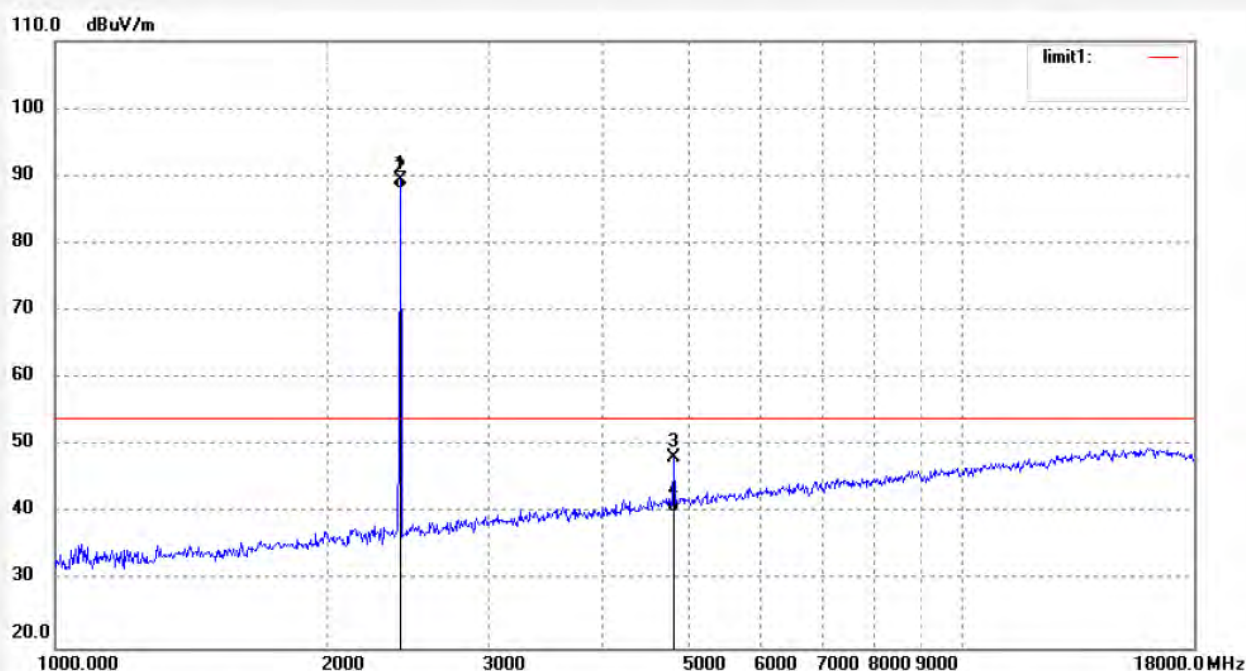
30MHz to 1GHz Test data
ACCURATE TECHNOLOGY CO., LTD.
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
 Tel:+86-0755-26503290
 Fax:+86-0755-26503396

Job No.: LGW2019 #364
 Standard: FCC Part 15C 3M Radiated
 Test item: Radiation Test
 Temp.(C)/Hum.(%) 23 C / 48 %
 EUT: MIIIW Dual-mode Keyboard
 Mode: TX 2402MHz
 Model: MWBK01
 Manufacturer: MIIIW

Polarization: Horizontal
 Power Source: DC 3V
 Date: 19/02/21/
 Time:
 Engineer Signature: WADE
 Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	88.57	0.89	89.46	114.00	-24.54	peak			
2	2402.000	87.27	0.89	88.16	94.00	-5.84	AVG			
3	4804.025	40.79	7.40	48.19	74.00	-25.81	peak			
4	4804.025	32.84	7.40	40.24	54.00	-13.76	AVG			

Job No.: LGW2019 #365

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2402MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

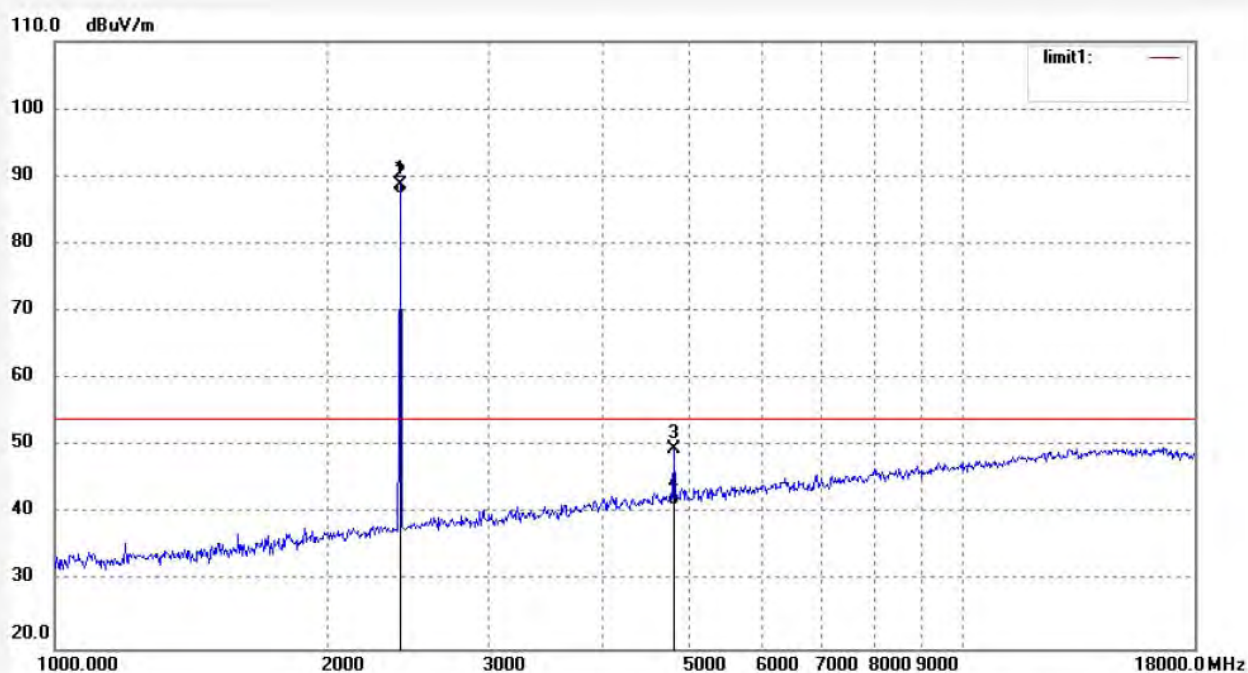
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	87.77	0.89	88.66	114.00	-25.34	peak			
2	2402.000	86.47	0.89	87.36	94.00	-6.64	AVG			
3	4804.027	42.15	7.40	49.55	74.00	-24.45	peak			
4	4804.027	33.93	7.40	41.33	54.00	-12.67	AVG			

Job No.: LGW2019 #368

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2440MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

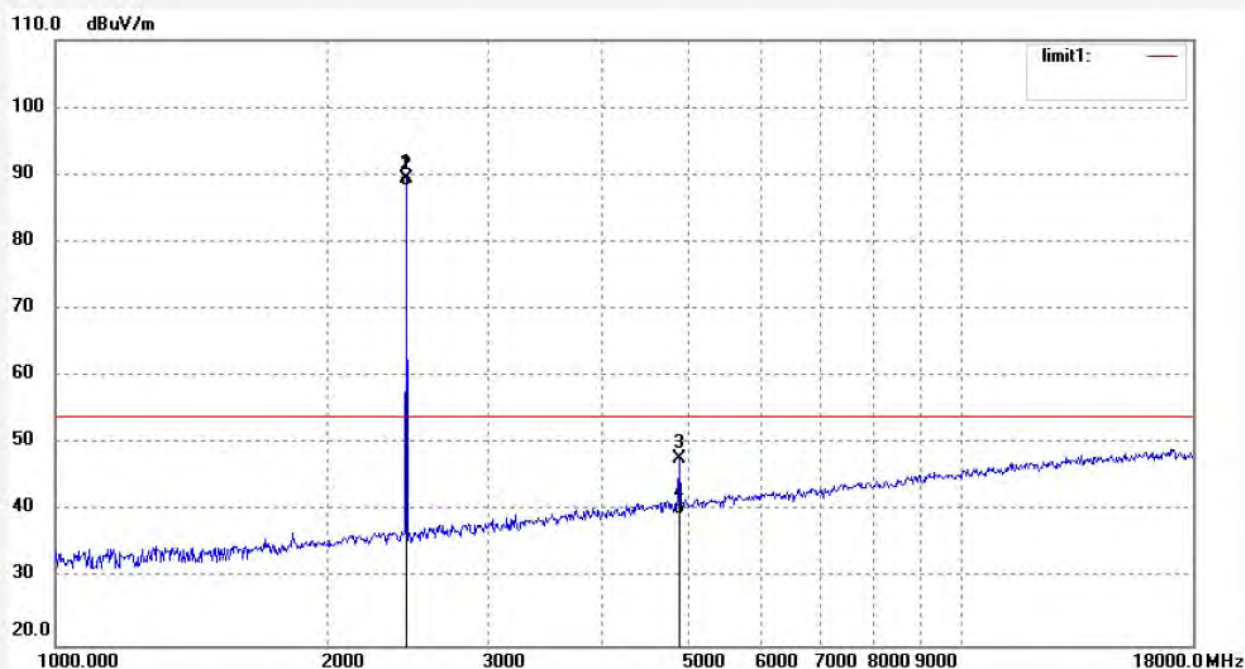
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	88.44	1.04	89.48	114.00	-24.52	peak			
2	2440.000	87.24	1.04	88.28	94.00	-5.72	AVG			
3	4880.030	39.79	8.10	47.89	74.00	-26.11	peak			
4	4880.030	31.44	8.10	39.54	54.00	-14.46	AVG			

Job No.: LGW2019 #369

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2440MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

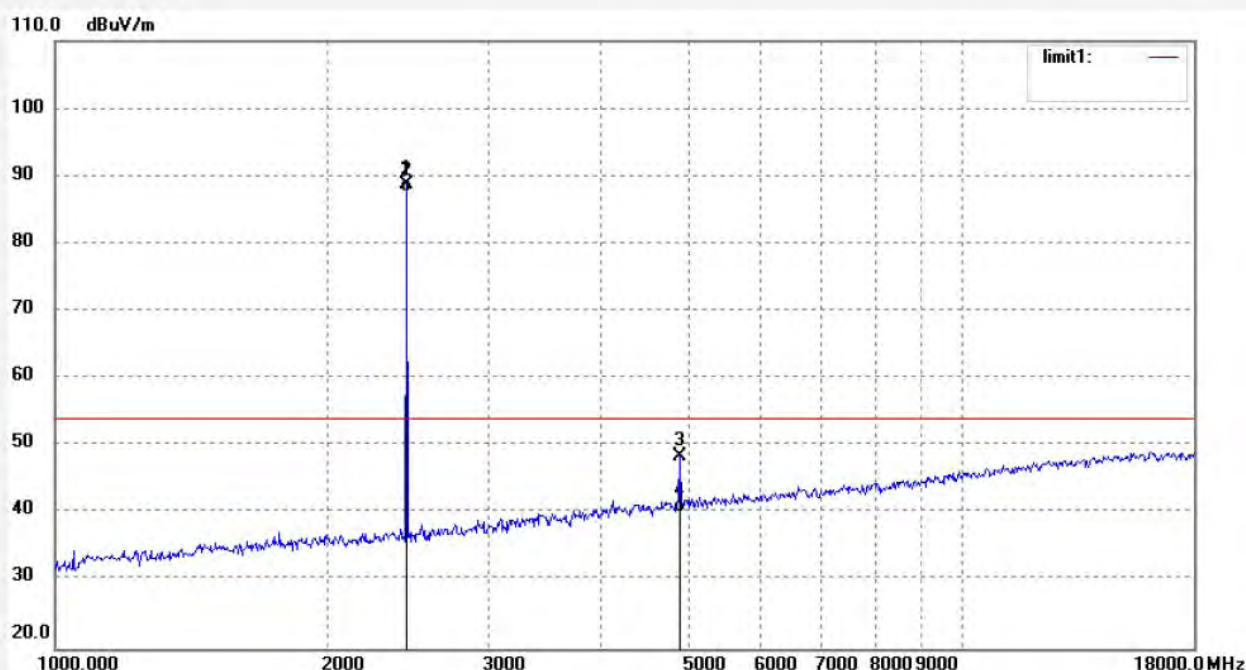
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	87.68	1.04	88.72	114.00	-25.28	peak			
2	2440.000	86.48	1.04	87.52	94.00	-6.48	AVG			
3	4880.029	40.29	8.10	48.39	74.00	-25.61	peak			
4	4880.029	32.02	8.10	40.12	54.00	-13.88	AVG			

Job No.: LGW2019 #371

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

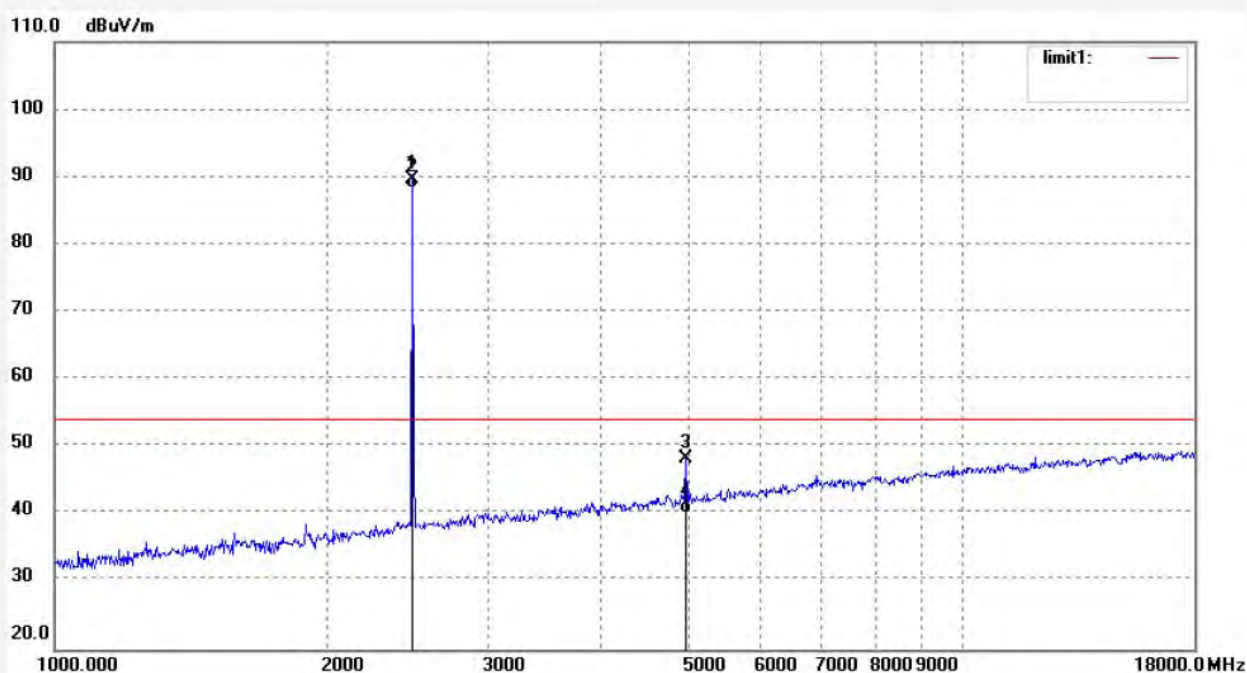
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	88.50	1.10	89.60	114.00	-24.40	peak			
2	2480.000	87.20	1.10	88.30	94.00	-5.70	AVG			
3	4960.032	39.69	8.60	48.29	74.00	-25.71	peak			
4	4960.032	31.61	8.60	40.21	54.00	-13.79	AVG			

Job No.: LGW2019 #370

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

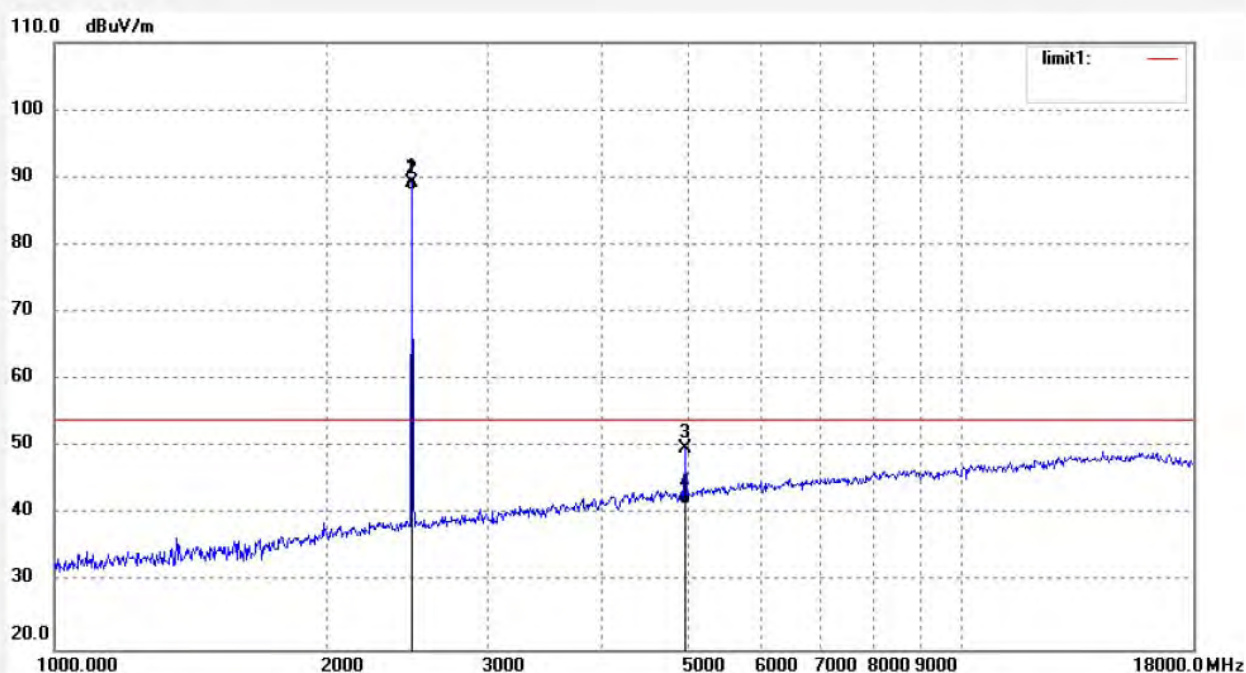
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	88.20	1.10	89.30	114.00	-24.70	peak			
2	2480.000	86.90	1.10	88.00	94.00	-6.00	AVG			
3	4960.031	41.18	8.60	49.78	74.00	-24.22	peak			
4	4960.031	32.97	8.60	41.57	54.00	-12.43	AVG			

Job No.: LGW2019 #375

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2402MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

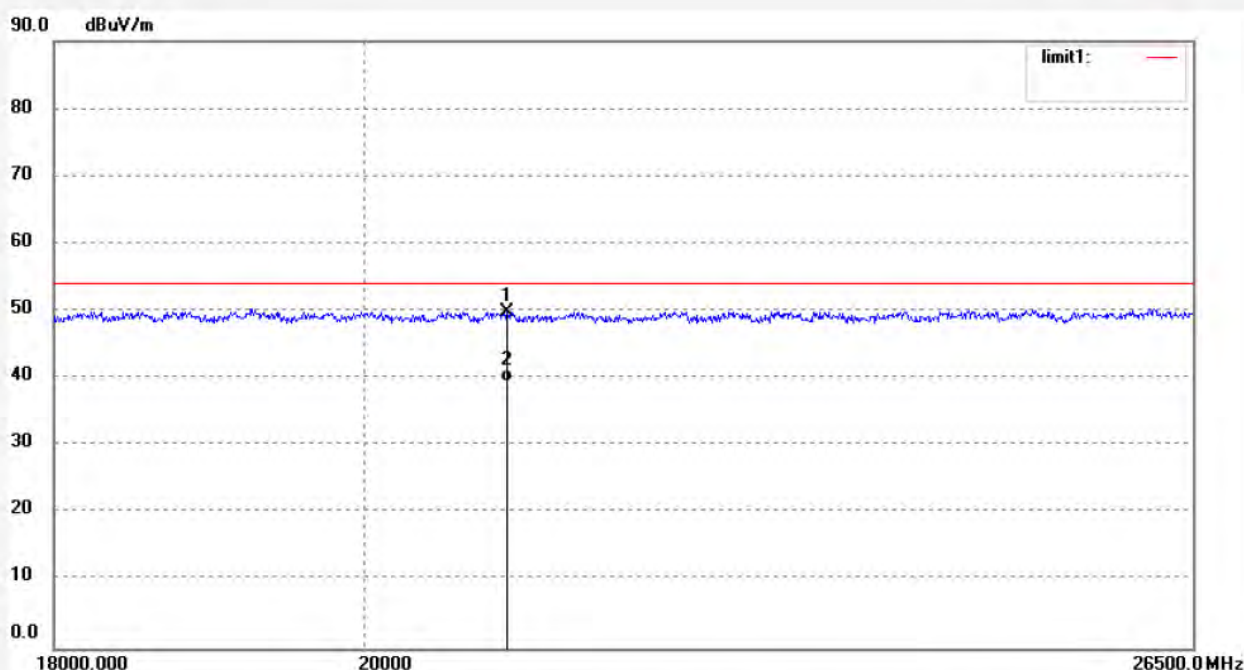
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	20995.485	11.41	38.41	49.82	74.00	-24.18	peak			
2	20995.485	1.04	38.41	39.45	54.00	-14.55	AVG			

Job No.: LGW2019 #374

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2402MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

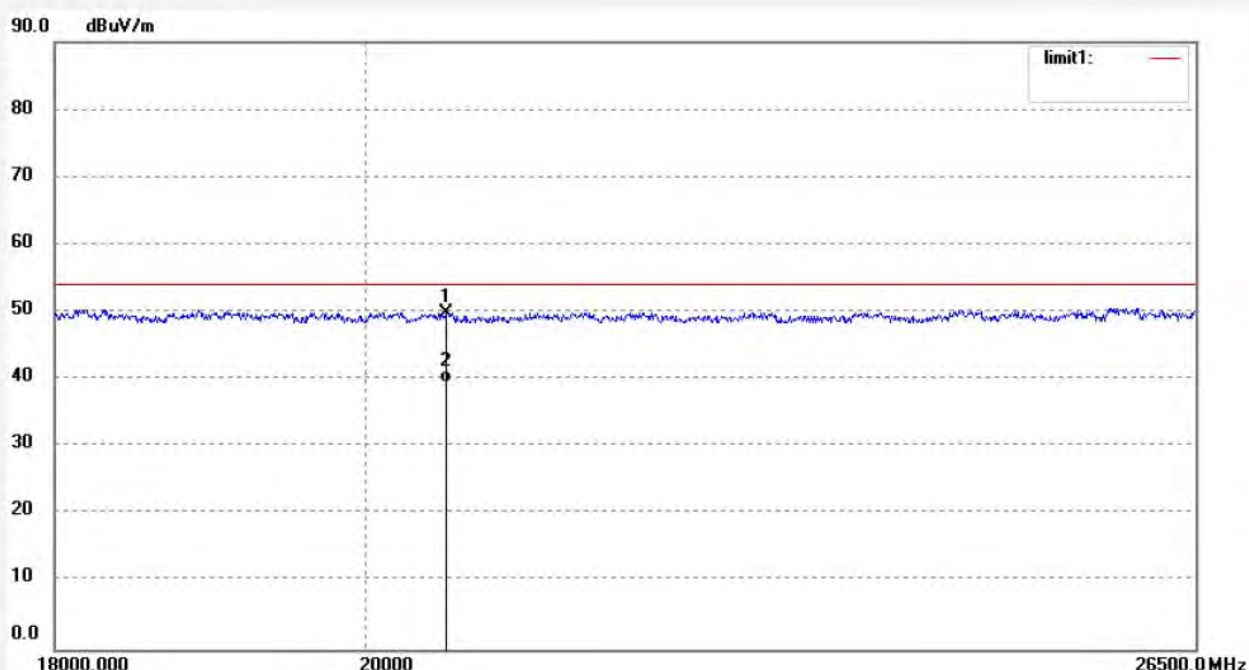
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	20553.575	11.48	38.39	49.87	74.00	-24.13	peak			
2	20553.575	1.16	38.39	39.55	54.00	-14.45	AVG			

Job No.: LGW2019 #376

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2440MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

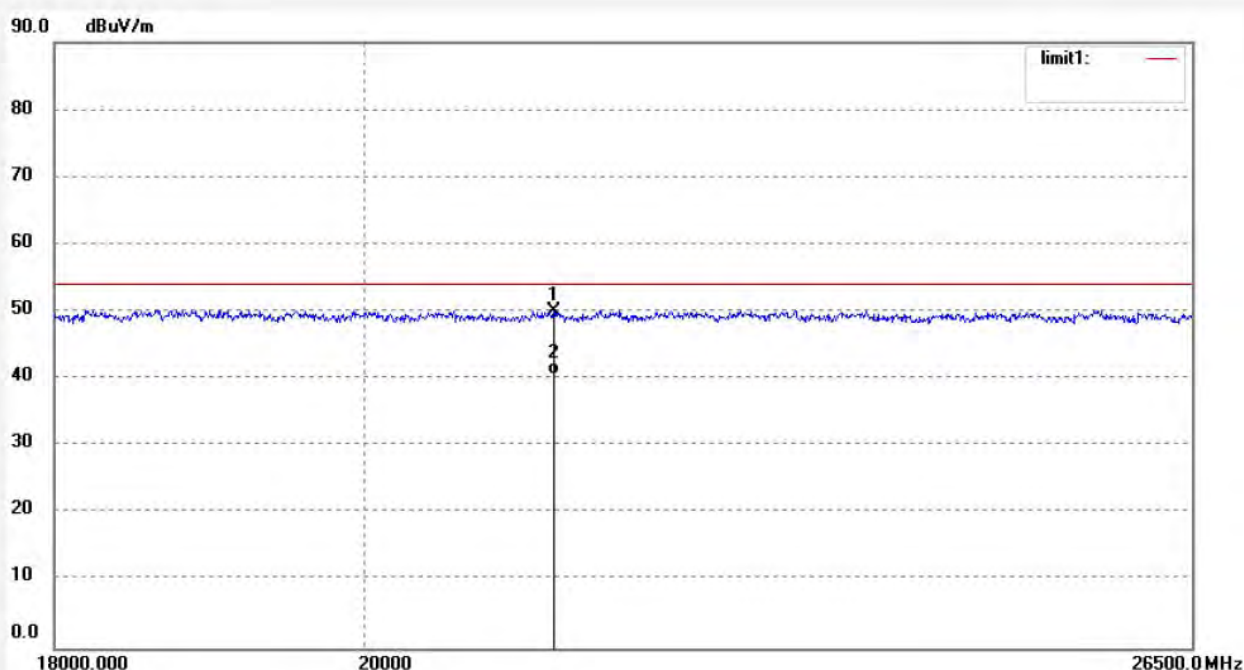
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21331.078	11.55	38.48	50.03	74.00	-23.97	peak			
2	21331.078	2.09	38.48	40.57	54.00	-13.43	AVG			

Job No.: LGW2019 #377

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2440MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

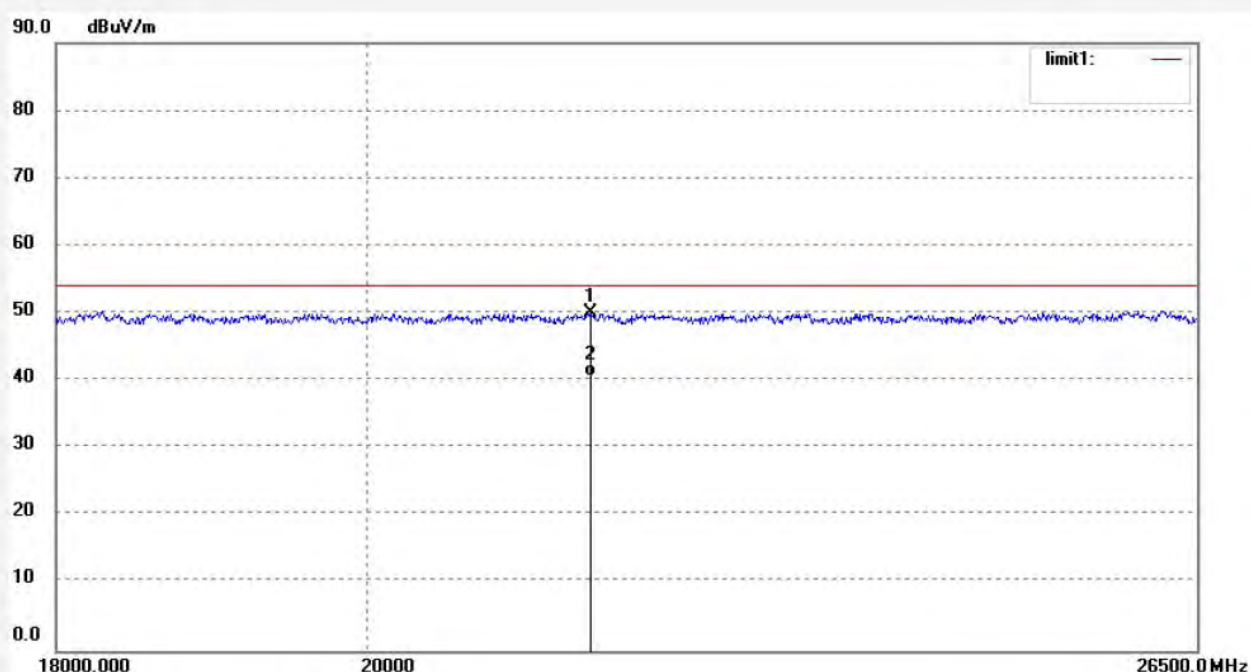
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21571.684	10.79	39.26	50.05	74.00	-23.95	peak			
2	21571.684	1.28	39.26	40.54	54.00	-13.46	AVG			

Job No.: LGW2019 #379

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Horizontal

Power Source: DC 3V

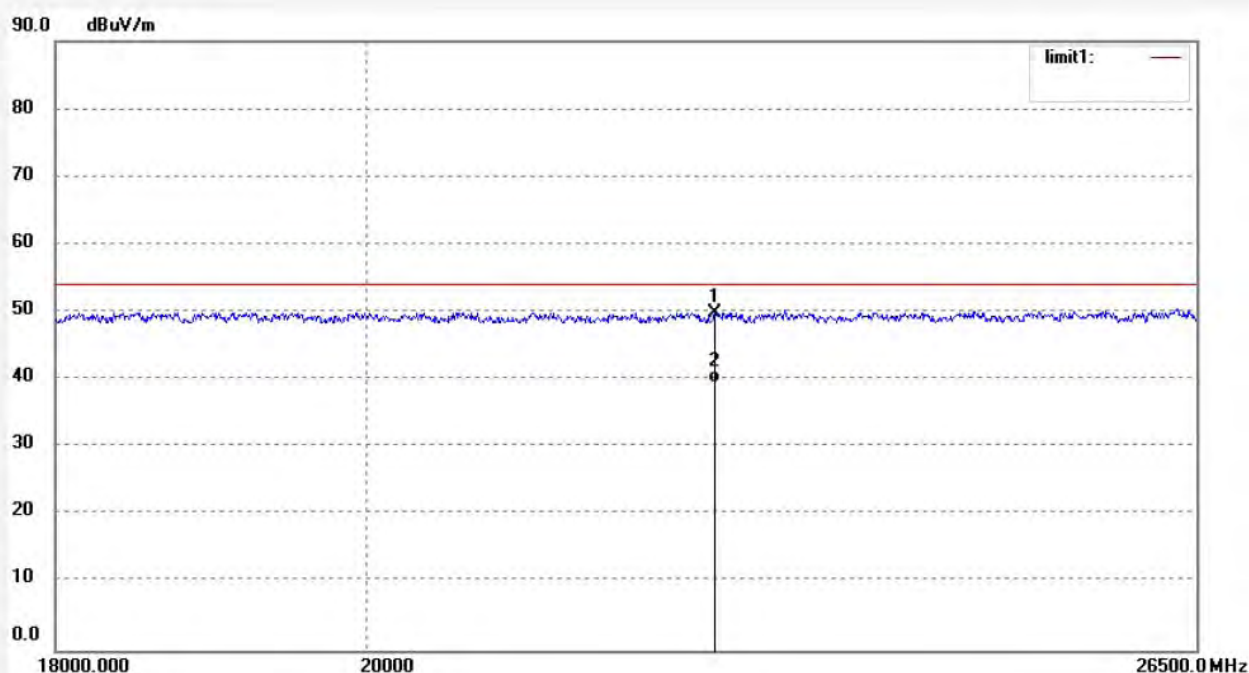
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22509.254	9.99	39.83	49.82	74.00	-24.18	peak			
2	22509.254	-0.42	39.83	39.41	54.00	-14.59	AVG			



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Fax:+86-0755-26503396

Job No.: LGW2019 #378

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: MIIIW Dual-mode Keyboard

Mode: TX 2480MHz

Model: MWBK01

Manufacturer: MIIIW

Polarization: Vertical

Power Source: DC 3V

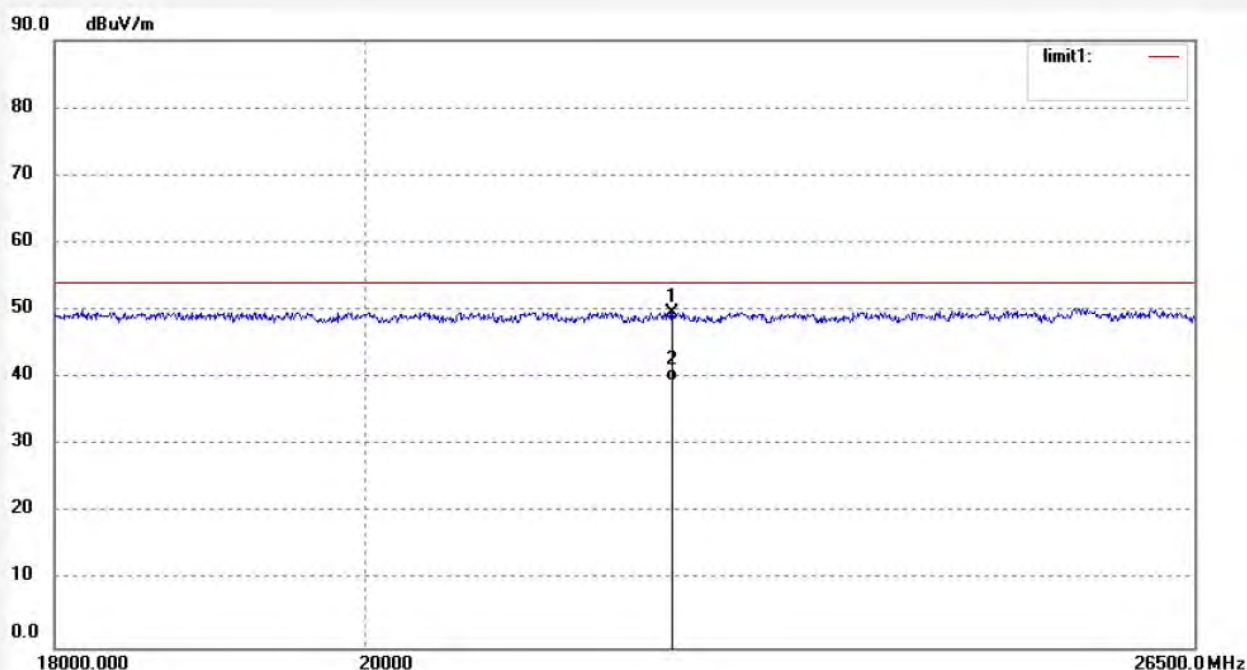
Date: 19/02/21/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22198.011	10.36	39.28	49.64	74.00	-24.36	peak			
2	22198.011	0.17	39.28	39.45	54.00	-14.55	AVG			

8. ANTENNA REQUIREMENT

8.1.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.

8.2.Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.

******* End of Test Report *******