



# FCC PART 15.247 TEST REPORT

For

**SHANGHAI MERIT TECHNOLOGY CORP.**

1058 TAOGAN RD., SHESHAN TOWN, SONGJIANG DISTRICT, SHANGHAI, China

**FCC ID: XJ6HT-29**

<b>Report Type:</b> Original Report	<b>Product Type:</b> 2CH 2.4GHZ FHSS RADIO CONTROL SYSTEM
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<b>Report Number:</b> RSHA190531001-00B	
<b>Report Date:</b> 2019-06-24	
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## **TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	4
OBJECTIVE .....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY .....	4
MEASUREMENT UNCERTAINTY .....	5
TEST FACILITY .....	5
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
DESCRIPTION OF TEST CONFIGURATION .....	6
EUT EXERCISE SOFTWARE .....	6
SPECIAL ACCESSORIES.....	6
EQUIPMENT MODIFICATIONS .....	7
SUPPORT EQUIPMENT LIST AND DETAILS .....	7
EXTERNAL I/O CABLE.....	7
BLOCK DIAGRAM OF TEST SETUP .....	7
<b>SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>TEST EQUIPMENT LIST .....</b>	<b>10</b>
<b>FCC§15.247 (i), §1.1310 &amp;§2.1093 – RF EXPOSURE .....</b>	<b>11</b>
MEASUREMENT RESULT .....	11
<b>FCC §15.203 – ANTENNA REQUIREMENT .....</b>	<b>12</b>
APPLICABLE STANDARD .....	12
ANTENNA INFORMATION .....	12
<b>FCC §15.205, §15.209 &amp; §15.247(d) – RADIATED EMISSIONS.....</b>	<b>13</b>
APPLICABLE STANDARD .....	13
EUT SETUP .....	13
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP .....	14
TEST PROCEDURE .....	14
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	14
TEST RESULTS SUMMARY .....	14
TEST DATA .....	15
<b>FCC §15.247(a) (1)-CHANNEL SEPARATION TEST .....</b>	<b>26</b>
APPLICABLE STANDARD .....	26
TEST PROCEDURE .....	26
TEST DATA .....	26
<b>FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH.....</b>	<b>29</b>
APPLICABLE STANDARD .....	29
TEST PROCEDURE .....	29
TEST DATA .....	29
<b>FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST .....</b>	<b>32</b>
APPLICABLE STANDARD .....	32
TEST PROCEDURE .....	32
TEST DATA .....	32
<b>FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME).....</b>	<b>34</b>
APPLICABLE STANDARD .....	34

TEST PROCEDURE .....	34
TEST DATA .....	34
<b>FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT .....</b>	<b>37</b>
APPLICABLE STANDARD .....	37
TEST PROCEDURE .....	37
TEST DATA .....	37
<b>FCC §15.247(d) - BAND EDGES TESTING .....</b>	<b>40</b>
APPLICABLE STANDARD .....	40
TEST PROCEDURE .....	40
TEST DATA .....	40

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

Applicant	SHANGHAI MERIT TECHNOLOGY CORP.
Tested Model	HT-29
Product Type	2CH 2.4GHZ FHSS RADIO CONTROL SYSTEM
Dimension	170mm(L)*120mm(W)*70mm(H)
Power Supply	DC 6Vfrom 1.5V*4cell"AA" alkaline battery

*\*All measurement and test data in this report was gathered from production sample serial number: 20190531001.  
(Assigned by the BACL. The EUT supplied by the applicant was received on 2019-05-31)*

### Objective

This test report is prepared on behalf of SHANGHAI MERIT TECHNOLOGY CORP. in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.209 and 15.247 rules.

### Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s).

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliant Testing of Unlicensed Wireless Devices and FCC 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliant Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Measurement Uncertainty**

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

Channel list for FHSS (GFSK) Modulation:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
15	2415	31	2431
16	2416	32	2432
17	2417	33	2433
18	2418	34	2434
19	2419	35	2435
20	2420	36	2436
21	2421	37	2437
22	2422	38	2438
23	2423	39	2439
24	2424	40	2440
25	2425	41	2441
26	2426	42	2442
27	2427	43	2443
28	2428	44	2444
29	2429	45	2445
30	2430	46	2446

EUT was tested with Channel 15, 30 and 46.

### EUT Exercise Software

The EUT was tested in the engineering mode; EUT can be setup for fixed channel mode and hopping mode.

### Special Accessories

No special accessory.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

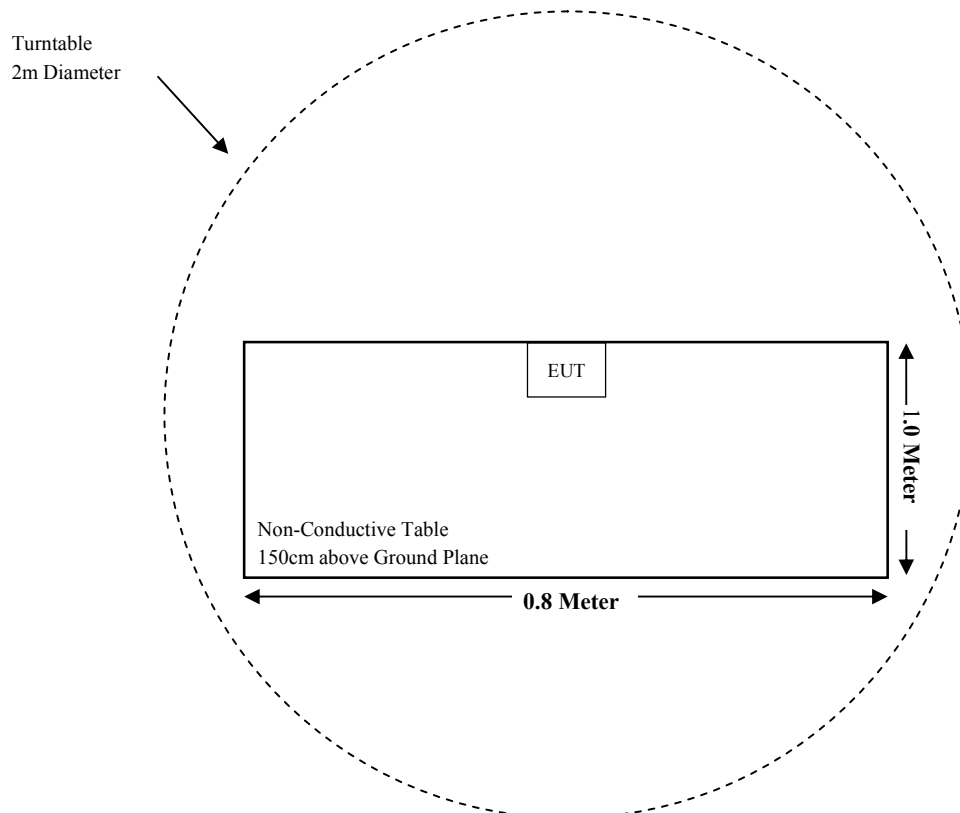
Manufacturer	Description	Model	Serial Number
/	/	/	/

### External I/O Cable

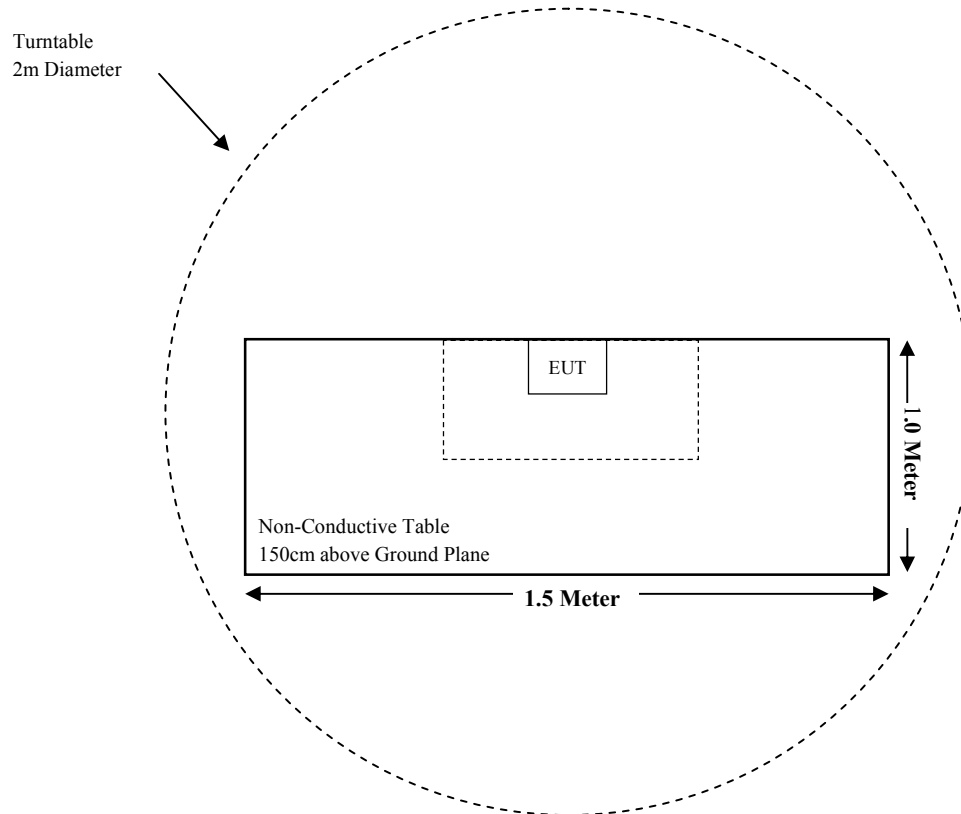
Cable Description	Length (m)	From Port	To
/	/	/	/

### Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):





**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§15.247 (i)§1.1310 & §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Not Applicable (See Note)
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliant
§15.247(a)(1)	20 dB Emission Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

Note: The EUT is powered by batteries.

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test (Chamber 1#)</b>					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-30	2019-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sonoma Instrument	Pre-amplifier	310N	171205	2018-08-14	2019-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
<b>Radiated Emission Test (Chamber 2#)</b>					
Rohde & Schwarz	EMI Test Receiver	FSV40	101116	2018-11-30	2019-11-29
ETS-LINDGREN	Horn Antenna	3115	6229	2017-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
Mini-Circuits	Amplifier	2641-1	491	2019-02-20	2020-02-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2019-03-22	2020-03-21
MICRO-TRONICS	Notch filter	BRM50702	/	2018-08-05	2019-08-04
Narda	Attenuator/10dB	10dB	/	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
<b>RF Conducted Test</b>					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-11-30	2019-11-29
Narda	Attenuator/2dB	2dB	/	2018-08-15	2019-08-14
Narda	Attenuator	10dB	010	2018-08-15	2019-08-14
MERIT	RF Cable	/	/	Each Time	/

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## FCC§15.247 (i), §1.1310 &§2.1093 – RF EXPOSURE

### Applicable Standard

According to §2.1093 and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v06:

For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion

### Measurement Result

Frequency Range (MHz)	Max Tune-up Conducted Power		Calculated Distance (mm)	Calculated Value	Threshold (10-g SAR)	SAR Test Exclusion
	(dBm)	(mW)				
2415-2446	13.00	19.95	26	1.2	7.5	Yes

#### Note:

1. This is a handheld device



**Result: No SAR test is required.**

**FCC §15.203 – ANTENNA REQUIREMENT**

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**Applicable Standard**

According to FCC § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**Antenna Information**

The EUT has a dipole antenna with unique connector, which the antenna gain is 2.0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliant.

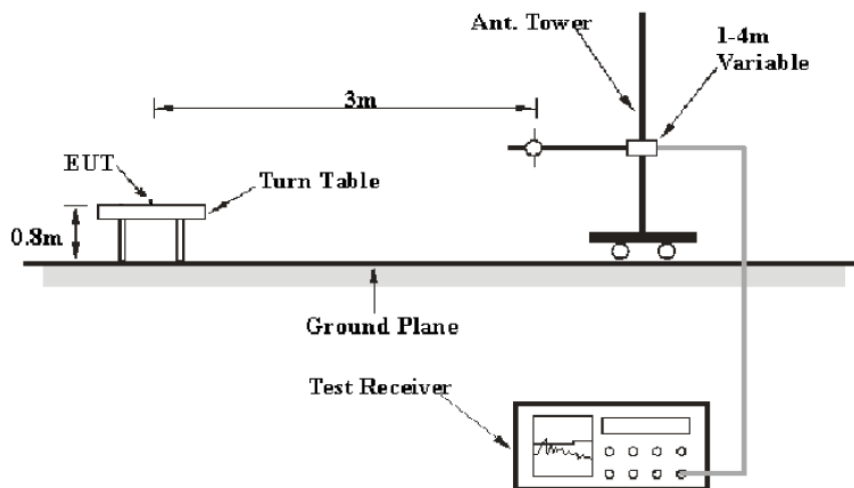
## FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

### Applicable Standard

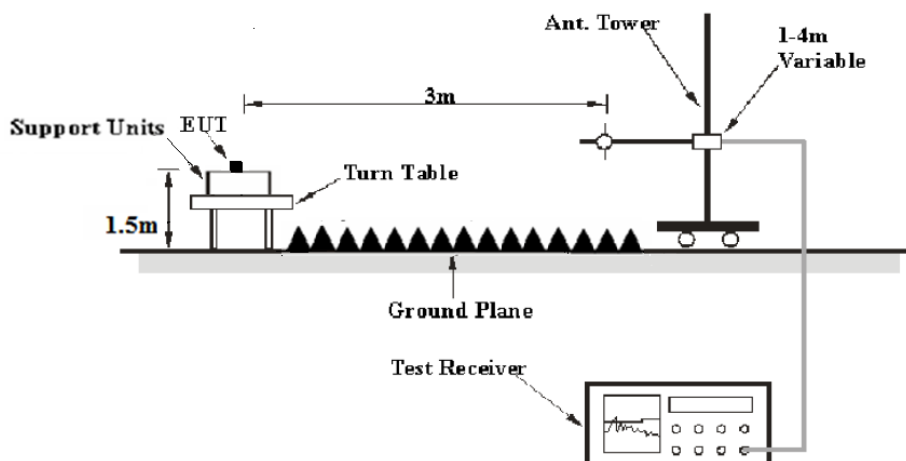
FCC §15.205; §15.209; §15.247(d)

### EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

## EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	QP	120 kHz	QP
1-18GHz	1MHz	3 MHz	PK	/	PK
	1MHz	10Hz	PK	/	Ave.
18-25GHz	1MHz	3 MHz	PK	/	PK
	1MHz	3 MHz	Ave.	/	Ave.

## Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

**Test Data****Environmental Conditions**

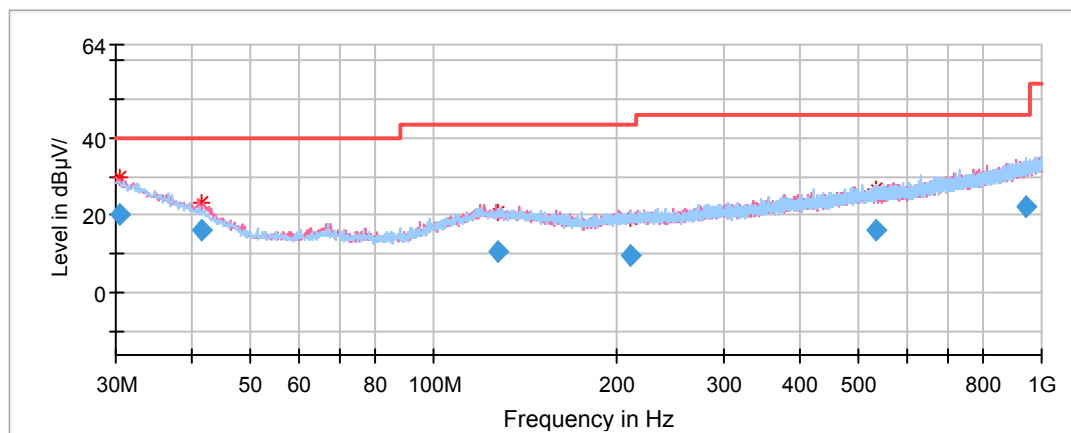
<b>Temperature:</b>	24.2 °C~24.3°C
<b>Relative Humidity:</b>	50%~51%
<b>ATM Pressure:</b>	101.2 kPa~101.3kPa

The testing was performed by Matt yao from 2019-06-12 to 2019-06-25.

**Spurious Emission Test:****30MHz-1GHz:**

Pre-Scan with low, middle and high channels in the X,Y and Z axes of orientation, the worst case **high channel in X-axis of orientation** was recorded

EUT operation mode: Transmitting



Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dBμV/m)	Height (cm)	Polar (H/V)				
30.554550	20.14	101.0	V	170.0	-4.3	40.00	19.86
41.557850	16.14	101.0	V	216.0	-11.8	40.00	23.86
127.541450	10.79	101.0	V	190.0	-11.5	43.50	32.71
210.170600	9.82	101.0	V	254.0	-12.3	43.50	33.68
535.040650	16.00	198.0	H	19.0	-5.8	46.00	30.00
942.356850	22.03	198.0	H	0.0	1.1	46.00	23.97

**1GHz-18GHz:**

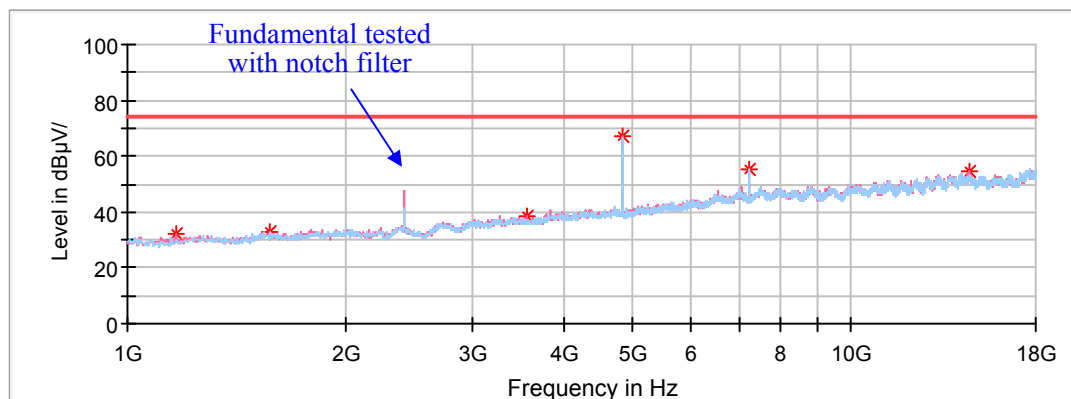
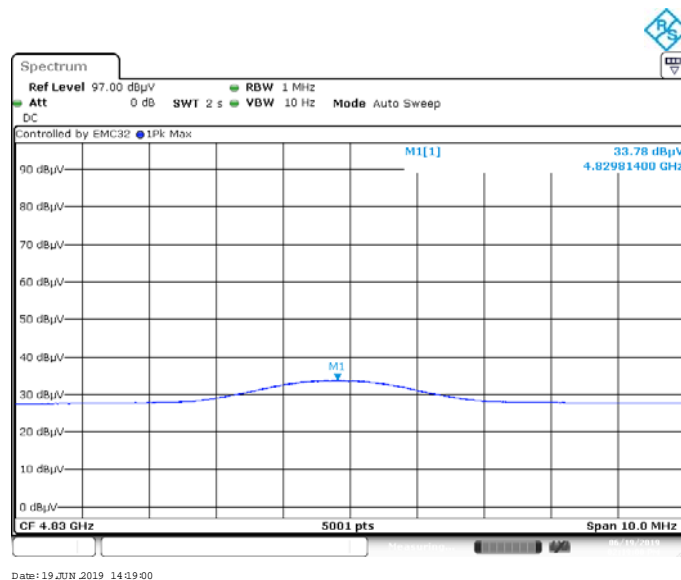
Pre-Scan in the X,Y and Z axes of orientation, the worst case **in X-axis of orientation** was recorded

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor  
Corrected Amplitude = Corrected Factor + Reading  
Margin = Limit - Corrected. Amplitude

**Low Channel: 2415MHz****Peak Horizontal & Vertical:**

Full Spectrum

**Average Vertical:**

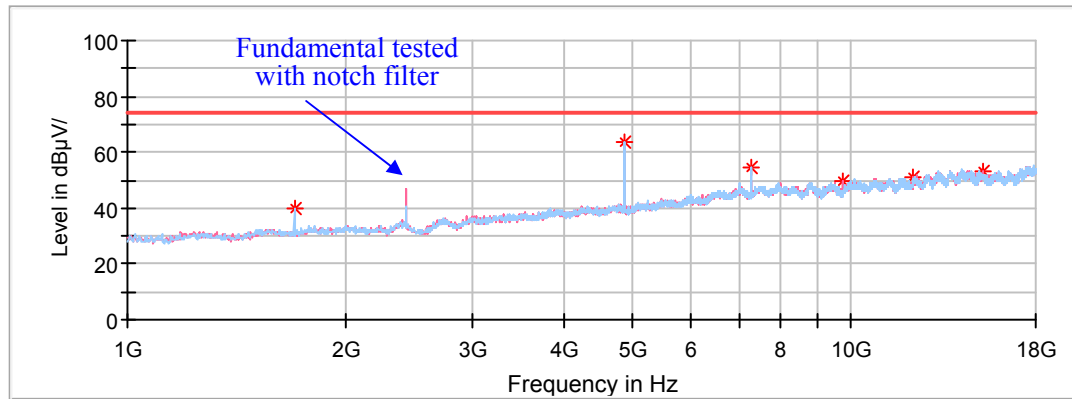


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1166.6	---	17.81	100	V	246	-11.7	54	36.19
1166.6	31.91	---	100	V	246	-11.7	74	42.09
1574.6	---	19.43	200	H	356	-9.7	54	34.57
1574.6	33.11	---	200	H	356	-9.7	74	40.89
3567	---	22.48	100	V	286	-3.3	54	31.52
3567	38.62	---	100	V	286	-3.3	74	35.38
4830	---	33.78	100	H	121	-0.5	54	20.22
4830	66.83	---	100	H	121	-0.5	74	7.17
7245	---	29.49	150	V	344	5.7	54	24.51
7245	55.42	---	150	V	344	5.7	74	18.58
14572.8	---	38.88	200	H	6	12.5	54	15.12
14572.8	54.37	---	200	H	6	12.5	74	19.63

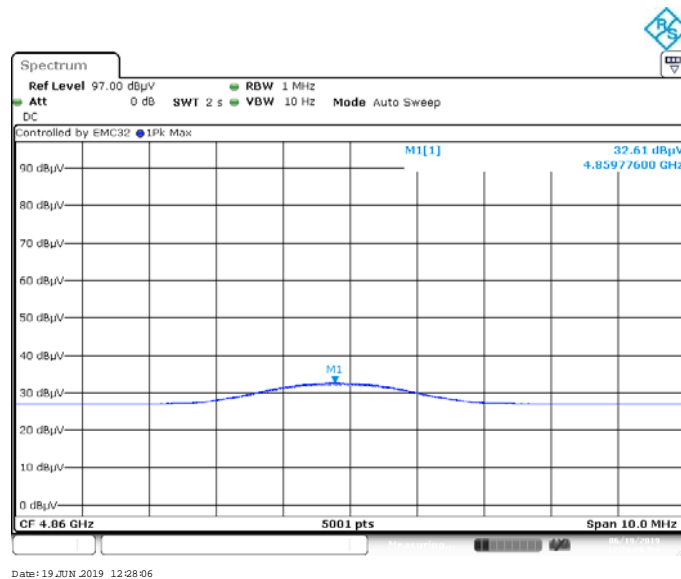
### Middle Channel: 2430MHz

#### Peak Horizontal & Vertical:

Full Spectrum



#### Average Vertical:

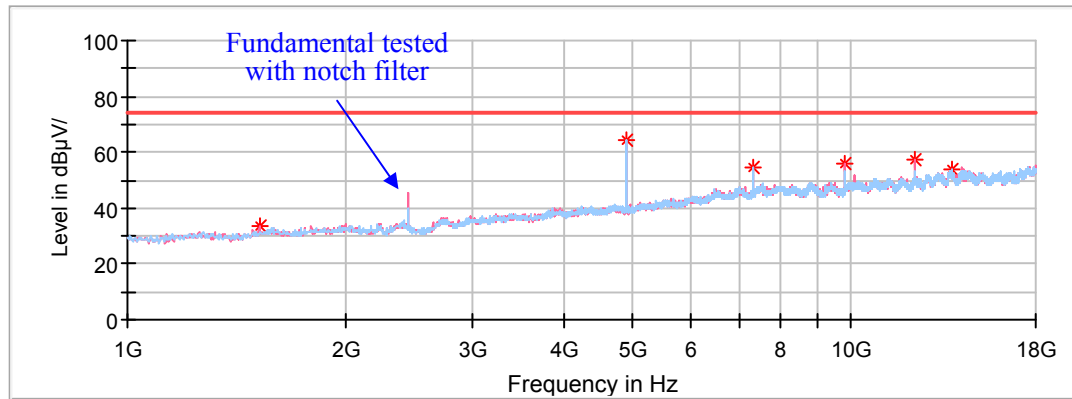


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1700.4	39.79	---	250	H	91	-9.3	74	34.21
1700.4	---	20.33	250	H	91	-9.3	54	33.67
4860	63.64	---	150	H	109	-0.5	74	10.36
4860	---	32.61	150	H	109	-0.5	54	21.39
7290	54.28	---	100	V	250	5.8	74	19.72
7290	---	27.53	100	V	250	5.8	54	26.47
9717.6	49.84	---	150	V	104	7.9	74	24.16
9717.6	---	30.12	150	V	104	7.9	54	23.88
12152	50.72	---	100	H	36	10.2	74	23.28
12152	---	35.22	100	H	36	10.2	54	18.78
15222.2	53.11	---	200	V	231	11.4	74	20.89
15222.2	---	37.64	200	V	231	11.4	54	16.36

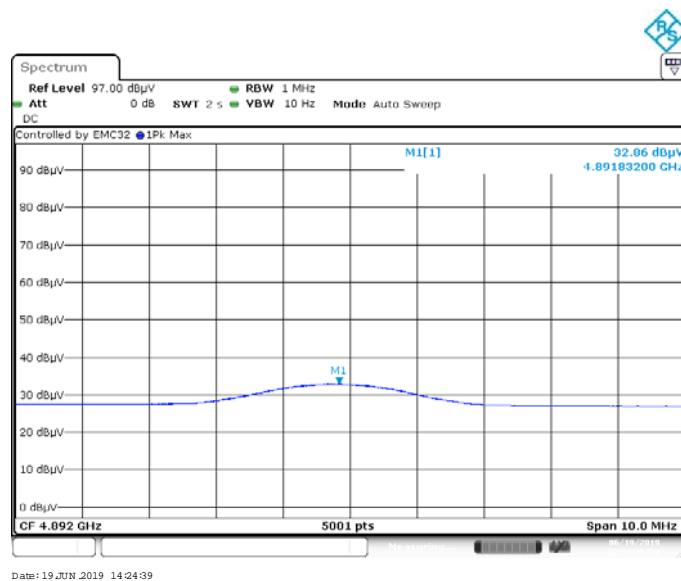
# High Channel: 2446MHz

## Peak Horizontal & Vertical:

Full Spectrum



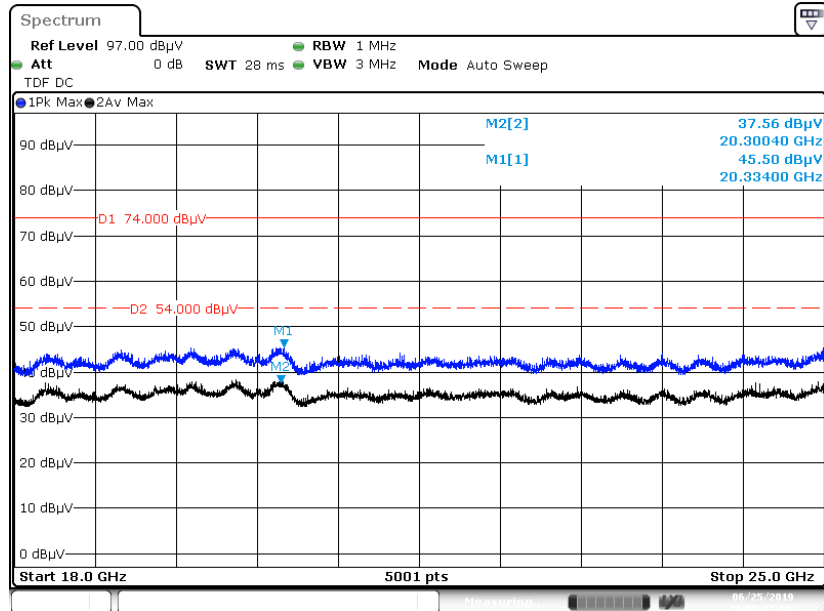
## Average Vertical:



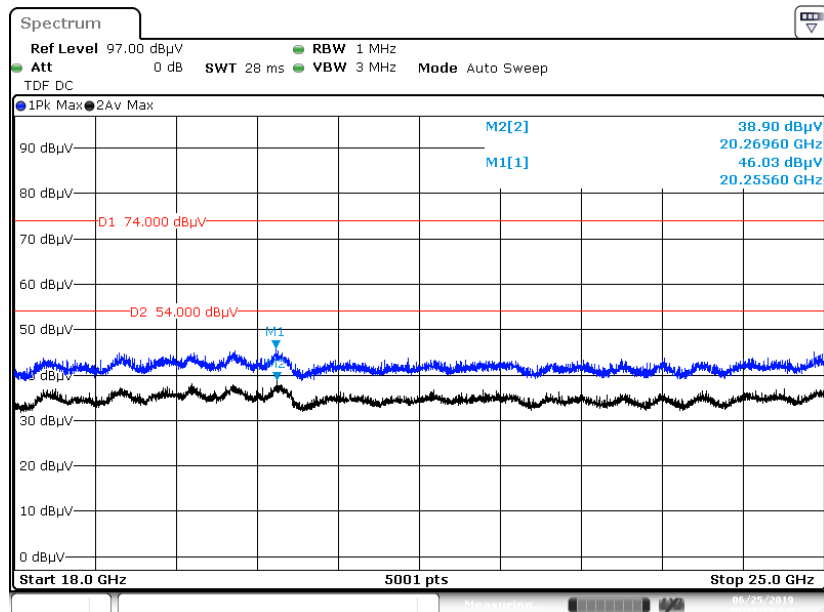
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1520.2	33.38	---	150	V	347	-9.9	74	40.62
1520.2	---	19.75	150	V	347	-9.9	54	34.25
4892	64.39	---	200	H	114	-0.4	74	9.61
4892	---	32.86	200	H	114	-0.4	54	21.14
7338	54.36	---	250	H	0	5.9	74	19.64
7338	---	36.27	250	H	0	5.9	54	17.73
9782.2	55.69	---	200	V	87	8	74	18.31
9782.2	---	35.24	200	V	87	8	54	18.76
12230.2	57	---	100	V	290	10.2	74	17
12230.2	---	34.69	100	V	290	10.2	54	19.31
13750	53.86	---	150	H	99	12.2	74	20.14
13750	---	36.75	150	H	99	12.2	54	17.25

**18GHz-25GHz:**

Pre-Scan with low, middle and high channels in the X,Y and Z axes of orientation, the worst case **high channel in X-axis of orientation** was recorded

**Horizontal**

Date: 25 JUN 2019 10:05:27

**Vertical**

Date: 25 JUN 2019 10:23:27

**Fundamental Test & Restricted Bands Emissions:**

*Pre-Scan in the X,Y and Z axes of orientation, the worst case in X-axis of orientation was recorded*

Note:

1. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

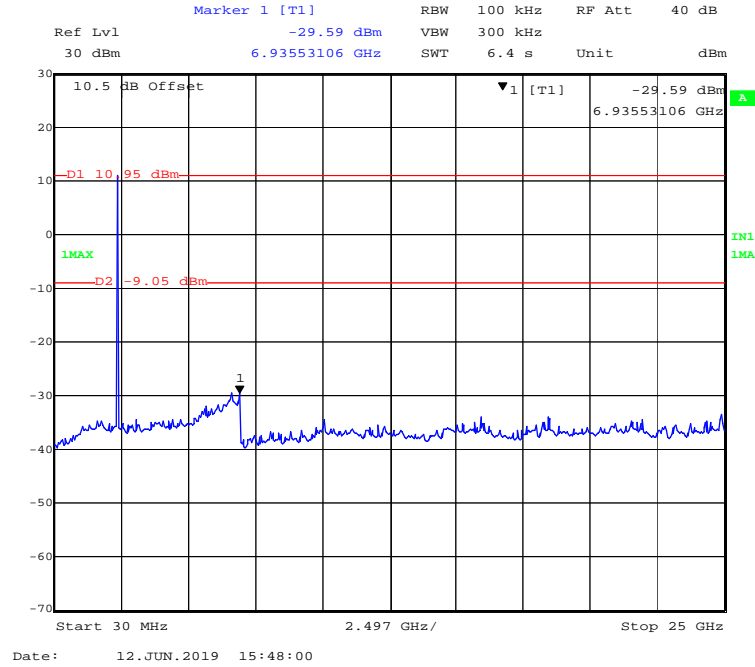
Corrected Amplitude = Corrected Factor + Reading

Margin = Limit - Corrected. Amplitude

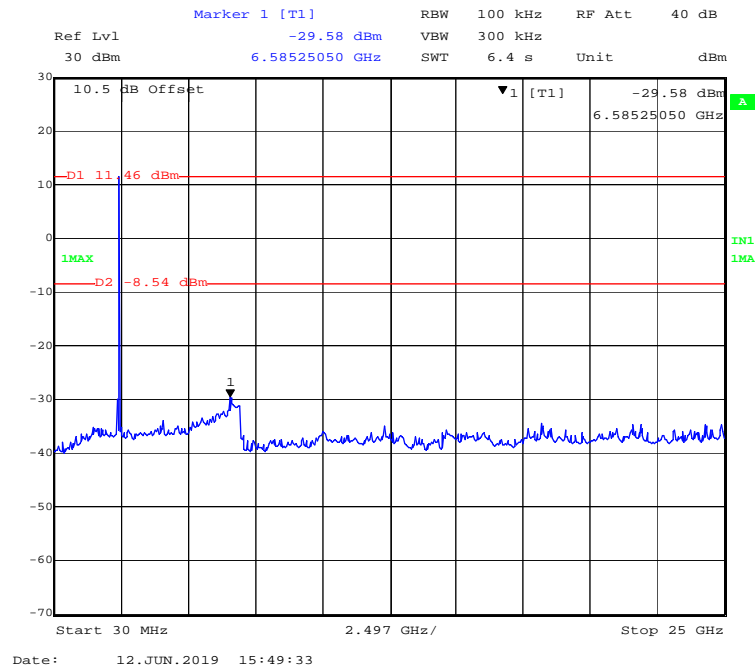
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
Low Channel: 2415MHz								
2389.872000	57.1	---	200	V	279	2.9	74	16.9
2389.872000	---	36.91	200	V	279	2.9	54	17.09
High Channel: 2446MHz								
2483.840000	56.64	---	150	V	22	3	74	17.36
2483.840000	---	36.17	150	V	22	3	54	17.83

# Conducted Spurious Emissions at Antenna Port:

## Low Channel

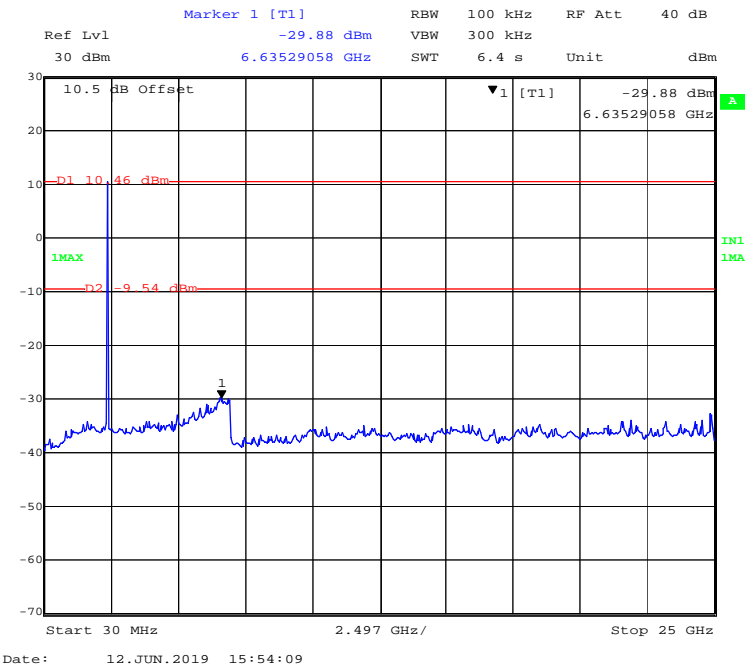


## Middle Channel





High Channel



**FCC §15.247(a) (1)-CHANNEL SEPARATION TEST****Applicable Standard**

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.

**Test Procedure**

1. Set the EUT in transmitting mode, maxhold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace.
3. Measure the channel separation.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	24.2 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.2 kPa

*The testing was performed by Matt yao on 2019-06-24.*

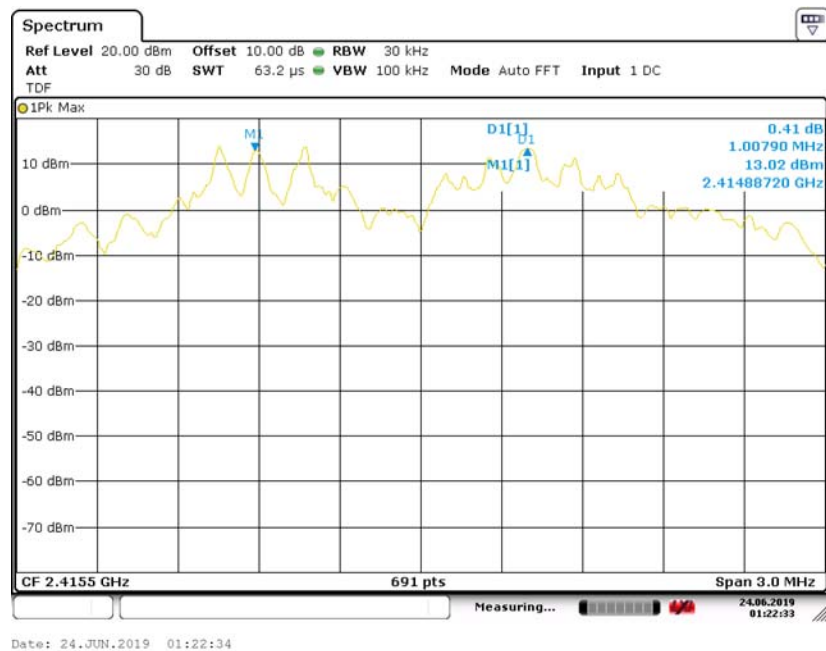
*EUT operation mode: Hopping*

*Test Result: Compliant.*

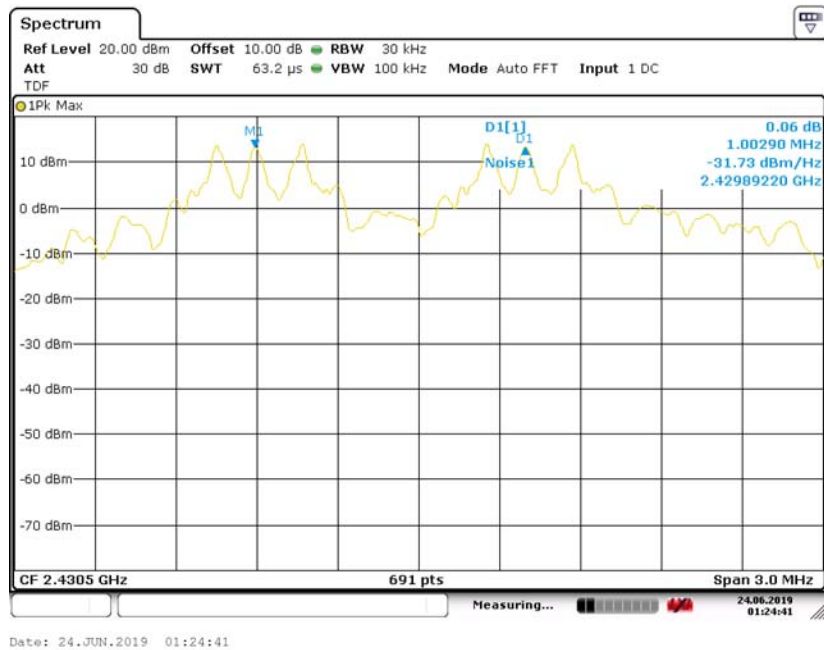
Modulation	Channel	Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
GFSK	Low	2415	1008	525.1	Pass
	Adjacent	2416			
	Middle	2430	1003	529.1	Pass
	Adjacent	2431			
	Adjacent	2445	1003	489.0	Pass
	High	2446			

The limit = 20dB Bandwidth\*2/3

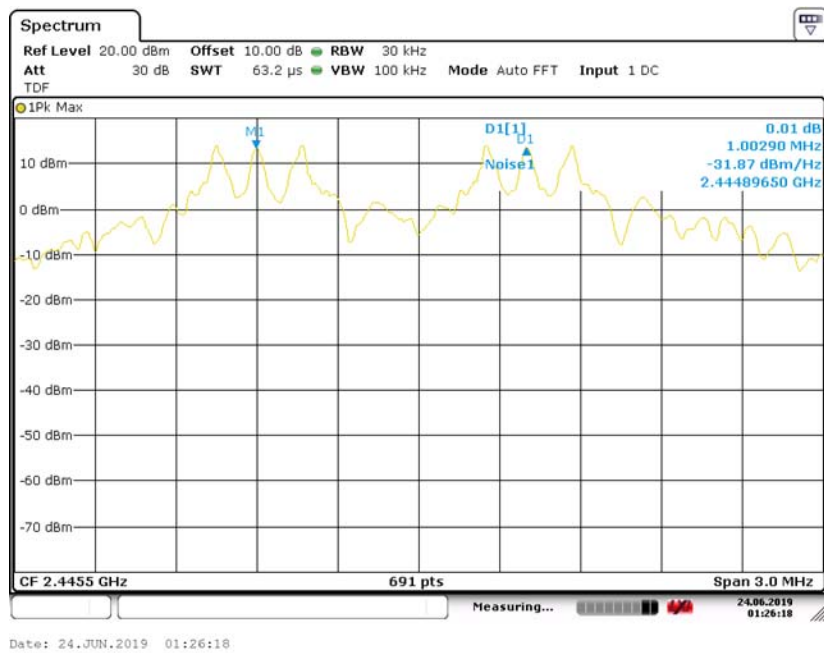
### Low Channel



### Middle Channel



### High Channel



**FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH****Applicable Standard**

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.

**Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	24.2 °C
<b>Relative Humidity:</b>	50%
<b>ATM Pressure:</b>	101.2 kPa

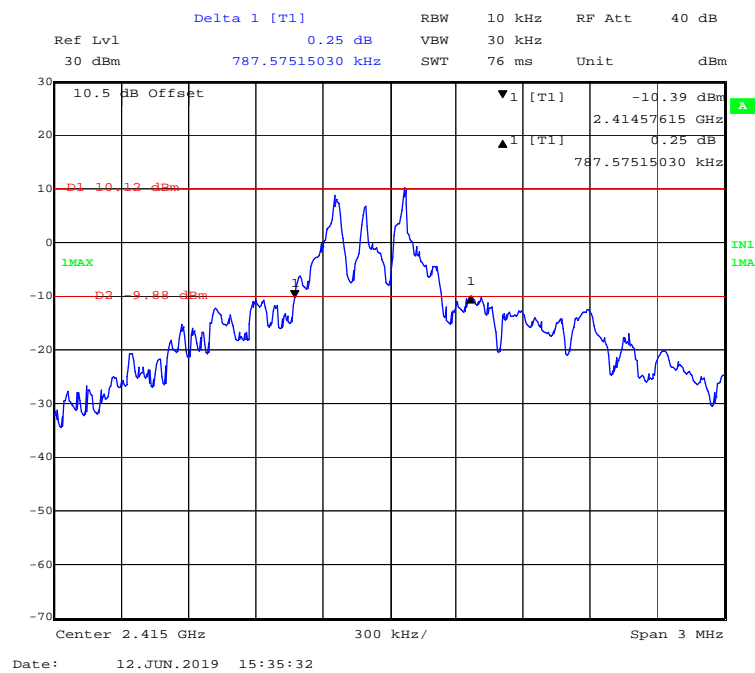
*The testing was performed by Matt yao on 2019-06-12.*

*EUT operation mode: Transmitting*

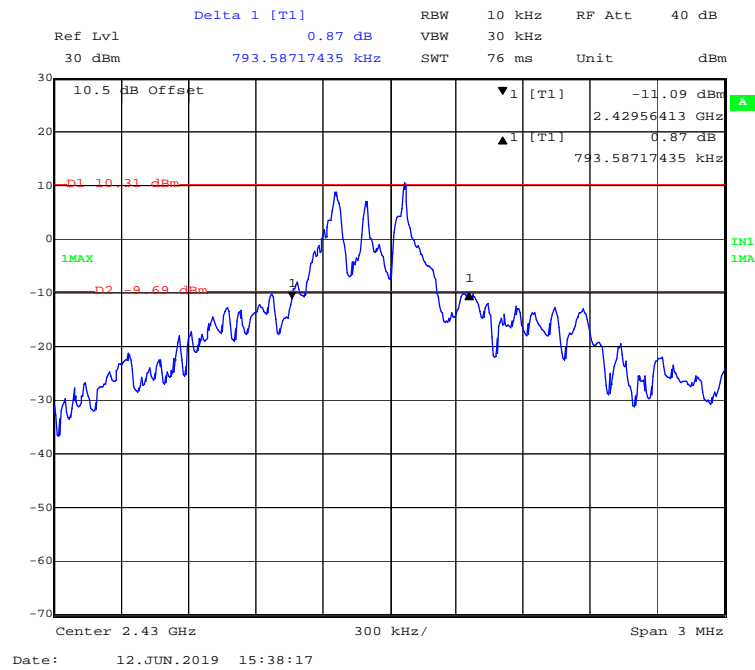
*Test Result: Compliant.*

Modulation	Channel	Frequency (MHz)	20 dB Emission Bandwidth (kHz)
GFSK	Low	2415	787.6
	Middle	2430	793.6
	High	2446	733.5

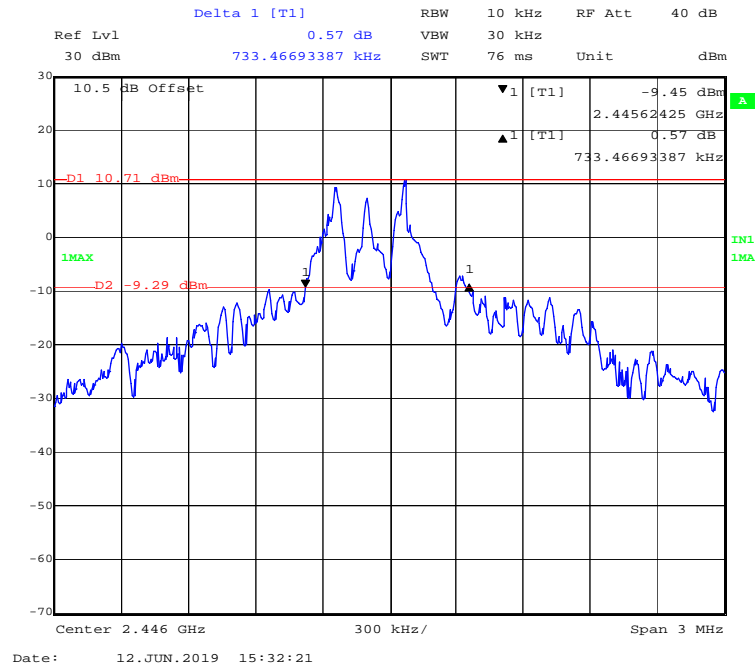
### Low Channel



### Middle Channel



### High Channel



**FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST****Applicable Standard**

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.

**Test Procedure**

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the max-hold function record the quantity of the channel.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	24.2 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.2 kPa

*The testing was performed by Matt yao on 2019-06-19.*

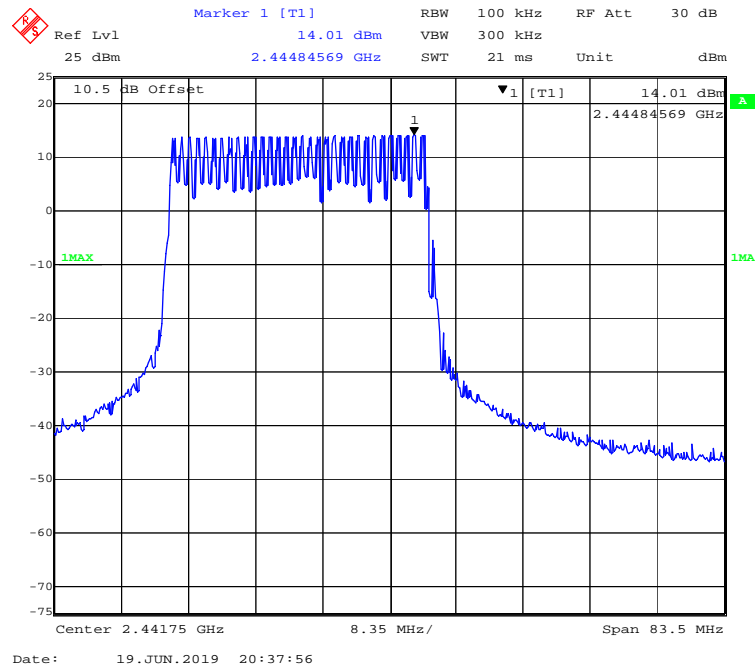
*EUT operation mode: Hopping*

*Test Result: Compliant.*



Modulation	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
GFSK	2400-2483.5	32	≥15

### Number of Hopping Channels



## **FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)**

### **Applicable Standard**

Frequency hopping systems in the 2400-2483.5 MHz 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.

### **Test Procedure**

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	24.2 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.2 kPa

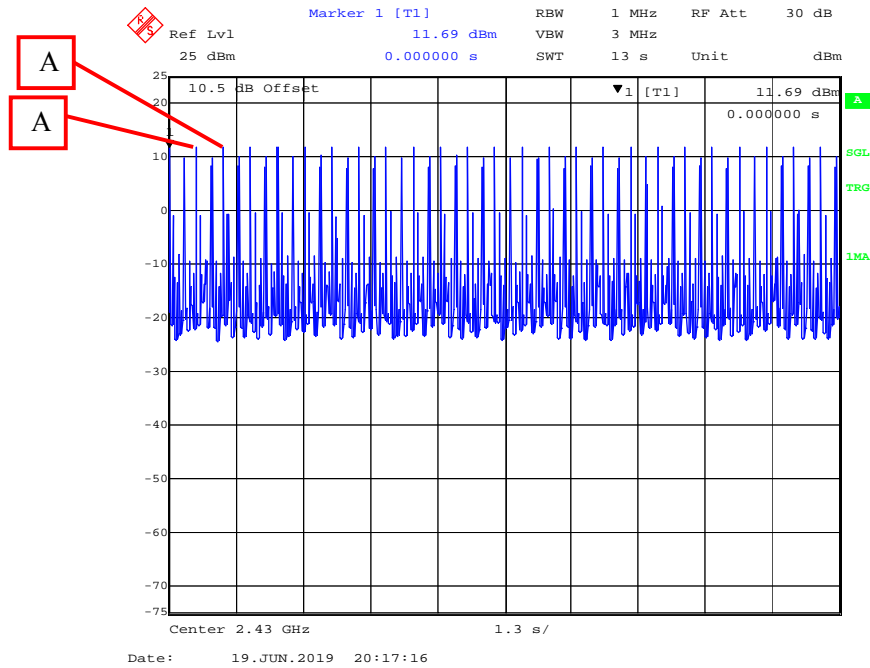
*The testing was performed by Matt yao on 2019-06-19.*

*EUT operation mode: Hopping*

*Test Result: Compliant.*

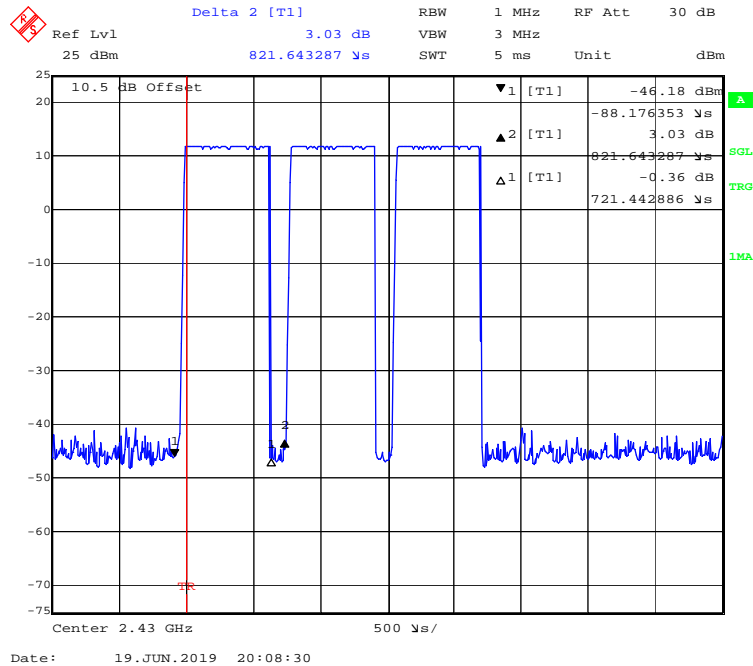
Modulation	Channel	Pulse Width	Pulse Number	Dwell Time	Limit	Result
		(ms)		(s)	(s)	
GFSK	Middle	0.664	25*3	0.050	≤0.4	Pass
	Note:Dwell time = Pulse time*N Observed time = 0.4s* hopping number= 0.4s*32=12.8s					

### Number of Pulses

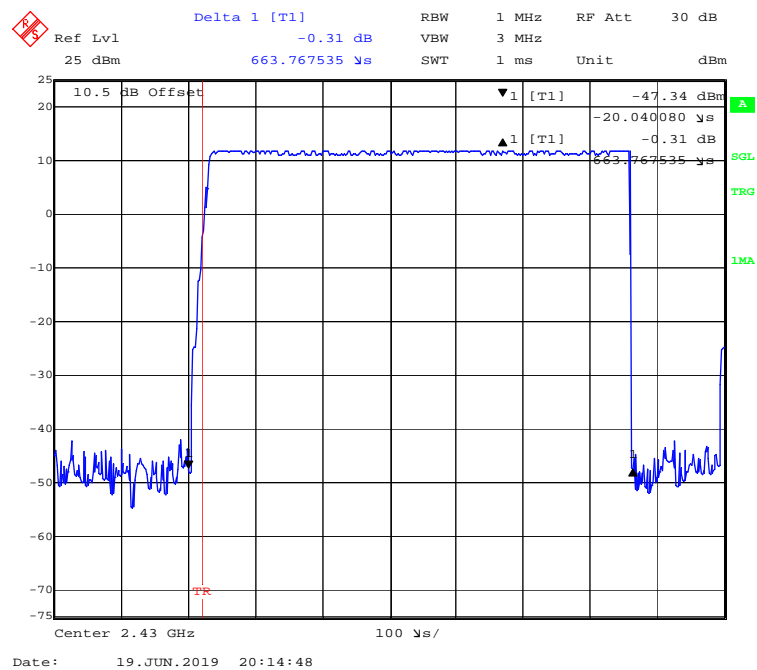


Note: A means one pulse train.

### Zoom in A



Single Pulse



**FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT****Applicable Standard**

According to §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. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

**Test Procedure**

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	24.2 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.2 kPa

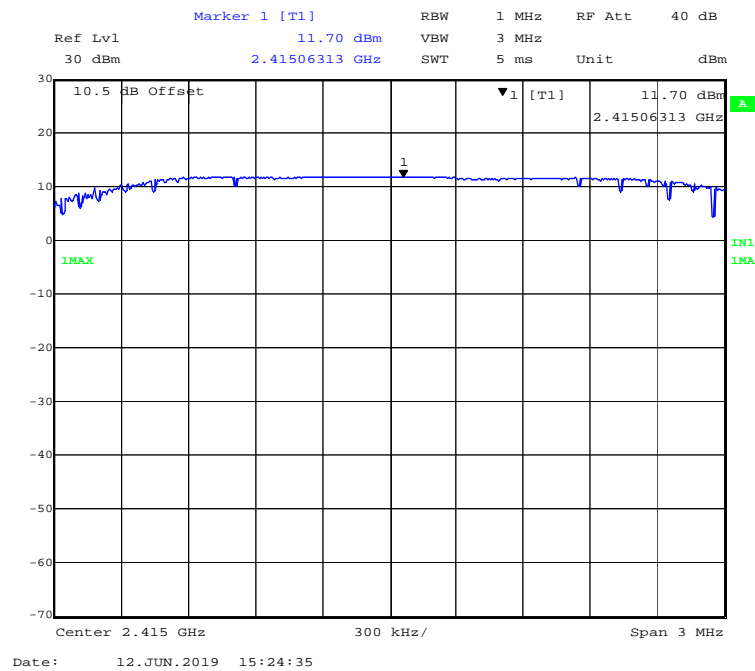
*The testing was performed by Matt yao on 2019-06-12.*

*EUT operation mode: Transmitting*

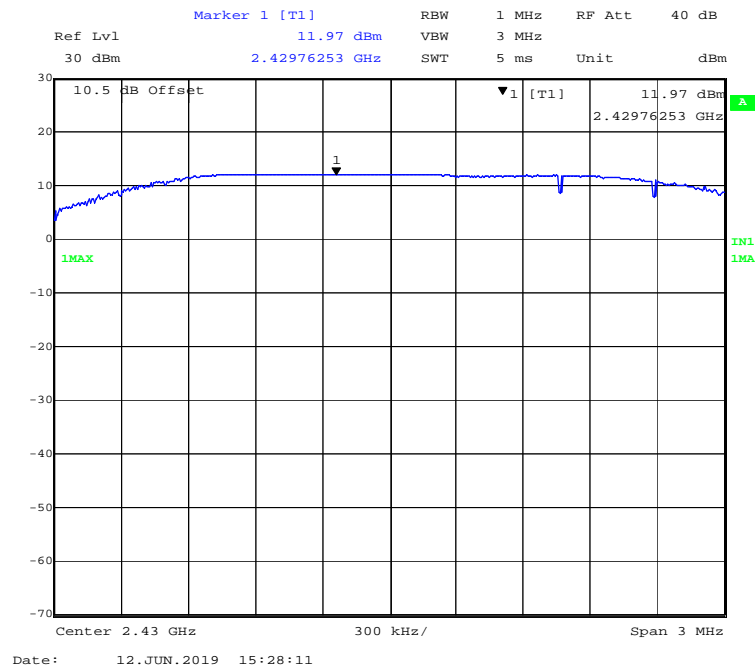
*Test Result: Compliant.*

Modulation	Channel	Frequency (MHz)	Output Power		Limit (mW)
			(dBm)	(mW)	
GFSK	Low	2415	11.70	14.79	125
	Middle	2430	11.97	15.74	125
	High	2446	12.32	17.06	125

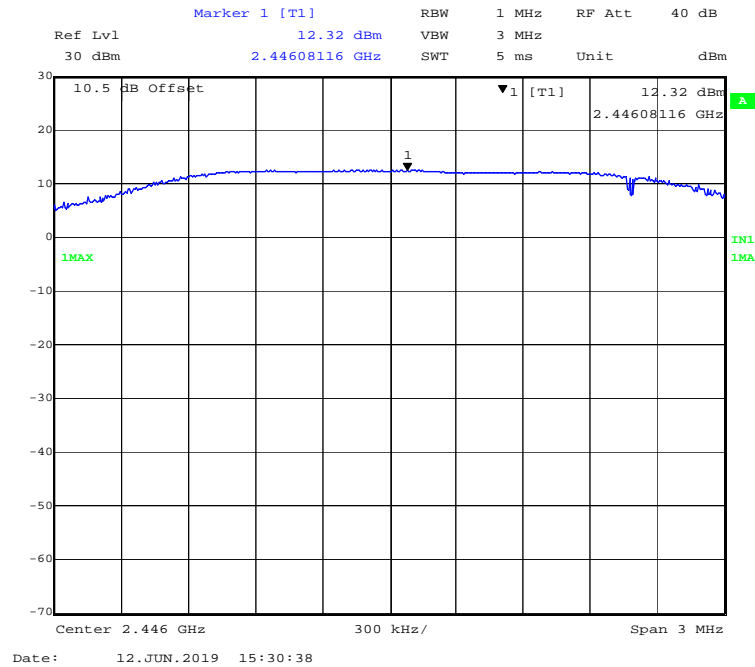
### Low Channel



### Middle Channel



### High Channel



## **FCC §15.247(d) - BAND EDGES TESTING**

### **Applicable Standard**

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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### **Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	24.2~25.0 °C
<b>Relative Humidity:</b>	48~50%
<b>ATM Pressure:</b>	101.2~103.0 kPa

*The testing was performed by Matt yao from 2019-06-12 to 2019-06-20.*

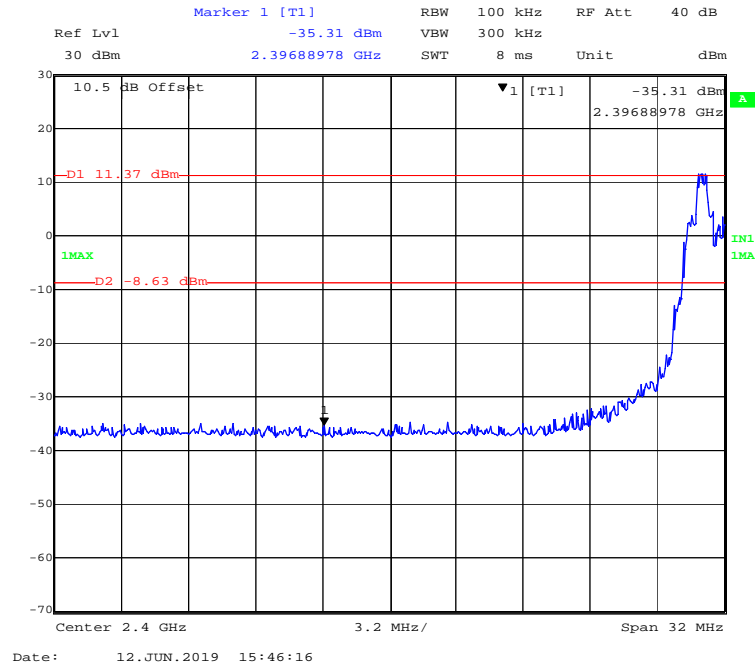
*EUT operation mode: Transmitting&Hopping*

*Test Result: Compliant.*

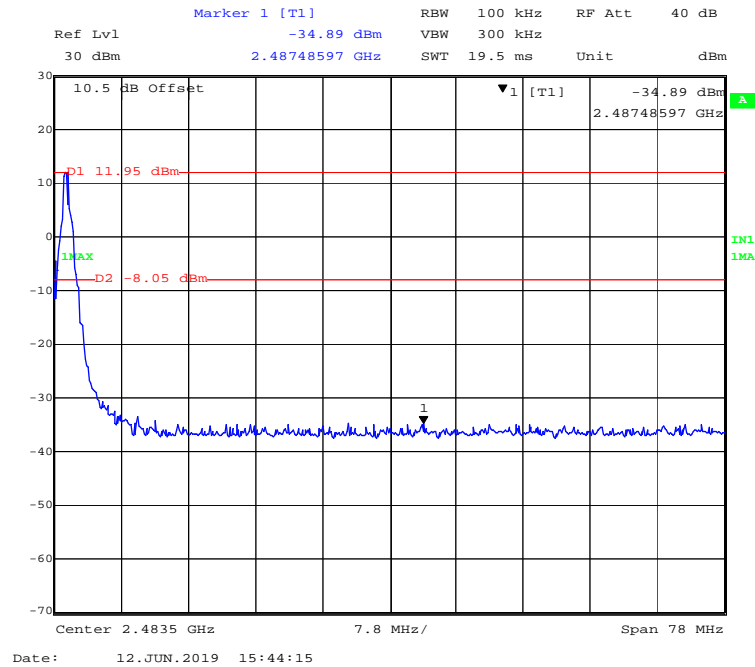


# Band Edge

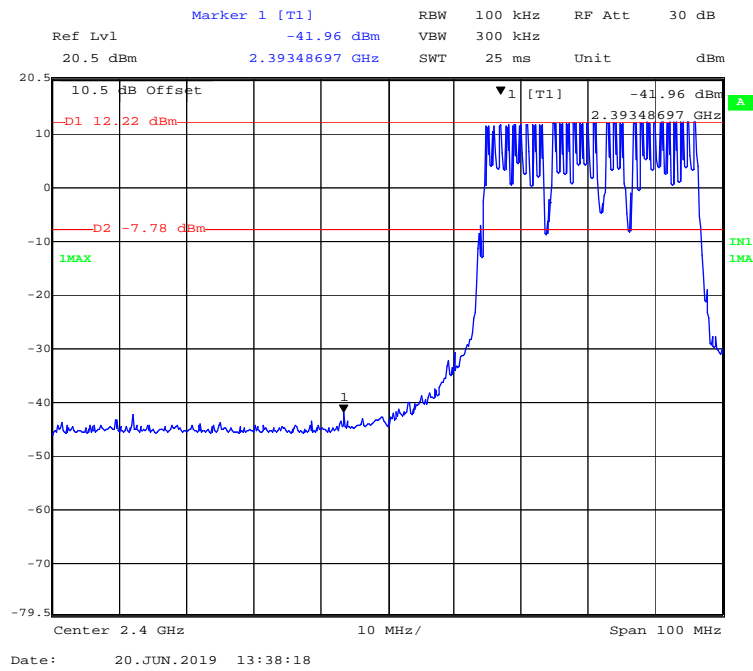
## Left Side



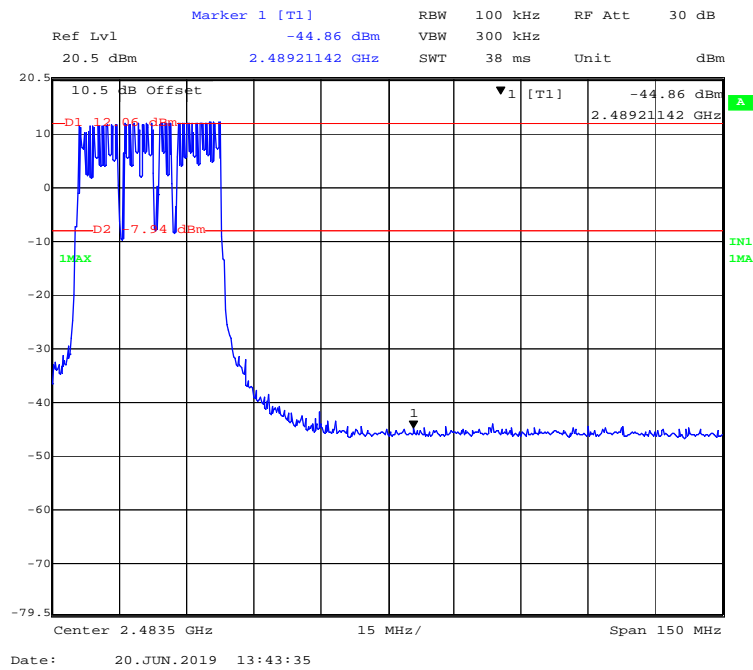
## Right Side



### Left Side-Hopping



### Right Side-Hopping



\*\*\*\*\* END OF REPORT \*\*\*\*\*