




FCC PART 15.249 TEST REPORT

For

Chengdu XGimi Technology Co., Ltd.

5F, Building A7, Tianfu Software Park, Tianfu Avenue, Hi-tech Zone, Chengdu, China

FCC ID: 2AFENB915C

Report Type: Original Report	Product Name: Remote Controller
Report Number: RSC180108001	
Report Date: 2018-01-23	
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Note: This test report was prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Chengdu).

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **Chengdu XGimi Technology Co., Ltd.**, model number: **B915C (FCC ID: 2AFENB915C)** or the "EUT" as referred to in this report was one **Remote Controller**.

Mechanical Description of EUT

The EUT was measured approximately: 150 mm (L) x 17.5 mm (W) x 35 mm (H).
Rated input voltage: DC3V from 2*AAA batteries.

Note: The products, test model: B915C, multiple models: B917C, B919C, B921C. Their differences were presented in Product Difference Statement provided by the applicant of this report. So we selected model B915C to fully test.

**All measurement and test data in this report was gathered from final production sample, serial number: 180108001/01 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2018-01-04, and EUT conformed to test requirement.*

Objective

This report is prepared on behalf of **Chengdu XGimi Technology Co., Ltd.** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS submissions with FCC ID: 2AFENXG08X
FCC Part 15.407 NII submissions with FCC ID: 2AFENXG08X
FCC Part 15.247 DSS submissions with FCC ID: 2AFENXG08X
FCC Part 15.249 DXX submissions with FCC ID: 2ADYC-SM-355GB
FCC Part 15.249 DXX submissions with FCC ID: 2ADYC-SK-48AG

Measurement Uncertainty

Item			Uncertainty
AC power line conducted emission			2.71 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.57 dB
		V	4.81 dB
	200MHz-1GHz	H	5.69 dB
		V	6.07 dB
	1GHz-6GHz		5.49 dB
	6GHz-18GHz		5.57 dB
	18GHz-25GHz		5.48 dB
Conducted RF Power			±0.61dB
Power Spectrum Density			±0.61dB
Occupied Bandwidth			±5%
Humidity			±5%
Temperature			±1°C

Test Methodology

All measurements contained in this report are conducted with ANSI C63.10-2014, American National Standard for Compliance testing of Unlicensed Wireless devices.

All radiated and conducted emissions measurement is performed at BACL. The radiated testing is performed at an antenna-to-EUT distance of 3 Meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 910975, the FCC Designation No. : CN1186.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062C-1.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured in testing mode, the maximum output power configured by default setting and switched the channels by keys.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2404	3	2479
2	2440	/	/

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

No software was used during test.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
-	-	-	-

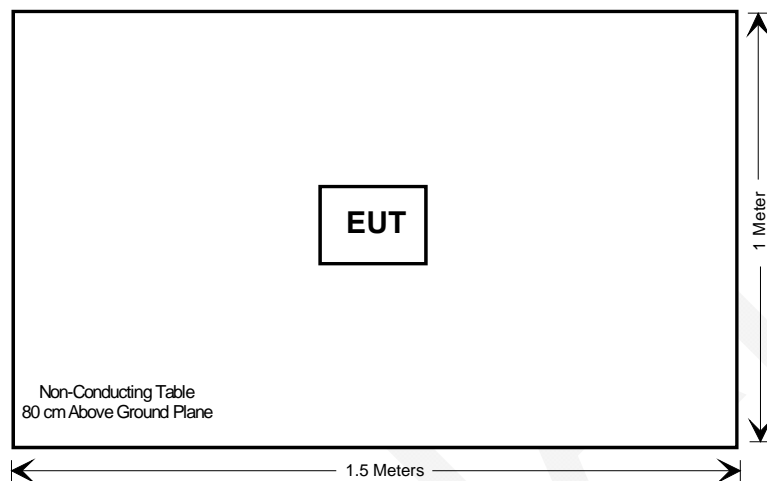
External I/O Cable

Cable Description	Length (m)	From	To
-	-	-	-

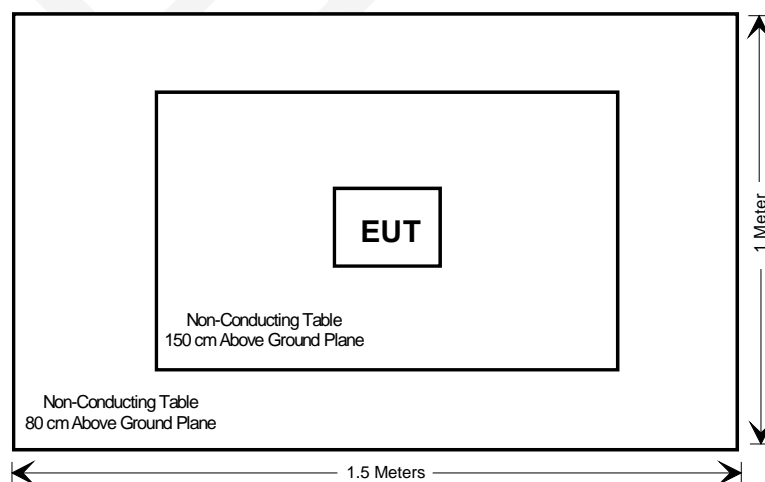
Block Diagram of Test Setup

Radiated Emissions

Below 1GHz



Above 1GHz:



Test Equipments List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2017-05-20	2018-05-19
Rohde & Schwarz	EMI Test Receiver	ESIB 40	100215	2017-09-12	2018-09-11
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2017-05-19	2020-05-18
INMET	Attenuator	18N-6dB	64671	2017-11-10	2018-11-09
ETS	Horn Antenna	3115	003-6076	2017-05-19	2020-05-18
A.H. Systems, Inc	Horn Antenna	SAS-574	510	2017-05-19	2020-05-18
Sonoma	Pre-Amplifier	310N	186684	2017-08-18	2018-08-17
Mini-circuits	Pre-Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
HP	Pre-Amplifier	8449B	3008A00277	2017-08-10	2018-08-09
Sinoscite.,Co Ltd	Reject Band Filter	BSF 2402-2480MN	0898-005	2017-11-10	2018-11-09
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2017-11-10	2018-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2017-11-10	2018-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2017-11-10	2018-11-09
Rohde & Schwarz	EMC32	N/A	V 8.52.0	N/A	N/A
RF Test					
Rohde & Schwarz	Spectrum Analyzer	FSL18	100180	2017-09-26	2018-09-25
WEINSCHL ENGINEERING	Attenuator	1A10dB	AA4135	2017-11-10	2018-11-09
N/A	RF Cable	N/A	N/A	Each Time	/

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§15.205, §15.209 §15.249	Spurious Emissions	Compliant
§15.215(c)	20 dB Emission Bandwidth	Compliant

Not Applicable: The device is battery operated equipment.

FCC §15.203 - ANTENNA REQUIREMENT

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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has one PCB antenna arrangement, which was permanently attached and the antenna gain is 2.7 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.205, §15.209 & §15.249 - SPURIOUS EMISSIONS

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

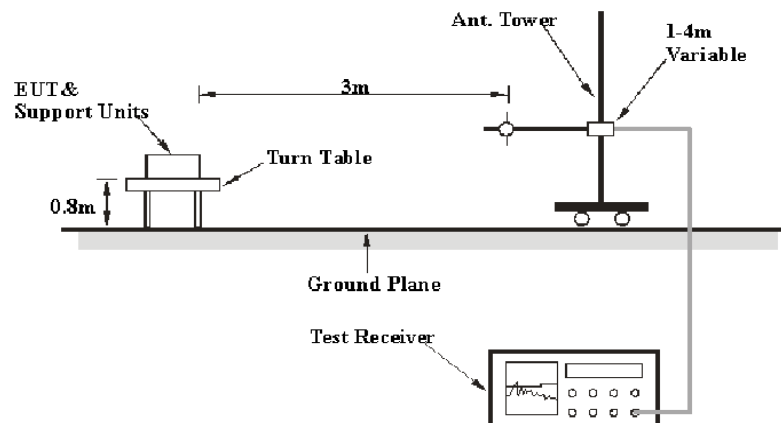
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

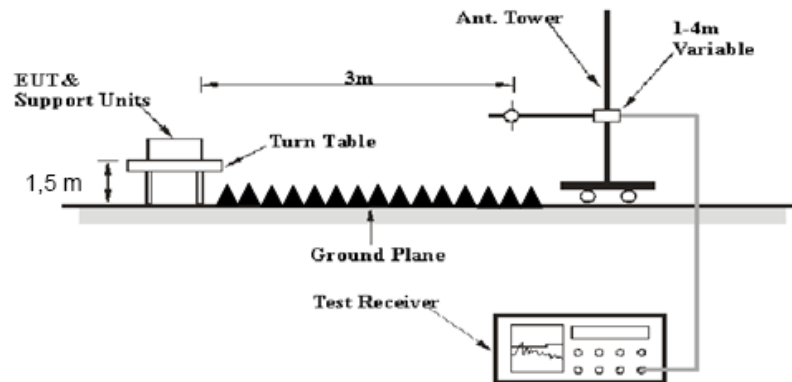
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.249 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	3 MHz	/	AV

Test Procedure

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

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

Corrected Amplitude & Margin Calculation

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

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

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:

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

FINAL

Test Data

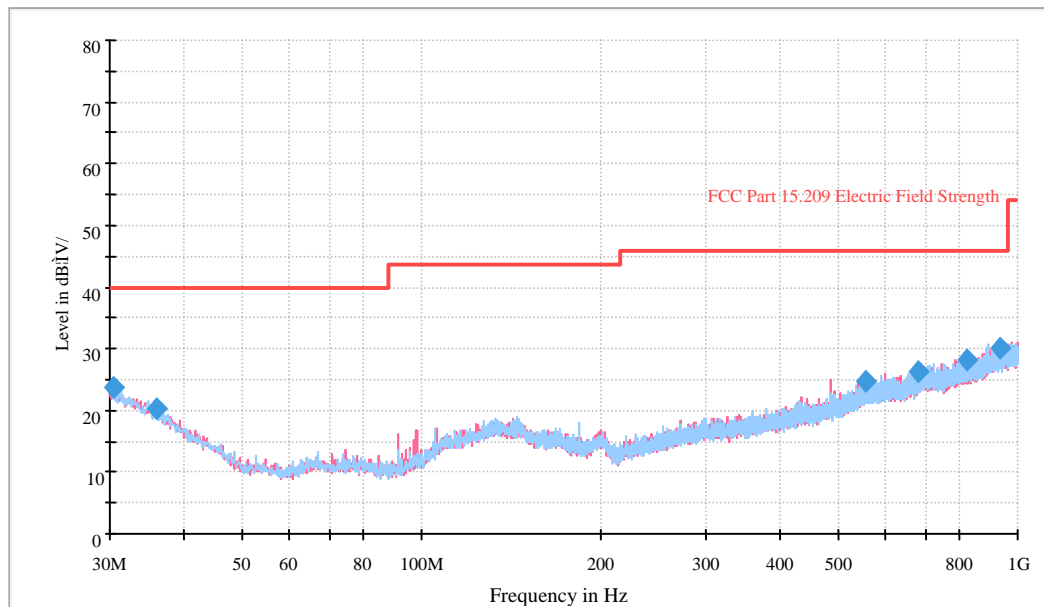
Environmental Conditions

Temperature:	21 °C
Relative Humidity:	44 %
ATM Pressure:	95.5 kPa

* The testing was performed by Tom Tang on 2018-01-16.

Test Mode: Transmitting

1) 30 MHz to 1 GHz_Low channel-worst case



Frequency (MHz)	MaxPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.485000	24.0	120.000	149.0	V	158.0	-5.1	16.0	40.0
35.941250	20.7	120.000	149.0	V	275.0	-8.8	19.3	40.0
555.982500	25.7	120.000	101.0	H	168.0	-5.1	20.3	46.0
683.658750	27.0	120.000	101.0	H	12.0	-3.3	19.0	46.0
819.458750	28.8	120.000	101.0	H	270.0	-1.6	17.2	46.0
933.676250	30.7	120.000	149.0	V	149.0	0.7	15.3	46.0

2) Above 1 GHz

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBμV	PK/AV	H/V	dB(1/m)	dB	dB	dBμV/m	dBμV/m	dB
Frequency: 2404 MHz									
2404	66.45	PK	H	28.71	3.00	0.00	98.16	114.00	15.84
2404	53.02	AV	H	28.71	3.00	0.00	84.73	94.00	9.27
2404	65.18	PK	V	28.71	3.00	0.00	96.89	114.00	17.11
2404	51.43	AV	V	28.71	3.00	0.00	83.14	94.00	10.86
2390	29.17	PK	H	28.67	3.00	0.00	60.84	74.00	13.16
2390	15.41	AV	H	28.67	3.00	0.00	47.08	54.00	6.92
2400	29.41	PK	H	28.70	3.00	0.00	61.11	74.00	12.89
2400	15.41	AV	H	28.70	3.00	0.00	47.11	54.00	6.89
4808	37.32	PK	H	33.86	5.12	26.87	49.43	74.00	24.57
4808	24.96	AV	H	33.86	5.12	26.87	37.07	54.00	16.93
7212	32.63	PK	H	36.40	6.17	26.35	48.85	74.00	25.15
7212	18.13	AV	H	36.40	6.17	26.35	34.35	54.00	19.65
Frequency: 2440 MHz									
2440	65.91	PK	H	28.82	3.00	0.00	97.73	114.00	16.27
2440	53.02	AV	H	28.82	3.00	0.00	84.84	94.00	9.16
2440	64.67	PK	V	28.82	3.00	0.00	96.49	114.00	17.51
2440	51.43	AV	V	28.82	3.00	0.00	83.25	94.00	10.75
4880	36.53	PK	H	34.06	5.09	26.87	48.81	74.00	25.19
4880	24.36	AV	H	34.06	5.09	26.87	36.64	54.00	17.36
7320	33.32	PK	H	36.55	6.22	26.40	49.69	74.00	24.31
7320	17.81	AV	H	36.55	6.22	26.40	34.18	54.00	19.82
Frequency: 2479 MHz									
2479	64.85	PK	H	28.94	2.99	0.00	96.78	114.00	17.22
2479	51.20	AV	H	28.94	2.99	0.00	83.13	94.00	10.87
2479	64.23	PK	V	28.94	2.99	0.00	96.16	114.00	17.84
2479	50.61	AV	V	28.94	2.99	0.00	82.54	94.00	11.46
2483.5	28.93	PK	H	28.95	2.99	0.00	60.87	74.00	13.13
2483.5	13.48	AV	H	28.95	2.99	0.00	45.42	54.00	8.58
4958	35.92	PK	H	34.28	5.05	26.88	48.37	74.00	25.63
4958	20.52	AV	H	34.28	5.05	26.88	32.97	54.00	21.03
7437	33.15	PK	H	36.71	6.27	26.45	49.68	74.00	24.32
7437	17.45	AV	H	36.71	6.27	26.45	33.98	54.00	20.02

Note:

Corrected Amplitude = Corrected Factor + Reading

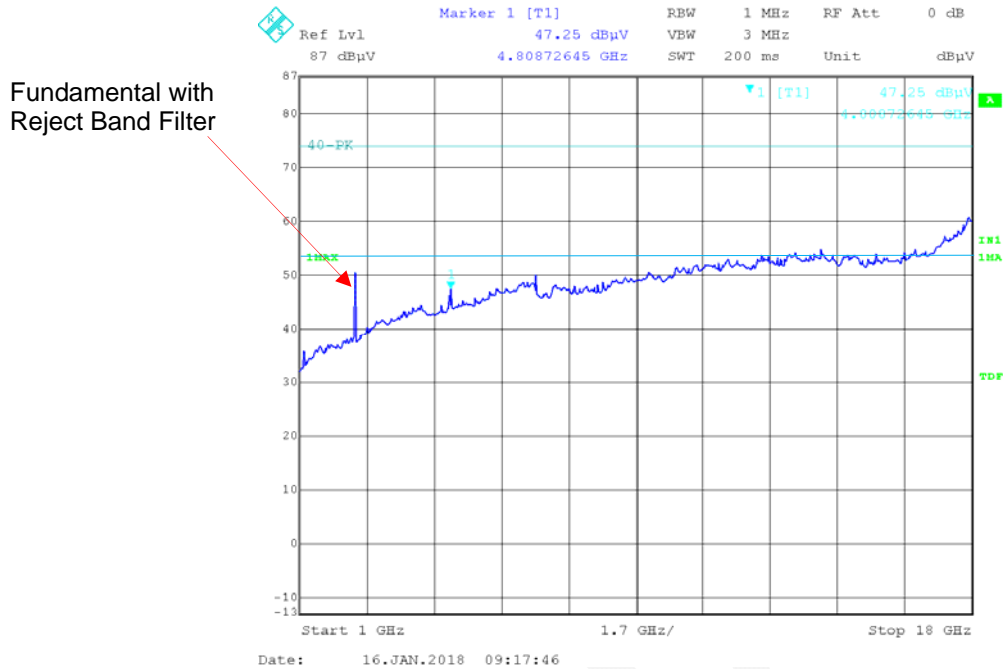
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

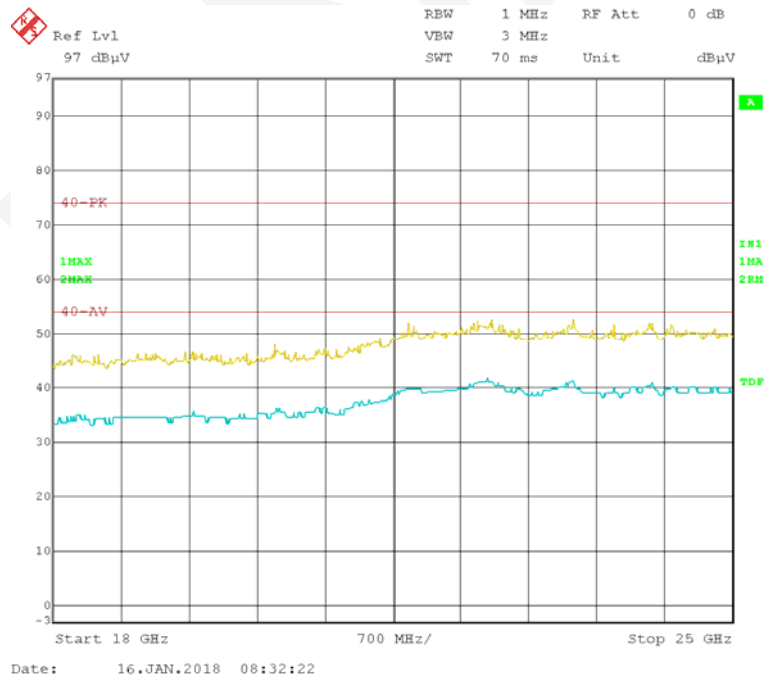
Spurious emissions more than 20 dB below the limit were not reported.

Please refer to the below pre-scan plot of worst case:

Low Channel_Horizontal_1GHz-18GHz

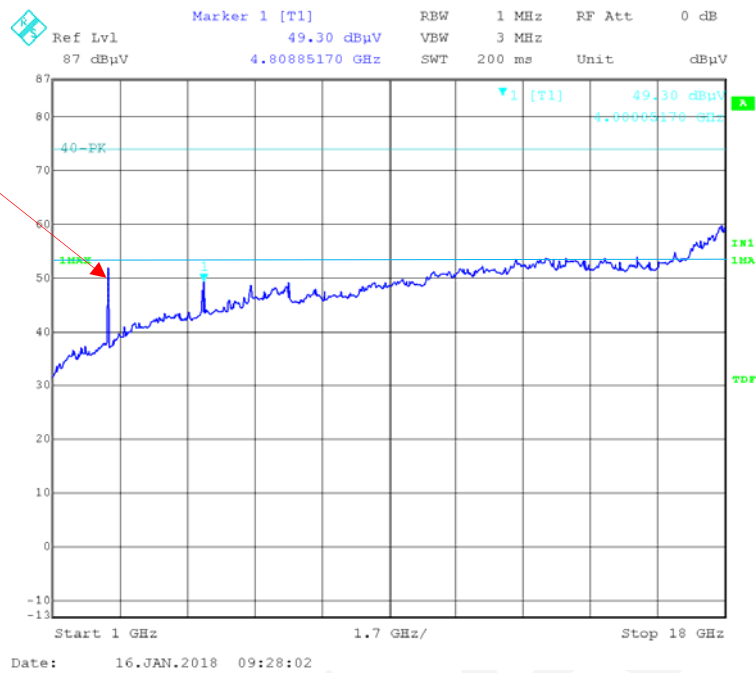


Low Channel_Horizontal_18GHz-25GHz

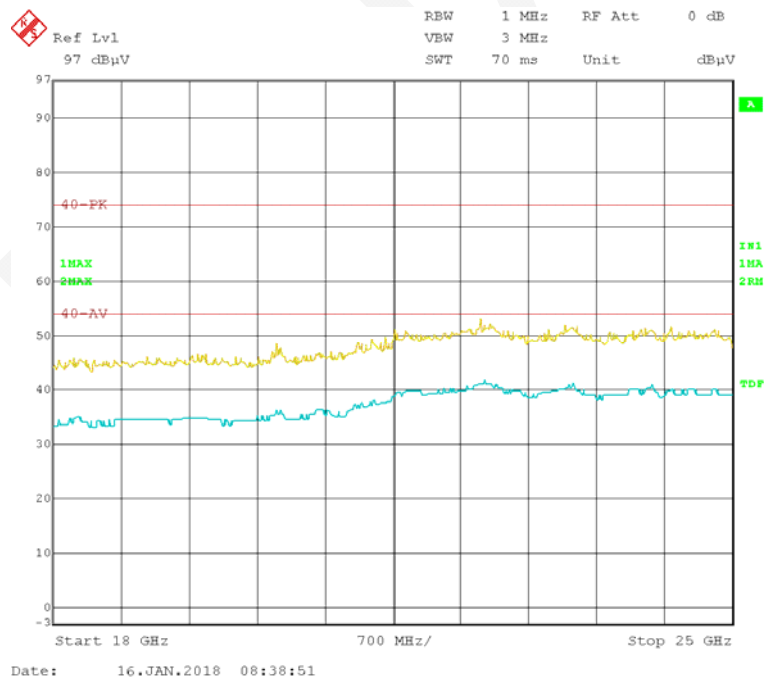


Low Channel_Vertical_1GHz-18GHz

Fundamental with
Reject Band Filter



Low Channel_Vertical_18GHz-25GHz



FCC §15.215(c) – 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, 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.

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 on the test table without connection to measurement instrument. Turn on the EUT. 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

Temperature:	19 °C
Relative Humidity:	40 %
ATM Pressure:	95.6 kPa

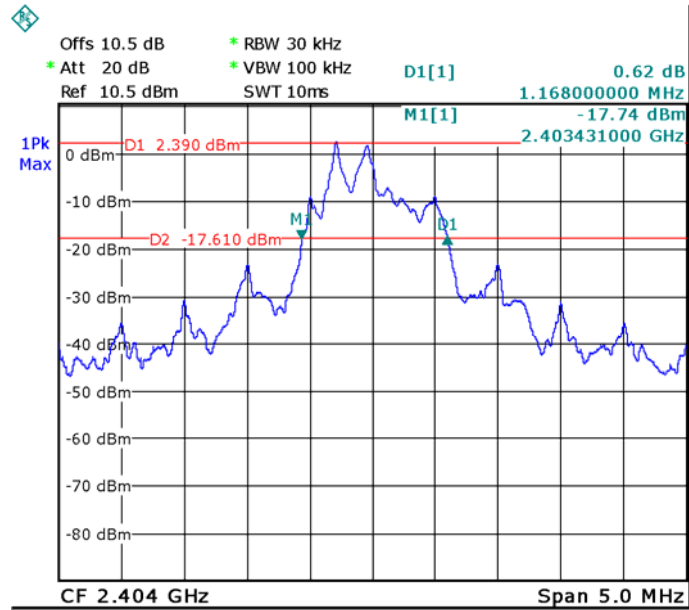
* The testing was performed by Tom Tang on 2018-01-16.

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table and plots.

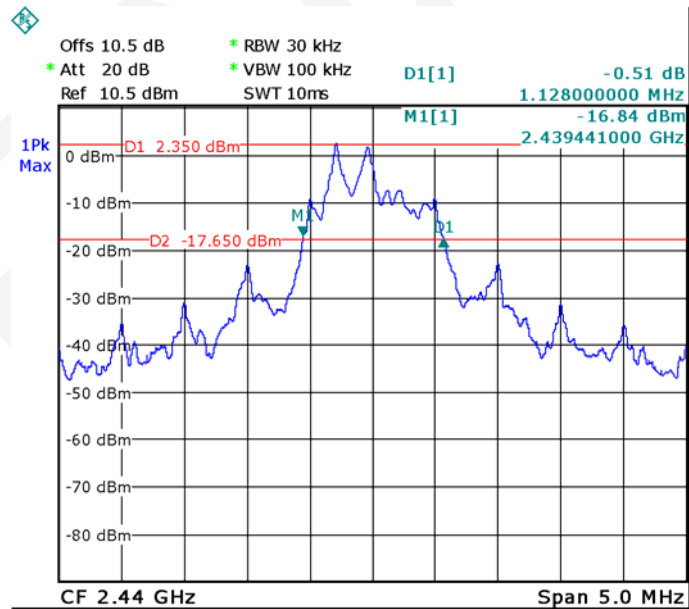
Channel	Frequency (MHz)	20dB OBW (MHz)
Low	2404	1.168
Middle	2440	1.128
High	2479	1.118

Low Channel



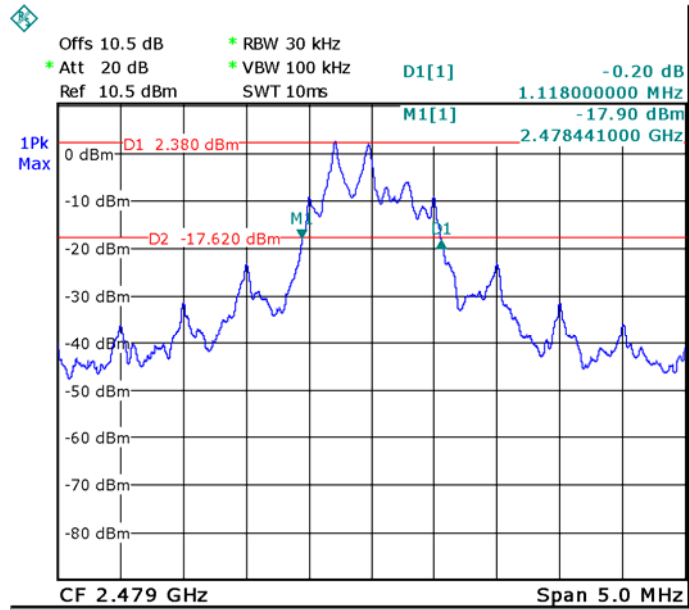
Date: 16.JAN.2018 14:22:29

Middle Channel



Date: 16.JAN.2018 14:27:38

High Channel



Date: 16.JAN.2018 14:29:12

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