TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.247

TEST REPORT

For

Aputure Imaging Industries Co., Ltd

3rd Floor, Building 21, Longjun industrial, estate, Longhua, Bao'an, Shenzhen, P.R.China

FCC ID:2AABZ-DCHDTX

Report Type:	**Product Name:**
Original Report	Deity Connect Interview Kit

Report Number:	RDG191122005-00
Report Date:	2020-01-17
Reviewed By:	Ivan Cao Assistant manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Deity Connect Interview Kit
EUT Model:	Deity Connect Interview Kit
Multiple Models:	Deity Connect Interview Kit US,HD-TX,HD-TX US
Operation Frequency:	2406-2474MHz
Maximum Peak Output Power (Conducted):	12.26 dBm
Modulation Type:	GFSK
Rated Input Voltage:	DC 3.7V from battery or DC 5V from USB port
Serial Number:	RDG191122005-RF-S7
EUT Received Date:	2019-12-25
EUT Received Status:	Good

Note: Model Deity Connect Interview Kit was selected for fully testing, the detailed information about the difference among Deity Connect Interview Kit US,HD-TX,HD-TX US and model Deity Connect Interview Kit can be referred to the declaration letter which was stated and guaranteed by the manufacturer.

Objective

This report is prepared on behalf of Aputure Imaging Industries 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 the EUT compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

Part of systems with granted FCC ID:2AABZ-DCBPTX.
Part of systems with granted FCC ID:2AABZ-DCDUORX.

Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices".

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "△ ". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode.

The device employs 18 channels as below:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2406	7	2430	13	2454
2	2410	8	2434	14	2458
3	2414	9	2438	15	2462
4	2418	10	2442	16	2466
5	2422	11	2446	17	2470
6	2426	12	2450	18	2474

EUT was tested with channel 1, 10 and 18.

The device have two antenna port, and the system select one chain for Tx and Rx base on good perfemance determined by the system.

EUT Exercise Software

No software was used during test, the mode and power setting switched by kes. The maximum power level was as below table:

Antenna Port	Channel	Frequency (MHz)	Power Level
Chain 1	Low	2406	-8
	Middle	2442	-8
	High	2474	-8
Chain 2	Low	2406	-8
	Middle	2442	-8
	High	2474	-8

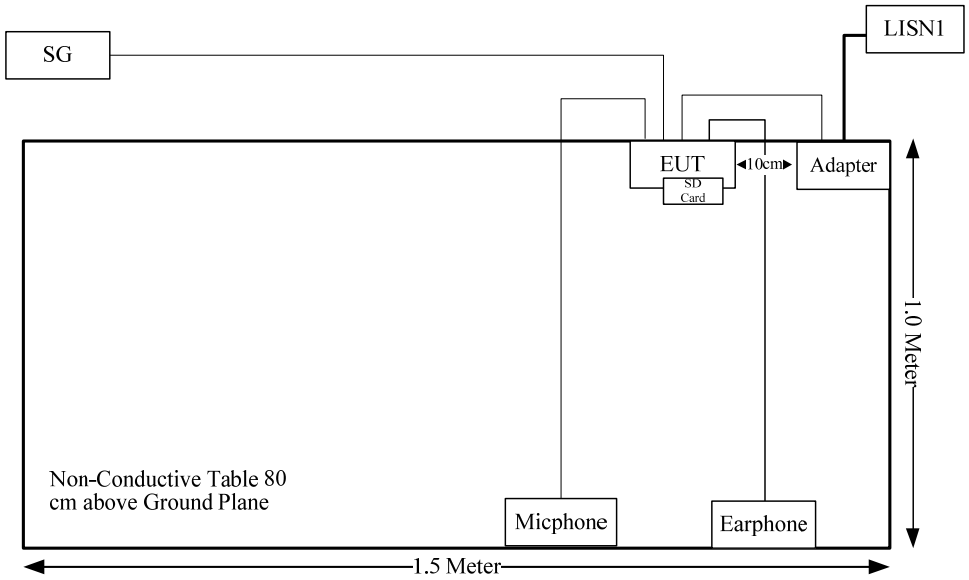
Equipment Modifications

Manufacturer	Description	Model	Serial Number
Agilent	MXG Vector Signal Generator	N5182B	MY51350142
Soundking	Microphone	EH040	/
MI	Earphone	/	/
HONOTO	Adapter	ADS-12EA-05 050105	T67HGF0100
SanDisk	SD Card	/	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Connecter Cable	Yes	No	10	N5182B	EUT
Microphone Cable	Yes	No	3.0	Microphone	EUT
Earphone Cable	Yes	No	1.5	EUT	Earphone
USB Cable	Yes	Yes	0.5	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC§15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
FCC §15.203	Antenna requirement	Compliance
FCC §15.207(a)	AC line conducted emissions	Compliance
FCC §15.205, §15.209, §15.247(d)	Spurious emissions	Compliance
FCC §15.247(a)(1)	Channel separation	Compliance
FCC §15.247(a)(1)	20 dB bandwidth	Compliance
FCC §15.247(a)(1)(iii)	Quantity of hopping channel test	Compliance
FCC §15.247(a)(1)(iii)	Time of occupancy (dwell time)	Compliance
FCC §15.247(b)(1)	Peak output power measurement	Compliance
FCC §15.247(d)	Band edges	Compliance

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(i) and §1.1310, 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:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(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
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

When hand-held use without Holder:
The max conducted power including tune-up tolerance is 13 dBm (19.95 mW).
[(max. power of channel, mW)/(min. test separation distance, mm)][√f(GHz)]
= 19.95/5*(√2.474) = 6.3< 7.5

When Body-worn with Holder:
The distance between the antenna to back side is 48 mm.
[(max. power of channel, mW)/(min. test separation distance, mm)][√f(GHz)]
= 19.95/48*(√2.474) = 0.7< 3.0

So the stand-alone SAR evaluation is not necessary.

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 use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has two internal antenna arrangement, fulfill the requirement of this section. Please refer to below information and the EUT photos:

Antenna	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
1	FPC	50	3 dBi/2.4~2.5GHz
2	FPC	50	0.5 dBi/2.4~2.5GHz

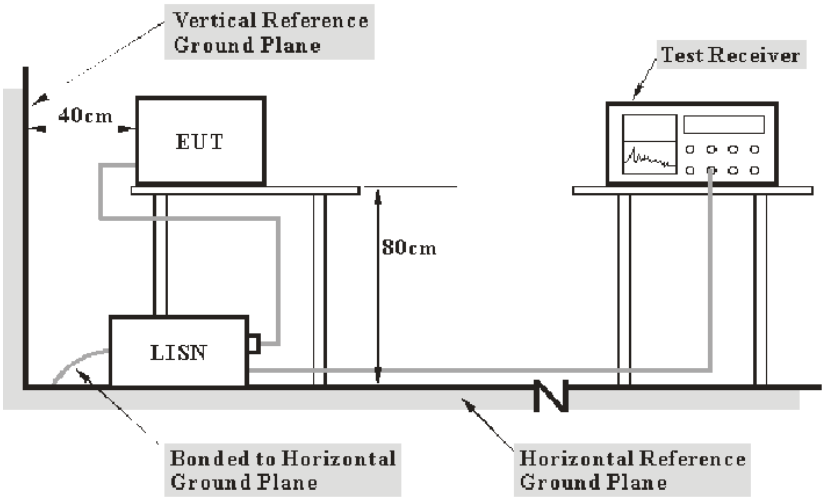
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main LISN with a 120 V/60 Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN or ISN

The "**Margin**" column of the following data tables indicates the degree of compliance within 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:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	LISN	ENV 216	101614	2019-09-12	2020-09-12
R&S	EMI Test Receiver	ESCI	101121	2019-05-09	2020-05-09

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

Test Data

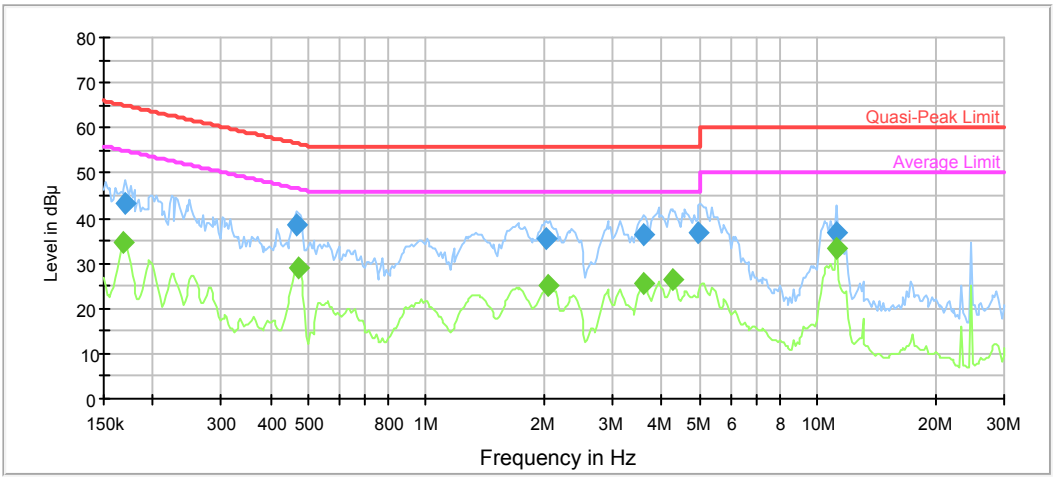
Environmental Conditions

Temperature:	22.8°C
Relative Humidity:	66%
ATM Pressure:	101.5kPa
Test by:	Sem Xiang
Test Date:	2020-01-06

Test Result: Compliance

Test Mode: Transmitting

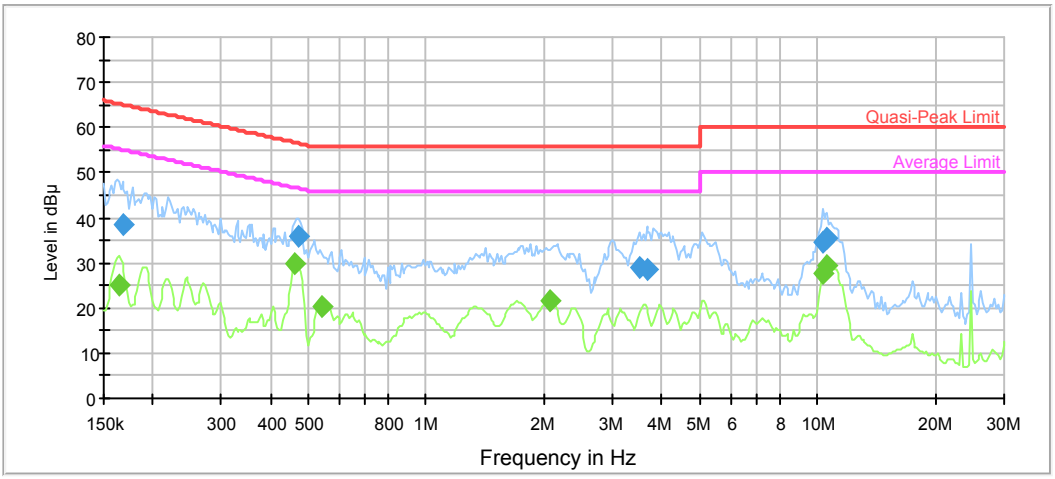
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170714	43.3	9.000	L1	9.7	21.6	64.9
0.466367	38.3	9.000	L1	9.7	18.3	56.6
2.033721	35.6	9.000	L1	9.8	20.4	56.0
3.585996	36.5	9.000	L1	9.8	19.5	56.0
4.979837	36.7	9.000	L1	9.8	19.3	56.0
11.149269	36.6	9.000	L1	10.0	23.4	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.169024	34.7	9.000	L1	9.7	20.3	55.0
0.471031	29.1	9.000	L1	9.7	17.4	46.5
2.054059	25.3	9.000	L1	9.8	20.7	46.0
3.585996	25.3	9.000	L1	9.8	20.7	46.0
4.289380	26.2	9.000	L1	9.8	19.8	46.0
11.149269	33.3	9.000	L1	10.0	16.7	50.0

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.167350	38.3	9.000	N	9.7	26.8	65.1
0.471031	35.9	9.000	N	9.6	20.6	56.5
3.515338	29.0	9.000	N	9.6	27.0	56.0
3.658074	28.6	9.000	N	9.6	27.4	56.0
10.296163	34.6	9.000	N	9.8	25.4	60.0
10.608147	35.4	9.000	N	9.8	24.6	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.164053	25.1	9.000	N	9.7	30.1	55.3
0.461750	29.8	9.000	N	9.6	16.9	46.7
0.541438	20.5	9.000	N	9.6	25.5	46.0
2.074599	21.5	9.000	N	9.6	24.5	46.0
10.296163	27.7	9.000	N	9.8	22.3	50.0
10.608147	29.5	9.000	N	9.8	20.5	50.0

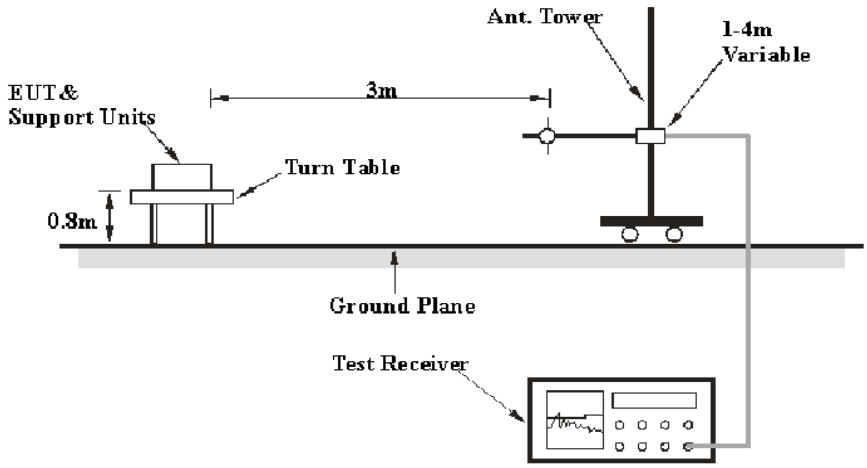
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

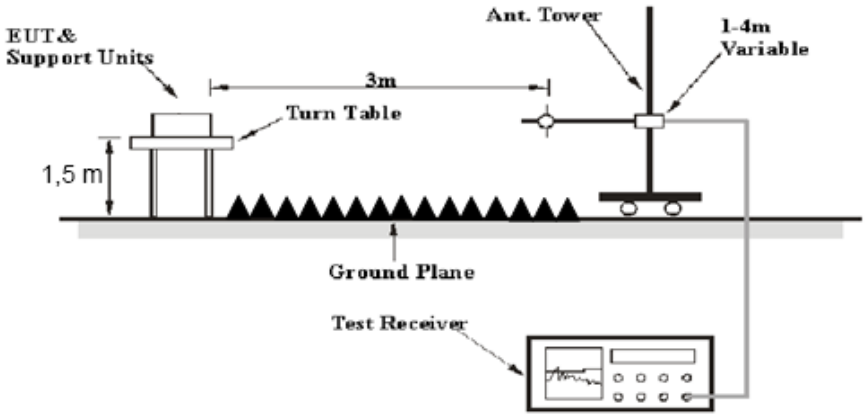
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 10 meters chamber, above 1GHz tests were performed in the 3 meters chamber A, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

According to FCC public notice: DA-00-705, during the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

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 Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - 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:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Below 1GHz					
R&S	EMI Test Receiver	ESCI	100224	2019-09-12	2020-09-12
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-2	2017-08-25	2020-08-25
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2019-09-24	2020-09-24
Sonoma	Amplifier	310N	185914	2019-10-13	2020-10-13
Radiation Above 1GHz					
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
MICRO-COAX	Coaxial Cable	UFA147-1-2362-100100	64639 231029-001	2019-02-24	2020-02-24
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2019-09-05	2020-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2019-06-27	2020-06-27
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2019-06-16	2020-06-16
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2019-06-16	2020-06-16

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

Test Data

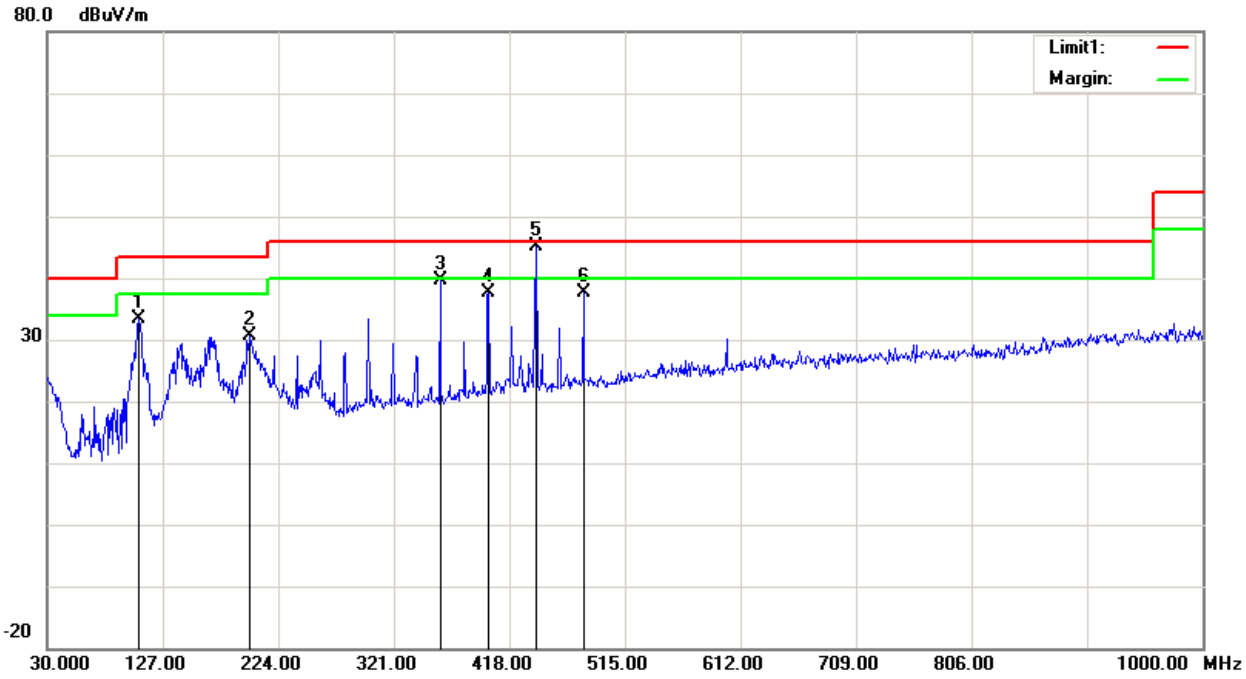
Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	22.8°C	26.8 °C
Relative Humidity:	44%	54%
ATM Pressure:	101.7kPa	101.8kPa
Tester:	Jackson Zhang	Tyler Pan
Test Date:	2020-01-15	2020-01-06

Test Mode: Transmitting(Per pre-test, Antenna 1 was the worst)

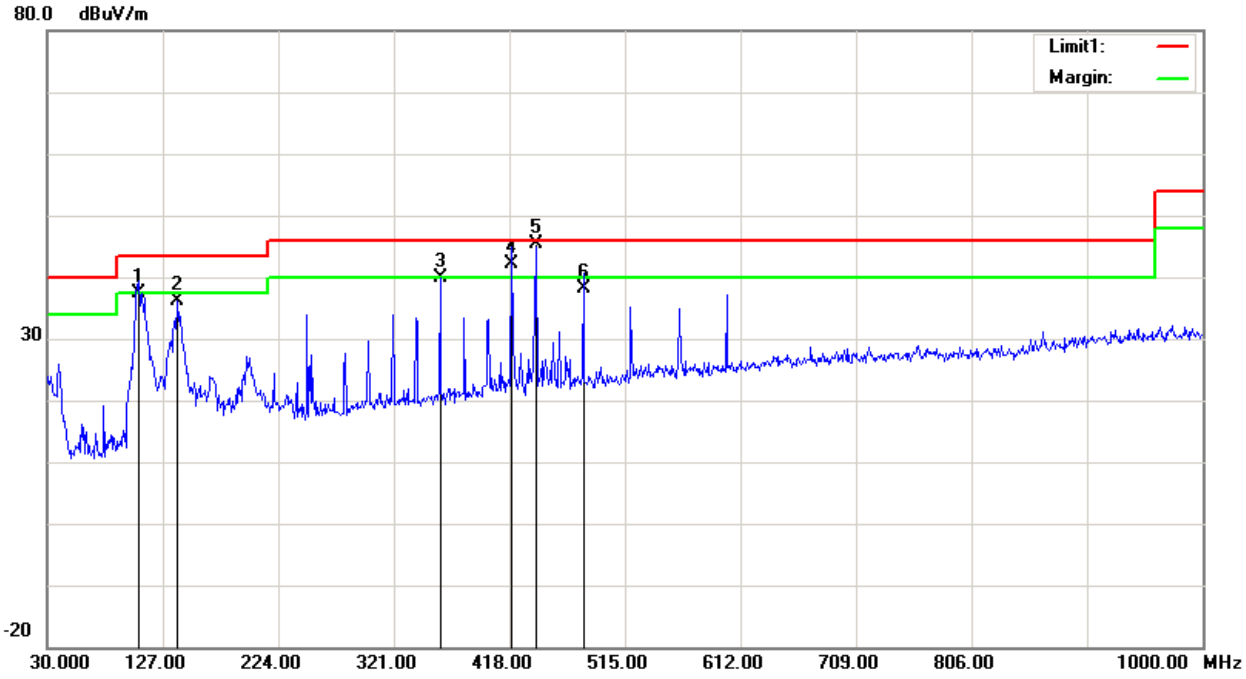
1) 30MHz-1GHz

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
106.6300	46.75	peak	-13.47	33.28	43.50	10.22
199.7500	39.94	peak	-9.39	30.55	43.50	12.95
359.8000	45.75	peak	-6.00	39.75	46.00	6.25
400.5400	42.82	peak	-5.25	37.57	46.00	8.43
440.3100	49.70	QP	-4.55	45.15	46.00	0.85
480.0800	41.42	peak	-3.83	37.59	46.00	8.41

Vertical:



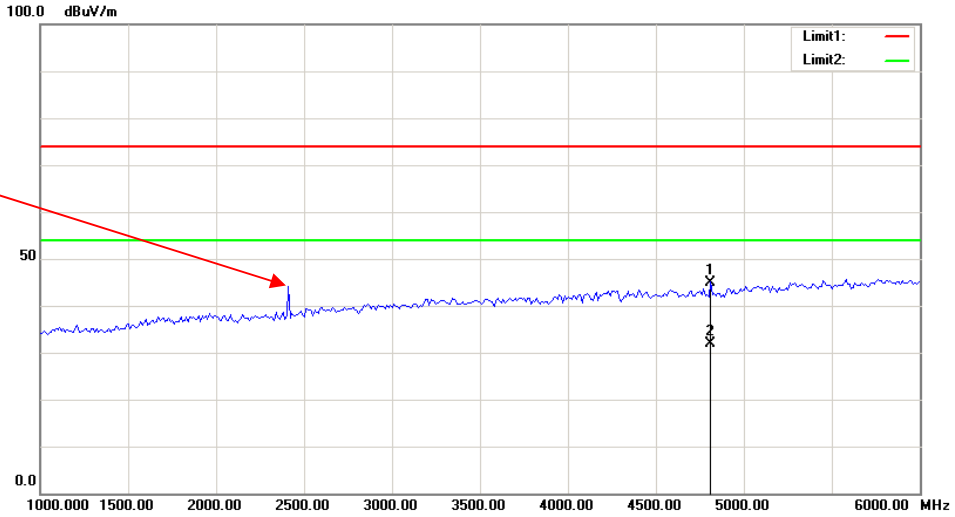
Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
106.6300	50.91	QP	-13.47	37.44	43.50	6.06
139.6100	45.46	peak	-9.37	36.09	43.50	7.41
359.8000	45.83	peak	-6.00	39.83	46.00	6.17
419.9400	46.78	QP	-4.68	42.10	46.00	3.90
440.3100	50.05	QP	-4.55	45.50	46.00	0.50
480.0800	42.03	QP	-3.83	38.20	46.00	7.80

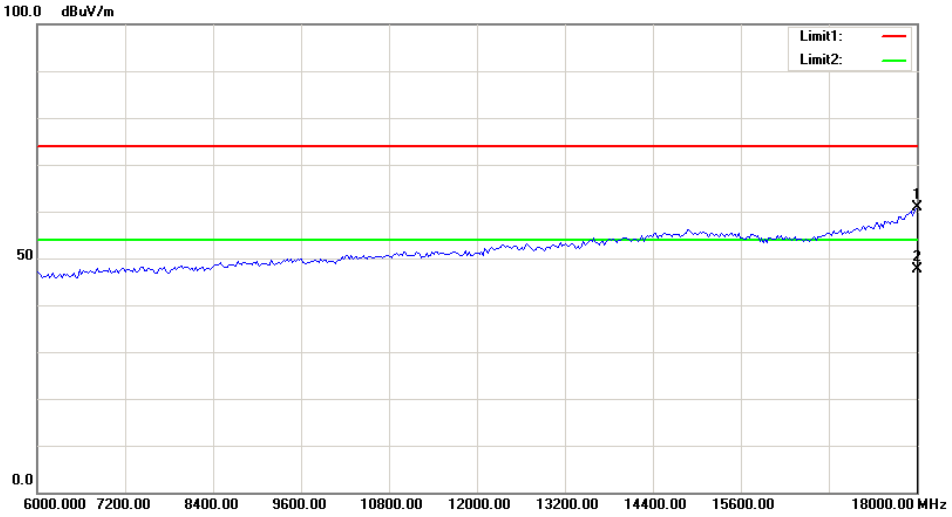
2)1GHz-25GHz*:*

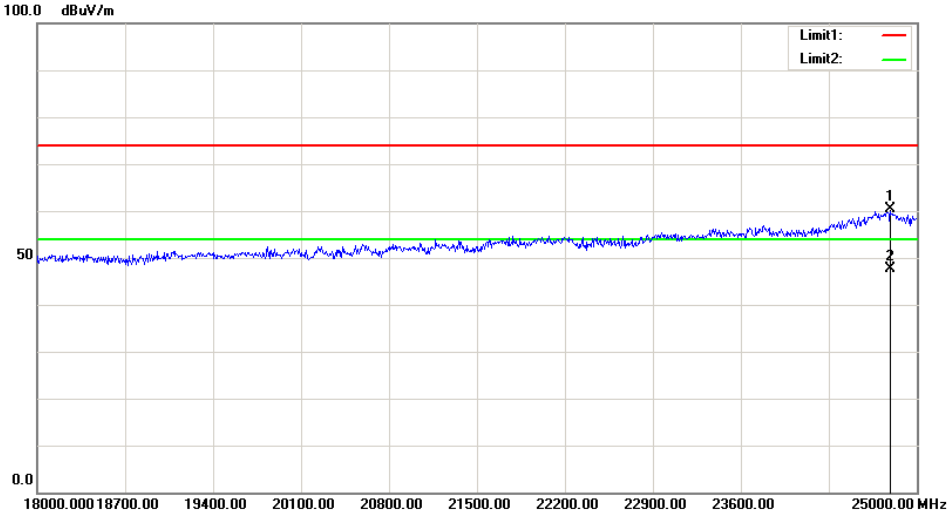
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB/m)					
Low Channel: 2406 MHz									
2406.00	80.19	PK	H	24.83	3.34	0.00	108.36	N/A	N/A
2406.00	76.27	AV	H	24.83	3.34	0.00	104.44	N/A	N/A
2406.00	76.12	PK	V	24.83	3.34	0.00	104.29	N/A	N/A
2406.00	72.32	AV	V	24.83	3.34	0.00	100.49	N/A	N/A
2390.00	26.35	PK	H	24.80	3.33	0.00	54.48	74.00	19.52
2390.00	14.23	AV	H	24.80	3.33	0.00	42.36	54.00	11.64
4812.00	48.70	PK	H	29.72	4.58	27.38	55.62	74.00	18.38
4812.00	40.44	AV	H	29.72	4.58	27.38	47.36	54.00	6.64
7218.00	37.89	PK	H	33.95	5.60	27.20	50.24	74.00	23.76
7218.00	25.67	AV	H	33.95	5.60	27.20	38.02	54.00	15.98
Middle Channel: 2442 MHz									
2442.00	80.64	PK	H	24.90	3.36	0.00	108.90	N/A	N/A
2442.00	76.82	AV	H	24.90	3.36	0.00	105.08	N/A	N/A
2442.00	76.40	PK	V	24.90	3.36	0.00	104.66	N/A	N/A
2442.00	72.85	AV	V	24.90	3.36	0.00	101.11	N/A	N/A
4884.00	48.35	PK	H	29.87	4.56	27.56	55.22	74.00	18.78
4884.00	39.04	AV	H	29.87	4.56	27.56	45.91	54.00	8.09
7326.00	36.99	PK	H	34.12	5.69	27.26	49.54	74.00	24.46
7326.00	24.31	AV	H	34.12	5.69	27.26	36.86	54.00	17.14
High Channel: 2474 MHz									
2474.00	81.11	PK	H	24.95	3.38	0.00	109.44	N/A	N/A
2474.00	77.58	AV	H	24.95	3.38	0.00	105.91	N/A	N/A
2474.00	76.93	PK	V	24.95	3.38	0.00	105.26	N/A	N/A
2474.00	73.10	AV	V	24.95	3.38	0.00	101.43	N/A	N/A
2483.50	38.37	PK	H	24.97	3.38	0.00	66.72	74.00	7.28
2483.50	22.75	AV	H	24.97	3.38	0.00	51.10	54.00	2.90
4948.00	49.80	PK	H	30.00	4.57	27.41	56.96	74.00	17.04
4948.00	40.03	AV	H	30.00	4.57	27.41	47.19	54.00	6.81
7422.00	37.44	PK	H	34.28	5.77	27.19	50.30	74.00	23.70
7422.00	24.97	AV	H	34.28	5.77	27.19	37.83	54.00	16.17

Worst plots(Low channel)
Horizontal

Fundamental Test with Band Rejection Filter

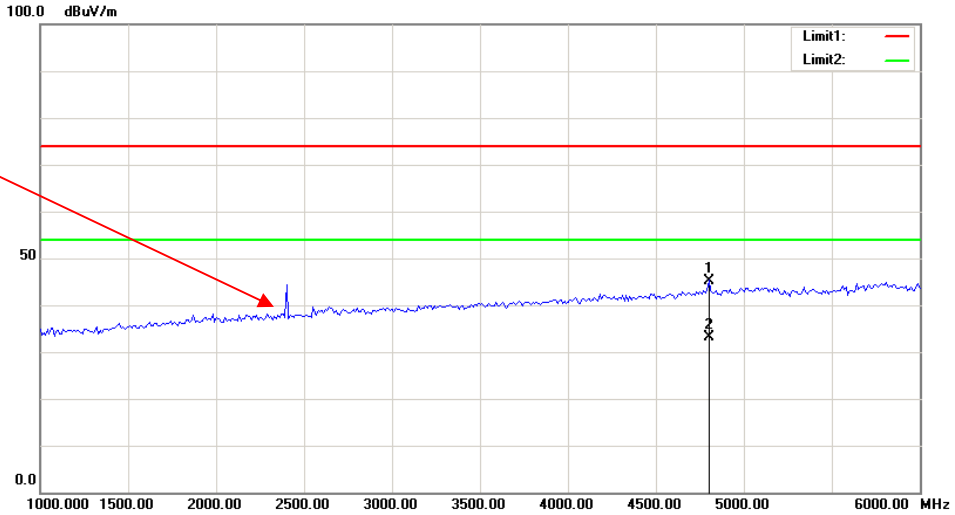


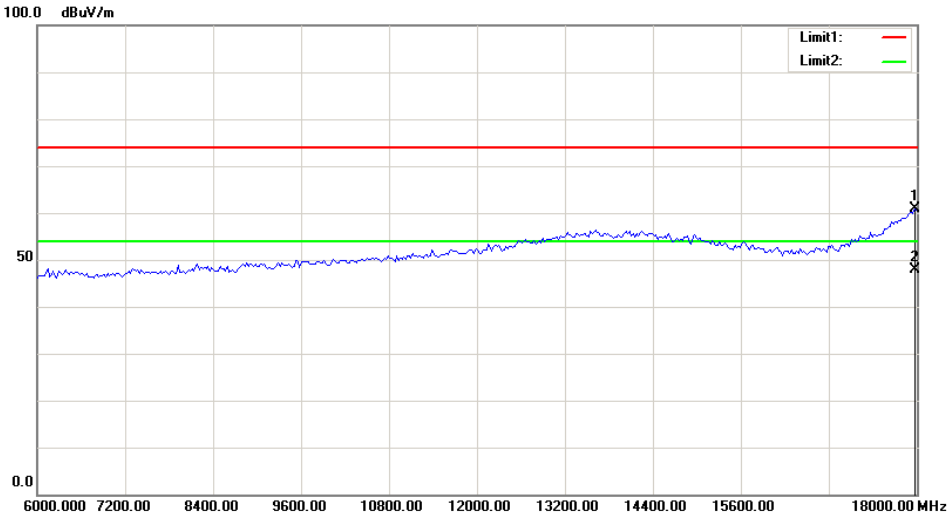


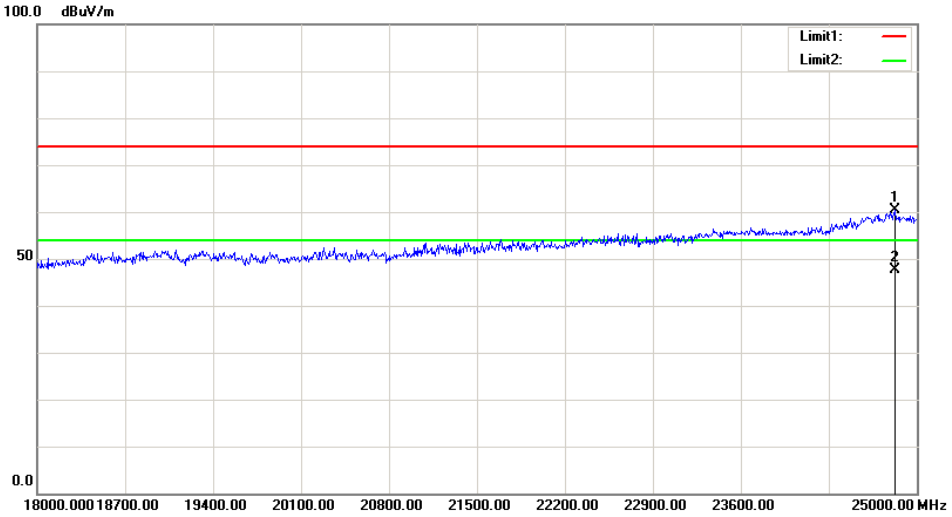


Vertical

Fundamental Test with Band Rejection Filter







FCC §15.247(a) (1) - CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.50 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Procedure

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace.
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	46%
ATM Pressure:	102.2 kPa
Test by:	Xia Yang
Test Date:	2020-01-17

Test Result: Compliance.

Please refer to following tables and plots

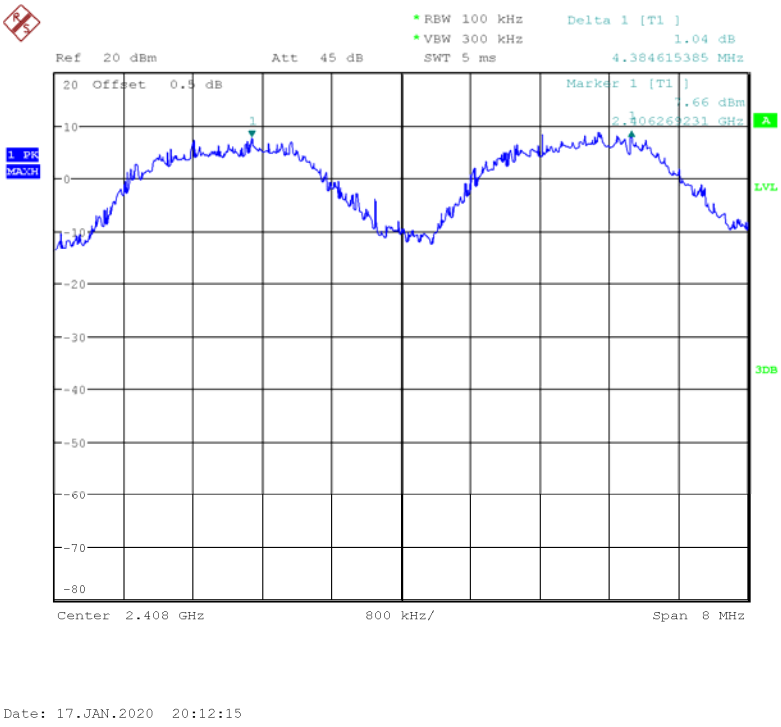
Test Mode: Transmitting

Antenna	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
ANT1	Low	2406	4.3846	3.013
	Middle	2442	4.6282	2.906
	High	2474	4.0385	2.970
ANT2	Low	2406	4.3846	2.949
	Middle	2442	4.0385	2.874
	High	2474	4.3718	2.874

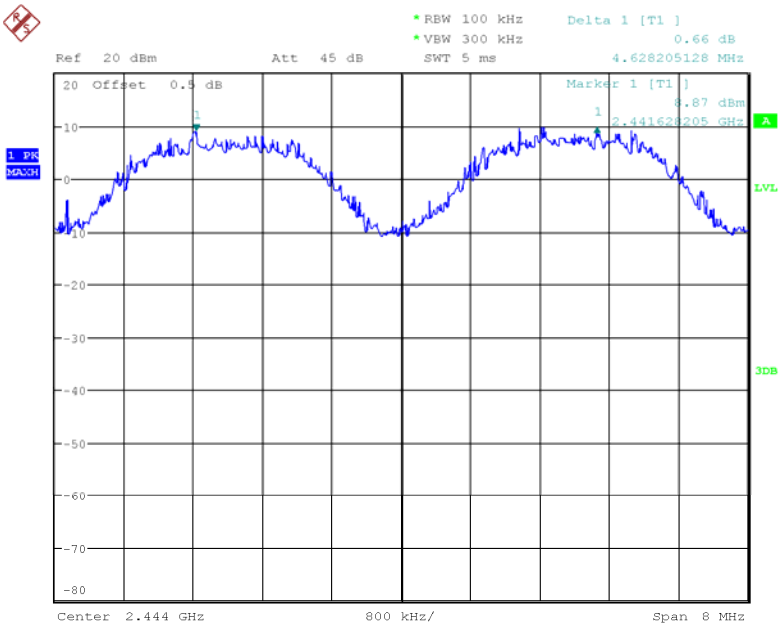
Note: Limit= (2/3) × 20dB bandwidth

ANT1:

Low Channel

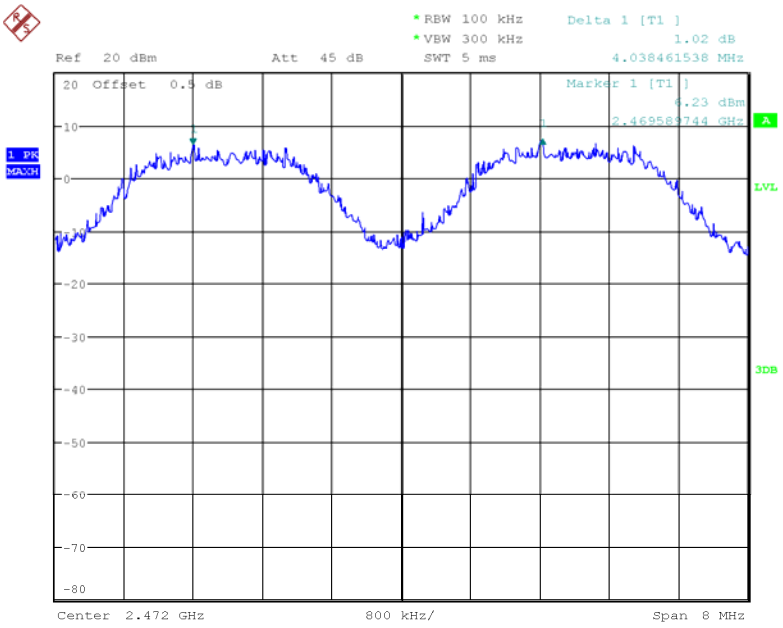


Middle Channel



Date: 17.JAN.2020 20:13:05

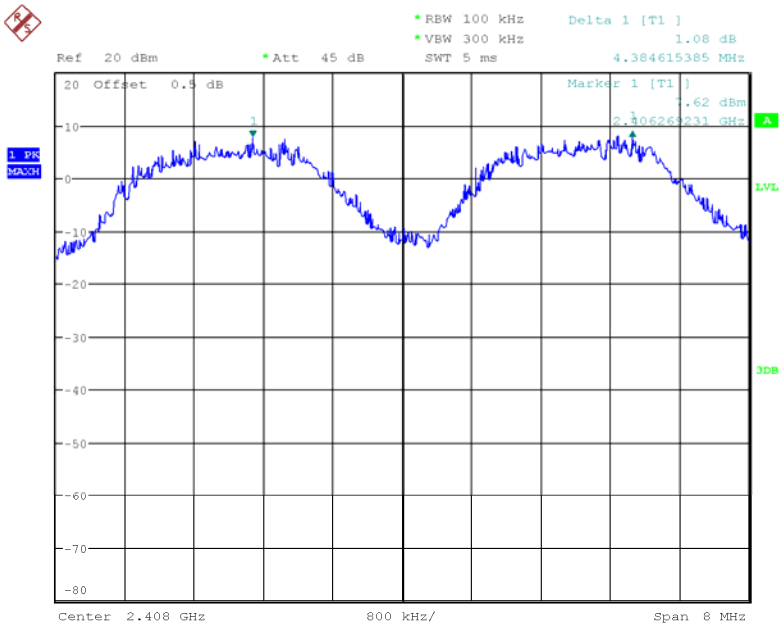
High Channel



Date: 17.JAN.2020 20:15:05

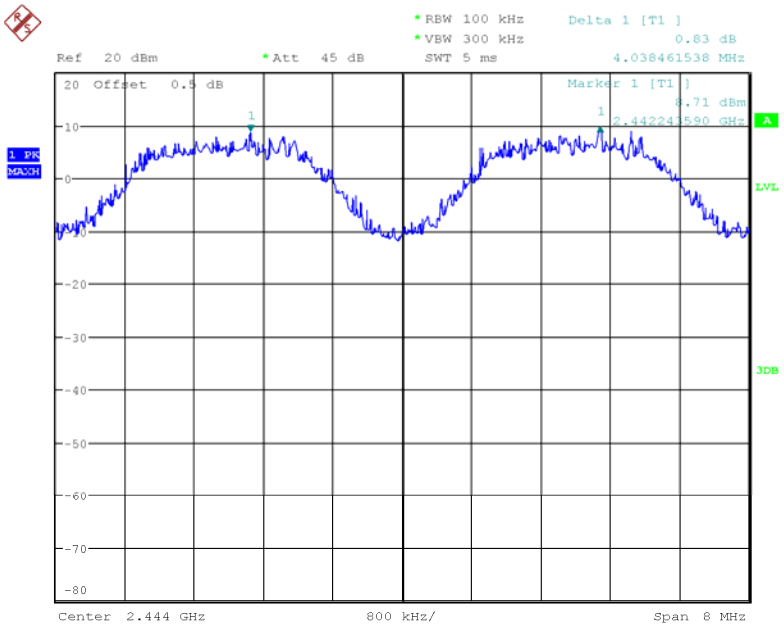
ANT2:

Low Channel



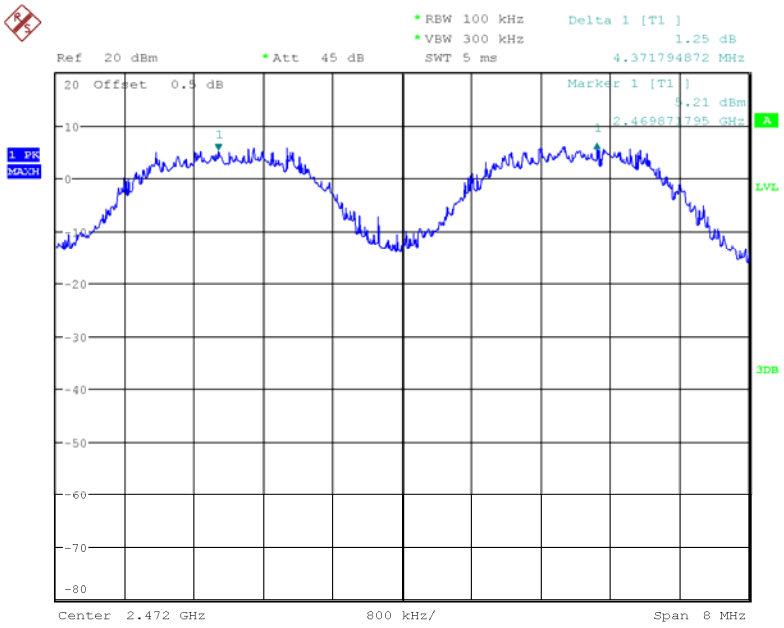
Date: 17.JAN.2020 20:42:43

Middle Channel



Date: 17.JAN.2020 20:43:23

High Channel



Date: 17.JAN.2020 20:44:40

FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING

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 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	46%
ATM Pressure:	102.2 kPa
Test by:	Xia Yang
Test Date:	2020-01-17

Test Result: Compliance.

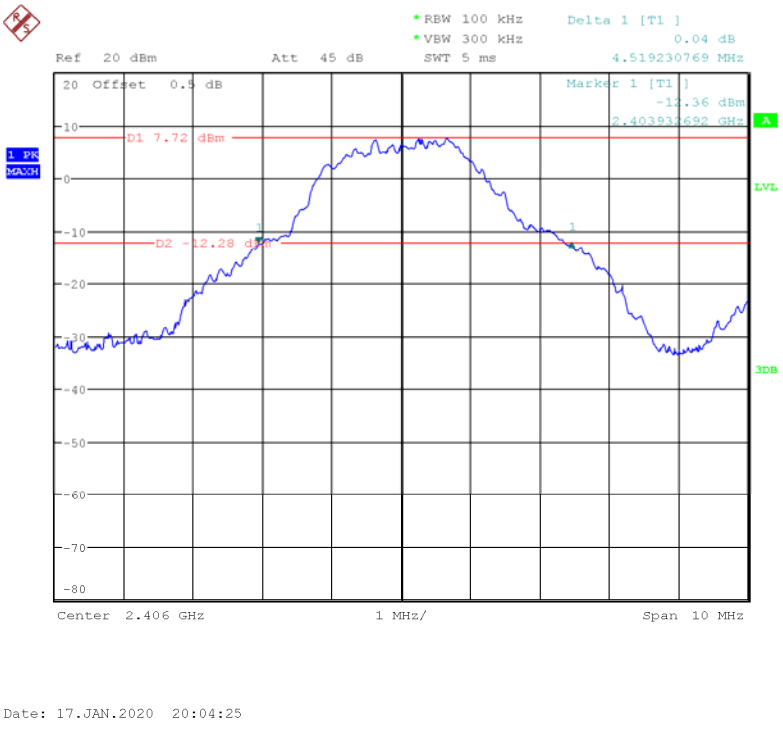
Please refer to following tables and plots

Test Mode: Transmitting

Antenna	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
ANT1	Low	2406	4.519
	Middle	2442	4.359
	High	2474	4.455
ANT2	Low	2406	4.423
	Middle	2442	4.311
	High	2474	4.311

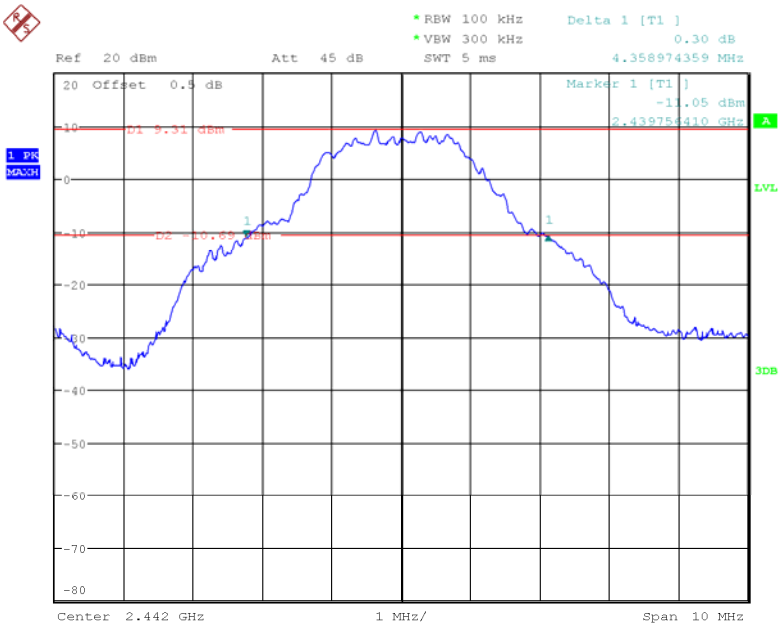
ANT1:

Low Channel



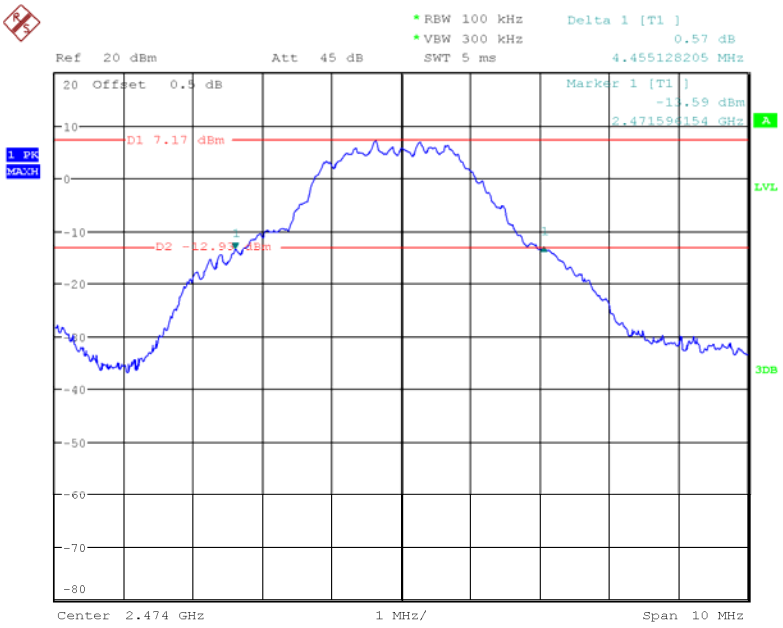
Date: 17.JAN.2020 20:04:25

Middle Channel



Date: 17.JAN.2020 20:02:57

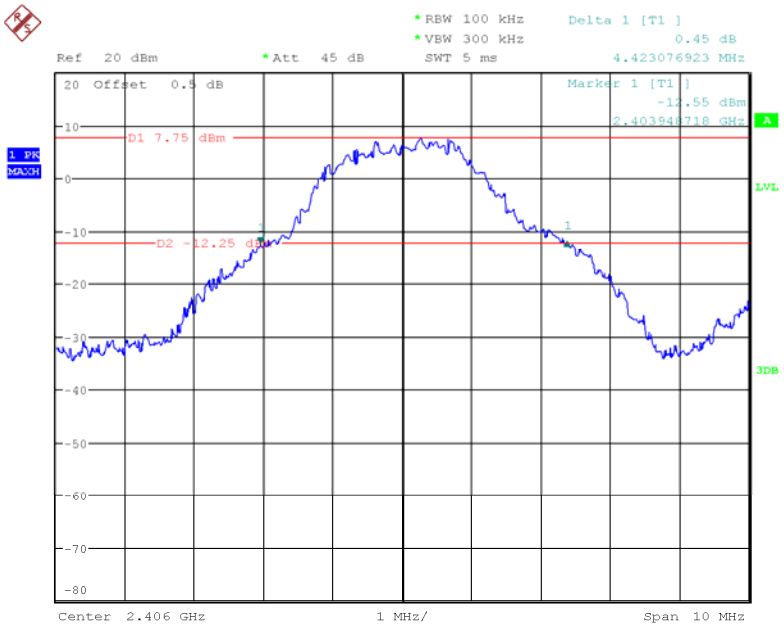
High Channel



Date: 17.JAN.2020 20:06:08

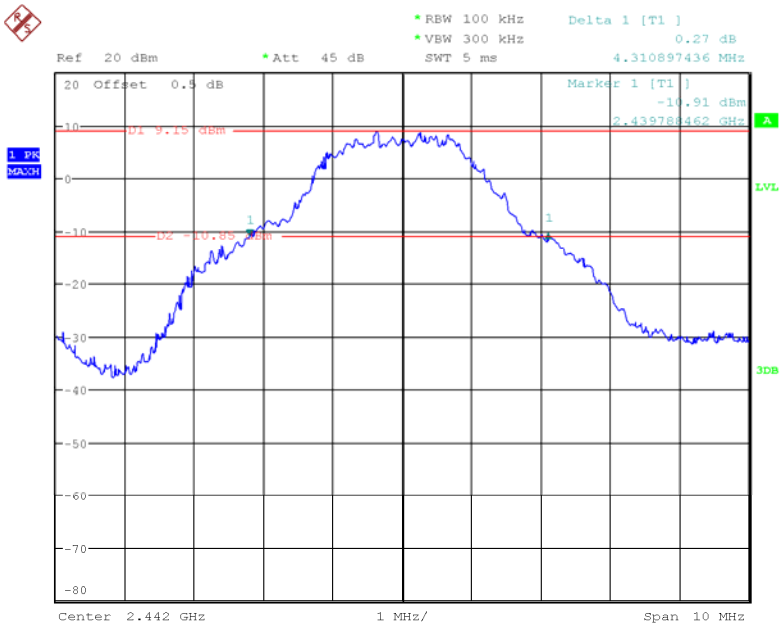
ANT2:

Low Channel



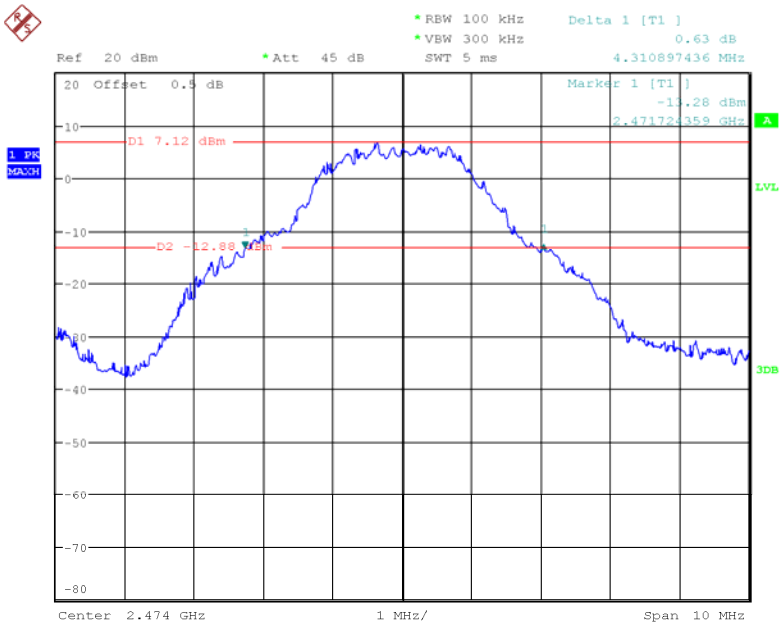
Date: 17.JAN.2020 20:46:15

Middle Channel



Date: 17.JAN.2020 20:47:54

High Channel



Date: 17.JAN.2020 20:49:03

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	46%
ATM Pressure:	102.2 kPa
Test by:	Xia Yang
Test Date:	2020-01-17

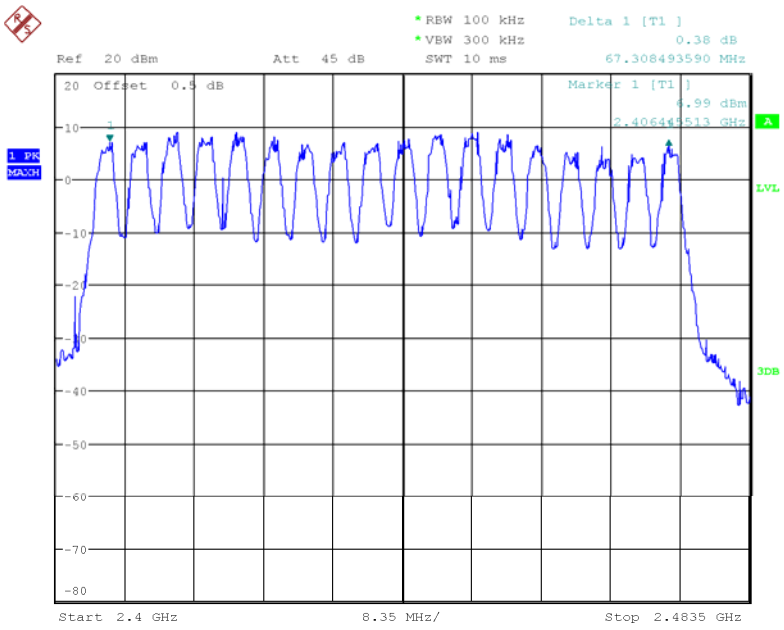
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

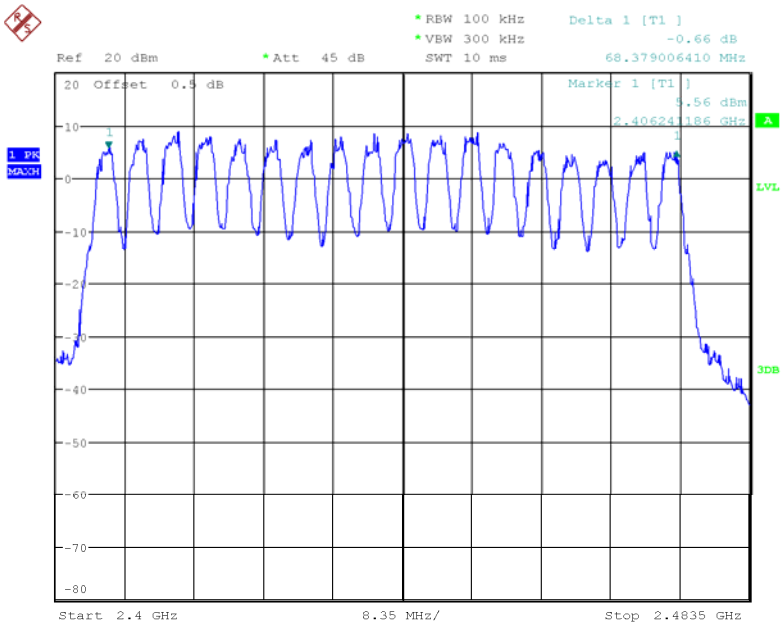
Antenna	Frequency Range (MHz)	Number of Hopping Channel	Limit
ANT 1	2400-2483.5	18	≥15
ANT 2	2400-2483.5	18	≥15

ANT 1



Date: 17.JAN.2020 20:18:09

ANT 2



Date: 17.JAN.2020 20:50:23

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; the time of single pulses was tested.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	46%
ATM Pressure:	102.2 kPa
Test by:	Xia Yang
Test Date:	2020-01-17

Test Result: Compliance.

Please refer to following tables and plots

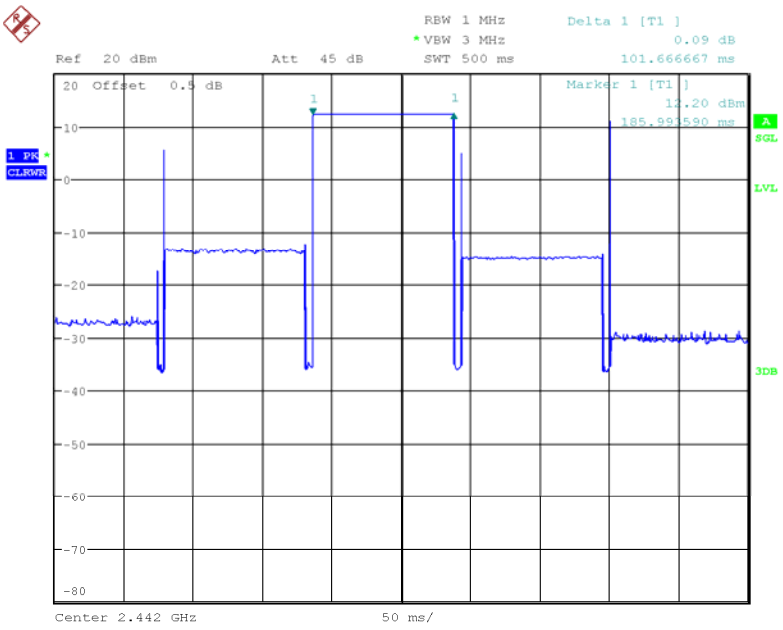
Test Mode: Transmitting

Antenna	Channel	Frequency (MHz)	Puse width (ms)	Hopping Numbers in Period	Result (s)	Limit (s)
1	Middle	2442	0.102	3	0.306	0.4
2	Middle	2442	0.102	3	0.306	0.4

Note: The test result = Time per one hopping (Pulse width) * hopping number (within the time obtained by multiplying the hopping channel number by 0.4s)
period=0.4 seconds multiplied by the number of hopping channels employed=0.4*18=7.2s

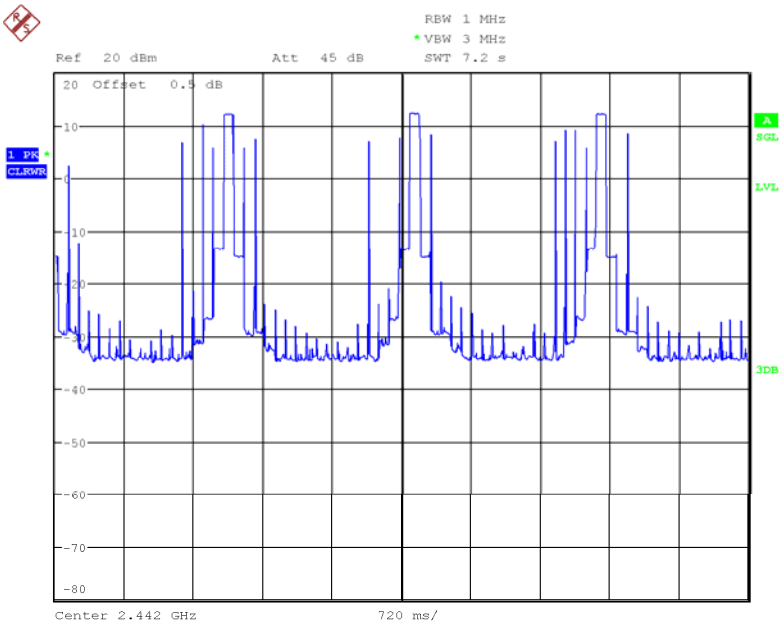
ANT1-Middle Channel:

Pulse Width



Date: 17.JAN.2020 20:20:36

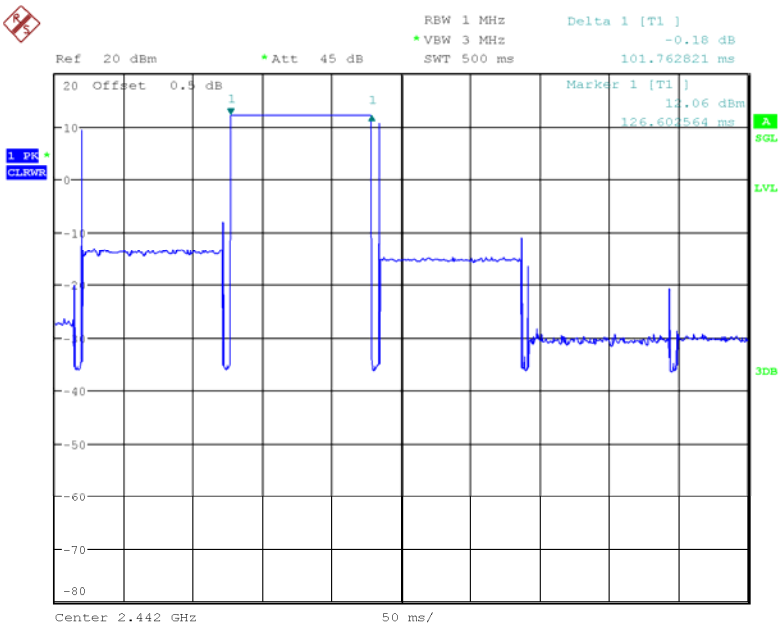
Hopping Numbers



Date: 17.JAN.2020 20:21:26

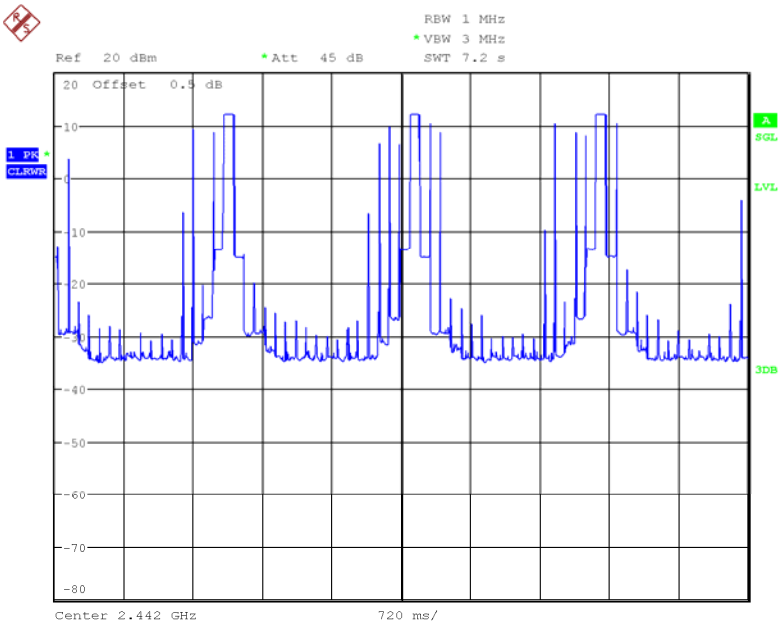
ANT2-Middle Channel:

Pulse Width



Date: 17.JAN.2020 20:52:10

Hopping Numbers



Date: 17.JAN.2020 20:53:08

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. 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A
Agilent	USB Wideband Power Sensor	U2021XA	MY5425009	2019-05-09	2020-05-09

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

Test Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	46%
ATM Pressure:	102.2 kPa
Test by:	Xia Yang
Test Date:	2020-01-17

Test Result: Compliance.

Test Mode: Transmitting

Antenna	Frequency (MHz)	Peak Conducted Output power (dBm)	Limit (dBm)
ANT1	2406	11.30	21
	2442	12.26	21
	2474	10.46	21
ANT2	2406	11.26	21
	2442	12.23	21
	2474	10.44	21

Note: The data above was tested in conducted mode.

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/ VBW of spectrum analyzer to 100/300 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

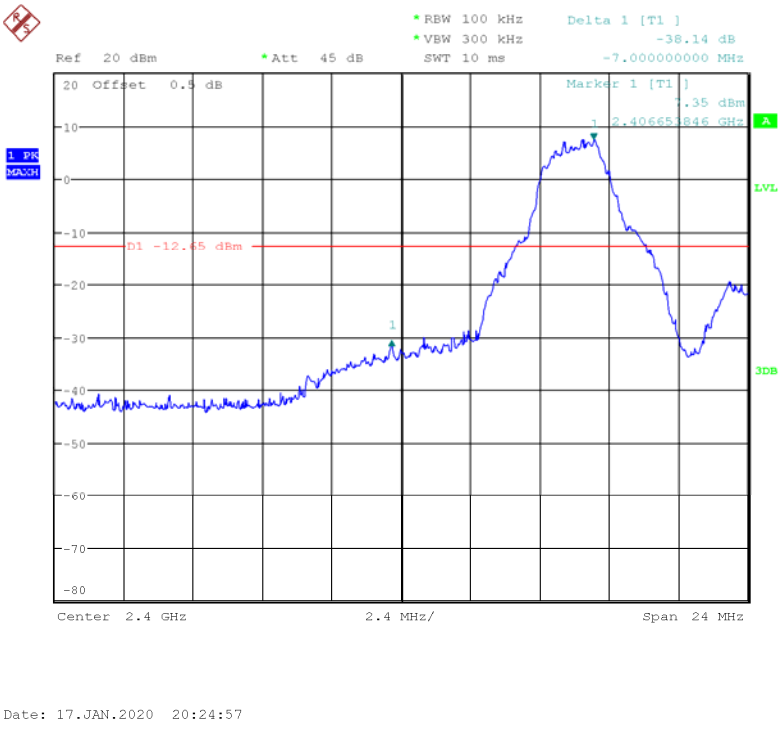
Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	46%
ATM Pressure:	102.2 kPa
Test by:	Xia Yang
Test Date:	2020-01-17

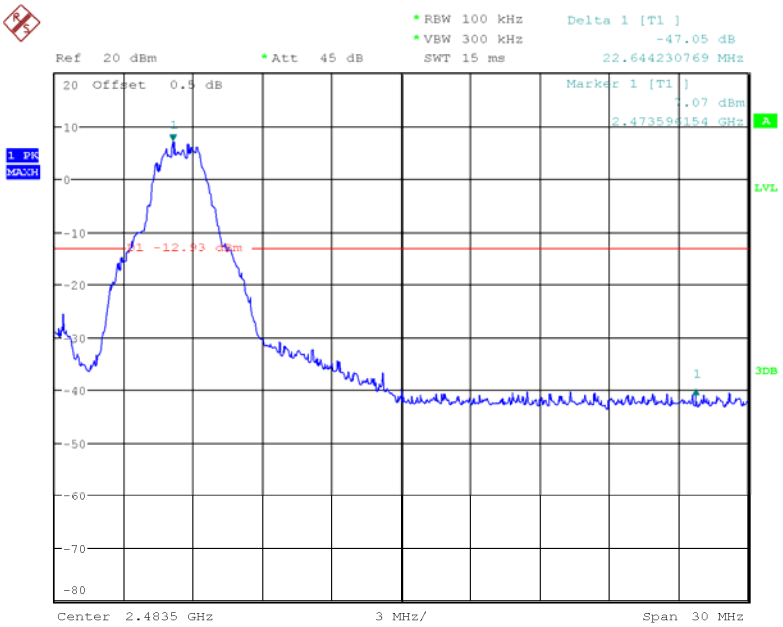
Test Result: Compliance

Single Channel Mode,
ANT 1:

Band Edge, Left Side



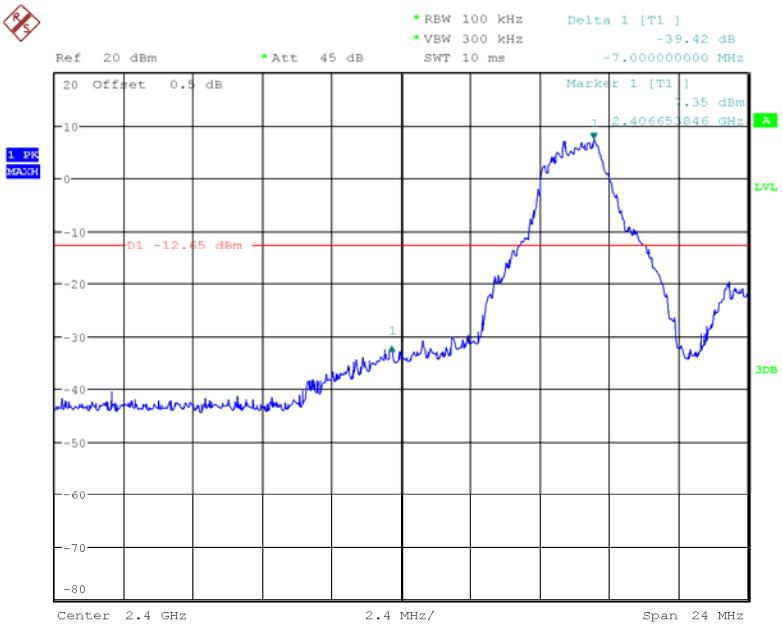
Band Edge, Right Side



Date: 17.JAN.2020 20:30:05

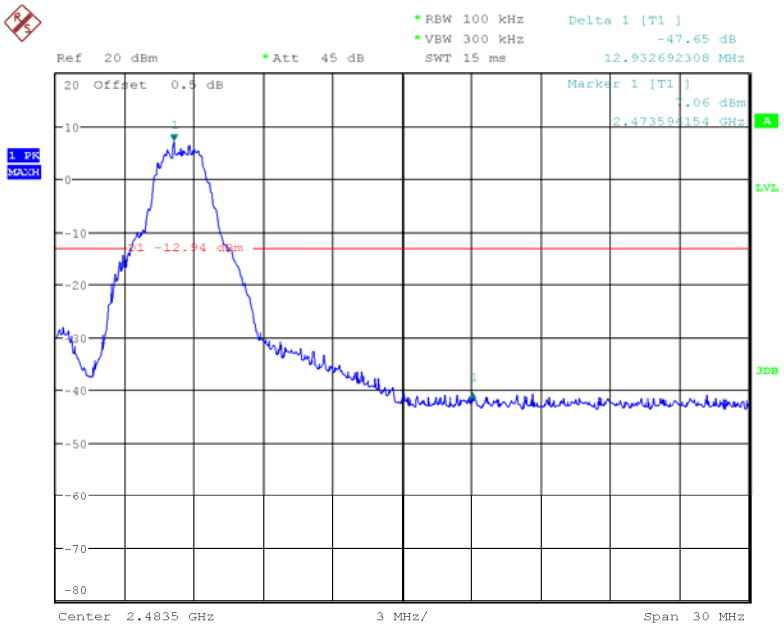
ANT 2:

Band Edge, Left Side



Date: 17.JAN.2020 20:56:14

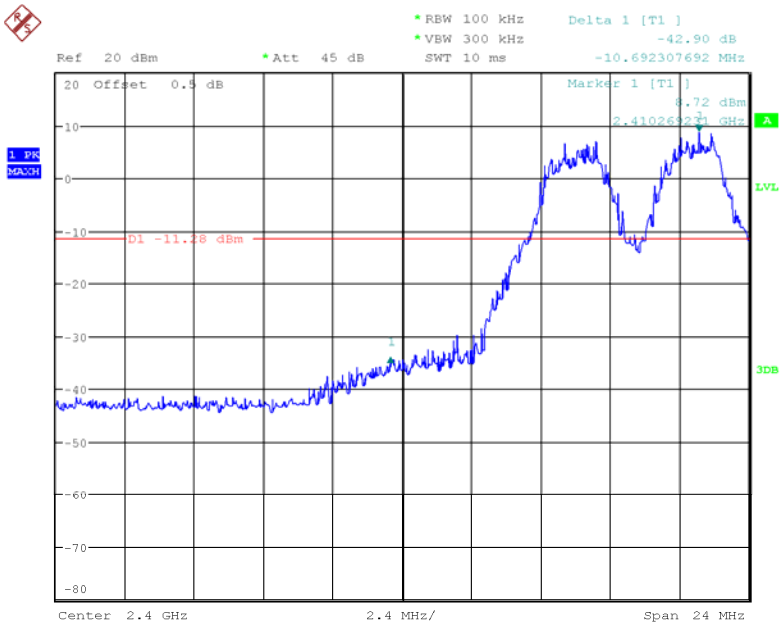
Band Edge, Right Side



Date: 17.JAN.2020 20:59:17

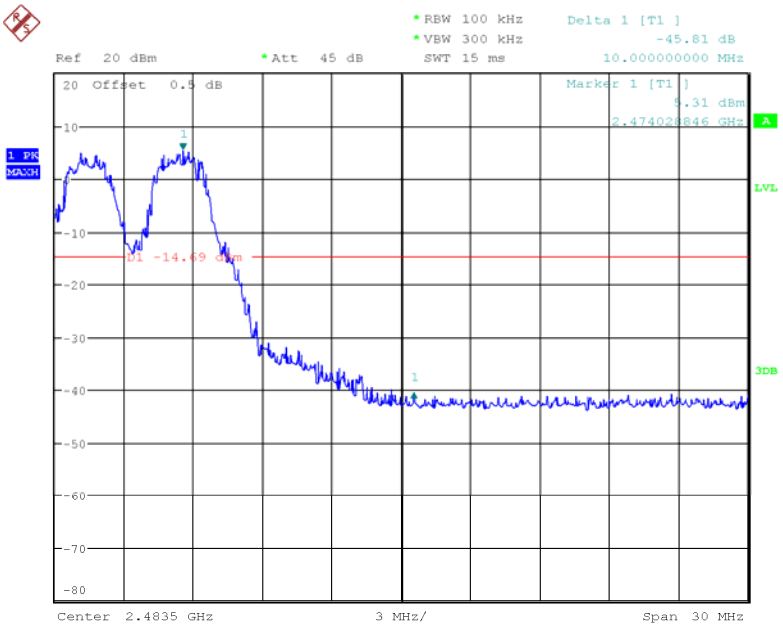
Hopping Channel Mode,
ANT 1:

Band Edge, Left Side



Date: 17.JAN.2020 20:26:55

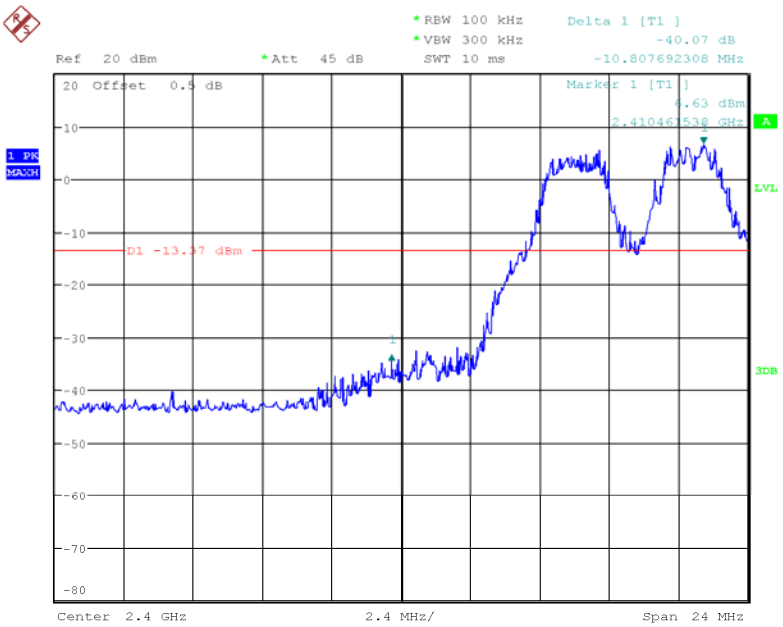
Band Edge, Right Side



Date: 17.JAN.2020 20:28:42

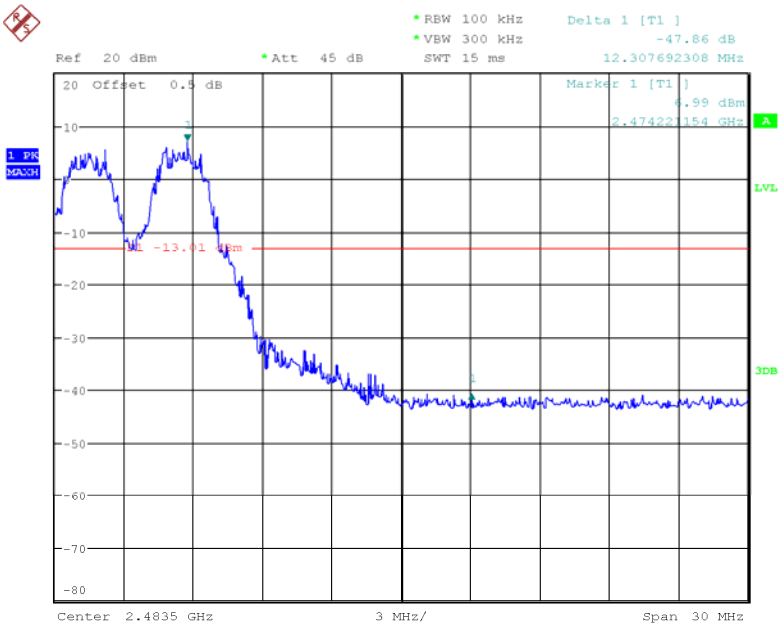
ANT 2:

Band Edge, Left Side



Date: 17.JAN.2020 20:57:10

Band Edge, Right Side



Date: 17.JAN.2020 20:58:02

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